

Autonics

INDUCTIVE PROXIMITY SENSOR CYLINDRICAL TYPE AC 2WIRE

M A N U A L



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

Caution for your safety

※Please keep "Caution for your safety" to avoid accidents or damages as using it correctly.

※The meaning of 'Warning' and 'Caution' is as follows;

Warning In case a serious injury or dead may be occurred.

Caution In case a little injury or damage of this unit may be occurred.

※The meaning of the mark on the product and manual is as follows;
△ is a caution mark for danger in special condition.

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.

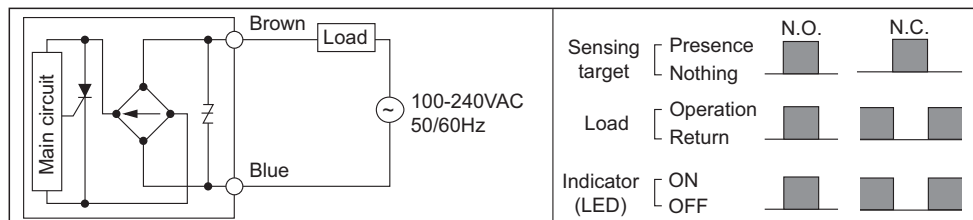
Caution

- 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.
- Please observe the rated specifications. It may cause serious damage to the product.

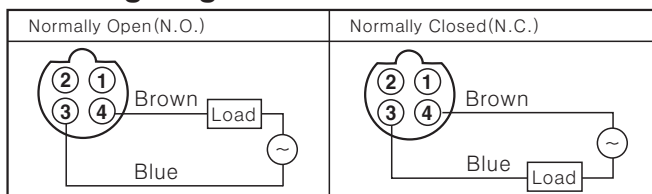
Ordering information

P	R	L	18	-	5	A	O	Output	O	Normally open
								Power supply	C	Normally closed
								Sensing distance	A	100-240VAC
								Dimension	Number	Standard sensing distance(Unit: mm)
								Body size	Number	Diameter of head(Unit: mm)
								Shape	No mark	Standard type
									L	Long body
									R	Cylindrical type
									P	Inductive proximity sensor

Control output diagram & Load operation



Wiring diagram



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

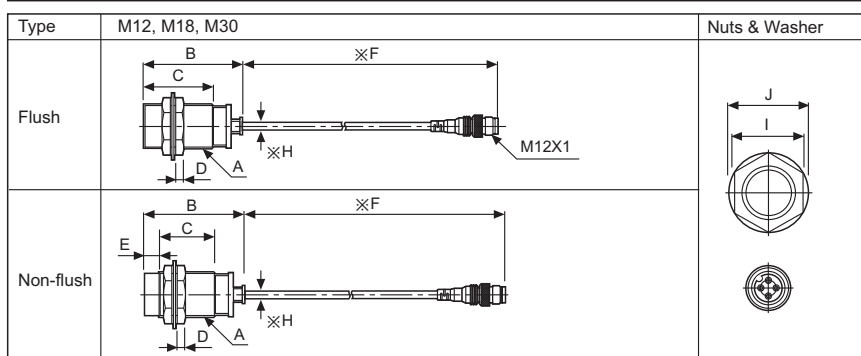
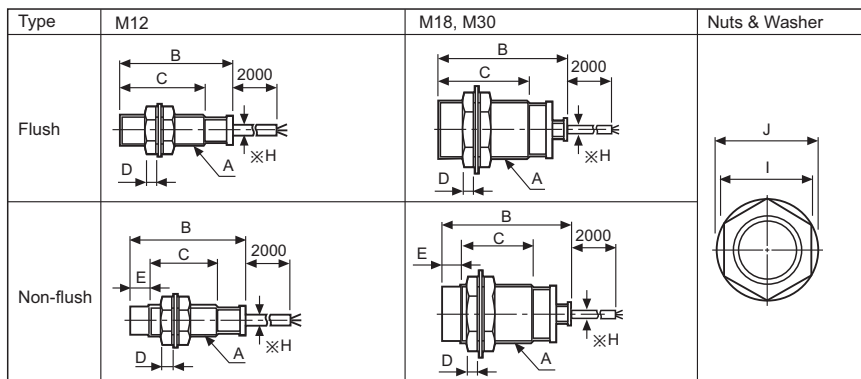
※The above specification are subject to change without notice.

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	PR18-8AO PR18-8AC PRL18-8AO PRW18-8AO PRWL18-8AO	PR30-10AO PR30-10AC PRL30-10AO PRW30-10AO PRWL30-10AO	PR30-15AO PR30-15AC PRL30-15AO PRW30-15AO PRWL30-15AO
Sensing distance	2mm	4mm	5mm	8mm	10mm	15mm
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12X2X1mm(Iron)		18X18X1mm(Iron)	25X25X1mm(Iron)	30X30X1mm(Iron)	45X45X1mm(Iron)
Setting distance	0 to 1.4	0 to 2.8	0 to 3.5	0 to 5.6	0 to 7	0 to 10.5
Power supply	100-240VAC 50/60Hz(Operating voltage: 85-264VAC)					
Leakage current	Max. 2.5mA					
Response frequency	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 1 minute					
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					
Environment	Ambient temperature: -25 to 70°C, Storage: -30 to 80°C Ambient humidity: 35 to 95%RH, Storage: 35 to 95%RH					
Protection circuit	Surge protection circuit					
Material	Case and nut: Nickel-plated brass, Washer: Nickel-plated steel, Sensing part: Heat-resistant ABS, General cable(Black): Polyvinyl chloride (PVC)					
Protection	IP67(IEC standard)					
Approval	CE					
Unit weight	PR: Approx. 72g PRW: Approx. 42g	PR: Approx. 118g, PRL: Approx. 130g PRW: Approx. 66g, PRWL: Approx. 78g	PR: Approx. 170g, PRL: Approx. 208g PRW: Approx. 122g, PRWL: Approx. 158g			

※Environment resistance is rated at no freezing or condensation.

Dimensions



※'F' standard: Cable outgoing connector type 300mm.

※'H' type: ø4, 2 cores/ø5, 2 cores(Conductor cross section: 0.3mm², Insulator diameter: ø1.25)

Item	Type	Model	A	B	C	D	E	F	H	I	J
Flush	M12	PR	M12X1	63	48.5	4	-	300	4	17	21
		PRW	M18X1	54	35.8	4	-	300	5	24	29
		PRL	M18X1	80.5	62.5	4	-	300	5	24	29
	M30	PR	M30X1.5	58	38	5	-	300	5	35	42
		PRW	M30X1.5	80	60	5	-	300	5	35	42
		PRWL	M30X1.5	80	60	5	-	300	5	35	42
Non-flush	M12	PR	M12X1	63	41.5	4	7	300	4	17	21
		PRW	M18X1	54	25	4	10	300	5	24	29
		PRL	M18X1	80	52	4	10	300	5	24	29
	M30	PR	M30X1.5	58	28	5	10	300	5	35	42
		PRW	M30X1.5	80	50	5	10	300	5	35	42
		PRWL	M30X1.5	80	50	5	10	300	5	35	42

Connection of the power supply

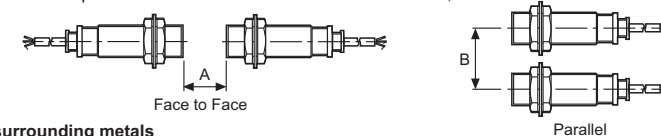
Be sure to connect the power after connecting the load, because direct connection of the proximity sensor may cause damage to the inner circuit of this product.



Mutual-interference & Influence by surrounding metals

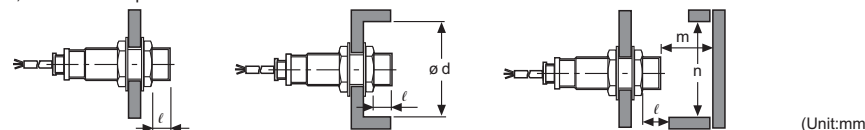
Mutual-interference

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.



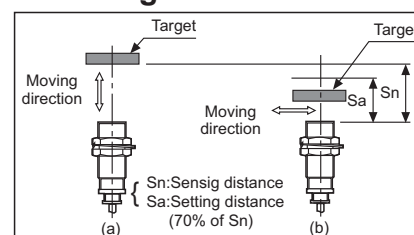
Influence by surrounding metals

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 Item	PR□12-2AO PRW□12-2AO	PR□12-4AO PRW□12-4AO	PR□18-5AO PRW□18-5AO	PR□18-8AO PRW□18-8AO	PR□30-10AO PRW□30-10AO	PR□30-15AO PRW□30-15AO
A	12	24	30	48	60	90
B	24	36	36	54	60	90
ℓ	0	11	0	14	0	15
ø d	12	36	18	54	30	90
m	6	12	15	24	30	45
n	18	36	27	54	45	90

Setting distance

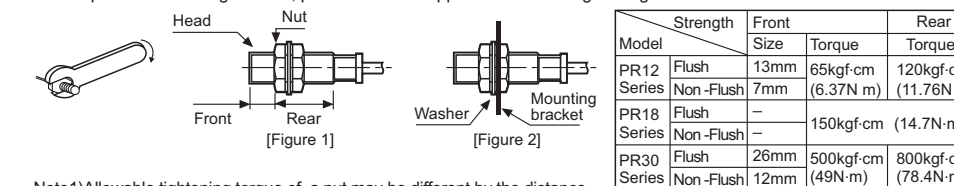


●Sensing distance can be changed by the shape, size or material of the target. Therefore please check the sensing distance (Sa) as (a), then pass the target within range of setting distance (Sn) as (b).

●Setting distance (Sa) = Sensing distance (Sn) X 70%
Ex) PR30-10AO
Setting distance (Sa) = 10mm X 0.7 = 7mm

Caution for using

- This equipment shall not be used outdoors or beyond specified temperature range.
- Do not apply over tensile strength of cord. (ø 4 : max. 30N, ø 5 : max. 50N)
- Do not use the same conduit with cord of this unit and electric power line or power line.
- Do not put overload to tighten nut, please use the supplied 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 front part range is from head to the size of [Table 1] and the rear part includes a nut (see above [Figure 1]).

Note2) The allowable tightening torque denotes a torque value when using a provided washer as above [Figure 2].

- Please check the voltage changes of power source in order not to exceed the rated power input.
- Do not connect capacity load to output part directly.
- Please make wire short as much as possible in order to avoid noise.
- Be sure to use cable as indicated specification on this product. If using wrong cable or bended cable, it shall not have waterproof properties.
- It is possible to extend cable with over 0.3mm² and max. 200m.
- If the target is plated, the operating 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 occur 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 connecting the load with big inrush current (DC type bulb) to this unit, the big inrush current will flow because 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 current limit resistor in order to protect proximity sensor.
- In case of the load current is low : When the load current is under 5mA, make the residual voltage is less than return voltage by connecting the bleeder resistor and load in parallel to flow 5mA to proximity sensor.
※110VAC 50/60Hz : 20kΩ, Min. 3W, 220VAC 50/60Hz : 39kΩ, Min. 5W
- If making a transceiver close to proximity sensor or wire connection, it may cause malfunction.

※It may cause malfunction if above instructions are not followed.

Major products

- Proximity sensors
- Area sensors
- Door/Door side sensors
- Counters
- Rotary encoders
- Power controllers
- Panel meters
- Temperature controllers
- Temperature/Humidity transducers
- Stepping motors/drivers/motion controllers
- Laser marking system(CO₂, Nd:YAG)
- Laser welding/soldering system
- Photoelectric sensors
- Fiber optic sensors
- Pressure sensors
- Timers
- Display units
- Sensor controllers
- Graphic/Logic panels
- Tachometer/Pulse(Rate) meters

Autonics Corporation
http://www.autonics.com

Satisfiable Partner For Factory Automation

HEAD QUARTERS :
41-5, Yongsang-dong, Yongsan-si, Gyeongnam, 626-847, Korea

OVERSEAS SALES :
Bldg. 402 3rd FL, Bucheon Techno Park, 193, Yaksan-dong, Wonmi-gu, Bucheon-si, Gyeonggi-do, 420-734, Korea
TEL: 82-32-610-2730 / FAX: 82-32-329-0728
E-mail : sales@autonics.com

The proposal of a product improvement and development : product@autonics.com

Autonics

INDUCTIVE PROXIMITY SENSOR DC 2-WIRE TYPE



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

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

1. 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.

2. Do not connect power directly without load.
It may cause damage to inner components or burn them out.

Caution

1. 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.

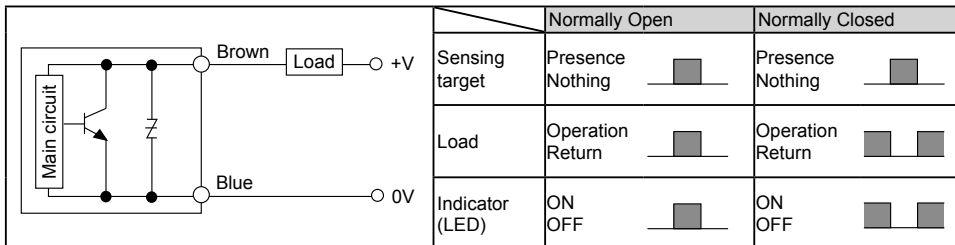
2. Do not impact on this unit.
It may cause malfunction or damage to the product.

3. 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

P	R	CMT	12	-	2	D	O	U	-	IV
Item	Shape	Connection	Dimension	Sensing distance	Power supply	Control output	Sensing side	Cable type	No mark	
									Standard cable	
									Standard cable(IEC standards model)	
									Oil resistant cable	
									Oil resistant cable(IEC standards model)	
									Standard type	
									Upper sensing type	
									Normally Open(N.O.)	
									Normally Closed(N.O.)	
									12-24VDC(Non-polarity type)	
									12-24VDC	
									Standard sensing distance(Unit: mm)	
									Diameter of head(mm)	
									One side length(mm)	
									DC 2-wire, cable outgoing type	
									DC 2-wire, cable outgoing connector type	
									DC 2-wire, connector type	
									Cylindrical type	
									Square new design type	
									Inductive proximity sensor	

Control output diagram & Load operation



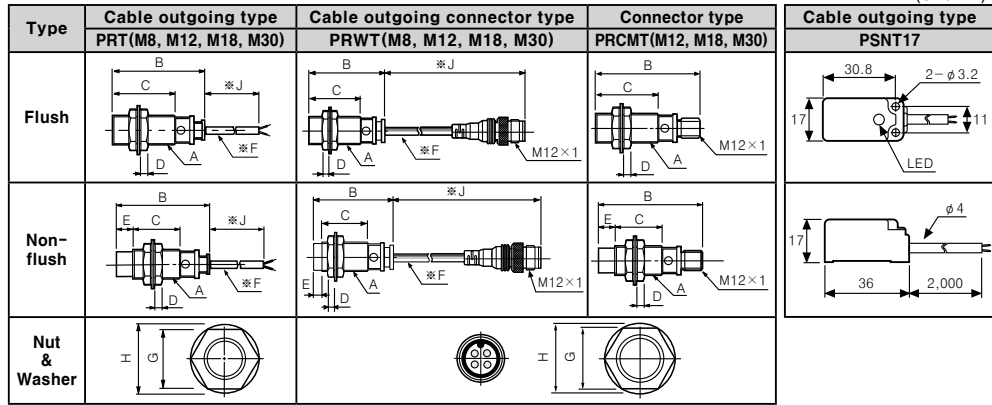
※The above specifications are subject to change without notice.

Specifications

Model	PRT08-1.5DO PRT08-1.5DC PRWT08-1.5DO PRWT08-1.5DC PRWT08-1.5DO-V PRWT08-1.5DC-V PRWT08-1.5DO-IV PRWT08-1.5DC-IV	PRT08-2DO PRT08-2DC PRWT08-2DO PRWT08-2DC PRWT08-2DO-V PRWT08-2DC-V PRWT08-2DO-IV PRWT08-2DC-IV	PRT12-2 DO PRT12-2 C PRWT12-2 DO PRWT12-2 C PRWT12-2 DO-IV PRWT12-2 C-IV PRCMT12-2DO PRCMT12-2DC PRCMT12-2DO-IV PRCMT12-2DC-IV	PRT12-4 DO PRT12-4 C PRWT12-4 DO PRWT12-4 C PRWT12-4 DO-IV PRWT12-4 C-IV PRCMT12-4DO PRCMT12-4DC PRCMT12-4DO-IV PRCMT12-4DC-IV	PRT18-5 DO PRT18-5 C PRWT18-5 DO PRWT18-5 C PRWT18-5 DO-IV PRWT18-5 C-IV PRCMT18-5DO PRCMT18-5DC PRCMT18-5DO-IV PRCMT18-5DC-IV	PRT18-8 DO PRT18-8 C PRWT18-8 DO PRWT18-8 C PRWT18-8 DO-IV PRWT18-8 C-IV PRCMT18-8DO PRCMT18-8DC PRCMT18-8DO-IV PRCMT18-8DC-IV	PRT30-10 DO PRT30-10 C PRWT30-10 DO PRWT30-10 C PRWT30-10 DO-IV PRWT30-10 C-IV PRCMT30-10DO PRCMT30-10DC PRCMT30-10DO-IV PRCMT30-10DC-IV	PRT30-15 DO PRT30-15 C PRWT30-15 DO PRWT30-15 C PRWT30-15 DO-IV PRWT30-15 C-IV PRCMT30-15DO PRCMT30-15DC PRCMT30-15DO-IV PRCMT30-15DC-IV	PSNT17-5DO PSNT17-5DC PSNT17-5DOU 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
Power supply (Operating voltage)	12-24VDC(10-30VDC)								
Leakage current	Max. 0.6mA								
Response frequency	1.5kHz		1.0kHz		1.5kHz		500Hz		350Hz
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(PR-T08 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)								
Materials	Case/Nut : Nickel plated Brass, Washer : Nickel plated Iron, Sensing surface : Heat-resistant ABS, Standard cable(Black) : Polyvinyl chloride(PVC), Oil resistant cable(Gray) : Oil resistant Polyvinyl chloride(PVC)								
Approval	CE								
Weight	PRT: Approx. 52g PRWT: Approx. 32g		PRT: Approx. 72g PRWT: Approx. 42g PRCMT: Approx. 26g		PRT: Approx. 110g PRWT: Approx. 58g PRCMT: Approx. 48g		PRT: Approx. 170g PRWT: Approx. 122g PRCMT: Approx. 142g		PSNT: 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.
※Environment resistance is rated at no freezing or condensation.

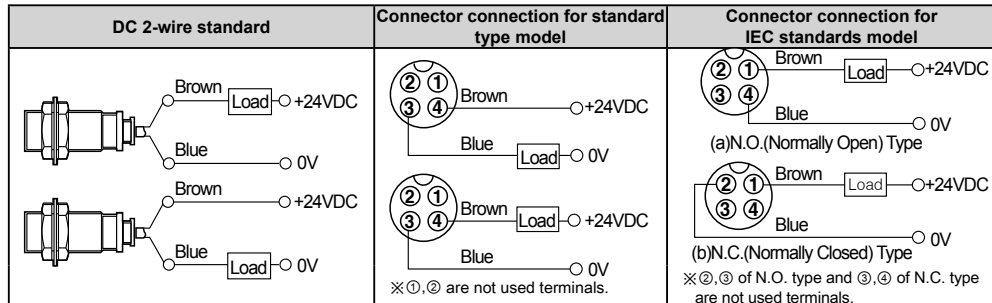
Dimensions



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

※'J' type standard : Cable outgoing type/2,000mm, Cable outgoing connector type/300mm
※'F' type : ø3.5, 2 cores(Conductor cross section:0.2mm², Insulator diameter:ø1), ø4, 2 cores/ø5, 2 cores(Conductor cross section:0.3mm², Insulator diameter:ø1.25)

Connections

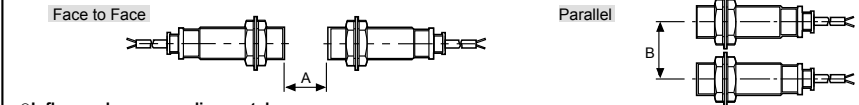


※Load can be wired to any direction.
※No need to consider polarity for non-polarity type of power supply.

Mutual-interference & Influence by surrounding metals

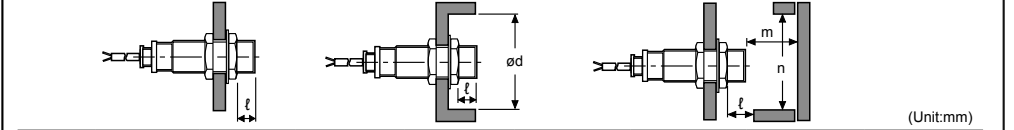
Mutual-interference

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.

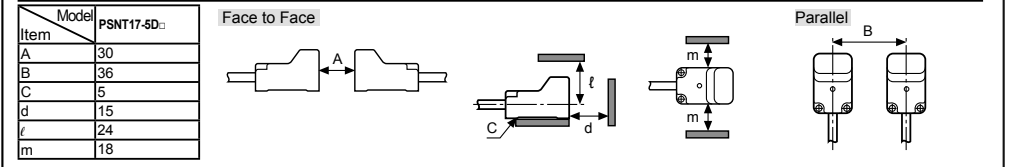


Influence by surrounding metals

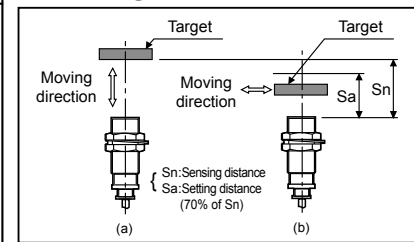
When sensors are mounted on metallic panel, it must be prevented sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart.



Model	PRT08-1.5DO PRWT08-1.5DO	PRT08-2DO PRWT08-2DO	PRT12-2DO PRWT12-2DO PRCMT12-2DO	PRT12-4DO PRWT12-4DO PRCMT12-4DO	PRT18-5DO PRWT18-5DO PRCMT18-5DO	PRT18-8DO PRWT18-8DO PRCMT18-8DO	PRT30-10DO PRWT30-10DO PRCMT30-10DO	PRT30-15DO PRWT30-15DO PRCMT30-15DO
A	9	12	12	24	30	48	60	90
B	16	24	24	36	36	54	60	90
t	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



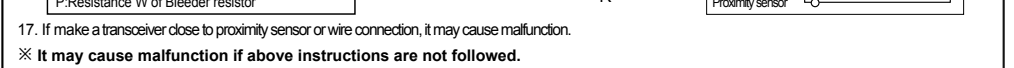
Setting distance



• 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

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.
$$V_s = \text{Power supply, } I_o: \text{Min. operating current for proximity sensor, } I_{off}: \text{Return current of load, } P: \text{Resistance } W \text{ of Bleeder resistor}$$
$$\approx R_s \leq \frac{V_s}{I_o - I_{off}} \text{ (k}\Omega\text{)} \quad P > \frac{V_s^2}{R} \text{ (mW)}$$



17. If make a transceiver close to proximity sensor or wire connection, it may cause malfunction.
※ It may cause malfunction if above instructions are not followed.

Major products

- Proximity sensors
- Area sensors
- Photoelectric sensors
- Fiber optic sensors
- Door/Door side sensors
- Sensor controllers
- Graphic/Logic panels
- Temperature controllers
- Temperature/Humidity transducers
- Stepping motors/drivers/motion controllers
- Laser marking system(CO₂, Nd:YAG)
- Laser welding/soldering system
- Counters
- Timers
- Display units
- Panel meters
- Pressure sensors
- Rotary encoders
- Power controllers
- Tachometer/Pulse(Rate) meters
- Switching power supplies
- Field network devices

Autonics Corporation
http://www.autonics.com

Satisfiable Partner For Factory Automation

■HEAD QUARTERS:
41-5, Yongdang-dong, Yangsan-si, Gyeongsang, 626-847, Korea

■OVERSEAS SALES:
Bldg. 402, 3rd FL., Bucheon Techno Park, 193, Yaksdae-dong, Wonn-gu, Bucheon-si, Gyeonggi-do, 420-734, Korea
TEL : 82-32-610-2730 / FAX : 82-32-329-0728
E-mail : sales@autonics.com

The proposal of a product improvement and development. product@autonics.com

Autonics

INDUCTIVE PROXIMITY SENSOR CYLINDRICAL TYPE DC 3WIRE

M A N U A L



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

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

1. 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.

Caution

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

Ordering information

P	R	W	L	18	5	DN	V
Cable type							
Output							
Sensing distance							
Dimension							
Body size							
Connection							
Shape							
Item							
No mark	Standard cable						
V	Oil resistant cable						
S	Option						
DN	NPN N.O.(Normally Open)						
DN2	NPN N.C.(Normally Closed)						
DP	PNP N.O.(Normally Open)						
DP2	PNP N.C.(Normally Closed)						
Number	Standard sensing distance(Unit: mm)						
Number	Diameter of head(mm)						
No mark	Standard						
S	Short body						
L	Long body						
No mark	DC 3 wire, cable outgoing type						
W	DC 3 wire, cable outgoing connector type						
R	Cylindrical type						
P	Inductive proximity sensor						

Control output diagram & Load operating

NPN Output		Brown Black Blue	+V 0V	Load	Normally Open	Normally Closed	
					Sensing target	Presence	Presence
					Load (Brown-Black)	Operation	Operation
					Output voltage (Black-Blue)	H	H
PNP Output		Brown Black Blue	+V 0V	Load	Normally Open	Normally Closed	
					Sensing target	Presence	Presence
					Load (Black-Blue)	Operation	Operation
					Output voltage (Black-Blue)	H	H
Indicator (LED)		ON	OFF	ON	OFF		

※The above specifications are subject to change without notice.

Specifications

Model	PR08-1.5DN PR08-1.5DP PR08-1.5DN2 PR08-1.5DP2 PRL08-1.5DN PRL08-1.5DP PRL08-1.5DN2 PRL08-1.5DP2 PRW08-1.5DN PRW08-1.5DP PRW08-1.5DN2 PRW08-1.5DP2 PRW08-1.5DN-V PRW08-1.5DP-V PRW08-1.5DN2-V PRW08-1.5DP2-V PRWL08-1.5DN PRWL08-1.5DP PRWL08-1.5DN2 PRWL08-1.5DP2	PR08-2DN PR08-2DP PR08-2DN2 PR08-2DP2 PRL08-2DN PRL08-2DP PRL08-2DN2 PRL08-2DP2 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	PR12-2DN PR12-2DP PR12-2DN2 PR12-2DP2 PRS12-2DN PRS12-2DP PRS12-2DN2 PRS12-2DP2	PR12-4DN PR12-4DP PR12-4DN2 PR12-4DP2 PRL12-4DN PRL12-4DP PRL12-4DN2 PRL12-4DP2 PRW12-4DN PRW12-4DP PRW12-4DN2 PRW12-4DP2 PRWL12-4DN PRWL12-4DP PRWL12-4DN2 PRWL12-4DP2	PR18-5DN PR18-5DP PR18-5DN2 PR18-5DP2 PRL18-5DN PRL18-5DP PRL18-5DN2 PRL18-5DP2 PRW18-5DN PRW18-5DP PRW18-5DN2 PRW18-5DP2 PRWL18-5DN PRWL18-5DP PRWL18-5DN2 PRWL18-5DP2	PR30-10DN PR30-10DP PR30-10DN2 PR30-10DP2 PRL30-10DN PRL30-10DP PRL30-10DN2 PRL30-10DP2 PRW30-10DN PRW30-10DP PRW30-10DN2 PRW30-10DP2 PRWL30-10DN PRWL30-10DP PRWL30-10DN2 PRWL30-10DP2	PR30-15DN PR30-15DP PR30-15DN2 PR30-15DP2 PRL30-15DN PRL30-15DP PRL30-15DN2 PRL30-15DP2 PRW30-15DN PRW30-15DP PRW30-15DN2 PRW30-15DP2 PRWL30-15DN PRWL30-15DP PRWL30-15DN2 PRWL30-15DP2									
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)		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 (Operating voltage)	12-24VDC (10-30VDC)															
Current consumption	Max. 10mA															
Response frequency	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 ~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 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	Operating indicator(RED LED)															
Environment	Ambient temperature: -25 to 70°C, Storage: -30 to 80°C															
	Ambient humidity: 35 to 95%RH, Storage: 35 to 95%RH															
Protection circuit	Surge protection, Reverse polarity protection, Overload & short circuit protection															
	IP67(IEC Standards)															
Materials	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: Heat-resistant ABS, Standard cable(Black): Polyvinyl chloride(PVC), Oil resistant cable(Gray): Oil resistant Polyvinyl chloride(PVC)															
Approval	CE															
Unit weight	PR: Approx. 52g PRL: Approx. 54g PRW: Approx. 32g PRWL: Approx. 34g			PR: Approx. 72g PRS: Approx. 70g PRW: Approx. 42g PRL: Approx. 76g			PR: Approx. 110g PRL: Approx. 130g PRW: Approx. 58g PRL: Approx. 78g			PR: Approx. 170g PRL: Approx. 210g PRW: Approx. 122g PRL: Approx. 158g						

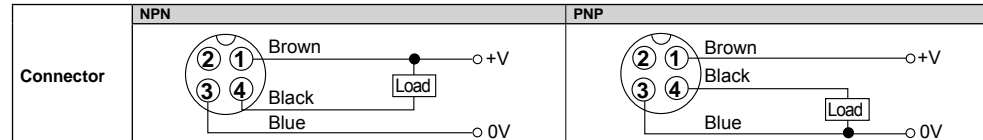
Dimensions

Type	Cable outgoing type	Cable outgoing 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	
Flush	M8	PR	M8×1	30	30	4	—	2,000	3.5	13	15
		PRL	M8×1	40	40	4	—	2,000	3.5	13	15
		PRW	M8×1	30	30	4	—	300	4	13	15
		PRWL	M8×1	40	40	4	—	300	4	13	15
	M12	PR	M12×1	46	31.5	4	—	2,000	4	17	21
		PRS	M12×1	39	24.5	4	—	2,000	4	17	21
		PRW	M12×1	46	31.5	4	—	300	4	17	21
		PRL	M12×1	58.5	44	4	—	2,000	4	17	21
	M18	PR	M18×1	47.5	29.5	4	—	2,000	5	24	29
		PRL	M18×1	80.5	62	4	—	2,000	5	24	29
		PRW	M18×1	47.5	29.5	4	—	300	5	24	29
		PRWL	M18×1	80.5	62	4	—	300	5	24	29
M30	PR	M30×1.5	58	38	5	—	2,000	5	35	42	
	PRL	M30×1.5	80	60	5	—	2,000	5	35	42	
	PRW	M30×1.5	58	38	5	—	300	5	35	42	
	PRWL	M30×1.5	80	60	5	—	300	5	35	42	
Non-flush	M8	PR	M8×1	30	30	4	4	2,000	3.5	13	15
		PRL	M8×1	40	40	4	4	2,000	3.5	13	15
		PRW	M8×1	30	30	4	4	300	4	13	15
		PRWL	M8×1	40	40	4	4	300	4	13	15
	M12	PR	M12×1	46	31.5	4	7	2,000	4	17	21
		PRS	M12×1	39	24.5	4	7	2,000	4	17	21
		PRW	M12×1	46	31.5	4	7	300	4	17	21
		PRL	M12×1	58.5	37	4	7	2,000	4	17	21
	M18	PR	M18×1	47	29	4	10	2,000	5	24	29
		PRL	M18×1	80	62	4	10	2,000	5	24	29
		PRW	M18×1	47	29	4	10	300	5	24	29
		PRWL	M18×1	80	62	4	10	300	5	24	29
M30	PR	M30×1.5	58	38	5	10	2,000	5	35	42	
	PRL	M30×1.5	80	60	5	10	2,000	5	35	42	
	PRW	M30×1.5	58	38	5	10	300	5	35	42	
	PRWL	M30×1.5	80	60	5	10	300	5	35	42	

※F type standard: Cable outgoing type/2,000mm, Cable outgoing connector type/300mm
※G type: ø3.5, 3 cores(Conductor cross section: 0.2mm², Insulator diameter: ø1) and ø4, 3 cores/ø5, 3 cores(Conductor cross section: 0.3mm², Insulator diameter: ø1.25)

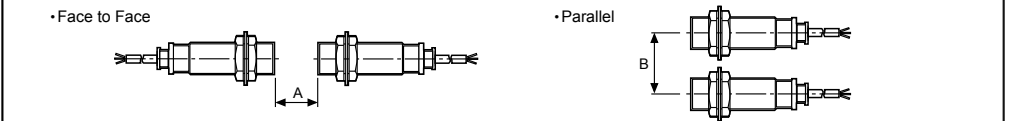
Connections



Mutual-interference & Influence by surrounding metals

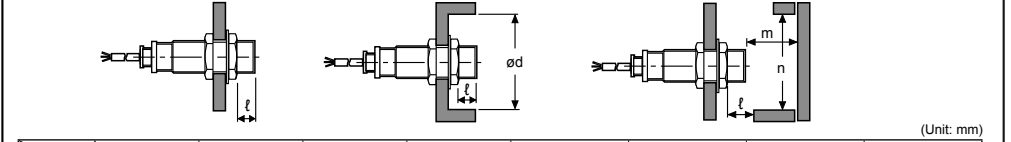
Mutual-interference

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.



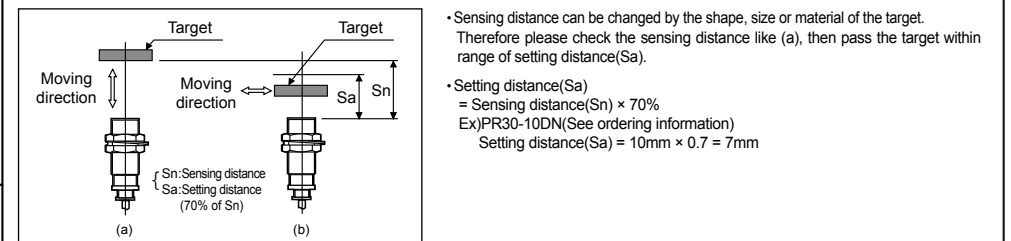
Influence by surrounding metals

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	9	12	12	24	30	48	60	90
A	16	24	24	36	36	54	60	90
B	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



Caution for using

- This equipment shall not be used outdoors or beyond specified temperature range.
- Do not apply over 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.
- Do not put overload to tighten nut, please use the supplied washer for tightening.

Model	Series	Strength	Front		Rear	
			Size	Torque	Size	Torque
PR08	Flush	7mm	40kgf·cm	90kgf·cm		
	Non-flush	5mm	(3.92N·m)	(8.82N·m)		
PR12	Flush	13mm	65kgf·cm	120kgf·cm		
	Non-flush	7mm	(6.37N·m)	(11.76N·m)		
PR18	Flush	-	150kgf·cm			
	Non-flush	-	(14.7N·m)			
PR30	Flush	26mm	500kgf·cm	800kgf·cm		
	Non-flush	12mm	(49N·m)	(78.4N·m)		

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 [Picture 1] respectively. The rear part includes a nut on the head side(see above [Picture 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 [Picture 2].
- Please check the voltage changes of power source in order not to exceed the rated power input.
 - Do not use this unit during transient time(80ms) after apply power.
 - It might result in damage to this product, if use automatic transformer. So please use insulated transformer.
 - Please make wire as short as possible in order to avoid noise.
 - Be sure to use cable as indicated specification on this product. If wrong cable or bended cable is used, it shall not maintain the water proof.
 - It is possible to extend cable with over 0.3mm² and max. 200m.
 - If the target is plated, the operating 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 connecting the load with big inrush current(DC type bulb) to this unit, the big inrush current will flow because 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.
 - If making a transceiver close to proximity sensor or wire connection, it may cause malfunction.

※It may cause malfunction if above instructions are not followed.

Major products

- Proximity sensors
- Area sensors
- Photoelectric sensors
- Fiber optic sensors
- Door/Door side sensors
- Sensor controllers
- Graphic/Logic panels
- Temperature controllers
- Tachometer/Pulse(Rate) meters
- Temperature/Humidity transducers
- Switching power supplies
- Stepping motors/drivers/motion controllers
- Field network devices
- Laser marking system(CO₂, Nd:YAG)
- Laser welding/soldering system
- Counters
- Timers
- Display units
- Panel meters
- Pressure sensors
- Rotary encoders
- Power controllers

Autonics Corporation
http://www.autonics.com

Satisfiable Partner For Factory Automation

■ HEAD QUARTERS:
41-5, Yongdang-dong, Yangsan-si, Gyeongnam, 626-847, Korea

■ OVERSEAS SALES:
Bldg. 402 3rd FL., Bucheon Techno Park, 193, Yakdae-dong, Wornim-gu, Bucheon-si, Gyeonggi-do, 420-734, Korea
TEL: 82-32-610-2730 / FAX: 82-32-329-0728
E-mail: sales@autonics.com

The proposal of a product improvement and development: product@autonics.com

Autonics

INDUCTIVE PROXIMITY SENSOR DC 2-WIRE TYPE



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

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.

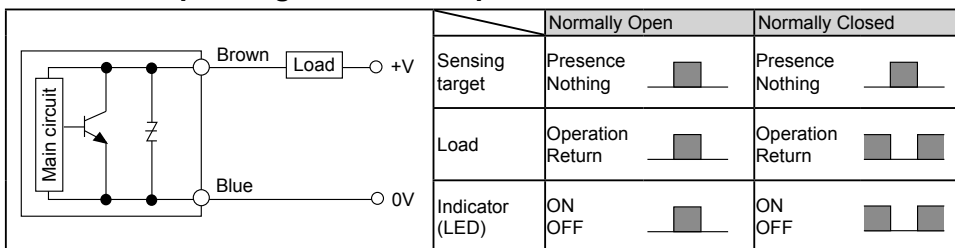
Caution

- 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

P	R	CMT	12	-	2	D	O	U	-	IV
Cable type										
Sensing side										
Control output										
Power supply										
Sensing distance										
Dimension										
Connection										
Shape										
Item										
No mark	Standard cable									
I	Standard cable(IEC standards model)									
V	Oil resistant cable									
IV	Oil resistant cable(IEC standards model)									
No mark	Standard type									
U	Upper sensing type									
O	Normally Open(N.O.)									
C	Normally Closed(N.O.)									
X	12-24VDC(Non-polarity type)									
D	12-24VDC									
Number	Standard sensing distance(Unit: mm)									
Number	Diameter of head(mm)									
Number	One side length(mm)									
T	DC 2-wire, cable outgoing type									
WT	DC 2-wire, cable outgoing connector type									
CMT	DC 2-wire, connector type									
R	Cylindrical type									
SN	Square new design type									
P	Inductive proximity sensor									

Control output diagram & Load operation



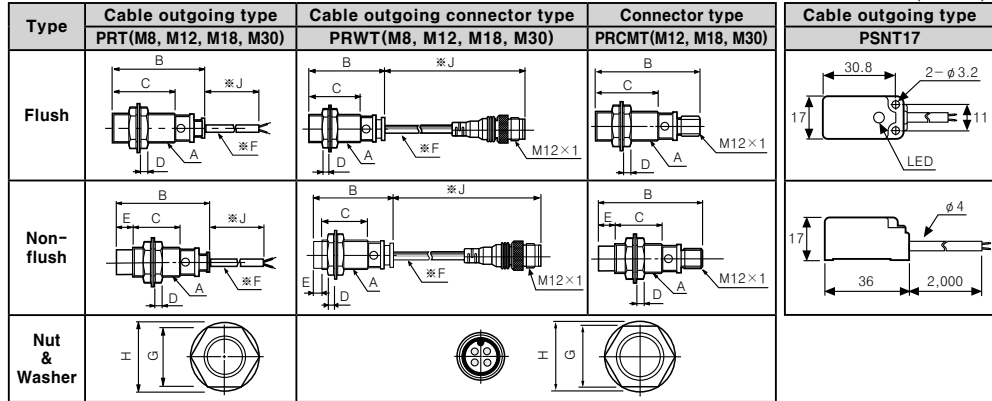
※The above specifications are subject to change without notice.

Specifications

Model	PRT08-1.5DO PRT08-1.5DC PRWT08-1.5DO PRWT08-1.5DC PRWT08-1.5DO-V PRWT08-1.5DC-V PRWT08-1.5DO-IV PRWT08-1.5DC-IV	PRT08-2DO PRT08-2DC PRWT08-2DO PRWT08-2DC PRWT08-2DO-V PRWT08-2DC-V PRWT08-2DO-IV PRWT08-2DC-IV	PRT12-2 O PRT12-2 C PRWT12-2 O PRWT12-2 C PRWT12-2 O-I PRWT12-2 C-I PRWT12-2 O-IV PRWT12-2 C-IV	PRT12-4 O PRT12-4 C PRWT12-4 O PRWT12-4 C PRWT12-4 O-I PRWT12-4 C-I PRWT12-4 O-IV PRWT12-4 C-IV	PRT18-5 O PRT18-5 C PRWT18-5 O PRWT18-5 C PRWT18-5 O-I PRWT18-5 C-I PRWT18-5 O-IV PRWT18-5 C-IV	PRT18-8 O PRT18-8 C PRWT18-8 O PRWT18-8 C PRWT18-8 O-I PRWT18-8 C-I PRWT18-8 O-IV PRWT18-8 C-IV	PRT30-10 O PRT30-10 C PRWT30-10 O PRWT30-10 C PRWT30-10 O-I PRWT30-10 C-I PRWT30-10 O-IV PRWT30-10 C-IV	PRT30-15 O PRT30-15 C PRWT30-15 O PRWT30-15 C PRWT30-15 O-I PRWT30-15 C-I PRWT30-15 O-IV PRWT30-15 C-IV	PSNT17-5DO PSNT17-5DC PSNT17-5DOU 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 7mm
Power supply (Operating voltage)	12-24VDC(10-30VDC)								
Leakage current	Max. 0.6mA								
Response frequency	1.5kHz		1.0kHz		1.5kHz		500Hz		350Hz
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(PR-T08 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)								
Materials	Case/Nut : Nickel plated Brass, Washer : Nickel plated Iron, Sensing surface : Heat-resistant ABS, Standard cable(Black) : Polyvinyl chloride(PVC), Oil resistant cable(Grey) : Oil resistant Polyvinyl chloride(PVC)								
Approval	CE								
Weight	PRT: Approx. 52g PRWT: Approx. 32g		PRT: Approx. 72g PRWT: Approx. 42g PRCMT: Approx. 26g		PRT: Approx. 110g PRWT: Approx. 58g PRCMT: Approx. 48g		PRT: Approx. 170g PRWT: Approx. 122g PRCMT: Approx. 142g		PSNT: 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.
※Environment resistance is rated at no freezing or condensation.

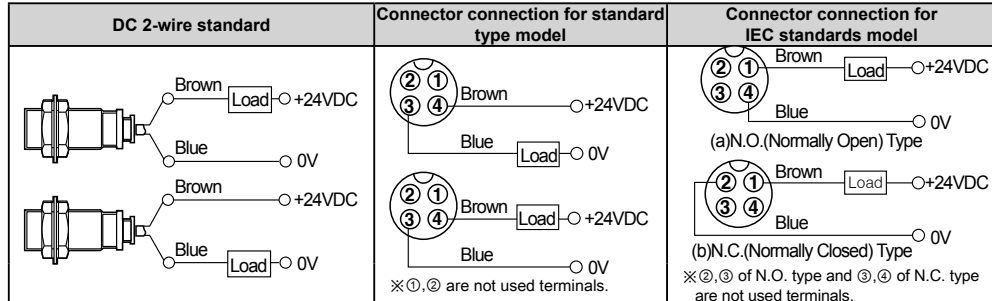
Dimensions



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

※'J' type standard : Cable outgoing type/2,000mm, Cable outgoing connector type/300mm
※'F' type : ø3.5, 2 cores(Conductor cross section:0.2mm², Insulator diameter:ø1), ø4, 2 cores/ø5, 2 cores(Conductor cross section:0.3mm², Insulator diameter:ø1.25)

Connections

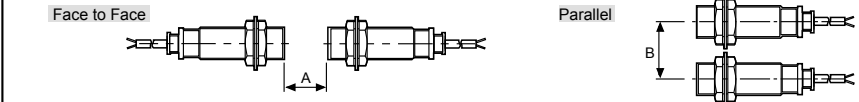


※Load can be wired to any direction.
※No need to consider polarity for non-polarity type of power supply.

Mutual-interference & Influence by surrounding metals

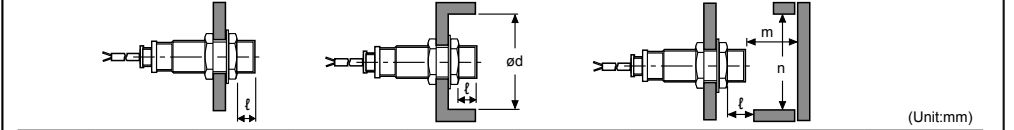
① Mutual-interference

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.

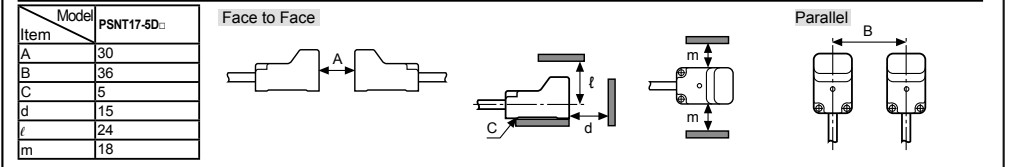


② Influence by surrounding metals

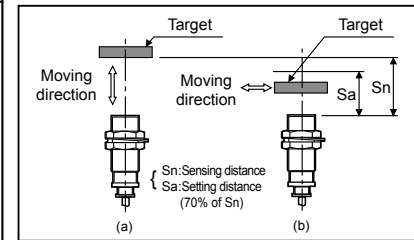
When sensors are mounted on metallic panel, it must be prevented sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart.



Model	PRT08-1.5DO PRWT08-1.5DO	PRT08-2DO PRWT08-2DO	PRT12-2DO PRWT12-2DO	PRT12-4DO PRWT12-4DO	PRT18-5DO PRWT18-5DO	PRT18-8DO PRWT18-8DO	PRT30-10DO PRWT30-10DO	PRT30-15DO PRWT30-15DO
A	9	12	12	24	30	48	60	90
B	16	24	24	36	36	54	60	90
t	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



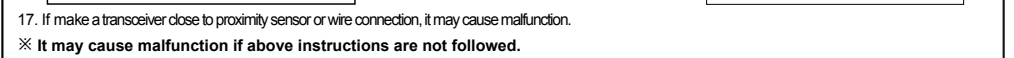
Setting distance



- 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

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.
$$R_s \leq \frac{V_s}{I_o - I_{off}} \text{ (k}\Omega\text{)} \quad P > \frac{V_s^2}{R} \text{ (mW)}$$



17. If make a transceiver close to proximity sensor or wire connection, it may cause malfunction.
※ It may cause malfunction if above instructions are not followed.

Major products

- Proximity sensors
- Area sensors
- Photoelectric sensors
- Fiber optic sensors
- Door/Door side sensors
- Sensor controllers
- Graphic/Logic panels
- Temperature controllers
- Temperature/Humidity transducers
- Stepping motors/drivers/motion controllers
- Laser marking system(CO₂, Nd:YAG)
- Laser welding/soldering system
- Counters
- Timers
- Display units
- Panel meters
- Pressure sensors
- Rotary encoders
- Power controllers
- Tachometer/Pulse(Rate) meters
- Switching power supplies
- Field network devices

Autonics Corporation
http://www.autonics.com

Satisfiable Partner For Factory Automation

HEAD QUARTERS :
41-5, Yongdang-dong, Yangsan-si, Gyeongsang, 626-847, Korea

OVERSEAS SALES :
Bldg. 402 3rd FL., Bucheon Techno Park, 193, Yaksae-dong, Wonmi-gu, Bucheon-si, Gyeonggi-do, 420-734, Korea
TEL : 82-32-610-2730 / FAX : 82-32-329-0728
E-mail : sales@autonics.com

The proposal of a product improvement and development. product@autonics.com

Autonics

INDUCTIVE PROXIMITY SENSOR CYLINDRICAL TYPE DC 3WIRE

M A N U A L



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

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

1. 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.

Caution

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

Ordering information

P	R	W	L	18	-	5	DN	-	V
Cable type									
Output									
Sensing distance									
Dimension									
Body size									
Connection									
Shape									
Item									
No mark	Standard cable								
V	Oil resistant cable								
S	Option								
DN	NPN N.O.(Normally Open)								
DN2	NPN N.C.(Normally Closed)								
DP	PNP N.O.(Normally Open)								
DP2	PNP N.C.(Normally Closed)								
Number	Standard sensing distance(Unit: mm)								
Number	Diameter of head(mm)								
No mark	Standard								
S	Short body								
L	Long body								
No mark	DC 3 wire, cable outgoing type								
W	DC 3 wire, cable outgoing connector type								
R	Cylindrical type								
P	Inductive proximity sensor								

Control output diagram & Load operating

NPN Output		Brown Black Blue	+V 0V	Load	10kΩ	Sensing target	Normally Open	Normally Closed
							Presence	Presence
							Nothing	Nothing
							Operation Return	Operation Return
PNP Output		Brown Black Blue	+V 0V	Load	10kΩ	Sensing target	Normally Open	Normally Closed
							Presence	Presence
							Nothing	Nothing
							Operation Return	Operation Return
Output voltage (Black-Blue)		H	L	H	L			
Indicator (LED)		ON	OFF	ON	OFF			

※The above specifications are subject to change without notice.

Specifications

Model	PR08-1.5DN PR08-1.5DP PR08-1.5DN2 PR08-1.5DP2 PRL08-1.5DN PRL08-1.5DP PRL08-1.5DN2 PRL08-1.5DP2 PRW08-1.5DN PRW08-1.5DP PRW08-1.5DN2 PRW08-1.5DP2 PRW08-1.5DN-V PRW08-1.5DP-V PRW08-1.5DN2 PRW08-1.5DP2	PR08-2DN PR08-2DP PR08-2DN2 PR08-2DP2 PRL08-2DN PRL08-2DP PRL08-2DN2 PRL08-2DP2 PRW08-2DN PRW08-2DP PRW08-2DN2 PRW08-2DP2 PRW08-2DN-V PRW08-2DP-V PRW08-2DN2 PRW08-2DP2	PR12-2DN PR12-2DP PR12-2DN2 PR12-2DP2 PRS12-2DN PRS12-2DP PRS12-2DN2 PRS12-2DP2	PR12-4DN PR12-4DP PR12-4DN2 PR12-4DP2 PRL12-4DN PRL12-4DP PRL12-4DN2 PRL12-4DP2	PR18-5DN PR18-5DP PR18-5DN2 PR18-5DP2 PRL18-5DN PRL18-5DP PRL18-5DN2 PRL18-5DP2 PRW18-5DN PRW18-5DP PRW18-5DN2 PRW18-5DP2	PR18-8DN PR18-8DP PR18-8DN2 PR18-8DP2 PRL18-8DN PRL18-8DP PRL18-8DN2 PRL18-8DP2 PRW18-8DN PRW18-8DP PRW18-8DN2 PRW18-8DP2	PR30-10DN PR30-10DP PR30-10DN2 PR30-10DP2 PRL30-10DN PRL30-10DP PRL30-10DN2 PRL30-10DP2 PRW30-10DN PRW30-10DP PRW30-10DN2 PRW30-10DP2	PR30-15DN PR30-15DP PR30-15DN2 PR30-15DP2 PRL30-15DN PRL30-15DP PRL30-15DN2 PRL30-15DP2 PRW30-15DN PRW30-15DP PRW30-15DN2 PRW30-15DP2								
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)		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 (Operating voltage)	12-24VDC (10-30VDC)															
Current consumption	Max. 10mA															
Response frequency	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 ~ 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	500m/s ² (50G) X, Y, Z directions for 3 times															
Indicator	Operating indicator (Red LED)															
Environment	Ambient temperature: -25 to 70°C, Storage: -30 to 80°C															
	Ambient humidity: 35 to 95%RH, Storage: 35 to 95%RH															
Protection circuit	Surge protection, Reverse polarity protection, Overload & short circuit protection															
	IP67 (IEC Standards)															
Materials	Case/Nut: Nickel plated Brass, Washer: Nickel plated Iron, Sensing surface: Heat-resistant ABS, Standard cable(Black): Polyvinyl chloride(PVC), Oil resistant cable(Gray): Oil resistant Polyvinyl chloride(PVC)															
Approval	CE															
Unit weight	PR: Approx. 52g PRL: Approx. 54g PRW: Approx. 32g PRWL: Approx. 34g			PR: Approx. 72g PRS: Approx. 70g PRW: Approx. 42g PRL: Approx. 76g			PR: Approx. 110g PRL: Approx. 130g PRW: Approx. 58g PRLW: Approx. 78g			PR: Approx. 170g PRL: Approx. 210g PRW: Approx. 122g PRLW: Approx. 158g						

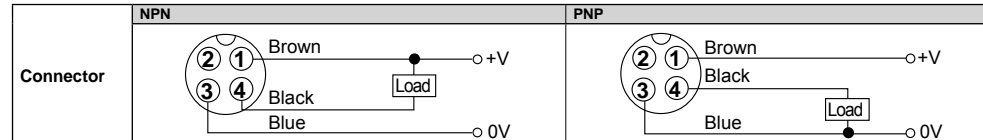
Dimensions

Type	Cable outgoing type	Cable outgoing 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	
Flush	M8	PR	M8×1	30	30	4	-	2,000	3.5	13	15
		PRL	M8×1	40	40	4	-	2,000	3.5	13	15
		PRW	M8×1	30	30	4	-	300	4	13	15
		PRWL	M8×1	40	40	4	-	300	4	13	15
	M12	PR	M12×1	46	31.5	4	-	2,000	4	17	21
		PRS	M12×1	39	24.5	4	-	2,000	4	17	21
		PRW	M12×1	46	31.5	4	-	300	4	17	21
		PRL	M12×1	58.5	44	4	-	2,000	4	17	21
	M18	PR	M18×1	47.5	29.5	4	-	2,000	5	24	29
		PRL	M18×1	80.5	62	4	-	2,000	5	24	29
		PRW	M18×1	47.5	29.5	4	-	300	5	24	29
		PRWL	M18×1	80.5	62	4	-	300	5	24	29
M30	PR	M30×1.5	58	38	5	-	2,000	5	35	42	
	PRL	M30×1.5	80	60	5	-	2,000	5	35	42	
	PRW	M30×1.5	58	38	5	-	300	5	35	42	
	PRWL	M30×1.5	80	60	5	-	300	5	35	42	
Non-flush	M8	PR	M8×1	30	30	4	4	2,000	3.5	13	15
		PRL	M8×1	40	40	4	4	2,000	3.5	13	15
		PRW	M8×1	30	30	4	4	300	4	13	15
		PRWL	M8×1	40	40	4	4	300	4	13	15
	M12	PR	M12×1	46	31.5	4	7	2,000	4	17	21
		PRS	M12×1	39	24.5	4	7	2,000	4	17	21
		PRW	M12×1	46	31.5	4	7	300	4	17	21
		PRL	M12×1	58.5	44	4	7	2,000	4	17	21
	M18	PR	M18×1	47	29	4	10	2,000	5	24	29
		PRL	M18×1	80	62	4	10	2,000	5	24	29
		PRW	M18×1	47	29	4	10	300	5	24	29
		PRWL	M18×1	80	62	4	10	300	5	24	29
M30	PR	M30×1.5	58	38	5	10	2,000	5	35	42	
	PRL	M30×1.5	80	60	5	10	2,000	5	35	42	
	PRW	M30×1.5	58	38	5	10	300	5	35	42	
	PRWL	M30×1.5	80	60	5	10	300	5	35	42	

※F: type standard: Cable outgoing type/2,000mm, Cable outgoing connector type/300mm
 ※G: type: ø3.5, 3 cores (Conductor cross section: 0.2mm², Insulator diameter: ø1) and ø4, 3 cores/ø5, 3 cores (Conductor cross section: 0.3mm², Insulator diameter: ø1.25)

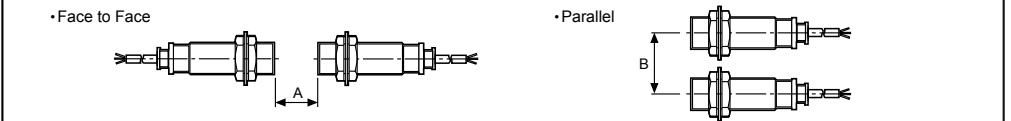
Connections



Mutual-interference & Influence by surrounding metals

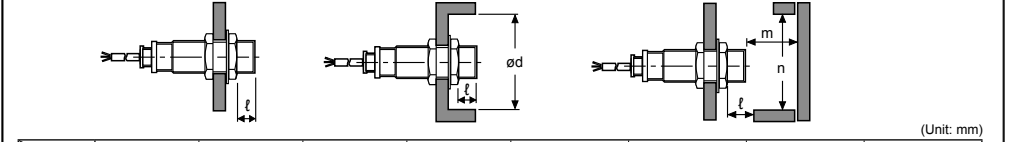
Mutual-interference

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.



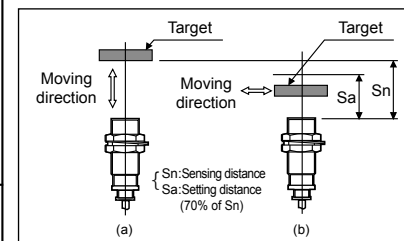
Influence by surrounding metals

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	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
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%
 Ex) PR30-10DN (See ordering information)
 Setting distance(Sa) = 10mm × 0.7 = 7mm

Caution for using

- This equipment shall not be used outdoors or beyond specified temperature range.
- Do not apply over 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.
- Do not put overload to tighten nut, please use the supplied washer for tightening.

Model	Series	Strength	Front		Rear	
			Size	Torque	Size	Torque
PR08	Flush	7mm	40kgf·cm	90kgf·cm		
	Non-flush	5mm	(3.92N·m)	(8.82N·m)		
PR12	Flush	13mm	65kgf·cm	120kgf·cm		
	Non-flush	7mm	(6.37N·m)	(11.76N·m)		
PR18	Flush	-	150kgf·cm			
	Non-flush	-	(14.7N·m)			
PR30	Flush	26mm	500kgf·cm	800kgf·cm		
	Non-flush	12mm	(49N·m)	(78.4N·m)		

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 [Picture 1] respectively. The rear part includes a nut on the head side (see above [Picture 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 [Picture 2].
- Please check the voltage changes of power source in order not to exceed the rated power input.
 - Do not use this unit during transient time(80ms) after apply power.
 - It might result in damage to this product, if use automatic transformer. So please use insulated transformer.
 - Please make wire as short as possible in order to avoid noise.
 - Be sure to use cable as indicated specification on this product. If wrong cable or bended cable is used, it shall not maintain the water proof.
 - It is possible to extend cable with over 0.3mm² and max. 200m.
 - If the target is plated, the operating 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 connecting the load with big inrush current(DC type bulb) to this unit, the big inrush current will flow because 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.
 - If making a transceiver close to proximity sensor or wire connection, it may cause malfunction.

※It may cause malfunction if above instructions are not followed.

Major products

- Proximity sensors
- Area sensors
- Photoelectric sensors
- Fiber optic sensors
- Door/Door side sensors
- Sensor controllers
- Graphic/Logic panels
- Temperature controllers
- Tachometer/Pulse(Rate) meters
- Temperature/Humidity transducers
- Switching power supplies
- Stepping motors/drivers/motion controllers
- Field network devices
- Laser marking system(CO₂, Nd:YAG)
- Laser welding/soldering system
- Counters
- Timers
- Display units
- Panel meters
- Pressure sensors
- Rotary encoders
- Power controllers

Autonics Corporation
<http://www.autonics.com>

Satisfiable Partner For Factory Automation

■ HEAD QUARTERS:
 41-5, Yongdang-dong, Yangsan-si, Gyeongnam, 626-847, Korea

■ OVERSEAS SALES:
 Bldg. 402 3rd FL., Bucheon Techno Park, 193, Yakdae-dong, Wornim-gu, Bucheon-si, Gyeonggi-do, 420-734, Korea
 TEL: 82-32-610-2730 / FAX: 82-32-329-0728
 E-mail: sales@autonics.com

The proposal of a product improvement and development: product@autonics.com

EP-KE-07-0360J