

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		Sensing target	Presence	Nothing	Presence	Nothing
		Load (Brown-Black)	Operation	Return	Operation	Return
		Output voltage (Black-Blue)	H	L	H	L
		Indicator (LED)	ON	OFF	ON	OFF
PNP Output		Sensing target	Presence	Nothing	Presence	Nothing
		Load (Black-Blue)	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 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 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 PRW12-4DN PRW12-4DP PRW12-4DN2 PRW12-4DP2	PR18-5DN PR18-5DP PR18-5DN2 PR18-5DP2 PRL18-5DN PRL18-5DP PRW18-5DN PRW18-5DP PRW18-5DN2 PRW18-5DP2	PR30-10DN PR30-10DP PR30-10DN2 PR30-10DP2 PRL30-10DN PRL30-10DP PRW30-10DN PRW30-10DP PRW30-10DN2 PRW30-10DP2 PRW30-10DN-V PRW30-10DP-V	PR30-15DN PR30-15DP PR30-15DN2 PR30-15DP2 PRL30-15DN PRL30-15DP PRW30-15DN PRW30-15DP PRW30-15DN2 PRW30-15DP2 PRW30-15DN-V PRW30-15DP-V	
Sensing distance	1.5mm	2mm	2mm	4mm	5mm	8mm	10mm	
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 7mm	
Power supply (Operating voltage)	12-24VDC (10-30VDC)							
Current consumption	Max. 10mA							
Response frequency	1.5kHz	1kHz	1.5kHz	500Hz	500Hz	350Hz	400Hz	
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 PRLW: Approx. 78g	PR: Approx. 170g PRL: Approx. 210g PRW: Approx. 122g PRLW: Approx. 158g				

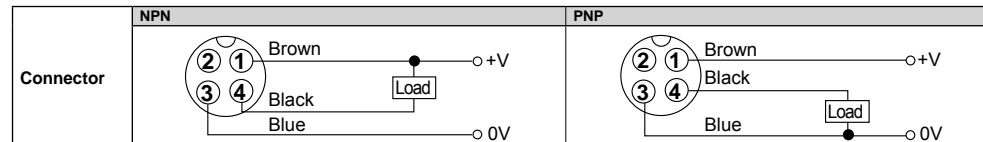
Dimensions

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)

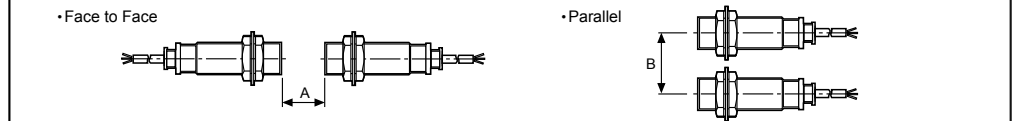
Connections



Mutual-interference & Influence by surrounding metals

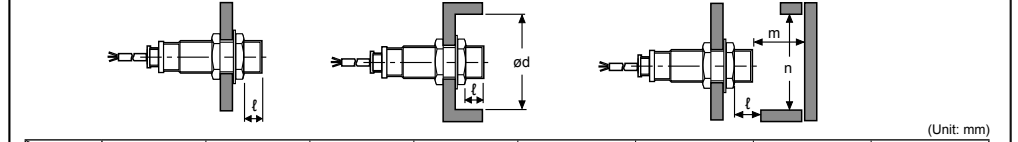
Mutual-interference

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.



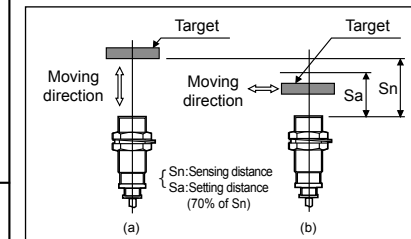
Influence by surrounding metals

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
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
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 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