

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 machineries (Nuclear power control, medical equipment vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it requires installing fail-safe device, or contact us for information on type required.

It may result in serious damage, fire or human injury.

Caution

1. 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.

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

3. Do not apply AC power and observe specification rating.
It may result in serious damage to the product.

Ordering information

P R L L 18 - 5 DN - V

Item: P (Inductive proximity sensor), R (Cylindrical type), L (Long body), L (Short body), 18 (Body size), - (Standard sensing distance), 5 (Dimension), DN (Output), - (Cable type), V (Standard cable)

Cable type	V	Standard cable
	S	Oil resistant cable
	DN	NPN N.O. (Normally Open)
	DN2	NPN N.C. (Normally Closed)
	DP	PNP N.O. (Normally Open)
	DP2	PNP N.C. (Normally Closed)
Output	Number	Unit: mm
Standard sensing distance	Number	Diameter of head (mm)
Dimension	S	Standard
	L	Long body
Body size	W	DC 3 wire, cable outgoing type
	R	DC 3 wire, cable outgoing connector type
Connection	P	Inductive proximity sensor

Control output diagram & Load operating

NPN Output	Main circuit	Normally Open		Normally Closed		
		Presence	Nothing	Presence	Nothing	
NPN Output		Sensing target				
		Load (Brown-Black)				
		Output voltage (Black-Blue)	H	L	H	L
		Indicator (LED)	ON	OFF	ON	OFF
		Normally Open		Normally Closed		
		Presence		Nothing		
PNP Output		Sensing target				
		Load (Black-Blue)				
		Output voltage (Black-Blue)	H	L	H	L
		Indicator (LED)	ON	OFF	ON	OFF
		Normally Open		Normally Closed		
		Presence		Nothing		

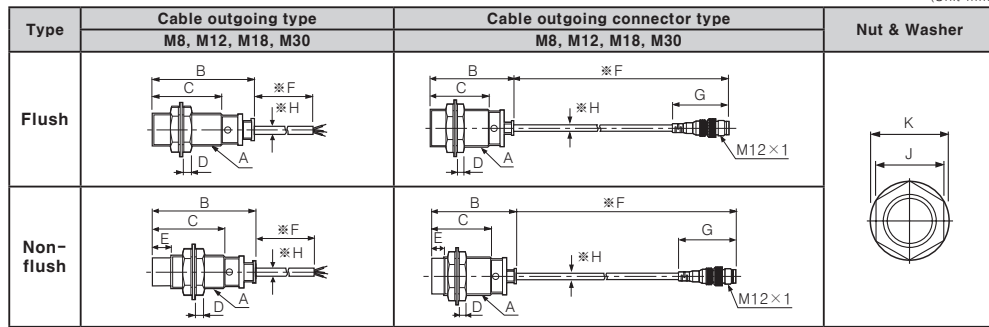
※ The above specifications are subject to change without notice.

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 PRWL08-1.5DN PRWL08-1.5DP PRWL08-1.5DN2 PRWL08-1.5DP2	PR08-2DN PR08-2DP PRL08-2DN PRL08-2DP PRW08-2DN PRW08-2DP PRW08-2DN2 PRW08-2DP2 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 PRS12-4DN PRS12-4DP PRS12-4DN2 PRS12-4DP2	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	PR18-8DN PR18-8DP PR18-8DN2 PR18-8DP2 PRL18-8DN PRL18-8DP PRL18-8DN2 PRL18-8DP2 PRW18-8DN PRW18-8DP PRW18-8DN2 PRW18-8DP2 PRWL18-8DN PRWL18-8DP PRWL18-8DN2 PRWL18-8DP2	PR30-10DN PR30-10DP PR30-10DN2 PR30-10DP2 PRL30-10DN PRL30-10DP PRL30-10DN2 PRL30-10DP2 PRW30-10DN PRW30-10DP PRW30-10DN2 PRW30-10DP2 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 ± 10%	2mm ± 10%	2mm ± 10%	4mm ± 10%	5mm ± 10%	8mm ± 10%	10mm ± 10%	15mm ± 10%				
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 ~ 1.05mm		0 ~ 1.4mm		0 ~ 2.8mm		0 ~ 3.5mm		0 ~ 5.6mm		0 ~ 7mm	
Power supply (Operating voltage)	12 ~ 24VDC (10 ~ 30VDC)											
Current consumption	Max. 10mA											
Response frequency	1.5kHz		1kHz		1.5kHz		500Hz		500Hz		350Hz	
Affection by Temp.	Within ± 10°C max. of sensing distance at 20°C in temperature range of -25 ~ 70°C (PRL08 Series: Max. ± 20%)											
Control output	Max. 200mA											
Insulation resistance	Min. 50MΩ (500VDC megger)											
Dielectric strength	1,500VAC 50/60Hz for 1minute											
Vibration	1mm amplitude at frequency of 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 temperature: -25 ~ 70°C, Storage: -30 ~ 80°C											
	Ambient humidity: 35 ~ 95%RH, Storage: 35 ~ 95%RH											
Protection circuit	Surge protection, Reverse polarity protection, Overload & short circuit protection											
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. 68g PRL: Approx. 70g PRW: Approx. 30g PRWL: Approx. 32g		PR: Approx. 70g PRS: Approx. 68g PRW: Approx. 40g PRL: Approx. 72g		PR: Approx. 119g PRL: Approx. 149g PRW: Approx. 84g PRWL: Approx. 108g		PR: Approx. 118g PRL: Approx. 142g PRW: Approx. 84g PRWL: Approx. 108g		PR: Approx. 184g PRL: Approx. 222g PRW: Approx. 143g PRWL: Approx. 178g		PR: Approx. 181g PRL: Approx. 227g PRW: Approx. 143g PRWL: Approx. 178g	

※ Condition for use in Environment is no freezing or condensation.

Dimensions

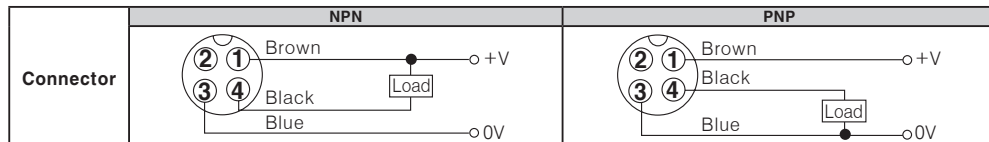


Type		A	B	C	D	E	F	G	H	J	K
Flush	M8	PR M8 × 1	30	30	4	—	2,000	—	3.5	13	15
		PRL M8 × 1	40	40	4	—	2,000	—	3.5	13	15
		PRW M8 × 1	30	30	4	—	300	43.5	4	13	15
		PRWL M8 × 1	40	40	4	—	300	43.5	4	13	15
Non-flush	M12	PR M12 × 1	46	31.5	4	—	2,000	—	4	17	21
		PRS M12 × 1	39	24.5	4	—	2,000	—	4	17	21
		PRW M12 × 1	46	31.5	4	—	300	43.5	4	17	21
		PRL M12 × 1	58.5	44	4	—	2,000	43.5	4	17	21
Flush	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	43.5	5	24	29
		PRWL M18 × 1	80.5	62	4	—	300	43.5	5	24	29
Non-flush	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	43.5	5	35	42
		PRWL M30 × 1.5	80	60	5	—	300	43.5	5	35	42

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

※ 'H' type: φ3.5, 3 cores (Conductor cross section: 0.2mm², Insulator diameter: φ1) and φ4, 3 cores/φ5, 3 cores (Conductor cross section: 0.3mm², Insulator diameter: φ1.25)

Connections



Multi-interference & Influence by surrounding metals

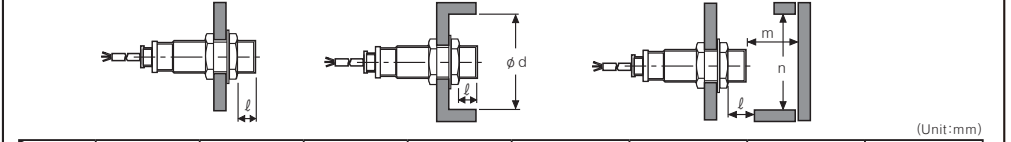
Mutual-interference

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.



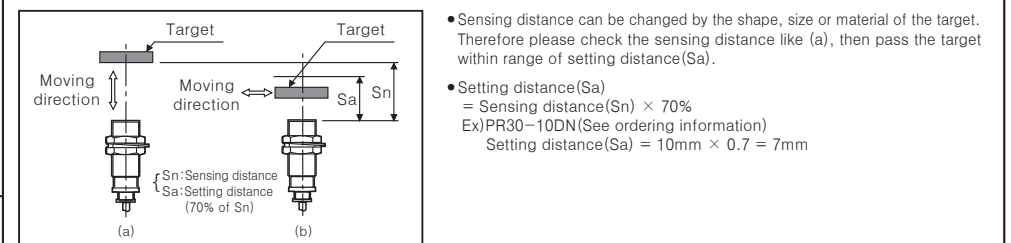
Influence by surrounding metals

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/Item	PR08-1.5D□	PR08-2D□	PR12-2D□	PR12-4D□	PR18-5D□ PRW18-5D□	PR18-8D□ PRW18-8D□	PR30-10D□ PRW30-10D□	PR30-15D□ PRW30-15D□
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
φd	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. (φ4: 30N max., φ5: 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	Strength	Front		Rear
		Size	Torque	Torque
PR08 Series	Flush	7mm	40kgf · cm (3.92N · m)	90kgf · cm (8.82N · m)
	Non-flush	5mm	—	—
PR12 Series	Flush	13mm	65kgf · cm (6.37N · m)	120kgf · cm (11.76N · m)
	Non-flush	7mm	—	—
PR18 Series	Flush	—	—	150kgf · cm (14.7N · m)
	Non-flush	—	—	—
PR30 Series	Flush	26mm	500kgf · cm (49N · m)	800kgf · cm (78.4N · m)
	Non-flush	12mm	—	—

[Table 1]

Note1) Allowable tightening torque of a nut may be above 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 rating 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 since 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.
- 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

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