DRW171499AA

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

1. **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.
2. **Do not disassemble or modify the unit.**
   Failure to follow this instruction may result in fire.
3. **Do not connect, repair, or inspect the unit while connected to a power source.**
   Failure to follow this instruction may result in fire.
4. **Check 'Connections' before wiring.**
   Failure to follow this instruction may result in fire.

⚠ Caution

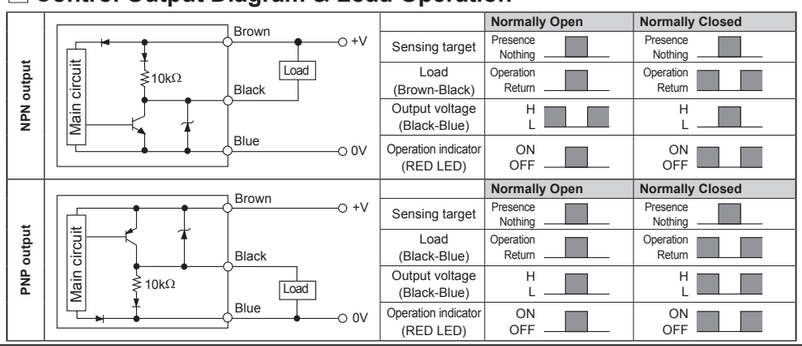
1. **Use the unit within the rated specifications.**
   Failure to follow this instruction may result in fire or product damage.
2. **Use dry cloth to clean the unit, and do not use water or organic solvent.**
   Failure to follow this instruction may result in fire.
3. **Do not use the unit in the place 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	**No mark**	Standard cable
	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

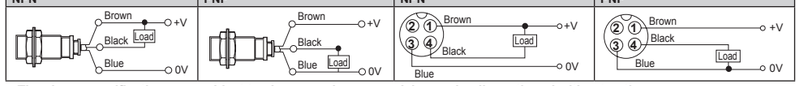


	Normally Open	Normally Closed
Sensing target	Presence / Nothing	Presence / Nothing
Load (Brown-Black)	Operation / Return	Operation / Return
Output voltage (Black-Blue)	H / L	H / L
Operation indicator (RED LED)	ON / OFF	ON / OFF

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

■ Connections

Cable type		Cable connector type	
NPN	PNP	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).**

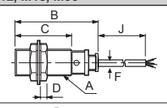
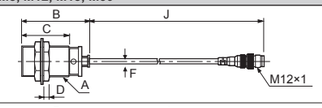
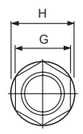
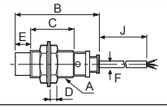
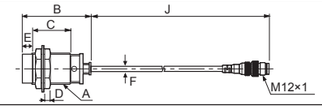
■ Specifications

Model	PR08-1.5DN / PR08-1.5DP / PR08-1.5DN2 / 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 / 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 / PRWL08-2DN / PRWL08-2DP / PRWL08-2DN2 / PRWL08-2DP2	PR12-2DN / PR12-2DP / PR12-2DN2 / PR12-2DP2 / PRS12-2DN / PRS12-2DP / PRS12-2DN2 / PRS12-2DP2 / PRW12-2DN / PRW12-2DP / PRW12-2DN2 / PRW12-2DP2 / PRL12-2DN / PRL12-2DP	PR12-4DN / PR12-4DP / PR12-4DN2 / PR12-4DP2 / PRS12-4DN / PRS12-4DP / PRS12-4DN2 / PRS12-4DP2 / PRW12-4DN / PRW12-4DP / PRW12-4DN2 / PRW12-4DP2 / PRL12-4DN / PRL12-4DP	PR18-5DN / PR18-5DP / PR18-5DN2 / PR18-5DP2 / PR18-5DN / PR18-5DP / PR18-5DN2 / PR18-5DP2 / 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 / PRW30-10DN-V / PRW30-10DP-V / 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 / PRW30-15DN-V / PRW30-15DP-V / 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	1.5kHz	1kHz	1.5kHz	500Hz	500Hz	350Hz	400Hz	200Hz
Residual voltage	Max. 2.0V		Max. 1.5V					
Affection by Temp.	Within ±10℃ max. of sensing distance at 20℃ in temperature range of -25 to 70℃(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/s²(approx. 50G) X, Y, Z directions for 3 times							
Indicator	Operation indicator(Red LED)							
Environment: Ambient temp.	-25 to 70℃, Storage: -30 to 80℃							
Environment: Ambient humi.	35 to 95%RH, Storage: 35 to 95%RH							
Protection circuit	Surge protection, Reverse polarity proteciton, 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			
Cable※2: PRW, PRWL	Ø4mm, 3-wire, 300mm, M12 Connector				Ø5mm, 3-wire, 300mm, M12 Connector			
Materials	Case/Nut: Nikel plated Brass, Washer: Nikel 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) / PRL: Approx. 142g(Approx. 130g) / PRW: Approx. 70g(Approx. 58g) / PRWL: Approx. 90g(Approx. 78g)		PR: Approx. 207g(Approx. 170g) / PRL: Approx. 247g(Approx. 210g) / PRW: Approx. 134g(Approx. 122g) / PRWL: 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

(Unit: mm)

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

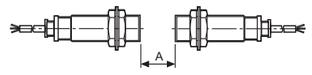
Type			A	B	C	D	E	F	G	H	J
Flush	M8	PR	M8×1	30	30	4	–	3.5	13	15	2,000
		PRL	M8×1	40	40	4	–	3.5	13	15	2,000
		PRW	M8×1	30	30	4	–	4	13	15	300
		PRWL	M8×1	40	40	4	–	4	13	15	300
	M12	PR	M12×1	46	31.5	4	–	4	17	21	2,000
		PRS	M12×1	39	24.5	4	–	4	17	21	2,000
		PRW	M12×1	46	31.5	4	–	4	17	21	300
		PRL	M12×1	74.5	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
Non-flush	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

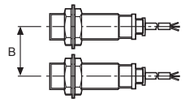
●Mutual-interference

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

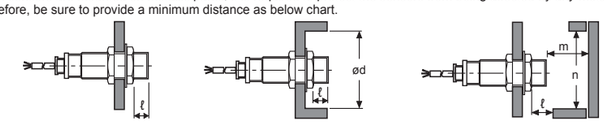


• Parallel



●Influence by surrounding metals

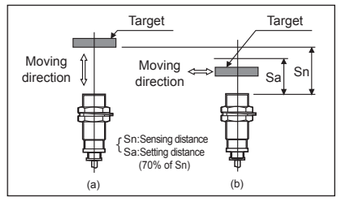
When sensors are mounted on metallic panel, it is required to protect the sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart.



(Unit: mm)

Item \ Model	PR□08-1.5D□	PR□08-2D□	PR□12-2D□	PR□12-4D□	PR□18-5D□ PRW□18-5D□	PR□18-8D□ PRW□18-8D□	PR□30-10D□ PRW□30-10D□	PR□30-15D□ PRW□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%
E.g.)PR30-10DN(See ordering information)
Setting distance(Sa) = 10mm × 0.7 = 7mm

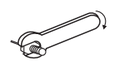
■ Installation and Tightening Torque

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].

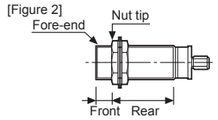
[Table 1]

Model \ Strength		Front: Size	Front: Torque	Rear: Torque
PR08 Series	Flush	7mm	3.92N·m	8.82N·m
	Non-flush	5mm		
PR12 Series	Flush	13mm	6.37N·m	11.76N·m
	Non-flush	7mm		
PR18 Series	Flush	-	14.7N·m	
	Non-flush	-		
PR30 Series	Flush	26mm	49N·m	78.4N·m
	Non-flush	12mm		

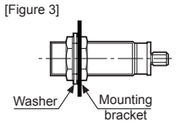
[Figure 1]



[Figure 2]



[Figure 3]



■ Cautions during Use

1. Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
2. 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
3. Use the product, after 0.8 sec of supplying power.
4. 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.
5. 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, CO_2, 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

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