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.

Marning

- . Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial econo loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
 Failure to follow this instruction may result in fire, personal injury, or economic loss.

- Do not disassemble or modify the unit.
 Failure to follow this instruction may result in fire.

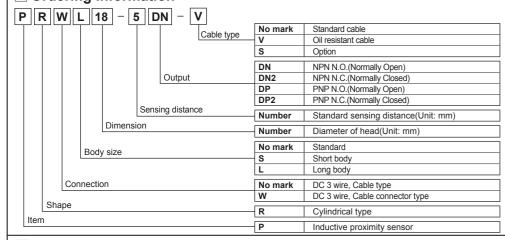
 Do not connect, repair, or inspect the unit while connected to a power source.
- Failure to follow this instruction may result in fire.
- Check 'Connections' before wiring.

 Failure to follow this instruction may result in fire.

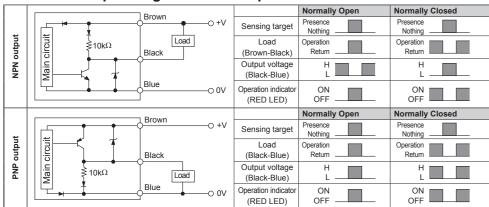
⚠ Caution

- 1. Use the unit within the rated specifications.
- Failure to follow this instruction may result in fire or product damage
- Use dry cloth to clean the unit, and do not use water or organic solvent. Failure to follow this instruction may result in fire.
- 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

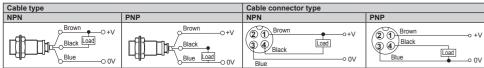
Ordering Information



■ Control Output Diagram & Load Operation



Connections



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

*Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage)

■ Specifications

	ресіті	cations										
Model	ı	PR08-1.5DN PR08-1.5DN PR08-1.5DN2 PR08-1.5DN2 PR108-1.5DN PRL08-1.5DN PRL08-1.5DN2 PR08-1.5DN2 PRW08-1.5DN2 PRW08-1.5DN2 PRW08-1.5DN2 PRW08-1.5DN2 PRW08-1.5DN2 PRW08-1.5DN2 PRW08-1.5DN2 PRW08-1.5DN2 PRW108-1.5DN2 PRW108-1.5DN2 PRW108-1.5DN2 PRW108-1.5DN2 PRW108-1.5DN2 PRW108-1.5DN2 PRW108-1.5DN2 PRW108-1.5DN2	PRW08-2DP-V PRWL08-2DN PRWL08-2DP	PR12-2DN PR12-2DP PR12-2DP2 PR12-2DP2 PR512-2DP2 PR512-2DP2 PR512-2DP2 PRW12-2DP2 PRW12-2DP2 PRW12-2DP2 PRW12-2DP2 PRW12-2DP2 PRW12-2DP2 PRL12-2DP2 PRL12-2DP	PR12-4DN PR12-4DP PR12-4DP2 PR12-4DP2 PR512-4DP PR512-4DP2 PR512-4DP2 PRW12-4DP2 PRW12-4DP2 PRW12-4DP2 PRW12-4DP2 PRL12-4DP2 PRL12-4DP		PR18-8DN PR18-8DN2 PR18-8DN2 PR18-8DP2 PR18-8DP2 PR18-8DP2 PR18-8DN2 PR18-8DN2 PRW18-8DN2 PRW18-8DN2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2	PRW30-10DP2 PRW30-10DN-V PRW30-10DP-V PRWL30-10DN	PR30-15DN PR30-15DN PR30-15DN2 PR30-15DN2 PR30-15DN2 PRL30-15DN PRL30-15DN2 PRW30-15DP2 PRW30-15DP2 PRW30-15DN2 PRW30-15DN2 PRW30-15DN2 PRW30-15DN2 PRW30-15DN2 PRW30-15DN2 PRW30-15DP2 PRW30-15DP2 PRW30-15DP2 PRW30-15DP2 PRW30-15DP2 PRW30-15DP2 PRW30-15DP2 PRW30-15DP2 PRW30-15DP2 PRW30-15DP2 PRW30-15DP2			
	ng distance	1.5mm	2mm	2mm	4mm	5mm	8mm	10mm	15mm			
Hyste		Max. 10% of se	nsing distance									
target		8×8×1mm (Iron))	12×12×1mm (Ir	. ,	18×18×1mm (Iron)	25×25×1mm (Iron)	30×30×1mm (Iron)	45×45×1mm (Iron)			
	g distance	0 to 1.05mm	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									
	r supply ating voltage)											
	t consumption	Max. 10mA										
Respo	onse ency×1	1.5kHz	1kHz	1.5kHz	500Hz	500Hz	350Hz	400Hz	200Hz			
Resid	ual voltage	Max. 2.0V	Max. 2.0V Max. 1.5V Within ±10°C max. of sensing distance at 20°C in temperature range of -25 to 70°C(PR_08 Series: Max. ±20%)									
Affection by Temp.			ax. of sensing dis	stance at 20°C in	temperature ran	ige of -25 to 70°C	(PR 08 Series:	Max. ±20%)				
	ol output	Max. 200mA										
	ion resistance	Min. 50MΩ(at 500VDC megger)										
	ctric strength	1,500VAC 50/60Hz for 1minute										
Vibrat		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										
Indica		Operation indicator(Red LED) -25 to 70°C, Storage: -30 to 80°C										
	Ambient temp.											
ment	Ambient humi.	35 to 95%RH, Storage: 35 to 95%RH										
Protec		Surge protection, Reverse polarity proteciton, Overload & short circuit protection IP67(IEC Standards)										
FIOLE	CIOII	Ø3.5mm, 3-wire	e, 2m	Ø4mm, 3-wire,	2m	Ø5mm, 3-wire, 2m						
Cable ^{%2}	PR, PRL	(AWG24, Core of 0.08mm, Number Insulator diameter)	er of cores: 40,	(AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: Ø1.25mm)								
ပြီ	PRW, PRWL	Ø4mm, 3-wire,	300mm, M12 Co	nnector		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) PR: Approx. 84g(Approx. 72g) PR: Approx. 122g(Approx. 110g) PR: Approx. 207g(Approx. 170g) PRL: Approx. 68g(Approx. 54g) PRS: Approx. 82g(Approx. 70g) PRL: Approx. 142g(Approx. 130g) PRL: Approx. 247g(Approx. 210g) PRW: Approx. 32g) PRW: Approx. 32g(Approx. 24g) PRW: Approx. 70g(Approx. 58g) PRW: Approx. 134g(Approx. 12g) PRWL: Approx. 34g(Approx. 34g) PRW: Approx. 34g(Approx. 88g(Approx. 76g) PRWL: Approx. 34g(Approx. 195g(Approx. 158g) PRW: Approx. 195g(Approx. 158g) PRW: Approx										

- PRWL: Approx. 46g(Approx. 34g)|PRL: Approx. 88g(Approx. 76g)|PRWL: Approx. 90g(Approx. 78g)|PRWL: Approx 195g(Approx. 158g) x1: 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. X3: The weight with packaging and the weight in parentheses is only unit weight.
- Environment resistance is rated at no freezing or condensation.

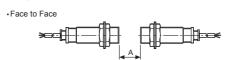
Dimensions

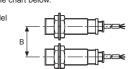
	iliciisiolis		(Unit: mm)	
Tumo	Cable type	Cable connector type	Nut & Washer	
Type	M8, M12, M18, M30	M8, M12, M18, M30		
Flush	B J J T F A	B J M12×1	H	
Non- flush	B C T T F	B J M12×1		

Туре			A	В	С	D	E	F	G	Н	J
	M8	PR	M8×1	30	30	4	T -	3.5	13	15	2,000
		PRL	M8×1	40	40	4	T -	3.5	13	15	2,000
	IVIO	PRW	M8×1	30	30	4	-	4	13	15	300
		PRWL	M8×1	40	40	4	1-	4	13	15	300
		PR	M12×1	46	31.5	4	T -	4	17	21	2,000
	M12	PRS	M12×1	39	24.5	4	T-	4	17	21	2,000
	W112	PRW	M12×1	46	31.5	4	T -	4	17	21	300
Flush		PRL	M12×1	74.5	60	4	I -	4	17	21	2,000
riusii		PR	M18×1	47.5	29.5	4	T -	5	24	29	2,000
	M18	PRL	M18×1	80.5	62.5	4	I -	5	24	29	2,000
	IVI18	PRW	M18×1	47.5	29.5	4	1-	5	24	29	300
		PRWL	M18×1	80.5	62.5	4	T -	5	24	29	300
		PR	M30×1.5	58	38	5	-	5	35	42	2,000
	M30	PRL	M30×1.5	80	60	5	I -	5	35	42	2,000
	IVI3U	PRW	M30×1.5	58	38	5	T -	5	35	42	300
		PRWL	M30×1.5	80	60	5	T -	5	35	42	300
		PR	M8×1	30	30	4	4	3.5	13	15	2,000
	M8	PRL	M8×1	40	40	4	4	3.5	13	15	2,000
	IVIO	PRW	M8×1	30	30	4	4	4	13	15	300
		PRWL	M8×1	40	40	4	4	4	13	15	300
		PR	M12×1	46	24.5	4	7	4	17	21	2,000
	M12	PRS	M12×1	39	17.5	4	7	4	17	21	2,000
	IVITZ	PRW	M12×1	46	24.5	4	7	4	17	21	300
Non-flush		PRL	M12×1	58.5	37	4	7	4	17	42 2 42 42 3 42 3 42 3 42 3 15 2 15 3 15 21 2 21 2 21 2 2 2 2 2 2 2 2 2 2 2 2	2,000
Non-nusn		PR	M18×1	47	19	4	10	5	24	29	2,000
	M18	PRL	M18×1	80.5	62.5	4	10	5	24	29	2,000
	IVITO	PRW	M18×1	47	19	4	10	5	24	29	300
		PRWL	M18×1	80.5	62.5	4	10	5	24	29	300
		PR	M30×1.5	58	28	5	10	5	35	42	2,000
	M30	PRL	M30×1.5	80	50	5	10	5	35	42	2,000
	M30	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

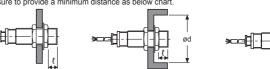
When several proximity sensors are mounted closely, malfunction of sensor may be caused due to mutual interference. Therefore, be sure to provide a minimum distance between the two sensors with referring to the chart below





oInfluence by surrounding metals

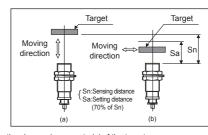
When sensors are mounted on metallic panel, it is required to protect the sensors from being affected by any metallic object except target Therefore, be sure to provide a minimum distance as below chart.



						_		(Unit: mm)
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□	PRU30-10DD PRW30-10DD	PR□30-15D□ PRW□30-15D□
	9	12	12	24	30	48	60	90
	16	24	24	36	36	54	60	90
	0	8	0	11	0	14	0	15
	8	24	12	36	18	54	30	90
	4.5	6	6	12	15	24	30	45
	12	24	18	36	27	54	45	90

Setting Distance

ød





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

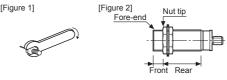
When tightening the nut, use the provided washer as [Figure 1]. When installing the product, the tightening torque of the nut varies according to the distance from the fore-end.

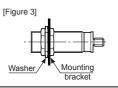
The front part of the product is from the fore-end to the dimension on the below table, and the rear part is from the tip of the nut to the end of the product. [Figure 2]

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]								
	Strength	Front		Rear				
Model		Size	Torque	Torque				
PR08 Series	Flush	7mm	3.92N·m	8.82N·m				
	Non-flush	5mm	3.92N·III					
PR12	Flush	13mm	6.37N·m	11.76N·m				
Series	Non-flush	7mm	0.3719111					
PR18	Flush	-	14.7N·m					
Series	Non-flush	-	14.719111					
PR30	Flush	26mm	49N·m	78.4N·m				
Series	Non-flush	12mm	4914:111	70.4IN·III				





Cautions during Use

Follow instructions in 'Cautions' during Use'. Otherwise, it may cause unexpected accidents.
 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.

■ Temperature Controllers ■ Temperature/Humidity Transducers
■ SSRs/Power Controllers
■ Counters

■ Timers

■ Panel Meters

- 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') 3 Pollution degree 2
- ② Altitude max. 2,000m 4 Installation category I

Major Products

- Fiber Optic Sensors
- Door Sensors
 Door Side Sensors
- Area Sensors ■ Proximity Sensors
- Pressure Sensors
 Rotary Encoders

- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers
 Graphic/Logic Panels
 Field Network Devices
- Laser Marking System (Fiber, CO₂, Nd: YAG)
 Laser Welding/Cutting System



