#### **Autonics**

# INDUCTIVE PROXIMITY SENSOR

## CYLINDRICAL TYPE DC 3WIRE



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

#### Caution for your safety

XPlease keep these instructions and review them before using this unit.

XPlease 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.

XThe following is an explanation of the symbols used in the operation manual.

⚠Caution: Injury or danger may occur under special conditions.

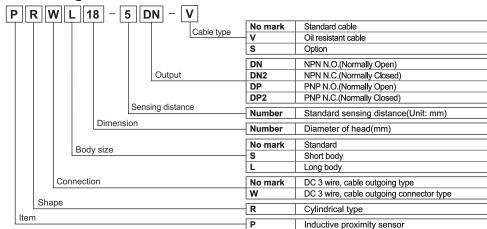
### ⚠Warning

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.

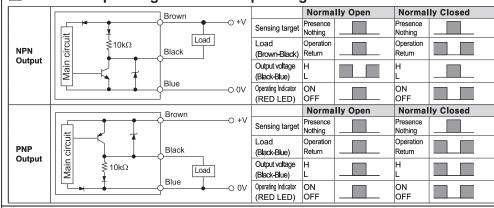
#### **∆** Caution

- 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 the rated specification. It may result in serious damage to the product.

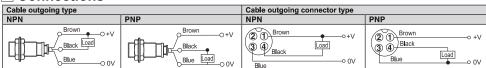
#### Ordering information



#### Control output diagram & Load operating



#### Connections



### **■** Specifications

	, <b>-</b> p											
Mo	odel	PR08-15DN PR08-15DP PR08-15DN2 PR08-15DN2 PR08-15DP2 PRU8-15DP PRU8-15DP PRU8-15DP2 PRW08-15DP2	PR08-2DN PR08-2DP PR08-2DN2 PR08-2DN2 PR08-2DP2 PR108-2DP PR108-2DP PR108-2DP2 PRW08-2DP2	PR12-2DN PR12-2DN PR12-2DN2 PR12-2DN2 PR512-2DP2 PR512-2DP2 PR512-2DP2 PR512-2DP2 PRW12-2DN2 PRW12-2DN2 PRW12-2DN2 PRW12-2DN2 PRW12-2DN2 PRW12-2DN2 PRW12-2DN2 PRW12-2DN2	PR12-4DN PR12-4DP PR12-4DP2 PR12-4DP2 PRS12-4DP PRS12-4DP PRS12-4DP2 PRS12-4DP2 PRW12-4DN PRW12-4DN PRW12-4DP2 PRW12-4DN2 PRW12-4DP2 PRL12-4DN PRL12-4DP	PR18-5DN PR18-5DP PR18-5DP2 PR18-5DP2 PR1.18-5DP2 PR1.18-5DP2 PR1.18-5DP2 PR4.18-5DP2 PR4.18-5DP2 PR4.18-5DP2 PR4.18-5DP2 PR4.18-5DP2 PR4.18-5DP2 PR4.18-5DP2 PR4.18-5DP2 PR4.18-5DP2 PR4.18-5DP2 PR4.18-5DP2 PR4.18-5DP2	PR18-8DN PR18-8DP PR18-8DP2 PR18-8DP2 PR18-8DP2 PR18-8DP2 PR18-8DP2 PR18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2 PRW18-8DP2	PR30-100N PR30-100P PR30-100P2 PR30-100P2 PR30-100P PR130-100P PR130-100P2 PR130-100P2 PR130-100P2 PR130-100P2 PR130-100P2 PR130-100P2 PR130-100P2 PR130-100P2 PR130-100P2 PR130-100P2 PR130-100P2 PR130-100P2 PR130-100P2 PR	PR30-15DN PR30-15DN PR30-15DN2 PR30-15DN2 PR30-15DP2 PR30-15DP PR30-15DP2 PR30-15DP2 PR30-15DP2 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 PRW30-15DP2 PRW30-15DP2 PRW30-15DP2 PRW30-15DP2			
Se	nsing distance	1.5mm	2mm	2mm	4mm	5mm	8mm	10mm	15mm			
	steresis	Max. 10% of se										
Sta	andard sensing get	8×8×1mm(Iron		12×12×1mm(li	ron)	18×18×1mm(Iron)	25×25×1mm(Iron)	30×30×1mm(Iron)	45×45×1mm(Iror			
	tting 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			
	wer supply perating voltage)	12-24VDC (10-30VDC)	1		1	1						
	rrent consumption	Max. 10mA										
	sponse frequency <sup>※1</sup>	1.5kHz	1kHz	1.5kHz	500Hz	500Hz	350Hz	400Hz	200Hz			
	sidual voltage	Max. 2.0V										
	ection by Temp.	Within ±10°C max. of sensing distance at 20°C in temperature range of -25 ~70°C(PR⊡08 Series: Max. ±20%)										
	ntrol output	Max. 200mA										
	ulation resistance	Min. 50MΩ(at 500VDC megger)										
Dielectric strength 1,500VAC 50/60Hz for 1minute												
	oration	1mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours										
	iock	500m/s <sup>2</sup> (50G) X, Y, Z directions for 3 times										
-	dicator	Operating indicator(Red LED)										
Environment	Ambient temperature	-25 to 70°C, Sto	5 to 70°C, Storage: -30 to 80°C									
Enviro	Ambient humidity	35 to 95%RH,	Storage: 35 to 95%	%RH								
Pro	tection circuit	Surge protection, Reverse polarity proteciton, Overload & short circuit protection										
Pre	otection	IP67(IEC Stand	dards)									
		Ø3.5, 3-wire, 2	m	Ø4 3 wire 2m	`	Ø5. 3-wire, 2m						
Cable	PR, PRL	Ø3.5, 3-wire, 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator diameter: Ø1mm)   Ø4, 3-wire, 2m (AWG22, Core diameter: 0.0										
PRW, PRWL		Ø4, 3-wire, 300mm, M12 Connector Ø5, 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)										
Ap	proval	C€										
Unit weight <sup>※2</sup>		PR: Approx. 640 PRL: Approx. 660 PRW: Approx. 40 PRWL: Approx.	g(Approx. 52g) 6g(Approx. 54g) 4g(Approx. 32g) 46g(Approx. 34g)	PR: Approx. 84 PRS: Approx. 84 PRW: Approx. 84 PRL: Approx. 84	4g(Approx. 72g) 82g(Approx. 70g) 54g(Approx. 42g 38g(Approx. 76g)	PR: Approx. 122 PRL: Approx. 14 PRW: Approx. 70 PRWL: Approx. 9	g(Approx. 110g) 2g(Approx. 130g) 0g(Approx. 58g) 90g(Approx. 78g)	PR: Approx. 2070 PRL: Approx. 24 PRW: Approx. 13 PRWL: Approx 19	g(Approx. 170g) g(Approx. 210g 4g(Approx. 122g 95g(Approx. 158			
×1	: The response				sensing target is	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.
- x2: The weight with packaging and the weight in parentheses is only unit weight. XEnvironment resistance is rated at no freezing or condensation

#### Dimensions

Time	Cable outgoing type	Cable outgoing connector type	Nut & Washer		
Туре	M8, M12, M18, M30	M8, M12, M18, M30	Nut & Washer		
Flush	B	B **J	H		
Non- ∰ush	B C WJ A	B #J			

Туре			Α	В	С	D	E	F	G	Н	J
		PR	M8×1	30	30	4	T-	3.5	13	15	2,000
	м8	PRL	M8×1	40	40	4	-	3.5	13	15	2,000
	INIO	PRW	M8×1	30	30	4	<b>—</b>	4	13	15	300
		PRWL	M8×1	40	40	4	-	4	13	15	300
		PR	M12×1	46	31.5	4	T-	4	17	21	2,000
	****	PRS	M12×1	39	24.5	4	T -	4	17	21	2,000
	M12	PRW	M12×1	46	31.5	4	-	4	17	21	300
		PRL	M12×1	74.5	60	4	T-	4	17	21	2,000
Flush		PR	M18×1	47.5	29.5	4	<b>—</b>	5	24	29	2,000
		PRL	M18×1	80.5	62.5	4	-	5	24	29	2,000
	M18	PRW	M18×1	47.5	29.5	4	T-	5	24	29	300
		PRWL	M18×1	80.5	62.5	4	-	5	24	29	300
		PR	M30×1.5	58	38	5	-	5	35	42	2,000
		PRL	M30×1.5	80	60	5	T -	5	35	42	2,000
	M30	PRW	M30×1.5	58	38	5	<b>—</b>	5	35	42	300
		PRWL	M30×1.5	80	60	5	_	5	35	42	300
		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
	M8	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
	WIIZ	PRW	M12×1	46	24.5	4	7	4	17	21	300
Non-Mush		PRL	M12×1	58.5	37	4	7	4	17	21	2,000
NOII-MASII		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
	INITO	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
	MISU	PRW	M30×1.5	58	28	5	10	5	35	42	300
		PRWL	M30×1.5	80	50	5	10	5	35	42	300

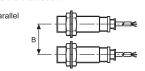
#### XJ' type standard: Cable outgoing type/2,000mm, Cable outgoing connector type/300mm

#### 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

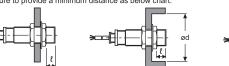


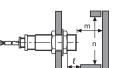




#### olnfluence by surrounding metals

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.

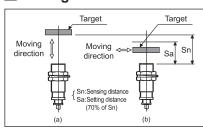




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Model em	PR□08-1.5D□	PR□08-2D□	PR□12-2D□	PR□12-4D□	PR□18-5D□ PRW□18-5D□	PR□18-8D□ PRW□18-8D□	PRU30-10DU PRWU30-10DU	PRU30-15DD PRW30-15DD
4	9	12	12	24	30	48	60	90
3	16	24	24	36	36	54	60	90
?	0	8	0	11	0	14	0	15
ød	8	24	12	36	18	54	30	90
m	4.5	6	6	12	15	24	30	45
1	12	24	18	36	27	54	45	90

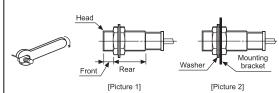
#### Setting distance



- 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

- 1. This equipment shall not be used outdoors or beyond specified temperature range.
- 2. Do not apply over tensile strength of cord. (ø3.5: 25N max. ø4: 30N max., ø5: 50N max.) B. Do not use the same conduit with cord of this unit and electric power line or power line.
- 4. Do not put overload to tighten nut, please use the supplied washer for tightening



9.		Strength	Front		Rear	
	Model		Size	Torque	Torque	
	PR08	Flush	7mm	40kgf-cm	90kgf·cm (8.82N·m)	
	Series	Non-⊠ish	5mm	(3.92N·m)		
}	PR12	Flush	13mm	65kgf·cm	120kgf·cm (11.76N·m)	
	Series	Non-⊠ish	7mm	(6.37N·m)		
	PR18	Flush	-	150kgf·cm		
	Series	Non-⊠sh	-	(14.7N·m)		
	PR30	Flush	26mm	500kgf-cm	800kgf·cm	
	Series	Non-⊠ish	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 excess the rated power inputDo 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.
- 9. 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
- 10. It is possible to extend cable with over 0.3mm<sup>2</sup> and max. 200m. 11. If the target is plated, the operating distance can be changed by the plating material.

- 12. It may result in malfunction by metal particle on product.

  13. 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.
- 14. 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.
- 15. If making a transceiver close to proximity sensor or wire connection, it may cause malfunction

XIt may cause malfunction if above instructions are not followed.

#### ■ Major products

- Door sensors SSR/Power controllers ■ Counters
- Door side sensors
- Area sensors ■ Timers

- Pressure sensors
- Panel meters
- Tachometer/Pulse(Rate) meters ■ Display units ■ Rotary encoders
- Connector/Sockets Sensor controllers
- Switching mode power supplies ■ Fiber optic sensors ■ Temperature/Humidity transducers ■ Control switches/Lamps/Buzzers
  - I/O Terminal Blocks & Cables
  - Stepper motors/drivers/motion controllers
  - Graphic/Logic panels Field network devices

Laser welding/soldering system

- Laser marking system(Fiber, CO₂, Nd:YAG)
- HEAD QUARTERS: 3, Bansong-ro phoueon-gir, massing 2 VERSEAS SALES: 402-404 Bucheon Techno Park, 655, Pyeongo 402-404, Bucheon Techno Park, 655, Pyeon Vonmi-gu, Bucheon, Gyeonggi-do, Korea EL: 82-32-610-2730 / FAX: 82-32-329-0728

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