

# Autonics

## INDUCTIVE PROXIMITY SENSOR (SPATTER RESISTANT TYPE)

### PRA SERIES

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.

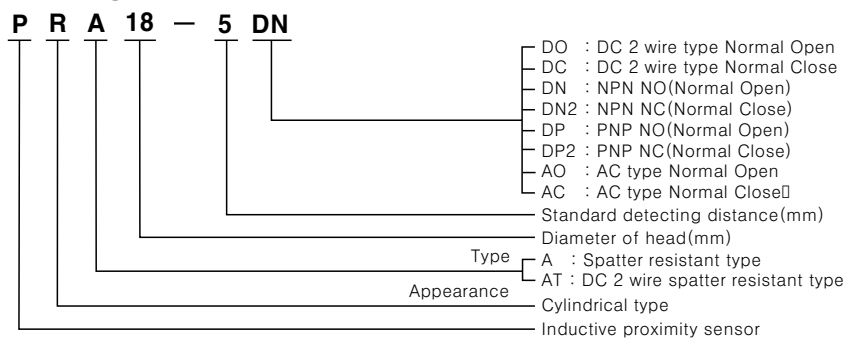
#### Warning

- 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.
- Do not connect power directly without load. It may result in damage to inner components or burn them out.

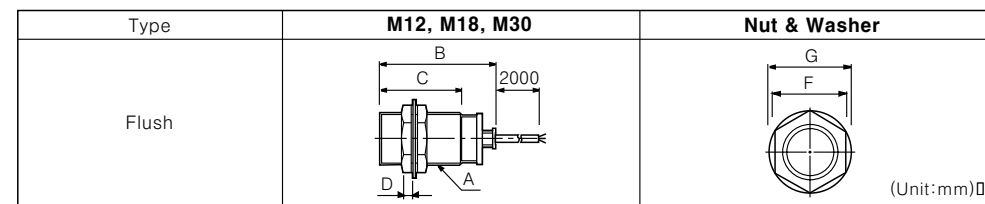
#### Caution

- Do not use this unit in place where there is 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 use this product beyond rated voltage or apply AC power to DC power. It may result in serious damage to the product.

#### Ordering information



#### Dimensions



Type	A	B	C	D	F	G
DC type	M12	M12×1	42.5	31.5	4	17
	M18	M18×1	47	29	4	24
	M30	M30×1.5	58	38	5	35
AC type	M12	M12×1	59.5	48.5	4	21
	M18	M18×1	53.3	35.3	4	24
	M30	M30×1.5	58	38	5	35

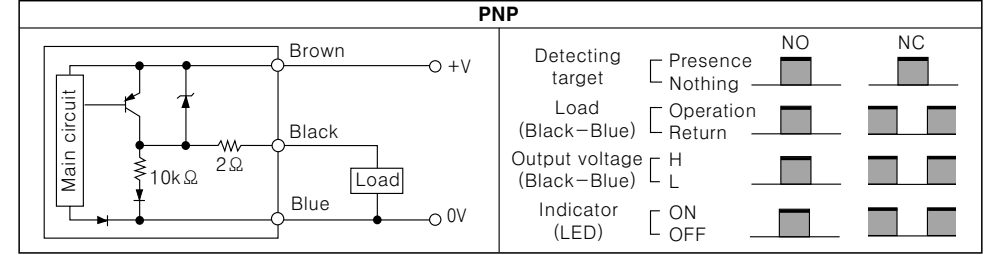
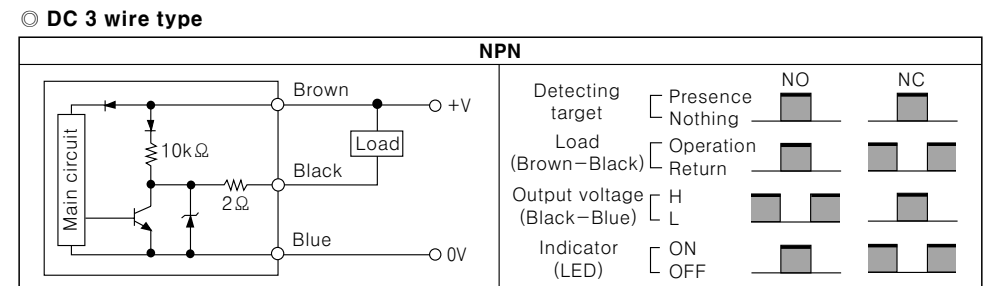
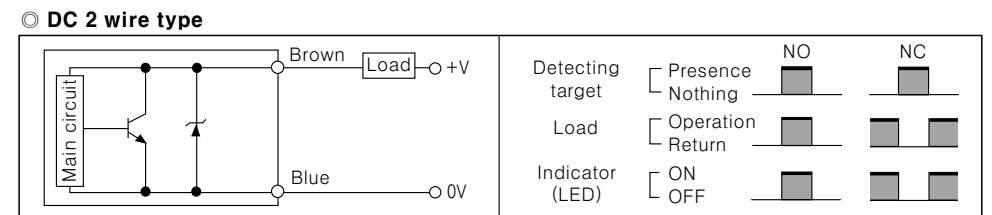
\*The above specification are changeable without notice anytime.

#### Specifications

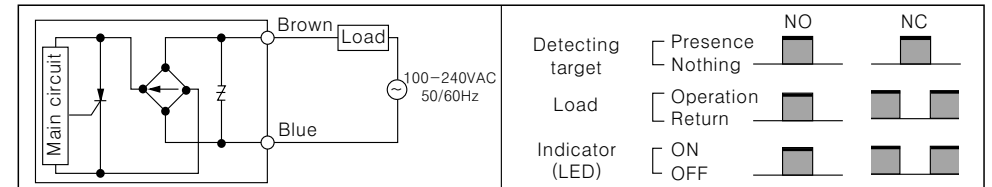
Model	PRAT12-2DO PRAT12-2DC	PRAT18-5DO PRAT18-5DC	PRAT30-10DO PRAT30-10DC	PRA12-2DN PRA12-2DP PRA12-2DN2 PRA12-2DP2	PRA18-5DN PRA18-5DP PRA18-5DN2 PRA18-5DP2	PRA30-10DN PRA30-10DP PRA30-10DN2 PRA30-10DP2	PRA12-2AO PRA12-2AC	PRA18-5AO PRA18-5AC	PRA30-10AO PRA30-10AC
Detecting distance	2mm±10%	5mm±10%	10mm±10%	2mm±10%	5mm±10%	10mm±10%	2mm±10%	5mm±10%	10mm±10%
Hysteresis	Max. 10% of detecting distance								
Standard detecting target	12×12×1mm (Iron)	18×18×1mm (Iron)	30×30×1mm (Iron)	12×12×1mm (Iron)	18×18×1mm (Iron)	30×30×1mm (Iron)	12×12×1mm (Iron)	18×18×1mm (Iron)	30×30×1mm (Iron)
Setting distance	0 to 1.4	0 to 3.5	0 to 7	0 to 1.4	0 to 3.5	0 to 7	0 to 1.4	0 to 3.5	0 to 7
Power supply (Operating voltage)	24VDC (15-30VDC)			12-24VDC (10-30VDC)			100-240VAC 50/60Hz (85-264VAC)		
Current consumption	Max. 10mA								
Leakage current	Max. 0.9mA						Max. 2.5mA		
Response frequency	800Hz	350Hz	250Hz	800Hz	350Hz	250Hz	20Hz		
Residual voltage	Max. 7V			Max. 1.5V			Max. 10V		
Affection by Temp.	±10% Max. of detecting distance at +20°C within temperature range of -25 to +70°C								
Control output	50mA			200mA			150mA		200mA
Insulation resistance	Min. 50MΩ (500VDC)								
Dielectric strength	1500VAC 50/60Hz for 1minute						2500VAC 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 <sup>2</sup> (50G) X, Y, Z direction for 3 times								
Indicator	Operating indicator (RED LED)								
Ambient temperature	-25 to +70°C (non-freezing condition)								
Storage temperature	-30 to +80°C (non-freezing condition)								
Ambient humidity	35 to 95%RH								
Protection circuit	Surge protection circuit, Overload & short circuit protection.			Reverse polarity protection, Surge protection circuit, Overload & short circuit protection			Surge protection circuit		
Protection	IP67 (IEC specification)								
Insulation type(*1)	□								
Weight	Approx. 63g	Approx. 122g	Approx. 181g	Approx. 70g	Approx. 119g	Approx. 184g	About 66g	About 130g	About 185g

\*(\*1) □ Mark indicated that equipment protected throughout by double insulation or reinforced insulation.

#### Control output diagram & Load operating



#### Connections



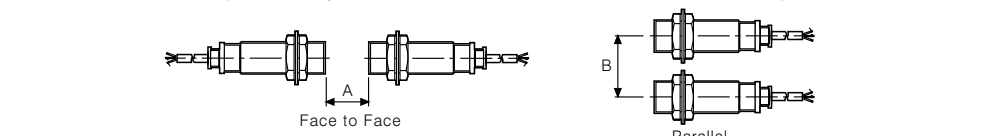
#### Connection of the power supply

Be sure to connect the power after connecting the load, because direct connection of the proximity sensor may cause damage to the inner elements of this product.

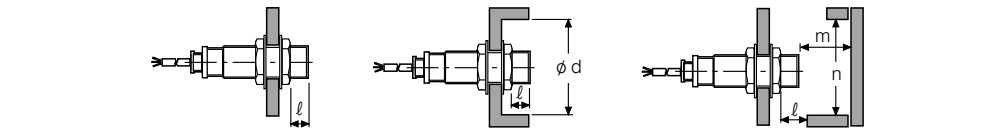


#### Mutual-interference & Influence by surrounding metals

○ Mutual-interference  
When plural proximity sensors are mounted in a close row, malfunction of sensor may be caused due to mutual interference. Therefore, be sure to provide a minimum distance between the two sensors, as below charts.



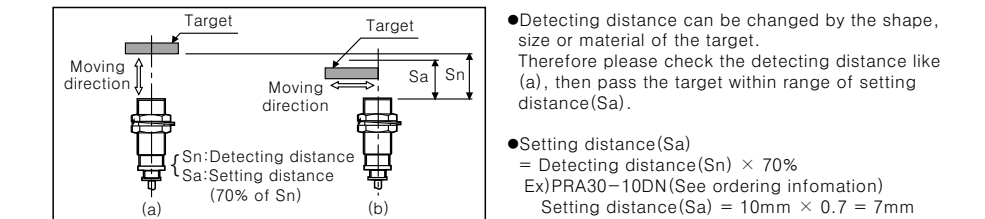
○ Influence by surrounding metals  
When sensors are mounted on metallic panel, it must be prevented sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart.



Item	Model	PRA□12-2□□	PRA□18-5□□	PRA□30-10□□
A		12	30	60
B		24	36	60
ℓ		00	0	0
φd		12	18	30
m		6	15	30
n		18	27	45

(Unit:mm)

#### Setting distance



#### Caution for using

- This equipment shall not be used outdoors or beyond specified temperature range.
  - Do not load over than 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. Also avoid the same connection.
  - Do not put overload to tighten nut, please use washer for tightening. Note1) Allowable strength may be different by the length of head. As see the picture, allowable tightening strength of front part and rear part are in (Chart 1). Rear part includes head nut as like picture. Note2) (Chart1) is for using washer.
  - 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.
  - Do not connect capacity load to output part directly.
  - It may result in damage to the product, if use automatic transformer. So please use insulated transformer.
  - Please make wire short as much as possible in order to avoid noise.
  - Be sure to cable as indicated specification on this product. If use wrong cable or bended cable, it shall not maintain the water-proof.
  - It is possible to extend cable with over 0.3mm<sup>2</sup> 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 connect the load with big inrush current (DC type bulb) to this unit, the big inrush current will flow due to 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.
  - In case of the load current is small (AC type) : When the load current is under 5mA, make the residual voltage is less than return voltage to connect the bleeder resistor to load in parallel. \*110VAC 50/60Hz : 20kΩ, Min. 3W, 220VAC 50/60Hz : 39kΩ, Min. 5W
  - In case of the load current is small (DC 2 wire) : Please make flowing current in proximity sensor less than return current of load to connect bleeder resistor and load in parallel.  $R \leq \frac{Vs}{Io - Ioff} (k\Omega) \quad P > \frac{Vs^2}{R} (mW)$  (Vs: Power supply, Io: Min. operating current for proximity sensor, Ioff: Return current of load, P: Resistance W of Bleeder resistor)
  - If make a transistor close to proximity sensor or wire connection, it may cause malfunction.
- \*It may cause malfunction if above instructions are not followed.**

#### Main products

- COUNTER
- TIMER
- TEMPERATURE CONTROLLER
- PANEL METER
- TACHOMETER/LINE SPEED METER/PULSE METER
- DISPLAY UNIT
- PROXIMITY SENSOR
- PHOTOELECTRIC SENSOR
- FIBER OPTIC SENSOR
- PRESSURE SENSOR
- ROTARY ENCODER
- SENSOR CONTROLLER
- POWER CONTROLLER
- STEPPING MOTOR & DRIVER & CONTROLLER

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