INDUCTIVE PROXIMITY SENSOR **Autonics** (SPATTER RESISTANT TYPE) **PRA SERIES** 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 electric shock or fire.
- 3. Do not connect, repair, or inspect the unit while connected to a power source.
- Failure to follow this instruction may result in electric shock or 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 electric shock or 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

Dimensions

Do not supply power without load.
 Failure to follow this instruction may result in fire or product damage.

Ordering Information No mark Standard cable PRAWT18-5DO-IStandard/Cable meterial IEC standards mode Oil resistant cable DC 2-wire Normally Open(N.O.) DC 2-wire Normally Closed(N.C NPN Normally Open(N.O.) NPN Normally Closed(N.C. Output type PNP Normally Open(N.O.) DP2 AO PNP Normally Closed(N.C.) AC Normally Open(N.O.) AC Normally Closed(N.C.) DC 2-wire Non-polarity type Normally Open(N.O.) DC 2-wire Non-polarity type Normally Closed (N.C.) Sensing distance Number | Standard sensing distance (unit: mm) Dimension Number Diameter of head (unit: mm) Cable form No mark DC 3-wire DC 2-wire Cable type No mark Cable type Cable connector ype Feature Spatter resistance type Shape Cylindrical type Inductive proximity sensor

Turne	Cabl	Cable type			Cable connector type					Nut, Washer	
Туре	PRA/	PRA/PRAT(M12, M18, M30)				PRAWT(M12, M18, M30)					
Flush		B C J Operation indicator				B J C F A Operation indicator					
Туре			Α	В	С	D	F	G	Н	J	
DC type	M12	PRA PRAT PRAWT	M12×1	43	32	4	4	17	21	2,000 2,000 300	
	M18	PRA PRAT PRAWT	M18×1	47.5	29.5	4	5	24	29	2,000 2,000 300	
	M30	PRA PRAT PRAWT	M30×1.5	58.5	38.5	5	5	35	42	2,000 2,000 300	
AC type	M12	PRA	M12×1	60	49	4	4	17	21	2,000	
	M18	PRA	M18×1	53.8	35.8	4	5	24	29	2,000	
	M30	PRA	M30×1.5	58.5	38.5	5	5	35	42	2,000	

XThe 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

Mode	ıl	PRAT12-2 C-V PRAWT12-2 O PRAWT12-2 C PRAWT12-2 O-I	PRAT18-5 OPRAT18-5 OPRAT18-5 OPRAT18-5 OPRAWT18-5 OPRAW	PRAT30-10_C-V PRAWT30-10_O PRAWT30-10_C PRAWT30-10_O-I	PRA12-2DP PRA12-2DN2	PRA18-5DN PRA18-5DP PRA18-5DN2 PRA18-5DP2	PRA30-10DN PRA30-10DP PRA30-10DN2 PRA30-10DP2		PRA18-5AO PRA18-5AC	PRA30-10AO PRA30-10AC		
Sensi	ing distance	2mm	5mm	10mm	2mm	5mm	10mm	2mm	5mm	10mm		
Hyste	resis	Max. 10% of s	ensing distanc	e								
Stand		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)		
Settin	g distance	0 to 1.4mm	0 to 3.5mm	0 to 7mm	0 to 1.4mm	0 to 3.5mm	0 to 7mm	0 to 1.4mm	0 to 3.5mm	0 to 7mm		
	r supply ating voltage)	12-24VDC== (10-30VDC==))		12-24VDC== (10-30VDC==))		100-240VAC~ 50/60Hz (85-264VAC~)				
Curren	t consumption	_			Max. 10mA			_				
Leaka	age current	Max. 0.6mA			<u> </u>			Max. 2.5mA				
Respon	nse frequency*1	1.5kHz	500Hz	400Hz	1.5kHz	500Hz	400Hz	20Hz				
Resid	ual voltage ^{*2}	Max. 3.5V(No	n-polarity type i	is Max. 5V)	Max. 1.5V			Max. 10V				
Affect	ion by Temp.	Max. ±10% for	r sensing distar	nce at ambient	temperature 20)°C						
Contr	ol output	2 to 100mA			200mA			5 to 150mA	5 to 200mA			
Insulat	ion resistance	Over 50MΩ (a	t 500VDC meg	ger)								
Dielec	ctric strength	1,500VAC 50/	60Hz for 1 min	ute (between al	Il terminals and	case)						
Vibrat	tion	1mm amplitud	le at frequency	of 10 to 55Hz i	n each of X, Y,	Z direction for	2 hours					
Shock	k	500m/s2 (appro	ox. 50G) X, Y, Z	Z direction for 3	times							
Indica	ator	Operation indi	cator (red LED)								
Environ-	Ambient temp.	-25 to 70°C, S	torage: -30 to 8	80°C								
ment	Ambient humi.	35 to 95%RH,	Storage: 35 to	95%RH								
Prote	ction circuit	Surge protecti	on circuit, ver current prof	tection circuit		circuit, output sh		Surge protection circuit				
Prote	ction	IP67(IEC Stan			[F	,						
	Cable type	Ø4mm, 2-wire, 2m	Ø5mm, 2-wire	, 2m	Ø4mm, 3-wire, 2m	Ø5mm, 3-wire	, 2m	Ø4mm, 2-wire, 2m	Ø5mm, 2-wire	, 2m		
2		AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: Ø1.25mm										
Cable*3	Cable connector	Ø4mm, 2-wire, 300mm, M12 connector	Ø5mm, 2-wire M12 connecto									
type		AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator out diameter: Ø1.25mm										
Meter	rials		FE coated Brase e(Black): Polyvi				ce: PTFE, oil resistant poly	yvinyl chloride	(PVC)			
Insula	ation type	Double insulation or reinforced insulation (Mark: Dielectric strength between the measuring input part and the power part: 1.5k/VAC)										
Appro	oval	CE										
Weight ^{**4}		PRAT: Approx. 84g (approx. 72g) PRAWT: Approx. 54g	PRAT: Approx. 122g (approx. 110g) PRAWT: Approx. 70g (approx. 58q)	(approx. 170g) PRAWT: Approx. 134g	Approx. 84g (approx. 72g)	Approx. 122g (approx. 110g)	Approx. 207g (approx. 170g)	Approx. 78g (approx. 66g)	Approx. 118g (approx. 106g)	Approx. 207g (approx. 170g)		
			N-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	10-1-P								

- **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.

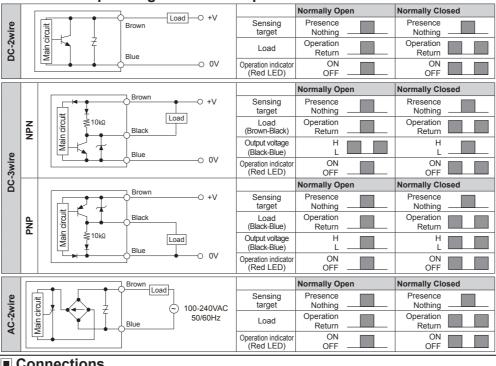
 **2: Before using non-polarity type, check the condition of connected device because residual voltage is 5V.

 **3: Do not pull 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 AWG222 cable or over within 200m.

 **4: The weight with packaging and the weight in parenthesis is only unit weight.

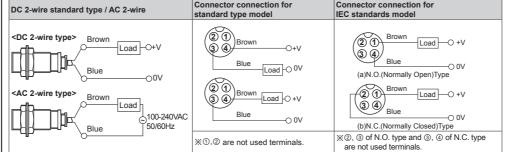
 **Environment resistance is rated at no freezing or condensation.

Control Output Diagram & Load Operation



Connections

(unit: mm)



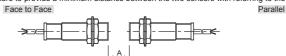
Power Supply Connection

Be sure to connect the power after connecting the load, because direct connection of the proximity sensor may cause damage to the



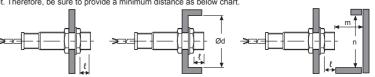
Mutual-interference & Influence by Surrounding Metals

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



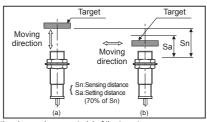
Influence by surrounding metals

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.



											(uriit. iiiiii)
PRA□12-2□□				PRA□18-5□□				PRA□30-10□□			
Α	12	Ød	12	Α	30	Ød	18	Α	60	Ød	30
В	24	m	6	В	36	m	15	В	60	m	30
ł	0	n	18	ł	0	n	27	ł	0	n	45

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.)PRA30-10DN
- Setting distance(Sa) = 10mm × 0.7 = 7mm

Installation and Tightening Torque

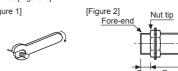
When tightening the nut, use the provided washer as [Figure 1] When installing the product, the tightening torque of the nut varies

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]

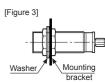
In case the nut is placed in the front part of the product, apply

tightening torque for front part.

[Table 1] the allowable tightening torque table is for inserting the washer as [Figure 3].







[Table 1]

Caution during Use

- 1. 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. 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
- If the surface of the product is rubbed with a hard object, PTFE coating can be worn out.

■ SSRs/Power Controllers

■ Sensor Controllers

■ Panel Meters
■ Tachometers/Pulse (Rate) Meters

Counters

■ Timers

- 6. This unit may be used in the following environment 1) Indoors (in the environment condition rated in 'Specifications'
- 3 Pollution degree 2

Major Products

- 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/Motion C
- Graphic/Logic Panels ■ Field Network Devices
- Laser Marking System (Fiber, Co., Nd;vag)

