Autonics

INDUCTIVE PROXIMITY SENSOR
(Spatter Resistant DC 3-wire Connector Type)
PRACM/PRDACM SERIES

INSTRUCTION MANUAL

Thank you for choosing our Autonics products.
Please read the following safety considerations before use.

■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.

※Safety considerations are categorized as follows.
⚠**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.

※The symbols used on the product and instruction manual represent the following
⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠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 personal injury, fire, or economic loss.

⚠Caution

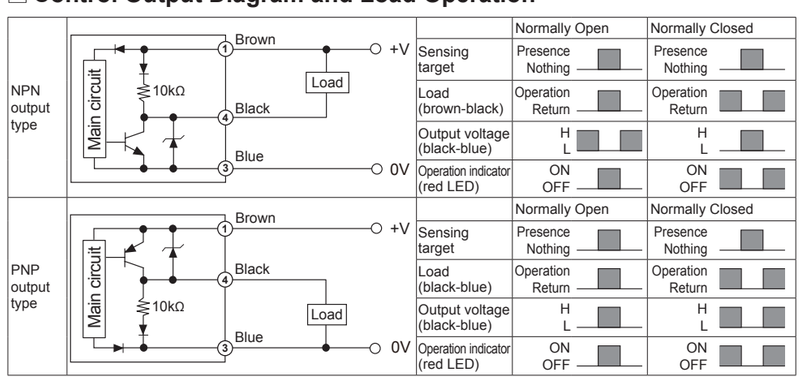
1. Do not use the unit where flammable or explosive gas, chemical, strong alkalis, or acids may be present.
Failure to follow this instruction may result in fire or explosion.
2. Do not impact on the unit.
Failure to follow this instruction may result in product damage or malfunction.
3. Do not use loads beyond the rated voltage range. Do not supply AC power to DC power unit.
Failure to follow this instruction may result in product damage.

■ Ordering Information

P R DA CM 18 – 5 D N

Output	**N**	NPN Normally Open (N.O.)
	N2	NPN Normally Closed (N.C.)
	P	PNP Normally Open (N.O.)
	P2	PNP Normally Closed (N.C.)
Power supply	**D**	12-24VDC
Sensing distance	**Number**	Standard sensing distance (unit: mm)
Dimension	**Number**	Diameter of head (mm)
Connection	**CM**	DC 3-wire connector type
Feature	**A**	Spatter resistant type
	DA	Long sensing distance spatter resistant type
Shape	**R**	Cylindrical type
Item	**P**	Inductive proximity sensor

■ Control Output Diagram and 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

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

■ Specifications

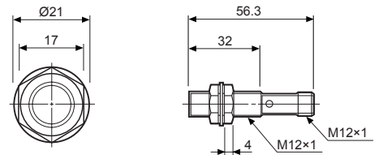
Model		PRACM12-2DN PRACM12-2DP PRACM12-2DN2 PRACM12-2DP2	PRDACM12-4DN PRDACM12-4DP PRDACM12-4DN2 PRDACM12-4DP2	PRACM18-5DN PRACM18-5DP PRACM18-5DN2 PRACM18-5DP2	PRDACM18-7DN PRDACM18-7DP PRDACM18-7DN2 PRDACM18-7DP2	PRACM30-10DN PRACM30-10DP PRACM30-10DN2 PRACM30-10DP2	PRDACM30-15DN PRDACM30-15DP PRDACM30-15DN2 PRDACM30-15DP2
Sensing distance		2mm	4mm	5mm	7mm	10mm	15mm
Hysteresis		Max. 10% of sensing distance					
Standard sensing target		12×12×1mm (iron)		18×18×1mm (iron)	20×20×1mm (iron)	30×30×1mm (iron)	45×45×1mm (iron)
Setting distance		0 to 1.4mm	0 to 2.8mm	0 to 3.5mm	0 to 4.9mm	0 to 7mm	0 to 10.5mm
Power supply (operating voltage)		12-24VDC (10-30VDC)					
Current consumption		Max. 10mA					
Response frequency※1		1.5kHz	500Hz	500Hz	300Hz	400Hz	100Hz
Residual voltage		Max. 1.5V					
Affection by temp.		Max. ±10% for sensing distance at ambient temperature 20℃					
Control output		Max. 200mA					
Insulation resistance		Min. 500MΩ (at 500VDC megger)					
Dielectric strength		1,500VAC 50/60Hz for 1 minute					
Vibration		1mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours					
Shock		500m/s² (approx. 50G) in each X, Y, Z direction for 3 times					
Indicator		Operation indicator (red LED)					
Environment	Ambient temperature	-25 to 70℃, storage: -30 to 80℃					
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH					
Protection circuit		Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit					
Protection		IP67 (IEC standards)					
Materials		Case/Nut: Teflon coated brass, Washer: Teflon coated iron, Sensing surface: Teflon					
Approval		CE					
Weight※2		Approx. 38g (approx. 26g)		Approx. 61g (approx. 49g)		Approx. 146g (approx. 134g)	

※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: The weight includes packaging. The weight in parentheses is for unit only.
※Environment resistance is rated at no freezing or condensation.

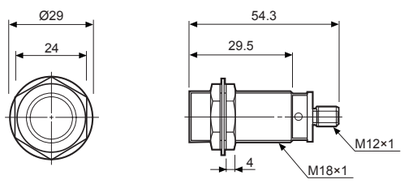
■ Dimensions

(unit: mm)

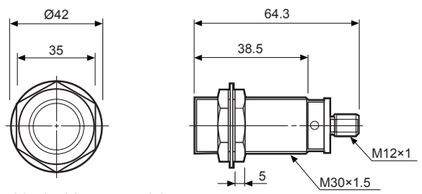
• PR(D)ACM12



• PR(D)ACM18

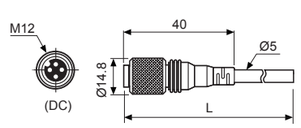


• PR(D)ACM30

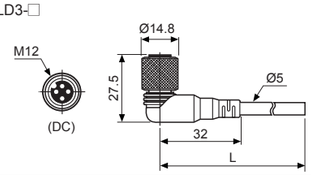


● Connection cable (sold separately)

• CID3-□

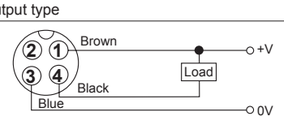
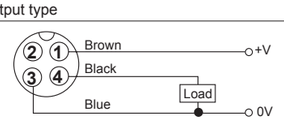


• CLD3-□



※"L" Standard cable length is 2m, 5m.

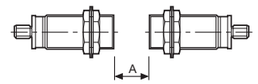
■ Wiring Diagram

NPN output type	PNP output type
	

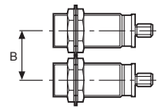
■ Mutual-interference and Influence By Surrounding Metals

●**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.

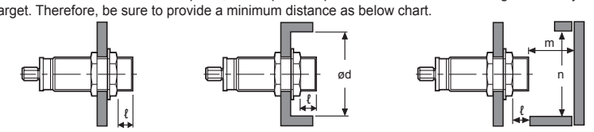
Face to Face



Parallel



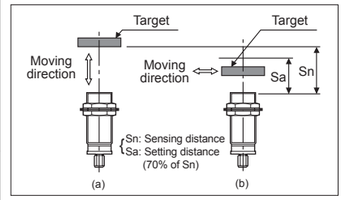
●**Influence by surrounding metals**
When sensors are mounted on metallic panel, it is required to protect the sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart.



(unit: mm)

Item \ Model	PRACM12-2D□	PRDACM12-4D□	PRACM18-5D□	PRDACM18-7D□	PRACM30-10D□	PRDACM30-15D□
A	12	24	30	42	60	90
B	24	24	36	36	60	60
ℓ	0	0	0	0	0	0
ød	12	12	18	18	30	30
m	6	12	15	21	30	45
n	18	18	27	27	45	45

■ Setting Distance

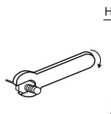


● Sensing distance can be changed by the shape, size or material of the target.
Check the sensing distance like (a), then pass the target within range of setting distance (Sa).

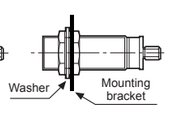
● Setting distance (Sa) : Sensing distance (Sn) × 70%
e.g.) PRACM30-10DN
Setting distance (Sa) = 10mm × 0.7 = 7mm

■ Caution During Use

1. This equipment shall not be used outdoors or beyond specified temperature range.
2. Do not apply over tensile strength of cord. (Ø4: max. 30N, Ø5: max. 50N)
3. Do not use the same conduit with cord of the unit and electric power line or power line.
4. Do not put overload to tighten nut, use the supplied washer for tightening.



[Figure 1]



[Figure 2]

Strength / Model		Front Size	Front Torque	Rear Torque
PR(D)ACM12 Series	Flush	13mm	65kgf·cm (6.37N·m)	120kgf·cm (11.76N·m)
PR(D)ACM18 Series	Flush	—	150kgf·cm (14.7N·m)	
PR(D)ACM30 Series	Flush	26mm	500kgf·cm (49N·m)	800kgf·cm (78.4N·m)

[Table 1]

Note 1) 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 [Figure 1] respectively. The rear part includes a nut on the head side (see above [Figure 1]). Apply a tightening torque of the front part when the nut on the front is located in the front part.
Note 2) The allowable tightening torque denotes a torque value when using a provided washer as above [Figure 2].

5. Check the voltage changes of power source in order not to excess the rated power input.
6. Do not use the unit during transient time (80ms) after apply power.
7. It might result in damage to the unit, if use automatic transformer. Use insulated transformer.
8. Make wire as short as possible in order to avoid noise.
9. Be sure to use cable as indicated specification on the unit. If wrong cable or bent cable is used, it shall not maintain the waterproof.
10. It is possible to extend cable with over 0.3mm² 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 the unit, install the varistor or absorber to source of surge, even though there is built-in surge absorber in the unit.
14. If connecting the load with big inrush current (DC type bulb) to the 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 using a DC type bulb, 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.

※**Failure to follow these instructions may result in product damage.**

■ 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
- Tachometers/Pulse (Rate) Meters
- Display Units
- Sensor Controllers

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