Autonics

INDUCTIVE PROXIMITY SENSOR
LONG DISTANCE CYLINDRICAL TYPE
DC 2WIRE CONNECTOR

M A N U A L

CE

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

■ Caution for 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

1. 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.
2. Do not connect power directly without load.
   It may result in damage to inner components or burn them out.

⚠ 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.
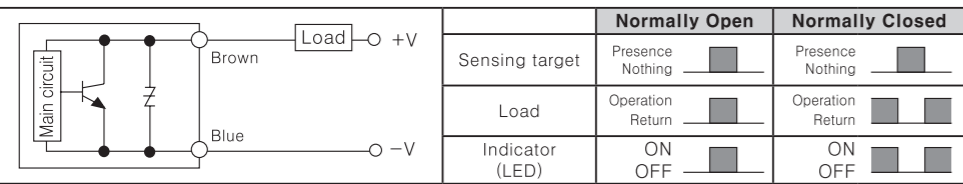3. Do not apply AC power and observe specification rating.
   It may result in serious damage to the product.
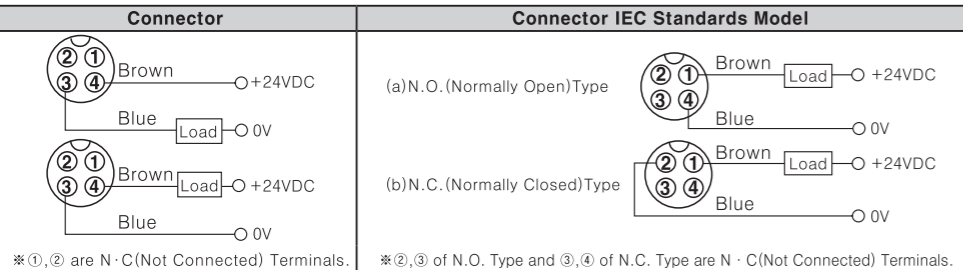
■ Ordering information

P R D CMT - 18 - 7 DO - I

Cable type		Connector type
	I	Connector type(IEC Standards model)
Output	**DO**	Normally Open(N.O.)
	DC	Normally Closed(N.C.)
Standard sensing distance	**Number**	Unit: mm
Dimension	**Number**	Diameter of head(mm)
Connection	**CMT**	DC 2wire Connector type
	CMLT	DC 2wire, long pipe, Connector type
Feature	**D**	Long sensing distance type
Shape	**R**	Cylindrical type
Item	**P**	Inductive proximity sensor

■ Control output diagram & Load operating

		Normally Open	Normally Closed
Sensing target	Presence		
	Nothing		
Load	Operation		
	Return		
Indicator (LED)		ON OFF	ON OFF

■ Connections

Connector	Connector IEC Standards Model
②① Brown +24VDC / Blue ③④ Load 0V	(a)N.O.(Normally Open)Type ②① Brown Load +24VDC / ③④ Blue 0V
②① Brown Load +24VDC / ③④ Blue 0V	(b)N.C.(Normally Closed)Type ②① Brown Load +24VDC / ③④ Blue 0V

※①,② are N·C(Not Connected) Terminals.
※②,③ of N.O. Type and ③,④ of N.C. Type are N·C(Not Connected) Terminals.
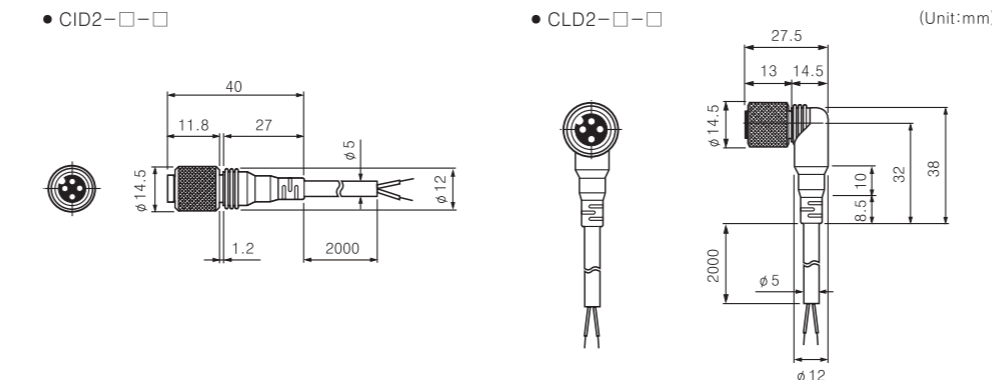
■ Specifications

Model	PRDCMT12-4DO PRDCMT12-4DC PRDCMT12-4DO-I PRDCMT12-4DC-I PRDCMLT12-4DO PRDCMLT12-4DC PRDCMLT12-4DO-I PRDCMLT12-4DC-I	PRDCMT12-8DO PRDCMT12-8DC PRDCMT12-8DO-I PRDCMT12-8DC-I PRDCMLT12-8DO PRDCMLT12-8DC PRDCMLT12-8DO-I PRDCMLT12-8DC-I	PRDCMT18-7DO PRDCMT18-7DC PRDCMT18-7DO-I PRDCMT18-7DC-I PRDCMLT18-7DO PRDCMLT18-7DC PRDCMLT18-7DO-I PRDCMLT18-7DC-I	PRDCMT18-14DO PRDCMT18-14DC PRDCMT18-14DO-I PRDCMT18-14DC-I PRDCMLT18-14DO PRDCMLT18-14DC PRDCMLT18-14DO-I PRDCMLT18-14DC-I	PRDCMT30-15DO PRDCMT30-15DC PRDCMT30-15DO-I PRDCMT30-15DC-I PRDCMLT30-15DO PRDCMLT30-15DC PRDCMLT30-15DO-I PRDCMLT30-15DC-I	PRDCMT30-25DO PRDCMT30-25DC PRDCMT30-25DO-I PRDCMT30-25DC-I PRDCMLT30-25DO PRDCMLT30-25DC PRDCMLT30-25DO-I PRDCMLT30-25DC-I
Sensing distance	4mm ±10%	8mm ±10%	7mm ±10%	14mm ±10%	15mm ±10%	25mm ±10%
Hysteresis	Max. 10% of sensing distance					
Standard sensing target	12×12×1mm(Iron)	25×25×1mm(Iron)	20×20×1mm(Iron)	40×40×1mm(Iron)	45×45×1mm(Iron)	75×75×1mm(Iron)
Setting distance	0~2.8mm	0~5.6mm	0~4.9mm	0~9.8mm	0~10.5mm	0~17.5mm
Power supply (Operating voltage)	12~24VDC (10~30VDC)					
Current consumption	Max. 0.6mA					
Response frequency(※1)	450Hz	400Hz	250Hz	200Hz	100Hz	100Hz
Residual voltage	Max. 3.5V					
Affection by Temp.	Within ±10℃ max. of sensing distance at 20℃ in temperature range of −25~70℃					
Control output	2~100mA					
Insulation resistance	Min. 50MΩ(500VDC megger)					
Dielectric strength	1,500VAC 50/60Hz for 1minute					
Vibration	1mm amplitude at frequency of 10~55Hz in each of X, Y, Z directions for 2 hours					
Shock	500㎨(50G) X, Y, Z directions for 3 times					
Indicator	Operating indicator(Red LED)					
Ambient temperature	−25~70℃(at non−freezing status)					
Storage temperature	−30~80℃(at non−freezing status)					
Ambient humidity	35~95%RH(at non−dew status)					
Protection circuit	surge protection circuit, Reverse polarity proteciton circuit, Overcurrent protection					
Protection	IP67(IEC Standards)					
Materials	Case/Nut: Nikel plated Brass, Washer: Nikel plated Iron, Sensing surface: Heat−resistant ABS					
Approval	CE					
Weight	PRDCMT12: Approx. 26g PRDCMLT12: Approx. 36g		PRDCMT18: Approx. 49g PRDCMLT18: Approx. 73g		PRDCMT30: Approx. 134g PRDCMLT30: Approx. 169g	

※ **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.

■ Dimensions

(Unit:mm)

Type	Connector type		Nut & Washer
	M12	M18, M30	
Flush	B C / E A M12X1	C D / E A M12X1	H G
Non-flush	B F C D / E A M12X1	B F C D / E A M12X1	
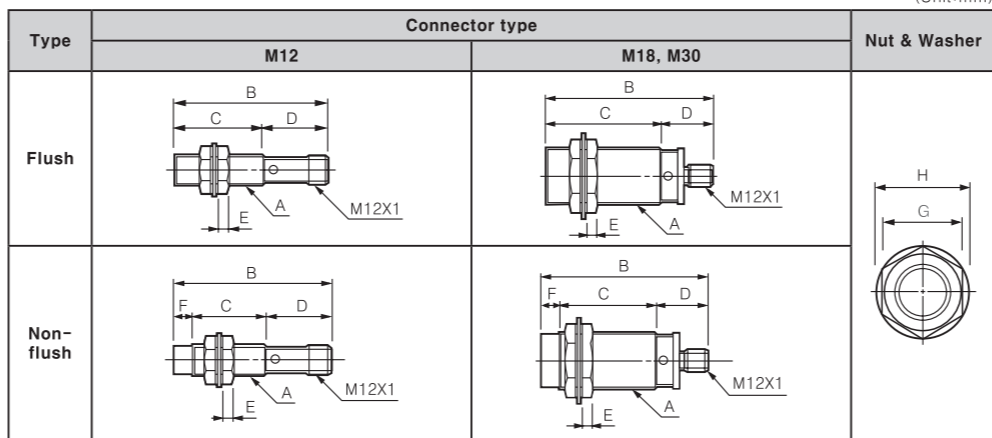
	Type		A	B	C	D	E	F	G	H
Flush	M12	PRDCMT	M12×1	55.8	31.5	24.3	4	—	17	21
		PRDCMLT	M12×1	68.3	44	24.3	4	—	17	21
	M18	PRDCMT	M18×1	54.3	29.5	24.3	4	—	24	29
		PRDCMLT	M18×1	87.3	62	24.3	4	—	24	29
	M30	PRDCMT	M30×1.5	63.8	38	25.8	5	—	35	42
		PRDCMLT	M30×1.5	85.8	60	25.8	5	—	35	42
Non-flush	M12	PRDCMT	M12×1	55.8	24.5	24.3	4	7	17	21
		PRDCMLT	M12×1	68.3	37	24.3	4	7	17	21
	M18	PRDCMT	M18×1	53.8	19	24.3	4	10	24	29
		PRDCMLT	M18×1	86.8	52	24.3	4	10	24	29
	M30	PRDCMT	M30×1.5	63.8	28	25.8	5	10	35	42
		PRDCMLT	M30×1.5	85.8	50	25.8	5	10	35	42

● CID2-□-□

40
11.8 27 ⌀5
⌀14.5
1.2 2000 ⌀12

● CLD2-□-□

(Unit:mm)

27.5
13 14.5
⌀14.5
32 38
8.5 10
2000 ⌀5
⌀12

## ■ Multi-interference & 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.
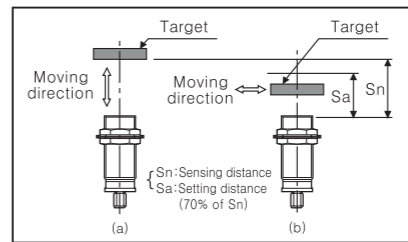
Face to Face   Parallel
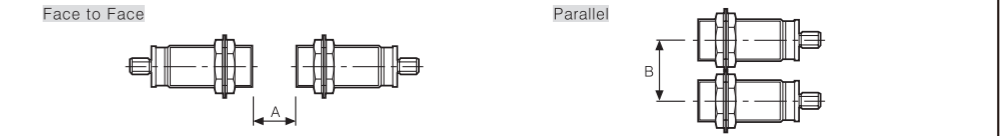
○**Influence by surrounding metals**
When sensors are mounted on metallic panel, it is required to protect the sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart.

(Unit:mm)
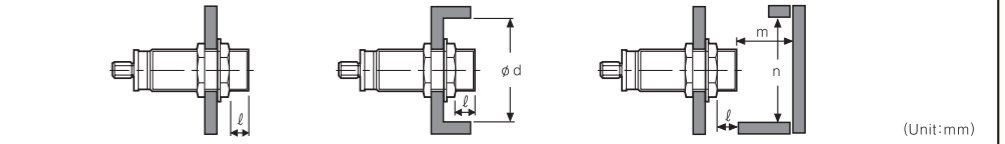
Model / Item	PRDCMT12-4D□ PRDCMLT12-4D□	PRDCMT12-8D□ PRDCMLT12-8D□	PRDCMT18-7D□ PRDCMLT18-7D□	PRDCMT18-14D□ PRDCMLT18-14D□	PRDCMT30-15D□ PRDCMLT30-15D□	PRDCMT30-25D□ PRDCMLT30-25D□
A	24	48	42	84	90	150
B	24	36	36	54	60	90
ℓ	0	11	0	14	0	15
⌀ d	12	36	18	54	30	90
m	12	24	21	42	45	75
n	18	36	27	54	45	90

■ Setting distance

Target   Target
Moving direction   Moving direction   Sn Sa
(a)   (b)

Sn:Sensing distance
Sa:Setting distance (70% of Sn)

● 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)PRCMT18-7DO(See ordering information)
   Setting distance(Sa) = 7mm × 0.7 = 4.9mm
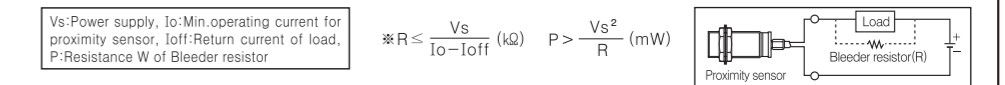
■ Caution for using

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

Head   Front Rear
washer   mounting bracket
Front Rear
[Picture 1]   [Picture 2]

Model	Strength	Front		Rear
		Size	Torque	Torque
PRDCMT12 Series	Flush	13mm	65kgf·cm (6.37N·m)	120kgf·cm (11.76N·m)
	Non-flush	7mm		
PRDCMT18 Series	Flush		150kgf·cm (14.7N·m)	
	Non-flush			
PRDCMT30 Series	Flush	26mm	500kgf·cm (49N·m)	800kgf·cm (78.4N·m)
	Non-flush	12mm		

[Table 1]

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].

5. Please check the voltage changes of power source in order not to excess rating power input.
6. Do not use this unit during transient time(80ms) after apply power.
7. It might result in damage to this product, if use automatic transformer. So please use insulated transformer.
8. 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−proof.
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 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 since 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.
15. If making a transceiver close to proximity sensor or wire connection, it may cause malfunction.
16. In case of the load current is small : Make the residual current is less than return current to connect the bleeder resistor to load in parallel.

Vs:Power supply, Io:Min.operating current for proximity sensor, Ioff:Return current of load, P:Resistance W of Bleeder resistor

$$R \le \frac{Vs}{Io - Ioff} (kΩ) \quad P > \frac{Vs^2}{R} (mW)$$

Proximity sensor   Bleeder resistor(R)

※ It may cause malfunction if above instructions are not followed.

■ Major products

■ Photoelectric sensors	■ Temperature controllers	■ Switching mode power supplies
■ Fiber optic sensors	■ Temperature/Humidity transducers	■ Control switches/Lamps/Buzzers
■ Door sensors	■ SSR/Power controllers	■ I/O Terminal Blocks & Cables
■ Door side sensors	■ Counters	■ Stepper motors/drivers/motion controllers
■ Area sensors	■ Timers	■ Graphic/Logic panels
■ Proximity sensors	■ Panel meters	■ Field network devices
■ Pressure sensors	■ Tachometer/Pulse(Rate) meters	■ Laser marking system(Fiber, CO₂, Nd:YAG)
■ Rotary encoders	■ Display units	■ Laser welding/soldering system
■ Connector/Sockets	■ Sensor controllers	

EP-KE-07-0510A