Autonics

INDUCTIVE PROXIMITY SENSOR
DC 2-WIRE TYPE
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

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.
2. **Do not connect power directly without load.**
   It may cause damage to inner components or burn them out.

⚠Caution

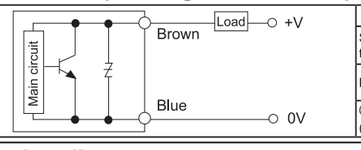
1. **Do not use this unit in place where there is flammable, explosive gas, chemical or strong alkalis, acids.**
   It may cause a fire or explosion.
2. **Do not impact on this unit.**
   It may cause malfunction or damage to the product.
3. **Do not use this product beyond rated voltage or apply AC power to DC power.**
   It may cause serious damage to the product.

■ Ordering information

P R CMT 12 – 2 D O U – IV

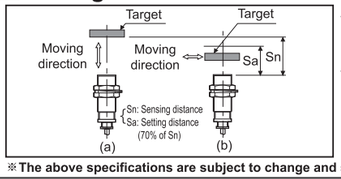
Cable type	No mark	Standard cable
	I	Standard cable(IEC standards model)
	V	Oil resistant cable
	IV	Oil resistant cable(IEC standards model)
Sensing side	No mark	Standard type
	U	Upper sensing type
Control output	O	Normally Open(N.O.)
	C	Normally Closed(N.O.)
Power supply	X	12-24VDC(Non-polarity type)
	D	12-24VDC
Sensing distance	Number	Standard sensing distance(Unit: mm)
Dimension	Number	Diameter of head(mm)
	Number	One side length(mm)
Connection	T	DC 2-wire, cable outgoing type
	WT	DC 2-wire, cable outgoing connector type
	CMT	DC 2-wire, connector type
Shape	R	Cylindrical type
	SN	Square new design type
Item	P	Inductive proximity sensor

■ Control output diagram & Load operation



	Normally Open	Normally Closed
Sensing target	Presence / Nothing	Presence / Nothing
Load	Operation / Return	Operation / Return
Operation indicator (Red RED)	ON / OFF	ON / OFF

■ Setting distance



- Detecting distance can be changed by the shape, size or material of the target. Therefore please check the detecting distance like (a), then pass the target within range of setting distance(Sa).
- Setting distance(Sa)
  = Sensing distance(Sn)× 70%
  Ex)PRCMT12-2DC
  Setting distance(Sa) = 2mm × 0.7 = 1.4mm

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

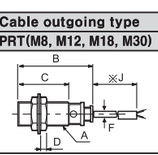
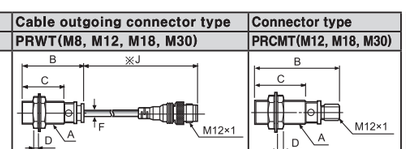
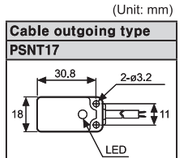
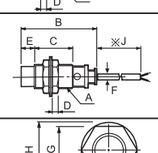
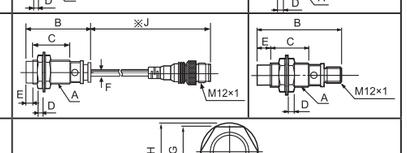
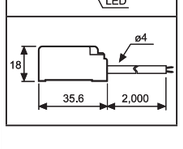
■ Specifications

Model	PRT08-1.5DO PRT08-1.5DC PRWT08-1.5DO PRWT08-1.5DC PRWT08-1.5DO-V PRWT08-1.5DC-V PRWT08-1.5DO-IV PRWT08-1.5DC-IV	PRT08-2DO PRT08-2DC PRWT08-2DO PRWT08-2DC PRWT08-2DO-V PRWT08-2DC-V PRWT08-2DO-IV PRWT08-2DC-IV	PRT12-2□O PRT12-2□C PRWT12-2□O PRWT12-2□C PRWT12-2□O-I PRWT12-2□C-I PRCMT12-2DO PRCMT12-2DC PRCMT12-2DO-I PRCMT12-2DC-I	PRT12-4□O PRT12-4□C PRWT12-4□O PRWT12-4□C PRWT12-4□O-I PRWT12-4□C-I PRCMT12-4DO PRCMT12-4DC PRCMT12-4DO-I PRCMT12-4DC-I	PRT18-5□O PRT18-5□C PRWT18-5□O PRWT18-5□C PRWT18-5□O-I PRWT18-5□C-I PRCMT18-5DO PRCMT18-5DC PRCMT18-5DO-I PRCMT18-5DC-I	PRT18-8□O PRT18-8□C PRWT18-8□O PRWT18-8□C PRWT18-8□O-I PRWT18-8□C-I PRCMT18-8DO PRCMT18-8DC PRCMT18-8DO-I PRCMT18-8DC-I	PRT30-10□O PRT30-10□C PRWT30-10□O PRWT30-10□C PRWT30-10□O-I PRWT30-10□C-I PRCMT30-10DO PRCMT30-10DC PRCMT30-10DO-I PRCMT30-10DC-I	PRT30-15□O PRT30-15□C PRWT30-15□O PRWT30-15□C PRWT30-15□O-I PRWT30-15□C-I PRCMT30-15DO PRCMT30-15DC PRCMT30-15DO-I PRCMT30-15DC-I	PSNT17-5DO PSNT17-5DC PSNT17-5DOU PSNT17-5DCU
Sensing distance	1.5mm	2mm	2mm	4mm	5mm	8mm	10mm	15mm	5mm
Hysteresis	Max. 10% of sensing distance								
Standard sensing target	8×8×1mm(Iron)		12×12×1mm(Iron)		18×18×1mm(Iron)	25×25×1mm(Iron)	30×30×1mm(Iron)	45×45×1mm(Iron)	18×18×1mm(Iron)
Setting 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	0 to 3.5mm
Power supply (Operating voltage)	12-24VDC(10-30VDC)								
Leakage current	Max. 0.6mA								
Response frequency※1	1.5kHz	1.0kHz	1.5kHz	500Hz		350Hz	400Hz	200Hz	700Hz
Residual voltage※2	Max. 3.5V(Non-polarity type is Max. 5V)								
Affection by Temp.	Within ±10°C max. of sensing distance at 20°C in temperature range of -25 to 70°C(PRT08 Series: Max. ±20%)								
Control output	2 to 100mA								
Insulation resistance	Min. 500MΩ(500VDC megger)								
Dielectric strength	1,500VAC 50/60Hz for 1minute								
Vibration	1mm amplitude at frequency 10~55Hz in each of X, Y, Z directions for 2 hours								
Shock	500m/s²(50G) X, Y, Z directions for 3 times								
Indicator	Operating indicator(Red LED)								
Environment: Ambient Temp.	-25 to 70°C, Storage: -30 to 80°C								
Environment: Ambient humidity	35~95%RH, Storage: 35 to 95%RH								
Protection circuit	Surge protection		Surge protection circuit, overload & short circuit protection						
Protection	IP67(IEC Standard)								
Cable: PRT	Ø3.5, 3-wire, 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator diameter: Ø1mm)		Ø4, 2-wire, 2m (AWG22, Core diameter: 0.08mm, Number of cores: 60, Insulator diameter: Ø1.25mm)		Ø5, 2-wire, 2m				Ø4, 2-wire, 2m
Cable: PRWT	Ø4, 2-wire, 300mm, M12 connector				Ø5, 2-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)								
Approval	CE								
Weight※3	PRT: Approx. 64g(Approx. 52g) PRWT: Approx. 44g(Approx. 32g)		PRT: Approx. 84g(Approx. 72g) PRWT: Approx. 54g(Approx. 42g) PRCMT:Approx. 38g(Approx. 26g)		PRWT:Approx. 122g(Approx. 110g) PRWT:Approx. 70g(Approx. 58g) PRCMT:Approx. 60g(Approx. 48g)		PRT:Approx. 207g(Approx. 170g) PRWT:Approx. 134g(Approx. 122g) PRCMT:Approx. 154g(Approx.142g)		PSNT: Approx. 92g (Approx. 71g)

※**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**: The weight with packaging and the weight in parentheses is only unit weight.
※Environment resistance is rated at no freezing or condensation.

■ Dimensions

(Unit: mm)

Type	Cable outgoing type PRT(M8, M12, M18, M30)	Cable outgoing connector type PRWT(M8, M12, M18, M30)	Connector type PRCMT(M12, M18, M30)
Flush			
Non-flush			
Nut & Washer			

Cable outgoing type PSNT17

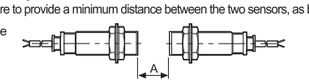
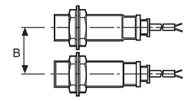
Type			A	B	C	D	E	F	G	H	J
Flush	M8	PRT	M8×1	30	30	4	–	3.5	13	15	2,000
		PRWT	M8×1	30	30	4	–	4	13	15	300
	M12	PRT	M12×1	46	31.5	4	–	4	17	21	2,000
		PRWT	M12×1	46	31.5	4	–	4	17	21	300
		PRCMT	M12×1	55.8	31.5	4	–	–	17	21	–
	M18	PRT	M18×1	47.5	29.5	4	–	5	24	29	2,000
		PRWT	M18×1	47.5	29.5	4	–	5	24	29	300
		PRCMT	M18×1	54.3	29.5	4	–	–	24	29	–
	M30	PRT	M30×1.5	58	38	5	–	5	35	42	2,000
		PRWT	M30×1.5	58	38	5	–	5	35	42	300
		PRCMT	M30×1.5	63.8	38	5	–	–	35	42	–
Non-flush	M8	PRT	M8×1	30	26	4	4	3.5	13	15	2,000
		PRWT	M8×1	30	26	4	4	4	13	15	300
	M12	PRT	M12×1	46	24.5	4	7	4	17	21	2,000
		PRWT	M12×1	46	24.5	4	7	4	17	21	300
		PRCMT	M12×1	55.8	24.5	4	7	–	17	21	–
	M18	PRT	M18×1	47	19	4	10	5	24	29	2,000
		PRWT	M18×1	47	19	4	10	5	24	29	300
		PRCMT	M18×1	53.8	19	4	10	–	24	29	–
	M30	PRT	M30×1.5	58	28	5	10	5	35	42	2,000
		PRWT	M30×1.5	58	28	5	10	5	35	42	300
		PRCMT	M30×1.5	63.8	28	5	10	–	35	42	–

※'J' type standard : Cable outgoing type/2,000mm, Cable outgoing connector type/300mm

■ Mutual-interference & Influence by surrounding metals

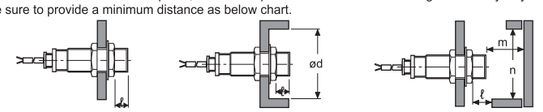
◎**Mutual-interference**

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 table.

Face to Face  Parallel 

◎**Influence by surrounding metals**

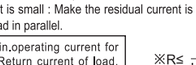
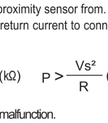
When sensors are mounted on metallic panel, it must be prevented sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart.



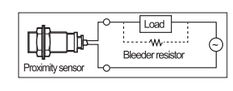
(Unit: mm)

Item \ Model	PRT08-1.5D□ PRWT08-1.5D□	PRT08-2D□ PRWT08-2D□	PRT12-2□□ PRWT12-2□□ PRCMT12-2□□	PRT12-4□□ PRWT12-4□□ PRCMT12-4□□	PRT18-5□□ PRWT18-5□□ PRCMT18-5□□	PRT18-8□□ PRWT18-8□□ PRCMT18-8□□	PRT30-10□□ PRWT30-10□□ PRCMT30-10□□	PRT30-15□□ PRWT30-15□□ PRCMT30-15□□
A	9	12	12	24	30	48	60	90
B	16	24	24	36	36	54	60	90
ℓ	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
n	12	24	18	36	27	54	45	90

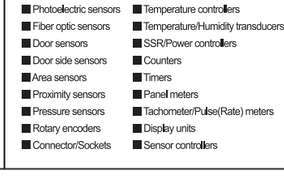
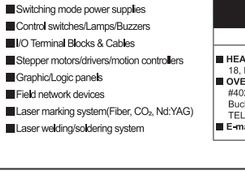
Item \ Model	PSNT17-5D□
A	30
B	36
C	5
d	15
ℓ	24
m	18

Face to Face  Parallel 

Influence by surrounding metals



■ Connections

DC 2-wire standard	Connector connection for standard type model	Connector connection for IEC standards model
		

※Load can be wired to any direction.

※①,② are not used terminals.

(a)N.O.(Normally Open) Type

(b)N.C.(Normally Closed) Type

※②,③ of N.O. type and ③,④ of N.C. type are not used terminals.

※No need to consider polarity for non-polarity type of power supply.

■ Caution for using

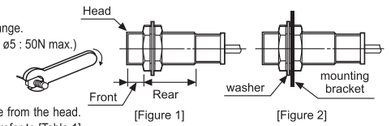
1. This equipment shall not be used outdoors or beyond specified temperature range.
2. Do not load over than tensile strength of cord.(ø3.5: 25N max., ø4 : 30N max., ø5 : 50N max.)
3. Do not use the same conduit with cord of this unit and electric power line or power line. Also avoid the same connection.
4. Do not put overload to tighten nut, please use washer for tightening.
   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 [Figure 1] respectively. The rear part includes a nut on the head side(see above [Figure 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 [Figure 2].
   Note3)PSNT17 Series : Tighten strength of installing bolts should be under 15kgf·cm(1.47N·m).
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. Do not connect capacity load to output part directly.
8. It may result in damage to the product, if use automatic transformer. So please use insulated transformer.
9. Please make wire short as much as possible in order to avoid noise.
10. Be sure to cable as indicated specification on this product. If use wrong cable or bended cable, it shall not maintain the water- proof.
11. It is possible to extend cable with over 0.3㎟ and max. 200m.
12. If the target is plated, the sensing distance can be changed by the plating material.
13. It may result in malfunction by metal particle on product.
14. 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.
15. 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.
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

$※R \leq \frac{Vs}{Io\text{-}Ioff}\ (k\Omega) \qquad P > \frac{Vs^2}{R}\ (mW)$

17. If make a transceiver close to proximity sensor or wire connection, it may cause malfunction.

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



[Figure 1] [Figure 2]

Model \ Strength		Front Size	Front Torque	Rear Torque
PRT08 Series	Flush	7mm	40kgf·cm (3.92N·m)	90kgf·cm (8.82N·m)
	Non-flush	5mm		
PRT12 Series	Flush	13mm	65kgf·cm (6.37N·m)	120kgf·cm (11.76N·m)
	Non-flush	7mm		
PRT18 Series	Flush	-	150kgf·cm(14.7N·m)	
	Non-flush	-		
PRT30 Series	Flush	26mm	500kgf·cm (49N·m)	800kgf·cm (78.4N·m)
	Non-flush	12mm		

[Table 1]

■ Major products

- Photoelectric sensors
- Fiber optic sensors
- Door sensors
- Door side sensors
- Area sensors
- Proximity sensors
- Pressure sensors
- Rotary encoders
- Connector/Sockets
- Temperature controllers
- Temperature/Humidity transducers
- SSR/Power controllers
- Counters
- Timers
- Panel meters
- Tachometer/Pulse(Rate) meters
- Display units
- Sensor controllers
- 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/soldering system

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