

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

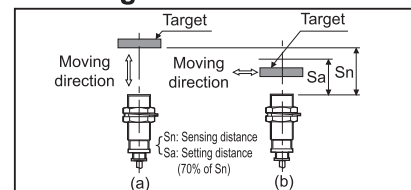
Ordering code: P R CMT 12 - 2 D O U - IV

| Item | Shape | Connection | Dimension | Sensing distance | Power supply | Control output | Sensing side | Cable type |
|--------------|---------|--|-----------|------------------|--------------|----------------|--------------|------------|
| 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 | | | | | | |
| | O | Normally Open(N.O.) | | | | | | |
| | C | Normally Closed(N.O.) | | | | | | |
| Power supply | X | 12-24VDC(Non-polarity type) | | | | | | |
| | D | 12-24VDC | | | | | | |
| Dimension | Number | Standard sensing distance(Unit: mm) | | | | | | |
| | Number | Diameter of head(mm) | | | | | | |
| | Number | One side length(mm) | | | | | | |
| | T | DC 2-wire, cable outgoing type | | | | | | |
| Connection | WT | DC 2-wire, cable outgoing connector type | | | | | | |
| | CMT | DC 2-wire, connector type | | | | | | |
| | R | Cylindrical type | | | | | | |
| Shape | SN | Square new design type | | | | | | |
| | P | Inductive proximity sensor | | | | | | |

Control output diagram & Load operation

| | | | | |
|-------------------------------|-----|----------------|------------------|------------------|
| Main circuit | | Sensing target | Normally Open | Normally Closed |
| | | | Presence | Presence |
| | | Nothing | Nothing | |
| | | Load | Operation Return | Operation Return |
| Operation indicator (Red RED) | ON | ON | | |
| | OFF | 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 | PRT08-2DO | PRT12-2-O | PRT12-4-O | PRT18-5-O | PRT18-8-O | PRT30-10-O | PRT30-15-O | PSNT17-5DO | |
|----------------------------------|---|--|-------------------------------|---------------------------------|---|---------------------------------|---------------------------------|-----------------------------------|--------------------------------|--|
| 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) | |
| Setting distance | 0 to 1.05mm | | 0 to 1.4mm | | 0 to 2.8mm | | 0 to 3.5mm | | 0 to 3.5mm | |
| Power supply (Operating voltage) | 12-24VDC(10-30VDC) | | | | | | | | | |
| Leakage current | Max. 0.6mA | | | | | | | | | |
| Response frequency | 1.5kHz | 1.0kHz | 1.5kHz | 500Hz | 350Hz | 400Hz | 200Hz | 700Hz | | |
| Residual voltage | 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 | 500ms(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 | | | | | | | | | |
| | 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 | | Ø5, 2-wire, 2m | | | |
| | 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 | PRT: Approx. 64g(Approx. 52g) | PRTWT: Approx. 44g(Approx. 32g) | PRT: Approx. 84g(Approx. 72g) | PRTWT: Approx. 54g(Approx. 42g) | PRT: Approx. 122g(Approx. 110g) | PRTWT: Approx. 70g(Approx. 58g) | PRT: Approx. 207g(Approx. 170g) | PRTWT: Approx. 134g(Approx. 122g) | PSNT: Approx. 92g(Approx. 71g) | |
| | | | | | | | | | | |

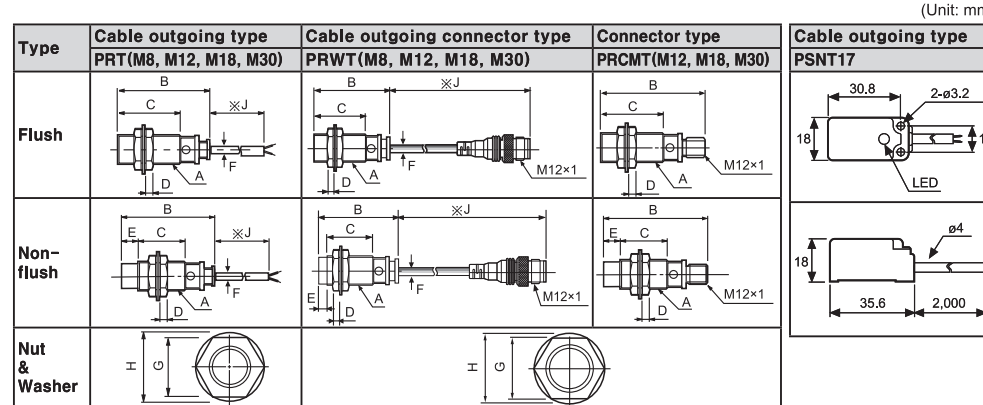
*1: The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

*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.

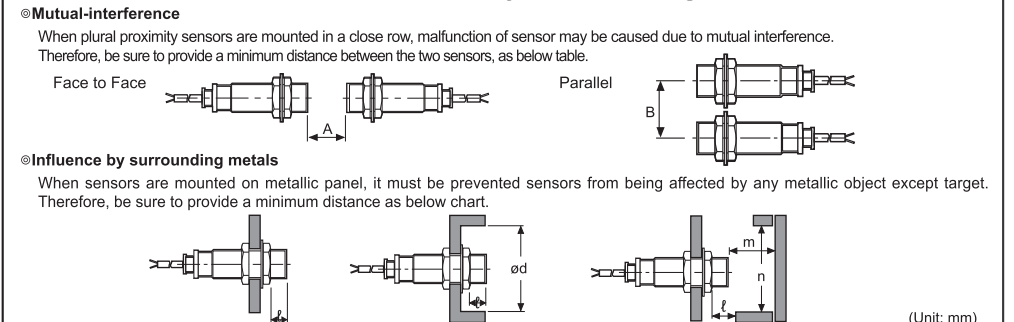
Dimensions



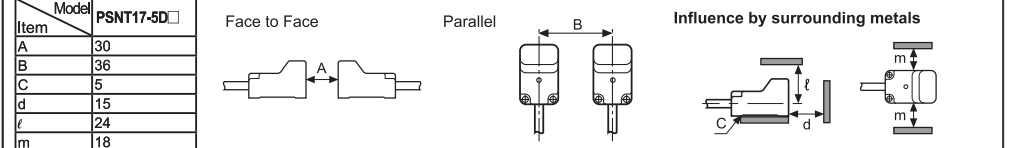
| Type | | A | B | C | D | E | F | G | H | J | |
|-----------|-----|------|---------|------|------|---|---|-----|----|----|-------|
| Flush | M8 | PRT | M8×1 | 30 | 30 | 4 | - | 3.5 | 13 | 15 | 2,000 |
| | | PRWT | M8×1 | 30 | 30 | 4 | - | 4 | 13 | 15 | 300 |
| | M12 | PRT | M12×1 | 46 | 31.5 | 4 | - | 4 | 17 | 21 | 2,000 |
| | | PRWT | M12×1 | 46 | 31.5 | 4 | - | 4 | 17 | 21 | 300 |
| | M18 | PRT | M18×1 | 55.8 | 31.5 | 4 | - | - | 17 | 21 | - |
| | | PRWT | M18×1 | 47.5 | 29.5 | 4 | - | 5 | 24 | 29 | 2,000 |
| Non-flush | M18 | PRT | M18×1 | 47.5 | 29.5 | 4 | - | 5 | 24 | 29 | 300 |
| | | PRWT | M18×1 | 47.5 | 29.5 | 4 | - | 5 | 24 | 29 | 300 |
| | M30 | PRT | M30×1.5 | 54.3 | 29.5 | 4 | - | - | 24 | 29 | - |
| | | PRWT | M30×1.5 | 58 | 38 | 5 | - | 5 | 35 | 42 | 2,000 |

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

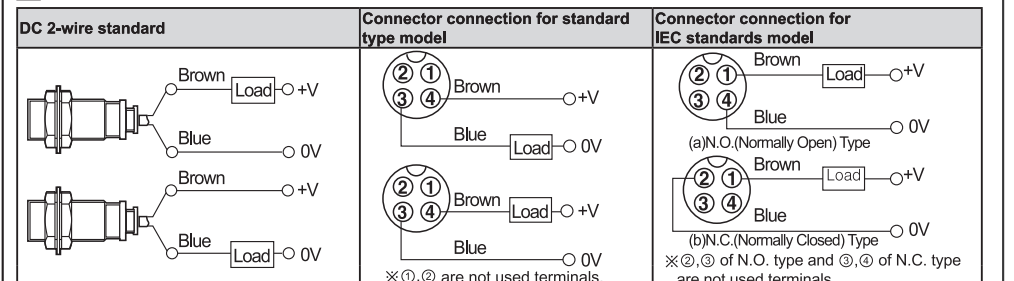
Mutual-interference & Influence by surrounding metals



| Model Item | PRT08-1.5DO PRWT08-1.5DO | PRT08-2DO PRWT08-2DO | PRT12-2-O PRWT12-2-O PRCMT12-2-O | PRT12-4-O PRWT12-4-O PRCMT12-4-O | PRT18-5-O PRWT18-5-O PRCMT18-5-O | PRT18-8-O PRWT18-8-O PRCMT18-8-O | PRT30-10-O PRWT30-10-O PRCMT30-10-O | PRT30-15-O PRWT30-15-O PRCMT30-15-O | PSNT17-5DO PSNT17-5DC PSNT17-5DCU |
|------------|-----------------------------|-------------------------|--|--|--|--|---|---|---|
| A | 9 | 12 | 12 | 24 | 36 | 48 | 60 | 90 | |
| B | 16 | 24 | 24 | 36 | 54 | 72 | 90 | 135 | |
| t | 0 | 8 | 0 | 11 | 0 | 14 | 0 | 15 | |
| od | 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 | |



Connections



*Load can be wired to any direction. *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.
- 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 0.3mm 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.
- V_s : Power supply, I_o : Min. operating current for proximity sensor, I_{off} : Return current of load, R : Resistance of Bleeder resistor
- $R \leq \frac{V_s}{I_o - I_{off}} (k\Omega)$ $P > \frac{V_s^2}{R} (mW)$
- 17. If make a transceiver close to proximity sensor or wire connection, it may cause malfunction.

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
- IO 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

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