Autonics

# INDUCTIVE PROXIMITY SENSOR
# LONG DISTANCE CYLINDRICAL TYPE DC 3WIRE

**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(nuclear power control, medical equipment vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it is required to install fail-safe device, or contact us for information on type required.**
   It may cause a fire, human injury or proerty loss.

### ⚠Caution

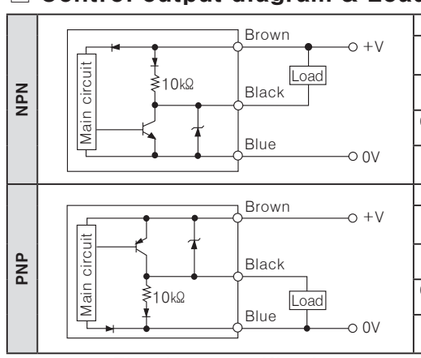
1. **Do not use this unit where flammable, explosive gas, chemical or strong alkalis, acids exists.**
   It may cause a fire or explosion.
2. **Do not impact on this unit.**
   It may result in malfunction or damage to the product.
3. **Do not apply AC power and observe specification rating.**
   It may result in serious damage to the product.

## ▣ Ordering information

**P R D CM L 18 - 7 DN**

| | | |
|---|---|---|
| Control output | **DN** | NPN N.O.(Normally Open) |
| | **DN2** | NPN N.C.(Normally Closed) |
| | **DP** | PNP N.O.(Normally Open) |
| | **DP2** | PNP N.C.(Normally Closed) |
| Sensing distance | **Number** | Sensing distance(Unit: mm) |
| Dimension | **Number** | Diameter of head(Unit: mm) |
| Body size | **No mark** | Standard type |
| | **L** | Long body |
| Connection | **CM** | 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 | Presence / Nothing |
| Load (Brown-Black) | Operation / Return | Operation / Return |
| Output voltage (Black-Blue) | H / L | H / L |
| Indicator (LED) | ON / OFF | ON / OFF |

※ **The above specifications are subject to change without notice.**

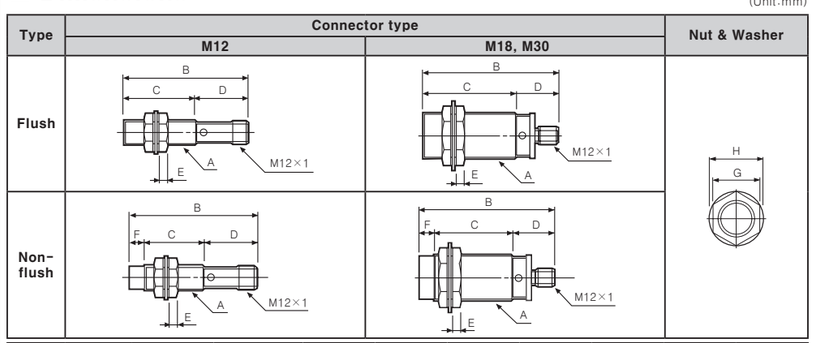
## ▣ Specifications

| Model | PRDCM12-4DN<br>PRDCM12-4DP<br>PRDCM12-4DN2<br>PRDCM12-4DP2<br>PRDCML12-4DN<br>PRDCML12-4DP<br>PRDCML12-4DN2<br>PRDCML12-4DP2 | PRDCM12-8DN<br>PRDCM12-8DP<br>PRDCM12-8DN2<br>PRDCM12-8DP2<br>PRDCML12-8DN<br>PRDCML12-8DP<br>PRDCML12-8DN2<br>PRDCML12-8DP2 | PRDCM18-7DN<br>PRDCM18-7DP<br>PRDCM18-7DN2<br>PRDCM18-7DP2<br>PRDCML18-7DN<br>PRDCML18-7DP<br>PRDCML18-7DN2<br>PRDCML18-7DP2 | PRDCM18-14DN<br>PRDCM18-14DP<br>PRDCM18-14DN2<br>PRDCM18-14DP2<br>PRDCML18-14DN<br>PRDCML18-14DP<br>PRDCML18-14DN2<br>PRDCML18-14DP2 | PRDCM30-15DN<br>PRDCM30-15DP<br>PRDCM30-15DN2<br>PRDCM30-15DP2<br>PRDCML30-15DN<br>PRDCML30-15DP<br>PRDCML30-15DN2<br>PRDCML30-15DP2 | PRDCM30-25DN<br>PRDCM30-25DP<br>PRDCM30-25DN2<br>PRDCM30-25DP2<br>PRDCML30-25DN<br>PRDCML30-25DP<br>PRDCML30-25DN2<br>PRDCML30-25DP2 |
|---|---|---|---|---|---|---|
| Sensing distance | 4㎜ | 8㎜ | 7㎜ | 14㎜ | 15㎜ | 25㎜ |
| Hysteresis | Max. 10% of sensing distance | | | | | |
| Standard sensing target | 12×12×1㎜(Iron) | 25×25×1㎜(Iron) | 20×20×1㎜(Iron) | 40×40×1㎜(Iron) | 45×45×1㎜(Iron) | 75×75×1㎜(Iron) |
| Setting distance | 0 to 2.8㎜ | 0 to 5.6㎜ | 0 to 4.9㎜ | 0 to 9.8㎜ | 0 to 10.5㎜ | 0 to 17.5㎜ |
| Power supply (Operating voltage) | 12-24VDC(10-30VDC) | | | | | |
| Current consumption | Max. 10mA | | | | | |
| Response frequency | 500㎐ | 400㎐ | 300㎐ | 200㎐ | 100㎐ | 100㎐ |
| Residual voltage | Max. 1.5V | | | | | |
| Affection by Temp. | Within ±10℃ max. of sensing distance at 20℃ in temperature range of -25 to 70℃ | | | | | |
| Control output | Max. 200mA | | | | | |
| Insulation resistance | Min. 50㏁(at 500VDC megger) | | | | | |
| Dielectric strength | 1,500VAC 50/60㎐ for 1minute | | | | | |
| Vibration | 1㎜ amplitude at frequency of 10 ~ 55㎐ 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) | | | | | |
| Environment: Ambient temperature | -25 to 70℃, Storage: -30 to 80℃ | | | | | |
| Environment: Ambient humidity | 35 to 95%RH, Storage: 35 to 95%RH | | | | | |
| Protection circuit | Surge protection, Reverse polarity proteciton, Overload & short circuit protection | | | | | |
| Protection | IP67(IEC standards) | | | | | |
| Materials | • Case/Nut: Nikel plated Brass • Washer: Nikel plated Iron • Sensing surface: Heat-resistant ABS | | | | | |
| Approval | CE | | | | | |
| Unit Weight | PRDCM: Approx. 26g<br>PRDCML: Approx. 36g | | PRDCM: Approx. 49g<br>PRDCML: Approx. 73g | | PRDCM: Approx. 134g<br>PRDCML: Approx. 169g | |

※ Environment resistance is rated at no freezing or condensation.

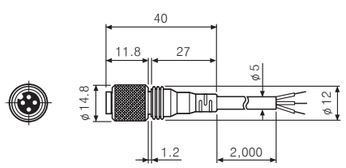
## ▣ Dimensions

(Unit:mm)

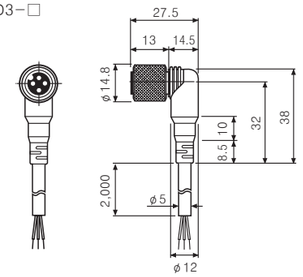



| Type | | | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|---|
| Flush | M12 | PRDCM | M12×1 | 55.8 | 31.5 | 24.3 | 4 | — | 17 | 21 |
| | | PRDCML | M12×1 | 68.3 | 44 | 24.3 | 4 | — | | |
| | M18 | PRDCM | M18×1 | 54.3 | 29.5 | 24.8 | 4 | — | 24 | 29 |
| | | PRDCML | M18×1 | 87.3 | 62.5 | 24.8 | 4 | — | | |
| | M30 | PRDCM | M30×1.5 | 63.8 | 38 | 25.8 | 5 | – | 35 | 42 |
| | | PRDCML | M30×1.5 | 85.8 | 60 | 25.8 | 5 | – | | |
| Non-flush | M12 | PRDCM | M12×1 | 55.8 | 24.5 | 24.3 | 4 | 7 | 17 | 21 |
| | | PRDCML | M12×1 | 68.3 | 37 | 24.3 | 4 | 7 | | |
| | M18 | PRDCM | M18×1 | 53.8 | 19 | 24.8 | 4 | 10 | 24 | 29 |
| | | PRDCML | M18×1 | 86.8 | 52 | 24.8 | 4 | 10 | | |
| | M30 | PRDCM | M30×1.5 | 63.8 | 28 | 25.8 | 5 | 10 | 35 | 42 |
| | | PRDCML | M30×1.5 | 85.8 | 50 | 25.8 | 5 | 10 | | |

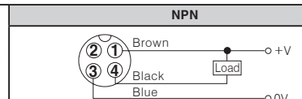
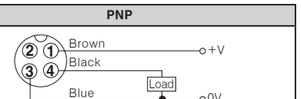
• CID3-□




• CLD3-□




## ▣ Connections

| Connector | NPN | PNP |
|---|---|---|
| |  |  |

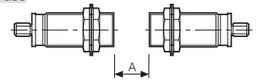


## ▣ Mutual-interference & Influence by surrounding metals

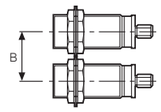
**◎Mutual-interference**

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

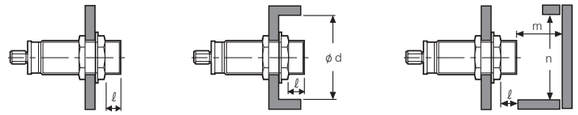



Parallel




**◎Influence by surrounding metals**

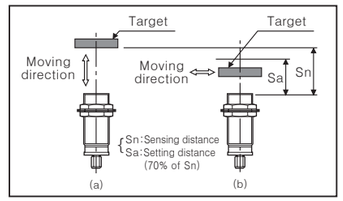
When sensors are mounted on metallic panel, it is required to protect the sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart.




(Unit:mm)

| Item \ Model | PRDCM(L)12-4D□ | PRDCM(L)12-8D□ | PRDCM(L)18-7D□ | PRDCM(L)18-14D□ | PRDCM(L)30-15D□ | PRDCM(L)30-25D□ |
|---|---|---|---|---|---|---|
| A | 24 | 48 | 42 | 84 | 90 | 150 |
| B | 24 | 36 | 36 | 54 | 60 | 90 |
| ℓ | 0 | 11 | 0 | 14 | 0 | 15 |
| ϕd | 12 | 36 | 18 | 54 | 30 | 90 |
| m | 12 | 24 | 21 | 42 | 45 | 75 |
| n | 18 | 36 | 27 | 54 | 45 | 90 |

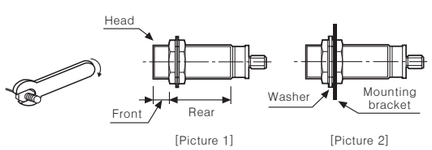
## ▣ Setting distance




- 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%
  Ex)PRDCM18-7DN
  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. (ϕ4: max. 30N, ϕ5: max. 50N)
3. Do not use the same conduit with cord of this unit and electric power line or power line.
4. Do not put overload to tighten nut, please use the supplied washer for tightening.




[Picture 1] [Picture 2]

| Model \ Strength | | Front Size | Front Torque | Rear Torque |
|---|---|---|---|---|
| PRDCM12 Series | Flush | 13mm | 65kgf·cm (6.37N·m) | 120kgf·cm (11.76N·m) |
| | Non-flush | 7mm | | |
| PRDCM18 Series | Flush | – | 150kgf·cm (14.7N·m) | |
| | Non-flush | – | | |
| PRDCM30 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 the rated 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. 0.3㎟ or larger cable can be extended up to 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, etc.) to this 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 you use DC type bulb, please connect extra relay or resistance in order to protect proximity sensor from.
15. When the transceiver is attached to the proximity sensor or close to the wires, it may cause a malfunction.

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

## ▣ Major products

- Proximity sensors
- Area sensors
- Photoelectric sensors
- Fiber optic sensors
- Door/Door side sensors
- Sensor controllers
- Graphic/Logic panels
- Temperature controllers
- Tachometer/Pulse(Rate) meters
- Temperature/Humidity transducers
- Switching power supplies
- Stepping motors/drivers/motion controllers
- Field network devices
- Laser marking system($CO_2$, Nd:YAG)
- Laser welding/soldering system
- Counters
- Timers
- Display units
- Panel meters
- Pressure sensors
- Rotary encoders
- Power controllers


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■**E-mail :** sales@autonics.com
**The proposal of a product improvement and development :product@autonics.com**



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