



# Autonics PRDT12-8DO Cylindrical Inductive Long Distance Proximity Sensors Instruction Manual

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# Autonics

Cylindrical Inductive Long-Distance Proximity Sensors  
PRD Series (DC 2-wire)  
INSTRUCTION MANUAL  
TCD210246AA

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## PRDT12-8DO Cylindrical Inductive Long Distance Proximity Sensors

Thank you for choosing our Autonics product.

Read and understand the instruction manual and manual thoroughly before using the product.

For your safety, read and follow the below safety considerations before using. For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.


Keep this instruction manual in a place where you can find easily.

The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Follow Autonics website for the latest information.

## Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.

-  symbol indicates caution due to special circumstances in which hazards may occur.



**Warning** Failure to follow instructions may result in serious injury or death.

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, economic loss or fire.
2. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present. Failure to follow this instruction may result in explosion or fire.
3. Do not disassemble or modify the unit. Failure to follow this instruction may result in fire.
4. Do not connect, repair, or inspect the unit while connected to a power source. Failure to follow this instruction may result in fire.
5. Check 'Connections' before wiring. Failure to follow this instruction may result in fire.



**Caution** Failure to follow instructions may result in injury or product damage.

1. Use the unit within the rated specifications. Failure to follow this instruction may result in fire or product damage.
2. Use a dry cloth to clean the unit, and do not use water or organic solvent. Failure to follow this instruction may result in fire.
3. Do not supply power without load. Failure to follow this instruction may result in fire or product damage.

## Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- 12 – 24 VDC= power supply should be insulated and limited voltage / current or Class 2, SELV power supply device.
- Use the product, after 0.8 sec of supplying power.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent surge and inductive noise. Do not use near the equipment which generates strong magnetic force or high frequency noise

(transceiver, etc.). In case installing the product near the equipment which generates strong surge (motor, welding machine, etc.), use diode or varistor to remove surge.

- If the surface is rubbed with a hard object, PTFE coating can be worn out.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000 m
  - Pollution degree 2
  - Installation category II



## Cautions for Installation

- Install the unit correctly with the usage environment, location, and the designated specifications.
- Do NOT impacts with a hard object or excessive bending of the wire lead-out. It may cause damage the water resistance.
- Do NOT pull the 0 3.5 mm cable with a tensile strength of 25 N, the 0 4 mm cable with a tensile strength of 30 N or over and the 0 5 mm cable with a tensile strength of 50 N or over. It may result in fire due to the broken wire.
- When extending wire, use AWG 22 cable or over within 200 m.

## Ordering Information

This is only for reference, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website.



1. Characteristic  
No mark: General type  
A: Spatter-resistant type
2. Connection  
No mark: Cable type  
W: Cable connector type  
CM: Connector type
3. Body length  
No mark: Normal  
L: Long
4. DIA. of sensing side  
Number: DIA. of sensing side (unit: mm)
5. Sensing distance  
Number: Sensing distance (unit: mm)
6. Power supply  
D: 12 – 24 VDC   
X: 12 – 24 VDC  (non-polarity)
7. Control output

O : Normally open

C: Normally closed

## 8. Cable

No mark: Standard type

I: Standard type (IEC standards)

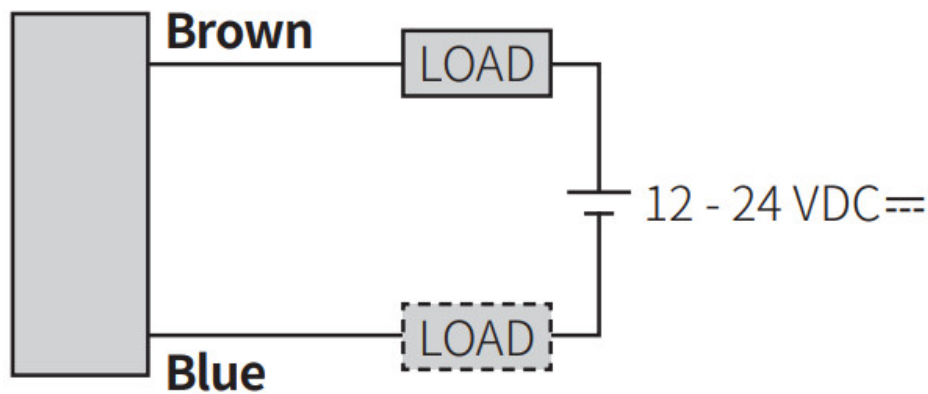
V: Oil resistant cable type

IV: Oil resistant cable type (IEC standards)

## Connections

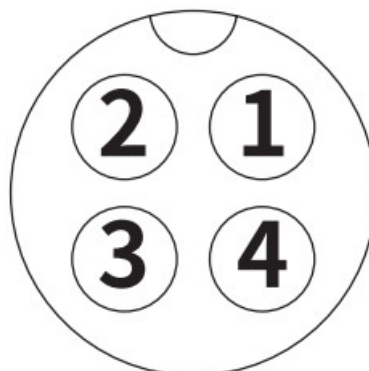
- LOAD can be wired to any direction.
- Connect LOAD before supplying the power.
- No need to consider polarity for non-polarity type of power supply.

## Cable type



## Cable connector type / Connector type

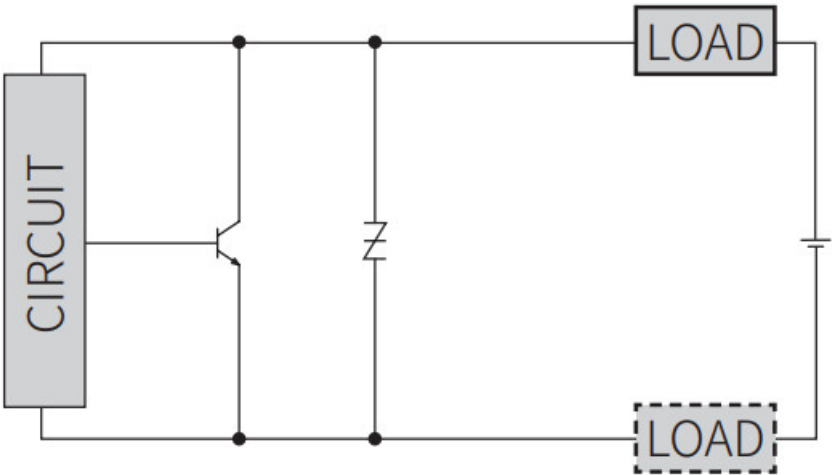
- For LOAD connection, follow the cable type connection.
- Fasten the connector not to shown the thread. (0.39 to 0.49 N m)
- Fasten the vibration part with PTFE tape.















Pin	Color	Func.
1	–	–
2	–	–
3	Blue	0V
4	Brown	+V

IEC standards				
Pin	Normally open		Normally close	
	Color	Func.	Color	Func.
	Brown	+V	Brown	+V
	–	–	Blue	0V
	–	–	–	–
a®	Blue	0V	–	–

Inner circuit

























Operation Timing Chart

	Normally open	Normally closed
Sensing target	Presence 	Presence 
	Nothing 	Nothing 
Load	Operation 	Operation 
	Return 	Return 
Operation indicator (red)	ON 	ON 
	OFF 	OFF 

Sold Separately

- Connector cable, connector connection cable
- Transmission coupler
- Spatter protection cover
- Fixed bracket




Installation	Flush type			
General	PRD  T08-2 	PRD  T12-4 	PRD  T18-7 	PRD  T30-15 
Spatter-resistant	—	PRDA  T12-4 	PRDA  T18-7 	PRDA  T30-15 
DIA. of sensing side	Ø8 mm	Ø 12 mm	Ø18 mm	Ø30 mm
Sensing distance	2 mm	4 mm	7 mm	15 mm
Setting distance	0 to 1.4 mm	0 to 2.8 mm	0 to 4.9 mm	0 to 10.5 mm
Hysteresis	15% of sensing distance	10% of sensing distance		
Standard sensing target: iron	8 x 8 x 1 mm	12 x 12 x 1 mm	20 x 20 x 1 mm	45 x 45 x 1 mm
Response frequency “)	1 kHz	450 Hz	250 Hz	100 Hz
Affection by temperature	< ± 10 %for sensing distance at ambient temperature 20 °C (DIA of sensing side Ø 8 mm : ± 15 %)			
Indicator	Operation indicator (red)			
Approval				

Installation	Non-flush type			
General	PRD 108-4 M	PRD• T12-8 0	PRD• T18-14	PRD•T30-25
DIA. of sensing side	Ø8 mm	Ø 12 mm	Ø18 mm	Ø30 mm
Sensing distance	4 mm	8 mm	14 mm	25 mm
Setting distance	0 to 2.8 mm	0 to 5.6 mm	0 to 9.8 mm	0 to 17.5 mm
Hysteresis	15% of sensing distance	< 10% of sensing distance		
Standard sensing target: iron	12 X 12 X 1 mm	25 X 25 X 1 mm	40 X 40 X 1 mm	75 X 75 X 1 mm
Response frequency “)	800 Hz	400 Hz	200 Hz	100 Hz
Affection by temperature	< + 10 %for sensing distance at ambient temperature 20 °C (DIA of sensing side Ø 8 mm : ± 15 %)			
Indicator	Operation indicator (red)			
Approval				

01) 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.

Unit weigh (package)01)		08 mm	012 mm	018 mm	030 mm
Cable	Normal	≈ 43 g (≈ 63g)	≈ 62g(≈ 74g)	≈ 97 g (≈ 115g)	≈ 143 g (≈ 180g)
			≈ 72 g(≈ 84 g)	≈ 122 g (≈ 134 g)	≈ 221 g (≈ 184 g)
	Long	—	≈ 82 g(≈ 94 g)	≈ 127 g (≈ 145 g)	≈ 183 g (≈ 220 g)
Cable connector	Normal	≈ 25 g (≈ 45g)	≈ 32 g (≈ 55g)	≈ 62g(≈ 80g)	≈ 130 g (≈ 145g)
			≈ 42 g(≈ 54 g)	≈ 65 g (≈ 77 g)	≈ 143g(≈ 155 g)
	Long	—	—	≈ 92 g (≈ 110 g)	—
Connector	Normal	≈ 10 g(≈ 32g)	≈ 20g(≈ 50g)	≈ 42 g (≈ 60g)	≈ 110 g (≈ 150 g)
		—	≈ 26g (≈ 38 g)	≈ 49g (≈ 61 g)	≈ 134 g (≈ 46 g)
	Long	—	—	≈ 60 g(≈ 78 g)	≈ 150 g (≈ 190 g)

1. In case of normal body length, it is written in General type order.  
Spatter-resistant type  
In case of long body length, it is only available general type.

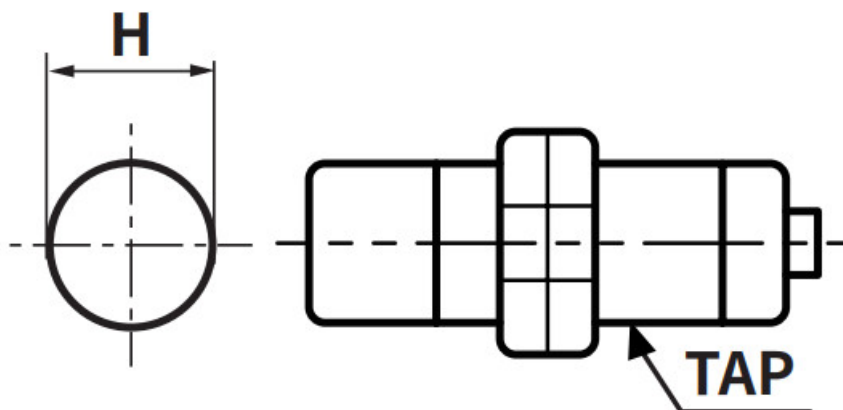
Power supply	12 – 24 VDC  (ripple P-P: ≤ 10 %), operating voltage: 10 – 30 VDC 
Leakage current	DIA. of sensing side Ø 8mm: ≤ 0.8 mA DIA. of sensing side Ø 12 mm, Ø 18 mm, Ø 30 mm: ≤ 0.6 mA
Control output	2 to 100 mA
Residual voltage sul	≥ 3.5 V (Non-polarity: ≤ 5V)
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MO (500 VDC  megger)
Dielectric strength	DIA. of sensing side 08 mm :1,000 VAC~ 50/60 Hz for 1 min (between all terminals and case) (connector type: 1,500 VAC~ 50/60 Hz for 1 min (between all terminals and case)) DIA. of sensing side Ø 12 mm, 018 mm, Ø 30 mm :1,500 VAC~ 50/60 Hz for 1 min (between all terminals and case)
Vibration	1 mm double amplitude at frequency 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours
Shock	500 m/s <sup>2</sup> (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (non-freezing or non-condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (non-freezing or non-condensation)
Protection structure	IP67 (IEC standards)
Connection	Cable type / Cable connector type/Connector type model
Cable spec. Ca)	DIA. of sensing side Ø 8 mm: Ø 3.5 mm, 2-wire DIA. of sensing side Ø 12 mm: Ø 4 mm, 2-wire DIA. of sensing side Ø 18 mm, Ø 30 mm: Ø 5 mm, 2-wire
Wire spec.	Ø 3.5 mm cable : AWG 24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm Ø 4 mm, Ø 5 mm cable : AWG 22 (0.08 mm, 60-core), insulator diameter: 01.25 mm
Connector spec.	M12 connector
Material	Standard type cable (black): polyvinyl chloride (PVC) Oil resistant cable (gray): polyvinyl chloride (oil resistant PVC)
General	Case/Nut: nickel plated brass (DIA. of sensing side Ø 8 mm connector type case: 5U5303), washer: nickel plated iron, sensing side: PBT
Spatter-resistant	Case/Nut: PTFE coated brass, washer: PTFE coated iron, sensing side: PTFE

1. Check the condition of connected device.
2. Cable type: 2 m, Cable connector type: 300 mm

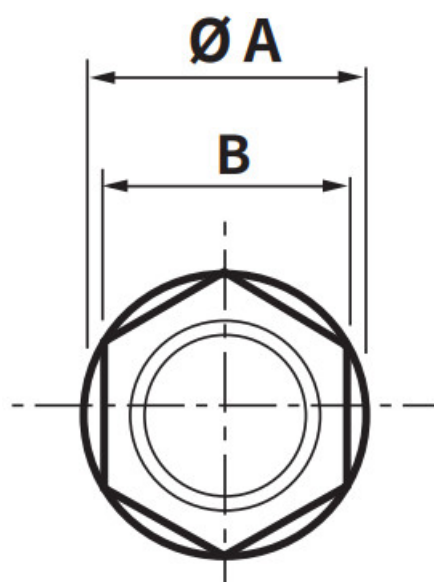


## Cut-out Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics web site.



	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Mounting hole (H)	Ø 8.5 +0.50	Ø 12.5 +0.50	Ø 18.5 +0.50	Ø 30.5 +0.50
TAP	M8x1	M12x1	M18x1	M30x1



	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Ø A	15	21	29	42
B	13	17	14	35

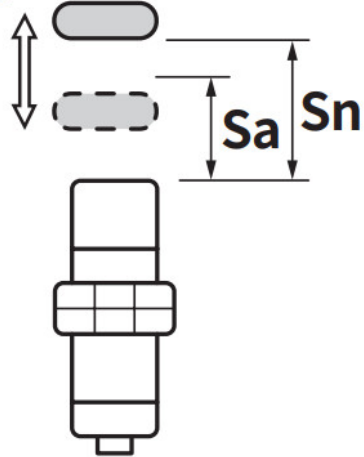
## Setting Distance Formula

Detecting distance can be changed by the shape, size or material of the target. For stable sensing, install the unit within the 70 % of sensing distance.

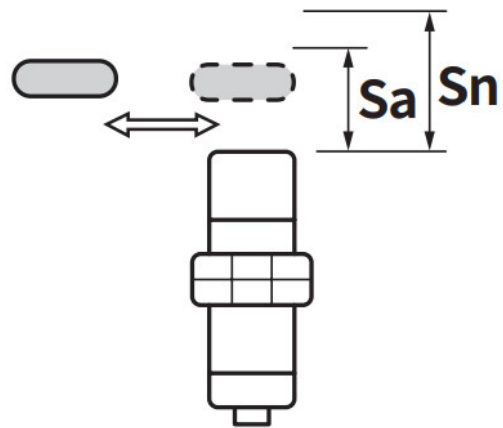
**Setting distance (Sa)**

**= Sensing distance (Sn) x 70 0/0**

Sensing target  
: Up-Down movement



Sensing target  
: Right-Left movement

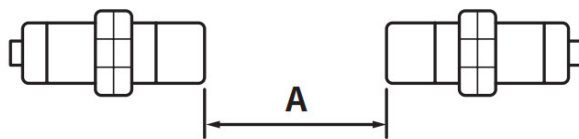


## Mutual-interference & Influence by Surrounding Metals

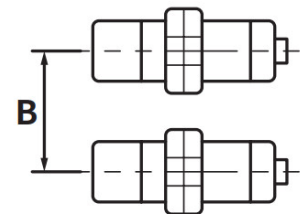
- Mutual-interference

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]

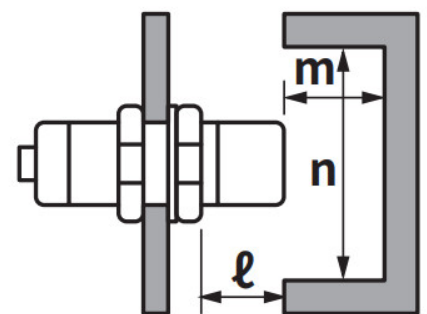
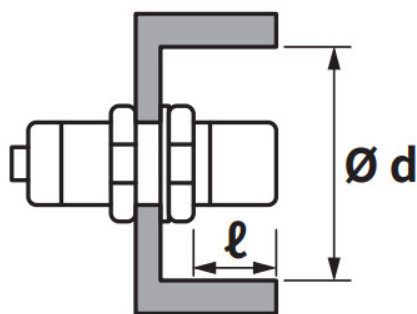
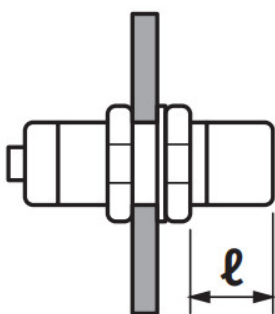


[Parallel]



- 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.



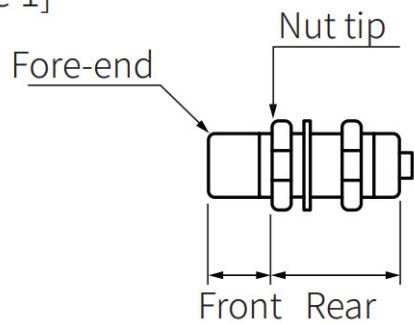
(unit:mm)

Sensing side	Ø 8 mm		Ø 12 mm		Ø 18 mm		Ø 30 mm	
Item	Flush	Non-flush	Flush	Non-flush	Flush	Non-flush	Flush	Non-flush
A	20	80	25	120	50	200	110	350
B	15	60	25	100	35	110	90	300
C	0	12	2.5	15	3.5	14	6	20
d	8	24	18	40	27	70	45	120
m	6	8	12	20	24	40	45	90
n	12	24	18	40	27	70	45	120

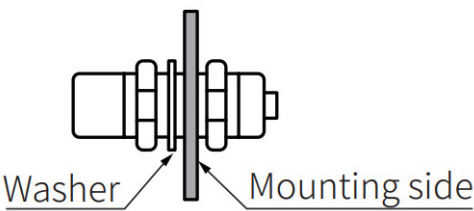
### Tightening Torque

Use the provided washer to tighten the nuts. The tightening torque of the nut varies with the distance from the fore-end. [Figure 1] If the nut tip is located at the front of the product, apply the front tightening torque. the allowable tightening torque table is for inserting the washer as [Figure 2].

[Figure 1]



[Figure 2]



Sensing side	Ø 8 mm		Ø 12 mm		Ø 18 mm		Ø 30 mm	
Strength	Flush	Non-flush	Flush	Non-flush	Flush	Non-flush	Flush	Non-flush
Front size	7 mm	5 mm	13 mm	7 mm	—	—	26 mm	12mm
Front torque	3.92 N m		6.37 N m		14.7 N m		49 N m	
Rear torque	8. 82 N m		11. 76 N m		14.7 N m		78.4 N m	

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### Documents / Resources

	<p><a href="#">Autonics PRDT12-8DO Cylindrical Inductive Long Distance Proximity Sensors</a> [pdf] Instru ction Manual</p> <p>PRDT12-8DO Cylindrical Inductive Long Distance Proximity Sensors, PRDT12-8DO, Cylindrical Inductive Long Distance Proximity Sensors, Long Distance Proximity Sensors, Proximity Sensors</p>
	<p><a href="#">Autonics PRDT12-8DO Cylindrical Inductive Long-Distance Proximity Sensors</a> [pdf] User Manual</p> <p>PRDT12-8DO Cylindrical Inductive Long-Distance Proximity Sensors, PRDT12-8DO, Cylindrical Inductive Long-Distance Proximity Sensors, Inductive Long-Distance Proximity Sensors, Long- Distance Proximity Sensors, Proximity Sensors, Sensors</p>

References

-  [autonics.com](https://www.autonics.com)