Cylindrical Inductive Long-Distance Proximity Sensors

PRD Series (DC 2-wire) INSTRUCTION MANUAL

TCD210246AA

Autonics

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.

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

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

- 01. 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.
- 02. 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. 03. Do not disassemble or modify the unit.

Failure to follow this instruction may result in fire.

04. Do not connect, repair, or inspect the unit while connected to a power source.

Failure to follow this instruction may result in fire.

05. 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.

01. Use the unit within the rated specifications.

- Failure to follow this instruction may result in fire or product damage. 02. 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
- 03. 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 Ø 3.5 mm cable with a tensile strength of 25 N, the Ø 4 mm cable with a tensile strength of 30 N or over and the Ø 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.

PRD	0	0	8	т	4	-	6	6	0	-
Characteristic No mark: General type A: Spatter-resistant type							sing dis er: Sensi		ince (un	it: mm)
Oconnection						Pow	er supp	oly		

D: 12 - 24 VDC== X: 12 - 24 VDC== (non-polarity) 8

Control output O: Normally open

C: Normally closed O Cable

O DIA. of sensing side Number: DIA. of sensing side (unit: mm)

No mark: Standard type I: Standard type (IEC standards) V: Oil resistant cable type IV: Oil resistant cable type (IEC standards)

Connections

No mark: Cable type

CM: Connector type

Body length

L: Long

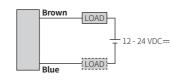
No mark: Normal

W: Cable connector type

- · LOAD can be wired to any direction.
- Connect LOAD before suppling the power.

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

Cable type

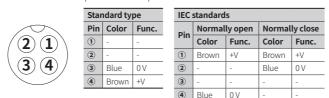


Cable connector type / Connector type

• For LOAD connection, follow the cable type connection.

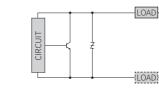
Fasten the connector not to shown the thread. (0.39 to 0.49 N m)

· Fasten the vibration part with PTFE tape.

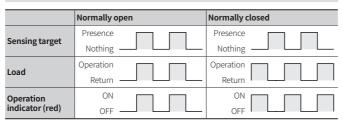


0 V

Inner circuit



Operation Timing Chart



Sold Separately

- Connector cable. connector connection cable Transmission couple
- Spatter protection cover Fixed bracket

Specifications

Specifi	icati	ons	;							
nstallation		Flus	h tyne							
			Flush type PRD_T08-2 PRD_T12-4 PRD_T18-7 PRD_T30-15							
patter-resistant -		-			PRDA T12-4		RDA T18-7	PRDA T30-15		
IA. of sens		Øßr	nm	Ø		0	18 mm	Ø 30 mm		
ide			Ø8mm							
ensing dis		2 mr			4 mm		mm	15 mm		
etting dist	ance		1.4 mm	0 to 2.8 mm		0	to 4.9 mm	0 to 10.5 mm		
lysteresis		≤ 15 dista	5 % of sensing ance	\leq 10 % of sensing d		ista	ance			
tandard ensing targ	get:		8 × 1 mm	$12 \times 12 \times 1$ mm		2	0 imes 20 imes 1 mm	45 imes45 imes1mm		
on esponse requency ⁰¹	1)	1 kH	z	450 Hz		2	50 Hz	100 Hz		
ffection by	/		: 10 % for sensir							
emperatur	e		to f sensing side Ø 8 mm: $\leq \pm 15\%$)							
ndicator			ration indicator (red) ERL C € ERL C € ERL							
pproval		CEI	ITL	Ce	. EAL	C	€ ERC	C€ERE		
nstallation		Non	-flush type							
eneral		PRD	T08-4	PR	D T12-8	P	RD T18-14	PRD T30-25		
IA. of sens de	ing	Ø8r	nm	ØI	L2 mm	ø	18 mm	Ø 30 mm		
ae ensing dist	tance	4 mr	n	80	nm	1	4 mm	25 mm		
etting dist			2.8 mm	-	5.6 mm	-	to 9.8 mm	0 to 17.5 mm		
			5 % of sensing							
ysteresis		dista		≤	10 % of sensing d	ista	ance			
andard ensing targ on	get:	12 ×	: 12 × 1 mm	$25 \times 25 \times 1$ mm		4	0 imes40 imes1mm	75 imes75 imes1 mm		
esponse	1)	800	Hz	40) Hz	2	00 Hz	100 Hz		
equency °					-			100112		
ffection by mperatur					stance at ambien mm: $\leq \pm 15$ %)	t te	emperature 20 °C			
dicator	-		ration indicator							
oproval		CE		_	EAC	C	€ ERE	C€ERL		
	nse fred	uency	is the average va			ng t	arget is used and the	width is set as		
					he sensing distance			-		
nit weight ackage) ⁰¹	:)		Ø8mm		Ø 12 mm		Ø 18 mm	Ø 30 mm		
	Norn	nal	\approx 43 g (\approx 63 g	g)	\approx 62 g (\approx 74 g)		$\approx 97~g~(\approx 115~g)$	≈ 143 g (≈ 180 g		
able			-		≈ 72 g (≈ 84 g)		pprox 122 g ($pprox$ 134 g) ≈ 221 g (≈ 184 g		
	Long				\approx 82 g (\approx 94 g)		≈ 127 g (≈ 145 g	i) ≈ 183 g (≈ 220 g		
able	Norn	nal	$\approx 25 \text{ g} (\approx 45 \text{ g})$				\approx 62 g (\approx 80 g)	≈ 130 g (≈ 145 g		
nnector			-		≈ 42 g (≈ 54 g)		≈ 65 g (≈ 77 g)	≈ 143 g (≈ 155 g		
	Long		-		-		$\approx 92 \text{ g} (\approx 110 \text{ g})$	-		
nnoctor	Norn	nal	≈ 10 g (≈ 32 g				$\approx 42 \text{ g} (\approx 60 \text{ g})$ $\approx 40 \text{ g} (\approx 61 \text{ g})$	$\approx 110 \text{ g} (\approx 150 \text{ g})$		
onnector			-		≈ 26g (≈ 38 g)		$\approx 49 g (\approx 61 g)$ $\approx 60 g (\approx 78 g)$	≈ 134 g (≈ 146 g ≈ 150 g (≈ 190 g		
	Long		-		Conoral turno		~ 00 g (~ 18 g)	~ 130 B (~ 130 B		
In case of r In case of l	normal ong bo	body l dy leng	ength, it is writter gth, it is only avail	n in - able	General type Spatter-resistant ty general type.	ype	order.			
ower supp	ly		12 - 24 VDC=	ripp	le P-P: ≤ 10 %), o	pe	rating voltage: 10 -	30 VDC		
akage cui			12 - 24 VDC≕ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≕ DIA. of sensing side Ø 8mm: ≤ 0.8 mA							
-				side	e Ø 12 mm, Ø 18 n	nm	,Ø30 mm: ≤ 0.6 n	nA		
ontrol out)1)	2 to 100 mA							
esidual vo	itage	,	≤ 3.5 V (Non-p			-				
rotection	circuit		Surge protection circuit, output short over current protection circuit, reverse polarity protection							
sulation r	esista	nce	\geq 50 M Ω (500 VDC= megger)							
			DIA. of sensing side Ø 8 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							
electric st	rengt	h	(connector type: 1,500 VAC \sim 50/60 Hz for 1 min (between all terminals and case))							
					e Ø 12 mm, Ø 18 n) Hz for 1 min (bet			ud case)		
bration			: 1,500 VAC \sim 50/60 Hz for 1 min (between all terminals and case) 1 mm double amplitude at frequency 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours							
Shock			direction for 2 hours $500 \text{ m/s}^2 (\approx 50 \text{ G})$ in each X, Y, Z direction for 3 times							
Ambient temperature		ture								
mbient humidity		35 to 95 %RH, storage: 35 to 95 %RH (non-freezing or non-condensation)								
otections			IP67 (IEC stand		-					
Connection			Cable type / Cable connector type / Connector type model							
able spec.			DIA. of sensing DIA. of sensing	side side	e Ø 8 mm: Ø 3.5 m e Ø 12 mm: Ø 4 m	ım, m,	2-wire 2-wire			
			DIA. of sensing	side	e Ø 18 mm, Ø 30 n	nm	:Ø5mm,2-wire			
ire spec						40	-core), insulator dia	ameter: Ø 1 mm		
ire spec.			Ø 4 mm, Ø 5 m : AWG 22 (0.08			ord	diameter: Ø 1.25 m	m		
onnectors	spec.		M12 connecto							
aterial					le (black): polyvin					
							ride (oil resistant P			
General							ensing side Ø 8 mm on, sensing side: PE			

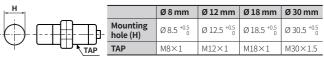
Case/Nut: PTFE coated brass, washer: PTFE coated iron, sensing side: PTFE

01) Check the condition of connected device 02) Cable type: 2 m, Cable connector type: 300 mm

Snatter-resistant

Cut-out Dimensions

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



1	ØA	
	. В	
	-	
-		

	Ø8mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
ØA	15	21	29	42
В	13	17	24	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) × 70 %

Sensing	g targe	et
Up-Down	move	men
r ∩.		F
- ∜	162	Sn
_	3a	Ł

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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



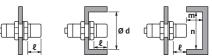






Influence by surrounding metals

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

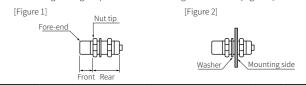


(unit: mm) Sensing Ø 8 mm Ø 12 mm Ø 18 mm Ø 30 mm Non Non Non Flush Flush Flush Flush flush flush flush flush 80 120 50 200 110 350 25 110 В 60 25 100 35 90 300 2.5 12 15 3.5 14 6 20 R Ød 24 18 40 27 70 45 120 12 20 24 40 45 90 m 8 24 18 40 27 70 45 120

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].



	Ø8mm		Ø 12 mm		Ø 18 mn	ı	Ø 30 mm	
side 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	12 mm
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	

