Rectangular Inductive Proximity Sensors

PS Series INSTRUCTION MANUAL

DRW160733AD

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
- 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.
- are 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.
- ailure 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.

ailure 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

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.
- . 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 2.5 mm cable with a tensile strength of 20 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. • Refer to the table below for the screw tightening torque when mounting the bracket.

| | | 0 | 0 1 | |
|---------------------|---------|----------|----------|--|
| Sensing side length | 8 mm | 12 mm | 50 mm | |
| Tightening torque | 0.3 N m | 0.49 N m | 0.98 N m | |

Ordering Information

This is only for reference. For selecting the specific model, follow the Autonics web site.

| PS | 0 | - | 2 | D | 3 | • • |
|----|------------------------------|---|----------|----------|-----|--|
| - | sing sid er: Side | 0 | | (unit: r | nm) | Control output N: NPN Normally Open N2: NPN Normally Closed P: PNP Normally Open P2: PNP Normally Closed |
| - | sing dis er: Sensi | | ance (ui | nit: mn | 1) | Sensing side No-mark: Standard type |

U: Upper side type

12-24 VDC=

LOAD

Control Output Circuit

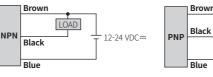
(PNP output)

Product Components

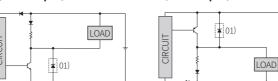
| Sensing side length | 8 mm | 12 mm | 50 mm |
|---------------------|------------|------------|---------------|
| Bracket | $1 \times$ | $1 \times$ | - |
| Bolt | M3 × 2 | M3 × 2 | $M4 \times 4$ |
| Nut | - | M3 × 2 | - |

Connections





Control Output Circuit (NPN output)



01) Sensing side length 8 mm: except zener diode

Operation Timing Chart

| | | Normally Open | Normally Closed |
|----------------|--------------|---------------|-----------------|
| Sensing target | | Presence | Presence |
| | | Nothing | Nothing Nothing |
| Load | | Operation | Operation |
| Luau | | Return L | Return |
| Output | NPN output | | |
| voltage | | н | |
| | | | |
| | on indicator | | |
| (red) | | OFF LL | |

Specifications Installation Standard type / Upper side type Model PS08-2.5D ----PS12-4D ----PS50-30D Sensing side length 8 mm 12 mm 50 mm Sensing distance 30 mm 5 mm 4 mm Setting distance 0 to 2.8 mm 0 to 21 mm) to 1 75 m \leq 20 % of sensing distance (sensing side length 8 mm; \leq 10 %) Hysteresis Standard sensing $12 \times 12 \times 1$ mm $3 \times 8 \times 1 \,\text{mm}$ $90 \times 90 \times 1 \,\text{mm}$ target: iron Response frequency ⁰¹⁾ 500 Hz l kHz 50 Hz Affection by $\leq \pm$ 10 % for sensing distance at ambient temperature 20 °C sensing side length 8 mm: $\leq \pm$ 15 %) temperature Indicator Operating indicator (red) C€ EÆE C€ EÆE C€ EÆ[Approval \approx 16 g (\approx 30 g) \approx 62 g (\approx 77 g) \approx 220 g (\approx 256 g) Unit weight (package) ncy is the average value. The standard sensing target is used and the width is set as ard sensing target, 1/2 of the sensing distance for the distance. 2 times of the standard se 12-24 VDC= (ripple P-P: \leq 10 %) Power supply operating voltage: 10-30 VDC= Current consumption < 10 mA Sensing side length 8 mm: \leq 100 mA Control output ensing side length 12 mm, 50 mm: \leq 200 mA Sensing side length 8 mm: \leq 1.0 V **Residual voltage** sing side length 12 mm, 50 mm; \leq 1.5 V Surge protection circuit, output short over current protection circuit, Protection circuit verse polarity protection Insulation resistance \geq 50 M Ω (500 VDC== megger) 1,500 VAC \sim 50/60Hz for 1 minute (between all terminals and case) **Dielectric strength** sing side length 8 mr $1.000 \text{ VAC} \sim 50/60 \text{Hz}$ for 1 minute (between all terminals and case)) mm amplitude at frequency 10 to 55 Hz in each of X, Y, Z directions Vibration for 2 hours Shock 500 m/s² (pprox 50 G) X, Y, Z directions for 3 times Ambient temp. 25 to 70 %RH, storage: -30 to 80 %RH (non-freezing or non-condensation) Ambient humi 35 to 95 %RH, storage: 35 to 95 %RH (non-freezing or non-condensation) IP67 (IFC standards) Protection Cable type Connection Sensing side length 8 mm: Ø 2.5 mm, 3-wire, 1 m Sensing side length 12 mm: Ø 4 mm, 3-wire, 2 m Cable spec. Sensing side length 50 mm: Ø 5 mm, 3-wire, 2 m Ø 2.5 mm cable AWG 28 (0.08 mm, 19-wire), insulator diameter: Ø 0.9 mm Wire spec. Ø 4 mm, Ø 5 mm cable : AWG 22 (0.08 mm, 60-wire), insulator diameter: Ø 1.25 mm Sensing side length 8 mm Case: PC, Sensing side length 12 mm Case: Heat-resistant ABS, Sensing side length 50 mm Case: PBT,

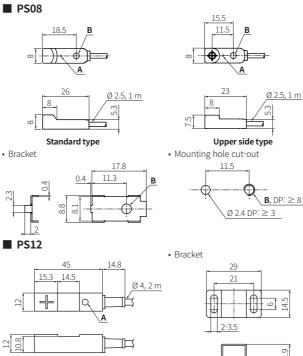
Dimensions

Material

• Unit: mm, For the detailed dimensions of the product, follow the Autonics web site.

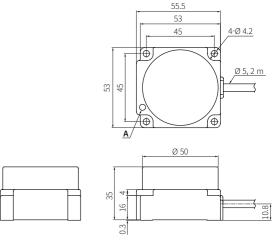
standard cable (black): polyvinyl chloride (PVC)

A Operation indicator (red) B Tap hole



Standard type / Upper side type





Standard type

Setting Distance Formula

Detecting distance can be changed by the shape, size or material of the target

For stable sensing, intall the unit within the 70% of sensing distance.

Setting distance (Sa)

= Sensing distance (Sn) × 70%





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]

Upper side type



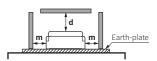
Influence by surrounding metals

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.

Standard type







(unit: mm)

| 8 mm | 12 mm | 50 mm |
|------|---------------|---|
| 16 | 24 | 180 |
| 16 | 24 | 130 |
| 3 | 5 | - |
| 15 | 12 | 120 |
| 8 | 12 | 50 |
| | 16 16 3 | 16 24 16 24 3 5 |