Autonics PFI Series (DC 3-wire) Rectangular Flat type Inductive Proximity Sensors Instruction Manual

Rectangular Flat-type
Inductive Proximity Sensors
PFI Series (DC 3-wire)
INSTRUCTION MANUAL
TCD210253AB

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.

Contents

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.

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.
- Tighten the installing screws with under 1.47 N m torque.

Ordering Information

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

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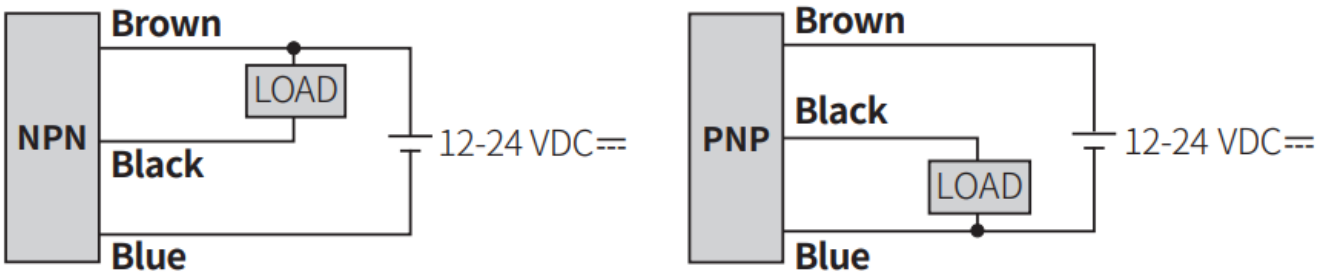
1. Control output
   N: NPN Normally Open
   N2: NPN Normally Closed
   P: PNP Normally Open
   P2: PNP Normally Closed

Product Components

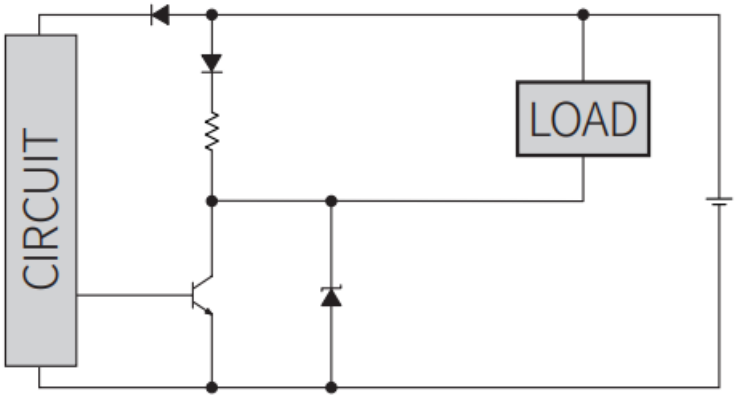
- M3 Bolt × 2

Connections

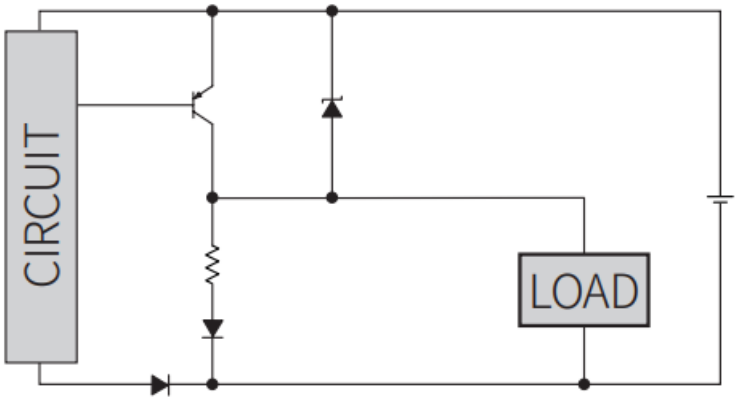
- Cable type



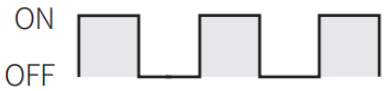
- Inner circuit (NPN output)



- Inner circuit (PNP output)



Operation Timing Chart

		Normally open	Normally closed
Sensing target			
Load			
Output voltage	NPN output		
	PNP output		
Operation indicator (red)			

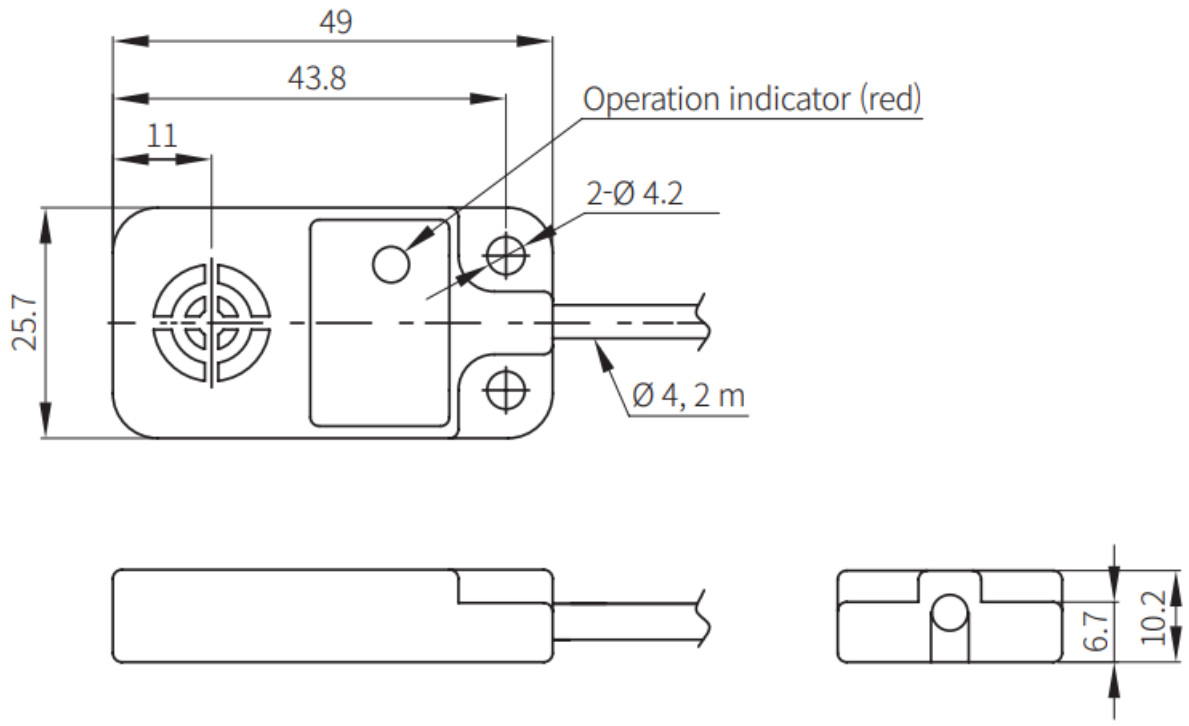
Specifications

Installation	Upper side type
Model	PFI25-8D▢
Sensing side length	25 mm
Sensing distance	8 mm
Setting distance	0 to 5.6 mm
Hysteresis	≤10 %of sensing distance
Standard sensing target: iron	25 x 25 x 1 mm
Response frequency eu	200 Hz
Affection by temperature	≤ +10 %for sensing distance at ambient temperature 20 °C
Indicator	Operation indicator (red)
Approval	CE EAC
Unit weight	≈ 70 g
01) There;ponsefrequency is the average value. The standard sensing target is used and the width is set as t.m es of the standard sensing target, 1/2 of the sensing distance for the distance.	
Power supply	12 – 24 VDC= (ripple ≤ 10 40, operating voltage: 10 – 30 VDC=
Current consumption	≤ 10 mA
Control output	≤ 200 mA
Residual voltage	5 1.5 V

Protection circuit	Surge protection circuit, output short over current protection circuit, reverse pol arity protection
Insulation type	≥50 MΩ (500 VDC= megger)
Dielectric strength	1.500 VAC~ 50 / 60 Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz (for 1 min) in each X, Y. Z dir ection for 2 hours
Shock	500 m/s2(7– 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation:
Protection structure	11,67 (IEC standards)
Connection	Cable type model
Wire spec.	Ø 4 mm, 3-wire, 2 m
Connector spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø1.25 mm
Material	Case: PPS, standard type cable (black): polyvinyl chloride (PVC)

Dimensions

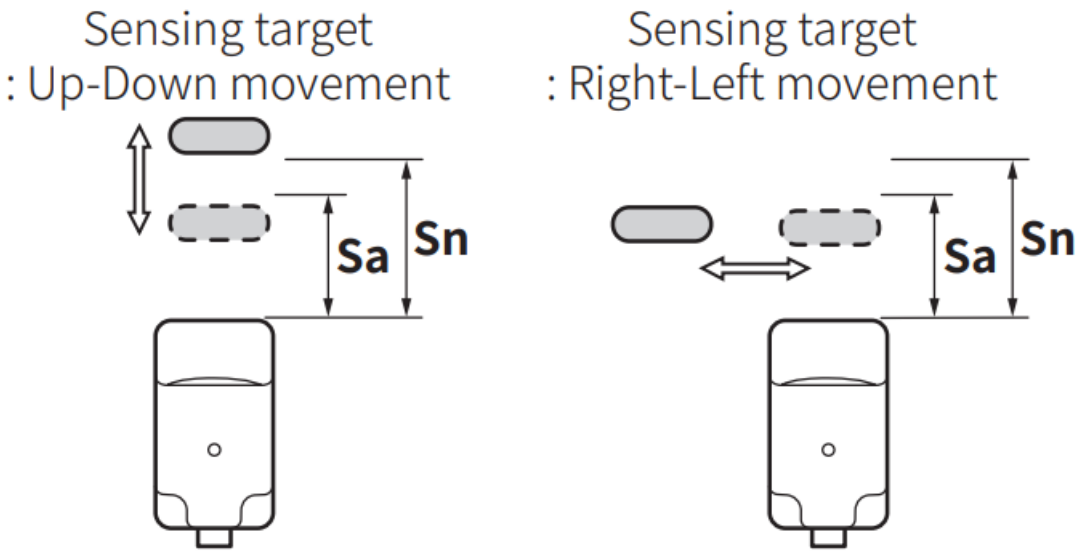
- Unit: mm, For the detailed dimensions of the product, follow the Autonics web site.



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)

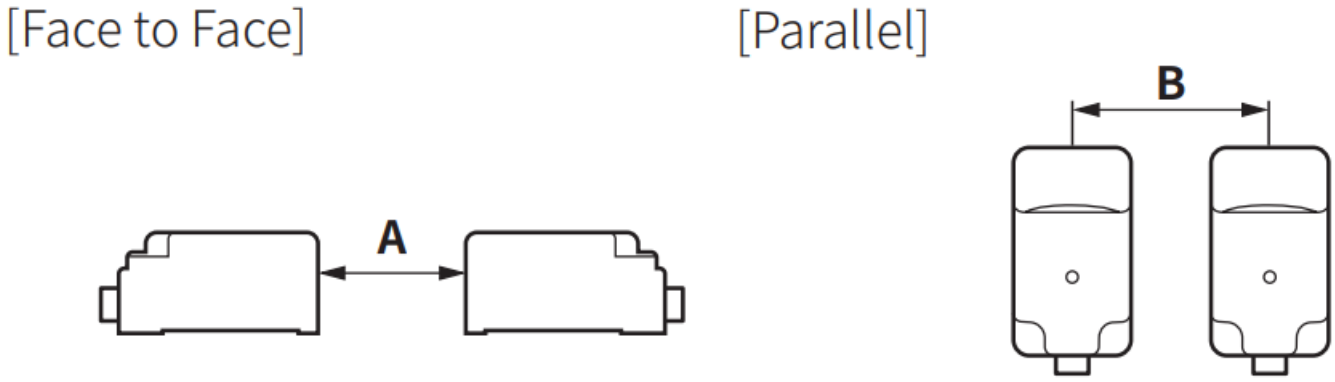
= Sensing distance (Sn) × 70%



Mutual-interference & Influence by Surrounding Metals

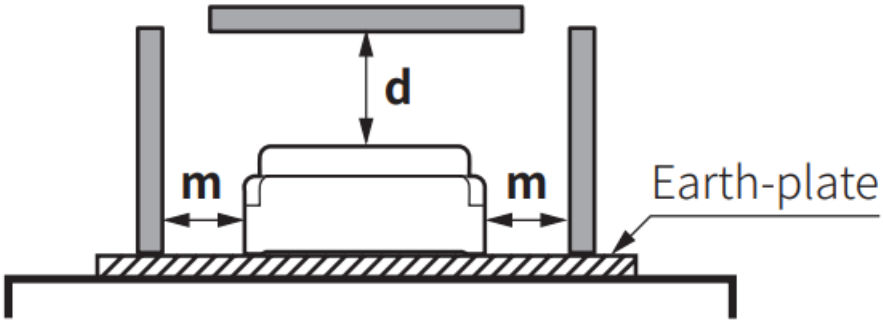
- **Mutual-interference**
  When plural proximity sensors are mounted in a close row, malfunction of sensor may be caused due to mutual interference.
  Therefore, be sure to provide a minimum distance between the two sensors, as below table.

A	100 mm	B	80 mm



- **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.

d	15 mm	m	5 mm



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Documents / Resources

	Autonics PFI Series (DC 3-wire) Rectangular Flat type Inductive Proximity Sensors [pdf] Instruction Manual PFI Series DC 3-wire Rectangular Flat type Inductive Proximity Sensors, PFI Series, DC 3-wire Rectangular Flat type Inductive Proximity Sensors, Inductive Proximity Sensors

References

- autonics.com