

Autonics

Full Metal Long Sensing Distance Proximity Sensor PRFD SERIES

INSTRUCTION MANUAL



Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

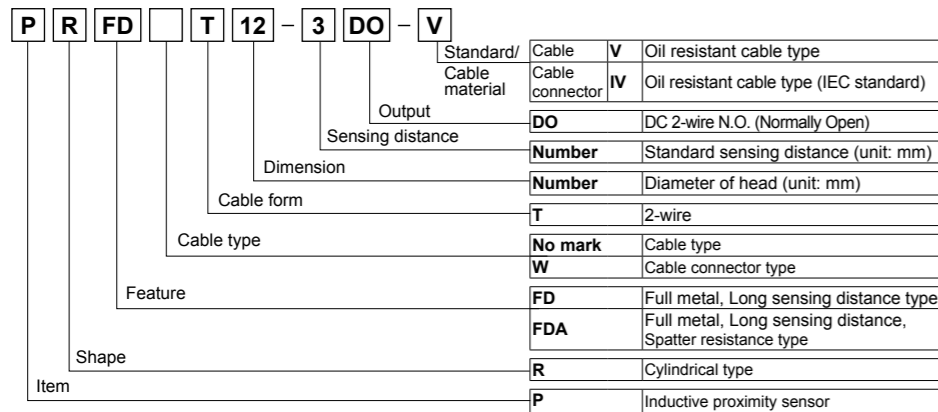
■ Safety Considerations

- ※ Please observe all safety considerations for safe and proper product operation to avoid hazards.
 - ※ ⚠ symbol represents caution due to special circumstances in which hazards may occur.
 - ⚠ Warning** Failure to follow these instructions may result in serious injury or death.
 - ⚠ Caution** Failure to follow these instructions may result in personal injury or product damage.
- ⚠ Warning**
- 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 fire, personal injury, or economic loss.
 - Do not disassemble or modify the unit.**
Failure to follow this instruction may result in fire.
 - Do not connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in fire.
 - Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.

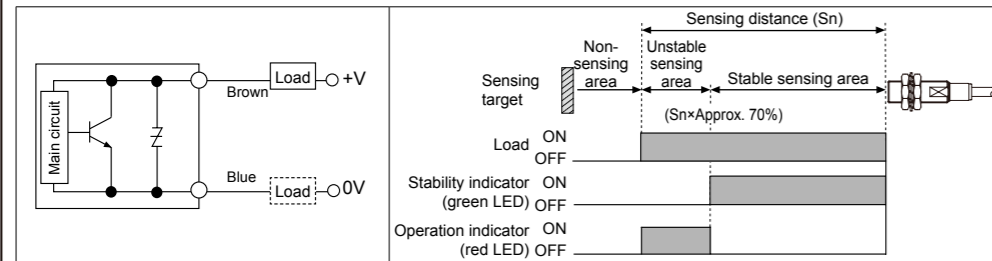
⚠ Caution

- Use the unit within the rated specifications.**
Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit, and do not use water or organic solvent.**
Failure to follow this instruction may result in fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**
Failure to follow this instruction may result in fire or explosion.
- Do not supply power without load.**
Failure to follow this instruction may result in fire or product damage.

■ Ordering Information



■ Control Output Diagram & Load Operating

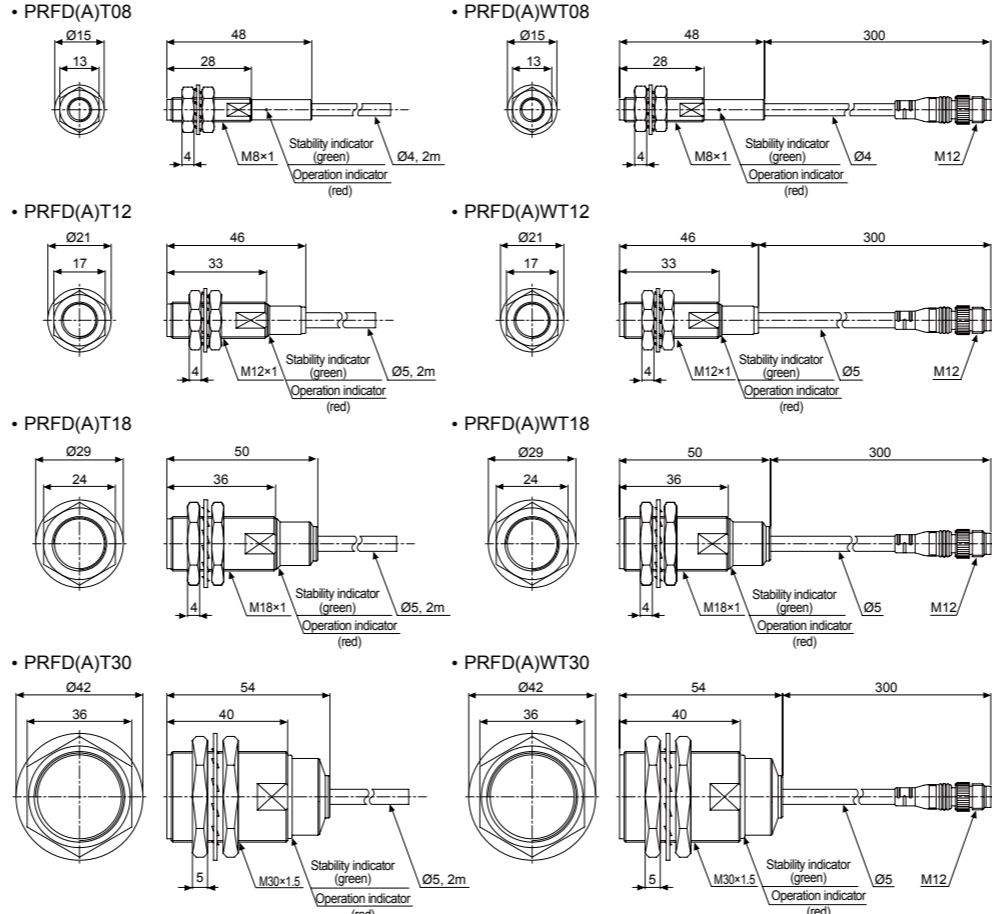


■ Specifications

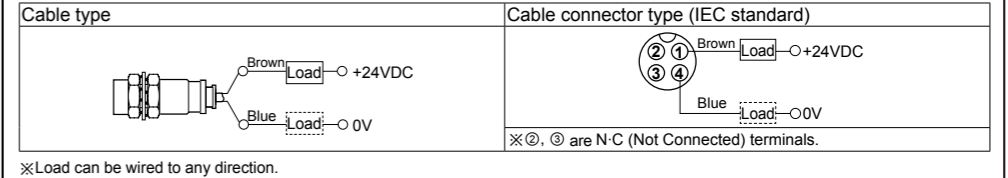
| Model | Cable type | PRFD08-2DO-V PRFDAT08-2DO-V | PRFD12-3DO-V PRFDAT12-3DO-V | PRFD18-7DO-V PRFDAT18-7DO-V | PRFD30-12DO-V PRFDAT30-12DO-V |
|-------|----------------------------------|---|-------------------------------------|--|---------------------------------------|
| | Cable connector type | PRFDWT08-2DO-IV PRFDAWT08-2DO-IV | PRFDWT12-3DO-IV PRFDAWT12-3DO-IV | PRFDWT18-7DO-IV PRFDAWT18-7DO-IV | PRFDWT30-12DO-IV PRFDAWT30-12DO-IV |
| | Diameter of the sensing side | 8mm | 12mm | 18mm | 30mm |
| | Sensing distance ^{*1} | 2mm | 3mm | 7mm | 12mm |
| | Installation | Shield (flush) | | | |
| | Hysteresis | Max. 15% of sensing distance | | | |
| | Standard sensing target | 12×12×1mm (iron) | 12×12×1mm (iron) | 30×30×1mm (iron) | 54×54×1mm (iron) |
| | Setting distance | 0 to 1.4mm | 0 to 2.1mm | 0 to 4.9mm | 0 to 8.4mm |
| | Power supply (operating voltage) | 12-24VDC (=) (10-30VDC =) | | | |
| | Leakage current | Max. 0.8mA | | | |
| | Response frequency ^{*2} | 150Hz | 80Hz | 80Hz | 50Hz |
| | Residual voltage | Max. 3.5V | | | |
| | Affection by temperature | Max. ±20% for sensing distance at ambient temperature 20°C | | | |
| | Control output | Max. 3 to 100mA | | | |
| | Insulation resistance | Over 50MΩ (at 500VDC megger) | | | |
| | Dielectric strength | 1,000VAC 50/60Hz for 1 min | | | |
| | Vibration | 1.5mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours | | | |
| | Shock | 500m/s ² (approx. 50G) in each X, Y, Z direction for 10 times | | 1,000m/s ² (approx. 100G) in each X, Y, Z direction for 10 times | |
| | Indicator | Stability indicator: green LED, Operation indicator: red LED | | | |
| | Environment | Ambient temperature: -25 to 70°C, storage: -25 to 70°C Ambient humidity: 35 to 95%RH, storage: 35 to 95%RH | | | |
| | Protection circuit | Surge protection circuit, over current protection circuit | | | |
| | Protection | IP67 (IEC standard) | | | |
| | Cable | Cable type ^{*3} Ø4mm, 2-wire, 2m ^{*4} (AWG22, core diameter: 0.08mm, no. of cores: 60, insulator diameter: Ø1.25mm) | | Ø5mm, 2-wire, 2m ^{*4} (AWG22, core diameter: 0.08mm, no. of cores: 60, insulator diameter: Ø1.25mm) | |
| | | Cable connector type Ø4mm, 2-wire, 300mm, M12 connector (AWG22, core diameter: 0.08mm, no. of cores: 60, insulator diameter: Ø1.25mm) | | Ø5mm, 2-wire, 300mm, M12 connector (AWG22, core diameter: 0.08mm, no. of cores: 60, insulator diameter: Ø1.25mm) | |
| | Material | Case/Nut: stainless steel 303 (SUS303, PTFE coated ^{*5}), washer: stainless steel 304 (SUS304), sensing side: stainless steel 303 (SUS303, PTFE coated ^{*5} , thickness of PRFD(A)T08: 0.2mm, PRFD(A)T12/18: 0.4mm, PRFD(A)T30: 0.5mm), oil resistant cable (gray): oil resistant polyvinyl chloride (PVC) | | | |
| | Approval | CE | | | |
| | Weight ^{*6} | Approx. 80g (approx. 55g) | Approx. 110g (approx. 83g) | Approx. 132g (approx. 97g) | Approx. 225g (approx. 170g) |

- ※1: When using the nut which of material is not stainless steel 303 (SUS303) such as brass, the sensing distance is variable.
- ※2: 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.
- ※3: Do not pull the cable with a tensile strength of 50N or over. It may result in fire due to the broken wire. When extending wire, use AWG22 cable or over within 200m.
- ※4: Option is 5m.
- ※5: PTFE coated is only for spatter resistance type model.
- ※6: The weight includes packaging. The weight in parenthesis is for unit only.
- ※Environment resistance is rated at no freezing or condensation.

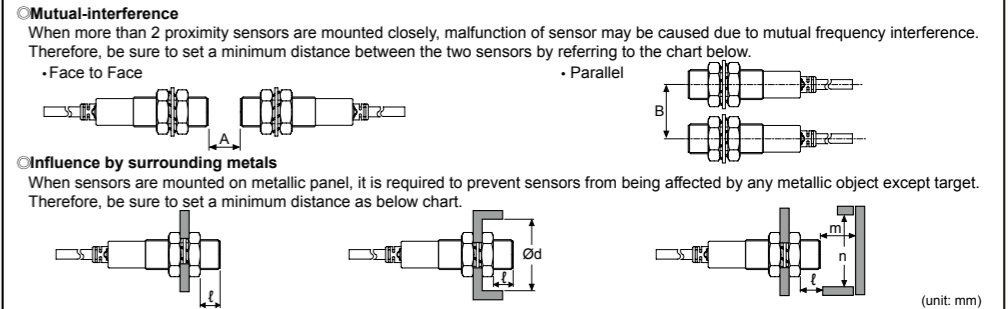
■ Dimensions



■ Connections

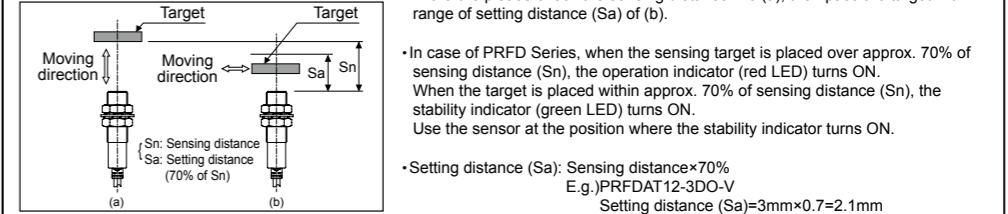


■ Mutual-Interference & Influence by Surrounding Metals

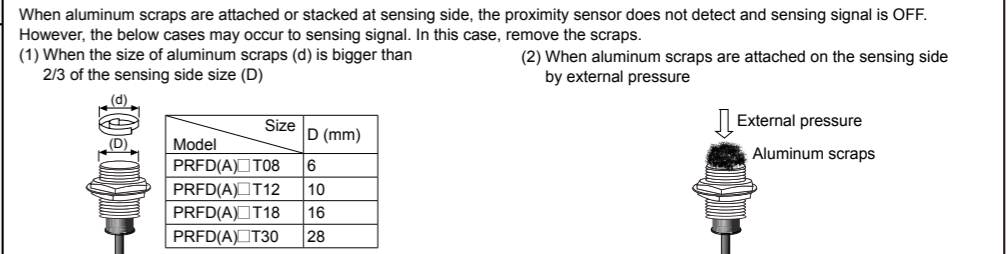


| Item | Model | PRFD(A)T08-2DO-□ | PRFD(A)T12-3DO-□ | PRFD(A)T18-7DO-□ | PRFD(A)T30-12DO-□ |
|------|-------|------------------|------------------|------------------|-------------------|
| A | | 35 | 40 | 65 | 110 |
| B | | 35 | 35 | 60 | 100 |
| ℓ | | 0 | 0 | 0 | 0 |
| Ød | | 8 | 12 | 18 | 30 |
| m | | 8 | 12 | 28 | 48 |
| n | | 30 | 40 | 60 | 100 |

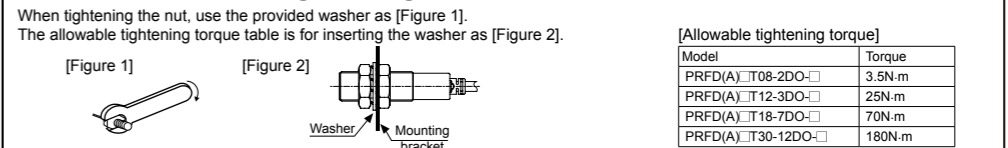
■ Setting Distance



■ Effect of Aluminum Scraps



■ Installation and Tightening Torque



■ Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Use the product, after 0.5 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.
- Do NOT connect the sensors more than three in parallel.
- Do not connect capacity load to the output terminal directly.
- If the surface of the product is rubbed with a hard object, PTFE coating can be worn out.
- This unit may be used in the following environments.
 - ① Indoors (in the environment condition rated in 'Specifications')
 - ② Altitude max. 2,000m
 - ③ Pollution degree 2
 - ④ Installation category II

■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connector/Sockets
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometers/Pulse (Rate) Meters
- Display Units
- Sensor Controllers
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System (Fiber, Co, Nd: YAG)
- Laser Welding/Cutting System

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