PRFDW Series

Full metal, Cylindrical, Long Sensing Distance, Cable Connector Type Proximity Sensor

`NEW`

◼ Features

- Long sensing distance
  (1.5 to 2 times longer sensing distance guaranteed compared to existing models)
- High impact and wear resistance to friction with the work or metallic brush (sensing face/housing material: stainless steel)
- Reduced possibility of malfunction by aluminum scraps
- Excellent noise immunity with specialized sensor IC
- Built-in surge protection circuit and output short over current protection circuit
- Stability indicator (greed LED) and operation indicator (red LED)
  : excellent visibility with the 360˚ ring type indicator
- Equipped with the oil resistant cable
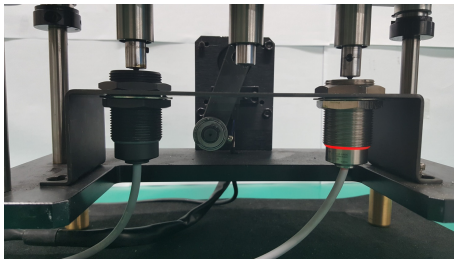- Protection structure: IP67 (IEC standard)

⚠ **Please read "Safety Considerations" in operation manual before using.**
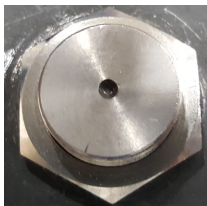
CE

◼ Durability Test

High resistance to the impact of removing Welding sludge attached to the sensing face

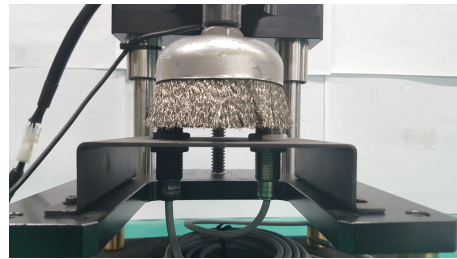#### ◎ Continuous hitting test

Test conditions
Hitting object: 1.3kg of weight
Hitting speed: 48 times per 1 min
The number of hitting times: 300 thousand times
Test model: PRFDWT18

<Test result>

◎ Metallic brush test

Test conditions
Testing object: stainless cup brush
Rotation speed: 80RPM
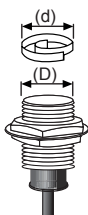Testing time: 3 hours
Test model: PRFDWT18

<Test result>

◼ Effect of Aluminum Scraps

When aluminum scraps are attached or stacked at sensing side, the proximity sensor does not detect and sensing signal is OFF. However, the below cases may occur to sensing signal. In this case, remove the scraps.

(1) When the size of aluminum scraps (d) is bigger than 2/3 of the sensing side size (D)

Model \ Size	D (mm)
PRFDW12	10
PRFDW18	16
PRFDW30	28

(2) When aluminum scraps are attached on the sensing side by external pressure

External pressure

Aluminum scraps
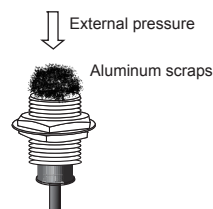
Full metal, Cylindrical, Long Sensing Distance, Cable Connector Type

◾ Specifications

● DC 2-wire type

Model		PRFDWT12-3DO-IV	PRFDWT18-7DO-IV	PRFDWT30-12DO-IV
Diameter of sensing side		12mm	18mm	30mm
Sensing distance[※1]		3mm	7mm	12mm
Installation		Shield (flush)		
Hysteresis		Max. 15% of sensing distance		
Standard sensing target		12×12×1mm (iron)	30×30×1mm (iron)	54×54×1mm (iron)
Setting distance		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]		80Hz	80Hz	50Hz
Residual voltage		Max. 3.5VDC⎓		
Affection by Temp.		Max. ±20% for sensing distance at ambient temperature 20℃		
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		1,000m/s^2 (approx. 100G) in each X, Y, Z direction for 10 times		
Indicator		Stability indicator: green LED, Operation indicator: red LED		
Environ-ment	Ambient temperature	-25 to 70℃, storage: -25 to 70℃		
	Ambient humidity	35 to 95%RH, storage: 35 to 95%RH		
Protection circuit		Surge protection circuit, output short over current protection circuit		
Protection		IP67 (IEC standard)		
Cable		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 (SUS 303), washer: stainless steel 304 (SUS 304), sensing side: stainless steel 303 (SUS 303, thickness of PRFDWT12/18: 0.4mm, PRFDWT30: 0.5mm), oil resistant cable (gray): oil resistant polyvinyl chloride (PVC)		
Approval		C€		
Weight[※3]		Approx. 110g (approx. 83g)	Approx. 132g (approx. 97g)	Approx. 225g (approx. 170g)

※1: When using the nut which is not stainless steel 303 (SUS303) material 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.
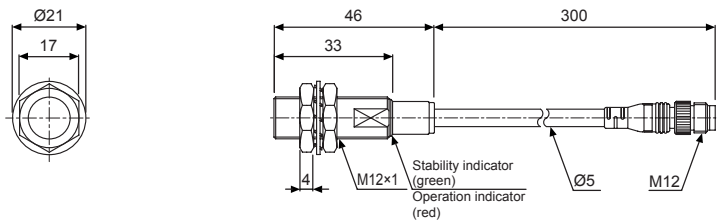※3: The weight includes packaging. The weight in parenthesis is for unit only.
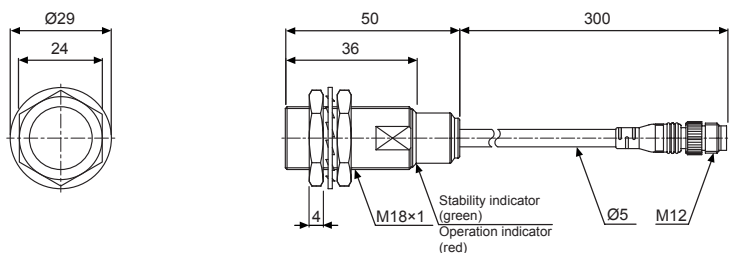※Environment resistance is rated at no freezing or condensation.

◾ Dimensions

(unit: mm)

● PRFDWT12-3DO-IV

● PRFDWT18-7DO-IV

(A) Photoelectric Sensors
(B) Fiber Optic Sensors
(C) Door/Area Sensors
(D) Proximity Sensors
(E) Pressure Sensors
(F) Rotary Encoders
(G) Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets
(H) Temperature Controllers
(I) SSRs / Power Controllers
(J) Counters
(K) Timers
(L) Panel Meters
(M) Tacho / Speed / Pulse Meters
(N) Display Units
(O) Sensor Controllers
(P) Switching Mode Power Supplies
(Q) Stepper Motors & Drivers & Controllers
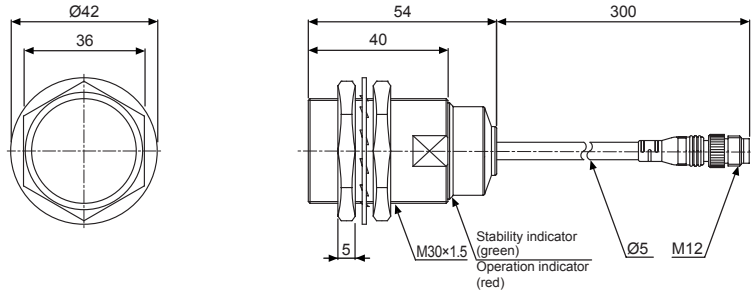(R) Graphic/ Logic Panels
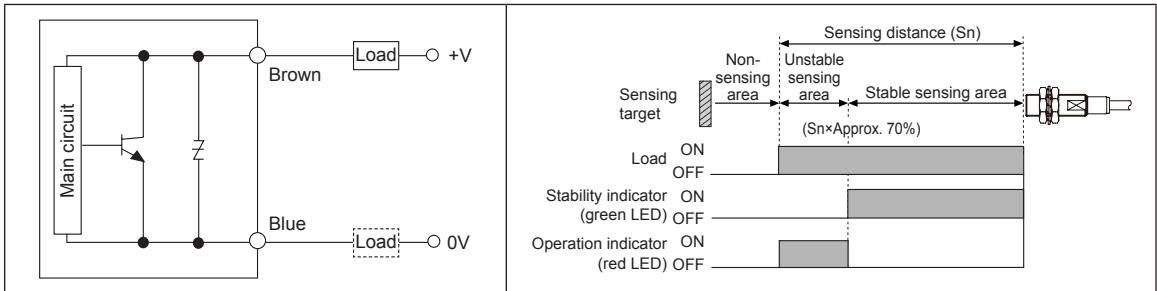(S) Field Network Devices
(T) Software

PRFDW Series

▣ Dimensions

● **PRFDWT30-12DO-IV**

Ø42
36
54
40
300

5
M30×1.5
Stability indicator (green)
Operation indicator (red)
Ø5
M12

▣ Control Output Diagram & Load Operating

● **DC 2-wire type**

Main circuit
Brown
Load — +V
Blue
Load — 0V

Sensing distance (Sn)

Non-sensing area
Unstable sensing area
Stable sensing area

Sensing target

(Sn×Approx. 70%)

Load ON / OFF
Stability indicator (green LED) ON / OFF
Operation indicator (red LED) ON / OFF

※When the sensing target is placed over approx. 70% of sensing distance (Sn), the operation indicator (red LED) turns ON.
  When the target is placed within approx. 70% of sensing distance (Sn), the stability indicator (green LED) turns ON.
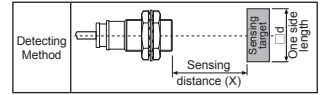 Use the sensor at the position where the stability indicator turns ON.

▣ Connections
● **DC 2-wire type (IEC standard)**

Normally Open (N.O.)

② ①
③ ④
Brown
Load — +24VDC
Blue
— 0V

② ①
③ ④
Brown
— +24VDC
Blue
Load — 0V

※②, ③ are N·C (Not Connected) terminals.
※For the type and specifications of connector wires, please refer to G-5 page.

Autonics

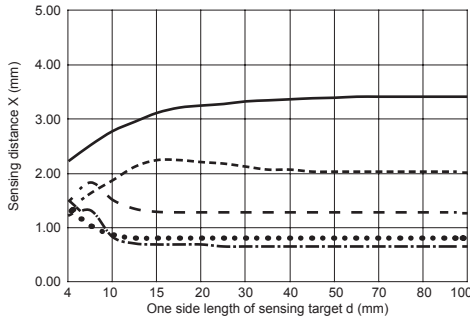# Full metal, Cylindrical, Long Sensing Distance, Cable Connector Type

◼ Sensing Distance Feature Data by Target Material and Size

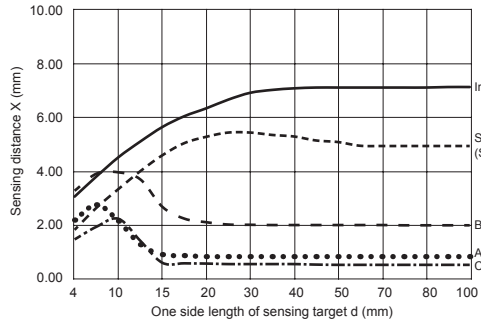Detecting Method | Sensing distance (X) | Sensing target | One side length d

● PRFDWT12-3DO-IV

Sensing distance X (mm) vs One side length of sensing target d (mm)
- Iron(SS401)
- Stainless steel 364 (SUS364)
- Brass(C3601)
- Aluminum(ALS052)
- Copper(C1100)

● PRFDWT18-7DO-IV

Sensing distance X (mm) vs One side length of sensing target d (mm)
- Iron(SS401)
- Stainless steel 364 (SUS364)
- Brass(C3601)
- Aluminum(ALS052)
- Copper(C1100)

● PRFDWT30-12DO-IV

Sensing distance X (mm) vs One side length of sensing target d (mm)
- Iron(SS401)
- Stainless steel 364 (SUS364)
- Brass(C3601)
- Aluminum(ALS052)
- Copper(C1100)

◼ Sensing Distance Feature Data by Parallel (Left/Right) Movement

Detecting Method | Sensing area (Y) | Sensing target | Sensing distance (X)

● PRFDWT12-3DO-IV

Sensing area (mm) vs Sensing area Y (mm)
Left ← Center → Right

● PRFDWT18-7DO-IV

Sensing area (mm) vs Sensing area Y (mm)
Left ← Center → Right

● PRFDWT30-12DO-IV

Sensing area (mm) vs Sensing area Y (mm)
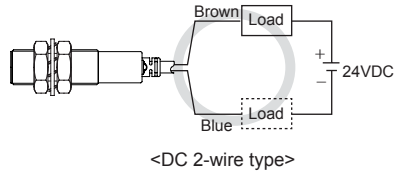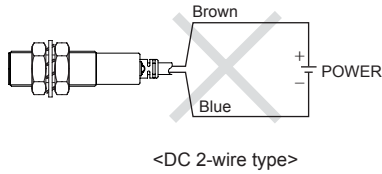Left ← Center → Right
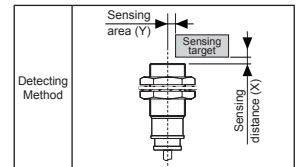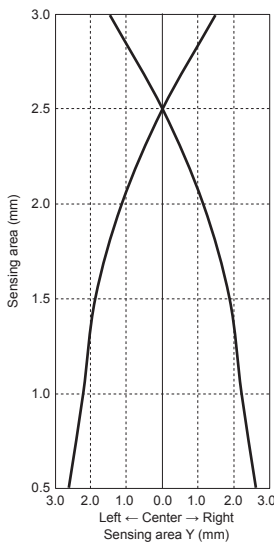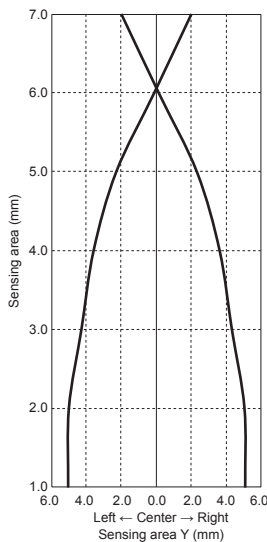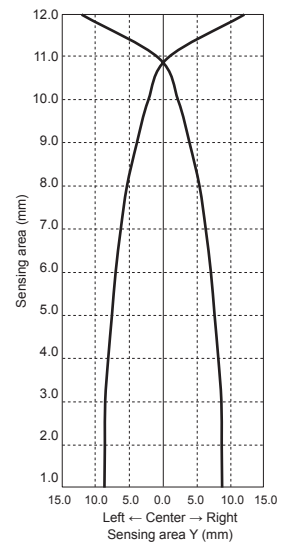
PRFDW Series

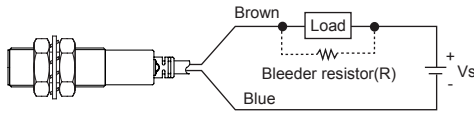## ▣ Proper Usage
◎ Load connections

<DC 2-wire type>

<DC 2-wire type>

When using DC 2-wire type proximity sensor, the load must be connected, otherwise internal components may be damaged. The load can be connected to either wire.

◎ In case of the load current is small

● DC 2-wire type

$$R \leq \frac{V_s}{I_o - I_{off}} \ (k\Omega) \qquad P > \frac{V_s^2}{R} \ (W)$$

$$\left[\begin{array}{ll} V_s: \text{Power supply,} & I_o: \text{Min. action current of proximity sensor,} \\ I_{off}: \text{Return current of load,} & P: \text{Number of Bleeder resistance watt} \end{array} \right]$$

Please make the current on proximity sensor smaller than the return current of load by connecting a bleeder resistor in parallel.
※W value of Bleeder resistor should be bigger for proper heat dissipation.

◎ Mutual-interference & Influence by surrounding metals

When several proximity sensors are mounted close to one another a malfunction of the may be caused due to mutual interference. Therefore, be sure to keep a minimum distance between the two sensors as below chart indicates.
Do NOT connect the sensors more than three in parallel.

Face to Face

Parallel B
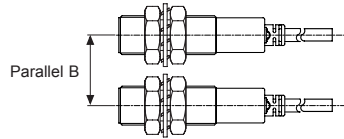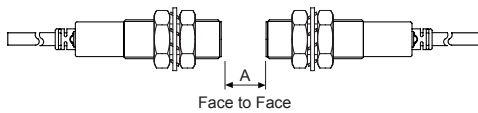
When sensors are mounted on metallic panel, it is required to protect the sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart indicates.
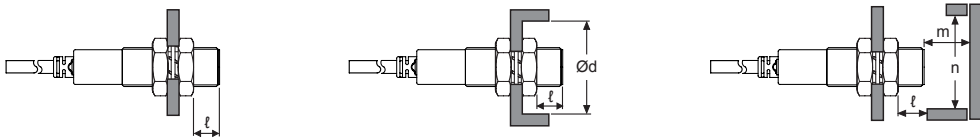
(unit: mm)

Item \ Model	PRFDWT12-3DO-IV	PRFDWT18-7DO-IV	PRFDWT30-12DO-IV
A	40	65	110
B	35	60	100
ℓ	0	0	0
Ød	12	18	30
m	12	28	48
n	40	60	100