


## Proximity Sensor with Resin Case with Superb Water Resistance


- IP68 protection.
- Models with different frequencies also available.



 Be sure to read *Safety Precautions* on page 5.

### Ordering Information

#### Sensors

Model		Sensing distance		Output configuration		Model	
						Operation mode	
						NO	NC
Shielded 	M8	1.5 mm			DC 3-wire, NPN	E2F-X1R5E1	E2F-X1R5E2
					AC 2-wire	E2F-X1R5Y1	E2F-X1R5Y2
	M12	2 mm			DC 3-wire, NPN	E2F-X2E1 <sup>*1</sup>	E2F-X2E2 <sup>*1</sup>
					AC 2-wire	E2F-X2Y1 <sup>*1</sup>	E2F-X2Y2 <sup>*1</sup>
	M18	5 mm			DC 3-wire, NPN	E2F-X5E1 <sup>*1</sup>	E2F-X5E2 <sup>*1</sup>
					AC 2-wire	E2F-X5Y1 <sup>*1</sup> <sub>*2</sub>	E2F-X5Y2 <sup>*1</sup> <sub>*2</sub>
	M30	10 mm			DC 3-wire, NPN	E2F-X10E1 <sup>*1</sup>	E2F-X10E2 <sup>*1</sup>
					AC 2-wire	E2F-X10Y1 <sup>*1</sup> <sub>*2</sub>	E2F-X10Y2 <sup>*1</sup> <sub>*2</sub>

\*1. Models with different frequencies are also available. The model numbers are E2F-X□□□5 (e.g., E2F-X5E15).

\*2. Models are also available with short-circuit protection. The model numbers are E2F-X□Y□-53 (e.g., E2F-X5Y1-53).  
The power supply voltage, however, is 100 to 120 VAC.

#### Accessories (Order Separately)

##### Protective Covers

## Ratings and Specifications

Model		E2F-X1R5E□ E2F-X1R5Y□	E2F-X2E□ E2F-X2Y□	E2F-X5E□ E2F-X5Y□	E2F-X10E□ E2F-X10Y□
Item					
Sensing distance		1.5 mm ±10%	2 mm ±10%	5 mm ±10%	10 mm ±10%
Set distance		0 to 1.2 mm	0 to 1.6 mm	0 to 4 mm	0 to 8 mm
Differential travel		10% max. of sensing distance			
Detectable object		Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 3.)			
Standard sensing object		Iron, 8 × 8 × 1 mm	Iron, 12 × 12 × 1 mm	Iron, 18 × 18 × 1 mm	Iron, 30 × 30 × 1 mm
Response frequency *1		E Models: 2 kHz, Y Models: 25 Hz	E Models: 1.5 kHz, Y Models: 25 Hz	E Models: 600 Hz, Y Models: 25 Hz	E Models: 400 Hz, Y Models: 25 Hz
Power supply voltage (operating voltage range)		E Models: 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max. Y Models: 24 to 240 VAC (20 to 264 VAC)			
Current consumption		E Models: 17 mA max.			
Leakage current		Y Models: 1.7 mA max. at 200 VAC (Refer to <i>Engineering Data</i> on page 3.)			
Control output	Load current	E Models: 200 mA max. Y Models: 5 to 100 mA		E Models: 200 mA max. Y Models: 5 to 300 mA	
	Residual voltage	E Models: 2 V max. (Load current: 200 mA, Cable length: 2 m) Y Models: Refer to <i>Engineering Data</i> on page 4.			
Indicators		E Models: Detection indicator (red) Y Models: Operation indicator (red)			
Operation mode (with sensing object approaching)		E1/Y1 Models: NO    Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 4 for details. E2/Y2 Models: NC			
Protection circuits		E Models: Reverse polarity protection, Load short-circuit protection, Surge suppressor; Y Models: None			
Ambient temperature range		Operating/Storage: –25 to 70°C (with no icing or condensation)			
Ambient humidity range		Operating/Storage: 35% to 95%			
Temperature influence		±10% max. of sensing distance at 23°C in the temperature range of –25 to 70°C			
Voltage influence		E Models: ±2.5% max. of sensing distance at rated voltage in rated voltage ±15% range Y Models: ±1% max. of sensing distance at rated voltage in rated voltage ±10% range			
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case			
Dielectric strength		E Models: 1,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case Y Models: (M8 Models): 2,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case (Other M8 Models): 4,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case			
Vibration resistance		Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions			
Shock resistance		Destruction: 1,000 m/s <sup>2</sup> 10 times each in X, Y, and Z directions			
Degree of protection		IEC 60529 IP68, in-house standards: oil-resistant			
Connection method		Pre-wired Models (Standard cable length: 2 m)			
Weight (packed state)		Approx. 40 g	Approx. 50 g	Approx. 130 g	Approx. 170 g
Materials	Case	Polyarylate resin			
	Sensing surface				
	Clamping nuts	Polyacetal			
Accessories		Instruction manual			

\*1. The response frequency is an average value. Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object, and a set distance of half the sensing distance.

\*2. When using the Sensor in environments subject to splashing cutting oil, deterioration may result due to the additives in the oil. The E2E is recommended in such environments.

### OMRON Test Method

Usage conditions: 10 m or less under water in natural conditions

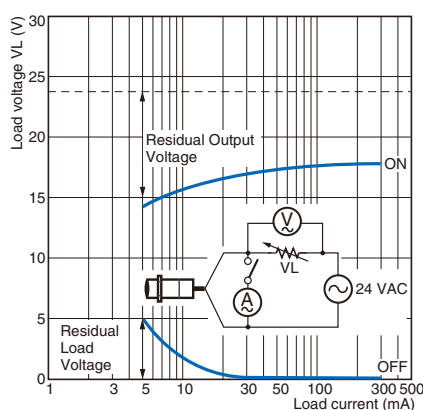
1. No water ingress after 1 hour under water at 2 atmospheres of pressure.

2. Sensing distance and insulation resistance specifications must be met after 20 repetitions of 1 hour in 0°C water and 1 hour in 70°C water.

## Residual Output Voltage

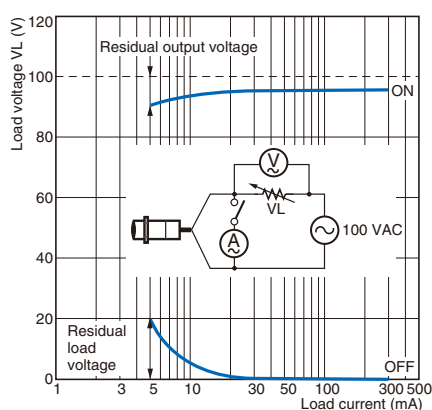
E2F-X□Y□

at 24 VAC



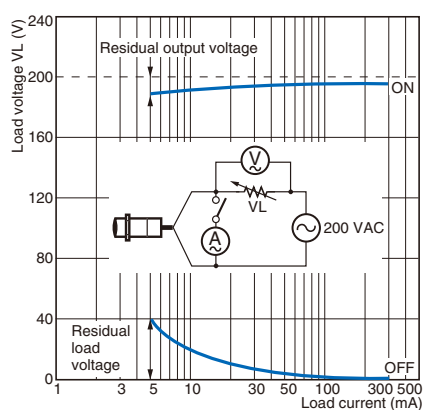
E2F-X□Y□

at 100 VAC



E2F-X□Y□

at 200 VAC



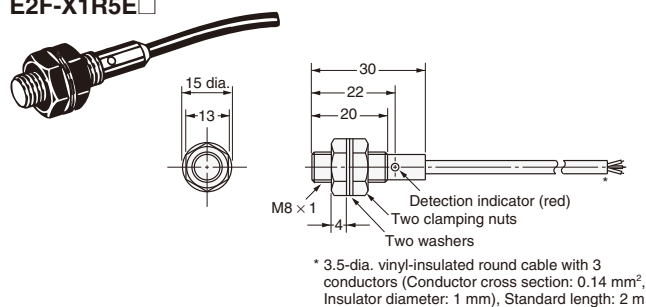
## I/O Circuit Diagrams

Output configuration	Operation mode	Model	Timing chart	Output circuit
DC 3-wire	NO	E2F-X1R5E1 E2F-X2E1 E2F-X5E1 E2F-X10E1	Sensing object: Present (ON), Not present (OFF) Load (between brown and black leads): Operate (ON), Reset (OFF) Output voltage (between black and blue leads): High (ON), Low (OFF) Detection indicator (red): ON (ON), OFF (OFF)	<p>*1. Load current: 200 mA max. *2. When a transistor is connected.</p>
	NC	E2F-X1R5E2 E2F-X2E2 E2F-X5E2 E2F-X10E2	Sensing object: Present (ON), Not present (OFF) Load (between brown and black leads): Operate (ON), Reset (OFF) Output voltage (between black and blue leads): High (ON), Low (OFF) Detection indicator (red): ON (ON), OFF (OFF)	
AC 2-wire	NO	E2F-X1R5Y1 E2F-X2Y1 E2F-X5Y1 E2F-X10Y1	Sensing object: Present (ON), Not present (OFF) Load: Operate (ON), Reset (OFF) Operation indicator (red): ON (ON), OFF (OFF)	
	NC	E2F-X1R5Y2 E2F-X2Y2 E2F-X5Y2 E2F-X10Y2	Sensing object: Present (ON), Not present (OFF) Load: Operate (ON), Reset (OFF) Operation indicator (red): ON (ON), OFF (OFF)	

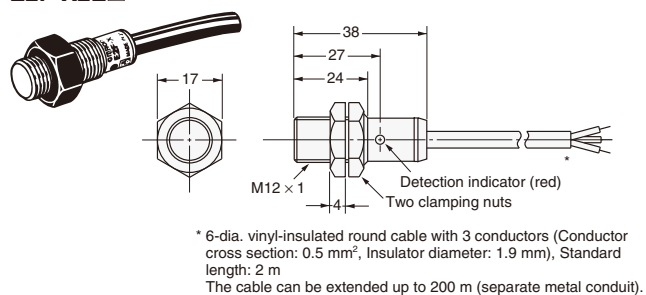
## Dimensions

### DC 3-Wire Models

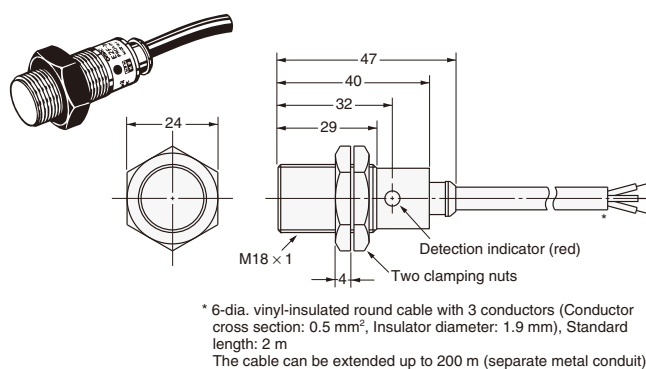
#### E2F-X1R5E□



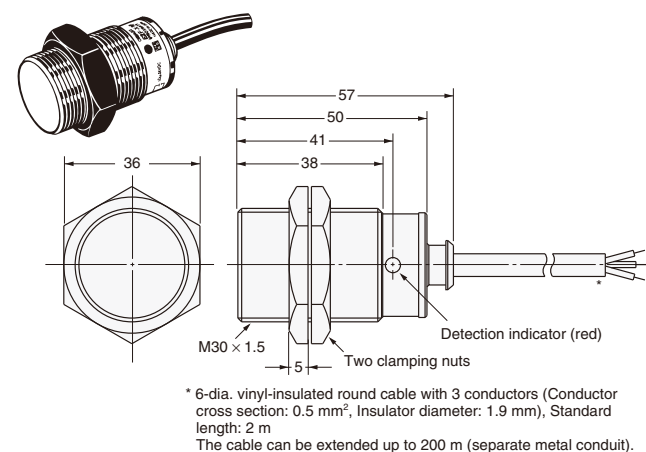
#### E2F-X2E□



#### E2F-X5E□

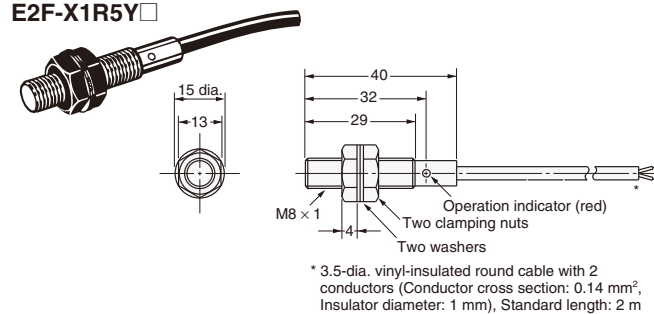


#### E2F-X10E□

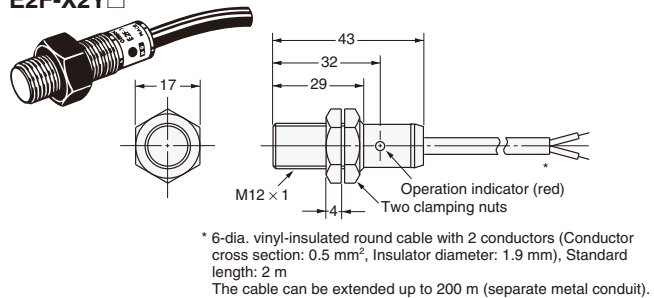


### AC 2-Wire Models

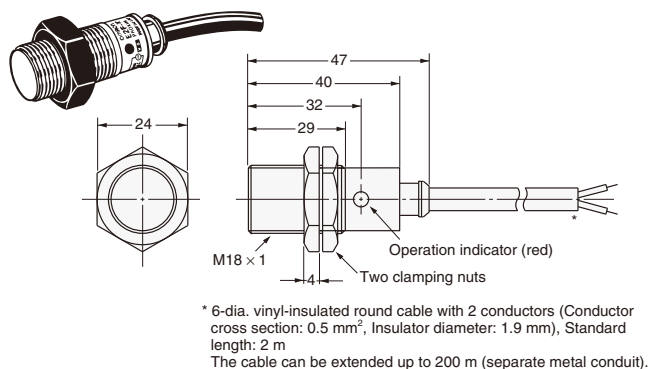
#### E2F-X1R5Y□



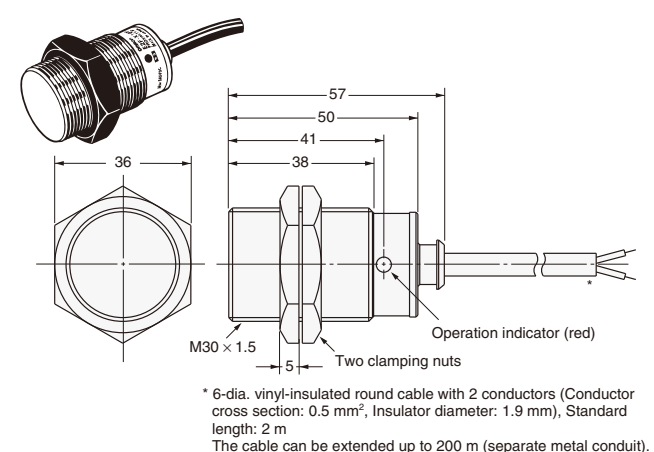
#### E2F-X2Y□



#### E2F-X5Y□



#### E2F-X10Y□



### Mounting Hole Dimensions



Model	E2F-X1R5□□	E2F-X2□□	E2F-X5□□	E2F-X10□□
F (mm)	8.5 <sup>+0.5</sup> <sub>0</sub> dia.	12.5 <sup>+0.5</sup> <sub>0</sub> dia.	18.5 <sup>+0.5</sup> <sub>0</sub> dia.	30.5 <sup>+0.5</sup> <sub>0</sub> dia.