

## Proximity Sensor with Resin Case with Superb Water Resistance

- Rugged, watertight plastic housing offers good chemical resistance and withstands washdown; IP68 protection
- Wide operating voltages: 10 to 30 VDC and 20 to 264 VAC
- Operation indicator on all models
- Short-circuit protection available on all DC and some AC models
- Mutual interference prevention with models with different frequencies is also available.




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

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

## Ordering Information

**Sensors** [Refer to *Dimensions* on page 6.]

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

\*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.

## Ordering Information

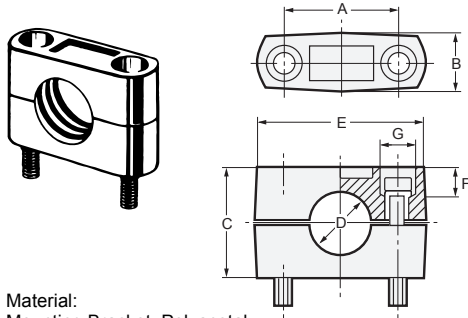
### Accessories (Order Separately)

#### Protective Covers

Refer to Y92□ for details.

#### Mounting Brackets

Special resin mounting sleeves: Four different models available.  
Simply select the size that fits the outside diameter of the Sensor.



Material:  
Mounting Bracket: Polyacetal  
Hexagonal bolt and spring washer: Nickel-plated iron

#### Mounting Bracket Dimensions

Item Model	Dimension (mm)							Applied hexagonal bolts	Applicable Sensor diameter
	A	B	C	D	E	F	G		
Y92E-B8	18±0.2	10 max.	18	8 dia.	28 max.	6	7.4 dia.	M4 × 20	M8
Y92E-B12	24±0.2	12.5 max.	20	12 dia.	37 max.	6	8 dia.	M4 × 25	M12
Y92E-B18	32±0.2	17 max.	30	18 dia.	47 max.	7	9.8 dia.	M5 × 32	M18
Y92E-B30	45±0.2	17 max.	50	30 dia.	60 max.	10	9.8 dia.	M5 × 50	M30

Note: Consider the influence of surrounding metal when mounting non-shielded Sensors. (Refer to information on individual Sensors for dimensions.)

#### Nut Sets

These nut sets are for mounting the Sensors. Order them if you lose the mounting nuts supplied with the sensor. Order the correct set for the outer diameter of your Sensor.

Model	Item	Applicable Sensor	Applicable Sensor diameter	Set contents
Y92E-NWM08-E2F	E2F		M8	Clamping nuts (polyacetal): 2
Y92E-NWM12-E2F			M12	
Y92E-NWM18-E2F			M18	
Y92E-NWM30-E2F			M30	

## 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		E1 Models: Detection indicator (red), E2 Models: Operation indicator (red) Y Models: Operation indicator (red)			
Operation mode (with sensing object approaching)		E1/Y1 Models: NO E2/Y2 Models: NC Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 4 for details.			
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 *2			
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

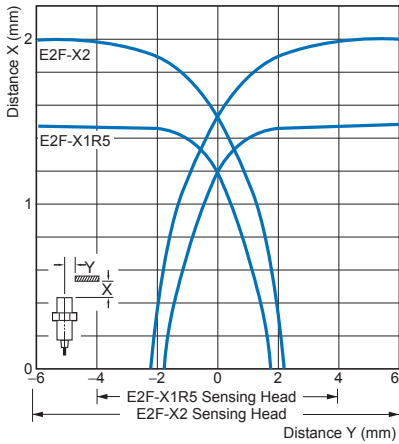
1. No water ingress after 1 hour under water at 2 atmospheres of pressure.

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.

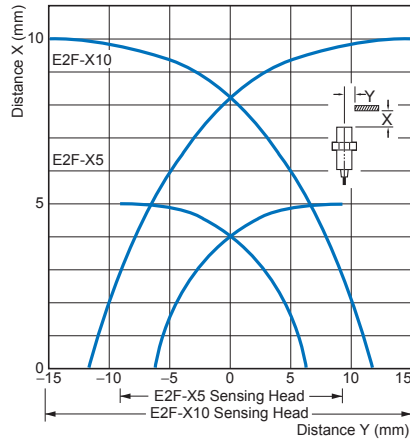
## Engineering Data (Reference Value)

### Sensing Area

#### E2F-X1R5□□/-X2□□

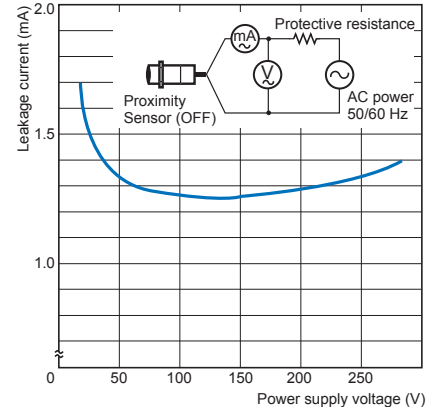


#### E2F-X5□□/-X10□□



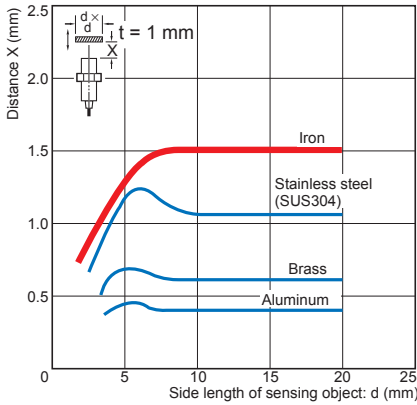
### Leakage Current

#### E2F-X□Y□

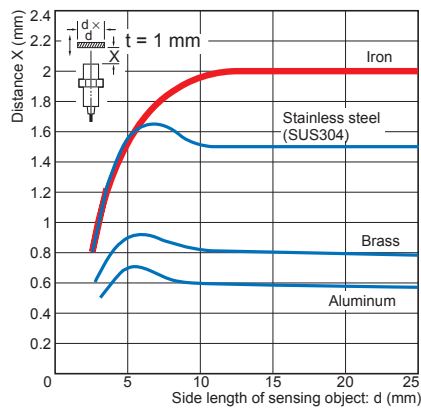


### Influence of Sensing Object Size and Material

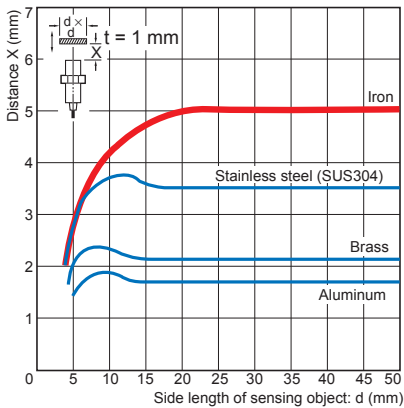
#### E2F-X1R5□□



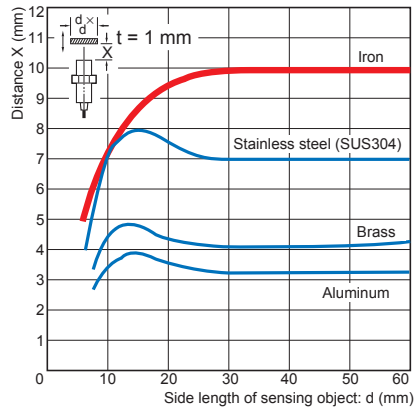
#### E2F-X2□□



#### E2F-X5□□

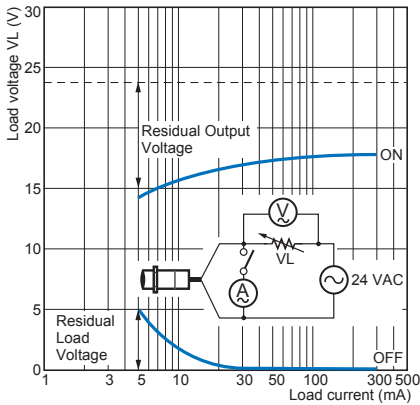


#### E2F-X10□□

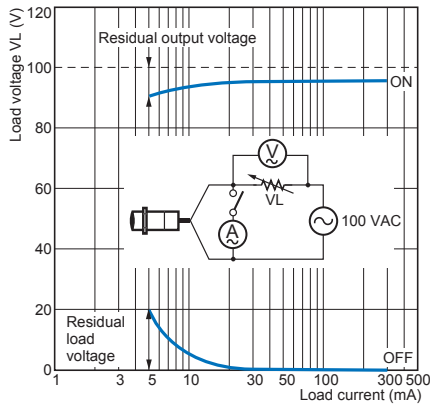


## Residual Output Voltage

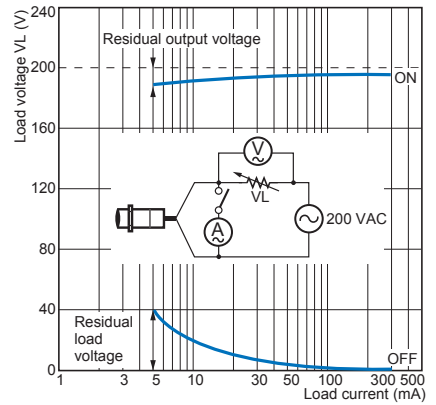
### E2F-X□Y□ at 24 VAC



### 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	<p>Sensing object: Present (ON), Not present (OFF)</p> <p>Load (between brown and black leads): Operate (ON), Reset (OFF)</p> <p>Output voltage (between black and blue leads): High (ON), Low (OFF)</p> <p>Detection indicator (red): ON (ON), OFF (OFF)</p>	<p><b>E2F-X1R5□</b></p> <p>*1. Load current: 200 mA max. *2. When a transistor is connected.</p>
	NC	E2F-X1R5E2 E2F-X2E2 E2F-X5E2 E2F-X10E2	<p>Sensing object: Present (ON), Not present (OFF)</p> <p>Load (between brown and black leads): Operate (ON), Reset (OFF)</p> <p>Output voltage (between black and blue leads): High (ON), Low (OFF)</p> <p>Detection indicator (red): ON (ON), OFF (OFF)</p>	<p><b>Except the E2F-X1R5□.</b></p> <p>*1. Load current: 200 mA max. *2. When a transistor is connected.</p>
AC 2-wire	NO	E2F-X1R5Y1 E2F-X2Y1 E2F-X5Y1 E2F-X10Y1	<p>Sensing object: Present (ON), Not present (OFF)</p> <p>Load: Operate (ON), Reset (OFF)</p> <p>Operation indicator (red): ON (ON), OFF (OFF)</p>	
	NC	E2F-X1R5Y2 E2F-X2Y2 E2F-X5Y2 E2F-X10Y2	<p>Sensing object: Present (ON), Not present (OFF)</p> <p>Load: Operate (ON), Reset (OFF)</p> <p>Operation indicator (red): ON (ON), OFF (OFF)</p>	

## Safety Precautions

Refer to *Warranty and Limitations of Liability*.

### ⚠ WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.



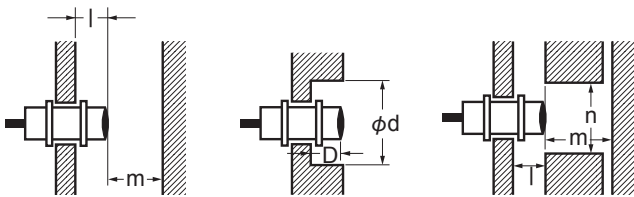
### Precautions for Correct Use

Do not use this product under ambient conditions that exceed the ratings.

#### ● Design

##### Influence of Surrounding Metal

When mounting the Sensor within a metal panel, ensure that the clearances given in the following table are maintained. Failure to maintain these distances may cause deterioration in the performance of the Sensor.



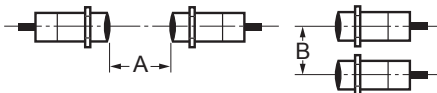
##### Influence of Surrounding Metal

(Unit: mm)

Model	Item	l	d	D	m	n
E2F-X1R5□□	0	0	8	0	4.5	12
E2F-X2□□			12		8	18
E2F-X5□□			18		20	27
E2F-X10□□			30		40	45

##### Mutual Interference

When installing Sensors face-to-face or side-by-side, ensure that the minimum distances given in the following table are maintained.



##### Mutual Interference

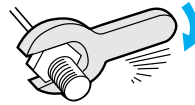
(Unit: mm)

Model	Item	A	B
E2F-X1R5□□		20	15
E2F-X2□□		30 (20)	20 (12)
E2F-X5□□		50 (30)	35 (18)
E2F-X10□□		100 (50)	70 (35)

Note: Values in parentheses apply to Sensors operating at different frequencies. Models numbers for Sensors with different frequencies are E2F-X□□□5.

#### ● Mounting

Do not tighten the nut with excessive force.



Model	Torque
E2F-X1R5□□	0.78 N·m
E2F-X2□□	
E2F-X5□□	2 N·m
E2F-X10□□	

#### ● Maintenance and Inspection

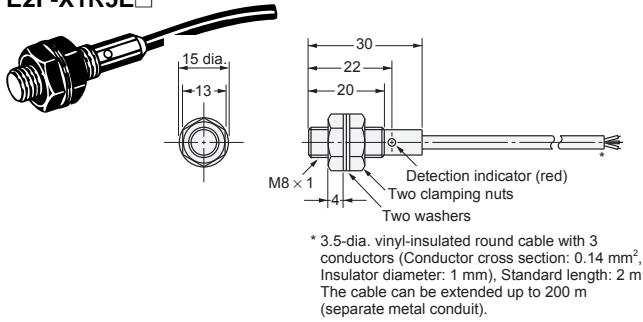
Do not use AC 2-Wire Models in water or in locations subject to water if the sensing surface or any other part of the Sensor is damaged, e.g., from contact with the sensing object. Electric shock may result.

## Dimensions

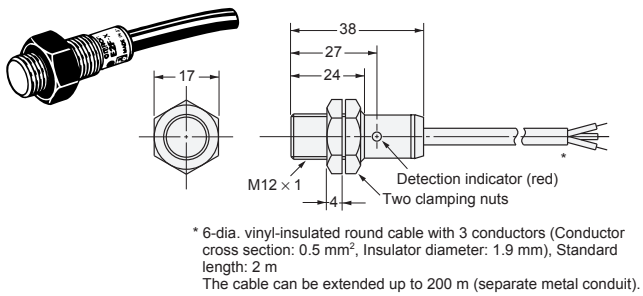
(Unit: mm)  
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

### DC 3-Wire Models

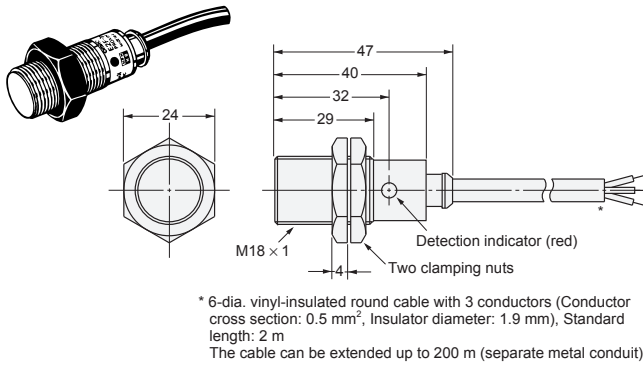
#### E2F-X1R5E□



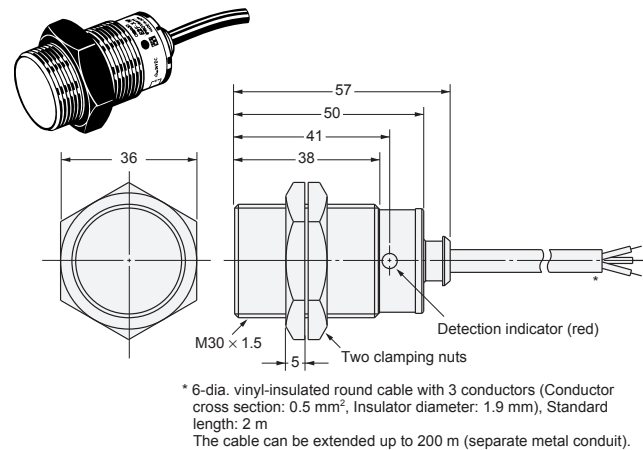
#### E2F-X2E□



#### E2F-X5E□

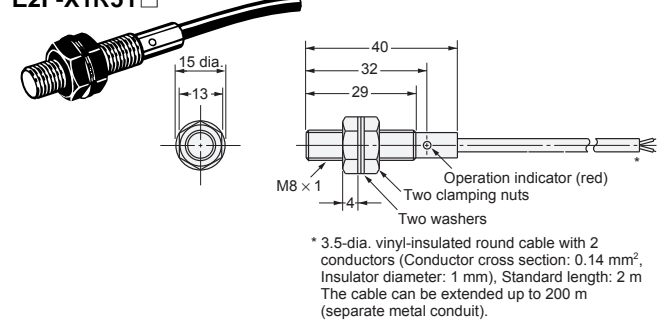


#### E2F-X10E□

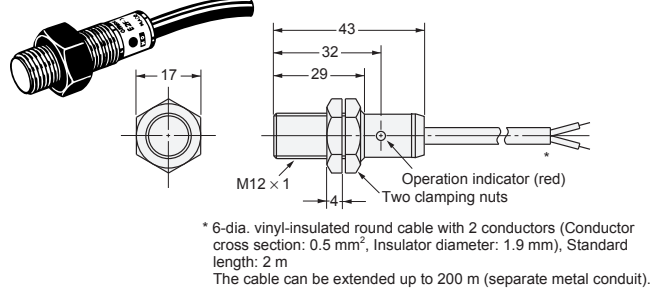


### AC 2-Wire Models

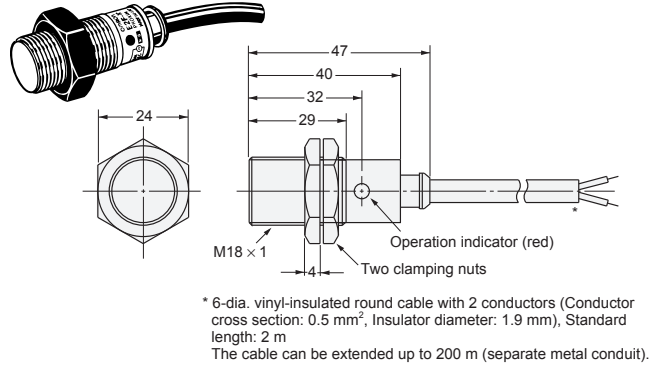
#### E2F-X1R5Y□



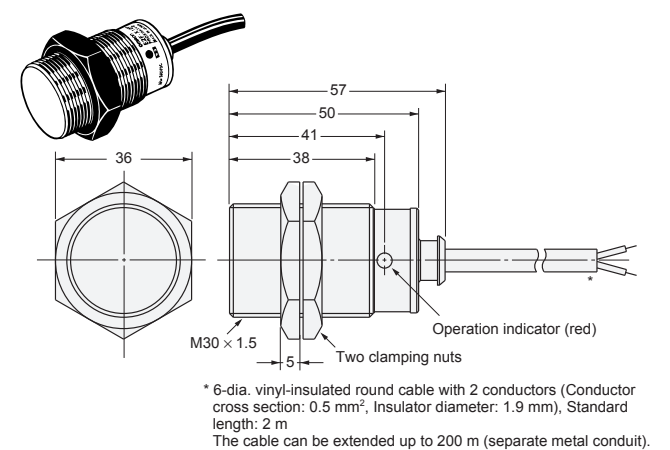
#### E2F-X2Y□



#### 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.

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1. **Offer; Acceptance.** These terms and conditions (these "Terms") are deemed part of all quotes, agreements, purchase orders, acknowledgments, price lists, catalogs, manuals, brochures and other documents, whether electronic or in writing, relating to the sale of products or services (collectively, the "Products") by Omron Electronics LLC and its subsidiary companies ("Omron"). Omron objects to any terms or conditions proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
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  - d. Delivery and shipping dates are estimates only; and
  - e. Omron will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
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17. **Export Controls.** Buyer shall comply with all applicable laws, regulations and licenses regarding (i) export of products or information; (ii) sale of products to "forbidden" or other proscribed persons; and (iii) disclosure to non-citizens of regulated technology or information.
18. **Miscellaneous.** (a) **Waiver.** No failure or delay by Omron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) **Assignment.** Buyer may not assign its rights hereunder without Omron's written consent. (c) **Law.** These Terms are governed by the law of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Products (without regard to conflict of law principles). (d) **Amendment.** These Terms constitute the entire agreement between Buyer and Omron relating to the Products, and no provision may be changed or waived unless in writing signed by the parties. (e) **Severability.** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (f) **Setoff.** Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice. (g) **Definitions.** As used herein, "including" means "including without limitation"; and "Omron Companies" (or similar words) mean Omron Corporation and any direct or indirect subsidiary or affiliate thereof.

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  - (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
  - (ii) Use in consumer products or any use in significant quantities.
  - (iii) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
  - (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this Product.
 NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON'S PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
2. **Programmable Products.** Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.
3. **Performance Data.** Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.
4. **Change in Specifications.** Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.
5. **Errors and Omissions.** Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.