



## Spatter-resistant Fluororesin-coated Proximity Sensor

- Superior spatter resistance.
- Long Sensing-distance Models added for sensing distances up to 15 mm.
- Pre-wired Smartclick Connector Models are also available.



Be sure to read *Safety Precautions* on page 6.

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 7.]

#### Pre-wired Models

##### Long Sensing-distance Models

Appearance	Sensing distance	Output configuration	Operation mode	Model
Shielded 	M12 4 mm	DC 2-wire (no polarity)	NO	E2EQ-X4X1 2M
	M18 8 mm			E2EQ-X8X1 2M
	M30 15 mm			E2EQ-X15X1 2M

##### Standard Models

Appearance	Sensing distance	Output configuration	Operation mode	Model
Shielded 	M12 3 mm	DC 2-wire	NO	E2EQ-X3D1 2M
	M18 7 mm			E2EQ-X7D1 2M
	M30 10 mm			E2EQ-X10D1 2M

#### Pre-wired Smartclick Connector Models (M12)

##### Long Sensing-distance Models





Appearance	Sensing distance	Output configuration	Operation mode	Model
Shielded 	M12 4 mm	DC 2-wire (no polarity) (3)-(4) pin arrangement	NO	E2EQ-X4X1-M1TJ 0.3M
	M18 8 mm			E2EQ-X8X1-M1TJ 0.3M
	M30 15 mm			E2EQ-X15X1-M1TJ 0.3M

##### Standard Models


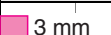


Standard Models	Sensing distance	Output configuration	Operation mode	Model
Shielded 	M12 3 mm	DC 2-wire (1)-(4) pin arrangement	NO	E2EQ-X3D1-M1TGJ 0.3M
	M18 7 mm			E2EQ-X7D1-M1TGJ 0.3M
	M30 10 mm			E2EQ-X10D1-M1TGJ 0.3M

## Pre-wired Connector Models (M12)

## Long Sensing-distance Models

Appearance		Sensing distance	Output configuration	Operation mode	Model
Shielded 	M12	 4 mm	DC 2-wire (without polarity) (3)-(4) pin arrangement	NO	E2EQ-X4X1-M1J 0.3M
	M18	 8 mm			E2EQ-X8X1-M1J 0.3M
	M30	 15 mm			E2EQ-X15X1-M1J 0.3M


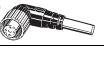

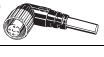

## Standard Models

Standard Models		Sensing distance	Output configuration	Operation mode	Model
Shielded 	M12	 3 mm	DC 2-wire (1)-(4) pin arrangement	NO	E2EQ-X3D1-M1GJ 0.3M
	M18	 7 mm			E2EQ-X7D1-M1GJ 0.3M
	M30	 10 mm			E2EQ-X10D1-M1GJ 0.3M

## Accessories (Order Separately)

## Sensor I/O Connectors (M12, Sockets on One Cable End)

(Models with Pre-wired Connectors: A Connector is not provided with the Sensor. Be sure to order a Connector separately.) [Refer to XS2, XS5.]

Appearance	Cable length	Sensor I/O Connector model number	Applicable Proximity Sensor model number
Straight 	2 m	XS2F-D421-DC0-F	E2EQ-X□X1-M1J
	5 m	XS2F-D421-GC0-F	
L-shape 	2 m	XS2F-D422-DC0-F	
	5 m	XS2F-D422-GC0-F	
Straight 	2 m	XS2F-D421-DA0-F	E2EQ-X□D1-M1GJ
	5 m	XS2F-D421-GA0-F	
L-shape 	2 m	XS2F-D422-DA0-F	
	5 m	XS2F-D422-GA0-F	
Smartclick Connector Straight 	2 m	XS5F-D421-D80-F	E2EQ-X□X1-M1TJ E2EQ-X□D1-M1TGJ
	5 m	XS5F-D421-G80-F	

Note: Refer to *Introduction to Sensor I/O Connectors* for details.

## Ratings and Specifications

## Long Sensing-distance Models

Item	Model	E2EQ-X4X1 E2EQ-X4X1-M1(T)J	E2EQ-X8X1 E2EQ-X8X1-M1(T)J	E2EQ-X15X1 E2EQ-X15X1-M1(T)J
Sensing distance		4 mm ±10%	8 mm ±10%	15 mm ±10%
Set distance *1		0 to 3.2 mm	0 to 6.4 mm	0 to 12 mm
Differential travel		15% max. of sensing distance		
Standard sensing object		Iron, 12 × 12 × 1 mm	Iron, 18 × 18 × 1 mm	Iron, 30 × 30 × 1 mm
Response frequency *2		1 kHz	0.5 kHz	0.25 kHz
Control output	Load current	3 to 100 mA		
	Residual voltage *3	5 V max. (Load current: 100 mA, Cable length: 2 m)		
Operation mode (with sensing object approaching)		Load ON: NO; For details, refer to the timing charts on page 5.		
Protection circuits		Load short-circuit protection, Surge suppressor		
Ambient temperature range		Operating: -25 to 70°C, Storage: -40 to 85°C, (with no icing or condensation)		
Temperature influence		±15% max. of sensing distance at 23°C in the temperature range of -40 to 85°C ±10% max. of sensing distance at 23°C in the temperature range of -25 to 70°C		±15% max. of sensing distance at 23°C in the temperature range of -25 to 70°C
Voltage influence		±1% max. of sensing distance at rated voltage in the rated voltage ±15% range		
Shock resistance		Destruction: 1,000m/s <sup>2</sup> 10 times each in X, Y, and Z directions		
Connection method		Pre-wired Models (Standard cable length: 2 m), Pre-wired Connector Models		
Weight (packed state)	Pre-wired Models	Approx. 65 g	Approx. 140 g	Approx. 190 g
	Pre-wired Connector Models	Approx. 20 g	Approx. 40 g	Approx. 90 g

\*1. Use the Sensor within the range in which the green indicator is ON.

\*2. The response frequency is an average value.

\*3. The residual voltage is 5 V. Make sure that the device connected to the Sensor can withstand the residual voltage.

## Standard Models

Item		Model	E2EQ-X3D1 E2EQ-X3D1-M1(T)GJ	E2EQ-X7D1 E2EQ-X7D1-M1(T)GJ	E2EQ-X10D1 E2EQ-X10D1-M1(T)GJ
Sensing distance			3 mm $\pm$ 10%	7 mm $\pm$ 10%	10 mm $\pm$ 10%
Set distance			0 to 2.4 mm	0 to 5.6 mm	0 to 8 mm
Differential travel			10% max. of sensing distance		
Standard sensing object			Iron, 12 $\times$ 12 $\times$ 1 mm	Iron, 18 $\times$ 18 $\times$ 1 mm	Iron, 30 $\times$ 30 $\times$ 1 mm
Response frequency *			1 kHz	500 Hz	400 Hz
Control output	Load current		3 to 100 mA		
	Residual voltage		3 V max. (Load current: 100 mA, Cable length: 2 m)		
Operation mode (with sensing object approaching)			Load ON: NO; For details, refer to the timing charts on page 5.		
Protection circuits			Load short-circuit protection, Surge suppressor		
Ambient temperature range			Operating/Storage: $-25$ to $70^{\circ}\text{C}$ (with no icing or condensation)		
Temperature influence			$\pm$ 10% max. of sensing distance at $23^{\circ}\text{C}$ in the temperature range of $-25$ to $70^{\circ}\text{C}$		
Voltage influence			$\pm$ 2.5% max. of sensing distance at rated voltage in the rated voltage $\pm$ 15% range		
Shock resistance			Destruction: 1,000 m/s <sup>2</sup> 10 times each in X, Y, and Z directions		
Connection method			E2EQ-X□D1: Pre-wired Models (Standard cable length: 2 m) E2EQ-X□D1-M1GJ: Pre-wired Connector Models (Standard cable length: 300mm)		
Weight (packed state)	Pre-wired Models		Approx. 120 g	Approx. 160 g	Approx. 220 g
	Pre-wired Connector Models		Approx. 80 g	Approx. 110 g	Approx. 190 g

\* 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.

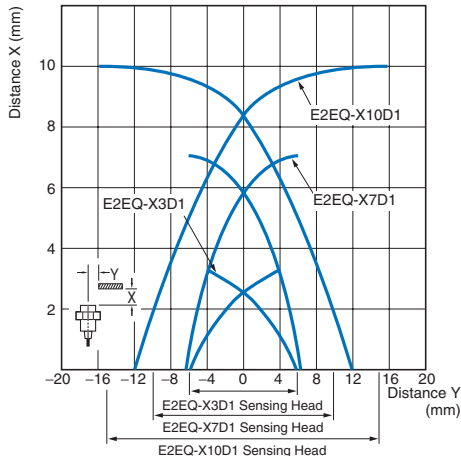
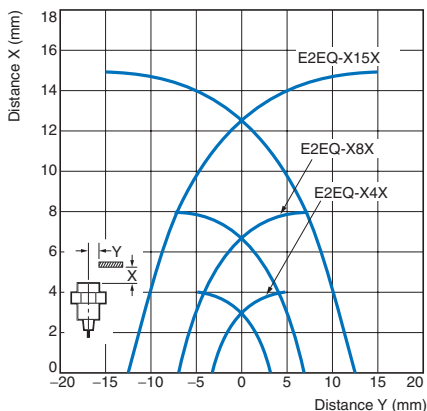
## Common Ratings and Performance

Item		Model	E2EQ-X4X1 E2EQ-X4X1-M1(T)J E2EQ-X3D1 E2EQ-X3D1-M1(T)GJ	E2EQ-X8X1 E2EQ-X8X1-M1(T)J E2EQ-X7D1 E2EQ-X7D1-M1(T)GJ	E2EQ-X15X1 E2EQ-X15X1-M1(T)J E2EQ-X10D1 E2EQ-X10D1-M1(T)GJ
Detectable object			Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 4.)		
Power supply voltage (operating voltage range)			12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.		
Leakage current			0.8 mA max.		
Indicators			Operation indicator (red), Setting indicator (green)		
Ambient humidity range			Operating/Storage: 35% to 95% (with no condensation)		
Insulation resistance			50 M $\Omega$ min. (at 500 VDC) between current-carrying parts and case		
Dielectric strength			1,000 VAC 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		
Degree of protection			IEC 60529 IP67, in-house standards: oil-resistant		
Materials	Case		Fluororesin coating (Base material: brass)		
	Sensing surface		Fluororesin		
	Clamping nuts		Fluororesin coating (Base material: brass)		
	Toothed washer		Zinc-plated iron		
Accessories			Instruction manual		

Engineering Data (Reference Value)

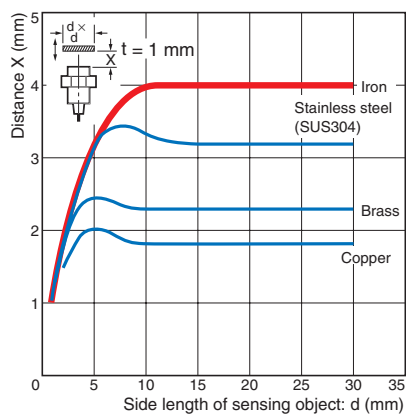
Sensing Area

E2EQ-X□X□(-M1(T)J) Shielded Models E2EQ-X□D□(-M1(T)GJ)

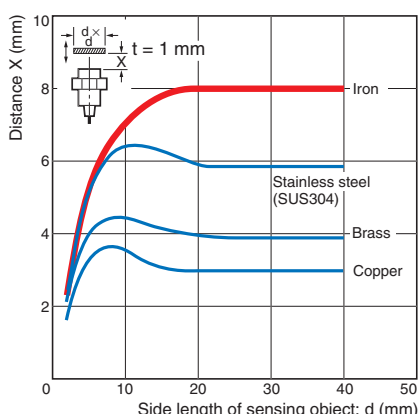


Influence of Sensing Object Size and Material

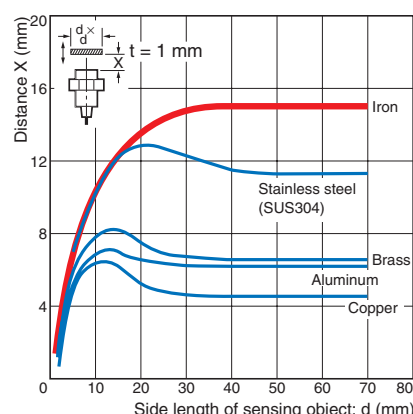
E2EQ-X4X1(-M1(T)J)



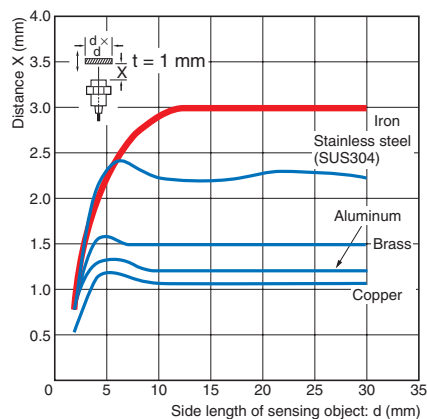
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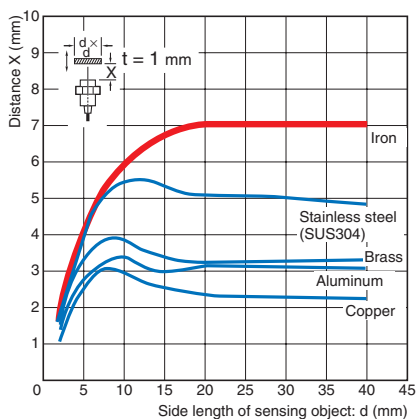
E2EQ-X15X1(-M1(T)J)



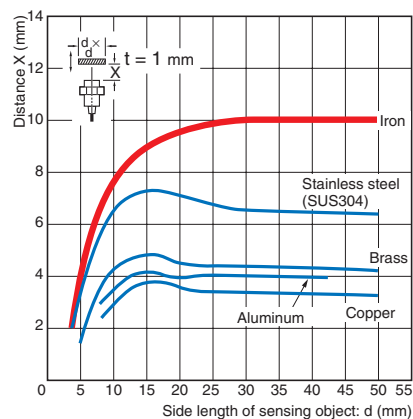
E2EQ-X3D1(-M1(T)GJ)



E2EQ-X7D1(-M1(T)GJ)

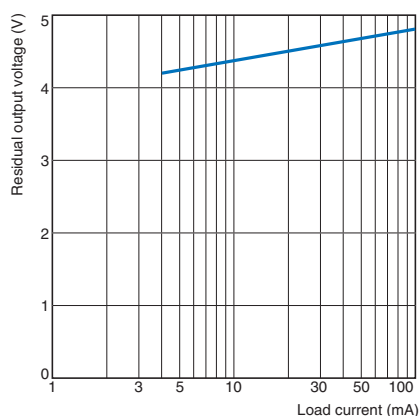


E2EQ-X10D1(-M1(T)GJ)

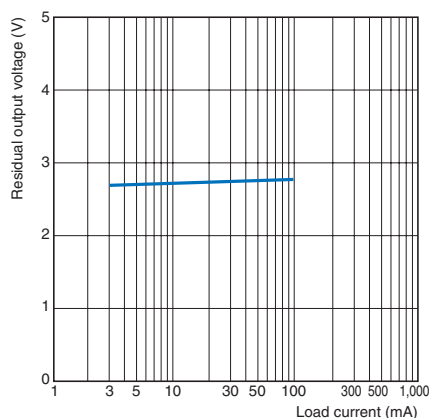


## Residual Output Voltage

E2EQ-X□X□(-M1(T)J)

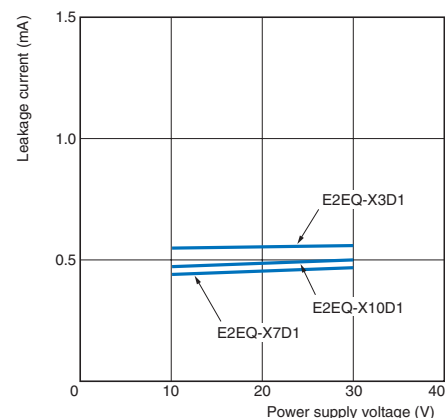


E2EQ-X□D□(-M1(T)GJ)



## Leakage Current

E2EQ-X□D



## I/O Circuit Diagrams

### Long Sensing-distance Models

Model	Operation mode	Timing Chart	Output circuit
E2EQ-X4X1 E2EQ-X8X1 E2EQ-X15X1 E2EQ-X4X1-M1(T)J E2EQ-X8X1-M1(T)J E2EQ-X15X1-M1(T)J	NO	<p>The timing chart shows a sensing object moving from a non-sensing area through an unstable sensing area to a stable sensing area. The rated sensing distance is 100% at the start of the stable area and 80% (TYP) at the end. Output states are: Setting indicator (green) ON, Operation indicator (red) ON, and Control output ON during the stable sensing area.</p>	<p>The output circuit shows a proximity sensor main circuit connected to a load between the +V (Brown) and 0V (Blue) lines.</p> <p>Note 1. The load can be connected to either the +V or 0 V side. Note 2. There is no polarity. Therefore, the brown and blue lines have no polarity.</p> <p><b>Connector Pin Arrangement</b></p> <p>Note: Pins 1 and 2 are not used.</p>

### Standard Models

Model	Operation mode	Timing Chart	Output circuit
E2EQ-X3D1 E2EQ-X7D1 E2EQ-X10D1 E2EQ-X3D1-M1(T)GJ E2EQ-X7D1-M1(T)GJ E2EQ-X10D1-M1(T)GJ	NO	<p>The timing chart shows a sensing object moving through sensing areas. The rated sensing distance is 100% at the start of the stable area and 80% (TYP) at the end. Output states are: Setting indicator (green) OFF, Operation indicator (red) OFF, and Control output ON during the stable sensing area.</p>	<p>The output circuit shows a proximity sensor main circuit connected to a load between the +V (Brown) and 0V (Blue) lines.</p> <p>Note: The load can be connected to either the +V or 0 V side.</p> <p><b>Connector Pin Arrangement</b></p> <p>Note: Pins 2 and 3 are not used.</p>

## Pre-wired Connector Model Connections

Model	E2EQ-X□X1-M1(T)J		E2EQ-X□D1-M1(T)GJ	
Connections	Pre-wired Connector Model E2EQ-X□X1-M1J	Sensor I/O Connector XS2F-D42□-□C0-F	Pre-wired Connector Model E2EQ-X□D1-M1GJ	Sensor I/O Connector XS2F-D42□-□A0-F
		 ○ Brown (not used) ○ Blue (-) ○ Black (+)		 ○ Brown (+) ○ Blue (-)
	Pre-wired Connector Model E2EQ-X□X1-M1TJ	Sensor I/O Connector XS5F-D421-□80-F	Pre-wired Connector Model E2EQ-X□D1-M1TGJ	Sensor I/O Connector XS5F-D421-□80-F
		 ○ Brown (not used) ○ White (not used) ○ Blue (-) ○ Black (+)		 ○ Brown (+) ○ White (not used) ○ Blue (not used) ○ Black (-)

## 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.



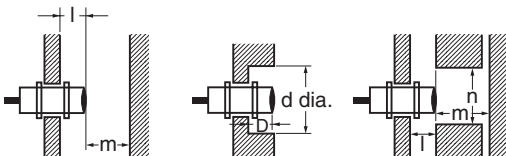
### Precautions for Correct Use

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.

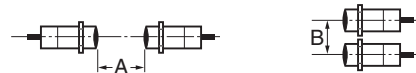


##### Influence of Surrounding Metal (Unit: mm)

Model	Item	l	d	D	m	n
E2EQ-X4X1(-M1(T)J)		2.4	18	2.4	12	18
E2EQ-X8X1(-M1(T)J)		3.6	27	3.6	24	27
E2EQ-X15X1(-M1(T)J)		6	45	6	45	45
E2EQ-X3D1(-M1(T)GJ)		12			8	18
E2EQ-X7D1(-M1(T)GJ)	0	18	0		20	27
E2EQ-X10D1(-M1(T)GJ)		30			40	45

#### Mutual Interference

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

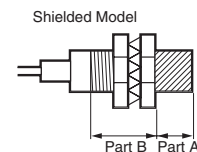


#### Mutual Interference (Unit: mm)

Model	Item	A	B
E2EQ-X4X1(-M1(T)J)		30	20
E2EQ-X8X1(-M1(T)J)		60	35
E2EQ-X15X1(-M1(T)J)		110	90
E2EQ-X3D1(-M1(T)GJ)		30	20
E2EQ-X7D1(-M1(T)GJ)		50	35
E2EQ-X10D1(-M1(T)GJ)		100	70

#### ● Mounting

Do not tighten the nut with excessive force. A washer must be used with the nut.



Note: 1. The allowable tightening strength depends on the distance from the edge of the head, as shown in the following table. (A is the distance from the edge of the head. B includes the nut on the head side. If the edge of the nut is in part A, the tightening torque for part A applies instead.)

2. The following torque assume washers are being used.

Model	Torque	Part A		Part B
		Dimension (mm)	Torque	Torque
E2EQ-X4X1(-M1(T)J)	---	---	30 N·m	
E2EQ-X8X1(-M1(T)J)			70 N·m	
E2EQ-X15X1(-M1(T)J)			180 N·m	
E2EQ-X3D1(-M1(T)GJ)	24	15 N·m	---	
E2EQ-X7D1(-M1(T)GJ)	29		---	
E2EQ-X10D1(-M1(T)GJ)	26	39 N·m	78 N·m	

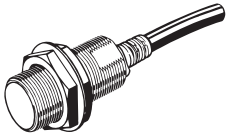
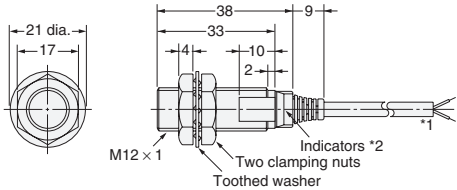
Dimensions

Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Pre-wired Models

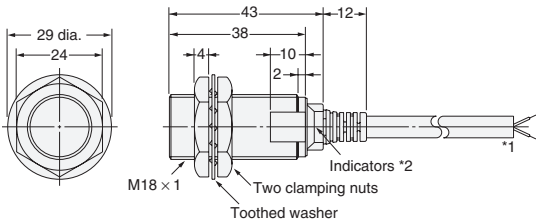
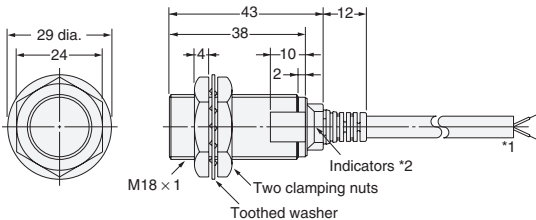
Long Sensing-distance Models

**E2EQ-X4X1**

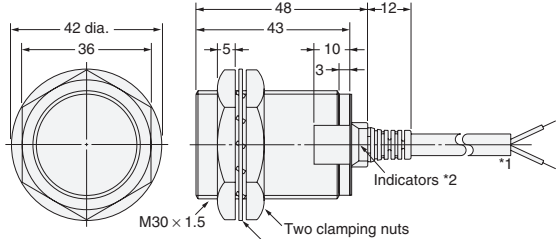
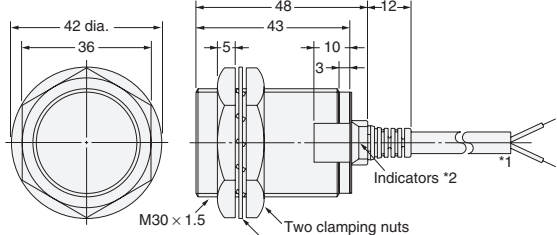
\*1. 4-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).  
\*2. Operation indicator (red), Setting indicator (green)

**E2EQ-X8X1**

\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).  
\*2. Operation indicator (red), Setting indicator (green)

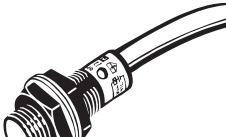
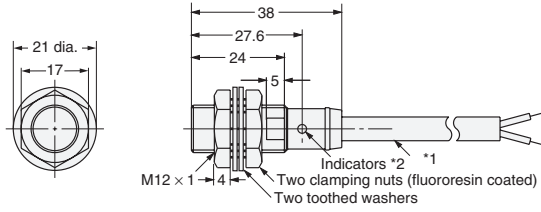
**E2EQ-X15X1**

\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).  
\*2. Operation indicator (red), Setting indicator (green)

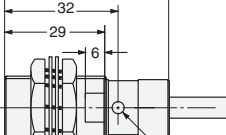
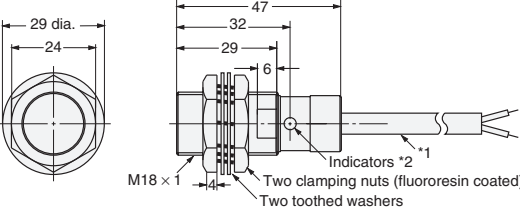
Standard Models

**E2EQ-X3D1**

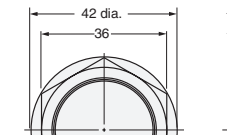
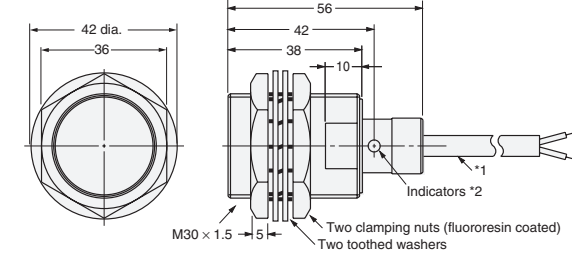
\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).  
\*2. Operation indicator (red), Setting indicator (green)

**E2EQ-X7D1**

\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).  
\*2. Operation indicator (red), Setting indicator (green)

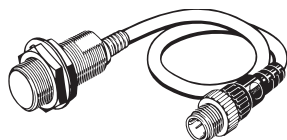
**E2EQ-X10D1**

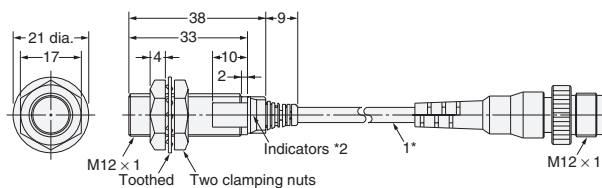
\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).  
\*2. Operation indicator (red), Setting indicator (green)

## Pre-wired Connector Models

### Long Sensing-distance Models

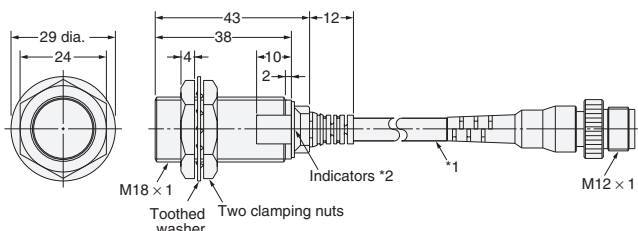


### E2EQ-X4X1-M1(T)J



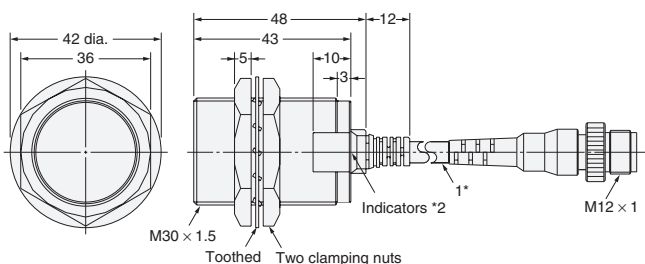
\*1. 4-dia. vinyl-insulated round cable (Flame-resistant, Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm), Standard length: 300 mm  
 \*2. Operation indicator (red), Setting indicator (green)

### E2EQ-X8X1-M1(T)J



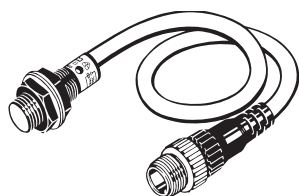
\*1. 6-dia. vinyl-insulated round cable (Flame-resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 300 mm  
 \*2. Operation indicator (red), Setting indicator (green)

### E2EQ-X15X1-M1(T)J

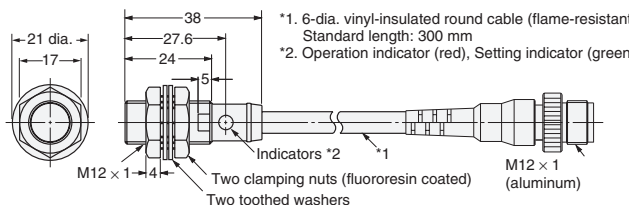


\*1. 6-dia. vinyl-insulated round cable (Flame-resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 300 mm  
 \*2. Operation indicator (red), Setting indicator (green)

## Standard Models

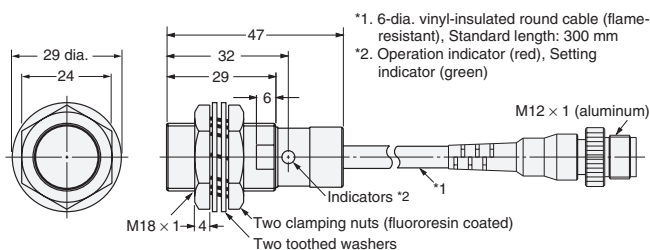


### E2EQ-X3D1-M1(T)GJ



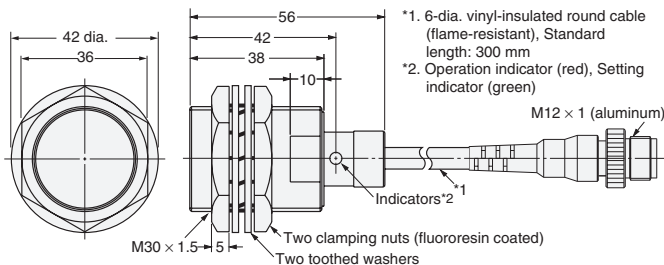
\*1. 6-dia. vinyl-insulated round cable (flame-resistant), Standard length: 300 mm  
 \*2. Operation indicator (red), Setting indicator (green)

### E2EQ-X7D1-M1(T)GJ



\*1. 6-dia. vinyl-insulated round cable (flame-resistant), Standard length: 300 mm  
 \*2. Operation indicator (red), Setting indicator (green)

### E2EQ-X10D1-M1(T)GJ



\*1. 6-dia. vinyl-insulated round cable (flame-resistant), Standard length: 300 mm  
 \*2. Operation indicator (red), Setting indicator (green)

## Mounting Hole Dimensions



Model	E2EQ-X4X E2EQ-X3	E2EQ-X8X E2EQ-X7	E2EQ-X15X E2EQ-X10
F (mm)	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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2012.8

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