


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


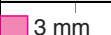


Standard Models	Sensing distance	Output configuration	Operation mode	Model
Shielded 	M12  3 mm	DC 2-wire (1)-(4) pin arrangement	NO	E2EQ-X3D1-M1TGJ 0.3M
	M18  7 mm			E2EQ-X7D1-M1TGJ 0.3M
	M30  10 mm			E2EQ-X10D1-M1TGJ 0.3M

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


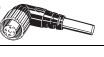

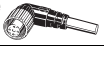

Standard Models

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/Sensor Controllers* 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 ² 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 ±10%	7 mm ±10%	10 mm ±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 × 12 × 1 mm	Iron, 18 × 18 × 1 mm	Iron, 30 × 30 × 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°C (with no icing or condensation)		
Temperature influence			±10% max. of sensing distance at 23°C in the temperature range of -25 to 70°C		
Voltage influence			±2.5% max. of sensing distance at rated voltage in the rated voltage ±15% range		
Shock resistance			Destruction: 1,000 m/s ² 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.

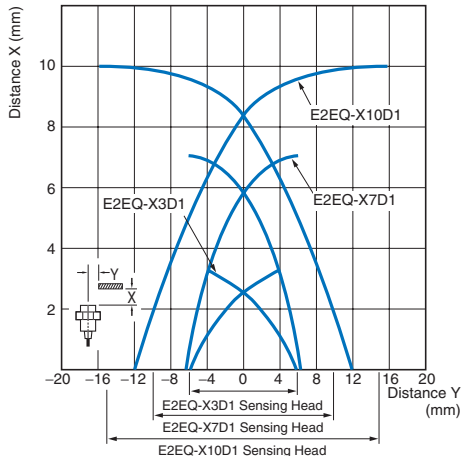
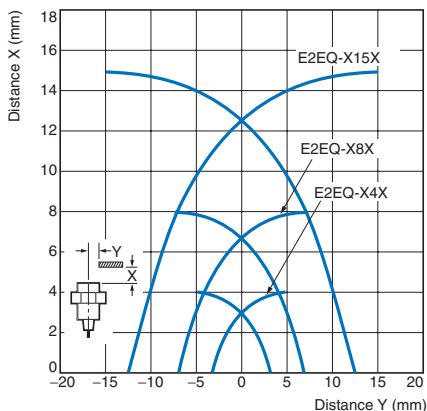
Common Ratings and Performance

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 MΩ 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)

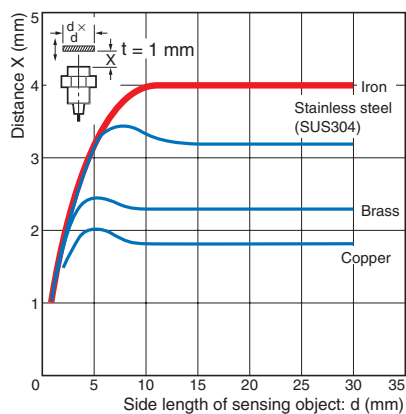
Sensing Area

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

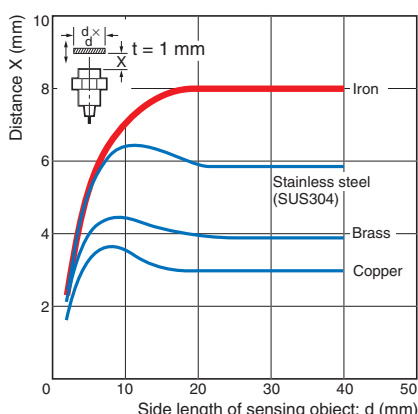


Influence of Sensing Object Size and Material

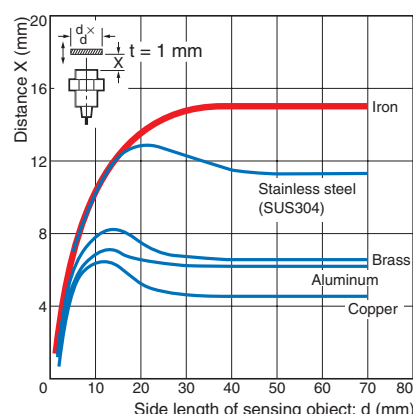
E2EQ-X4X1(-M1(T)J)



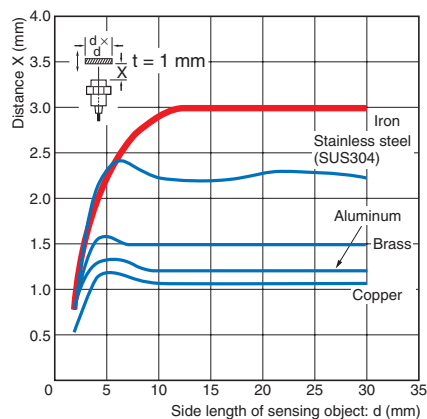
E2EQ-X8X1(-M1(T)J)



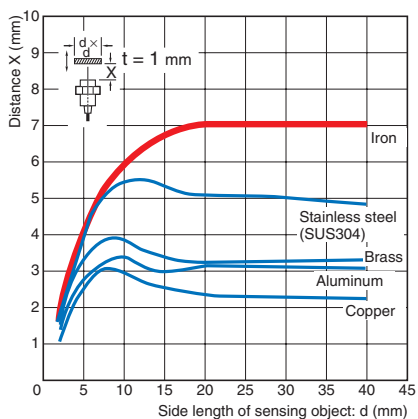
E2EQ-X15X1(-M1(T)J)



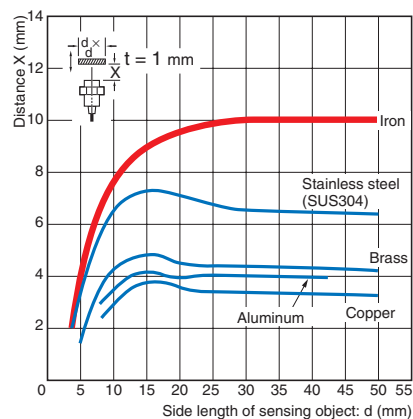
E2EQ-X3D1(-M1(T)GJ)



E2EQ-X7D1(-M1(T)GJ)

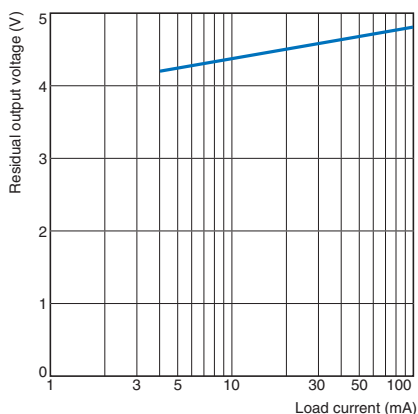


E2EQ-X10D1(-M1(T)GJ)

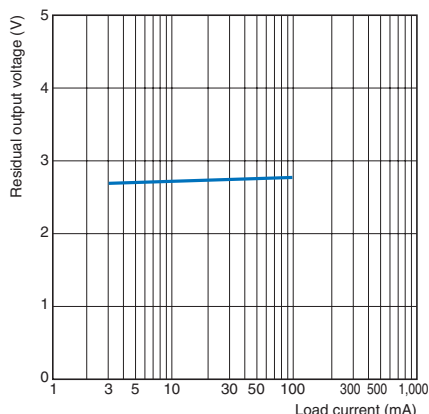


Residual Output Voltage

E2EQ-X□X□(-M1(T)J)

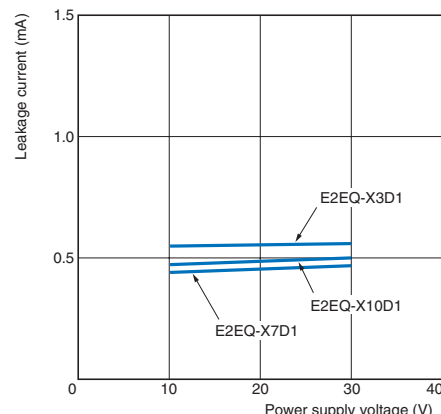


E2EQ-X□D□(-M1(T)GJ)



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>Note 1. The load can be connected to either the +V or 0 V side.</p> <p>Note 2. There is no polarity. Therefore, the brown and blue lines have no polarity.</p> <p>Connector Pin Arrangement</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>Note: The load can be connected to either the +V or 0 V side.</p> <p>Connector Pin Arrangement</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.



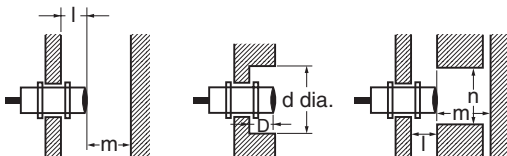
Precautions for Correct Use

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.

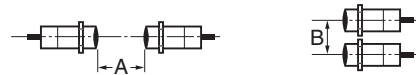


Influence of Surrounding Metal (Unit: mm)

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.

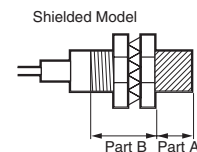


Mutual Interference (Unit: mm)

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.

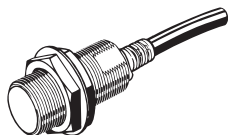
Model	Torque	Part A		Part B
		Dimension (mm)	Torque	Torque
E2EQ-X4X1(-M1(T)J)	---	---	30 N·m	
E2EQ-X8X1(-M1(T)J)			70 N·m	
E2EQ-X15X1(-M1(T)J)			180 N·m	
E2EQ-X3D1(-M1(T)GJ)	24	15 N·m	---	
E2EQ-X7D1(-M1(T)GJ)	29			
E2EQ-X10D1(-M1(T)GJ)	26	39 N·m	78 N·m	

Dimensions

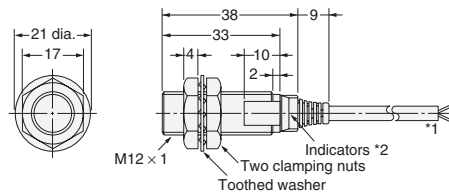
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Pre-wired Models

Long Sensing-distance Models

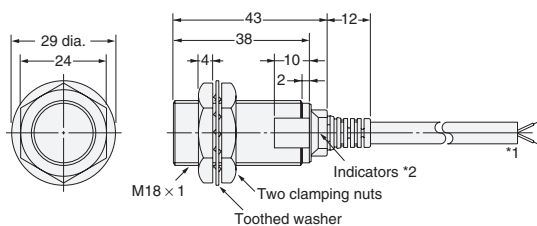


E2EQ-X4X1



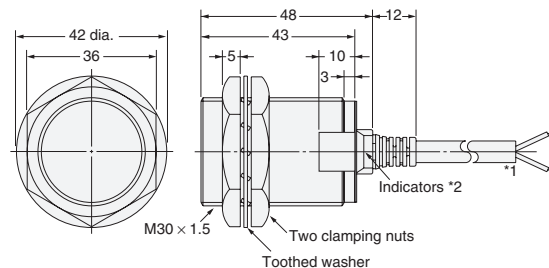
- *1. 4-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 2 m
The cable can be extended up to 200 m (separate metal conduit).
- *2. Operation indicator (red), Setting indicator (green)

E2EQ-X8X1



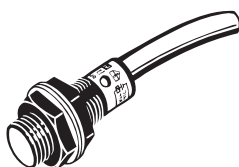
- *1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
The cable can be extended up to 200 m (separate metal conduit).
- *2. Operation indicator (red), Setting indicator (green)

E2EQ-X15X1

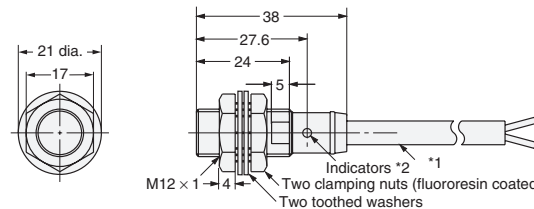


- *1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
The cable can be extended up to 200 m (separate metal conduit).
- *2. Operation indicator (red), Setting indicator (green)

Standard Models

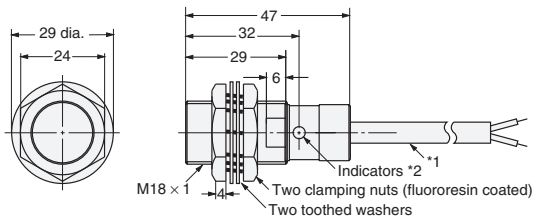


E2EQ-X3D1



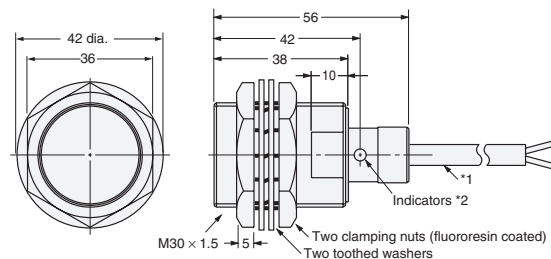
- *1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
The cable can be extended up to 200 m (separate metal conduit).
- *2. Operation indicator (red), Setting indicator (green)

E2EQ-X7D1



- *1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm², 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)

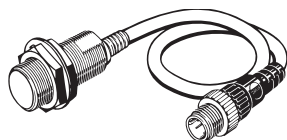
E2EQ-X10D1



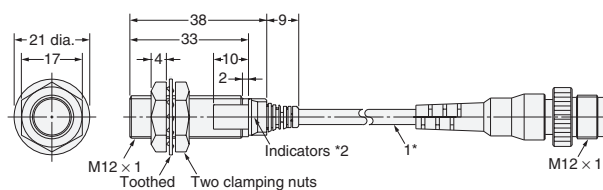
- *1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
The cable can be extended up to 200 m (separate metal conduit).
- *2. Operation indicator (red), Setting indicator (green)

Pre-wired Connector Models

Long Sensing-distance Models

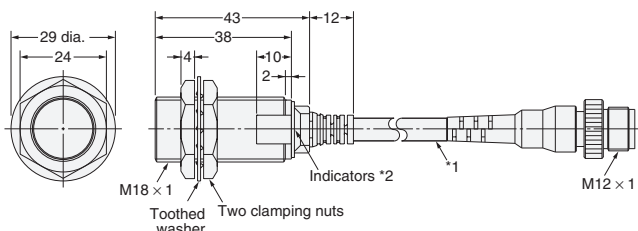


E2EQ-X4X1-M1(T)J



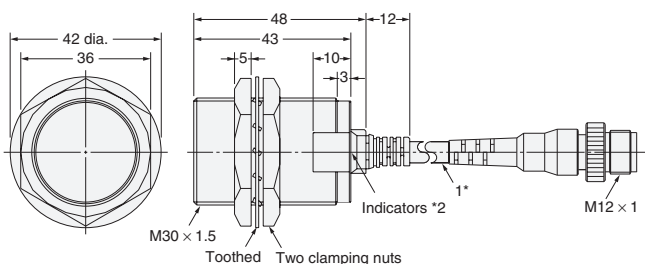
*1. 4-dia. vinyl-insulated round cable (Flame-resistant, Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 300 mm
 *2. Operation indicator (red), Setting indicator (green)

E2EQ-X8X1-M1(T)J



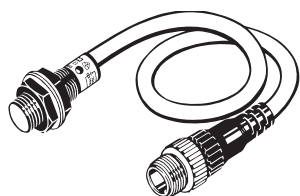
*1. 6-dia. vinyl-insulated round cable (Flame-resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 300 mm
 *2. Operation indicator (red), Setting indicator (green)

E2EQ-X15X1-M1(T)J

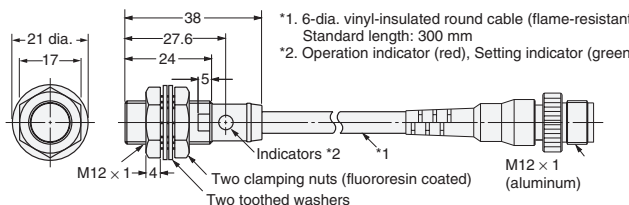


*1. 6-dia. vinyl-insulated round cable (Flame-resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 300 mm
 *2. Operation indicator (red), Setting indicator (green)

Standard Models

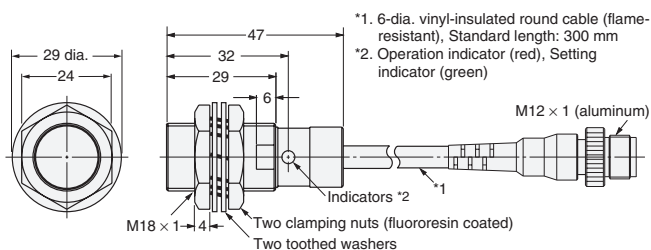


E2EQ-X3D1-M1(T)GJ



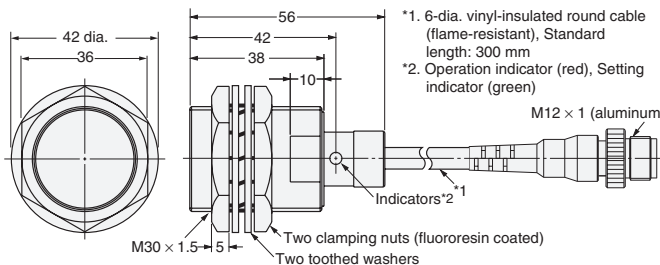
*1. 6-dia. vinyl-insulated round cable (flame-resistant), Standard length: 300 mm
 *2. Operation indicator (red), Setting indicator (green)

E2EQ-X7D1-M1(T)GJ



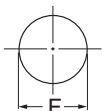
*1. 6-dia. vinyl-insulated round cable (flame-resistant), Standard length: 300 mm
 *2. Operation indicator (red), Setting indicator (green)

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 ^{+0.5} ₀ dia.	18.5 ^{+0.5} ₀ dia.	30.5 ^{+0.5} ₀ dia.

Terms and Conditions Agreement

Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.

(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

Limitation on Liability; Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

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 PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

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.

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.

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.

2014.1

In the interest of product improvement, specifications are subject to change without notice.

OMRON Corporation
Industrial Automation Company

<http://www.ia.omron.com/>

(c)Copyright OMRON Corporation 2014 All Right Reserved.