E2EQ

CSM_E2EQ_DS_E_9_1

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.



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



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

Ordering Information

Sensors [Refer to Dimensions on page 7.]

Pre-wired Models

Long Sensing-distance Models

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

Standard Models

Appearar	Appearance Sensing distance		Output configuration	Operation mode	Model	
	M12	3 mm				E2EQ-X3D1 2M
Shielded	M18	7 mm		DC 2-wire	NO	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
Chielded	M12	4 mm	DC 2-wire		E2EQ-X4X1-M1TJ 0.3M
Shielded	M18	8 mm	(no polarity) (3)-(4) pin arrangement	NO	E2EQ-X8X1-M1TJ 0.3M
	M30	15 mm			E2EQ-X15X1-M1TJ 0.3M

Standard Models

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

Pre-wired Connector Models (M12)

Long Sensing-distance Models

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

Standard Models

Standard M	Standard Models		nce	Output configuration	Operation mode	Model
	M12	3 mm		DC 2-wire		E2EQ-X3D1-M1GJ 0.3M
Shielded	M18	7 mm		(1)-(4) pin arrangement	NO	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	
Straight	5 m	XS2F-D421-GC0-F	E2EQ-X□X1-M1J
L-shape	2 m	XS2F-D422-DC0-F	
	5 m	XS2F-D422-GC0-F	
Straight	2 m	XS2F-D421-DA0-F	
	5 m	XS2F-D421-GA0-F	E2EQ-X□D1-M1GJ
L-shape	2 m	XS2F-D422-DA0-F	LZEQ XIBT WIGO
2 onapo	5 m	XS2F-D422-GA0-F	
Smartclick Connector Straight	2 m	XS5F-D421-D80-F	E2EQ-X□X1-M1TJ
	5 m	XS5F-D421-G80-F	E2EQ-X□D1-M1TGJ

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

Ratings and Specifications

Long Sensing-distance Models

	Model	E2EQ-X4X1	E2EQ-X8X1	E2EQ-X15X1		
Item		E2EQ-X4X1-M1(T)J	E2EQ-X8X1-M1(T)J	E2EQ-X15X1-M1(T)J		
Sensing d	istance	4 mm ±10%	8 mm ±10%	15 mm ±10%		
Set distan	ce *1	0 to 3.2 mm	0 to 6.4 mm	0 to 12 mm		
Differentia	ıl travel	15% max. of sensing distance				
Standard s	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	Load current	3 to 100 mA				
output	Residual voltage *3	5 V max. (Load current: 100 mA, Cable length: 2 m)				
Operation object app	mode (with sensing proaching)	Load ON: NO; For details, refer to the timing charts on page 5.				
Protection	circuits	Load short-circuit protection, Surge suppressor				
Ambient to	emperature range	Operating: –25 to 70°C, Storage: –40 to 85°C, (with no icing or condensation)				
Temperatu	ure 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 the temperature range of –25 to 70°C				
Voltage in	fluence	±1% max. of sensing distance at rated voltage in the rated voltage ±15% range				
Shock res	istance	Destruction: 1,000m/s² 10 times each in X, Y, and Z directions				
Connection method		Pre-wired Models (Standard cable length:	: 2 m), Pre-wired Connector Models			
Weight	Pre-wired Models	Approx. 65 g	Approx. 140 g	Approx. 190 g		
(packed state)	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

	Model	E2EQ-X3D1	E2EQ-X7D1	E2EQ-X10D1		
Item		E2EQ-X3D1-M1(T)GJ	E2EQ-X7D1-M1(T)GJ	E2EQ-X10D1-M1(T)GJ		
Sensing dista	ance	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 tr	avel	10% max. of sensing distance				
Standard sen	sing object	Iron, 12 × 12 × 1 mm	Iron, 18 × 18 × 1 mm	Iron, 30 × 30 × 1 mm		
Response fre	equency *	1 kHz	500 Hz	400 Hz		
Control	Load current	3 to 100 mA				
output	Residual voltage	3 V max. (Load current: 100 mA, Cable length: 2 m)				
Operation mo	ode (with sensing aching)	Load ON: NO; For details, refer to the timing charts on page 5.				
Protection ci	rcuits	Load short-circuit protection, Surge suppressor				
Ambient tem	perature 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 influ	ence	$\pm 2.5\%$ max. of sensing distance at rated voltage in the rated voltage $\pm 15\%$ range				
Shock resista	ance	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	Pre-wired Models	Approx. 120 g	Approx. 160 g	Approx. 220 g		
(packed state)	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.

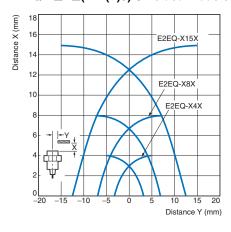
Common Ratings and Performance

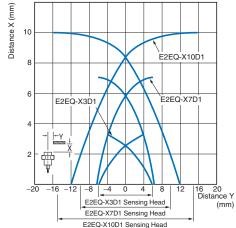
Item	Model	E2EQ-X4X1 E2EQ-X4X1-M1(T)J E2EQ-X3D1 E2EQ-X3D1-M1(T)GJ	E2EQ-X8X1 E2EQ-X8X1-M1(T)J E2EQ-X7D1 E2EQ-X7D1-M1(T)GJ	E2EQ-X15X1 E2EQ-X15X1-M1(T)J E2EQ-X10D1 E2EQ-X10D1-M1(T)GJ		
Detectable o	bject	Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 4.)				
Power suppl (operating v	ly voltage oltage range)	12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.				
Leakage cur	rent	0.8 mA max.				
Indicators		Operation indicator (red), Setting indicator (green)				
Ambient hur	midity range	Operating/Storage: 35% to 95% (with no condensation)				
Insulation re	esistance	50 M Ω min. (at 500 VDC) between current-carrying parts and case				
Dielectric str	rength	1,000 VAC for 1 min between current-carrying parts and case				
Vibration res	sistance	Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions				
Degree of pr	otection	IEC 60529 IP67, in-house standards: oil-resistant				
	Case	Fluororesin coating (Base material: brass)				
Materials	Sensing surface	Fluororesin				
wateriais	Clamping nuts	Fluororesin coating (Base material: brass)				
	Toothed washer	Zinc-plated iron				
Accessories		Instruction manual				

Engineering Data (Reference Value)

Sensing Area

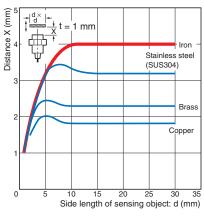
$\begin{tabular}{ll} E2EQ-X \square X \square (-M1(T)J) \ Shielded \ Models \\ \end{tabular} \begin{tabular}{ll} E2EQ-X \square D \square (-M1(T)GJ) \\ \end{tabular}$



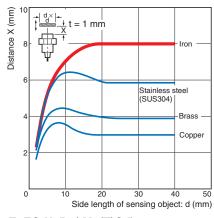


Influence of Sensing Object Size and Material

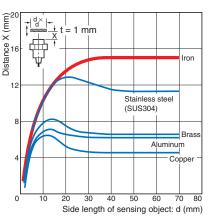
E2EQ-X4X1(-M1(T)J)



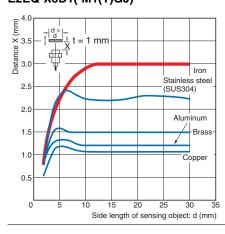
E2EQ-X8X1(-M1(T)J)



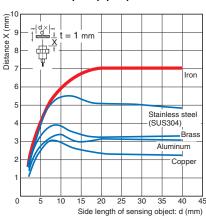
E2EQ-X15X1(-M1(T)J)



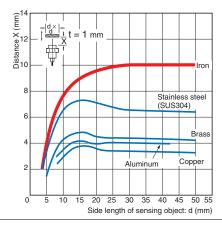
E2EQ-X3D1(-M1(T)GJ)



E2EQ-X7D1(-M1(T)GJ)

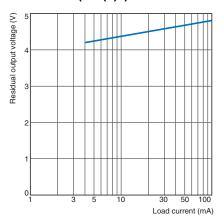


E2EQ-X10D1(-M1(T)GJ)

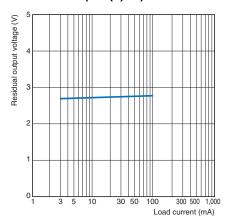


Residual Output Voltage

$\mathsf{E2EQ\text{-}X}\square\mathsf{X}\square(\mathsf{-M1}(\mathsf{T})\mathsf{J})$

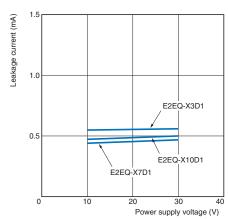


 $\mathsf{E2EQ\text{-}X} \square \mathsf{D} \square (\mathsf{-M1}(\mathsf{T})\mathsf{GJ})$



Leakage Current

E2EQ-X□D



I/O Circuit Diagrams

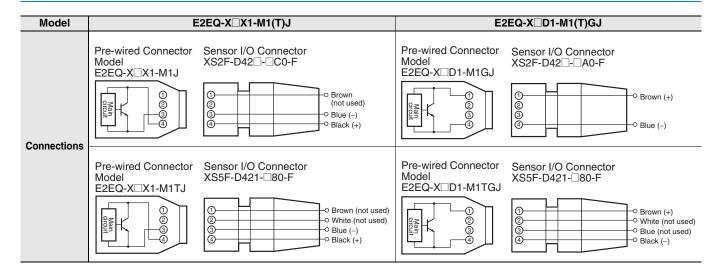
Long Sensing-distance Models

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	Unstable Set position sensing Non-sensing area area Sensing object (%) Rated sensing distance ON Setting indicator OFF (green) ON Operation indicator OFF (red) ON ON Control output	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. Connector Pin Arrangement 1 2 4 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

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	Unstable Set position Sensing area area Stable sensing area Sensing Object ON Setting indicator OFF (green) ON Operation indicator (red) ON Control output	Note: Pins 2 and 3 are not used.

Pre-wired Connector Model Connections



Safety Precautions

Refer to Warranty and Limitations of Liability.



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



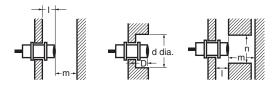
Precautions for Correct Use

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 Ite	n I	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.





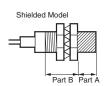
Mutual Interference (Unit: mm)

Model Item	Α	В
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.

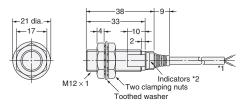
Torque	Part A		Part B	
Model	Dimension (mm)	Torque	Torque	
E2EQ-X4X1(-M1(T)J)		30 N⋅m		
E2EQ-X8X1(-M1(T)J)		70 N⋅m		
E2EQ-X15X1(-M1(T)J)		180	N⋅m	
E2EQ-X3D1(-M1(T)GJ)	24	15 N·m		
E2EQ-X7D1(-M1(T)GJ)	29	13 14-111		
E2EQ-X10D1(-M1(T)GJ)	26	39 N⋅m	78 N⋅m	

Pre-wired Models

Long Sensing-distance Models

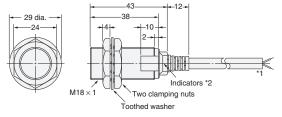


E2EQ-X4X1



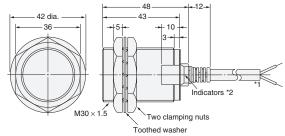
- *1. 4-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 2 m
- The cable can be extended up to 200 m (separate metal conduit). *2. Operation indicator (red), Setting indicator (green)

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



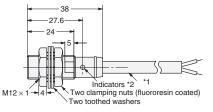
- *1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
 The cable can be extended up to 200 m (separate metal conduit).
 *2. Operation indicator (red), Setting indicator (green)

Standard Models



E2EQ-X3D1

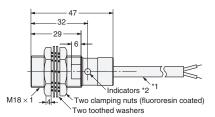




- *1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m The cable can be extended up to 200 m (separate metal
- *2. Operation indicator (red), Setting indicator (green)

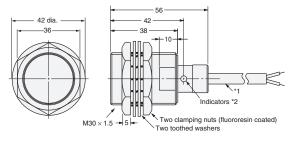
E2EQ-X7D1





- *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
- *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).

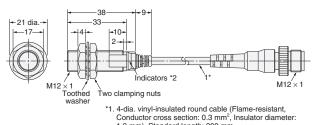
 *2. Operation indicator (red), Setting indicator (green)

Pre-wired Connector Models

Long Sensing-distance Models

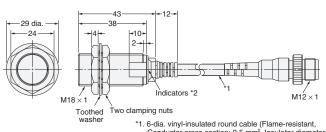


E2EQ-X4X1-M1(T)J



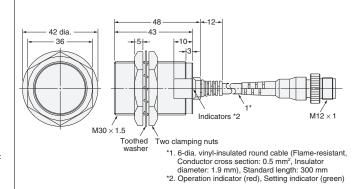
- 1.3 mm), Standard length: 300 mm
 *2. Operation indicator (red), Setting indicator (green)

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)

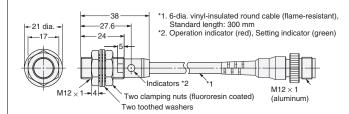
E2EQ-X15X1-M1(T)J



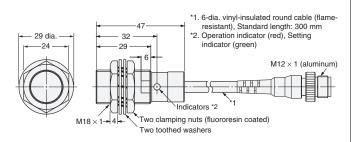
Standard Models



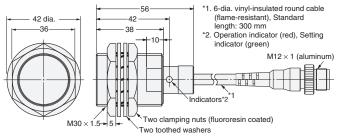
E2EQ-X3D1-M1(T)GJ



E2EQ-X7D1-M1(T)GJ



E2EQ-X10D1-M1(T)GJ



Mounting Hole Dimensions



Model	E2EQ-X4X E2EQ-X3	E2EQ-X8X E2EQ-X7	E2EQ-X15X E2EQ-X10
F (mm)	12.5 ₀ ^{+0.5} dia.	18.5 ₀ ^{+0.5} dia.	30.5 ₀ ^{+0.5} dia.

Terms and Conditions Agreement

Read and understand this catalog.

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- (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.
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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.

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<u>Errors and Omissions.</u> <u>Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is accurate.</u> assumed for clerical, typographical or proofreading errors or omissions.

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