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## Chip-immune Inductive Proximity Sensor

- Correct operation even with aluminum or iron chips sticking to the Sensor.  
Only the sensing object is detected.
- Pre-wired Smartclick Connector Models also available.



Be sure to read *Safety Precautions* on page 7.

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 8.]  
**Pre-wired Models**

Appearance		Sensing distance		Output configuration		Model	
						Operation mode	
						NO	NC
	M12	2 mm		DC 2-Wire Models	E2EZ-X2D1-N 2M	E2EZ-X2D2-N 2M	
	M18	4 mm		DC 3-wire, NPN	E2EZ-X4C1 2M	—	
				DC 2-wire	E2EZ-X4D1-N 2M	E2EZ-X4D2-N 2M	
	M30	8 mm		DC 3-wire, NPN	E2EZ-X8C1 2M	—	
				DC 2-wire	E2EZ-X8D1-N 2M	E2EZ-X8D2-N 2M	

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

Appearance		Sensing distance		Output configuration		Model	
						Operation mode	
						NO	NC
	M12	2 mm		DC 2-wire, (3)-(4) pin arrangement	E2EZ-X2D1-M1TJ 0.3M	—	
				DC 2-wire, (1)-(4) pin arrangement	E2EZ-X2D1-M1TGJ 0.3M	—	
	M18	4 mm		DC 2-wire, (3)-(4) pin arrangement	E2EZ-X4D1-M1TJ 0.3M	—	
				DC 2-wire, (1)-(4) pin arrangement	E2EZ-X4D1-M1TGJ 0.3M	—	
	M30	8 mm		DC 2-wire, (3)-(4) pin arrangement	E2EZ-X8D1-M1TJ 0.3M	—	
				DC 2-wire, (1)-(4) pin arrangement	E2EZ-X8D1-M1TGJ 0.3M	—	






Pre-wired Connector Models (M12)

Appearance		Sensing distance			Output configuration		Model	
							Operation mode	
							NO	NC
Shielded 	M12		2 mm			DC 2-wire, (3)-(4) pin arrangement	E2EZ-X2D1-M1J 0.3M	—
						DC 2-wire, (1)-(4) pin arrangement	E2EZ-X2D1-M1GJ 0.3M	—
	M18		4 mm			DC 2-wire, (3)-(4) pin arrangement	E2EZ-X4D1-M1J 0.3M	—
						DC 2-wire, (1)-(4) pin arrangement	E2EZ-X4D1-M1GJ 0.3M	—
	M30		8 mm			DC 2-wire, (3)-(4) pin arrangement	E2EZ-X8D1-M1J 0.3M	—
						DC 2-wire, (1)-(4) pin arrangement	E2EZ-X8D1-M1GJ 0.3M	—

Accessories (Order Separately)

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

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

Appearance	Cable length	Sensor I/O Connector model number	Applicable Proximity Sensor model number
Straight 	2 m	XS2F-D421-DD0	E2EZ-X□D1-M1J
	5 m	XS2F-D421-GD0	
L-shape 	2 m	XS2F-D422-DD0	
	5 m	XS2F-D422-GD0	
Straight 	2 m	XS2F-D421-DA0-F	E2EZ-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	E2EZ-X□D1-M1TJ E2EZ-X□D1-M1TGJ
	5 m	XS5F-D421-G80-F	

Mounting Brackets

Protective Covers

Sputter Protective Covers

Refer to Y92□ for details.

## Ratings and Specifications

Item	Model	E2EZ-X2D□-N E2EZ-X2D□-M1J E2EZ-X2D□-M1GJ	E2EZ-X4D□-N E2EZ-X4D□-M1J E2EZ-X4D□-M1GJ	E2EZ-X8D□-N E2EZ-X8D□-M1J E2EZ-X8D□-M1GJ	E2EZ-X4C1	E2EZ-X8C1
Sensing distance		2 mm ±10%	4 mm ±10%	8 mm ±10%	4 mm ±10%	8 mm ±10%
Set distance *1		0 to 1.6 mm	0 to 3.2 mm	0 to 6.4 mm	0 to 3.2 mm	0 to 6.4 mm
Differential travel		20% max. of sensing distance				
Detectable object		Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 4.)				
Standard sensing object		Iron, 12 × 12 × 1 mm	Iron, 30 × 30 × 1 mm	Iron, 54 × 54 × 1 mm	Iron, 30 × 30 × 1 mm	Iron, 54 × 54 × 1 mm
Response frequency *2		200 Hz	100 Hz	30 Hz	C Models: 12 Hz	C Models: 8 Hz
Power supply voltage (operating voltage range)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.			C Models: 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.	
Current consumption		---			C Models: 15 mA max.	
Leakage current		0.8 mA max.			---	
Control output	Load current	3 to 100 mA max.			C Models: NPN open-collector output 100 mA max. at 12 VDC (30 VDC max.) 200 mA max. at 24 VDC (30 VDC max.)	
	Residual voltage	3 V max. (Load current: 100 mA, Cable length: 2 m)			C Models: 2 V max. (Load current: 200 mA, Cable length: 2 m)	
Indicators		D1 Models: Operation indicator (red), Setting indicator (green) D2 Models: Operation indicator (red)			C Models: Detection indicator (red)	
Operation mode (with sensing object approaching)		D1 Models: NO D2 Models: NC For details, refer to the <i>Timing chart</i> on page 5.			NO For details, refer to the <i>Timing chart</i> on page 5.	
Protection circuits		Load short-circuit protection, Surge suppressor			C Models: Load short-circuit protection, Reverse polarity protection, Surge suppressor	
Ambient temperature range		Operating/Storage: 0 to 50°C (with no icing or condensation)				
Ambient humidity range		Operating/Storage: 35% to 95% (with no condensation)				
Temperature influence		±20% max. of sensing distance at 23°C in the temperature range of 0 to 50°C				
Voltage influence		±2.5% max. of sensing distance at rated voltage in the rated voltage ±10% range				
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case				
Dielectric strength		1,000 VAC, 50/60 Hz for 1 minute between current-carrying parts and case			C Models: 1,000 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 IP67, in-house standards: oil-resistant				
Connection method		Pre-wired Models (Standard cable length: 2 m) and Pre-wired Connector Models				
Weight (packed state)		E2EZ-X2D□-N: Approx. 70 g E2EZ-X2D□-M1J: Approx. 40 g E2EZ-X2D□-M1GJ: Approx. 40 g	E2EZ-X4D□-N: Approx. 160 g E2EZ-X4D□-M1J: Approx. 90 g E2EZ-X4D□-M1GJ: Approx. 90 g	E2EZ-X8D□-N: Approx. 220 g E2EZ-X8D□-M1J: Approx. 160 g E2EZ-X8D□-M1GJ: Approx. 160 g	Approx. 170 g	Approx. 270 g
Materials	Case	Nickel-plated brass				
	Sensing surface	PBT			Heat-resistant ABS	
	Clamping nuts	Zinc-plated iron				
	Toothed washer	Zinc-plated iron				
Accessories		Instruction manual				

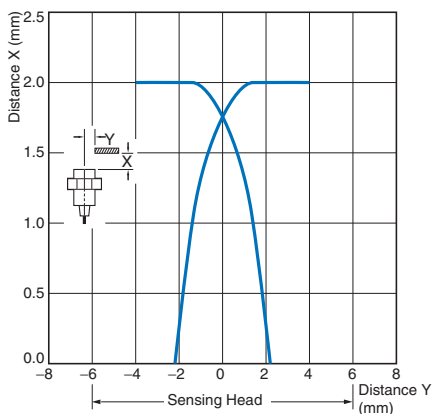
\*1. Use the Sensor within the range in which the green indicator is ON.

\*2. 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.

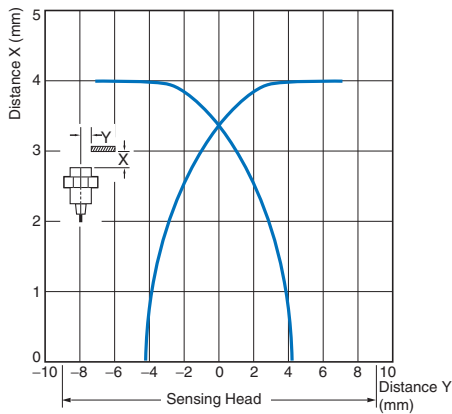
## Engineering Data (Reference Value)

### Sensing Area

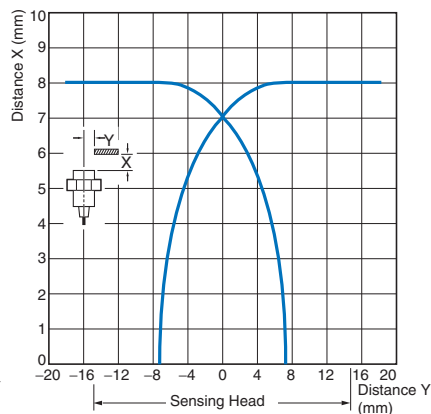
#### E2EZ-X2



#### E2EZ-X4

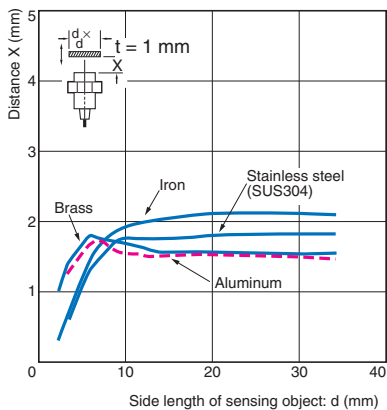


#### E2EZ-X8

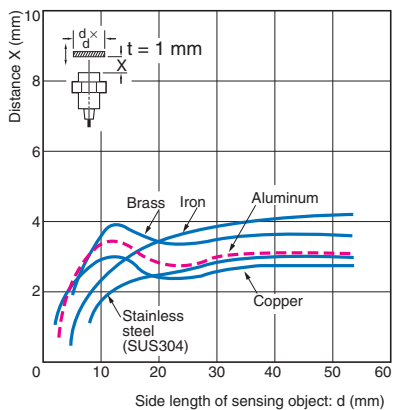


### Influence of Sensing Object Size and Material

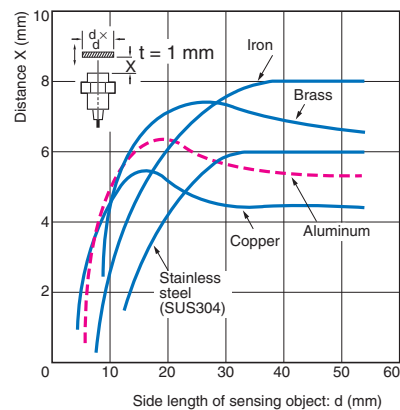
#### E2EZ-X2



#### E2EZ-X4

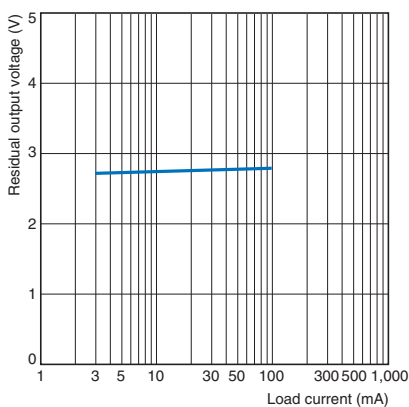


#### E2EZ-X8



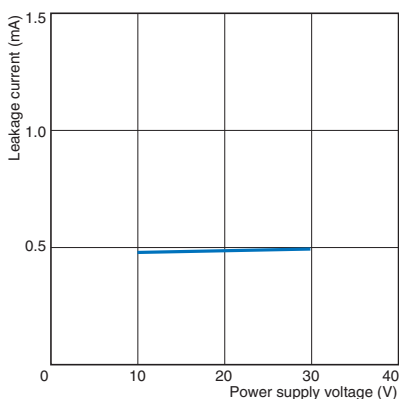
### Residual Output Voltage

#### E2EZ-X□D□-N



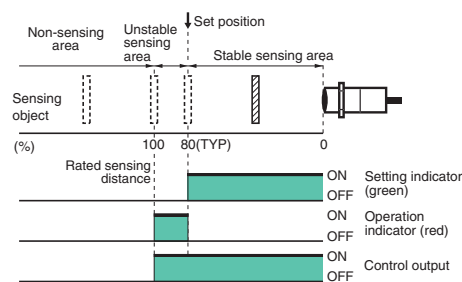
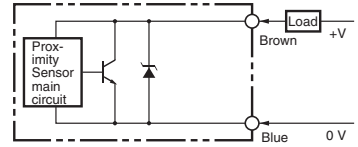
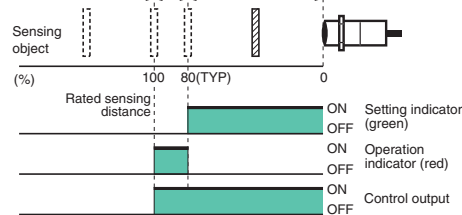
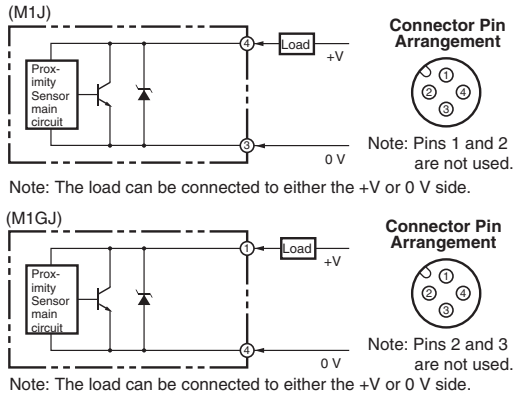
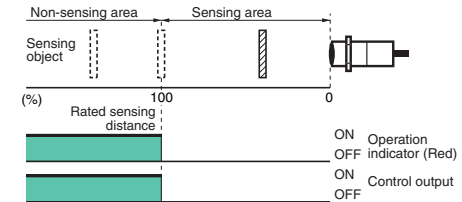
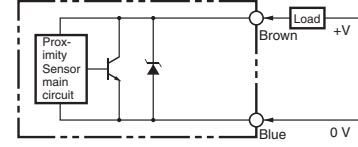
### Leakage Current

#### E2EZ-X□D□-N

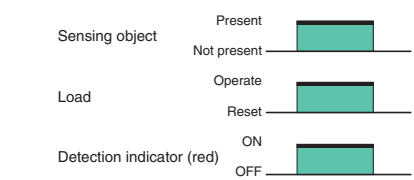
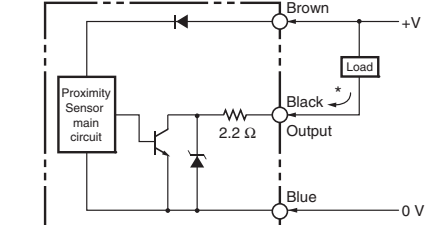


I/O Circuit Diagrams

DC 2-Wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2EZ-X2D1-N E2EZ-X4D1-N E2EZ-X8D1-N		 Note: The load can be connected to either the +V or 0 V side.
	E2EZ-X2D1-M1J E2EZ-X2D1-M1GJ E2EZ-X4D1-M1J E2EZ-X4D1-M1GJ E2EZ-X8D1-M1J E2EZ-X8D1-M1GJ		 Note: The load can be connected to either the +V or 0 V side. Note: Pins 1 and 2 are not used. Note: Pins 2 and 3 are not used.
NC	E2EZ-X2D2-N E2EZ-X4D2-N E2EZ-X8D2-N		 Note: The load can be connected to either the +V or 0 V side.

DC 3-wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2EZ-X4C1 E2EZ-X8C1		 * 100 mA max. at 12 V, 200 mA max. at 24 V (load current).

## Connections for Sensor I/O Connectors

Proximity Sensor		Sensor I/O Connectors		Connections
Model	Operation mode	Model	Model	
DC 2-Wire Models (IEC pin wiring)	NO	E2EZ-X□D1-M1GJ	XS2F-D42□-□A0-F 1: Straight 2: L-shape D: 2-m cable G: 5-m cable	
DC 2-Wire Models (previous pin wiring)		E2EZ-X□D1-M1J	XS2F-D42□-□D0 1: Straight 2: L-shape D: 2-m cable G: 5-m cable	
DC 2-Wire Models (IEC pin wiring)		E2EZ-X□D1-M1TGJ	XS5F-D421-□80-F D: 2-m cable G: 5-m cable	
DC 2-Wire Models (previous pin wiring)		E2EZ-X□D1-M1TJ		

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

## 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.



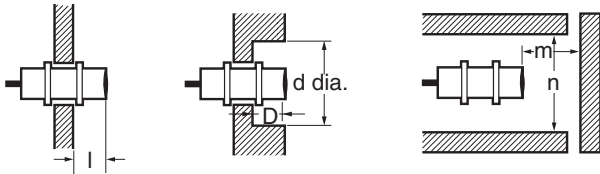
**Precautions for Correct Use**

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)**

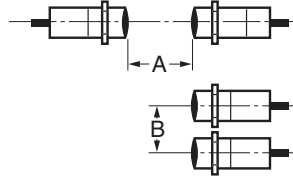
Model	Item Embedded material	l	d	D	m	n
E2EZ-X2□	Iron	0	12	0	8	18
	Aluminum	2	25	2		36
E2EZ-X4□	Iron	0	18	0	16	27
	Aluminum	5	40	5		54
E2EZ-X8□	Iron	0	30	0	32	45
	Aluminum	10	70	10		90

**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
E2EZ-X2□		30	20
E2EZ-X4□		40	50
E2EZ-X8□		60	100



**Aluminum and Iron Cuttings**

Normally aluminum or iron cuttings will not be detected even if they adhere to or accumulate on the sensing surface. Detection signals may be output for the following: If this occurs, remove the cuttings from the sensing surface.

1. Relationship between the Size of the Cutting (d) and the Size of the Sensing Surface (D)

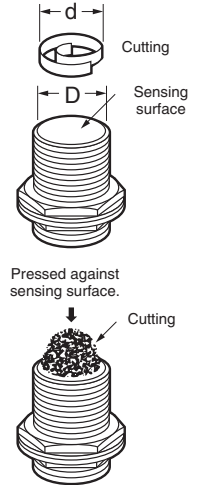
Cuttings of the size  $d \geq \frac{2}{3}D$  on the sensing surface \*

**Cuttings of the size d\* (Unit: mm)**

Model	Size	D
E2EZ-X2□		10 *
E2EZ-X4□		16
E2EZ-X8□		28

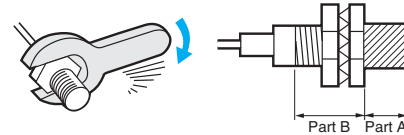
\* E2EZ-X2□:  $d \geq \frac{1}{3}D$  on the sensing surface.

2. Cuttings Pressed against the Sensing Surface



● **Mounting**

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



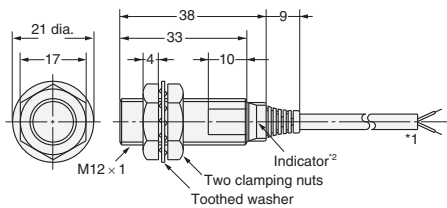
Note: 1. The allowable tightening strength depends on the distance from the edge of the head, as shown in the following table. (A is the distance from the edge of the head. B includes the nut on the head side. If the edge of the nut is in part A, the tightening torque for part A applies instead.)  
2.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

Model	Tightening Torque		
	Part A	Part B	
	Dimension (mm)	Torque	Torque
E2EZ-X2D□-□		30 N·m	
E2EZ-X4D□-□		70 N·m	
E2EZ-X8D□-□		180 N·m	
E2EZ-X4C1	20	15 N·m	29 N·m
E2EZ-X8C1	22	29 N·m	39 N·m

## Dimensions

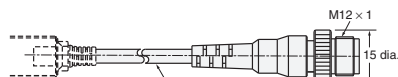
(Unit: mm)  
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

### E2EZ-X2D□-N



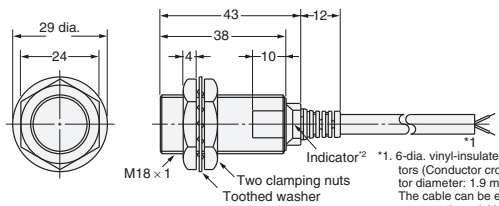
\*1. 4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm), Standard length: 2 m  
\*2. D1 Models: Operation indicator (red), Setting indicator (green), D2 Models: Operation indicator (red)

### Pre-wired Connector Models (-M1J/M1GJ)



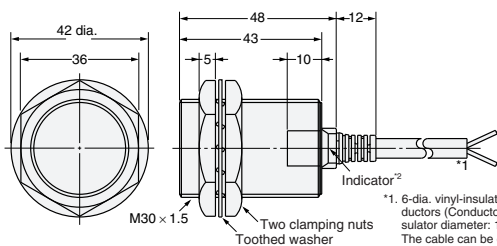
4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm), Standard length: 300 mm

### E2EZ-X4D□-N



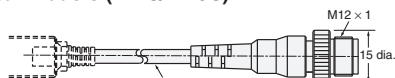
\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).  
\*2. D1 Models: Operation indicator (red), Setting indicator (green), D2 Models: Operation indicator (red)

### E2EZ-X8D□-N



\*1. 6-dia. vinyl-insulated round cable with 2 conductors (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. D1 Models: Operation indicator (red), Setting indicator (green), D2 Models: Operation indicator (red)

### Pre-wired Connector Models (-M1J/M1GJ)



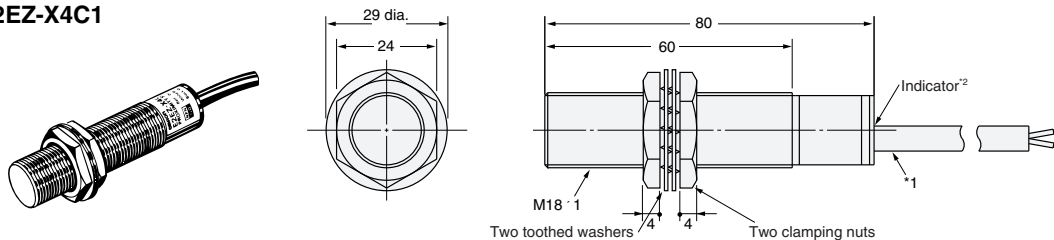
6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 300 mm

### Pre-wired Connector Models (-M1J/M1GJ)



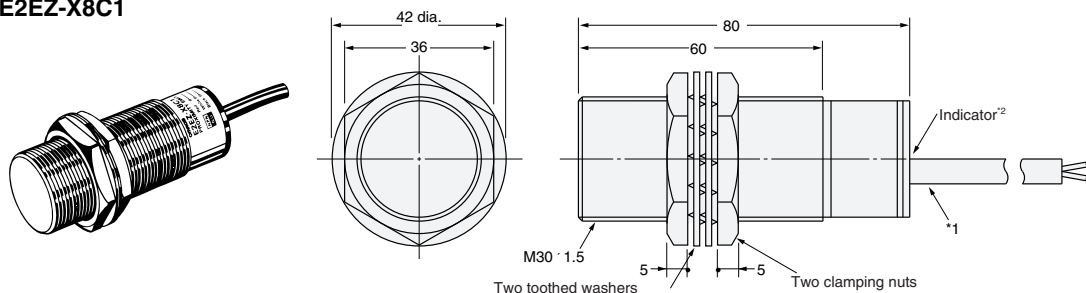
6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 300 mm

### E2EZ-X4C1



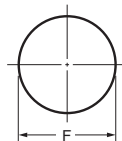
\*1. C Models: 6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
\*2. C Models: Detection indicator (red)

### E2EZ-X8C1



\*1. C Models: 6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
\*2. C Models: Detection indicator (red)

### Mounting Hole Dimensions



Model	F (mm)
E2EZ-X2□	12.5 dia. <sup>+0.5</sup> / <sub>-0</sub>
E2EZ-X4□	18.5 dia. <sup>+0.5</sup> / <sub>-0</sub>
E2EZ-X8□	30.5 dia. <sup>+0.5</sup> / <sub>-0</sub>

## 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.

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