




## 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
 Shielded	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 3-wire, PNP	E2EZ-X4B1 2M	—	
					DC 2-wire	E2EZ-X4D1-N 2M	E2EZ-X4D2-N 2M	
	M30	8 mm			DC 3-wire, NPN	E2EZ-X8C1 2M	—	
					DC 3-wire, PNP	E2EZ-X8B1 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
 Shielded	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	—	
					DC 3-wire, PNP	E2EZ-X4B1-M1J 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	—	
					DC 3-wire, PNP	E2EZ-X8B1-M1J 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	
 Straight	2 m	XS2F-D421-DC0-F	E2EZ-X□B1-M1J
	5 m	XS2F-D421-GC0-F	
 L-shape	2 m	XS2F-D422-DC0-F	
	5 m	XS2F-D422-GC0-F	
 Smartclick Connector Straight	2 m	XS5F-D421-D80-F	E2EZ-X□D1-M1TJ
	5 m	XS5F-D421-G80-F	E2EZ-X□D1-M1TGJ

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-X4B1 E2EZ-X4B1-M1J	E2EZ-X8C1 E2EZ-X8B1 E2EZ-X8B1-M1J
Sensing distance		2 mm ±10%	4 mm ±10%	8 mm ±10%	4 mm ±10%	8 mm ±10%
Set distance <sup>*1</sup>		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 <sup>*2</sup>		200 Hz	100 Hz	30 Hz	12 Hz	8 Hz
Power supply voltage (operating voltage range)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.			12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.	
Current consumption		---			15 mA max.	
Leakage current		0.8 mA max.			---	
Control output	Load current	3 to 100 mA max.			NPN open-collector output/PNP 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)			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)			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			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				
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				

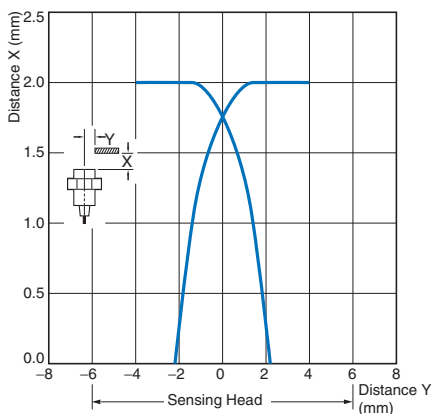
\*1. Use the Sensor within the range in which the green indicator is ON.

\*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.

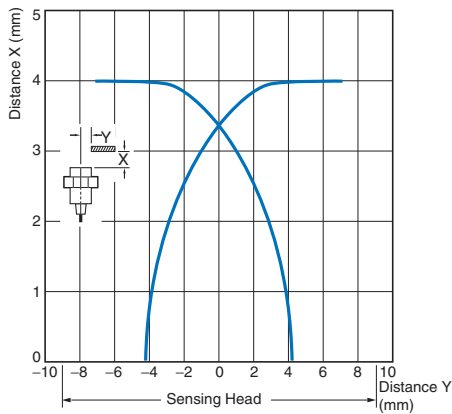
## Engineering Data (Reference Value)

### Sensing Area

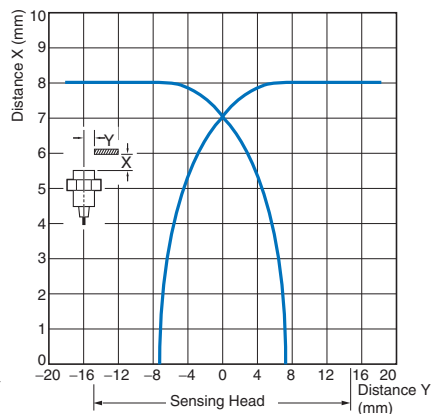
#### E2EZ-X2



#### E2EZ-X4

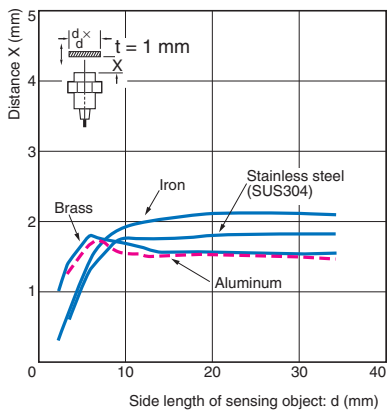


#### E2EZ-X8

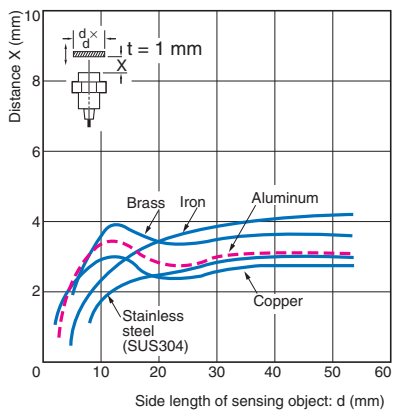


### Influence of Sensing Object Size and Material

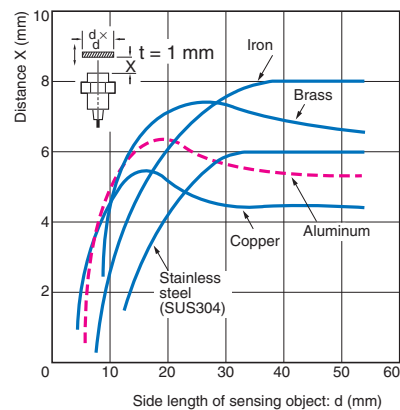
#### E2EZ-X2



#### E2EZ-X4

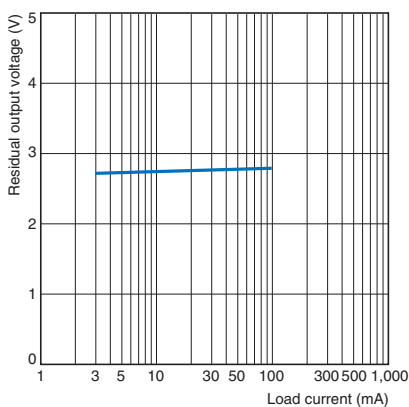


#### E2EZ-X8



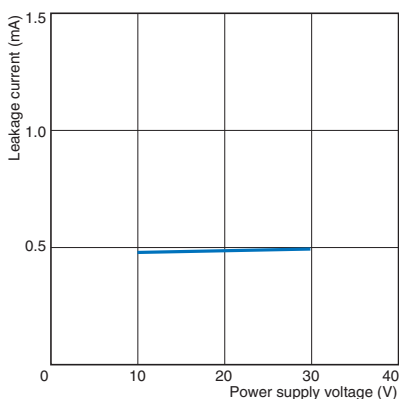
### Residual Output Voltage

#### E2EZ-X□D□-N



### Leakage Current

#### E2EZ-X□D□-N



I/O Circuit Diagrams

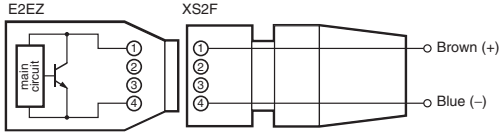
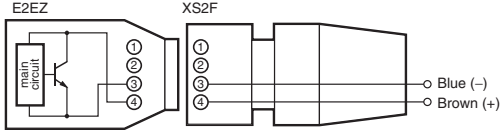
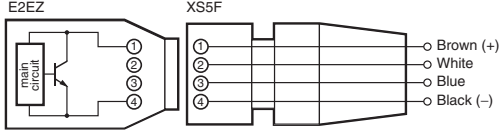
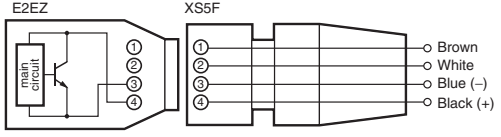
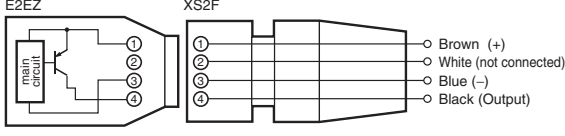
DC 2-Wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2EZ-X2D1-N E2EZ-X4D1-N E2EZ-X8D1-N	<p>Non-sensing area    Unstable sensing area    Stable sensing area</p> <p>Sensing object</p> <p>(%)    100    80(TYP)    0</p> <p>Rated sensing distance</p> <p>ON Setting indicator (green) OFF ON Operation indicator (red) OFF ON Control output OFF</p>	<p>Note: The load can be connected to either the +V or 0 V side.</p>
	E2EZ-X2D1-M1J E2EZ-X2D1-M1GJ E2EZ-X4D1-M1J E2EZ-X4D1-M1GJ E2EZ-X8D1-M1J E2EZ-X8D1-M1GJ		<p>(M1J) Connector Pin Arrangement Note: Pins 1 and 2 are not used.</p> <p>(M1GJ) Connector Pin Arrangement Note: Pins 2 and 3 are not used.</p> <p>Note: The load can be connected to either the +V or 0 V side.</p>
NC	E2EZ-X2D2-N E2EZ-X4D2-N E2EZ-X8D2-N	<p>Non-sensing area    Sensing area</p> <p>Sensing object</p> <p>(%)    100    0</p> <p>Rated sensing distance</p> <p>ON Operation indicator (Red) OFF ON Control output OFF</p>	<p>Note: The load can be connected to either the +V or 0 V side.</p>

DC 3-wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2EZ-X4C1 E2EZ-X8C1	<p>Sensing object    Present    Not present</p> <p>Load    Operate    Reset</p> <p>Detection indicator (red)    ON    OFF</p>	<p>* 100 mA max. at 12 V, 200 mA max. at 24 V (load current).</p>
	E2EZ-X4B1 E2EZ-X8B1		<p>Connector Pin Arrangement Note: Pin 2 is not used.</p>

## 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	XS5F-D421-□80-F D: 2-m cable G: 5-m cable	
DC 3-Wire Models		E2EZ-X□B1-M1J	XS2F-D42□□C0 1: Straight 2: L-shape D: 2-m cable G: 5-m cable	

Note: Different from Proximity Sensor wire colors.

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.



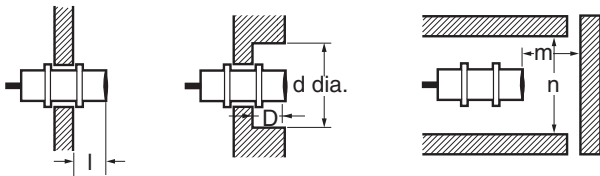
### Precautions for Correct Use

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)

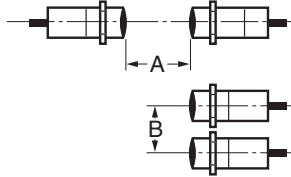
Model	Item Embedded material	l	d	D	m	n
E2EZ-X2□	Iron	0	12	0	8	18
	Aluminum	2	25	2		36
E2EZ-X4□	Iron	0	18	0	16	27
	Aluminum	5	40	5		54
E2EZ-X8□	Iron	0	30	0	32	45
	Aluminum	10	70	10		90

##### 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.

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

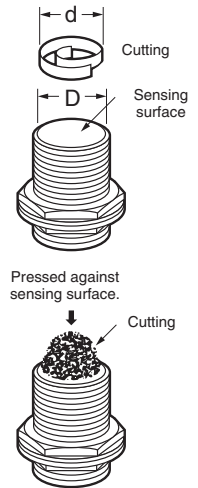
Cuttings of the size  $d \geq \frac{2}{3}D$  on the sensing surface \*

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.

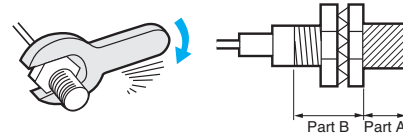
- Cuttings Pressed against the Sensing Surface



#### ● 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.)

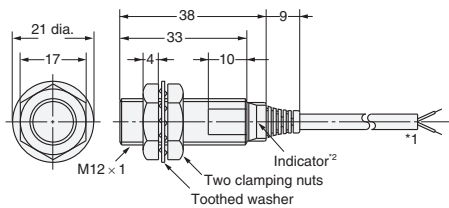
2. The following torque assume washers are being used.

Model	Tightening Torque	
	Part A	Part B
E2EZ-X2D□-□	Dimension (mm)	Torque
E2EZ-X4D□-□	20	15 N·m
E2EZ-X8D□-□	22	29 N·m
E2EZ-X4C1	20	15 N·m
E2EZ-X4B1	20	29 N·m
E2EZ-X8C1	22	29 N·m
E2EZ-X8B1	22	39 N·m

## Dimensions

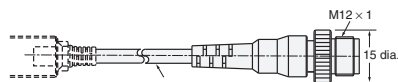
(Unit: mm)  
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

### E2EZ-X2D□-N



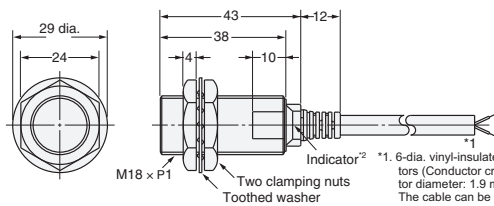
\*1. 4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm), Standard length: 2 m  
\*2. D1 Models: Operation indicator (red), Setting indicator (green), D2 Models: Operation indicator (red)

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



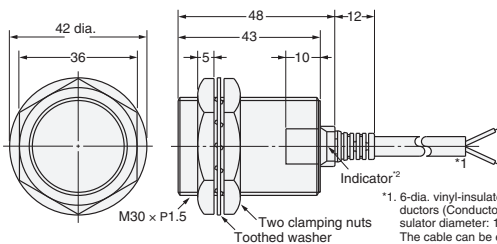
4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm), Standard length: 300 mm

### E2EZ-X4D□-N



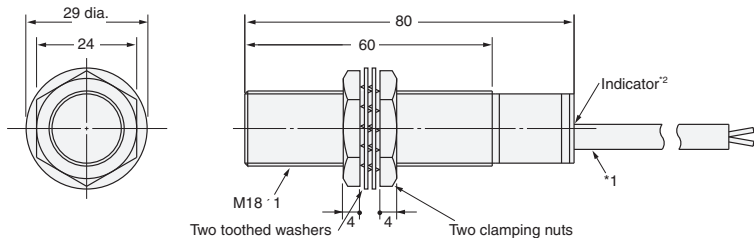
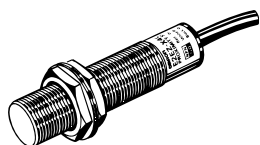
\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).  
\*2. D1 Models: Operation indicator (red), Setting indicator (green)  
D2 Models: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

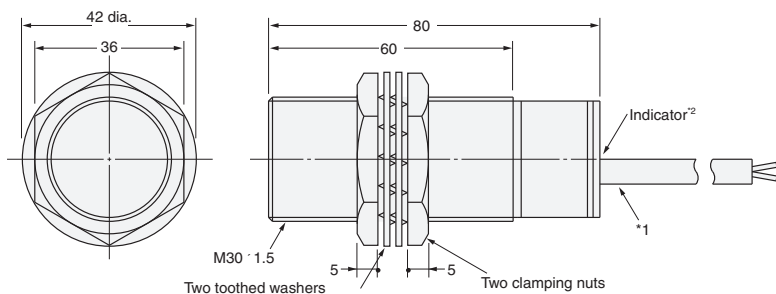
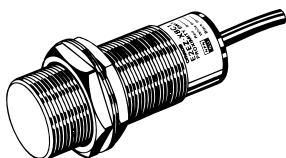
### E2EZ-X4C1 E2EZ-X4B1



\*1. 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. Detection indicator (red)

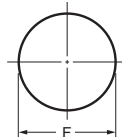
### E2EZ-X8C1 E2EZ-X8B1



\*1. 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

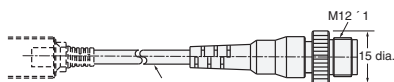
\*2. Detection indicator (red)

### 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>

### 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



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