


## All-metal Proximity Sensor

## E2EV

### Detects All Kinds of Metal at the Same Distance

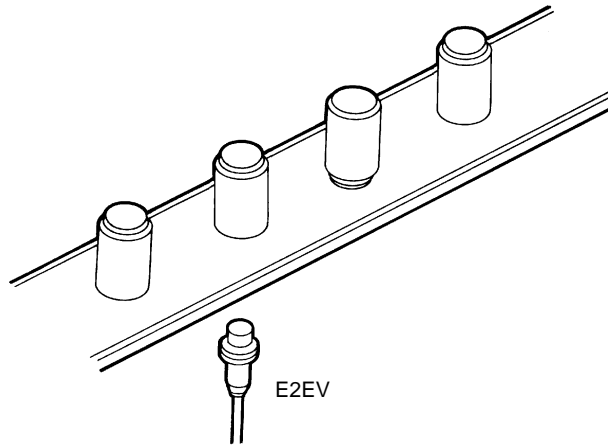
- Resistance to the effects from the material being detected enables use on lines carrying different types of workpieces.
- Sensing distance for non-magnetic metals better than other proximity switches.
- Models available from M12 to M30.
- Up to three times the previous sensing distance for aluminum.

### Ordering Information

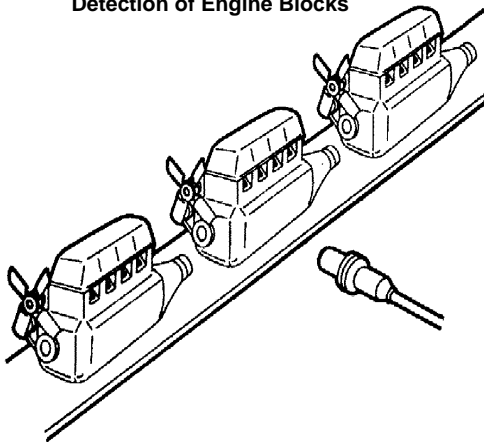
Shield	Size	Sensing distance	DC 3-wire models	
			Output	Model
Shielded 	M12	2 mm	NPN NO	E2EV-X2C1
			PNP NO	E2EV-X2B1
			NPN NC	E2EV-X2C2
			PNP NC	E2EV-X2B2
	M18	5 mm	NPN NO	E2EV-X5C1
			PNP NO	E2EV-X5B1
			NPN NC	E2EV-X5C2
			PNP NC	E2EV-X5B2
	M30	10 mm	NPN NO	E2EV-X10C1
			PNP NO	E2EV-X10B1
			NPN NC	E2EV-X10C2
			PNP NC	E2EV-X10B2

# Application Examples

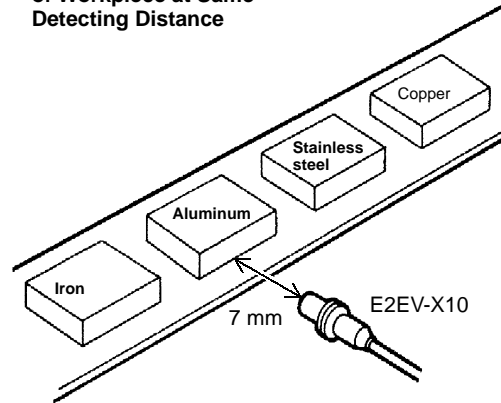
Discriminating the Top and Bottom of Aluminum Cans



Detection of Engine Blocks



Detecting Various Types of Workpiece at Same Detecting Distance



# Specifications

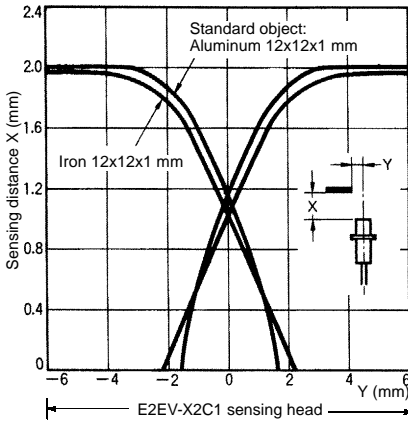
## ■ Ratings/Characteristics

Item	E2EV-X2j j	E2EV-X5j j	E2EV-X10j j
<b>Sensing distance</b>	2.0 mm ± 10%	5.0 mm ± 10%	10.0 mm ± 10%
<b>Rated supply voltage (Operating voltage range)</b>	12 to 24 VDC, ripple (p-p):10% max. (10 to 30 VDC)		
<b>Current consumption</b>	15 mA max.		
<b>Sensing object</b>	Magnetic and non-magnetic metals		
<b>Sensing distance (standard object)</b>	0 to 1.4 mm (aluminum 12 x 12 x 1 mm)	0 to 3.5 mm (aluminum 18 x 18 x 1 mm)	0 to 7 mm (aluminum 30 x 30 x 1 mm)
<b>Differential travel</b>	10% of sensing distance max.		
<b>Response frequency</b>	150 Hz	70 Hz	70 Hz
<b>Operating status (with sensing object approaching)</b>	C1/B1 models: Load ON C2/B2 models: Load OFF		
<b>Control output</b>	NPN-NO open collector, NPN-NC open collector, PNP-NO open collector or PNP-NC open collector (switching capacity: 100 mA max.) (at 30 VDC)		
<b>Circuit protection</b>	Protection for load short-circuit, surge voltage, reverse polarity		
<b>Indicator</b>	Operation indicator (red LED)		
<b>Ambient temperature</b>	Operating: -10°C to 55°C (with no icing)		
<b>Ambient humidity</b>	Operating: 35% to 95%		
<b>Temperature influence</b>	±20% of sensing distance at 23°C in the temperature range of -10°C to 55°C		
<b>Voltage influence</b>	±2.5% of sensing distance within a range of ±15% of the rated power supply voltage		
<b>Residual voltage</b>	2.0 V max. (100 mA load current with 2-m cord)		
<b>Insulation resistance</b>	50 MΩ min. (at 500 VDC) between current carry parts and case		
<b>Dielectric strength</b>	1000 VAC, 50/60 Hz for 1 minute between current carry parts and case		
<b>Vibration resistance</b>	Malfunction: 10 to 55 Hz. 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions		
<b>Shock resistance</b>	Malfunction: 1000 m/s <sup>2</sup> (approx.100G) 10 times each in X, Y, and Z directions		
<b>Enclosure rating</b>	IEC IP67		
<b>Weight (with 2-m cord)</b>	Approx.120 g	Approx.140 g	Approx.190 g
<b>Material</b>	<b>Case</b>	Brass	
	<b>Sensing surface</b>	Heat-resistant ABS	

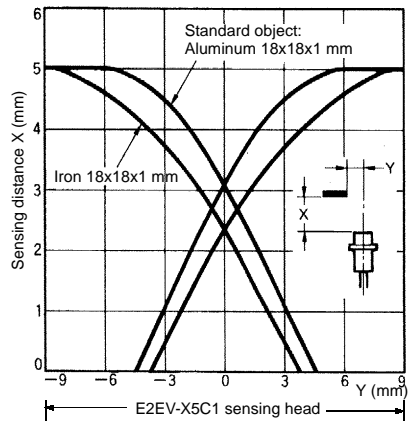
# Engineering Data

## ■ Operating Range

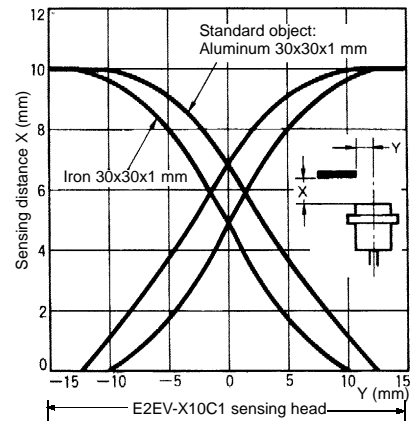
E2EV-X2



E2EV-X5

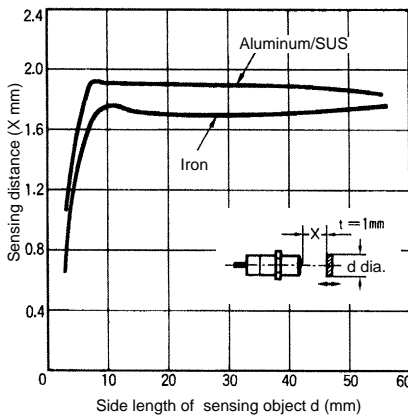


E2EV-X10

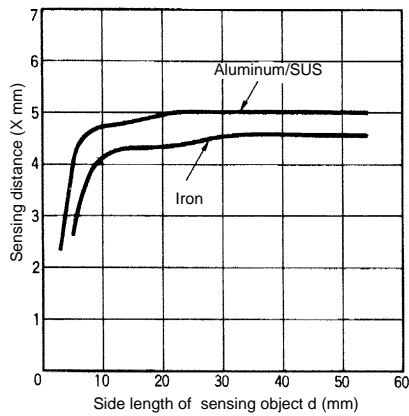


## ■ Sensing Distance vs. Size of Sensing Object

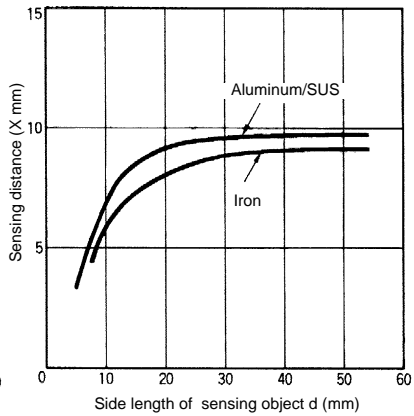
E2EV-X2



E2EV-X5

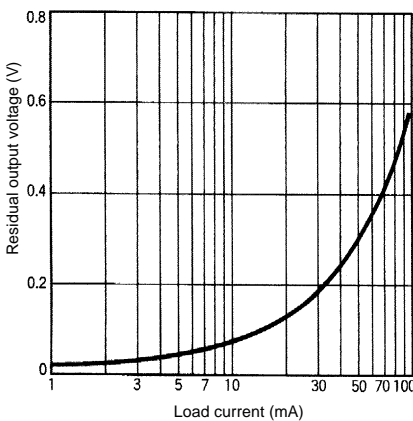


E2EV-X10



## ■ Residual Output Characteristics (Typical)

E2EV-X

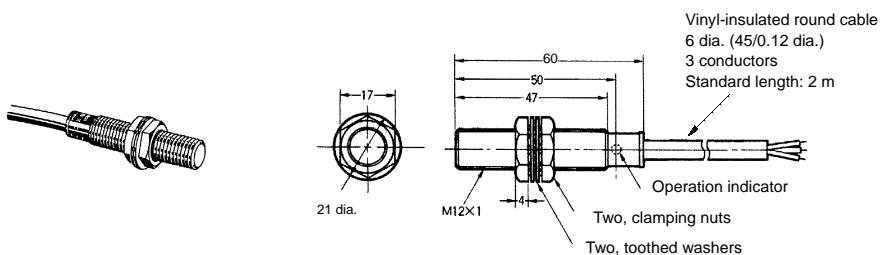


**Note:** All units are in millimeters unless otherwise indicated.

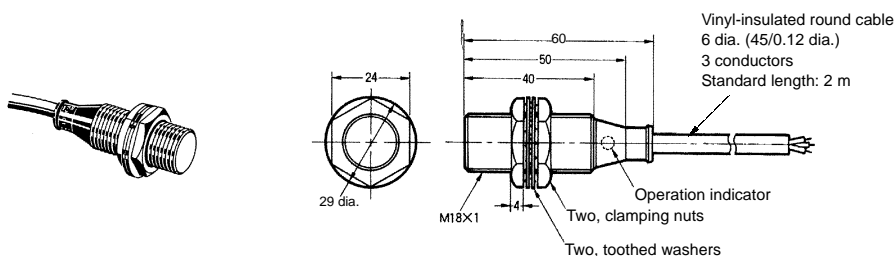
# Dimensions

Note: All units are in millimeters unless otherwise indicated.

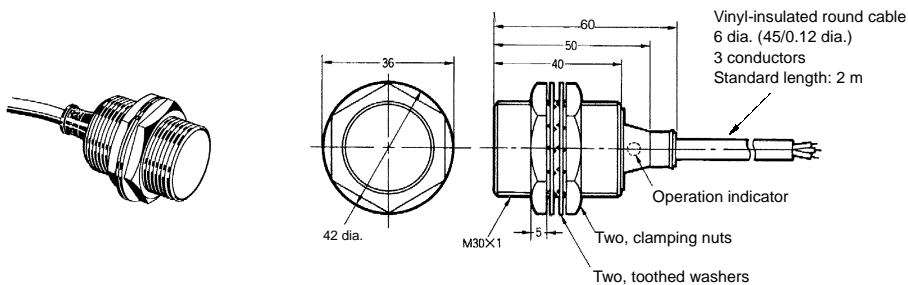
## E2EV-X2j j



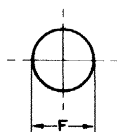
## E2EV-X5j j



## E2EV-X10j j



## Mounting Hole Dimensions

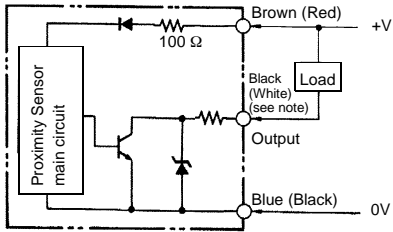


Model	F (mm)
E2EV-X2j	12.5 <sup>+0.5</sup> <sub>-0</sub> dia.
E2EV-X5j	18.5 <sup>+0.5</sup> <sub>-0</sub> dia.
E2EV-X10j	30.5 <sup>+0.5</sup> <sub>-0</sub> dia.

# Operation

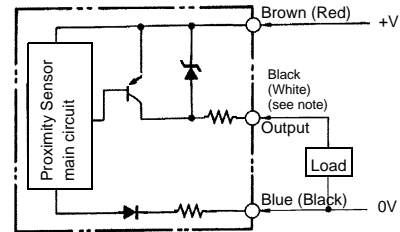
## ■ Output Circuit

### E2EV-Xj Cj (NPN Type)



Note: Load current: 100 mA max.

### E2EV-Xj Bj (PNP Type)

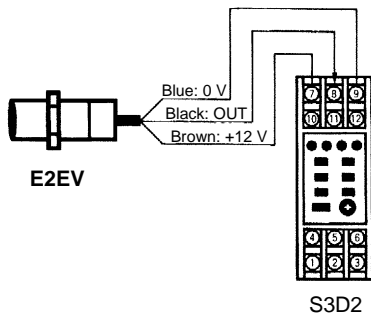


Note: Load current: 100 mA max.

	Yes	NO	ON	NC
Sensing object	No		OFF	
Output transistor (load)	ON		ON	
	OFF		OFF	
Operation indicator (LED)	ON		ON	
	OFF		OFF	

## ■ Wiring

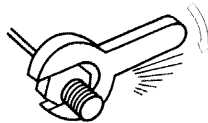
Operation can be reversed using the OMRON S3D2's signal input switch.



# Precautions

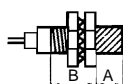
## Installation

Do not tighten the nuts with excessive force. Be sure to use toothed washers when tightening.



- Note:**
1. Allowable tightening strength is different depending on the distance from the top of head, as shown in the following table. (A is the distance from the top of the head. B includes the nut on the head side.)
  2. The following strengths assume washers are being used.

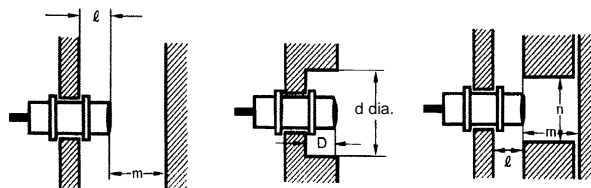
Shield type



Model	A		B
	Size (mm)	Strength (torque)	Strength (torque)
E2EV-X2j	17	60 kgf S cm (5.9 N S m)	100 kgf S cm (9.8 N S m)
E2EV-X5j	22	150 kgf S cm (15 N S m)	500 kgf S cm (49 N S m)
E2EV-X10j	26	400 kgf S cm (39 N S m)	800 kgf S cm (78 N S m)

## Influence of Surrounding Metals

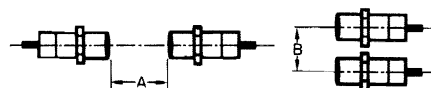
When mounting onto metallic panels, be sure to provide the minimum clearances shown below.



Model	E2EV-X2j	E2EV-X5j	E2EV-X10j
ℓ	0	0	0
d	12	18	30
D	0	0	0
m	8	20	40
n	18	27	45

## Mutual Interference

When arranging Sensors opposite or parallel to each other, be sure to provide the minimum separations shown below.



Model	E2EV-X2j	E2EV-X5j	E2EV-X10j
A	30	50	100
B	20	35	70

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. D033-E1-2 **In the interest of product improvement, specifications are subject to change without notice.**

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