E2EV

Long-distance Detection of Aluminum, Brass, and other Non-ferrous Metals

- Same sensing distance as iron.
- Maximum sensing distance: 10 mm.

Be sure to read *Safety Precautions* on page 792.

Ordering Information

Sensors

Appearance		Sensing distance	Output configuration	Model	
				Operation mode	
				NO	NC
Shielded	M12	2 mm	DC 3-Wire NPN	E2EV-X2C1	E2EV-X2C2
	M18	5 mm		E2EV-X5C1	E2EV-X5C2
	M30	10 mm		E2EV-X10C1	E2EV-X10C2

Accessories (Order Separately)

Mounting Brackets

Protective Covers

Sputter Protective Covers

Refer to page 976 for details.

Ratings and Specifications

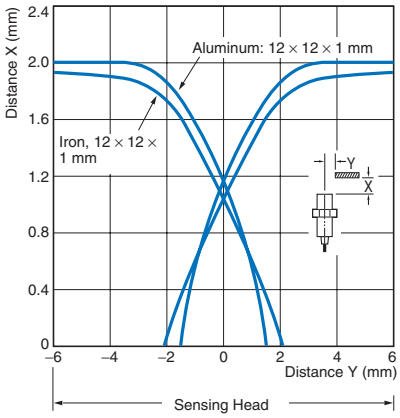
Item \ Model		E2EV-X2C1 E2EV-X2C2	E2EV-X5C1 E2EV-X5C2	E2EV-X10C1 E2EV-X10C2
Sensing distance		2mm ±10%	5 mm ±10%	10 mm ±10%
Set distance		0 to 1.4 mm	0 to 3.5 mm	0 to 7 mm
Differential travel		10% max. of sensing distance		
Sensing object		Ferrous metal and non-ferrous metal		
Standard sensing object		Aluminum: 12 × 12 × 1 mm	Aluminum: 18 × 18 × 1 mm	Aluminum: 30 × 30 × 1 mm
Response frequency *		150 Hz	70 Hz	
Power supply voltage (operating voltage range)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.		
Current consumption		15 mA max.		
Control output	Load current	NPN open-collector output, 100 mA max. (at 30 VDC)		
	Residual voltage	2 V max. (Load current: 100 mA, Cable length: 2 m)		
Indicators		Detection indicator (red)		
Operation mode (with sensing object approaching)		C1 Models: NO C2 Models: NC Refer to the timing charts under *I/O Circuit Diagrams* on page 791 for details.		
Protection circuits		Load short-circuit protection, Surge suppressor, Reverse polarity protection		
Ambient temperature		Operating/Storage: −10 to 55°C (with no icing or condensation)		
Ambient humidity		Operating/Storage: 35% to 95% (with no condensation)		
Temperature influence		±20% max. of sensing distance at 23°C in the temperature range of −10 to 55°C		
Voltage influence		±2.5% max. of sensing distance at rated voltage in the rated voltage ±15% 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/s² 10 times each in X, Y, and Z directions		
Degree of protection		IEC 60529 IP67		
Connection method		Pre-wired Models (Standard cable length: 2 m)		
Weight (packed state)		Approx. 120 g	Approx. 140 g	Approx. 190 g
Materials	Case	Nickel-plated brass		
	Sensing surface	Heat-resistant ABS		
	Clamping nuts	Nickel-plated brass		
	Toothed washer	Zinc-plated iron		
Accessories		Instruction manual		

* 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 for the DC switching section of half the sensing distance.

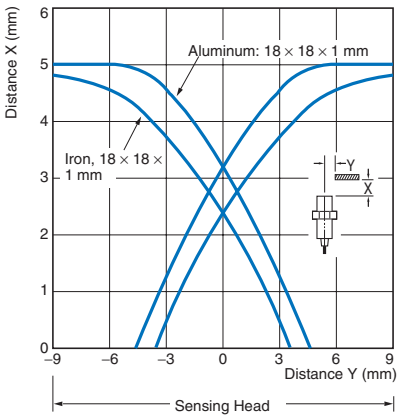
Engineering Data (Typical)

Sensing Area (Note: Other non-ferrous metal, such as stainless steel, copper, and brass, have the same characteristics.)

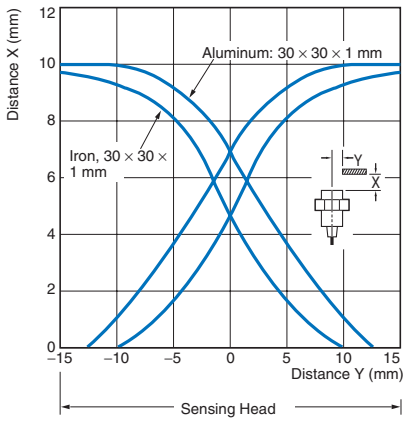
E2EV-X2C□



E2EV-X5C□

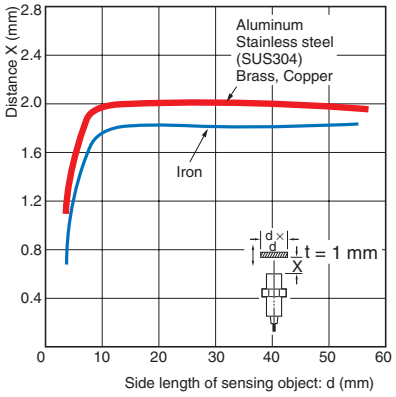


E2EV-X10C□

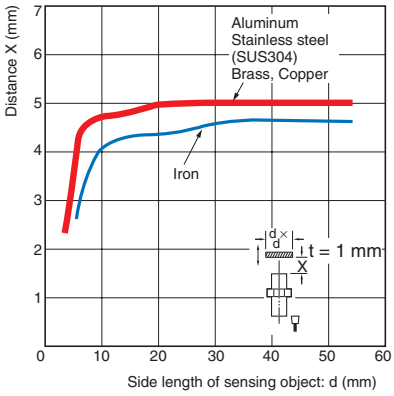


Influence of Sensing Object Size and Material

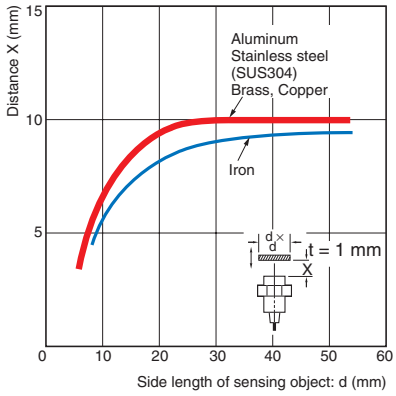
E2EV-X2C□



E2EV-X5C□

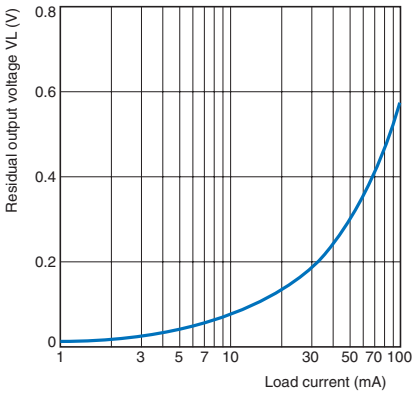


E2EV-X10C□



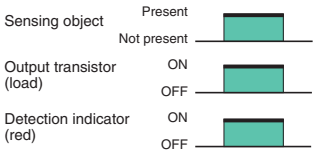
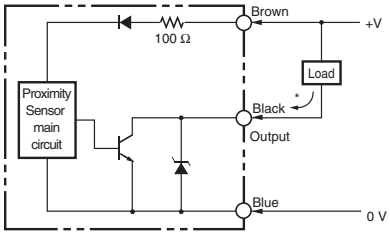
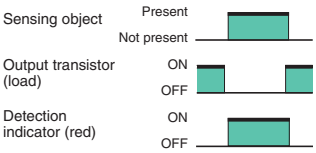
Residual Output Voltage

E2EV



I/O Circuit Diagrams

DC 3-Wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2EV-X2C1 E2EV-X5C1 E2EV-X10C1		
NC	E2EV-X2C2 E2EV-X5C2 E2EV-X10C2		

*Load current: 100 mA max.

Safety Precautions

Refer to *Warranty and Limitations of Liability* on page F-2.

⚠ WARNING

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

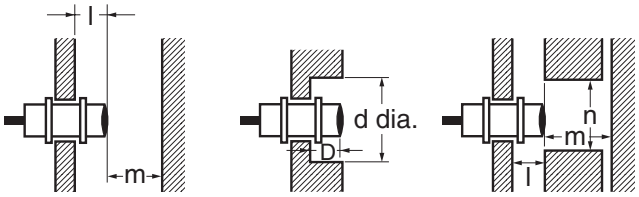
Precautions for Correct Use

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)

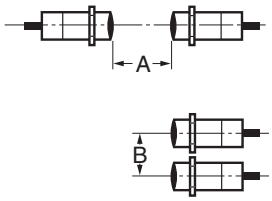
Model / Item	l	d	D	m	n
E2EV-X2C□	0	12	0	8	18
E2EV-X5C□		18		20	27
E2EV-X10C□		30		40	45

Mutual Interference

When installing Sensors face-to-face or side-by-side, ensure that the minimum distances given in the following table are maintained.

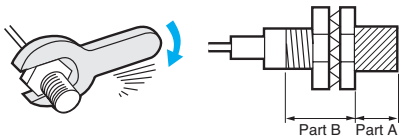
Mutual Interference (Unit: mm)

Model / Item	A	B
E2EV-X2C□	30	20
E2EV-X5C□	50	35
E2EV-X10C□	100	70



● Mounting

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



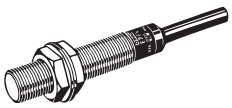
Note: 1. The allowable tightening strength depends on the distance from the edge of the head, as shown in the following table. (A is the distance from the edge of the head. B includes the nut on the head side. If the edge of the nut is in part A, the tightening torque for part A applies instead.)
2.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

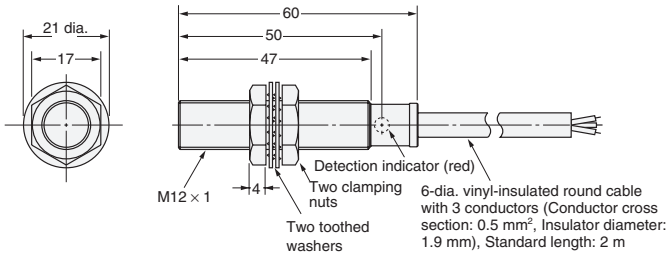
Tightening Torque / Model	Part A		Part B
	Dimension (mm)	Torque	Torque
E2EV-X2C□	17	5.9 N·m	9.8 N·m
E2EV-X5C□	22	15 N·m	49 N·m
E2EV-X10C□	26	39 N·m	78 N·m

Dimensions

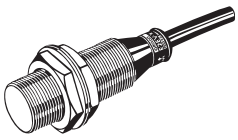
(Unit: mm)

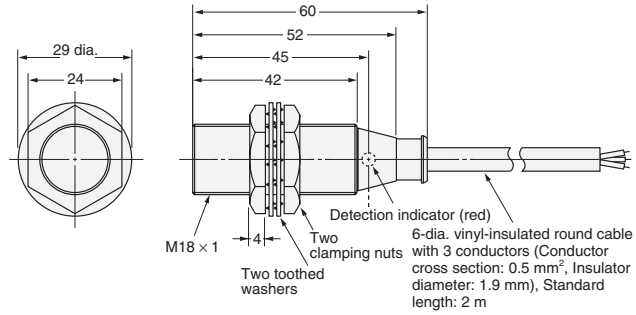
E2EV-X2C□



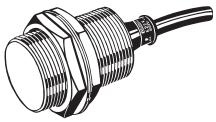


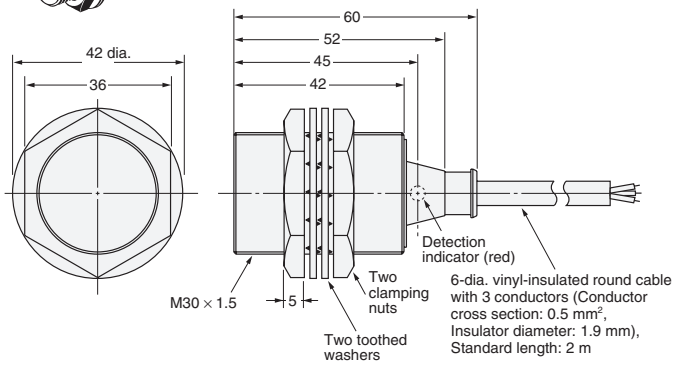
E2EV-X5C□



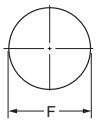


E2EV-X10C□





Mounting Hole Dimensions



Model	F (mm)
E2EV-X2C□	12.5 $^{+0.5}_{0}$ dia.
E2EV-X5C□	18.5 $^{+0.5}_{0}$ dia.
E2EV-X10C□	30.5 $^{+0.5}_{0}$ dia.