# **E2E2**

CSM\_E2E2\_DS\_E\_4\_2

# **Proximity Sensor with a Long Screw Length**

- Increased tightening strength. Cable protectors provided as a standard feature.
- Increased indicator visibility. A milled section for wrench grip on all models.





Be sure to read Safety Precautions on page 9.

## **Ordering Information**

#### **Sensors**

## **DC 2-Wire Models**

			Model			
Appearance	ce	Sensing distance	Operation	on mode		
			NO	NC		
Shielded	M12	3 mm	E2E2-X3D1 2M *	E2E2-X3D2 2M		
	M18	7 mm	E2E2-X7D1 2M *	E2E2-X7D2 2M		
	M30	10 mm	E2E2-X10D1 2M *	E2E2-X10D2 2M		
Unshielded	M12	8 mm	E2E2-X8MD1 2M *	E2E2-X8MD2 2M		
onsilielded —	M18	14 mm	E2E2-X14MD1 2M *	E2E2-X14MD2 2M		
	M30	20 mm	E2E2-X20MD1 2M *	E2E2-X20MD2 2M		

 $<sup>^{\</sup>star} \text{Models with different frequencies are also available. The model numbers are E2E2-X$\square$D15 (example: E2E2-X3D15).}$ 

#### **DC 3-Wire Models**

			Model		
Appearance	ce	Sensing distance	Operation mode		
			NO	NC	
Shielded	M12	2 mm	E2E2-X2C1 2M	E2E2-X2C2 2M	
	M18	5 mm	E2E2-X5C1 2M	E2E2-X5C2 2M	
	M30	10 mm	E2E2-X10C1 2M	E2E2-X10C2 2M	
Unshielded	M12	5 mm	E2E2-X5MC1 2M	E2E2-X5MC2 2M	
	M18	10 mm	E2E2-X10MC1 2M	E2E2-X10MC2 2M	
	M30	18 mm	E2E2-X18MC1 2M	E2E2-X18MC2 2M	

#### **AC 2-Wire Models**

Appearance		Sensing distance	Model Operation mode		
			NO	NC	
Shielded	M12	2 mm	E2E2-X2Y1 2M	E2E2-X2Y2 2M	
	M18	5 mm	E2E2-X5Y1 2M	E2E2-X5Y2 2M	
	M30	10 mm	E2E2-X10Y1 2M	E2E2-X10Y2 2M	
Unshielded	M12	5 mm	E2E2-X5MY1 2M	E2E2-X5MY2 2M	
	M18	10 mm	E2E2-X10MY1 2M	E2E2-X10MY2 2M	
	M30	18 mm	E2E2-X18MY1 2M	E2E2-X18MY2 2M	

## **Accessories (Order Separately)**

**Mounting Brackets Protective Covers Sputter Protective Covers** 

## **Ratings and Specifications**

## E2E2-X□D□ DC 2-Wire Models

Size M12 M18		М	30				
	Shielding	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
Item	Model	E2E2-X3D□	E2E2-X8MD□	E2E2-X7D□	E2E2-X14MD□	E2E2-X10D□	E2E2-X20MD□
Sensing of	listance	3 mm±10%	8 mm±10%	7 mm±10%	14 mm±10%	10 mm±10%	20 mm±10%
Set distar	nce *1	0 to 2.4 mm	0 to 6.4 mm	0 to 5.6 mm	0 to 11.2 mm	0 to 8 mm	0 to 16 mm
Differenti	al travel	10% max. of sen	sing distance				
Sensing of	bject	Ferrous metal (T page 5.)	he sensing distan	ce decreases with	n non-ferrous met	al. Refer to <i>Engin</i>	eering Data on
Standard	sensing object	Iron, $12 \times 12 \times 1 \text{ mm}$	Iron, $30 \times 30 \times 1 \text{ mm}$	Iron, $18 \times 18 \times 1 \text{ mm}$	Iron, $30 \times 30 \times 1 \text{ mm}$	Iron, $30 \times 30 \times 1 \text{ mm}$	Iron, 54 × 54 × 1 mm
Response	e frequency *2	1 kHz	800 Hz	500 Hz	400 Hz		100 Hz
	pply voltage g voltage range)	12 to 24 VDC (10	to 30 VDC), ripp	le (p-p): 10% max	ζ.		
Leakage	current	0.8 mA max.					
Control output	Switching capacity	3 to 100 mA					
output	Residual voltage	3 V max. (Load o	current: 100 mA, 0	Cable length: 2 m)			
Indicators	3		ration indicator (re ration indicator (re		licator (green)		
Operation (with sen- proaching	sing object ap-	D1 Models: NO D2 Models: NC	Refer to the timin	g charts under I/C	) Circuit Diagrams	on page 8 for det	ails.
Protectio	n circuits	Surge absorber,	Load short-circuit	protection			
Ambient 1	emperature	Operating/Storag	ge: –25 to 70°C (w	vith no icing or cor	ndensation)		
Ambient	numidity	Operating/Storag	ge: 35% to 95% (v	vith no condensat	ion)		
Temperat	ure influence	±10% max. of se	nsing distance at	23°C in the temper	erature range of –	25 to 70°C	
Voltage in	nfluence	±1% max. of sen	sing distance at r	ated voltage in the	e rated voltage ±1	5% range	
Insulation	resistance	50 M $\Omega$ min. (at 5	00 VDC) betweer	current-carrying	parts and case		
Dielectric	strength	1000 VAC, 50/60	Hz for 1 minute l	oetween current-c	arrying parts and	case	
Vibration (destruct	resistance on)	10 to 55 Hz, 1.5-	mm double ampli	tude for 2 hours e	ach in X, Y, and Z	directions	
Shock res (destructi		1,000 m/s <sup>2</sup> 10 tin	nes each in X, Y,	and Z directions			
Degree of	protection	IEC IP67, in-house standard for oil resistance					
Connection	on method	Pre-wired Models (Standard cable length: 2 m)					
Weight (p	acked state)	Approx. 65 g Approx. 150 g Approx. 210 g					
	Case	Brass					
Materi-	Sensing surface	РВТ					
als	Clamping nuts	Nickel-plated bra	ISS				
	Toothed washer	Zinc-plated iron					
Accessor	ies	Instruction sheet					

<sup>\*1.</sup> Use the E2E2 within the range in which the setting indicator (green LED) is ON (except D2 Models).
\*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.

## **E2E2-X**□**C**□ **DC** 3-Wire Models

	Size	M <sup>.</sup>	12	M18		M30	
	Shielding	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
Item	Model	E2E2-X2C□	E2E2-X5MC□	E2E2-X5C□	E2E2-X10MC□	E2E2-X10C□	E2E2-X18MC□
Sensing of	listance	2 mm±10%	5 mm±10%	5 mm±10%	10 mm±10%	10 mm±10%	18 mm±10%
Set distar	ice	0 to 1.6 mm	0 to 4 mm	0 to 4 mm	0 to 8 mm	0 to 8 mm	0 to 14 mm
Differentia	al travel	10% max. of sen	sing distance	I.	I	I	
Sensing of	bject	Ferrous metal (T page 5.)	he sensing distar	ce decreases with	n non-ferrous met	al. Refer to <i>Engin</i>	eering Data on
Standard	sensing object	Iron, 12 × 12 × 1 mm	Iron, 15 × 15 × 1 mm	Iron, 18 × 18 × 1 mm	Iron, $30 \times 30 \times 1 \text{ mm}$	Iron, $30 \times 30 \times 1 \text{ mm}$	Iron, 54 × 54 × 1 mm
Response	frequency *1	1.5 kHz	400 Hz	600 Hz	200 Hz	400 Hz	100 Hz
	pply voltage (op- oltage range) *2	12 to 24 VDC (10	to 30 VDC), ripp	ele (p-p): 10% max	<b>(</b> .		
Leakage o	current	13 mA max.					
Control	Load current	NPN open-collec	tor output, 200 m	A max. (30 VDC r	max.)		
output	Residual voltage	2 V max. (Load o	current: 200 mA, 0	Cable length: 2 m)			
Indicators		Operation indicator (red)					
Operation (with sens	sing object ap-	C1 Models: NO C2 Models: NC Refer to the timing charts under I/O Circuit Diagrams on page 8 for details.				ails.	
Protection	n circuits	Reverse polarity	protection, Surge	absorber, Load s	hort-circuit protec	tion	
Ambient t	emperature	Operating/Storag	je: –40 to 85°C (v	vith no icing or co	ndensation)		-
Ambient h	numidity	Operating/Storag	je: 35% to 95% (v	vith no condensat	ion)		
Temperat	ure influence		•	•	erature range of – erature range of –		
Voltage in	nfluence	±1% max. of sen	sing distance at r	ated voltage in the	e rated voltage ±1	5% range	
Insulation	resistance	50 M $\Omega$ min. (at 5	00 VDC) betweer	n current-carrying	parts and case		
Dielectric	strength	1,000 VAC, 50/6	0 Hz for 1 minute	between current	carry parts and ca	ise	
Vibration (destructi	resistance on)	10 to 55 Hz, 1.5-	mm double ampli	tude for 2 hours e	ach in X, Y, and Z	directions	
Shock res (destructi		1,000 m/s <sup>2</sup> 10 tin	nes each in X, Y,	and Z directions			
Degree of	protection	IEC IP67, in-house standard for oil resistance					
Connection method Pre-wired Models (Standard cable length: 2 m) and Connector Models							
Weight (packed state)Approx. 75 gApprox. 160 gApprox. 220 g							
Case Brass							
Materi- Sensing surface PBT							
als	Clamping nuts	Nickel-plated bra	SS				
	Toothed washer	Zinc-plated iron	Zinc-plated iron				
Accessor	ies	Instruction sheet					

<sup>\*1.</sup> 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.

\*2. A full-wave rectification power supply of 24 VDC ±20% (average value) can be used.

## **E2E2-X**□**Y**□ **AC 2-Wire Models**

Shielding   Model   EZE2-X2YC    EZE2-X5YC    EZE2-X5YC    EZE2-X10MV		Size	M.	12	M18		M30	
Sensing distance		Shielding	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
Set distance 0 to 1.6 mm 0 to 4 mm 0 to 4 mm 0 to 8 mm 0 to 8 mm 0 to 18 mm 0 to 14 mm 0 to 14 mm 0 to 4 mm 0 to 8 mm 0 to 18 mm 0 to 14 mm 0 to 14 mm 0 to 18 mm 0 to 18 mm 0 to 14 mm 0 to 18 mm 0 to 18 mm 0 to 14 mm 0 to 18 mm 0 to 18 mm 0 to 18 mm 0 to 14 mm 0 to 18 mm 0 to 18 mm 0 to 18 mm 0 to 14 mm 0 to 18 mm 0 to 18 mm 0 to 14 mm 0 to 18 mm 0 t	Item Model		E2E2-X2Y□	E2E2-X5MY□	E2E2-X5Y□	E2E2-X10MY□	E2E2-X10Y□	E2E2-X18MY□
Differential travel   10% max. of sensing distance	Sensing of	distance	2 mm±10%	5 mm±10%	5 mm±10%	10 mm±10%	10 mm±10%	18 mm±10%
Sensing object  Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to Engineering Data on page 5.)  Standard sensing object  Iron, 12 × 12 × 1 mm 15 × 15 × 1 mm 18 × 18 × 1 mm 30 × 30 × 1 mm 30 × 30 × 1 mm 54 × 54 × 1 mm  Response frequency  25 Hz  Power supply voltage (operating voltage range) 11  Leakage current  1.7 mA max.  24 to 240 VAC (20 to 264 VAC), 50/60 Hz  Residual voltage  Refer to Engineering Data on page 5.  Operation mode (with sensing object approaching)  Ambient temperature *1, 2  Ambient temperature *1, 2  Ambient humidity  Operating/Storage: -40 to 85°C (with no icing or condensation)  Temperature 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  Voltage influence  ±15% max. of sensing distance at 23°C in the temperature range of -25 to 70°C  Voltage influence  ±15% max. of sensing distance at 26°C in the temperature range of -25 to 70°C  Voltage influence  ±10% max. of sensing distance at 26°C in the temperature range of -25 to 70°C  Voltage influence  ±10% max. of sensing distance at 26°C in the temperature range of -25 to 70°C  Voltage influence  ±10% max. of sensing distance at 26°C in the temperature range of -25 to 70°C  Voltage influence  ±10% max. of sensing distance at 26°C in the temperature range of -25 to 70°C  Voltage influence  ±10% max. of sensing distance at 26°C in the temperature range of -25 to 70°C  Voltage influence  ±10% max. of sensing distance at 26°C in the temperature range of -25 to 70°C  Voltage influence  ±10% max. of sensing distance at 26°C in the temperature range of -25 to 70°C  Voltage influence  ±10% max. of sensing distance at 26°C in the temperature range of -25 to 70°C  Voltage influence  ±10% max. of sensing distance at 26°C in the temperature range of -25 to 70°C  Voltage influence  ±10% max. of sensing distance at 26°C in the temperature range of -25 to 70°C  Voltage influence  ±10% max. of sensing diance at 2	Set distar	nce	0 to 1.6 mm	0 to 4 mm	0 to 4 mm	0 to 8 mm	0 to 8 mm	0 to 14 mm
Standard sensing object    Iron,   12 × 12 × 1 mm   Iron,   18 × 18 × 1 mm   30 × 30 × 1 mm   54 × 54 × 1 mm   54 × 54 × 1 mm   18 × 18 × 1 mm   30 × 30 × 1 mm   54 × 54 × 1 mm	Differentia	al travel	10% max. of sen	sing distance	1	1		1
Response frequency Power supply voltage (operating voltage range) 11  Leakage current  1.7 mA max.  Control Output Residual voltage Refer to Engineering Data on page 5.  Indicators  Operation mode (with sensing object approaching) Ambient humidity  Operating/Storage: -40 to 85°C (with no icing or condensation)  Temperature influence  115% 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  Voltage influence  116 max. of sensing distance at 23°C in the temperature range of -25 to 70°C  Voltage influence  117 max. of sensing distance at 23°C in the temperature range of -25 to 70°C  Voltage influence  118 max. of sensing distance at 23°C in the temperature range of -25 to 70°C  Voltage influence  119 max. of sensing distance at 23°C in the temperature range of -25 to 70°C  Voltage influence  110 max. of sensing distance at 23°C in the temperature range of -25 to 70°C  Voltage influence  110 max. of sensing distance at rated voltage in the rated voltage ±15% range  Insulation resistance  (destruction)  10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions  Connection method  Pre-wired Models (Standard cable length: 2 m) and Connector Models  Weight (packed state)  Approx. 65 g	Sensing of	object	,	he sensing distan	ce decreases with	n non-ferrous met	al. Refer to <i>Engin</i>	<i>eering Data</i> on
Power supply voltage (operating voltage range) 1   24 to 240 VAC (20 to 264 VAC), 50/60 Hz	Standard	sensing object	, , , , , , , , , , , , , , , , , , ,	- ,	- ,	,	*	,
erating voltage range) *1       24 to 240 VAC (20 to 264 VAC), 50/60 Hz         Leakage current       1.7 mA max.       5 to 200 mA       5 to 300 mA         Control output       Load current *2       5 to 200 mA       5 to 300 mA         Indicators       Operation indicator (red)         Operation mode (with sensing object approaching)       Y1 Models: NO Y2	Response	e frequency	25 Hz					
Control output         Load current *2 Residual voltage         5 to 200 mA         5 to 300 mA           Indicators         Operation indicator (red)           Operation mode (with sensing object approaching)         Y1 Models: NO Y2 Models: NO			24 to 240 VAC (2	20 to 264 VAC), 5	0/60 Hz			
Residual voltage   Refer to Engineering Data on page 5.	Leakage o	current	1.7 mA max.					
Departion mode (with sensing object approaching)	Control	Load current *2	5 to 200 mA		5 to 300 mA			
Operation mode (with sensing object approaching)Y1 Models: NCRefer to the timing charts under I/O Circuit Diagrams on page 8 for details.Ambient temperature *1, 2Operating/Storage: -40 to 85°C (with no icing or condensation)Ambient humidityOperating/Storage: 35% to 95% (with no condensation)Temperature 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°CVoltage influence±1% max. of sensing distance at rated voltage in the rated voltage ±15% rangeInsulation resistance50 MΩ min. (at 500 VDC) between current-carrying parts and caseDielectric strength4,000 VAC, 50/60 Hz for 1 minute between current carry parts and caseVibration resistance (destruction)10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directionsShock resistance (destruction)1,000 m/s² 10 times each in X, Y, and Z directionsDegree of protectionIEC IP67, in-house standard for oil resistanceConnection methodPre-wired Models (Standard cable length: 2 m) and Connector ModelsWeight (packed state)Approx. 65 gApprox. 150 gApprox. 210 gMaterialsCaseBrassSensing surface alsPBTClamping nuts Toothed washerNickel-plated brassToothed washerZinc-plated iron	output	Residual voltage	Refer to Enginee	ering Data on page	e 5.			
(with sensing object approaching)         Ambient temperature *1, 2       Operating/Storage: -40 to 85°C (with no icing or condensation)         Ambient humidity       Operating/Storage: 35% to 95% (with no condensation)         Temperature 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         Voltage influence       ±1% max. of sensing distance at 23°C in the temperature range of -25 to 70°C         Insulation resistance       50 MΩ min. (at 500 VDC) between current-carrying parts and case         Dielectric strength       4,000 VAC, 50/60 Hz for 1 minute between current carry 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         Connection method       Pre-wired Models (Standard cable length: 2 m) and Connector Models         Weight (packed state)       Approx. 65 g       Approx. 150 g       Approx. 210 g         Materials       Sensing surface       Clamping nuts       Nickel-plated brass         Toothed washer       Zinc-plated iron	Indicators	3	Operation indicat	tor (red)				
Ambient humidityOperating/Storage: 35% to 95% (with no condensation)Temperature 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°CVoltage influence±1% max. of sensing distance at rated voltage in the rated voltage ±15% rangeInsulation resistance50 MΩ min. (at 500 VDC) between current-carrying parts and caseDielectric strength4,000 VAC, 50/60 Hz for 1 minute between current carry parts and caseVibration resistance (destruction)10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directionsShock resistance (destruction)1,000 m/s² 10 times each in X, Y, and Z directionsDegree of protectionIEC IP67, in-house standard for oil resistanceConnection methodPre-wired Models (Standard cable length: 2 m) and Connector ModelsWeight (packed state)Approx. 65 gApprox. 150 gApprox. 210 gMaterialsCaseBrassSensing surface (Imping nuts)Nickel-plated brassToothed washerZinc-plated iron	(with sens	sing object ap-	neier to the liming chans under 1/O Circuit Diagrams on bage o for details.					ails.
# 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    Voltage influence	Ambient t	temperature *1, 2	Operating/Storag	je: –40 to 85°C (v	vith no icing or cor	ndensation)		
### ±10% max. of sensing distance at 23°C in the temperature range of -25 to 70°C  ### Voltage influence  ### ±1% max. of sensing distance at rated voltage in the rated voltage ±15% range  ### Insulation resistance  ### Insulation resis	Ambient I	humidity	Operating/Storag	je: 35% to 95% (v	vith no condensat	ion)		
Insulation resistance       50 MΩ min. (at 500 VDC) between current-carrying parts and case         Dielectric strength       4,000 VAC, 50/60 Hz for 1 minute between current carry 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 IP67, in-house standard for oil resistance         Connection method       Pre-wired Models (Standard cable length: 2 m) and Connector Models         Weight (packed state)       Approx. 65 g       Approx. 150 g       Approx. 210 g         Materials       Case       Brass         Sensing surface       PBT         Clamping nuts       Nickel-plated brass         Toothed washer       Zinc-plated iron	Temperat	ure influence						
Dielectric strength  4,000 VAC, 50/60 Hz for 1 minute between current carry parts and case  Vibration resistance (destruction)  Shock resistance (destruction)  1,000 m/s² 10 times each in X, Y, and Z directions  Degree of protection  IEC IP67, in-house standard for oil resistance  Connection method  Pre-wired Models (Standard cable length: 2 m) and Connector Models  Weight (packed state)  Approx. 65 g  Approx. 150 g  Approx. 210 g  Materials  Clamping nuts  Nickel-plated brass  Toothed washer  Zinc-plated iron	Voltage in	nfluence	±1% max. of sen	sing distance at r	ated voltage in the	e rated voltage ±1	5% range	
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 IP67, in-house standard for oil resistance         Connection method       Pre-wired Models (Standard cable length: 2 m) and Connector Models         Weight (packed state)       Approx. 65 g       Approx. 150 g       Approx. 210 g         Materials       Sensing surface       PBT         Clamping nuts       Nickel-plated brass         Toothed washer       Zinc-plated iron	Insulation	resistance	50 M $\Omega$ min. (at 5	00 VDC) betweer	current-carrying	parts and case		
(destruction)  Shock resistance (destruction)  Degree of protection  IEC IP67, in-house standard for oil resistance  Connection method  Pre-wired Models (Standard cable length: 2 m) and Connector Models  Weight (packed state)  Approx. 65 g  Approx. 150 g  Approx. 210 g  Materials  Clamping nuts  Nickel-plated brass  Toothed washer  Toothed washer	Dielectric	strength	4,000 VAC, 50/6	0 Hz for 1 minute	between current	carry parts and ca	se	
1,000 m/s² 10 times each in X, Y, and Z directions			10 to 55 Hz, 1.5-	mm double ampli	tude for 2 hours e	ach in X, Y, and Z	directions	
Connection method     Pre-wired Models (Standard cable length: 2 m) and Connector Models       Weight (packed state)     Approx. 65 g     Approx. 150 g     Approx. 210 g       Materials     Sensing surface     PBT       Clamping nuts     Nickel-plated brass       Toothed washer     Zinc-plated iron			1,000 m/s <sup>2</sup> 10 tin	nes each in X, Y,	and Z directions			
Weight (packed state)  Approx. 65 g  Approx. 150 g  Approx. 210 g  Materials  Case Brass  Sensing surface PBT  Clamping nuts Nickel-plated brass  Toothed washer  Zinc-plated iron	Degree of	fprotection	IEC IP67, in-hou	se standard for oi	l resistance			
Materials  Case Brass Sensing surface PBT Clamping nuts Nickel-plated brass Toothed washer Zinc-plated iron	Connection	on method	Pre-wired Models (Standard cable length: 2 m) and Connector Models					
Materials Sensing surface PBT Clamping nuts Nickel-plated brass Toothed washer Zinc-plated iron	Weight (p	acked state)	Approx. 65 g         Approx. 150 g         Approx. 210 g					
Als Clamping nuts Nickel-plated brass Toothed washer Zinc-plated iron		Case	Brass					
Toothed washer Zinc-plated iron		Sensing surface	rface PBT					
· ·	als	Clamping nuts	Nickel-plated bra	ss				
Accessories Instruction sheet		Toothed washer	Zinc-plated iron					
	Accessor	ies	Instruction sheet					

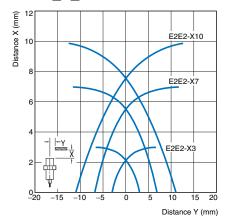
<sup>\*1.</sup> When supplying 24 VAC to any of the above models, make sure that the operating ambient temperature range is at least –25°C to 85°C.
\*2. When using an M18 or M30 Connector Model at an ambient temperature between 70 and 85°C, make sure that the Sensor has a control output (load current) of 5 to 200 mA max.

## **Engineering Data (Reference Value)**

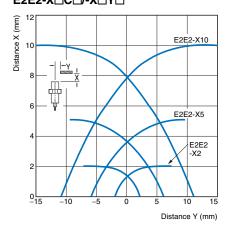
#### **Sensing Area**

## **Shielded Models**

## E2E2-X□D□

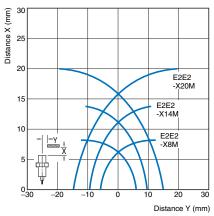


## $E2E2-X\square C\square/-X\square Y\square$

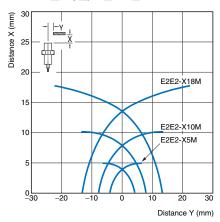


#### **Unshielded Models** E2E2-X□MD□



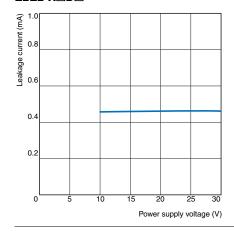


#### $E2E2-X\square MC\square/-X\square MY\square$

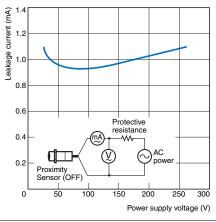


## **Leakage Current**

## E2E2-X□D□

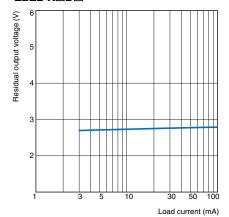


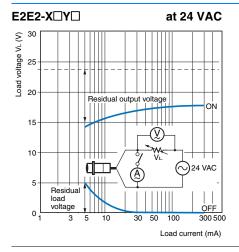


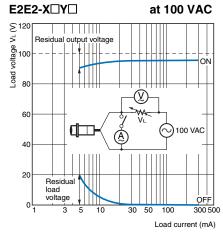


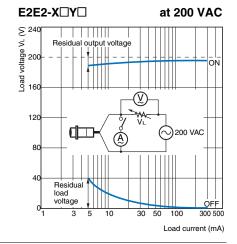
## **Residual Output Voltage**

## E2E2-X□D□



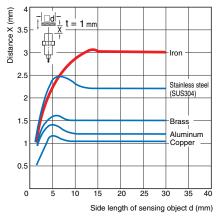




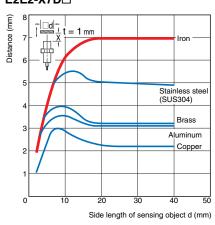


## Influence of Sensing Object Size and Material

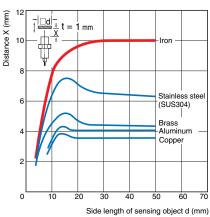
#### E2E2-X3D□



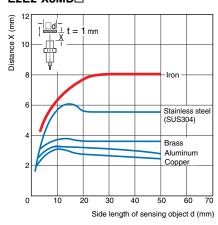
## E2E2-X7D□



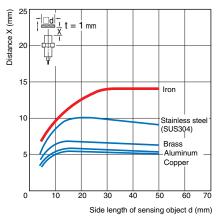
**E2E2-X10D**□



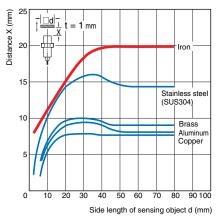
## E2E2-X8MD□



#### E2E2-X14MD□



#### E2E2-X20MD□



80

Side length of sensing object d (mm)

#### E2E2-X2C /-X2Y E2E2-X5C□/-X5Y□ **E2E2-X10C**□/-X10Y□ Distance X (mm) Distance X (mm) Iron Iron Iron Stainless steel (SUS304) Stainless steel (SUS304) 1.5 Stainless steel (SUS304) Brass Brass Brass Aluminum Aluminum Aluminum 0.5 Side length of sensing object d (mm) Side length of sensing object d (mm) Side length of sensing object d (mm) E2E2-X5MC□/-X5MY□ E2E2-X10MC -X10MY **E2E2-X18MC**□/-X18MY□ $\downarrow \frac{1}{2} \frac{1}{2} \frac{1}{2} t = 1 \text{ mm}$ Distance X (mm) $\begin{array}{c|c} \hline \downarrow & \hline \\$ Distance X (mm) Distance X (mm) t = 1 mm 10 20 Iron Iron 15 Stainless steel (SUS304) Stainless steel (SUS304) Stainless steel (SUS304) 10 Brass Brass Aluminum Aluminum Aluminum

Side length of sensing object d (mm)

Side length of sensing object d (mm)

0

## I/O Circuit Diagrams

## **DC 2-Wire Models**

Operation mode	Model	Timing Charts	Output circuit
NO	E2E2-X3D1 E2E2-X7D1 E2E2-X10D1 E2E2-X8MD1 E2E2-X14MD1 E2E2-X20MD1	Sensing object    ON Setting indicator OFF (green) ON Operation OFF (middle) of the control output OFF	Proximity Sensor main circuit
NC	E2E2-X3D2 E2E2-X7D2 E2E2-X10D2 E2E2-X8MD2 E2E2-X14MD2 E2E2-X20MD2	Sensing area  Sensing object  (%) 100 0  Rated sensing distance  ON Operation OFF indicator (red)  ON Control output  OFF	Note: The load can be connected to either the +V or 0 V side.

## **DC 3-Wire Models**

Operation mode	Model	Timing Charts	Output circuit
NO	E2E2-X2C1 E2E2-X5C1 E2E2-X10C1 E2E2-X5MC1 E2E2-X10MC1 E2E2-X18MC1	Sensing object Not present Not present Operation indicator (red) Control output OFF ON OFF	Proximity Sensor Black
NC	E2E2-X2C2 E2E2-X5C2 E2E2-X10C2 E2E2-X5MC2 E2E2-X10MC2 E2E2-X18MC2	Sensing object Not present Not present Operation indicator (red) OFF Control output OFF	main circuit Blue 0 V

#### **AC 2-Wire Models**

Operation mode	Model	Timing Charts	Output circuit
NO	E2E2-X2Y1 E2E2-X5Y1 E2E2-X10Y1 E2E2-X5MY1 E2E2-X10MY1 E2E2-X18MY1	Sensing object Not present Operation indicator ON (red) OFF Control output OFF	Brown Load Proximity Sensor
NC	E2E2-X2Y2 E2E2-X5Y2 E2E2-X10Y2 E2E2-X5MY2 E2E2-X10MY2 E2E2-X18MY2	Sensing object Not present Operation indicator OFF Control output OFF	main circuit Blue

## **Safety Precautions**



This product is not designed or rated for ensuring safety of persons either directly or indirectly.



Do not use it for such purposes.

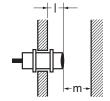
#### **Precautions for Correct Use**

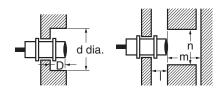
Do not use this product under ambient conditions that exceed the ratings.

## Design

#### **Influence of Surrounding Metal**

When mounting the Sensor within a metal panel, ensure that the clearances given in the following table are maintained.



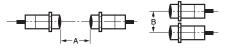


(Unit: mm)

Model		Item	M12	M18	M30
		1	0	0	0
		d	12	18	30
	Shielded	D	0	0	0
		m	8	20	40
DC 2-Wire Models		n	18	27	45
E2E2-X□D□		1	15	22	30
		d	40	70	90
	Unshielded	D	15	22	30
		m	20	40	70
		n	40	70	90
		1	0	0	0
		d	12	18	30
	Shielded	D	0	0	0
DC 3-Wire Models		m	8	20	40
E2E2-X□C□		n	18	27	45
AC 2-Wire Models E2E2-X□Y□		1	15	22	30
		d	40	55	90
	Unshielded	D	15	22	30
		m	20	40	70
		n	36	54	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	M12	M18	M30
	Shielded	Α	30 (20)	50 (30)	100 (50)
DC 2-Wire Models	Silleided	В	20 (12)	35 (18)	70 (35)
E2E2-X□D□	Unshielded	Α	120 (60)	200 (100)	300 (100)
	Unshleided	В	100 (50)	110 (60)	200 (100)
DC 3-Wire Models	Shielded	Α	30	50	100
E2E2-X□C□ AC 2-Wire Models	Sillelded	В	20	35	70
	Unshielded	Α	120	200	300
E2E2-X□Y□	Orisinelaea	В	100	110	200

Note: Values in parentheses apply to Sensors operating at different frequencies.

# Relationship between Sizes and Models

	Size	Model
		E2E2-X3D□
	Shielded	E2E2-X2C□
M12		E2E2-X2Y□
IVIIZ		E2E2-X8MD□
	Unshielded	E2E2-X5MC□
		E2E2-X5MY□
		E2E2-X7D□
	Shielded	E2E2-X5C□
M18		E2E2-X5Y□
IVITO		E2E2-X14MD□
	Unshielded	E2E2-X10MC□
		E2E2-X10MY□
		E2E2-X10D□
	Shielded	E2E2-X10C□
M30		E2E2-X10Y□
		E2E2-X20MD□
	Unshielded	E2E2-X18MC□
		E2E2-X18MY□

## Mounting



## tening Torque

Do not tighten the nut with excessive force.

A washer must be used with the nut.

The following strengths assume washers are being used.

Model	Torque
M12	30 N⋅m
M18	70 N⋅m
M30	180 N⋅m

#### **Dimensions**

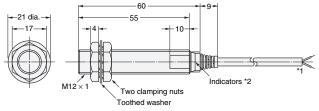
#### **Shielded**



#### **Unshielded**



#### E2E2-X3D\(\text{\textsize}/\text{E2E2-X2C}\(\text{\textsize}/\text{E2E2-X2Y}\(\text{\textsize})



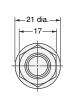
\*1. 4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 2 m

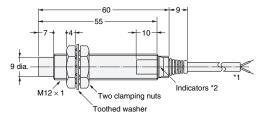
Standard length: 2 m
4-dia. viryl-insulated round cable with 3 conductors
(Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm),
Standard length: 2 m

The cable can be extended to up to 200 m (Separate metal conduit.)

\*2. D Models: Operation indicator (red) and setting indicator (green),
C/Y Models: Operation indicator (red)

## E2E2-X8MD\(\text{\textsize}/\text{E2E2-X5MC}\(\text{\textsize}/\text{E2E2-X5MY}\(\text{\textsize})



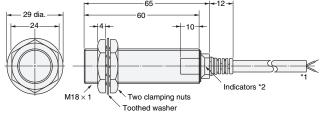


\*1. 4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 2 m

4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 2 m
The cable can be extended to up to 200 m (Separate metal conduit.)

\*2. D Models: Operation indicator (red) and setting indicator (green),
 C/Y Models: Operation indicator (red)

#### **E2E2-X7D** | / **E2E2-X5C** | / **E2E2-X5Y** |



\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m

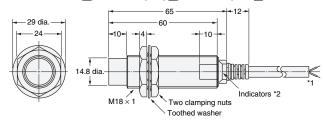
6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m

Standard length: 2 m

The cable can be extended to up to 200 m (Separate metal conduit.)

2. D Models: Operation indicator (red) and setting indicator (green),
C/Y Models: Operation indicator (red)

## E2E2-X14MD\(\to\)/E2E2-X10MC\(\to\)/E2E2-X10MY\(\to\)



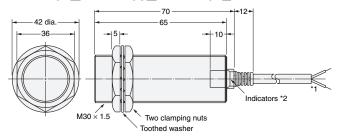
\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m

6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m

The cable can be extended to up to 200 m (Separate metal conduit.)

\*2. D Models: Operation indicator (red) and setting indicator (green),
C/Y Models: Operation indicator (red)

#### E2E2-X10D / E2E2-X10C / E2E2-X10Y



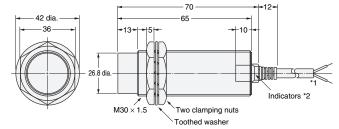
\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m 6-dia. vinyl-insulated round cable with 3 conductors

6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m

The cable can be extended to up to 200 m (Separate metal conduit.)

\*2. D Models: Operation indicator (red) and setting indicator (green),
C/Y Models: Operation indicator (red)

#### E2E2-X20MD / E2E2-X18MC / E2E2-X18MY



\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m 6-dia. vinyl-insulated round cable with 3 conductors

6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m

Standard length: 2 m
The cable can be extended to up to 200 m (Separate metal conduit.)
\*2. D Models: Operation indicator (red) and setting indicator (green),
C/Y Models: Operation indicator (red)

\*2. D Models: Operation indicator (red) and setting indicator (green), iciator (green), C/Y Models: Operation indicator (red)

#### **Mounting Hole Dimensions**



Dimension	M12	M18	M30
F (mm)	12.5 <sup>+0.5</sup> <sub>0</sub> dia.	18.5 <sup>+0.5</sup> <sub>0</sub> dia.	30.5 <sup>+0.5</sup> <sub>0</sub> dia.

Note 1. Two clamping nuts and one toothed washer are provided with each Sensors.

2. The model number is laser-marked on the cable section and milled section.