Specifications

Ratings/Characteristics

E2E

E2E-X□D□ DC 2-wire Models

Size		M8		M12		M18		M30	
Type		Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
Item		E2E-X2D□	E2E-X4MD□	E2E-X3D□	E2E-X8MD□	E2E-X7D□	E2E-X14MD□	E2E-X10D□	E2E-X20MD□
Sensing distance		2 mm ±10%	4 mm ±10%	3 mm ±10%	8 mm ±10%	7 mm ±10%	14 mm ±10%	10 mm ±10%	20 mm ±10%
Set distance (See note 1.)		0 to 1.6 mm	0 to 3.2 mm	0 to 2.4 mm	0 to 6.4 mm	0 to 5.6 mm	0 to 11.2 mm	0 to 8.0 mm	0 to 16.0 mm
Differential travel		15% max. of sensing distance		10% max. of sensing distance					
Sensing object		Ferrous metal (The sensing distance decreases with non-ferrous metal, refer to *Engineering Data*.)							
Standard sensing object		Iron, 8 x 8 x 1 mm	Iron, 20 x 20 x 1 mm	Iron,12 x 12 x 1 mm	Iron,30 x 30 x 1 mm	Iron, 18 x 18 x 1 mm	Iron, 30 x 30 x 1 mm	Iron,30 x 30 x 1 mm	Iron, 54 x 54 x 1 mm
Response speed (See note 2.)		1.5 kHz	1.0 kHz	1.0 kHz	0.8 kHz	0.5 kHz	0.4 kHz	0.4 kHz	0.1 kHz
Power supply voltage (operating voltage range)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.							
Leakage current		0.8 mA max.							
Control output	Load current	3 to 100 mA Diagnostic output: 50 mA for -D1(5)S models							
	Residual voltage (See note 3.)	3 V max. (Load current: 100 mA, Cable length: 2 m. M1J-T models only: 5 V max.)							
Indicator		D1 Models: Operation indicator (red LED), setting indicator (green LED) D2 Models: Operation indicator (red LED)							
Operation mode (with sensing object approaching)		D1 Models: NO D2 Models: NC For details, refer to *Timing Charts*.							
Diagnostic output delay		0.3 to 1 s							
Protection circuits		Surge suppressor, output load short-circuit protection (for control and diagnostic output)							
Ambient temperature		Operating: –25°C to 70°C, Storage: –40°C 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 –25°C to 70°C		±10% max. of sensing distance at 23°C in the temperature range of –25°C to 70°C					
Voltage influence		±1% max. of sensing distance in the rated voltage range ±15%							
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case							
Dielectric strength		1,000 VAC at 50/60 Hz for 1 min between current-carrying parts and case							
Vibration resistance		10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions							
Shock resistance		500 m/s^2 10 times each in X, Y, and Z directions		1,000 m/s^2 10 times each in X, Y, and Z directions					
Degree of protection		IEC 60529 IP67 (Pre-wired models, pre-wired connector models: JEM standard IP67g (waterproof and oil-proof))							
Connection method		Pre-wired models (standard length: 2 m), connector models, pre-wired connector models (standard length: 0.3 m)							
Weight (packed state)	Pre-wired models	Approx. 60 g		Approx. 70 g		Approx. 130 g		Approx. 175 g	
	Pre-wired connector models	---		Approx. 40 g		Approx. 70 g		Approx. 110 g	
	Connector models	Approx. 15 g		Approx. 25 g		Approx. 40 g		Approx. 90 g	
Material	Case	Stainless steel (SUS303)		Brass-nickel plated					
	Sensing surface	PBT (polybutylene terephthalate)							
	Cable	PVC (polyvinyl chloride) all E2E-□□□-U PUR/PE (polyurethane/polyethylene)							
	Clamping nuts	Brass-nickel plated							
	Toothed washer	Iron-zinc plated							
Accessories		Instruction manual							

Note: 1. Use the E2E within the range in which the setting indicator (green LED) is ON (except D2 models).
2. The response speed 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.
3. The residual voltage of each E2E model with the model number suffix "-M1J-T" is 5 V. When connecting an E2E model with the suffix "-M1J-T" to a device, make sure that the device can withstand the residual voltage.

E2E-X□E□/F□ DC 3-wire Models

Size		M8		M12		M18		M30	
Type		Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
Item		E2E-X1R5E□/F□	E2E-X2ME□/F□	E2E-X2E□/F□	E2E-X5ME□/F□	E2E-X5E□/F□	E2E-X10ME□/F□	E2E-X10E□/F□	E2E-X18ME□/F□
Sensing distance		1.5 mm ±10%	2 mm ±10%	2 mm ±10%	5 mm ±10%	5 mm ±10%	10 mm ±10%	10 mm ±10%	18 mm ±10%
Set distance		0 to 1.2 mm	0 to 1.6 mm	0 to 1.6 mm	0 to 4.0 mm	0 to 4.0 mm	0 to 8.0 mm	0 to 8.0 mm	0 to 14.0 mm
Differential travel		10% max. of sensing distance							
Sensing object		Ferrous metal (The sensing distance decreases with non-ferrous metal, refer to *Engineering Data*.)							
Standard sensing object		Iron, 8 x 8 x 1 mm	Iron, 12 x 12 x 1 mm	Iron, 12 x 12 x 1 mm	Iron, 15 x 15 x 1 mm	Iron, 18 x 18 x 1 mm	Iron, 30 x 30 x 1 mm	Iron, 30 x 30 x 1 mm	Iron, 54 x 54 x 1 mm
Response speed (See note 1.)		2.0 kHz	0.8 kHz	1.5 kHz	0.4 kHz	0.6 kHz	0.2 kHz	0.4 kHz	0.1 kHz
Power supply voltage (operating voltage range) (See note 2.)		12 to 24 VDC (10 to 40 VDC), ripple (p-p): 10% max.							
Current consumption		13 mA max.							
Control output	Load current (See note 2.)	200 mA max.							
	Residual voltage	2 V max. (Load current : 200 mA, Cable length: 2 m)							
Indicator		Operation indicator (red LED)							
Operation mode (with sensing object approaching)		E1 F1 Models: NO E2 F2 Models: NC For details, refer to *Timing Charts*.							
Protection circuits		Power supply reverse polarity protection, surge suppressor, output load short-circuit protection							
Ambient temperature (See note 2)		Operating/Storage: –40°C to 85°C (with no icing or condensation)							
Ambient humidity		Operating/Storage: 35% to 95% (with no icing)							
Temperature influence		±15% max. of sensing distance at 23°C in the temperature range of –40°C to 85°C ±10% max. of sensing distance at 23°C in the temperature range of –25°C to 70°C							
Voltage influence		±1% max. of sensing distance in the rated voltage range ±15%							
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case							
Dielectric strength		1,000 VAC at 50/60 Hz for 1 min between current-carrying parts and case							
Vibration resistance		10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions							
Shock resistance		500 m/s² 10 times each in X, Y, and Z directions		1,000 m/s² 10 times each in X, Y, and Z directions					
Degree of protection		IEC 60529 IP67 (Pre-wired models: JEM standard IP67g (waterproof and oil-proof))							
Connection method		Pre-wired models (standard length 2 m), connector models							
Weight (packed state)	Pre-wired models	Approx. 65 g		Approx. 75 g		Approx. 150 g		Approx. 195 g	
	Connector models	Approx. 15 g		Approx. 25 g		Approx. 40 g		Approx. 90 g	
Material	Case	Stainless steel (SUS303)		Brass-nickel plated					
	Sensing surface	PBT (polybutylene terephthalate)							
	Cable	PVC (polyvinyl chloride)							
	Clamping nuts	Brass-nickel plated							
	Toothed washer	Iron-zinc plated							
Accessories		Instruction manual							

Note: 1. The response speed 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. When using an E2E with an M8 connector at an ambient temperature range between 70°C and 85°C, supply 10 to 30 VDC to the E2E and make sure that the E2E has a control output of 100 mA maximum.

E2E-X□Y□ AC 2-wire Models

Size		M8		M12		M18		M30	
Type		Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
Item		E2E-X1R5Y□	E2E-X2MY□	E2E-X2Y□	E2E-X5MY□	E2E-X5Y□	E2E-X10MY□	E2E-X10Y□	E2E-X18MY□
Sensing distance		1.5 mm ±10%	2 mm ±10%	2 mm ±10%	5 mm ±10%	5 mm ±10%	10 mm ±10%	10 mm ±10%	18 mm ±10%
Set distance		0 to 1.2 mm	0 to 1.6 mm	0 to 1.6 mm	0 to 4.0 mm	0 to 4.0 mm	0 to 8.0 mm	0 to 8.0 mm	0 to 14.0 mm
Differential travel		10% max. of sensing distance							
Sensing object		Ferrous metal (The sensing distance decreases with non-ferrous metal, refer to *Engineering Data*.)							
Standard sensing object		Iron, 8 x 8 x 1 mm	Iron,12 x 12 x 1 mm	Iron, 12 x 12 x 1 mm	Iron, 15 x 15 x 1 mm	Iron, 18 x 18 x 1 mm	Iron, 30 x 30 x 1 mm	Iron, 30 x 30 x 1 mm	Iron, 54 x 54 x 1 mm
Response speed		25 Hz							
Power supply voltage (operating voltage range) (See note 1.)		24 to 240 VAC, 50/60 Hz (20 to 264 VAC)							
Leakage current		1.7 mA max.							
Control output	Load current (See note 2.)	5 to 100 mA		5 to 200 mA		5 to 300 mA			
	Residual voltage	Refer to *Engineering Data*.							
Indicator		Operation indicator (red LED)							
Operation mode (with sensing object approaching)		Y1 Models: NO Y2 Models: NC For details, refer to *Timing Charts*.							
Protection circuit		Surge suppressor							
Ambient temperature (See notes 1 and 2.)		Operating/Storage: –25°C to 70°C (with no icing or condensation)		Operating/Storage: –40°C to 85°C (with no icing or condensation)					
Ambient humidity		Operating/Storage: 35% to 95% (with no condensation)							
Temperature influence		±10% max. of sensing distance at 23°C in the temperature range of –25°C to 70°C		±15% max. of sensing distance at 23°C in the temperature range of –40°C to 85°C ±10% max. of sensing distance at 23°C in the temperature range of –25°C to 70°C					
Voltage influence		±1% max. of sensing distance in the rated voltage range ±15%							
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case							
Dielectric strength		4,000 VAC at 50/60 Hz for 1 min between current-carrying parts and case (2,000 VAC for M8 Models)							
Vibration resistance		10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions							
Shock resistance		500 m/s^2 10 times each in X, Y, and Z directions		1,000 m/s^2 10 times each in X, Y, and Z directions					
Degree of protection		IEC 60529 IP67 (Pre-wired models: JEM standard IP67g (waterproof, oil-proof))							
Connection method		Pre-wired models (standard length 2 m), connector models							
Weight (packed state)	Pre-wired models	Approx. 60 g		Approx. 70 g		Approx. 130 g		Approx. 175 g	
	Connector models	Approx. 15 g		Approx. 25 g		Approx. 40 g		Approx. 90 g	
Material	Case	Stainless steel (SUS303)		Brass-nickel plated					
	Sensing surface	PBT (polybutylene terephthalate)							
	Cable	PVC (polyvinyl chloride)							
	Clamping nuts	Brass-nickel plated							
	Toothed washer	Iron-zinc plated							
Accessories		Instruction manual							

Note: 1. When supplying 24 VAC to any of the above models, make sure that the operating ambient temperature range is over –25°C.
2. When using an M18-or M30-sized E2E within an ambient temperature of 70°C to 85°C, make sure that the E2E has a control output of 5 to 200 mA max.

AC/DC 2-wire Models

Size		M12	M18	M30
Type		Shielded		
Item		E2E-X3T1	E2E-X7T1	E2E-X10T1
Sensing distance		3 mm ±10%	7 mm ±10%	10 mm ±10%
Set distance		0 to 2.4 mm	0 to 5.6 mm	0 to 8.0 mm
Differential travel		10% max. of sensing distance		
Sensing object		Ferrous metal (The sensing distance decreases with non-ferrous metal, refer to *Engineering Data*.)		
Standard sensing object		Iron, 12 x 12 x 1 mm	Iron, 18 x 18 x 1 mm	Iron, 30 x 30 x 1 mm
Response speed (See note 1.)	DC	1.0 kHz	0.5 kHz	0.4 kHz
	AC	25 Hz		
Power supply voltage (operating voltage range) (See note 2.)		24 to 240 VDC (20 to 264 VDC)/48 to 240 VAC (40 to 264 VAC)		
Leakage current		1 mA DC max., 2 mA AC max.		
Control output	Load current	5 to 100 mA		
	Residual voltage	6.0 VDC max. (Load current: 100 mA, Cable length: 2 m) 10 VAC max. (Load current: 5 mA , Cable length: 2 m)		
Indicator		Operation indicator (red LED), setting indicator (green LED)		
Operation mode (with sensing object approaching)		NO For details, refer to *Timing Charts*.		
Protection circuits		Output load short-circuit protection (at 20 to 40 VDC), Surge suppressor		
Ambient temperature		Operating: –25°C to 70°C, Storage: –40°C to 85°C (with no icing or condensation)		
Ambient humidity		Operating/Storage: 35% to 95% (with no condensation)		
Temperature influence		±10% max. of sensing distance at 23°C in the temperature range of –25°C to 70°C		
Voltage influence		±1% max. of sensing distance in the rated voltage range ±15%		
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case		
Dielectric strength		4,000 VAC at 50/60 Hz for 1 min between current-carrying parts and case		
Vibration resistance		10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions		
Shock resistance		1,000 m/s^2 10 times each in X, Y, and Z directions		
Degree of protection		IEC 60529 IP67 (JEM standard IP67g (waterproof, oil-proof))		
Connection method		Pre-wired Models (standard length 2 m)		
Weight (packed state)		Approx. 80 g	Approx. 140 g	Approx. 190 g
Material	Case	Brass-nickel plated		
	Sensing surface	PBT (polybutylene terephthalate)		
	Cable	PVC (polyvinyl chloride)		
	Clamping nuts	Brass-nickel plated		
	Toothed washer	Iron-zinc plated		
Accessories		Instruction manual		

Note: 1. The response speed 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. Power supply voltage waveform: Use a sine wave for the power supply. Using a rectangular AC power supply may result in faulty reset.