Stainless Steel Sensing Surface Amplifier Proximity Sensor

E2EC-M/-Q

CSM_E2EC-M_-Q_DS_E_5_2

Improved Durability with Stainless Steel Sensing Head

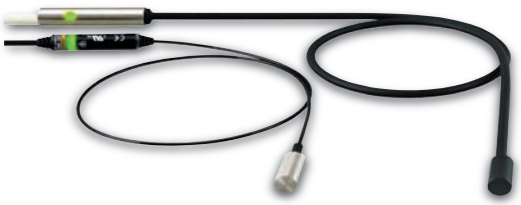
Models with improved spatter resistance ideal for welding also available.

E2EC-M
E2EC-Q
Sensing Surface has 10 times the strength against wear, compared to previous models.

E2EC-M
E2EC-Q
Sensing head is 18 mm in length. Ideal for use embedded in devices.

E2EC-Q
Prevents adherence of weld spatter to the Sensing Head. (Improved spatter-resistant model)

E2EC-Q
Employs a fluoride cable (Improved spatter-resistant model)



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

⚠ Be sure to read *Safety Precautions* on page 5.

Ordering Information

Sensors [Refer to *Dimensions* on page 6.]

Appearance		Sensing distance	Output configuration	Model
				Operation mode: NO
Shielded When mounting to an iron surface	8 dia.	2 mm	DC 3-wire PNP	**E2EC-MC2B1 2M**
			DC 2-wire (polarity)	**E2EC-MC2D1 2M**
			DC 2-wire (no polarity) (3)-(4) pin arrangement	**E2EC-QC2D1-M1GJ-T 0.3M**

Accessories (Order Separately)

Sensor I/O Connector (M12, Sockets on One Cable End)

Models with Pre-wired Connectors: A Connector is not provided with the Sensor. Be sure to order a Connector separately. [Refer to XS2.]

Appearance	Cable length	Sensor I/O Connector model	Applicable Proximity Sensors
Straight 	2 m	**XS2F-D421-DD0**	E2EC-QC2D1-M1GJ-T
	5 m	**XS2F-D421-GD0**	
L-shape 	2 m	**XS2F-D422-DD0**	
	5 m	**XS2F-D422-GD0**	

Note: The Sensor I/O Connector models in the previous table are for standard cables. Be sure to use a heat-resistant cable (XS2F-D42□-□80F) when using the Sensor in environments susceptible to spatter.

Ratings and Specifications

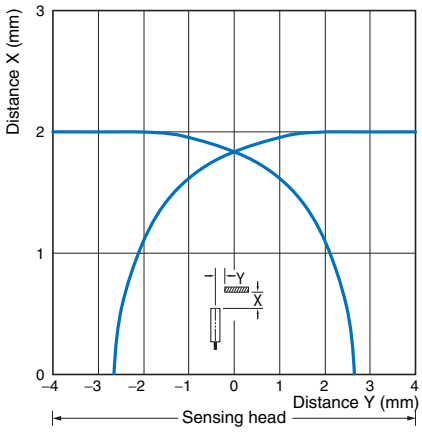
Type			DC 3-Wire PNP Models	DC 2-Wire Models	DC 2-Wire Models (no polarity) (spatter-resistant type)
Size			8 dia. (Sensing Head)		
Shielding			Shielded		
Model			E2EC-MC2B1	E2EC-MC2D1	E2EC-QC2D1-M1GJ-T
Sensing distance			2 mm±15%	2 mm±10%	
Set distance			0 to 1.2 mm	0 to 1.4 mm	
Differential travel			15% max. of sensing distance		
Detectable object			Ferrous metals (The sensing distance will decreases with non-ferrous metal. Refer to *Engineering Data (Reference Value)* on page 3.)		
Standard sensing object			Iron, 8 × 8 × 1 mm		
Response frequency			100 Hz		
Power supply voltage (operating voltage range)			12 to 24 VDC, ripple (p-p): 10% max. (10 to 30 VDC)		
Current consumption			10 mA max.	---	
Leakage current			---	0.8 mA max.	
Control output	Load current		100 mA max.	3 to 50 mA	
	Residual voltage		2 V max. (Load current: 100 mA, Cable length: 2 m)	3 V max. (Load current: 50 mA, Cable length: 2 m)	5 V max. (Load current: 50 mA, Cable length: 2 m)
Indicators			Operation indicator (yellow)	Operation indicator (red), Setting indicator (green)	
Operation mode (with sensing object approaching)			NO (normally open) Refer to the timing charts under *I/O Circuit Diagrams* on page 4 for details.		
Protection circuits			Power supply reverse polarity protection, Surge suppressor, Load short-circuit protection, Reversed output polarity protection	Surge suppressor, Load short-circuit protection	
Ambient temperature range			Operating and storage: –25 to 70°C (with no icing or condensation)		
Ambient humidity range			Operating and storage: 35% to 95% (with no condensation)		
Temperature influence			±20% max. of sensing distance at 23°C in the temperature range of –25 to 70°C		
Voltage influence			±5% max. of sensing distance at rated voltage in the rated voltage ±15% range	±1% max. of sensing distance at the rated voltage range in the voltage range of ±15%	
Insulation resistance			50 MΩ min. (at 500 VDC) between current-carrying parts and case		
Dielectric strength			1,000 VAC for 1 min 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^2 10 times each in X, Y, Z directions		
Degree of protection			IEC IP67, In-house standards: oil-resistant (For Sensor Head only)		
Connection method			Pre-wired Connector Models (Standard cable length: 2 m)		Connector Models (Standard cable length: 0.3 m)
Weight (packed state)			Approx. 65 g		Approx. 95 g
Materials	Sensor Head	Case	Stainless steel (SUS303)		Stainless steel (SUS303) Fluororesin coated
		Sensing surface (thickness)	Stainless steel (SUS303) (0.2 mm)		Stainless steel (SUS303) Fluororesin coated (0.2 mm)
		Cable	Polyester elastomer (TPEE) (Shielded)		Fluoro-rubber (Shielded)
	Cable Amplifier	Case	ABS resin		Stainless steel (SUS303)
		Cable	Polyvinyl chloride (PVC)		Fluorocarbon cable (flame-resistant)
Accessories			Amplifier Mounting Bracket, instruction manual		

Note: Time is required for the sensing distance to stabilize after the power supply is turned ON. Confirm operation sufficiently in the actual operating environment and use the Sensor within the set distance to obtain a sufficient sensing distance.

Engineering Data (Reference Value)

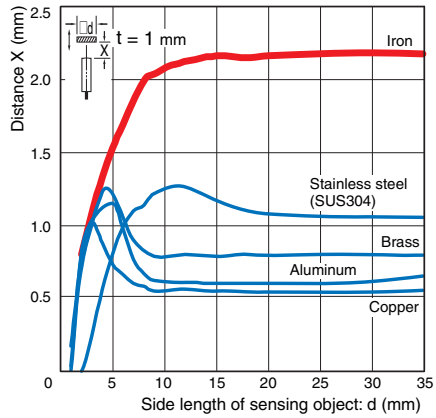
Sensing Area

E2EC-MC2□□, E2EC-QC2D1-M1GJ-T

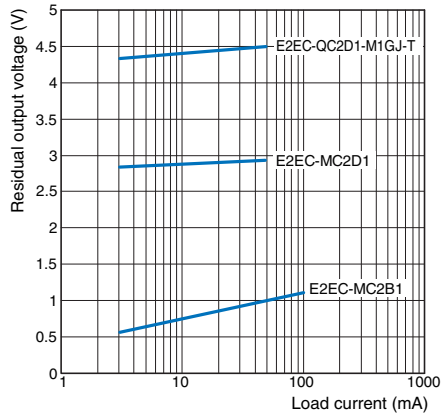


Influence of Sensing Object Size and Material

E2EC-MC2□□, E2EC-QC2D1-M1GJ-T

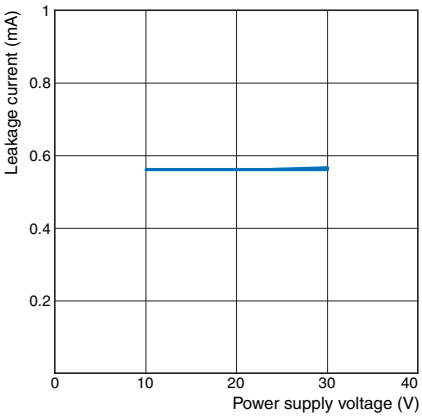


Residual Output Voltage



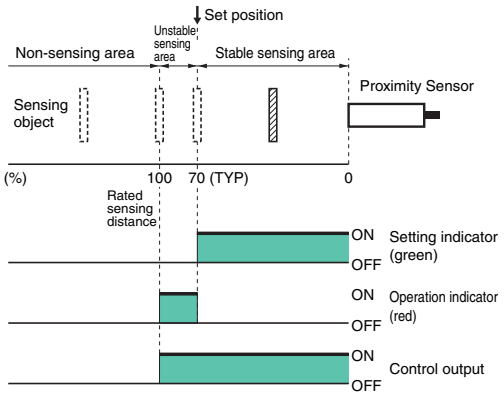
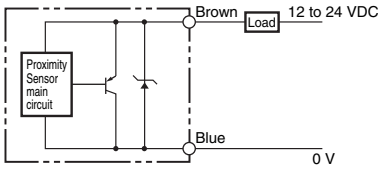
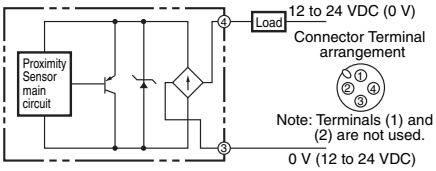
Leakage Current

DC 2-Wire Model, E2EC-MC2D1, E2EC-QC2D1-M1GJ-T

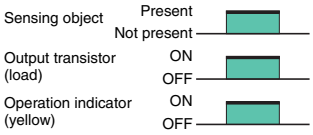
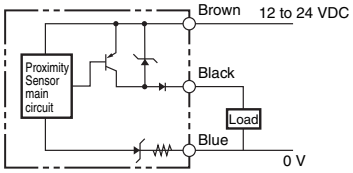


I/O Circuit Diagrams

DC 2-Wire Models

Operation mode	Model	Timing charts	Output circuit
Polarity NO	E2EC-MC2D1		 Note: The load can be connected to either the +V or 0 V side.
No polarity NO	E2EC-QC2D1-M1GJ-T		 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	E2EC-MC2B1		 Maximum load current: 100 mA

Safety Precautions

Refer to *Warranty and Limitations of Liability* for detailed precautions.

⚠ WARNING

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

Never use this product with an AC power supply.
Otherwise, explosion may result.

Precautions for Correct Use

The following precautions must be observed to ensure safe operation.

(1) Do not use the Sensor in an environment where inflammable or explosive gas is present.
(2) Do not attempt to disassemble, repair, or modify any Sensors.
(3) Power Supply Voltage
Do not use a voltage that exceeds the rated operating voltage range. Applying a voltage that is higher than the operating voltage range may result in explosion or fire.
(4) Incorrect Wiring
Be sure that the power supply polarity and other wiring is correct. Incorrect wiring may cause explosion or fire.
(5) Connection without a Load
If the power supply is connected directly without a load, the internal elements may explode or burn. Be sure to insert a load when connecting the power supply.
(6) This Sensor received UL Standard certification under the assumption that the Sensor will be used in a Class 2 circuit. When using the Sensor in the United States or Canada, be sure to use it in a Class 2 circuit.

Precautions for Correct Use

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

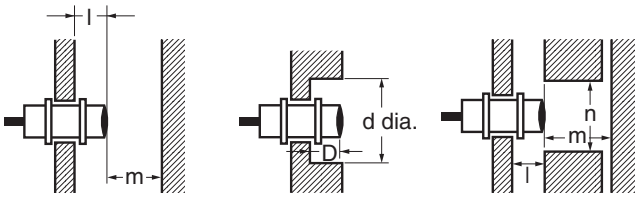
(1) Do not use the Sensor in the following locations.
1. Outdoor locations directly subject to sunlight, rain, snow, or water droplets
2. Locations subject to atmospheres with chemical vapors, in particular solvents and acids
3. Locations subject to corrosive gas

(2) The Sensor may malfunction if used near ultrasonic cleaning equipment, high-frequency equipment, transceivers, cellular phones, inverters, or other devices that generate a high-frequency electric field. Refer to the *Technical Guide Photoelectric Sensors* for typical measures.
(3) Laying the Sensor wiring in the same conduit or duct as high-voltage wires or power lines may result in incorrect operation and damage due to induction. Wire the Sensor using a separate conduit or independent conduit.
(4) Cleaning
Never use thinner or other solvents. Otherwise, the Sensor surface may be dissolved.

● Design

Influence of Surrounding Metal

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

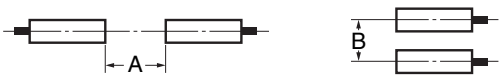


Influence of Surrounding Metal (Unit: mm)

Model	Item: Embedding material	l	d	D	m	n
E2EC-MC2B1	Iron	0	8	0	6	30
	Non-ferrous metal	10	50	10		50
E2EC-MC2D1	Iron	0	8	0		30
	Non-ferrous metal	10	50	10		50
E2EC-QC2D1-M1GJ-T	Iron	0	8	0		30
	Non-ferrous metal	10	50	10		50

Mutual Interference

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

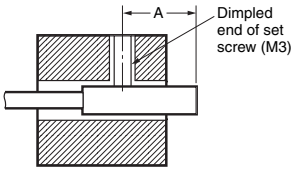


Mutual Interference (Unit: mm)

Model / Item	A	B
E2EC-MC2B1	40	30
E2EC-MC2D1		
E2EC-QC2D1-M1GJ-T		

● Mounting

- Refer to the following table for the torque and tightening ranges applied to mount the Sensor. Tightening must be as given in the following table.



Permissible Tightening Range and Torque

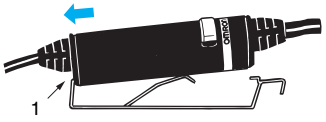
Model	Tightening	Set screw tightening
E2EC-MC2B1	8 to 16 mm	0.98 N·m
E2EC-MC2D1		
E2EC-QC2D1-M1GJ-T		

Amplifier Mounting Bracket

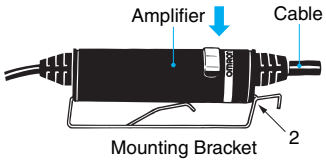
E2EC-MC2□□

Mounting

1. Insert the Amplifier into the trapezoidal end (i.e., the fixing side) of the Mounting Bracket.

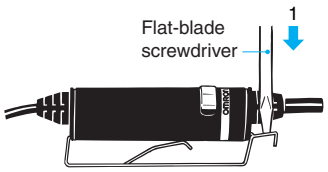


2. Press the other end of the Amplifier onto the Bracket.

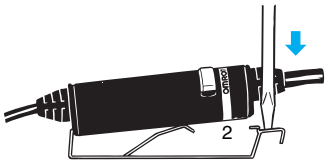


Dismounting

1. Lightly press the hook on the Mounting Bracket with a flat-blade screwdriver.

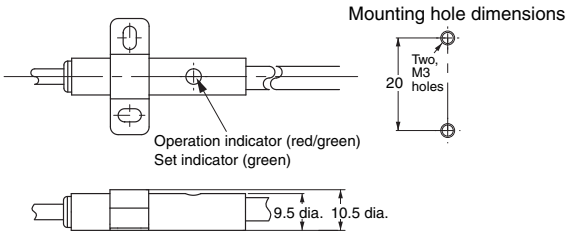


2. The Amplifier will be automatically released due to the spring force of the Mounting Bracket.



E2EC-QC2D1-M1GJ-T

Used the supplied mounting brackets to secure the Amplifier.

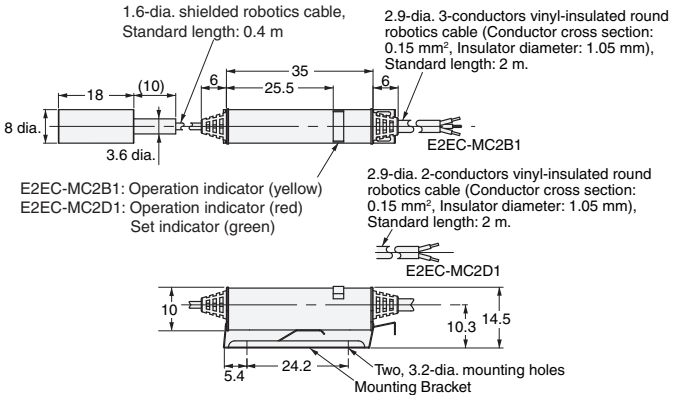


Dimensions

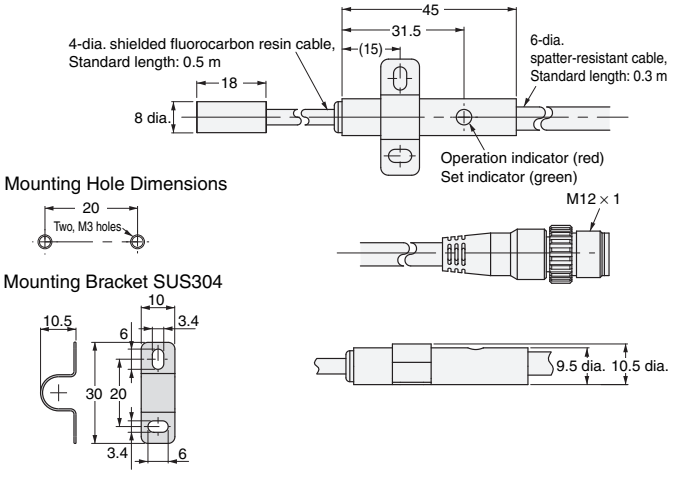
(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Sensors

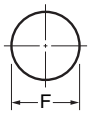
E2EC-MC2B1, E2EC-MC2D1



E2EC-QC2D1-M1GJ-T



Sensing Head Mounting Hole Dimensions



Model	F (mm)
E2EC-M/-Q	8.5 $^{+0.5}_{0}$ dia.

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2023.4

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Industrial Automation Company

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