

## Advanced Performance and Wide Range of Selections in a Super-compact Size



- Only 5.5 × 5.5 mm with a built-in Amplifier.
- Maximum sensing distance: 2.5 mm. Stable detection even with workpiece fluctuations.
- Response frequency: 1 kHz.
- Low current consumption.



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 6.

## Ordering Information

**Sensors** [Refer to *Dimensions* on page 7.]


### DC 2-Wire Models

Appearance	Sensing surface	Sensing distance	Model	
			Operation mode	
			NO	NC
Unshielded 	Top	1.6 mm	E2S-W11 1M *1 *2	E2S-W12 1M
	Front		E2S-Q11 1M *1 *2	E2S-Q12 1M
	Top	2.5 mm	E2S-W21 1M *1 *2	E2S-W22 1M *2
	Front		E2S-Q21 1M *1 *2	E2S-Q22 1M *2

\*1. Models with a different frequency are also available to prevent mutual interference. The model numbers are E2S-□□□B (e.g., E2S-W11B).

\*2. Models are also available with robotics (bend resistant) cables. Add "-R" to the model number.(e.g., E2S-W11-R 1M)

### DC 3-Wire Models





Appearance	Sensing surface	Sensing distance		Output configuration	Model	
					Operation mode	
					NO	NC
<div>Unshielded</div> 	Top	<div></div> 1.6 mm	NPN	E2S-W13 1M *1 *2	E2S-W14 1M	
	Front			E2S-Q13 1M *1 *2	E2S-Q14 1M	
	Top	<div></div> 2.5 mm		E2S-W23 1M *1 *2	E2S-W24 1M *2	
	Front			E2S-Q23 1M *1 *2	E2S-Q24 1M *2	
	Top	<div></div> 1.6 mm	PNP	E2S-W15 1M *1	E2S-W16 1M	
	Front			E2S-Q15 1M *1	E2S-Q16 1M	
	Top	<div></div> 2.5 mm		E2S-W25 1M *1	E2S-W26 1M	
	Front			E2S-Q25 1M *1	E2S-Q26 1M	

\*1. Models with a different frequency are also available to prevent mutual interference. The model numbers are E2S-□□□B (e.g., E2S-W13B).

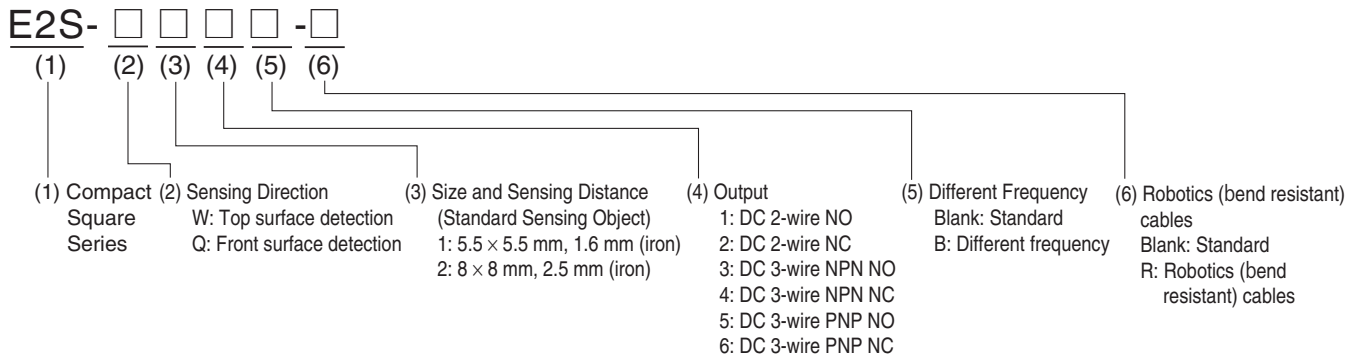
\*2. Models are also available with robotics (bend resistant) cables. Add "-R" to the model number.(e.g., E2S-W13-R 1M)

Accessories (Order Separately)

**Mounting Brackets** Some Mounting Brackets are provided with the Sensor. Order other Mounting Brackets separately if required.  
[Refer to *Dimensions* on page 7.]

Appearance	Model	Quantity	Remarks
	Y92E-C1R6	1	Provided with E2S-□1□□. (fixed with one screw)
	Y92E-C2R5		Provided with E2S-□2□□. (fixed with one screw)
	Y92E-D1R6		For E2S-□1□□ (fixed with two screws)
	Y92E-D2R5		For E2S-□2□□ (fixed with two screws)

Model Number Legend



## Ratings and Specifications

### DC 2-Wire Models

Model		E2S-W11 E2S-W12	E2S-Q11 E2S-Q12	E2S-W21 E2S-W22	E2S-Q21 E2S-Q22
Item					
Sensing surface		Top	Front	Top	Front
Sensing distance		1.6 mm ±15%		2.5 mm ±15%	
Set distance		0 to 1.2 mm		0 to 1.9 mm	
Differential travel		10% max. of sensing distance			
Detectable object		Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 4.)			
Standard sensing object		Iron, 12 × 12 × 1 mm		Iron, 15 × 15 × 1 mm	
Response frequency *		1 kHz min.			
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 50 mA max.			
	Residual voltage	3 V max. (under load current of 50 mA with cable length of 1 m)			
Indicators		<input type="checkbox"/> 1 Models: Operation indicator (red), Setting indicator (green) <input type="checkbox"/> 2 Models: Operation indicator (red)			
Operation mode (with sensing object approaching)		<input type="checkbox"/> 1 Models: NO <input type="checkbox"/> 2 Models: NC Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 5 for details.			

\* 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.

### DC 3-Wire Models

Model		E2S-W13 E2S-W14	E2S-Q13 E2S-Q14	E2S-W23 E2S-W24	E2S-Q23 E2S-Q24	E2S-W15 E2S-W16	E2S-Q15 E2S-Q16	E2S-W25 E2S-W26	E2S-Q25 E2S-Q26
Item		Top	Front	Top	Front	Top	Front	Top	Front
Sensing surface		Top	Front	Top	Front	Top	Front	Top	Front
Sensing distance		1.6 mm ±15%		2.5 mm ±15%		1.6 mm ±15%		2.5 mm ±15%	
Set distance		0 to 1.2 mm		0 to 1.9 mm		0 to 1.2 mm		0 to 1.9 mm	
Differential travel		10% max. of sensing distance							
Detectable object		Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 4.)							
Standard sensing object		Iron, 12 × 12 × 1 mm		Iron, 15 × 15 × 1 mm		Iron, 12 × 12 × 1 mm		Iron, 15 × 15 × 1 mm	
Response frequency *		1 kHz min.							
Power supply voltage (operating voltage range)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.							
Current consumption		13 mA max. at 24 VDC (no-load)							
Control output	Load current	NPN open-collector output, 50 mA max. (30 VDC max.)				PNP open-collector output, 50 mA max. (30 VDC max.)			
	Residual voltage	1.0 V max. (under load current of 50 mA with cable length of 1 m)							
Indicators		Operation indicator (orange)							
Operation mode (with sensing object approaching)		□□3 Models: NO □□4 Models: NC Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 5 for details.				□□5 Models: NO □□6 Models: NC Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 5 for details.			

\* 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.

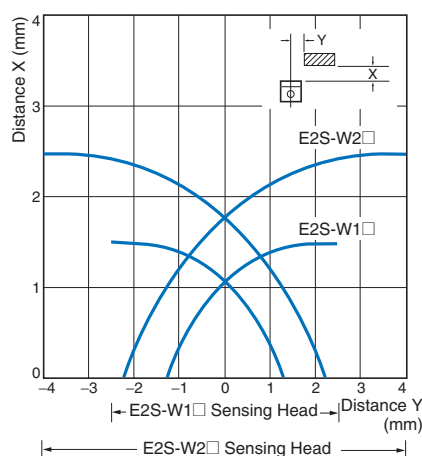
## Specifications

Item	Model	E2S-□□□
Protection circuits	Reverse polarity protection, Surge suppressor	
Ambient temperature range	Operating: -25 to 70°C (with no icing or condensation), Storage: -40 to 85°C (with no icing or condensation)	
Ambient humidity range	Operating: 35% to 90% (with no condensation), Storage: 35% to 95% (with no condensation)	
Temperature influence	±15% max. of sensing distance at 23°C in the temperature range of -25 to 70°C	
Voltage influence	±2.5% max. of sensing distance at rated voltage in rated voltage ±10% range	
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: 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions	
Degree of protection	IEC 60529 IP67	
Connection method	Pre-wired Models (Standard cable length: 1 m)	
Weight (packed state)	Approx. 10 g	
Materials	Case	Polyarylate resin
Accessories	Mounting Brackets	

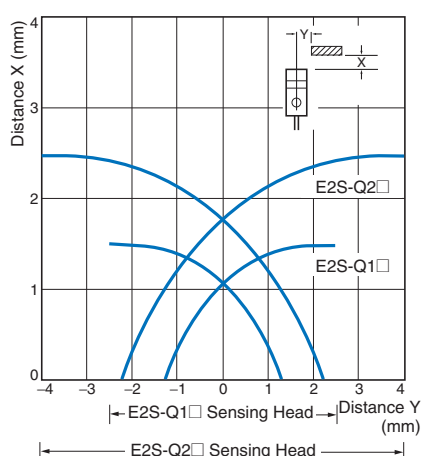
## Engineering Data (Reference Value)

### Sensing Area

E2S-W1□/-W2□

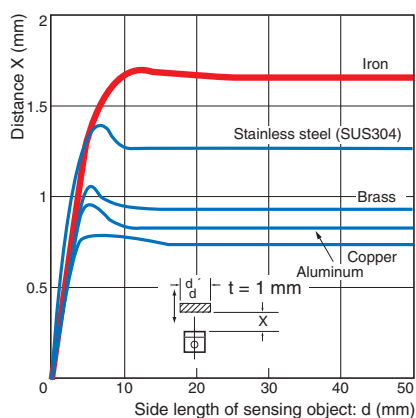


E2S-Q1□/-Q2□

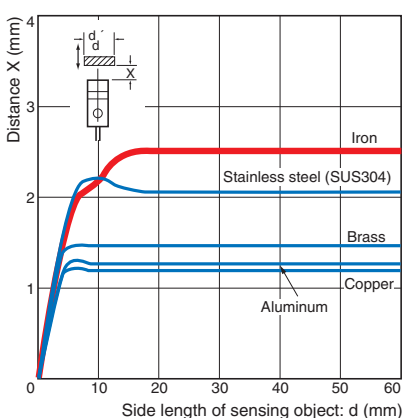


### Influence of Sensing Object Size and Material

E2S-W1□/-Q1□



E2S-W2□/-Q2□



## I/O Circuit Diagrams

### DC 2-Wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2S-W11 E2S-W21 E2S-Q11 E2S-Q21	<p>Non-sensing area    Unstable sensing area    Stable sensing area</p> <p>Sensing object</p> <p>(%)    100    80    0</p> <p>Rated sensing distance</p> <p>ON    OFF    ON    OFF    ON    OFF</p> <p>Setting indicator (green)</p> <p>Operation indicator (red)</p> <p>Control output</p>	<p>Note: The load can be connected to either the +V or 0 V side.</p>
NC	E2S-W12 E2S-W22 E2S-Q12 E2S-Q22	<p>Non-sensing area    Sensing area</p> <p>Sensing object</p> <p>(%)    100    0</p> <p>Rated sensing distance</p> <p>ON    OFF    ON    OFF</p> <p>Operation indicator (red)</p> <p>Control output</p>	<p>Note: The load can be connected to either the +V or 0 V side.</p>

### DC 3-Wire Models

Operation mode	Output configuration	Model	Timing chart	Output circuit
NO	NPN	E2S-W13 E2S-W23 E2S-Q13 E2S-Q23	<p>Sensing object    Present    Not present</p> <p>Output transistor (load)    ON    OFF</p> <p>Operation indicator (orange)    ON    OFF</p>	<p>* Load current: 50 mA max.</p>
NC		E2S-W14 E2S-W24 E2S-Q14 E2S-Q24	<p>Sensing object    Present    Not present</p> <p>Output transistor (load)    ON    OFF</p> <p>Operation indicator (orange)    ON    OFF</p>	
NO	PNP	E2S-W15 E2S-W25 E2S-Q15 E2S-Q25	<p>Sensing object    Present    Not present</p> <p>Output transistor (load)    ON    OFF</p> <p>Operation indicator (orange)    ON    OFF</p>	<p>* Load current: 50 mA max.</p>
NC		E2S-W16 E2S-W26 E2S-Q16 E2S-Q26	<p>Sensing object    Present    Not present</p> <p>Output transistor (load)    ON    OFF</p> <p>Operation indicator (orange)    ON    OFF</p>	

## Safety Precautions

Refer to *Warranty and Limitations of Liability*.

### WARNING

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

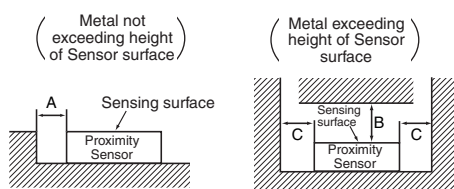
Do not use this product under ambient conditions that exceed the ratings.

#### ● Design

##### Influence of Surrounding Metal

- When mounting the Sensor within a metal panel, ensure that the clearances given in the following table are maintained. Failure to maintain these distances may cause deterioration in the performance of the Sensor.

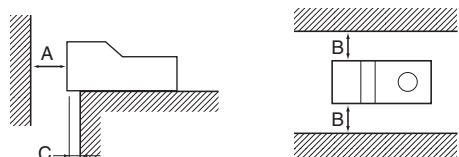
##### ● Models with Top Sensing Surface



(Unit: mm)

Model	Distance	A	B	C
E2S-W1□	0	0	8	2
E2S-W2□			15	10

##### ● Models with Front Sensing Surface



(Unit: mm)

Model	Distance	A	B	C
E2S-Q1		8	3	2
E2S-Q2		15	10	3

#### Applicable e-CON Connector Models and Manufacturers

The companies and model number of e-CON connections that can be used with Sensor cables are listed in the following table. Confirm applicability when purchasing e-CON connectors for connection to Pre-wired Sensors.

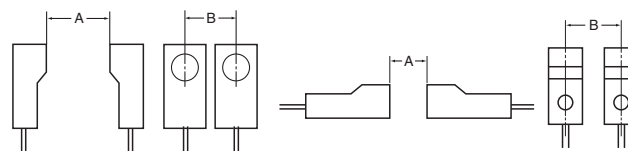
Model	Applicable e-CON Connector	Manufacturer
E2S-W□3/4	XN2A-1470 Cable Plug Connector	OMRON
E2S-Q□3/4		

#### Mutual Interference

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

##### ● Models with Top Sensing Surface

##### ● Models with Front Sensing Surface



(Unit: mm)

Model	Distance	A	B
E2S-W(Q)1□		50 (40) *1	20 (5.5) *1, *2
E2S-W(Q)2□		75 (50) *1	25 (8) *1, *2

\*1. Values in parentheses apply to Sensors operating at different frequencies.

\*2. Mutual interference will not occur for close-proximity mounting if models with different frequencies are used together.

#### ● Mounting

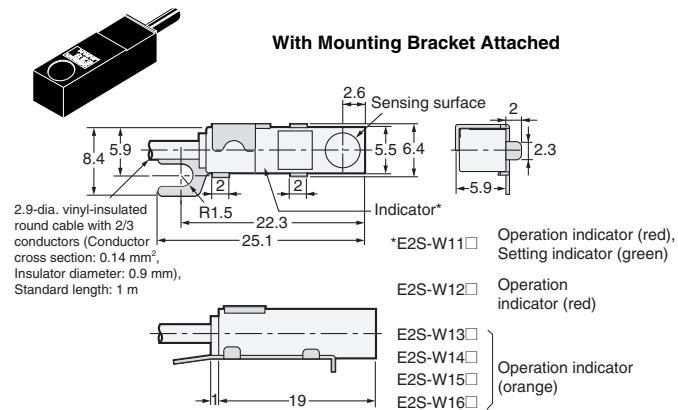
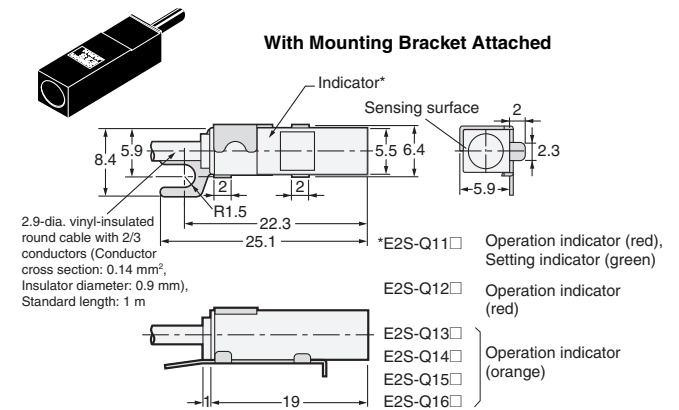
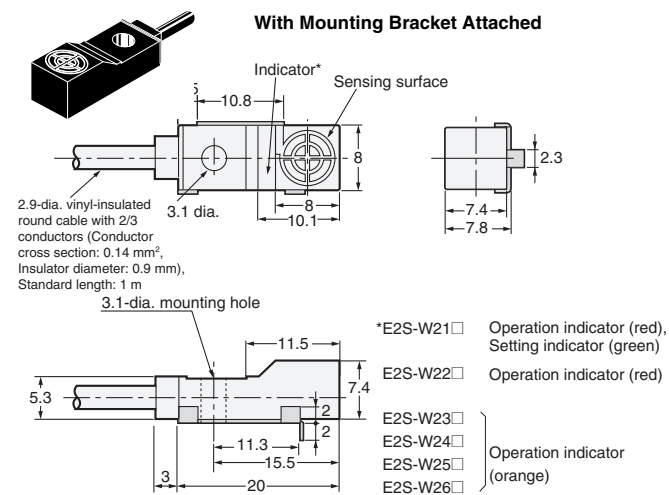
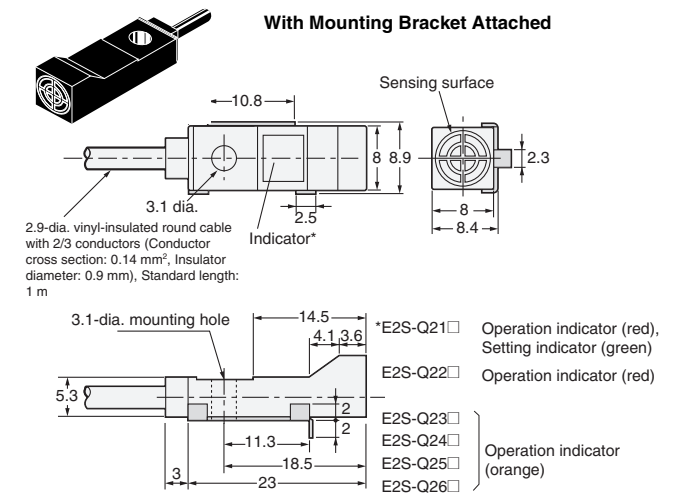
##### Tightening Torque

For the E2S-W(Q)2□, the maximum tightening torque that should be applied to the mounting screws is 0.7 N·m.

## Dimensions

Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

## Sensors

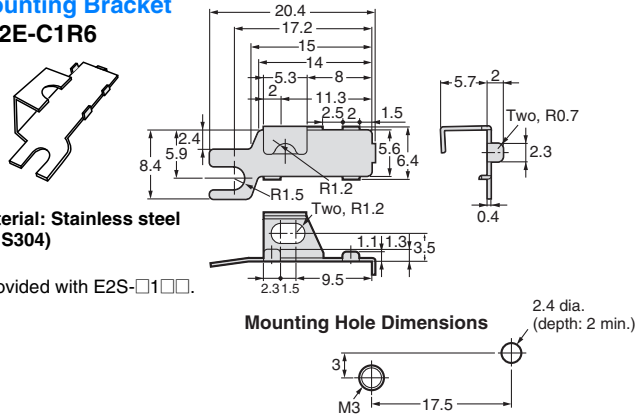
E2S-W1 ☐E2S-Q1 ☐E2S-W2 ☐E2S-Q2 ☐

Accessories (Order Separately)

Mounting Bracket  
Y92E-C1R6

Material: Stainless steel  
(SUS304)

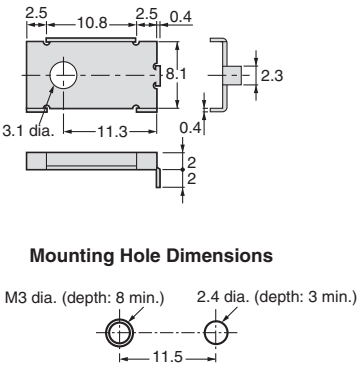
\*Provided with E2S-□1□□.



Mounting Bracket  
Y92E-C2R5

Material: Stainless steel  
(SUS304)

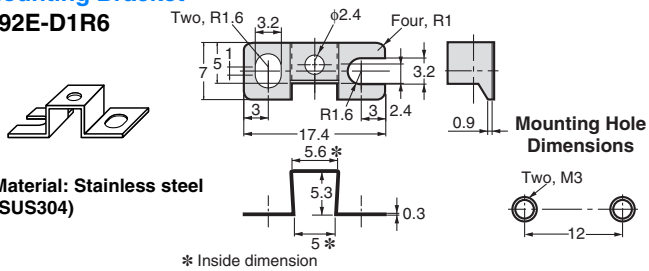
\* Provided with E2S-□2□□.



Mounting Bracket  
Y92E-D1R6

Material: Stainless steel  
(SUS304)

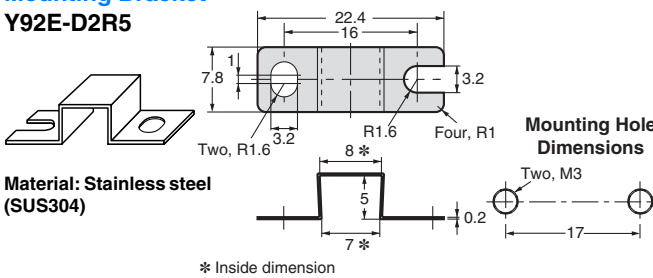
\* Inside dimension



Mounting Bracket  
Y92E-D2R5

Material: Stainless steel  
(SUS304)

\* Inside dimension





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