

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.



 Be sure to read *Safety Precautions* on page 6.

Ordering Information

Sensors

DC 2-Wire Models

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

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

DC 3-Wire Models

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

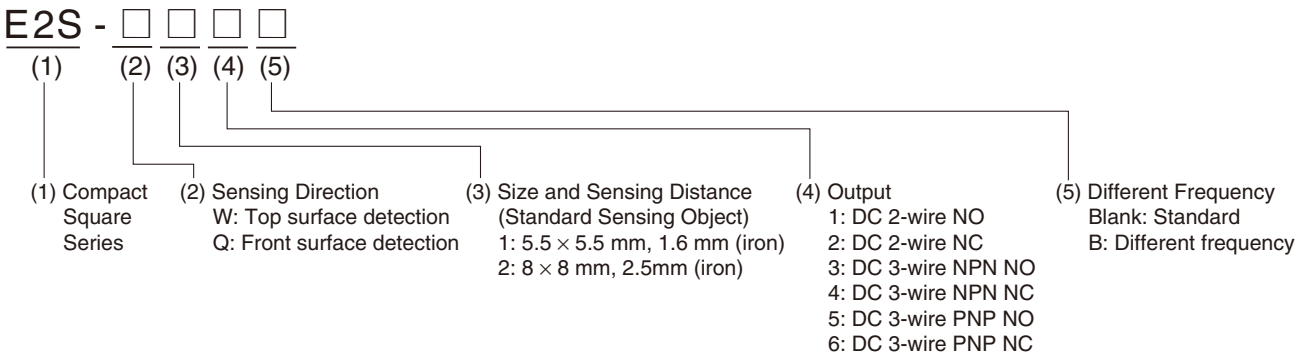
* Models with a different frequency are also available to prevent mutual interference. The model numbers are E2S-□□□B (e.g., E2S-W13B).

Accessories (Order Separately)
Mounting Brackets *

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)

* Refer to page 8 for mounting dimensions.

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		□□1 Models: Operation indicator (red), Setting indicator (green) □□2 Models: Operation indicator (red)			
Operation mode (with sensing object approaching)		□□1 Models: NO □□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									
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.

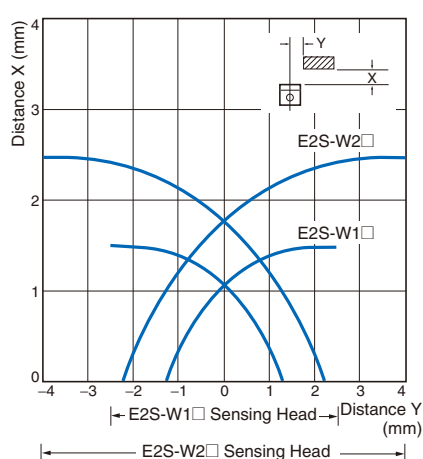
Specifications

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 ² 3 times each in X, Y, and Z directions	
Degree of protection	IEC 60529 IP67	
Connection method	Pre-wired Models (Standard cable length: 1m)	
Weight (packed state)	Approx. 10 g	
Materials	Case	Polyarylate resin
Accessories	Mounting Brackets	

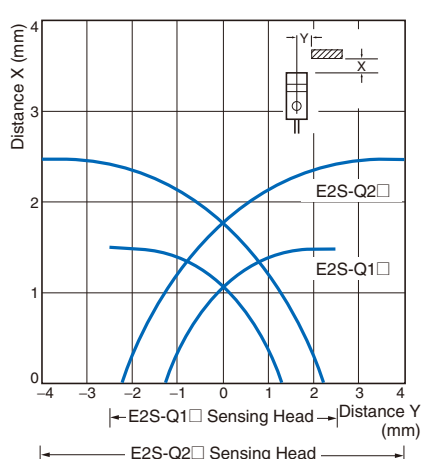
Engineering Data (Typical)

Sensing Area

E2S-W1□/-W2□

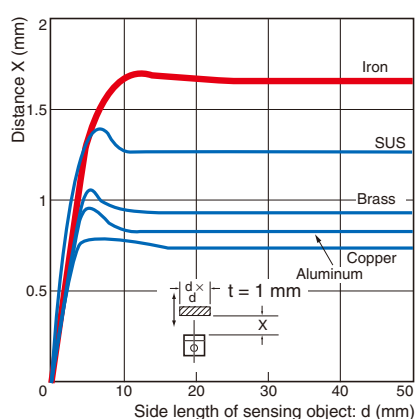


E2S-Q1□/-Q2□

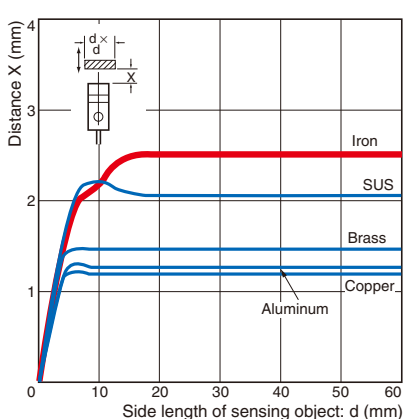


Influence of Sensing Object Size and Material

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	Non-sensing area Unstable sensing area Stable sensing area Sensing object (%) 100 80 0 Rated sensing distance Proximity Sensor ON OFF Setting indicator (green) ON OFF Operation indicator (red) ON OFF Control output	Note: The load can be connected to either the +V or 0 V side.
NC	E2S-W12 E2S-W22 E2S-Q12 E2S-Q22	Non-sensing area Sensing area Sensing object (%) 100 0 Rated sensing distance Proximity Sensor ON OFF Operation indicator (red) ON OFF Control output	Note: The load can be connected to either the +V or 0 V side.

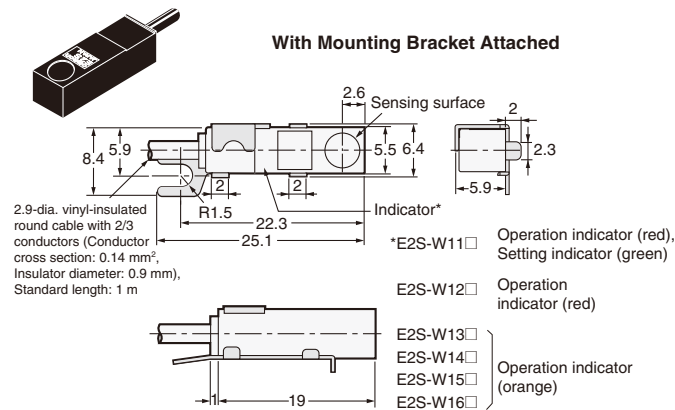
DC 3-Wire Models

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

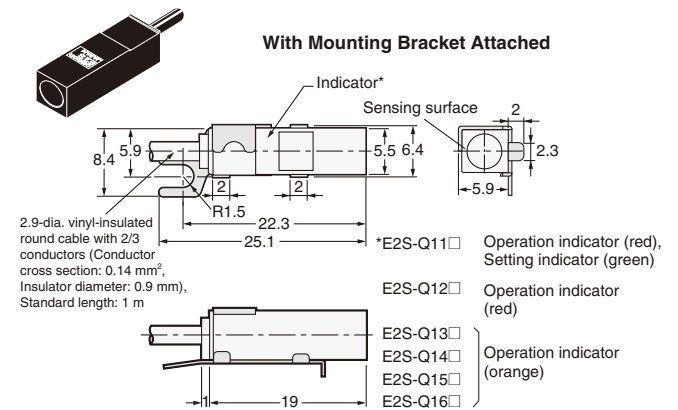
Dimensions

Sensors

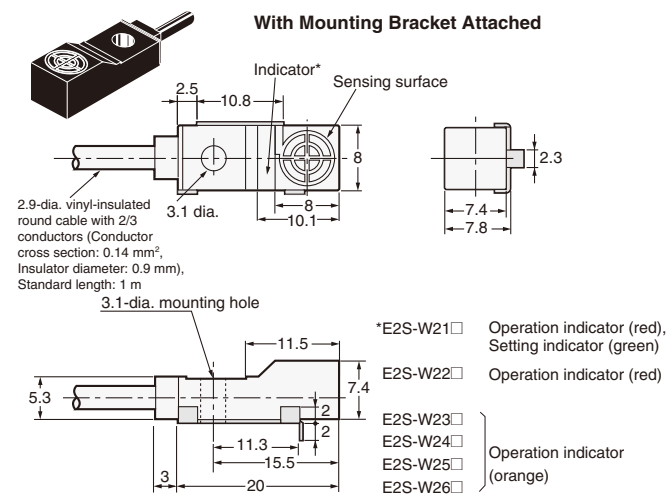
E2S-W1□



E2S-Q1□



E2S-W2□



E2S-Q2□

