

Long Range Metal Body Sensor

E3S-C

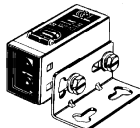

30 m Range With Advanced Fuzzy Logic

- Mutual interference protection
- NPN/PNP switch selectable output
- M12 plug-in connector
- Meets IP67 and NEMA 4X, 6P
- Vibration resistance of 10 Hz to 2 kHz and a shock resistance of 1,000 m/s² (approx. 100 G)



Ordering Information

■ SENSORS

Mounting	Method of detection	Sensing distance	Part number	
			Pre-leaded	Connector
Horizontal 	Through-beam	30 m (98.43 ft)	E3S-CT11	E3S-CT16
	Polarized retroreflective	3 m (9.84 ft)	E3S-CR11	E3S-CR16
	Diffuse reflective	70 cm (27.56 in)	E3S-CD11	E3S-CD16
2 m (6.56 ft)		E3S-CD12	E3S-CD17	
Vertical 	Through-beam	30 m (98.43 ft)	E3S-CT61	E3S-CT66
	Polarized retroreflective	3 m (9.84 ft)	E3S-CR61	E3S-CR66
	Diffuse reflective	70 cm (27.56 in)	E3S-CD61	E3S-CD66
		2 m (6.56 ft)	E3S-CD62	E3S-CD67

■ ACCESSORIES

Description	Part number
Slits for E3S-CT□□ sensors (4 pairs: 0.5 mm, 1.0 mm, 2 mm, and 4 mm wide, includes mounting hardware)	E39-S61
Mounting bracket for E39-R1 reflector	E39-L7

■ CONNECTOR CABLES

Connector type	Cable size	Length	Straight connector	Right angle connector
3-wire DC MicroChange®	22 AWG	2 m (6.56 ft)	Y96E-43SD2	Y96E-43RD2
		5 m (16.40 ft)	Y96E-43SD5	Y96E-43RD5
		10 m (32.8 ft)	Y96E-43SD10	Y96E-43RD10

REPLACEMENT PARTS

Description	Part number
Mounting bracket for E3S-C□1□ (horizontal)	E39-L102
Mounting bracket for E3S-C□6□ (vertical)	E39-L103
Reflector (supplied with retroreflective sensors)	E39-R1

Specifications

Part number		E3S-CT11 E3S-CT61 E3S-CT16 E3S-CT66	E3S-CR11 E3S-CR61 E3S-CR16 E3S-CR66	E3S-CD11 E3S-CD61 E3S-CD16 E3S-CD66	E3S-CD12 E3S-CD62 E3S-CD17 E3S-CD67
Method of detection		Through-beam	Polarized retroreflective	Diffuse reflective	
Supply voltage		10 to 30 VDC, $\pm 10\%$			
Current consumption		50 mA max. (emitter and receiver)	40 mA max.		
Sensing distance	White mat paper	0 to 30 m (0 to 98.43 ft)	0 to 3 m (0 to 9.84 ft)	0 to 70 cm (0 to 27.56 in)	0 to 2 m (0 to 6.56 ft)
	With accessories	4-mm slit: 15 m 2-mm slit: 7 m 1-mm slit: 3.5 m 0.5-mm slit: 1.8 m	E39-R2: 0 to 4 m E39-R3: 0 to 150 cm E39-R4: 0 to 75 cm E39-RSA: 5 to 35 cm E39-RSB: 5 to 60 cm	—	
	Minimum object size	4-mm slit: 2.6-mm dia. 2-mm slit: 2-mm dia. 1-mm slit: 1-mm dia. 0.5-mm slit: 0.5-mm dia.	E39-R1 Reflector: 13-mm dia. E39-R3: 8-mm dia. E39-R4: 4-mm dia.	—	
Light source		Pulse modulated infrared LED (880 nm)	Pulse modulated red LED (700 nm)	Pulse modulated infrared LED (880 nm)	
Standard object	Type	Opaque materials	Opaque materials	Opaque and transparent materials	
	Size	9 mm (3.54 in) min.	30 mm (1.18 in) min.	30 x 30 cm (11.81 x 11.81 in) white mat paper	
Operation mode		Light-ON/Dark-ON operation, switch selectable			
Variation in sensing distance		-		$\pm 10\%$ max.	
Hysteresis		-		20% max. of sensing distance	
Variation in optical axis and mounting direction		$\pm 2^\circ$ max.			
Sensitivity		Adjustable, 3/4 turn knob		Adjustable, 2-1/2 turn knob with clutch and indicator	
Mutual interference protection		Not provided	Provided		
Control output	Type	NPN or PNP (selectable), open collector current output			
	Max. load	100 mA max.			
	Residual voltage	NPN output: 1.2 V max., PNP output: 2.0 V max.			
Response time	OFF	1 ms max.			2 ms max.
	ON	1 ms max.			2 ms max.
Circuit protection		Output short-circuit protection, reversed polarity protection			
Vibration resistance	Destruction	10 to 2 kHz, 1.5-mm double amplitude, or 300 m/s ² (approx. 30G) 0.5 hrs each in X, Y, and Z axes			
Shock resistance	Destruction	1,000 m/s ² (approx. 100G) 3 times each in X, Y, and Z axes			

(This table continues on the next page.)

Part number		E3S-CT11 E3S-CT61 E3S-CT16 E3S-CT66	E3S-CR11 E3S-CR61 E3S-CR16 E3S-CR66	E3S-CD11 E3S-CD61 E3S-CD16 E3S-CD66	E3S-CD12 E3S-CD62 E3S-CD17 E3S-CD67
Indicators	Emitter	Power ON (red)		Stability indicator (green), Light Incident (red)	
	Receiver	Stability indicator (green), Light Incident (red)			
Materials	Lens	Acrylic			
	Case	Zinc die-cast			
	Operation panel	Sulfonated polyether			
	Bracket	Stainless steel			
Mounting		Either side surface with two threaded holes. Bracket for horizontal (E39-L102) or vertical (E39-L103) sensors and hardware included.			
Connections	Emitters	2-conductor cable, 2 m (6.56 ft) length or 4 pin, 12 mm connector	3-conductor cable, 2 m (6.56 ft) length (for prewired types)		
	Receiver	3-conductor cable, 2 m (6.56 ft) length or 4 pin, 12 mm connector			
Weight	Horizontal model	110 g (3.88 oz.)			
	Vertical model	115 g (4.06 oz.)			
Enclosure ratings	IEC 144	IP67			
	NEMA	1, 4X, 6P, 12, 13			
Ambient temperature	Operating	-25°C to 55°C (-13°F to 131°F)			
	Storage	-40°C to 70°C (-40°F to 158°F)			

■ OUTPUT CIRCUIT DIAGRAMS

Output configuration	Mode switch	Output transistor	Output circuits
NPN	Light-ON	ON when light is received.	<p>ZD : $V_Z = 39\text{ V}$ Note: Set the NPN and PNP output selector to NPN.</p>
	Dark-ON	ON when light is not received.	
PNP	Light-ON	ON when light is received.	<p>ZD : $V_Z = 39\text{ V}$ Note: Set the NPN and PNP output selector to PNP.</p>
	Dark-ON	ON when light is not received.	