

Affected Parts

Product discontinuation	Recommended replacement
E4A-3K-9	No recommended replacement
E4A-3K DC12-24	No recommended replacement
E4A-3K AC120/240	No recommended replacement
E4A-3K	No recommended replacement
E4B-LS20E4	E4C-DS30
	E4C-UDA11
E4B-LS70E4	E4C-DS80
	E4C-UDA11
E4B-LS70E4-2	E4C-DS80
	E4C-UDA11
E4B-RS70E4	E4C-DS80
	E4C-UDA11
E4B-TS50E4	E4E2-TS50C1
E4B-TS50SF4	No recommended replacement
E4B-TS50RF4	No recommended replacement
E4B-TS50F4	No recommended replacement
E4B-TS50F4 5M	No recommended replacement
E4B-T1SF4	No recommended replacement
E4B-T1RF4	No recommended replacement
E4B-T1F4	No recommended replacement
E4B-TS50SE4	No recommended replacement
E4B-TS50RE4	No recommended replacement
E4B-T1SE4	No recommended replacement
E4B-T1RE4	No recommended replacement
E4B-T1E4	No recommended replacement

Detail of Differences

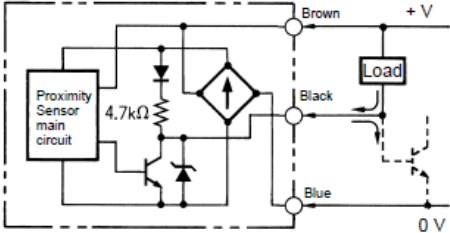
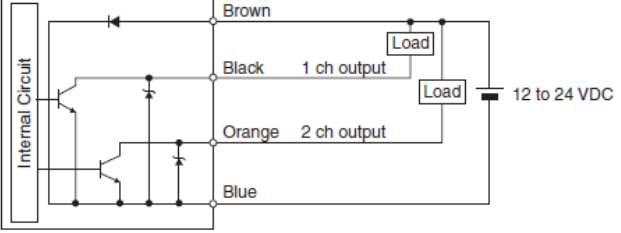
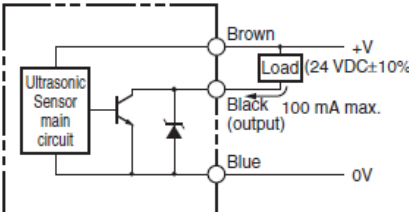
Reference Documentation

Description	Media	Publication number
E4A-3K Datasheet	PDF	D046-E1-3-1
E4B Datasheet	PDF	D065-E1-01
E4C Datasheet	PDF	F76I-E-01
E4E2 Datasheet	PDF	F828-E1-02

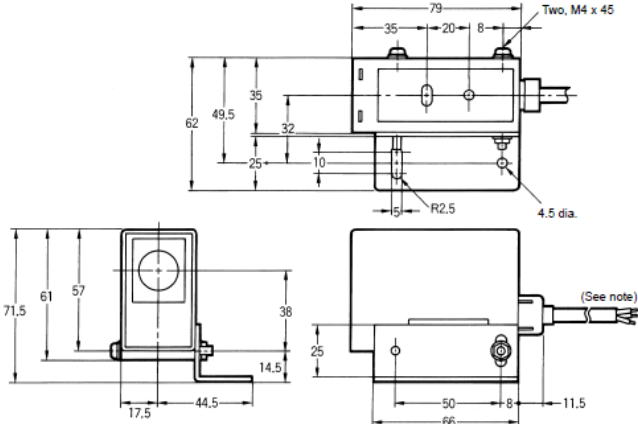
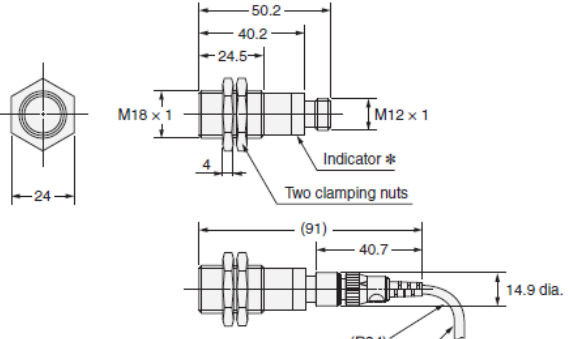
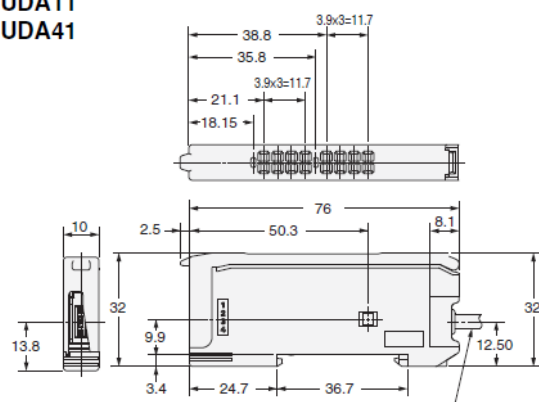
Body Color

Product discontinuation	Recommended replacement
E4B series : Gray	E4C-DS series : Silver E4C-UDA series : Black E4E2 series : Black

Wiring Diagrams

Product discontinuation	Recommended replacement
<p>E4B series</p>  <p>Note:</p> <ol style="list-style-type: none"> 1. 100 mA max. (load current) 2. Required when the transistor circuit is connected. 	<p>E4C-UDA11</p>  <p>E4E2-TS50C1</p> 

Dimensions

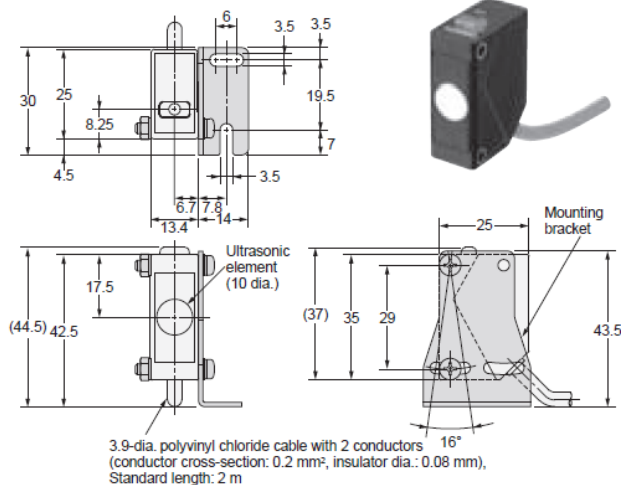
Product discontinuation	Recommended replacement
<p>E4B series</p> 	<p>Sensor Heads</p> <p>E4C-DS30 E4C-DS80</p>  <p>4-mm diameter vinyl-insulated round cable with 4 conductors (cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m</p> <p>Amplifiers</p> <p>E4C-UDA11 E4C-UDA41</p>  <p>4-mm diameter vinyl-insulated round cable with 4 conductors (cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m</p>

Product discontinuation

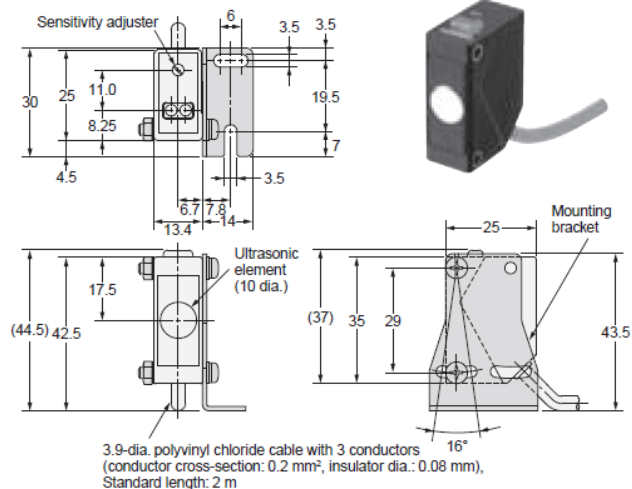
Recommended replacement

E4B series

Emitter
E4E2-TS50TC1



Receiver
E4E2-TS50RC1

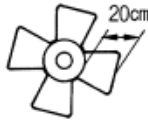


Characteristics

Product discontinuation						
Item	Model	E4B-TS50E4	E4B-T1E4	E4B-LS20E4	E4B-LS70E4	E4B-RS70E4
		Sensing method	Through-beam		Convergent reflective distance	
	Sensing distance	50 cm	1 m	5 to 20 cm	20 to 60 cm (20 to 70 cm) (see note 1)	20 to 60 cm (20 to 70 cm) (see note 1) (in 10-cm divisions)
Supply voltage		12 to 24 VDC \pm 10% (10.8 to 26.4 VDC) with a max. ripple \pm 10% (p-p)				
Current consumption	12 VDC	Emitter: 155 mA max. Receiver: 30 mA max.	Emitter: 70 mA max. Receiver: 30 mA max.	100 mA max.		
	24 VDC	Emitter: 80 mA max. Receiver: 30 mA max.	Emitter: 50 mA max. Receiver: 30 mA max.	50 mA max.		
Standard sensing object		10 x 10 cm flat plate		4 x 4 cm flat plate		
Differential travel		---		20% max. of sensing distance		3 cm max.
Directional angle (see note 2)		\pm 8° max.				
Ultrasonic oscillation frequency		Approx. 200 kHz				
Response frequency (see note 4)		50 Hz	10 Hz	50 Hz	20 Hz	
Operating mode		Incident or interrupted (selectable)				
Control output		NPN, 100 mA at 30 VDC (with a residual voltage of 1.5 V max.) and an output resistance of 4.7 k Ω				
Indicators		SENSING indicator (red LED) and STABILITY indicator (green LED)				
Ultrasonic speed compensation		No				Yes
Ambient temperature		Operating: -10°C to 55°C				
Ambient humidity		Operating: 35% to 95%				
Temperature influence		\pm 10% max. of sensing distance at 20°C in the temperature range of -10°C and 55°C				
Voltage influence		\pm 5% max. of sensing distance at a voltage between 90% and 110% of the rated power supply voltage				
Residual voltage		1.5 V max. under a load current of 100 mA and a cord length of 2 m				
Insulation resistance		20 M Ω min. (at 500 VDC) between current carry parts and case				
Dielectric strength		1,000 V (50/60 Hz) for 1 min between current carry 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 (approx. 50G) 3 times each in X, Y, and Z directions.				
Degree of protection (see note 3)		IEC IP66 (JEM IP66 water resistive)				
Weight (with 2-m-long cord and Mounting Bracket)		Approx. 600 g (with Emitter and Receiver)		Approx. 300 g		

Note:

- These are the available sensing distances at an ambient temperature range between 0°C and 45°C.
- This is the half-value angle obtainable at a signal of -6 dB.
- The enclosure rating indicates the degree of protection of the case, which will depend on the operating condition.
- The response frequencies are values obtained with the E4B used for detecting a rotating propeller-shaped disc as shown on the right.



Space:Blade = 1:1

Recommended replacement

Item	Model	E4E2-TS50C□
Sensing distance		500 mm
Standard sensing object		40 × 40 × 2 mm SPCC plate
Response frequency		20 Hz max.
Power supply voltage (operating voltage range)		24 VDC (21.6 to 26.4 V) with a max. ripple (p-p) 10%
Current consumption		E4E2-TS50TC1 Emitter: 25 mA max. at 24 VDC E4E2-TS50RC1 Receiver: 15 mA max. at 24 VDC
Control output		NPN open collector, Load voltage: 26.4 VDC max., Load current: 100 mA max. (Residual voltage: 1 V max.)
Indicators		Emitter: Power indicator (red) Receiver: Operation indicator (red), Stability indicator (green)
Ambient temperature		Operating: 0 to 50°C, Storage: -10 to 55°C (with no icing or condensation)
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)
Insulation resistance		100 MΩ min. (at 500 VDC) between current-carrying parts and case
Dielectric strength		1,500 VAC (50/60 Hz) 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 three times each in X, Y, and Z directions
Degree of protection		IP64 (IEC)
Connection method		Pre-wired (Standard cable length: 2 m)
Weight (packed state)		Approx. 160 g (Emitter and Receiver)
Materials		Case: ABS resin, Oscillator surface: Epoxy resin
Accessories		Mounting Bracket (with screws), adjustment screwdriver, instruction sheet

Sensor Heads

Item	Model	E4C-DS30	E4C-DS30L	E4C-DS80	E4C-DS80L	E4C-DS100
Measurement range		60 to 275 mm		85 to 735 mm		110 to 910 mm
Standard sensing object		100 X 100 mm SUS flat plate				
Near distance dead band		0 to 50 mm		0 to 70 mm		0 to 90 mm
Ultrasonic oscillation frequency		Approx. 390 kHz		Approx. 255 kHz		
Response speed *		30 ms		100 ms		125 ms
Ambient temperature range		Operating: -25 to +70°C, Storage: -40 to +85°C (with no icing or condensation)				
Ambient humidity range		Operating and storage: 35% to 85% (with no condensation)				
Enclosure rating		IP65				
Indicator		(Yellow) Lit: Sensor within sensing range (Green) Lit: Power indicator				(Yellow) Lit: Sensor within sensing range
Weight		Approx. 150 g				Approx. 170 g
Materials		Case: Nickel-plated brass, Oscillator surface: Glass epoxy resin and polyurethane				
Accessories		Instruction Manual, XS2F-D523-D80-A (Cable length: 2 m), XN2A-1430				

* This value is the average number of operations set to 256.

Amplifiers

Item	Model Type	E4C-UDA11	E4C-UDA41	E4C-UDA11AN	E4C-UDA41AN
		Twin Output Models		Analog Output Models	
Output configuration		NPN output	PNP output	NPN output	PNP output
Connection method		Pre-wired			
Supply voltage		12 to 24 VDC ±10%, ripple 10% max.			
Current consumption		80 mA max.			
Control output		NPN open collector (26.4 VDC max.), Load current: 50 mA max., Residual voltage: 1 V max.			
Timer		OFF/OFF-delay/ON-delay/one-shot			
Timer time		1 ms to 5 s			
Analog output	Connected load	---		Voltage output (1 to 5 VDC)	
	Output form	---		10 kΩ min.	
	Resolution	---		1.0% F.S.	
	Temperature characteristics	---		0.3% F.S./°C	
	Repeat accuracy	---		2.0% F.S. *	
	Linearity	---		Within ±2% F.S.	
Protective circuit		Power supply reverse polarity protection, output short-circuit protection			
Ambient temperature range		Operating: -25 to +55°C, Storage: -30 to +70°C (with no icing or condensation)			
Ambient humidity range		Operating and storage: 35% to 85% (with no condensation)			
Insulation resistance		50 MΩ min. (at 500 VDC)			
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min			
Vibration resistance		10 to 150 Hz, 0.75-mm double amplitude, 80 min each in X, Y, and Z directions			
Shock resistance		500 m/s ² , 3 times each in X, Y and Z directions			
Enclosure rating		IP 50			
Materials		Case: PBT (polybutylene terephthalate), Cover: Polycarbonate			
Weight (packed state)		Approx. 150 g			
Accessories		Instruction Manual			

* Value one hour after the product is turned ON. External disturbances, however, sometimes cause minute outputs.

Operation Ratings

Product discontinuation	Recommended replacement
<p>E4B-LS20E4</p>	<p>E4C-DS30</p>
<p>E4B-LS70E4, E4B-RS70E4</p>	<p>E4C-DS80</p>
<p>E4B-TS50E4</p>	<p>E4E2-TS50C1</p>

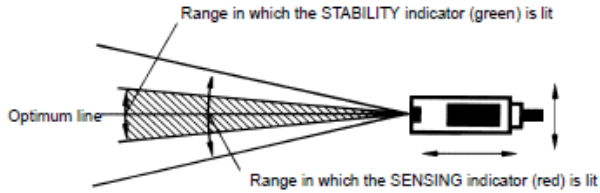
Operation Methods

Product discontinuation

1. E4B-T1 and E4B-TS50 Through-beam Models

Set the SENSITIVITY adjuster of the Receiver to maximum.

Move the Emitter and Receiver vertically and horizontally until the SENSING indicator of the Receiver is lit and secure the Emitter and Receiver at the midpoint of the range within which the STABILITY indicator is lit.



2. E4B-LS20* and E4B-LS70 Convergent Reflective Distance Model

Locate the Sensor so that both the STABILITY and SENSING indicators will be lit when the sensing object is placed at the sensing position, and the STABILITY indicator will be lit and the SENSING indicator will turn OFF when the sensing object is removed.

Step	1	2	3
Sensing			
Distance adjuster		---	---
Adjustment procedure	Place the sensing object at the sensing position and turn the distance adjuster clockwise gradually until both the SENSING and STABILITY indicators are lit.	Move the Emitter and Receiver vertically and horizontally and secure the Emitter and Receiver at the midpoint of the range within which the STABILITY indicator is lit.	Remove the sensing object and check that the SENSING indicator is OFF and the STABILITY indicator is continuously lit.

Note: If the STABILITY indicator is not lit while the Sensor is in operation, this indicates a possible operational error. Check or readjust the ...

3. E4B-RS70 Convergent Reflective Zone

General Use

Locate the Sensor so that both the STABILITY and SENSING indicators will be lit when the sensing object is placed at the sensing position and the STABILITY indicator will be lit and the SENSING indicator will be off when the sensing object is removed.

Step	1	2	3
Sensing			
Distance selector		---	---
Adjustment procedure	Place the sensing object at the sensing position and turn the distance selector clockwise gradually until both the SENSING and STABILITY indicators are lit.	Move the Emitter and Receiver vertically and horizontally and secure the Emitter and Receiver at the midpoint of the range within which the STABILITY indicator is lit.	Remove the sensing object and check that the SENSING indicator is OFF and the STABILITY indicator is continuously lit.

Note: 1. If the STABILITY indicator is not lit while the Sensor is in operation, this indicates a possible operational error. Check or readjust the sensitivity.

2. If the background object is within a distance of 1.5 m from the sensing head, the SENSING indicator may be lit and the STABILITY indicator may not be lit in spite of the absence of the sensing object. In such a case, give priority to the adjustment of the indicators with the sensing object located at the sensing position.

Recommended replacement

E4E2-TS50C1

• Adjustment

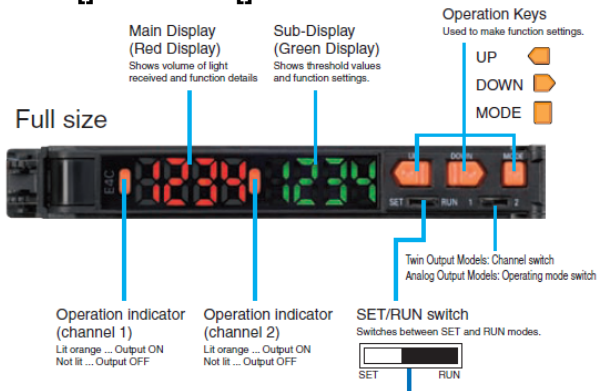
Sensitivity Adjuster

- Check the power indicator (red) of the Emitter, then turn the sensitivity adjuster (ADJ) clockwise as far as it will go.
- Be sure not to turn the sensitivity adjuster excessively. If the sensitivity adjuster is turned beyond the permissible range, no sensitivity adjustment will be possible.

Indicators

- The green indicator on the Receiver shows stability during sound input. Adjust the mounting shaft so that this indicator light brightly when there is no sensing object present.
- While passing a sensing object through the path, adjust the operation indicator (red) on the Receiver so that it light and goes out correctly.

E4C-DS[] / E4C-UDA[]



Switching to SET Mode

Mode Selection		Function Selection
0-oP non	0. Operation mode Note: "0. Operation mode" is not supported for analog outputs.	n-on Near distance ON F-on Far distance ON
1-Ru 8	1. Number of samples to average	1 to 256
2-tF ----	2. Timer	---- Timer disabled offd OFF-delay timer on-d ON-delay timer 15ht One-shot timer
3-dP	3. Display switch	250 130 Current distance and threshold value PERP botn Distance between the nearest workplace on the Near side and the farthest workplace on the Far side 250 PERP Current distance and distance at peak 250 lch Current distance and channel No.
4-nd 2Pnt	4. MODE key setting	2Pnt Teaching with and without a workpiece Ruto Automatic-teaching PPt Position teaching OrSt Execute a zero reset ofSt Position teaching
5-bS ----	5. Bank selection	0 to 3
6-br 0	6. Bank registration	0 to 3
7-ru d 123	7. Display orientation	d 123 Normal display E2 1P Reversed display
8-SS ----	8. Sensor model selection	30 E4C-DS30 80 E4C-DS80 100 E4C-DS100
9-Sc ----	9. Scaling set	on Scaling set off Scaling not set
For the Twin Output Model		
10ot 2oUt	10. Output method setting	2oUt Output on each channel ArEA This is output only when there is a workplace between the two threshold value distances. 2b 1t 2BIT output
For the Analog Output Model		
10Ar 2Pnt	10. Output method setting	2Pnt Range of two preset points is output as 1 to 5 V. rFct Near-distance side related distance to background setting range is output as 1 to 5 V. nFcS Range of two points preset by direct entry is output as 1 to 5 V.

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