

Photoelectric Sensors with Separate Digital Amplifiers (Laser-type Amplifier Units)

E3C-LDA Series



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- All three beam types provide ample long-distance detection of 1,000 mm for Diffuse Reflective Models.
- Coaxial Retroreflective Models provide detection performance equivalent to through-beam sensors, simplifying Sensor installation.
- Industry-first variable focal point and optical axis alignment mechanisms. Optimize for workpieces and improve inspection quality.
- Drive the laser with an Amplifier the same size as a Digital Fiber Amplifier.



Ordering Information

■ Sensor Heads

Sensing method	Focus	Model number	Remarks
Diffuse reflective	Spot	E3C-LD11	Mounting a Beam Unit (sold separately) allows the use of line and area beams.
	Line	E3C-LD21	This model number is for the set consisting of the E39-P11 mounted to the E3C-LD11.
	Area	E3C-LD31	This model number is for the set consisting of the E39-P21 mounted to the E3C-LD11.
Coaxial retroreflective (with MSR)	Spot (variable)	E3C-LR11 (See note.)	Mounting a Beam Unit (sold separately) allows the use of line and area beams.
	Spot (2.0-mm fixed dia.)	E3C-LR12 (See note.)	---

Note: Select a reflector (sold separately) according to the application.

■ Amplifier Units



Amplifier Units with Cables

Item		Appearance	Functions	Model	
				NPN output	PNP output
Advanced models	Twin-output models		Area output, self-diagnosis, differential operation	E3C-LDA11	E3C-LDA41
	External-input models		Remote setting, counter, differential operation	E3C-LDA21	E3C-LDA51
	ATC function		ATC (Active Threshold Control)	E3C-LDA11AT	E3C-LDA41AT
	Analog output		Analog output	E3C-LDA11AN	E3C-LDA41AN





Amplifier Units with Connectors

Item		Appearance	Functions	Model	
				NPN output	PNP output
Advanced models	Twin-output models		Area output, self-diagnosis, differential operation	E3C-LDA6	E3C-LDA8
	External-input models		Remote setting, counter, differential operation	E3C-LDA7	E3C-LDA9
	ATC function		ATC (Active Threshold Control)	E3C-LDA6AT	E3C-LDA8AT

■ Amplifier Unit Connectors (Order Separately)



Item	Appearance	Cable length	No. of conductors	Model
Master Connector		2 m	4	E3X-CN21
Slave Connector			2	E3X-CN22

■ Mobile Console (Order Separately)






Appearance	Model	Remarks
	E3X-MC11-SV2 (model number of set) (See notes 1 and 2.)	Mobile Console with Head, Cable, and AC adapter provided as accessories
	E3X-MC11-C1-S	Mobile Console
	E3X-MC11-H1	Head
	E39-Z12-1	Cable (1.5 m)

- Note 1.** Use the E3X-MC11-SV2 Mobile Console for the E3C-LDA-series Amplifier Units. Other Mobile Consoles cannot be used.
2. The E3X-MC11-SV2 is an upgraded version of the E3X-MC11-S, to which a corresponding Sensor Head is added. (The E3X-MC11-SV2 and E3X-MC11-S are compatible.)

■ Accessories (Order Separately) Beam Units

Applicable Sensor Head	Appearance	Focus	Model
E3C-LD11		Line	E39-P11
		Area	E39-P21
E3C-LR11		Line	E39-P31
		Area	E39-P41

Reflectors

Type	Appearance	Model
Standard Effective area: 23 × 23 mm		E39-R12
Standard Effective area: 7 × 7 mm		E39-R13
Short-distance transparent detection Effective area: 23 × 23 mm		E39-R14
Sheet (cuttable) Effective area: 195 × 22 mm		E39-RS4
Sheet (cuttable) Effective area: 108 × 46 mm		E39-RS5

Specifications

■ Ratings/Characteristics Sensor Heads

Item	Diffuse reflective			Coaxial retroreflective (with MSR)			
	E3C-LD11	E3C-LD21	E3C-LD31	E3C-LR11	E3C-LR11 + E39-P31	E3C-LR11 + E39-P41	E3C-LR12
Light source (emission wavelength)	Red semiconductor laser diode (650 nm), 2.5 mW max. (JIS standard: Class 2, FDA standard: Class II)						1 mW max. (JIS standard Class 1)
Sensing distance	High-resolution mode: 30 to 1,000 mm Standard mode: 30 to 700 mm Super-high-speed mode: 30 to 250 mm (See note 1.)			7 m 5 m 2 m (See note 2.)	1,700 mm, 1,300 mm 700 mm (See note 2.)	900 mm 700 mm 400 mm (See note 2.)	7 m 5 m 2 m (See note 2.)
Beam size (See note 3.)	0.8 mm max. (at distances up to 300 mm)	33 mm (at 150 mm)	33 × 15 mm (at 150 mm)	0.8 mm max. (at distances up to 1,000 mm)	28 mm (at 150 mm)	28 × 16 mm (at 150 mm)	2.0 mm dia. (at distances up to 1,000 mm)
Functions	Variable focal point mechanism (beam size adjustment) (See note 4.), optical axis adjustment mechanism (axis adjustment)						
Indicators	LDON indicator: Green; Operation indicator: Orange						
Ambient illumination (receiver side)	3,000 lx (incandescent lamp)						
Ambient temperature	Operating: -10°C to 55°C; Storage: -25°C to 70°C (with no icing or condensation)						
Ambient humidity	Operating/storage: 35% to 85% (with no condensation)						
Vibration resistance (destruction)	10 to 150 Hz with double amplitude of 0.7 mm, in X, Y, and Z directions for 80 min each						
Degree of protection	IEC 60529: IP40						
Materials	Case and cover: ABS Front surface filter: Acrylic resin			Case and cover: ABS Front surface filter: Glass			
Weight (packed)	Approx. 85 g			Approx. 100 g			

- Note 1.** Values are sensed for white paper.
2. These values apply when a E39-R12 Reflector is used. The MSR function is built-in. The reflected light from the object being measured may affect the sensing accuracy, so adjust the threshold value before use.
3. The beam radius is the value for the middle measurement distance and indicates a typical value for the middle sensing distance. The radius is defined by light intensity of $1/e^2$ (13.5%) of the central light intensity. Light will extend beyond the main beam and may be affected by conditions surrounding the object being measured.
4. The E3C-LR12 has a fixed beam size (the focus point cannot be changed).

Amplifier Units

Item	Type	External-input models		Twin-output models		ATC-output models		Analog-output models	
	Model	NPN output	E3C-LDA21	E3C-LDA7	E3C-LDA11	E3C-LDA6	E3C-LDA11AT	E3C-LDA6AT	E3C-LDA11AN
		PNP output	E3C-LDA51	E3C-LDA9	E3C-LDA41	E3C-LDA8	E3C-LDA41AT	E3C-LDA8AT	E3C-LDA41AN
Supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.							
Power consumption		1,080 mW max. (current consumption: 45 mA max. at power supply voltage of 24 VDC)							
Control output	ON/OFF output	Load power supply voltage: 26.4 VDC max.; NPN/PNP (depends on model) open collector Load current: 50 mA max.; residual voltage: 1 V max.							
	Analog output	---							Control output Voltage output: 1 to 5 VDC (connected load 10 kΩ min.) Temperature characteristics 0.3% F.S./°C Response time/Repeat accuracy Super-high-speed mode: 100 μs/4.0% F.S. High-speed mode: 250 μs/4.0% F.S. Standard mode: 1 ms/2.0% F.S. High-resolution mode: 4 ms/2.0% F.S.
Response time	Super-high-speed mode	80 μs for operation and reset			100 μs for operation and reset				
	High-speed mode	250 μs for operation and reset							
	Standard mode	1 ms for operation and reset							
	High-resolution mode	4 ms for operation and reset							
Functions	Differential detection	Switchable between single edge and double edge detection mode. Single edge: Can be set to 250 μs, 500 μs, 1 ms, 10 ms, or 100 ms. Double edge: Can be set to 500 μs, 1 ms, 2 ms, 20 ms, or 200 ms.							
	Timer function	Select from OFF-delay, ON-delay, or one-shot timer. 1 ms to 5 s (1 to 20 ms set in 1-ms increments, 20 to 200 ms set in 10-ms increments, 200 ms to 1 s set in 100-ms increments, and 1 to 5 s set in 1-s increments)							
	Zero-reset	Negative values can be displayed.							
	Initial reset	Settings can be returned to defaults as required.							
	Mutual interference prevention	Possible for up to 10 Units. (See note.)							
	Counter	Switchable between up counter and down counter. Set count: 0 to 9,999,999		---					
I/O settings	External input setting (Select from teaching, power tuning, zero reset, light OFF, or counter reset.)		Output setting (Select from channel 2 output, area output, or self-diagnosis.)		Output setting (Select from channel 2 output, area output, self-diagnosis, or ATC error output.)		Analog output setting (Offset voltage can be adjusted.)		
Digital display		Select from digital incident level + threshold or six other patterns.							
Display orientation		Switching between normal/reversed display is possible.							
Ambient temperature range		Operating: Groups of 1 to 2 Amplifiers: -25°C to 55°C Groups of 3 to 10 Amplifiers: -25°C to 50°C Groups of 11 to 16 Amplifiers: -25°C to 45°C Storage: -30°C to 70°C (with no icing)							
Ambient humidity range		Operating and storage: 35% to 85% (with no condensation)							
Insulation resistance		20 MΩ at 500 VDC							
Dielectric strength		1,000 VAC at 50/60 Hz for 1 min.							
Vibration resistance		Destruction: 10 to 150 Hz, 0.7-mm double amplitude for 80 min each in X, Y, and Z directions							
Shock resistance		Destruction: 500 m/s ² , 3 times each in X, Y, Z directions							
Degree of protection		IP50 (IEC 60529)							
Connection method		Prewired cable or wire-reducing connector							
Weight (packed state)		With prewired cable: Approx. 100 g With wire-reducing connector: Approx. 55 g							
Materials	Case	Polybutylene terephthalate (PBT)							
	Cover	Polycarbonate							

Note: Communications are disabled if super-high-speed mode is selected, and the mutual interference prevention function and the communications function for the Mobile Console will not function.

