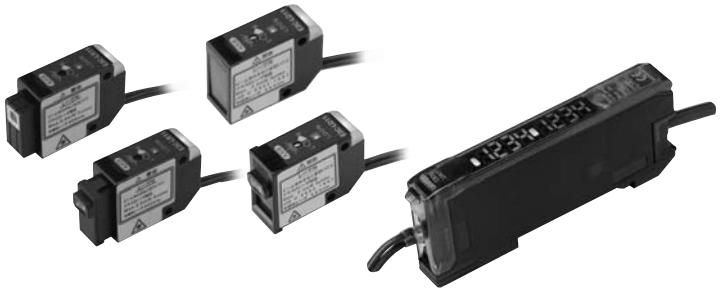
OMRON

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

E3C-LDA Series

- 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.
- The E3C-LDA0 supports an EtherCAT Sensor Communications Unit or CompoNet Sensor Communications Unit.



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

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

Pre-wired Models

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

Wire-saving Connector Models

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

* These models allow you to use an E3X-DRT21-S VER.3 Sensor Communications Unit. When using the E3X-DRT21-S VER.3, use an E3X-CN02 Connector without a Cable for the Wire-saving Connector.

Sensor Communications Unit Connector Models for EtherCAT and CompoNet

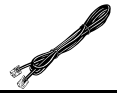
Item		Appearance	Functions	Model	Applicable Sensor Communications Unit
Advanced model	Twin-output model		Area output, self-diagnosis, differential operation	E3C-LDA0	E3X-ECT
					E3X-CRT

■ Accessories (Order Separately)

Amplifier Unit Connectors (Required for models for Wire-saving Connectors.)

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

Mobile Console

Appearance	Model	Remarks
	E3X-MC11-SV2 (model number of set) *1, *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)

*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.)

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

* Use a standard model (E39-R12/R13) if the distance from the Sensor is 400 mm or more. Use the short-distance model (E39-R14) if the distance is less than 400 mm.

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 *1			7 m 5 m 2 m *2	1,700 mm, 1,300 mm 700 mm *2	900 mm 700 mm 400 mm *2	7 m 5 m 2 m *2
Beam size*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)*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			

*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.
*4. The E3C-LR12 has a fixed beam size (the focus point cannot be changed).

Amplifier Unit

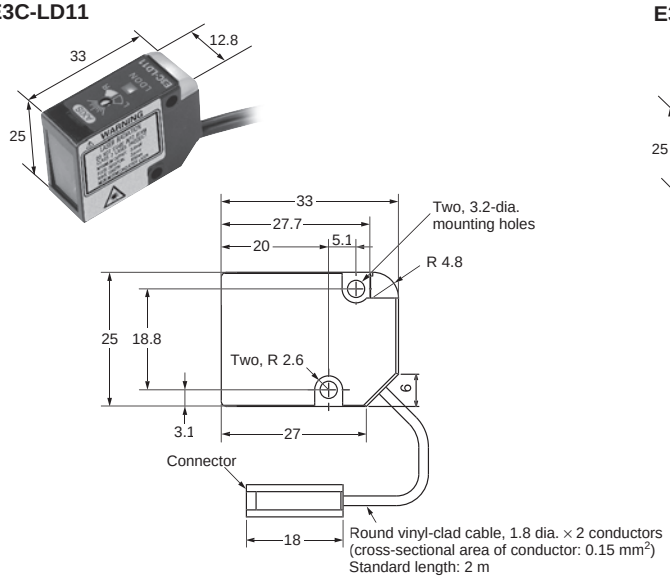
Type		External-input models		Twin-output models			ATC-output models		Analog-output models
		Standard models		Standard models		Model for Sensor Communications Unit	Standard models		Standard models
		Pre-wired	Wire-saving connector	Pre-wired	Wire-saving connector		Pre-wired	Wire-saving connector	Pre-wired
Model / Item	NPN output	E3C-LDA21	E3C-LDA7	E3C-LDA11	E3C-LDA6	E3C-LDA0[*1]	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[*2]	80 μs for operation and reset		100 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.[*2]							
	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[*3]		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[*4]		Destruction: 10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions							
Shock resistance[*5]		Destruction: 500 m/s^2, 3 times each in X, Y, and Z directions							
Degree of protection		IP50 (IEC 60529)							
Connection method[*6]		Pre-wired or wire-saving connector							
Weight (packed state)		Pre-wired Models: Approx. 100 g Wire-saving Connector Models: Approx. 55 g Sensor Communications Unit Connector Models: Approx. 55 g							
Materials	Case	Polybutylene terephthalate (PBT)							
	Cover	Polycarbonate							

*1. This model allows you to use an E3X-ECT EtherCAT Sensor Communications Unit or E3X-CRT CompoNet Sensor Communications Unit.
*2. 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.
*3. The following temperature ranges apply when an E3X-ECT EtherCAT or E3X-CRT CompoNet Sensor Communications Unit is used with the E3C-LDA0: Groups of 1 or 2 Amplifier Units: 0 to 55°C, Groups of 3 to 10 Amplifier Units: 0 to 50°C, Groups of 11 to 16 Amplifier Units: 0 to 45°C, Groups of 17 to 30 Amplifier Units (with the E3X-ECT): 0 to 40°C.
*4. The vibration resistance of the E3C-LDA0 is as follows: Destruction: 10 to 150 Hz with a 0.7-mm double amplitude for 80 min each in X, Y, and Z directions.
*5. The shock resistance of the E3C-LDA0 is as follows: Destruction: 150 m/s^2, 3 times each in X, Y, and Z directions.
*6. A connector for a Sensor Communications Unit is used to connect the E3C-LDA0.

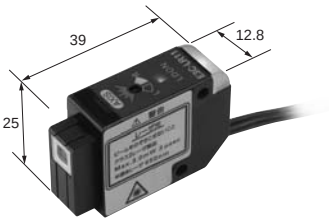
Dimensions

Sensor Head

E3C-LD11

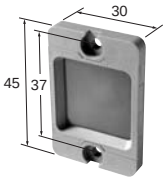


E3C-LR11

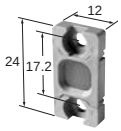


Reflector

E39-R12/-R14

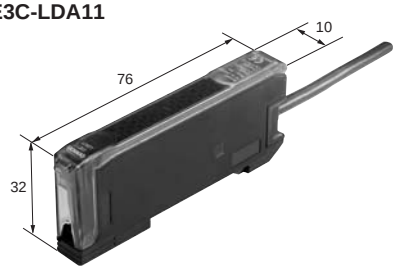


E39-R13



Amplifier Unit

E3C-LDA11



This document provides information mainly for selecting suitable models. Please read the Instruction Sheet carefully for information that the user must understand and accept before purchase, including information on warranty, limitations of liability, and precautions.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

OMRON Corporation **Industrial Automation Company**
Tokyo, JAPAN
Contact: www.ia.omron.com

Regional Headquarters
OMRON EUROPE B.V.
Sensor Business Unit
Carl-Benz-Str. 4, D-71154 Nufringen, Germany
Tel: (49) 7032-811-0/Fax: (49) 7032-811-199

OMRON ELECTRONICS LLC
One Commerce Drive Schaumburg,
IL 60173-5302 U.S.A.
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.
No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.
Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

Authorized Distributor:

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