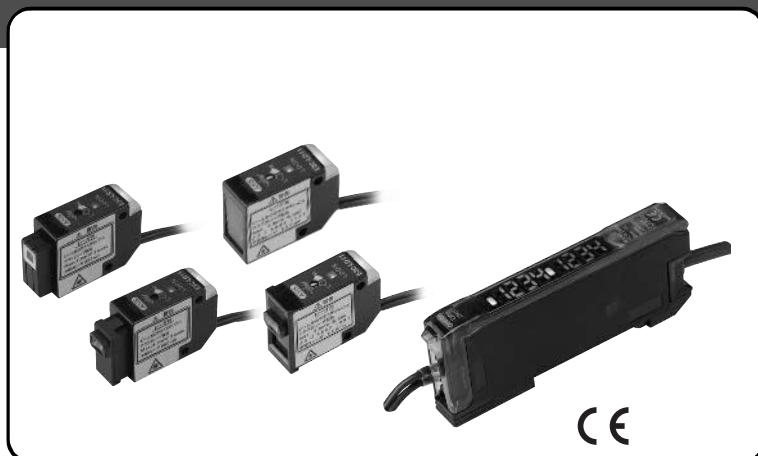


# Photoelectric Sensors with Separate Digital Amplifiers (Laser-type Amplifier Units)

# 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.



## 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

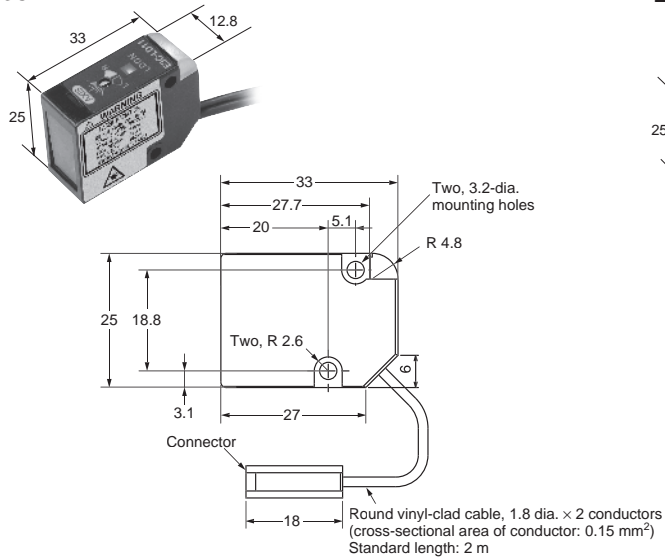
Type		External-input models		Twin-output models		ATC-output models		Analog-output models
Model	NPN output	E3C-LDA21	E3C-LDA7	E3C-LDA11	E3C-LDA6	E3C-LDA11AT	E3C-LDA6AT	E3C-LDA11AN
Item	PNP output	E3C-LDA51	E3C-LDA9	E3C-LDA41	E3C-LDA8	E3C-LDA41AT	E3C-LDA8AT	E3C-LDA41AN
Supply voltage		12 to 24 VDC ±10%, 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/s², 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.

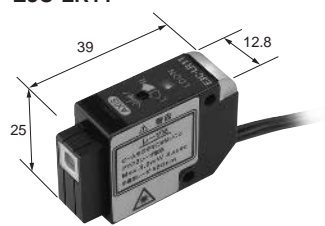
# Dimensions

## Sensor Head

E3C-LD11

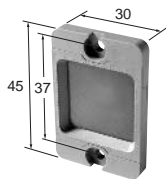


E3C-LR11

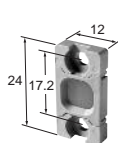


## Reflector

E39-R12/-R14

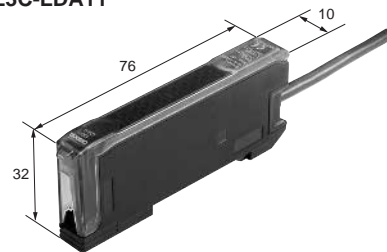


E39-R13



## 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.

Cat. No. E338-E1-04

In the interest of product improvement, specifications are subject to change without notice.

**OMRON Corporation**

Industrial Automation Company

Sensing Devices Division H.Q.

Application Sensors Division

Shiokoji Horikawa, Shimogyo-ku,

Kyoto, 600-8530 Japan

Tel: (81)75-344-7068/Fax: (81)75-344-7107

Printed in Japan

1205-0.2M (1202) (M)

## Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

## Warranty and Limitations of Liability

### WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

### LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

## Application Considerations

### SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the product.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

## Disclaimers

### CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the product may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased product.

### DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

### ERRORS AND OMISSIONS

The information in this catalog has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

### PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

### PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

### COPYRIGHT AND COPY PERMISSION

This catalog shall not be copied for sales or promotions without permission.

This catalog is protected by copyright and is intended solely for use in conjunction with the product. Please notify us before copying or reproducing this catalog in any manner, for any other purpose. If copying or transmitting this catalog to another, please copy or transmit it in its entirety.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Omron:

[E3C-LDA9](#) [E3C-LDA7](#) [E3C-LDA6](#) [E3C-LDA8](#) [E3C-LDA11AN](#) [E3C-LDA41AN](#) [E3C-LR11 4M](#) [E3X-CN21 5M](#) [E3X-CN22 5M](#) [E3X-MC11-C1-S](#)