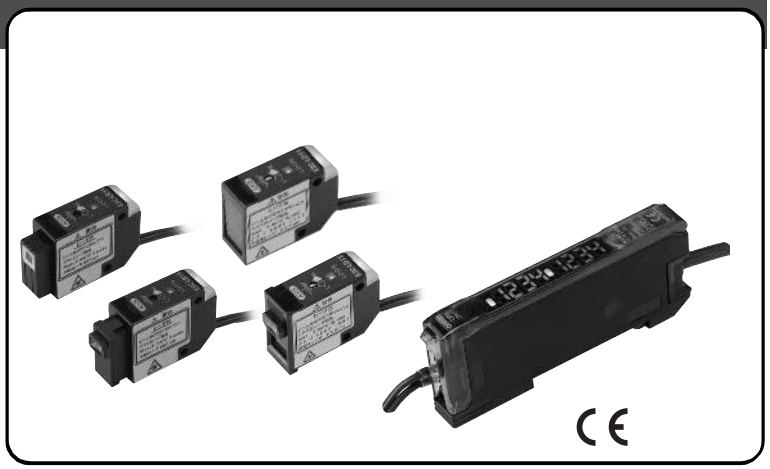
OMRON

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.



## 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) |

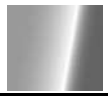
**Note 1.** Use the E3X-MC11-SV2 Mobile Console for the E3C-LDA-series Amplifier Units. Other Mobile Consoles cannot be used.
**2.** The E3X-MC11-SV2 is an upgraded version of the E3X-MC11-S, to which a corresponding Sensor Head is added. (The E3X-MC11-SV2 and E3X-MC11-S are compatible.)

## ■ 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<br>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<br>Standard mode: 30 to 700 mm<br>Super-high-speed mode: 30 to 250 mm<br>(See note 1.) | | | 7 m<br>5 m<br>2 m<br>(See note 2.) | 1,700 mm,<br>1,300 mm<br>700 mm<br>(See note 2.) | 900 mm<br>700 mm<br>400 mm<br>(See note 2.) | 7 m<br>5 m<br>2 m<br>(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<br>Front surface filter: Acrylic resin | | | Case and cover: ABS<br>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

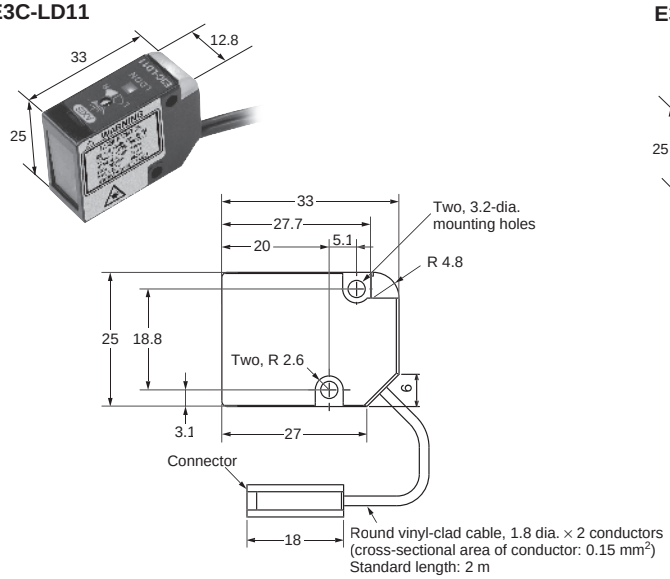
| Item | Model / Type | External-input models | | Twin-output models | | ATC-output models | | Analog-output models |
|---|---|---|---|---|---|---|---|---|
| | NPN output | E3C-LDA21 | E3C-LDA7 | E3C-LDA11 | E3C-LDA6 | E3C-LDA11AT | E3C-LDA6AT | E3C-LDA11AN |
| | PNP output | E3C-LDA51 | E3C-LDA9 | E3C-LDA41 | 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<br>Load current: 50 mA max.; residual voltage: 1 V max. | | | | | | |
| | Analog output | --- | | | | | | Control output<br>Voltage output: 1 to 5 VDC (connected load 10 kΩ min.)<br>Temperature characteristics 0.3% F.S./°C<br>Response time/Repeat accuracy<br>Super-high-speed mode: 100 µs/4.0% F.S.<br>High-speed mode: 250 µs/4.0% F.S.<br>Standard mode: 1 ms/2.0% F.S.<br>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.<br>Single edge: Can be set to 250 µs, 500 µs, 1 ms, 10 ms, or 100 ms.<br>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.<br>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.<br>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<br>Groups of 3 to 10 Amplifiers: –25°C to 50°C<br>Groups of 11 to 16 Amplifiers: –25°C to 45°C<br>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<br>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.

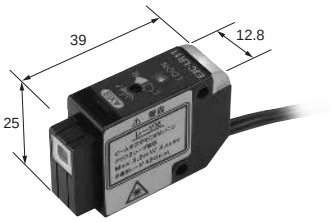
# Dimensions

## Sensor Head

**E3C-LD11**

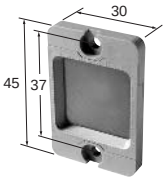



**E3C-LR11**

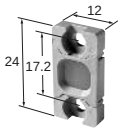



## Reflector

**E39-R12/-R14**

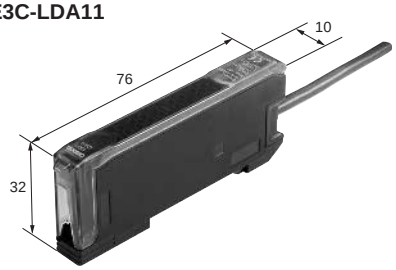



**E39-R13**




## 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.

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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.**

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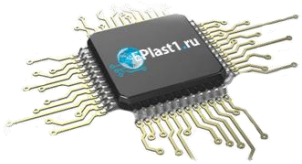


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