Photoelectric Sensor with Separate Digital Amplifier (Laser-type)

E3C-LDA

Variable Laser Beam for Spot, Line, or Area Detection

- Long-distance detection (diffuse reflective: 1 m, retro-reflective: 7 m).
- Beam shape selectable from spot, line, and area types to match various applications.
- Adjustable spot diameter.
- Adjustable optical axis.
- The E3DC-LDA0, which supports the EtherCAT Sensor Communications Unit and the CompoNet Sensor Communications Unit, is also included in product lineup.

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

Features

Diffuse Reflective Model

- All three beam types provide ample long-distance detection of 1,000 mm.

Three beam types means a wider variety of applications.

- Spot, Line, and Area Types
  Suitable for various applications without any additional costs.
  - Mount Beam Units to a Spot Type Sensor to convert to Line or Area Type.

Line Type

- E3C-LD21

Area Type

- E3C-LD31

Coaxial Retroreflective Model

- Easy Sensor Installation and Sensing Characteristics Equivalent to Through-beam Sensors.

Variable Focal Point Mechanism

- Spot diameter can be adjusted to enable ultra-high-precision positioning.

Optical Axis Adjustment Mechanism

- The sensor detection point can be easily changed.

Sensing distance of 1 m.

Sensing distance of 7 m.
Ordering Information

Sensor Heads (Dimensions → page 12, 13)

<table>
<thead>
<tr>
<th>Sensing method</th>
<th>Appearance</th>
<th>Beam shape</th>
<th>Model</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diffuse-reflective</td>
<td>Spot</td>
<td>(variable)</td>
<td>E3C-LD11 2M</td>
<td>Mounting a Beam Unit (sold separately) allows the use of line and area beams.</td>
</tr>
<tr>
<td></td>
<td>Line</td>
<td>(variable)</td>
<td>E3C-LD21 2M</td>
<td>This model number is for the set consisting of the E39-P11 mounted to the E3C-LD11.</td>
</tr>
<tr>
<td></td>
<td>Area</td>
<td>(variable)</td>
<td>E3C-LD31 2M</td>
<td>This model number is for the set consisting of the E39-P21 mounted to the E3C-LD11.</td>
</tr>
<tr>
<td>Coaxial Retro-reflective</td>
<td>Spot</td>
<td>(variable)</td>
<td>E3C-LR11* 2M</td>
<td>Mounting a Beam Unit (order separately) enables the use of line and area beams.</td>
</tr>
<tr>
<td></td>
<td>Spot (2.0-mm fixed dia.)</td>
<td></td>
<td>E3C-LR12* 2M</td>
<td>—</td>
</tr>
</tbody>
</table>

* Select a Reflector (order separately) according to the application.

Amplifier Units

Pre-wired Amplifier Units (Dimensions → page 14)

<table>
<thead>
<tr>
<th>Item</th>
<th>Appearance</th>
<th>Functions</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced models</td>
<td></td>
<td>NPN output</td>
<td>PNP output</td>
</tr>
<tr>
<td>External-input models</td>
<td></td>
<td>Remote setting</td>
<td>Counter</td>
</tr>
<tr>
<td>Twin-output models</td>
<td></td>
<td>Area output</td>
<td>Self-diagnosis</td>
</tr>
<tr>
<td>ATC function</td>
<td></td>
<td>ATC (Active Threshold Control)</td>
<td>E3C-LDA11AT 2M</td>
</tr>
<tr>
<td>Analog output</td>
<td></td>
<td>Analog output</td>
<td>E3C-LDA11AN 2M</td>
</tr>
</tbody>
</table>

Amplifier Units with Wire-saving Connectors (A Wire-saving Connector (sold separately) is required.) (Dimensions → page 15, 16)

<table>
<thead>
<tr>
<th>Item</th>
<th>Appearance</th>
<th>Functions</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced models</td>
<td></td>
<td>NPN output</td>
<td>PNP output</td>
</tr>
<tr>
<td>External-input models</td>
<td></td>
<td>Remote setting</td>
<td>Counter</td>
</tr>
<tr>
<td>Twin-output models</td>
<td></td>
<td>Area output</td>
<td>Self-diagnosis</td>
</tr>
<tr>
<td>ATC function</td>
<td></td>
<td>ATC (Active Threshold Control)</td>
<td>E3C-LDA6AT</td>
</tr>
</tbody>
</table>

* 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-CN 02 Connector without a Cable for the Wire-saving Connector.

Amplifier Unit with Connector for Sensor Communications Unit (for EtherCAT and CompoNet) (Dimensions → page 16)

<table>
<thead>
<tr>
<th>Item</th>
<th>Appearance</th>
<th>Functions</th>
<th>Model</th>
<th>Applicable Sensor Communications Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced models</td>
<td></td>
<td></td>
<td>E3C-LDA0</td>
<td>E3X-ECT</td>
</tr>
<tr>
<td>Twin-output models</td>
<td></td>
<td>Area output</td>
<td>Self-diagnosis</td>
<td>Differential operation</td>
</tr>
</tbody>
</table>

Accessories (Order Separately)

Wire-saving connectors (Required for models for Wire-saving Connectors.) *Protective stickers: provided. (Dimensions → E3X-DA-S/MDA)

<table>
<thead>
<tr>
<th>Item</th>
<th>Appearance</th>
<th>Cable length</th>
<th>No. of conductors</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master</td>
<td></td>
<td>2 m</td>
<td>4</td>
<td>E3X-CN21</td>
</tr>
<tr>
<td>Slave</td>
<td></td>
<td></td>
<td>2</td>
<td>E3X-CN22</td>
</tr>
</tbody>
</table>

Ordering Precaution for Amplifier Units with Wire-saving Connectors

Amplifier Units and Connectors are sold separately. Refer to the following tables when placing an order.

**Amplifier Unit**

<table>
<thead>
<tr>
<th>Model</th>
<th>NPN output</th>
<th>PNP output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced models</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E3C-LDA6</td>
<td>E3C-LDA8</td>
<td>E3C-LDA7</td>
</tr>
<tr>
<td>E3C-LDA6AT</td>
<td>E3C-LDA8AT</td>
<td></td>
</tr>
</tbody>
</table>

**Applicable Connector (order separately)**

<table>
<thead>
<tr>
<th>Master Connector</th>
<th>Slave Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3X-CN21</td>
<td>E3X-CN22</td>
</tr>
</tbody>
</table>

**When Using 5 Amplifier Units**

<table>
<thead>
<tr>
<th>5 Amplifier Units</th>
<th>1 Master Connector</th>
<th>4 Slave Connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mobile Console (Dimensions → E3X-DA-S/MDA)

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Model</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E3X-MC11-SV2 (model number of set)</td>
<td>Mobile Console with Head, Cable, and AC adapter provided as accessories</td>
</tr>
<tr>
<td></td>
<td>E3X-MC11-C1-SV2</td>
<td>Mobile Console</td>
</tr>
<tr>
<td></td>
<td>E3X-MC11-H1</td>
<td>Head</td>
</tr>
<tr>
<td></td>
<td>E39-Z12-1</td>
<td>Cable (1.5 m)</td>
</tr>
</tbody>
</table>

Note: Use the E3X-MC11-S Mobile Console for the E3X-LDA Series Amplifier Units. The E3X-MC11-SV2 is an upgraded version of the E3X-MC11-S that is fully interchangeable with the older model. Refer to E3X-DA-S/MDA for details.

Beam Unit (for E3C-LD11/LR11)
A Beam Unit is not provided with the Sensor and must be ordered separately as required.

<table>
<thead>
<tr>
<th>Applicable Sensor Head</th>
<th>Appearance</th>
<th>Beam shape</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3C-LD11</td>
<td>Line</td>
<td>E39-P11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Area</td>
<td>E39-P21</td>
<td></td>
</tr>
<tr>
<td>E3C-LR11</td>
<td>Line</td>
<td>E39-P31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Area</td>
<td>E39-P41</td>
<td></td>
</tr>
</tbody>
</table>

Reflectors (Required when using retro-reflective models)
A Reflector is not provided with the Sensor head. Be sure to order a Reflector separately.

<table>
<thead>
<tr>
<th>Type</th>
<th>Appearance</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard</td>
<td>E39-R12</td>
</tr>
<tr>
<td></td>
<td>Effective area: 23 × 23 mm *</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standard</td>
<td>E39-R13</td>
</tr>
<tr>
<td></td>
<td>Effective area: 7 × 7 mm *</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transparent object detection</td>
<td>E39-R14</td>
</tr>
<tr>
<td></td>
<td>Effective area: 23 × 23 mm *</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sheet (cuttable)</td>
<td>E39-RS4</td>
</tr>
<tr>
<td></td>
<td>Effective area: 195 × 22 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sheet (cuttable)</td>
<td>E39-RS5</td>
</tr>
<tr>
<td></td>
<td>Effective area: 108 × 46 mm</td>
<td></td>
</tr>
</tbody>
</table>

Note: For details, refer to Reflectors → E39-L/E39-S/E39-R

* 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.

Mounting Bracket
A Mounting Bracket is not provided with the Amplifier Unit and must be ordered separately as required.

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E39-L143</td>
<td>1</td>
</tr>
</tbody>
</table>

End Plate
A End Plate is not provided with the Amplifier Unit and must be ordered separately as required.

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PFP-M</td>
<td>1</td>
</tr>
</tbody>
</table>
### Sensor Heads

**Light source (wavelength)**
- **Diffuse-reflective**: Red semiconductor laser diode (650 nm), 3 mW max. (JIS Class 2, IEC/EN Class 2, and FDA Class 2)
- **Coaxial Retro-reflective (with M.S.R. function)**: Red semiconductor laser diode (650 nm), 3 mW max. (JIS Class 2, IEC/EN Class 2, and FDA Class 2)

**Sensing distance**
- **Diffuse-reflective**: High-resolution mode: 30 to 1,000 mm<br>Standard mode: 30 to 700 mm<br>Super-high-speed mode: 30 to 250 mm *1
- **Coaxial Retro-reflective (with M.S.R. function)**: 7 m<br>5 m *2<br>1,700 mm<br>1,300 mm *2<br>700 mm<br>900 mm<br>700 mm *2

**Focus** *3
- **Diffuse-reflective**: 0.8 mm max. (at distances up to 300 mm)<br>33 mm (at 150 mm)<br>33 × 15 mm (at 150 mm)<br>0.8 mm max. (at distances up to 1,000 mm)<br>28 mm (at 150 mm)<br>28 × 16 mm (at 150 mm)<br>2.0-mm dia. (at distance up to 1,000 mm)
- **Coaxial Retro-reflective (with M.S.R. function)**: 2.0-mm dia. (at distance up to 1,000 mm)

**Functions**
- Variable focal point mechanism (focus adjustment) *4, optical axis adjustment mechanism (axis adjustment)

**Indicators**
- LDON indicator: Green; Operation indicator: Orange

**Ambient illumination (Receiver side)**
- Incandescent lamp: 3,000 lx

**Ambient temperature**
- Operating: −10 to 55°C, Storage: −25 to 70°C (with no icing or condensation)

**Ambient humidity**
- Operating/storage: 35% to 85% (with no condensation)

**Insulation resistance**
- 20 MΩ min. at 500 VDC

**Dielectric strength**
- 1,000 VAC at 50/60 Hz for 1 minute

**Shock resistance**
- Destruction: 300 m/s² 6 directions 3 times each (up/down, right/left, forward/backward)

**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**
- IP40 (IEC) IP40 (IEC 60529)

**Connection method**
- Connector (standard cable length: 2 m)

**Materials**
- Case and cover: ABS<br>Front surface filter: Methacrylic resin<br>Case and cover: ABS<br>Front surface filter: Glass

**Weight (packed state)**
- Approx. 85 g<br>Approx. 100 g

**Accessories**
- Instruction manual, Laser warning labels (English)

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*1. Sensing distance values are for white paper.
*2. These sensing distance 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/e² (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 focal point cannot be changed).
### Amplifier Units

<table>
<thead>
<tr>
<th>Item</th>
<th>Model Type</th>
<th>External-input models</th>
<th>Twin-output models</th>
<th>ATC-output models</th>
<th>Analog-output models</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Standard models</td>
<td>Standard models</td>
<td>Model for Sensor Communications Unit</td>
<td>Standard models</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-wired</td>
<td>Pre-wired</td>
<td>Pre-wired</td>
<td>Pre-wired</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wire-saving</td>
<td>Wire-saving</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPN output</td>
<td>E3C-LDA21</td>
<td>E3C-LDA7</td>
<td>E3C-LDA11</td>
<td>E3C-LDA6</td>
<td>E3C-LDA11AT</td>
</tr>
<tr>
<td></td>
<td>E3C-LDA41AT</td>
<td>E3C-LDA6AT</td>
<td>E3C-LDA11AN</td>
<td>E3C-LDA6AT</td>
<td>E3C-LDA11AN</td>
</tr>
<tr>
<td>PNP output</td>
<td>E3C-LDAC1</td>
<td>E3C-LDAC9</td>
<td>E3C-LDAC11</td>
<td>E3C-LDAC8</td>
<td>E3C-LDAC41AT</td>
</tr>
<tr>
<td></td>
<td>E3C-LDAC8AT</td>
<td>E3C-LDAC8AT</td>
<td>E3C-LDAC11AN</td>
<td>E3C-LDAC8AT</td>
<td>E3C-LDAC11AN</td>
</tr>
</tbody>
</table>

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)

*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/s², 3 times each in X, Y, and Z directions.

*6. A connector for a Sensor Communications Unit is used to connect the E3C-LDA0.
Engineering Data (Reference Value)

Minimum Beam Diameter vs. Sensing Distance

E3C-LD11

Beam diameter (μm)

Distance (mm)

E3C-LR11

Beam diameter (μm)

Distance (mm)

E3C-LR12

Beam diameter (μm)

Distance (mm)

Beam Shape vs. Sensing Distance

E3C-LD21

Beam shape X/Y (mm)

Distance (mm)

E3C-LD31

Beam shape X/Y (mm)

Distance (mm)

Note: The dashed lines indicate non-visible regions of the beam shape.

Differential Travel vs. Sensing Distance

E3C-LD

Differential travel (mm)

Distance (mm)
## I/O Circuit Diagrams

### NPN Output

<table>
<thead>
<tr>
<th>Model</th>
<th>Operation mode</th>
<th>Timing charts</th>
<th>Mode selector switch</th>
<th>Output circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3C-LDA11</td>
<td>Light-ON</td>
<td></td>
<td></td>
<td>L-ON (LIGHT ON)</td>
</tr>
<tr>
<td>E3C-LDA6</td>
<td>Light-ON</td>
<td></td>
<td></td>
<td>L-ON (LIGHT ON)</td>
</tr>
<tr>
<td>E3C-LDA11AT</td>
<td>Light-ON</td>
<td></td>
<td></td>
<td>L-ON (LIGHT ON)</td>
</tr>
<tr>
<td>E3C-LDA6AT</td>
<td>Light-ON</td>
<td></td>
<td></td>
<td>L-ON (LIGHT ON)</td>
</tr>
<tr>
<td>Dark-ON</td>
<td></td>
<td></td>
<td></td>
<td>D-ON (DARK ON)</td>
</tr>
<tr>
<td>E3C-LDA21</td>
<td>Light-ON</td>
<td></td>
<td></td>
<td>L-ON (LIGHT ON)</td>
</tr>
<tr>
<td>E3C-LDA7</td>
<td>Light-ON</td>
<td></td>
<td></td>
<td>L-ON (LIGHT ON)</td>
</tr>
<tr>
<td>Dark-ON</td>
<td></td>
<td></td>
<td></td>
<td>D-ON (DARK ON)</td>
</tr>
<tr>
<td>E3C-LDA11AN</td>
<td>Light-ON</td>
<td></td>
<td></td>
<td>L-ON (LIGHT ON)</td>
</tr>
<tr>
<td>Dark-ON</td>
<td></td>
<td></td>
<td></td>
<td>D-ON (DARK ON)</td>
</tr>
</tbody>
</table>
**PNP Output**

<table>
<thead>
<tr>
<th>Model</th>
<th>Operation mode</th>
<th>Timing charts</th>
<th>Mode selector switch</th>
<th>Output circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3C-LDA41</td>
<td>Light-ON</td>
<td>ch1/ Incident light</td>
<td>L-ON (LIGHT ON)</td>
<td></td>
</tr>
<tr>
<td>E3C-LDA8</td>
<td>Dark-ON</td>
<td>ch2/ No incident light</td>
<td>D-ON (DARK ON)</td>
<td></td>
</tr>
<tr>
<td>E3C-LDA41AT</td>
<td>Light-ON</td>
<td>Incident light</td>
<td>L-ON (LIGHT ON)</td>
<td></td>
</tr>
<tr>
<td>E3C-LDA8AT</td>
<td>Dark-ON</td>
<td>No incident light</td>
<td>D-ON (DARK ON)</td>
<td></td>
</tr>
<tr>
<td>E3C-LDA51</td>
<td>Light-ON</td>
<td>Incident light</td>
<td>L-ON (LIGHT ON)</td>
<td></td>
</tr>
<tr>
<td>E3C-LDA9</td>
<td>Dark-ON</td>
<td>No incident light</td>
<td>D-ON (DARK ON)</td>
<td></td>
</tr>
<tr>
<td>E3C-LDA41AN</td>
<td>Light-ON</td>
<td>Incident light</td>
<td>L-ON (LIGHT ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dark-ON</td>
<td>No incident light</td>
<td>D-ON (DARK ON)</td>
<td></td>
</tr>
</tbody>
</table>
Nomenclature

Amplifier Units
**Twin Output Models**
(E3C-LDA11/LDA41/LDA6/LDA8/LDA0)

**External Input Models**
(E3C-LDA21/LDA51/LDA7/LDA9)

Safety Precautions

Refer to the *Photoelectric Sensors Technical Guide*.

**WARNING**
This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purpose.

Never look into the laser beam. Doing so continuously will result in visual impairment.

**Precautions for Safe Use**
The following rules are required to ensure safety. Be sure to observe these rules.

1. **Installation environment**
   - Do not use in an environment where combustible or explosive gas is present.
   - To ensure safe operation and maintenance of the product, install it away from high-voltage devices and power devices.

2. **Power supply and wiring**
   - Do not exceed the rated voltage (12 to 24 VDC ±10%).
   - Do not remove a connector while it is supplying power. This may damage the product.

3. **Other points**
   - Do not attempt to disassemble, repair, or modify the product.
   - When disposing of the product, treat it as industrial waste.
Precautions for Correct Use

Do not use the product in atmospheres or environments that exceed product ratings.

Official laser safety measures have been established regarding laser devices both inside and outside of Japan. For details, refer to Laser Beam Safety Standards.

Amplifier Units

Designing

Operation after Turning Power ON

The Amplifier Unit is ready to operate within 200 ms after the power supply is turned ON. If the Sensor and load are connected to power supplies separately, be sure to turn ON the power supply to the Sensor first.

Cleaning

Do not use thinner, benzene, acetone, or kerosene. If the filter on the front of the sensor becomes soiled with dust, oil droplets, or other materials,

(a) Use a blower brush (used to clean camera lenses) to blow large dust particles from the surface. Do not blow the dust away with your mouth.
(b) Use a soft cloth (for cleaning lenses) with a little alcohol to remove the remaining dust.

Note: Do not use a scrubbing action when cleaning as a scratch on the filter could result in the Sensor malfunctioning.

About the object

Measurement may not be possible or may not be precise with some types of object materials and shapes (such as transparent objects, objects with extremely low reflectance, objects smaller than the beam diameter, objects with a large curvature, highly tilted objects, etc).

Mounting

Mounting and removing the sensor head

1. Open the protective cover.
2. With the locking lever on the sensor head connector facing up, insert the connector into the connector opening.

To remove the connector, press down on the locking lever and pull the connector out.

Connecting and Disconnecting Connectors

(Mounting Connectors)

1. Insert the Master or Slave Connector into the Amplifier Unit until it clicks into place.
2. Attach the protector seals (provided as accessories) to the sides of master and slave connectors that are not connected.

Note: Attach the seals to the sides with grooves.

(Removing Connectors)

1. Slide the slave Amplifier Unit(s) for which the Connector is to be removed away from the rest of the group.
2. After the Amplifier Unit(s) has been separated, press down on the lever on the Connector and remove it. (Do not attempt to remove Connectors without separating them from other Amplifier Units first.)
Mounting and Removing Amplifier Units

(Mounting Amplifier Units)
1. Mount the Amplifier Units one at a time onto the DIN track.

![Diagram of Amplifier Units being mounted on DIN track]

2. Slide the Amplifier Units together, line up the clips, and press the Amplifier Units together until they click into place.

(Separating Amplifier Units)
Slide Amplifier Units away from each other, and remove from the DIN track one at a time. (Do not attempt to remove Amplifier Units from the DIN track without separating them first.)

Note: 1. The specifications for ambient temperature will vary according to the number of Amplifier Units used together. For details, refer to Ratings and Specifications on page 5.
2. Always turn OFF the power supply before mounting or separating Amplifier Units.

Mounting the End Plate (PFP-M)
An End Plate should be used if there is a possibility of the Amplifier Unit moving, e.g., due to vibration. If a Mobile Console is going to be mounted, connect the End Plate in the direction shown in the following diagram.

Mounting the Mobile Console Head
Leave a gap of at least 20 mm between the nearest Amplifier Unit and the Mobile Console head.

Beam shape adjustment function
The shape of the beam at each sensing distance can be adjusted by turning the beam shape control.

(E3C-LD11/LR11)
Turn the control to the left to adjust the focal position to short distance detection. Turn the control to the right to adjust the focal position to long distance detection.

(E3C-LD21)
Turn the control to the left to decrease the beam width. Turn the control to the right to increase the beam width.

(E3C-LD31)
Turn the control to the left to decrease the beam area. Turn the control to the right to increase the beam area. Do not turn the beam shape control to more than 60 mN·m. Otherwise, this may damage the unit.

Optical axis alignment function
The angle of beam projection can be adjusted by turning the optical axis alignment control.

Turning the control about 45° to the right will move the optical axis to the left by the number of degrees shown below.

Turning the control about 45° to the left will move the optical axis to the right by the number of degrees shown below.

If the act of adjusting the optical axis changes the beam shape, adjust the beam shape again. Turning the control 180° will return the optical axis to its original position.

Adjustment angle

<table>
<thead>
<tr>
<th>Model</th>
<th>Adjustment Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3C-LR11</td>
<td>Approx. 1.5°</td>
</tr>
<tr>
<td>E3C-LR12</td>
<td>Approx. 1.0°</td>
</tr>
<tr>
<td>E3C-LD22</td>
<td>Approx. 2.0°</td>
</tr>
</tbody>
</table>

EEPROM Writing Error
If the data is not written to the EEPROM correctly due to a power failure or static-electric noise, initialize the settings with the keys on the Amplifier Unit. ERR/EEP will flash on the display when a writing error has occurred.

Optical Communications
Several Amplifier Units can be slid together and used in groups. Do not, however, slide the Amplifier Units or attempt to remove any of the Amplifier Units during operation.

● Other Precautions

Protective Cover
Always keep the protective cover in place when using the Amplifier Unit.

Mobile Console
Use the E3X-MC11-C1-SV2 Mobile Console for the E3C-LDA-series Amplifier Units.

● Adjustments

Mutual Interference Protection Function
There may be some instability in the digital display values due to light from other sensors. If this occurs, decrease the sensitivity (i.e., decrease the power or increase the threshold) to perform stable detection.
Dimensions

Sensor Heads

E3C-LD11

E3C-LD21

E3C-LD31

With Beam Unit Attached

Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.
**E3C-LR11/-LR12**

Emitter/Receiver:
- 2.2 dia.
- 3.1
- 7
- 8.8
- 3 dia.
- 15.8

Connector:
- 6

1.8-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.15 mm²).
Standard length: 2 m

**FOCUS control**
(Beam shape control)
*The E3C-LR12 does not have FOCUS control.*

**AXIS control**
(Optical axis alignment control)

**LD ON indicator**
Operation indicator

**2.7 dia.**

**6.6**

**R4.8**

Two, 3.2-dia. mounting holes

**26**

**33**

**39**

**18.8**

**20.9**

**24.5**

**12.8**

**13.2**

**12.8**

**2.7 dia.**

**24.5**

**6.6**

**18.7**

**2.7 dia.**

**13.2**

**12.8**

**18.7**

**2.7 dia.**

**13.2**

**12.8**

**18.7**

LD ON indicator
Operation indicator
Amplifier Units

Pre-wired Amplifier Units
E3C-LDA11
E3C-LDA21
E3C-LDA41
E3C-LDA51
E3C-LDA11AT
E3C-LDA41AT
E3C-LDA11AN
E3C-LDA41AN

With Mounting Bracket Attached

* The Mounting Bracket can also be used on side A.

Mounting Bracket (E39-L143) (Order separately)
SUS304 stainless steel

Hole for optical communications

Two, 3.2-dia. mounting holes

Connector

Mounting Holes

Two, M3

Main display
Round (●): Power tuning indicator
Oblong (□): 2nd operation indicator

Operation indicator

Sub-display

4 dia. vinyl-insulated round cable with 4 conductors (Conductor cross section: 0.2 mm², Insulation diameter: 1.1 mm), Standard length: 2 m

Pre-wired Amplifier Units
E3C-LDA11
E3C-LDA21
E3C-LDA41
E3C-LDA51
E3C-LDA11AT
E3C-LDA41AT
E3C-LDA11AN
E3C-LDA41AN
Amplifier Units with Wire-saving Connectors

E3C-LDA6
E3C-LDA7
E3C-LDA8
E3C-LDA9
E3C-LDA6AT
E3C-LDA8AT

Connector

Main display
Operation indicator
Sub-display

Round (o): Power tuning indicator
Oblong (g): 2nd operation indicator

With Mounting Bracket Attached

Mounting Bracket (E39-L143) (Order separately)
SUS304 stainless steel

Connector
E3X-CN21
E3X-CN22

* The Mounting Bracket can also be used on side A.

Mounting Holes

Two, M3

Mounting Holes

4.1
13.8

10
9.9

34.1
34.8

34.1
16

32
3.4

2.5
50.3

92.7
38.8

3.9 × 3
= 11.7

3.9 × 3
= 11.7

21.1
18.15

15.96

4 dia.
**Amplifier Units with Wire-saving Connectors**

- E3C-LDA6
- E3C-LDA7
- E3C-LDA8
- E3C-LDA9
- E3C-LDA6AT
- E3C-LDA8AT

* Cable diameters are as follows:
  - E3X-CN12 2.6 dia.
  - E3X-CN22 4.0 dia.

**Amplifier Unit with Connector for Sensor Communications Unit**

- E3C-LDA0

**Accessories (Order Separately)**

- **Reflectors**
  Refer to E39-S/E39-R for details.

- **Mounting Bracket**
  Refer to E39-L for details.

- **End Plate**
  Refer to DIN rail for details.

- **Wire-saving connector**
  Refer to E3X-DA-S/MDA for details.

- **Mobile Console**
  Refer to E3X-DA-S/MDA for details.
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