

E3X-DA-N

Digital Fiber Amplifier

Amplifier

- Select from Three Clear Display Methods:
Digital incident level
Digital percent level
LED Bar Display
- Save-wiring Connector
- Auto Power Control

Mobile Console

- Remote Tuning and Adjustment
- “Copy and Paste” Function
- “Mode Lock” Function

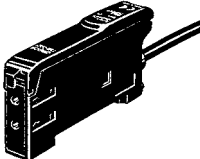
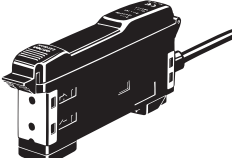
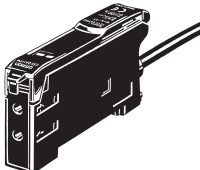


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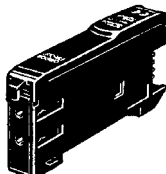
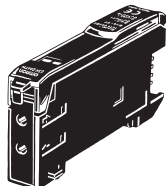
Amplifier Units, Connectors, Mobile Console, and Accessories

■ Amplifier Units

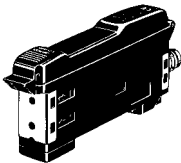
Amplifier Units with Cables

| Item | | Appearance | Control output | Model | |
|------------------------|-----------|---|---------------------------------|-------------|-------------|
| | | | | NPN output | PNP output |
| Standard models | |  | ON/OFF output | E3X-DA11-N | E3X-DA41-N |
| Monitor-output models | | | ON/OFF output Monitor output | E3X-DA21-N | E3X-DA51-N |
| Mark-detecting models | Blue LED | | ON/OFF output | E3X-DAB11-N | E3X-DAB41-N |
| | Green LED | | | E3X-DAG11-N | E3X-DAG41-N |
| Infrared models | | | | E3X-DAH11-N | E3X-DAH41-N |
| Water-resistant models | |  | | E3X-DA11V | E3X-DA41V |
| Twin-output models | |  | | E3X-DA11TW | E3X-DA41TW |

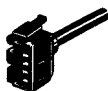

Amplifier Units with Standard Connectors

| Item | | Appearance | Applicable Connector (order separately) | | Control output | Model | |
|-----------------------|-----------|---|---|----------|---------------------------------|------------|------------|
| | | | | | | NPN output | PNP output |
| Standard models | |  | Master | E3X-CN11 | ON/OFF output | E3X-DA6 | E3X-DA8 |
| | | | Slave | E3X-CN12 | | | |
| Monitor-output models | | | Master | E3X-CN21 | ON/OFF output Monitor output | E3X-DA7 | E3X-DA9 |
| | | | Slave | E3X-CN22 | | | |
| Mark-detecting models | Blue LED | | Master | E3X-CN11 | ON/OFF output | E3X-DAB6 | E3X-DAB8 |
| | | | Slave | E3X-CN12 | | | |
| | Green LED | | Master | E3X-CN11 | | E3X-DAG6 | E3X-DAG8 |
| | | | | Slave | | | |
| Infrared models | | | Master | E3X-CN11 | | E3X-DAH6 | E3X-DAH8 |
| | | | Slave | E3X-CN12 | | | |
| Twin-output models | |  | Master | E3X-CN21 | | E3X-DA6TW | E3X-DA8TW |
| | | | Slave | E3X-CN22 | | | |

Amplifier Units with M8 Connectors



| Item | | Appearance | Applicable Connector (order separately) | Control output | Model | |
|-----------------|--|--|---|----------------|------------|------------|
| | | | | | NPN output | PNP output |
| Standard models | |  | XS3F-M421-40□-A XS3F-M422-40□-A | ON/OFF output | E3X-DA14V | E3X-DA44V |

■ Amplifier Unit Connectors (Order Separately)



| Item | Appearance | Cable length | No. of conductors | Model |
|------------------|---|--------------|-------------------|----------|
| Master Connector |  | 2 m | 3 | E3X-CN11 |
| | | | 4 | E3X-CN21 |
| Slave Connector |  | | 1 | E3X-CN12 |
| | | | 2 | E3X-CN22 |

Note Stickers for Connectors are included as accessories.

■ Sensor I/O Connectors (Order Separately)

| Size | Cable specifications | Appearance | Cable type | | Model |
|------|----------------------|---|------------|-----------------|-----------------|
| M8 | Standard cable | Straight connector  | 2 m | Four-core cable | XS3F-M421-402-A |
| | | | 5 m | | XS3F-M421-405-A |
| | | L-shaped connector  | 2 m | | XS3F-M422-402-A |
| | | | 5 m | | XS3F-M422-405-A |

■ Mobile Console (Order Separately)

| Appearance | Model | Remarks |
|---|-------------|---|
|  | E3X-MC11 | Mobile Console with head, cable, and AC adapter provided as accessories. Power supply method: chargeable battery |
|  | E3X-MC11-C1 | Mobile Console |
|  | E3X-MC11-H1 | Head |
|  | E39-Z12-1 | Cable (1.5 m) |

■ Combining Amplifier Units and Connectors

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

| Amplifier Units | | |
|-----------------------|-----------|-----------|
| Type | NPN | PNP |
| Standard models | E3X-DA6 | E3X-DA8 |
| Mark-detecting models | E3X-DAB6 | E3X-DAB8 |
| | E3X-DAG6 | E3X-DAG8 |
| Infrared models | E3X-DAH6 | E3X-DAH8 |
| Monitor-output models | E3X-DA7 | E3X-DA9 |
| Twin-output models | E3X-DA6TW | E3X-DA8TW |

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| Applicable Connectors (Order Separately) | |
|--|-------------------|
| Master Connector | Slave Connector |
| E3X-CN11 (3-wire) | E3X-CN12 (1-wire) |
| E3X-CN21 (4-wire) | E3X-CN22 (2-wire) |

When Using 5 Amplifier Units

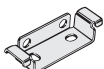
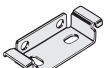
| |
|---------------------------|
| Amplifier Units (5 Units) |
|---------------------------|

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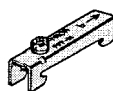
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|---|
| 1 Master Connector + 4 Slave Connectors |
|---|

■ Accessories (Order Separately)

Mounting Brackets

| Appearance | Applicable model | Model | Quantity |
|---|----------------------|----------|----------|
|  | E3X-DA□-N E3X-DA□ | E39-L143 | 1 |
|  | E3X-DA□V | E39-L148 | 1 |

End Plate

| Appearance | Model | Quantity |
|--|-------|----------|
|  | PFP-M | 1 |

Operating Instructions Sticker

| Model | Remarks |
|--------|-------------------------|
| E39-Y1 | Attach near the sensor. |

Specifications: Amplifier Units

■ Ratings/Characteristics

Amplifier Units with Cables

| Item | | Standard models | Monitor-output models | Mark-detecting models | | Infrared models | Water-resistant models | Twin-output models |
|--------------------------------------|-------------------------------|---|---|-----------------------|--------------------|-----------------------|---|---|
| Output type | NPN output | E3X-DA11-N | E3X-DA21-N | E3X-DAB11-N | E3X-DAG11-N | E3X-DAH11-N | E3X-DA11V | E3X-DA11TW |
| | PNP output | E3X-DA41-N | E3X-DA51-N | E3X-DAB41-N | E3X-DAG41-N | E3X-DAH41-N | E3X-DA41V | E3X-DA41TW |
| Light source (wavelength) | | Red LED (660 nm) | | Blue LED (470 nm) | Green LED (525 nm) | Infrared LED (870 nm) | Red LED (660 nm) | |
| Supply Voltage | | 12 to 24 VDC ± 10%, ripple (p-p) 10% max. | | | | | | |
| Power consumption | | Normally: 960 mW max. (current consumption: 40 mA max. at power supply voltage of 24 VDC) Eco Mode: 720 mW max. (current consumption: 30 mA max. at power supply voltage of 24 VDC) Digital display not lit: 600 mW max. (current consumption: 25 mA max. at power supply voltage of 24 VDC) | | | | | | |
| Control output | ON/OFF output | NPN/PNP (depends on model) open collector; load current: 50 mA max.; residual voltage: 1 V max.; Light ON/Dark ON mode selector | | | | | | |
| | Monitor output | --- | Load 1 to 5 VDC, 10 kΩ min. | --- | | | | |
| Circuit protection | | Reverse polarity, output short-circuit, mutual interference prevention (supported for up to 10 Units) | | | | | | |
| Response time | | Super-high-speed mode: 0.25 ms for operation and reset respectively Standard mode: 1 ms for operation and reset respectively Super-long-distance mode: 4 ms for operation and reset respectively | | | | | | Super-high-speed mode: 0.5 ms for operation and reset respectively Standard mode: 2 ms for operation and reset respectively Super-long-distance mode: 7 ms for operation and reset respectively |
| Sensitivity setting | | Teaching or manual method | | | | | | |
| Functions | Timer function | OFF-delay timer: 0 to 200 ms, 1 to 20 ms (set in 1 ms units); 20 to 200 ms (set in 5 ms units) | | | | | | |
| | Automatic power control (APC) | Fiber-optic current digital control | | | --- | | | Fiber-optic current digital control |
| | Zero-reset | Display can be reset to zero when required (negative values can be displayed). | | | | | | |
| | Initial reset | Settings can be returned to defaults as required. | | | | | | |
| | Monitor focus | --- | Upper and lower limits can be set as required for every 100 digital values. | --- | | | | |
| Display | | Operation indicator (orange), 7-segment digital incident level display (red), 7-segment digital incident level percentage display (red), threshold and excess gain 2-color indication bar (green and red), 7-segment digital threshold display (red) | | | | | | |
| Display timing | | Switching between normal/peak-hold/bottom-hold possible | | | | | | |
| Display orientation | | Switching between normal/reverse possible | | | | | | |
| Optical axis adjustment | | Optical axis adjustment possible (hyper-flashing function) | | | | | | |
| Ambient illumination (receiver side) | | Incandescent lamp: 10,000 lux max. Sunlight: 20,000 lux max. | | | | | | |
| Ambient temperature | | Operating: Groups of 1 to 3 Amplifiers: -25°C to 55°C Groups of 4 to 11 Amplifiers: -25°C to 50°C Groups of 12 to 16 Amplifiers: -25°C to 45°C (with no icing or condensation) Storage: -30°C to 70°C (with no icing or condensation) | | | | | | |
| Ambient humidity | | Operating and storage: 35% to 85% (with no condensation) | | | | | | |
| Insulation resistance | | 20 MΩ min. (at 500 VDC) | | | | | | |
| Dielectric strength (destruction) | | 1,000 VAC at 50/60 Hz for 1 minute | | | | | | |
| Vibration resistance (destruction) | | 10 to 55 Hz with a 1.5-mm double amplitude for 2 hrs each in X, Y and Z directions | | | | | | |
| Shock resistance (destruction) | | 500 m/s ² , for 3 times each in X, Y and Z directions | | | | | | |
| Enclosure rating | | IEC 60529 IP50 (with Protective Cover attached) | | | | | IEC 60529 IP66 (with Protective Cover attached) | IEC 60529 IP50 (with Protective Cover attached) |
| Connection method | | Pre-wired (standard cable length: 2 m) | | | | | | |
| Weight (packed state) | | Approx. 100 g | | | | | Approx. 110 g | Approx. 100 g |
| Material | Case | Polybutylene terephthalate (PBT) | | | | | | |
| | Cover | Polycarbonate | | | | | Polyethersulfone | Polycarbonate |
| Accessories | | Instruction sheet | | | | | | |

Amplifier Units with Connectors

(Specifications different to those for Amplifier Units with cables)

| Item | | Standard models | Monitor-output models | Mark-detecting models | | Infrared models | Water-resistant models (See note.) | Twin-output models |
|-----------------------|------------|--------------------|-----------------------|-----------------------|----------|-----------------|------------------------------------|--------------------|
| Output type | NPN output | E3X-DA6 | E3X-DA7 | E3X-DAB6 | E3X-DAG6 | E3X-DAH6 | E3X-DA14V | E3X-DA6TW |
| | PNP output | E3X-DA8 | E3X-DA9 | E3X-DAB8 | E3X-DAG8 | E3X-DAH8 | E3X-DA44V | E3X-DA8TW |
| Connection method | | Standard connector | | | | | M8 connector | Standard connector |
| Weight (packed state) | | Approx. 55 g | | | | | Approx. 65 g | Approx. 55 g |

Note: The dielectric strength for water-resistant models is 500 VAC at 50/60 Hz for 1 minute.

Connectors

| Item | | E3X-CN11/21/22 | E3X-CN12 |
|-----------------------|----------|---|--------------|
| Rated current | | 2.5 A | |
| Rated voltage | | 50 V | |
| Contact resistance | | 20 mΩ max. (20 mVDC max., 100 mA max.) (See note 1.) | |
| No. of insertions | | 50 times (See note 2.) | |
| Material | Housing | Polybutylene terephthalate (PBT) | |
| | Contacts | Phosphor bronze/gold-plated nickel | |
| Weight (packed state) | | Approx. 55 g | Approx. 25 g |

Note: 1. The figure is for connection to the Amplifier Unit and the adjacent Connector. It does not include the conductor resistance of the cable.
2. The figure for the number of insertions is for connection to the Amplifier Unit and the adjacent Connector.

Mobile Console


| Item | E3X-MC11 |
|-----------------------|--|
| Supply voltage | Charged with AC adapter |
| Connection method | Connected via adapter |
| Weight (packed state) | Approx. 580 g (Console only: 120 g) |

Ordering Information: Fiber Units


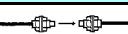










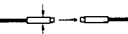




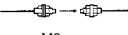

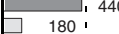


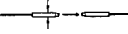

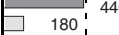


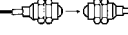

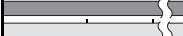
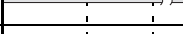

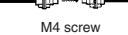


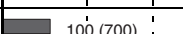









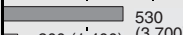
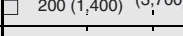



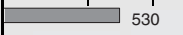


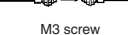




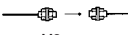







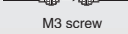



■ Through-beam Fiber Units

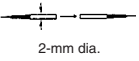
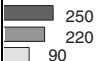
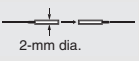
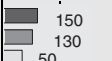
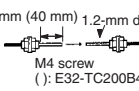
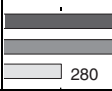
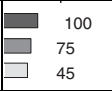
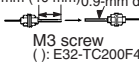
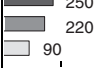
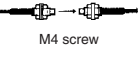
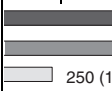
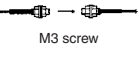
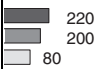
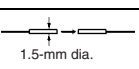
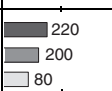

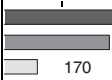
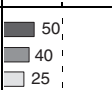
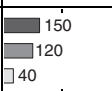

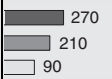



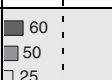

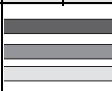
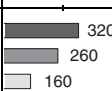
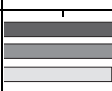
Refer to the end of the following table for notes and precautions.

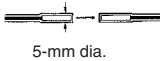
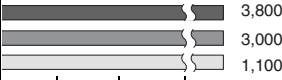

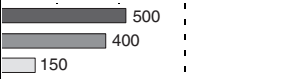
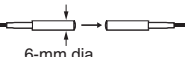
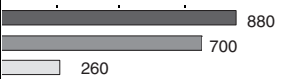
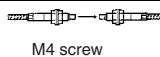
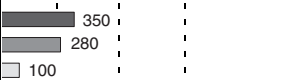
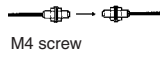

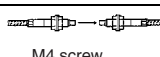
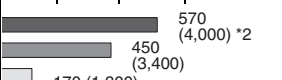

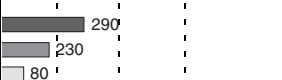
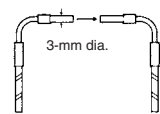
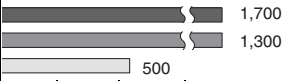



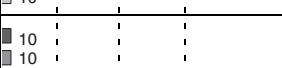
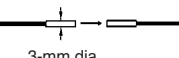
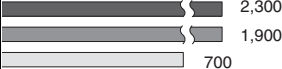


Note: Specifications for the E3X-DA□V and E3X-DA□TW are included in those for the E3X-DA□N, and specifications for the E3X-DAG□N are included in those for the E3X-DAB□N.

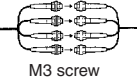
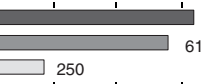
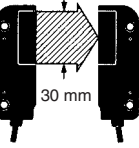
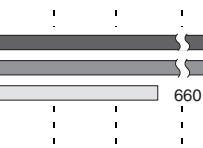
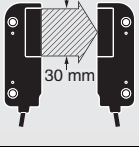
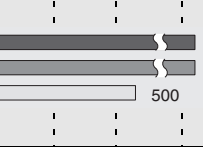
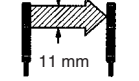
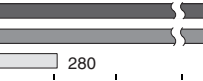
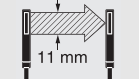
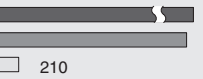
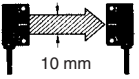

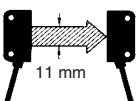
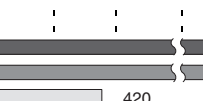
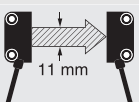
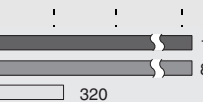
 Indicates models that allow free cutting. Models without this mark do not allow free cutting.

 : Super-long-distance mode  : Standard mode  : Super-high-speed mode

| Application | Features | Appearance | Applicable Amplifier Unit | Sensing distance (mm) (Values in parentheses: when using the E39-F1 Lens Unit) | Standard object *3 (min. sensing object: opaque) | Model | Permissible bending radius |
|-----------------|---|--|---------------------------|---|---|------------|----------------------------|
| Long distance | M4  |  M4 screw | E3X-DA□-N |  1,660 (4,000)  1,330 (3,200)  490 (1,200) | 1.4-mm dia. (0.02-mm dia.) | E32-T11L | 25 mm |
| | | | E3X-DAB11-N |  150  120  75 | | | |
| | | | E3X-DAH□-N |  430  350  120 | | | |
| | 3-mm dia.  |  3-mm dia. | E3X-DA□-N |  1,660  1,330  490 | 1.4-mm dia. (0.01-mm dia.) | E32-T12L | |
| | M3  |  M3 screw | E3X-DA□-N |  500  440  180 | 0.9-mm dia. (0.01-mm dia.) | E32-T21L | 10 mm |
| | 2-mm dia.; small diameter  |  2-mm dia. | E3X-DA□-N |  500  440  180 | | E32-T22L | |
| | M14; with lens; ideal for explosion-proof applications  |  M14 screw | E3X-DA□-N |  20,000 *1  20,000 *1  9,800 | 10-mm dia. (0.01-mm dia.) | E32-T17L | 25 mm |
| General-purpose | M4  |  M4 screw | E3X-DA□-N |  950 (4,000) *2  760 (4,000) *2  280 (2,100) | 1.0-mm dia. (0.01-mm dia.) | E32-TC200 | 25 mm |
| | | | E3X-DAB11-N |  100 (700)  75 (550)  45 (350) | | | |
| | | | E3X-DAH□-N |  250  200  70 | | | |
| | M4 screw  |  M4 screw | E3X-DA□-N |  670 (4,000) *2  530 (3,700)  200 (1,400) | | E32-T11R | 1 mm |
| | 3-mm dia.  |  3-mm dia. | E3X-DA□-N |  670  530  200 | | E32-T12R | |
| | M3; possible to mount the reflective side-view conversion attachment E39-F5  |  M3 screw | E3X-DA□-N |  850  680  250 | | E32-TC200A | 25 mm |
| | M3; for detecting minute objects  |  M3 screw | E3X-DA□-N |  250  220  90 | 0.5-mm dia. (0.01-mm dia.) | E32-TC200E | 10 mm |
| | | | E3X-DAB11-N |  25  20  10 | | | |
| | M3 screw; small diameter  |  M3 screw | E3X-DA□-N |  150  130  50 | | E32-T21R | 1 mm |

| Applica- tion | Features | Appearance | Applicable Amplifier Unit | Sensing distance (mm) (Values in parentheses: when using the E39-F1 Lens Unit) | Standard object *3 (min. sens- ing object: opaque) | Model | Permis- sible bending radius |
|---|--|---|--|---|--|---|---------------------------------------|
| Thin fiber | 2-mm dia.; for detect- ing minute sensing objects (Free-cut) |  2-mm dia. | E3X-DA□-N |  | 0.5-mm dia. (0.01-mm dia.) | E32-T22 | 10 mm |
| | 2-mm dia.; small di- ameter (Free-cut) |  2-mm dia. | E3X-DA□-N |  | | E32-T22R | 1 mm |
| | 1.2-mm dia.; with sleeve (Free-cut) | 90 mm (40 mm) 1.2-mm dia.  M4 screw (): E32-TC200B4 | E3X-DA□-N E3X-DAB11-N |   | 1.0-mm dia. (0.01-mm dia.) | E32-TC200B E32-TC200B4 | 25 mm |
| | 0.9-mm dia.; with sleeve (Free-cut) | 90 mm (40 mm) 0.9-mm dia.  M3 screw (): E32-TC200F4 | E3X-DA□-N |  | 0.5-mm dia. (0.01-mm dia.) | E32-TC200F E32-TC200F4 | 10 mm |
| Flexible (resists break- ing) (R4) | Ideal for mounting on moving sections (R4) (Free-cut) |  M4 screw | E3X-DA□-N |  | 1.0-mm dia. (0.01-mm dia.) | E32-T11 | 4 mm |
| | |  M3 screw | E3X-DA□-N |  | 0.5-mm dia. (0.01-mm dia.) | E32-T21 | |
| | |  1.5-mm dia. | E3X-DA□-N |  | | E32-T22B | |
| Side- view | Long distance; space-sav- ing (Free-cut) | 3-mm dia.  | E3X-DA□-N |  | 1.0-mm dia. (0.01-mm dia.) | E32-T14L | 25 mm |
| | | | E3X-DAB11-N |  | | | |
| | | | E3X-DAH□-N |  | | | |
| | Space-sav- ing (Free-cut) | 3-mm dia.  | E3X-DA□-N |  | | E32-T14LR | 1 mm |
| | Suitable for detect- ing minute sensing objects (Free-cut) | 1-mm dia.  | E3X-DA□-N |  | 0.5-mm dia. (0.01-mm dia.) | E32-T24 | 10 mm |
| | Suitable for detect- ing minute sensing objects; small diameter (Free-cut) | 1-mm dia.  | E3X-DA□-N |  | | E32-T24R | 1 mm |
| | Screw- mounting type (Free-cut) |  | E3X-DA□-N E3X-DAB11-N E3X-DAH□-N |    | 4.0-mm dia. (0.01-mm dia.) | E32-T14 | 25 mm |

| Application | Features | Appearance | Applicable Amplifier Unit | Sensing distance (mm) (Values in parentheses: when using the E39-F1 Lens Unit) | Standard object *3 (min. sensing object: opaque) | Model | Permissible bending radius |
|---------------------|---|--|---------------------------|--|---|----------|----------------------------|
| Chemical-resistant | Fluorescein-covered; withstands chemicals and harsh environments (operating ambient temperature: -30°C to 70°C) (Free-cut) |  5-mm dia. | E3X-DA□-N |  | 4.0-mm dia. (0.01-mm dia.) | E32-T12F | 40 mm |
| | Fluorescein covered; side-view; withstands chemicals and harsh environments (operating ambient temperature: -30°C to 70°C) (Free-cut) |  5-mm dia. | E3X-DA□-N |  | 3.0-mm dia. (0.01-mm dia.) | E32-T14F | |
| | Fluorescein; withstands chemicals and harsh environments (operating ambient temperature: -40°C to 200°C) |  6-mm dia. | E3X-DA□-N |  | 1.0-mm dia. (0.01-mm dia.) | E32-T81F | 10 mm |
| Heat-resistant | Resists 200°C; flexible (R10); fiber sheath material: fluororesin (operating ambient temperature: -40°C to 200°C) |  M4 screw | E3X-DA□-N |  | 1.0-mm dia. (0.01-mm dia.) | E32-T81R | 10 mm |
| | Resists 150°C *4; fiber sheath material: fluororesin (operating ambient temperature: -40°C to 150°C) (Free-cut) |  M4 screw | E3X-DA□-N |  | 1.5-mm dia. (0.01-mm dia.) | E32-T51 | 35 mm |
| | Resists 300°C *5; with spiral tube; high mechanical strength; fiber sheath material: stainless steel (operating ambient temperature: -40°C to 300°C) |  M4 screw | E3X-DA□-N |  | 1.0-mm dia. (0.01-mm dia.) | E32-T61 | 25 mm |
| | Side-view; resists 150°C *4; suitable for detecting minute sensing objects; fiber sheath material: fluororesin (operating ambient temperature: -40°C to 150°C) (Free-cut) |  2-mm dia. | E3X-DA□-N |  | | E32-T54 | 35 mm |
| | Resists 200°C *5; L-shaped; fiber sheath material: stainless steel |  3-mm dia. | E3X-DA□-N |  | 1.7-mm dia. (0.01-mm dia.) | E32-T84S | 25 mm |
| Slot Sensor | Suitable for film sheet detection; no optical axis adjustment required; easy to mount (Free-cut) |  | E3X-DA□-N |  | 4.0-mm dia. (2.0-mm dia.) | E32-G14 | 25 mm |
| | | | E3X-DAB11-N |  | | | |
| | | | E3X-DAH□-N |  | | | |
| Narrow vision field | Suitable for detecting wafers; (Free-cut) |  3-mm dia. | E3X-DA□-N |  | 1.7-mm dia. (0.01-mm dia.) | E32-T22S | 10 mm |
| | Side-view; suitable for detecting wafer (Free-cut) |  3.5 x 3-mm dia. | E3X-DA□-N |  | 2.0-mm dia. (0.01-mm dia.) | E32-T24S | |

| Application | Features | Appearance | Applicable Amplifier Unit | Sensing distance (mm) (Values in parentheses: when using the E39-F1 Lens Unit) | Standard object *3 (min. sensing object: opaque) | Model | Permissible bending radius |
|--------------|--|---|---------------------------|--|---|-----------|----------------------------|
| Area sensing | Multi-point detection (4-head) |  M3 screw | E3X-DA□-N |  | 2.0-mm dia. (0.01-mm dia.) | E32-M21 | 25 mm |
| | Detects in a 30-mm area (Free-cut) |  30 mm | E3X-DA□-N |  | (0.3-mm dia.) *6 | E32-T16W | 10 mm |
| | |  30 mm | E3X-DA□-N |  | | E32-T16WR | 1 mm |
| | Side-view; suitable for applications with limited spatial depth (Free-cut) |  11 mm | E3X-DA□-N |  | (0.2-mm dia.) *6 | E32-T16J | 10 mm |
| | |  11 mm | E3X-DA□-N |  | | E32-T16JR | 1 mm |
| | Suitable for detecting over a 10-mm area; long distance (Free-cut) |  10 mm | E3X-DA□-N |  | (0.6-mm dia.) *7 | E32-T16 | 25 mm |
| | Stable for detecting minute sensing objects in a wide area; degree of protection: IEC60529 IP50 (Free-cut) |  11 mm | E3X-DA□-N |  | (0.2-mm dia.) *6 | E32-T16P | 10 mm |
| | |  11 mm | E3X-DA□-N |  | | E32-T16PR | 1 mm |

*1The E32-T17L allows a longer sensing distance because its optical fiber length is 10 m.

*2These models allow a longer sensing distance because their optical fiber length is 2 m.

*3Indicates values for standard mode.

*4For continuous operation, use the products within a temperature range of -40°C to 130°C.

*5Indicates the heat-resistant temperature at the fiber tip.

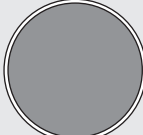
*6These figures are for a sensing distance of 300 mm. (Figures for the diameter of sensing objects are in the still state.)

*7These figures are ones for which detection is possible in each sensing area at a digital incident level of 1,000. (Figures for the diameter of sensing objects are in the still state.)

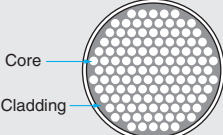
- Note:**
1. The size of standard sensing object is the same as the fiber core diameter (lens diameter for models with lens).
 2. The values of the minimum sensing object for the through-beam models indicate those obtained where the models are set to receive light when the digital incident level exceeds 1,000 (set to digital incident level display).
 3. Greater freedom with wiring at no loss in light intensity enabled by a comprehensive lineup of flexible fiber models (permissible bending radius: 1 mm). Refer to the following illustration.

Flexible fiber models are indicated by an "R" at the end of the model number.

Flexible fiber contains multiple cores. These cores are all surrounded by cladding, giving a minimum bending radius of 1 mm. The fiber can be bent at right angles without affecting the light intensity. Handle it just like any other cable.



Conventional Fiber
Conventional fiber uses just one core and one cladding section. Bending the fiber may break it or reduce the light intensity.




Flexible Fiber
Flexible fiber contains multiple independent cores all surrounded by cladding. The fiber can be bent without breaking or reducing the light intensity.




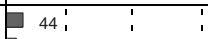

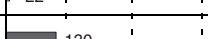
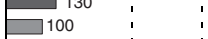
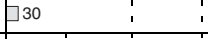

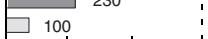




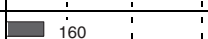



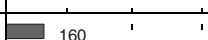

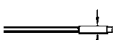







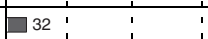

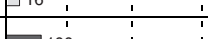


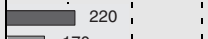
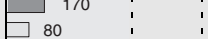


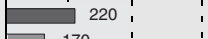
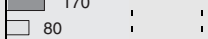
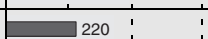

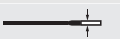
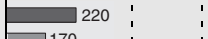
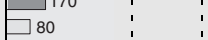
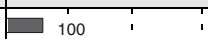






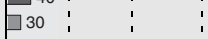

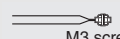
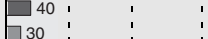
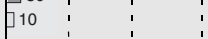
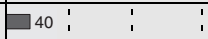

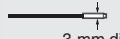
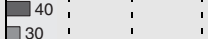
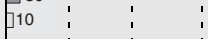

■ Fiber Units with Reflective Sensors

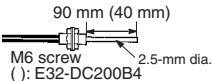
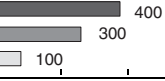
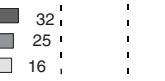
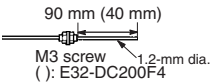
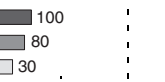
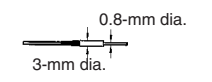
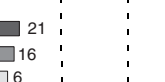
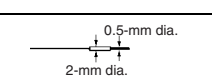
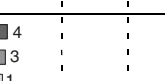
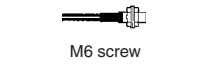
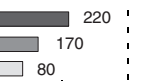

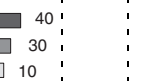
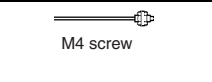
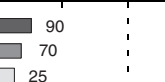
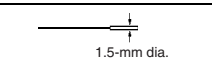
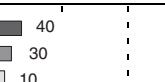
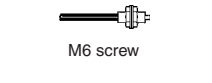
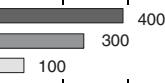
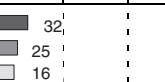
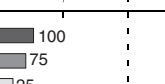
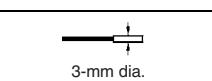
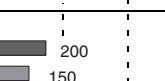
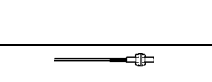
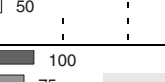
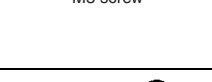
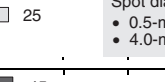
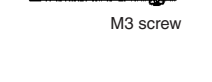

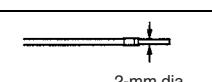
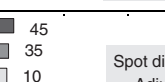
Refer to the end of the following table for notes and precautions.



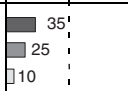

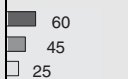

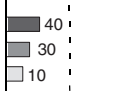

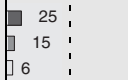
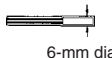
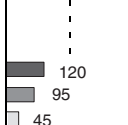

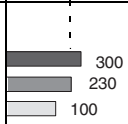

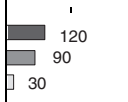
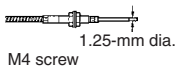
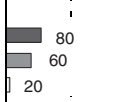

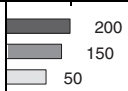
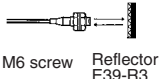
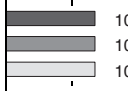
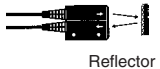
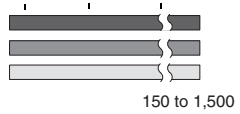
Note: Specifications for the E3X-DA□V and E3X-DA□TW are included in those for the E3X-DA□N, and specifications for the E3X-DAG□-N are included in those for the E3X-DAB□-N.






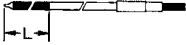

 Indicates models that allow free cutting. Models without this mark do not allow free cutting.

 : Super-long-distance mode  : Standard mode  : Super-high-speed mode

| Application | Features | Appearance | Applicable Amplifier Unit | Sensing distance (mm) *1 | Standard object (min. sensing object *2: Gold wire) | Model | Permissible bending radius |
|-----------------|---|--|---------------------------|--|---|------------|----------------------------|
| Long distance | M6  |  M6 screw | E3X-DA□-N |  500  400  150 | 500×500 (0.01-mm dia.) | E32-D11L | 25 mm |
| | | | E3X-DAB11-N |  44  35  22 | 100×100 (0.1-mm dia.) | | |
| | | | E3X-DAH□-N |  130  100  30 | 200×200 (0.01-mm dia.) | | |
| | 3-mm dia.; small diameter  |  3-mm dia. | E3X-DA□-N |  300  230  100 | 300×300 (0.01-mm dia.) | E32-D12 | |
| | M4  |  M4 screw | E3X-DA□-N |  160  130  45 | 200×200 (0.01-mm dia.) | E32-D21L | 10 mm |
| | 3-mm dia.; small diameter  |  3-mm dia. | E3X-DA□-N |  160  130  45 | | E32-D22L | |
| General-purpose | M6  |  M6 screw | E3X-DA□-N |  400  300  100 | 400×400 (0.01-mm dia.) | E32-DC200 | 25 mm |
| | | | E3X-DAB11-N |  32  25  16 | 100×100 (0.1-mm dia.) | | |
| | | | E3X-DAH□-N |  100  75  25 | 100×100 (0.01-mm dia.) | | |
| | M6  |  M6 screw | E3X-DA□-N |  220  170  80 | 300×300 (0.01-mm dia.) | E32-D11R | 1 mm |
| | 3-mm dia.  |  3-mm dia. | E3X-DA□-N |  220  170  80 | | E32-D12R | |
| | M3; small diameter  |  M3 screw | E3X-DA□-N |  100  80  30 | 100×100 (0.01-mm dia.) | E32-DC200E | 10 mm |
| | | | E3X-DAB11-N |  8  6  4 | 25×25 (0.2-mm dia.) | | |
| | M3; small diameter  |  M3 screw | E3X-DA□-N |  40  30  10 | 50×50 (0.01-mm dia.) | E32-D21R | 1 mm |
| | 3-mm dia.; small diameter  |  3-mm dia. | E3X-DA□-N |  40  30  10 | | E32-D22R | |

| Applica- tion | Features | Appearance | Applicable Amplifier Unit | Sensing distance (mm) *1 | Standard object (min. sensing object *2: Gold wire) | Model | Permis- sible bending radius |
|--|--|---|------------------------------|---|---|---------------------------|---------------------------------------|
| Thin fiber | 2.5-mm dia.; with sleeve (Free-cut) |  | E3X-DA□-N |  | 400×400 (0.01-mm dia.) | E32-DC200B E32-DC200B4 | 25 mm |
| | | | E3X-DAB11-N |  | 100×100 (0.1-mm dia.) | | |
| | 1.2-mm dia.; with sleeve (Free-cut) |  | E3X-DA□-N |  | 100×100 (0.01-mm dia.) | E32-DC200F E32-DC200F4 | 10 mm |
| | 0.8-mm dia.; for detect- ing minute sensing objects (Free-cut) |  | E3X-DA□-N |  | 25×25 (0.01-mm dia.) | E32-D33 | 4 mm |
| | 0.5-mm dia.; for detecting minute sensing objects |  | E3X-DA□-N |  | | E32-D331 | |
| Flexible (resists break- ing) (R4) | Ideal for mount- ing on moving sections (R4) (Free-cut) |  | E3X-DA□-N |  | 300×300 (0.01-mm dia.) | E32-D11 | 4 mm |
| | |  | E3X-DA□-N |  | 50×50 (0.01-mm dia.) | E32-D21 | |
| | |  | E3X-DA□-N |  | 100×100 (0.01-mm dia.) | E32-D21B | |
| | |  | E3X-DA□-N |  | 50×50 (0.01-mm dia.) | E32-D22B | |
| Coaxial | M6 coax- ial; high-pre- cision positioning (Free-cut) |  | E3X-DA□-N |  | 500×500 (0.01-mm dia.) | E32-CC200 | 25 mm |
| | | | E3X-DAB11-N |  | 100×100 (0.1-mm dia.) | | |
| | | | E3X-DAH□-N |  | 100×100 (0.01-mm dia.) | | |
| | 3-mm dia.; small di- ameter; coaxial; high-precision positioning (Free-cut) |  | E3X-DA□-N |  | 300×300 (0.01-mm dia.) | E32-D32L | |
| | M3 coax- ial; high-pre- cision positioning (Free-cut) |  | E3X-DA□-N |  Spot diameter*6 • 0.5-mm dia. • 4.0-mm dia. max. | 100×100 (0.01-mm dia.) | E32-C31 | |
| | M3 coaxial; high-precision positioning |  | E3X-DA□-N |  Spot diameter*6 • 0.1-mm dia. • 0.2-mm dia. • 4.0-mm dia. max. | 50×50 (0.01-mm dia.) | E32-C41 | |
| | 2-mm dia. coaxial; high-precision positioning |  | E3X-DA□-N |  Spot diameter*6 • Adjustable in the range 0.1 to 0.6-mm dia. | | E32-C42 | |
| | 2-mm dia. co- axial; high-precision positioning (Free-cut) |  | E3X-DA□-N |  Spot diameter*6 • Adjustable in the range 0.5 to 1.0-mm dia. | 100×100 (0.01-mm dia.) | E32-D32 | |

| Application | Features | Appearance | Applicable Amplifier Unit | Sensing distance (mm) *1 | Standard object (min. sensing object *2: Gold wire) | Model | Permissible bending radius |
|--------------------|---|---|---------------------------|--|---|-------------------------------|----------------------------|
| Side-view | 6-mm dia.; long distance (Free-cut) | 6-mm dia.  | E3X-DA□-N |  150 110 50 | 200×200 (0.01-mm dia.) | E32-D14L | 25 mm |
| | | | E3X-DAH□-N |  35 25 10 | 50×50 (0.01-mm dia.) | | |
| | 6-mm dia. (Free-cut) | 6-mm dia.  | E3X-DA□-N |  60 45 25 | 100×100 (0.01-mm dia.) | E32-D14LR | 1 mm |
| | 2-mm dia.; small diameter space-saving (Free-cut) | 2-mm dia.  | E3X-DA□-N |  40 30 10 | 50×50 (0.01-mm dia.) | E32-D24 | 10 mm |
| | | 2-mm dia.  | E3X-DA□-N |  25 15 6 | | E32-D24R | 1 mm |
| Chemical-resistant | Fluororesin-covered; withstands chemicals and harsh environments (operating ambient temperature: -30°C to 70°C) (Free-cut) | 6-mm dia.  | E3X-DA□-N |  120 95 45 | 200×200 (0.01-mm dia.) | E32-D12F | 40 mm |
| Heat-resistant | Resists 150°C *3; fiber sheath material: fluororesin (operating ambient temperature: -40°C to 150°C) (Free-cut) | M6 screw  | E3X-DA□-N |  300 230 100 | 200×200 (0.01-mm dia.) | E32-D51 | 35 mm |
| | Resists 300°C *4; fiber sheath material: stainless steel (operating ambient temperature: -40°C to 300°C) | M6 screw  | E3X-DA□-N |  120 90 30 | | E32-D61 | 25 mm |
| | Resists 400°C *4; fiber sheath material: stainless steel (operating ambient temperature: -40°C to 400°C) | 1.25-mm dia. M4 screw  | E3X-DA□-N |  80 60 20 | 100×100 (0.01-mm dia.) | E32-D73 | |
| Area sensing | Side-view; detection over wide areas (Free-cut) |  | E3X-DA□-N |  200 150 50 | 300×300 (0.01-mm dia.) | E32-D36P1 | 25 mm |
| Retroreflective | Transparent object detection (Free-cut) | M6 screw Reflector E39-R3  | E3X-DA□-N |  10 to 250 10 to 250 10 to 250 | 35-mm dia. (0.1-mm dia.) | E32-R21 + E39-R3 (Attachment) | 10 mm |
| | Transparent object detection (operating ambient temperature: -25°C to 55°C); degree of protection: IEC60529 IP66 (Free-cut) | Reflector E39-R1  | E3X-DA□-N |  150 to 1,500 | 35-mm dia. (0.2-mm dia.) | E32-R16 + E39-R1 (Attachment) | 25 mm |

| Applica-tion | Features | Appearance | Applicable Amplifier Unit | Sensing distance (mm) *1 | Standard object (min. sensing object *2: Gold wire) | Model | Permis-sible bending radius |
|------------------------|---|---|---------------------------|-------------------------------|---|------------------------|-----------------------------|
| Limited reflec-tive | Suitable for position-ing crystal glass (Free-cut) |  | E3X-DA□-N | 4 to 12 | 100×100 Soda glass with reflec-tion factor of 7% | E32-L56E1 E32-L56E2 | 35 mm |
| | Detects wafers and small differences in height; (operat-ing ambient tem-perature: -40°C to 105°C); degree of protection: IEC60529 IP50 (Free-cut) |  | E3X-DA□-N | 4±2 4±2 4±2 | 25×25 (0.01-mm dia.) | E32-L24L | 10 mm |
| | |  | E3X-DA□-N | 7.2±1.8 7.2±1.8 7.2±1.8 | | E32-L25L | |
| | Detects wafers and small differences in height; degree of protection: IEC60529 IP50 (Free-cut) |  | E3X-DA□-N | 3.3 3.3 3.3 | | E32-L25 | 25 mm |
| | |  | E3X-DA□-N | 3.3 3.3 3.3 | | E32-L25A | |
| | | | | | | | |
| Fluid-level de-tection | Fluid contact type: unbendable sec-tion L 150 mm, 350 mm (two types) |  | E3X-DA□-N | --- | Pure water at 25°C | E32-D82F1 E32-D82F2 | 40 mm |
| | Tube-mount-ing type (Free-cut) |  | E3X-DA□-N | --- | Fluid | E32-L25T | 10 mm |

*1Sensing distance indicates values for white paper.

*2Indicates values for standard mode.

*3For continuous operation, use the products within a temperature range of -40°C to 130°C.

*4Indicates the heat-resistant temperature at the fiber tip.

*5The values indicated are for use with a Lens Unit (order sepa-rately).

- Note:**
1. The values of the minimum sensing object indicate those obtained at a distance where the smallest object can be sensed with the Reflective Fiber Unit.
 2. When set to the maximum sensitivity setting for the internal reflective light, incident light may continue to be received. In such case, use under two-point teaching or without-object teaching.

Output Circuits

Refer to the end of the following table for notes and precautions.

| Output | Model | Mode selector | Timing chart | State of output transistor | Output circuit |
|-------------------------|--|-----------------|--------------|----------------------------|----------------|
| NPN | E3X-DA11-N E3X-DAB11-N E3X-DAG11-N E3X-DAH11-N E3X-DA11V E3X-DA6 E3X-DAB6 E3X-DAG6 E3X-DAH6 E3X-DA14V | LIGHT ON (L/ON) | | Light ON | |
| | | DARK ON (D/ON) | | Dark ON | |
| | | LIGHT ON (L/ON) | | Light ON | |
| | | DARK ON (D/ON) | | Dark ON | |
| E3X-DA21-N E3X-DA7 | E3X-DA21-N E3X-DA7 | LIGHT ON (L/ON) | | Light ON | |
| | | DARK ON (D/ON) | | Dark ON | |
| | | LIGHT ON (L/ON) | | Light ON | |
| | | DARK ON (D/ON) | | Dark ON | |
| E3X-DA11TW E3X-DA6TW | E3X-DA11TW E3X-DA6TW | LIGHT ON (L/ON) | | Light ON | |
| | | DARK ON (D/ON) | | Dark ON | |
| | | LIGHT ON (L/ON) | | Light ON | |
| | | DARK ON (D/ON) | | Dark ON | |



Note: Pin 2 is not used.

Note: Load resistance: 10 kΩ min.

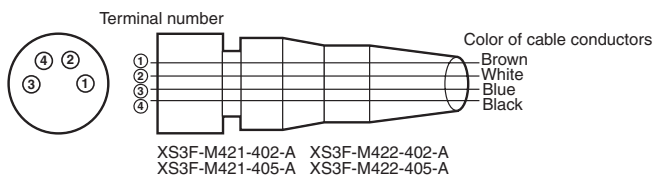
| Output | Model | Mode selector | Timing chart | State of output transistor | Output circuit |
|--------|---|-----------------|--|----------------------------|--|
| PNP | E3X-DA41-N E3X-DAB41-N E3X-DAG41-N E3X-DA41V E3X-DA8 E3X-DAB8 E3X-DAG8 E3X-DAH8 E3X-DA44V | LIGHT ON (L/ON) | Incident light No incident light Operation indicator ON (orange) OFF Output transistor ON OFF Load (relay) Operate Release (Between blue and black) | Light ON | <p>Connector Pin Arrangement</p> <p>Note: Pin 2 is not used.</p> |
| | | DARK ON (D/ON) | Incident light No incident light Operation indicator ON (orange) OFF Output transistor ON OFF Load (relay) Operate Release (Between blue and black) | Dark ON | |
| | E3X-DA51-N E3X-DA9 | LIGHT ON (L/ON) | Incident light No incident light Operation indicator ON (orange) OFF Output transistor ON OFF Load (relay) Operate Release (Between blue and black) | Light ON | <p>Note: Load resistance: 10 kΩ min.</p> |
| | E3X-DA41TW E3X-DA8TW | LIGHT ON (L/ON) | CH1/ CH2 Incident light No incident light Operation indicator ON (orange) OFF Output transistor ON OFF Load (relay) Operate Release (Between blue and black) | Light ON | |
| | | DARK ON (D/ON) | CH1/ CH2 Incident light No incident light Operation indicator ON (orange) OFF Output transistor ON OFF Load (relay) Operate Release (Between blue and black) | Dark ON | |

Note: With E3X-DA□TW models, only channel 1 is output when set for area sensing operation.

LIGHT ON: ON when the incident level is between the thresholds for channels 1 and 2.

DARK ON: OFF when the incident level is between the thresholds for channels 1 and 2. (Channel 2 is always OFF.)

Connectors (Sensor I/O Connectors)

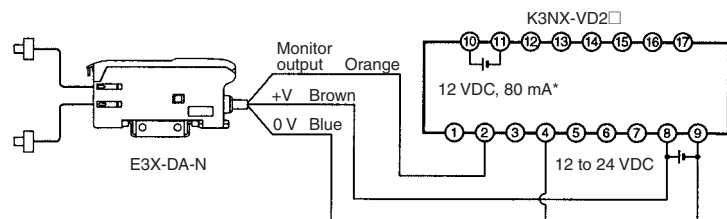


| Classification | Color of cable conductors | Connection pin number | Application |
|----------------|---------------------------|-----------------------|--------------------|
| DC | Brown | 1 | Power supply (+V) |
| | White | 2 | --- |
| | Blue | 3 | Power supply (0 V) |
| | Black | 4 | Output |

Note: Pin 2 is not used.

Connection

Connection with K3NX-VD2 Process Meter



* Use this service power supply for the Sensor with reference to the power consumption of each Sensor.

- Note:**
1. Various I/O Units are available for the K3NX. Select an appropriate output type depending on the application.
 2. For details about the K3NX, refer to the K3NX Datasheet (N084) or the K3NX Operation Manual (N090).
 3. This wiring is for the K3NX with DC power supply specifications and the Monitor (Analog) Sensor with DC power supply specifications. Check respective power supply specifications before wiring them.

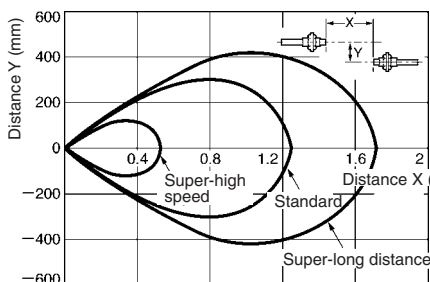
Engineering Data (Typical)

■ E3X-DA□-N/E3X-DA□V/E3X-DA□TW

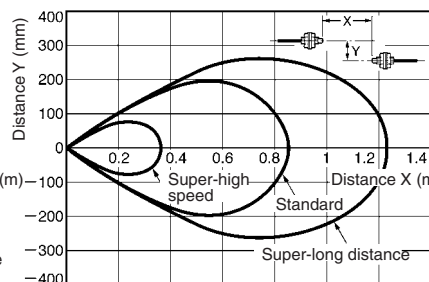
Parallel Operating Range

At max. sensitivity. (Use for optical axis adjustment at installation.)

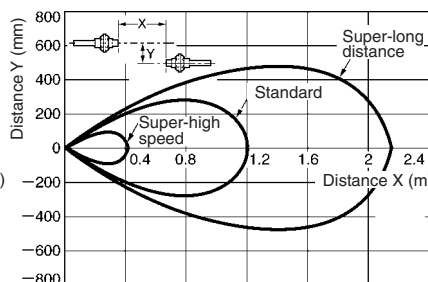
E32-TC200 (Through-beam)



E32-T11R (Through-beam)



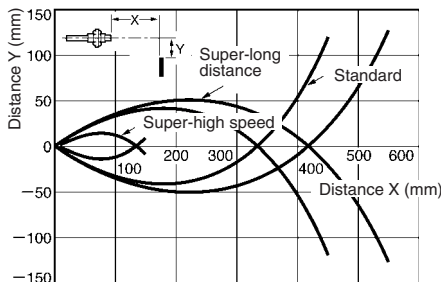
E32-T11 (Through-beam)



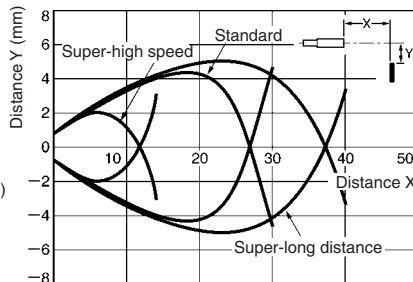
Operating Range

With standard sensing object at max. sensitivity. (Use for the positioning of the object and Sensor.)

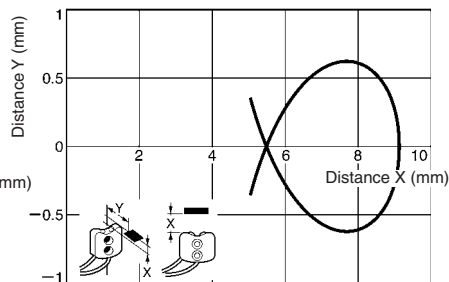
E32-DC200 (Reflective)



E32-D33 (Reflective)



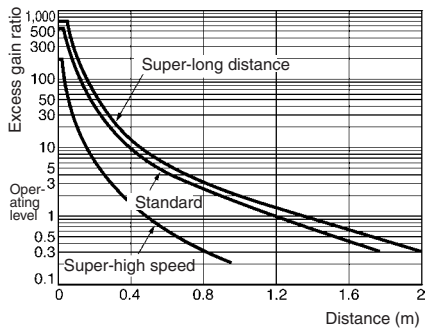
E32-L25L (Limited Reflective)



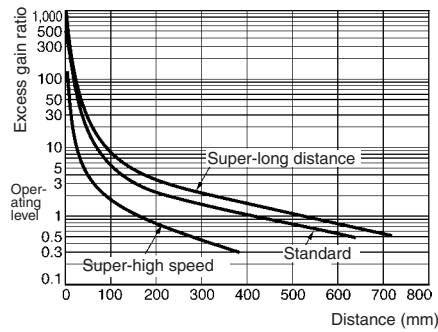
Excess Gain Ratio vs. Distance

With standard sensing object. At max. sensitivity.

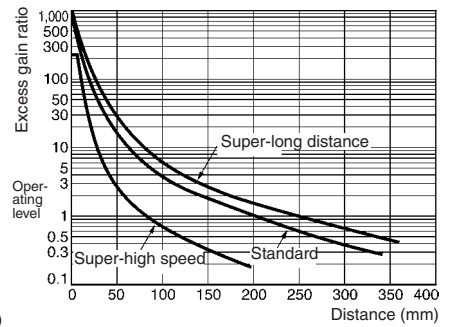
**E32-TC200
(Through-beam)**



**E32-DC200
(Reflective)**

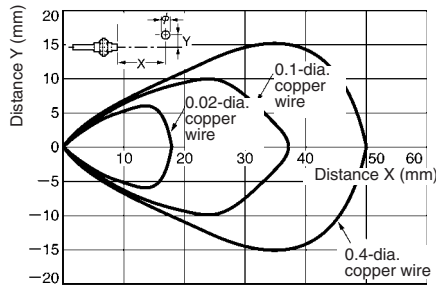


**E32-D21L
(Reflective)**

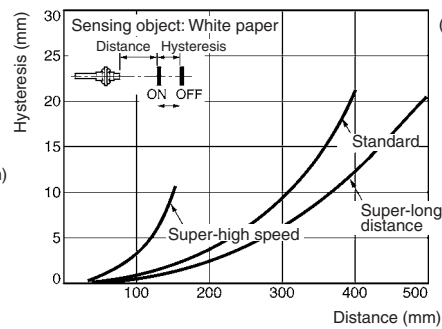


■ E3X-DA□-N/E3X-DA□V/E3X-DA□TW

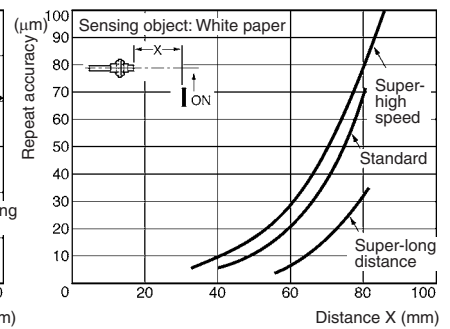
**Sensing Distance vs.
Operating Range
E32-DC200 (Reflective)**



**Hysteresis vs.
Sensing Distance
E32-D11L (Reflective)**

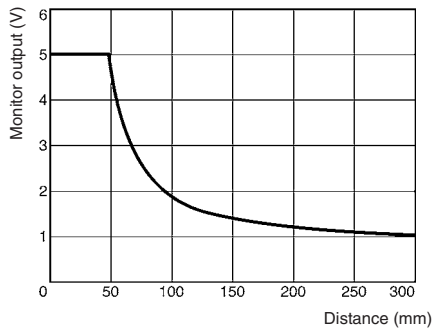


**Repeat Accuracy vs.
Sensing Distance
E32-DC200 (Reflective)**

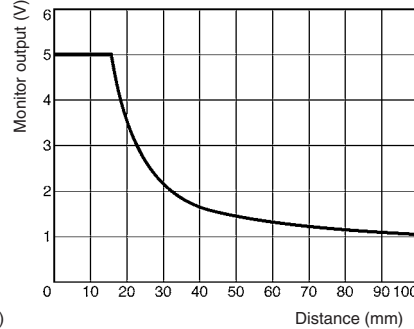


Monitor Output vs. Distance (Standard Mode)

E32-TC200 (Through-beam)



E32-DC200 (Reflective)

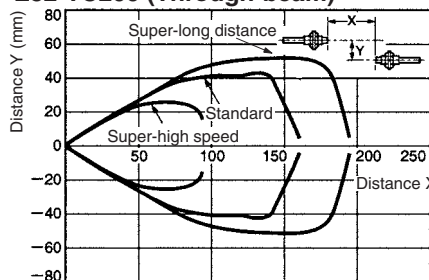


■ E3X-DAB□-N/E3X-DAG□-N

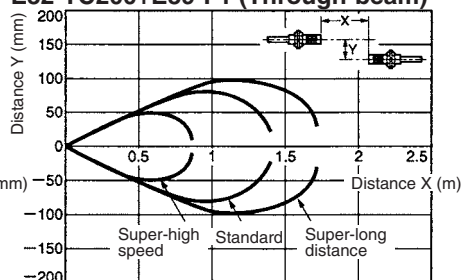
Parallel Operating Range

At max. sensitivity. (Use for optical axis adjustment at installation.)

E32-TC200 (Through-beam)



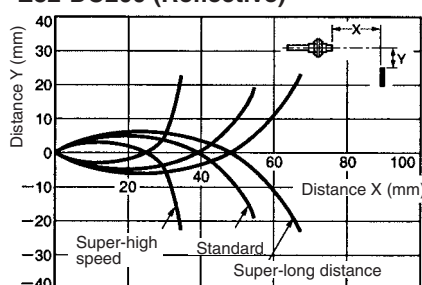
E32-TC200+E39-F1 (Through-beam)



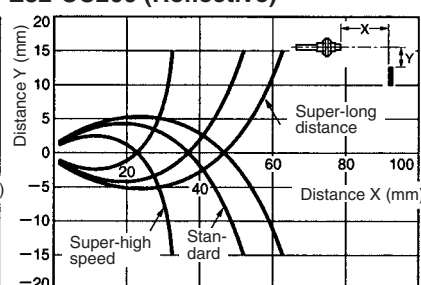
Operating Range

With standard sensing object at max. sensitivity. (Use for the positioning of the object and Sensor.)

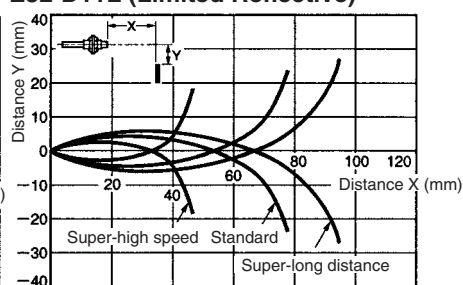
E32-DC200 (Reflective)



E32-CC200 (Reflective)



E32-D11L (Limited Reflective)

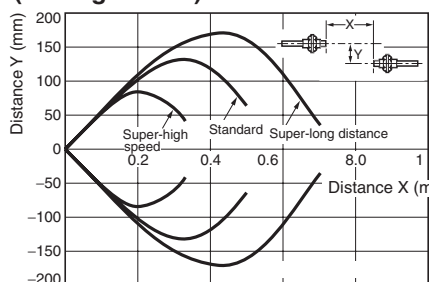


■ E3X-DAH-N

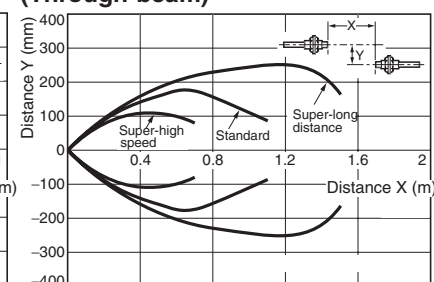
Parallel Operating Range

At max. sensitivity. (Use for optical axis adjustment at installation.)

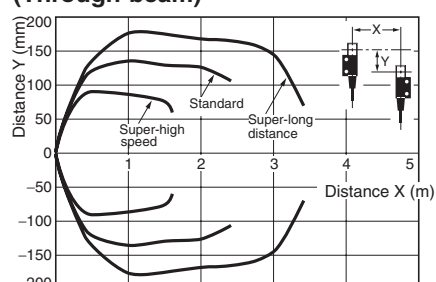
E32-TC200 (Through-beam)



E32-T11L (Through-beam)



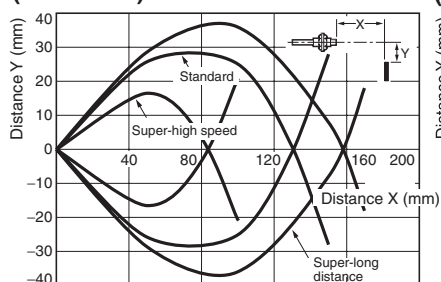
E32-T14 (Through-beam)



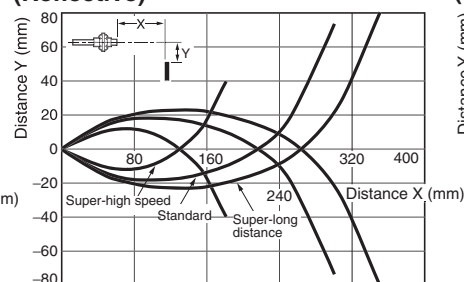
Operating Range

With standard sensing object at max. sensitivity. (Use for the positioning of the object and Sensor.)

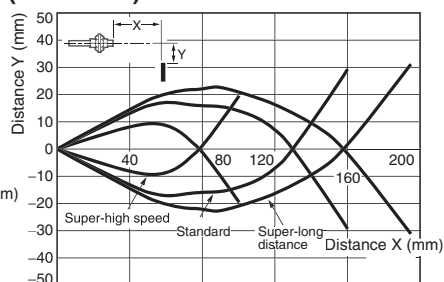
E32-DC200 (Reflective)



E32-D11L (Reflective)



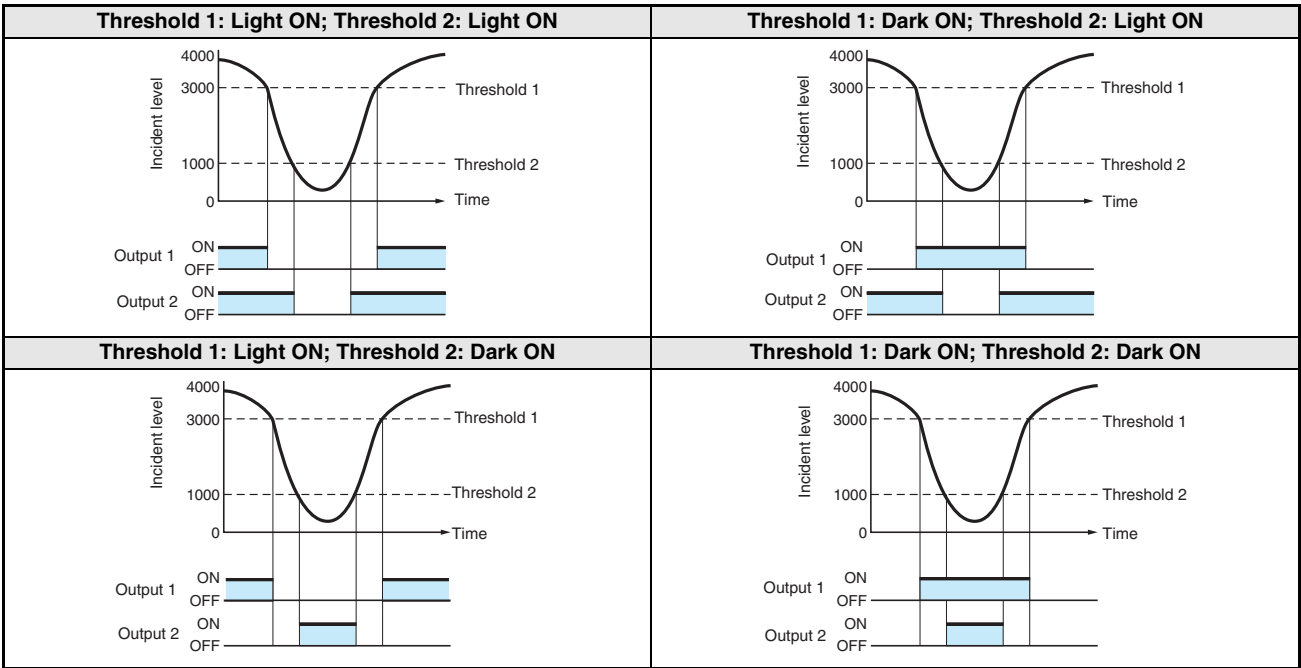
E32-CC200 (Reflective)



Technical Reference (for E3X-DA-TW Twin-output Models)

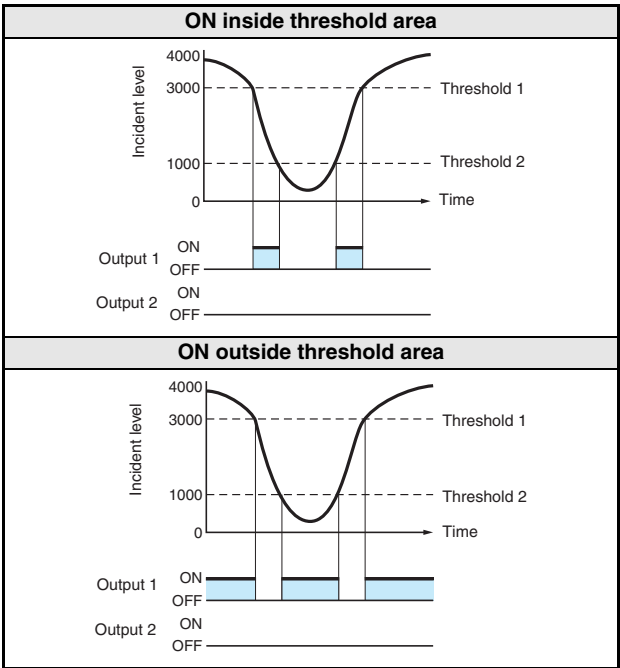
Output Patterns for Normal Operation

Outputs 1 and 2 can be set to operate independently and either Light ON mode or Dark ON mode can be selected (independently) for channels 1 and 2 making a total of 4 possible output patterns (In the following examples, threshold 1 is set to 3,000, and threshold 2 is set to 1,000.).



Output Patterns for Area Sensing

This series includes models equipped with area sensing functionality, a first for Digital Fiber Amplifiers. This functionality can be used to monitor whether the incident level is inside or outside the threshold area. The 2 output patterns below are possible for this kind of operation.



Note: Output 2 is always OFF.

Application

■ Wiring Precautions

Read the following before using the Amplifier Unit and Sensor to ensure safety.

Power Supply Voltage

Do not impose any voltage exceeding the rated voltage on the E3X-DA-N. Do not impose AC power (100 VAC) on models that operate with DC. In both cases, the E3X-DA-N may rupture or burn.

Load Short-circuits

Do not short-circuit the load connected to the E3X-DA-N, otherwise the E3X-DA-N may rupture or burn.

Polarity

When supplying power to the E3X-DA-N, make sure that the polarity of the power is correct, otherwise the E3X-DA-N may rupture or burn.

No-load Operation

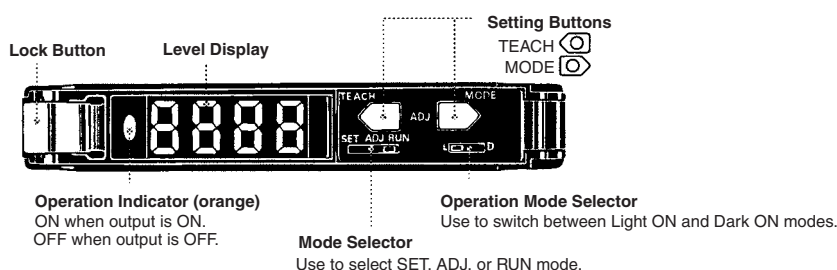
A load must be connected to the E3X-DA-N during operation, otherwise internal elements may rupture or burn. Always wire through a load.

Operating Environment

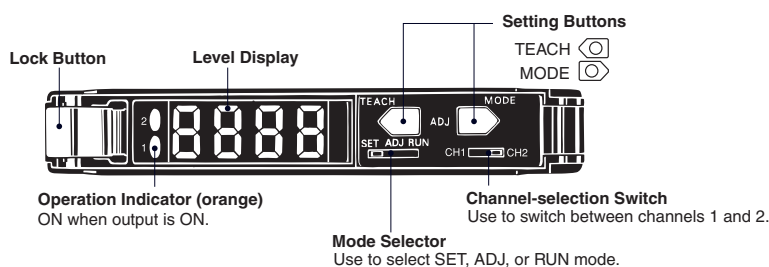
- Do not use the Amplifier Unit or Sensor in places with flammable or explosive gas.
- Do not use the Amplifier Unit or Sensor underwater.
- Do not disassemble, repair, or modify the Amplifier Unit or Sensor.

■ Amplifier Units

Nomenclature: Standard, Monitor-output, Mark-detecting, Infrared, and Water-resistant Models



Nomenclature: Twin-output Models



Installation

Turning Power ON

The Sensor 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.

Power Supply Type

A full or half-wave rectifying power supply without a smoothing circuit cannot be used.

Wiring

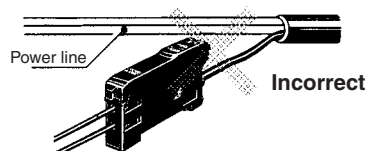
Cable

The cable can be extended, provided that the extension wire applied is at least 0.3 mm² thick and the total distance no more than 100 m.

Do not pull the cable with a force exceeding 30 N.

Separation from Power or High-tension Lines

Do not wire power lines or high-tension lines alongside the lines of the Amplifier Unit in the same conduit, otherwise the Amplifier Unit may be damaged or malfunction due to induction. Be sure to wire the lines of the Amplifier Unit separated as far as possible from power lines or high-tension lines or laid in an exclusive, shielded conduit.



Power Supply

If a standard switching regulator is used as a power supply, the frame ground (FG) terminal and the ground (G) terminal must be grounded, otherwise faulty operation may result from the switching noise of the power supply.

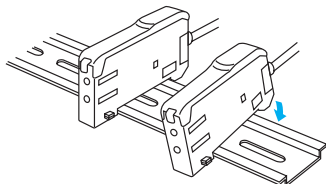
M8 Metal Connectors (Water-resistant Models)

- Turn OFF the power before inserting or removing connectors.
- Hold the connector cover when inserting or removing the connector.
- Tighten the fixing screws by hand. Using tools such as pliers may cause damage.
- The applicable tightening torque range is 0.3 to 0.4 N·m. If tightening is insufficient, the enclosure rating may not be maintained, and vibrations may cause the connector to come loose.

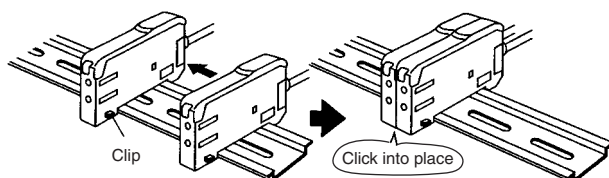
Mounting

Joining Amplifier Units

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



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



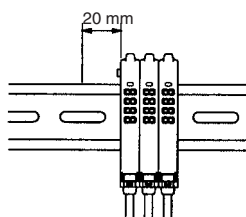
Separating Amplifier Units

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/Characteristics*.
 2. Always turn OFF the power supply before joining or separating Amplifier Units.

Mounting the Mobile Console Head

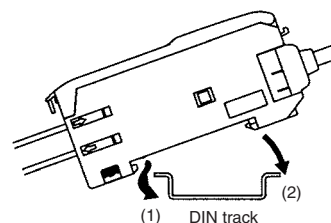
Leave a gap of at least 20 mm between the nearest Amplifier Unit and the Mobile Console head.



Mounting

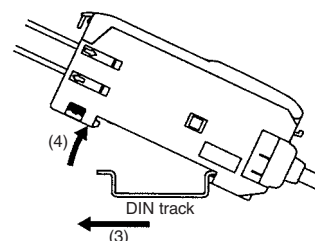
1. Mount the front part on the mounting bracket (order separately) or a DIN track.
2. Press the back part onto the mounting bracket or the DIN track.

Note: Do not mount the back of the Amplifier Unit onto the mounting bracket or the DIN track first, otherwise the mounting strength of the Amplifier Unit may be reduced. Always mount the front of the Amplifier Unit first.

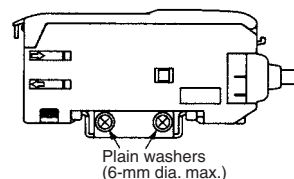


Dismounting

By pressing the Amplifier Unit in direction (3) and lifting the fiber insertion part in direction (4) as shown in the following diagram, the Amplifier Unit can be dismounted with ease.



When side-mounting using a mounting bracket, secure the mounting bracket to the Amplifier Unit and then mount using M3 screws. Use plain washers of diameter 6 mm or less when mounting.



Adjustment

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., increase the threshold) to perform stable detection.

EEPROM Writing Error

If the data is not written to the EEPROM correctly due to a power failure during teaching or static-electric noise, repeat the whole teaching procedure.

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.

Hysteresis Adjustment

The hysteresis setting can be adjusted using the Mobile Console. Do not, however, set the hysteresis to a value lower than the factory setting. Using a setting less than the factory setting may result in incorrect operation.

Operating Environment

Water Resistance

Although the E3X-DA□V has water-resistant specifications, if dirt (via water) adheres to the hole for optical communications, it may prevent normal communications. As a countermeasure, regularly (e.g., when performing inspections) wipe the area around the hole with a dry cloth.

Ambient Conditions

If dust or dirt adheres to the hole for optical communications, it may prevent normal communications. Be sure to remove any dust or dirt before using the Units.

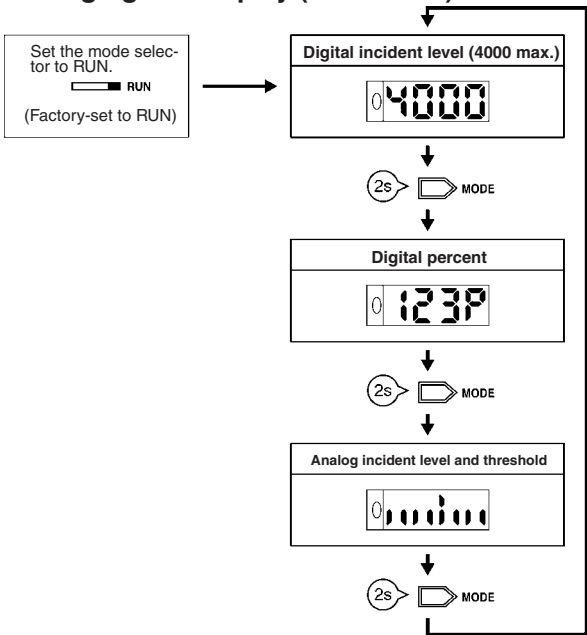
Miscellaneous

Ratings and Specifications

The ratings and performance specifications for items such as the minimum sensing object and characteristics are based on products taken at random from certain production lots. Use this data as reference only.

Amplifier Adjustments: All Models

Changing the Display (RUN Mode)



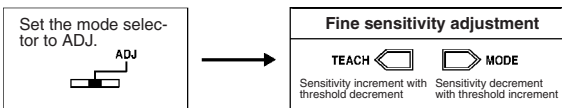
Manual Tuning (Fine Sensitivity Adjustment) in ADJ Mode

Perform fine sensitivity adjustment after teaching and manual tuning (without using the teaching function) in the way shown below:

Twin-output Models

First, select the channel to be adjusted using the channel selection switch.

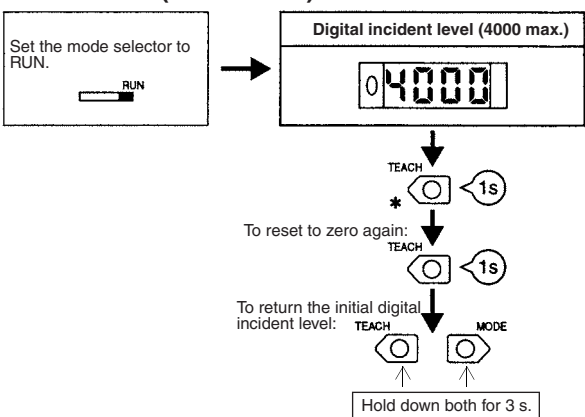
CH1 CH2



The items displayed in ADJ mode vary with the display setting in RUN mode.

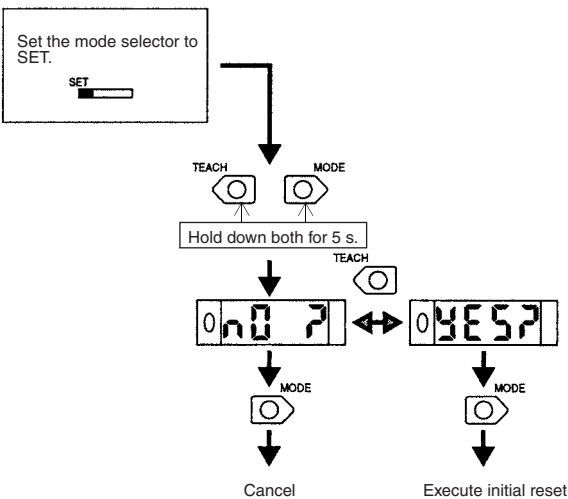
| RUN mode | | ADJ mode |
|------------------------|---|-------------------|
| Digital incident level | → | Digital threshold |
| Digital percent | → | Digital percent |
| Analog value | → | Analog value |

Zero-reset (RUN Mode)

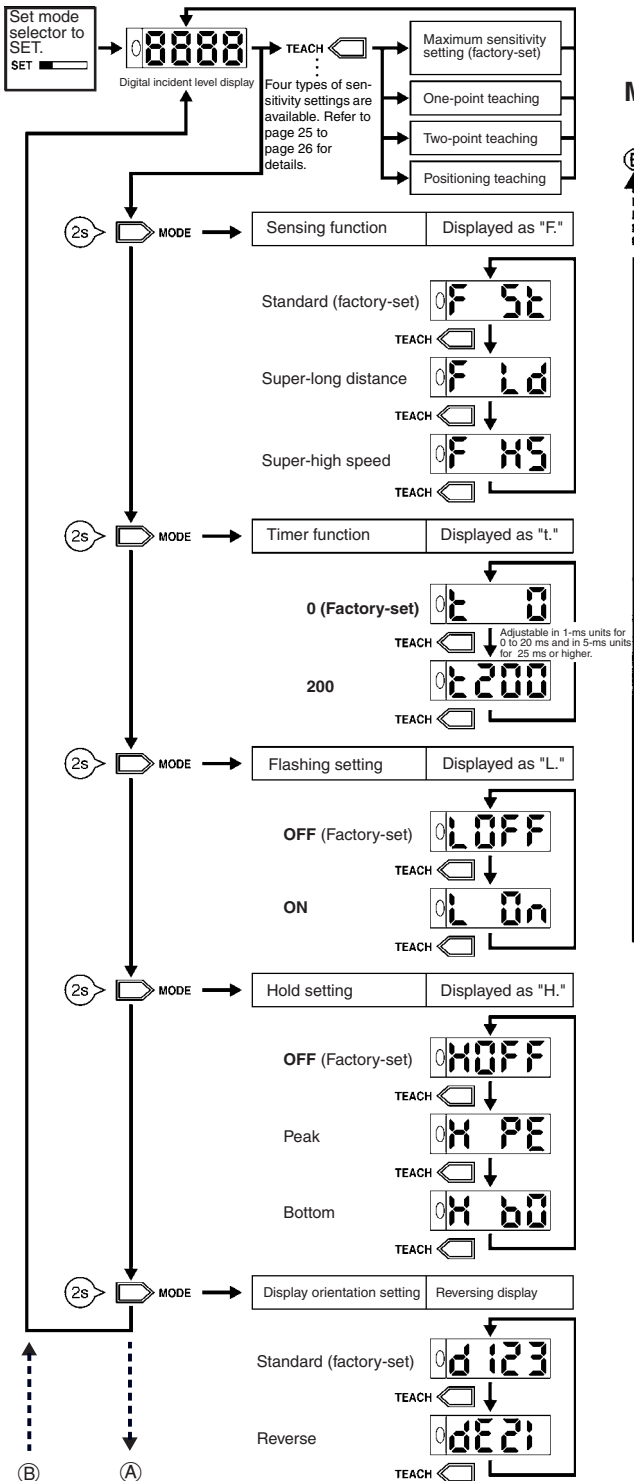


Note: There is no limit on the number of times zero-reset can be used.

Initial Reset (SET Mode)

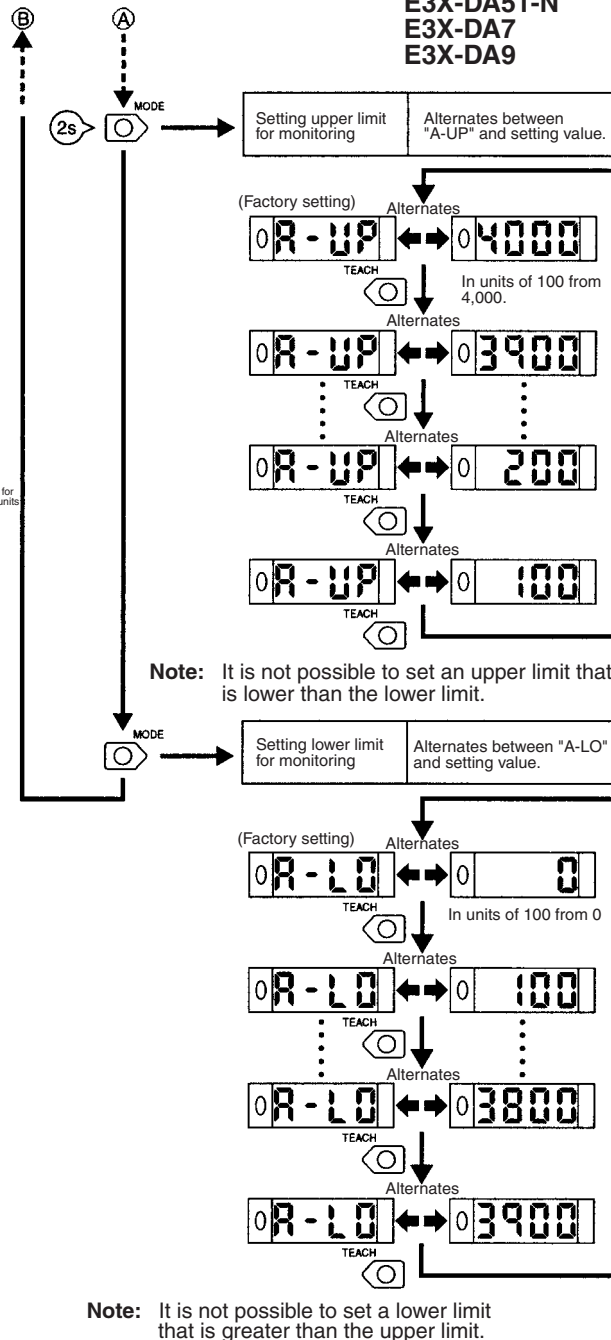


Setting Functions in SET Mode



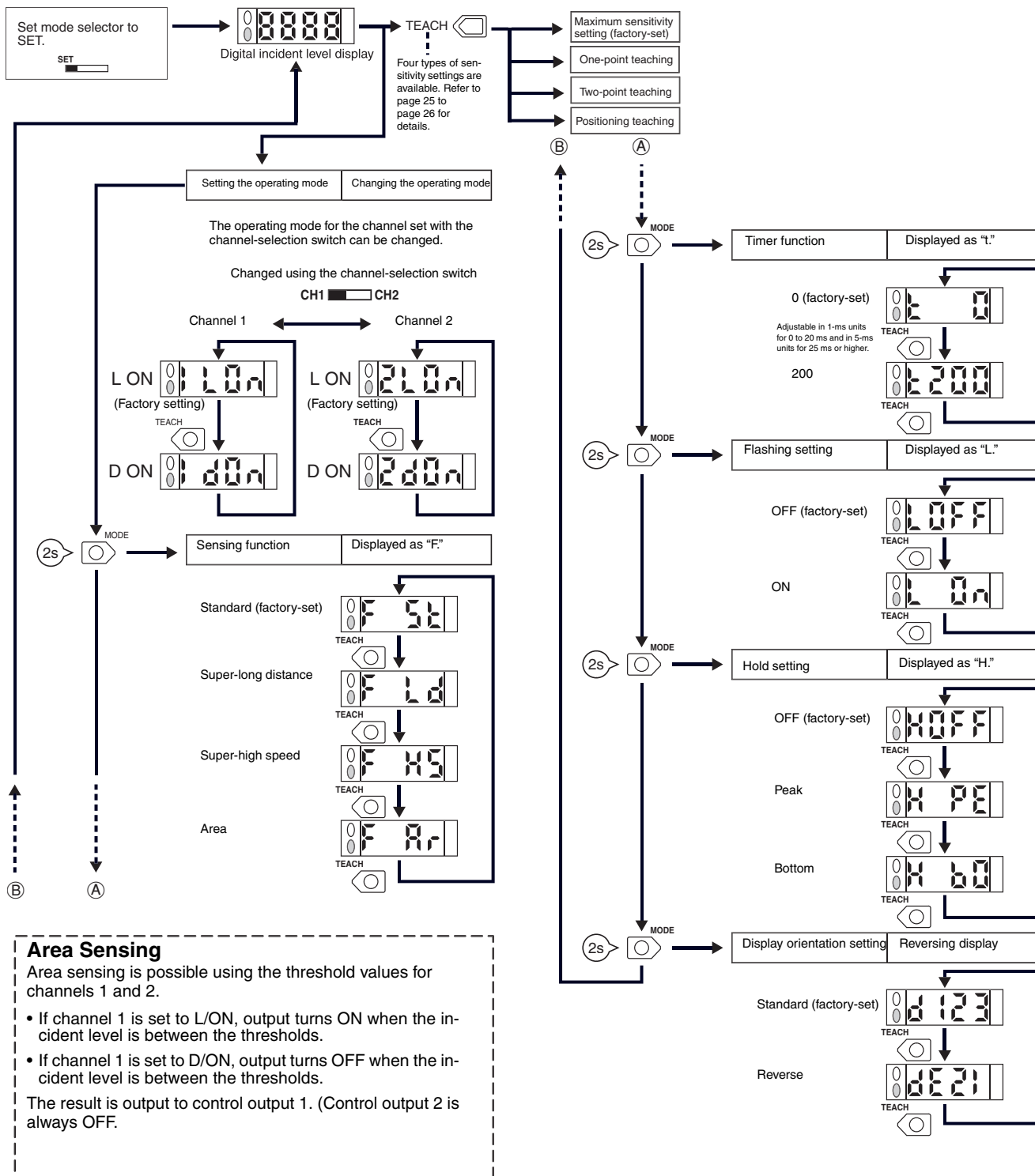
Monitor Focus

Available with:
E3X-DA21-N
E3X-DA51-N
E3X-DA7
E3X-DA9



Adjustments: Twin-output Models Only

Setting Functions (SET Mode)



Adjustments: Teaching (All Models, SET Mode)

The four types of teaching given below are available.

Once the setting is made, the Amplifier Unit operates according to the settings. The red level display will flash if a teaching error occurs. In that case, repeat the whole teaching procedure.

With twin-output models, switch to the channel to be adjusted using the channel-selection switch.



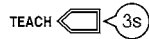
Set the mode selector to SET to start teaching. SET

Maximum Sensitivity Setting

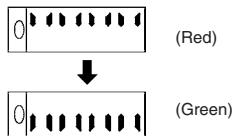
1. Set the mode selector to SET.



2. Press the TEACH button for 3 seconds min.



3. Setting is complete when the level display changes from red to green.
The level display will display the digital incident level later.



4. Set to RUN mode.

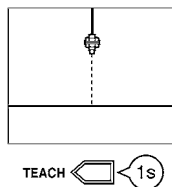


One-point Without-object Teaching

1. Set the mode selector to SET.



2. Press the TEACH button for approximately 1 second.



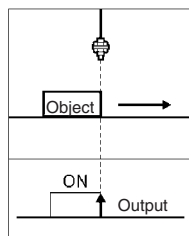
3. Teaching is complete when the red level display is lit.
The level display will display the digital incident level later.



4. Set to RUN mode.



5. The threshold is automatically set with the object.



Note: If one-point teaching is not available because the difference in level is too fine, try two-point teaching.

Operation Mode Selector

| Operation mode | | Operation |
|----------------|-------|------------------|
| Light ON | L• ON | L (Factory-set) |
| Dark ON | D• ON | D |

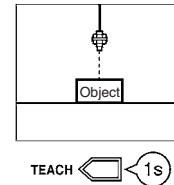
Note: There is no operation mode selector for twin-output models.

Two-point With/Without-object Teaching

1. Set the mode selector to SET.



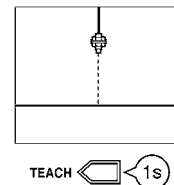
2. Press the TEACH button for approximately 1 second when the object is at the sensing position.



3. The red level display is lit.



4. Press the TEACH button for approximately 1 second with no object.



5. Teaching is complete when the green level display is lit.
The level display will display the digital incident level later.



6. Set to RUN mode.



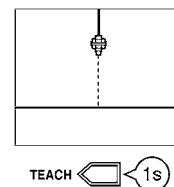
Note: The order of “with-object” and “without-object” setting procedures above can be reversed.

Pin-point Teaching (for Positioning)

1. Set the mode selector to SET.



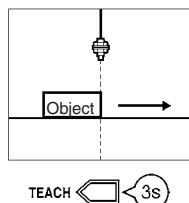
2. Press the TEACH button for approximately 1 second with no object.



3. The red level display is lit.



4. Place the object in the desired position, and press the TEACH button for 3 seconds min.



5. Teaching is complete when the green level display is lit. The level display will display the digital incident level later. (The red level display will flash if a teaching error occurs.)



6. Set to RUN mode.



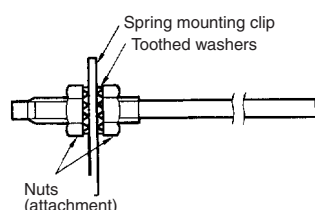
Fiber Units

Mounting

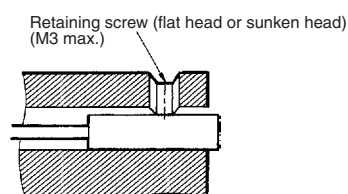
Tightening Force

The tightening force applied to the Fiber Unit should be as follows:

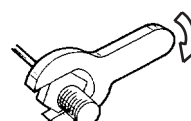
Screw-mounting Model



Cylindrical Model



Use a proper-sized wrench.

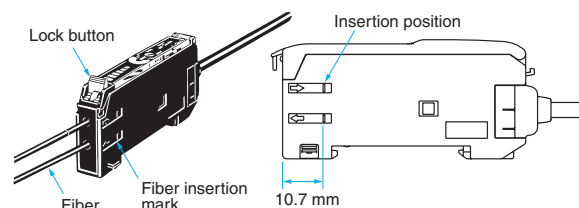


Fiber Connection and Disconnection

The E3X Amplifier Unit has a lock button. Connect or disconnect the fibers to or from the E3X Amplifier Unit using the following procedures:

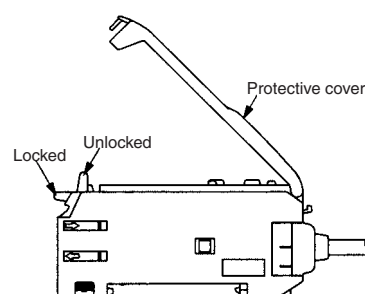
1. Connection

Open the protective cover, insert the fibers according to the fiber insertion marks on the side of the Amplifier Unit, and lower the lock button.



2. Disconnection

Remove the protective cover and raise the lock button to pull out the fiber.



Note: To maintain the fiber properties, confirm that the lock is released before removing the fiber.

3. Precautions for Fiber Connection/Disconnection

Be sure to lock or unlock the lock button within an ambient temperature range between -10°C and 40°C .

| Fiber Units | Clamping torque |
|--|--|
| M3/M4 screw | 0.78 N • m max. |
| M6 screw/ 6-mm dia. column | 0.98 N • m max. |
| 1.5-mm dia. column | 0.2 N • m max. |
| 2-mm dia./3-mm dia. column | 0.29 N • m max. |
| E32-T12F 5-mm dia. fluororesin model | 0.78 N • m max. |
| E32-D12F 6-mm dia. fluororesin model | |
| E32-T16 | 0.49 N • m max. |
| E32-R21 | 0.39 N • m max. |
| E32-M21 | Up to 5 mm to the tip: 0.49 N • m max. More than 5 mm from the tip: 0.78 N • m max. |
| E32-L25A | 0.78 N • m max. |
| E32-T16P E32-T24S E32-L24L E32-L25L | 0.29 N • m max. |

Cutting Fiber

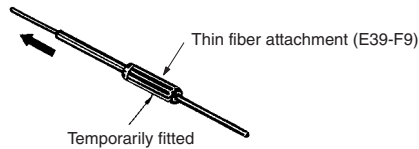
Insert a fiber into the Fiber Cutter and determine the length of the fiber to be cut.

Press down the Fiber Cutter in a single stroke to cut the fiber.

The cutting holes cannot be used twice. If the same hole is used twice, the cutting face of the fiber will be rough and the sensing distance will be reduced. Always use an unused hole.

Cut a thin fiber as follows:

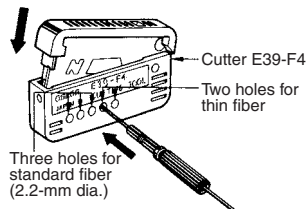
1. An attachment is temporarily fitted to a thin fiber before shipment.



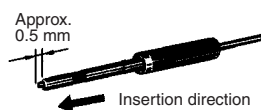
2. Secure the attachment after adjusting the position of it in the direction indicated by the arrow.



3. Insert the fiber to be cut into the E39-F4.



4. Finished state (proper cutting state)



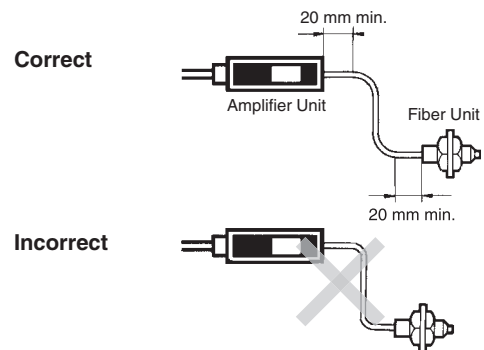
Note: Insert the fiber in the direction indicated by the arrow.

Connection

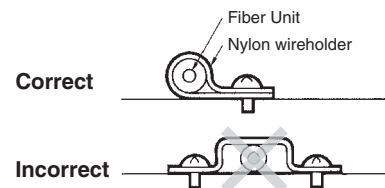
Do not pull or press the Fiber Units. The Fiber Units have a withstand force of 9.8 N or 29.4 N max. (pay utmost attention because the fibers are thin).

Do not bend the Fiber Unit beyond the permissible bending radius given under *Specifications: Amplifier Units* on page 4.

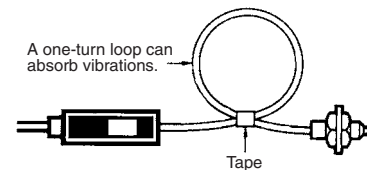
Do not bend the edge of the Fiber Units (excluding the E32-T□R and E32-D□R).



Do not apply excess force on the Fiber Units.



The Fiber Head could be break by excessive vibration. To prevent this, the following is effective:

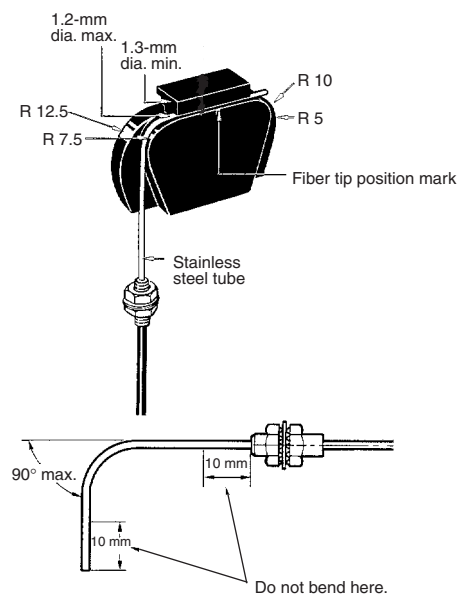


Bending Radius

E39-F11 Sleeve Bender

The bending radius of the stainless steel tube should be as large as possible. The smaller the bending radius becomes, the shorter the sensing distance will be.

Insert the tip of the stainless steel tube to the Sleeve Bender and bend the stainless steel tube slowly along the curve of the Sleeve Bender (refer to the figure).

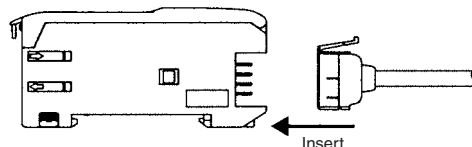


■ Amplifier Units with Connectors

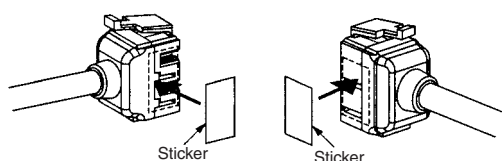
Mounting

Mounting Connectors

1. Insert the Master or Slave Connector into the Amplifier Unit until it clicks into place.



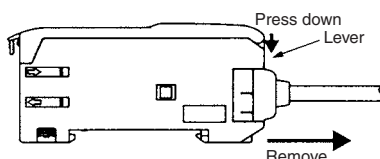
2. Join Amplifier Units together as required after all the Master and Slave Connectors have been inserted.
3. Attach the stickers (provided as accessories) to the sides of Master and Slave Connectors that are not connected to other Connectors.



Note: Attach the stickers to the sides with grooves.

Removing Connectors

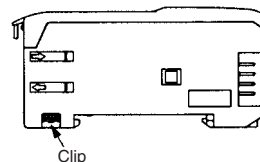
1. Slide the slave Amplifier Unit(s) for which the Connector is to be removed away from the rest of the group.
2. After the Amplifier Unit(s) has been separated, press down on the lever on the Connector and remove it. (Do not attempt to remove Connectors without separating them from other Amplifier Units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



Mounting End Plate (PFP-M)

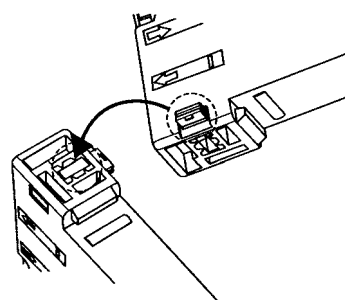
Depending on how it is mounted, an Amplifier Unit may move during operation. In this case, use an End Plate.

Before mounting an End Plate, remove the clip from the master Amplifier Unit using a nipper or similar tool.

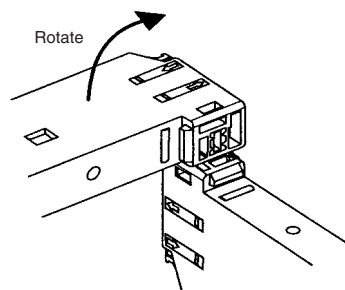


The clip can also be removed using the following mechanism, which is incorporated in the construction of the section underneath the clip.

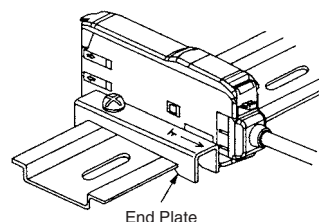
1. Insert the clip to be removed into the slit underneath the clip on another Amplifier Unit.



2. Remove the clip by rotating the Amplifier Unit.



When using the E3X-DA-N with the Mobile Console, mount the End Plate in the way shown below.



Pull Strengths for Connectors (Including Cables)

E3X-CN11, E3X-CN21, E3X-CN22: 30 N max.
E3X-CN12: 12 N max.

■ Reflector

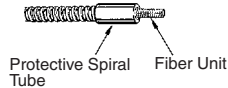
Use of E39-R3 Reflector

Use detergent, etc., to remove any dust or oil from the surfaces where tape is applied. Adhesive tape will not be attached properly if oil or dust remains on the surface.

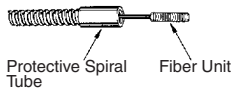
The E39-R3 cannot be used in places where it is exposed to oil or chemicals.

E39-F32 □ Protective Spiral Tubes

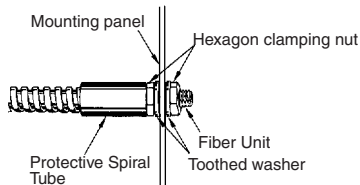
Insert a fiber to the Protective Spiral Tube from the head connector side (screwed) of the tube.



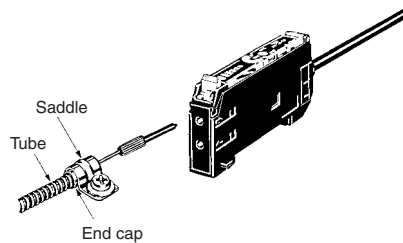
Push the fiber into the Protective Spiral Tube. The tube should be straight so that the fiber is not twisted when inserted. Then turn the end cap of the spiral tube.



Secure the Protective Spiral Tube on a suitable place with the attached nut.

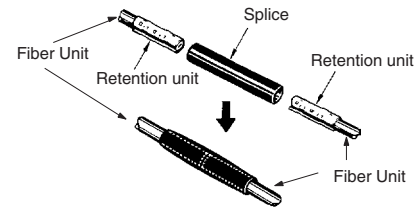


Use the attached saddle to secure the end cap of the Protective Spiral Tube. To secure the Protective Spiral Tube at a position other than the end cap, apply tape to the tube so that the portion becomes thicker in diameter.



E39-F10 Fiber Connector

Mount the Fiber Connector as shown in the following illustration.



The Fiber Units should be as close as possible when they are connected.

Sensing distance will be reduced by approximately 25% when fibers are connected.

Only 2.2-mm-dia. fibers can be connected.

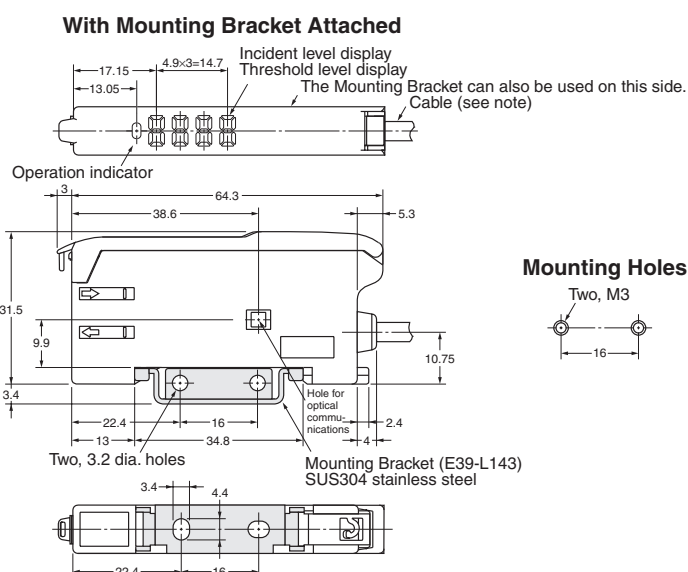
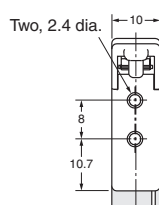
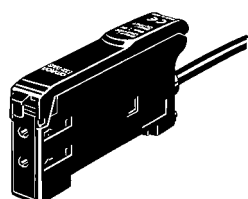
Dimensions

Note: All units are in millimeters unless otherwise indicated.

■ Amplifier Units

Amplifier Units with Cables

| | |
|-------------|-------------|
| E3X-DA11-N | E3X-DAG11-N |
| E3X-DA21-N | E3X-DAH11-N |
| E3X-DAB11-N | E3X-DAB41-N |
| E3X-DA41-N | E3X-DAG41-N |
| E3X-DA51-N | E3X-DAH41-N |



Note: E3X-DA11-N/DA41-N/DAB11-N: A 4-dia., 3-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.2 mm²; insulation diameter: 1.1 mm) is used.

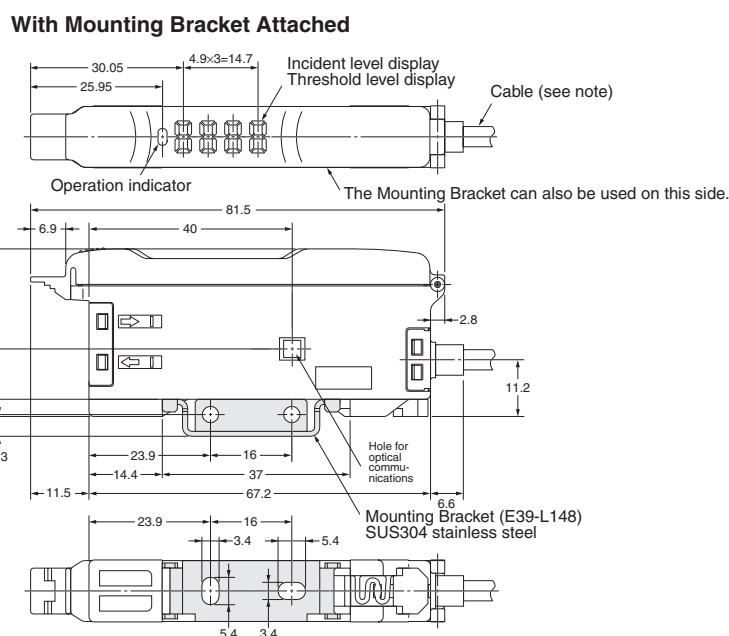
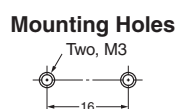
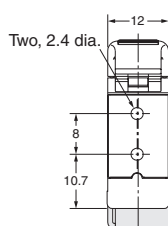
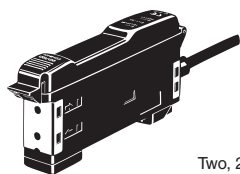
Standard length: 2 m.

E3X-DA21-N/DA51-N: A 4-dia., 4-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.2 mm²; insulation diameter: 1.1 mm) is used.

Standard length: 2 m.

Amplifier Units with Cables, Water-resistant Models

E3X-DA11V
E3X-DA41V

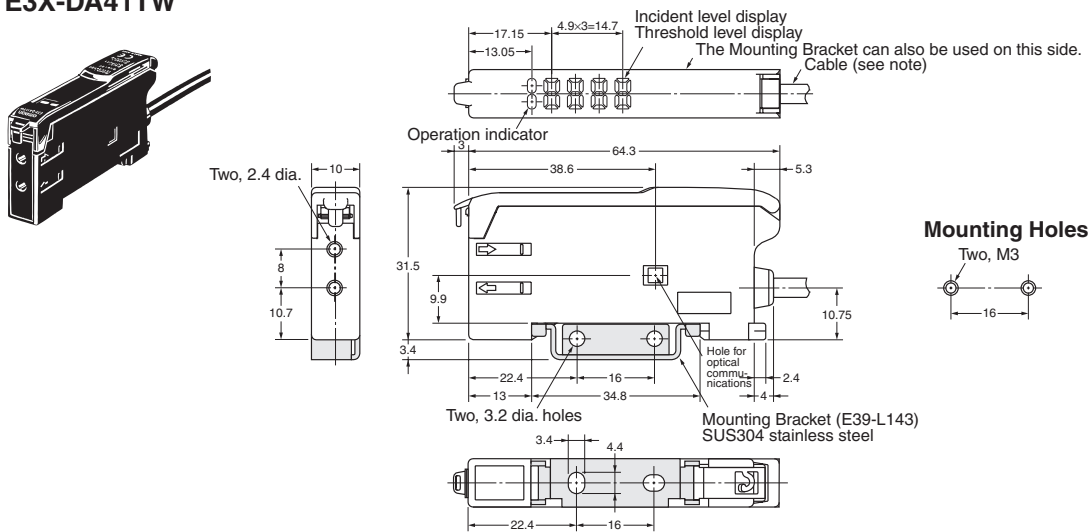


Note: A 4-dia., 3-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.2 mm²; insulation diameter: 1.1 mm) is used.
Standard length: 2 m.

Amplifier Units with Cables, Twin-output Models

E3X-DA11TW
E3X-DA41TW

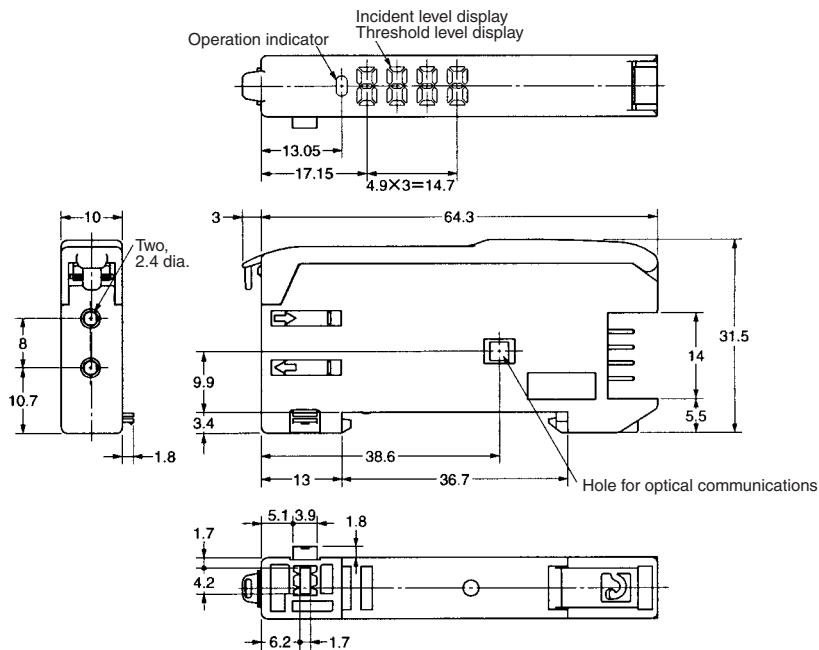
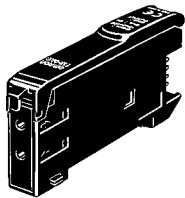
With Mounting Bracket Attached



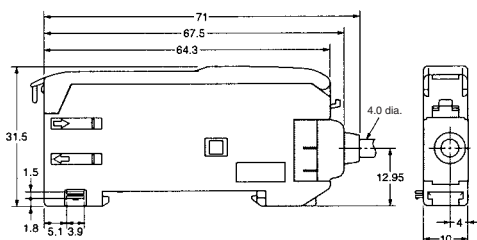
Note: A 4-dia., 4-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.2 mm²; insulation diameter: 1.1 mm) is used.
Standard length: 2 m.

Amplifier Units with Standard Connectors

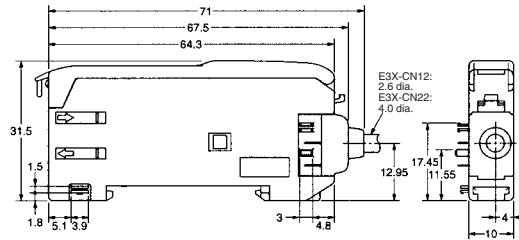
E3X-DA6 **E3X-DAG6**
E3X-DA7 **E3X-DAH6**
E3X-DA8 **E3X-DAB8**
E3X-DA9 **E3X-DAG8**
E3X-DAB6 **E3X-DAH8**



Dimensions with Master Connector Connected

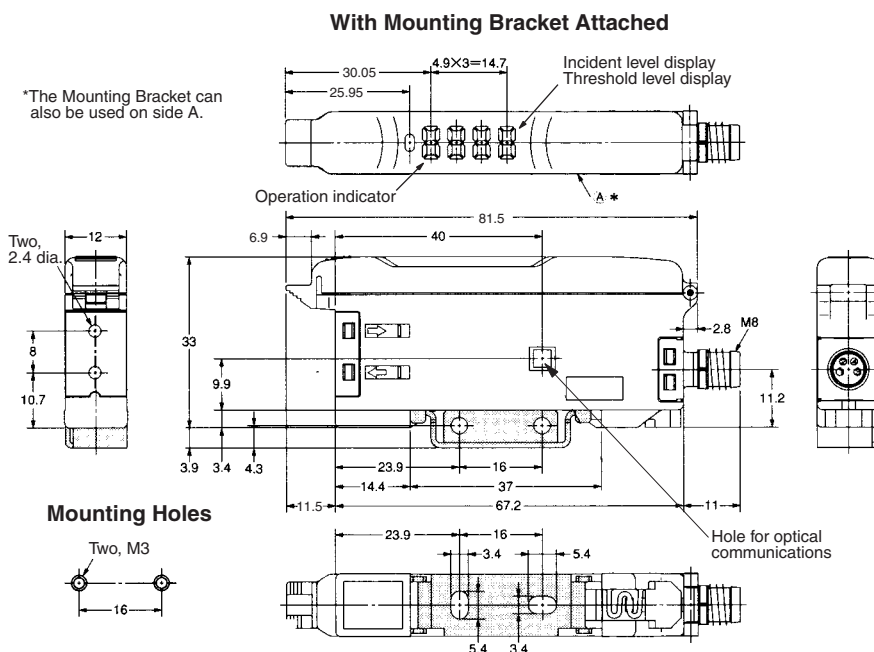
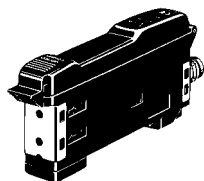


Dimensions with Slave Connector Connected



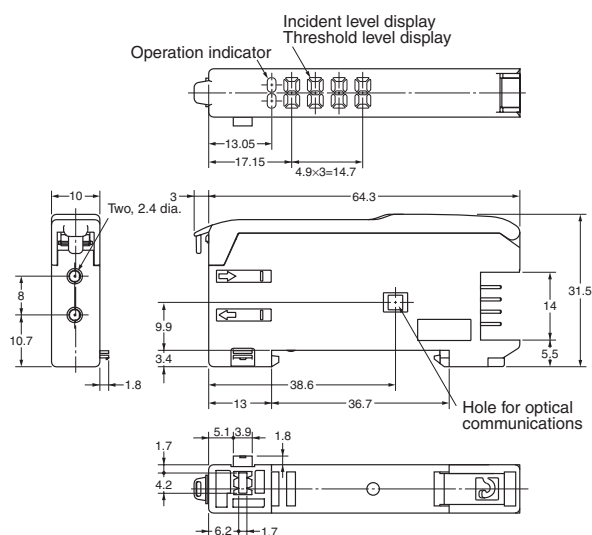
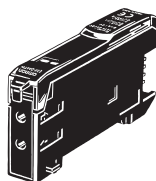
Amplifier Units with M8 Connectors, Water-resistant Models

E3X-DA14V
E3X-DA44V

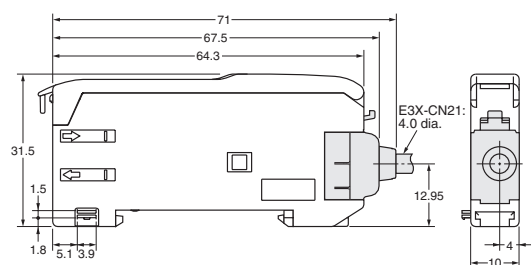


Amplifier Units with Standard Connectors, Twin-output Models

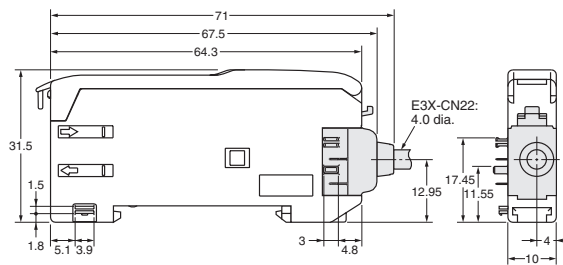
E3X-DA6TW
E3X-DA8TW



Dimensions with Master Connector Connected



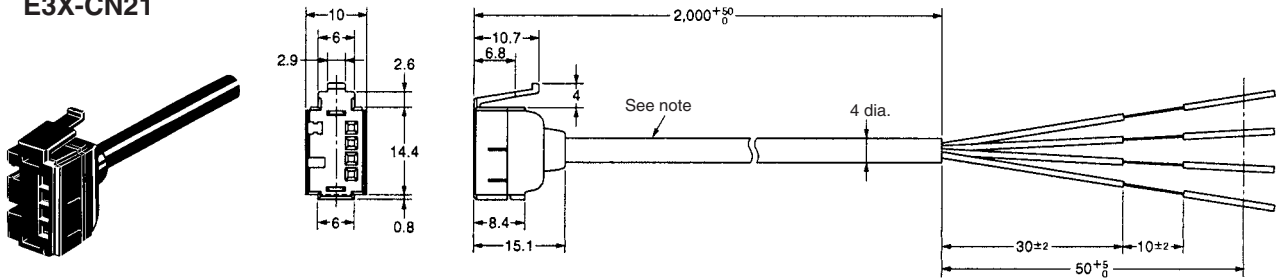
Dimensions with Slave Connector Connected



■ Amplifier Units with Connectors

Master Connectors

E3X-CN11
E3X-CN21

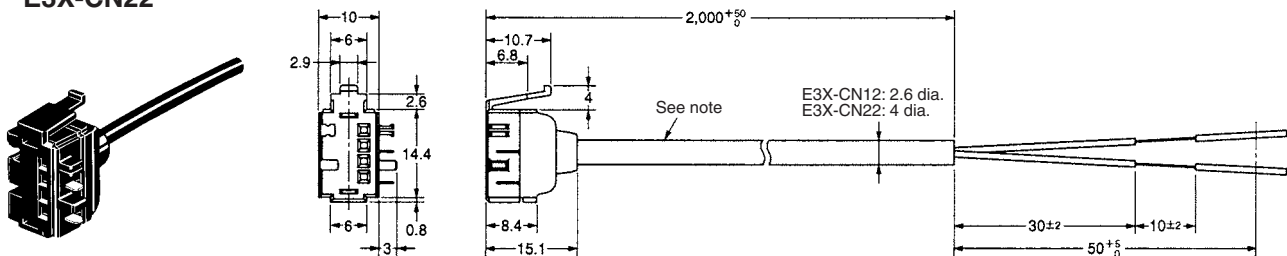


Note: E3X-CN11: A 4-dia., 3-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.2 mm^2 ; insulation diameter: 1.1 mm) is used.

E3X-CN21: A 4-dia., 4-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.2 mm^2 ; insulation diameter: 1.1 mm) is used.

Slave Connectors

E3X-CN12
E3X-CN22



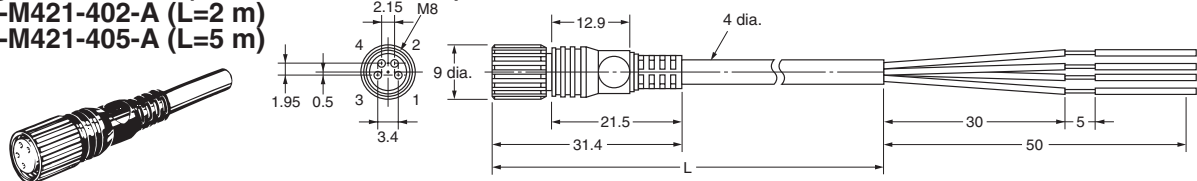
Note: E3X-CN12: A 2.6-dia., single-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.2 mm^2 ; insulation diameter: 1.1 mm) is used.

E3X-CN22: A 4-dia., 2-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.2 mm^2 ; insulation diameter: 1.1 mm) is used.

■ Sensor I/O Connectors

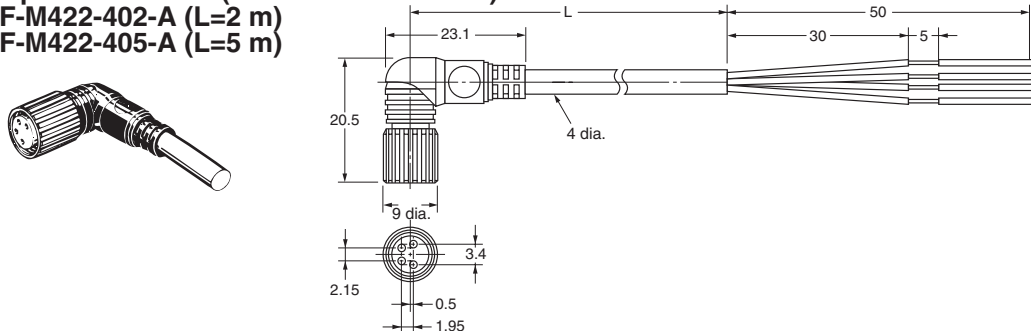
Straight Connector (at One End of Cable)

XS3F-M421-402-A (L=2 m)
XS3F-M421-405-A (L=5 m)



L-shaped Connector (at One End of Cable)

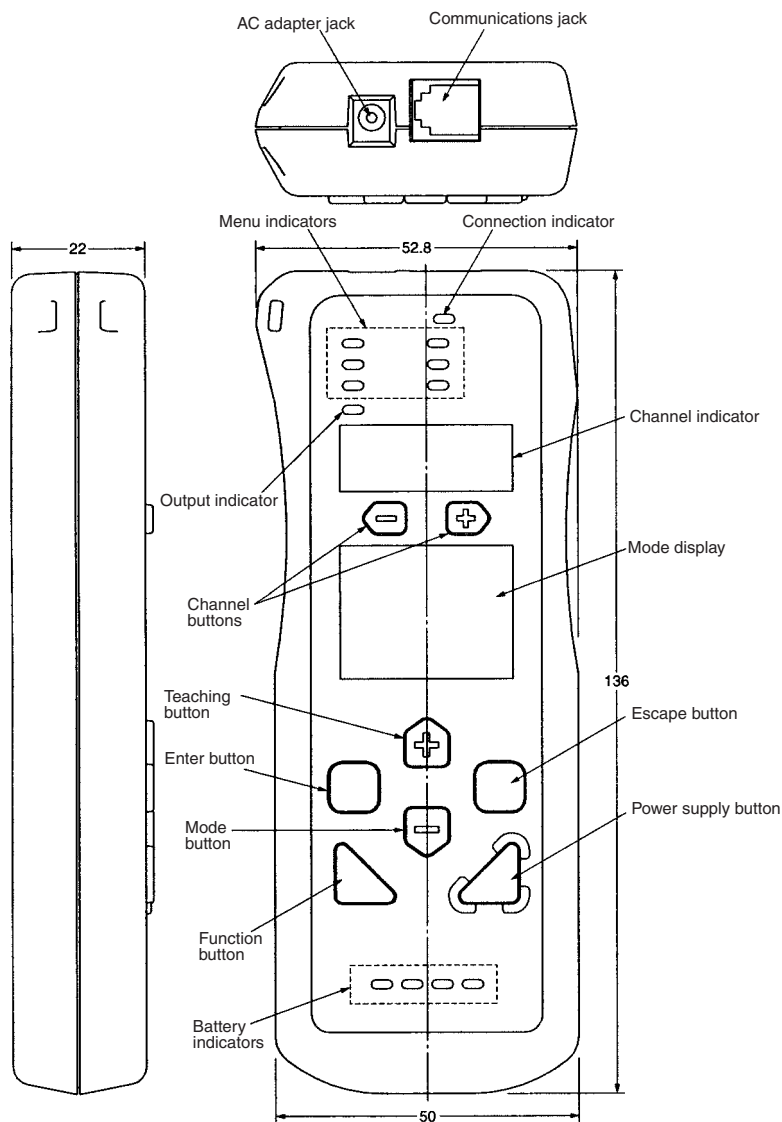
XS3F-M422-402-A (L=2 m)
XS3F-M422-405-A (L=5 m)



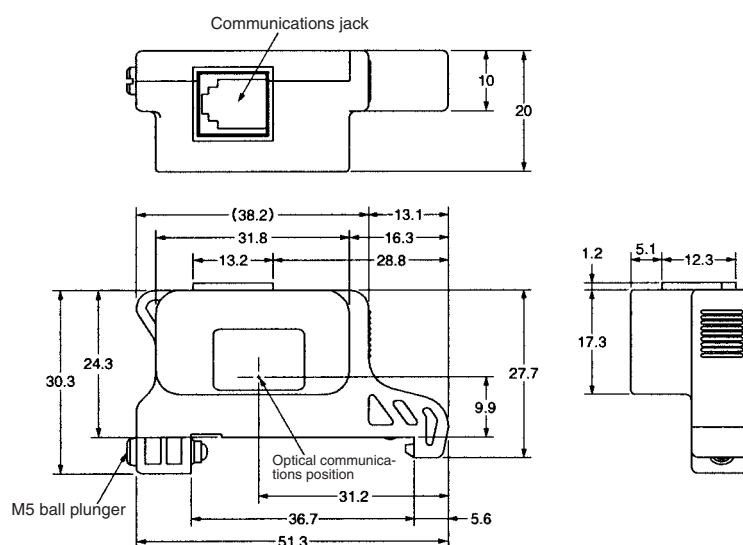
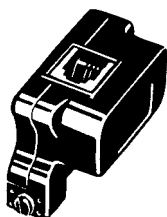
■ Mobile Console

(Set: E3X-MC11)

(Console only: E3X-MC11-C1)

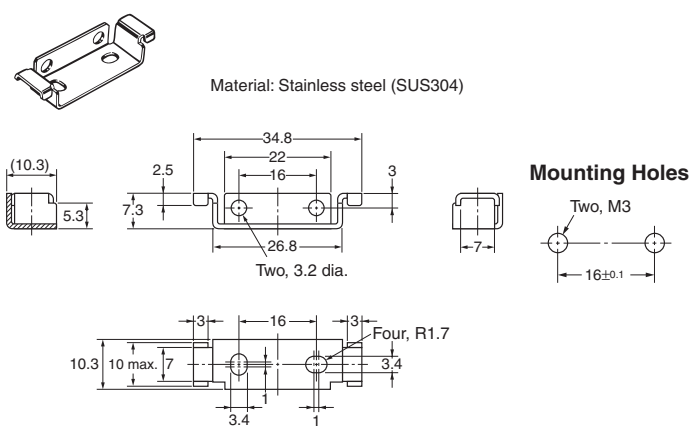


Mobile Console Head (E3X-MC11-H1)

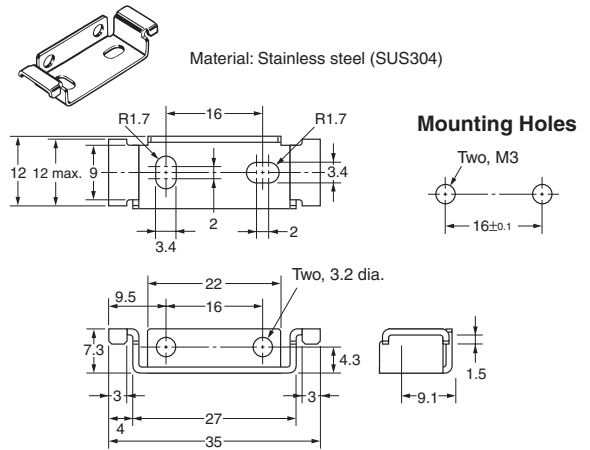


Mounting Brackets

E39-L143

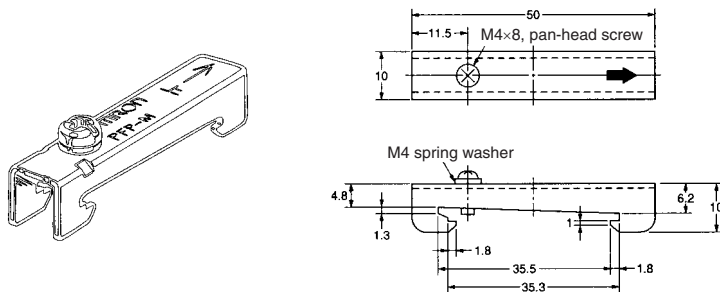


E39-L148



End Plate

PFP-M



Operating Instructions Sticker

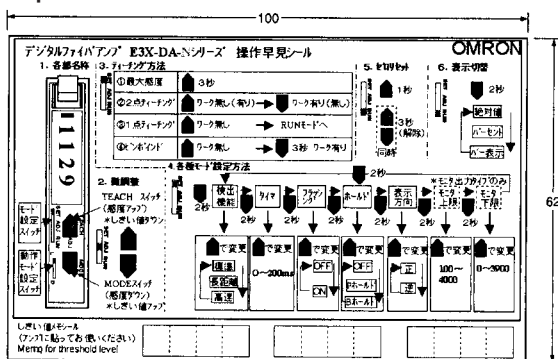
E39-Y1 (1 English and 1 Japanese sticker per set)

Material

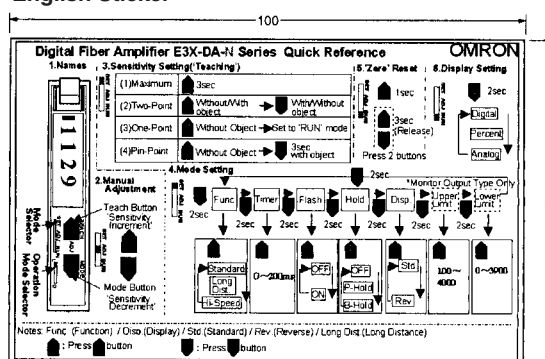
Front side: Paper

Reverse side: Adhesive tape

Japanese Sticker



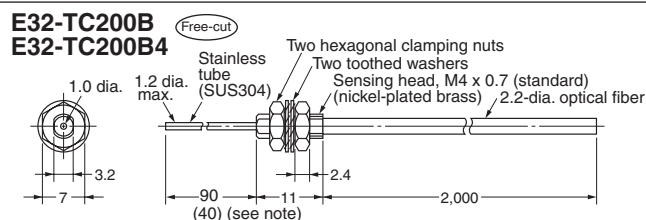
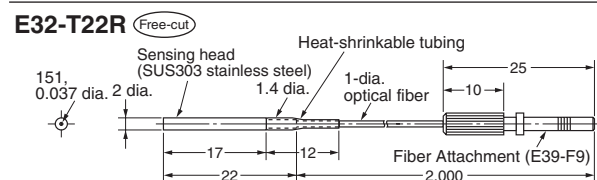
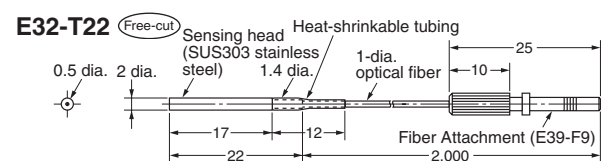
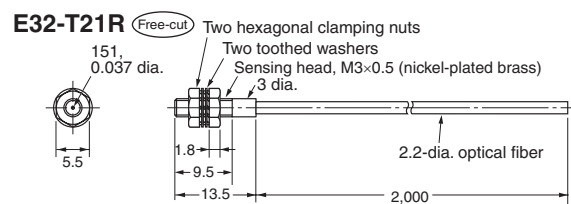
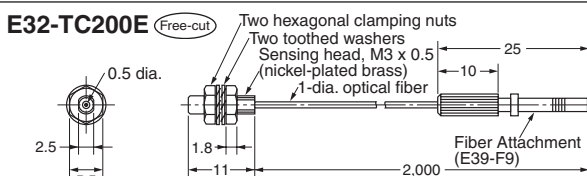
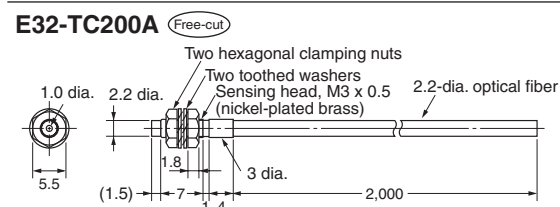
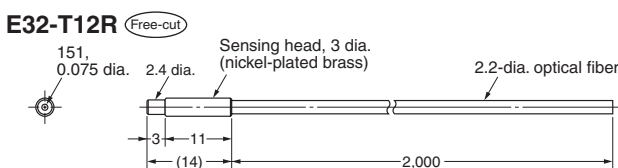
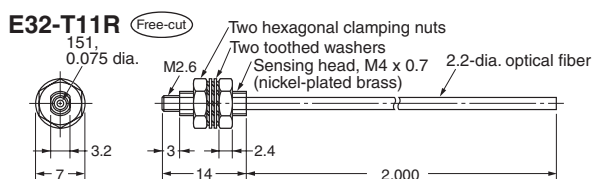
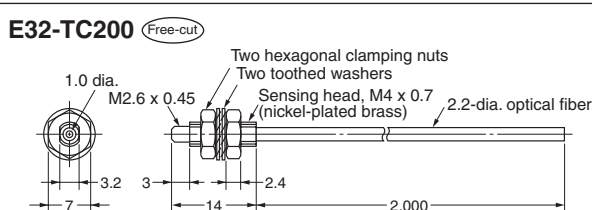
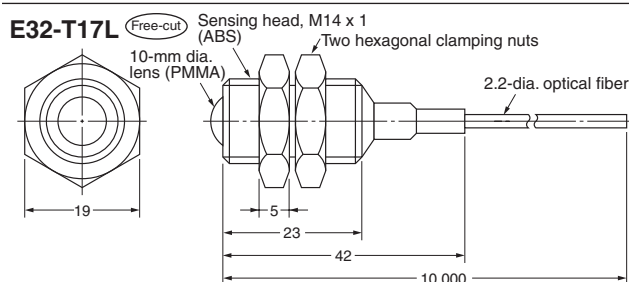
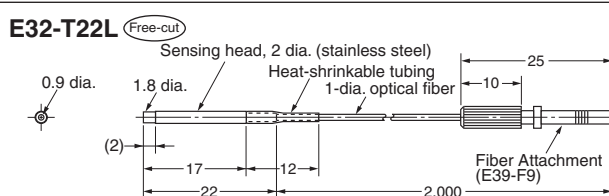
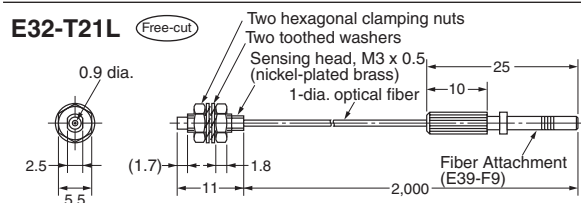
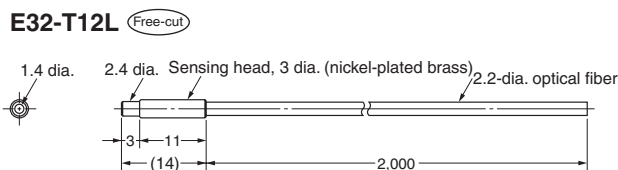
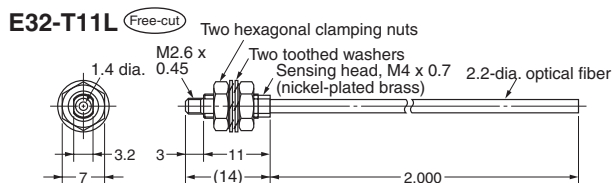
English Sticker



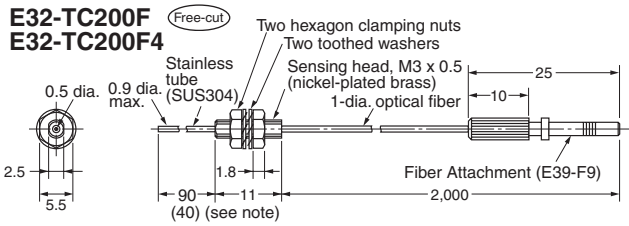
Fiber Units

Through-beam Fiber Units (Sold in Pairs)

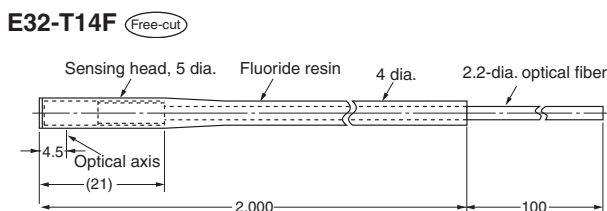
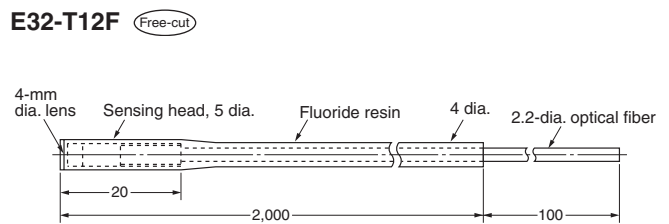
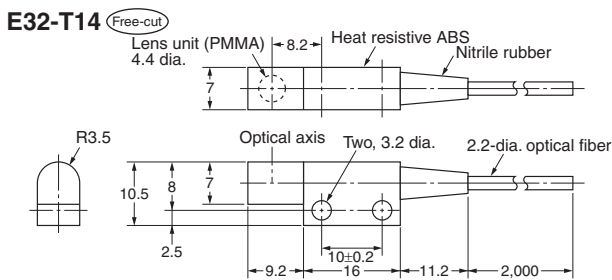
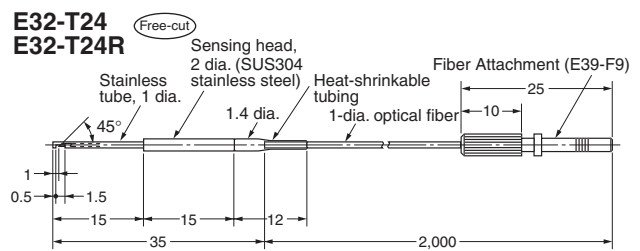
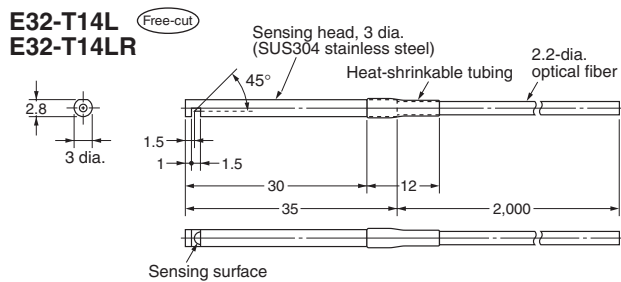
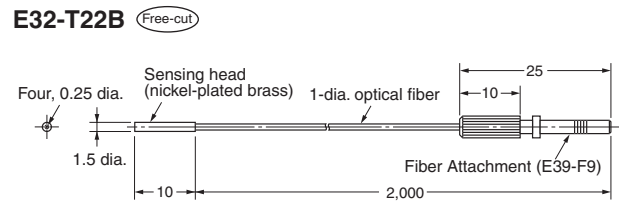
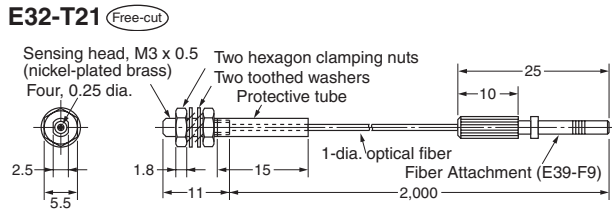
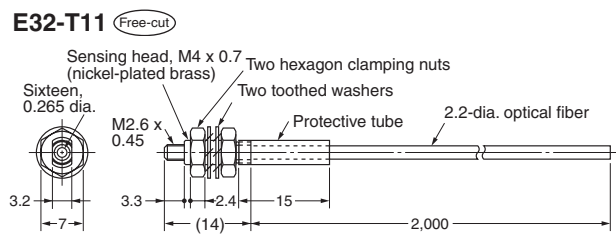
(Free-cut) Indicates models that allow free cutting. Models without this mark do not allow free cutting.



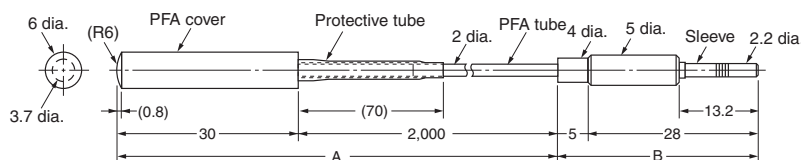
Note: The value in the parentheses is for the E32-TC200B4.



Note: The value in the parentheses is for the E32-TC200F4.

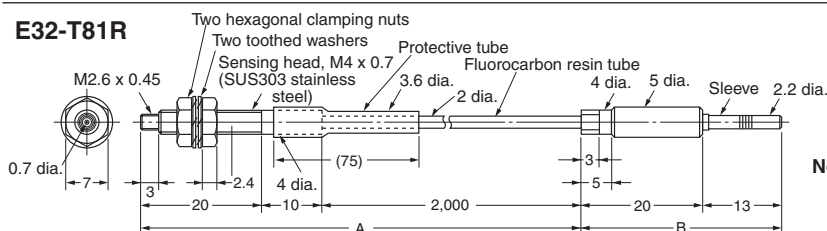


E32-T81F

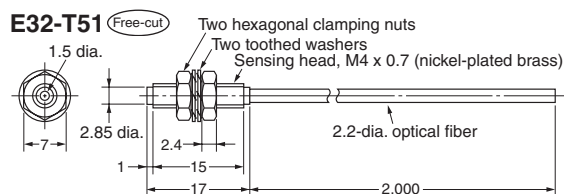


Note: Section A resists 200°C and section B resists 110°C.

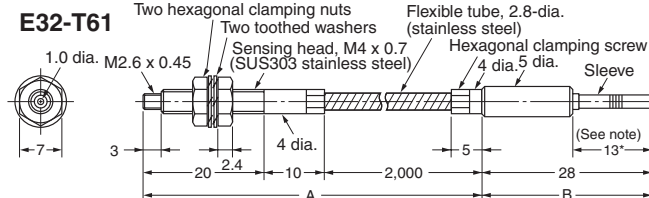
E32-T81R



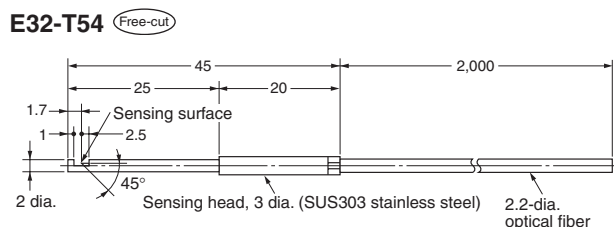
Note: Section A resists 200°C and section B resists 110°C.



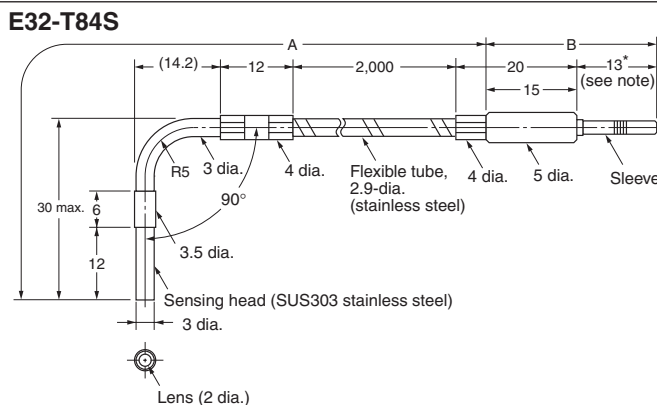
Note: Resistant temperature is 150°C.
Resistant temperature is 130°C
when used continuously.



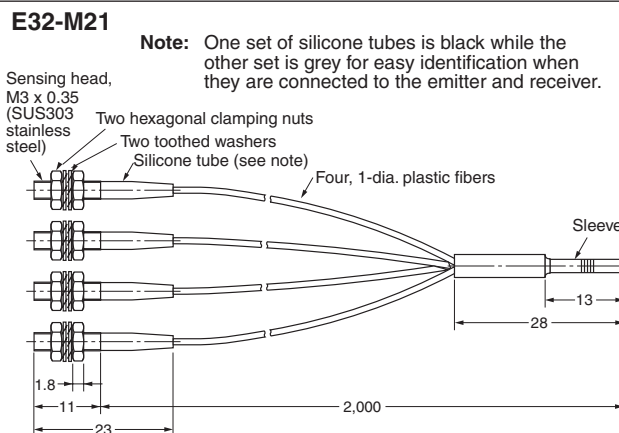
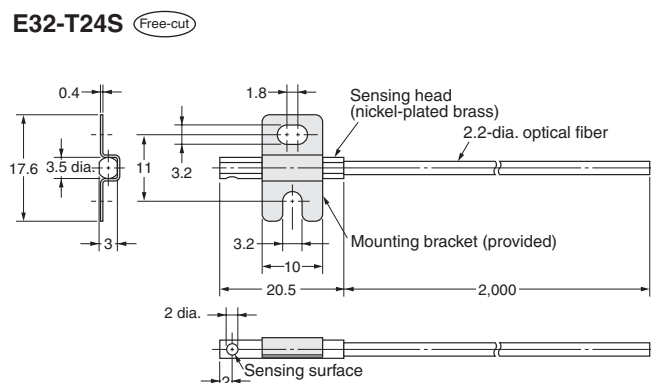
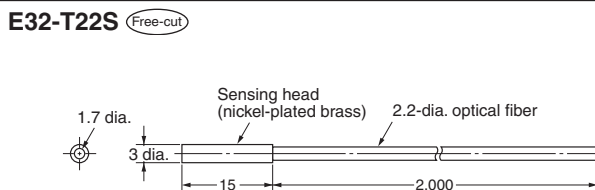
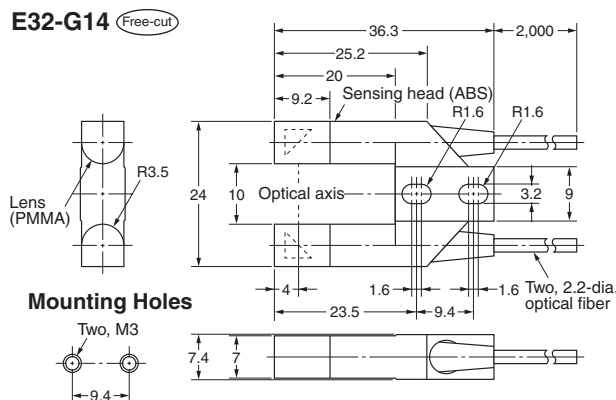
Note: Section A resists 300°C and section B (which is inserted to the Amplifier) resists 110°C.
The operating temperature of the section to be inserted into the Sensor (marked with *) must be within the operating temperature range of the Amplifier.



Note: Resistant temperature is 150°C.
Resistant temperature is 130°C
when used continuously.

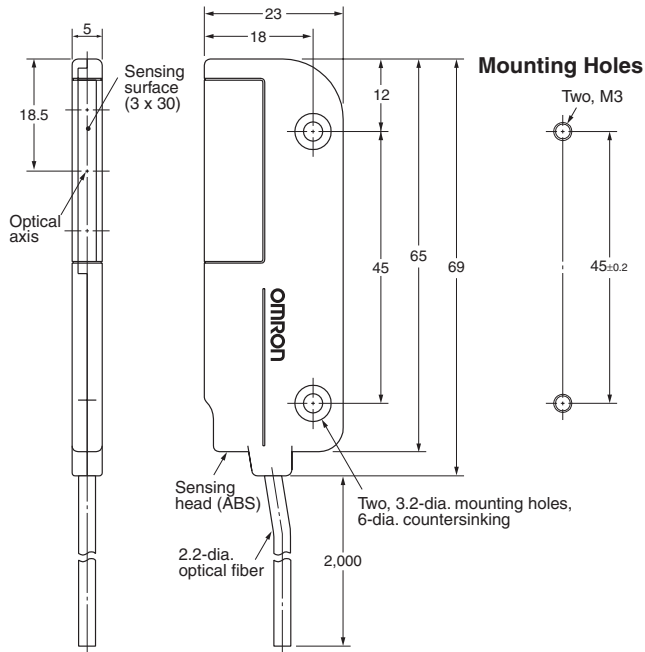


Note: Section A resists 200°C and section B (which is inserted to the Amplifier) resists 110°C.
The operating temperature of section to be inserted into the Sensor (marked with *) must be within the operating temperature range of the Amplifier.



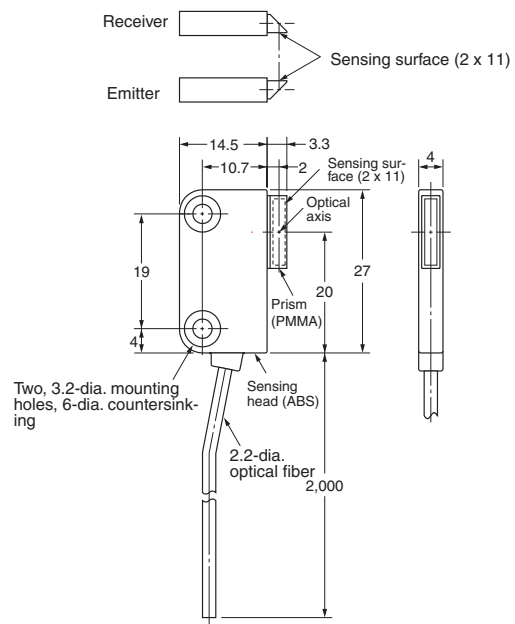
E32-T16W E32-T16WR

(Free-cut)



E32-T16J E32-T16JR

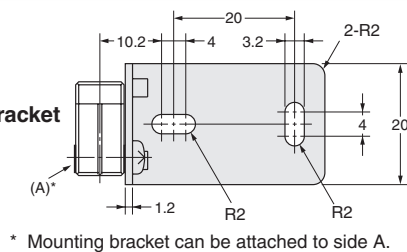
(Free-cut)



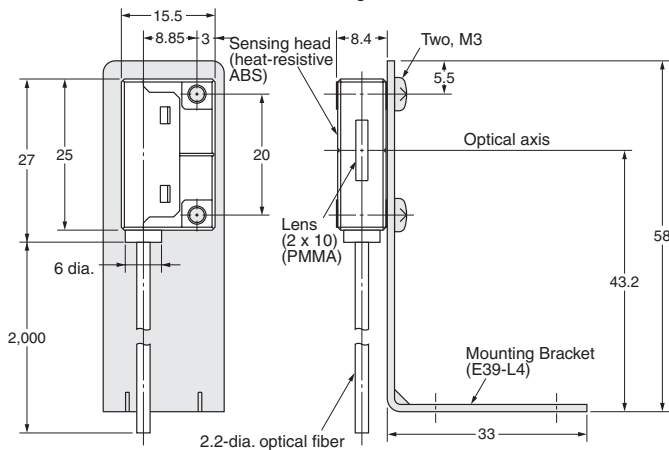
E32-T16

(Free-cut)

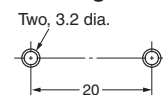
With Mounting Bracket



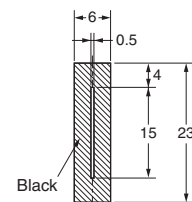
* Mounting bracket can be attached to side A.



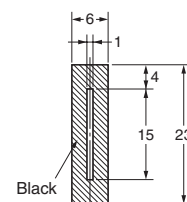
Mounting Holes



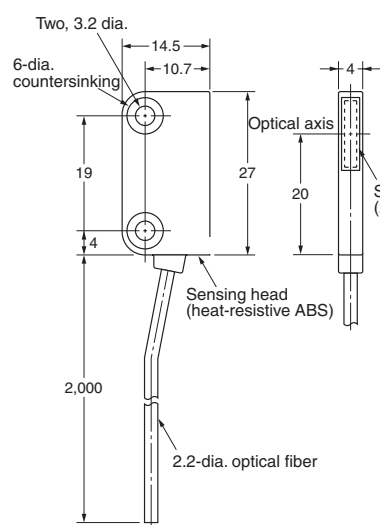
0.5-mm-wide Slit Seal
(Supplied with the Unit in Pairs)



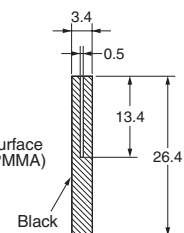
1-mm-wide Slit Seal
(Supplied with the Unit in Pairs)



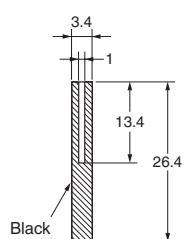
E32-T16P Free-cut E32-T16PR



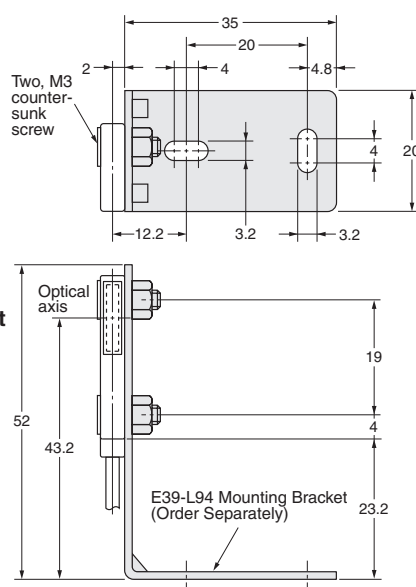
0.5-mm-wide Slit Seal (Supplied with the Unit in Pairs)



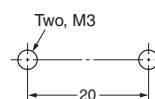
1-mm-wide Slit Seal (Supplied with the Unit in Pairs)



With Mounting Bracket



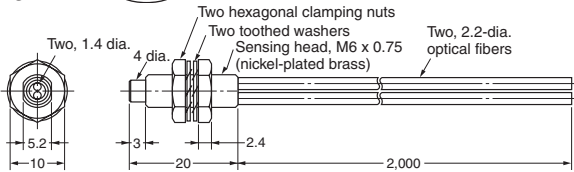
Mounting Holes



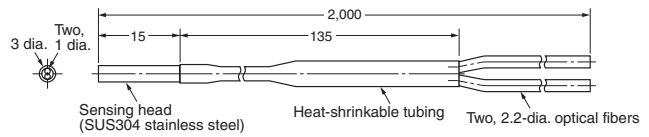
■ Reflective Fiber Units

Free-cut Indicates models that allow free cutting. Models without this mark do not allow free cutting.

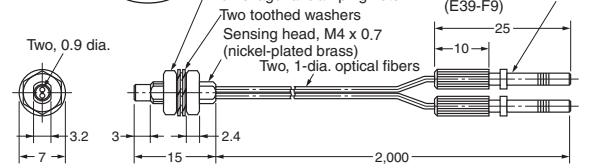
E32-D11L **Free-cut**



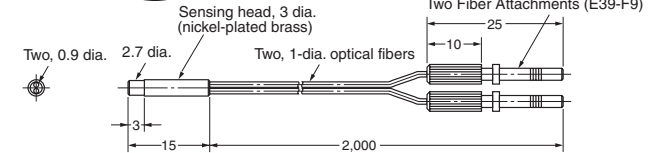
E32-D12 **Free-cut**



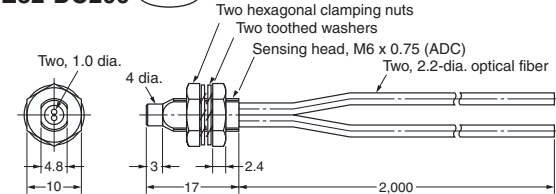
E32-D21L **Free-cut**



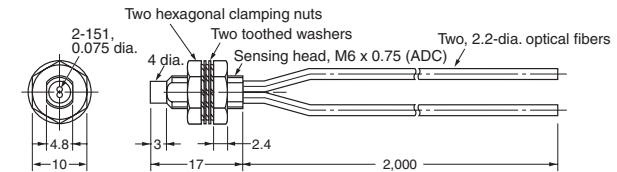
E32-D22L **Free-cut**



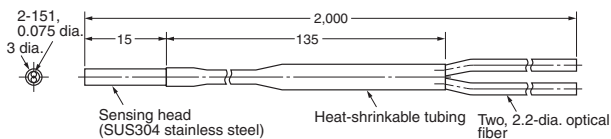
E32-DC200 **Free-cut**



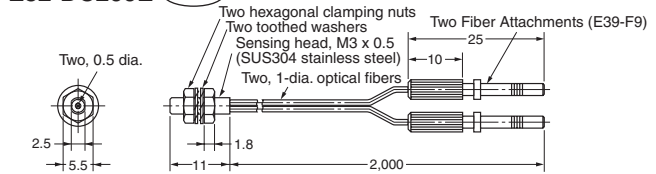
E32-D11R **Free-cut**



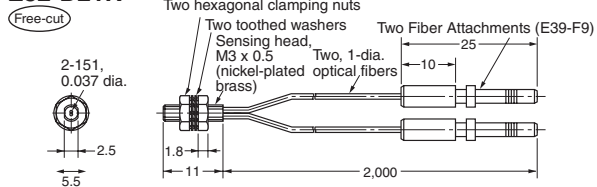
E32-D12R **Free-cut**



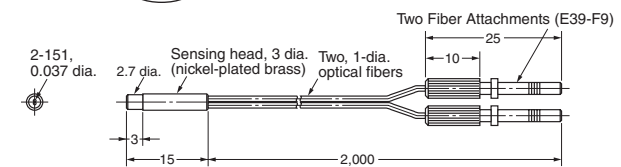
E32-DC200E **Free-cut**



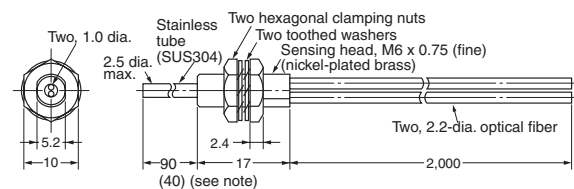
E32-D21R **Free-cut**



E32-D22R **Free-cut**

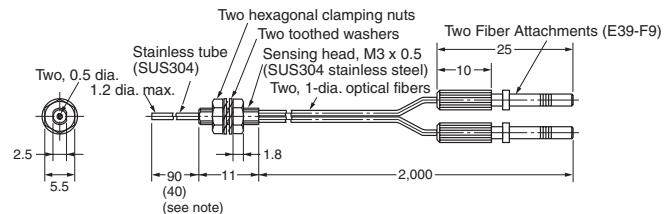


E32-DC200B **Free-cut**
E32-DC200B4



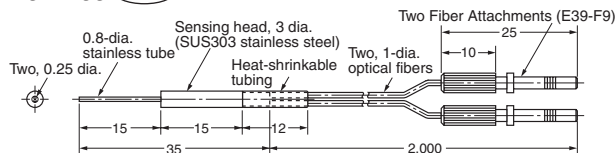
Note: The value in the parentheses is for the E32-DC200B4.

E32-DC200F **Free-cut**
E32-DC200F4

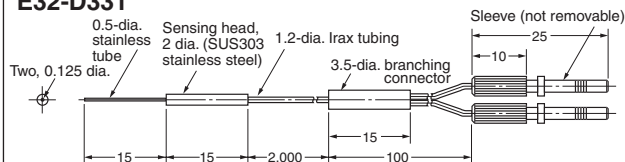


Note: The value in the parentheses is for the E32-DC200F4.

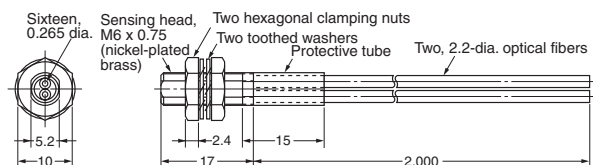
E32-D33 (Free-cut)



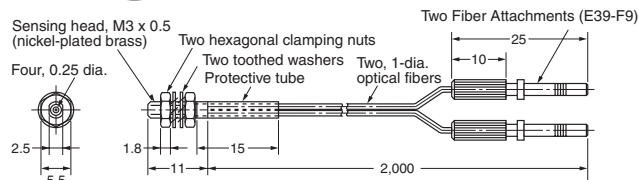
E32-D331



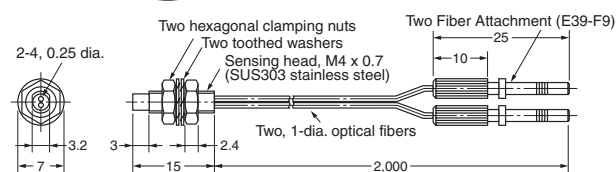
E32-D11 (Free-cut)



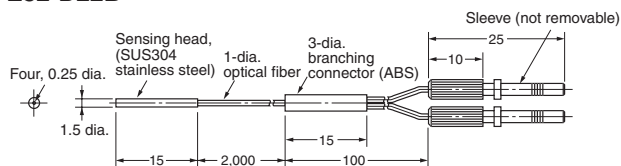
E32-D21 (Free-cut)



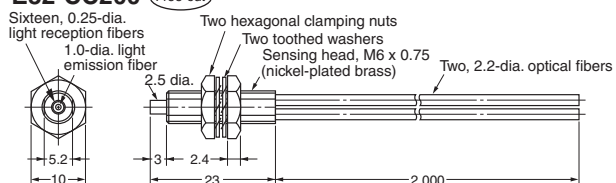
E32-D21B (Free-cut)



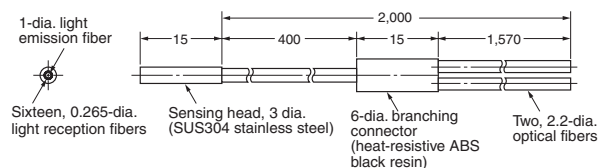
E32-D22B



E32-CC200 (Free-cut)



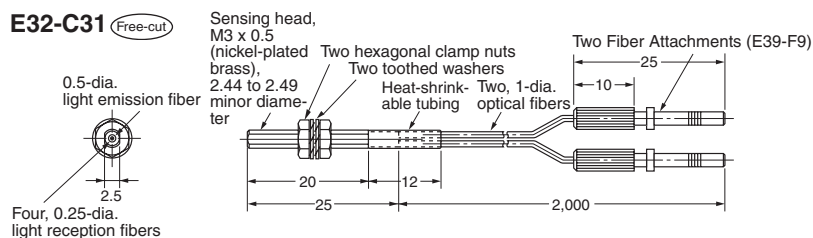
E32-D32L (Free-cut)



Note: The fiber for the emitter is identified by a white line.

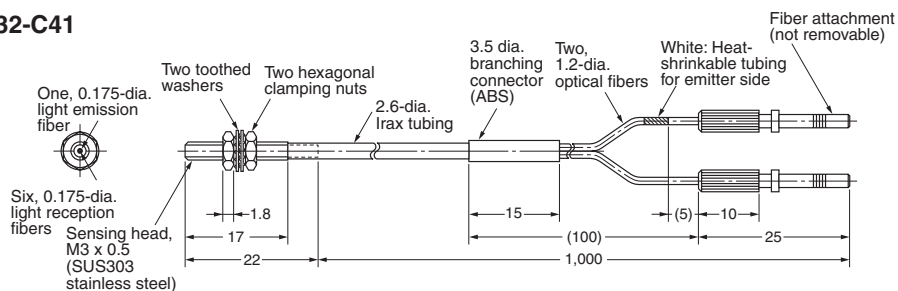
Note: The fiber for the emitter is identified by a yellow dotted line.

E32-C31 (Free-cut)

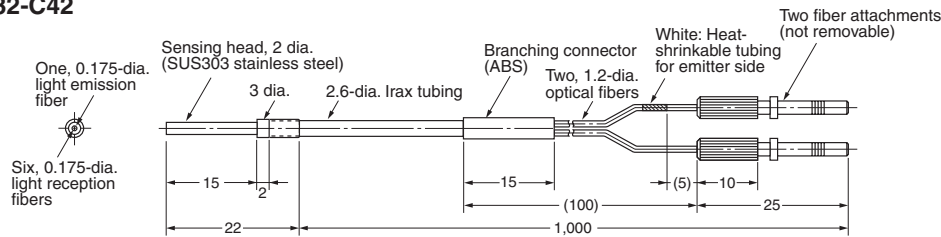


Note: The fiber for the emitter is identified by a white line.

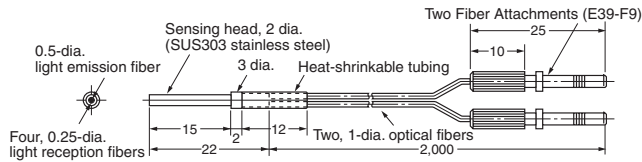
E32-C41



E32-C42

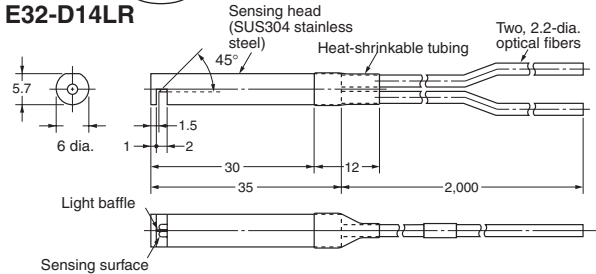


E32-D32 (Free-cut)

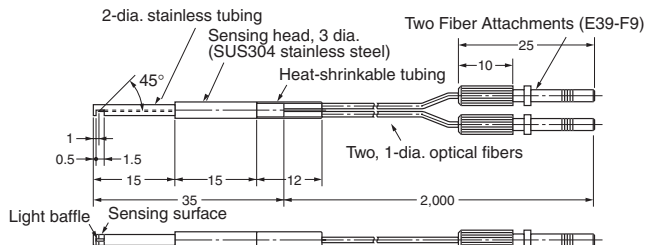


Note: The fiber for the emitter is identified by a white line.

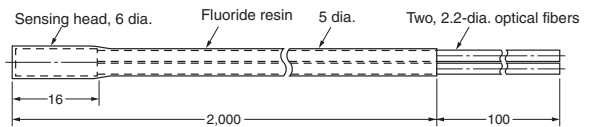
E32-D14L (Free-cut) E32-D14LR



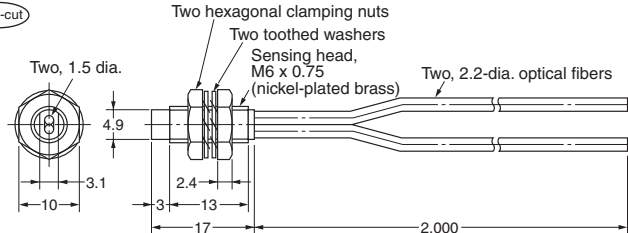
E32-D24 (Free-cut) E32-D24R



E32-D12F (Free-cut)

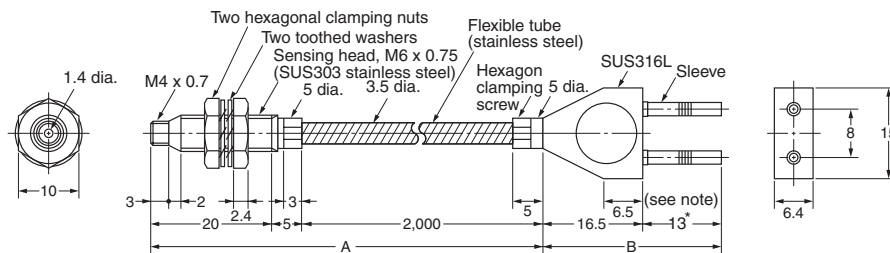


E32-D51 (Free-cut)



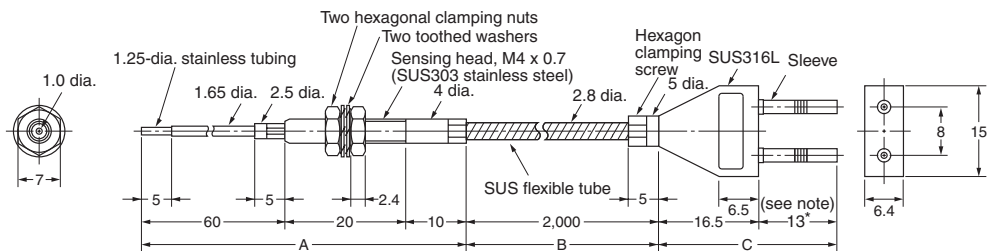
Note: Resistant temperature is 150°C.
Resistant temperature is 130°C
when used continuously.

E32-D61



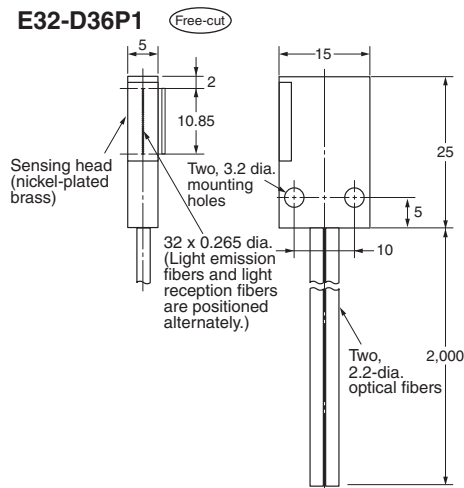
Note: Section A resists 300°C and section B (which is inserted to the Amplifier) resists 110°C. The operating temperature of the section to be inserted into the Sensor (marked with *) must be within the operating temperature range of the Amplifier.

E32-D73

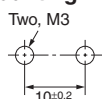


Note: Section A resists 400°C, section B resists 300°C, and section C (which is inserted to the Amplifier) resists 110°C. The operating temperature of the section to be inserted into the Sensor (marked with *) must be within the operating temperature range of the Amplifier.

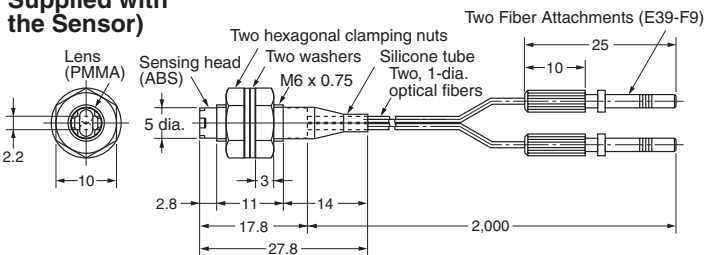
E32-D36P1



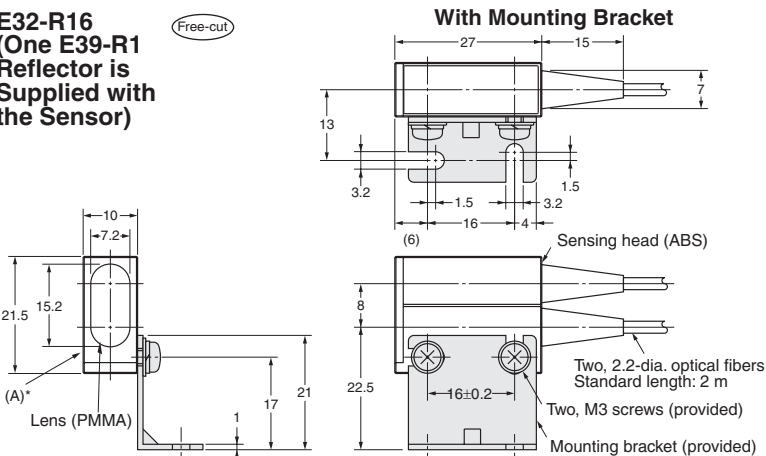
Mounting Holes



**E32-R21
(One E39-R3
Reflector is
Supplied with
the Sensor)**

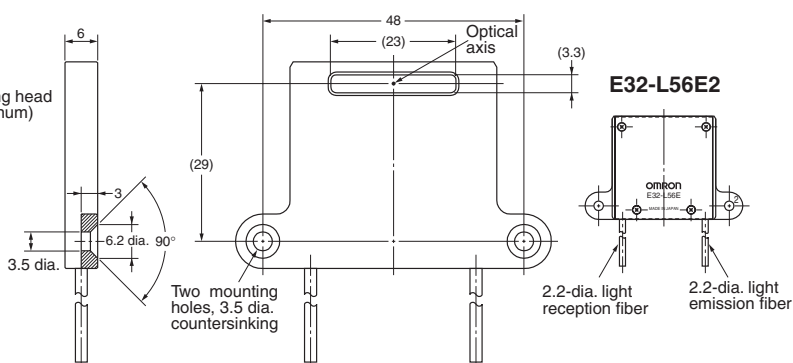
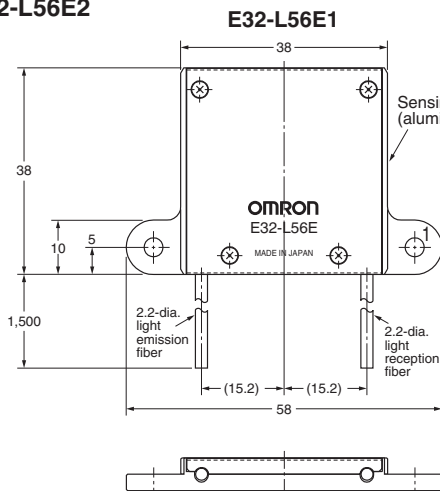


E32-R16
(One E39-R1
Reflector is
Supplied with
the Sensor)



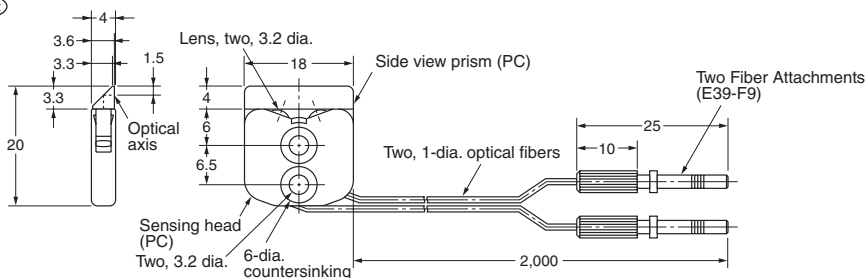
* Mounting bracket can be attached to side A.

E32-L56E1
E32-L56E2

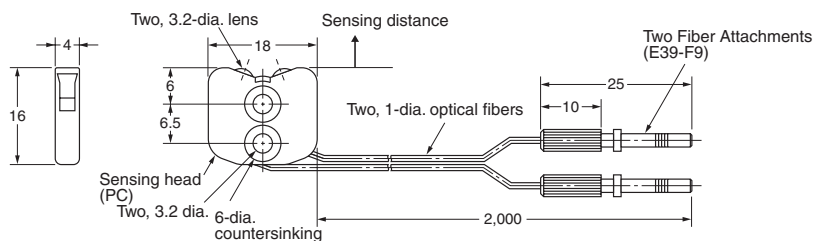


Note: Label is attached to the fiber to be inserted in the emitter side.

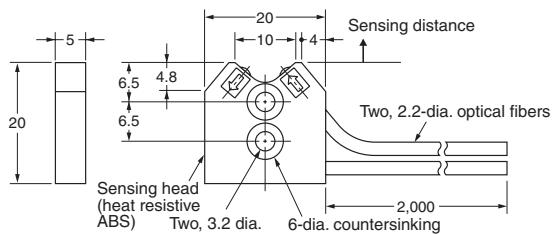
E32-L24L (Free-cut)



E32-L25L Free-cut

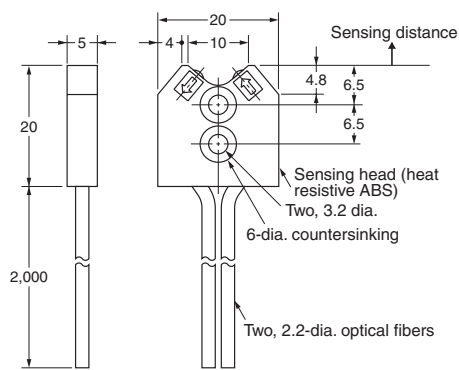


E32-L25 (Free-cut)



Note: The fiber for the emitter is identified by a white line.

E32-L25A (Free-cut)



Note: The fiber for the emitter is identified by a white line.

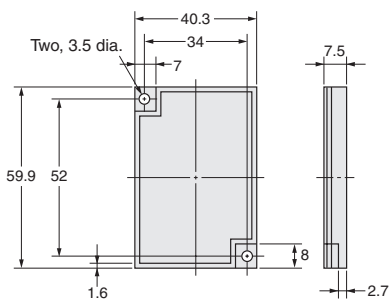
■ Accessories (Order Separately)

Reflectors

Reflector E39-R1



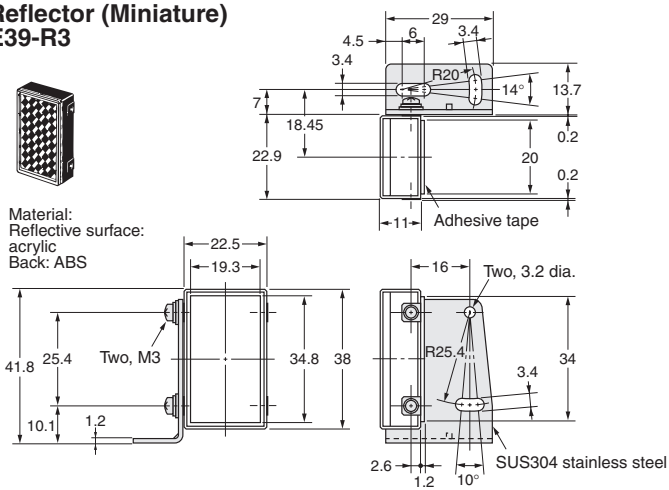
Material:
Reflective surface:
acrylic
Back: ABS



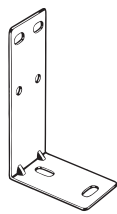
Reflector (Miniature) E39-R3



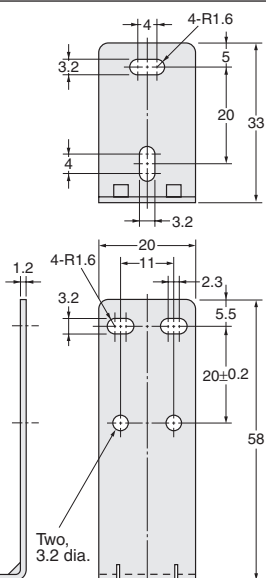
Material:
Reflective surface:
acrylic
Back: ABS



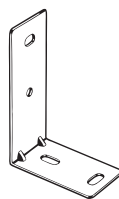
E39-L4



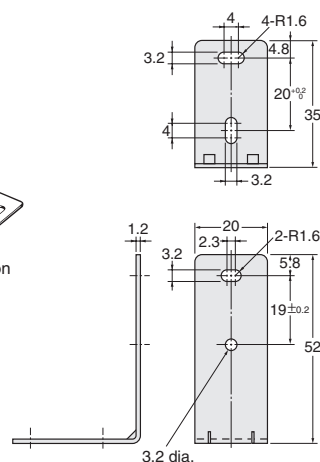
Material: iron



E39-L94



Material: iron

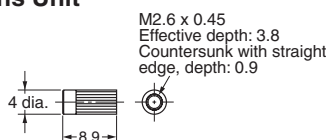


Lens Units

E39-F1 Long Distance Lens Unit



Material:
Tube: Brass
Lens: Optical glass

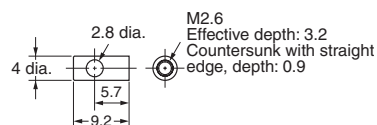


Note: One set includes two units.

E39-F2 Side-view Unit

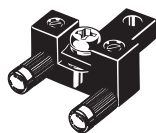


Material:
Tube: Brass
Lens: Optical glass

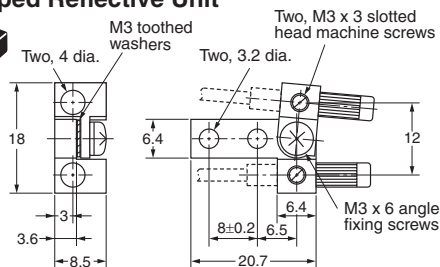


Note: One set includes two units.

E39-F3 Lens-equipped Reflective Unit

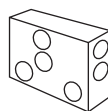


Material:
Tube: Brass
Base: Aluminum

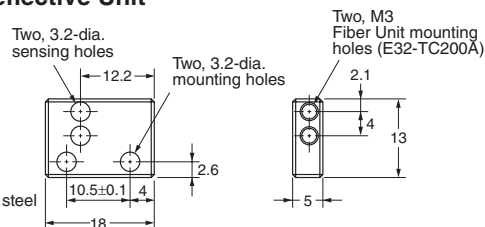


Note: Fix the fiber head using the slotted head machine screw. Do not insert the E39-F1 Lens.

E39-F5 Side-view Reflective Unit

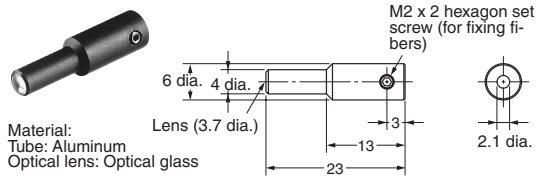


Material:
Base: Brass
Reflector: Stainless steel



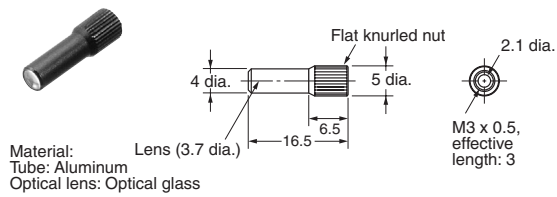
Note: Only E32-TC200A can be mounted. When mounting, remove all of the accompanying screws first and then screw the E32-TC200A into the E39-F5 until the stopper comes into contact.

E39-F3A Small Spot Lens Unit



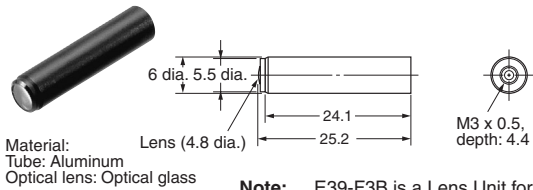
Note: E39-F3A is a Lens Unit for the E32-D32 and E32-C42.

E39-F3A-5 Small Spot Lens Unit



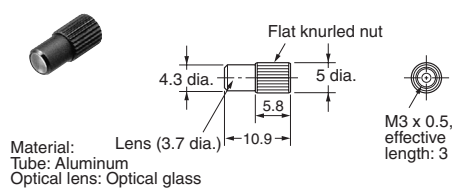
Note: E39-F3A-5 is a Lens Unit for the E32-C31 and E32-C41.

E39-F3B Small Spot Lens Unit



Note: E39-F3B is a Lens Unit for the E32-C31 and E32-C41.

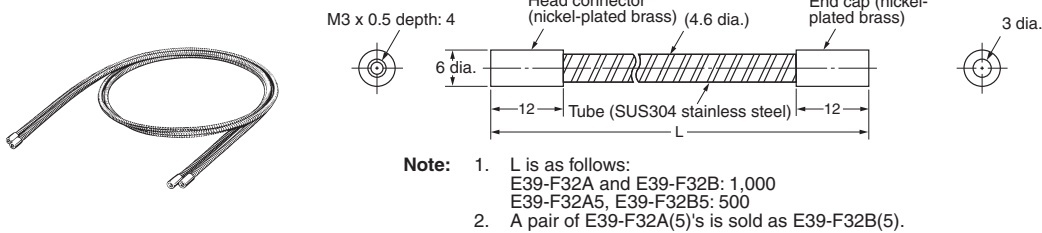
E39-F3C Small Spot Lens Unit



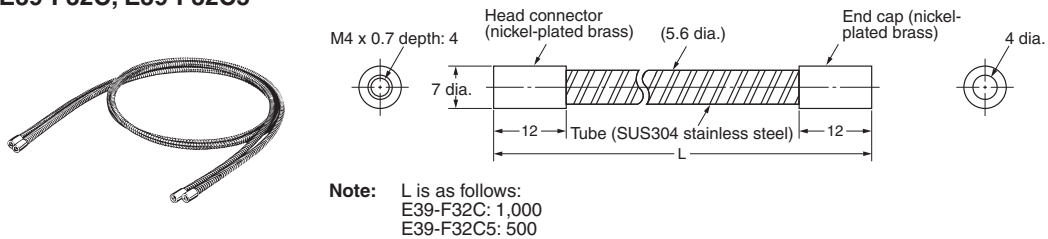
Note: E39-F3C is a Lens Unit for the E32-C31 and E32-C41.

Protective Spiral Tubes

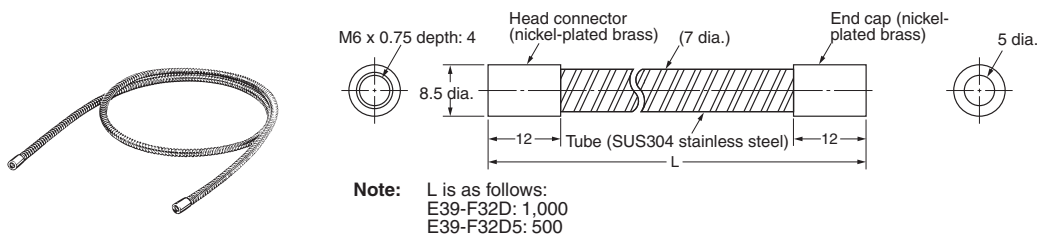
E39-F32A, E39-F32A5 E39-F32B, E39-F32B5



E39-F32C, E39-F32C5

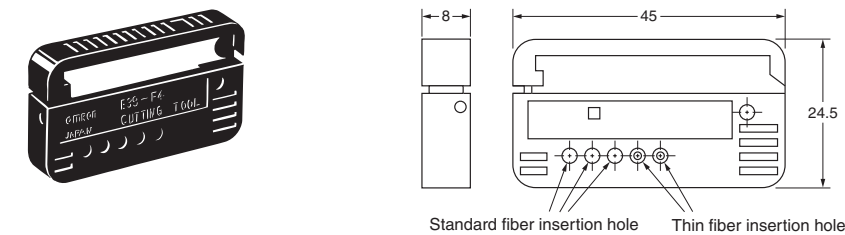


E39-F32D, E39-F32D5

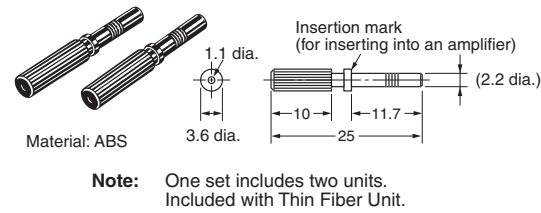


Other Accessories

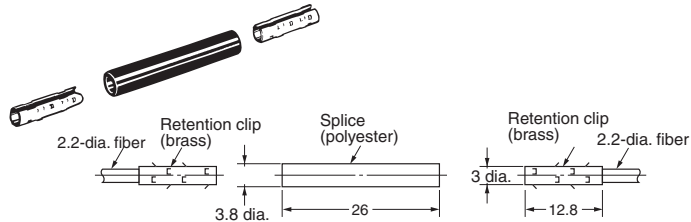
E39-F4 Fiber Cutter



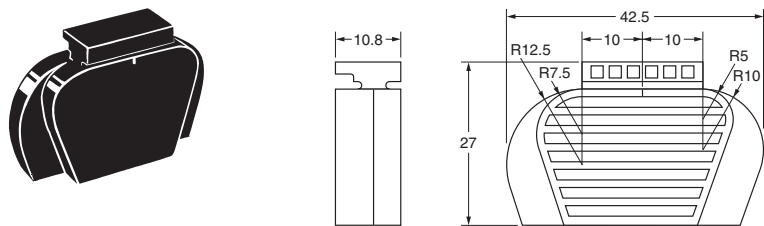
E39-F9 Attachment for Thin Fiber



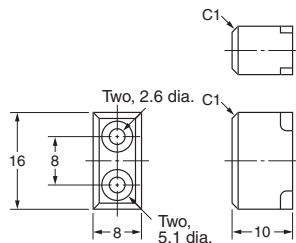
E39-F10 Fiber Connector



E39-F11 Sleeve Bender



E39-K2 Protective Attachment



Application Example

