

Simple Fiber Amplifiers

E3X-SD/NA Series

OMRON

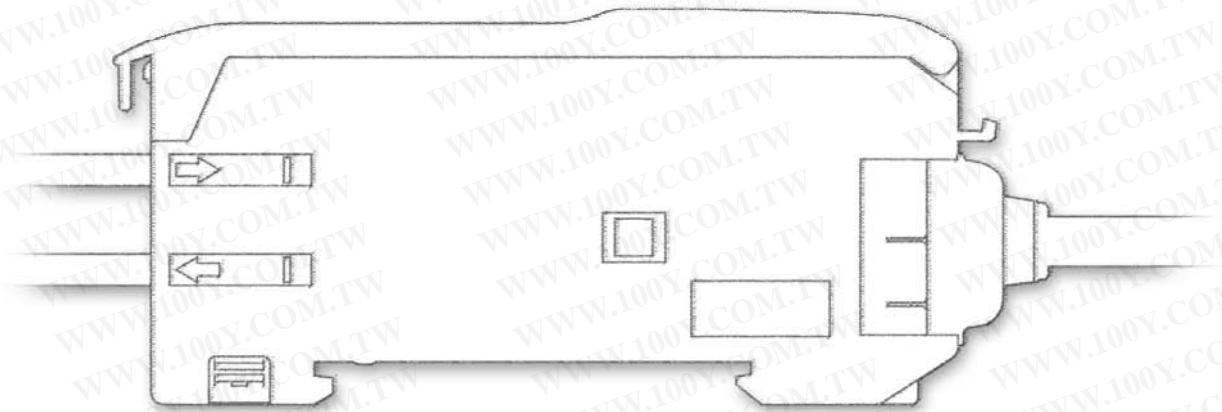
勝特力材料 886-3-5753170
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[Http://www.100y.com.tw](http://www.100y.com.tw)

Simplicity and High Performance

The Series now includes models with digital displays and direct key setting.



Digital Display – Direct Key Setting



Bar Display – Manual Setting

Simplicity and High Performance

1

Operation and Displays So Simple That Anyone Can Use the Amplifier Right Away

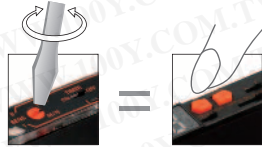
A design that focuses on simple operation has resulted in an Amplifier that is so simple it can be operated without the manual.

The Amplifier also uses a large, easy-to-read operation indicator and a simple display for excess gain (i.e., incident level/operating level).

Essentially anyone can use the Amplifier right away. **No manual**

Setting is completed with a single press when teaching with/without the workpiece.

No screwdriver



Fine adjustments can be made in increments of 1% using the Up and Down Keys.

E3X-SD

10 mm

Fine tuning can be performed using the 8-turn adjuster (with indicator).

E3X-NA

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Compact

Small body with width of 10 mm and simple operation.

Compact size with length of 65 mm.

No modes

A timer function is provided as a standard feature.

The switch is for the timer only, so no complicated operation is required.

Largest display in the industry = **6 mm**

Intuitive display for excess gain (i.e., incident level/operating level)

Large, easy-to-read operation indicator

Stable incident light

Stable light interruption

Operating level

Large bar display with five levels: 80%, 90%, 100%, 110%, and 120%

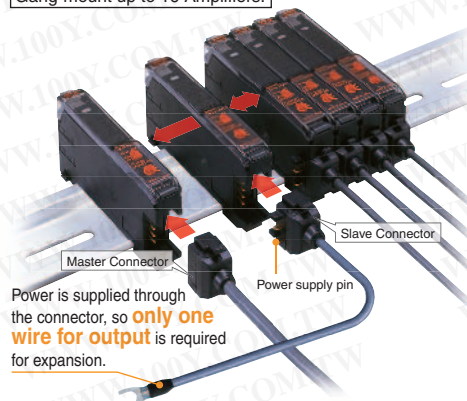
Immediately determine operation and amount of light with a simple, bright display.

With the E3X-SD, settings and management can be performed reliably using the digital display ranging from 0% to 999% (10 times), and with the E3X-NA, the same can be performed intuitively using the large 5-level bar display.

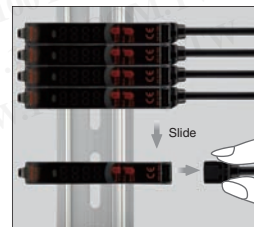
2

Wire-saving Connector to Reduce Work and Stock Management

Gang-mount up to 16 Amplifiers.



- Large reduction in wiring work
- Simple management: No distinction between master and slaves



Work efficiency is also improved during maintenance.

3

General-purpose Performance for Simple Use

The three most important performance capabilities when selecting a sensor are achieved to a high standard: distance, speed, and precision.

A balance is provided between reliable detection performance and capability for a broad range of applications.

Balanced
application capabilities

E3X-SD

High-speed Models

Long-distance Models

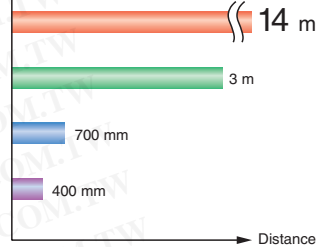
Distance

Super-long-distance
Fiber Unit
E32-T17L

Standard Fiber Unit +
Long-distance Lens
E32-TC200+E39-F1

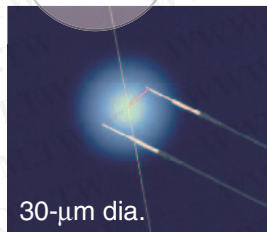
Long-distance Fiber Unit
E32-T11L

Standard Fiber Unit
E32-TC200



Sufficient distance performance. A maximum distance of 14 m can be achieved by using a Long-distance Fiber Unit (through-beam) in combination with the Amplifier.

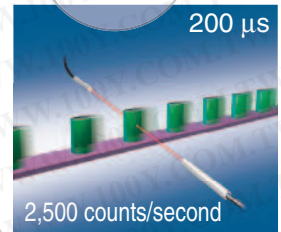
Precision



Gold wire with a diameter of 30 μ m can be detected.
And minute workpieces can be detected.
Note: The diameter of 30 μ m is a typical value when the sensing distance and sensitivity are set to their optimal conditions.

The response speed handles 2,500 counts per second to enable detecting high-speed workpieces (25,000 counts per second for the E3X-NA□F).

Speed



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4

Optical Communications to Prevent Mutual Interference for Up to Five Amplifiers

Optical communications is used between Amplifiers.

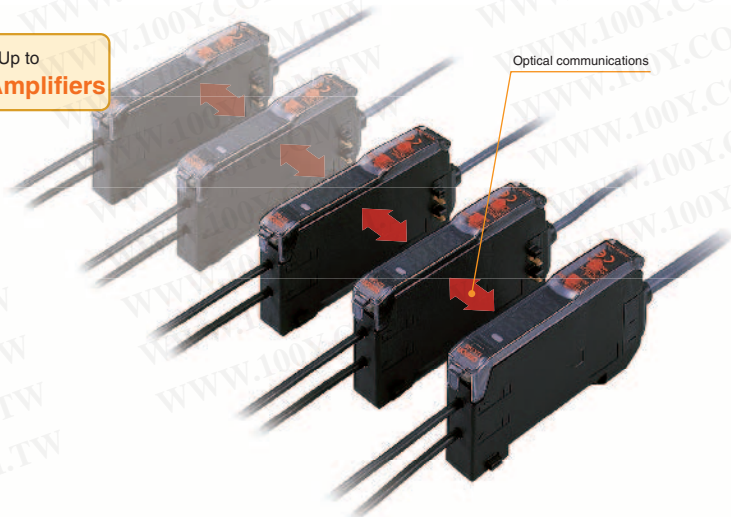
Interference is reliably prevented for up to five Amplifiers by mutually staggering the light emission timing (except for the E3X-NA□F).

Up to
five Amplifiers

Optical communications



High-speed response of 200 μ s and reliable interference prevention for up to five Amplifiers



Simple

For simple operation: Select a Simple Fiber Amplifier.

Standard Amplifiers

NEW

Reliable

Digital display and direct setting



E3X-SD□

Intuitive

Bar display and adjuster setting



E3X-NA□

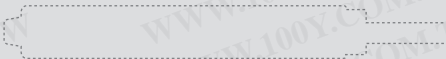
Fastest in class

Super-high-speed Amplifiers (20 μs)



E3X-NA□F

Water-resistant Amplifiers (IP66)



E3X-NA□V

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All in One

For multifunctional capability: Select an Advanced Fiber Amplifier.

Standard Amplifiers



E3X-DA□-S

Standard models

E3X-DA□AN-S

Easy measurement control using analog output

Advanced Amplifiers



E3X-DA□TW-S

Range determination using twin outputs

E3X-DA□RM-S

Sensor control using external signal

E3X-DA□AT-S

World's first Reliable operation in dust using automatic threshold control.

Two-channel Amplifiers

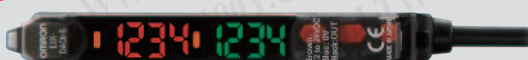


E3X-MDA□

New concept Save space with two Amplifiers packed into a single case.

Color-sensing Amplifiers

NEW



E3X-DAC□-S

World's first Color sensing models with white LEDs
 Stable detection with resistance against workpiece movement.

Simple Fiber Amplifier

E3X-SD/-NA

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The Standard for Fiber Amplifiers with Simple Operation and High Performance

- Operation so simple that essentially anyone can use the amplifier right way.
- Immediately determine operation and amount of light with a simple, bright display.
- General-purpose capabilities to simply handle a broad range of applications.



Ordering Information

Amplifier Units

Digital Display and Direct Key Setting

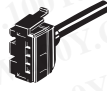
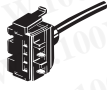
| Item | Appearance | Connection method | Ratings and Specifications | Model | |
|-----------------|------------|-----------------------|----------------------------|------------|------------|
| | | | | NPN output | PNP output |
| Standard models | | Pre-wired | --- | E3X-SD11 | E3X-SD41 |
| | | Wire-saving connector | | E3X-SD6 | E3X-SD8 |

Bar Display and Adjuster Setting

| Item | Appearance | Connection method | Ratings and Specifications | Model | |
|-----------------------------|------------|-----------------------|----------------------------|------------|------------|
| | | | | NPN output | PNP output |
| Standard models | | Pre-wired | --- | E3X-NA11 | E3X-NA41 |
| | | Wire-saving connector | | E3X-NA6 | E3X-NA8 |
| High-speed detection models | | Pre-wired | Response time: 20 μs | E3X-NA11F | E3X-NA41F |
| Water-resistant models | | Pre-wired | Degree of protection: IP66 | E3X-NA11V | E3X-NA41V |
| | | Connector (M8) | | E3X-NA14V | E3X-NA44V |

E3X-SD/-NA



Amplifier Unit Connectors (Order Separately) Note: Stickers for Connectors are included as accessories.

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

| | | | | | |
|---|------------------------|--------------------|--------------------|---|-------------------------|
| Combining Amplifier Units and Connectors <small>(Basically, Amplifier Units and Connectors are sold separately) Refer to the following tables when placing an order.</small> | Amplifier Units | | + | Applicable Connectors (Order Separately) | |
| | Type | NPN | | PNP | Master Connector |
| | Standard models | E3X-SD6 E3X-NA6 | E3X-SD8 E3X-NA8 | | E3X-CN11 (3-wire) |

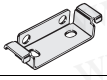
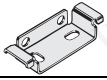
| | | |
|-------------------------------------|---|---|
| When Using 5 Amplifier Units | + | 1 Master Connector + 4 Slave Connectors |
| 5 Amplifier Units | | |

Sensor I/O Connectors (Order Separately)

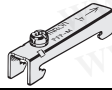
| Size | Cable specifications | Appearance | Cable type | Model | |
|------|----------------------|---|------------|----------------------|------------------------|
| M8 | Standard cable | Straight connector  | 2 m | Four-conductor cable | XS3F-M421-402-A |
| | | | 5 m | | XS3F-M421-405-A |
| | | L-shaped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

Accessories (Order Separately)

Mounting Brackets

| Appearance | Applicable models | Model | Quantity |
|---|--------------------------------|-----------------|----------|
|  | E3X-SD□ E3X-NA□ E3X-NA□F | E39-L143 | 1 |
|  | E3X-NA□V | E39-L148 | |

End Plate

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

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Ratings and Specifications

Amplifier Units

| Item | Type Model | Digital display and direct key setting | | Bar display and adjuster setting | | |
|--------------------------------|---------------|--|--|--|-----------------------------|---|
| | | Standard models | | Standard models | High-speed detection models | Water-resistant models |
| | | E3X-SD□ | | E3X-NA□ | E3X-NA□F | E3X-NA□V |
| Light source (wavelength) | | Red LED (620 nm) | | Red LED (680 nm) | | |
| Power supply voltage | | 12 to 24 VDC ±10%, ripple (p-p): 10% max. | | | | |
| Current consumption | | 960 mW max. (Power supply: 24 V, Current consumption: 40 mA max.) | | 35 mA max. | | |
| Control output | | Open-collector output (NPN or PNP) Load power supply: 26.4 V max., Load current: 50 mA max. (Residual voltage: 1.5 V max.) (*1) Light-ON/Dark-ON mode selector | | | | |
| Response time | | Operate or reset: 200 μs max. (*2) | | Operate: 20 μs max. Reset: 30 μs max. | | Operate or reset: 200 μs max. (*2) |
| Sensitivity adjustment | | UP/DOWN direct key setting, teaching | | 8-turn sensitivity adjuster (with indicator) | | |
| Protection circuits | | Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection (*3) | | | | |
| Timer function | | ON/OFF-delay timer: 10 ms (each fixed) | | OFF-delay timer: 40 ms (fixed) | | |
| Mutual interference prevention | | Up to 5 Amplifiers (optically synchronized) | | None | | Up to 5 Amplifiers (optically synchronized) |
| Ambient illumination | | Receiver side Incandescent lamp: 10,000 lux max. Sunlight: 20,000 lux max. | | | | |
| Ambient temperature range | | 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 Storage: -30°C to 70°C (with no icing or condensation) | | | | |
| Ambient humidity range | | Operating and storage: 35% to 85% (with no condensation) | | | | |
| Insulation resistance | | 20 MΩ min. (at 500 VDC) | | | | |
| Dielectric strength | | 1,000 VAC at 50/60 Hz for 1 minute (*4) | | | | |
| 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 | | | | |
| Degree of protection | | IEC 60529 IP50 (with Protective Cover attached) | | | | IEC 60529 IP66 (with Protective Cover attached) |
| Connection method | | Pre-wired (standard cable length: 2 m), or connector | | | | |
| Weight (packed state) | | Pre-wired model: Approx. 100 g, Model with connector: Approx. 55 g (*5) | | | | |
| Material | Case | Polybutylene terephthalate (PBT) | | | | |
| | Cover | Polycarbonate | | | | Polyethersulfone (PES) |
| Accessories | | Instruction manual | | | | |

*1. For the E3X-NA, residual voltage is 1 V max.

*2. When there are 8 or more E3X-NA Amplifiers mounted side-by-side, the response time will be 350 μs max.

*3. The E3X-NA does not have output reverse polarity prevention.

*4. Water-resistant models and models with connectors have a dielectric strength of 500 VAC.

*5. Add 10 g for water-resistant models.

Amplifier Unit Connectors

| Item | Model | E3X-CN11 | E3X-CN12 |
|-----------------------|---------|---|--------------|
| Rated current | | 2.5 A | |
| Rated voltage | | 50 V | |
| Contact resistance | | 20 mΩ max. (20 mVDC max., 100 mA max.) (The above figure is for connection to the Amplifier Unit and the adjacent Connector. It does not include the conductor resistance of the cable.) | |
| Number of insertions | | Destruction: 50 times (for connection to the Amplifier Unit and the adjacent Connector) | |
| Material | Housing | Polybutylene terephthalate (PBT) | |
| | Contact | Phosphor bronze/gold-plated nickel | |
| Weight (packed state) | | Approx. 55 g | Approx. 25 g |

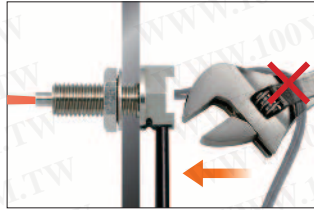
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Fiber Unit Overview

No snagging, no breaking:
Right-angle (L-shaped) Models

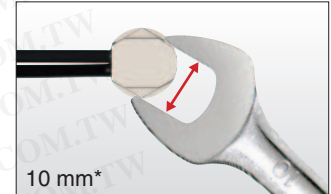


Feature 1 | L-shaped Attachment

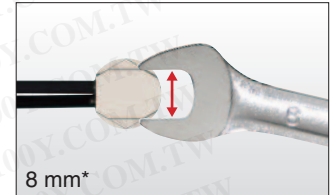


No snagging during maintenance.
Fiber flexibility prevents breaking.

Feature 2 | New Head Shape



10 mm*



8 mm*

Convenient design
accommodates two wrench sizes.
Allows quick tightening.

*For M6 models.

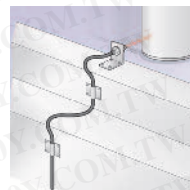
Flat and flexible fiber models are easy to mount
and will not break.

Reflective Fiber Units

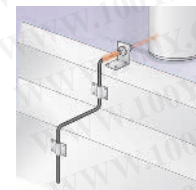
Flat View
E32-D15ZR



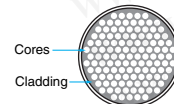
Feature | No Breaking



Conventional fiber



Flexible fiber



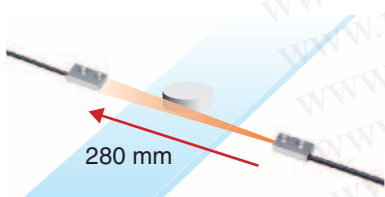
Cores

Cladding

A large number of ultrafine cores are all surrounded by cladding. As a result, the fiber is flexible and can be bent without significantly reducing the light intensity. This helps solve problems, such as fiber being broken by getting caught on other objects.

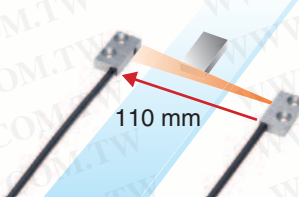
Through-beam Fiber Units

Top View
E32-T15XR



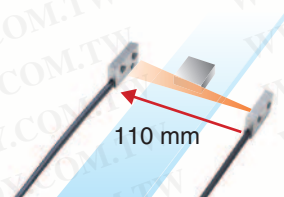
280 mm

Side View
E32-T15YR



110 mm

Flat View
E32-T15ZR



110 mm

Size: 15 x 8 x 3 mm

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**Sensing Distance
 Through-beam Models**

(Unit: mm)

| Type | Model | E3X-SD□ | E3X-NA□ | |
|------------------------------|---------------------------------|---|-----------------------------|------|
| | | Standard models | High-speed detection models | |
| Standard models | Flexible (new standard) | E32-T11R/E32-T12R/E32-T15XR/E32-TC200BR (B4R) | 280 | 80 |
| | | E32-T14LR/E32-T15YR/E32-T15ZR | 110 | 33 |
| | | E32-T21R/E32-T22R/E32-T222R/E32-T25XR/ E32-TC200FR (F4R) | 60 | 18 |
| | | E32-T24R/E32-T25YR/E32-T25ZR | 30 | 9 |
| | Standard | E32-TC200/E32-T12/E32-T15X/E32-TC200B (B4) | 400 | 120 |
| | | E32-T14L/E32-T15Y/E32-T15Z | 240 | 70 |
| | | E32-TC200A | 360 | 100 |
| | | E32-TC200E/E32-T22/E32-T222/E32-T25X/E32-TC200F (F4) | 100 | 30 |
| | | E32-T24/E32-T25Y/E32-T25Z | 90 | 27 |
| | Break resistant | E32-T11/E32-T12B/E32-T15XB | 360 | 100 |
| | | E32-T21/E32-T221B/E32-T22B | 100 | 30 |
| | | E32-T25XB | 75 | 20 |
| | Fluorine coating | E32-T11U | 360 | 100 |
| Special-beam models | Long distance, high power | E32-T17L | 14000 | 4200 |
| | | E32-TC200 + E39-F1 | 3000 | 900 |
| | | E32-T11R + E39-F1 | 2100 | 630 |
| | | E32-T11 + E39-F1 | 2000 | 600 |
| | | E32-T14 | 1800 | 540 |
| | | E32-T11L/E32-T12L | 700 | 210 |
| | | E32-T11L + E39-F2 | 500 | 150 |
| | | E32-T11R + E39-F2 | 220 | 65 |
| | | E32-T11 + E39-F2 | 360 | 100 |
| | Ultracompact, ultrafine sleeve | E32-T21L/E32-T22L | 200 | 60 |
| | | E32-T223R | 60 | 18 |
| | | E32-T33-S5 | 20 | 6 |
| | | E32-T333-S5 | 5 | 1.5 |
| | Fine beam (narrow vision field) | E32-T334-S5 | 2.5 | 0.8 |
| | | E32-T22S | 1000 | 300 |
| | Area sensing | E32-T24S | 700 | 210 |
| | | E32-T16PR | 450 | 130 |
| | | E32-T16P | 600 | 180 |
| | | E32-T16JR | 390 | 110 |
| | | E32-T16J | 520 | 150 |
| | | E32-T16WR | 690 | 200 |
| | | E32-T16W | 920 | 270 |
| | | E32-T16 | 1500 | 450 |
| E32-M21 | | 300 | 90 | |
| Environment resistive models | Heat resistant | E32-T51 | 400 | 120 |
| | | E32-T54 | 130 | 35 |
| | | E32-T81R-S | 180 | 50 |
| | | E32-T61-S + E39-F2 | 390 | 130 |
| | | E32-T61-S + E39-F1 | 3000 | 900 |
| | | E32-T84S-S | 700 | 210 |
| | | E32-T61-S | 300 | 90 |
| | Chemical resistant | E32-T11F | 1050 | 380 |
| | | E32-T12F | 1600 | 480 |
| | | E32-T14F | 200 | 60 |
| | | E32-T51F | 700 | 200 |
| | | E32-T81F-S | 350 | 100 |
| | Vacuum resistant | E32-T51V | 100 | --- |
| | | E32-T51V + E39-F1V | 600 | --- |
| | | E32-T54V | 65 | --- |
| | | E32-T54V + E39-F1V | 390 | --- |
| | | E32-T84SV | 250 | --- |

For information on Fiber Units, refer to the *E32 Series Fiber Sensor Best Selection* (Cat. No. E354).

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Reflective Models

(Unit: mm)

| Type | Model | E3X-SD□ E3X-NA□ | E3X-NA□F | |
|--------------------------------|-------------------------|---|---|-----------|
| | | Standard models | High-speed detection models | |
| Standard models | Flexible (new standard) | E32-D11R/E32-D12R/E32-D15XR/E32-DC200BR (B4R) | 30 | |
| | | E32-D14LR | 5 | |
| | | E32-D15YR/E32-D15ZR | 5 | |
| | | E32-D211R/E32-D21R/E32-D22R/E32-D25XR/ E32-DC200FR (F4R) | 5 | |
| | | E32-D24R | 2.3 | |
| | | E32-D25YR/E32-D25ZR | 1.2 | |
| | Standard | E32-DC200/E32-D15X/E32-DC200B (B4) | 50 | |
| | | E32-D12 | 40 | |
| | | E32-D14L | 13 | |
| | | E32-D15Y/E32-D15Z | 15 | |
| | | E32-D211/E32-DC200E/E32-D22/E32-D25X/ E32-DC200F (F4) | 12 | |
| | | E32-D24 | 5 | |
| | Break resistant | E32-D25Y/E32-D25Z | 3.3 | |
| | | E32-D11/E32-D15XB | 30 | |
| | | E32-D21B/E32-D221B | 10 | |
| | | E32-D21/E32-D22B | 5 | |
| | Fluorine coating | E32-D25XB | 8 | |
| | | E32-D11U | 30 | |
| | Special-beam models | Long distance, high power | E32-D16 | 70 to 400 |
| | | | E32-D11L | 65 |
| E32-D21L/E32-D22L | | | 17 | |
| Ultracompact, ultrafine sleeve | | E32-D33 | 3.3 | |
| | | E32-D331 | 0.5 | |
| Coaxial, small spot | | E32-CC200R | 25 | |
| | | E32-CC200 | 50 | |
| | | E32-D32L | 25 | |
| | | E32-C31/E32-D32 | 13 | |
| | | E32-C42 + E39-F3A | Spot diameter of 0.1 to 0.6 mm at 6 to 15 mm. | |
| | | E32-D32 + E39-F3A | Spot diameter of 0.5 to 1 mm at 6 to 15 mm. | |
| | | E32-C41 + E39-F3A-5 | Spot diameter of 0.1 mm at 7 mm. | |
| | | E32-C31 + E39-F3A-5 | Spot diameter of 0.5 mm at 7 mm. | |
| | | E32-C41 + E39-F3B | Spot diameter of 0.2 mm at 17 mm. | |
| | | E32-C31 + E39-F3B | Spot diameter of 0.5 mm at 17 mm. | |
| E32-C31 + E39-F3C | | Spot diameter of 4 mm max. at 0 to 20 mm. | | |
| Area sensing | | E32-D36P1 | 25 | |
| Retro-reflective | | E32-R21 + E39-R3 (provided) | 10 to 250 | |
| | | E32-R16 + E39-R1 (provided) | 150 to 1500 | |
| Convergent-reflective | | E32-L25/E32-L25A | 3.3 | |
| | E32-L24S | 0 to 4 | | |
| | E32-L24L | 2 to 6 (center 4) | | |
| | E32-L25L | 5.4 to 9 (center 7.2) | | |
| | E32-L86 | 4 to 10 | | |
| | E32-L16 | 0 to 15 | | |
| Environment resistive models | Heat resistant | E32-D51 | 40 | |
| | | E32-D81R/E32-D61 | 15 | |
| | | E32-D73 | 10 | |
| | Chemical resistant | E32-D12F | 16 | |
| | | E32-D14F | 6.5 | |

For information on Fiber Units, refer to the *E32 Series Fiber Sensor Best Selection* (Cat. No. E354).

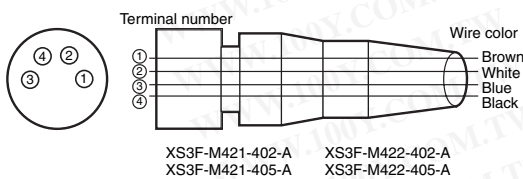
I/O Circuit Diagrams

| Output form | Model | Output transistor operation mode | Timing charts | Operation selector | Output circuit |
|-------------|---|----------------------------------|---------------|--------------------|---|
| NPN Output | E3X-SD11 E3X-SD6 E3X-NA11 E3X-NA6 E3X-NA11F E3X-NA11V E3X-NA14V | Light-ON | | LIGHT ON (L-ON) | <p>• M8 Connector Pin Arrangement </p> <p>*Not present on the E3X-NA.</p> |
| | | Dark-ON | | DARK ON (D-ON) | |
| PNP Output | E3X-SD41 E3X-SD8 E3X-NA41 E3X-NA8 E3X-NA41F E3X-NA41V E3X-NA44V | Light-ON | | LIGHT ON (L-ON) | <p>• M8 Connector Pin Arrangement </p> <p>*Not present on the E3X-NA.</p> |
| | | Dark-ON | | DARK ON (D-ON) | |

Note: Timing Charts for Timer Settings (T: Set Time)

| ON delay | OFF delay |
|---|---|
| | |
| <p>L-ON</p> <p>OFF</p> <p>D-ON</p> <p>OFF</p> | <p>L-ON</p> <p>ON</p> <p>OFF</p> <p>D-ON</p> <p>ON</p> <p>OFF</p> |

Plug (Sensor I/O Connector)



| Classification | Wire color | Connection pin | Application |
|----------------|------------|----------------|--------------------|
| DC | Brown | 1 | Power supply (+V) |
| | White | 2 | --- |
| | Blue | 3 | Power supply (0 V) |
| | Black | 4 | Output |

Note: Pin 2 is not used.

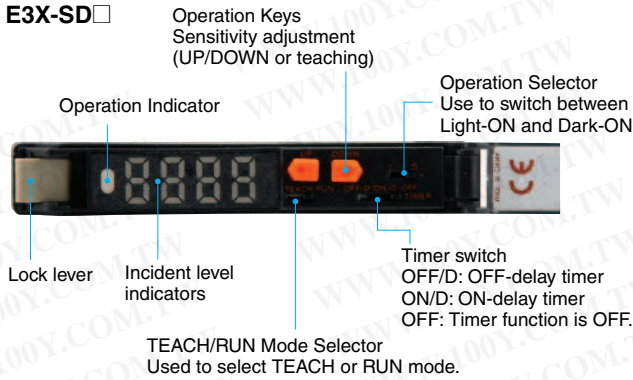
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E3X-SD/-NA

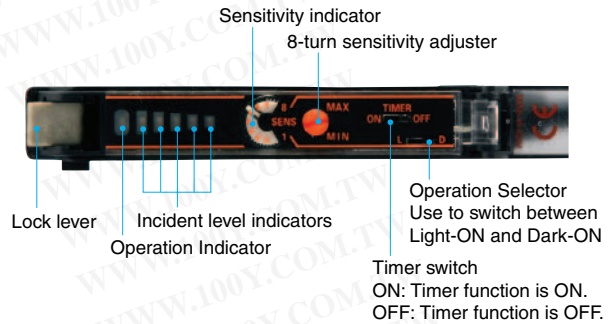
Nomenclature

Amplifier Units

E3X-SD



E3X-NA



Safety Precautions

WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly.

Do not use it for such purposes.



Caution

Do not exceed the rated voltage. Excess voltage may result in malfunction or fire.



Do not use an AC power supply. Using an AC power supply may result in rupturing.



High-temperature environments may result in burn injury.



Precautions for Safe Use

The following precautions must be observed to ensure safety.

1. Do not use the product in locations where flammable or explosive gas is present.
2. Do not use the product in locations subject to splashing water, oil, or chemicals, or in locations subject to steam.
3. Do not attempt to disassemble, repair, or modify the product.
4. Do not apply voltage or current in excess of the rated ranges.
5. Do not use the product in atmospheres or environments that exceed product ratings.
6. Do not wire the product incorrectly, such as using incorrect power supply polarity.
7. Connect the load properly.
8. Do not short-circuit both ends of the load.
9. Do not use the product if the case is damaged.
10. When disposing of the product, dispose of it as industrial waste.
11. Do not use the product in locations subject to direct sunlight.
12. The surface temperature of the product may rise as a result of the ambient temperature, power supply, or other usage conditions. Use caution when performing maintenance and washing. Failure to do so may result in burn injury.

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Precautions for Correct Use

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

Amplifier Units

● Designing

Communications Hole

The hole on the side of the Amplifier Unit is a communications hole for preventing mutual interference when Amplifier Units are mounted side-by-side. The E3X-MC11 Mobile Console (order separately) cannot be used.

If an excessive amount of light is received via the Sensor, the mutual interference prevention function may not work. In this case, make the appropriate adjustments using the sensitivity adjuster.

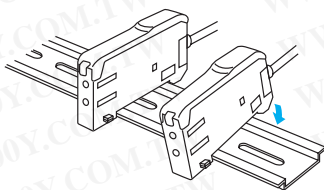
The mutual interference prevention function will not operate when the E3X-SD/NA is used side-by-side with E3X-DA-N models.

● Mounting

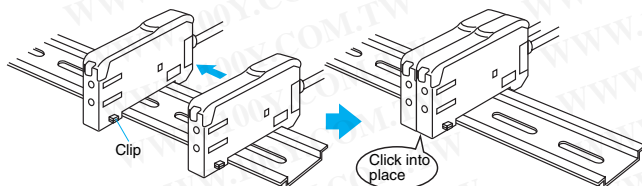
DIN Track Mounting/Removal

Mounting 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.



Removing Amplifier Units

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

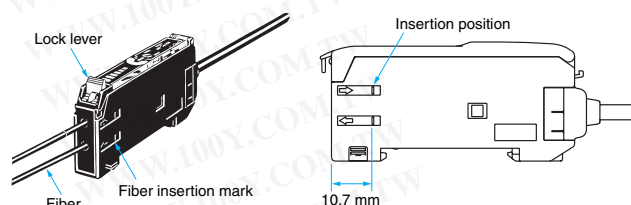
- Note 1.** The specifications for ambient temperature will vary according to the number of Amplifier Units used together. For details, refer to *Ratings and Specifications*.
- 2.** Always turn OFF the power supply before mounting or removing Amplifier Units.

Fiber Connection and Disconnection

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

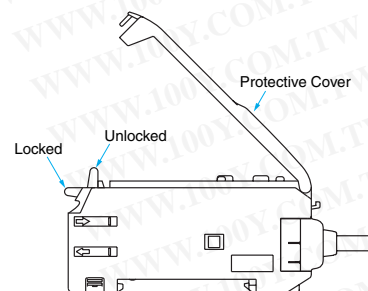
1. Connection

Open the Protective Cover, insert the fibers according to the fiber insertion marks on the side of the Amplifier Unit, and lower the lock lever.



2. Disconnection

Remove the Protective Cover and raise the lock lever 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 lever within an ambient temperature range between -10°C and 40°C .

● Operating Environment

Ambient Conditions

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

● Other

Protective Cover

Be sure to mount the Protective Cover before use.

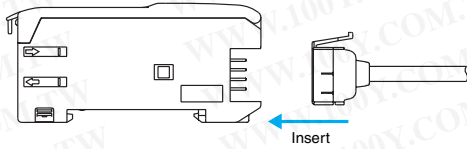
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Amplifier Units with Connectors

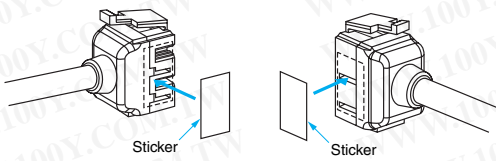
● Mounting

Mounting Connectors

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



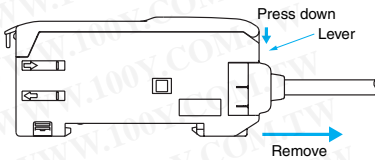
2. Join Amplifier Units together as required after all the Master and Slave Connectors have been inserted.
3. Attach the stickers (provided as accessories) to the sides of Master and Slave Connectors that are not connected to other Connectors.



Note: Attach the stickers to the sides with grooves.

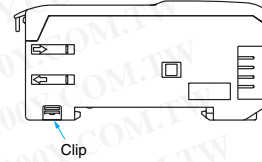
Removing Connectors

1. Slide the slave Amplifier Unit for which the Connector is to be removed away from the rest of the group.
2. After the Amplifier Unit 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.)



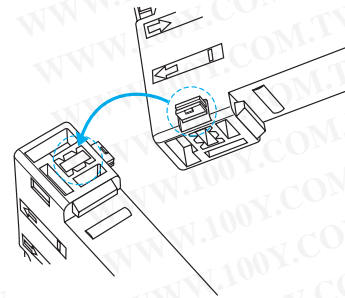
Mounting End Plate (PFP-M)

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.

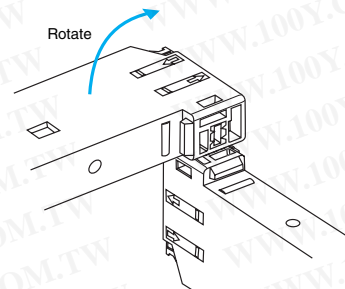


The clip can also be removed using the following mechanism, which is incorporated in the construction of the section underneath the clip.

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.



Pull Strengths for Connectors (Including Cables)

E3X-CN11: 30 N max.

E3X-CN12: 12 N max.

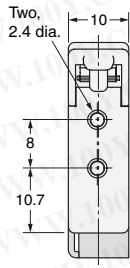
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Dimensions

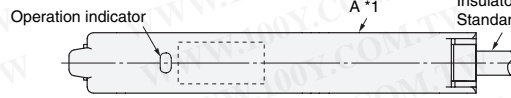
Amplifier Units

Amplifier Units with Cables

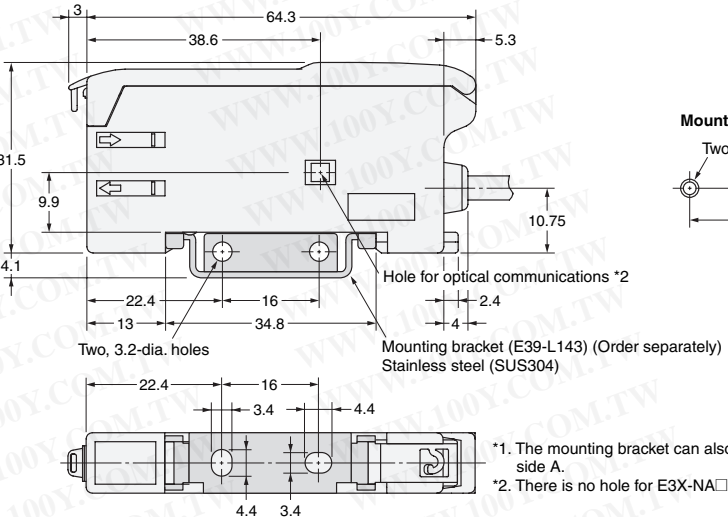
- E3X-SD11
- E3X-SD41
- E3X-NA11
- E3X-NA11F
- E3X-NA41
- E3X-NA41F



With Mounting Bracket Attached



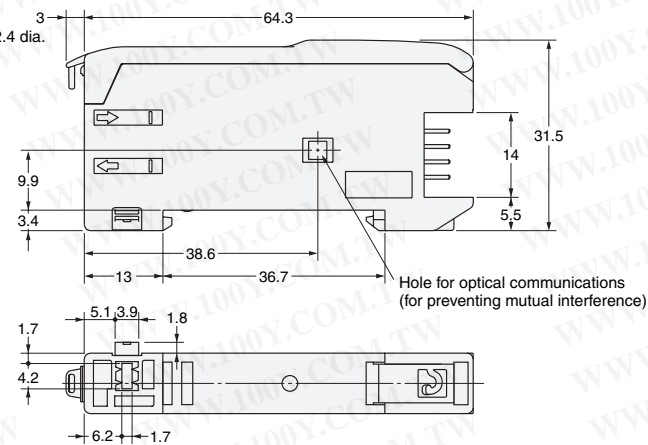
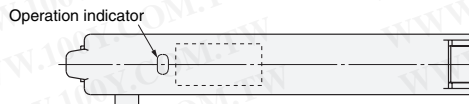
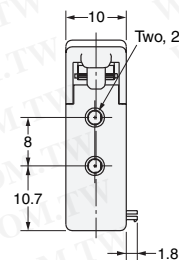
4-dia. vinyl-insulated round cable with 3 conductors* (Conductor cross section: 0.2 mm²; Insulator diameter: 1.1 mm), Standard length: 2 m.



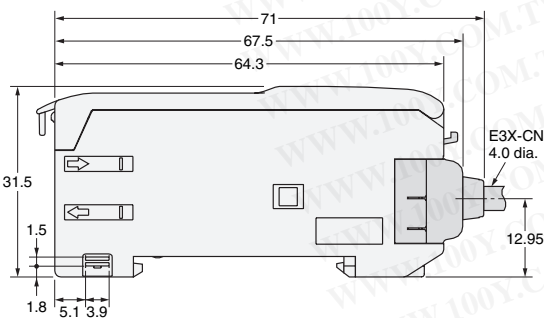
*1. The mounting bracket can also be used on side A.
 *2. There is no hole for E3X-NA□F models.

Amplifier Units with Connectors

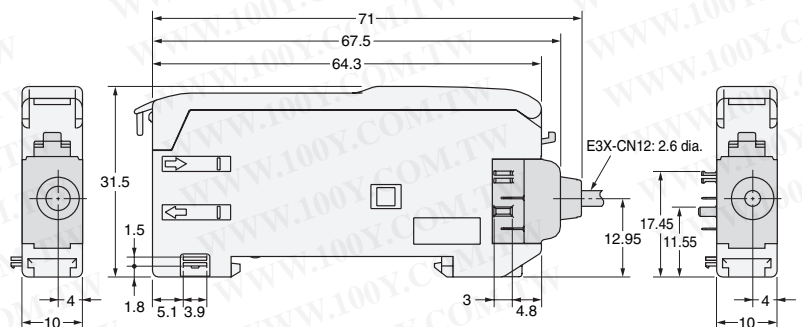
- E3X-SD6
- E3X-SD8
- E3X-NA6
- E3X-NA8



Dimensions with Master Connector Connected



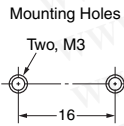
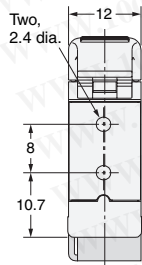
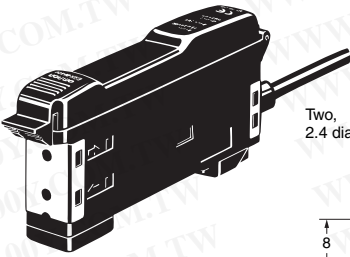
Dimensions with Slave Connector Connected



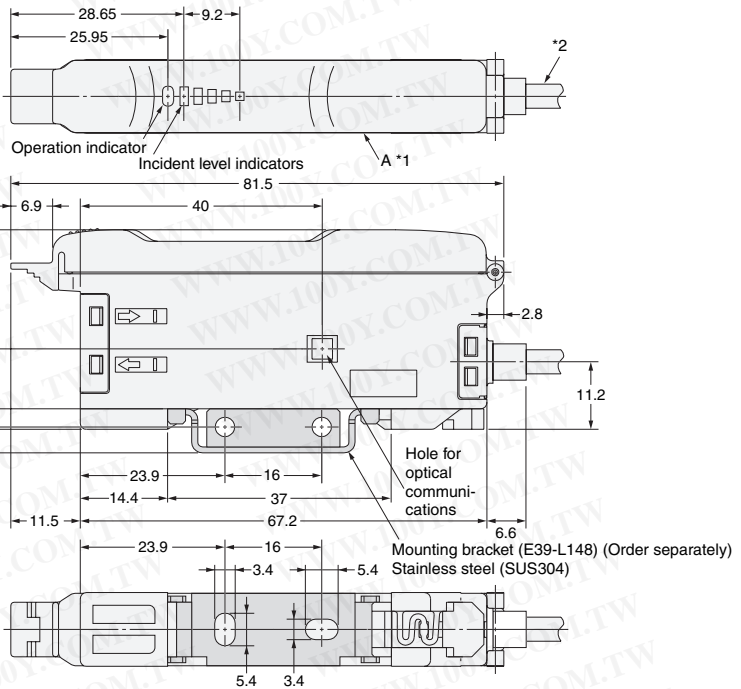
E3X-SD/-NA

Amplifier Units with Cables, Water-resistant Models

E3X-NA11V
E3X-NA41V



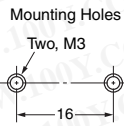
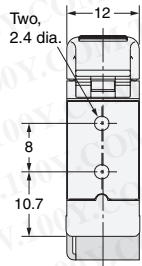
With Mounting Bracket Attached



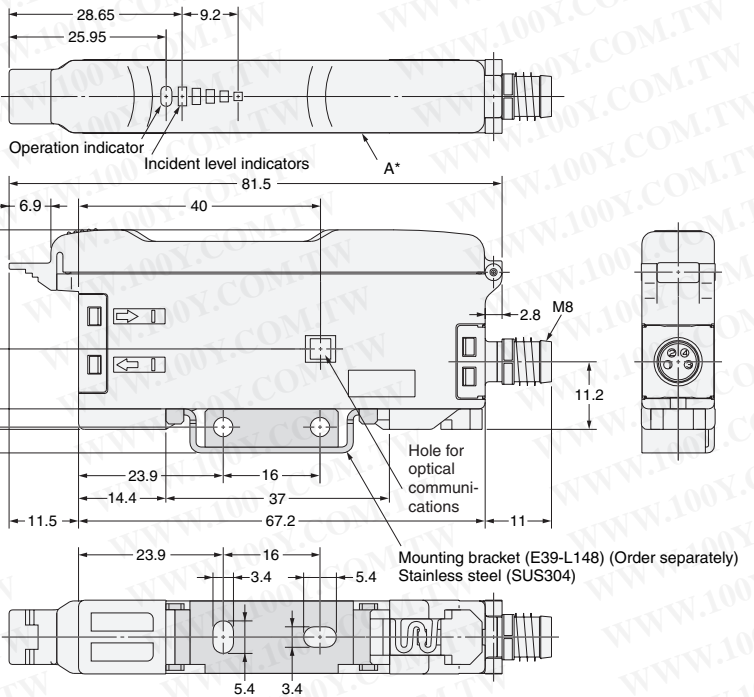
- *1. The mounting bracket can also be used on side A.
- *2. 4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.45 mm², Insulator diameter: 1.1 mm), Standard length: 2 m.

Amplifier Units with Connectors, Water-resistant Models

E3X-NA14V
E3X-NA44V



With Mounting Bracket Attached

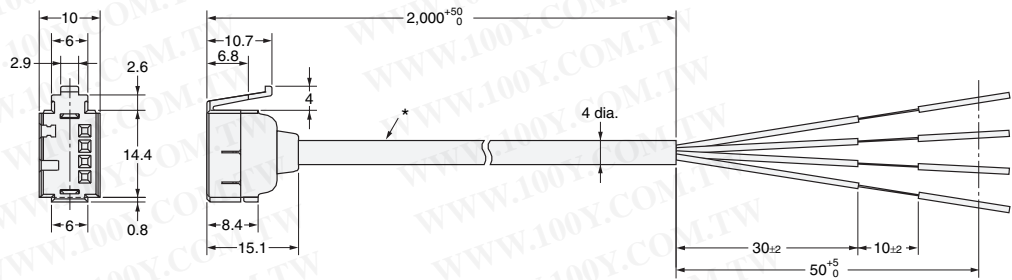
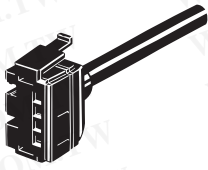


* The mounting bracket can also be used on this side A.

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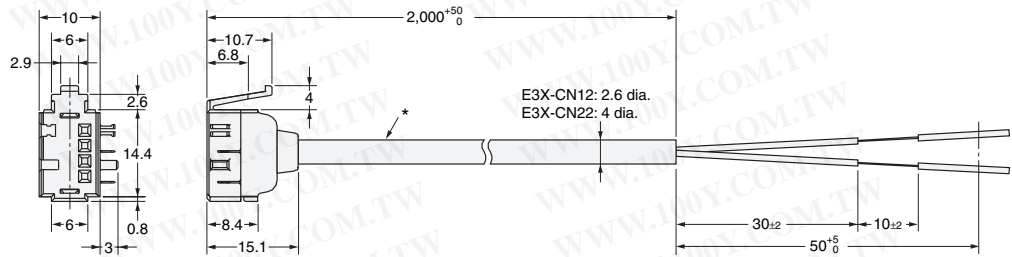
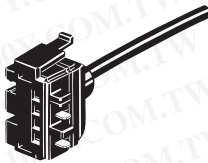
Amplifier Unit Connectors

Master Connector E3X-CN11



*E3X-CN11: 2.6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.2 mm², Insulator diameter: 1.1 mm)

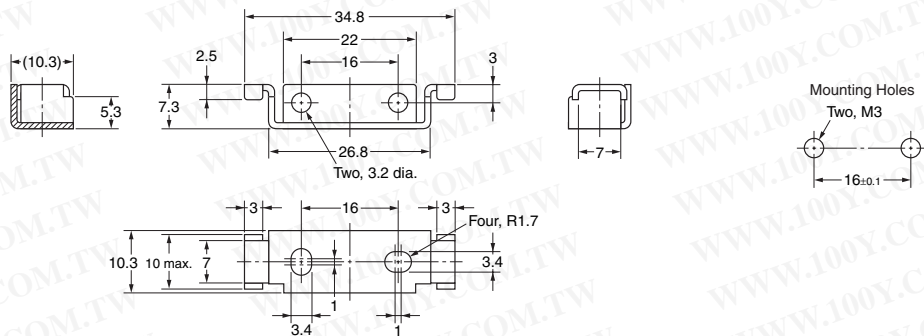
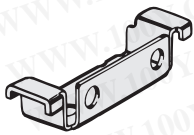
Slave Connector E3X-CN12



*E3X-CN12: 2.6-dia. vinyl-insulated round cable with 1 conductor (Conductor cross section: 0.2 mm², Insulator diameter: 1.1 mm)

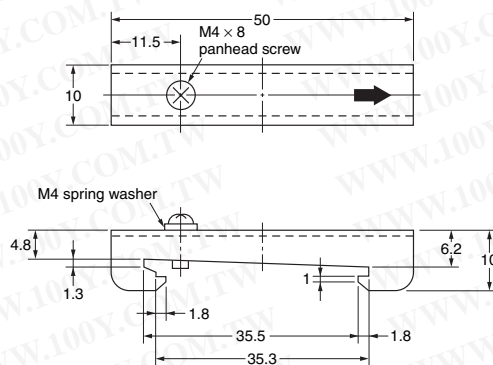
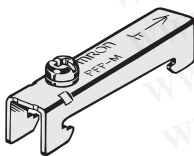
Accessories (Order Separately)

Mounting Brackets E39-L143



Material: Stainless steel (SUS304)

End Plates PFP-M



For information on Fiber Units, refer to the *E32 Series Fiber Sensor Best Selection* (Cat. No. E354).

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E3X-SD/-NA

Operating Procedure

E3X-SD □

1 Displays

A 7-segment display showing excess gain is provided in addition to the orange operation indicator. Use these when adjusting the light axis and setting the sensitivity at setup.




| Display/indicator status (for L/ON) | Excess gain | Description |
|---|-----------------|---|
|  | 999% (10 times) | 110% min. Stable incident light |
|  | 100% | 90% to 110% Unstable incident light or Unstable interrupted light |
|  | 0% | 90% max. Stable interrupted light |

2 Sensitivity Setting

The sensitivity can be set with the UP and DOWN Keys similar to using an adjuster knob. The sensitivity can also be easily set by using the following three teaching functions.





2-1. Maximum Sensitivity Setting

The sensitivity can be set to the maximum. This is the optimal setting for resistance against the effects of dust.

| Operation description | Switch/Key | Display |
|--|------------|---|
| Set the TEACH/RUN selector switch to TEACH. | TEACH RUN |  |
| Press the UP Key for 3 s min. | UP |  |
| Set the TEACH/RUN selector switch to RUN (start of measurement). | TEACH RUN |  |



2-2. Teaching with/without a Workpiece



Two points (one with the workpiece and the other without) are detected, and the operating level is set to the midpoint.

| Operation description | Switch/Key | Display |
|--|------------|---|
| Set the TEACH/RUN selector switch to TEACH. | TEACH RUN |  |
| Press the UP Key with the workpiece present. | UP |  |
| Press the UP Key with the workpiece not present. | UP |  |
| Set the TEACH/RUN selector switch to RUN (start of measurement). | TEACH RUN |  |

2-3. Automatic Teaching

Changes within a time are detected, and the operating level is set to the midpoint between the maximum and the minimum values of the changes. This setting is optimal for when the workpieces cannot be stopped.

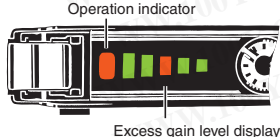




| Operation description | Switch/Key | Display |
|---|------------|---|
| Set the TEACH/RUN selector switch to TEACH. | TEACH RUN |  |
| Press the UP Key. | UP |  |

| Operation description | Switch/Key | Display |
|---|------------|---|
| Hold down the UP Key during detection. Let the workpiece pass while the key is held down. | UP |  |
| Set the TEACH/RUN selector switch to RUN (start of measurement). | TEACH RUN |  |

E3X-NA □

1 Displays

A bar display (with four green and one red) showing excess gain is provided in addition to the orange operation indicator. Use these when adjusting the light axis and setting the sensitivity at setup.

| Display/indicator status (for L/ON) | Excess gain level | Description |
|--|----------------------|---|
|  | Approx. 120% min. | Stable incident light |
|  | Approx. 110% to 120% | |
|  | Approx. 90% to 110% | Unstable incident light or Unstable interrupted light |
|  | Approx. 80% to 90% | Stable interrupted light |
|  | Approx. 80% max. | |

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