Photoelectric and ultrasonic label sensors in fork shape housing

E3U-GL

The E3U-GL range of label sensors offers solutions to detect all standard as well as challenging labels (e.g. transparent labels with metallized parts). Stable operation, where other sensors may require frequent re-teaching, improves the reliability of the labeling process. Fast and easy set-up reduces the time and effort during change over periods.

- High resolution Photoelectric fiber sensors for comfortable remote setting via separate amplifier unit
- Ultrasonic sensor for the detection of transparent and metallic labels
- Reliable operation and exact positioning

Features

Stable operation and quick set-up

Stable operation eliminates the need to re-adjust the sensor due to temperature changes or other influences during production.

The E3U-GL offers quick and easy manual or auto teaching, allowing fast and efficient change overs.

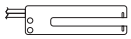
High positional accuracy

The compact photoelectric E3U-GL_ label sensors are based on E3X-SD amplifier and E32-EG15 fiber head, which has been designed to allow easy mounting close to the dispenser edge. This reduces the potential of positional drift caused by the carrier film stretching.

Detection of transparent labels

The E3U-GLU ultrasonic sensors allow the detection of all kinds of labels even when transparent or metallized.

Ordering Information

Sensor type	Application	Slot width	Connection method			Order Code	
			M12	pre-wired	System connector	PNP	NPN
Photoelectric 	Non-transparent labels	5 mm	–	■	–	E3U-GL1P 2M[*1]	E3U-GL1N 2M[*1]
			–	–	■	E3U-GL2P[*1]	E3U-GL2N[*1]
Ultrasonic	All labels	3 mm	■	–	–	E3U-GLU1	

[*1.] E3U-GL_ bundle including E32-EG15R 2M fiber head and E3X-SD amplifier

Accessories

Amplifier Unit Connectors (sold separately)

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN11
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

Note: Stickers for Connectors are included as accessories.

Sensor I/O connectors

Size	Shape	Type	Features	Material		Order code	
				Nut	Cable		
M12		General purpose (screw)	4 wire	Brass (CuZn)	PVC 2 m PUR 2 m	XS2F-M12PVC4S2M-EU XS2F-M12PUR4S2M-EU	XS2F-M12PVC4A2M-EU XS2F-M12PUR4A2M-EU

Note: For the complete list of sensor I/O connectors refer to E26E Accessories datasheet.

Specifications

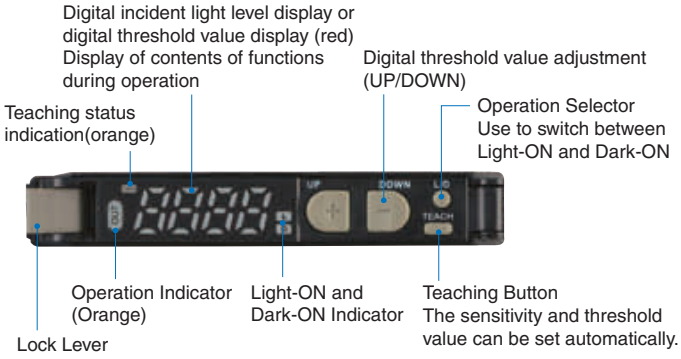
Item	E3U-GL_P	E3U-GL_N	E3U-GLU
Sensing distance (slot width)	5 mm		3 mm
Slot depth	45 mm		65 mm
Sensing method	Photoelectric (red LED)		Ultrasonic
Power supply voltage	12 to 24 VDC		
Power consumption	80 mA		70 mA
Response time	Operate or reset: 200 µs max.		125-425 µs max. (depending on object)
Control output	Open-collector output (PNP) Load current: 50 mA	Open-collector output (NPN) Load current: 50 mA	PNP + NPN Load current: 150 mA
Sensitivity adjustment	2-point teaching, auto-teaching, UP/DOWN direct key setting		UP/DOWN direct key setting
Timer function	ON/OFF-delay timer: 10 ms (fixed)		–
Ambient illumination	Incandescent lamp: 10,000 lux max. Sunlight: 20,000 lux max.		n.a
Ambient temperature	–25° to 55°C		4° to 50°C
Protection circuits	Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection		
Degree of protection	EN 60529: IP67 (sensing head), IP50 (amplifier)		EN 60529: IP65
Weight	Pre-wired model: Approx. 130 g, Model with connector: Approx. 90 g		170 g
Material	Aluminium, black anodized (fiber head)		Aluminium, black anodized

Note: For full specifications of E3U-GL please refer to datasheet of amplifier E3X-SD.

Nomenclature

Amplifier Units

E3X-SD



Operating Procedure

1. E3U-GL_

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 two teaching functions.

Teaching with/without a label

Two points (one with the label and the other without) are detected, and the operating level is set to the midpoint.
Light level is also automatically set to the optimal value.

Operation description	Button/Key
Press the TEACH button with the label.	TEACH
Press the TEACH button without the label (gap).	TEACH

Automatic Teaching

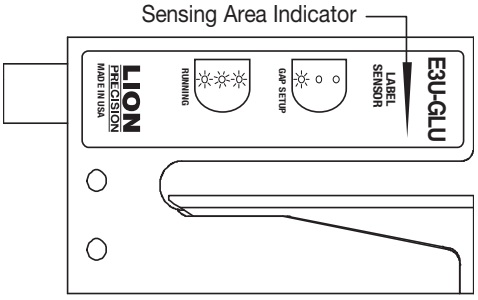
Changes within a time are detected, and the operating level is set to the midpoint between the maximum and the minimum values of the changes. This setting is optimal for when the process cannot be stopped. Execute automatic teaching again if the incident light level is not automatically set to the optimal value.

Operation description	Button/Key
Press the TEACH button for 3 s min. Let the labels pass while the button is pressed.	TEACH

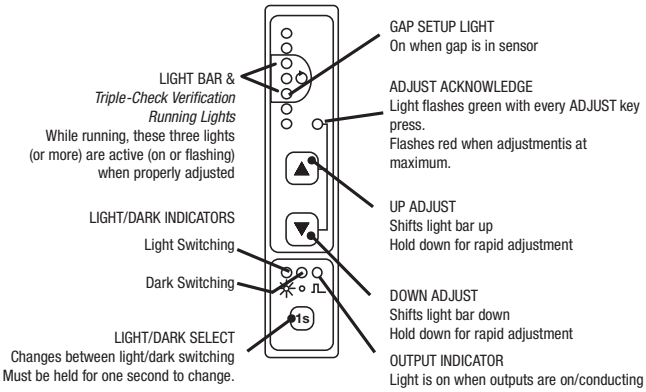
2. E3U-GLU1

E3U-GLU1 Setup

1. Mount the sensor in order that labels pass under the "Sensing Area" indicator:



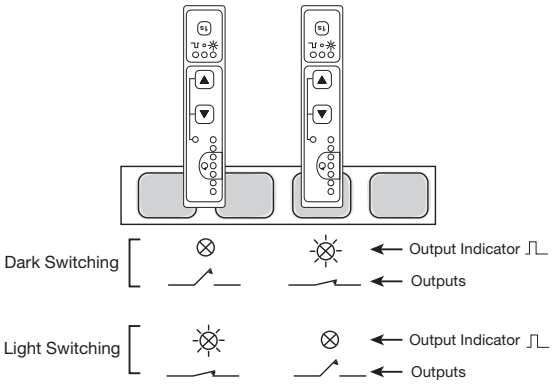
2. Place a gap in the sensor (or remove a label and place the liner only in the sensor)
3. Use UP/DOWN Adjust buttons to light the "Gap Setup" light on the light bar.



4. Run labels through the sensor and verify that the three "Running" lights are active (on or flashing) while labels are passing through the sensor. If not, use Adjust buttons until they are. More lights than the three "Running" lights may be active while running labels. If more then the three "Running" lights are active, use adjustments to center the display.

For best performance, web must remain in contact with the base plate.

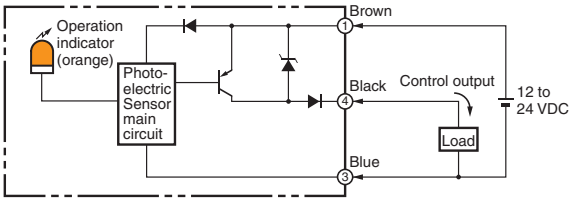
Light/Dark Switching



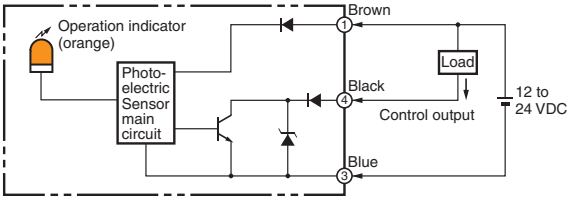
Light/Dark switching mode is displayed by the Light/Dark Indicators. To change between light and dark switching, hold the Light/Dark Select ("1S") button for 1 second.

Output Circuit Diagram

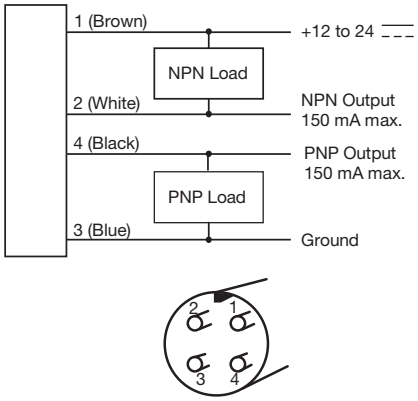
E3U-GL_P



E3U-GL_N



E3U-GLU1



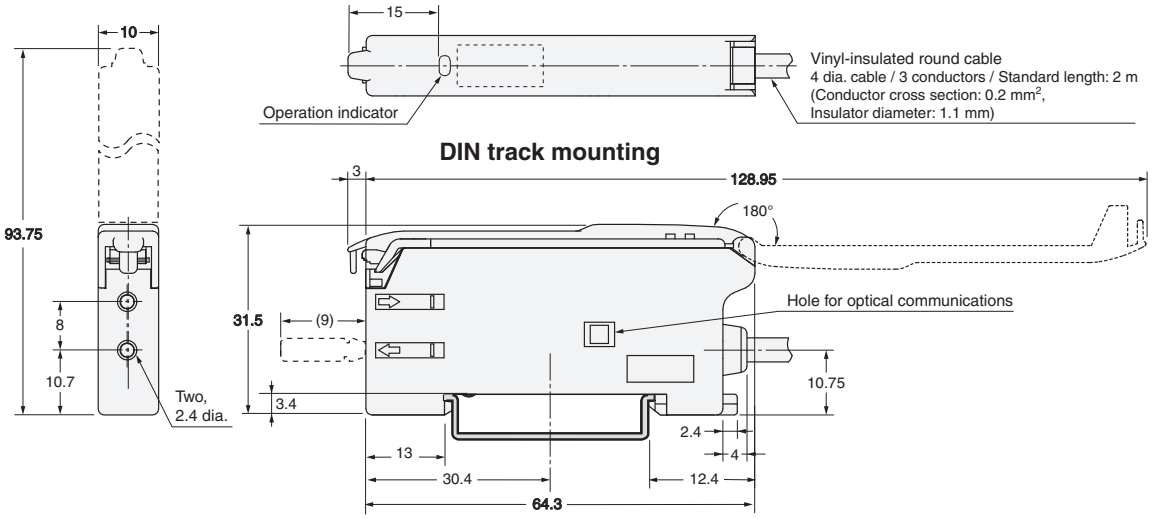
Dimensions

(Unit: mm)
Tolerance class IT16 applies to dimensions in this sheet unless otherwise specified.

E3U-GL_ Amplifier Units

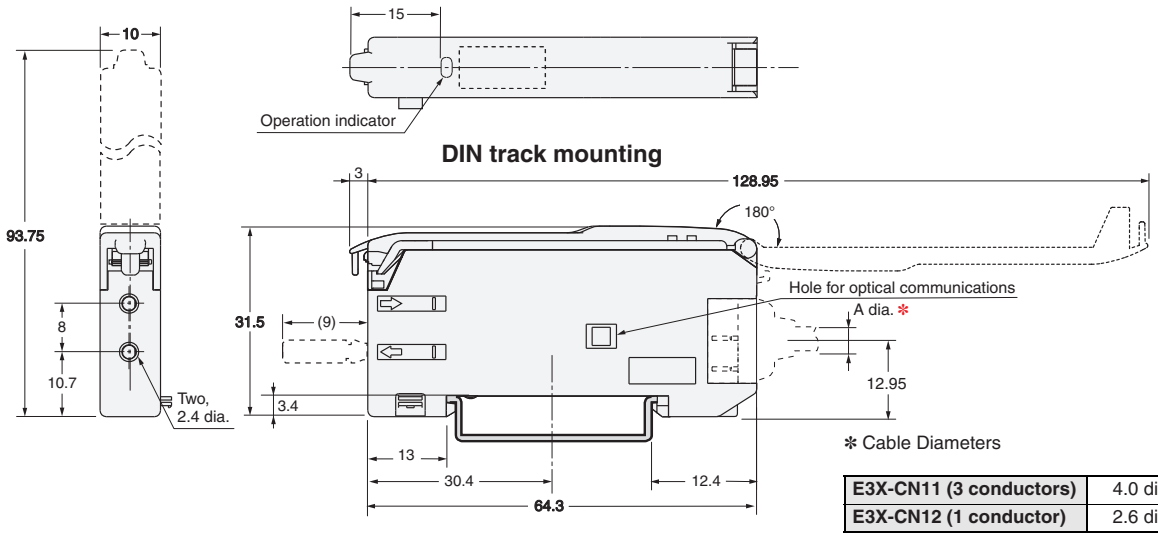
Amplifier Units with Cables

E3X-SD21
E3X-SD51



Amplifier Units with Connectors

E3X-SD7
E3X-SD9

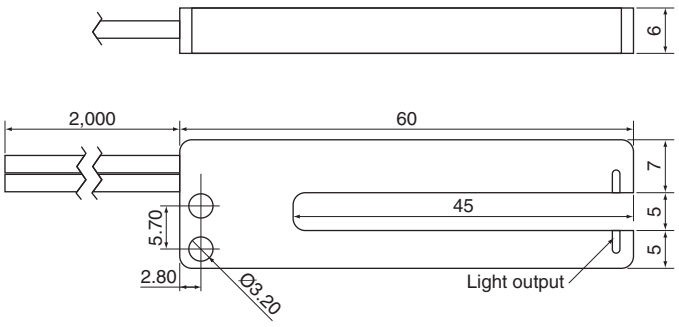


✻ Cable Diameters

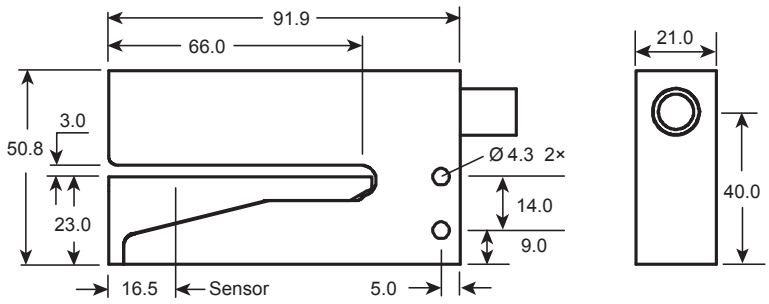
E3X-CN11 (3 conductors)	4.0 dia.
E3X-CN12 (1 conductor)	2.6 dia.

E3U-GL_ Fiber head

E32-EG15R 2M



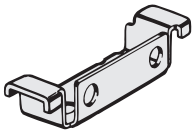
E3U-GLU



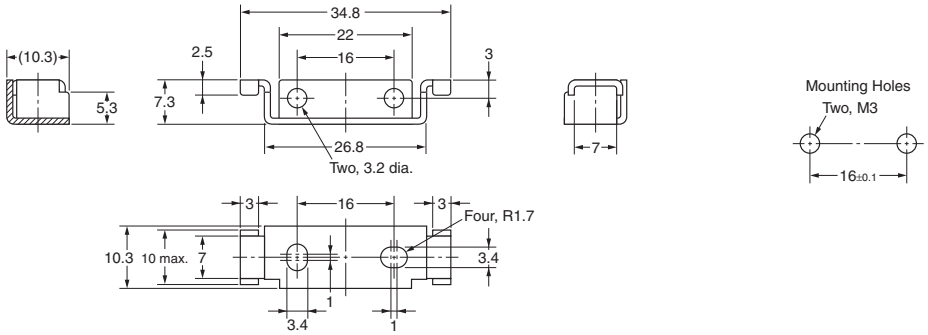
Accessories for amplifier units (sold separately)

Mounting Brackets

E39-L143

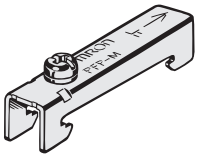


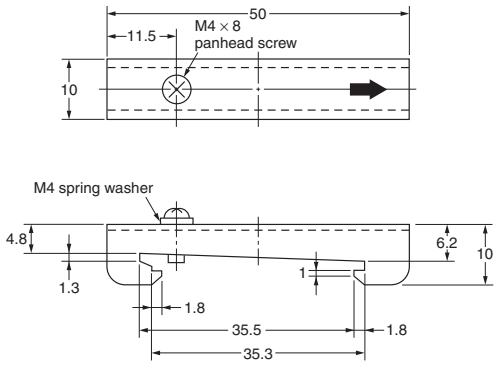
Material: Stainless steel (SUS304)



End Plates

PFP-M





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.

Precautions for Correct Use

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

E3U-GL Amplifier Units

Designing

Communications Hole

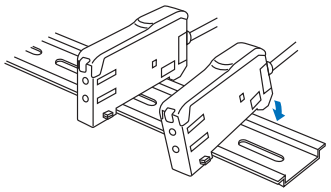
The hole on the side of the Amplifier Unit is a communications hole for preventing mutual interference when Amplifier Units are mounted side-by-side. The E3X-MC11 Mobile Console (sold separately) cannot be used.
If an excessive amount of light is received via the Sensor, the mutual interference prevention function may not work. In this case, make the appropriate adjustments using the sensitivity adjuster.
Mutual interference prevention is effective when E3X-SD-series Amplifiers are gang-mounted without other E3X-series Amplifiers.

Mounting

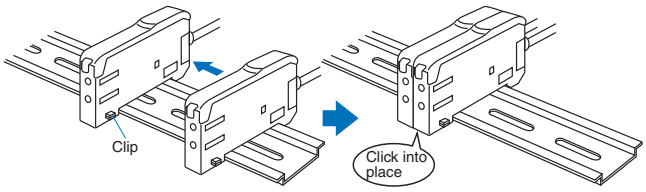
DIN Track Mounting/Removal

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.)

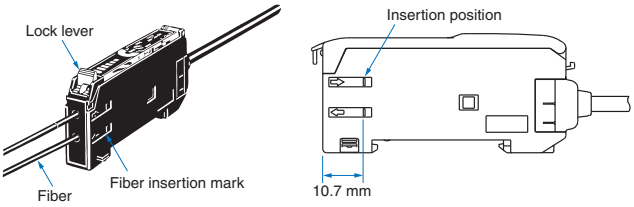
Note 1. The specifications for ambient temperature will vary according to the number of Amplifier Units used together. For details, refer to *Specifications*.
2. Always turn OFF the power supply before mounting or removing Amplifier Units.

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:

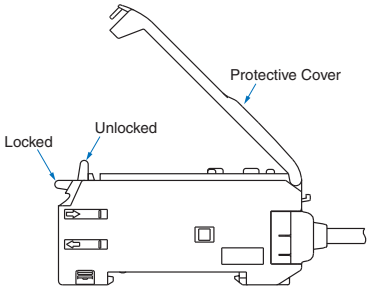
1. Connection

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

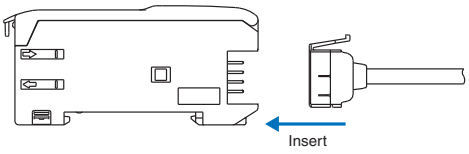
Be sure to mount the Protective Cover before use.

Amplifier Units with Connectors

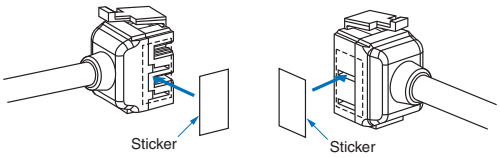
Mounting

Mounting Connectors

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



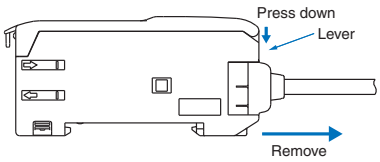
2. Join Amplifier Units together as required after all the Master and Slave Connectors have been inserted.
3. Attach the stickers (provided as accessories) to the sides of Master and Slave Connectors that are not connected to other Connectors.



Note: Attach the stickers to the sides with grooves.

Removing Connectors

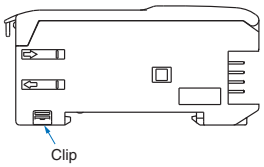
1. Slide the slave Amplifier Unit for which the Connector is to be removed away from the rest of the group.
2. After the Amplifier Unit has been separated, press down on the lever on the Connector and remove it. (Do not attempt to remove Connectors without separating them from other Amplifier Units first.)



Mounting End Plate (PFP-M)

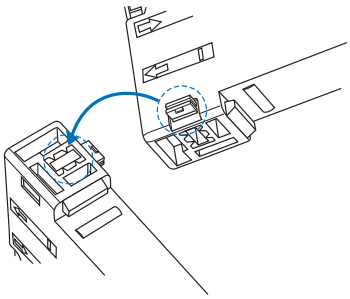
Depending on how it is mounted, an Amplifier Unit may move during operation. In this case, use an End Plate.

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

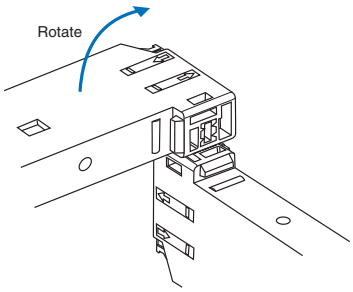


The clip can also be removed using the following mechanism, which is incorporated in the construction of the section underneath the clip.

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.

WARRANTY

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

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

LIMITATIONS OF LIABILITY

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

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

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

SUITABILITY FOR USE

THE PRODUCTS CONTAINED IN THIS DOCUMENT ARE NOT SAFETY RATED. THEY ARE NOT DESIGNED OR RATED FOR ENSURING SAFETY OF PERSONS, AND SHOULD NOT BE RELIED UPON AS A SAFETY COMPONENT OR PROTECTIVE DEVICE FOR SUCH PURPOSES. Please refer to separate catalogs for OMRON's safety rated products.

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

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

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

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

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

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

PERFORMANCE DATA

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

CHANGE IN SPECIFICATIONS

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

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

DIMENSIONS AND WEIGHTS

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

ERRORS AND OMISSIONS

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

PROGRAMMABLE PRODUCTS

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

Cat. No. E66E-EN-02 **In the interest of product improvement, specifications are subject to change without notice.**

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