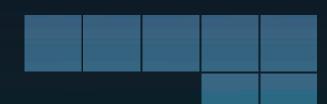


OMRON

Best Selection

Fiber Sensor Best Selection Catalog



Start with Smart!

Easily select the most reliable Fiber Unit for your detection conditions.





Smart Fiber Amplifier Units

E3NX-FA Series

→ 68 Page

Addition of Infrared models, Analog output models and Communications models with wired outputs.



Smart Fiber Amplifier Units

E3X-ZV Series

→ 69 Page

A new fiber amplifier unit able to detect the "presence or absence" of workpieces with "solid stability" at an "amazing price".



realizing

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stallation

ace

Space

seam Improvemen

Objects

environmental mmunity

Information 62 Page

Fiber Amplifiers, Communications Unit, and Accessories

Technical Suide and Precautions

102 Page

Optimal Fiber Sensor for additional

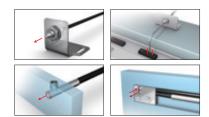
Fiber Units for various Installation Conditions,

Easy

"Mounts Anywhere"

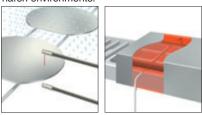
Wide Variety

Variously-shaped, compact heads allow installation in any small space.



Suitable for Harsh Environments

Fiber Units are available for various installation conditions and can be installed as is, even in harsh environments.





"Achieve Easy Detection in Many Applications"

Smart Tuning

Just press the button to set the optimum incident level and threshold.

Consistent settings are achieved for all users with this ultra-easy procedure.

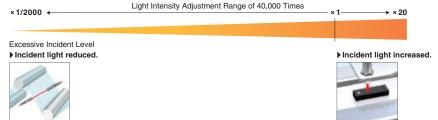




Optimum Light Intensity Adjustment

from Transparent Objects to Black Workpieces

The incident level is optimized to enable stable detection even for saturated or insufficient incident levels.



Smart Fiber Amplifier Units E3NX-FA

68, 70 Page

"Smooth Wiring and Setting"

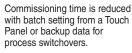
Reduced Wiring

Simply link the Fiber Amplifier Units together for easy wiring and checking.

Separate Installation

Use the Distributed Sensor Unit for distributed installation to reduce introduction costs and work.

Easy Setup







Fiber

'Easy' and 'Stable' for

iber Senso eatures

installation when starting production.

Fiber Amplifier Units with easy optimum setting

Stable

Fiber Units

E32





"Expanded Application Response Capabilities"

Improved Basic Performance

Improvements in the sensing distance and minimum sensing object increase the range of application for stable detection.

1.5 Times
the Sensing Distance*

6 m

For E32-LT11 Fiber Unit with a fiber length of 3.5 m

1/10th
the Minimum Sensing Object*

0.3 μm dia.

Typical example of actual measurements with E32-D11R Fiber Unit.

*Compared to E3X-ZV.

Sensor Communications Units

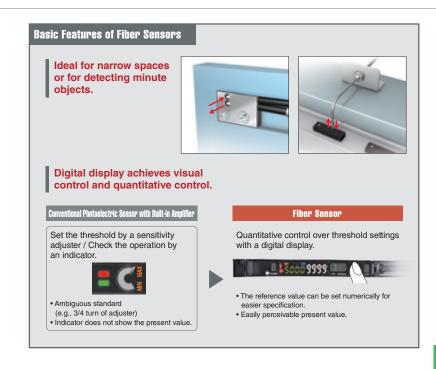
E3NW

Ether CAT. CC-Link V2

68, 70 Page

Sensor

Minimal Cost Process.



Threaded Hex-shaped Cylindrical

Flat

Sleeved

Small Spot

Narrow view

BGS

Limitedreflective

resistant, Oil-resistant

Bending

Heatresistant

Detection

Liquid-level

Vacuum

Selection by Category

STEP 1

Select a Fiber Unit.

Select a category.

Fiber Unit Index

05 Page Select a model. Category Pages / 06 to 66 STEP 2

Select a Fiber **Amplifier Unit and Communications**

STEP 3

Select Accessories of Fiber Amplifier Unit 71,87

Before Selecting Fiber Units

The Fiber Units specifications give the sensing distance when the Fiber Unit and Fiber Amplifier Unit is combined. Check the Fiber Amplifier Unit series for easier selection.

<Specifications on Each Fiber Unit Category Page>



Fiber Amplifier Unit Series

			E3X-ZV Series	E3NX-FA Series				
	Output		1 output	1 or 2 outputs (depending on the model)				
External input			Not supported	Supported or not supported (depending on the model)				
Fiber Amplifier Response time			50 μs /250 μs/1 ms/16 ms (Default: 250 μs)	30 μs (32 μs)/250 μs/1 ms/16 ms (Default: 250 μs)				
Unit specifications	Sensing distance	E32-T11R	2,000 mm	3,000 mm				
	(Giga-power mode)	E32-D11R	840 mm	1,260 mm				
	Minimum sensing object	E32-T11R	5 μm dia.	2 μm dia.				
Sensor Communications	Communications m (Sensor Communica		_	EtherCAT (E3NW-ECT) CC-Link (E3NW-CCL)				
Unit application	Applicable Sens	sors	_	Fiber Sensor (E3NX-FA0/FA10/FA40/FAH0) Laser Sensors (E3NC-LA0, E3NC-SA0) Contact-Type Sensor (E9NC-TA0)				
	Ordering Inform	nation	86 Page	70 Page				
Page listings	Ratings and Sp	ecifications	88 Page	72 Page				
3 -	Dimensions		89 Page	76 Page				

Selection by Model

STEP 1

Search for the page in the model index.

102

STEP 2

Search for the model on the corresponding pages.

Page

High Power

Narrow view

BGS

Retroreflective

Limitedreflective

Chemicalresistant,

Oil-resistant

Heatresistant

FPD.

Fiber Unit Index

Standard Installation



Standard screw-type installation The Fiber Units is mounted into a drilled hole and secured



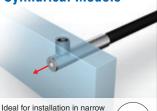


Easily mount tightening just one nut. The cable follows the wall, so extra space is not



10

Cylindrical Models



spaces.
The Fiber Unit is secured with

12

Saving Space

Flat Models



06

Mount directly in limited spaces without using special mounting brackets.

16

Suitable for close-range Ideal for detecting minute objects in areas with limited space

20

Beam Improvements

Small-Spot, Reflective (Minute Object Detection)



Small-spot to accurately detect

24

Transparent Object Detection



Suitable for detection on large equipment, of large objects, and in environments with airborne particles.

28

Beam Improvements

Narrow View



The Fiber Unit emit a non-spreading beam to prevent false detection of light reflected off surrounding objects.



Detection without Background Interference



Detect only objects in the sensing range, and not in the background.

36

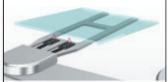
Retro-reflective



Detect transparent objects reliably because the beam passes through the object twice, resulting in greater light interruption

38

Limited-reflective (Glass Detection)



The limited-reflective optical system provides stable detection of specular reflective

Bendina

40

Page

Detection

Liquid-level

Vacuum

Semi. Solar

Environmental Immunity



Bending-resistant, **Disconnection-resistant**

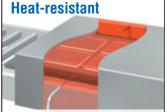


Resistant to repeated bending on moving parts and breaking from snagging or shock.



54

Page



Can be used in environments at up to 400°C.

48

Special Applications



workpieces whose position

Liquid-level Detection



mounted on tubes or in liquid.

Vacuum-resistant



Can be used under high vacuums of up to 10⁻⁵ Pa.



FPD, Semiconductors, and Solar Cells



58

Designed specifically to reliably detect glass substrates and wafers.

Threaded Models

Cylindrical

Flat

Sleeved

Small Spot

High Power Narrow view

BGS

Retro-reflective

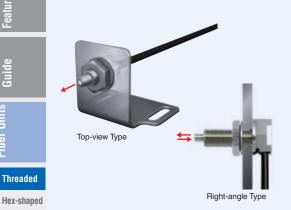
Limitedreflective Chemical-

Oil-resistant Bendina Heat-

resistant Detection

Vacuum FPD, Semi.

Liquid-level



- Standard configuration. These Fiber Units are mounted into a hole drilled in a bracket and secured with nuts.
- The Right-angle Model prevents snagging on the cable because the cable runs along the mounting surface.





Specifications

■→■ Through-beam Fiber Units

Sensing				Se	nsing dis	tance (mm)		Optical axis		
direction (Aperture	Cizo Annoorongo (mm)		Bending radius of cable	radius E3X-ZV			A	diameter (minimum sensing	Models	07 Page Dimensions No.
angle)			or ouble	■GIGA=HS	Other modes	■GIGA=HS	Other modes			110.
Right- angle (Approx. 60°)		14.7 M4	Flexible,	2,000	ST : 1,000	3,000	ST : 1,500	1 dia. (5 µm dia./-	E32-T11N 2M	07-A
Top-view (Approx. 60°)	M4	14 M4 [IP67]	R1	700	SHS: 280	1,050	SHS: 280	2 μm dia.)	E32-T11R 2M	07-B
Top-view	IVI -1	15	R25	4,000 2,700	ST : 4,000 shS: 1,080	4,000 4,000	ST : 4,000 SHS: 1,080	2.3 dia. (0.1 dia./	E32-LT11 2M	07-C
(Approx. 15°)		M4 Build-in Lens IP50	Flexible, R1	2,300	ST : 3,500 SHS: 920	4,000 3,450	ST : 4,000 SHS: 920	0.03 dia.)	E32-LT11R 2M	07-6

^{*} The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm.

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

 $[E3X-ZV] \ GIGA: Giga-power \ mode \ (16 \ ms), \ HS: High-speed \ mode \ (250 \ \mu s), \ ST: \ Standard \ mode \ (1 \ ms), \ and \ SHS: \ Super-high-speed \ mode \ (50 \ \mu s), \ ST: \ Standard \ mode \ (1 \ ms), \ And \ SHS: \ Super-high-speed \ mode \ (50 \ \mu s), \ ST: \ Standard \ mode \ (1 \ ms), \ And \ SHS: \ Super-high-speed \ mode \ (50 \ \mu s), \ ST: \ ST$

[E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

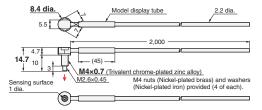
- 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- 3. The sensing distances for E3NX-FA are values for E3NX-FA \square models. The distances for E3NX-FAH \square infrared models are different.
- 4. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Dimensions

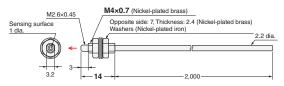
Installation Information → 62 to 66 Page

Through-beam Fiber Units (Set of 2)

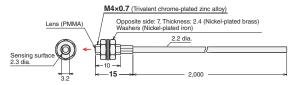
07-A E32-T11N 2M (Free Cutting)



(07-B) E32-T11R 2M (Free Cutting)



07-C E32-LT11 2M (Free Cutting) E32-LT11R 2M (Free Cutting)



- Reference Information for Model Selection -

Features of the Right-angle Type

- · Cable is less prone to snagging.
- Cable runs along the mounting surface for less space compared with Top-view Fiber Units.
- The nut is attached to the Fiber Unit to reduce installation work.

Build-in Lens

What Are Fiber Units with Build-in Lenses?

These Fiber Units have built-in lenses.

They feature high-power beams.

You don't have to worry about the lens falling off and getting lost.

What Is "Flexible" Fiber?

The flexible fiber has a small bending radius for easy routing without easily breaking. It is easy to use because the cable can be bent without significantly reducing light intensity.



Structure which has a cladding around a large number of ultrafine cores.

And

Long-distance Sensing Applications

A separate Lens Unit can be attached to extend the sensing distance.

→ 30 Page

Breaking Due to Snagging or Shock

The Fiber Unit can be protected from breaking with stainless steel spiral tube.

→ 44 Page (Excluding the E32-T11N 2M.)

Threaded

Hex-shaped Cylindrical

Flat

Sleeved

Small Spot

High Power Narrow

view

BGS

Retroreflective Limitedreflective

Chemicalresistant, Oil-resistant

Bendina

Heatresistant

Detection Liquid-level

Vacuum

FPD, Semi. Solar

Threaded Models

iber Senso eatures

election iuide

Fiber Units

Standard Installation

Cylindrical

Flat

Sleeved

Saving Space

Small Spot

High Power

Narrow

view

BGS

Retroreflective

Limitedreflective

ent Objects

Chemical-resistant,
Oil-resistant

Bending

Heat-

Area Detection

Liquid-level

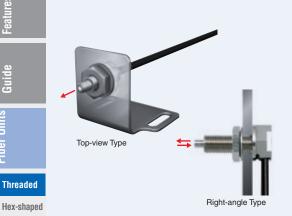
Vacuum

FPD,
Semi,
Solar

Fiber Amplifiers, Communications Unit, and Accessories

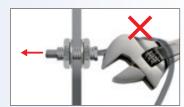
> Technical Guide and Precautions

Model Index (



- Standard configuration. These Fiber Units are mounted into a hole drilled in a bracket and secured with nuts.
- The Right-angle Model prevents snagging on the cable because the cable runs along the mounting surface.





Specifications

Reflective Fiber Units

Sensing			Dandir :	Se	nsing	dis	tance (mm)		Optical axis		00 Dess
direction (Aperture	Size	Appearance (mm)	Bending radius of cable	E3X-Z	V		E3NX-F	Α	diameter (minimum sensing	Models	09 Page Dimensions No.
angle)			0.000.0	■GIGA = HS	Other mo	des	■GIGA = HS	Other mode	object)		
Right-	М3	Coaxial 20.5	Flexible.	110 46		50 14	160 69	ST : 75 SHS: 14		E32-C31N 2M	09-A
angle (Approx. 60°)	М6	Coaxial 24 M6	R4	780		00	1,170	ST : 520 SHS: 100		E32-C91N 2M	09-B
Top-view (Approx. 60°)		11 M3	Flexible, R1	■ 140 □ 40		60	2 10	ST : 90 SHS: 16		E32-D21R 2M	09-C
	М3	Coaxial 25 M3	R25	330	ST : 1	50	490	ST : 220	(o piii aiai)	E32-C31 2M	09-D
		Coaxial 11 M3 IP67	R10	■ 100	SHS:	44	150	SHS: 44	2 μm dia.)	E32-C31M 1M	09-E
	M4	15 M4 IP67	Flexible,	140 40		60 16	210 60	ST : 90 SHS: 16		E32-D211R 2M	09-F
	M6	17 M6	R1	840		00	360	ST : 520 SHS: 100		E32-D11R 2M	09-G
	IVI6	Coaxial 23 M6	R25	1,400		80	2,100	ST : 900 SHS: 180		E32-CC200 2M	09-H
Top-view (Approx. 15°)			R25	860		10	1,290	ST : 540 SHS: 110		E32-LD11 2M	
	M6 M6	M6 Baild-in Letts IP50	Flexible, R1	840		00	1,260	ST : 520 SHS: 100	(1 dia./ 0.03 dia.)	E32-LD11R 2M	09-1

- Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.
 - [E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)
 - 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
 - 3. The sensing distances for Reflective Fiber Units are for white paper. (The sensing distance for the E32-LD11 2M / E32-LD11R 2M are for glossy white paper.)
 - **4.** The sensing distances for E3NX-FA are values for E3NX-FA□ models. The distances for E3NX-FAH□ infrared models are different.
 - 5. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

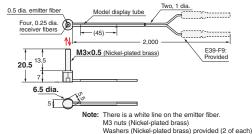
Cylindrical

Sleeved

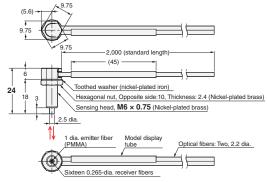
Dimensions

Reflective Fiber Units

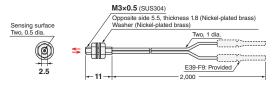
09-A E32-C31N 2M (Free Cutting)



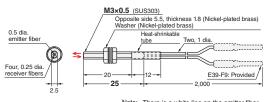
09-B E32-C91N 2M (Free Cutting)



09-C E32-D21R 2M (Free Cutting)

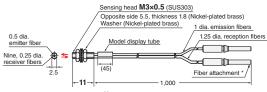


09-D E32-C31 2M (Free Cutting)



Note: There is a white line on the emitter fiber.

09-E E32-C31M 1M (Free Cutting)

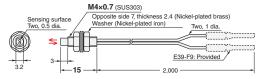


Note: There is a white line on the emitter fiber

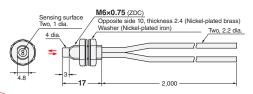
* The Fiber Attachments that are provided were specially designed for this Fiber Unit. E39-F9 cannot be attached.

Installation Information → 62 to 66 Page

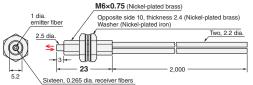
09-F E32-D211R 2M (Free Cutting)



09-G E32-D11R 2M (Free Cutting)



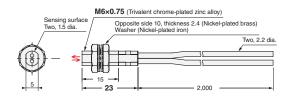
09-H) E32-CC200 2M (Free Cutting)



Note: There is a white line on the emitter fiber.

09-I E32-LD11 2M (Free Cutting) E32-LD11R 2M (Free Cutting)

And



Breaking Due to Snagging or Shock

The Fiber Unit can be protected from breaking

with stainless steel spiral tube.

- Reference Information for Model Selection -

Features of Coaxial Reflective Type

These Fiber Units offer better detection of small objects at close distances (of 2 mm or less) than Standard Reflective Fiber Units.

They also detect glossy surfaces more reliably than Standard Reflective Fiber Units, even if the surface is tilted.

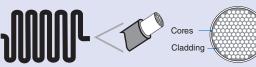
The receiver fibers are arranged around the emitter fiber as shown below.

Emitter Fiber Receiver Fibers

What Is "Flexible" Fiber?

The flexible fiber has a small bending radius for easy routing without easily breaking. It is easy to use because the cable can be bent without significantly reducing light intensity.

→ 46 Page



Structure which has a cladding around a large number of ultrafine cores

Features of the Right-angle Type

- · Cable is less prone to snagging.
- · Cable runs along the mounting surface for less space compared with Top-view Fiber Units.
- . The nut is attached to the Fiber Unit to reduce installation work.

What Are Fiber Units with Build-in Lenses?

These Fiber Units have built-in lenses.

They feature high-power beams.

You don't have to worry about the lens falling off and getting lost.

Hex-shaped Models

Threaded Hex-shaped

Cylindrical

Flat

Small Snot

Sleeved

High Power

Narrow

BGS

Retro-Limited-

reflective

Chemicalresistant. Oil-resistant Bending

> Heatresistant

Area Detection

Liquid-level

Vacuum

FPD, Semi Solar



- You can easily mount these Fiber Units by making a hole in the bracket and tightening just one nut.
- The cable follows the wall, so extra space is not required, and the cable will not get caught on other objects.



A Fiber Unit with Build-in Lens is the new standard in fiber units. We recommend this new standard Fiber Unit that achieves stable detection with a high-power beam.

You don't have to worry about the lens falling off and getting lost. Through-beam Flat Fiber Units are also available. (\rightarrow 16 page)

Specifications

Through-beam Fiber Units

				Se	nsing dis	tance (mm)		Optical axis				
Aperture angle	Size	Appearance (mm)	Bending radius of cable	E3X-Z	E3X-ZV		E3NX-FA		E3NX-FA (minimum sensing		Models	11 Page Dimensions No.
			■GIGA =HS	Other modes	■GIGA =HS	Other modes						
Approx.	M4	14.4 Build-in I Cons	Flexible, R2	4,000*	ST : 3,500 SHS: 920	4,000* 3,450	ST : 4,000* SHS: 920	2.3 dia. (0.1 dia./ 0.03 dia.)	E32-LT11N 2M	11-A		
Approx. 60°	1417	14.7 M4	Flexible, R1	2,000	ST : 1,000 SHS: 280	3,000	ST : 1,500 SHS: 280	1 dia. (5 μm dia./ 2 μm dia.)	E32-T11N 2M	11-B		

Reflective Fiber Units

			D P	Se	nsing dis	tance (mm)		Optical axis		
Aperture angle	Size	Appearance (mm)	Bending radius of cable	E3X-Z	v	E3NX-F	A	diameter (minimum sensing	Models	11 Page Dimensions No.
				■GIGA = HS	Other modes	■GIGA = HS	Other modes			140.
Approx.	M6	15.8		840	ST : 350	1,260	ST : 520	(0.1 dia./	E32-LD11N 2M	11-C
15°	0	Build-in Lens M6		■ 240	SHS: 100	360	SHS: 100	0.03 dia.)	LOL LOTTIN LIN	11-0
	M3	Coaxial 18.5	Flexible,	290	ST : 130	440	ST : 190		E32-C21N 2M	
	IVIS	M3	R2	ı 90	SHS: 39	130	SHS: 39	(5 µm dia./	E32-C21N 2M	(11-D)
Approx.	M4	13.5		840	ST : 350	1,260	ST : 520	2 μm dia.)	E32-D21N 2M	415
60°	IVI4	M4 IP67		■ 240	SHS: 100	360	SHS: 100		LOL DE III EM	(11-E)
	MC	Coaxial 24	Flexible,	780	ST : 350	1,170	ST : 520	(5 µm dia./	E20 C04N 0M	
	M6	M6 IP67	R4	■ 220	SHS: 100	340	SHS: 100	2 µm dia.)	E32_C91N 2M	11-F

Retro-reflective Fiber Units (With M.S.R. Function)

			Dandina	Se	nsing dis	tance (mm)		Optical axis		
Aperture angle			Bending radius of cable	E3X-Z	:V	E3NX-FA		diameter (minimum sensing	Models	11 Page Dimensions No.
			■GIGA =HS	Other modes	■GIGA =HS	Other modes			140.	
Approx.	М6	8.5. 44 15.8 80 80 Baildfall cms	Flexible, R2	1,350	ST : 1,200 SHS: 550	2,020	ST : 1,800 SHS: 550	-	E32-LR11NP 2M + E39-RP1	11-G

* The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm.

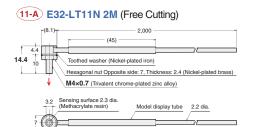
- The following mode names and response times apply to the modes given in the Sensing distance column.

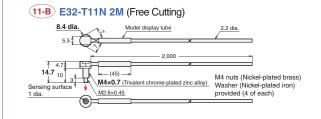
 [E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 μs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 μs)
- [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)
- 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values.
- The first value is for the E3X-ZV and the second value is for the E3NX-FA. The sensing distances for Reflective Sensors are for white paper. (The sensing distances for the E32-LD11N 2M are for glossy white paper)
- With Retro-reflective Models, objects with a high reflection factor may cause the Fiber Sensor to detect reflected light as incident light. Also, stable detection may not be possible for transparent objects. Check suitability beforehand. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Dimensions

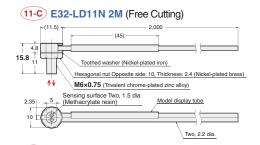
Installation Information → 62 to 66 Page

Through-beam Fiber Units

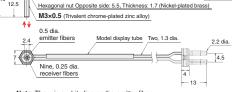




Reflective Fiber Units



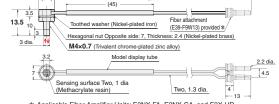
11-D E32-C21N 2M (Free Cutting) Toothed washer (Nickel-plated iron) (E39-F9W13) provided * 12.5 Hexagonal nut Opposite side: 5.5, Thickness: 1.7 (Nickel-plated brass)



Note: There is a white line on the emitter fiber * Applicable Fiber Amplifier Units: E3NX-FA, E3NX-CA, and E3X-HD.

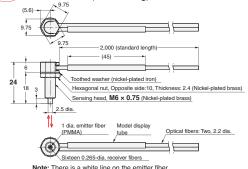
Use the enclosed E39-F9-7 Fiber Attachment for other models, such as the E3X-SD, E3X-NA, and other models that have an 8-mm space between the emitter and receiver fiber insertion holes

11-E E32-D21N 2M (Free Cutting) ۲(8.1) ۲



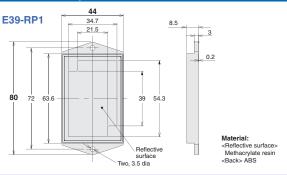
* Applicable Fiber Amplifier Units: E3NX-FA, E3NX-CA, and E3X-HD. Use the enclosed E39-F9-7 Fiber Attachment for other models, such as the E3X-SD, E3X-NA, and other models that have an 8-mm space between the emitter and receiver fiber insertion holes.

11-F E32-C91N 2M (Free Cutting)



Retro-reflective Fiber Units (With M.S.R. Function)

11-G E32-LR11NP 2M (Free Cutting) ⊬-(11.5)-- 2.000 (45) Toothed washer (Nickel-plated iron) Hexagonal nut Opposite side: 10, Thickness: 2.4 (Nickel-plated brass) M6×0.75 (Trivalent chrome-plated zinc alloy)



- Reference Information for Model Selection -

Features of Coaxial Reflective Type

These Fiber Units offer better detection of small objects at close distances (of 2 mm or less) than Standard Reflective Fiber Units.

They also detect glossy surfaces more reliably than Standard Reflective Fiber Units, even if the surface is tilted.

The receiver fibers are arranged around the emitter fiber as shown below.

Emitter Fiber Receiver Fibers

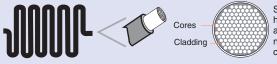
Transparent Object Detection

Retro-reflective Models are ideal for detection of transparent objects.

→ 39 Page: Performance Comparison of Transparent Object Detection

What Is "Flexible" Fiber?

The flexible fiber has a small bending radius for easy routing without easily breaking. It is easy to use because the cable can be bent without significantly reducing light intensity.



Structure which has a cladding around a large number of ultrafine

And

Long-distance Sensing Applications with the E32-T11N

A separate Lens Unit can be attached to extend the sensing distance.

→ 30 Page

Threaded

Hex-shaped Cylindrical

Sleeved

Small Spot

High Power

view

BGS

Retroreflective Limited-

reflective Chemical-Oil-resistant

Bendina

resistant

Detection

Liquid-level

Vacuum

FPD, Semi. Solar

iber Sensoı eatures

election uide

Fiber Units

Threaded
Hex-shaped

Standard Insta

Cylindrical

Flat

Sleeved

Small Spot

High Power
Narrow
view

Saving Space

provements

Beam In

BGS

Retroreflective

Limitedreflective

ransparent Obj

Chemicalresistant, Oil-resistant

Bending

> Heatresistant

Detection

Liquid-level

Vacuum

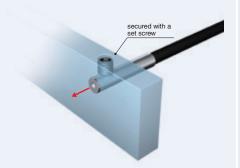
FPD, Semi, Solar

Installation Information

Fiber Amplifiers, Communications Unit, and Accessories

> echnical Suide and Precautions

> > **Model Index**



- Inserted where space is limited. (Secured using a set screw.)
- Ultramate space-saving by micro-fiber head. (1 dia. × 10 mm)



• Side-view models can be mounted where there is limited depth.

Specifications

■→■ Through-beam Fiber Units

				Se	ensing dis	tance (mm)		Optical axis		40.5
Size	Sensing direction	Appearance (mm)	Bending radius of cable	E3X-ZV		E3NX-	FA	diameter (minimum sensing	Models	13 Page Dimensions No.
			Or oublo	■GIGA = HS	Other modes	■GIGA =HS	Other modes			140.
1 dia.		10 1 dia.	Flexible, R1	450	ST : 250 SHS: 60	670	ST : 370 SHS: 60	0.5 dia.	E32-T223R 2M	13-A
1.5 dia.	Top-view	10 1.5 dia.	Bendresistant, R4	680	ST : 400 SHS: 90	1,020	ST : 600 SHS: 90	(5 μm dia./ · 2 μm dia.)	E32-T22B 2M	13-B
3 dia.		14 3 dia.	Flexible,	700	ST : 1,000 SHS: 280	3,000 1,050	ST : 1,500 SHS: 280	1 dia. (5 µm dia./-	E32-T12R 2M	13-C
5 ula.	Side-view	35 3 dia.	R1	750	ST : 450 SHS: 100	390	ST : 670 SHS: 100	2 μm dia.)	E32-T14LR 2M	13-D

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs)

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 μs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 μs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 μs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 μs)

- 2. The value is for the E3X-ZV and the second value is for the E3NX-FA.
- 3. The sensing distances for E3NX-FA are values for E3NX-FA models. The distances for E3NX-FAH infrared models are different.
- 4. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Standard Installation Cylindrical Models

Dimensions

Installation Information → 62 to 66 Page



Through-beam Fiber Units (Set of 2)





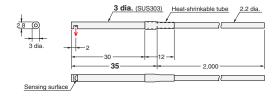
13-B E32-T22B 2M (Free Cutting)



13-C E32-T12R 2M (Free Cutting)



13-D E32-T14LR 2M (Free Cutting)



- Reference Information for Model Selection -

Recommended Mounting Hole Dimensions

The recommended mounting-hole dimensions for Cylindrical Fiber Units are given below.



			(OTHE HITT)
Outer diameter of Fiber Unit	1 dia.	1.5 dia.	3 dia.
Dimension F	1.2 ^{+0.5} ₀ dia.	1.7 +0.5 dia.	3.2 ^{+0.5} dia.

Threaded Hex-shaped

Cylindrical

Flat Sleeved

Small Spot

High Power

Narrow view

BGS

Retro-reflective Limitedreflective

Chemicalresistant, Oil-resistant

Bending

resistant Detection

Heat-

Liquid-level

Vacuum

Solar

FPD, Semi.

iber Senso eatures

election uide

iber Units

Threaded
Hex-shaped

tandard Installatio

Cylindrical

aving Space

Small Spot

Flat

Sleeved

Narrow view BGS

Retroreflective

Limitedreflective

Chemicalresistant, Oil-resistant

> Heatresistant

Area Detection

Liquid-level

Vacuum FPD,

Semi, Solar

Installation

Fiber Amplifiers, Communications Unit, and Accessories

> echnical uide and recautions

> > Model Index

secured with a set screw

 Inserted where space is limited. (Secured using a set screw.)

Specifications

Reflective Fiber Units

			Danding	Ser	nsing dis	stance (mm)		Optical axis		15 Dama
Size	Sensing direction	Appearance (mm)	Bending radius of cable	E3X-ZV	7	E3NX-F	Α	diameter (minimum sensing	Models	15 Page Dimensions No.
			or ouble	■GIGA =HS	Other modes	■GIGA =HS	Other modes			110.
1.5 dia.		15 1.5 dia.	Bend- resistant, R4	140 40	ST : 60 SHS: 16	210	ST : 90 SHS: 16		E32-D22B 2M	15-A
1.5 dia. + 0.5 dia.		The sleeve cannot be bent. 3 15 1.5 dia. 0.5 dia.	R4	1 28		42 12	ST : 18 SHS: 4		E32-D43M 1M	15-B
	Top-view	15 3 dia. [IP67	Flexible, R1	140 40	ST : 60 SHS: 16	210	ST : 90 SHS: 16		E32-D22R 2M	15-C
3 dia.		15 3 dia.	Bend- resistant, R4	300	ST : 140 SHS: 40	450	ST : 210 SHS: 40	(5 μm dia./ 2 μm dia.)	E32-D221B 2M	15-D
		Coaxia) 15 3 dia.	R25	200	ST : 300 SHS: 90	300	ST : 450 SHS: 90		E32-D32L 2M	15-E
3 dia. + 0.8 dia.		The sleeve cannot be bent. 20 15 3 dia. IP67	R25 -	■ 70	ST : 30 SHS: 8	100	ST : 45 SHS: 8		E32-D33 2M	15-F
6 dia.	Side-view	42 6 dia.	Flexible, R1	220	ST : 100 SHS: 28	330	ST : 150 SHS: 28		E32-D14LR 2M	15-G

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs)

- [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- 3. The sensing distances for Reflective Fiber Units are for white paper.
- 4. The sensing distances for E3NX-FA are values for E3NX-FA models. The distances for E3NX-FAH infrared models are different.
- 5. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Cylindrical Models

Dimensions

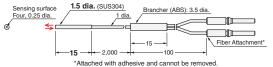
Installation Information → 62 to 66 Page

Standard Installation



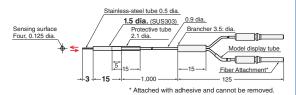
Reflective Fiber Units

15-A E32-D22B 2M (No Cutting)



Enlarged View of Sensing Surface two, 0.25 dia.

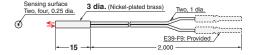
15-B E32-D43M 1M (No Cutting)



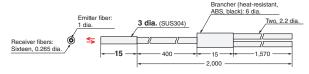
15-C E32-D22R 2M (Free Cutting)



15-D E32-D221B 2M (Free Cutting)

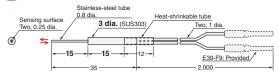


15-E E32-D32L 2M (Free Cutting)

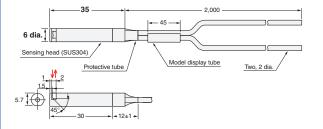


Note: There is a yellow dotted line on the Emitter fiber

15-F E32-D33 2M (Free Cutting)



15-G E32-D14LR 2M (Free Cutting)



- Reference Information for Model Selection -

Features of Coaxial Reflective Type

These Fiber Units offer better detection of small objects at close distances (of 2 mm or less) than Standard Reflective Fiber Units.

They also detect glossy surfaces more reliably than Standard Reflective Fiber Units, even if the surface is tilted.

The receiver fibers are arranged around the emitter fiber as shown below.

Emitter fiber Receiver fibers

Recommended Mounting Hole Dimensions

The recommended mounting-hole dimensions for Cylindrical Fiber Units are given below.



Outer diameter of Fiber Unit	1.5 dia.	3 dia.
Dimension F	1.7 ^{+0.5} ₀ dia.	3.2 ^{+0.5} ₀ dia.

(Linit: mm)

Threaded Hex-shaned

Cylindrical

Flat Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limitedreflective

Chemicalresistant, Oil-resistant

> Bending Heatresistant

Detection

Liquid-level

Vacuum FPD, Semi.

Solar

Threaded Hex-shaped Cylindrical

Saving Space Sleeved

Flat

Small Spot High Power

Narrow view

BGS

Retro-reflective Limited-

> Chemicalresistant, Oil-resistant

reflective

Bending

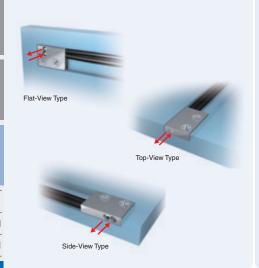
Heatresistant

Detection

Liquid-level

Vacuum

FPD, Semi.



- Thin profile for mounting in limited spaces.
- Mounts directly without using special mounting brackets.

Specifications

■→■ Through-beam Fiber Units

			Se	nsina dis	stance (mm)		Optical axis		
Sensing direction	Appearance (mm)	Bending radius of cable	E3X-Z\		E3NX-F	A	diameter (minimum sensing	Models	17 Page Dimensions No.
		Of Cable	■GIGA =HS	Other modes	■GIGA =HS	Other modes	object)		NO.
Top-view	8 13 15 IP67		2,000	ST : 1,000 SHS: 280	3,000	ST : 1,500 SHS: 280	1 dia. (5 µm dia./ 2 µm dia.)	E32-T15XR 2M	17-A
Top-view	2 T 12 + 7		450	ST : 250 SHS: 60	670	ST : 370 SHS: 60	0.5 dia. (5 µm dia./ 2 µm dia.)	E32-T25XR 2M	17-B
Side-view	31 8 IP67		750	ST : 450 SHS: 100	390	ST : 670 SHS: 100	1 dia. (5 µm dia./ 2 µm dia.)	E32-T15YR 2M	17-C
	12 7 21 IP67	Flexible, R1	170 150	ST : 100 SHS: 20	250 70	ST : 150 SHS: 20	0.5 dia. (5 µm dia./ 2 µm dia.)	E32-T25YR 2M	17-D
	8 15 3 IP67		750	ST : 450 SHS: 20	390	ST : 670 SHS: 100	1 dia. (5 µm dia./ 2 µm dia.)	E32-T15ZR 2M	17-E
Flat-view	7 12 IP67		170 50	ST : 100 SHS: 20	250 70	ST : 150 SHS: 20	0.5 dia. (5 µm dia./ 2 µm dia.)	E32-T25ZR 2M	17-F
	8.5 8.5 Build-in Lens		2,400	ST : 1,200 SHS: 300	3,600 1,200	ST : 1,800 SHS: 300	3 dia. (0.1 dia./ 0.03 dia.)	E32-LT35Z 2M	17-G

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 μ s), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 μ s) $[E3NX-FA]\ GIGA:\ Giga-power\ mode\ (16\ ms),\ HS:\ High-speed\ mode\ (250\ \mu s),\ ST:\ Standard\ mode\ (1\ ms),\ and\ SHS:\ Super-high-speed\ mode\ (30\ \mu s),\ ST:\ Standard\ mode\ (1\ ms),\ And\ SHS:\ Super-high-speed\ mode\ (30\ \mu s),\ ST:\ Standard\ mode\ (1\ ms),\ And\ SHS:\ Super-high-speed\ mode\ (30\ \mu s),\ ST:\ Standard\ mode\ (1\ ms),\ And\ SHS:\ Super-high-speed\ mode\ (30\ \mu s),\ ST:\ Standard\ mode\ (1\ ms),\ And\ SHS:\ Super-high-speed\ mode\ (30\ \mu s),\ ST:\ Standard\ mode\ (1\ ms),\ And\ SHS:\ Super-high-speed\ mode\ (30\ \mu s),\ ST:\ Standard\ mode\ (1\ ms),\ And\ SHS:\ Super-high-speed\ mode\ (30\ \mu s),\ ST:\ Standard\ mode\ (1\ ms),\ And\ SHS:\ Super-high-speed\ mode\ (30\ \mu s),\ ST:\ STANDARD\ mode\ (30\ \mu s),\ STAN$

2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.

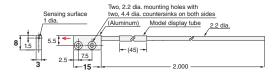
- 3. The sensing distances for Reflective Fiber Units are for white paper.
- 4. The sensing distances for E3NX-FA are values for E3NX-FA|| models. The distances for E3NX-FAH|| infrared models are different.
- 5. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Installation Information → 62 to 66 Page

Dimensions

Through-beam Fiber Units (Set of 2)

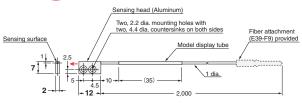
17-A E32-T15XR 2M (Free Cutting)



Note: 1. Set of two symmetrically shaped Fiber Units

2. Four, M2 \times 8 stainless steel countersunk mounting screws are provided.

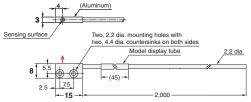
17-B E32-T25XR 2M (Free Cutting)



Set of two symmetrically shaped Fiber Units

2. Four, M2 × 8 stainless steel countersunk mounting screws are provided.

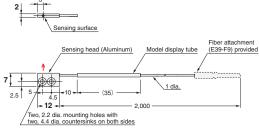
17-C E32-T15YR 2M (Free Cutting)



Note: 1. Set of two symmetrically shaped Fiber Units.

2. Four, M2 x 8 stainless steel countersunk mounting screws are provided.

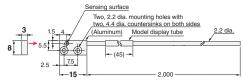
(17-D) E32-T25YR 2M (Free Cutting)



Note: 1. Set of two symmetrically shaped Fiber Units

2. Four, M2 × 8 stainless steel countersunk mounting screws are provided.

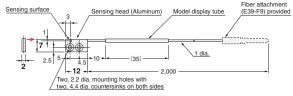
17-E E32-T15ZR 2M (Free Cutting)



Note: 1. Set of two symmetrically shaped Fiber Units

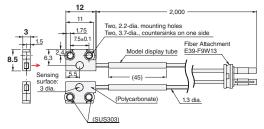
2. Four, M2 × 8 stainless steel countersunk mounting screws are provided.

17-F E32-T25ZR 2M (Free Cutting)



Note: 1. Set of two symmetrically shaped Fiber Units.
2. Four, M2 × 8 stainless steel countersunk mounting screws are provided.

17-G E32-LT35Z 2M (Free Cutting)



Note: 1. Set of two symmetrically shaped Fiber Units.

Four, M2 x 8 stainless-steel, pan-head mounting screws, four spring washers, four flat washers, and four nuts are provided.

Threaded

Hex-shaned Cylindrical

Flat

Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limited-

reflective Chemical-

resistant, Oil-resistant

Bending

Heatresistant

Detection

Liquid-level Vacuum

> FPD, Semi. Solar

Flat Models

Threaded

Flat

Sleeved

Small Spot

High Power Narrow view

BGS

Retroreflective Limitedreflective Chemical-Oil-resistant Bending

Saving Space

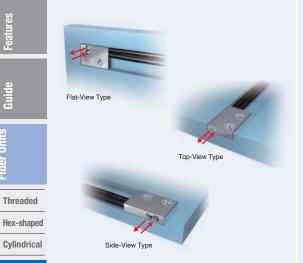
Heatresistant Detection

Liquid-level Vacuum

Solar

FPD,

Semi,



- •Thin profile for mounting in limited spaces.
- · Mounts directly without using special mounting brackets.

Specifications

Reflective Fiber Units

			Se	ensing	dis	stance (mm)			Optical axis		
Sensing direction	Appearance (mm)	Bending radius of cable	E3X-Z\	/		E3NX-	FA .	diameter (minimum sensing		Models	19 Page Dimensions No.
			■GIGA =HS	Other mo	des	■GIGA =HS	Other n	nodes	object)		
Top-view	15 3 I		240	ST : SHS:	350 100	1,260	ST: SHS:	520 100		E32-D15XR 2M	19-A
Top-view	12 2 1 8 IP67		140 40	ST : SHS:	60 16	210 60	ST:	90 16		E32-D25XR 2M	19-B
Side-view	3 I I I I I I I I I I I I I I I I I I I	Flexible, R1	200 52	ST: SHS:	100	300 78	ST: SHS:	150 24	(5 μm dia./	E32-D15YR 2M	19-C
Side-view	2 12 2 1 1P67		■ 40	ST: SHS:		60	ST: SHS:	20 4	2 μm dia.) ¹	E32-D25YR 2M	19-D
Flat-view	15 10 3		200 52	ST: SHS:	100 24	300 78	ST: SHS:	150 24		E32-D15ZR 2M	19-E
	12 - P1 8 IP67		■ 40	ST: SHS:		60	ST: SHS:	20 4		E32-D25ZR 2M	19-F

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs)

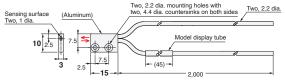
[E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

- 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- $\textbf{3.} \ \ \text{The sensing distances for Reflective Fiber Units are for white paper.}$
- $\textbf{4.} \ \text{The sensing distances for E3NX-FA} \ \text{are values for E3NX-FA} \ \text{models.} \ \text{The distances for E3NX-FAH} \ \text{infrared models are different.}$
- $\textbf{5.} \ \text{The E3X-HD Series offers the same sensing distance as the E3X-ZV}.$

Dimensions

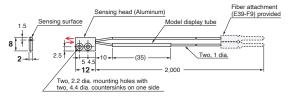
Installation Information → 62 to 66 Page **Reflective Fiber Units**

19-A E32-D15XR 2M (Free Cutting)



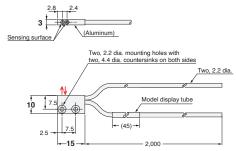
Note:Two, M2 \times 8 stainless steel countersunk mounting screws are provided.

19-B E32-D25XR 2M (Free Cutting)



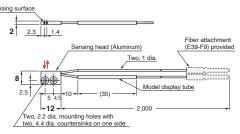
Note:Two, M2 x 8 stainless steel countersunk mounting screws are provided

19-C E32-D15YR 2M (Free Cutting)



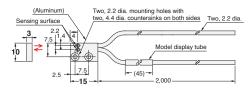
Note:Two, M2 x 8 stainless steel countersunk mounting screws are provided.

19-D E32-D25YR 2M (Free Cutting)



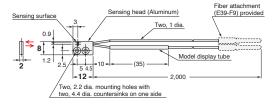
Note:Two, M2 \times 8 stainless steel countersunk mounting screws are provided.

19-E E32-D15ZR 2M (Free Cutting)



Note:Two, M2 × 8 stainless steel countersunk mounting screws are provided.

19-F E32-D25ZR 2M (Free Cutting)



Note:Two, M2 x 8 stainless steel countersunk mounting screws are provided.

Threaded

Hex-shaped Cylindrical

Flat

Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limited-

Chemicalresistant, Oil-resistant

reflective

Bending

Heatresistant

Detection

Liquid-level

Vacuum

FPD, Semi. Solar

Sleeve Models (Close-range Detection)

Through-beam → This Page

Reflective → 22 Page

Threaded Hex-shaped Cylindrical

Saving Space Flat

Sleeved

Small Spot High Power

Narrow view BGS

Retro-reflective Limited-

reflective Chemicalresistant, Oil-resistant

Bendina

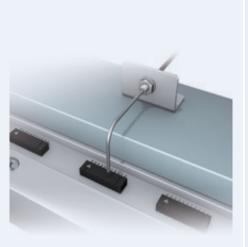
Heatresistant

Detection

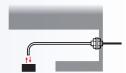
Liquid-level

Vacuum

FPD, Semi.



- Sleeve Fiber Units allow detection away from the point of installation for stable close-range detection of small objects.
- The shape of sleeve can be changed freely. (Refer to the sleeve bending specifications in the Appearance column of the specifications table.)



Specifications

■→■ Through-beam Fiber Units

			Se	nsing dis	stance (mm)		Optical axis		
Sensing direction	Appearance (mm)	Bending radius of cable	E3X-ZV		E3NX-F	Ά	diameter (minimum sensing	Models	21 Page Dimensions No.
			■GIGA =HS	Other modes	■GIGA =HS	Other modes			
	The sleeve cannot be bent. 20	Flexible,	170	ST : 100	250	ST : 150		E32-T24R 2M	21-A
Olds vis	IP67	R1	■ 50	SHS: 20	■ 75	SHS: 20	0.5 dia. (5 µm dia./	E32-124N ZM	
Side-view	The sleeve cannot be bent. 15 15 2.5 dia.		450	ST : 250	670	ST : 370	2 µm dia.)	E32-T24E 2M	21-B
	0.81 dia.		150	SHS: 60	220	SHS: 60		E32-124E 2M	21-8
	The sleeve cannot be bent.	R10	150	ST : 90	220	ST : 130	0.25 dia.		210
	15 () 0.5 dia. 3 dia.	HIU	5 0	SHS: 20	■ 75	SHS: 20	(5 μm dia./ 2 μm dia.)	E32-T33 1M	(21-C)
-	The sleeve cannot be bent.		510	ST : 300	760	ST : 450	0.5 dia.		
Top-view	15 0.82 dia. M3 IP67		170	SHS: 68	250	SHS: 68	(5 μm dia./ 2 μm dia.)	E32-T21-S1 2M	(21-D)
	Sleeve bending radius: 5 mm	Flexible,	2,000	ST : 1,000	3,000	ST : 1,500	1 dia.		
	11 1.2 dia. IP67	R1	700	SHS: 280	1,050	SHS: 280	(5 μm dia./ 2 μm dia.)	E32-TC200BR 2M	(21-E)

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 μs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 μs)

- 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values.
- The first value is for the E3X-ZV and the second value is for the E3NX-FA. 3. The sensing distances for E3NX-FA are values for E3NX-FA \square models. The distances for E3NX-FAH \square infrared models are different.
- 4. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

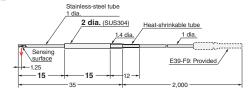
Dimensions

Installation Information → 62 to 66 Page

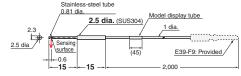


Through-beam Fiber Units (Set of 2)

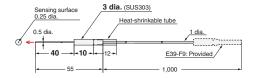
21-A E32-T24R 2M (Free Cutting)



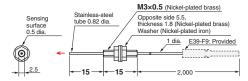
21-B E32-T24E 2M (Free Cutting)



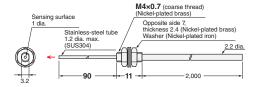
21-C E32-T33 1M (Free Cutting)



21-D E32-T21-S1 2M (Free Cutting)



21-E E32-TC200BR 2M (Free Cutting)



- Reference Information for Model Selection -



In case of bending sleeve

The E32-TC200BR has a bendable sleeve. Use the Sleeve Bender to bend them.

Sleeve Bender (sold separately)

Appearance	Applicable Fiber Units	Model
Uses for the bending of the sleeve.	E32-TC200BR	E39-F11

Fiber Senso

Selectio

er Units

Threaded Hex-shaped

Cylindrical

Flat Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limitedreflective

Chemicalresistant, Oil-resistant

Bending

Heatresistant

Area Detection

Liquid-level

FPD, Semi.

Solar Installation

Amplifiers, nunications and

chnical Coide and Ur

odel Index

Threaded

Hex-shaned Cylindrical

Saving Space Flat

Sleeved

Small Spot High Power

> Narrow view

Retro-reflective

BGS

Limitedreflective Chemicalresistant,

Oil-resistant Bendina

Heatresistant

Detection

Liquid-level

Vacuum

FPD, Semi. Solar



- Sleeve Fiber Units allow detection away from the point of installation for stable close-range detection of small objects.
- The shape of sleeve can be changed freely. (Refer to the sleeve bending specifications in the Appearance column of the specifications table.)



Specifications

Reflective Fiber Units

			Se	nsing dis	stance (mm)		Optical axis		
Sensing direction	Appearance (mm)	Bending radius of cable	E3X-Z	v	E3NX-I	-A	diameter (minimum sensing	Models	23 Page Dimension No.
		Of Cable	■GIGA =HS	Other modes	■GIGA =HS	Other modes			140.
0.1	The sleeve cannot be bent. 15 3 dia.	Flexible, R1	70	ST : 30 SHS: 8	30	ST : 45 SHS: 8		E32-D24R 2M	23-A
Side-view	Sleeve bending 15 radius: 65 4.8 dia. 2.1 dia.	R25	120	ST : 53 SHS: 14	67	ST : 79 SHS: 14		E32-D24-S2 2M	23-B
	The sleeve cannot be bent. 15 3 1.5 dia. 1.5 dia. IP67	R4	■ 28 ■ 8	ST : 12 SHS: 4	42 12	ST : 18 SHS: 4		E32-D43M 1M	23-C
	The sleeve cannot 15 be bent. 15 2 dia. 0.5 dia.	114	14	ST : 6 SHS: 2	■ 21 6	ST : 9 SHS: 2		E32-D331 2M	23-D
	The sleeve cannot 20 be bent. 15 3 dia.	R25	70	ST : 30 SHS: 8	100	ST : 45 SHS: 8		E32-D33 2M	23-E
	The sleeve cannot 5 15 3 dia. 0.82 dia. IP67 The sleeve 15	R4	63	ST : 27	94	ST : 40		E32-D32-S1 0.5M	23-F
Top-view	cannot be bent. 15 M3 0.82 dia.		18	SHS: 7	27	SHS: 7	. ,	E32-D31-S1 0.5M	23-G
	Sleeve bending 11 radius: 5 mm 40 M3 1.2 dia. IP67	Flexible, R1	40	ST : 60 SHS: 16	60	ST : 90 SHS: 16		E32-DC200F4R 2M	23-H
	The sleeve cannot be bent. 22 4 dia. 1.65 dia. IP67	R10	250	ST : 110	370	ST : 160		E32-D22-S1 2M	23-1
TT CC bb	Sleeve bending 16 radius: 67 M4 1.65 dia.	-	72	SHS: 30	100	SHS: 30		E32-D21-S3 2M	23-J
	The sleeve cannot be bent. 90 1 M6 2.5 dia.	Flexible, R1 240 SHS: 100 360 SHS: 100		E32-DC200BR 2M	23-K				
	Sleeve bending 15 10 radius: 10 mm 67 1.65 dia.	R10	250 \ 72	ST : 110 SHS: 30	370	ST : 160 SHS: 30		E32-D25-S3 2M	23-L

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 μs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 μs)

[E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 μs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 μs)

2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA. 3. The sensing distances for Reflective Fiber Units are for white paper.

4. The sensing distances for E3NX-FA are values for E3NX-FA @ models. The distances for E3NX-FAH@ infrared models are different.

- 5. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Installation Information → 62 to 66 Page

er Sensor

election

iber Units

Threaded
Hex-shaped
Cylindrical

Flat Sleeved

Small Spot

High Power

Narrow view

BGS Retro-

Limitedreflective

Chemicalresistant, Oil-resistant

> Bending Heatresistant

Area Detection

Liquid-level

FPD, Semi, Solar

> Installation Information

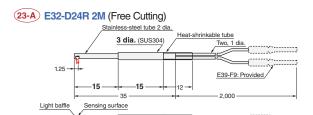
iber Amplitiers, ommunications nit, and

> ide and ecautions

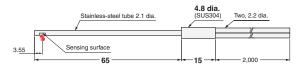
Model Index

Dimensions

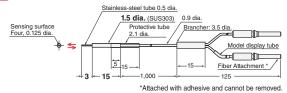
Reflective Fiber Units



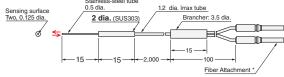
23-B E32-D24-S2 2M (Free Cutting)



23-C E32-D43M 1M (No Cutting)

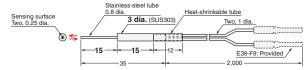


23-D E32-D331 2M (No Cutting)

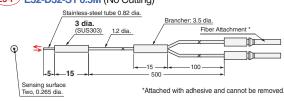


*Attached with adhesive and cannot be removed.

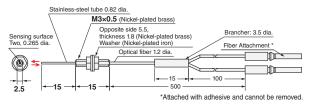
23-E E32-D33 2M (Free Cutting)



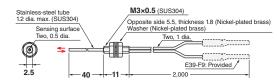
23-F E32-D32-S1 0.5M (No Cutting)



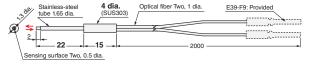
23-G E32-D31-S1 0.5M (No Cutting)



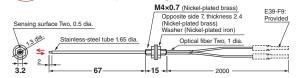
23-H E32-DC200F4R 2M (Free Cutting)



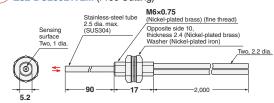
23-I E32-D22-S1 2M (Free Cutting)



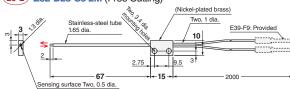
23-J E32-D21-S3 2M (Free Cutting)



23-K E32-DC200BR 2M (Free Cutting)



23-L E32-D25-S3 2M (Free Cutting)



- Reference Information for Model Selection -



In case of bending sleeve

The E32-DC200F4R, E32-D21-S3 and E32-D25-S3 have bendable sleeves. Use the Sleeve Bender to bend them.

Sleeve Bender (sold separately)

Appearance	Applicable Fiber Units	Model
Uses for the bending of the sleeve.	E32-DC200F4R E32-D21-S3 E32-D25-S3	E39-F11

Small-Spot, Reflective (Minute Object Detection)

Small-spot Lens Unit → 26 Page

Threaded Hex-shaned

Cylindrical

Flat

Small Spot

High Power

Sleeved

Narrow view

BGS

Retro-reflective Limited-

> Chemicalresistant, Oil-resistant

> > Bendina

reflective

Heatresistant

Detection

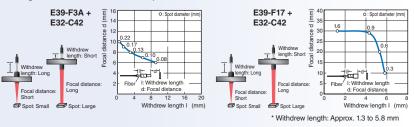
Liquid-level

Vacuum FPD, Semi. Solar

• Small-spot is ideal for detecting minute objects. Select the Fiber Unit that is best suited for the workpiece size and installation

(Refer to Reference Information for Model Selection)

· Available with a variable-spot Lens Unit to change the spot diameter without replacing the fiber. The spot diameter can be adjusted according to the size of the workpiece by changing the withdrew length and sensing distance. Refer to the following graph, which shows the relation between the withdrew length, focal distance, and spot diameter.



Specifications

Reflective Fiber Units

Variable-spot types

Lens Units + Fiber Unit

	Cmat	Center	Lens Units	Lens Units + Fiber Units	Fiber	r Unit	25 Page	
Туре	Spot diameter	distance (mm)	Models	Appearance (mm)	Bending radius of cable	Model	Dimensions No.	
Variable anet	0.1 to 0.6 dia.	6 to 15	E39-F3A	23 2 dia. 6 dia.	Panding	E22 C42 1M	25-A	
variable spot	0.3 to 1.6 dia. 1	10 to 30	E39-F17	22.2 2 dia. 6 dia.	nzy	E32-042 IM	25-B	

Parallel-light-spot types

Lens Units + Fiber Unit

	Spot	Center	Lens Units	Lens Units + Fiber Units	Fiber	Unit	25 Page Dimensions
Туре	diameter	distance (mm)	Model	Appearance (mm)	Bending radius of cable		
Darallal light	4 dia.	0 to 20		10.9 M3 5 dia.	R25	E32-C31 2M	25-C
Parallel light	4 uia.	01020	E39-F3C	10.9 5 dia. M3	Flexible, R2	E32-C21N 2M	25-D

Small-spot types

Integrated Lens

Туре	Spot diameter	Center distance (mm)	Appearance (mm)	Bending radius of cable	Models	25 Page Dimensions No.	
Short-distance, Small-spot	0.1 dia.	5	Lens: unnecessary		E32-C42S 1M	25-E	
Long-distance, Small-spot	6 dia.	50	Lens: unnecessary 25.6 [IP50	H25	E32-L15 2M	25-F	

^{*} The spot diameter and the center distance are the same when using with E3X-ZV series or E3NX-FAL series. The distance for E3NX-FAH infrared models varies.

Installation Information → 62 to 66 Page

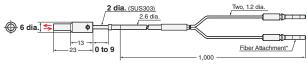
Cylindrical

reflective

Dimensions

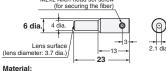
Reflective Fiber Units





Note: There is a white tube on the emitter fiber

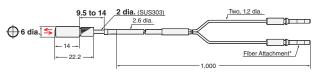
E39-F3A



Aluminum for body and optical glass for lens.

Note: This is the Lens Unit for the E32-C42

25-B E32-C42 1M (No Cutting) + E39-F17



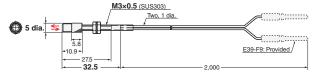
* Attached with adhesive and cannot be removed. Note: There is a white tube on the emitter fiber.

E39-F17



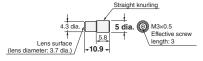
Material: optical glass for lens

25-C E32-C31 2M (Free Cutting) + E39-F3C



Note: There is a white line on the emitter fiber.

E39-F3C

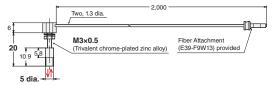


Material:

Aluminum for body and optical glass for lens.

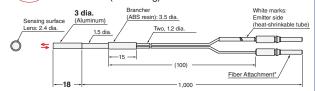
Note: This is the Lens Unit for the E32-C31 and E32-C31N.

25-D E32-C21N 2M (Free Cutting) + E39-F3C



Note: There is a white line on the emitter fiber.

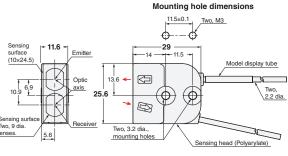
25-E **E32-C42S 1M** (No Cutting)



Models

* Attached with adhesive and cannot be removed. Note: There is a white tube on the emitter fiber.

25-F E32-L15 2M (Free Cutting)



Note: There is a white tube on the emitter fiber.

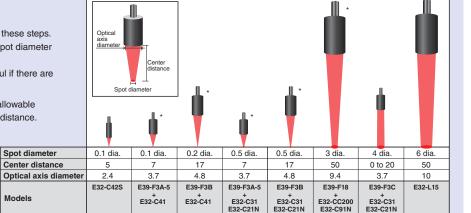
(Unit: mm)

- Reference Information for Model Selection -

Model Selection Tips

Select the best model by following these steps.

- 1. Select the model based on the spot diameter suitable for the workpiece size.
 - * The Variable-spot Type is useful if there are
- 2. Select the model based on the allowable



E32-C21N

E32-C21N

<Map of Spot Diameters and Center Distances:

* Refer to page 26 for details.

E32-C21N

- different sensing object sizes.
- installation distance and center distance.

(Refer to Reference Information for Model Selection)

Threaded Hex-shaped

Cylindrical

Sleeved

Flat

Small Spot High Power

Beam Improvements Narrow view BGS

Retro-reflective Limited-

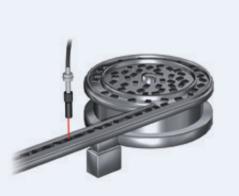
Chemicalresistant, Oil-resistant Bending

> Heatresistant

Detection

Liquid-level

Vacuum FPD, Semi.



• Small-spot is ideal for detecting minute objects. Select the Fiber Unit that is best suited for the workpiece size and installation

Specifications

Reflective Fiber Units

Small-spot Models

Lens Units + Fiber Units

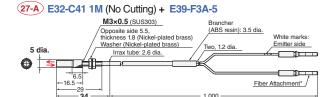
	Spot	Center	Lens Units	Lens Units + Fiber Units	Fiber	Units	27 Page
Туре	diameter	distance (mm)	Models	Appearance(mm)	Bending radius of cable	Models	Dimensions No.
	0.1 dia.			16.5 M3 5 dia.	## Rending radius of cable Models	E32-C41 1M	27-A
Short- distance, small-spot	0.5 dia.	7	E39-F3A-5	M3	1 H25	E32-C31 2M	27-B
	0.5 dia.			5 dia. M3 Flexible, R2 25.2 M3 Flexible, R2 E32-0 E32-0 E32-0 E32-0 E32-0 E32-0 E32-0 E32-0 E32-0 E32-0	E32-C21N 2M	27-C	
	0.2 dia.			M3		E32-C41 1M	27-D
Medium- distance, small-spot	0.2 dia.	E39-F3B	мз	1 H25	E32-C31 2M	27-E	
	U.S GIA.				Flexible, R2	E32-C21N 2M	27-F
Long- distance,	tance, 3 dia 50 E30 E18	F20 F40	30 M6 10 dia.	R25	E32-CC200 2M	27-G	
small-spot		50	E39-F18	30 M6 10 dia.	Flexible, R4	E32-C91N 2M	27-H

^{*} The spot diameter and the center distance are the same when using with E3X-ZV series or E3NX-FA \square series. The distance for E3NX-FAH \square infrared models varies.

Installation Information → 62 to 66 Page

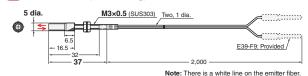
Dimensions

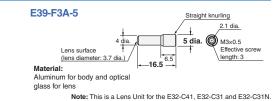
Reflective Fiber Units



* Attached with adhesive and cannot be removed. Note: There is a white tube on the emitter fiber.

27-B E32-C31 2M (Free Cutting) + E39-F3A-5





27-C E32-C21N 2M (Free Cutting) + E39-F3A-5



- 24.1 -

Note: This is a Lens Unit for the E32-C41, E32-C31 and E32-C31N.

(

(E39-F9W13) provided

Note: There is a white line on the emitter fiber

5.5

Note: This is a Lens Unit for the E32-C91N and E32-CC200.

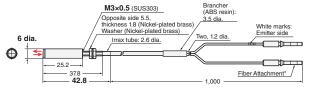
M3×0.5

Depth: 4.4

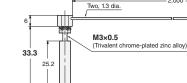
-007

 $(\bigcirc$





* Attached with adhesive and cannot be removed. Note: There is a white tube on the emitter fiber.



Aluminum for body and optical glass for lens

6 dia

E39-F18

Material:

27-F E32-C21N 2M (Free Cutting) + E39-F3B

10 dia

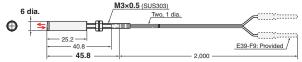
E39-F3B

Material:

glass for lens

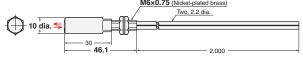
6 dia.

27-E E32-C31 2M (Free Cutting) + E39-F3B



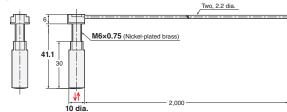
Note: There is a white line on the emitter fiber

27-G E32-CC200 2M (Free Cutting) + E39-F18



Note: There is a white line on the emitter fiber.

(27-H) E32-C91N 2M (Free Cutting) + E39-F18



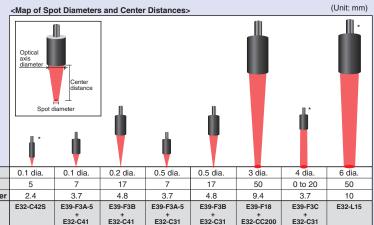
Note: There is a white line on the emitter fiber.

- Reference Information for Model Selection -

Model Selection Tips

Select the best model by following these steps.

- 1. Select the model based on the spot diameter suitable for the workpiece size.
 - * The Variable-spot Type is useful if there are different sensing object sizes.
- 2. Select the model based on the allowable installation distance and center distance.



	V							
Spot diameter	0.1 dia.	0.1 dia.	0.2 dia.	0.5 dia.	0.5 dia.	3 dia.	4 dia.	6 dia.
Center distance 5 7 17		7	17	50	0 to 20	50		
Optical axis diameter	2.4	3.7	4.8	3.7	4.8	4.8 9.4		10
Models	E32-C42S	E39-F3A-5 + E32-C41	E39-F3B + E32-C41	E39-F3A-5 + E32-C31 E32-C21N	E39-F3B + E32-C31 E32-C21N	E39-F18 + E32-CC200 E32-C91N	E39-F3C + E32-C31 E32-C21N	E32-L15

* Refer to page 24 for details.



Hex-shaned Cylindrical

> Flat Sleeved

Small Spot

High Power

view

Limited-

Chemicalresistant, Oil-resistant

Bendina

resistant

Liquid-level

FPD.

High-power Beam (Long-distance Installation, Dust-resistant) **Fiber only** → This Page

Lens (to 70° C) \rightarrow 30 Page

Threaded Hex-shaned Cylindrical

Flat

Sleeved

Narrow view

BGS

reflective Limitedreflective Chemical-Oil-resistant Bendina

Small Spot Beam Improvements **High Power**

resistant Detection

Heat-

Liquid-level Vacuum

FPD, Semi.



- Maximum sensing distance without attaching a Lens: 20 m (E32-T17L) Suitable for detection of large objects and for use in large-scale installations.
- Powerful enough to resist the influences of dust and dirt. (Refer to the comparisons of incident level on the Reference Information for Model Selection.)
- In addition to the products listed on this page, Lenses are available to extend the sensing distance. (\rightarrow 30 to 33 pages)

Specifications

Through-beam Fiber Units

			B	S	ensing dis	stance (mm)		Optical axis		00 D
Sensing direction	Aperture angle	Appearance (mm)	Bending radius of cable	E3X-ZV		E3NX-F	A	diameter (minimum sensing	Models	29 Page Dimensions No.
			or ouble	■GIGA=HS	Other modes	■GIGA=HS	Other modes	object)		110.
Right-	15°	14.4	Flexible,	4,000 *1	ST : 3,500	4,000 *1	ST : 4,000	2.3 dia. (0.1 dia./	E32-LT11N 2M	29-A
angle		M4 Build-in Lens	R2	2,300	SHS: 920	3,450	SHS: 920	0.03 dia.)		
		42		20,000 *2	*2 ST : 20,000	20,000 *2	*2 ST : 20,000			
10°	M14 IP67		20,000 *2	SHS: 8,000	20,000 *2	SHS: 8,000	10 dia.	E32-T17L 10M	29-B	
			R25	4,000 *1	*1 ST : 4,000	4,000 *1	*1 ST : 4,000			
Top-view		15		2,700	SHS: 1,080	4,000 *1	SHS: 1,080	2.3 dia.	E32-LT11 2M	
	15°	M4	Flexible,	4,000 *1	ST : 3,500	4,000 *1	*1 ST : 4,000	(0.1 dia./ 0.03 dia.)		29-C
		Build-in Lens IP50	R1	2,300	SHS: 920	3,450	SHS: 920		E32-LT11R 2M	
		10.5		4,000 *1	*1 ST : 4,000	4,000 *1	*1 ST : 4,000	4 dia.		
Side-view	30°	36.4 R25	4,000 *1	SHS: 1,800	4,000 *1	SHS: 1,800	(0.1 dia./ 0.03 dia.)	E32-T14 2M	29-D	

- The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm.

*2 The optical fiber is 10 m long on each side, so the sensing distance is 20,000 mm.

Note1. The sensing distances for the E3NX-FA are values for E3NX-FA□ devices. The distance for E3NX-FAH□ infrared models varies

2. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Reflective Fiber Units

				S	ensing dis	tance (mm)		Optical axis		
	Aperture angle	Appearance (mm)	ppearance (mm) Bending radius of cable		E3X-ZV		A	diameter (minimum sensing	Model	29 Page Dimensions No.
			or cable	■GIGA=HS	Other modes	■GIGA=HS	Other modes	object)		
Top-view	4°	9 17.5	Bendresistant, R4		ST : 40 to 1,400 SHS: 40 to 480	40 to 4,200 40 to 1,350	ST : 40 to 2,100 SHS: 40 to 720	_	E32-D16 2M	29-E

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs)

[E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs) 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values.

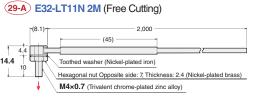
- The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- 3. The sensing distances for Reflective Fiber Units are for white paper 4. The sensing distances for the E3NX-FA are values for E3NX-FA devices. The distance for E3NX-FAH infrared models varies.
- 5. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Dimensions

Installation Information → 62 to 66 Page

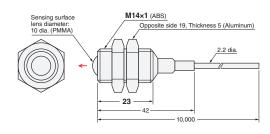
Beam Improvements

Through-beam Fiber Units (Set of 2)

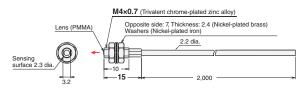




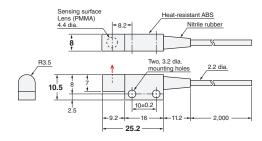
29-B E32-T17L 10M (Free Cutting)



29-C E32-LT11 2M (Free Cutting) E32-LT11R 2M (Free Cutting)



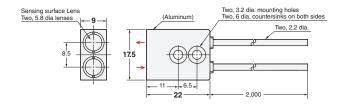
29-D E32-T14 2M (Free Cutting)



Installation Information → 62 to 66 Page

Reflective Fiber Units

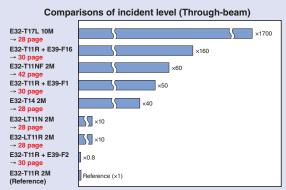
29-E E32-D16 2M (Free Cutting)

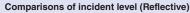


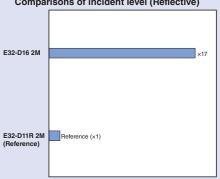
- Reference Information for Model Selection -

Comparisons of incident level

Select the model based on the comparisons of incident level against Standard Fiber Units.







Threaded Hex-shaped

Cylindrical

Flat

Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limited-

reflective Chemical-

resistant, Oil-resistant Bending

> Heatresistant

Detection

Liquid-level

Vacuum FPD, Semi.

Solar

Threaded Hex-shaned Cylindrical

Flat

Sleeved

Small Spot Beam Improvements **High Power**

Narrow view BGS

Retroreflective Limited-

reflective resistant, Oil-resistant

> Bendina Heatresistant

Detection

Liquid-level

Vacuum FPD, Semi

Specifications

■→■ Through-beam Fiber Units

	Lens Units	Туре	High-pow	ver (incid	ent level: 5	0 times)	Ultra-high-	power (inc	ident level:	160 times)	Side-Vie	w (incide	nt level: 0.	8 times)	
		Models		E39	9-F1			E39-I	F16			E39	-F2		
		Appearance	•			30-A	•			30-B		N. C.		30-C	
		Aperture angle		Appro	ox. 12°			Appr	ox. 6°			Appr	ox. 60°		
Fiber Units		Optical axis diameter (minimum sensing object)	4 dia. (0.1 dia.)					7.2 dia.				3 dia. (0.1 dia.)			
						Sensing distance (mm)									
Models	Ap	Appearance (mm)		zv	E3N		E3X-ZV		E3NX-FA		E3X		E3NX-FA		
			■GIGA=HS	Other modes	■GIGA =HS	Other modes	■GIGA=HS	Other modes	■GIGA=HS	Other modes	■GIGA=HS	Other modes	■GIGA=HS	Other modes	
E32-T11N 2M	14	7 M4		SHS: 2,000		* ST : 4,000 SHS: 2,000		ST: 4,000 SHS: 3,600		ST : 4,000 SHS: 3,600	_	_	_	_	
E32-T11R 2M	14	M4		* ST :4,000 SHS:2,000		ST : 4,000 SHS: 2,000		ST: 4,000 SHS: 3,600	4,000*	ST : 4,000 SHS: 3,600		ST : 800 SHS: 200	2,170 750	ST : 1,200 SHS: 200	
E32-T11 2M	14	M4		ST :4,000 SHS:1,860	4.000*	ST : 4,000 SHS: 1,860	4.000*	ST : 4,000 * SHS: 4,000	4,000*	ST : 4,000 * SHS: 4,000		ST : 1.320 SHS: 320		ST : 1,98	

 $^{^{\}star}\,$ The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm.

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

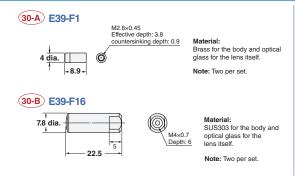
[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

- 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- 3. The sensing distances for the E3NX-FA are values for E3NX-FA \square devices. The distance for E3NX-FAH \square infrared models varies.
- 4. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Dimensions

Installation Information → 62 to 66 Page

Lens Units (Set of 2)





Brass for the body and optical glass for the lens itself.

Note: Two per set.

Beam Improvements

Installation Information → 62 to 66 Page

Threaded Hex-shaped Cylindrical

> Flat Sleeved

Small Spot High Power

> Narrow view

> > BGS

Retroreflective Limitedreflective

Chemicalresistant, Oil-resistant

> Bending Heatresistant

Detection

Liquid-level

Vacuum FPD, Semi.

Solar

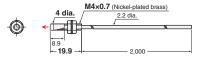
Dimensions

Through-beam Fiber Units (Set of 2)

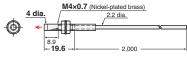
31-A E32-T11N 2M (Free Cutting) + E39-F1



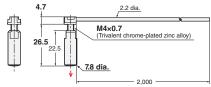
31-B E32-T11R 2M (Free Cutting) + E39-F1



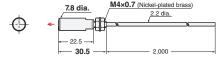
31-C E32-T11 2M (Free Cutting) + E39-F1



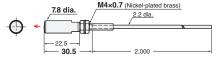
31-D E32-T11N 2M (Free Cutting) + E39-F16



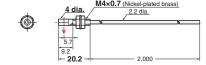
31-E E32-T11R 2M (Free Cutting) + E39-F16



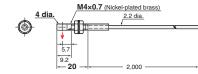
31-F E32-T11 2M (Free Cutting) + E39-F16



31-G E32-T11R 2M (Free Cutting) + E39-F2



31-H E32-T11 2M (Free Cutting) + E39-F2

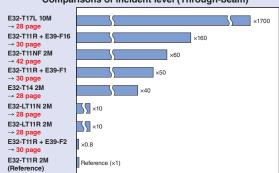


- Reference Information for Model Selection -

Comparisons of incident level

Select the model based on the comparisons of incident level against Standard Fiber Units.

Comparisons of incident level (Through-beam)



Threaded Hex-shaned Cylindrical

Flat

Sleeved

Small Spot Beam Improvements **High Power**

Narrow view BGS

Retroreflective Limited-

Chemicalresistant. Oil-resistant Bendina

reflective

Heatresistant

Detection

Liquid-level

Vacuum FPD. Semi. Solar

Specifications

Through-beam Fiber Units (Heat-resistant)

	<u> </u>														
Lens Units Type			High-pov	High-power (incident level: 50 times)				Ultra-high-power (incident level: 160 times)				Side-View (incident level: 0.8 times)			
Models				E39-F1			E39-F16				E39-F2				
Appearan		Appearance				32-A	6			32-B				32-C	
	Aperture angle			Appro	ox. 12°		Approx. 6°				Approx. 60°				
Optical axis diameter (minimum sensing object)			4 dia. (0.1 dia.)			7.2 dia.				3 dia. (0.1 dia.)					
							Sensing distance (mm)								
Models	Appearance (mm)		E3X-ZV		E3NX-FA		E3X-ZV		E3NX-FA		E3X-ZV		E3NX-FA		
			■GIGA=HS	Other modes	■GIGA =HS	Other modes	■GIGA =HS	Other modes	■GIGA =HS	Other modes	■GIGA =HS	Other modes	■GIGA=HS	Other	
	Heat-resistant up to	o 100°C	4,000*	ST : 4,000	4,000*	ST : 4,000	4,000*	ST : 4,000	4,000*	ST :4,000	1.400	ST : 720	2,100	ST : 1,080	
E32-T51R 2M		14 M4	3,900	SHS: 1,500	4,000*	SHS: 1,500	4,000*	SHS: 4,000		SHS: 4,000		SHS: 200	750	SHS: 200	
	Heat-resistant up to	200°C	4,000*	ST : 4,000	4,000*	ST : 4,000	4,000*	ST :4,000	4,000*	ST :4,000	1,000	ST : 550	1,500	ST : 820	
E32-T81R-S 2M		M4	2,700	SHS: 1,000	4,000*	SHS: 1,000	4,000*	SHS: 1,800	4,000*	SHS: 1,800	∥360	SHS: 140	■ 540	SHS: 140	
E32-T61-S 2M	Heat-resistant up to 3 (200°C) (See Note 3)	350°C		ST : 4,000		ST : 4,000		ST :4,000		ST :4,000	1,680	ST : 900	2,520	ST : 1,350	
		M4	4,000*	SHS: 1,800	4,000*	SHS: 1,800	4,000*	SHS: 3,100	4,000*	SHS: 3,100	■ 600	SHS: 240	900	SHS: 240	

 $^{^{\}star}\,$ The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm.

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.

3. The ambient temperature of E32-T61-S must be between -40 to 200°C when using it with E39-F1 or E39-F2 Lens Unit. The ambient temperature of E32-T61-S must be between –40 to 350°C when using it with E39-F16 Lens Unit.

4. The sensing distances for the E3NX-FA are values for E3NX-FA□ devices. The distance for E3NX-FAH□ infrared models varies.

5. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

	Lens Units	Туре	High-pov	ver (incid	ent level: 5	0 times)	Ultra-high-	power (inc	ident level: 1	160 times)
		Models		E39-I	F1-33		E39-F16			
		Appearance				32-D	•			32-B
		Aperture angle		Appro	ox. 12°		Approx. 6°			
Fiber Units		Optical axis diameter (minimum sensing object)	4 dia. (0.1 dia.)				7.2 dia.			
		Sensing distance (mm)								
Models	App	pearance (mm)	E3X-ZV		E3NX-FA		E3X-ZV		E3NX-FA	
			■GIGA=HS	Other modes	■GIGA=HS	Other modes	■GIGA=HS	Other modes	■GIGA=HS	Other modes
	Heat-resistant up to			ST : 4,000	4,000*	ST : 4,000	4,000*	ST :4,000	4,000*	ST : 4,000
E32-T51 2M	17 M4		2,300	SHS: 1,400	3,450	SHS: 1,400	4,000*	SHS: 4,000	4,000*	SHS: 4,000*

^{*} The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm.

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

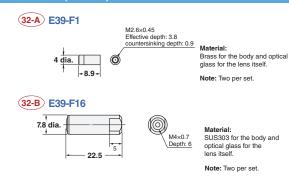
[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 μs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 μs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

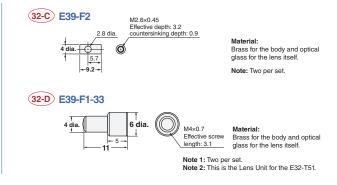
2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA. 3.The sensing distances for the E3NX-FA are values for E3NX-FA devices. The distance for E3NX-FAH infrared models varies. 4. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Dimensions

Installation Information → 62 to 66 Page

Lens Units (Set of 2)





Dimensions

Installation Information → 62 to 66 Page

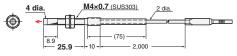
Beam Improvements



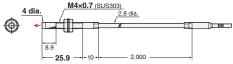
Through-beam Fiber Units (Set of 2)

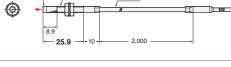




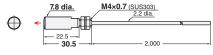


33-C E32-T61-S 2M (No Cutting) + E39-F1

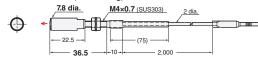




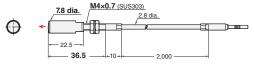
33-D E32-T51R 2M (Free Cutting) + E39-F16



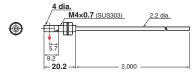
33-E E32-T81R-S 2M (No Cutting) + E39-F16



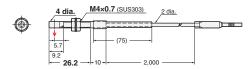
33-F E32-T61-S 2M (No Cutting) + E39-F16



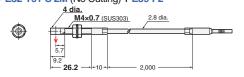
33-G E32-T51R 2M (Free Cutting) + E39-F2



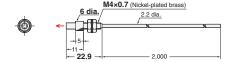
33-H E32-T81R-S 2M (No Cutting) + E39-F2



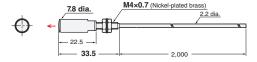
33-I E32-T61-S 2M (No Cutting) + E39-F2



33-J E32-T51 2M (Free Cutting) + E39-F1-33



33-K E32-T51 2M (Free Cutting) + E39-F16

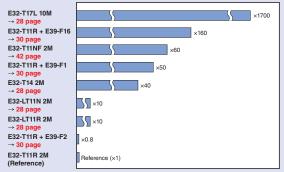


Reference Information for Model Selection -

Comparisons of incident level

Select the model based on the comparisons of incident level against Standard Fiber Units.

Comparisons of incident level (Through-beam)



Threaded Hex-shaped

Cylindrical

Flat Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limitedreflective

Chemicalresistant, Oil-resistant

> Bending Heatresistant

Detection

Liquid-level

Vacuum FPD, Semi.

Solar

Narrow View (Detection Across clearance

Threaded Hex-shaped Cylindrical

Flat

Sleeved

Small Spot High Power

Narrow view

Retro-reflective Limited-

Chemicalresistant, Oil-resistant Bendina

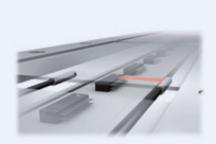
Heatresistant

Liquid-level

Detection

Vacuum

FPD, Semi.



• The fine beam prevents false detection of light that is reflected off surrounding objects.



Specifications

Through-beam Fiber Units

Sensing direction			Bending radius of cable	Se	ensing dis	tance (mm)	Optical axis diameter		05 Daw	
	Aperture angle	Appearance (mm)		E3X-Z	v	E3NX-I	FA	(minimum sensing	Models	35 Page Dimensions No.
				■GIGA=HS	Other modes	■GIGA=HS	Other modes	object)		
Side-view	1.5°	Thickness: 3 mm IP50	Flexible, R1	3,220	ST : 1,780	4,000*	ST : 2,670 SHS: 500	2 dia. (0.1 dia./ 0.03 dia.)	E32-A03 2M	35-A
	1.5	24.5 NO I3		1,200	SHS: 500	1,800			E32-A03-1 2M	35-B
	3.4°	20.5 Thickness: 2 mm IP50		1,280 450	ST : 680 SHS: 200	1,920	ST : 1,020 SHS: 200	1.2 dia. (0.1 dia./ 0.03 dia.)	E32-A04 2M	35-C
	4 °	3.5 dia.	Flexible, R1	1,460	ST : 2,200 SHS: 580	4,000* 2,190	ST : 3,300 SHS: 580	2 dia. - (0.1 dia./	E32-T24SR 2M	35-D
			D40	1,740	ST : 2,600 SHS: 700	4,000* 2,610	ST : 3,900 SHS: 700	0.03 dia.)	E32-T24\$ 2M	35-E
Top-view		15 3 dia. [P50	R10	2,500	ST : 3,800 SHS: 1,000	4,000* 3,750	ST : 4,000 SHS: 1,000	1.7 dia. (0.1 dia./ 0.03 dia.)	E32-T22\$ 2M	35-F

^{*} The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm.

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs)

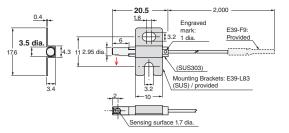
- 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- 3. The sensing distances for the E3NX-FA are values for E3NX-FA□ devices. The distance for E3NX-FA□ infrared models varies.
- 4. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Dimensions

Installation Information → 62 to 66 Page

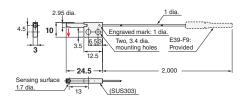
Through-beam Fiber Units (Set of 2)

35-A E32-A03 2M (Free Cutting)



Note: Use the engraved surface and its opposing surface as installation (reference) surfaces

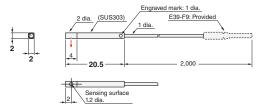
35-B E32-A03-1 2M (Free Cutting)



Note 1: Use the engraved surface and its opposing surface as installation (reference) surfaces.

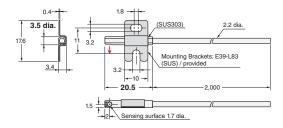
Note 2: Set of two symmetrically shaped Fiber Units.

35-C E32-A04 2M (Free Cutting)

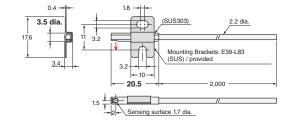


Note: Use the engraved surface and its opposing surface as installation (reference) surfaces.

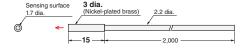
35-D E32-T24SR 2M (Free Cutting)



35-E E32-T24S 2M (Free Cutting)



35-F E32-T22S 2M (Free Cutting)

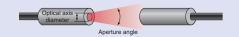


Reference Information for Model Selection -

influenced by surrounding objects.

Aperture angle and Optical Axis Diameter

The Aperture angle is the output angle of the emitted beam, and the optical axis diameter is the core diameter of the emitter fiber. A fiber with a narrow view has a larger optical axis diameter than standard fibers, but the aperture angle is smaller so it is not



Threaded Hex-shaped

Cylindrical

Flat

Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limited-

reflective Chemicalresistant, Oil-resistant

Bending

Heatresistant

Detection

Liquid-level

Vacuum FPD, Semi.

Solar

Detection without Background Interference

Threaded Hex-shaned

Cylindrical

Flat

Sleeved

Small Spot Beam Improvements High Power Narrow

view

BGS

reflective

Limitedreflective Chemical-Oil-resistant

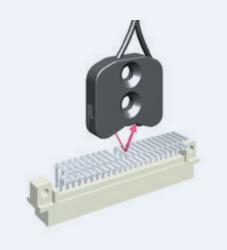
Bendina Heatresistant

Detection

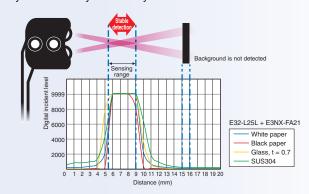
Liquid-level

Vacuum

FPD, Semi.



• These Fiber Units detect only objects in the sensing range. Objects in the background that are located beyond a certain point are not detected. They are not easily affected by the material or color of the sensing object.



Specifications

Limited-reflective Fiber Units

		Bending radius of cable	Se	ensing dis	stance (mm)		Standard			
Sensing direction	Appearance (mm)		E3X-ZV		E3NX-	FA	sensing object (minimum sensing	Models	37 Page Dimensions No.	
			■GIGA =HS	Other modes	■ GIGA=HS	Other modes	object)		113.	
Flat-view	20.5 3.8	R25	0 to 15 0 to 15	ST : 0 to 15	0 to 15 0 to 15	ST : 0 to 15	Soda glass with reflection factor of 7%	E32-L16-N 2M	37-A	
	2.5 14 2.5 11 IP50	D40	0 to 4	ST : 0 to 4 SHS: 0 to 4		ST : 0 to 4 SHS: 0 to 4	(5 µm dia./	E32-L24S 2M	37-B	
Side-view	4 18 1950	H10	5.4 to 9 5.4 to 9 (Center 7.2)	ST : 5.4 to 9 SHS: 5.4 to 9 (Center 7.2)	5.4 to 9 5.4 to 9 (Center 7.2)	ST : 5.4 to 9 SHS: 5.4 to 9 (Center 7.2)	2 μm dia.)	E32-L25L 2M	37-C	

- Note 1. If operation is affected by the background, perform power tuning or use the ECO Mode to decrease the incident light level.
 - 2. The following mode names and response times apply to the modes given in the Sensing distance column. [E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)
 - 3. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
 - 4. The sensing distances for Reflective Fiber Units are for white paper.
 - 5. The sensing distances for the E3NX-FA are values for E3NX-FA devices. The distance for E3NX-FAH infrared models varies.
 - 6. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

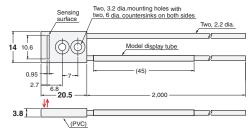
Dimensions

Installation Information → 62 to 66 Page

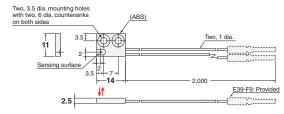


Limited-reflective Fiber Units

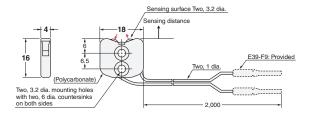
37-A E32-L16-N 2M (Free Cutting)



37-B E32-L24S 2M (Free Cutting)



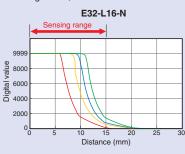
37-C E32-L25L 2M (Free Cutting)

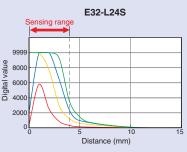


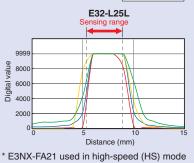
- Reference Information for Model Selection -

Sensing Distance vs. Digital Value

The following graphs show how the digital value is high within the sensing range and small outside. This explains why false detection does not occur outside the sensing range, even against common metal backgrounds, such as stainless steel.







-White paper -Black paper -Glass, t = 0.7

SUS304

Threaded Hex-shaped

Cylindrical

Flat Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limitedreflective

Chemicalresistant, Oil-resistant

> Bending Heat-

resistant Detection

Liquid-level

Vacuum FPD, Semi.

Solar

Retro-reflective

Retro-reflective \rightarrow This page **Limited-reflective** \rightarrow 40 page

iber Senso eatures

selection Buide

Fiber Units

Threaded

Hex-shape

Cylindrical

Sleeved Sleeved

Small Spot

Narrow view BGS

Retroreflective

> Chemicalresistant, Oil-resistant

reflective

Bending

Heatresistant

Area Detection

Liquid-level

Vacuum

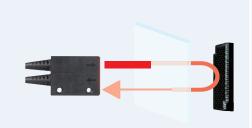
FPD, Semi, Solar

Information

iber Amplitiers, Ommunications Init, and Iccessories

> Fechnical Guide and Precautions

> > Model Index

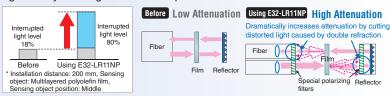


Retro-reflective Fiber Units are ideal for detecting transparent objects.
 The light beam passes through the object twice, this model interrupts light more than Through-beam model.



 Excellent detection performance with transparent films. (E32-LR11NP + E39-RP1)

The specially designed filter eliminates undesirable light, which allows significantly more light to be interrupted for stable detection of films.



Specifications

Retro-reflective Fiber Units (With M.S.R. Function)

Ту	/pe		Bending		Sensing dis	stance (mm)		Optical axis diameter		00 D
Features Size	Appearance (mm)	radius of cable	E3X-	E3X-ZV		E3NX-FA		Models	39 Page Dimensions No.	
				■GIGA=HS	Other modes	■GIGA=HS	Other modes	object)		
Film detection *	М6	15.8 8.5 44 80 Balleto Lens IP50	Flexible, R2	1,350	ST : 1,200 SHS: 550	2,020	ST : 1,800 SHS: 550	_	E32-LR11NP 2M + E39-RP1	39-A
Square	-	42 21.5 10 IP66	R25	150 to 1,500 150 to 1,500	ST : 150 to 1,500 SHS: 150 to 1,500	150 to 1,500 150 to 1,500	ST : 150 to 1,500 SHS: 150 to 1,500	(0.2 dia./ 0.07 dia.)	E32-R16 2M	39-B
Threaded Models	M6	22.5 38 M6 IP67	R10	10 to 250 10 to 250	ST : 10 to 250 SHS: 10 to 250	10 to 370 10 to 370	ST : 10 to 370 SHS: 10 to 250	(0.1 dia./ 0.03 dia.)	E32-R21 2M	39-C

^{*} This effect may not be as strong for some films. Check suitability beforehand.

Note 1. Objects with a high reflection factor may cause the Fiber Sensor to detect reflected light as incident light. Also, stable detection may not be possible for transparent objects. Check suitability beforehand.

- 2. The following mode names and response times apply to the modes given in the Sensing distance column.

 [E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs)

 [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)
- [ESNA-FA] click: cliga-power mode (to ms), no: high-speed mode (20 µs), or: standard mode (1 ms), and shots: super-high-speed mode (30 µs)

 3. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values.

 The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- 4. The sensing distances for the E3NX-FA are values for E3NX-FA□ devices. The distance for E3NX-FAH□ infrared models varies.
- 5. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

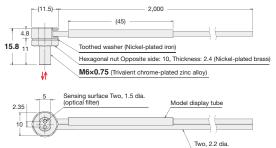
Transparent Object Detection Retro-reflective

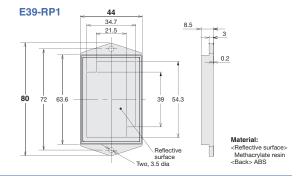
Dimensions

Installation Information → 62 to 66 Page

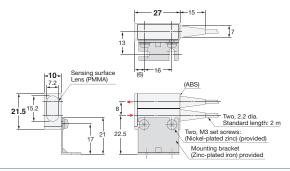
Retro-reflective Fiber Units (With M.S.R. Function)

39-A E32-LR11NP 2M (Free Cutting) (45)

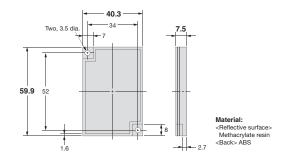




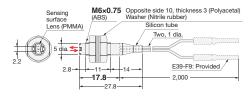
39-B E32-R16 2M (Free Cutting)

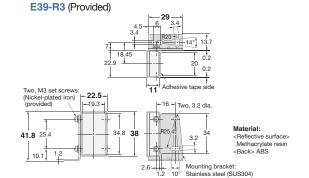


E39-R1 (Provided)



E32-R21 2M (Free Cutting)





Reference Information for Model Selection -

Performance Comparison of Transparent Object Detection

For detecting transparent objects, consider using following products together: E32-LR11NP 2M + E39-RP1.

- This configuration features a special built-in optical filter that ensures stable detection of double-refractive materials, such as films and PET bottles.
- The retro-reflective model is suitable for detecting glass.

Sensing object	Film wrapper on cigarette packs	PET bottles	Glass bottles	Plate glass, t: 0.7
E32-LR11NP 2M + E39-RP1	0	0	0	0
E32-R16 2M	\triangle	Δ	0	0
E32-R21 2M	\triangle	\triangle	0	0

E32-LR11NP Usage in Combination with a Sheet Reflector

Reference values of sensing distance are provided in the following table.

Reflector shape	Sensing of	listance (m	values)		
(mm)	E3X	K-ZV	E3NX	-FA	Models
,	■ GIGA=HS	Other modes	■GIGA =HS	Other modes	
50	550	ST : 500 SHS: 250	820	ST : 750 SHS: 250	E39-RSP1
12	430	3H3. 230	640	3H3. 230	
13.7	210	ST : 190	310	ST : 280	E39-RP37
23	160	-	240	-	

Threaded Hex-shaped

Cylindrical

Flat

Sleeved

Small Spot

High Power Narrow

view BGS

Retroreflective

Limited-

reflective Chemicalresistant, Oil-resistant

Bendina

Heatresistant

Detection Liquid-level

Vacuum

FPD, Semi. Solar

Retro-reflective → 38 page Limited-reflective → This page

Threaded Hex-shaned

Cylindrical

Flat

Sleeved

Small Spot

High Power Narrow view

BGS

Retroreflective Limitedreflective

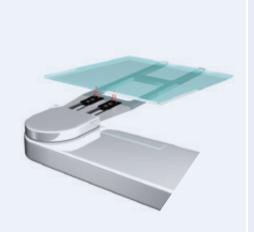
Chemical-Oil-resistant Bendina

Heatresistant Detection

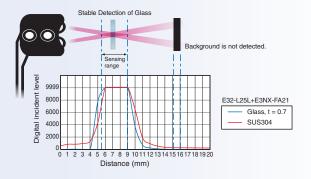
Liquid-level

Vacuum

FPD, Semi.



• These Fiber Units are based on a limited-reflective optical system where the emitting light and receiving light axes intersect at the same angle. This allows for stable detection of glass because the Fiber Units receives the specular reflection of the glass when the glass is in the sensing range.



Specifications

Limited-reflective Fiber Units

Ту	/ре		Dan din n	9	Sensing di	stance (mm)		Standard		44 Daws
Features	Detection direction	Appearance (mm)	Bending radius of cable	E3X-	zv	E3NX-	-FA	sensing object (minimum	Models	41 Page Dimensions No.
	unection		or ouble	■GIGA=HS	Other modes	■GIGA=HS	Other modes	sensing object)		110.
Small		14 2.5 I	R10	0 to 4	ST : 0 to 4	0 to 4	ST : 0 to 4	(5 µm dia./	E32-L24S 2M	41-A
size		11 IP50		0 to 4	SHS: 0 to 4	0 to 4	SHS: 0 to 4	2 μm dia.)	E32-L243 2M	
01		20.5		0 to 15	ST : 0 to 15	0 to 15	ST : 0 to 15			
Standard	Flat-	3.8 14 IP40		0 to 15	SHS: 0 to 12	0 to 15	SHS: 0 to 12		E32-L16-N 2M	41-B
Glass- substrate	view	24.5	B25	10 to 20	ST : 10 to 20	10 to 20	ST : 10 to 20	Soda glass with		
alignment, 70°C		5 1 14 IP40	H25	10 to 20	SHS: -	10 to 20	SHS: -	reflection factor of 7%	E32-A08 2M *	41-C
Standard		24.5		12 to 30	ST : 12 to 30	12 to 30	ST : 12 to 30		E32-A12 2M	41-D
long distance		5 1 14 IP40		12 to 30	SHS: -	12 to 30	SHS: -		E32-A 12 2M	41-0
Side	Side-	18		5.4 to 9	ST : 5.4 to 9	5.4 to 9	ST : 5.4 to 9	(5 µm dia./		
View form	view	16 IP50	R10	5.4 to 9 (Center 7.2)	SHS: 5.4 to 9 (Center 7.2)	5.4 to 9 (Center 7.2)	SHS: 5.4 to 9 (Center 7.2)	2 µm dia.)	E32-L25L 2M	41-E
Glass- substrate	Тор-	23		15 to 38	ST : 15 to 38	15 to 38	ST : 15 to 38	End surface of soda glass with reflection factor		
Mapping, 70°C	view	9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	R25	15 to 38 (Center 25)	(Center 25) SHS: –	15 to 38 (Center 25)	(Center 25) SHS: –	of 7% (t = 0.7 mm, rounded edges)	E32-A09 2M	41-F

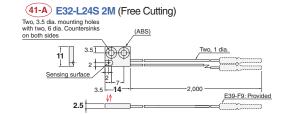
- * If operation is affected by the background, perform power tuning to decrease the incident light level
- Note 1. The following mode names and response times apply to the modes given in the Sensing distance column. [E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)
 - 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
 - 3. The sensing distances for Reflective Fiber Units are for white paper.
 - 4. The sensing distances for the E3NX-FA are values for E3NX-FA□ devices. The distance for E3NX-FAH□ infrared models varies.
 - 5. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Dimensions

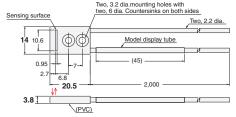
Installation Information → 62 to 66 Page



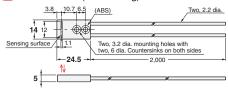
Limited-reflective Fiber Units



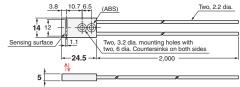
41-B E32-L16-N 2M (Free Cutting)



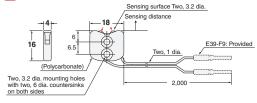
41-C E32-A08 2M (Free Cutting)



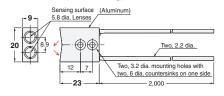
41-D E32-A12 2M (Free Cutting)



41-E E32-L25L 2M (Free Cutting)



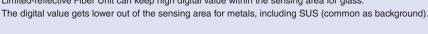
41-F E32-A09 2M (Free Cutting)



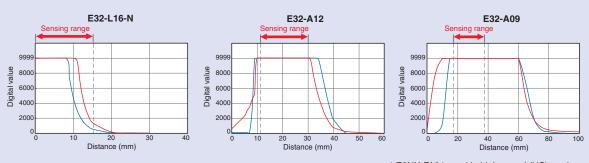
Reference Information for Model Selection -

Sensing Distance vs. Digital Value

Limited-reflective Fiber Unit can keep high digital value within the sensing area for glass.







* E3NX-FA21 used in high-speed (HS) mode.

Threaded Hex-shaned Cylindrical

Flat

Sleeved

Small Spot

High Power Narrow

view BGS

Retroreflective

Limited-

resistant, Oil-resistant Bending

> Heatresistant

Glass, t = 0.7

SUS304

Detection

Liquid-level

Vacuum FPD, Semi. Solar

Chemical-resistant, Oil-resistant

Threaded Hex-shaned Cylindrical

Flat

Small Spot

Sleeved

High Power

Narrow view

BGS

Retroreflective

Limitedreflective

Chemicalresistant, Oil-resistant

Heatresistant

Bendina

Environmental Immunity

Detection

Liquid-level

Vacuum

FPD, Semi Solar

• These Fiber Units are made from fluororesin for resistance to chemicals.

Chemical-resistant Data for Fluororesin (Reference)

Material Chemical	Fluororesin	Acryl	ABS	Polycarbonate	Polyethylene	PVC
Hydrochloric acid	0	Δ	Δ		Δ	×
Sulfuric acid	0	×	×	×	×	×
Sodium hydroxide	0	Δ	Δ	×	0	×
Methyl alcohol	0	×	Δ	×	0	×
Acetone	0	×	×	×	Δ	×
Toluene	0	Δ	×	×	Δ	×
Benzene	0	Δ	Δ	×	Δ	×

Note: Results depend on concentration.

Specifications

Through-beam Fiber Units

			Bending	Se	nsing dis	tance (mm)		Optical axis diameter		43 Page
Туре	Sensing direction	Appearance (mm)	radius of cable	E3X-ZV		E3NX-F	A	(minimum sensing	Models	Dimension No.
				■GIGA =HS	Other modes	■GIGA =HS	Other modes			
Oil- Right resistant angle	Right-	19.1 M8 *3	Flexible, R1	4,000 *1	*1 ST : 4,000 SHS: 2,200	4,000 *1 4,000 *1	*1 ST : 4,000 SHS: 2,200	4 dia. (0.1 dia./ 0.03 dia.)	E32-T11NF 2M	43-A
	angle	16 M4 *3 IP68G	Flexible, R1	2,200	ST : 1,100 SHS: 270	3,300	ST : 1,600 SHS: 270	2 dia. (0.1 dia./ 0.03 dia.)	E32-T11NFS 2M	43-A2
To Chemical/ oil resistant	To a silono	20 5 dia. IP67	R40	4,000 *1	ST : 4,000 SHS: 1,600	4,000 *1	ST : 4,000 SHS: 1,600	4 dia.	E32-T12F 2M	43-B
	Top-view	35 🗸	R4	4,000 *1	SHS: 1,000	4,000 *1	SHS: 1,000	(0.1 dia./ 0.03 dia.)	E32-T11F 2M	43-C
	Side-view	5 dia.	D40	1,400 500	ST : 800 SHS: 200	2,100 750	ST : 1,200 SHS: 200	3 dia. (0.1 dia./ 0.03 dia.)	E32-T14F 2M	43-D
Chemical/ oil resistant 150°C *2	Top-view	20 5 dia. IP67	R40	4,000 *1	ST : 2,800 SHS: 700	4,000 *1 2,700	*1 ST : 4,000 SHS: 700	4 dia. (0.1 dia./ 0.03 dia.)	E32-T51F 2M	43-E

*1 The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm. *2 For continuous operation, use the Fiber Unit between -40 and 130°C.
*3. The IP68G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards). The IP68 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil. Passed OMRON's Oil-resistant Component Evaluation Standards (OMRON's own durability evaluation standards) (Cutting oil type: specified in JIS K 2241:2000; Temperature: 35°C max.)

Note1. The sensing distances for the E3NX-FA are values for E3NX-FA devices. The distance for E3NX-FAH of Infrared models varies.

2. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Reflective Fiber Units

				Se	nsing dis	stance (mm)		Standard		40 D
Туре	Sensing direction	Appearance (mm)	Bending radius of cable	adius E3X-ZV		E3NX-FA		sensing object (minimum	Models	43 Page Dimensions No.
				■GIGA =HS	Other modes	■GIGA =HS	Other modes	sensing object)		
Semiconductors: Cleaning, developing, and etching, 60°C		Mounting holes A IP67		(Recomme 19 to 31 mm	ended sens	om tip of lens sing distance: 11 m ter of mounting hol sing distance: 22 m	e A	Glass	E32-L11FP 2M	43-F
Semiconductors: Resist stripping, 85°C		Mounting holes A 17.5 IP67	Mounting holes R40		8 to 20 mm from tip of lens (Recommended sensing distance: 11 mm) 32 to 44 mm from center of mounting hole A (Recommended sensing distance: 35 mm)			(t=0.7 mm)	E32-L11FS 2M	43-G
Chemical/ oil resistant	Top-view	16 A 6 dia.		GIGA -		GIGA -	ST : 280 SHS: 60	(5 µm dia./	E32-D12F 2M	43-H
Only cable: chemical resistant		17 M6	R4	■ 840 ■ 240	ST : 350 SHS: 100	1,260 360	ST : 520 SHS: 100	2 µm dia.)	E32-D11U 2M	43-1

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GilGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs)

[E3X-FA] GilGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA. 3. The sensing distances for Reflective Fiber Units are for white paper.

4. The sensing distances for the E3NX-FA are values for E3NX-FA devices. The distance for E3NX-FAH infrared models varies.

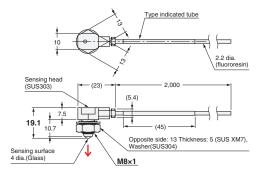
5. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Dimensions

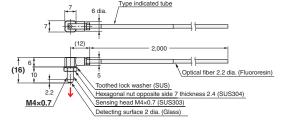
Installation Information → 62 to 66 Page

Through-beam Fiber Units (Set of 2)

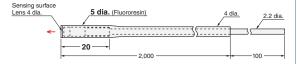
43-A E32-T11NF 2M (Free Cutting)



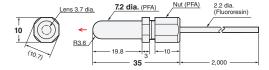
43-A2 E32-T11NFS 2M (Free Cutting)



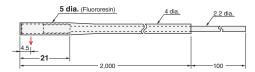
43-B E32-T12F 2M (Free Cutting)



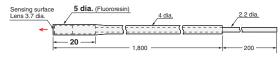
43-C E32-T11F 2M (Free Cutting)



43-D E32-T14F 2M (Free Cutting)



43-E E32-T51F 2M (Free Cutting)

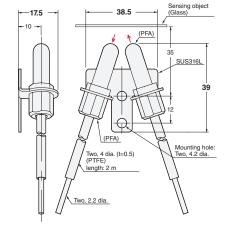


Environmental Immunity

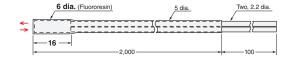
Reflective Fiber Units

43-F E32-L11FP 2M (Free Cutting) (Heat-resistant PVC) (**A**) Mounting hole Two, 4.2 dia. (PFA) Two, 4 dia. (t=0.5) (PTFE)

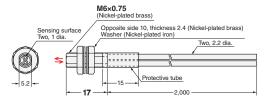
43-G E32-L11FS 2M (Free Cutting)



43-H E32-D12F 2M (Free Cutting)



43-I E32-D11U 2M (Free Cutting)



- Reference Information for Model Selection -

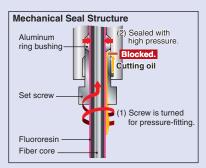
Oil-resistance performance of the E32-T11NF

Fluororesin Outer Cable Sheath

The fluororesin that covers the entire surface of the cable sheath (fiber covering) prevents the penetration of cutting oil.

Mechanical Seal Structure

An aluminum ring bushing is compressed and deformed by a set screw to seal the structure by pressing against the fluororesin part of the fiber core. This prevents the ingress of cutting oil from the joined surfaces.





Installation Information → 62 to 66 Page

Threaded Hex-shaned

Cylindrical Flat

Sleeved

Small Spot High Power

Narrow view

BGS

Retroreflective Limitedreflective

Chemical resistant Oil-resistant

> Rending Heatresistant

Detection

Liquid-level

Vacuum FPD. Semi.

Solar

Bending-resistant, Disconnection-resistant / Through-beam → This page

Reflective → 46 page

Threaded Hex-shaned Cylindrical

Flat Sleeved

Small Spot High Power Narrow

view

BGS reflective

Chemicalresistant, Oil-resistant

Limited-

Heatresistant

Detection

Bending

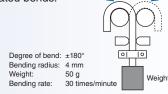
Liquid-level

Vacuum FPD,

Semi.



• Capable of withstanding one million repeated bends.



· A large number of independent fine fibers ensures good flexibility. Suitable for use on moving parts without easily breaking.



• Protective Stainless Spiral Tube is available for covering the fiber cable to protect it from accidental breaking due to snagging or shock.

Specifications

Through-beam Fiber Units

		Dandin	Se	nsing dis	stance (m	m)		Optical axis diameter		45 Daws
Size	Appearance (mm)	Bending radius of cable	E3X-ZV		E	BNX-F	A	(minimum sensing	Models	45 Page Dimensions No.
		Oi Gubio	■GIGA =HS	Other modes	■GIGA	=HS	Other modes			110.
1.5 dia.	10 1.5 dia.		680	ST : 400		1,020	ST : 600	0.5 dia.	E32-T22B 2M	45-A
M3	11 M3	Bendresistant,	220	SHS: 90	330		SHS: 90	(5 μm dia./ 2 μm dia.)	E32-T21 2M	45-B
M4	14 M4 IP67	R4	2,500	ST : 1,350 SHS: 360		3,750 1,350	ST : 2,020	1 dia. (5 μm dia./ 2 μm dia.)	E32-T11 2M	45-C
Square	12 12		500	ST : 300 SHS: 70	250	750	ST : 450 SHS: 70	0.5 dia. (5 μm dia./ 2 μm dia.)	E32-T25XB 2M	45-D

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column. [E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs)

- [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs) 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- 3. The sensing distances for the E3NX-FA are values for E3NX-FA devices. The distance for E3NX-FAH infrared models varies.
- 4. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Protective Stainless Spiral Tube (Sold separately)

Insert the fiber cable into the protective tube to prevent breaking by snagging or shock.

Applicable Fiber Units	Model	Quantity	45 Page Dimensions No.
E32-T11R 2M/E32-T11 2M/ E32-LT11 2M/E32-LT11R 2M/ E32-T51R 2M/E32-T51 2M	E39-F32C 1M	2 pieces	45-E

^{*} This Tube cannot be used if a Lens Unit is being used

Dimensions

Installation Information → 62 to 66 Page

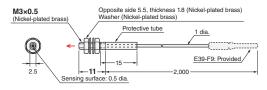


Through-beam Fiber Units (Set of 2)

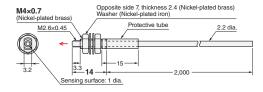
45-A E32-T22B 2M (Free Cutting)



45-B E32-T21 2M (Free Cutting)



45-C E32-T11 2M (Free Cutting)



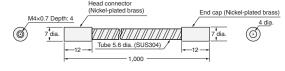
45-D E32-T25XB 2M (Free Cutting)



Note 1: Set of two symmetrically shaped Fiber Units.

Note 2: Four, M2 × 8 stainless steel countersunk mounting screws are provided.

45-E E39-F32C 1M



Note: Saddles (four, trivalent chromate-plated iron) are provided

Threaded Hex-shaped

Cylindrical

Flat Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limited-

reflective Chemicalresistant, Oil-resistant

Bending

Heatresistant

Detection

Liquid-level

Vacuum FPD, Semi.

Solar

Bending-resistant, Disconnection-resistant

Through-beam → 44 page

Reflective → This page

Hex-shaned Cylindrical

Flat Sleeved

Small Spot High Power

Narrow view

BGS

reflective Limited-

> Chemicalresistant, Oil-resistant

Bendina

Heatresistant

Detection

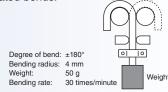
Liquid-level

Vacuum FPD,

Semi.



• Capable of withstanding one million repeated bends.



• A large number of independent fine fibers ensures good flexibility. Suitable for use on moving parts without easily breaking.



• Protective Stainless Spiral Tube is available for covering the fiber cable to protect it from accidental breaking due to snagging or shock.

Specifications

Reflective Fiber Units

		D	Se	nsing dis	tance (mm)		Optical axis		47.0
Size	Appearance (mm)	Bending radius of cable	E3X-ZV	,	E3NX-FA		diameter (minimum sensing	Models	47 Page Dimensions No.
			■GIGA =HS	Other modes	■GIGA = HS	Other modes			
1.5 dia.	15 1.5 dia.		140	ST : 60	210	ST : 90		E32-D22B 2M	47-A
МЗ	11 M3		■ 40	SHS: 16	60	SHS: 16		E32-D21 2M	47-B
3 dia.	15 3 dia.	Bendresistant,	300	ST : 140	450	ST : 210	(5 pm dia./	E32-D221B 2M	47-C
M4	15 M4	R4	90	SHS: 40	130	SHS: 40	2 μm dia.)	E32-D21B 2M	47-D
М6	17 M6 IP67		240	ST : 350 SHS: 100	360	ST : 520 SHS: 100		E32-D11 2M	47-E
Square	12 21 8		240	ST : 100 SHS: 30	360	ST : 150 SHS: 30		E32-D25XB 2M	47-F

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs)

- [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs) 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values.
- 3. The first value is for the E3X-ZV and the second value is for the E3NX-FA. The sensing distances for Reflective Fiber Units are for white paper.
- 4. The sensing distances for the E3NX-FA are values for E3NX-FA devices. The distance for E3NX-FAH infrared models varies.
- 5. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Protective Stainless Spiral Tube (Sold separately)

Insert the fiber cable into the protective tube to prevent breaking by snagging or shock.

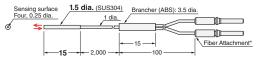
Applicable Fiber Units	Models	Quantity	47 Page Dimensions No.
E32-D21R 2M/E32-C31 2M/ E32-D21 2M	E39-F32A 1M	1 piece	
E32-D211R 2M/E32-D21B 2M	E39-F32C 1M	2 pieces	47-G
E32-D11R 2M/E32-CC200 2M/ E32-D11 2M/E32-D51R 2M/ E32-D51 2M	E39-F32D 1M	1 piece	

^{*} This Tube cannot be used if a Lens Unit is being used.

Environmental Immunity

Limited-reflective Fiber Units

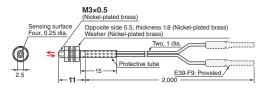
47-A E32-D22B 2M (No Cutting)



* Attached with adhesive and cannot be removed.

Enlarged View of Sensing Surface Two 0.25 dia. emitter fibers Two. 0.25 dia.

47-B E32-D21 2M (Free Cutting)



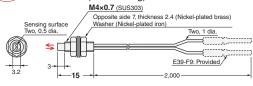
Enlarged View of Sensing Surface



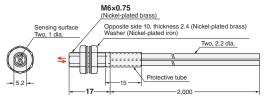
47-C E32-D221B 2M (Free Cutting)



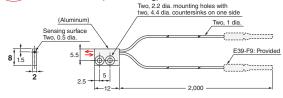
47-D E32-D21B 2M (Free Cutting)



47-E E32-D11 2M (Free Cutting)

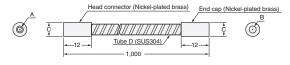


47-F E32-D25XB 2M (Free Cutting)



Note: Two, M2×8 stainless steel countersunk mounting screws are provided

47-G E39-F32A 1M/E39-F32C 1M/E39-F32D 1M



	Models	Α	В	С	D
Ξ	E39-F32A 1M	M3×0.5 Depth: 4	3 dia.	6 dia.	(4.6 dia.)
	E39-F32C 1M	M4×0.7 Depth: 4	4 dia.	7 dia.	(5.6 dia.)
	E39-F32D 1M	M6×0.75 Depth: 4	5 dia.	8.5 dia.	(7 dia.)

Note: Saddles (two (four for the E39-F32C 1M), trivalent chromate-plated iron)

Threaded Hex-shaped

Cylindrical

Flat

Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limited-

Chemicalresistant, Oil-resistant

reflective

Bending

Heatresistant

Detection

Liquid-level

Vacuum FPD, Semi. Solar

Threaded Hex-shaped

Flat

Cylindrical

Small Spot

High Power

Sleeved

Narrow view

BGS

Retro-reflective Limited-

> Chemicalresistant, Oil-resistant

Heatresistant

Bending

Detection

Liquid-level

Vacuum

FPD, Semi.

• Wide product variety for temperatures from 100 to 350°C. Select the model according to heat-resistant temperature.

Specifications

Through-beam Fiber Units

			Sei	nsing dis	stance (mm)		Optical axis		
Heat- resistant temperature	Appearance (mm)	Bending radius of cable	E3X-ZV	,	E3NX-F	A	diameter (minimum sensing	Models	49 Page Dimensions No.
			■GIGA =HS	Other modes	■GIGA = HS	Other modes	object)		
100°C *1	14 M4 IP50	Flexible, R2	1,600	ST : 800 SHS: 225	2,400	ST : 1,200 SHS: 225	1 dia. (0.1 dia./ 0.03 dia.)	E32-T51R 2M	49-A
150°C *2	17 M4 IP67	R35	1,000	ST : 1,500 SHS: 400	4,000 *5	ST : 2,250 SHS: 400	1.5 dia. (0.1 dia./ 0.03 dia.)	E32-T51 2M	49-B
150°C *2	3 dia.	R35	840 300	ST : 450 SHS: 120	1,260	ST : 670 SHS: 120	1.5 dia. (0.1 dia./ 0.03 dia.)	E32-T54 2M	49-C
200°C *3	30 20 M4 IP67	R10	1,000	ST : 550 SHS: 140	1,500	ST : 820 SHS: 140	0.7 dia. (5 μm dia./ 2 μm dia.)	E32-T81R-S 2M	49-D
200°C	3 dia. IP67	R25	1,740	ST : 2,600 SHS: 700	4,000 *5 2,610	ST : 3,900 SHS: 700	1.7 dia. (0.1 dia./ 0.03 dia.)	E32-T84S-S 2M	49-E
300°C	37.3 4 dia.	R25	■ 360 ■ 120	ST : 190 SHS: 50	540 180	ST : 290 SHS: 70	-	E32-T64-2 2M	49-F
350°C *4	30 20 M4 IP67	R25	1,680	ST : 900 SHS: 240	900	ST : 1,350 SHS: 240	1 dia. (5 μm dia./ 2 μm dia.)	E32-T61-S 2M	49-G
70°C			_					Standard Fiber Units can be used.	_

- For continuous operation, use the Fiber Unit between -40 to 90°C.
- For continuous operation, use the Fiber Unit between ~40 to 130°C.

 The heat-resistant rating is not the same for all parts of the Fiber Unit. Refer to the dimensions diagrams for details.

 The ambient operating temperature for the E32-T61-S 2M is ~60 to 350°C.

 The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm.

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

- 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- 3. The sensing distances for the E3NX-FA are values for E3NX-FA \square devices. The distance for E3NX-FAH \square infrared models varies.
- 4. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Installation Information → 62 to 66 Page

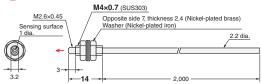
High Power

Retro-

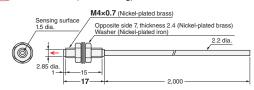
Dimensions

Through-beam Fiber Units (Set of 2)

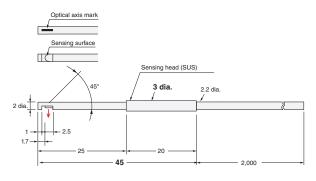
49-A E32-T51R 2M (Free Cutting)



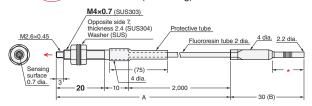
49-B E32-T51 2M (Free Cutting)



49-C E32-T54 2M (Free Cutting)

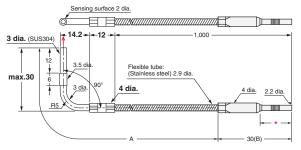


49-D E32-T81R-S 2M (No Cutting)



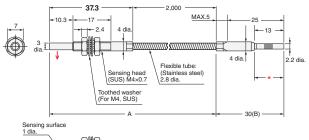
Note: The maximum allowable temperatures for sections A and B are 200°C and 110°C, respectively. The section inserted into the Amplifier Unit (indicated by *) must be maintained within the Amplifier Unit's operating temperature range.

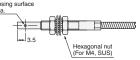
49-E E32-T84S-S 2M (No Cutting)



Note: The maximum allowable temperatures for sections A and B are 200°C and 110°C, respectively. The section inserted into the Amplifier Unit (indicated by ') must be maintained within the Amplifier Unit's operating temperature range.

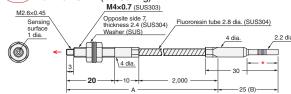
49-F E32-T64-2 2M (No Cutting)





Note: The maximum allowable temperatures for sections A and B are 300°C and 110°C, respectively. The section inserted into the Amplifier Unit (indicated by *) must be maintained within the Amplifier Unit's operating temperature range.

49-G E32-T61-S 2M (No Cutting)



Note: The maximum allowable temperatures for sections A and B are 350°C and 110°C, respectively. The section inserted into the Amplifier Unit (indicated by *) must be maintained within the Amplifier Unit's operating temperature range.

Reference Information for Model Selection -



Long-distance Sensing Applications

A separate Lens Unit can be attached to extend the sensing distance.

→ 32 page

Hex-shaped Cylindrical

Flat Sleeved

Small Spot High Power

Narrow view BGS

Retro-reflective Limited-

Chemicalresistant, Oil-resistant Bending

Heatresistant

Detection Liquid-level

> Vacuum FPD, Semi.

• Wide product variety for temperatures from 100 to 400°C. Select the model according to heat-resistant temperature.

Specifications

Reflective Fiber Units

Heat-		Dandir -		Sensing	distance (mm))	Standard		E1 Desc
resistant temperature	Appearance (mm)	Bending radius of cable	E3X-Z	v	E3NX-I	-A	sensing object (minimum	Models	51 Page Dimensions No.
•			■GIGA =HS	Other modes	■GIGA = HS	Other mod	sensing object)		
100°C *1	17.5 M6	Flexible, R2	670	ST : 280 SHS: 80	280		20	E32-D51R 2M	51-A
150°C *2	17 M6 IP67	R35	1,120	ST : 450 SHS: 144	1,680		70 (5 μm dia./ 2 μm dia.)	E32-D51 2M	51-B
200°C *3	25 M6 IP67	R10	420	ST : 180 SHS: 54	630		70	E32-D81R-S 2M	51-C
300°C *3	26 5 1 18 IP30		10 to 20	ST : 10 to 20 SHS: -	10 to 20	ST : 10 to SHS: -	Soda glass with reflection factor of 7%	E32-A08H2 2M	51-D
300 C 3	25 18 J ₅ IP50		1 to 5	ST : 1 to 5	1 to 5	ST : 1 to	_	E32-L64 2M	51-E
200°C *3	33.5		4 to 10	ST : 4 to 10 SHS: 4 to 10	[ST : 4 to	O	E32-L86 2M	51-F
300°C *3	30 91 24	R25	20 to 30	ST : 20 to 30 SHS: -	20 to 30	ST : 20 to	End surface of soda glass with eflection factor of 7% (t = 0.7 mm, rounded edges)	E32-A09H2 2M	51-G
350°C *3	28 M4 IP67		420	ST : 180	630	ST : 2	70	E32-D611-S 2M	51-H
300 0	25 M6		120	SHS: 54	180	SHS:	(5 μm dia./ 2 μm dia.)	E32-D61-S 2M	51-1
400°C *3	Sleeve bending 30 radius : 10 mm 60 M4		280	ST : 120 SHS: 36	420		80	E32-D73-S 2M	51-J
70°C			_		ı	-	1	Standard Fiber Units can be used.	_

- For continuous operation, use the Fiber Unit between -40 to 90°C .
- For continuous operation, use the Fiber Unit between –40 to 130°C.

 The heat-resistant rating is not the same for all parts of the Fiber Unit. Refer to the dimensions diagrams for details.
- Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

- 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- 3. The sensing distances for Reflective Fiber Units are for white paper.
- 4. The sensing distances for the E3NX-FA are values for E3NX-FA \parallel devices. The distance for E3NX-FAH \parallel infrared models varies.
- 5. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Installation Information → 62 to 66 Page

Cylindrical

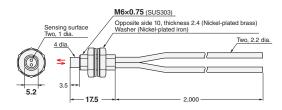
Sleeved

FPD. Semi. Solar

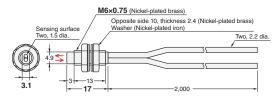
Dimensions

Reflective Fiber Units

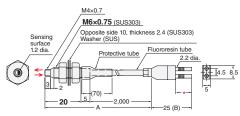
51-A E32-D51R 2M (Free Cutting)



51-B E32-D51 2M (Free Cutting)

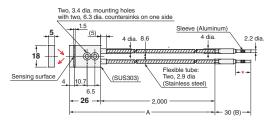


51-C E32-D81R-S 2M (No Cutting)



The maximum allowable temperatures for sections A and B are 200°C and 110°C, respectively. The section inserted into the Amplifier Unit (indicated by *) must be maintained within the Amplifier Unit's operating temperature

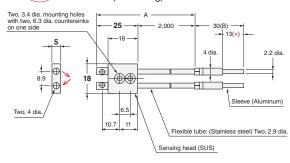
51-D E32-A08H2 2M (No Cutting)



Note: The maximum allowable temperatures for sections A and B are 300°C and 110°C, respectively. The section inserted into the Amplifier Unit (indicated by *) must be maintained within the Amplifier Unit's operating temperature range.

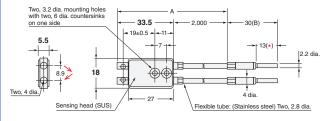


51-E E32-L64 2M (No Cutting)



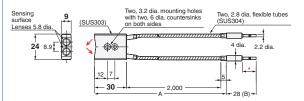
Note: The maximum allowable temperatures for sections A and B are 300°C and 110°C, respectively. The section inserted into the Amplifier Unit (indicated by *) must be maintained within the Amplifier Unit's operating temperature range.

51-F E32-L86 2M (No Cutting)



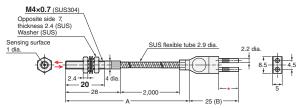
Note: The maximum allowable temperatures for sections A and B are 200°C and 110°C, respectively. The section inserted into the Amplifier Unit (indicated by *) must be maintained within the Amplifier Unit's operating temperature range

51-G E32-A09H2 2M (No Cutting)



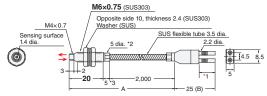
Note: The maximum allowable temperatures for sections A and B are 300°C and 110°C, respectively. The section inserted in the Amplifier Unit (indicated by *) must be maintained within the Amplifier Unit's operating temperature range.

51-H E32-D611-S 2M (No Cutting)



Note: The maximum allowable temperatures for sections A and B are 350°C and 110°C, respectively. The section inserted into the Amplifier Unit (indicated by 1) must be maintained within the Amplifier Unit's operating temperature range.

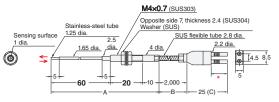
51-I E32-D61-S 2M (No Cutting)



- *2. The diameter is 6 dia, if the fiber
- length exceeds 10 m.
 The length is 10 if the fiber length exceeds 10 m.

Note: The maximum allowable temperatures for sections A and B are 350°C and 110°C, respectively. The section inserted into the Amplifier Unit (indicated by *1) must be maintained within the Amplifier Unit's operating temperature range.

51-J E32-D73-S 2M (No Cutting)



Note: The maximum allowable temperatures for sections A, B, and C are 400°C, 300°C, and 110°C, respectively.

The section inserted into the Amplifier Unit (indicated by *) must be maintained within the Amplifier Unit's operating temperature range

Threaded Hex-shaned

Flat

Small Spot

Sleeved

High Power Narrow

view BGS

Retroreflective Limited-

> Chemicalresistant, Oil-resistant

reflective

Bendina

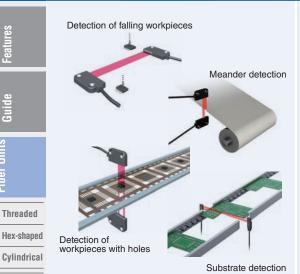
Heatresistant

Detection

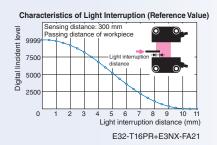
Liquid-level

Vacuum

FPD, Semi.



- Area beams are optimum for detecting workpieces presented in inconsistent positions, such as falling workpieces, or for meander detection, or for detecting workpieces with holes.
- This Fiber Unit is ideal for meander detectin because it outputs the digital value in a linear relation to the interrupted light distance.



Specifications

■→■ Through-beam Fiber Units

				Se	nsing dis	tance (mm)		Optical axis		
Туре	Sensing width	Appearance (mm)	Bending radius of cable	E3X-ZV		E3NX-F	A	diameter (minimum sensing	Models	53 Page Dimensions No.
			Or Gubio	■GIGA = HS	Other modes	■GIGA =HS	Other modes	object)		110.
		14.5 27 4-3		3,100	ST : 1,700 SHS: 440	1,680	ST : 2,550 SHS: 440	*2	E32-T16PR 2M	53-A
Area	11 mm	27 17.8 IP50	Flexible,	2,750	ST : 1,500 SHS: 380	4,000 *1	ST : 2,250 SHS: 380	(0.2 dia./ 0.07 dia.)	E32-T16JR 2M	53-B
Alea		30 11.6 IP40	R1	40 to 420 40 to 420		40 to 630 40 to 630	ST : 40 to 630 SHS: 40 to 240	_	E32-A13 2M	53-C
	30 mm	69 5		4,000 *1 1,700	ST : 2,600 SHS: 680	4,000 *1 2,550	ST : 3,900 SHS: 680	*2 (0.3 dia./ 0.1 dia.)	E32-T16WR 2M	53-D
Array	10 mm	7 32 7 20 IP50	R5	10	ST : 10 SHS: 10	10	ST : 10 SHS: 10	0.5 dia.	E32-G16 2M	53-E

- *1 The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm.
- *2 The values for the minimum sensing object were obtained for detection in the sensing area with the sensing distance set to 300 mm. (The values are for a stationary sensing object.)

The first value is for the E3X-ZV and the second value is for the E3NX-FA.

Note 1. The sensing distances for the E3NX-FA are values for E3NX-FA□ devices. The distance for E3NX-FAH□ infrared models varies.

2. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Reflective Fiber Units

				Sei	nsing dis	tance (mm)		Optical axis		
Туре	Sensing width	Appearance (mm)	Bending radius of cable	E3X-ZV		E3NX-F	A	diameter (minimum sensing	Model	53 Page Dimensions No.
			0.000.0	■GIGA = HS	Other modes	■GIGA =HS	Other modes			
Array	11 mm	15 25 25	Bend- resistant, R4		ST : 300 SHS: 90	1,050 300	ST : 450 SHS: 90	(5 μm dia./ 2 μm dia.)	E32-D36P1 2M	53-F

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

- 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- 3. The sensing distances for the E3NX-FA are values for E3NX-FA \square devices. The distance for E3NX-FAH \square infrared models varies.
- 4. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Area Beam (Area Detection)

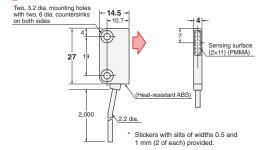
Dimensions

Installation Information → 62 to 66 Page

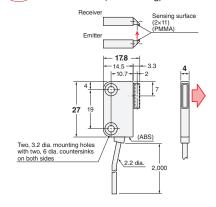


Through-beam Fiber Units (Set of 2)

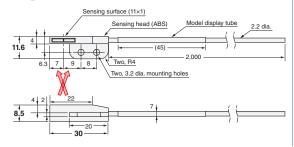
53-A E32-T16PR 2M (Free Cutting)

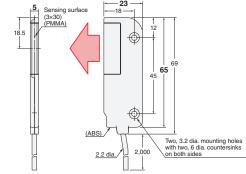


53-B E32-T16JR 2M (Free Cutting)

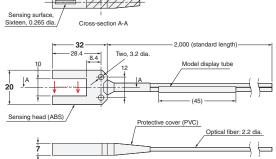


53-C E32-A13 2M (Free Cutting)



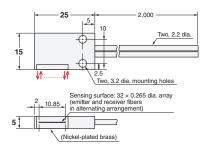


53-E E32-G16 2M

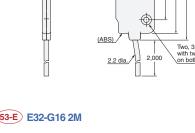


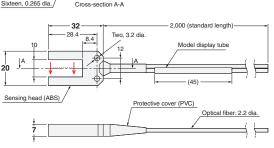
Through-beam Fiber Units (Set of 2)

53-F E32-D36P1 2M (Free Cutting)



53-D E32-T16WR 2M (Free Cutting)





Threaded Hex-shaped

Cylindrical

Flat Sleeved

Small Spot

High Power

Narrow view

BGS Retro-

reflective Limitedreflective

Chemicalresistant, Oil-resistant

Bending

Heatresistant

Detection

Liquid-level

Vacuum FPD,

Semi. Solar

Threaded Hex-shaped

Cylindrical

Flat

Small Spot

Sleeved

High Power

Narrow view

Retro-reflective

BGS

Limited-

Chemical-Oil-resistant

Bendina

Heatresistant

Detection

Liquid-level

Vacuum

FPD, Semi.

• Fiber Units for detecting liquid levels are available in two types: for tube mounting and liquid contact.

▶ Tube-mounting Types

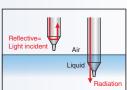
Detect the liquid level inside transparent tubes. Strap the Fiber Unit to a tube with band.



Liquid-contact Type

Detect the liquid level by direct contact with the liquid.

This model has excellent chemical-resistance because the Fiber Unit is covered in fluororesin.



Specifications

Detection scheme	Tube diameter	Features	Appearance (mm)	Bending radius of cable	Applicable range	Optical axis diameter (minimum sensing object)	Models	55 Page Dimensions No.
	3.2, 6.4 and 9.5 dia.	Resistant to bubbles and droplets Residual quantity detection	19.9 27	Bend- resistant, R4	Applicable tube: Transparent tube with a diameter of 3.2, 6.4, or 9.5 dia. and a recommended wall thickness of 1 mm	_	E32-A01 5M	55-A
Tube- mounting	8 to 10 dia.	Ideal for mounting at multilevels	10 T	R10	Applicable tube: Transparent tube with a diameter of 8 to 10 dia. and a recommended wall thickness of 1 mm	_	E32-L25T 2M	55-B
	No restrictions	Usable on large diameter tubes Resistant to bubbles and droplets	23.45 215	R4	Applicable tube: Transparent tube (no restrictions on diameter)	_	E32-D36T 2M	55-C
Liquid contact (heat-resistant up to 200°C)		-	6 dia.	R40 R25 *3	Liquid-contact Type *1	_	E32-D82F1 4M	55-D

- *1 If you want to change the amount of received light, please Refer to the Instruction Sheet of the Fiber Amplifier used.
- *2 The applicable range is the same whether an E3X-ZV series or E3NX-FA series is used. This does not include E3NX-FAH infrared models varies.
- When using a Fiber Amplifier Unit in giga-power mode, level detection may not work depending on the tube diameter. Make sure to confirm operation with the actual tube.

 *3 The bending radius of the sensing section (except for the unbendable section) is 40 mm, and the bending radius of the fiber is 25 mm.

- Reference Information for Model Selection -

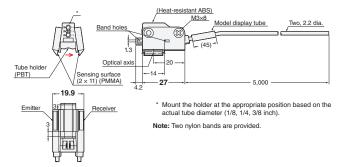
Determining the Best Model for Tube-mounted Types

Mounting and conditions	Recommended Unit	Features
When bubbles and the water droplets are generated	E32-A01	This is a Through-beam Model, so the incident light will differ greatly between with and without of liquid. It also uses an area beam, which is less prone to false detection by bubbles and droplets. With liquid Without liquid Light interrupted Light incident
Multilevel installation in limited space	E32-L25T	This model is suitable for mounting at multilevels because of the thin type (height: 10 mm).
Mounting on large diameter tubes	E32-D36T	This model has no restrictions on the tube diameter, so it can be mounted on many different tube sizes. It also uses an area beam, which is less prone to false detection by bubbles and droplets. With liquid Air Tube Reflective= Light incident

Special Applications Liquid-level Detection

Dimensions

55-A E32-A01 5M (Free Cutting)

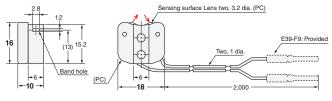


Tube-mounting Examples

Installation Information → 62 to 66 Page



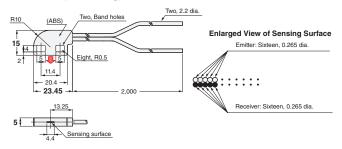
55-B E32-L25T 2M (Free Cutting)





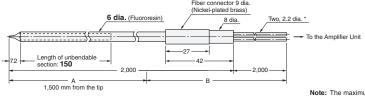
Note: Two nylon bands and one anti-reflector are provided

55-C E32-D36T 2M (Free Cutting)





55-D E32-D82F1 4M (Free Cutting)



* The 2-m section of optical fiber on the Amplifier unit side is plastic and therefore allows free cutting.

Note: The maximum allowable temperature is 200°C for section A and 85°C for section B.

And

Designed for Safe Residual quantity detection (E32-A01 only)

The E32-A01 Fiber Unit is designed to default to the same output as for liquid absent in the event of a failure, such as when the fiber breaks. This makes it suitable for residual quantity detection.

Trouble (disconnection)	Light interrupted
With liquid	Light interrupted
Without liquid	Light incident

If the failure goes unnoticed, this failsafe design will prevent false detection of liquid when there is no liquid present.

Threaded Hex-shaped

Cylindrical

Sleeved

Flat

Small Spot

High Power

Narrow view

> BGS Retro-

reflective Limitedreflective

Chemicalresistant, Oil-resistant

Bending

Heatresistant

Detection

Liquid-level

Vacuum

FPD, Semi. Solar

Vacuum-resistant

Threaded Hex-shaped Cylindrical

Small Spot High Power

Flat

Sleeved

Narrow view BGS

Retro-reflective Limitedreflective

Chemical-Oil-resistant Bendina

> Heatresistant

Detection Liquid-level

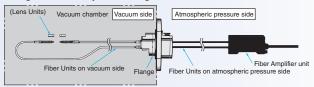
Vacuum

FPD, Semi.



- Can be used under high vacuums of up to 10⁻⁵ Pa.
- Available in models with heat resistant up to 120 or 200°C.

Configuration Example for using under vacuum



Specifications

Through-beam Fiber Units

			D	Ser	nsing dis	tance (mm)		Optical axis		D
Туре	Heat- resistant temperature	Appearance (mm)	Bending radius of cable	E3X-ZV		E3NX-F	A	diameter (minimum sensing	Models	57 Page Dimensions No.
				■GIGA = HS	Other modes	■GIGA =HS	Other modes	object)		
	120°C	30 M4	- R30	720 260	ST : 400 SHS: 100	1,080	ST : 600 SHS: 100	1.2 dia. (10 µm dia./ 4 µm dia.)	E32-T51V 1M	57-A
Vacuum side	120 0	35.9 4 dia.	H30	2,000*	ST : 2,000 SHS: 520	2,000*	* ST : 2,000 SHS: 520	4 dia. (0.1 dia./ 0.03 dia.)	E32-T51V 1M + E39-F1V	57-B
	200°C	3 dia.	- R25	1,760	ST : 950 SHS: 260	2,000*	ST : 1,420 SHS: 260	2 dia. (0.1 dia./ 0.03 dia.)	E32-T84SV 1M	57-C
Atmospheric pressure side	70°C	0	n25	_	ST : - SHS: -	_	ST : - SHS: -	_	E32-T10V 2M	57-D

^{*} The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm.

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.

- 3. The sensing distances for the E3NX-FA are values for E3NX-FA devices. The distance for E3NX-FAH infrared models varies.
- 4. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Flange

Appearance	Туре	Models	57 Page Dimensions No.
	4-channel flange	E32-VF4	57-E
5	1-channel flange	E32-VF1	57-F

Dimensions

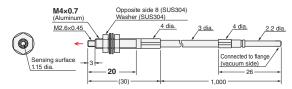
Installation Information → 62 to 66 Page



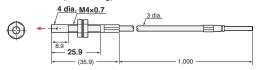
Through-beam Fiber Units (Set of 2)



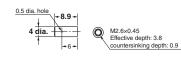
57-A E32-T51V 1M (No Cutting)



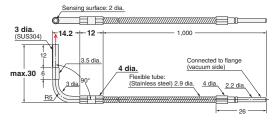
57-B E32-T51V 1M (No Cutting) + E39-F1V



E39-F1V



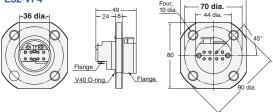




57-D E32-T10V 2M (Free Cutting)



57-E E32-VF4



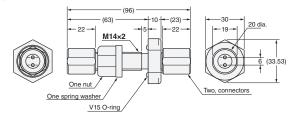
- Note 1. Mount the Flange so that the V40 O-ring is on the atmospheric-pressure side of the vacuum chamber wall.

 2. Mounting-hole dimensions: 38 dia. ±0.5 mm

 3. The maximum tightening torque is 9.8 N-m.

 4. A V40 O-ring is provided.

53-F E32-VF1



- Note 1. Mount the Flange so that the V15 O-ring is on the atmospheric-pressure side of the vacuum chamber wall.

 2. Mounting-hole dimensions: 14.5 dia. ±0.2 mm

 3. The maximum tightening torque is 14.7 N·m for the clamp nut and 1.5 N·m

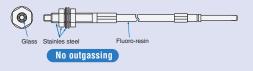
 - for the connector.

 4. A V15 O-ring, nut, spring washer, two connectors, and four O-rings for

Reference Information for Model Selection -

What Is a Vacuum-resistant Fiber Unit?

- The Flange is designed to create an air-tight seal on the vacuum side.
- The fibers and Flange on the vacuum side are made of non-outgassing materials. These parts are inspected, cleaned, and sealed in an air-tight package in a clean room prior to shipment.



Threaded

Hex-shaned

Cylindrical

Flat

Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limited-

reflective Chemicalresistant, Oil-resistant

Bending

Heat-

resistant Detection

Liquid-level

Vacuum

FPD, Semi. Solar

FPD, Semiconductors, and Solar Cells Limited-reflective → This page Through-beam → 60 page

iber Sensor eatures

Selection Guide

Fiber Units

Threaded

Hex-shaped

Space Flat

Small Spot

Sleeved

Cylindrical

High Power

Narrow view

Retroreflective

BGS

Limitedreflective

Chemicalresistant, Oil-resistant

Bending

Heatresistant

Area Detection

Liquid-level

Vacuum

Semi Solar

Installation Information

Fiber Amplitiers, Communications Unit, and Accessories

Technical Guide and Precautions

Model Index



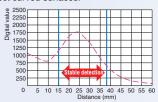
• Glass-substrate Alignment

Detection position accuracy: 0.2 mm max. No variation in detection positions even if the sensing distance changes.

▶ Tilting workpiece does not affect detection.

• Glass-substrate Mapping

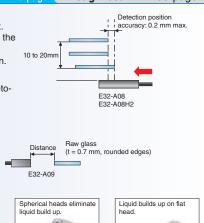
Stable detection is possible even for difficult-todetect curved surfaces.



• Glass Presence Detection in Wet Processes

 Stable non-contact detection even with warped glass.

The spherical heads ensure stable detection without being influenced by liquid.





Specifications

Limited-reflective Fiber Units

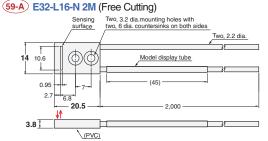
			Dandin	Se	ensing dis	tance (mm)		Standard		FO Dogg
Application	Ambient temperature	Appearance (mm)	Bending radius of cable	E3X-Z	v	E3NX-F	A	sensing object (minimum	Models	59 Page Dimensions No.
				■GIGA =HS	Other modes	■GIGA =HS	Other modes	sensing object)		
Glass presence detection	- 70°C	20.5 3.81 14 IP40		0 to 15	ST : 0 to 15 SHS: 0 to 12	0 to 15	ST : 0 to 15 SHS: 0 to 12		E32-L16-N 2M *1	59-A
	70 C	24.5 51 14 IP40		10 to 20	ST : 10 to 20	10 to 20	ST : 10 to 20	Soda glass	E32-A08 2M *1	59-B
Glass- substrate Alignment	300°C	26 5 1 18	R25	10 to 20	SHS: -	10 to 20	SHS: -	with reflection factor of 7%	E32-A08H2 2M *1	59-C
	70°C	24.5 5 1 14 IP40		12 to 30	ST : 12 to 30 SHS: –	12 to 30	ST : 12 to 30 SHS: –		E32-A12 2M	59-D
Mapping of	70 0	9 23 9 1 20		15 to 38 15 to 38 (Center 25)	ST : 15 to 38 SHS: - (Center 25)	15 to 38 15 to 38 (Center 25)	ST : 15 to 38 SHS: - (Center 25)	End surface of soda glass with reflection	E32-A09 2M	59-E
glass substrates	300°C *2	30 9 24		20 to 30 20 to 30 (Center 25)	ST : 20 to 30 SHS: - (Center 25)	20 to 30 20 to 30 (Center 25)	ST : 20 to 30 SHS: - (Center 25)	factor of 7% (t = 0.7 mm, rounded edges)	E32-A09H2 2M	59-F
Wet processes (Cleaning, Resist developing, and etching)	60°C	14 Mounting hole A	R40	(Recomn 19 to 31 n	nended sen nm from cei	from tip of lens sing distance: 11 nter of mounting l sing distance: 22	hole A	Glass	E32-L11FP 2M	59-G
Wet processes (Resist stripping)	85°C	Mounting hole A 717.5 [IP67		(Recomn 32 to 44 n	nended sen nm from cei	from tip of lens sing distance: 11 nter of mounting l sing distance: 35	hole A	(t=0.7mm)	E32-L11FS 2M	59-H

- *1 If operation is affected by the background, perform power tuning to decrease the incident light level.
- The maximum allowable temperature is not the same for all parts of the Fiber Unit. Refer to the dimensions diagrams for details.
 Must not be repeatedly subject to rapid temperature changes.
- Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

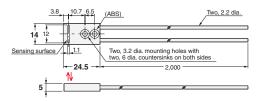
 [E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs)

 [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)
 - 2. The sensing distances for the E3NX-FA are values for E3NX-FA devices. The distance for E3NX-FAH infrared models varies.
 - 3. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

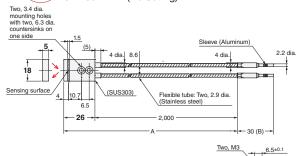
Limited-reflective Fiber Units



59-B E32-A08 2M (Free Cutting)

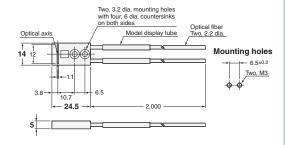


59-C E32-A08H2 2M (No Cutting)

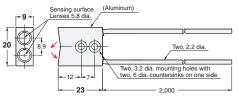


Note: The maximum allowable temperatures is 300°C for sections A and 110°C for section B (section inserted into Amplifier Unit). Mounting holes

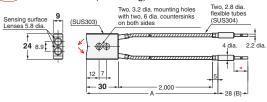
59-D E32-A12 2M (Free Cutting)



59-E E32-A09 2M (Free Cutting)

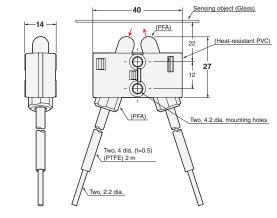


59-F E32-A09H2 2M (No Cutting)

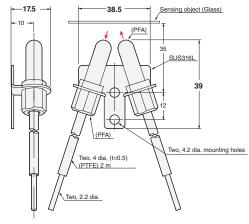


Note: The maximum allowable temperatures for sections A and B are 300°C and 110°C, respectively. The section inserted into the Amplifier Unit (indicated by *) must be maintained within the Amplifier Unit's operating temperature range.

59-G E32-L11FP 2M (Free Cutting)



59-H E32-L11FS 2M (Free Cutting)



Threaded Hex-shaped

Cylindrical

Flat

Sleeved

High Power

Small Spot

Narrow view

BGS

Retroreflective Limitedreflective

Chemicalresistant, Oil-resistant

> Bending Heat-

resistant

Detection Liquid-level

Vacuum

Semi, Solar

Threaded Hex-shaned Cylindrical

Flat

Sleeved **Small Spot**

High Power

Narrow view

BGS Retro-

reflective Limited-

Chemical-Oil-resistant

Bendina

Heatresistant

Detection

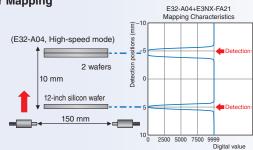
Liquid-level

Vacuum

Semi, Solar



Wafer Mapping



- Thin-profile design enables easy mounting on robot arms.
- Easy to adjust optical axis. (Typical alignment error between mechanical and optical axes is only $\pm 0.1^{\circ}$.)
- ▶ Reliably wafer detection, even when stacked closely together.

Specifications

Through-beam Fiber Units

				Bending	Ser	sing dis	tance (mm)		Optical axis diameter		61 Page
Application	Ambient temperature		Appearance (mm)	radius of cable	E3X-ZV		E3NX-F/	A	(minimum sensing	Models	Dimensions No.
				0.000.0	■GIGA =HS	Other modes	■GIGA =HS	Other modes			
			20.5 Thickness: 3 mm	Flexible, R1	3,220	ST : 1,780	4,000 *	ST : 2,670	2 dia.	E32-A03 2M	61-A
		1.5°	24.5 NO I3	R10	1,200	SHS: 500	1,800	SHS: 500	(0.1 dia./ 0.03 dia.)	E32-A03-1 2M	61-B
			24.5 10 I3	R10	2,500	ST : 1,400 SHS: 380	2,500	ST : 1,400 SHS: 380	_	E32-A03-2 2M	61-C
Wafer	70°C		20.5 Thickness: 2 mm	R10	1,280 450	ST : 680 SHS: 200	1,920	ST : 1,020 SHS: 200	1.2 dia. (0.1 dia./	E32-A04 2M	61-D
Mapping		3.4°	21 19 ± 1.2	R10	1,280 450	ST : 680 SHS: 200	1,920	ST : 1,020 SHS: 200	0.03 dia.)	E32-A04-1 2M	61-E
			20.5 3 ₂	R10	960 335	ST : 510 SHS: 150	1,440	ST : 760 SHS: 150	_	E32-A04-8 2M	61-F
		40	20.5	Flexible, R1	1,460	ST : 2,200 SHS: 580	4,000 * 2,190	ST : 3,300 SHS: 580	2 dia.	E32-T24SR 2M	61-G
		4°	3.5 dia.	R10	1,740	ST : 2,600 SHS: 700	4,000 * 2,610	ST : 3,900 SHS: 700	(0.1 dia./ 0.03 dia.)	E32-T24\$ 2M	61-H

 $^{^{\}star}\,$ The optical fiber is 2 m long on each side, so the sensing distance is 4,000 mm.

Note 1. The following mode names and response times apply to the modes given in the Sensing distance column.

[E3X-ZV] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (50 µs) [E3NX-FA] GIGA: Giga-power mode (16 ms), HS: High-speed mode (250 µs), ST: Standard mode (1 ms), and SHS: Super-high-speed mode (30 µs)

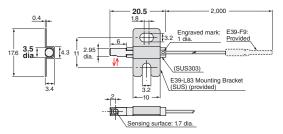
- 2. The values for the minimum sensing object are reference values that indicate values obtained in standard mode with the sensing distance and sensitivity set to the optimum values. The first value is for the E3X-ZV and the second value is for the E3NX-FA.
- 3. The sensing distances for the E3NX-FA are values for E3NX-FA \parallel devices. The distance for E3NX-FAH \parallel infrared models varies.
- 4. The E3X-HD Series offers the same sensing distance as the E3X-ZV.

Installation Information → 62 to 66 Page

Dimensions

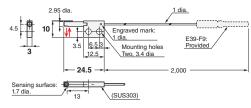
Through-beam Fiber Units (Set of 2)

61-A E32-A03 2M (Free Cutting)



Note: Use the engraved surface and its opposing surface as installation (reference) surfaces.

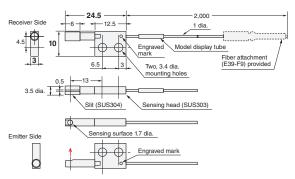
61-B E32-A03-1 2M (Free Cutting)



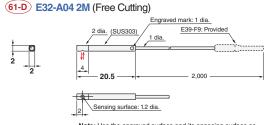
Note1: Use the engraved surface and its opposing surface as installation (reference) surfaces.

2. Set of two symmetrical parts.

61-C E32-A03-2 2M (Free Cutting)

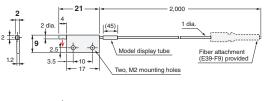


Note: Use the engraved surface and its opposing surface as installation (reference) surfaces.



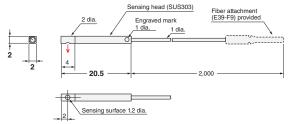
Note: Use the engraved surface and its opposing surface as installation (reference) surfaces.

61-E E32-A04-1 2M (Free Cutting)



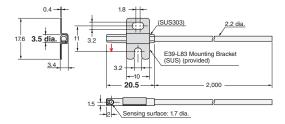


61-F E32-A04-8 2M (Free Cutting)

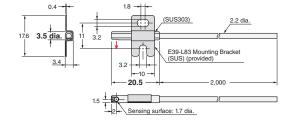


Note: Use the engraved surface and its opposing surface as installation (reference) surfaces.

61-G E32-T24SR 2M (Free Cutting)



61-H E32-T24S 2M (Free Cutting)



Threaded Hex-shaned

Cylindrical

Sleeved

Retro-

Chemicalresistant, Oil-resistant

Bending

Detection

Liquid-level

Hex-shaped Cylindrical

Flat

Sleeved Small Spot

High Power

Narrow view BGS

Retro-reflective

Limited-

resistant, Oil-resistant Bending

Heatresistant

Detection

Liquid-level

Vacuum

FPD, Semi, Solar

Information

Installation

		tallation					Cable			Weight	Demensions
Models	Ambient temperature	Tightening torque	Mounting hole	Bending radius	Unbendable length*1	Tensile strength	Sheath material	Core material	Emitter/receiver differentiation	(packed state) (g)	Page No.
E32-A01 5M	-40 to 70°C	0.03N · m	-	R4	10	9.8N	Fluororesin	Plastic	None	200	55 Page 55-A
:32-A03 2M	-40 to 70°C	0.29N · m	-	R1	0	9.8N	Polyethylene	Plastic	None	40	35 Page 35-A 61 Page 61-A
:32-A03-1 2M	-40 to 70°C	0.29N · m	-	R10	10	9.8N	Polyethylene	Plastic	None	50	35 Page 35-B 61 Page 61-B
32-A03-2 2M	-40 to 70°C	0.29N · m	_	R10	10	9.8N	Polyethylene	Plastic	Slit on receiver side	-	61 Page 61-C
:32-A04 2M	-40 to 70°C	0.29N · m	2.2 ^{+0.5} dia.	R10	10	9.8N	Polyethylene	Plastic	None	40	35 Page 35-C 61 Page 61-D
:32-A04-1 2M	-40 to 70°C	0.29N · m	-	R10	10	9.8N	Polyethylene	Plastic	None	-	61 Page 61-E
32-A04-8 2M	-25 to 105°C	0.29N · m	-	R10	10	9.8N	Fluororesin	Plastic	None	80	61 Page 61-F
32-A08 2M	-40 to 70°C	0.53N · m	-	R25	10	9.8N	Polyethylene	Plastic	None	60	41 Page 41-C 59 Page 59-B
32-A08H2 2M	-40 to 300°C	0.53N · m	_	R25	10	29.4N	SUS	Glass	None	240	51 Page (51-D) 59 Page (59-C)
32-A09 2M	-40 to 70°C	0.53N · m	_	R25	10	9.8N	Polyethylene	Plastic	None	60	41 Page 41-F 59 Page 59-E
32-A09H2 2M	-40 to 300°C	0.53N · m	_	R25	10	9.8N	SUS	Glass	None	230	51 Page (51-G 59 Page (59-F)
32-A12 2M	-40 to 70°C	0.53N · m	_	R25	10	9.8N	Polyethylene	Plastic	None	60	41 Page (41-D) 59 Page (59-D)
32-A13 2M	-25 to 70°C	0.29N · m	_	R1	0	9.8N	PVC	Plastic	None	-	53 Page 53-C
32-C21N 2M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} dia. *4	R2	0	9.8N	Polyethylene	Plastic	White line on emitter cable	30	11 Page 11-D
32-C31 2M	-40 to 70°C	0.78N · m	3.2 ^{+0.5} dia. *4	R25	10	9.8N	Polyethylene	Plastic	White line on emitter cable	40	09 Page 09-D
32-C31M 1M	-40 to 70°C	0.78N · m	3.2 ^{+0.5} dia.	R10	10	9.8N	Polyethylene	Plastic	White line on emitter cable	40	09 Page 09-E
32-C31N 2M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} ₀ dia. *4	R4	0	9.8N	PVC and Polyethylene	Plastic	White line on emitter cable	40	09 Page 09-A
32-C41 1M	-40 to 70°C	0.78N · m	3.2 ^{+0.5} ₀ dia. *4	R25	10	9.8N	Polyethylene	Plastic	White tube on emitter cable	30	27 Page 27-A
32-C42 1M	-40 to 70°C	0.29N · m	2.2 ^{+0.5} dia.	R25	10	9.8N	Polyethylene	Plastic	White tube on emitter cable	30	25 Page (25-A) (25-B)
32-C42S 1M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} dia.	R25	10	4N	Polyolefin	Plastic	White tube on emitter cable	30	25 Page 25-E
32-CC200 2M	-40 to 70°C	0.98N · m	6.2 ^{+0.5} dia.	R25	10	29.4N	Polyethylene	Plastic	White line on emitter cable	40	09 Page 09-H
32-C91N 2M	-40 to 70°C	0.98N · m	6.2 ^{+0.5} dia.	R4	0	29.4N	Polyethylene	Plastic	White line on emitter cable	36	09 Page 09-B
32-D11 2M	-40 to 70°C	0.98N · m	6.2 ^{+0.5} dia.	R4	10	29.4N	PVC	Plastic	None	50	47 Page 47-E
32-D11R 2M	-40 to 70°C	0.98N · m	6.2 ^{+0.5} dia.	R1	0	29.4N	PVC	Plastic	None	50	09 Page 09-G
32-D11U 2M	-40 to 70°C	0.98N · m	6.2 ^{+0.5} dia.	R4	10	29.4N	Fluororesin	Plastic	None	60	43 Page 43-1
32-D12F 2M	-40 to 70°C	0.78N · m	6.5 ^{+0.5} dia.	R40	10	29.4N	Fluororesin	Plastic	None	190	43 Page 43-H
32-D14LR 2M	-40 to 70°C	0.98N · m	_	R1	0	29.4N	PVC	Plastic	None	100	15 Page (15-G
32-D15XR 2M	-40 to 70°C	0.15N · m	-	R1	0	29.4N	PVC	Plastic	None	60	19 Page 19-A
32-D15YR 2M	-40 to 70°C	0.15N · m	-	R1	0	29.4N	PVC	Plastic	None	60	19 Page 19-C
32-D15ZR 2M	-40 to 70°C	0.15N · m	-	R1	0	29.4N	PVC	Plastic	None	60	19 Page (19-E
32-D16 2M	-40 to 70°C	0.53N · m	_	R4	10	29.4N	PVC	Plastic	None	70	29 Page 29-E
32-D21 2M	-40 to 70°C	0.78N · m	3.2 ^{+0.5} ₀ dia. *4	R4	10	9.8N	PVC	Plastic	None	20	47 Page 47-B
32-D211R 2M	-40 to 70°C	0.78N · m	4.2 ^{+0.5} ₀ dia.	R1	0	9.8N	Polyethylene	Plastic	None	40	09 Page 09-F
:32-D21B 2M	-40 to 70°C	0.78N · m	4.2 ^{+0.5} dia.	R4	10	9.8N	PVC	Plastic	None	40	47 Page 47-D

^{*1} Unbendable length of cable from fiber head.
Do not bend the cable for at least 20 mm from where the cable inserts into the Fiber Amplifier Unit.
*2 The heat-resistant rating is not the same for all parts of the Fiber Unit. Refer to the dimensions diagrams for details.
*3 Avoid rapid temperature changes.
*4 For embedded mounting, prepare a hole with a diameter of 2.6 mm.

Small Spot

High Power Narrow

view BGS

Retro-reflective Limitedreflective

Chemicalresistant, Oil-resistant

> Bending Heat-

resistant Detection

Liquid-level

Vacuum

FPD, Semi, Solar

		tallation					Cable			Weight	Demensions
Models	Ambient temperature	Tightening torque	Mounting hole	Bending radius	Unbendable length*1	Tensile strength	Sheath material	Core material	Emitter/receiver differentiation	(packed state) (g)	Page No.
32-D21N 2M	-40 to 70°C	0.78N · m	4.2 ^{+0.5} ₀ dia.	R2	0	9.8N	Polyethylene	Plastic	None	30	11 Page 11-E
32-D21R 2M	-40 to 70°C	0.78N · m	3.2 ^{+0.5} dia. *2	R1	0	9.8N	Polyethylene	Plastic	None	20	09 Page 09-C
32-D21-S3 2M	-40 to 70°C	0.78N · m	4.2 ^{+0.5} dia.	R10	10	9.8N	Polyethylene	Plastic	None	50	23 Page 23-J
32-D221B 2M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} dia.	R4	10	9.8N	PVC	Plastic	None	40	15 Page 15-D 47 Page 47-C
32-D22B 2M	-40 to 70°C	0.2N · m	1.7 ^{+0.5} dia.	R4	10	9.8N	PVC	Plastic	None	30	15 Page 15-A 47 Page 47-A
32-D22R 2M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} dia.	R1	0	9.8N	Polyethylene	Plastic	None	40	15 Page 15-0
32-D22-S1 2M	-40 to 70°C	0.29N · m	4.2 ^{+0.5} dia.	R10	10	9.8N	Polyethylene	Plastic	None	45	23 Page 23-I
32-D24R 2M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} dia.	R1	0	9.8N	Polyethylene	Plastic	None	40	23 Page 23-A
32-D24-S2 2M	-40 to 70°C	0.29N · m	5 ^{+0.5} dia.	R25	10	19.6N	Polyethylene	Plastic	None	55	23 Page 23-B
32-D25XB 2M	-40 to 70°C	0.15N · m	-	R4	10	9.8N	PVC	Plastic	None	40	47 Page 47-F
32-D25XR 2M	-40 to 70°C	0.15N · m	-	R1	0	9.8N	Polyethylene	Plastic	None	40	19 Page 19-E
32-D25YR 2M	-40 to 70°C	0.15N · m	-	R1	0	9.8N	Polyethylene	Plastic	None	40	19 Page 19-D
32-D25ZR 2M	-40 to 70°C	0.15N · m	-	R1	0	9.8N	Polyethylene	Plastic	None	40	19 Page 19-F
:32-D25-S3 2M	-40 to 70°C	0.29N · m	-	R10	10	9.8N	Polyethylene	Plastic	None	50	23 Page 23-L
32-D31-S1 0.5M	-40 to 70°C	0.78N · m	3.2 ^{+0.5} dia. *2	R4	10	9.8N	Polyolefin	Plastic	None	35	23 Page 23-0
32-D32L 2M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} dia.	R25	10	29.4N	Polyethylene	Plastic	Yellow dotted line on emitter cable	50	15 Page (15-E
32-D32-S1 0.5M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} dia.	R4	10	9.8N	Polyolefin	Plastic	None	35	23 Page 23-F
32-D33 2M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} dia.	R25	10	9.8N	Polyethylene	Plastic	None	40	15 Page 15-F 23 Page 23-E
32-D331 2M	-40 to 70°C	0.29N · m	2.2 ^{+0.5} dia.	R4	10	9.8N	Polyethylene	Plastic	None	30	23 Page 23-D
32-D36P1 2M	-40 to 70°C	0.78N · m	-	R4	10	29.4N	Polyethylene	Plastic	None	60	53 Page 53-F
32-D36T 2M	-40 to 70°C	-	-	R4	10	29.4N	Polyethylene	Plastic	None	190	55 Page 55-0
32-D43M 1M	-40 to 70°C	0.29N · m	1.7 ^{+0.5} dia.	R4	10	9.8N	Polyethylene	Plastic	None	30	15 Page 15-E 23 Page 23-0
32-D51 2M	-40 to 150°C *3	0.98N · m	6.2 ^{+0.5} dia.	R35	10	29.4N	Fluororesin	Plastic	None	60	51 Page (51-E
32-D51R 2M	-40 to 100°C *4	0.98N · m	6.2 ^{+0.5} ₀ dia.	R2	0	29.4N	Polyurethane	Plastic	None	60	51 Page 51-A
32-D61-S 2M	−60 to 350°C *5	0.98N · m	6.2 ^{+0.5} dia.	R25	10	29.4N	SUS	Glass	None	190	51 Page 51-I
32-D611-S 2M	−60 to 350°C *5	0.98N · m	4.2 ^{+0.5} ₀ dia.	R25	10	29.4N	SUS	Glass	None	170	51 Page 51-H
:32-D73-S 2M	-40 to 400°C *5	0.78N · m	4.2 ^{+0.5} dia.	R25	10	29.4N	SUS	Glass	None	170	51 Page (51-J
32-D81R-S 2M	-40 to 200°C *5	0.78N · m	6.2 ^{+0.5} ₀ dia.	R10	10	9.8N	Fluororesin	Glass	None	70	51 Page 51-0
32-D82F1 4M	-40 to 200°C	0.29N · m	6.5 ^{+0.5} ₀ dia.	R25	10	29.4N	Fluororesin	Plastic	None	450	55 Page 55- 0
32-DC200BR 2M	-40 to 70°C	0.98N · m	6.2 ^{+0.5} ₀ dia.	R1	0	29.4N	PVC	Plastic	None	60	23 Page 23-k
32-DC200F4R 2M	-40 to 70°C	0.78N · m	3.2 ^{+0.5} dia. *2	R1	0	9.8N	Polyethylene	Plastic	None	40	23 Page 23-F
:32-G16 2M	-40 to 70°C	0.53N · m	-	R5	0 *6	29.4N	Polyethylene	Plastic	-	51	53 Page 53-E
32-L11FP 2M	-10 to 60°C	0.78N · m	-	R40	10	9.8N	Fluororesin	Plastic	None	310	43 Page 43-F 59 Page 59-0
32-L11FS 2M	-10 to 85°C	0.78N · m	-	R40	10	9.8N	Fluororesin	Plastic	None	310	43 Page 43- 6 59 Page 59- H

^{*1} Unbendable length of cable from fiber head.

Do not bend the cable for at least 20 mm from where the cable inserts into the Fiber Amplifier Unit.

Do not bend the cable for at least 20 mm from where the cable his end the characteristic and the characteristic an

Threaded Hex-shaped Cylindrical

> Flat Sleeved

> > Small Spot

High Power Narrow view

BGS

Retro-reflective Limited-

resistant, Oil-resistant

Bending Heat-

resistant Detection

Liquid-level

Vacuum

FPD, Semi.

	Ins	Installation			Cable					Weight	Demensions	
Models	Ambient temperature	Tightening torque	Mounting hole	Bending radius	Unbendable length*1	Tensile strength	Sheath material	Core material	Emitter/receiver differentiation	(packed state) (g)	Page No.	
E32-L15 2M	-40 to 70°C	0.53N · m	-	R25	10	29.4N	Polyethylene	Plastic	White tube on emitter cable	60	25 Page 25-F	
E32-L16-N 2M	-40 to 70°C	0.29N · m	-	R25	10	29.4N	Polyethylene	Plastic	None	60	37 Page 37-A 41 Page 41-B 59 Page 59-A	
E32-L24S 2M	-40 to 70°C	0.29N · m	-	R10	10	9.8N	Polyethylene	Plastic	None	40	37 Page 37-B 41 Page 41-A	
E32-L25L 2M	-40 to 105°C *2	0.29N · m	-	R10	10	9.8N	Polyethylene	Plastic	None	40	37 Page 37-C 41 Page 41-E	
E32-L25T 2M	-40 to 70°C	-	-	R10	10	9.8N	Polyethylene	Plastic	None	40	55 Page (55-B)	
E32-L64 2M	-40 to 300°C *3	0.54N · m	-	R25	0	9.8N	SUS	Glass	None	220	51 Page 51-E	
E32-L86 2M	-40 to 200°C *3	0.54N · m	-	R25	0	9.8N	SUS	Glass	None	205	51 Page (51-F)	
E32-LD11 2M	-40 to 70°C	0.98N · m	-	R25	10	29.4N	Polyethylene	Plastic	None	40	09 Page 09-I	
E32-LD11N 2M	-40 to 70°C	0.98N · m	6.2 ^{+0.5} ₀ dia.	R2	0	29.4N	Polyethylene	Plastic	None	40	11 Page 11-C	
E32-LD11R 2M	-40 to 70°C	0.98N · m	-	R1	0	29.4N	Polyethylene	Plastic	None	40	09 Page 09-I	
E32-LR11NP 2M	–40 to 70°C *4	0.98N · m	6.2 ^{+0.5} ₀ dia.	R2	0	29.4N	Polyethylene	Plastic	None	40	39 Page 39-A 11 Page 11-G	
E32-LT11 2M	-40 to 70°C	0.78N · m	-	R25	10	29.4N	Polyethylene	Plastic	None	40	07 Page 07-C 29 Page 29-C	
E32-LT11N 2M	-40 to 70°C	0.78N · m	4.2 ^{+0.5} ₀ dia.	R2	0	29.4N	Polyethylene	Plastic	None	40	29 Page 29-A 11 Page 11-A	
E32-LT11R 2M	-40 to 70°C	0.78N · m	-	R1	0	29.4N	Polyethylene	Plastic	None	40	07 Page 07-C 29 Page 29-C	
E32-LT35Z 2M	-40 to 70°C	0.15N · m	-	R1	0	9.8N	Polyethylene	Plastic	None	25	17 Page 17-G	
E32-R16 2M	-25 to 55°C	0.54N · m	-	R25	10	29.4N	Polyethylene	Plastic	None	220 (E39-R1 included.)	39 Page 39-B	
E32-R21 2M	-40 to 70°C	0.39N · m	6.2 ^{+0.5} ₀ dia.	R10	10	9.8N	Polyethylene	Plastic	None	70 (E39-R3 included.)	39 Page 39-C	
E32-T10V 2M	−25 to 70°C	0.3N · m	-	R25	10	29.4N	Fluororesin	Plastic	None	170	57 Page 57-D	
E32-T11 2M	-40 to 70°C	0.78N · m	4.2 ^{+0.5} ₀ dia.	R4	10	29.4N	PVC	Plastic	None	40	45 Page 45-C	
E32-T11F 2M	-40 to 70°C	0.29N · m	-	R4	10	29.4N	Fluororesin	Plastic	None	60	43 Page 43-C	
E32-T11N 2M	-40 to 70°C	0.78N · m	4.2 ^{+0.5} ₀ dia.	R1	0	29.4N	PVC	Plastic	None	70	07 Page 07-A 11 Page 11-B	
E32-T11NF 2M	–25 to 70°C	12N · m	8.5 ^{+0.5} ₀ dia.	R1	0	29.4N	Fluororesin	Plastic	None	80	43 Page 43-A	
E32-T11NFS 2M	-25 to 70°C	0.78N · m	4.2 ^{+0.5} dia.	R1	0	29.4N	Fluororesin	Plastic	None	70	43 Page (43-A2)	
E32-T11R 2M	-40 to 70°C	0.78N · m	4.2 ^{+0.5} ₀ dia.	R1	0	29.4N	PVC	Plastic	None	50	07 Page 07-B 11 Page 11-B	
E32-T12F 2M	-40 to 70°C	0.78N · m	5.5 ^{+0.5} ₀ dia.	R40	10	29.4N	Fluororesin	Plastic	None	210	43 Page (43-B)	
E32-T12R 2M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} ₀ dia.	R1	0	29.4N	PVC	Plastic	None	60	13 Page 13-C	
E32-T14 2M	-40 to 70°C	0.49N · m	-	R25	10	29.4N	Polyethylene	Plastic	None	60	29 Page 29-D	
E32-T14F 2M	-40 to 70°C	0.78N · m	5.5 ^{+0.5} ₀ dia.	R40	10	29.4N	Fluororesin	Plastic	None	220	43 Page 43-D	
E32-T14LR 2M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} ₀ dia.	R1	0	29.4N	PVC	Plastic	None	60	13 Page (13-D)	
E32-T15XR 2M	-40 to 70°C	0.15N · m	-	R1	0	29.4N	PVC	Plastic	None	60	17 Page 17-A	
E32-T15YR 2M	-40 to 70°C	0.15N · m	-	R1	0	29.4N	PVC	Plastic	None	60	17 Page 17-C	
E32-T15ZR 2M	-40 to 70°C	0.15N · m	-	R1	0	29.4N	PVC	Plastic	None	60	17 Page 17-E	
E32-T16JR 2M	-40 to 70°C	0.29N · m	-	R1	0	9.8N	PVC	Plastic	None	60	53 Page 53-B	
E32-T16PR 2M	-40 to 70°C	0.29N · m	-	R1	0	9.8N	PVC	Plastic	None	60	53 Page 53-A	
E32-T16WR 2M	−25 to 55°C	0.29N · m	-	R1	0	9.8N	PVC	Plastic	None	60	53 Page 53-D	
E32-T17L 10M	-40 to 70°C	0.78N · m	14.5 ⁺¹ dia.	R25	10	29.4N	Polyethylene	Plastic	None	240	29 Page 29-B	

^{*1} Unbendable length of cable from fiber head.

Do not bend the cable for at least 20 mm from where the cable inserts into the Fiber Amplifier Unit.

*2 For continuous operation, use the Fiber Unit between -40 to 90°C.

*3 The heat-resistant rating is not the same for all parts of the Fiber Unit. Refer to the dimensions diagrams for details.

*4 Ambient operating temperature of the recommended reflector (E39-RP1) is -40 to 60°C.

	Installation Cable									Weight	Demensions
Models	Ambient temperature	Tightening torque	Mounting hole	Bending radius	Unbendable length*1	Tensile strength	Sheath material	Core material	Emitter/receiver differentiation	(packed state) (g)	Page No.
E32-T21 2M	-40 to 70°C	0.78N · m	3.2 ^{+0.5} ₀ dia. *2	R4	10	9.8N	PVC	Plastic	None	30	45 Page 45-B
E32-T21-S1 2M	-40 to 70°C	0.78N · m	3.2 ^{+0.5} ₀ dia. *2	R10	10	9.8N	Polyethylene	Plastic	None	45	21 Page 21-D
E32-T223R 2M	-40 to 70°C	0.20N · m	1.2 ^{+0.5} ₀ dia.	R1	20	9.8N	Polyethylene	Plastic	None	40	13 Page 13-A
E32-T22B 2M	-40 to 70°C	0.20N · m	1.7 ^{+0.5} dia.	R4	10	9.8N	PVC	Plastic	None	40	13 Page 13-B 45 Page 45-A
E32-T22S 2M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} dia.	R10	10	29.4N	PVC	Plastic	None	60	35 Page 35-F
E32-T24E 2M	-40 to 70°C	0.29N · m	2.7 ^{+0.5} dia.	R10	10	9.8N	Polyethylene	Plastic	None	40	21 Page 21-B
E32-T24R 2M	-40 to 70°C	0.29N · m	2.2 ^{+0.5} dia.	R1	0	9.8N	Polyethylene	Plastic	None	40	21 Page 21-A
E32-T24S 2M	-40 to 70°C	0.29N · m	-	R10	10	29.4N	PVC	Plastic	None	60	35 Page 35-E 61 Page 61-H
E32-T24SR 2M	-40 to 70°C	0.29N · m	_	R1	0	9.8N	PVC	Plastic	None	60	35 Page (35-D) 61 Page (61-G)
E32-T25XB 2M	-40 to 70°C	0.15N · m	-	R4	10	9.8N	PVC	Plastic	None	40	45 Page 45-D
E32-T25XR 2M	-40 to 70°C	0.15N · m	_	R1	0	9.8N	Polyethylene	Plastic	None	40	17 Page 17-B
E32-T25YR 2M	-40 to 70°C	0.15N · m	_	R1	0	9.8N	Polyethylene	Plastic	None	40	17 Page 17-D
E32-T25ZR 2M	-40 to 70°C	0.15N · m	_	R1	0	9.8N	Polyethylene	Plastic	None	40	17 Page 17-F
E32-T33 1M	-40 to 70°C	0.29N · m	3.2 ^{+0.5} ₀ dia.	R10	10	9.8N	Polyethylene	Plastic	None	40	21 Page 21-C
E32-T51 2M	-40 to 150°C	0.78N · m	4.2 ^{+0.5} ₀ dia.	R35	10	29.4N	Fluororesin	Plastic	None	70	49 Page 49-B
E32-T51F 2M	-40 to 150°C	0.78N · m	5.5 ^{+0.5} ₀ dia.	R40	10	29.4N	Fluororesin	Plastic	None	220	43 Page 43-E
E32-T51R 2M	-40 to 100°C	0.78N · m	4.2 ^{+0.5} ₀ dia.	R2	0	29.4N	Polyurethane	Plastic	None	60	49 Page 49-A
E32-T51V 1M	-25 to 120°C	0.29N · m	4.2 ^{+0.5} ₀ dia.	R30	10	29.4N	Fluororesin	Glass	None	160	57 Page 57-A
E32-T54 2M	-40 to 150°C	0.29N · m	-	R35	10	29.4N	Fluororesin	Plastic	None	160	49 Page 49-C
E32-T61-S 2M	-60 to 350°C *5	0.78N · m	4.2 ^{+0.5} ₀ dia.	R25	10	29.4N	SUS	Glass	None	200	49 Page 49-G
E32-T64-2 2M	-25 to 300°C *5	0.78N · m	-	R25	10	29.4N	SUS	Glass	None	70	49 Page 49-F
E32-T81R-S 2M	-40 to 200°C *5	0.78N · m	4.2 ^{+0.5} ₀ dia.	R10	10	9.8N	Fluororesin	Glass	None	60	49 Page 49-D
E32-T84SV 1M	-25 to 200°C	0.29N · m	4.5 ^{+0.5} ₀ dia.	R25	10	29.4N	SUS	Glass	None	190	57 Page 57-C
E32-T84S-S 2M	-40 to 200°C *5	0.29N · m	-	R25	10	9.8N	SUS	Glass	None	-	49 Page 49-E
E32-TC200BR 2M	-40 to 70°C	0.78N · m	4.2 ^{+0.5} ₀ dia.	R1	0	29.4N	PVC	Plastic	None	60	21 Page 21-E
E32-VF1	-25 to 70°C	_	_	-	_	_	-	-	-	240	57 Page 57-F
E32-VF4	-25 to 70°C	-	_	-	_	_	-	-	-	280	57 Page 57-E
E39-F1	-40 to 200°C	-	_	_	_	-	-	-	-	2	30 Page 30-A 31 Page 31-A to 31-C 32 Page 32-A 33 Page 33-A to 33-C
E39-F1-33	-40 to 200°C	-	-	-	-	-	-	-	-	3	32 Page 32-D
E39-F11	-	-	-	-	-	-	-	-	-	30	-
E39-F16	-40 to 350°C	-	-	-	-	-	-	-	-	15	30 Page 30-B 31 Page 31-D to 31-F 32 Page 22-B 33 Page 33-D to 33-F, 33-K
E39-F17	–25 to 70°C	-	-	-	-	-	-	-	-	10	25 Page 25-B

^{*1} Unbendable length of cable from fiber head.
Do not bend the cable for at least 20 mm from where the cable inserts into the Fiber Amplifier Unit.

*2 For embedded mounting, prepare a hole with a diameter of 2.6 mm.

*3 For continuous operation, use the Fiber Unit between -40 to 130°C.

*4 For continuous operation, use the Fiber Unit between -40 to 90°C.

*5 The heat-resistant rating is not the same for all parts of the Fiber Unit. Refer to the dimensions diagrams for details.

Threaded Hex-shaped Cylindrical

Flat Sleeved

Small Spot

High Power Narrow view

Retro-reflective

BGS

Limited-

resistant, Oil-resistant

Bending

Heatresistant

Detection

Liquid-level

Vacuum

FPD, Semi, Solar

	Ins	tallation					Cable			Weight	Demensions
Models	Ambient temperature	Tightening torque	Mounting hole	Bending radius	Unbendable length*1	Tensile strength	Sheath material	Core material	Emitter/receiver differentiation	(packed state) (g)	Page No.
E39-F18	-40 to 70°C	-	-	-	-	-	-	-	-	5	27 Page 27-G), 27-H
E39-F1V	-25 to 120°C	-	-	-	-	-	-	-	-	3	57 Page (57-B)
E39-F2	-40 to 200°C	-	-	-	-	-	-	-	-	2	30 Page 30-C 31 Page 31-G), 31-H) 32 Page 32-C 33 Page 33-G to 33-I
E39-F32A 1M	-40 to 150°C	-	-	R30	-	-	-	-	-	70	47 Page 47-G
E39-F32C 1M	-40 to 150°C	-	-	R30	-	-	-	-	-	110	45 Page 45-E 47 Page 47-G
E39-F32D 1M	-40 to 150°C	-	-	R30	-	-	-	-	-	80	47 Page 47-G
E39-F3A	-40 to 70°C	-	-	-	-	-	-	-	-	2	25 Page 25-A
E39-F3A-5	-40 to 70°C	-	-	-	-	-	-	-	-	1	27 Page 27-A, 27-B, 27-C
E39-F3B	−25 to 55°C	-	-	-	-	-	-	-	-	2	27 Page 27-D, 27-E, 27-F
E39-F3C	–25 to 55°C	-	-	-	-	-	-	-	-	1	25 Page (25-C), (25-D)
E39-R1	–25 to 55°C	-	-	-	-	-	-	-	-	20	39 Page 39-B
E39-R3	–25 to 55°C	-	-	-	-	-	-	-	-	20	39 Page 39-C
E39-RP1	-40 to 60°C	-	-	-	-	-	-	-	-	25	39 Page 39-A 11 Page 11-G
E39-RP37	−25 to 55°C	-	-	-	-	-	-	-	-	4	-
E39-RSP1	−25 to 55°C	-	-	-	-	-	-	-	-	4	-

^{*1} Unbendable length of cable from fiber head.

Do not bend the cable for at least 20 mm from where the cable inserts into the Fiber Amplifier Unit.

Small Spot

High Power
Narrow

view

Retroreflective

Chemicalresistant, Oil-resistant

I-resistant Bending

Heatresistant

Area Detection

Liquid-level

Vacuum

FPD, Semi, Solar

Installation Information

Fiber Ampliners, Communications Unit, and

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del Index

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iber Units

Threaded
Hex-shaped

Cylindrical Flat

Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limitedreflective

Chemicalresistant, Oil-resistant

Bending

Heatresistant

Area Detection

Liquid-level

Vacuum

FPD, Semi, Solar

Installation Information

Fiber Amplifiers, Communications Unit, and Accessories

Technical Suide and Precautions

Model Index

Smart Fiber Amplifier Units

Main Features

E3NX-FA Series

A Smart Fiber Amplifier Unit with Ultra-stable Detection and Ultra-easy Setup

Expanded Application Response Capabilities Advanced Basic Performance

Improvements in the sensing distance and minimum sensing object have increased the range of application for stable detection.





*Compared to E3X-ZV

Achieve Easy Detection in Many Applications

Advanced Smart Tuning

Just press the GTUNE button once with a workpiece and once without a workpiece to automatically set the optimum incident level and threshold. Consistent settings are achieved for all users with this ultra-easy procedure.





Optimum Light Intensity Adjustment from Transparent Objects to Black Workpieces

EtherCAT.

CC-Link V2

The incident level is optimized to enable stable detection even for saturated or insufficient incident levels.



70

Sensor Communications Units for E3NX-FA

E3NW Series

The Next-generation E3NW Sensor Network Units Revolutionize On-site Sensing

The Sensor Communications Unit with a master function and the Distributed Sensor Units with slave functions enable N-Smart Sensors communication over open networks.



Greatly Reduced Machine Manufacturing Costs

There is no need to change the current distributed installation to introduce a network without increasing costs.

Greatly Reduced Machine Commissioning Time

All of the settings can be made at the same time from a Touch Panel.

Greatly Improved Machine Productivity

Realtime monitoring lets you perform maintenance before malfunctions occur.

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iber Sensor

selection Suide

Fiber Units

Threaded Hex-shaped

Cylindrical

Flat

Small Spot

Sleeved

High Power

Narrow view

BGS

reflective Limited-

Chemical-

resistant, Oil-resistant

resistant

Detection
Liquid-level

Vacuum FPD,

Semi.

Solar Installation

iber Amplifiers, ommunications nit, and

> chnical ide and ecautions

> > lodel Index

Smart Fiber Amplifier Units

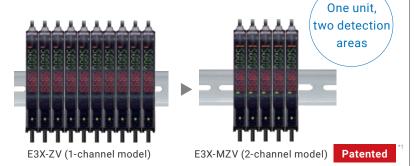
E3X-ZV Series

Affordable Amplifier Units with Simple Operation and Stable Detection Capabilities



2-channel model option to attain the ultimate cost reduction

The 2-channel model equipped with amplifier functions for two fiber amplifier units enables substantial purchase cost reduction since the required number of units is halved. Furthermore, it greatly contributes to the downsizing of equipment and control panel in addition to allowing substantial reduction in wiring workload and power consumption.



Note: Refer to E3X-ZV/MZV Catalog (Cat. No. E600).

*1. "Patent pending or Patented" indication means patent is pending or is patented in Japan. (As of February 2021.)

<Fiber Amplifier Unit Comparison>

			E3X-ZV Series	E3NX-FA Series		
	Output		1 output	1 or 2 outputs (depending on the model)		
	External input		Not supported	Supported or not supported (depending on the model)		
Fiber Amplifier	Response time		50 μs /250 μs/1 ms/16 ms (Default: 250 μs)	30 μs (32 μs)/250 μs/1 ms/16 ms (Default: 250 μs)		
Unit specifications	Sensing distance (Giga-power mode)	E32-T11R	2,000 mm	3,000 mm		
		E32-D11R	840 mm	1,260 mm		
	Minimum sensing object	E32-T11R	5 μm dia.	2 μm dia.		
Sensor Communications	Communications method (Sensor Communications Unit model)		_	EtherCAT (E3NW-ECT) CC-Link (E3NW-CCL)		
Unit application	Applicable Sens	sors	_	Fiber Sensor (E3NX-FA0/FA10/FA40/FAH0) Laser Sensors (E3NC-LA0, E3NC-SA0) Contact-Type Sensor (E9NC-TA0)*		
	Ordering Inform	nation	86 Page	70 Page		
Page listings	Ratings and Sp	ecifications	88 Page	72 Page		
· ·	Dimensions		89 Page	76 Page		

Note. The sensing distances for the E3NX-FA are values for E3NX-FA devices. The distance for E3NX-FAH infrared models varies.

Fiber Amplifier Unit Accessories

Hex-shaped Cylindrical Flat

Sleeved **Small Spot High Power** Narrow

BGS Retro-reflective

view

Limited-

Oil-resistant Bendina Heatresistant

Liquid-level

Detection

Vacuum FPD, Semi.

E3NX-FA Fiber Amplifier Units and Related Products

Fiber Amplifier Units E3NX-FA Series

E3NX-FA Series Products

	_		Inputs/	Мо	dels	Ratings and		
Туре	Appearance	Connecting method	outputs	NPN output	PNP output	Specifications	Dimensions	
				E3NX-FA11 2M	E3NX-FA41 2M		Page 76	
Standard		Pre-wired (2 m)	1 output	E3NX-FA11-5 2M *1	_	-	76-A	
models		Wire-saving Connector	1 output	E3NX-FA6	E3NX-FA8		Page 76 76-B	
		Pre-wired (2 m)	2 outputs + 1 input	E3NX-FA21 2M	E3NX-FA51 2M		Page 76 76-A	
Advanced			1 output + 1 input	E3NX-FA7	E3NX-FA9	Page 72	Page 76	
models		Wire-saving Connector	2 outputs	E3NX-FA7TW	E3NX-FA9TW		76-B	
			1 output + 1 input	E3NX-FA24	E3NX-FA54		Page 77	
	88	M8 Connector	2 outputs	_	E3NX-FA54TW	-	77-A	
Infrared models		Pre-wired (2 m)	1 output	E3NX-FAH11 2M	E3NX-FAH41 2M		Page 76 76-A	
		Wire-saving Connector	1 output	E3NX-FAH6 E3NX-FAH6			Page 76 76-B	
Analog output models		Pre-wired (2 m)	2 output	E3NX-FA11AN 2M	E3NX-FA41AN 2M		Page 76 76-A	
		Connector for Sensor		E3NX-FA0			Page 77	
Model for Sensor		Communications Unit	_	E3NX-FAH0		Page 74	77-B	
Communications Unit *2		Connector for Sensor Communications Unit Pre-wired (2 m)	1 output	E3NX-FA10 2M	E3NX-FA40 2M		Page 77 77-B	

Sensor Communications Unit

Sensor Communications Unit

ochsor communications out										
Communication method	Appearance	Applicable Fiber Amplifier Model	Model	Ratings and Specifications	Dimensions					
EtherCAT		E3NX-FA0 E3NX-FA10	E3NW-ECT	Page 84	Page 85 85-A					
CC-Link		E3NX-FA40 E3NX-FAH0	E3NW-CCL	*1	*1					

^{*1.} For details, refer to your OMRON website.

^{*1.} This type can prevent mutual interference for two units in the SHS2 mode.
*2. A Sensor Communications Unit is required if you want to use the Fiber Amplifier Unit on a network.

Note. The sensing distances for E3NX-FA in this catalog are values for E3NX-FA models. The distances for E3NX-FAH infrared models are different.

Distributed Sensor Unit

Appearance	Applicable Fiber Amplifier Model	Model	Ratings and Specifications	Dimensions
	E3NX-FA0	E3NW-DS	Page 84	Page 85 85-B

Note. The Distributed Sensor Unit can be connected to any of the Sensor Communications Units.

Use the following DS-Bus communication cable (recommended) when connecting a sensor communications unit and a distributed sensor unit.

Item	Manufacturer	Model
Communication cable	BANDO DENSEN Co., Ltd.	ESVC 0.5X2C, black

Connector cover for Sensor Communications Unit and Distributed Sensor Unit (provided)

Order a Cover when required, e.g., if you lose the covers.

Model	
E39-G27	

Accessories (sold separately)

Wire-saving connectors (Required for models for Wire-saving Connectors.)

Connectors are not provided with the Fiber Amplifier Unit and must be ordered separately. * Protective stickers: provided.

Туре	Appearance	Cable length	Number of conductors	Applicable Fiber Amplifier Units	Models	Ratings, Specifications and Dimensions
Master Connector			4	E3NX-FA7 E3NX-FA7TW	E3X-CN21	Page 94 94-A
Slave Connector	*	- 2 m	2	E3NX-FA9 E3NX-FA9TW	E3X-CN22	Page 94 94-B
Master Connector			3	E3NX-FA6 E3NX-FA8	E3X-CN11	Page 94 94-A
Slave Connector			1	E3NX-FAH6 E3NX-FAH8	E3X-CN12	Page 94 94-B

Sensor I/O Connectors (Required for models with M8 Connectors.)

Connectors are not provided with the Fiber Amplifier Unit and must be ordered separately. * Protective stickers: provided.

Appearance	Cable length	Number of conductors	Models	Ratings and Specifications	Dimensions
Straight	2 m		XS3F-M421-402-A		Page 94
	5 m	_	XS3F-M421-405-A	5	94-C
L-shaped	2 m	4	4		Page 94
	5 m		XS3F-M422-405-A		94-D

Mounting Bracket

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

Appearance	Model	Quantity	Dimensions
	E39-L143	1	Page 95 95-A

DIN Track

A Din Track is not provided with the Fiber Amplifier Unit and must be ordered separately as required.

Appearance	Туре	Models	Quantity	Dimensions
	Shallow type, total length: 1 m	PFP-100N		Page 95
	Shallow type, total length: 0.5 m	PFP-50N	1	95-B
	Deep type, total length: 1 m	PFP-100N2		Page 95 95-C

End Plate

Two End Plates are provided with the Sensor Communications Unit. End Plates are not provided with the Fiber Amplifier Unit and must be ordered separately as required.

Appearance	Model	Quantity	Dimensions
	PFP-M	1	Page 95 95-D

Cover

Attach these Covers to Amplifier Units.

Order a Cover when required, e.g., if you lose the covers.

Appearance	Model	Quantity
	E39-G25 FOR E3NX-FA	1

iber Senso eatures

selectio Auide

Fiber Units

Threaded Hex-shaped

Cylindrical

Flat Sleeved

Small Spot

High Power

Narrow view

Retroreflective

BGS

Limitedreflective

Chemicalresistant, Oil-resistant

> Heatresistant

Area Detection

Liquid-level

FPD, Semi.

Solar

Installation Information

Fiber Amplifiers, Communications Unit, and

> Technical Suide and Precautions

> > lodel Inde

Hex-shaned Cylindrical

Flat

Sleeved

Small Spot High Power

Narrow view BGS

reflective Limited-

Oil-resistant

Heatresistant

Bendina

Detection

Liquid-level

Vacuum FPD, Semi Solar

Ratings and Specifications

Standard models/ Advanced models/ Infrared models

Standa	rd models	/ Advanc	ed mode	els/ Infra	red mod	els					
	Type Standard models Advanced models				Infrared models						
	NPN output	E3NX-FA11	E3NX-FA6	E3NX-FA11-5 *1	E3NX-FA21	E3NX-FA7	E3NX-FA7TW	E3NX-FA24	_	E3NX-FAH11	E3NX-FAH6
	PNP output	E3NX-FA41	E3NX-FA8	_	E3NX-FA51	E3NX-FA9	E3NX-FA9TW	E3NX-FA54	E3NX-FA54TW	E3NX-FAH41	E3NX-FAH8
Item	Connecting method	Pre-wired	Wire-saving Connector	Pre-wired	Pre-wired	Wire-savin	g Connector	M8 Coi	nector	Pre-wired	Wire-saving Connector
Inputs/	Outputs	1 output			2 outputs	1 output	2 outputs	1 output	2 outputs	1 outputs	
outputs	External inputs	_			1 input	1 input	_	1 input	_	_	
Light source	ce (wavelength)	Red, 4-eleme	ent LED (625 i	nm)				Infrared LED (870n			(870nm)
Power sup	ply voltage	10 to 30 VDC	, including 10	% ripple (p-p)	_						
At Power supply voltage of 24 VDC Standard Models: Normal mode : 840 mW max. (Cu Eco function ON: 650 mW max. (Cu Eco function LO: 750 mW max. (Cu Advanced Models or Model for Sens Normal mode : 920 mW max. (Cu Eco function ON: 680 mW max. (Cu Eco function LO: 800 mW max. (Cu Infrared models: Normal mode : 1,080 mW max. (Cu Eco function ON: 920 mW max. (Cu Eco function ON: 920 mW max. (Cu Eco function LO: 1020 mW max. (Cu			max. (Currer max.	at consumption to consumption communication at consumption at consumption at consumption ent consumption to consumption ent consumption	n at 27 mA ma n at 31 mA ma ns Unit: n at 38 mA ma n at 28 mA ma n at 33 mA ma on at 45 mA m n at 38 mA ma on at 42 mA m	ax.) ax.) ax.) ax.) ax.) ax.) ax.) ax.)					
	Load power supply voltage: 30 VDC max., open-collector output (depends on the NPN/PNP output format) Load current: Groups of 1 to 3 Amplifier Units: 100 mA max., Groups of 4 to 30 Amplifier Units: 20 mA max. (Residual voltage: At load current of less than 10 mA: 1 V max., At load current of 10 to 100 mA: 2 V max.) OFF current: 0.1 mA max.										
External in	puts	_			Refer to *3.		-	Refer to *3.	_		
Indicators		Display direc	tion: Switchab r (orange), L/l	ole between no D indicator (or	green, Main d ormal and reve ange), ST indi y on models v	ersed. cator (blue), [OPC indicator	(green),			
Protection	circuits	Power supply reverse polarity protection, output short-circuit protection, and output reverse polarity protection									
	Super-high- speed mode (SHS)							utputs: 32 ms			
Response time	High-speed mode (HS)	Operate or re	eset: 250 ms								
	Standard mode (Stnd)	Operate or re	eset: 1 ms								
	Giga-power mode (GIGA)	Operate or reset: 16 ms									
Sensitivity adjustment Smart Tuning (2-point tuning, full auto tupercentage tuning (-99% to 99%)) or ma			uning, position tuning, maximum sensitivity tuning, power tuning, or anual adjustment								
Maximum connectable Units 30											
Super-high- speed mode No. of Units (SHS)											
for mutual interference	High-speed mode (HS)	10									
prevention *4	Standard mode (Stnd)	e (Stnd) 10 Power 10									
	Giga-power mode (GIGA)										
+4 This has a	This has an appropriate with all interference for this in the CLICO mode.										

*1. This type can prevent mutual interference for two units in the SHS2 mode. *2. At Power supply voltage of 10 to 30 VDC

Standard Models:

Normal mode : 990 mW max. (Current consumption: 33 mA max. at 30 VDC, 65 mA max. at 10 VDC)
Eco function ON: 780 mW max. (Current consumption: 26 mA max. at 30 VDC, 42 mA max. at 10 VDC)
Eco function LO: 840 mW max. (Current consumption: 28 mA max. at 30 VDC, 45 mA max. at 10 VDC)

Advanced Models:

Normal mode : 1,020 mW max. (Current consumption: 34 mA max. at 30 VDC, 67 mA max. at 10 VDC) Eco function ON: 810 mW max. (Current consumption: 27 mA max. at 30 VDC, 44 mA max. at 10 VDC) Eco function LO: 870 mW max. (Current consumption: 29 mA max. at 30 VDC, 48 mA max. at 10 VDC)

Normal mode : 1,260 mW max. (Current consumption: 42 mA max. at 30 VDC, 80 mA max. at 10 VDC) Eco function ON: 1,050 mW max. (Current consumption: 35 mA max. at 30 VDC, 60 mA max. at 10 VDC) Eco function LO: 1,140 mW max. (Current consumption: 38 mA max. at 30 VDC, 70 mA max. at 10 VDC) *3. The following details apply to the input.

į	Contact input (relay or switch)	Non-contact input (transistor)	Input time *3-1
		ON: 1.5 V max. (Sourcing current: 1 mA max.) OFF: Vcc - 1.5 V to Vcc (Leakage current: 0.1 mA max.)	ON: 9 ms min.
		ON: Vcc - 1.5 V to Vcc (Sinking current: 3 mA max.) OFF: 1.5 V max. (Leakage current: 0.1 mA max.)	OFF: 20 ms min.

^{*3-1.} Input time is 25 ms (ON)/(OFF) only when (in tUnE) or (in PtUn) input is selected.
*4. When the Super High Speed mode (SHS) is set, mutual interference prevention is disabled (2 units for E3NX-FA11-5).

E3NX-FA9 E3NX-FA9TW

Wire-saving Connector

Advanced models

F3NX-FA7 F3NX-FA7TW F3NX-FA24

Select from

normal

output

detection

mode, alarm

mode, error

output mode

or differential

detection

mode

E3NX-FA54 E3NX-FA54TW

M8 Connector

Select from

normal

output

detection

mode, alarm

mode, error

output mode

or differential

detection

mode

Select from input OFF. tuning,

power

tuning

emission

OFF, zero reset, or bank switching.

OFF, Sensor

Approx. 65 g/approx. 25 g

220

Infrared models

E3NX-FAH11 E3NX-FAH6

Select from ON or OFF. Select from normal

detection mode or area detection mode

Approx. 115 g/ Approx. 60g/

approx. 20g

approx. 75 g

202

E3NX-FAH8

Connector

E3NX-FAH41

Fiber Ser	
Selection	
Fiber Units	
Threaded	al lati on
Hex-shaped	ard Insta
Cylindrical	Standa
Flat	Space
Sleeved	Savinç
Small Spot	ıts
High Power	proveme
Narrow view	Beam Im
BGS	
Retro- reflective	ent Objects
Limited- reflective	Transpar
Chemical- resistant, Oil-resistant	mmunity
Bending	ımental I
Heat- resistant	Enviro
Area Detection	
Liquid-level	ications
Vacuum	Appli
FPD, Semi, Solar	
Installa Informa	tion ition
mplifiers, nications	ries

Accessories	Instruction Manual
*5. The bank is not reset by the	e user reset function or saved by the user save function.

Polycarbonate (PC) Polycarbonate (PC)

*6. Eco LO is supported for Amplifier Units manufactured in July 2014 or later.

PVC

231

2,000 m max

Pollution degree 3

20 MW min. (at 500 VDC)

1,000 VAC at 50/60 Hz for 1 min

228

Standard models

E3NX-FA8

Connector

E3NX-FA6 E3NX-FA11-5 *1

Pre-wired

Negative values can be displayed. (Threshold value is shifted.)

Select from ON, OFF or Execution on power-up.

Select from initial reset (factory defaults) or user reset (saved settings).

E3NX-FA21

E3NX-FA51

Pre-wired

Select from timer disabled, OFF-delay, ON-delay, one-shot, or ON-delay + OFF-delay timer: 1 to 9,999 ms

Select from OFF (digital display lit), Eco ON (digital display not lit), and Eco LO (digital display dimmed).

Select from normal detection mode, area detection mode or differential detection mode.

Select from

normal

output

detection

mode, alarm

mode, error

output mode

or differential

Select from input OFF,

tuning, power tuning,

emission OFF, Sensor

OFF, zero reset, or bank

Select from standard setting or user setting. For a user setting, the hysteresis width can be set from 0 to 9,999.

Operating and storage: 35 to 85% (with no condensation) within the surrounding air temperature range shown above

Approx. 60g/approx. 20g

detection

switching.

10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions

approx. 75 g

Incandescent lamp: 20,000 lx max., Sunlight: 30,000 lx max.

Groups of 1 or 2 Amplifier Units: -25 to 55°C, Groups of 3 to 10 Amplifier Units: -25 to 50°C,

Groups of 11 to 16 Amplifier Units: -25 to 45°C, Groups of 17 to 30 Amplifier Units: -25 to 40°C Storage: -30 to 70°C (with no icing or condensation)

500 m/s² for 3 times each in X, Y, and Z directions

approx. 75 g approx. 20g approx. 75 g

Approx. 115 g/ Approx. 60g/ Approx. 115 g/ Approx. 115 g/

223

mode.

E3NX-FA11

E3NX-FA41

Pre-wired

Always enabled

Select from banks 1 to 4.

NPN output

PNP output

method

Automatic power

control (APC) Dynamic power control (DPC)

Timer Zero reset

Resetting

Output 1

Output 2

External input

Hysteresis width

Ambient illumination

Ambient temperature

Ambient humidity range

Installation environment

Case

Cover

Insulation resistance

Dielectric strength

(destruction) Shock resistance

(destruction) Weight (packed state/

Sensor only)

MTTFd (Year)

Materials

Vibration resistance

(Receiver side)

range *7

Functions

settings *5

Eco mode *6 Bank switching

Item

^{*7.} When the number of connected units is 11 or more, the ambient temperature is less than 50°C.

Fiber Amplifiers, Communications Unit and Accessories

Hex-shaped

Cylindrical

Flat Sleeved **Small Spot**

High Power Narrow view

BGS

Retro-reflective Limited-

resistant, Oil-resistant Bendina

resistant

Liquid-level

Detection

FPD, Semi. Solar

Vacuum

Analog output models/ Model for Sensor Communications Unit

	Туре	Analog output models	Mod	Model for Sensor Communications Unit			
	NPN output	utput E3NX-FA11AN E3NX-FA10		ESNY FAO ESNY FAUO			
	PNP output	PNP output E3NX-FA41AN		E3NX-FA40	E3NX-FA0	E3NX-FAH0	
tem	Connecting method	Pre-wired	Connector for Sensor Communications Unit Pre-wired	Connector for Sensor Communications Unit			
nputs/	Outputs	2 outputs	1 output	- <u>*</u> 1			
utputs	External inputs	-	_				
ight sour	ce (wavelength)	Red, 4-element LED (625 nm)			Infrared LED (870nm)		
ower sup	pply voltage	10 to 30 VDC, including 10% ripple (p-p)	Supplied from the connector thro	ough the communication units.			
Power consumption *2		At Power supply voltage of 24 VDC Normal mode: 960 mW max. (Current consumption at 40 mA max.) Eco function ON: 770 mW max. (Current consumption at 32 mA max.) Eco function LO: 870 mW max. (Current consumption at 36 mA max.)	At Power supply voltage of 24 VDC Normal mode : 920 mW max. (Current consumption at 38 mA max.) Eco function ON: 680 mW max. (Current consumption at 26 mA max.) Eco function LO : 800 mW max. (Current consumption at 33 mA max.) Eco function LO : 1,0(Current consumption at 26 mA max.) Eco function LO : 800 mW max. (Current consumption at 33 mA max.)				
Control output		Load power supply voltage: 30 VDC max., open-collector out (depends on the NPN/PNP outpt Load current: Groups of 1 to 3 Al Groups of 4 to 30 Amplifier Units (Residual voltage: At load curren At load current OFF current: 0.1 mA max.	.t format) mplifier Units: 100 mA max., :20 mA max.	_			
Analog output (reference value)		Voltage output: 1-5 VDC (10 kW or more connected load), temperature characteristics: 0.3% F.S. / °C	_				
ndicators		7-segment displays (Sub digital display: green, Main digital display: white) Display direction: Switchable between normal and reversed. OUT indicator (orange), L/D indicator (orange), ST indicator (blue), DPC indicator (green), and OUT selection indicator (orange, only on models with 2 outputs)					
Protection	circuits	Power supply reverse polarity pro output short-circuit protection, an protection		Power supply reverse polarity protection	protection and output short-circuit		
	Super-high-speed mode (SHS)	Operate or reset: 80 ms	Operate or reset: 32 ms				
Control output	High-speed mode (HS)	Operate or reset: 250ms	Operate or reset: 250 ms				
Response ime	(Stnd)	Operate or reset: 1 ms	Operate or reset: 1 ms				
	Giga-power mode (GIGA)	Operate or reset: 16 ms Operate or reset: 16 ms					
Sensitivity	adjustment	Smart Tuning (2-point tuning, full percentage tuning (-99% to 99%)	auto tuning, position tuning, max)) or manual adjustment		tuning,		
Maximum connectable Units		30	With E3NW-ECT: 30 units (When connected to an OMRON NJ-series Controller.) With E3NW-CRT: 16 units (Note: E3NX-FAH0 can not be connected.) With E3NW-CCL: 16 units				
	Super-high-speed mode (SHS)	0 (The mutual interference preve	ntion function is disabled if the de	etection mode is set to super-hiç	gh-speed mode.)		
lo. of Units or mutual nterference	High-speed mode (HS)	10					
nterrerence prevention *3	Standard mode (Stnd)	10					
·	Giga-power mode (GIGA)	10					

*1. Two sensor outputs are allocated in the programmable logic controller PLC I/O table.

PLC operation via Communications Unit enables reading detected values and changing settings. *2. At Power supply voltage of 10 to 30 VDC

Analog output models:

Normal mode : 1,080 mW max. (Current consumption: 36 mA max. at 30 VDC, 75 mA max. at 10 VDC) Eco function ON: 840 mW max. (Current consumption: 28 mA max. at 30 VDC, 55 mA max. at 10 VDC) Eco function LO: 960 mW max. (Current consumption: 26 mA max. at 30 VDC, 55 mA max. at 10 VDC)

*3. The tuning will not change the number of units.

The least unit count among the mutual interference prevention units of E3NX and E3NC.

Check the mutual interference prevention unit count and response speed of each model.

Limited-

	Туре	Analog output models	Мо	del for Sensor Communication	ns Unit				
	NPN output	E3NX-FA11AN	E3NX-FA10	FONLY FAO	FONY FALIO				
	PNP output	E3NX-FA41AN	E3NX-FA40	E3NX-FA0	E3NX-FAH0				
em	Connecting method	Pre-wired	Connector for Sensor Communications Unit Pre-wired	Connector for Sens	or Communications Unit				
	Automatic power control (APC)	Always enabled.							
	Dynamic power control (DPC)	Provided							
	Timer	Select from timer disabled, OFF-delay, ON-delay, one-shot, or ON-delay + OFF-delay timer: 1 to 9,999 ms							
	Zero reset	Negative values can be displaye	d. (Threshold value is shifted.)						
	Resetting settings *4	Select from initial reset (factory of	defaults) or user reset (saved sett	ings).					
···nationa	Eco mode	Select from OFF (digital display I	lit), Eco ON (digital display not lit)	, and Eco LO (digital display dim	med).				
unctions	Bank switching	Select from banks 1 to 4.							
	Sensor OFF setting	_		Select from ON or OFF.	_				
	Power tuning	Select from ON or OFF.							
	Output 1	Select from normal detection mo	de, area detection mode or differ	ential detection mode (E3NX-FA	10/40 only).				
	Output 2	Select from Analog scaling or Analog offset.	_	Select from normal detection in alarm output mode, error output or differential detection mode (ıt mode				
	Hysteresis width	Select from standard setting or user setting. For a user setting, the hysteresis width can be set from 0 to 9,999.							
Ambient il Receiver	lumination side)	Incandescent lamp: 20,000 lx max., Sunlight: 30,000 lx max.							
Ambient temperature range		Operating: Groups of 1 or 2 Amplifier Units: -25 to 55°C, Groups of 3 to 10 Amplifier Units: -25 to 50°C, Groups of 11 to 16 Amplifier Units: -25 to 45°C, Groups of 17 to 30 Amplifier Units: -25 to 40°C Storage: -30 to 70°C (with no icing or condensation)	Operating: Groups of 1 or 2 Amplifier Units: 0 to 55°C, Groups of 3 to 10 Amplifier Units: 0 to 50°C, Groups of 11 to 16 Amplifier Units: 0 to 45°C Storage: -30 to 70°C (with no icing or condensation)	°C, o 10 Amplifier °C, to 16 Amplifier °C, to 16 Amplifier °C °C Storage: -30 to 70°C Groups of 1 or 2 Amplifier Units: 0 to 55°C, Groups of 3 to 10 Amplifier Units: 0 to 50°C, Groups of 11 to 16 Amplifier Units: 0 to 45°C, Groups of 17 to 30 Amplifier Units: 0 to 40°C Storage: -30 to 70°C (with no icing or condensation)					
mhient h	umidity range	-	⊥ % (with no condensation) within the	ne surrounding air temperature r	ange shown above				
Altitude	and the same	2,000 m max.	with the second s						
	n environment	Pollution degree 3							
	resistance	20 MW min. (at 500 VDC)							
Dielectric		1,000 VAC at 50/60 Hz for 1 min							
	resistance	1,000 VAC at 50/60 Hz for 1 min 10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions							
Shock residestruction	istance	500 m/s ² for 3 times each in X, Y, and Z directions	150 m/s ² for 3 times each in X,	, and Z directions					
Veight packed st	ate/Sensor only)	Approx. 115 g/approx. 75 g	Approx. 95 g/approx. 45 g	Approx. 65 g/approx. 25 g	Approx. 65 g/approx. 25 g				
	Case	Polycarbonate (PC)							
/laterials	Cover	Polycarbonate (PC)							
	Cable	PVC							
/ITTFd (Ye	ear)	214	_						
Accessori		Instruction Manual							

^{*5.} When the number of connected units is 11 or more, the ambient temperature is less than 50°C.

Threaded Hex-shaned Cylindrical

Sleeved

Flat

Small Spot

High Power Narrow view

Retroreflective Limited-

BGS

reflective resistant. Oil-resistant

Heatresistant

Bendina

Detection

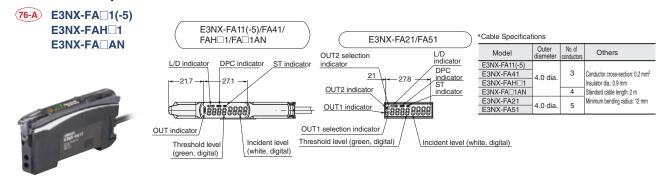
Liquid-level

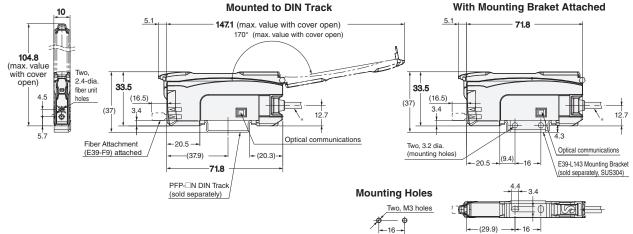
Vacuum FPD, Semi. Solar

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

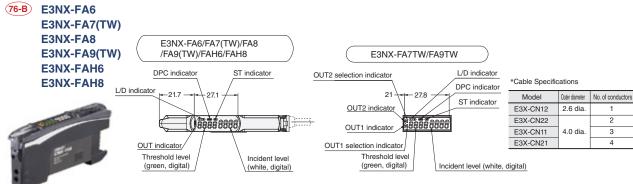
Pre-wired Amplifier Units

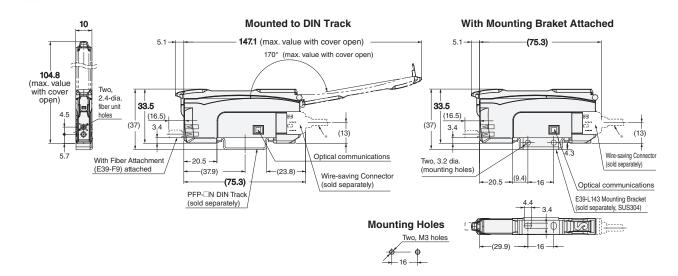
Dimensions





Amplifier Units with Wire-saving Connectors





Cylindrical

Flat Sleeved

Small Spot

High Power

Narrow view BGS

Retroreflective

Limitedreflective

Chemicalresistant, Oil-resistant

> Bending Heatresistant

Area Detection

Liquid-level

Vacuum FPD, Semi.

Solar

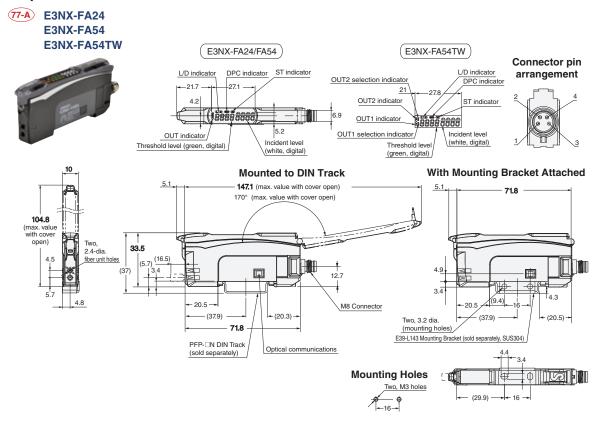
Installation Information

Fiber Amplifiers, Communications Juit, and

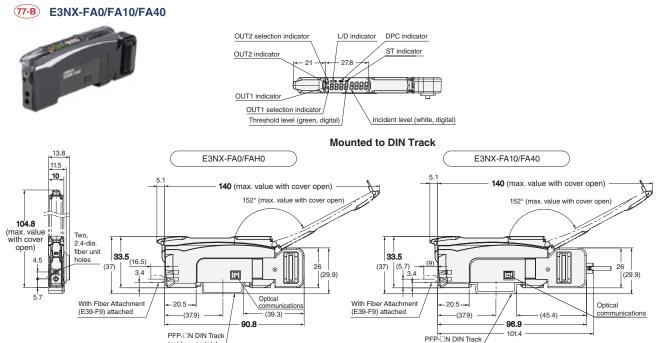
> chnical ide and ecautions

> > lodel Index

Amplifier Units with M8 Connector



Amplifier Unit with Connector for Sensor Communications Unit



(sold separately)

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Fiber Amplifiers, Communications Unit and Accessories

E3NX-FA

iber Sensor eatures

Selection Guide

Fiber Units

Threaded
Hex-shaped
Cylindrical
Flat
Flat

Small Spot
High Power

Sleeved

Narrow view BGS

Retroreflective Limitedreflective

Chemicalresistant, Oil-resistant

Heatresistant

Detection

Liquid-level

Vacuum FPD,

nstallation nformation

Semi, Solar

-iber Amplifiers, Communications Jnit, and Accessories

> econical Juide and Precautions

> > Model Index

I/O Circuit Diagrams

NPN Output

Models	Operation mode	Timing chart	L/D indicators	Output circuit
E3NX-FA11 E3NX-FA6 E3NX-FA11-5	Light-ON	Incident light No incident light OUT indicator (orange) Not lit Output ON transistor Load (e.g., relay) Reset (Between brown and black leads)	L lit.	Display OUT indicator (orange) Brown Black Photoelectric Photoelectric
E3NX-FAH11 E3NX-FAH6	Dark-ON	Incident light No incident light OUT indicator (orange) Not lit Output ON transistor OFF Load (e.g., relay) Reset (Between brown and black leads)	D lit.	Photoeletric Sensor main circuit Blue
	Light-ON	ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Set (e.g., relay) Reset (Between brown and black (orange) leads)	L/lit.	Display OUT1 indicator OUT2 indicator (orange)
E3NX-FA21	Dark-ON	ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Set (e.g., relay) Reset (Between brown and black (orange) leads)	D lit.	Photoelectric Sensor main circuit A Control output Pink ch2 External Blue intput
E3NX-FA7	Light-ON	Incident light No incident light OUT indicator (orange) Not lit Output ON transistor Load Set (e.g., relay) Reset (Between brown and black leads)	L/lit.	Display OUT indicator (orange) Brown Black Control output To to 30 TVDC Orange
E3NX-FA24	Dark-ON	Incident light No incident light OUT indicator (orange) Not lit Output ON transistor Load (e.g., relay) Reset (Between brown and black leads)	D lit.	M8 Connector Pin Arrangement ① ③ ① ① ③ ① ③ ② ④ ① ③ ② ④ ② ③ ④ ③ ③ ③ ③ ④ ③ ④ ③ ④ ③ ④ ③ ④ ③ ④ ③ ④ ③ ④ ③ ④ ③ ④ ③ ④
	Light-ON	ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Set (e.g., relay) Reset (Between brown and black (orange) leads)	L lit.	Display OUT1 indicator OUT2 indicator (orange) Brown CO CO Control output Load Orange ch1 10 to 30
E3NX-FA7TW	Dark-ON	ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Set (e.g., relay) Reset (Between brown and black (orange) leads)	D lit.	Photoelectric Sensor main circuit Photoelectric Photoelec
E3NX-FA11AN	Light-ON	Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black leads)	L lit.	Display OUT indicator (orange) Brown Black Control output T 20 VDC
	Dark-ON	Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black leads)	D lit.	Orange Analog output Load 10kΩ min.

Note. For E3NX-FA6/ FA7/ FA8/ FA9/ FA7TW/ FA9TW/ FAH6/ FAH8, diagram with optional wire-saving connector.

PNP Output

Models	Operation mode	Timing chart	L/D indicators	Output circuit
E3NX-FA41 E3NX-FA8 E3NX-FAH41 E3NX-FAH8	Light-ON	Incident light No incident light OUT indicator (orange) Not lit Output ON transistor Load Set (e.g., relay) Reset (Between blue and black leads)	L lit.	Display OUT indicator (orange) Brown Photoelectric Sensor main circuit Display OUT indicator (orange) Brown Black output — 10 to 30 VDC
	Dark-ON	Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Set (e.g., relay) Reset (Between blue and black leads)	D lit.	Sersor main circuit Black output 10 to 30 VDC
	Light-ON	ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Set (e.g., relay) Reset (Between blue and black (orange) leads)	L/lit.	Display OUT1 indicator OUT2 indicator (orange) Brown Pink External intput Control output Black ch1 1 10 to 30
E3NX-FA51	Dark-ON	ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Set (e.g., relay) Reset (Between blue and black (orange) leads)	D lit.	Photoelectric Control output 10 to 30 Control output Orange ch2 Load Blue Load
E3NX-FA9	Light-ON	Incident light No incident light OUT indicator (orange) Not lit Output ON transistor OFF Load Set (e.g., relay) Reset (Between blue and black leads)	L/lit.	Display OUT indicator (orange) Brown Orange Intput Control Black output To to 30 VDC Load
E3NX-FA54	Dark-ON	Incident light No incident light OUT indicator (orange) Not lit Output ON transistor Load (e.g., relay) Reset (Between blue and black leads)	D lit.	M8 Connector Pin Arrangement ① ③ ① ③
E3NX-FA9TW	Light-ON	ch1/ Incident light ch2 No incident light OUT indicator (orange) Not lit Output ON transistor OFF Load Set (e.g., relay) Reset (grange) leads)	L lit.	Display OUT1 indicator OUT2 indicator (orange) Brown Control output Black ch1 Control output Black ch1 Control output Cont
E3NX-FA9TW E3NX-FA54TW	Dark-ON	ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Set (e.g., relay) Reset (Between blue and black (orange) leads)	D lit.	• M8 Connector Pin Arrangement @ 4
E3NX-FA41AN	Light-ON	Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between blue and black leads)	L lit.	Display OUT indicator (orange) Brown Orange Analog output 10 to 30 VDC
	Dark-ON	Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between blue and black leads)	D lit.	Sensor main circuit Black Control output Load 10kΩ min.

Threaded Hex-shaped Cylindrical

> Flat Sleeved

Small Spot

High Power

Narrow view BGS

Retro-reflective Limited-

Chemicalresistant, Oil-resistant

> Bending Heatresistant

Area Detection

Liquid-level

Vacuum FPD, Semi, Solar

Threaded Hex-shaned Cylindrical

Flat Sleeved

Small Spot

Narrow view

High Power

BGS

Retroreflective Limited-

reflective resistant Oil-resistant

Bendina

Heatresistant

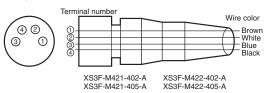
Detection

Liquid-level

Vacuum

FPD Semi Solar

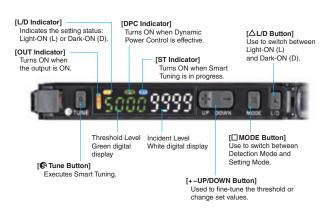
Plug (Sensor I/O Connector)



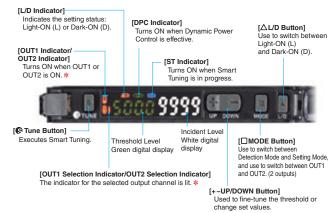
Wire color	Connection pin	Application
Brown	1	Power supply (+V)
White	2	External input / Output
Blue	3	Power supply (0 V)
Black	4	Output

Nomenclature

E3NX-FA11/FA41/FA6/FA8/FA7/FA9/ FA24/FA54/FA11-5/FAH11/FAH41/ FAH6/FAH8/FA11AN/FA41AN



E3NX-FA21/FA51/FA7TW/FA9TW/FA54TW/ FA10/FA40/FA0/FAH0



^{*} Only OUT1 turns ON for output

Operating Procedures

Basic Settings

Output switching

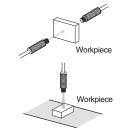
1. Press button.

Through-beam:

Set to "Dark ON" to turn the output ON with a workpiece in the detection area. [L/D Indicator] turns D ON.

Reflective:

Set to "Light ON" to turn the output ON with a workpiece in the detection area. [L/D Indicator] turns [L] ON.

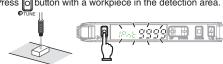


Smart Tuning [Easy Sensitivity Setting]

(1) Detect for Workpiece Presence/Absence

2-point Tuning

1. Press button with a workpiece in the detection area.



2. Press button again without a workpiece in the detection area. Release the button when $[\mathcal{ZP}_{\mathcal{A}^{\perp}}]$ is displayed. 2500 Setting is Completed

Incident light level setting: The larger incident level of the Step 1 and 2 values is adjusted to the power tuning level.

Threshold setting:

Set to the middle between the Step 1 and 2 incident light levels



Step 1 and Step 2 can be reversed.

(2) Enhance Durability of the Fiber Head against Dust and Dirt

Maximum Sensitivity Tuning

1. Hold o button for 3 seconds or longer with/without workpiece as shown below.

Release the button when [$\mathcal{F}(\mathcal{U}_{1})$] is displayed.



Reflective: Workpiece is absent

Setting is Completed

Incident light level setting: The incident level in Step 1 is adjusted to "0". Threshold setting: The value is set to approx. 7% of the incident light level of 1.

ever, the Sensor becomes more susceptible to the influence of background objects.

(3) Adjust for Moving Workpiece without Stopping Line

• Full Auto Tuning

1. Hold the button without the presence of a workpiece, and pass the workpiece through while $[\#\pi_{\mathbb{Z}}] \rightarrow [\#\pi_{\mathbb{Z}}] \rightarrow [\#\pi_{\mathbb{Z}}]$ is displayed in green digital.



(Keep holding the button while the workpiece passes through, and hold 7 seconds or longer until [Auto] is displayed in green digital. After the workpiece passes through, release your finger from the button.)





Incident light level setting: Adjust the max. incident light level on Step 1 as the power tuning level. Threshold setting: Set to the middle between max. and min. incident light levels on Step 1.

Threaded

Flat

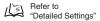
Small Spot

Basic Settings

(4) Determine Workpiece Position

Position Tuning

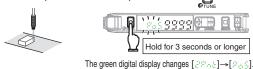
1. Turn ON power tuning in SET mode.



2. Press button without a workpiece in the area



3. Place the workpiece at the desired position and hold button.



Setting is Completed

Incident light level setting: The Step 3 incident level is adjusted to half the power tuning level. Threshold setting: Set to the same value as the Step 3 incident level.

(5) Detect Transparent or Small Workpiece

(Set Threshold by incident light level percentage)

Percentage Tuning

1. Turn ON Percentage Tuning in SET mode.







Setting is Completed

Refer to

Incident light level setting:

The Step 2 incident light level is adjusted to the power tuning level.

Set to the value obtained by (Incident Level at Step 2 x Percentage Tuning Level)

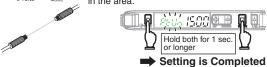


No Smart Tuning other than Power Tuning can be used if Percentage Tuning is set.

(6) Restore from the Incident Level Changed due to Dust and Dirt

Power Tuning

1. Hold and ubuttons for 1 second or longer without a workpiece in the area.



Incident light level setting: The Step 1 incident level is adjusted to the power tuning level. Threshold setting: Not changed

Perform the procedure with a workpiece in the area for reflective model setting.

If the setting is made after position tuning, set both the through-beam model and reflective model with a workpiece.

Refer to " • Smart Tuning Error " for error displays.

Smart Tuning Error						
Error / Display / Cause	Error Origin Tuning Type	Remedy				
Near Error The light level difference between Points 1 and 2 are extremely small.	2-point Tuning Full Auto Tuning	Change the detection function mode to a slower response time mode. Reduce the distance between the emitter and receiver. (Through-beam) Place the Fiber Head closer to the sensing object. (Reflective)				
Over Error DuEr Err Incident light level is too high.	All	Use a thin-diameter fiber. Widen the emitter and receiver distance. (Through-beam) Distance the Fiber Head from the sensing object. (Reflective)				
Low Error Lo Err Incident light level is	Tuning other than Maximum Sensitivity Tuning	Reduce the distance between the emitter and receiver. (Through-beam) Place the Fiber Head closer to the sensing object. (Reflective)				

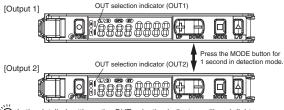
Refer to " Detailed Settings " to change the power tuning level.

Channel switching

Fiber Amplifiers, Communications Unit and Accessories

Models with 2 Outputs: E3NX-FA21,E3NX-FA51,E3NX-FA7TW, E3NX-FA9TW and E3NX-FA54TW

- The OUT selection indicators and the settings will change.
- 1. Press button for 1 second.
- 2. The OUT selection indicators (OUT1/OUT2) switch.



In the detailed settings, the OUT selection indicators will each light whenever the output (OUT1/OUT2) is set.

Minute Adjustment of Threshold Level

1. Press button to adjust the threshold level.

The threshold level becomes higher. II.0 1000 2 130 🕮 🛚 🖟 Hold the key for high-speed level adjustment.



(1) Stable Detection Regardless of Incident Level Change due to Dust and Dirt

- DPC Function (Use of the function with Through-beam model or Retro-reflective model is recommended)
- 1. Perform Smart Tuning.

Refer to "Smart Tuning"
Refer to "Power Tuning"

turns ON when the 2. Set the DPC function ON in SET mode.



Stabilizes the displayed incident level by correcting intern incident level changes. The displayed incident level decreases and the DPC indicator starts Incident blinking when incident level correction is not Light Level

The DPC indicator

(2) Reset Settings

Setting Reset

Initializes all the settings by returning them to the factory defaults.



- 2. Select [5 \(\)] in \bigcirc and press \bigcirc button.
- 3. Select [ﷺ button.

(3) Save or Read Settings

- 1. Hold o button and then hold button for 3 seconds or longer.
 - User Save Function Saves the current settings
 - 2. Select [5AuE] in 🖽 🗎 and press 🗐 button.
 - 3. Select [5848 485] in [4] and press 🔲 button.
- User Reset Function Reads out the saved settings
 - 2. Select [-5k] in Hand press d button.
- 3. Select [-5 \ U5 \ E] in and press dibutton.

(4) Prevent Mistake-operation

Key Lock Function

Disables all button operations. [Lat an] is displayed when the button is pressed.

Enable/Cancel (This procedure)



Fiber Amplifiers, Communications Unit and Accessories

Hex-shaned Cylindrical

Sleeved

Flat

Small Spot High Power Narrow

view BGS

Retro-

reflective

Limited-

reflective

Liquid-level

Vacuum

FPD

Semi

Solar

resistant Oil-resistant Bendina

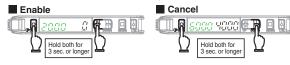
Heatresistant Detection

Convenient Setting Features

(5) Reset Incident Light Level to "0"

Zero Reset Function

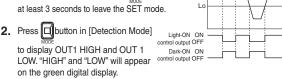
Changes the incident light level to "0". The threshould level is also shifted accordingly. The lower limit of the threshold is -1,999.



(6) Producing an Output When the Incident Level Is within an Area

Area Detection Mode

1. Select [SET Mode] - [OUT1 Mode] -[Area Detection Mode]. Press button for



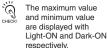
3. Press D button for the high and low thresholds to execute

Percentage Tuning: The thresholds are set as follows: High: Incident level from step 3 + Incident level from step 3 \times Percentage tuning level Low: Incident level from step 3 - Incident level from step 3 × Percentage tuning level

(7) Monitoring the Incident Level for Sensing Objects Passing at High Speed

Change Finder

1. Select [SET Mode]→[Digital Display] to set [8 58 6888].



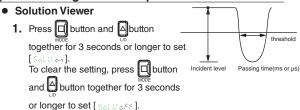
2. Press dutton for 3 seconds or longer to leave the SET mode.

3. Send a workpiece past the Fiber Unit.

The maximum and minimum incident levels will be displayed for 0.5 seconds when the workpiece passes.



(8) Determining If the Workpiece Can Be Detected



2. Send a workpiece past the Fiber Unit.

Displaying the Passing Time and Difference in Incident Levels.



Detailed Settings

3. DPC

4. Timer

5. Power

Tunina

A Function Selection:

P-1 0000

Function

Eaff

Function

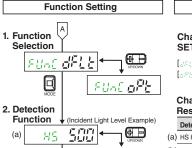
Hold Dutton for 3 seconds or longer to enter SET mode. SET mode provides the function settings described

hereafter. The initial display shown after transition from one

function to another represents the factory default.

The OUT selection <u>۾</u> '۾ indicators shows items for output 1 or output 2 individually for each output.





58 4000

50

 $\underline{G}(G)$

SHE

9,89,9

oF F

*1 SHS2 mode is set

aFFd

oned

only for E3NX-FA11-5.

Changing Functions to Set in SET mode

Description

[$\mathfrak{g}\mathfrak{g}_{\{\xi\}}$]: Functions 1. to 5. can be set [a/2]: Functions 1. to 16. can be set.

Changing Light Level and Response Time

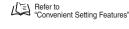
	Detection Function	Response Time	Light Level			
(a)	HS High-speed mode	250 µs	1(Standard			
(b)	STND Standard mode	1ms	1 time			
	GIGA Giga mode	16ms	8 times			
(d)	SHS Super High-speed mode*2	30µs	0.1 times			
(e)	SHS2 Super High-speed Mode	60µs	0.1 times			
Smart Tuning is canceled if the						
	detection mode is changed.					

The communication and mutual interference prevention functions are disabled when the detection mode is set to super-high-speed mode The response time for models with 2 outputs is 32 µs

The incident light level in SET mode is a reference value.

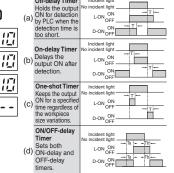
It may be changed when switched to detection mode.

Stable Detection Regardless of Incident Light Level Change





r both outputs for models with 2 outputs.)



A timer value can be set after pressing button when a timer menu (other display than "---") is displayed. Use button to set the time.

(1 to 9999 ms in 1 ms steps; the initial value: 10 ms)

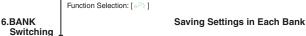
Changing the Target Incident Light Level (Power Tuning Level)

Use # button to set the power tuning level.

[#88 to 8888 in 1 steps; the initial

value: 99993]

Refer to "Convenient Setting Features"





Sleeved

High Power

Narrow view

BGS

Retroreflective Limited-

reflective Chemicalresistant

Oil-resistant Bendina

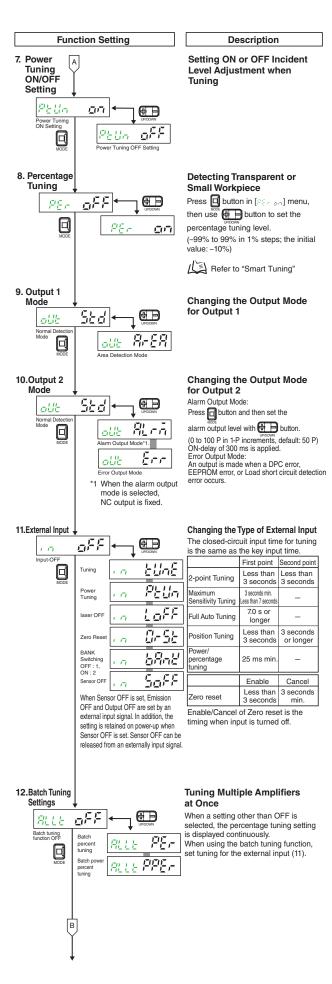
> Heatresistant

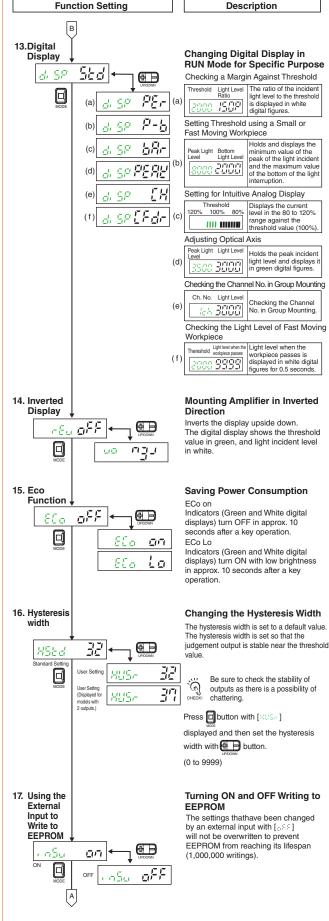
Detection

Liquid-level

Vacuum

FPD. Semi. Solar





Fiber Amplifiers, Communications Unit and Accessories

Hex-shaned

Cylindrical

Flat

Sleeved

Small Spot High Power Narrow

view

Retro-reflective Limited-

resistant, Oil-resistant

resistant

Bendina

Detection

Liquid-level

Vacuum

FPD, Semi.

Ratings and Specifications

Item Models	E3NW-ECT		E3NW-DS
Connectable Sensor Amplifier Units	Smart Fiber Amplifier Unit (Infrared models): E3NX Color Fiber Amplifier Unit: E3NX Smart Laser Amplifier Unit: E3NX Smart Laser Amplifier Unit (CMOS type): E3NX	X-FA0/FA1 X-FAH0 X-CA0 *1 C-LA0 C-SA0 C-TA0 *2	0/FA40
Power supply voltage	24VDC (20.4 to 26.4 VDC)		
Power and current consumption	$2.4~\mbox{W}$ max. (Not including the power supplied to Se 100 mA max. (Not including the current supplied to		2 W max. (Not including the power supplied to Sensor.) 80 mA max. (Not including the current supplied to Sensor.)
Indicators	L/A IN Indicator (Green), L/A OUT Indicator (Green), PWR Indicator (Green), RUN Indicator (Green), ERROR Indicator (Red), and SS (Sensor Status) indicator (Green/Red)		
Vibration resistance (destruction)	10 to 60 Hz with a 0.7-mm double amplitude, 60 to 150 Hz 50 m/s² for 1.5 hours each in X, Y, and Z directions		
Shock resistance (destruction)	Destruction: 150 m/s² for 3 times each in X, Y, and Z directions		
Ambient temperature range	Operating: 0 to 55°C, *3 Storage: -30 to 70°C (with no icing or condensation)		
Ambient humidity range	Operating and storage: 25% to 85% (with no cond	ensation)	
Maximum connectable Sensors	30 *4		10
Maximum connectable Distributed Sensor units	8		_
Insulation resistance	20 MΩ min. (at 500 VDC)		
Dielectric strength	500 VAC 50/60Hz 1 min		
Mounting method	35-mm DIN track-mounting		
Weight (packed state/unit only)	Approx. 185 g/Approx. 95 g		Approx. 160 g/Approx. 40 g
Materials	Polycarbonate		
Accessories	Power supply connector, Communications connector for DIN Track End Plates (2) and Instruction manual	E3NW-DS,	Power supply/communications connector, DIN Track End Plates (2), Ferrite cores (2) and Instruction manual

- *1. The E3NX-CA0 is supported for firmware version 1.06 or higher (Sensor Communications Units manufactured in June 2016 or later).
- *2. The E9NC-TA0 is supported for firmware version 1.03 or higher (Sensor Communications Units manufactured in July 2014 or later).
- *3. Temperature Limitations Based on Number of Connected Amplifier Units: Groups of 1 or 2 Amplifiers: 0 to 55°C, Groups of 3 to 10 Amplifiers: 0 to 50°C, Groups of 11 to 16 Amplifiers: 0 to 45°C, Groups of 17 to 30 Amplifiers: 0 to 40°C
- *4. A maximum total of 30 Sensors can be connected to a Sensor Communications Unit and Distributed Sensor Units.

Communications Specifications

Item	Specifications
Protocol	EtherCAT
Modulation	Baseband
Baud rate	100 Mbps
Physical layer	100Base-TX (IEEE802.3u)
Topology	Daisy chain
Communications media	STP category 5 or higher
Communications distance	100 m max. between nodes
Noise immunity	Compliant with IEC 61000-4-4, 1 kV min.
Node address setting method	Set the decimal rotary switches or software *1
Node address range	000 to 192 *2

- *1. The software setting is used when the node address setting switches are set to 0.
- *2. The range depend on the EtherCAT master that is used. Refer to the E3NW-ECT EtherCAT Sensor Communications Unit Operation Manual for details.

CC-Link-compatible products are also available. Refer to your OMRON website for details.

(Unit: mm)

Threaded Hex-shaped

Cylindrical Flat

Sleeved

Small Spot

High Power

Narrow view

BGS

Retro-reflective

Limited-

Chemicalresistant, Oil-resistant

Bending

Heatresistant

Detection

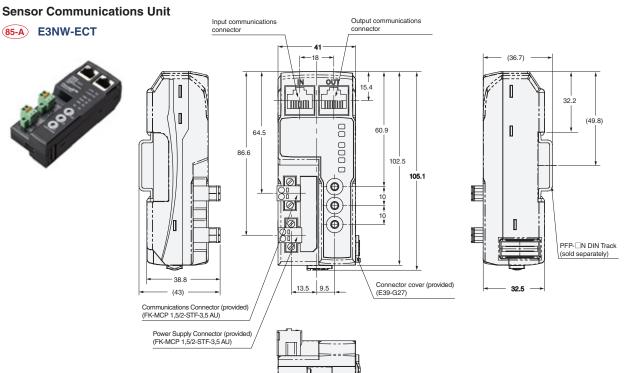
Liquid-level

Vacuum FPD, Semi.

Solar

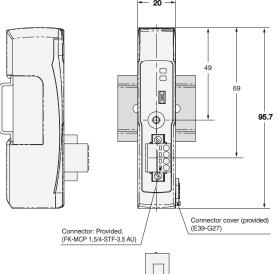


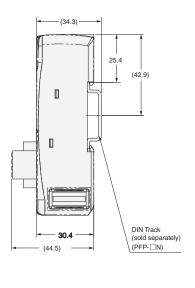
Tolerance class IT16 applies to demmensions in this date sheet unless otherwise specified.



Distributed Sensor Unit







Threaded Hex-shaped Cylindrical

Flat

Sleeved

Small Spot

Narrow

BGS

Limited-

Detection

Liquid-level

Vacuum

High Power view

Retro-reflective

resistant, Oil-resistant Bending

Heatresistant

FPD, Semi, Solar

E3X-ZV Fiber Amplifier Units and Related Products

Fiber Amplifier Units E3X-ZV Series

Туре	Appearance	Connecting method	Мос	Ratings and	Dimensions	
			NPN output	PNP output	Specifications	Dimensions
Standard models	17.13	Pre-wired (2 m)	E3X-ZV11 2M	E3X-ZV41 2M	Page 88	Page 89 89-A
		Wire-saving Connector	E3X-ZV6	E3X-ZV8		Page 89 89-B

Flat

Small Spot

Accessories (sold separately)

Wire-saving connectors (Required for models for Wire-saving Connectors.)

Connectors are not provided with the Fiber Amplifier Unit and must be ordered separately. * Protective stickers: provided.

Туре	Appearance	Cable length	Number of conductors	Models	Ratings and Specifications	Dimensions
Master Connector		- 2m -	3	E3X-CN11	- Page 94	Page 94 94-A
Slave Connector			1	E3X-CN12		Page 94 94-B

Mounting Bracket

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

Appearance	Model	Quantity	Dimensions
	E39-L143	1	Page 95 95-A

DIN Track

A Din Track is not provided with the Fiber Amplifier Unit and must be ordered separately as required.

Appearance	Туре	Models	Quantity	Dimensions
	Shallow type, total length: 1 m	PFP-100N		Page 95
	Shallow type, total length: 0.5 m	PFP-50N	1	95-B
	Deep type, total length: 1 m	PFP-100N2		Page 86 95-C

End Plate

Two End Plates are provided with the Sensor Communications Unit.

End Plates are not provided with the Fiber Amplifier Unit and must be ordered separately as required.

Appearance	Model	Quantity	Dimensions
5	PFP-M	1	Page 95 95-D

Fiber Amplifiers, Communications Unit and Accessories

Hex-shaped Cylindrical

Flat Sleeved Small Spot

High Power Narrow view BGS

Retro-reflective Limited-

resistant, Oil-resistant Bending

Heatresistant Detection

Liquid-level

Vacuum FPD, Semi.

Ratings and Specifications

	Туре	Standar	rd models		
	NPN output	E3X-ZV11	E3X-ZV6		
	PNP output	E3X-ZV41	E3X-ZV8		
Item	Connecting method	Pre-wired	Wire-saving Connector		
Outputs		1 output			
Light source (v	wavelength)	Red, 4-element LED (625 nm)			
Power supply	voltage	12 to 24 VDC ±10%, ripple (p-p) 10% max	х.		
Power consumption		Normal mode: 720 mW max. (Power supply voltage 24 V: Current consumption 30 mA max. / Power supply voltage 12 V: Current consumption 60 mA max.) Eco function ON: 530 mW max. (Power supply voltage 24 V: Current consumption 22 mA max. / Power supply voltage 12 V: Current consumption 44 mA max.)			
Control outpu	ut	2 V max.) OFF current: 0.1 mA max. 7-segment displays (Threshold Level displaydirection: Switchable between not	the type.) 10 mA: 1 V max., load current 10 to 100 mA: blay: green, Incident Light Level display: red		
Indicators		Smart Tuning Indicator (green) Standard models only: OUT indicator (orange) 2-channel models only: OUT1/2 indicator (orange), CH Indicator (green)			
Protection cir		Power supply reverse polarity protection, output short-circuit protection and output reverse polarity protection			
	Super-highspeed mode (SHS)	Operate or reset: 50 µsµ			
time	High-speed mode (HS)	Operate or reset: 250 µs *1			
	Standard mode (Stnd)	Operate or reset: 1 ms *3			
	Giga-power mode (GIGA)	Operate or reset: 16 ms			
Sensitivity ad	ljustment	Smart Tuning (2-point tuning, power tuning, percentage tuning (-99% to 99%), maximum sensitivity tuning, full auto tuning, position tuning) or manual adjustment			
Maximum con	nnectable Units	16			
Mutual interfe	erence prevention function	Emission cycle setting switching type (up to 4 units)			
	DPC (Dynamic Power Control)	Yes			
	ATC (Active Threshold Control)	Yes			
	Timer	Select from timer disabled, OFF-delay, Ol	N-delay or one-shot timer: 1 to 9,999 ms		
Functions	Zero reset	Negative values can be displayed. (Thres	•		
	Resetting settings	Select from initial reset (factory defaults)	·		
	Eco mode	Select from OFF (digital display lit) and Ed	• • • • • • • • • • • • • • • • • • • •		
	Power tuning	Select from ON or OFF.			
Ambient illum	nination (Receiver side)	Incandescent lamp: 20,000 lx max., Sunli	ght: 30,000 lx max.		
	perature range	Operating: -25°C to 55°C Storage: -30°C to 70°C (with no icing or condensation)			
Ambient humi	idity range	Operating and storage: 35 to 85% (with no condensation) within the surrounding air temperature range shown above			
Insulation resistance		20 MΩ min. (at 500 VDC)			
moulation res		1,000 VAC at 50/60 Hz for 1 min			
Dielectric stre	ength	1,000 1110 1110 1110 1110 1110 1110 11			
Dielectric stre	ength istance (destruction)	<u> </u>	ide for 2 hours each in X, Y, and Z direction		
Dielectric stre		<u> </u>	ide for 2 hours each in X, Y, and Z direction		
Dielectric stre Vibration resis Shock resista	stance (destruction)	10 to 55 Hz with a 1.5-mm double amplitu			
Dielectric stre Vibration resis Shock resista	istance (destruction)	10 to 55 Hz with a 1.5-mm double amplitu 500 m/s ² for 3 times each in X, Y, and Z of Approx. 95 g/	lirections Approx. 45 g/		
Dielectric stre Vibration resis Shock resista	istance (destruction) ance (destruction) ed state/Sensor only)	10 to 55 Hz with a 1.5-mm double amplitu 500 m/s² for 3 times each in X, Y, and Z of Approx. 95 g/ approx. 65 g	lirections Approx. 45 g/		
Dielectric stre Vibration resis Shock resista Weight (packe	istance (destruction) ance (destruction) ed state/Sensor only) Case	10 to 55 Hz with a 1.5-mm double amplitu 500 m/s² for 3 times each in X, Y, and Z of Approx. 95 g/ approx. 65 g Polycarbonate (PC).	lirections Approx. 45 g/		
Dielectric stre Vibration resis Shock resista Weight (packe	istance (destruction) ance (destruction) ed state/Sensor only) Case Cover Cable	10 to 55 Hz with a 1.5-mm double amplitu 500 m/s² for 3 times each in X, Y, and Z of Approx. 95 g/ approx. 65 g Polycarbonate (PC).	lirections Approx. 45 g/		

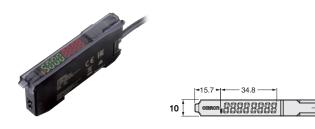
^{*1.}Mutual interference prevention function in the Response Time Priority Mode: 2 units: 350 Priority Mode: 4 units: 700 µs
*2.Mutual interference prevention function in the Unit Number Priority Mode: 4 units: 1.6 ms

Dimensions

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

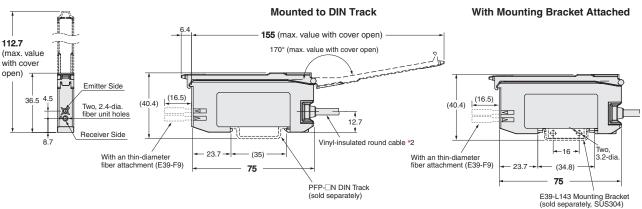
Pre-wired Amplifier Units

89-A E3X-ZV11 E3X-ZV41



- *1. The Mounting Bracket can also be used on side B.
- *2. Cable Specifications

Outer diameter	No. of conductors	Others
	3	Conductor cross-section: 0.12 mm ²
4 0 dia		Insulator dia.: 0.9 mm
4.0 uia.		Standard cable length: 2 m
		Minimum bending radius: 12 mm (Reference value)

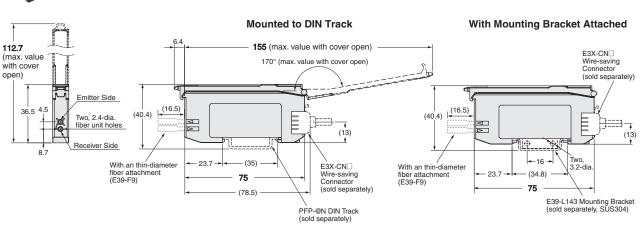


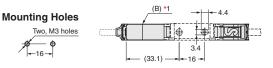


(B) *1 (33.1)- 16 -

Wire-saving Connectors Units







*1. The Mounting Bracket can also be used on side B.

Threaded Hex-shaped

Cylindrical

Flat

Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective Limitedreflective

Chemicalresistant, Oil-resistant

Bending

Heatresistant

Detection

Liquid-level

Vacuum FPD, Semi.

Solar

Fiber Amplifiers, Communications Unit and Accessories

Hex-shaped Cylindrical

Sleeved

Flat

High Power Narrow

Small Spot

BGS

view

Retro-reflective Limitedreflective

resistant, Oil-resistant

Heatresistant

Bending

Detection

Liquid-level

Vacuum FPD, Semi.

I/O Circuit Diagrams

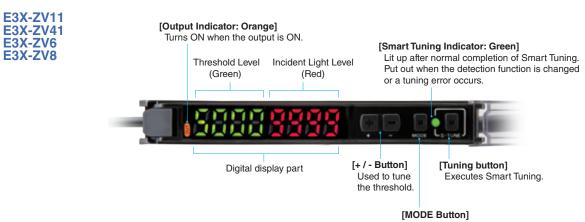
NPN Output

Model	Operation mode Timing chart		Output circuit	
E3X-ZV11	Light-ON	Incident light No incident light OUT indicator (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black leads)	Display OUT indicator (orange) Brown Black Control output 12 to sensor main	
E3X-ZV6	Dark-ON	Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black leads)	sersor main 124 VDC	

PNP Output

Model	Operation mode	Timing chart	Output circuit
E3X-ZV41	Light-ON	Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between blue and black leads)	Display OUT indicator (orange) Brown Control Black output 12 to 24 VDC
E3X-ZV8	Dark-ON	Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between blue and black leads)	Sessi milari COD Load Load Blue

Nomenclature



Use to switch between Detection Mode and Setting Mode.

Operating Procedures

Basic Settings

Output switching

Selection of Light ON (L-ON) or Dark ON (D-ON)

- Output switching
- 1. Hold the D button for 3 seconds or longer to enter the SET Mode.
- 2. Press the 🗗 🗖 button to select the following item.

In the case of diffuse reflection type or In the case of through-beam type or limited reflection type regressive reflection type State with incident light State with no incident light (Default) Turn ON when a workpiece is present Turn ON when a workpiece is present

3. Press the Detection for 3 seconds or longer to return to the Detection Mode.

Adjustment of Threshold Level

Minute Adjustment of Threshold Level

Set the threshold level in the Detection Mode. Press the 🗗 🗖 button to adjust the threshold level.



Initialization

Initializing Settings

Setting Reset

Initialize all settings to the factory-set defaults.

- 1. Hold the ubutton for 3 seconds or longer to enter the SET Mode.
- 2. Press the dibutton twice

3. Press the 🗗 🗖 button once.

4F5 Initialization selected

4. Press the 📵 button once.

Initialization completed ı nı E Settings can also be initialized by pressing the MODE button for 7 seconds or

longer in the Detection Mode. Contents saved by User Save Function are not cleared by the setting initialization.

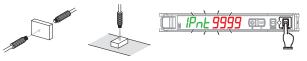
Basic Smart Tuning Method

Adjust the received light intensity and the threshold to appropriate values through Smart Tuning.

Most Basic Setting Method

• 2-point Tuning

1. Press the o button with a workpiece in the detection area.



2. Press the D button again without a workpiece in the detection area.



Incident light level setting: The larger incident level of the Step 1 and 2 values is adjusted to the power tuning level.

Threshold setting: Set to the middle between the Step 1 and 2 incident light levels.

Step 1 and Step 2 can be reversed

Making Received Light Intensity Uniform

Power Tuning

1. Hold the 🖸 and 🗖 buttons for 1 second or longer and release the button when [PLUn] appears





Incident light level setting: The Step 1 incident level is adjusted to the power tuning level. Threshold setting: Not changed. If the value is low, it will be set to the minimum value in which an output is turned ON / OFF correctly.

Perform the procedure with a workpiece in the area for reflective model setting. If the setting is made after position tuning, set both the through-beam model and reflective model with a workpiece

When power tuning ON / OFF setting is OFF, power tuning cannot be performed.

Setting a Threshold with Received Light Intensity Ratio

- Percentage Tuning
- 1. Turn ON Percentage Tuning in SET mode.
- Refer to "Detailed Settings".
- 2. Hold the o button for 1 second or longer without a workpiece in the area.





Incident light level setting: The Step 2 incident light level is adjusted to the power tuning level

Threshold setting: Set to [Set received light intensity x Percentage tuning level].

No Smart Tuning other than Power Tuning can be used if Percentage Tuning is set. Set the Percentage tuning level to be below 0 in the case of a through-beam type (Dark ON: D-ON), or to be above 0 in the case of a reflective type (Light ON: L-ON).

Threaded Hex-shaned

Flat

Sleeved

Small Spot

High Power

Limited-

Chemicalresistant, Oil-resistant

Bendina

resistant

Detection

Liquid-level

E3X-ZV

ber Sensor aatures

Selection Guide

Fiber Units

Threaded

Hex-shaped

Cylindrical

Flat Sleeved

Small Spot

Narrow view

BGS

Retroreflective

> Limitedreflective

Chemicalresistant, Oil-resistant

Heatresistant

Bendina

Area Detection

Liauid-level

Vacuum

FPD, Semi, Solar

Installation Information

Fiber Amplitiers, Communications Unit, and Accessories

> Technical Guide and Precautions

> > **Model Index**

Operating Procedures

Convenient Setting Features

Various Smart Tuning Methods

When Received Light Intensity Decreases due to Dust or Dirt

Maximum Sensitivity Tuning

Long-press the button for 3 seconds or longer in the presence of a workpiece in the case of through-beam type or without the presence of a workpiece in the case of reflective type, and then take your finger off the button when [FULL] is displayed on the green digital display part.

The green digital display changes [P_{nL}] \rightarrow [FULL].

Incident light level setting: The incident level when the button pressed is adjusted to "0". Threshold setting: The value is set to approx.

7% of the incident light level when the object button pressed. If the incident light level when the object button pressed is smaller during long distance detection, the minimum value by which an output is correctly turned ON will be set.

Making Adjustment with Passing Workpiece

Full Auto Tuning

Hold the button without the presence of a workpiece, and pass the workpiece through while [PDL] \rightarrow [FULL] \rightarrow [RULL] is displayed in green digital. (Keep holding the button while the workpiece passes through, and hold 7 seconds or longer until [RULD] is displayed in green digital. After the workpiece passes through, release your finger from the button.)

Incident light level setting: Adjust the max. incident light level while pressing the obtain as the power tuning level.

Threshold setting: Set to the middle between max. and min. incident light levels while pressing the obstance.

Determine Workpiece Position

Position Tuning

1. Press the button without a workpiece in the area.

The green digital display changes [Pnt].

2. Place the workpiece at the desired position and hold the objection of 3 seconds or longer.

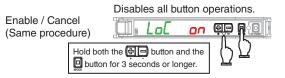
The green digital display changes [$2P_{n}E$] \rightarrow [$P_{0}5$].

Incident light level setting: The Step 2 incident level is adjusted to half the power tuning level. Threshold setting: Set to the same value as the Step 2 incident level.

Convenient Settings

Preventing Malfunction

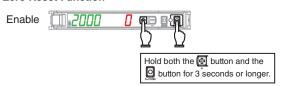
Key Lock Function



* Press either of the + or - button.

Returning Received Light Intensity Display to "0"

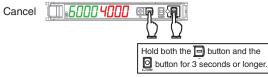
Zero Reset Function



CHECK

The zero reset function is canceled when either of the DPC function / differential function / Smart Tuning is performed.

When DPC (ATC) function or the differential output modes are performed, the zero reset cannot be performed.



, (3)

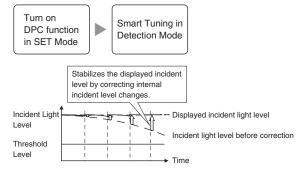
When released, [0-5 $_{0}$ FF] is displayed.

The threshold also changes accordingly. The lower threshold limit is -1999.

For Stable Detection Regardless of Received Light Intensity Changed due to Dust or Dirt

• DPC Function (Dynamic Power Control)

Use this function with through-beam type or regressive reflection type.



Set output switching to D-ON (Dark ON). When power tuning ON / OFF setting is OFF, Smart Tuning is in error or maximum sensitivity tuning is executed, the DPC function is disabled.

DPC function does not work depending on the setting.

When the Smart Tuning indicator is lit up and the DPC function is set to ON, the DPC function works.

If the threshold level must be changed according to the change in the received light intensity,

the ATC Function (Active Threshold Control) can be used instead. (Make the ratio of the received light intensity to the threshold level constant.)

The ATC function is enabled when the DPC function is set to ATC in the SET Mode and the Smart Tuning is executed in the Detection Mode. Other restrictions conform to those for the DPC function.

Small Spot

Narrow view

Retroreflective Limited-

resistant. Oil-resistant

reflective

Rending Heatresistant

Detection

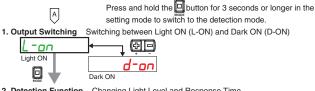
Liquid-level

Vacuum

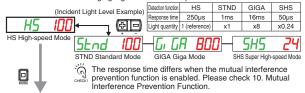
FPD. Semi. Solar

Detailed Settings

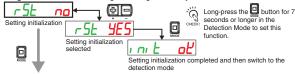
Hold 🔲 button for 3 seconds or longer to enter SET mode. SET mode provides the following function settings. Contents on the leftmost side of each item (thick-frame parts) are factory defaults.

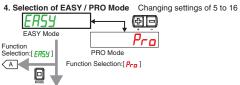


2. Detection Function Changing Light Level and Response Time



3. Setting Initialization Initializing all settings to factory-set defaults





5. Delay Timer Function Setting Output Timer

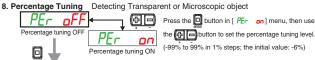
After pressing the button, Use the button to set the time. (1 to 9999 ms in 1 ms steps; the initial value: 10 ms Error range: 0.2 ms) For ZV6M / ZV8M: (0.1 to 0.5ms in 0.1 ms steps; 0.5 to 5ms in 0.5 ms steps; 5 to 9999 ms in 1 ms steps; the initial value: 10 ms Error range: 0.1 ms)



6. Power Tuning ON / OFF Setting To Turn ON / OFF the Light Amount Adjustment at Smart Tuning J ĠĐ PŁUn on⁴



Use the 🗗 🗖 button to set the power tuning level. [100 to 9999 in 1 steps; the initial value: 9999]

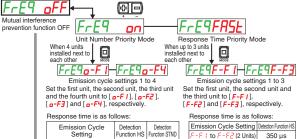


9. DPC Function Stable Detection Regardless of Incident Light Level Change



<u>σ-F / to σ-F '</u> (4 Units) 700 μs 1.6 ms

10. Mutual Interference Prevention Function Installing multiple Fiber Heads next to each other



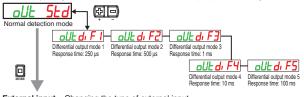
Variation in received light intensity when multiple Fiber Heads are installed next to each

Variation in received light intensity when multiple i-liber Heads are installed next to each other is reduced by setting emission cycles for each amplifier. It is not necessary to install fiber amplifiers in close contact with each other. The Unit Number Priority Mode and the Response Time Priority Mode cannot be mixed. In the Unit Number Priority Mode, set the detection function to HS / STND, and, in the Response Time Priority Mode, to HS. Furthermore, set the output mode to other than the differential output mode

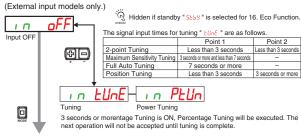
11. Output Mode Changing Output Mode

Fiber Amplifiers, Communications Unit and Accessories

The differential output modes 1 to 5 is turned on if the difference when compared with th received light intensity before the response time exceeds the threshold level. The differential output modes can be set by setting the detection function to HS. Also set DPC (ATC) function setting to OFF.



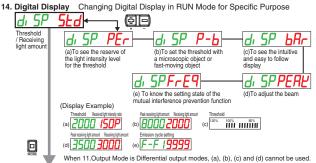
12. External input Changing the type of external input



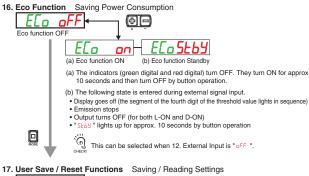
(The red digital display shows the incident light level.) The emission level can be increased / decreased with the 🗗 🗖 button. (L100 to 1. Initial value: L100) The emission level is updated when Smart Tuning is executed. The emission level can also be adjusted by increasing / decreasing it after Smart Tuning using the emission level adjustment function. However, since the light receiving sensitivity cannot be changed, the resultsof Smart Tuning cannot be reproduced. Depending on your environment, it may not work properly when the emission level is set low.

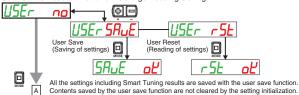
13. Emission Level Adjustment Function Increasing / decreasing emission power

The emission level alone can be set by long-pure source and the button for 3 seconds or longer in the Detection Mod ion level alone can be set by long-pressing both the 🔲 button









Fiber Amplifiers, Communications Unit and Accessories

Accessories (sold separately)

ber Sensol aatures

election uide

Fiber Units

Threaded
Hex-shaped
Cylindrical

Flat
Sleeved

Small Spot

High Power

Narrow view

BGS

Retroreflective

> Chemicalresistant, Oil-resistant

reflective

Heatresistant

Bendina

Area Detection

Liquid-level

Vacuum FPD,

Semi.

Solar

Installation

Fiber Ampliners, Communications Unit, and Accessories

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Ratings and Specifications

Wire-saving Connectors

Item	Тур	e Master (Master Connector		onnector	
пеш	Mode	ls E3X-CN21	E3X-CN11	E3X-CN22	E3X-CN12	
Number of conductors		rs 4	3	2	1	
Diameter of cable		le 4 dia.	4 dia.			
Rated current 2.5A						
Rated voltage 50VDC						
Contact resistance		(The above figure is	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 tere	Polybutylene terephthalate (PBT)			
Contact Phosphor bronze/gold-plated nickel						
Weight (packed stat	Approx. 55 g	Approx. 55 g Approx. 25 g			

Sensor I/O Connectors

Item	Models	XS3F-M42□-40□-A
Number of conductors		4
Diameter of cable		4 dia.
Rated current		1A
Rated voltage		125VDC
Contact resistance		$40~\text{m}\Omega$ max. (20 mVDC max., 100 mA max.)
Number of insertions		Destruction: 200 times

(Unit: mm)

Dimensions

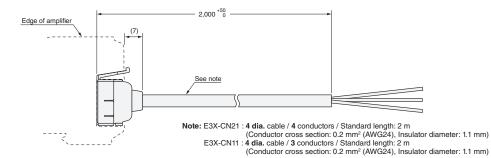
Tolerance class IT16 applies to demmensions in this date sheet unless otherwise specified.

Wire-saving Connectors (for Models with Wire-saving Connectors)

Master Connector



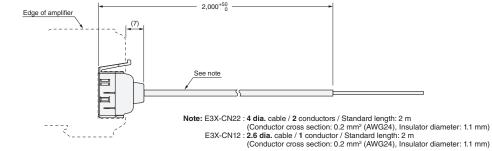




Slave Connector

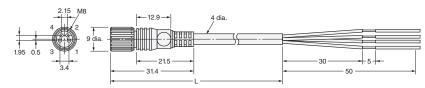




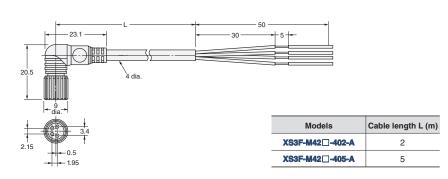


Sensor I/O Connectors (for Models with M8 Connectors)





94-D XS3F-M422-402-A XS3F-M422-405-A

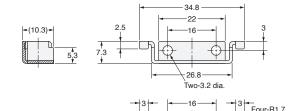


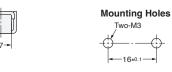
Mounting Brackets



95-A E39-L143





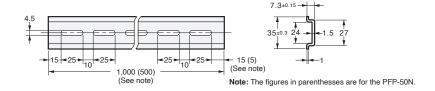


Material: Stainless steel (SUS304)

DIN track



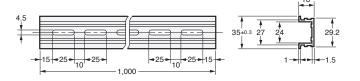




Material: Aluminum



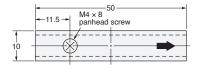


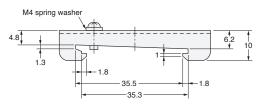


End Plate









Material: Iron, zinc plating

Threaded Hex-shaped

Cylindrical

Flat

Sleeved

Small Spot High Power

> Narrow view

> > BGS

reflective

Limited-

Chemicalresistant, Oil-resistant

Bending

resistant

Detection

Liquid-level

Vacuum

FPD, Semi. Solar

Threaded

Hex-shaned

Cylindrical

Flat

Sleeved

BGS

Limited-

Oil-resistant Bending

Heatresistant

Area Detection

Liquid-level

Vacuum

FPD, Semi, Solar

Installation Information

riber Amplitiers, Communications Unit, and Accessories

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> > Model Index

Reference Information for Fiber Units

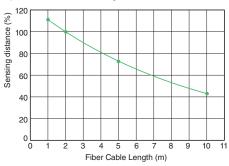
Influence of Fiber Cable Length

The sensing distance listed in the Fiber Units specifications are based on the fiber cable lengths found in the suffix of the model number. The sensing distance will change if the fiber cable is cut or extended.

The following graph shows the percentage change of the various fiber cable length, where 100% is the sensing distance for a fiber cable with a length of 2 m.

Use this as a guideline for installation distances.

Keep in mind that extending the cable with a fiber connector will result in even shorter sensing distances than the value given in the graph.

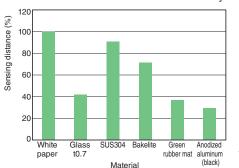


* The 100% value is for a fiber cable with a length of 2 m (same for Through-beam and Reflective Models).

Reflective Models: Sensing Distance Ratios by Workpiece Materials

The following graph shows the percentage change of the various workpieces, where 100% is the sensing distance for white paper, the standard sensing object.

Refer to the value of the material that looks like your workpiece.



* White paper is 100%

Types of Fiber Cables

This section describes the features of different types of fiber cables.

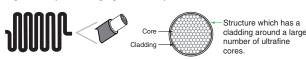
(This is given in the Fiber Unit specifications as either Flexible or Bend-resistant for the cable bending radius, and Coaxial for the appearance.

If no difinition is given, a standard cable is used.)

Flexible Fibers

The flexible fiber has a small bending radius for easy routing without easily breaking.

It is easy to use because the cable can be bent without significantly reducing light intensity.



Break-resistant Fibers

This fiber is resistant to repeated bends for use on moving parts.



Standard Fibers

This fiber have a large bending radius compared with bend-resistant or flexible fiber.

Use this fiber where the bending radius is large, or on non-moving parts.

Structure only of one fiber

Coaxial Reflective Fibers

These fibers are suitable for sensing small objects at close range.



iber Amplifiers, communications Init, and

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Category	Question	Answer
	How do I interpret the optical axis diameter in the Fiber Unit specifications?	The optical axis diameter is the beam size that the Through-beam Fiber Unit uses for detection. If you are detecting objects larger than the optical axis diameter, you can expect stable detection performance because the object will block all of the beams of light that are used for detection. The incident level may fluctuate, however, if the workpiece passes the beam at high speed. In this case, it is best to select a Fiber Unit with a smaller optical axis diameter, or change the response time of the Fiber Amplifier Unit to High-speed mode or to Super-high-speed mode setting. Beam spread of 60° Beam spread of 60° Complete the property of the
Fiber Units	Are there any differences between the Fiber Units that are used for emitter and receiver?	With Through-beam Fiber Units, there is no difference between emitter fibers and receiver fibers. With Reflective Fiber Units, the emitter fibers and receiver fibers are different on Coaxial Reflective Models. Emitter fiber cables have identification marks. Refer to the individual dimensions diagrams of Fiber Units for details.
	What size must the hole be to mount a Threaded or Cylindrical Fiber Unit?	Refer to the recommended mounting hole dimensions given on pages 58 to 61.
	Are Fiber Cables available in different lengths?	Some models are available with either 5-m or 10-m cable. Ask your OMRON representative for details.
	What is the aperture angle?	The aperture angle is the angle at which the emitter beam spreads out.
	Are these Fiber Units CE certified?	Fiber Units do not have any electrical components and therefore are exempt from CE certification.
	Can these Fiber Units be used in explosionproof areas?	Explosion-proof certification has not been obtained. Depending on the country in which the Fiber Units are used and how they are used, certification may be required. Check the relevant laws and regulations before use.
	What the Fiber Units with built-in lenses?	These highly recommended Fiber Units have built-in lenses that achieve stable detection with high-power beams.
Fiber Amplifier Units	Can the Fiber Amplifier Unit be operated from a mobile console?	Mobile consoles cannot be used with either the E3NX-FA Series or the E3X-ZV Series.
	Can a Sensor Communications Unit be used?	If you use E3NX-FA0 Amplifier Units, you can use the E3NW-ECT(EtherCAT), E3NW-CRT(CompoNet) or E3NW-CCL (CC-Link).

iber Sensoı eatures

Selectio Guide

Fiber Units

Threaded

Hex-shaped

Cylindrical

Saving Space

Small Spot

Flat

Sleeved

Narrow

BGS

Retro-

Limitedreflective

Chemicalresistant, Oil-resistant

Bending

Heatresistant

Area Detection

Liquid-level

Vacuum

FPD, Semi, Solar

Installation

riber Ampliners, Communications Unit, and Accessories

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For common precautions, refer to www.ia.omron.com

Fiber Amplifier Unit

Marning

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

Do not use it for such purposes.



Do not use the product with voltage in excess of the rated voltage.

Excess voltage may result in malfunction or fire.



Never use the product with AC power supply. Otherwise, explosion may result.



Precautions for Safe Use

The following precautions must be observed to ensure safe operation of the product. Doing so may cause damage or fire.

- (1) Do not install the product in the following locations.
 - · Locations subject to direct sunlight
 - · Locations subject to condensation due to high humidity
 - · Locations subject to corrosive gas
 - Locations subject to vibration or mechanical shocks exceeding the rated values
 - Locations subject to exposure to water, oil, chemicals
 - Locations subject to stream
 - Locations subjected to strong magnetic field or electric field
- (2) Do not use the product in environments subject to flammable or explosive gases.
- (3) Do not use the product in any atmosphere or environment that exceeds the ratings.
- (4) To secure the safety of operation and maintenance, do not install the product close to high-voltage devices and power devices
- (5) High-Voltage lines and power lines must be wired separately from this product. Wiring them together or placing them in the same duct may cause induction, resulting in malfunction or damage.
- (6) Do not apply load exceeding the ratings. Otherwise, damage or fire may result.
- (7) Do not short the load. Otherwise, damage or fire may result.
- (8) Connect the load correctly.
- (9) Do not miswire such as the polarity of the power supply.
- (10) To use this device as connecting with each other, be sure to connect with the same power supply and turn ON the power simultaneously. Using a separate power supply will influence the functions when connecting the devices to use them.
- (11) Do not use the product if the case is damaged.
- (12) Burn injury may occur. The product surface temperature rises depending on application conditions, such as the ambient temperature and the power supply voltage. Attention must be paid during operation or cleaning.
- (13) When setting the Sensor, be sure to check safety, such as by stopping the equipment.
- (14) Be sure to turn off the power supply before connecting or disconnecting wires.
- (15) Do not attempt to disassemble, repair, or modify the product Unit in any way.
- (16) When disposing of the product, treat it as industrial waste.
- (17) Do not use the Sensor in water, rain, or outdoors.

Precautions for Correct Use

- (1) Be sure to mount the unit to the DIN track until it clicks.
- (2) When using Amplifier Units with Wire-saving Connectors, attach the protective stickers (provided with E3X-CN-series Connectors) on the unused power pins to prevent electrical shock and short circuiting. When using Amplifier Units with Connectors for Communications Units, attach the protective caps (provided with Sensor Communications Unit).
- (3) <E3NX-FA series>

Amplifier Unit with Wire-saving Connector



Amplifier Unit with Connector for Communications Unit



The length for the cable extension must be 30 m or less (or less than 10 m for S-mark certified models).

Be sure to use a cable of at least 0.3 mm² for extension.

The power voltage must be 24 to 30 V when connecting amplifier units with extension cable and wire-saving connector. <E3X-ZV series>

The length for the cable extension must be 30 m or less. Be sure to use a cable of at least 0.3 mm² for extension.

- (4) Do not apply the forces on the cord exceeding the following limits: Pull: 40N; torque: 0.1N⋅m; pressure: 20N; bending: 29.4N
- (5) Do not apply excessive force such as tension, compression or torsion to the Amplifier Unit with the Fiber Unit fixed to the Amplifier Unit.
- (6) Always keep the protective cover in place when using the Amplifier Unit. Not doing so may cause malfunction.
- (7) It may take time until the received light intensity and measured value become stable immediately after the power is turned on depending on use environment.
- (8) The product is ready to operate 250 ms after the power supply is turned ON.
- (9) The Mobile Console E3X-MC11, E3X-MC11-SV2 and E3X-MC11-S cannot be connected.
- (10) Mutual interference prevention on the E3NX-FA Series does not function among the E3X-HD, E3X-DA-S, E3X-DA-N, E3X-SD, or E3X-NA Fiber Amplifier Units.

The mutual interference prevention function on the E3X-ZV/MZV Series works only between the E3X-ZV/MZV Series.

Mutual interference prevention on the E3X-HD Series does function among the E3X-DA-S and E3X-MDA Fiber Amplifier Units

- (11) If the unit receives excessive sensor light, the mutual interference prevention function may not work properly, resulting in malfunction of the unit. In such case, increase the threshold.
- (12) The E3NW-ECT Sensor Communications Unit can be used with the E3NX-FA0, but the E3X-DRT21-S, E3X-CRT, and E3X-ECT Sensor Communications Units cannot be used. The E3X-ZV/MZV Series cannot be used with Sensor Communications Units.
- (13) If you notice an abnormal condition such as a strange odor, extreme heating of the unit, or smoke immediately stop using the product, turn off the power, and consult your dealer.
- (14) Do not use thinner, benzine, acetone, and lamp oil for cleaning.

Solar

Mounting the Fiber Amplifier Units

■ Mounting on DIN Track

1. Let the hook on the Amplifier Unit's Fiber Unit connection side catch the track and push the unit until it clicks.

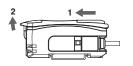


Removing from DIN Track

- 1. Push the unit in the direction 1.
- Lift it up in the direction 2.

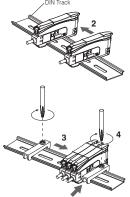


Refer to "I/O Circuit Diagrams" or check the side of the unit for wire color and role indications



■ Mounting Amplifier Units in Group (Wire-saving Connector Type Models)

- 1. Mount the Fiber Amplifier units one at a time onto the DIN track and push them until they click.
- 2. Slide the Fiber Amplifier units in the direction 2.
- 3. Use End Plates (PFP-M: separately sold) at the both ends of the grouped Fiber Amplifier units to prevent them from separating due to vibration or other cause.
- 4. Tighten the screw on the End Plates using a driver.





- · Under environments such as vibration, use an end plates even with a single Fiber Amplifier Unit.
- The maximum numbers of connectable Amplifier Units are given in the following table

		Maximum number of interconnected	Maximum number of mutual interference prevention			
E3NX-FA series*1		30	10			
standard i	E3X-ZV/MZV series standard models*1 (E3X-HD11/HD41/HD6/HD8)		- *2			
E3X-HD0	With E3X-ECT*3	30	10			
*3	With E3X-CRT*3	16	10			

- If Units are to be connected, the ambient temperature will change with the number of Units that are connected. Check the Ratings and Characteristics specifications.
- Always turn OFF the power before connecting or disconnecting
- *1. The mutual interference prevention function cannot be used if the detection mode is set to super-high-speed mode (SHS).
- *2. Mutual interference between up to 4 channels can be prevented by setting each Amplifier Unit individually.
- *3. Have been discontinued at the end of October 2024.

Mounting Fiber Units

Use Fiber Cutter

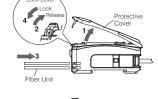
Cut a thin fiber as follows.

For standard fibers, insert to the desired cutting position and cut.

(1)	The fiber is shipped loosely tightened as shown in the figure at the right	Thin Fiber Attachment (E39-F9) 11.7 mm Loosely tighten.
(2)	Adjust the fiber to the desired length and fully tighten.	
(3)	Insert the Fiber Unit into E39-F4 and cut it.	Fiber Cutter E39-F4 Thin-diameter Fiber Unit Hole x 2 Standard Fiber Unit Hole (dia. 2.2 mm) x 3
(4)	Finished state. (Correctly cut end)	Note: The insertion direction into the Fiber Amplifier Unit is shown in the above figure.

Mount Fiber Unit

- 1. Open the protective cover.
- 2. Raise the lock lever.
- 3. Insert the Fiber Unit in the fiber unit hole to the bottom
- 4. Return the lock lever to the original position and fix the Fiber Unit.





• When mounting a coaxial reflective Fiber Unit, insert the single-core Fiber Unit to the upper hole (Emitter side) and the multi-core

Fiber Unit to the lower hole (Receiver side).

The cables for the Single-core Fiber Units (Emitters) have identification marks. Refer to the dimensions diagrams for details.

Single Core (o

Multi Core

• When removing the Fiber Unit, follow the above steps in reverse order.

To maintain the characteristics of the Fiber Unit, make sure the lock is released before removing the Fiber Unit.

Flat

Sleeved

BGS

Retro-

reflective

Limited-

reflective

Chemical-

resistant. Oil-resistant

Bendina

Heatresistant

Detection

Liquid-level

Fiber Units

Warning

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





Precautions for Correct Use

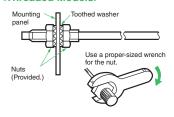
Do not use the Fiber Unit in atmospheres or environments that exceed product ratings.

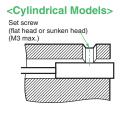
Mounting

Tightening Force

Refer to pages 62 to 66 for the tightening torque to apply when mounting a Fiber Unit.

<Threaded Models>

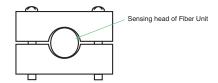




<Chemical and Oil-resistant Models>

The following method is recommended for mounting Fiber Units with fluororesin-covered sensing heads (E32-T F and E32-D F) to prevent from cracking the fluororesin case.

If you use a set screw to secure the Fiber Unit, tighten it with care to prevent from cracking the case.



Connections

. Do not subject the Fiber Unit to excessive force, such as tension or compression.

Refer to pages 62 to 66 for tensile strengths.

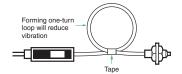
· Make sure any bend in the Fiber Unit is larger than the allowable bending radius.

Refer to pages 62 to 66 for bending radius ratings and length of unbendable sections at the base of the Fiber Unit.

· Do not compress or place heavy loads on the fibers.



• The method shown below is an effective way to prevent the Fiber Unit from breaking due to vibration.



Sleeve Bender (E39-F11)

- The bending radius of the stainless steel tube should be as large as possible. The smaller the bending radius is, the shorter the sensing distance will be. 1.2 mm dia. max
- Insert the tip of the stainless steel tube in the Sleeve Bender and slowly bend the tube along the curve of the Sleeve Bender.



Heat-resistant Fiber Units (E32-D51(R) and E32-T51(R))

Do not bend here

The fibers of these Units cannot be extended using the E39-F10 Fiber Connector.

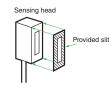
E32-T14

10 mr

These Units may enter the light-ON state if there are reflective objects at the end of the lenses.

If reflection is a problem, attach the black stickers provided to the ends of the lenses.

E32-T16PR



To use the provided slit, peel off the backing sheet, align the slit with the edges of the sensing surface, and attach it to the sensing head.

Use the slit in applications where saturation occurs (i.e., changes in incident level cannot be detected) due to short sensing distances.

Vacuum-resistant Fiber Units (E32- □V)

Although the Flanges, the Fiber Units on the vacuum side, and the Lens Units have been cleaned, as an extra precaution, clean these with alcohol before using them in high-vacuum environments to ensure that they are properly degreased.

Liquid-level Detection Fiber Unit (E32-D82F1)

· Secure the Fiber Unit using the unbendable section. Otherwise, the liquid-level detection position may be displaced.

Liquid-level Detection Fiber Units (Tube-mounting Models)

· Make sure that the tube is not deformed when using a band to secure the Fiber Unit.

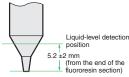
Fiber Units

Adjustment

Detection Position for Liquid-level Detection Fiber Unit (E32-D82F1)

The liquid-level detection position is 5.2 ±2 mm from the end of the fluororesin section. (Refer to the diagram on the right.)

The liquid-level detection position varies with the surface tension of the liquid and the degree of wetness at the Fiber Unit's detection position.



Other Precautions

Liquid-level Detection Fiber Unit (E32-D82F1)

- Operation may become unstable in the following cases:
 - 1. Bubbles stick to the cone of the sensing head.
 - 2. Solute deposits on the cone of the sensing head.
 - 3. The liquid has a high viscosity.
- There are some liquids, such as milky white liquids, for which detection is not possible.
- . Do not let the end of the fluororesin section bump into other
 - Damage to or deformation of the sensing head may cause unstable operation.
- The product shall be used in the following conditions. Ambient pressure: -50 to +500 kPa
- To use one-point teach mode (without object) Please carry out teaching where the detecting head is sunk into liquid. The sensitivity is set to 10% upper to the incident level in the liquid. This setting method is effective in high degree of viscosity, because it becomes stable to the fluctuation of incident level when the liquid drops from the tip.
- To use two-point teach mode (with/without object) Please teach where the detecting head is pulled up from liquid and next teach where it is sunk into liquid. This setting method is effective to a liquid which is easy to bubble at high temperature.
- Don't use maximum sensitivity mode because a liquid may be undetectable.

Chemical and Oil-resistant, Liquid-level Detection Fiber Unit (E32-D82F1)

Fluororesin shows strong chemical-resistant properties but is permeable if exposed to atmospheres with gaseous chemicals or water vapors, resulting in failure or damage.

Confirm applicability sufficiently before using the Fiber Unit in these environments.

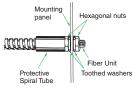
Accessories

Use of E39-R3 Reflector Provided with E32-R21

- 1. Use detergent 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.
- 2. The E39-R3 cannot be used in areas that are exposed to oil or chemicals.

Mounting method of Disconnection-resistant Protective Spiral Tubes (E39-F32□)

- 1.Insert the Fiber Unit into the Protective Spiral Tube from the head connector (threaded).
 - mmmmm
- 2. Push the fiber into the Protective Spiral Tube. The tube must be straight so that the fiber enters without twisting. Turn the Protective Spiral Tube, not the fiber.
- 3. Secure the Protective Spiral Tube to the mounting panel with the provided nuts.



4. Use the provided saddle to secure the end cap of the Protective Spiral

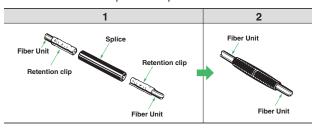
(To secure the Protective Spiral Tube at a position other than the end cap, apply tape to the tube so that the portion becomes thicker in diameter.)



Attaching the E39-F10 Fiber Connector

Attach the Fiber Connecter as shown in the following figures.

- 1. Insert the Fiber Unit in the retention clip.
- 2. Insert the retention clip into the splice.



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

The sensing distance is reduced by approximately 25% when Fiber Units are extended by the connector.

• Only 2.2-mm-diameter fibers can be connected.

Threaded Hex-shaned Cylindrical

Flat

Sleeved

Small Spot **High Power**

> Narrow view

> > **BGS**

Retroreflective Limitedreflective

Chemicalresistant, Oil-resistant

Bendina

Heatresistant

Area Detection

Liquid-level

Vacuum FPD. Semi. Solar

Selection by Model

Fiber Senso	Features	
=		

Illation	Threaded
rd Insta	Hex-shaped
Standa	Cylindrical
ace	Flat

Sleeved

Small Spot High Power

> Narrow view BGS

Retro-reflective Limited-

reflective Chemicalresistant, Oil-resistant

Bending

Heatresistant

Detection

Liquid-level

Vacuum FPD, Semi.

Solar

Model Index

		, ottori is	Model								
Models	Specifica- tions	Dimensions	Models	Specifica- tions	Dimensions	Models	Specifica- tions	Dimensions	Models	Specifica- tions	Dimensions
E32-A	,		E32-D25ZR 2M	P.18	P.19 19-F	E32-T12F 2M	P.42	P.43 43-B	E39-F3B	P.26	P.27 27-D
E32-A01 5M	P.54	P.55 55-A	E32-D25-S3 2M	P.22	P.23 23-L	E32-T12R 2M	P.12	P.13 13-C			27-E
E32-A03 2M	P.34	P.35 35-A	E32-D31-S1 0.5M	P.22	P.23 23-G	E32-T14 2M	P.28	P.29 29-D			27-F
	P.60	P.61 61-A	E32-D32L 2M	P.14	P.15 (15-E)	E32-T14F 2M	P.42	P.43 43-D	E39-F3C	P.24	P.25 25-C
E32-A03-1 2M	P.34	P.35 35-B	E32-D32-S1 0.5M	P.22	P.23 23-F	E32-T14LR 2M	P.12	P.13 (13-D)			25-D
	P.60	P.61 61-B	E32-D33 2M	P.14	P.15 (15-F)	E32-T15XR 2M	P.16	P.17 17-A	E39-R		
E32-A03-2 2M	P.60	P.61 61-C		P.22	P.23 23-E	E32-T15YR 2M	P.16	P.17 (17-C)	E39-R1		P.39 39-B
E32-A04 2M	P.34	P.35 35-C	E32-D331 2M	P.22	P.23 23-D	E32-T15ZR 2M	P.16	P.17 (17-E)	E39-R3		P.39 39-C
	P.60	P.61 61-D	E32-D36P1 2M	P.52	P.53 53-F	E32-T16JR 2M	P.52	P.53 53-B	E39-RP1	P.38	P.39 39-A
E32-A04-1 2M	P.60	P.61 61-E	E32-D36T 2M	P.54	P.55 55-C	E32-T16PR 2M	P.52	P.53 53-A		P.10	P.11 (11-G)
E32-A04-8 2M	P.60	P.61 61-F	E32-D43M 1M	P.14	P.15 (15-B)	E32-T16WR 2M	P.52	P.53 53-D	E39-RP37	P.39	
E32-A08 2M	P.40	P.41 (41-C)		P.22	P.23 23-C	E32-T17L 10M	P.28	P.29 29-B	E39-RSP1	P.39	
	P.58	P.59 (59-B)	E32-D51 2M	P.50	P.51 51-B	E32-T21 2M	P.44	P.45 45-B	E39-L		
E32-A08H2 2M	P.50	P.51 51-D	E32-D51R 2M	P.50	P.51 (51-A)	E32-T21-S1 2M	P.20	P.21 21-D	E39-L143		P.95 95-A
	P.58	P.59 59-C	E32-D61-S 2M	P.50	P.51 (51-I)	E32-T223R 2M	P.12	P.13 (13-A)	E3NW		
E32-A09 2M	P.40	P.41 (41-F)	E32-D611-S 2M	P.50	P.51 (51-H)	E32-T22B 2M	P.12	P.13 (13-B)	E3NW-DS	P.84	P.85 85-B
	P.58	P.59 59-E	E32-D73-S 2M	P.50	P.51 (51-J)		P.44	P.45 (45-A)	E3NW-ECT	P.84	P.85 85-A
E32-A09H2 2M	P.50	P.51 51-G	E32-D81R-S 2M	P.50	P.51 51-C	E32-T22S 2M	P.34	P.35 35-F	E3NX-FA		
	P.58	P.59 59-F	E32-D82F1 4M	P.54	P.55 55-D	E32-T24E 2M	P.20	P.21 21-B	E3NX-FA0	P.74	P.77 77-B
E32-A12 2M	P.40	P.41 41-D	E32-DC200BR 2M	P.22	P.23 23-K	E32-T24R 2M	P.20	P.21 21-A	E3NX-FA10 2M	P.74	P.77 77-B
	P.58	P.59 59-D	E32-DC200F4R 2M	P.22	P.23 23-H	E32-T24S 2M	P.34	P.35 35-E	E3NX-FA11 2M	P.72	P.76 76-A
E32-A13 2M	P.52	P.53 53-C	E32-G				P.60	P.61 61-H	E3NX-FA11-5 2M	P.72	P.76 76-A
E32-C	,		E32-G16 2M	P.52	P.53 53-E	E32-T24SR 2M	P.34	P.35 35-D	E3NX-FA11AN 2M	P.72	P.76 76-A
E32-C21N 2M	P.10	P.11 11-D	E32-L				P.60	P.61 61-G	E3NX-FA21 2M	P.72	P.76 76-A
	(P.24, 26)	(P.25, 27)	E32-L11FP 2M	P.42	P.43 43-F	E32-T25XB 2M	P.44	P.45 45-D	E3NX-FA24	P.72	P.77 77-A
E32-C31 2M	P.08	P.09 09-D		P.58	P.59 59-G	E32-T25XR 2M	P.16	P.17 17-B	E3NX-FA40 2M	P.74	P.77 77-B
	(P.24, 26)	(P.25, 27)	E32-L11FS 2M	P.42	P.43 43-G	E32-T25YR 2M	P.16	P.17 (17-D)	E3NX-FA41 2M	P.72	P.76 76-A
E32-C31M 1M	P.08	P.09 09-E		P.58	P.59 59-H	E32-T25ZR 2M	P.16	P.17 (17-F)	E3NX-FA41AN 2M	P.74	P.76 76-A
E32-C31N 2M	P.08	P.09 09-A	E32-L15 2M	P.24	P.25 25-F	E32-T33 1M	P.20	P.21 21-C	E3NX-FA51 2M	P.72	P.76 76-A
E32-C41 1M	P.26	P.27 27-A	E32-L16-N 2M	P.36	P.37 37-A	E32-T51 2M	P.48	P.49 49-B	E3NX-FA54	P.72	P.77 77-A
		27-D		P.40	P.41 41-B		(P.32)	(P.33)	E3NX-FA54TW	P.72	P.77 77-A
E32-C42 1M	P.24	P.25 25-A		P.58	P.59 59-A	E32-T51F 2M	P.42	P.43 43-E	E3NX-FA6	P.72	P.76 76-B
		25-B	E32-L24S 2M	P.36	P.37 37-B	E32-T51R 2M	P.48	P.49 49-A	E3NX-FA7	P.72	P.76 76-B
E32-C42S 1M	P.24	P.25 25-E		P.40	P.41 (41-A)		(P.32)	(P.33)	E3NX-FA7TW	P.72	P.76 76-B
E32-CC200 2M	P.08	P.09 09-H	E32-L25L 2M	P.36	P.37 37-C	E32-T51V 1M	P.56	P.57 57-A	E3NX-FA8	P.72	P.76 76-B
	(P.26)	(P.27)		P.40	P.41 (41-E)	E32-T54 2M	P.48	P.49 49-C	E3NX-FA9	P.72	P.76 76-B
E32-C91N 2M	P.08	P.09 09-B	E32-L25T 2M	P.54	P.55 55-B	E32-T61-S 2M	P.48	P.49 49-G	E3NX-FA9TW	P.72	P.76 76-B
	P.10	P.11 (11-F)	E32-L64 2M	P.50	P.51 51-E		(P.32)		E3NX-FAH0	P.74	P.77 77-B
E32-D			E32-L86 2M	P.50	P.51 (51-F)	E32-T64-2 2M	P.48	P.49 49-F	E3NX-FAH11 2M	P.72	P.76 76-A
E32-D11 2M	P.46	P.47 47-E	E32-LD11 2M	P.08	P.09 (09-I)	E32-T81R-S 2M	P.48	P.49 49-D	E3NX-FAH41 2M	P.72	P.76 (76-A)
E32-D11R 2M	P.08	P.09 09-G	E32-LD11N 2M	P.10	P.11 (11-C)		(P.32)	(P.33)	E3NX-FAH6	P.72	P.76 76-B
E32-D11U 2M	P.42	P.43 (43-I)	E32-LD11R 2M	P.08	P.09 (09-I)	E32-T84SV 1M	P.56	P.57 57-C	E3NX-FAH8	P.72	P.76 76-B
E32-D12F 2M	P.42	P.43 (43-H)	E32-LR11NP 2M	P.38	P.39 39-A	E32-T84S-S 2M	P.48	P.49 49-E	E3X-CN		
E32-D14LR 2M		P.15 (15-G)	FOO LT44 CT	P.10	-	E32-TC200BR 2M	P.20	P.21 21-E	E3X-CN11	P.94	P.94 94-A
E32-D15XR 2M	P.18	P.19 (19-A)	E32-LT11 2M	P.06	P.07 07-C	E32-V	D.F.O	D.E.7.	E3X-CN12	P.94	P.94 94-B
E32-D15YR 2M	P.18	P.19 (19-C)	E20 1744N 055	P.28	P.29 29-C	E32-VF1	P.56	P.57 57-F	E3X-CN21	P.94	P.94 94-A
E32-D15ZR 2M	P.18	P.19 (19-E)	E32-LT11N 2M	P.28	P.29 29-A	E32-VF4	P.56	P.57 57-E	E3X-CN22	P.94	P.94 94-B
E32-D31 2M	P.28	P.29 29-E	Egg LT44D Off	P.10	P.11 (11-A)	E39-F	D 20 20	D 20 90 A	E3X-ZV	Don	P.89 89-A)
E32-D211P 2M	P.46	P.47 47-B P.09 09-F	E32-LT11R 2M	P.06	P.07 07-C	E39-F1	<u> </u>	P.30 30-A	E3X-ZV/11 2M	P.88	P.89 89-A
E32-D21R 2M	P.08	=	E22-1 T257 084	P.28	P.29 29-C	E39-F1-33	P.32	P.32 32-D	E3X-ZV6	P.88	P.89 89-B
E32-D21N 2M	P.46	P.47 (47-D)	E32-LT35Z 2M	P.16	P.17 (17-G)	E39-F11	P.21	D 20 96 B	E3X-ZV9	P.88	$-\sim$
E32-D21N 2M	P.10	P.11 (11-E)	E32-R	D 20	P.39 39-B)	E39-F16	P.30, 32	$-\sim$	E3X-ZV8	P.88	P.89 89-B
E32-D21R 2M	P.08 P.22	P.09 09-C P.23 23-J	E32-R16 2M	P.38	=	E39-F17	P.24	P.25 25-B	PFP		P.95 95-B)
E32-D221R 2M		P.15 (15-D)	E32-R21 2M	P.38	P.39 39-C	E39-F18	P.26	P.27 27-G 27-H	PFP-100N		P.95 95-C
E32-D221B 2M	P.14 P.46	P.15 (15-D) P.47 (47-C)	E32-T	P.56	P.57 57-D	E39-F1V	P.56	P.57 57-B	PFP-100N2		P.95 95-B
F32-D22P 2M	P.46 P.14	\rightarrow	E32-T10V 2M					$-\sim$	PFP-50N		\sim
E32-D22B 2M		P.15 (15-A)	E32-T11 2M	P.44 (P.30)	P.45 (45-C) (P.31)	E39-F2	P.30, 32	\rightarrow	XS3F		P.95 95-D
E32-D22R 2M	P.46	P.47 47-A	E32-T11E 2M		P.43 (43-C)	E39-F32A 1M	P.46 P.44	P.47 47-G P.45 45-E		P.94	P.94 94-C
	P.14	\rightarrow	E32-T11F 2M	P.42		E39-F32C 1M		P.45 45-E	XS3F-M421-402-A		P.94 94-C
E32-D24R 2M	P.22	P.23 (23-I) P.23 (23-A)	E32-T11N 2M	P.06 (P.30)	P.07 07-A (P.31)	E30, E33D 4M	P.46	P.47 47-G	XS3F-M421-405-A	P.94 P.94	P.94 94-D
E32-D24R 2M	P.22	=	E22_T11NF 0**			E39-F32D 1M	P.46	\rightarrow	XS3F-M422-402-A		$-\sim$
E32-D254-S2 2M	P.22	P.23 23-B P.47 47-F	E32-T11NF 2M	P.42	P.43 (43-A)	E39-F3A	P.24	P.25 25-A	XS3F-M422-405-A	P.94	P.94 94-D
E32-D25XB 2M	P.46	\rightarrow	E32-T11NFS 2M	P.42	P.43 (43-A2)	E39-F3A-5	P.26	P.27 27-A			
E32-D25XR 2M	P.18	P.19 (19-B)	E32-T11R 2M	P.06 (P.30)	P.07 07-B (P.29, 31)			27-B			
E32-D25YR 2M	P.18	P.19 (19-D)		()				(27-C)			

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^{*} For performance (sensing distance and minimum sensing object) based on November 2017 OMRON investigation.

Smart Fiber Amplifier Units

Please refer to Smart Fiber Amplifier Units Catalog for details.





Smart Fiber Amplifier Units E3NX-FA Series

Cat. No. E426

Smart Fiber Amplifier Units E3X-ZV Series

Cat. No. E600

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