OMRON

Advanced Dual Fiber Sensors
E3X-MDA

Two Amplifiers Squeezed into a Single Sensor Provide Significant Cost, Space and Labor Savings

- Two channels accept two sets of fiber cables.
- AND/OR control output eliminates the need for a PLC or sensor controller.
- 4 element LED and Auto Power Control ensure stable, long term performance.
- Improved remote programmer.
- Same ease-of-use as the E3X-DA-N amplifiers.

Ordering Information

■ Amplifier Units

Stock Note: Shaded items are normally stocked.

Amplifier Units with Cables

Item	Appearance	Functions	Model	
			NPN output	PNP output
2-channel models		AND/OR output	**E3X-MDA11**	**E3X-MDA41**

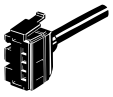
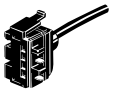
Amplifier Units with Connectors

Stock Note: Shaded items are normally stocked.

Item	Appearance	Functions	Model	
			NPN output	PNP output
2-channel models		AND/OR output	**E3X-MDA6**	**E3X-MDA8**

■ Amplifier Unit Connectors (Order Separately)

Stock Note: Shaded items are normally stocked.

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

Combining Amplifier Units and Connectors

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

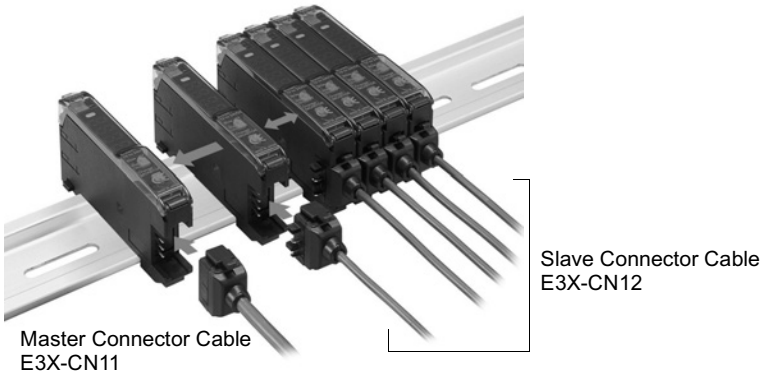
Amplifier Unit				Applicable Connector (Order Separately)	
Model	NPN output	PNP output		Master Connector	Slave Connector
2-channel models	E3X-MDA6	E3X-MDA8	+	E3X-CN21 (4-wire)	E3X-CN22 (2-wire)

Combining Multiple Wire-Saving Amplifiers and Connector Cables

When combining wire-saving amplifiers, the amplifiers that are connected together must all have the same part number. Only one master connector is required. The master connector cable distributes power to all the “ganged” wire-saving amplifiers. The rest of the wire-saving amplifiers require slave connector cables; slave connector cables handle output signal transmission only.

Example: Requirements for combining 5 E3X-MDA6 amplifiers:

- 1 master connector cable
- 5 slave connector cables
- 6 E3X-MDA6 amplifiers



■ Mobile Console (Order Separately)

Stock Note: Shaded items are normally stocked.

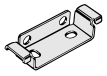
Appearance	Model	Remarks
	E3X-MC11-S (model number of set)	Mobile Console with Head, Cable, and AC adapter provided as accessories
	E3X-MC11-C1-S	Mobile Console
	E3X-MC11-H1	Head
	E39-Z12-1	Cable (1.5 m)

Note: Use the E3X-MC11-S Mobile Console for the E3X-DA-S/MDA-series Amplifier Units. Other Mobile Consoles cannot be used.

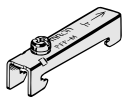
■ Accessories (Order Separately)

Stock Note: Shaded items are normally stocked.

Mounting Bracket

Appearance	Model	Quantity
	E39-L143	1

End Plate

Appearance	Model	Quantity
	PFP-M	1

Specifications

■ Ratings/Characteristics

Amplifier Units

Type			2-channel models	
Model		NPN output	E3X-MDA11	E3X-MDA6
Item		PNP output	E3X-MDA41	E3X-MDA8
Light source (wavelength)			Red LED (650 nm)	
Supply voltage			12 to 24 VDC ±10%, ripple (p-p) 10% max.	
Power consumption			1,080 mW max. (current consumption: 45 mA max. at power supply voltage of 24 VDC)	
Control output			Load power supply voltage: 26.4 VDC; open collector; load current: 50 mA max.; residual voltage: 1 V max.	
Circuit protection			Reverse polarity for power supply connection, output short-circuit	
Response time	High-speed mode	NPN	130 μs[*1] for operation and reset respectively	
		PNP		
	Standard mode		1 ms for operation and reset respectively	
	High-resolution mode		4 ms for operation and reset respectively	
Sensitivity setting			Teaching or manual method	
Functions	Power tuning		Light emission power and reception gain, digital control method	
	Timer function		Select from OFF-delay, ON-delay, or one-shot timer. 1 ms to 5 s (1 to 20 ms set in 1-ms increments, 20 to 200 ms set in 10-ms increments, 200 ms to 1 s set in 100-ms increments, and 1 to 5 s set in 1 s-increments)	
	Automatic power control (APC)		High-speed control method for emission current	
	Zero-reset		Display can be reset to zero when required (negative values can be displayed).	
	Initial reset		Settings can be returned to defaults as required.	
	Mutual interference prevention		Possible for up to 9 Units (18 channels)[*2, *3]	
	I/O settings		Output setting (Select from channel 2 output, AND, OR, leading edge sync, falling edge sync, or differential output)	
Display			Operation indicator for channel 1 (orange), Operation indicator for channel 2 (orange)	
Digital display			Select from the following: Incident level for channel 1 + incident level for channel 2, Incident level + threshold, incident level percentage + threshold, incident light peak level + no incident light bottom level, minimum incident light peak level + maximum no incident light bottom level, long bar display, incident level + peak hold, incident level + channel	
Display orientation			Normal/reverse program selectable	
Ambient illumination (receiver side)			Incandescent lamp:10,000 lux max. Sunlight:20,000 lux max.	
Ambient temperature			Operating:Groups of 1 to 2 Amplifiers: −25°C to 55°C Groups of 3 to 10 Amplifiers: −25°C to 50°C Groups of 11 to 16 Amplifiers: −25°C to 45°C (with no icing or condensation) Storage: −30°C to 70°C (with no icing or condensation)	
Ambient humidity			Operating and storage: 35% to 85% (with no condensation)	
Insulation resistance			20 MΩ min. (at 500 VDC)	
Dielectric strength			1,000 VAC at 50/60 Hz for 1 minute	
Vibration resistance (destruction)			10 to 55 Hz with a 1.5-mm double amplitude for 2 hrs each in X, Y and Z directions	
Shock resistance (destruction)			500 m/s^2, for 3 times each in X, Y and Z directions	
Enclosure rating			IEC 60529 IP50 (with Protective Cover attached)	
Connection method			Prewired cable	Standard connector
Weight (packed state)			Approx. 100 g	Approx. 55 g
Materials	Case		Polybutylene terephthalate (PBT)	
	Cover		Polycarbonate (PC)	
Accessories			Instruction sheet	

Note: ***1.** When differential output is selected for the output setting, the second channel output is 200 μs for operation and reset respectively.

***2.** Communications are disabled if the detection mode is selected during high-speed mode, and the communications functions for mutual interference prevention and the Mobile Console will not function.

***3.** Mutual interference prevention can be used for up to 5 Units (10 channels) if power tuning is enabled.

Amplifier Unit Connectors

Item		E3X-CN11/21/22	E3X-CN12
Rated current		2.5 A	
Rated voltage		50 V	
Contact resistance		20 mΩ max. (20 mVDC max., 100 mA max.) (The figure is for connection to the Amplifier Unit and the adjacent Connector. It does not include the conductor resistance of the cable.)	
No. of insertions (destruction)		50 times (The figure for the number of insertions is for connection to the Amplifier Unit and the adjacent Connector.)	
Materials	Housing	Polybutylene terephthalate (PBT)	
	Contacts	Phosphor bronze/gold-plated nickel	
Weight (packed state)		Approx. 55 g	Approx. 25 g

Mobile Console

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

Note: Refer to *Operation Manual* provided with the Mobile Console for details.

Ordering Information: Fiber Units

■ Through-beam Fiber Units

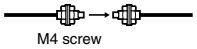
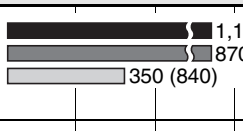
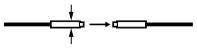
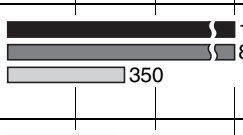
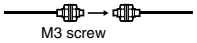
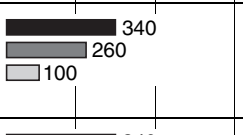
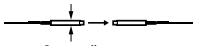
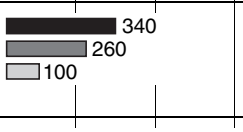
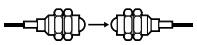
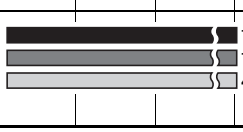
Note: 1. Free-cut Indicates models that allow free cutting. Models without this mark do not allow free cutting.

2. The size of standard sensing object is the same as the fiber core diameter (lens diameter for models with lens).

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

Long-distance Fiber Units

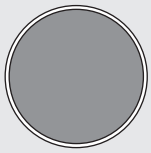
■ : High-resolution mode ■ : Standard mode ■ : Super-high-speed mode

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm) (Parentheses: With E39-F1 Lens Unit)	Standard object (min. object) (Parentheses: Opaque object)	Model	Permissible bending radius
M4 Free-cut		E3X-MDA		1.4-mm dia. (0.01-mm dia.)	E32-T11L	25 mm
3-mm dia. Free-cut		E3X-MDA			E32-T12L	
M3 Free-cut		E3X-MDA		0.9-mm dia. (0.005-mm dia.)	E32-T21L	10 mm
2-mm dia.; small diameter Free-cut		E3X-MDA			E32-T22L	
M14; with lens; ideal for explosion-proof applications Free-cut		E3X-MDA		10-mm dia.	E32-T17L	25 mm

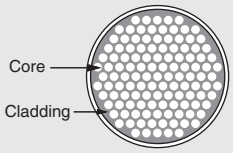
A Wide Range of Multicore Fibers for Easy Installation without Loss of Light Intensity

Multicore fiber models are indicated by an "R" at the end of the model number.
Multicore fiber contains multiple cores. These cores are all surrounded by cladding, giving a minimum bending radius of 1 mm.

The fiber can be bent at right angles without affecting the light intensity. Handle it just like any other cable.
Note: Do not use this fiber in applications that have repetitive bending.

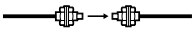
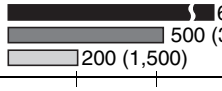
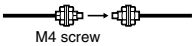
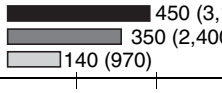
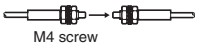
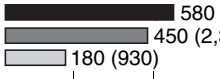
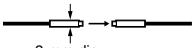
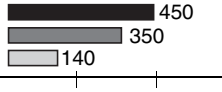
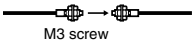
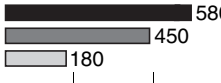
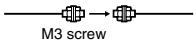
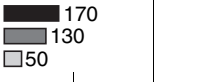
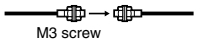
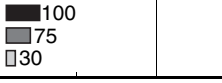


Conventional Fiber
Conventional fiber uses just one core and one cladding section. Bending the fiber may break it or reduce the light intensity.



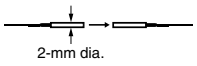
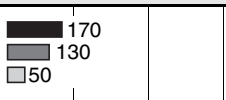
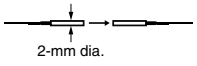
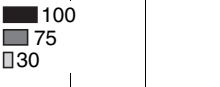
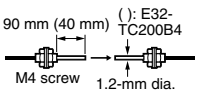
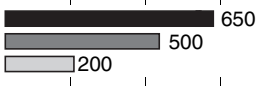
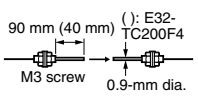
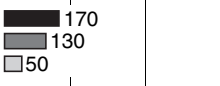
Multicore Fiber
Multicore fiber contains multiple independent cores all surrounded by cladding. The fiber can be bent without breaking or reducing the light intensity.

General-purpose Fiber Units

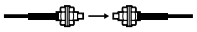
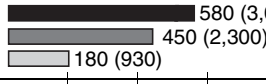
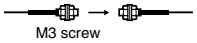
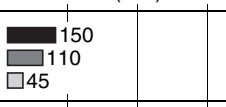
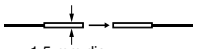
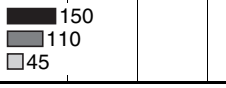
Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm) (Parentheses: With E39-F1 Lens Unit)	Standard object (min. object) (Parentheses: Opaque object)	Model	Permissible bending radius
M4 (Free-cut)	 M4 screw	E3X-MDA	 650 (4,000)* 500 (3,700) 200 (1,500)	1.0-mm dia. (0.005-mm dia.)	E32-TC200	25 mm
M4 Multicore (Free-cut)	 M4 screw	E3X-MDA	 450 (3,100) 350 (2,400) 140 (970)		E32-T11R	1 mm
M4 (Free-cut) Fiber-sheath material: fluororesin	 M4 screw	E3X-MDA	 580 (3,000)* 450 (2,300) 180 (930)		E32-T11U *NEW*	4 mm
3-mm dia. Multicore (Free-cut)	 3-mm dia.	E3X-MDA	 450 350 140		E32-T12R	1 mm
M3 (Free-cut) Possible to mount the E39-F5 Reflective Side-view Conversion Attachment	 M3 screw	E3X-MDA	 580 450 180		E32-TC200A	25 mm
M3; for detecting minute objects (Free-cut)	 M3 screw	E3X-MDA	 170 130 50	0.5-mm dia. (0.005-mm dia.)	E32-TC200E	10 mm
M3 Multicore (Free-cut)	 M3 screw	E3X-MDA	 100 75 30		E32-T21R	1 mm

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

Fiber Units with Thin Heads

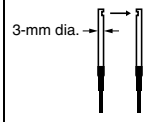
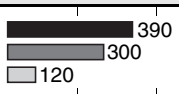
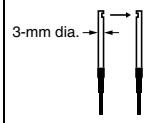
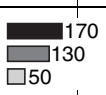
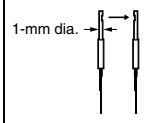
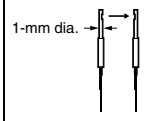
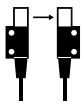
Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm) (Parentheses: With E39-F1 Lens Unit)	Standard object (min. object) (Parentheses: Opaque object)	Model	Permissible bending radius
2-mm dia.; for detecting minute objects (Free-cut)		E3X-MDA		0.5-mm dia. (0.005-mm dia.)	E32-T22	10 mm
2-mm dia.; for detecting minute objects Multicore (Free-cut)		E3X-MDA			E32-T22R	1 mm
1.2-mm dia.; with sleeve (Free-cut)		E3X-MDA		1.0-mm dia. (0.005-mm dia.)	E32-TC200B E32-TC200B4	25 mm
0.9-mm dia.; with sleeve (Free-cut)		E3X-MDA		0.5-mm dia. (0.005-mm dia.)	E32-TC200F E32-TC200F4	10 mm

Flexible Fiber Units (Resists Breaking) (R4)

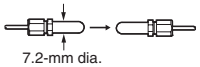
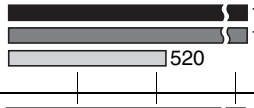
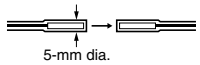
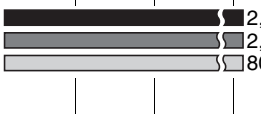
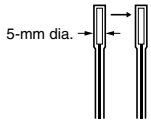
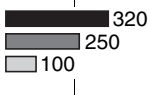
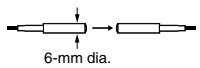
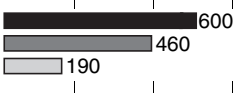
Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm) (Parentheses: With E39-F1 Lens Unit)	Standard object (min. object) (Parentheses: Opaque object)	Model	Permissible bending radius
Ideal for mounting on moving sections (R4) (Free-cut)		E3X-MDA		1.0-mm dia. (0.005-mm dia.)	E32-T11	4 mm
		E3X-MDA		0.5-mm dia. (0.005-mm dia.)	E32-T21	
		E3X-MDA			E32-T22B	

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

Side-view Fiber Units

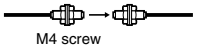
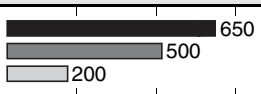
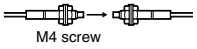
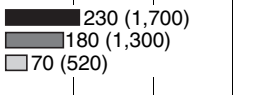
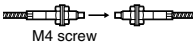
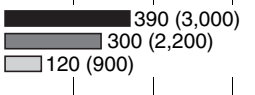
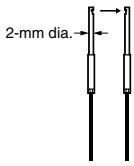
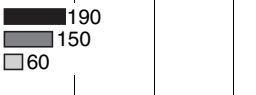
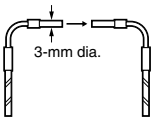
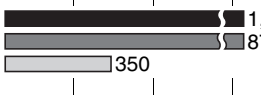
Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm) (Parentheses: With E39-F1 Lens Unit)	Standard object (min. object) (Parentheses: Opaque object)	Model	Permissible bending radius
Long distance; space-saving (Free-cut)		E3X-MDA		1.0-mm dia. (0.005-mm dia.)	E32-T14L	25 mm
Space-saving; Multicore (Free-cut)		E3X-MDA			E32-T14LR	1 mm
Suitable for detecting minute objects; small diameter (Free-cut)		E3X-MDA		0.5-mm dia. (0.005-mm dia.)	E32-T24	10 mm
Suitable for detecting minute objects; small diameter; Multicore (Free-cut)		E3X-MDA			E32-T24R	1 mm
Screw-mounting type; long distance (Free-cut)		E3X-MDA		4-mm dia. (0.1-mm dia.)	E32-T14	25 mm

Chemical-resistant Fiber Units

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm) (Parentheses: With E39-F1 Lens Unit)	Standard object (min. object) (Parentheses: Opaque object)	Model	Permissible bending radius
Teflon-covered*; round head that resists water drops (Free-cut)		E3X-MDA		4-mm dia. (0.1-mm dia.)	E32-T11F *NEW*	4 mm
Teflon-covered*; withstands chemicals and harsh environments (operating ambient temperature: −30°C to 70°C) (Free-cut)		E3X-MDA		4-mm dia. (0.1-mm dia.)	E32-T12F	40 mm
Teflon-covered*; withstands chemicals and harsh environments; side-view (operating ambient temperature: −30°C to 70°C) (Free-cut)		E3X-MDA		3-mm dia. (0.1-mm dia.)	E32-T14F	
Teflon*; withstands chemicals and harsh environments (operating ambient temperature: −40°C to 200°C)		E3X-MDA		1.0-mm dia. (0.005-mm dia.)	E32-T81F-S *NEW*	10 mm

Note: *Teflon is a registered trademark of the Dupont Company and the Mitsui Dupont Chemical Company for their fluoride resin.

Heat-resistant Fiber Units

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm) (Parentheses: With E39-F1 Lens Unit)	Standard object (min. object) (Parentheses: Opaque object)	Model	Permissible bending radius
Free-cut Resists 150°C[*1]; fiber sheath material: fluororesin (operating ambient temperature: −40°C to 150°C)		E3X-MDA		1.5-mm dia. (0.1-mm dia.)	E32-T51	35 mm
Resists 200°C; flexible (R10); fiber sheath material: Teflon[*2] (operating ambient temperature: −40°C to 200°C)		E3X-MDA		1.0-mm dia. (0.005-mm dia.)	E32-T81R-S *NEW*	10 mm
Resists 350°C[*3], with spiral tube; high mechanical strength; fiber sheath material: stainless steel (operating ambient temperature: −60°C to 350°C)		E3X-MDA			E32-T61-S *NEW*	25 mm
Free-cut Side-view; resists 150°C[*1]; suitable for detecting minute objects; fiber sheath material: fluororesin (operating ambient temperature: −40°C to 150°C)		E3X-MDA			E32-T54	35 mm
Resists 200°C[*3]; L-shaped; fiber sheath material: stainless steel		E3X-MDA		1.7-mm dia. (0.1-mm dia.)	E32-T84S-S *NEW*	25 mm

Note: *1. For continuous operation, use the products within a temperature range of −40°C to 130°C.

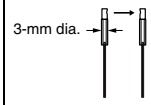
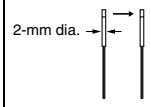
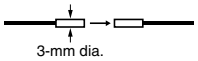
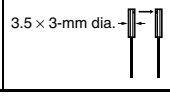
2. Teflon is a registered trademark of the Dupont Company and the Mitsui Dupont Chemical Company for their fluoride resin.

3. Indicates the heat-resistant temperature at the fiber tip.

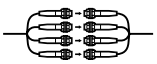
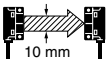
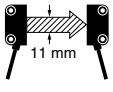
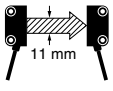
Fiber Unit with Slot Sensor

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm) (Parentheses: With E39-F1 Lens Unit)	Standard object (min. object) (Parentheses: Opaque object)	Model	Permissible bending radius
Free-cut Suitable for film sheet detection; no optical axis adjustment required; easy to mount		E3X-MDA		4-mm dia. (0.1-mm dia.)	E32-G14	25 mm

Fiber Units with a Narrow Vision Field

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm) (Parentheses: With E39-F1 Lens Unit)	Standard object (min. object) (Parentheses: Opaque object)	Model	Permissible bending radius
Super-narrow vision field; side-view; opening angle: 1.5°; simple adjustment (Free-cut)		E3X-MDA	750 580 250	2-mm dia. (0.1-mm dia.)	E32-A03	1 mm
Super-narrow vision field; small; side-view; opening angle: 3°; simple adjustment (Free-cut)		E3X-MDA	300 220 100	1.2-mm dia. (0.1-mm dia.)	E32-A04	10 mm
Suitable for detecting wafers (Free-cut)		E3X-MDA	1,600 1,250 500	1.7-mm dia. (0.1-mm dia.)	E32-T22S	25 mm
Side-view; suitable for detecting wafers (Free-cut)		E3X-MDA	1,100 870 350	2-mm dia. (0.1-mm dia.)	E32-T24S	10 mm

Area-sensing Fiber Units

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm) (Parentheses: With E39-F1 Lens Unit)	Standard object (min. object) (Parentheses: Opaque object)	Model	Permissible bending radius
Multi-point detection (4-head)		E3X-MDA	470 360 140	2-mm dia. (0.1-mm dia.)	E32-M21	25 mm
Detects in a 30-mm area (Free-cut)		E3X-MDA	1,400 1,100 450	(0.3-mm dia.)*1	E32-T16W	10 mm
		E3X-MDA	1,100 860 340		E32-T16WR (Multicore)	1 mm
Side-view; suitable for applications with limited spatial depth (Free-cut)		E3X-MDA	800 650 260	(0.2-mm dia.)*1	E32-T16J	10 mm
		E3X-MDA	600 480 190		E32-T16JR (Multicore)	1 mm
Suitable for detecting over a 10-mm area; long distance (Free-cut)		E3X-MDA	2,400 1,800 740	(0.6-mm dia.)*2	E32-T16	25 mm
Stable for detecting minute objects in a wide area (Free-cut)		E3X-MDA	970 750 300	(0.2-mm dia.)*1	E32-T16P	10 mm
		E3X-MDA	730 560 220		E32-T16PR (Multicore)	1 mm

Note: ***1.** These figures are for a sensing distance of 300 mm. (Figures for the diameter of sensing objects are in the still state.)

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

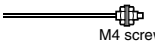
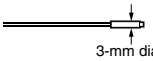
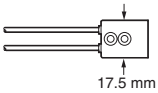
■ Diffuse Fiber Units

Note: 1. Free-cut Indicates models that allow free cutting. Models without this mark do not allow free cutting.

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

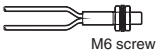
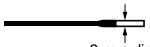
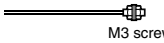
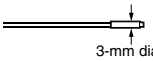
3. When set to the maximum sensitivity setting, internal light reflection may cause the sensor to detect incident light. In such case, adjust the threshold manually or automatically (teaching).

Long-distance Fiber Units

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)*	Standard object (min. object: Gold wire)	Model	Permissible bending radius
M6 Free-cut	 M6 screw	E3X-MDA	400 270 110	500×500 (0.005-mm dia.)	E32-D11L	25 mm
3-mm dia.; small diameter Free-cut	 3-mm dia.	E3X-MDA	230 160 70	300×300 (0.005-mm dia.)	E32-D12	
M4 Free-cut	 M4 screw	E3X-MDA	130 85 35	200×200 (0.005-mm dia.)	E32-D21L	10 mm
3-mm dia.; small diameter Free-cut	 3-mm dia.	E3X-MDA	130 85 35		E32-D22L	
Square head, long distance Free-cut	 17.5 mm	E3X-MDA	40 to 600 40 to 490 40 to 240	300×300	E32-D16 *NEW*	4 mm

Note: *Values were obtained using a white paper (standard object).

General-purpose Fiber Units

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)*	Standard object (min. object: Gold wire)	Model	Permissible bending radius
M6 Free-cut	 M6 Screw	E3X-MDA	300 210 90	400×400 (0.005-mm dia.)	E32-DC200	25 mm
M6 Multicore Free-cut	 M6 screw	E3X-MDA	300 170 50	300×300 (0.005-mm dia.)	E32-D11R	1 mm
M6 Fiber sheath material: fluororesin Free-cut	 M6 screw	E3X-MDA	170 125 50		E32-D11U *NEW*	4 mm
3-mm dia. Multicore Free-cut	 3-mm dia.	E3X-MDA	170 120 50		E32-D12R	1 mm
M3; small diameter Free-cut	 M3 screw	E3X-MDA	80 55 22	100×100 (0.005-mm dia.)	E32-DC200E	10 mm
M3; small diameter Multicore Free-cut	 M3 screw	E3X-MDA	30 22 8	50×50 (0.005-mm dia.)	E32-D21R	1 mm
3-mm dia.; small diameter; multicore Free-cut	 3-mm dia.	E3X-MDA	30 22 8		E32-D22R	

Note: *Values were obtained using a white paper (standard object).

Fiber Units with Thin Heads

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)*	Standard object (min. object: Gold wire)	Model	Permissible bending radius
2.5-mm dia.; with sleeve (Free-cut)	( ): E32-DC200B4 90 mm (40 mm) M6 screw 2.5-mm dia.	E3X-MDA	300 210 90	400×400 (0.005-mm dia.)	E32-DC200B E32-DC200B4	25 mm
1.2-mm dia.; with sleeve (Free-cut)	( ): E32-DC200F4 90 mm (40 mm) M3 screw 1.2-mm dia.	E3X-MDA	80 55 22	100×100 (0.005-mm dia.)	E32-DC200F E32-DC200F4	10 mm
0.8-mm dia.; for detecting minute objects (Free-cut)	3-mm dia. 0.8-mm dia.	E3X-MDA	16 10 4	25×25 (0.005-mm dia.)	E32-D33	4 mm
0.5-mm dia.; for detecting very minute objects	2-mm dia. 0.5-mm dia.	E3X-MDA	3 2 0.8		E32-D331	

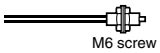
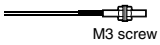
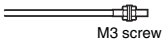
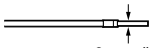
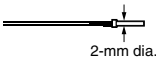
Note: *Values were obtained using a white paper (standard object).

Flexible Fiber Units (Resists Breaking) (R4)

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)*	Standard object (min. object: Gold wire)	Model	Permissible bending radius
Ideal for mounting on moving sections (R4) (Free-cut)	M6 screw	E3X-MDA	170 125 50	300×300 (0.005-mm dia.)	E32-D11	4 mm
(Free-cut)	M3 screw	E3X-MDA	30 22 8	50×50 (0.005-mm dia.)	E32-D21	
(Free-cut)	M4 screw	E3X-MDA	70 50 20	100×100 (0.005-mm dia.)	E32-D21B	
	1.5-mm dia.	E3X-MDA	30 22 8	50×50 (0.005-mm dia.)	E32-D22B	

Note: *Values were obtained using a white paper (standard object).

Coaxial Fiber Units

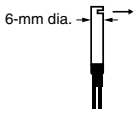
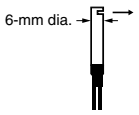
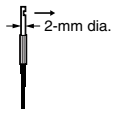
Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)*	Standard object (min. object: Gold wire)	Model	Permissible bending radius
M6 coaxial; high-precision positioning (Free-cut)	 M6 screw	E3X-MDA	300 210 90	500×500 (0.005-mm dia.)	E32-CC200	25 mm
3-mm dia.; small diameter; coaxial; high-precision positioning (Free-cut)	 3-mm dia.	E3X-MDA	150 100 45	300×300 (0.005-mm dia.)	E32-D32L	
M3 coaxial; high-precision positioning (Free-cut)	 M3 screw	E3X-MDA	75 50 22	100×100 (0.005-mm dia.)	E32-C31	
M3 coaxial; high-precision positioning	 M3 screw	E3X-MDA	35 22 8	50×50 (0.005-mm dia.)	E32-C41	
2-mm dia. coaxial; high-precision positioning	 2-mm dia.	E3X-MDA	35 22 8		E32-C42	
2-mm dia. coaxial; high-precision positioning (Free-cut)	 2-mm dia.	E3X-MDA	75 52 22	100×100 (0.005-mm dia.)	E32-D32	

Note: Values were obtained using a white paper (standard object).

Spot Diameter (Order Lens separately)

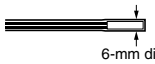
Lens	Appearance	Focusing lens type	Spot diameter values	
E39-F3A		Variable	E32-C42 Spot: 0.1-0.6 mm dia.	E32-D32 Spot: 0.5-1.0 mm dia.
E39-F3A-5		Fixed	E32-C31 Spot: 0.5 mm dia. Focal length: 7 mm	E32-C41 Spot: 0.1 mm dia. Focal length: 7 mm
E39-F3B			E32-C31 Spot: 0.5 mm dia. Focal length: 17 mm	E32-C41 Spot: 0.2 mm dia. Focal length: 17 mm
E39-F3C			E32-C31 Spot: 4.0 mm dia. Focal length: 20 mm	E32-C41 Spot: 4.0 mm dia. Focal length: 20 mm

Side-view Fiber Units

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)*	Standard object (min. object: Gold wire)	Model	Permissible bending radius
6-mm dia.; long distance (Free-cut)		E3X-MDA	110 80 36	200×200 (0.005-mm dia.)	E32-D14L	25 mm
6-mm dia. (Free-cut)		E3X-MDA	45 33 14	100×100 (0.005-mm dia.)	E32-D14LR (Multicore)	1 mm
2-mm dia.; small diameter; space-saving (Free-cut)		E3X-MDA	30 22 8	50×50 (0.005-mm dia.)	E32-D24	10 mm
		E3X-MDA	15 10 4		E32-D24R (Multicore)	1 mm

Note: *Values were obtained using a white paper (standard object).

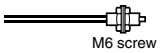
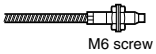
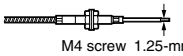
Chemical-resistant Fiber Units

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)*1	Standard object (min. object: Gold wire)	Model	Permissible bending radius
Teflon-covered*2; withstands chemicals and harsh environments (operating ambient temperature: −30°C to 70°C (Free-cut)		E3X-MDA	95 70 30	200×200 (0.005-mm dia.)	E32-D12F	40 mm

Note: *1. Values were obtained using a white paper (standard object).

***2.** Teflon is a registered trademark of the Dupont Company and the Mitsui Dupont Chemical Company for their fluoride resin.

Heat-resistant Fiber Units

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)*1	Standard object (min. object: Gold wire)	Model	Permissible bending radius
Resists 150°C*2; fiber sheath material: fluororesin (operating ambient temperature: −40°C to 150°C) (Free-cut)	 M6 screw	E3X-MDA	230 165 72	200×200 (0.005-mm dia.)	E32-D51	35 mm
Resists 200°C*3; fiber sheath material: fluororesin (operating ambient temperature: −40°C to 200°C)	 M6 screw	E3X-MDA	90 63 27		E32-D81R-S *NEW*	10 mm
Resists 350°C*3; fiber sheath material: stainless steel (operating ambient temperature: −60°C to 350°C)	 M6 screw	E3X-MDA	90 60 27		E32-D61-S *NEW*	25 mm
Resists 400°C*3; fiber sheath material: stainless steel (operating ambient temperature: −40°C to 400°C)	 M4 screw 1.25-mm dia.	E3X-MDA	60 40 18	100×100 (0.005-mm dia.)	E32-D73-S *NEW*	

Note: *1. Values were obtained using a white paper (standard object).

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

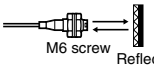
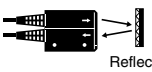
***3.** Indicates the heat-resistant temperature at the fiber tip.

Area-sensing Fiber Units

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)*	Standard object (min. object: Gold wire)	Model	Permissible bending radius
Side-view; detection over wide areas (Free-cut)		E3X-MDA	150 100 45	300×300 (0.005-mm dia.)	E32-D36P1	25 mm

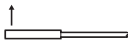
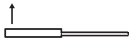
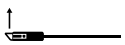
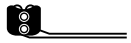
Note: *Values were obtained using a white paper (standard object).

Retroreflective Fiber Units

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)*	Standard object (min. object: Gold wire)	Model	Permissible bending radius
Transparent object detection; polarized (Free-cut)	 M6 screw Reflector E39-R3	E3X-MDA	10 to 250 10 to 250 10 to 250	35-mm dia. (0.1-mm dia.)	E32-R21 + E39-R3 (Attachment)	10 mm
Transparent object detection (operating ambient temperature: −25°C to 55°C); degree of protection: IEC60529 IP66; polarized (Free-cut)	 Reflector E39-R1	E3X-MDA	150 to 1,500 150 to 1,500 150 to 1,500	35-mm dia. (0.2-mm dia.)	E32-R16 + E39-R1 (Attachment)	25 mm

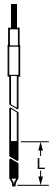
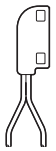
Note: *Values were obtained using a white paper (standard object).

Convergent Fiber Units

Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)*	Standard object (min. object: Gold wire)	Model	Permissible bending radius
Suitable for positioning liquid crystal glass (Free-cut)		E3X-MDA	0 to 15 0 to 15 0 to 15	100×100 Soda glass with reflection factor of 7%	E32-L16 *NEW*	25 mm
Suitable for positioning liquid crystal glass (Free-cut)		E3X-MDA	4 to 12 4 to 12 4 to 12		E32-L56E1 E32-L56E2	35 mm
Suitable for positioning liquid crystal glass (Resists 300°C)		E3X-MDA	5 to 18 5 to 18 5 to 18		E32-L66 *NEW*	25 mm
Liquid crystal glass, mounting detection, small (Free-cut)		E3X-MDA	0 to 4 0 to 4 0 to 4	25×25 (0.005-mm dia.)	E32-L24S *NEW*	10 mm
Detects wafers and small differences in height; (operating ambient temperature: –40°C to 105°C); degree of protection: IEC60529 IP50 (Free-cut)		E3X-MDA	4±2 4±2 4±2		E32-L24L	10 mm
		E3X-MDA	7.2±1.8 7.2±1.8 7.2±1.8		E32-L25L	
Detects wafers and small differences in height; degree of protection: IEC60529 IP50 (Free-cut)		E3X-MDA	3.3 3.3 3.3		E32-L25	25 mm
		E3X-MDA	3.3 3.3 3.3		E32-L25A	

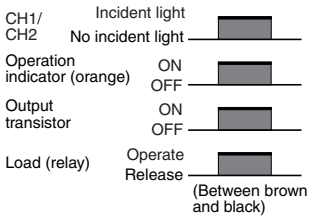
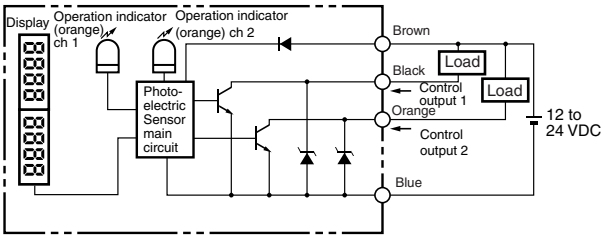
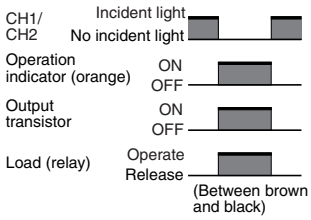
Note: *Values were obtained using a white paper (standard object).

Fluid-level Detection Fiber Units

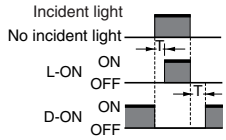
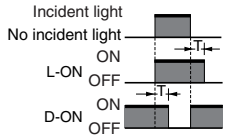
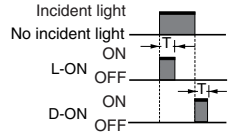
Features	Appearance	Applicable Amplifier Unit	Sensing distance (mm)	Standard object (min. object: Gold wire)	Model	Permissible bending radius
Fluid contact type: unbendable section L 150 mm, 350 mm (two types); (operating ambient temperature: −40°C to 200°C)		E3X-MDA	---	Pure water at 25°C	E32-D82F1 E32-D82F2	40 mm
Free-cut Tube-mounting type; Light ON when fluid is present; minimal influence from bubbles and water drops		E3X-MDA	Applicable tube: Transparent tube Tube diameter: 3.2, 6.4, or 9.5 mm (Tube must be FEP or material with equivalent transparency; recommended wall thickness: 1 mm)		E32-A01	4 mm
Free-cut Tube-mounting type; light ON when fluid is present; minimal influence from bubbles and water drops		E3X-MDA	Applicable tube: Transparent tube Tube diameter: 6 to 13 mm (Tube must be FEP or material with equivalent transparency; recommended wall thickness: 1 mm)		E32-A02	
Free-cut Tube-mounting type; dense mounting to detect level differences of 4 mm		E3X-MDA	Applicable tube: Transparent tube Tube diameter: 8 to 10 mm (Tube must be FEP or material with equivalent transparency; recommended wall thickness: 1 mm)		E32-L25T	10 mm
Free-cut Tube-mounting type; unlimited tube diameter; minimal influence from bubbles and water drops		E3X-MDA	Applicable tube: Transparent tube Tube diameter: No restriction (Tube must be FEP or material with equivalent transparency)		E32-D36F	4 mm

Output Circuits

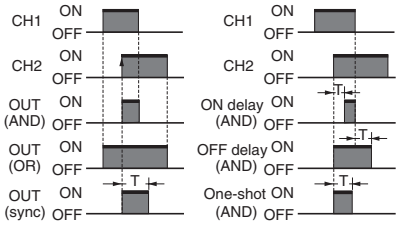
NPN Output

Model	Mode selector	Timing chart	State of output transistor	Output circuit
E3X-MDA11 E3X-MDA6	LIGHT ON (L/ON)		Light ON	
	DARK ON (D/ON)		Dark ON	

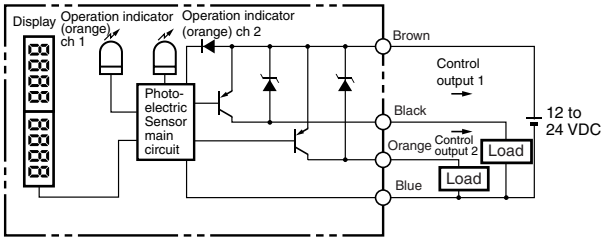
Note: 1. Time Charts for Timer Settings (T: Set Time)

ON delay	OFF delay	One-shot
		

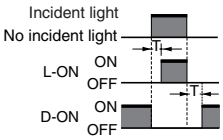
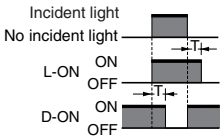
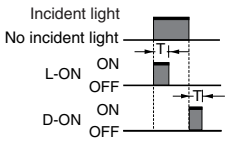
2. Control Output (AND, OR, Sync) and Time Chart for Timer Settings (T: Set Time)



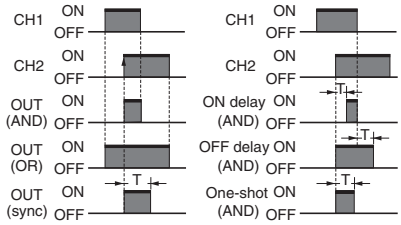
PNP Output

Model	Mode selector	Timing chart	State of output transistor	Output circuit
E3X-MDA41 E3X-MDA8	LIGHT ON (L/ON)	CH1/CH2: Incident light / No incident light Operation indicator (orange): ON / OFF Output transistor: ON / OFF Load (relay): Operate / Release (Between blue and black)	Light ON	
	DARK ON (D/ON)	CH1/CH2: Incident light / No incident light Operation indicator (orange): ON / OFF Output transistor: ON / OFF Load (relay): Operate / Release (Between blue and black)	Dark ON	

Note: 1. Time Charts for Timer Settings (T: Set Time)

ON delay	OFF delay	One-shot
		

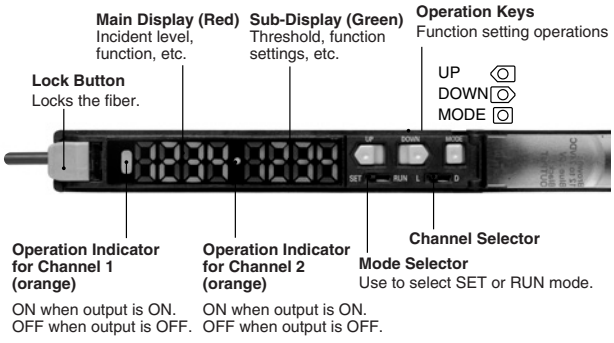
2. Control Output (AND, OR, Sync) and Time Chart for Timer Settings (T: Set Time)



Nomenclature

■ Amplifier Units

E3X-MDA□



Adjustment Methods

1. Setting the Operation Mode

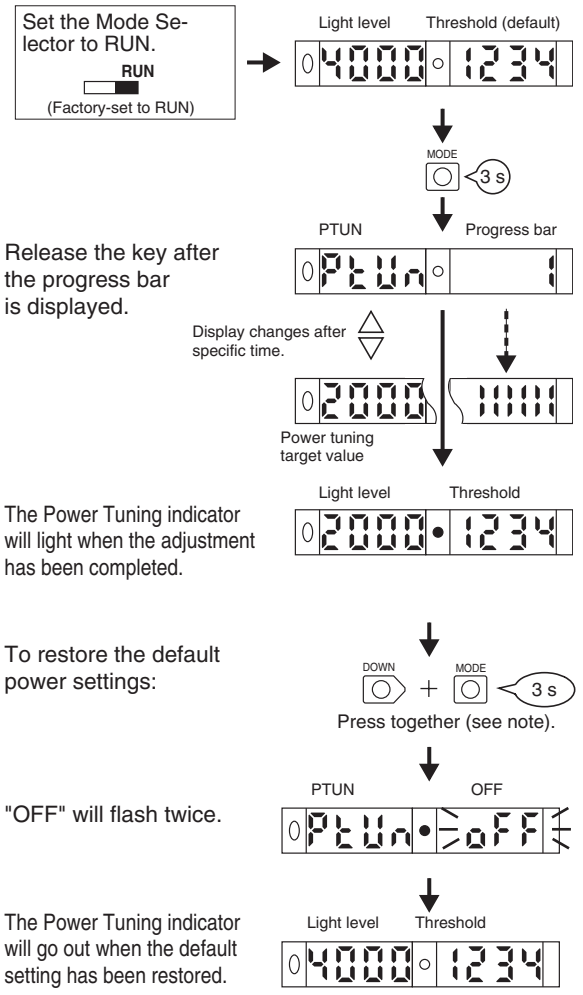
The operation mode is set in SET mode. Refer to *Section 5. Setting Functions in SET Mode on page 22*.

Set the Channel Selector to the desired channel before making *any* adjustments or settings.

2. Adjusting the Power (RUN Mode)

The current incident light level can be adjusted to near the power tuning target value (default: 2,000).

Confirm that the MODE key setting is PTUN (power tuning). The default setting is PTUN. Refer to *Section 5. Setting Functions in SET Mode on page 22*



Setting Errors

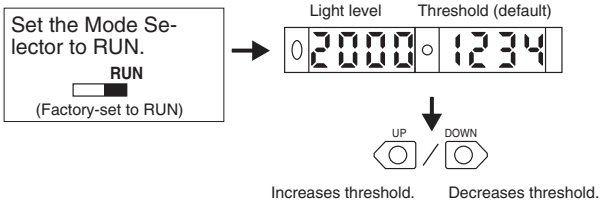
An error has occurred if one of the following displays appears after the progress bar is displayed.

Display	Error	Action
Flashes twice PtUn oUEr PTUN OVER	**Over Error** The incident light level is too low for the power tuning target value.	The power will not be tuned. The power can be increased up to approximately 5 times the incident light value.
Flashes twice PtUn bOtM PTUN BOTM	**Bottom Error** The incident light level is too high for the power tuning target value.	The power will be tuned to the minimum level. The power can be decreased down to approximately 1/25th the incident light value.

Note: Press the DOWN key right after pressing the MODE key.

3.Setting Thresholds Manually (RUN Mode)

A threshold can be set manually. A threshold value can also be fine-tuned using manual setting after teaching.



Note: Even if the display method for display switching is changed, the threshold will appear on the sub-display when the key is pressed.

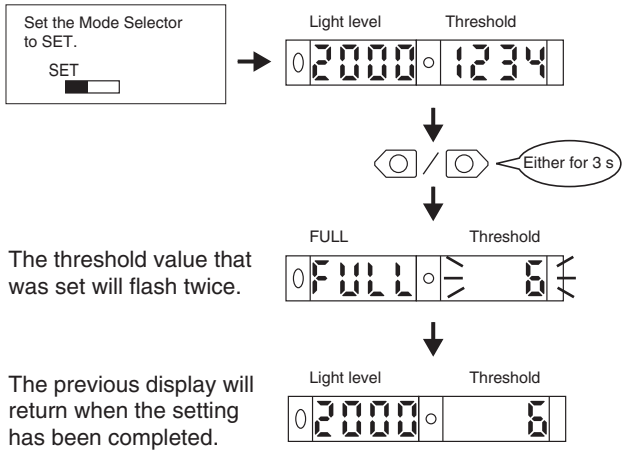
4. Teaching the Threshold Value (SET Mode)

There are four methods that can be used for teaching, as described below. Use the method most suitable for the application.

An error has occurred if OVER, LO, or NEAR is displayed on the sub-display. Repeat the operation from the beginning.

4-1. Setting the Threshold at Maximum Sensitivity

The threshold can be set at the maximum sensitivity. This method is ideal when using a Through-beam Fiber Unit to detect workpieces so that detection is not influenced to any great degree by dust and other environmental factors.

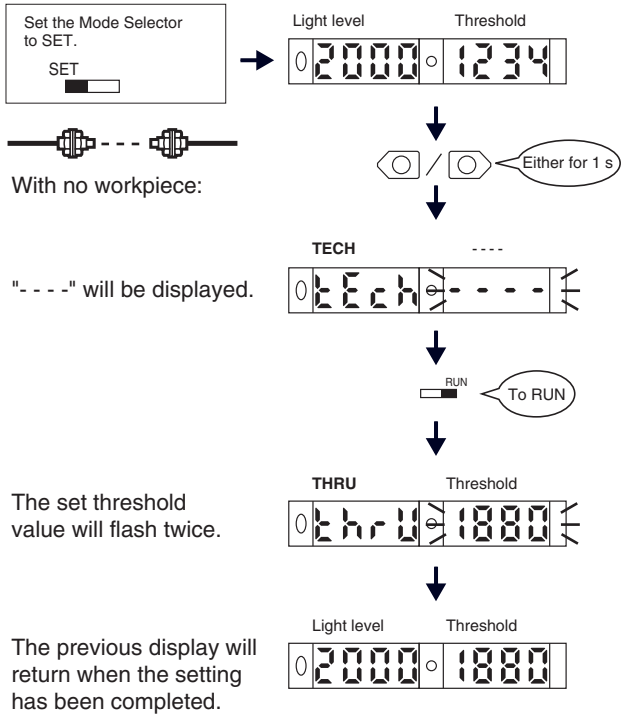


The threshold value that was set will flash twice.

The previous display will return when the setting has been completed.

4-2. Teaching a Through-beam Fiber Unit without a Workpiece

A value about 6% less than the incident light level can be set as the threshold value. This method is ideal when detecting very small differences in light level, such as when detecting very fine workpieces or transparent objects.

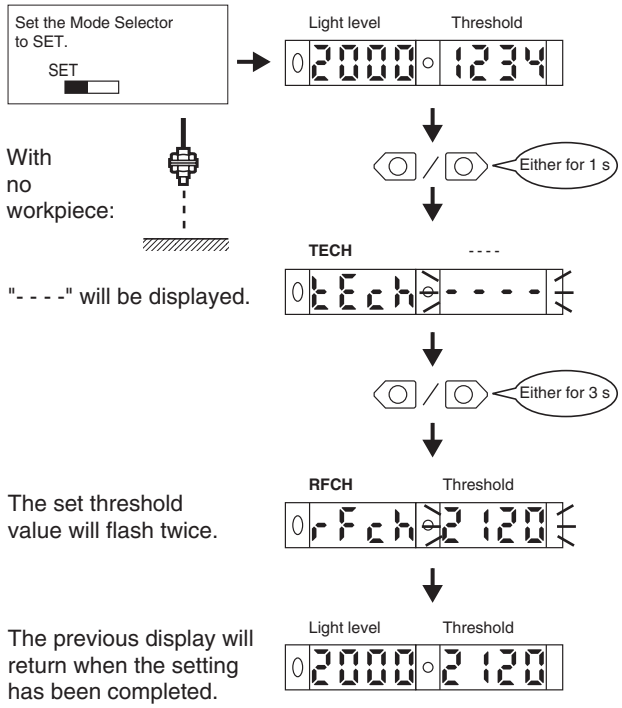


The set threshold value will flash twice.

The previous display will return when the setting has been completed.

4-3. Teaching a Diffuse Fiber Unit without a Workpiece

A value about 6% greater than the incident light level can be set as the threshold value. This method is ideal when using a Reflective Fiber Unit to detect workpieces so that detection is not influenced to any great degree by dust and other environmental factors.

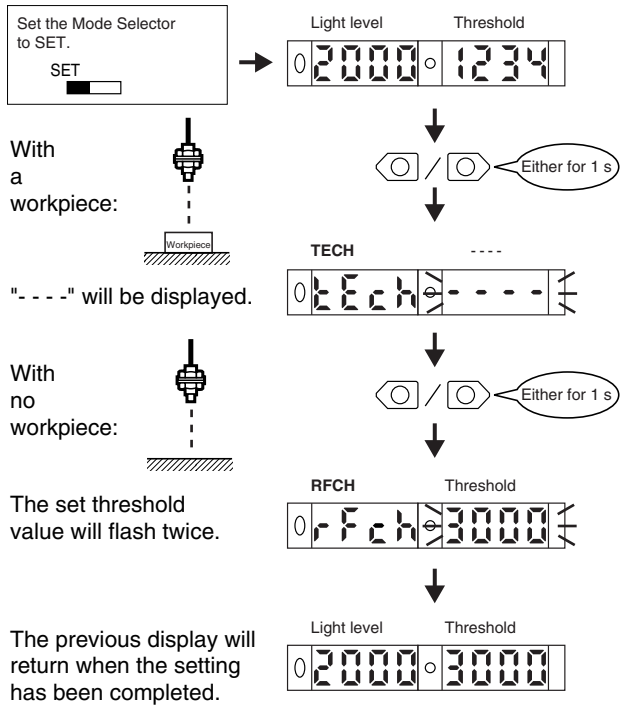


The set threshold value will flash twice.

The previous display will return when the setting has been completed.

4-4. Teaching With and Without a Workpiece

Teaching can be performed twice, once with and once without a workpiece, and the value between the two measured value can be set as the threshold.

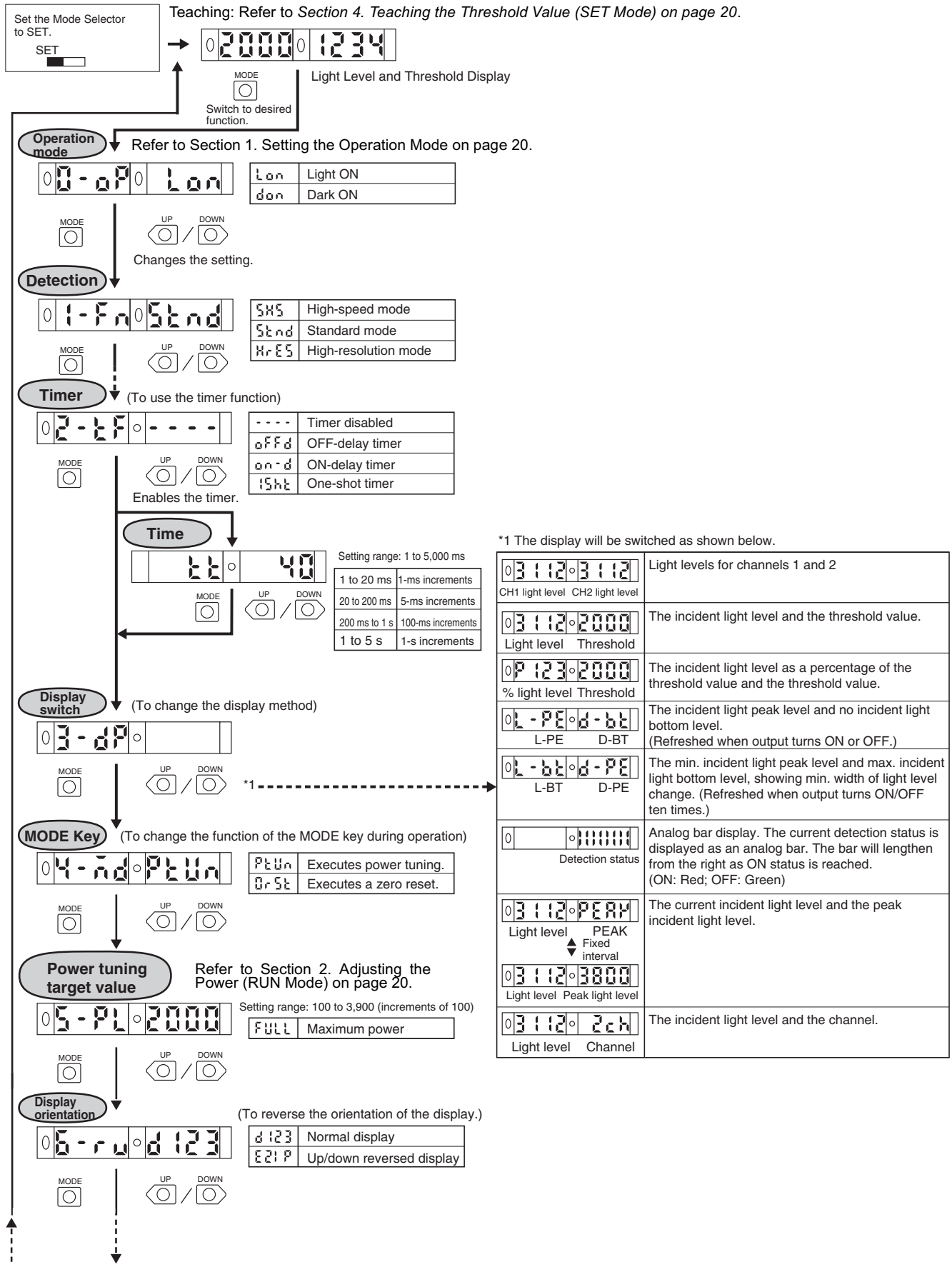


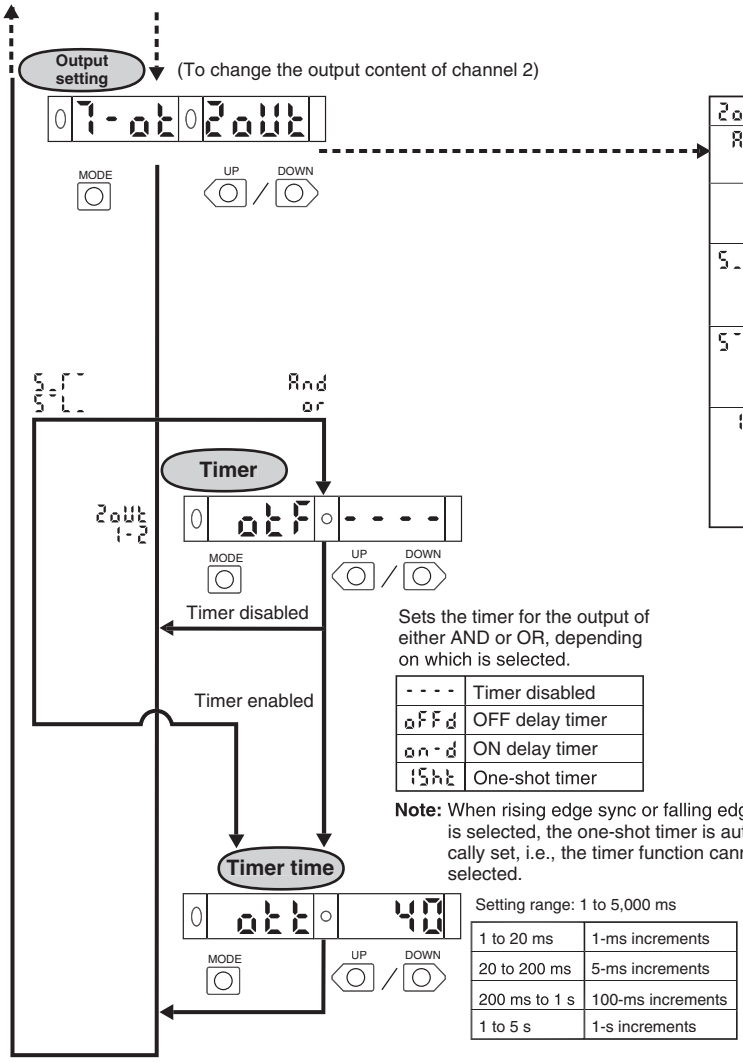
The set threshold value will flash twice.

The previous display will return when the setting has been completed.

5. Setting Functions in SET Mode

* The default settings are shown in the transition boxes between functions.





2out	Output for each channel
And	Output when the output is ON for both channels 1 and 2.
or	Output when the output is ON for either channel 1 or channel 2.
S_r	Rising edge sync. Output if channel 1 is ON when channel 2 changes from OFF to ON.
S_L	Falling edge sync. Output if channel 1 is ON when channel 2 changes from ON to OFF.
1-2	Operates according to the difference between channels (channel 1 - channel 2). The difference value is used for both threshold and output judgement execution.

Sets the timer for the output of either AND or OR, depending on which is selected.

----	Timer disabled
oFFd	OFF delay timer
on-d	ON delay timer
1Sht	One-shot timer

Note: When rising edge sync or falling edge sync is selected, the one-shot timer is automatically set, i.e., the timer function cannot be selected.

Setting range: 1 to 5,000 ms

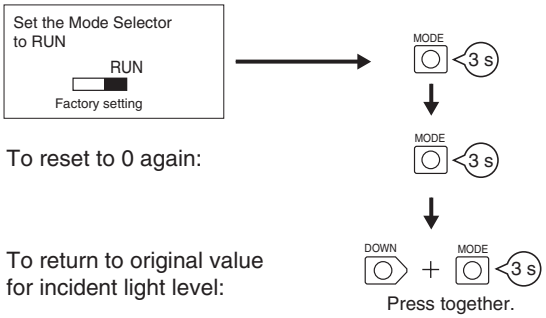
1 to 20 ms	1-ms increments
20 to 200 ms	5-ms increments
200 ms to 1 s	100-ms increments
1 to 5 s	1-s increments

6. Convenient Functions

6-1. Zeroing the Digital Display

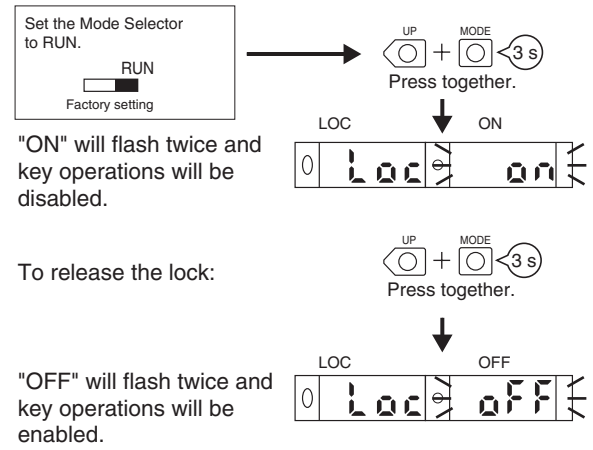
The incident light level on the digital display can be set to 0.

* Change the function to 0r5t (zero reset) as outlined on page 22. The default setting is PTUN.



6-2. Locking the Keys

All key operations can be disabled.

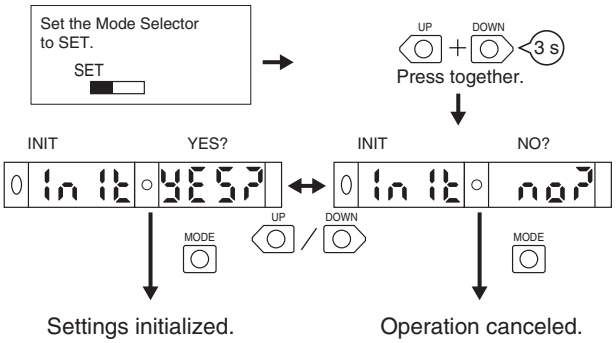


* If a key is pressed while key operations are locked, "LOC" will flash twice on the display to indicate that key operations have been disabled.

Note: Press the DOWN or UP key right after pressing the MODE key.

6-3. Initializing Settings

All settings can be returned to their original default settings.



Safety Precautions

Note: In addition to the following precautions, please read and observe the common precautions in the instruction sheet accompanying the product.

■ Amplifier Unit

Installation

Operation after Turning Power ON

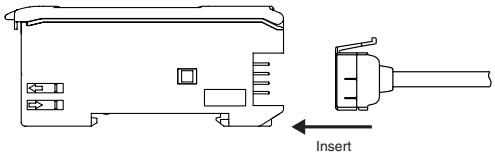
The Amplifier Unit is ready to operate within 200 ms after the power supply is turned ON. If the Sensor and load are connected to separate power supplies, be sure to turn ON the power supply of the Sensor first.

Mounting

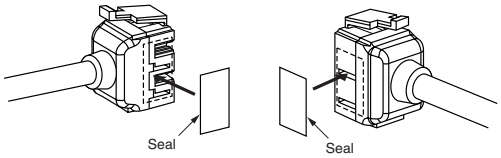
Connecting and Disconnecting Connectors

Mounting Connectors

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



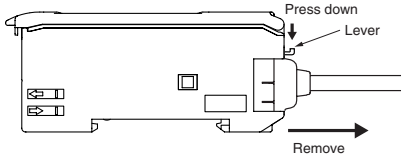
2. Attach the protector seals (provided as accessories) to the sides of master and slave connectors that are not connected.



Note: Attach the seals to the sides with grooves

Removing Connectors

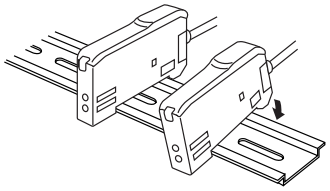
1. Slide the slave Amplifier Unit(s) for which the Connector is to be removed away from the rest of the group.
2. After the Amplifier Unit(s) has been separated, press down on the lever on the Connector and remove it. (Do not attempt to remove Connectors without separating them from other Amplifier Units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



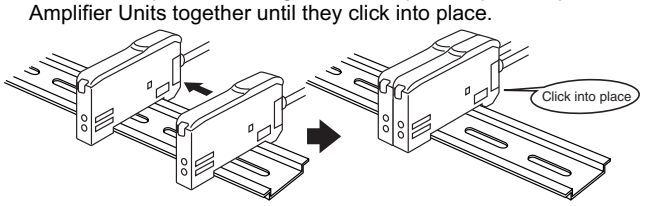
Joining and Removing Amplifier Units

Joining Amplifier Units

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



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



Separating Amplifier Units

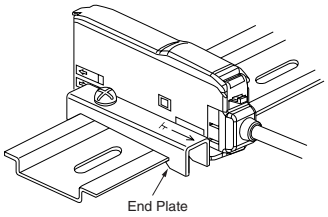
Slide Amplifier Units away from each other, and remove from the DIN track one at a time. (Do not attempt to remove Amplifier Units from the DIN track without separating them first.)

Note 1. The specifications for ambient temperature will vary according to the number of Amplifier Units used together. For details, refer to *Ratings/Characteristics*.

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

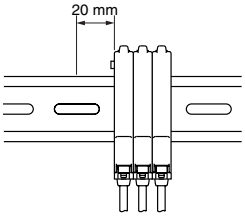
Mounting the End Plate (PFP-M)

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



Mounting the Mobile Console Head

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

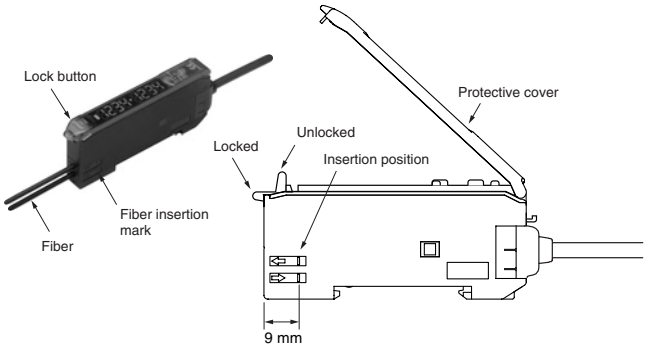


Fiber Connection

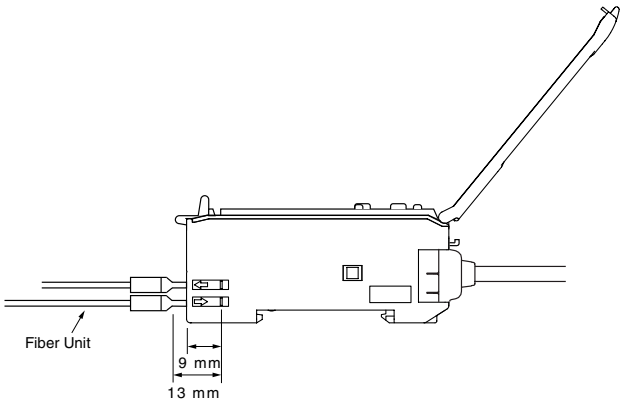
The E3X Amplifier Unit has a lock button for easy connection of the Fiber Unit. Connect or disconnect the fibers using the following procedures:

1. Connection

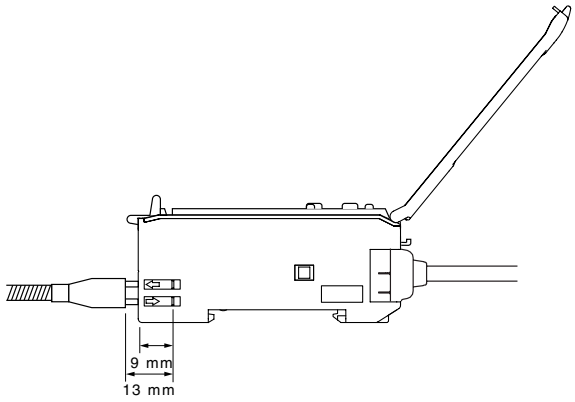
Open the protective cover, insert the fibers according to the fiber insertion marks on the side of the Amplifier Unit, and lower the lock button.



Fibers with E39-F9 Attachment

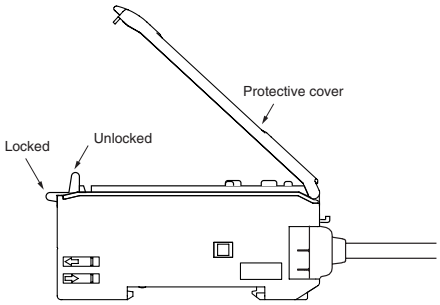


Fibers That Cannot Be Free-Cut (with Sleeves)



2. Disconnecting Fibers

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



Note: 1. To maintain the fiber properties, confirm that the lock is released before removing the fibers.

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

Adjustments

Mutual Interference Protection Function

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

EEPROM Writing Error

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

Optical Communications

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

Other Precautions

Protective Cover

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

Mobile Console

Use the E3X-MC11-S Mobile Console for the E3X-DA-S-series and the E3X-MDA series Amplifier Units. Other Mobile Consoles, such as the E3X-MC11, cannot be used.

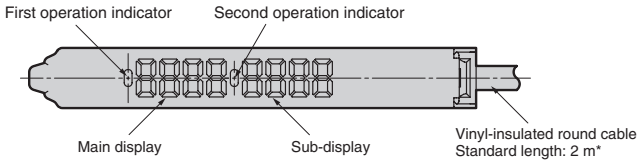
Dimensions

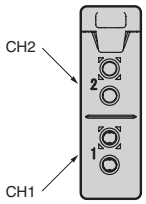
Unit: mm (inch)

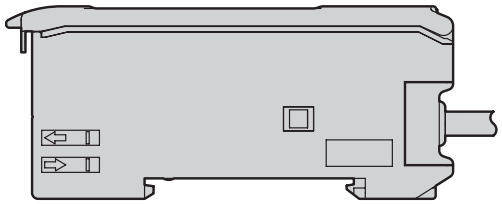
■ Amplifier Units

Amplifier Units with Cables

E3X-MDA11
E3X-MDA41



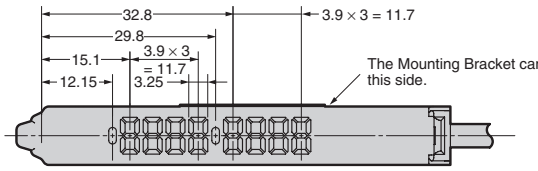


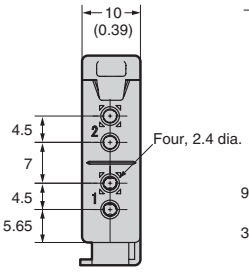


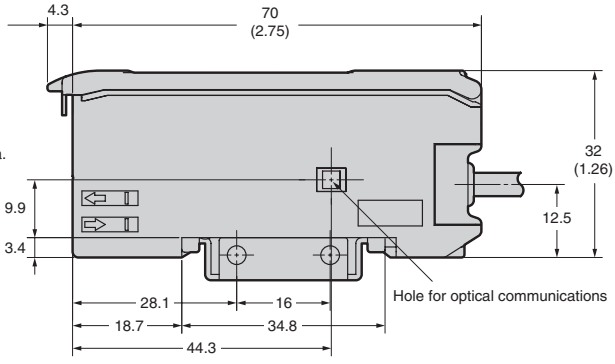
*Cable Specifications

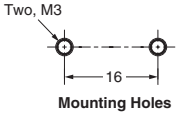
E3X-MDA11 MDA41	A 4-dia., 2-conductor (conductor cross-sectional area: 0.2 mm^2; insulation diameter: 1.1 mm)

With Mounting Bracket Attached

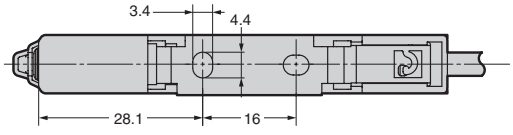








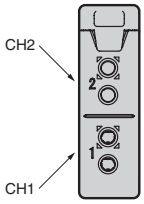
Mounting Holes

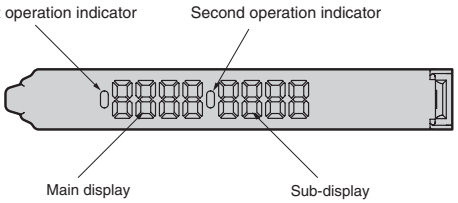


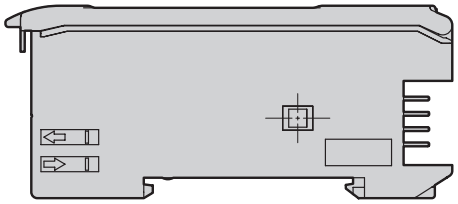
Unit: mm (inch)

Amplifier Units with Connectors

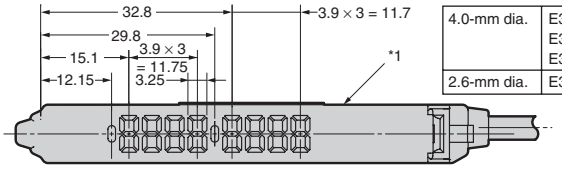
E3X-MDA6
E3X-MDA8





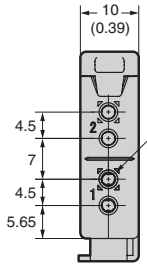


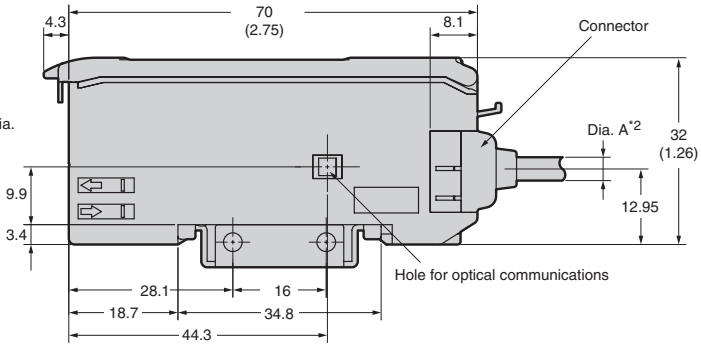
With Mounting Bracket Attached

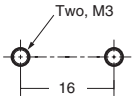


*1 The Mounting Bracket can also be used on this side.
*2 Cable Diameters

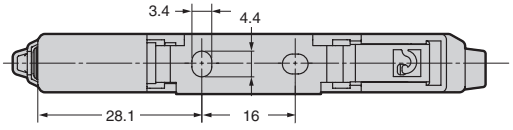
4.0-mm dia.	E3X-CN11 (3 conductors) E3X-CN21 (4 conductors) E3X-CN22 (2 conductors)
2.6-mm dia.	E3X-CN12 (1 conductor)







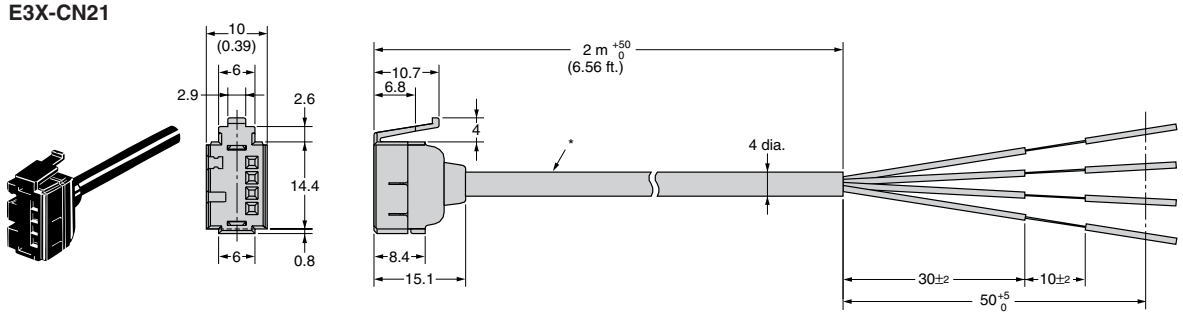
Mounting Holes



■ Amplifier Unit Connectors

Master Connectors

E3X-CN11
E3X-CN21

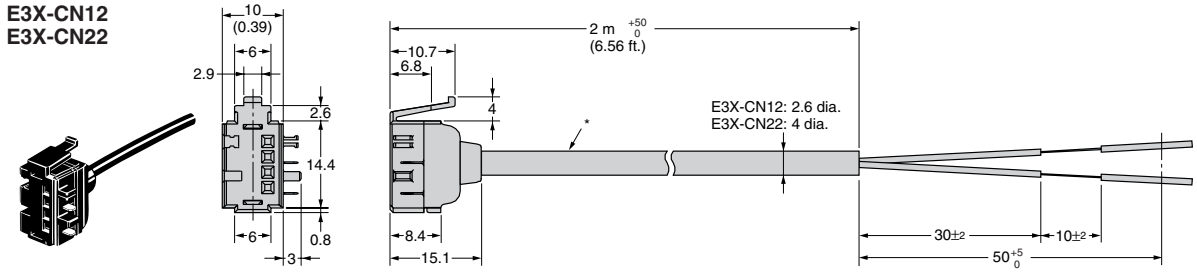


*E3X-CN11: A 4-dia., 3-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.2 mm^2; insulation diameter: 1.1 mm) is used.

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

Slave Connectors

E3X-CN12
E3X-CN22

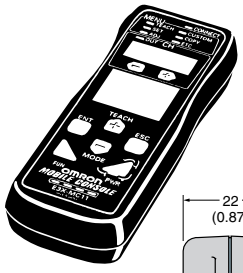


*E3X-CN12: A 2.6-dia., single-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.2 mm^2; insulation diameter: 1.1 mm) is used.

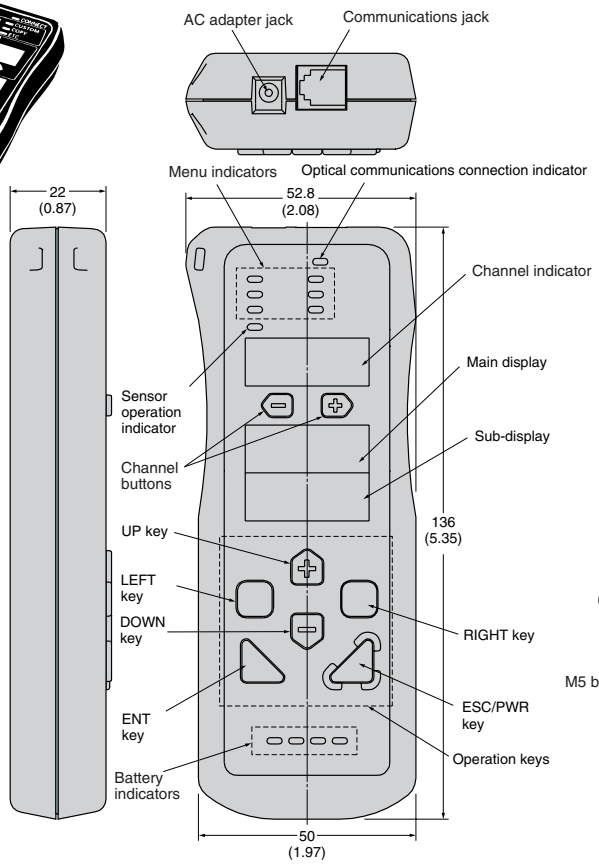
E3X-CN22: A 4-dia., 2-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.2 mm^2; insulation diameter: 1.1 mm) is used.

■ Mobile Console

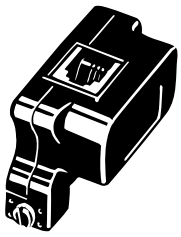
E3X-MC11-S

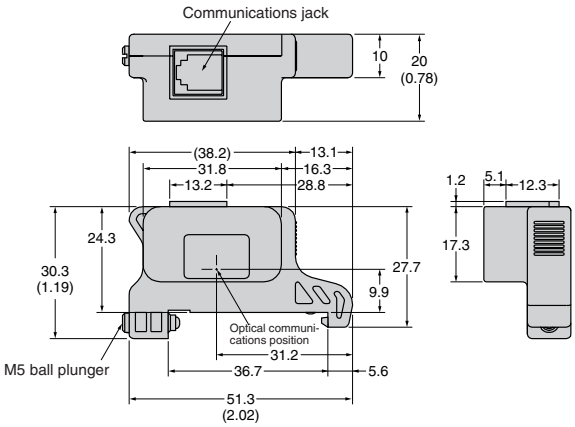


Mobile Console



Mobile Console Head





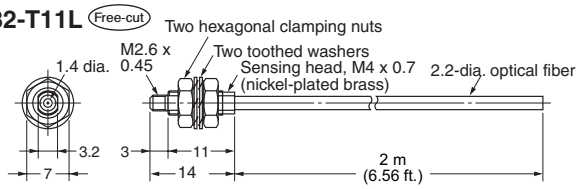
■ Fiber Optic Cables

Unit: mm (inch)

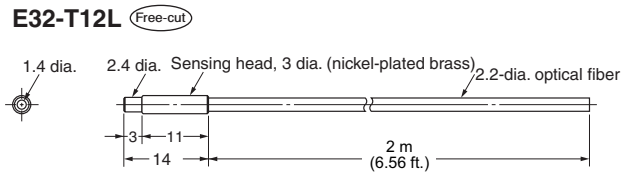
Through-beam Fiber Units (Sold in Pairs)

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

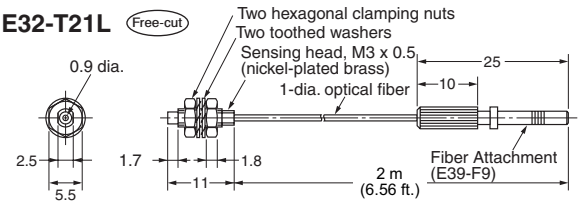
E32-T11L (Free-cut)



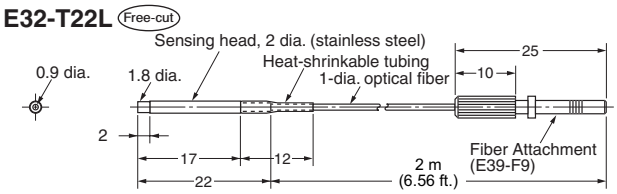
E32-T12L (Free-cut)



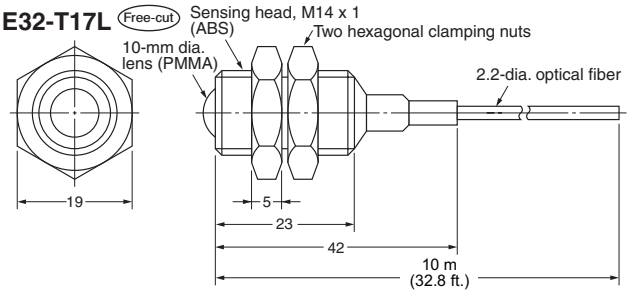
E32-T21L (Free-cut)



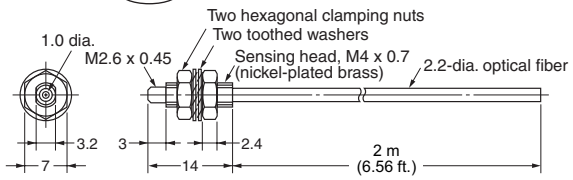
E32-T22L (Free-cut)



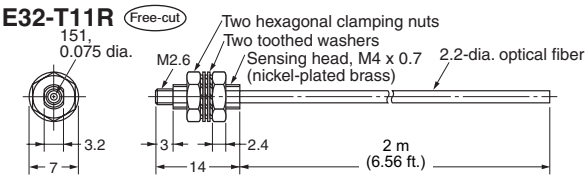
E32-T17L (Free-cut)



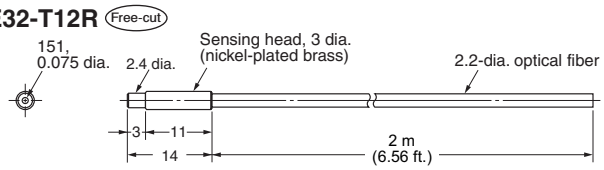
E32-TC200 (Free-cut)



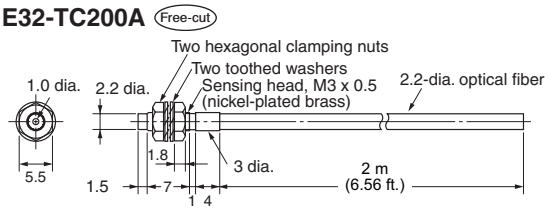
E32-T11R (Free-cut)



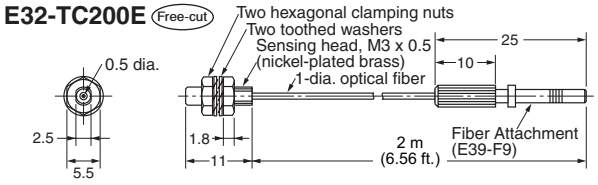
E32-T12R (Free-cut)



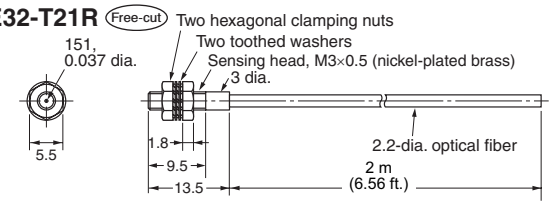
E32-TC200A (Free-cut)



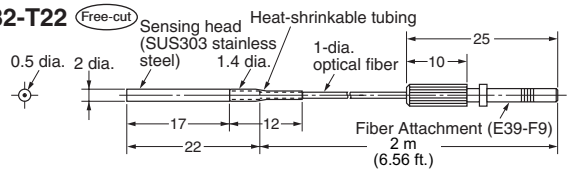
E32-TC200E (Free-cut)



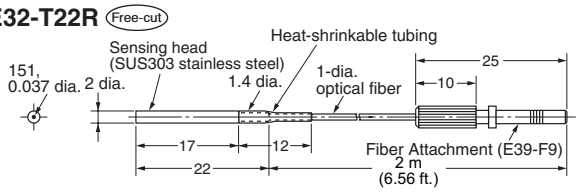
E32-T21R (Free-cut)



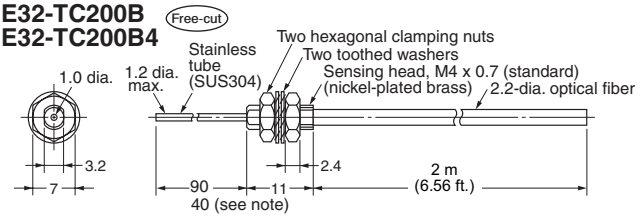
E32-T22 (Free-cut)



E32-T22R (Free-cut)



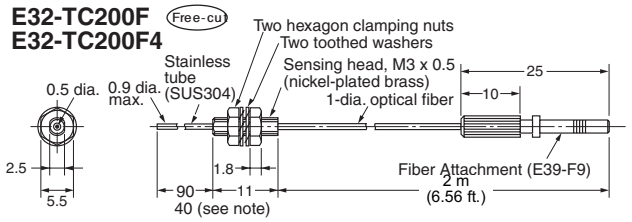
E32-TC200B
E32-TC200B4 (Free-cut)



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

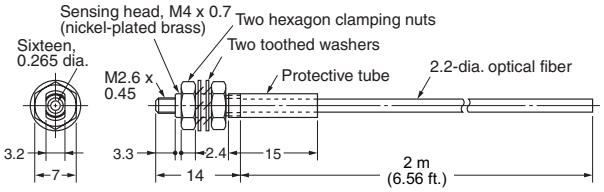
Unit: mm (inch)

E32-TC200F
E32-TC200F4

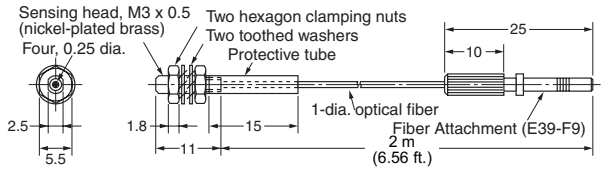


Note: The value in the parentheses is for the E32-TC200F4.

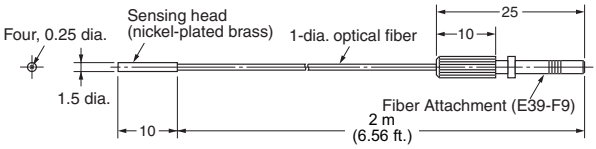
E32-T11



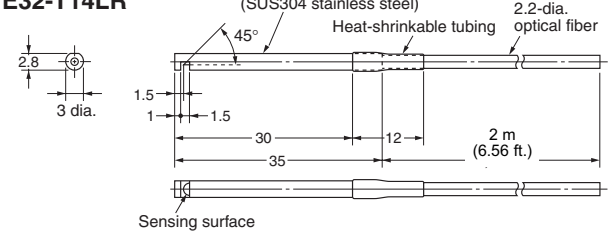
E32-T21



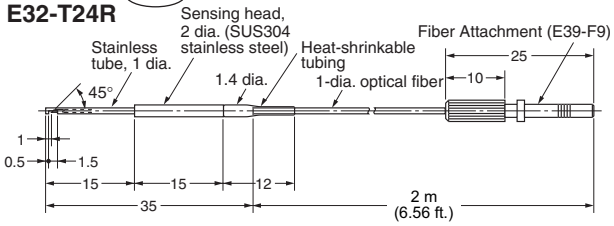
E32-T22B



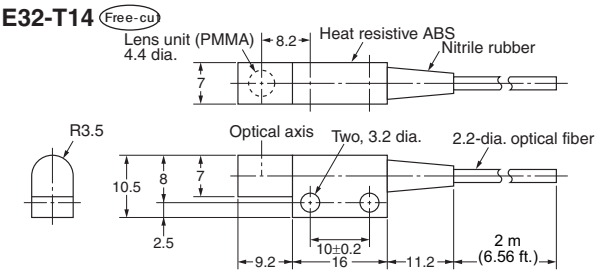
E32-T14L
E32-T14LR



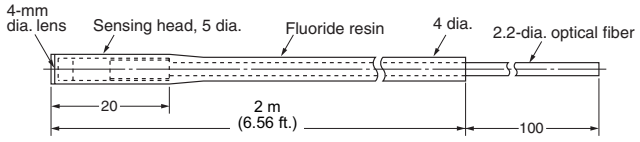
E32-T24
E32-T24R



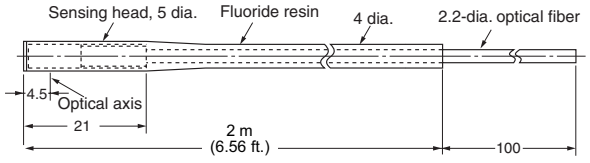
E32-T14



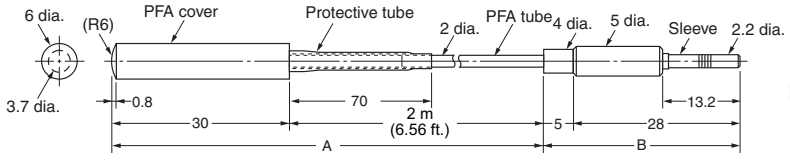
E32-T12F



E32-T14F

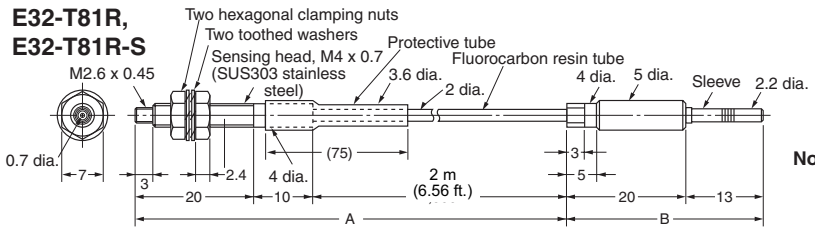


E32-T81F,
E32-T81F-S



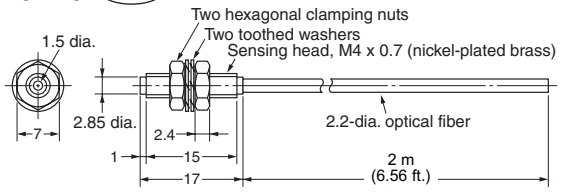
Note: Section A resists 200°C and section B resists 110°C.

E32-T81R,
E32-T81R-S



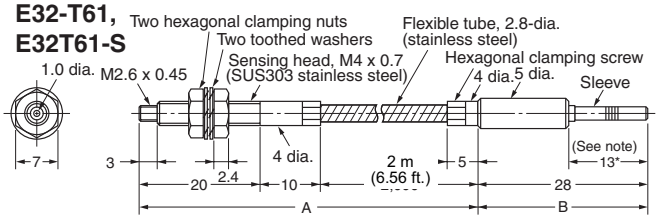
Note: Section A resists 200°C and section B resists 110°C.

E32-T51 Free-cut



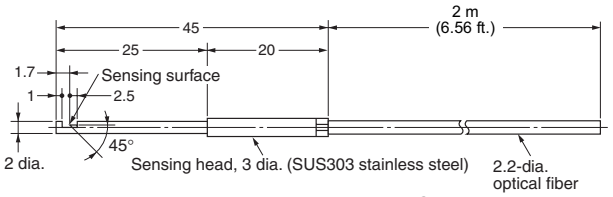
Note: Resistant temperature is 150°C. Resistant temperature is 130°C when used continuously.

E32-T61, E32T61-S



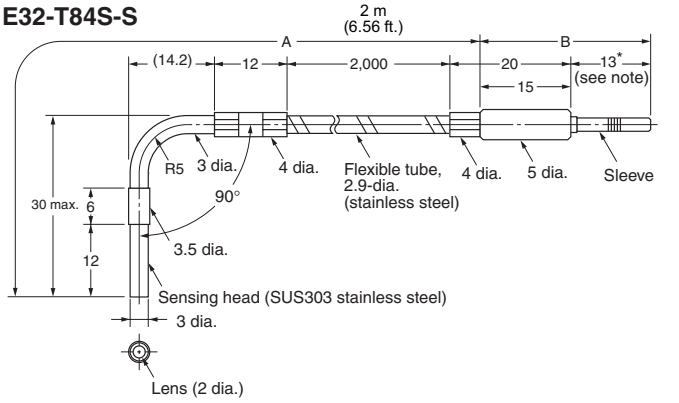
Note: Section A resists 300°C and section B (which is inserted to the Amplifier) resists 110°C.
The operating temperature of the section to be inserted into the Sensor (marked with *) must be within the operating temperature range of the Amplifier.

E32-T54 Free-cut



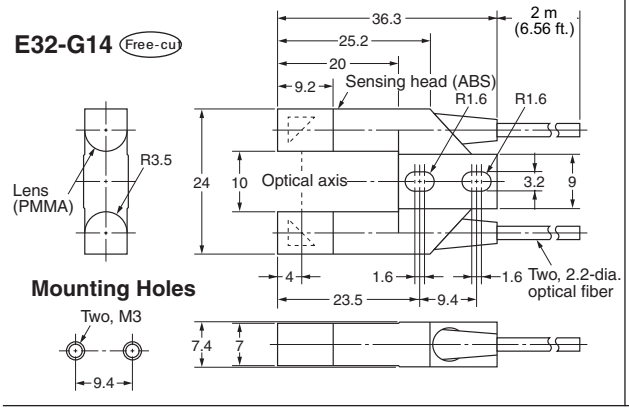
Note: Resistant temperature is 150°C. Resistant temperature is 130°C when used continuously.

E32-T84S, E32-T84S-S

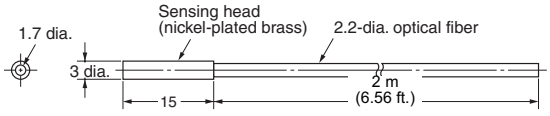


Note: Section A resists 200°C and section B (which is inserted to the Amplifier) resists 110°C.
The operating temperature of section to be inserted into the Sensor (marked with *) must be within the operating temperature range of the Amplifier.

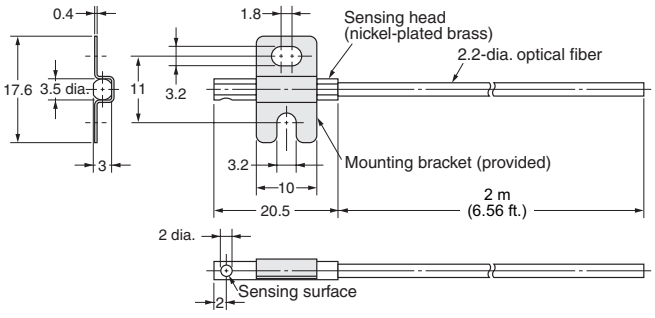
E32-G14 Free-cut



E32-T22S Free-cut

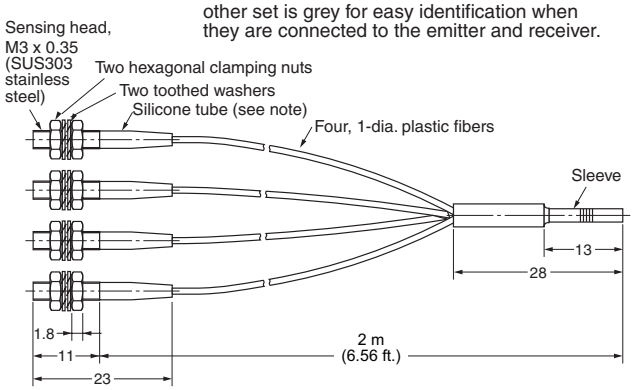


E32-T24S Free-cut



E32-M21

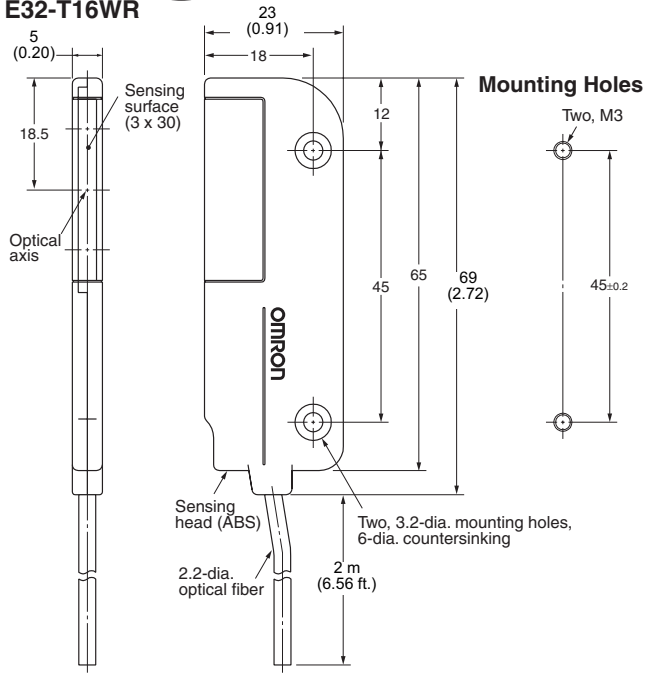
Note: One set of silicone tubes is black while the other set is grey for easy identification when they are connected to the emitter and receiver.



Unit: mm (inch)

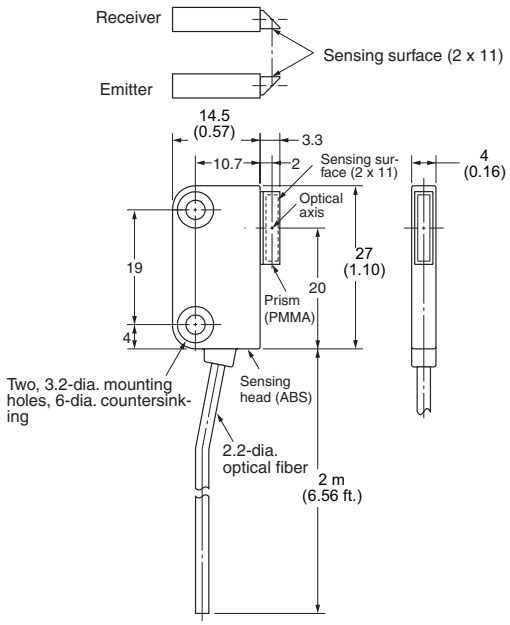
E32-T16W
E32-T16WR

Free-cut



E32-T16J
E32-T16JR

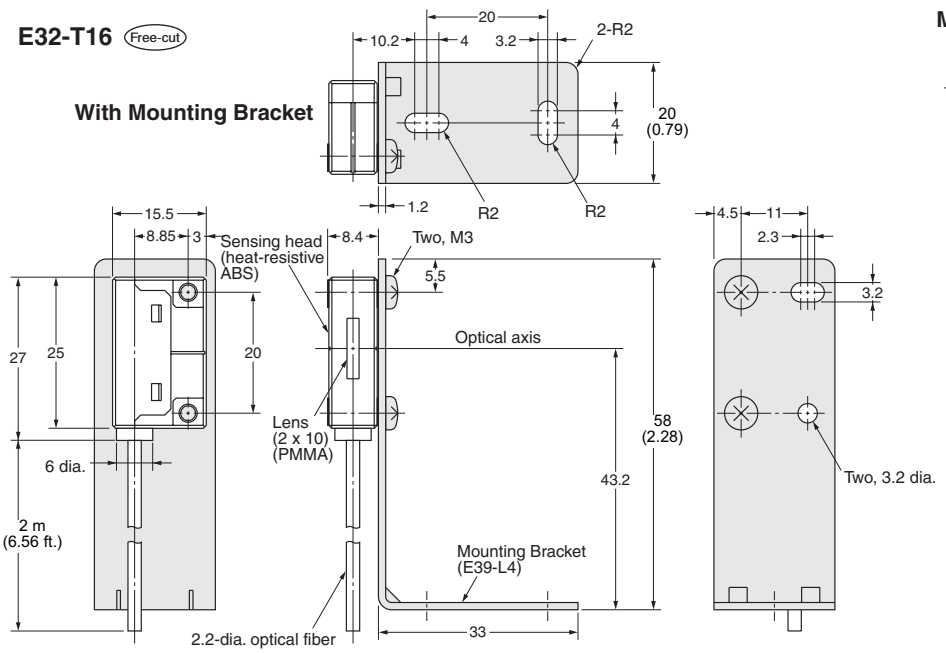
Free-cut



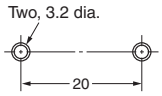
E32-T16

Free-cut

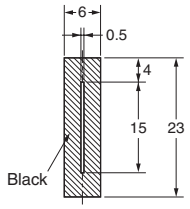
With Mounting Bracket



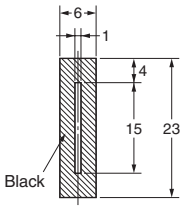
Mounting Holes



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

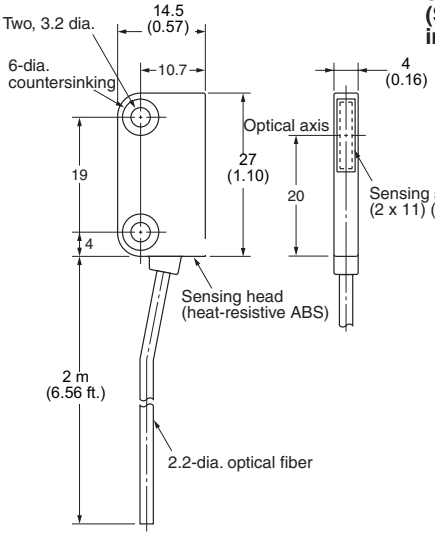


1-mm-wide Slit Seal (Supplied with the Unit in Pairs)

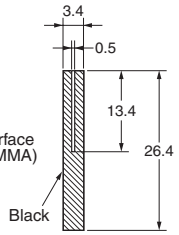


E32-T16P
E32-T16PR

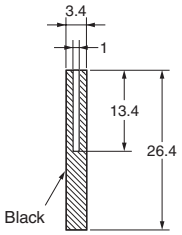
Free-cut



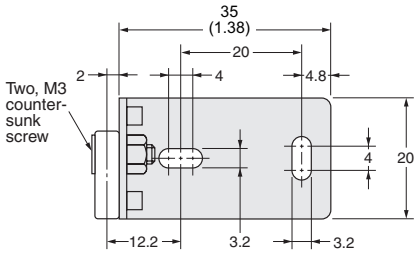
0.5-mm-wide Slit Seal (Supplied with the Unit in Pairs)

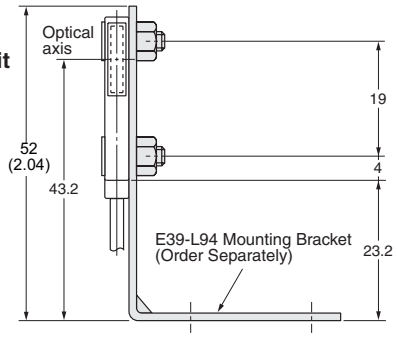


1-mm-wide Slit Seal (Supplied with the Unit in Pairs)

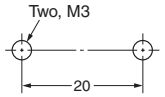


With Mounting Bracket



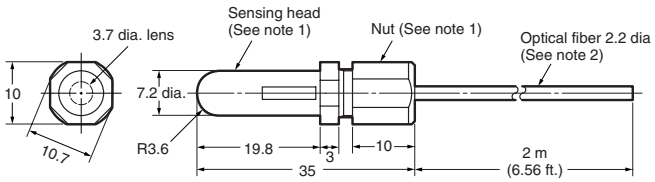


Mounting Holes



E32-T11F

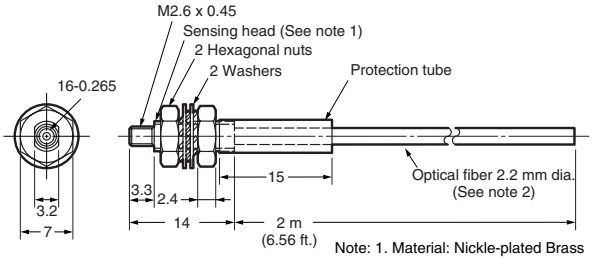
Free-cut



Note: 1. Material: PFA
2. Flouroresin

E32-T11U

Free-cut



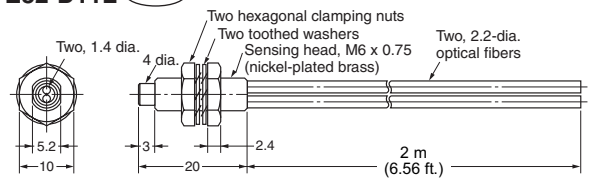
Note: 1. Material: Nickle-plated Brass
2. Sheath: Flouroresin

■ Diffuse Fiber Units

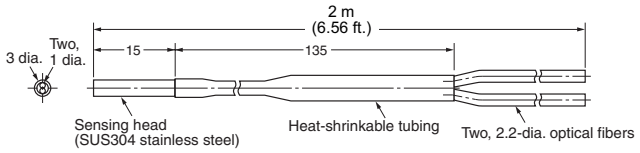
Unit: mm (inch)

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

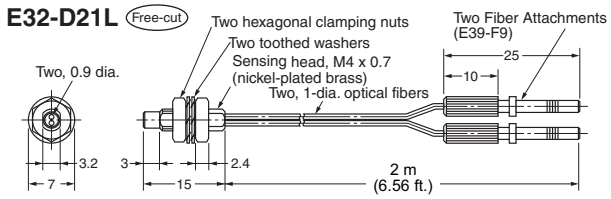
E32-D11L Free-cut



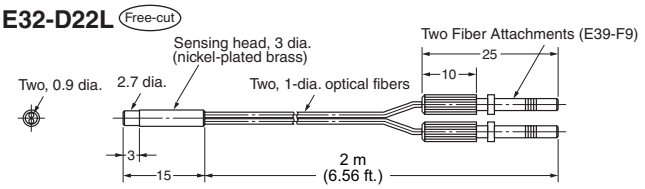
E32-D12 Free-cut



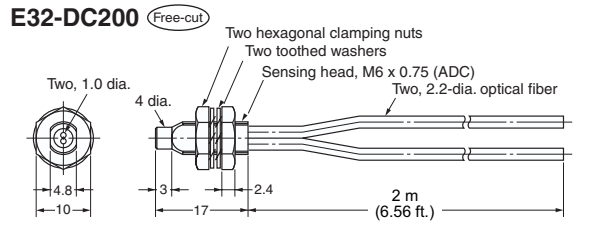
E32-D21L Free-cut



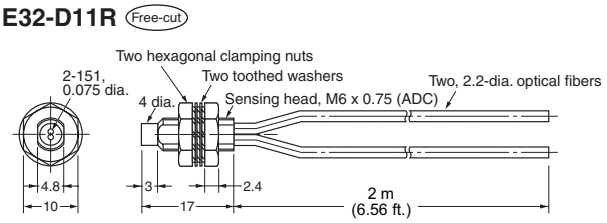
E32-D22L Free-cut



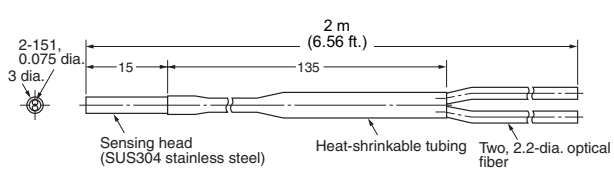
E32-DC200 Free-cut



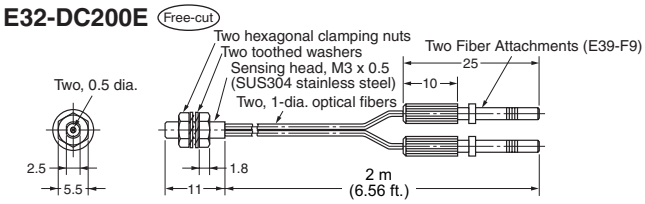
E32-D11R Free-cut



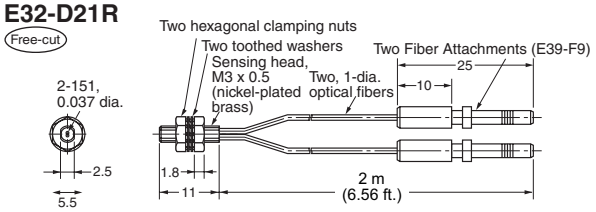
E32-D12R Free-cut



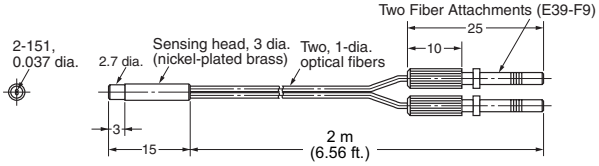
E32-DC200E Free-cut



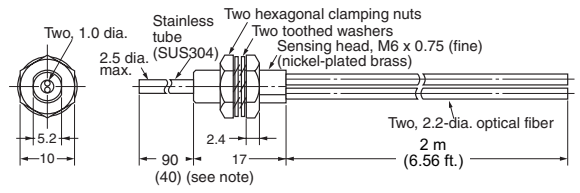
E32-D21R Free-cut



E32-D22R Free-cut

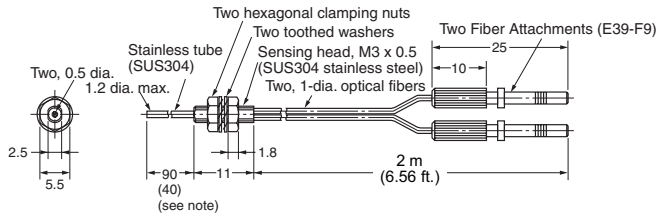


E32-DC200B Free-cut
E32-DC200B4



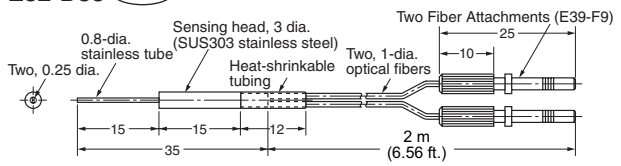
Note: The value in the parentheses is for the E32-DC200B4.

E32-DC200F Free-cut
E32-DC200F4

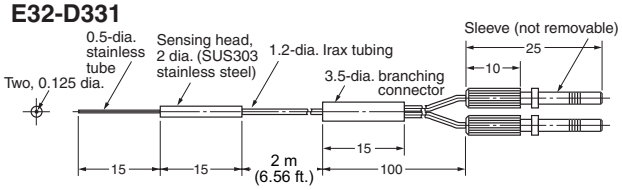


Note: The value in the parentheses is for the E32-DC200F4.

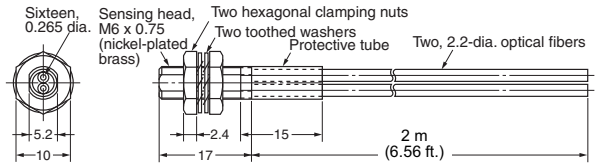
E32-D33 (Free-cut)



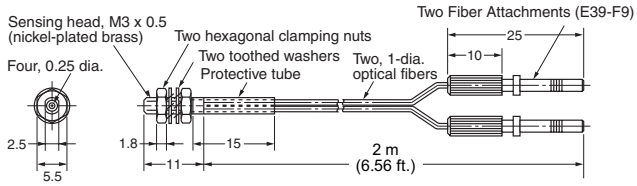
E32-D331



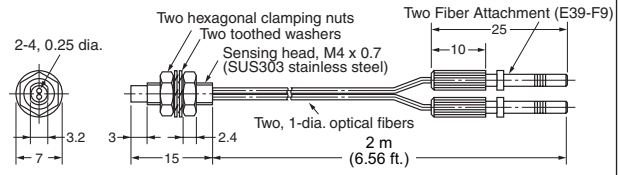
E32-D11 (Free-cut)



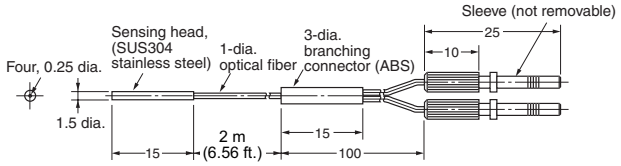
E32-D21 (Free-cut)



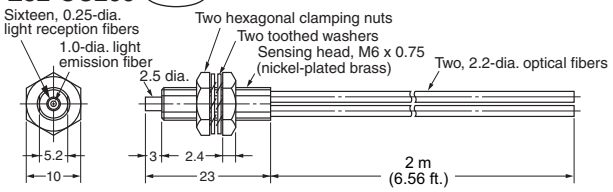
E32-D21B (Free-cut)



E32-D22B

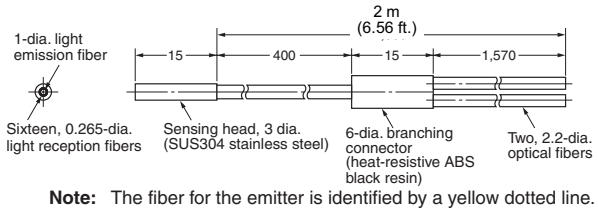


E32-CC200 (Free-cut)



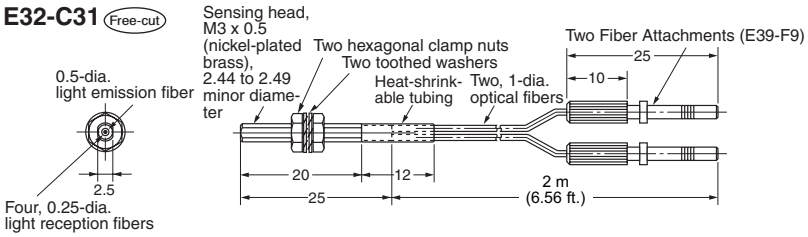
Note: The fiber for the emitter is identified by a white line.

E32-D32L (Free-cut)



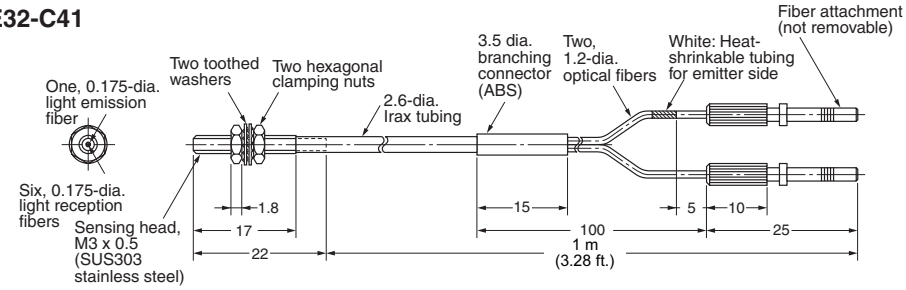
Note: The fiber for the emitter is identified by a yellow dotted line.

E32-C31 (Free-cut)



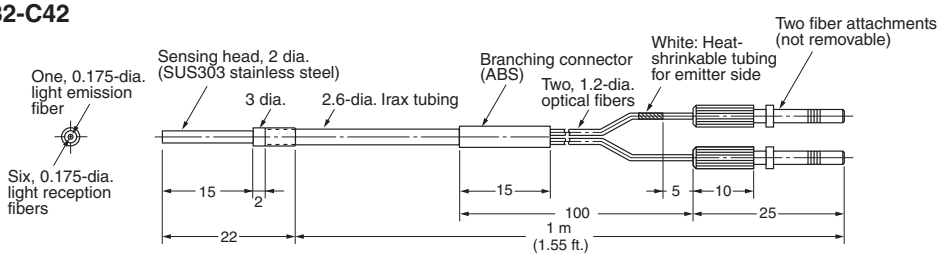
Note: The fiber for the emitter is identified by a white line.

E32-C41

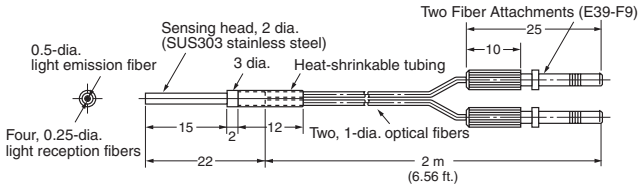


Unit: mm (inch)

E32-C42

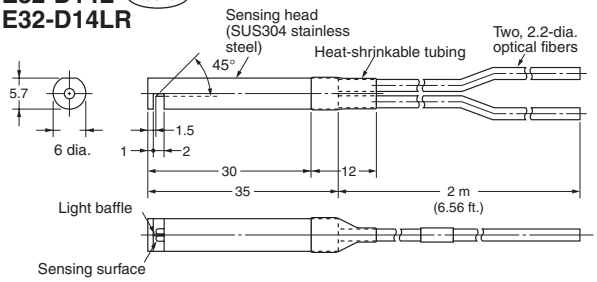


E32-D32 (Free-cut)

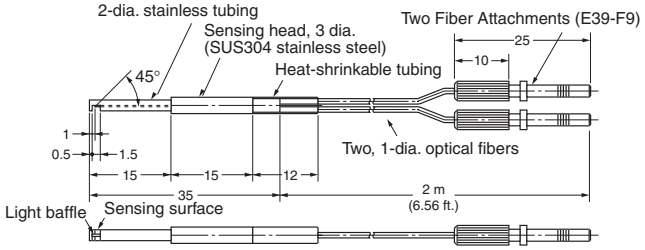


Note: The fiber for the emitter is identified by a white line.

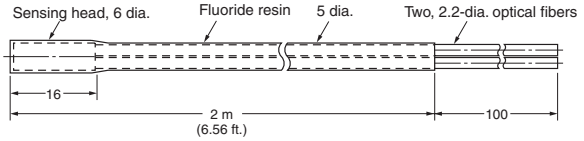
E32-D14L (Free-cut)
E32-D14LR



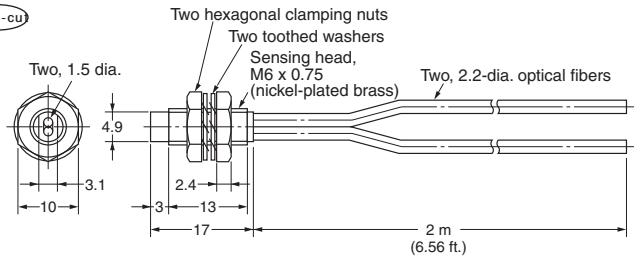
E32-D24 (Free-cut)
E32-D24R



E32-D12F (Free-cut)

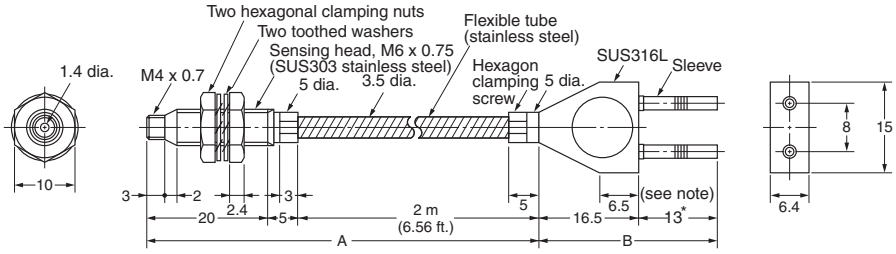


E32-D51 (Free-cut)



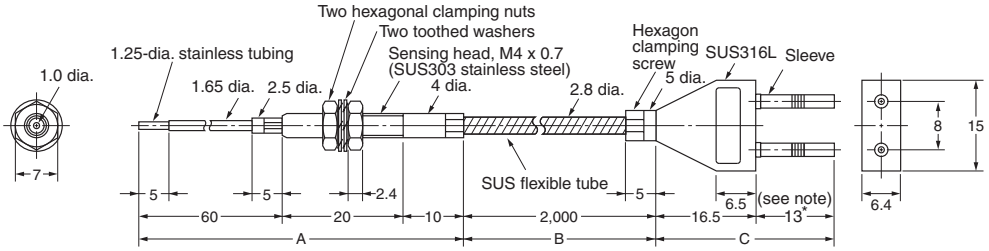
Note: Resistant temperature is 150°C. Resistant temperature is 130°C when used continuously.

E32-D61
E32-D61-S



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

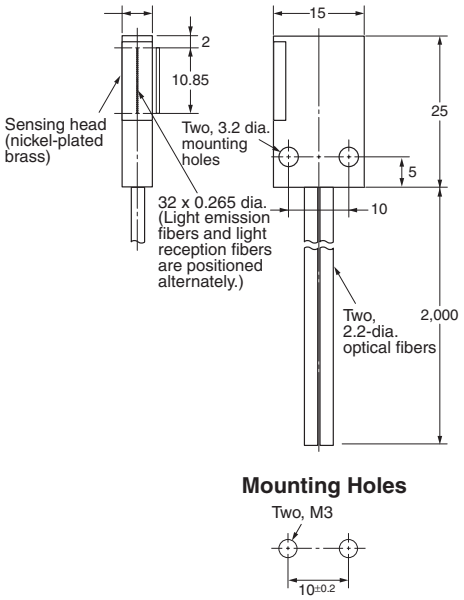
E32-D73, E32-D73-S



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

E32-D36P1

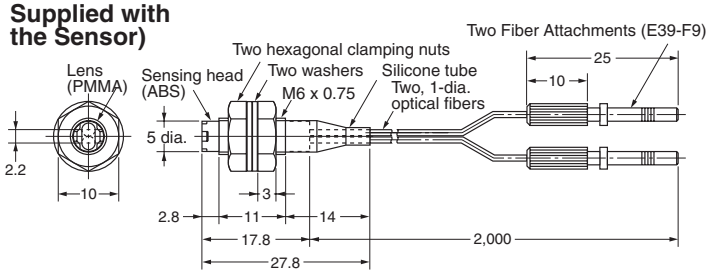
Free-cut



Mounting Holes

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

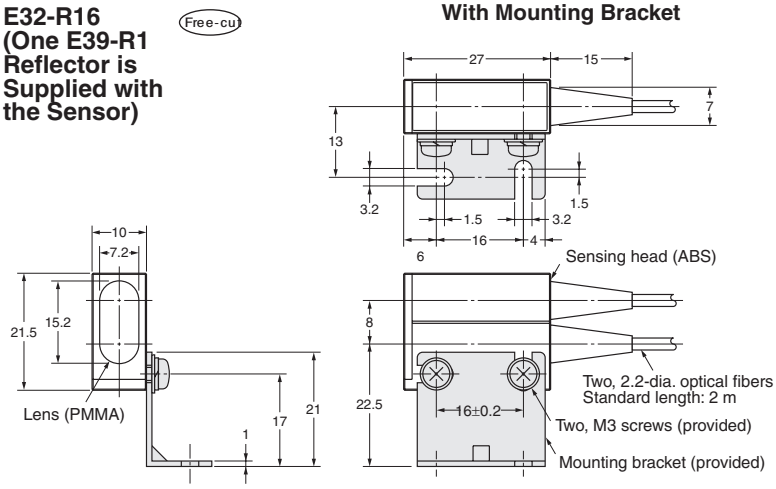
Free-cut



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

Free-cut

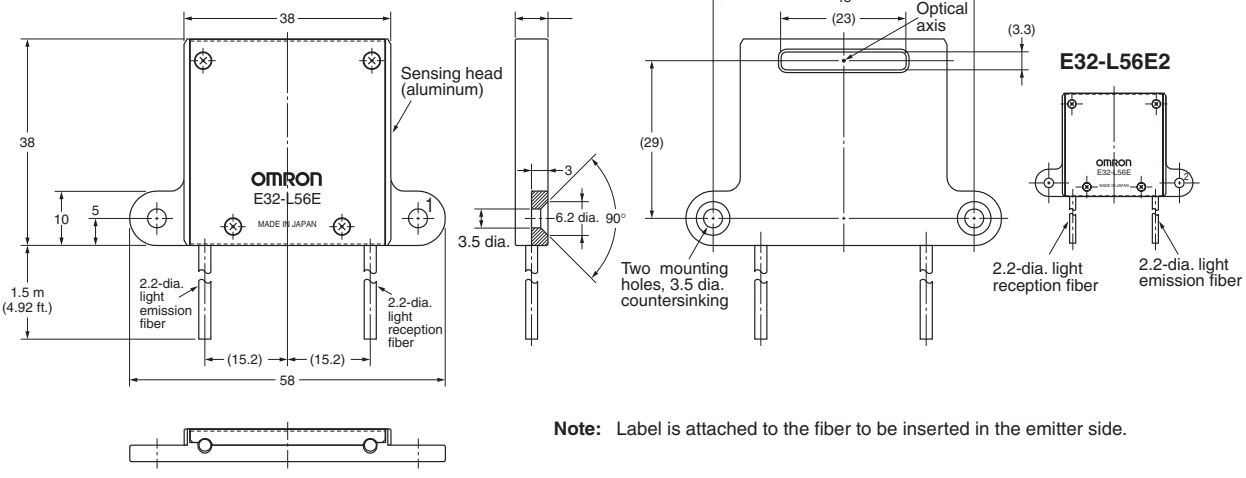
With Mounting Bracket



E32-L56E1 E32-L56E2

Free-cut

E32-L56E1

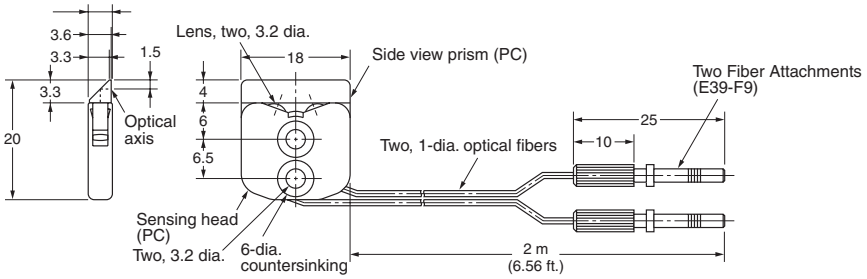


E32-L56E2

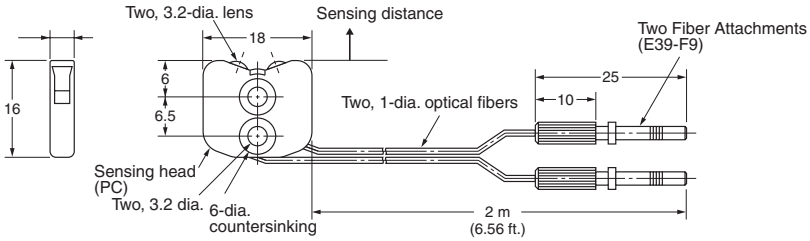
Note: Label is attached to the fiber to be inserted in the emitter side.

Unit: mm (inch)

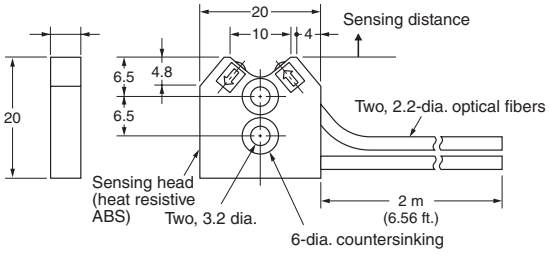
E32-L24L (Free-cut)



E32-L25L (Free-cut)

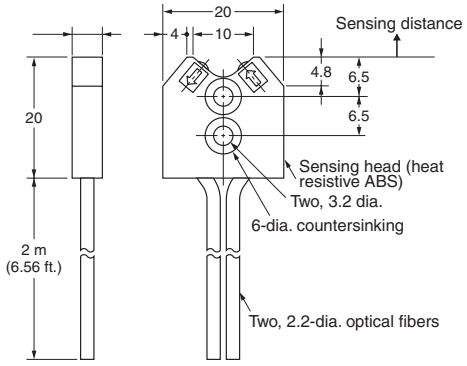


E32-L25 (Free-cut)



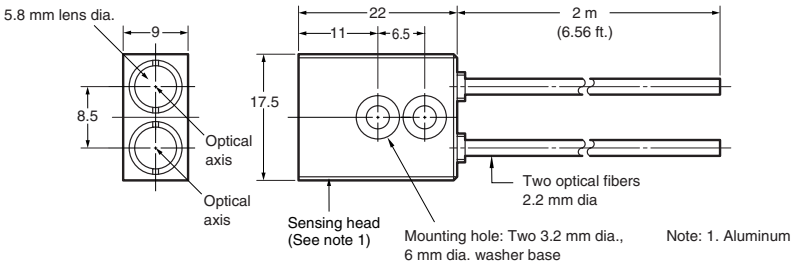
Note: The fiber for the emitter is identified by a white line.

E32-L25A (Free-cut)



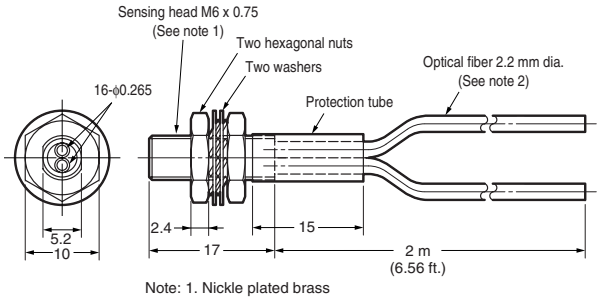
Note: The fiber for the emitter is identified by a white line.

E32-D16 (Free-cut)



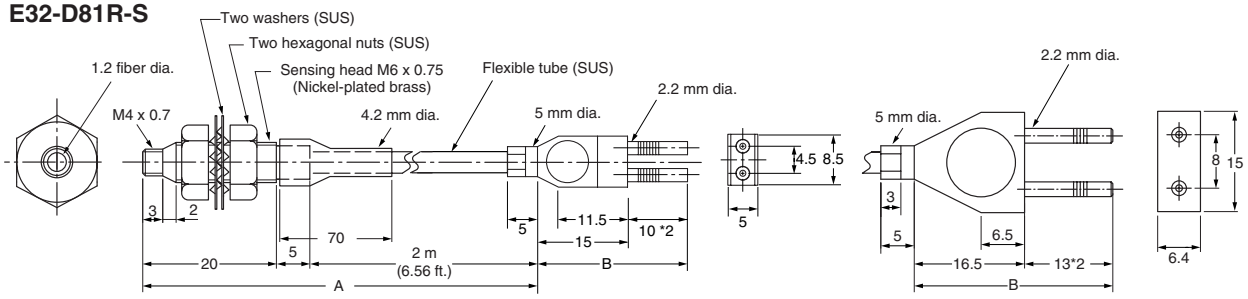
Note: 1. Aluminum

E32-D11U (Free-cut)



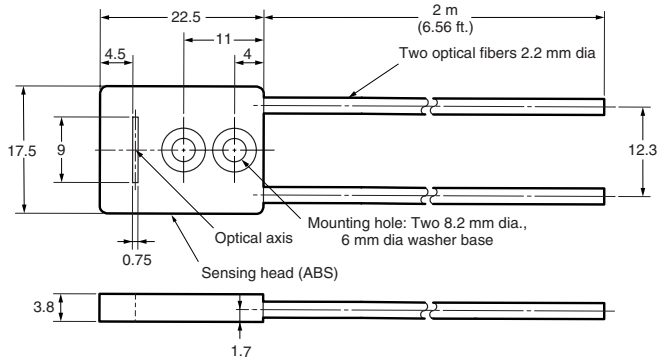
Note: 1. Nickle plated brass
2. Flouroresin

E32-D81R
E32-D81R-S

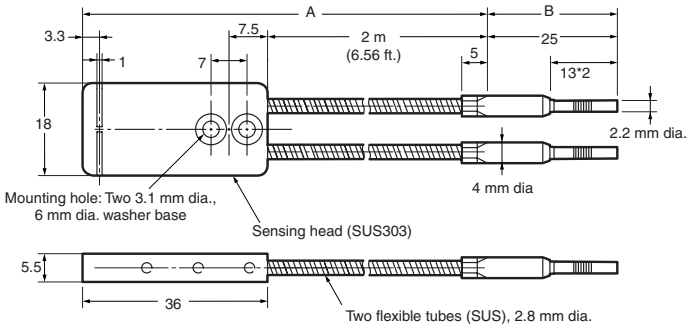


Note: Section "A" can resist temperatures to 200˚C; section "B" can resist temperatures to 110˚C.

E32-L16 (Free-cut)

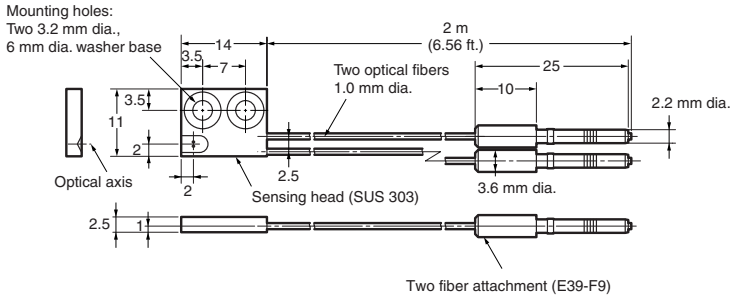


E32-L66



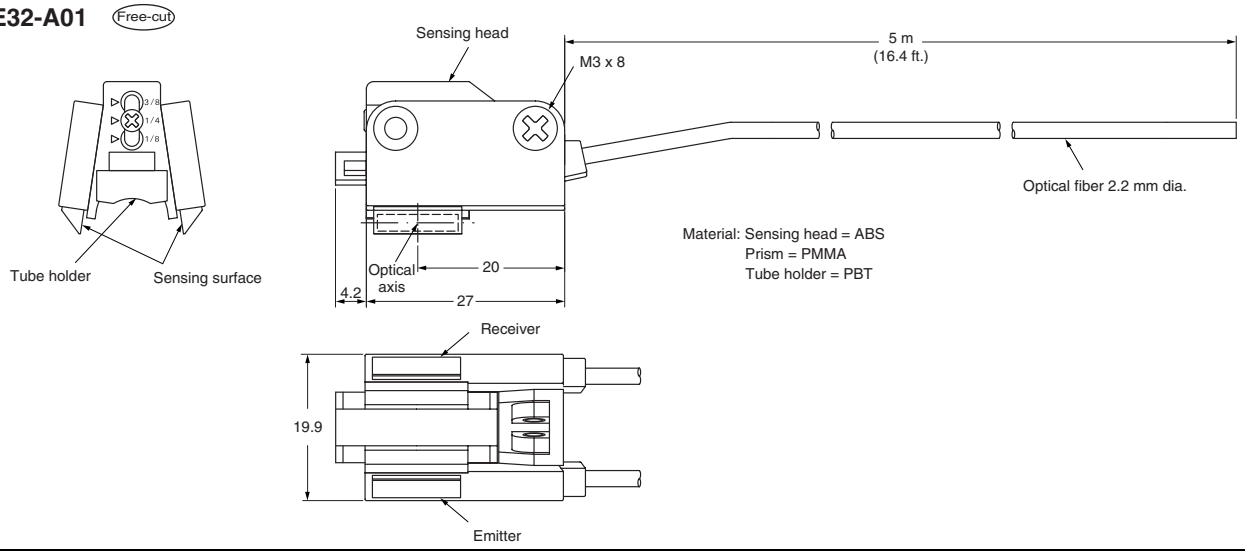
Note: Section "A" resists temperatures to 300˚C; section "B" resists temperatures to 110˚C

E32-L24S (Free-cut)

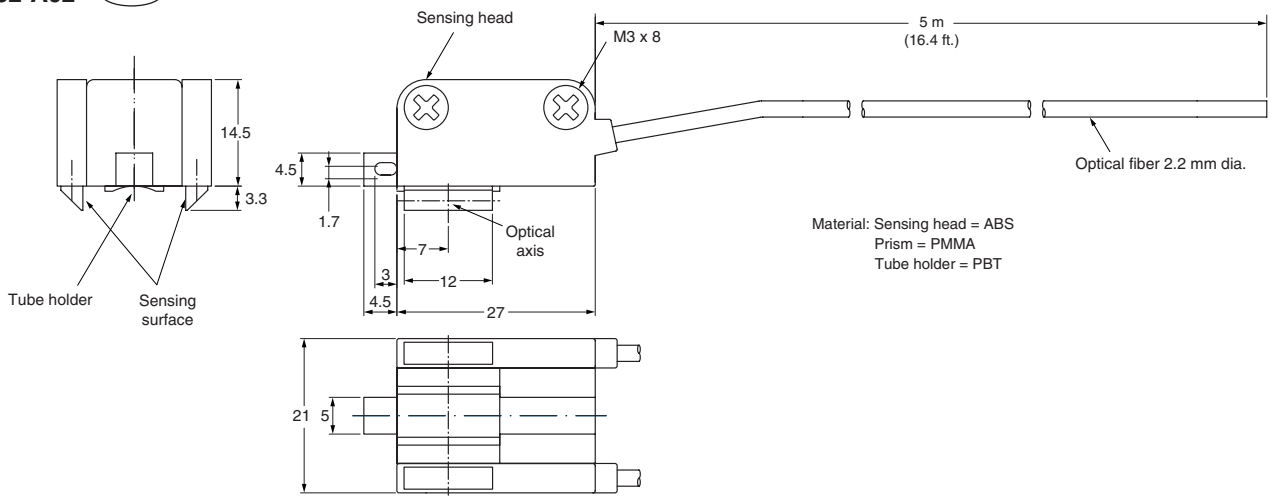


Unit: mm (inch)

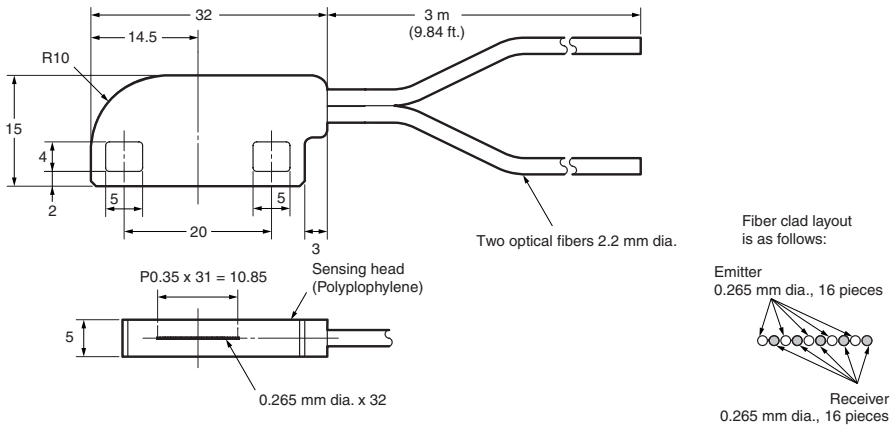
E32-A01 (Free-cut)



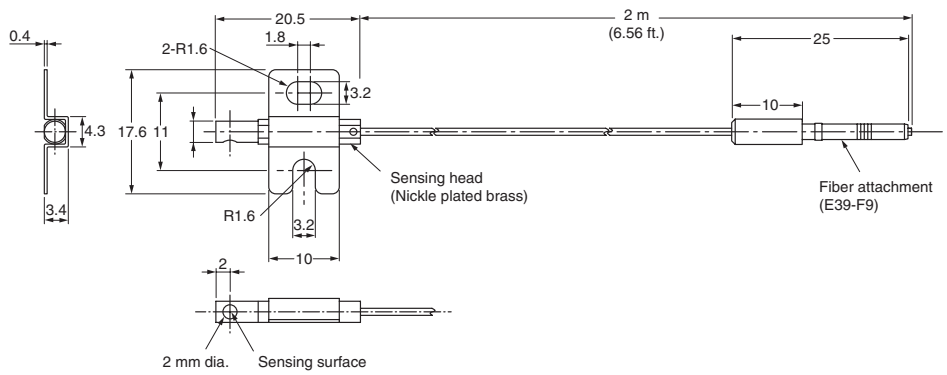
E32-A02 (Free-cut)



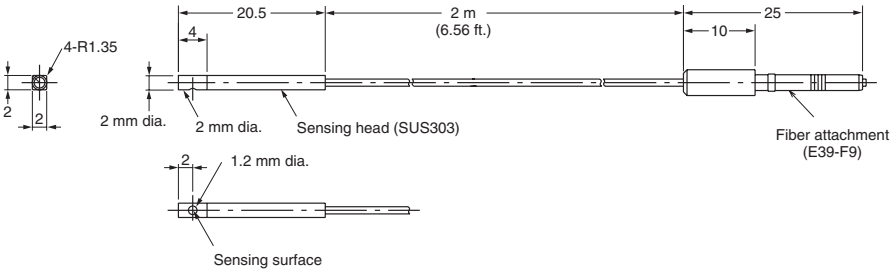
E32-D36F (Free-cut)



E32-A03 (Free-cut)



E32-A04 (Free-cut)

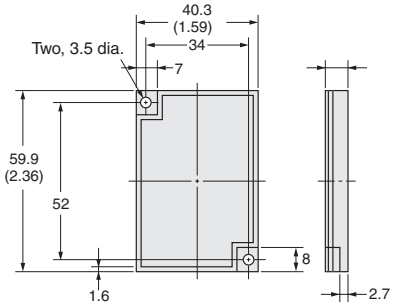


■ Accessories (Order Separately)

Reflectors

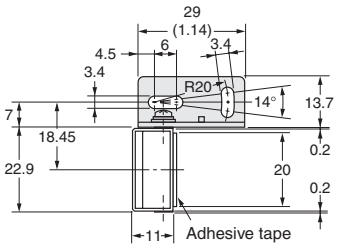
Reflector
E39-R1

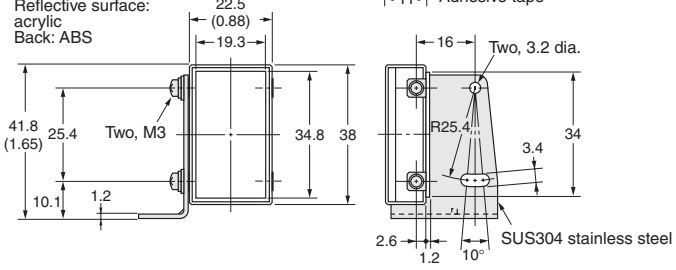
Material:
Reflective surface: acrylic
Back: ABS



Reflector (Miniature)
E39-R3

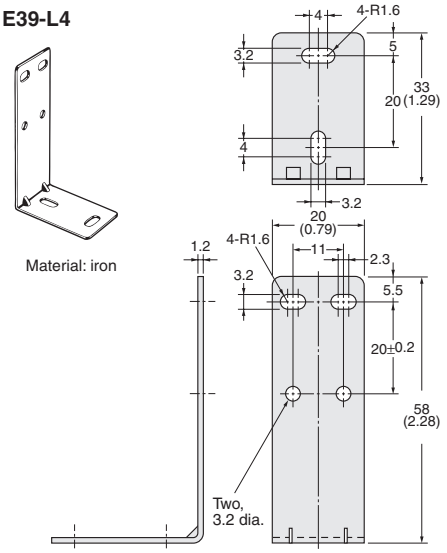
Material:
Reflective surface: acrylic
Back: ABS





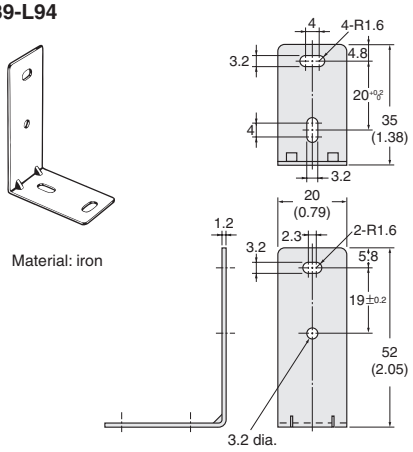
Unit: mm (inch)

E39-L4



Material: iron

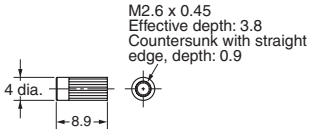
E39-L94



Material: iron

Lens Units

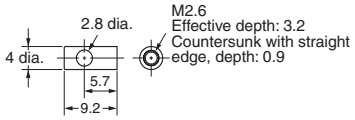
E39-F1
Long Distance Lens Unit



Material:
Tube: Brass
Lense: Optical glass

Note: One set includes two units.

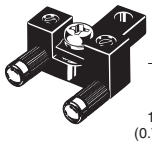
E39-F2
Side-view Unit

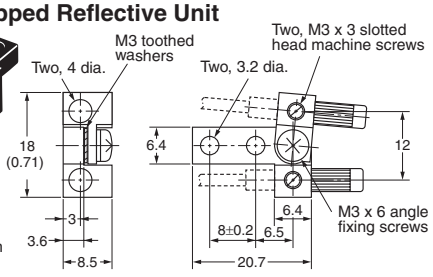


Material:
Tube: Brass
Lense: Optical glass

Note: One set includes two units.

E39-F3
Lens-equipped Reflective Unit

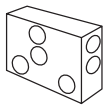


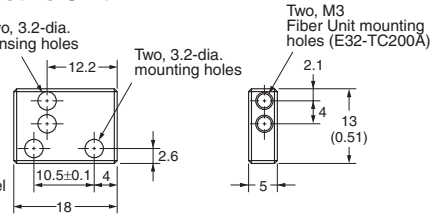


Material:
Tube: Brass
Base: Aluminum

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

E39-F5
Side-view Reflective Unit

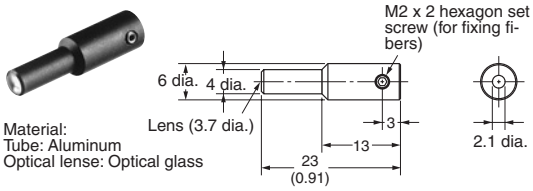




Material:
Base: Brass
Reflector: Stainless steel

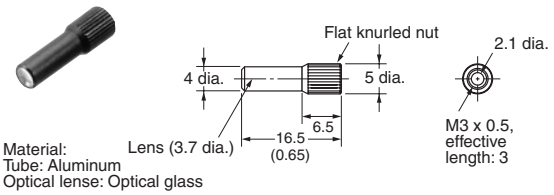
Note: Only E32-TC200A can be mounted. When mounting, remove all of the accompanying screws first and then screw the E32-TC200A into the E39-F5 until the stopper comes into contact.

E39-F3A
Small Spot Lens Unit



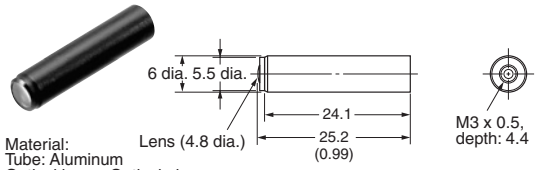
Note: E39-F3A is a Lens Unit for the E32-D32 and E32-C42.

E39-F3A-5
Small Spot Lens Unit



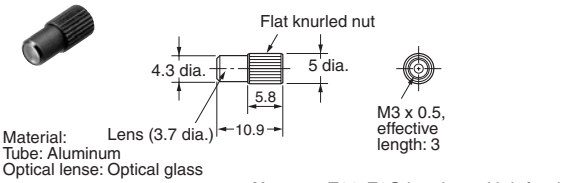
Note: E39-F3A-5 is a Lens Unit for the E32-C31 and E32-C41.

E39-F3B
Small Spot Lens Unit



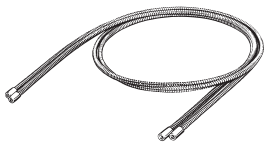
Note: E39-F3B is a Lens Unit for the E32-C31 and E32-C41.

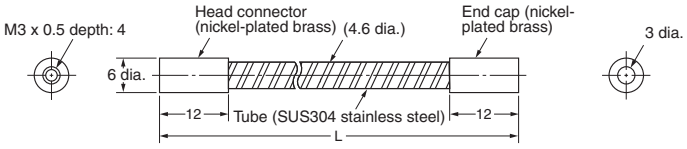
E39-F3C
Small Spot Lens Unit



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

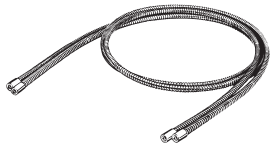
E39-F32A, E39-F32A5
E39-F32B, E39-F32B5

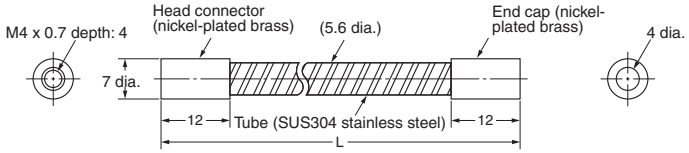




Note: 1. L is as follows:
E39-F32A and E39-F32B: 1m (3.28 ft)
E39-F32A5, E39-F32B5: .5m (1.64 ft)
2. A pair of E39-F32A(5)'s is sold as E39-F32B(5).

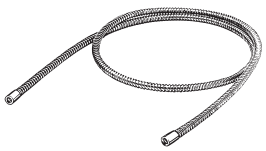
E39-F32C, E39-F32C5

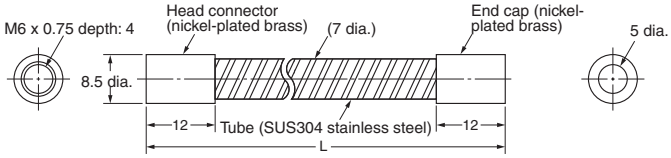




Note: L is as follows:
E39-F32C: 1m (3.28 ft)
E39-F32C5: .5m (1.64 ft)

E39-F32D, E39-F32D5



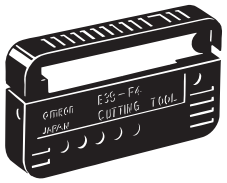


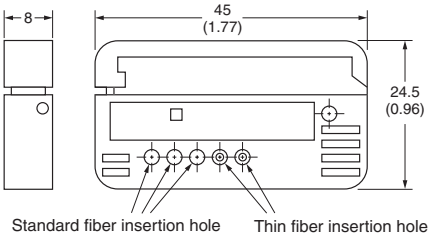
Note: L is as follows:
E39-F32D: 1m (3.28 ft)
E39-F32D5: .5m (1.64 ft)

Unit: mm (inch)

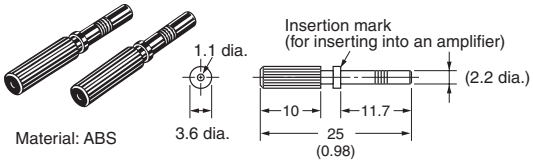
Other Accessories

E39-F4 Fiber Cutter



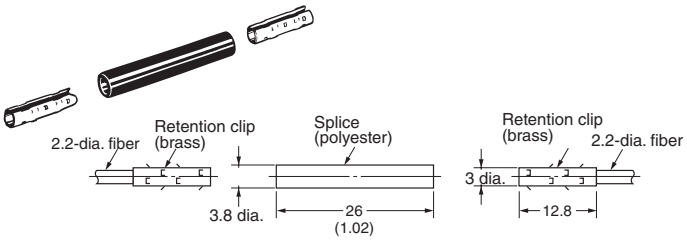


E39-F9 Attachment for Thin Fiber

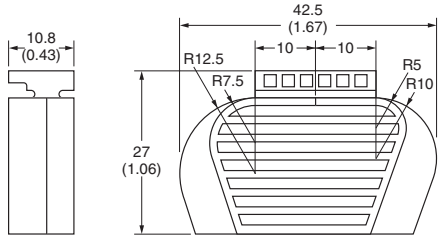


Note: One set includes two units.
Included with Thin Fiber Unit.

E39-F10 Fiber Connector

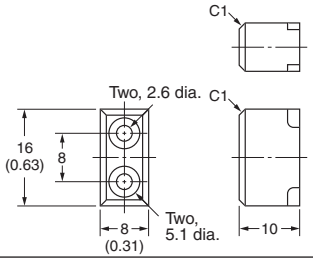


E39-F11 Sleeve Bender

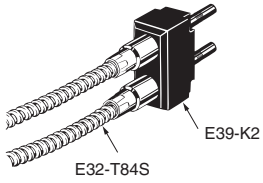


E39-K2 Protective Attachment

Material: ABS



Application Example



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