

Additional Series of Fiber Optics

Ideal Wafer Sensor for Semiconductor and Electronic Parts Industries

- **Stable Detection of Minute Objects in Any Position (E32-T16P)**
- **Ensures Stable Detection of Wafers and Glass-coated PCBs Without Being Influenced by Color and Brightness, and with a Detection Distance Three Times Greater than that of Conventional Fibers (E32-L24L/L25L)**
- **Detects Silicone Wafers and Glass Wafers as Accurately as Laser Fibers, with a LED Light Source (E32-T22S/T24S)**

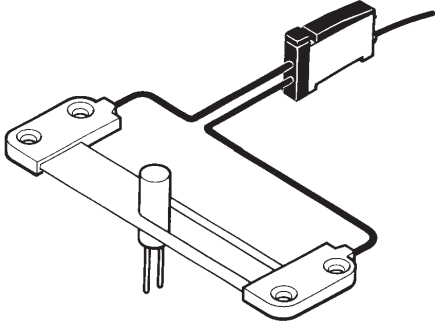


Application Examples

E32-T16P

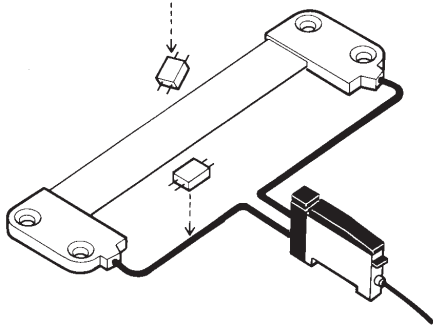
Discriminates Between Capacitors

Discriminates between capacitors according to diameter.



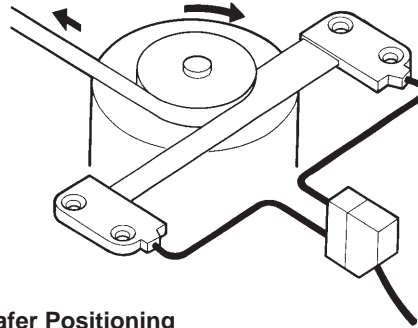
Detection of Chips

Metal or non-metal objects in a 11-mm zone can be detected. The objects need not pass through the zone in a straight line.



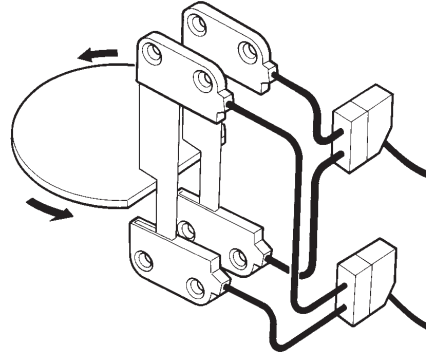
Detects Diameters of Tapes to be Rolled

In the following application, a signal is output when the diameter of the tape reaches a certain value.



Wafer Positioning

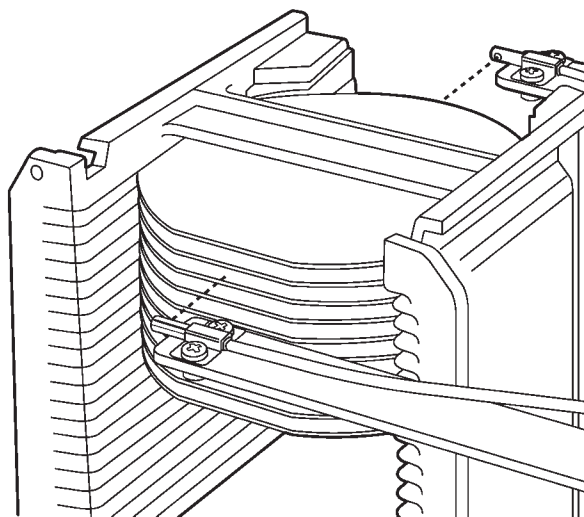
In the following application, highly precise wafer positioning is possible because the sensor uses belt-like light beams.



- The area width is as large as 2 x 11 mm.
- The diameter of the most minute detectable object is 1.3 mm when the beam is in the vertical direction. In the center of the optical axis, the diameter of the most minute detectable object is 0.4 mm when a 0.5-mm-wide slit is used.

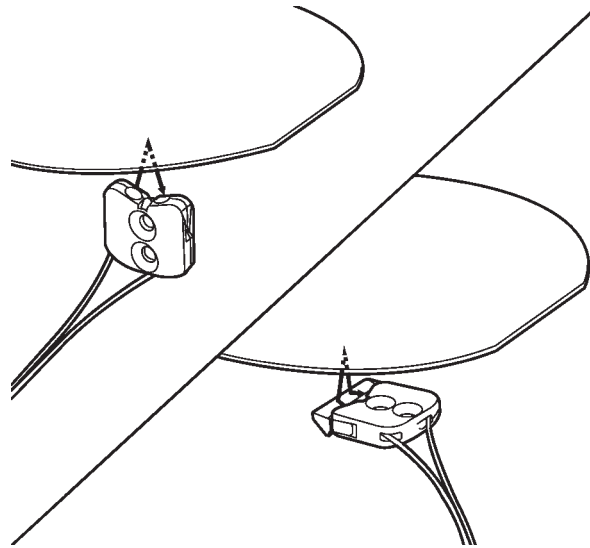
- The minute object detection capability of the E32-T16P is four to five times greater than that of OMRON's conventional E32-T16.
- The E32-T16P ensures highly precise object detection regardless of object positioning in the sensing area because the beam emitted by the E32-T16P is uniform.

E32-T22S/T24S



- Ensures the stable detection of minute objects, including silicone wafers and glass wafers in cassettes, without being influenced by other wafers.
- The Side-view Model (E32-T24S) is ideal for mounting in narrow spaces.
- The highly sensitive E3X-H11 Fiber Unit with a diameter of 3 mm, in combination with the E32-T22S or E32-T24S, can ensure a detection distance as large as 1 m.
- Has a flexible fiber with a bending radius of 10 mm.

E32-L24L/L25L



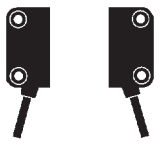
- Definite reflective wafer sensors ensure the stable detection of wafers and glass-coated PCBs without being influenced by color and brightness, as well as other wafers.
- Detects wafers and glass-coated PCBs without touching them and has a detection distance three times greater than that of OMRON's conventional fibers.
- The most heat-resistant convergent reflective wafer sensors with an ambient operating temperature range of -40°C to 105°C , thus detecting heat-treated wafers.
- The thin Side-view Model (E32-L24L) has a width of only 4 mm and does not require a large mounting space.

Specifications

■ Ratings/Characteristics

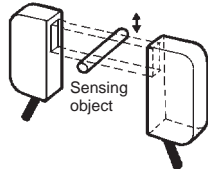
Fiber Unit

Through-beam Sensors



Item		E32-T16P		
				
		Slit width		
		Not used	0.5 mm wide	1 mm wide
With E3X-NT□□	Detection distance	480 mm	80 mm	160 mm
	Min. sensing object (see note)	Horizontal beam 1.3-mm dia. (0.6-mm dia.)	1.3-mm dia. (0.4-mm dia.)	1.3-mm dia. (0.5-mm dia.)
With E3X-NM□□	Detection distance	400 mm	65 mm	130 mm
	Min. sensing object (see note)	Horizontal beam 1.0-mm dia. (0.7-mm dia.)	1.0-mm dia. (0.4-mm dia.)	1.0-mm dia. (0.6-mm dia.)
Ambient temperature		Operating: -40°C to 70°C		
Ambient humidity		Operating: 35% to 85%		
Permissible bending radius (mean value when the detection distance is reduced by 10%)		R10 mm min.		
Material		Sensing head: Heat-resistive ABS Fiber sheath: Vinyl chloride		
Enclosure rating		IEC IP50		
Weight		Approx. 12 g		
Applicable amplifier unit		E3X-NT/-NM, E3X-T/-H/-A, E3XA-CC4A		
Attachments		Two slits each (0.5 mm and 1.0 mm wide)		

Note: Values not in parentheses represent detectable objects within the 11-mm-wide sensing area and values in parentheses represent detectable objects in the center of the E32-T16P sensing area. The diameters of sensing objects in the above table represent detectable object sizes, on condition that the objects are not moving.

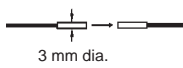
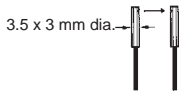
Sensing Method



Reflective Sensors

Item			Difinite reflective	Difinite reflective (side-view)
			Detects wafers and small difference in height	
			E32-L25L	E32-L24L
				
With E3X-NT□□	Detection distance (standard object)	White paper	7.2±1.8 mm (2.5 x 2.5 cm)	4±2 mm (2.5 x 2.5 cm)
		Black paper	---	
	Min. sensing object (copper wire)	0.012-mm dia.		
With E3X-NT□□	Detection distance (standard object)	White paper	7.2±1.8 mm (2.5 x 2.5 cm)	4±2 mm (2.5 x 2.5 cm)
		Black paper	---	
	Min. sensing object (copper wire)	0.015-mm dia.		
Differential travel			5% of detection distance	
Beam size			2 mm dia.	
Ambient temperature			Operating: -40°C to 105°C	
Ambient humidity			Operating: 35% to 85%	
Permissible bending radius (mean value when the detection distance is reduced by 10%)			R10 mm min.	
Material			Reinforced polyethylene	
Enclosure rating			IEC IP50	

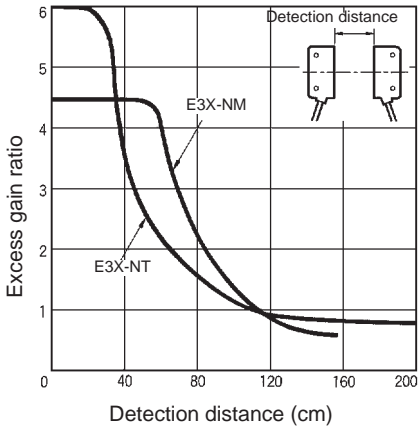
Fine Through-beam Sensors

Item			Separate	Separate (side-view)
			Detects wafers and small difference in height	
			E32-T22S	E32-T24S
				
With E3X-NT□□	Detection distance (standard object)	650 mm (1.7-mm dia. min.)	480 mm (1.7-mm dia. min.)	
	Min. sensing object (opaque objects)	0.2-mm dia.	0.1-mm dia.	
With E3X-NT□□	Detection distance (standard object)	650 mm (1.7-mm dia. min.)	450 mm (1.7-mm dia. min.)	
	Min. sensing object (opaque objects)	0.4-mm dia.		
Differential travel			---	
Beam size			13-mm dia. (at a distance of 200 mm)	
Ambient temperature			Operating: -40°C to 70°C (with no icing)	
Ambient humidity			Operating: 35% to 85%	
Permissible bending radius (mean value when the detection distance is reduced by 10%)			10 mm min.	
Material			Reinforced laminated vinyl chloride	
Enclosure rating			IEC IP67	

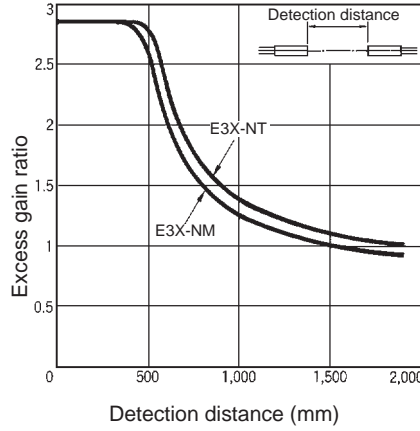
Engineering Data

■ Excess Gain Ratio

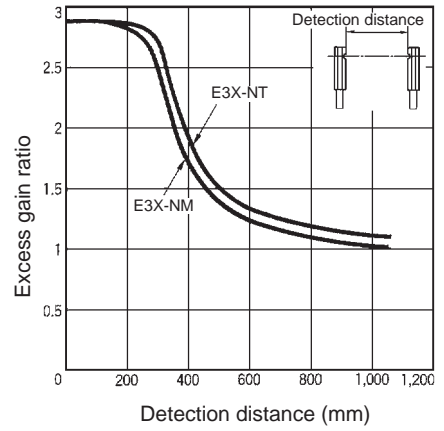
E32-T16P



E32-T22S

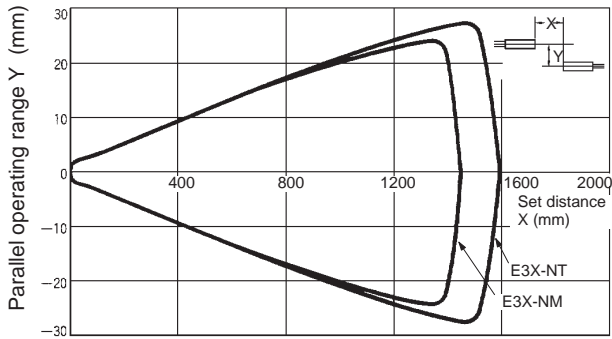


E32-T24S

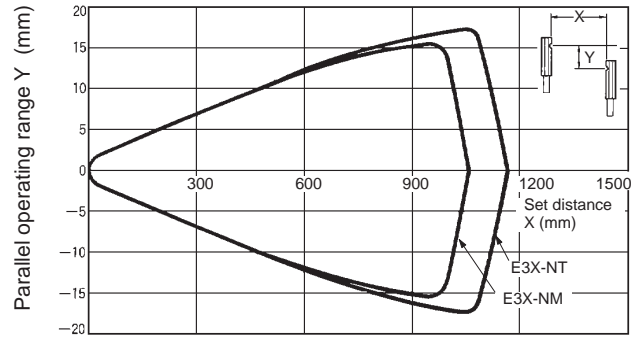


■ Parallel Operating Range

E32-T22S

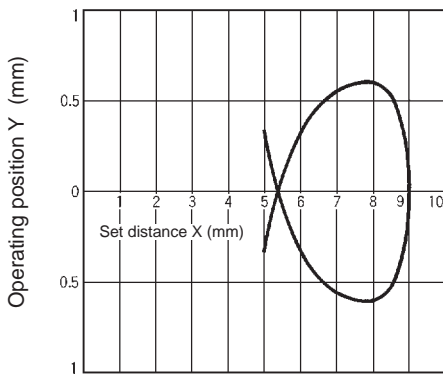


E32-T24S



■ Operating Range (Limited Reflector)

Sensing Object: Standard Object (White Paper)

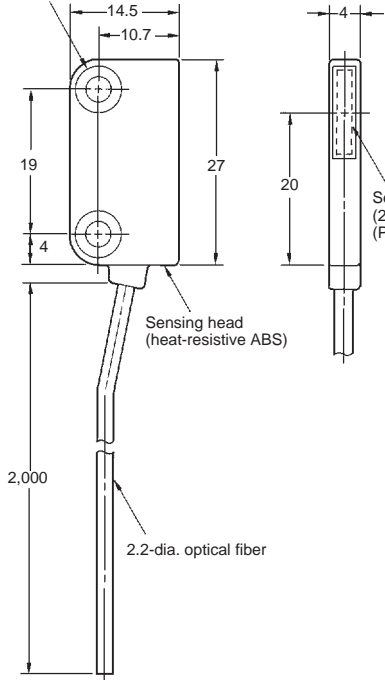


Dimensions

Note: All units are in millimeters unless otherwise indicated.

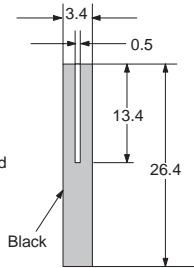
E32-T16P

Two, 3.2 dia., 6 dia counter sinking



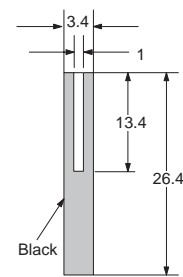
0.5-mm-wide Seal Slit

(Two slits are provided)

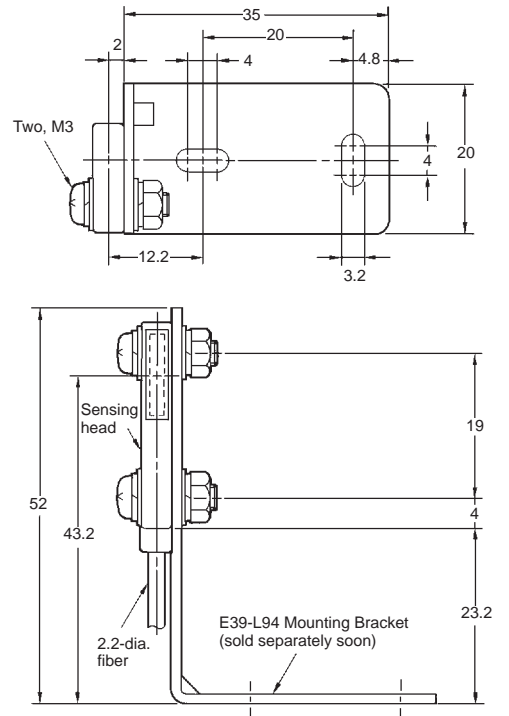


1-mm-wide Seal Slit

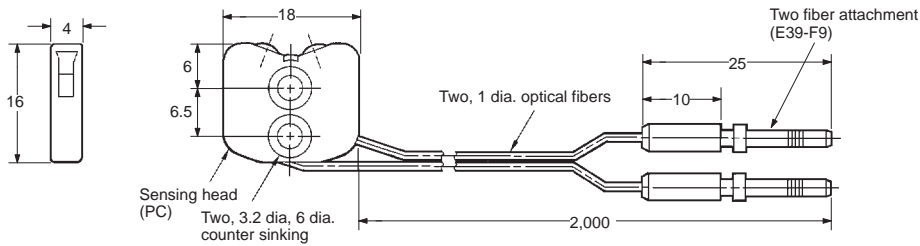
(Two slits are provided)



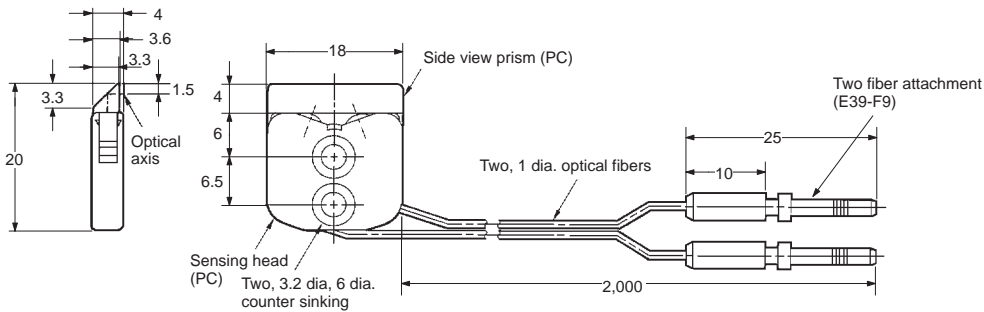
E32-T16P + E39-L94 Mounting



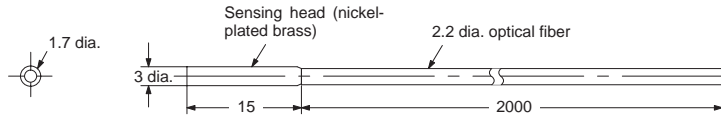
E32-L25L



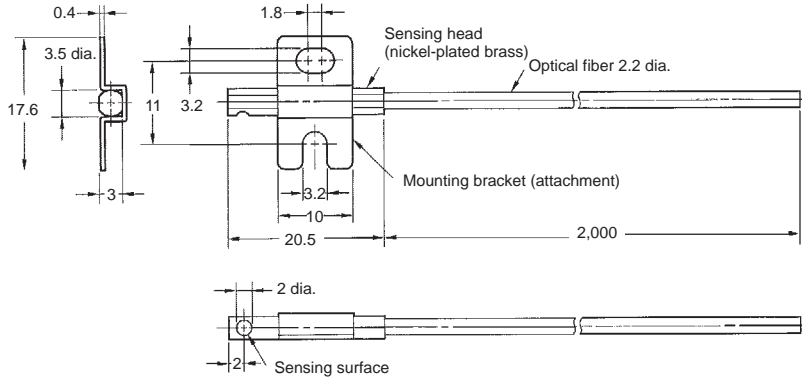
E32-L24L



E32-T22S



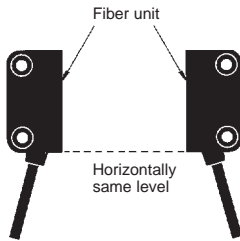
E32-T24S



Precautions

Mounting (E32-T16P)

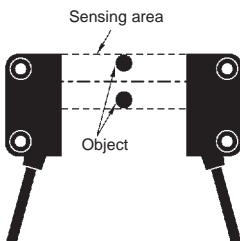
The emitter and receiver of the Fiber Unit must be on the same level and face each other.



Tighten each Fiber Unit to a torque of 0.3N • m (3 kgf • cm).

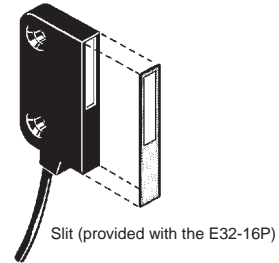
Sensitivity Adjustment (E32-T16P)

To detect minute objects in the sensing area using an amplifier with a built-in teaching function, teaching must be performed by placing one of the minute objects on the edge of the sensing area. If teaching is performed by placing the minute object in the center of the optical axis, minute objects on the edge may not be detected.



E32-16P Attachment Slit

When using a slit provided with the E32-16P, remove the paper from the back of the slit and paste the slit so that each corner of the slit matches that of the sensing face.



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. E232-E1-1 **In the interest of product improvement, specifications are subject to change without notice.**

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