OMRON

An Update: 14 of the Newest Fiber-Optic Cables

E32

Solve More Application Problems With 14 of the Newest Fiber-Optic Cables

- Combine cables with Omron's fiber-optic amplifiers for a complete solution to your sensing application
- Over 80 other fiber-optic cable solutions available, refer to E32 data sheet in Omron's Sensing Products catalog

Ordering Information

■ FEATURES

Application	Features		Sensing method	Part number
Robotic applications with constant flexing and little installation space at the sensing site	1.5 mm diameter sensing head, small 4 mm bending radius for 90-degree turns prevents reduction in sensing distance		Through-beam	**E32-T22B**
			Diffuse	**E32-D22B**
	M4 threaded head, 4 mm bending radius		Diffuse	**E32-D21B**
Harsh environment applications requiring chemical-resistant sensing heads	Teflon® resin sheath protects fiber and 5 mm diameter sensing heads from chemicals, solvents and oils; side-view sensing		Through-beam	**E32-T14F**
High-temperature sensing sites that also require chemical resistance	−40° to 150°C, side view sensing, small 2 mm diameter head for miniature target detection		Through-beam	**E32-T54**
Area detection senses objects coming in random positions anywhere within a wide beam, i.e., pill detection on a conveyor	30 mm sensing area		Through-beam	**E32-T16W**
	11 mm sensing area, side view		Through-beam	**E32-T16J**
	16 alternated light source/receiver fiber pairs over a 10.85 mm area, side view		Diffuse	**E32-D36P1**
High-precision detection requires the same operating position regardless of the direction from which the target enters the detection area	M3 threaded head, 2 m cable length		Diffuse, coaxial	**E32-C31**
	M3 threaded head, 1 m cable length		Diffuse, coaxial	**E32-C41**
	2 mm dia. sensing head, standard fiber		Diffuse, coaxial	**E32-C42**
Minute object detection in severely space-constrained sensing sites	2 mm dia. sensing head with 0.5 dia. x 15 mm probe detects objects as small as gold wire (0.01 mm dia.).		Diffuse	**E32-D331**
Precise position detection with background suppression for reflective surface objects, i.e., positioning glass wafers, slides	Rugged aluminum square sensing head. When used in pairs, eliminate mutual interference by ordering one of each.	Left side emitter	Convergent beam diffuse	**E32-L56E1**
		Right side emitter		**E32-L56E2**

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

■ ACCESSORIES (ORDER SEPARATELY)

Description	Applicable fiber-optic cables	Specification	Part number
Small spot lens adapters	Use with E32-D32 and E32-C42 fiber-optic cables	3.7 mm dia. lens	**E39-F3A**
	Use with E32-C31 and E32-C41 fiber-optic cables	3.7 mm dia. lens	**E39-F3A-5**
		4.8 mm dia. lens	**E39-F3B**
		3.7 mm dia. lens	**E39-F3C**

Sensing Distance with Fiber-optic Cables

■ THROUGH-BEAM FIBERS

: Long-distance mode : Standard mode : High-speed mode

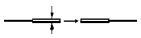
- "Standard object" measurements were made with E3X-DA-N set to Standard mode. The size of standard object is the same as the fiber core diameter or the lens diameter for models with a lens.
- "Minimum sensing object" is shown in parentheses below the standard object. The minimum sensing object size was determined when the E3X-DA-N amplifier received light that exceeded a light incident value of 1000 (set to digital incident level display).

✂ Indicates models that customers can cut to length for their application. Models without this mark are pre-cut by the factory to maintain their respective specifications.

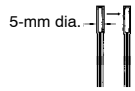
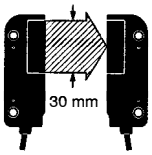
The table specifies the sensing characteristics of each fiber when used with the following amplifiers:

Legend:
DAN-HS E3X-DA-N (Digital amplifier- high speed mode)
DAN-LD E3X-DA-N (Digital amplifier- long distance mode)
DAN-SM E3X-DA-N (Digital amplifier- standard distance mode)

■ THROUGH-BEAM, GENERAL PURPOSE TYPE

Application	Features	Appearance	Type	Detection distance	Standard object (Min. detectable object: opaque)	**Part number**
Flexible, resists breaking	Ideal for mounting on moving sections 4 mm bending radius	 1.5 mm dia.	DAN-HS	80 mm	0.5-mm dia. (0.01-mm dia.)	**E32-T22B** ✂
			DAN-SM	200 mm		
			DAN-LD	220 mm		

■ SPECIAL-PURPOSE THROUGH-BEAM FIBERS

Application	Features	Appearance	Type	Detection distance	Standard object (Min. detectable object: opaque)	**Part number**
Chemical resistant	Side view Teflon-covered *1; with-stands chemicals and harsh environments; Operating ambient temperature: -30°C to 70°C (-22°F to 158°F)	 5-mm dia.	DAN-HS	150 mm	3.0-mm dia. (0.01-mm dia.)	**E32-T14F** ✂
			DAN-LD	400 mm		
			DAN-SM	500 mm		
Heat resistant	Side-view; resists 150°C *2; Detects minute targets; fiber sheath material: fluororesin; Operating ambient temperature: -40°C to 150°C (-40°F to 302°F)	 2-mm dia.	DAN-SM	80 mm	1.0-mm dia. (0.01-mm dia.)	**E32-T54** ✂
			DAN-LD	230 mm		
			DAN-SM	290 mm		
Area sensing *3	Detects in a 30-mm area	 30 mm	DAN-SM	660 mm	0.3-mm dia.*2	**E32-T16W** ✂
			DAN-LD	1,800 mm		
			DAN-SM	2,300 mm		
	Side-view; suitable for applications with limited spatial depth	 11 mm	DAN-SM	660 mm	0.2-mm dia.	**E32-T16J** ✂
			DAN-LD	1,800 mm		
			DAN-SM	2,300 mm		

Note: 1. Teflon is a registered trademark of the Dupont Company and the Mitsui Dupont Chemical Company for their fluoride resin.
2. For continuous operation, use the products within the temperature ranging from -40°C to 130°C (-40°F to 266°F)
3. These figures are for a sensing distance of 100 mm and for detecting over a 11-mm area, or 10-mm area for the E32-T16. (Figures for the diameter of sensing objects are in the still state.)

■ DIFFUSE FIBERS

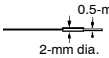
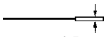
: Long-distance mode : Standard mode : High-speed mode

- "Standard object" measurements were made with E3X-DA-N set to Standard mode.
- "Minimum sensing object" is shown in parentheses below the standard object. The values of the minimum sensing object were obtained at a distance where the smallest object (gold wire) can be sensed with the Diffuse Fiber Unit.
- The E3X-DA-N may continue to receive internal reflective light when it is set to the maximum sensitivity setting. In this case, set the amplifier to "two-point teaching with or without-object teaching."

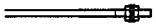
✂ Indicates models that customers can cut to length for their application. Models without this mark are pre-cut by the factory to maintain their respective specifications.

The table specifies the sensing characteristics of each fiber when used with the following amplifiers:

Legend:
DAN-HS E3X-DA-N (Digital amplifier- high speed mode)
DAN-LD E3X-DA-N (Digital amplifier- long distance mode)
DAN-SM E3X-DA-N (Digital amplifier- standard distance mode)

Application	Features	Appearance	Type	Detection distance (Values measured using white paper)	Standard object (Min. sensing object)	**Part number**
Thin fiber	Minute object detection (0.5-mm dia.)		DAN-HS	1 mm	25 × 25 (0.01-mm dia.)	**E32-D331**
			DAN-SM	3 mm		
			DAN-LD	4 mm		
Flexible (resists breaking)	Ideal for mounting on moving sections (R4)		DAN-HS	10 mm	100 × 100 (0.01-mm dia.)	**E32-D21B** ✂
			DAN-SM	70 mm		
			DAN-LD	90 mm		
			DAN-HS	10 mm	50 × 50 (0.01-mm dia.)	**E32-D22B**
			DAN-SM	30 mm		
			DAN-LD	40 mm		

■ SPECIAL-PURPOSE DIFFUSE FIBERS

Application	Features	Appearance	Type	Detection distance (Values measured using white paper)	Standard object (Min. sensing object)	**Part number**
Coaxial	M3 coaxial; high-precision positioning accuracy; possible to mount small-spot lens (E39-F3A-5/ F3B/F3C)		DAN-HS	25 mm	25 × 25 (0.01-mm dia.)	**E32-C31** ✂
			DAN-SM	75 mm		
			DAN-LD	100 mm		
	M3 coaxial; high-precision positioning accuracy; possible to mount small-spot lens (E39-F3A-5/ F3B/F3C)		DAN-HS	10 mm	50 × 50 (0.01-mm dia.)	**E32-C41**
			DAN-SM	35 mm		
			DAN-LD	45 mm		
	2-mm dia. coaxial; high-precision positioning accuracy; possible to mount small-spot (0.1 to 0.6 mm dia.) lens (E39-F3A)		DAN-HS	10 mm	50 × 50 (0.01-mm dia.)	**E32-C42**
			DAN-SM	35 mm		
			DAN-LD	45 mm		
Area sensing	Side-view; detection over wide areas		DAN-HS	50 mm	300 × 300 (0.01-mm dia.)	**E32-D36P1** ✂
			DAN-SM	150 mm		
			DAN-LD	200 mm		
Conver-gent beam	Suitable for positioning crystal glass		DAN-SM	4 to 12 mm	100 × 100 mm Soda glass with 7% reflection factor	**E32-L56E1** **E32-L56E2** ✂

Specifications

■ THROUGH-BEAM FIBER-OPTIC CABLES

Part number	Operating ambient temperature	Operating relative humidity	Permissible bending radius	Core material	Sheath material	Enclosure rating
E32-T14F	-40°C to 70°C (-40°F to 158°F) with no icing	35% to 85% with no condensation	40 mm	PMMA	Teflon® resin	IEC IP67
E32-T16J	-40°C to 70°C (-40°F to 158°F) with no icing		10 mm		PVC	IEC IP50
E32-T16W	-25°C to 55°C (-13°F to 131°F) with no icing		10 mm		PVC	IEC IP50
E32-T22B	-40°C to 70°C (-40°F to 158°F) with no icing		4 mm min.		PVC	IEC IP67
E32-T54	-40°C to 150°C (-40°F to 302°F) with no icing*		35 mm		Fluoride resin	IEC IP67

*When used continuously between -40°C and 130°C (-40°F and 266°F)
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■ DIFFUSE FIBER-OPTIC CABLES

Part number	Operating ambient temperature	Operating relative humidity	Permissible bending radius	Core material	Sheath material	Enclosure rating
E32-D21B	-40°C to 70°C (-40°F to 158°F) with no icing	35% to 85% with no condensation	4 mm min.	PMMA	PVC	IEC IP67
E32-D22B			4 mm min.			
E32-D331			25 mm		Polyethylene	IEC IP67
E32-D36P1			25 mm min.			—
E32-C31	-40°C to 70°C (-40°F to 158°F) with no icing		25 mm min.		PVC	IEC IP67
E32-C41			25 mm min.			
E32-C42			25 mm min.			
E32-L56E1	0°C to 70°C (32°F to 158°F) with no icing		35 mm min.		Fluoride resin	IEC IP40
E32-L56E2			35 mm min.			