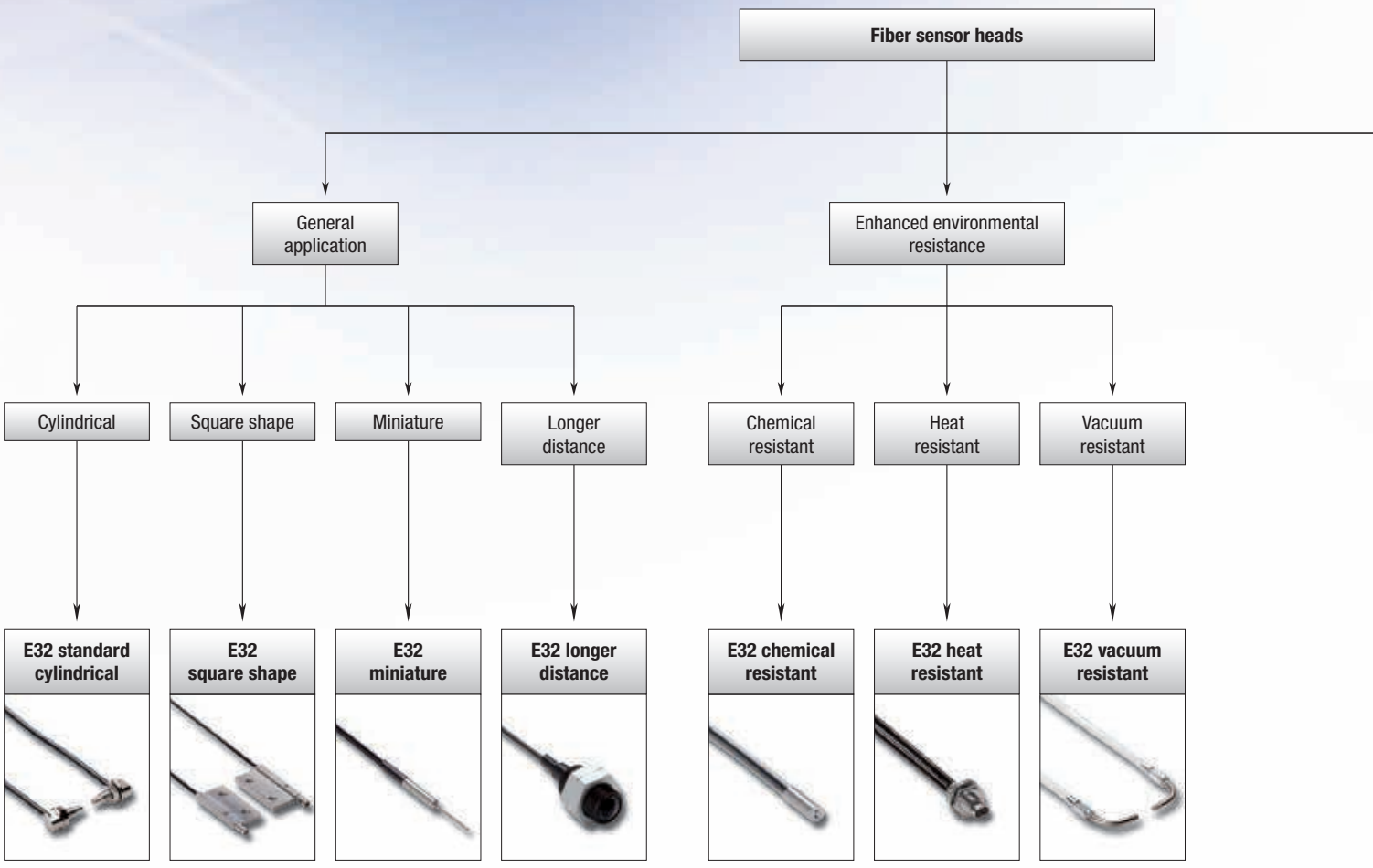
HIGH PRECISION IN SMALL SPACES

Precision and performance you can rely on

The requirements for fiber optic solutions can be very demanding particularly for applications with extreme temperatures and aggressive chemicals or for applications requiring highest precision with limited mounting space.
With the wide range of E32 fiber heads and the easy-usage amplifiers, the best performance fit for your application can be provided. The highest quality control procedures in design and manufacturing ensure that you get the precision and long service life that you can rely on.

- Long operational life
- Easy to install and adjust
- Wide portfolio range for best performance fit



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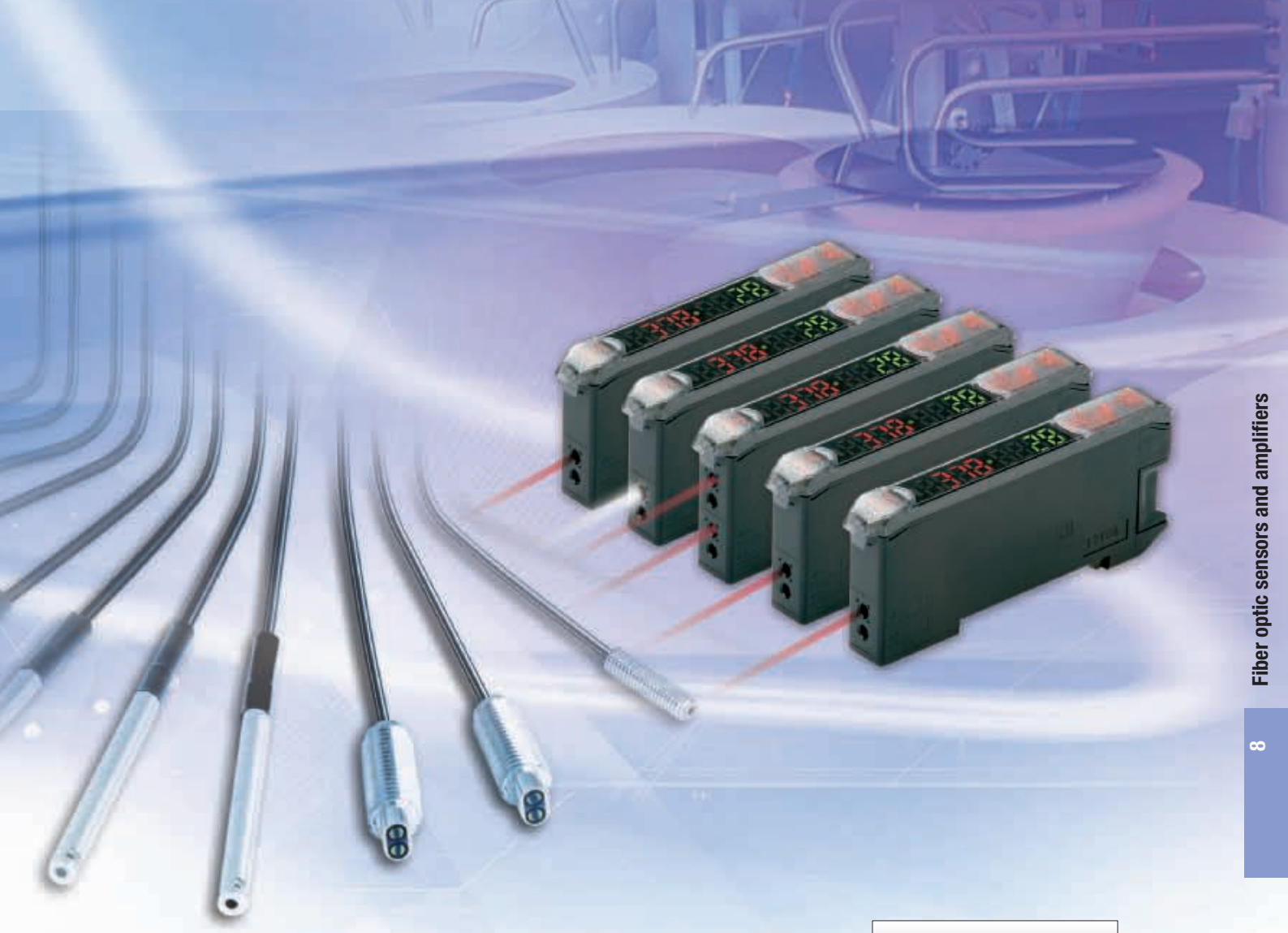

Fiber amplifiers

- **Special objects or installations**
  - Robot applications → **E32 robot**  Page 197
  - Precision detection → **E32 precision detection**  Page 198
  - Area monitoring → **E32 area monitoring**  Page 200
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- **Easy usage**
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- **Advanced functionality**
  - High functionality E3X-DA-S
  - High speed E3X-NA-F
  - Colour detection E3X-DAC-S
  - Double amplifier E3X-MDA
  - Infrared LED E3X-DAH-S

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Selection table

Fiber sensor heads

Type	Cylindrical	Square shape	Miniature	Longer distance	Chemical resistant
					
Model	**E32 Standard cylindrical**	**E32 Square shape**	**E32 Miniature**	**E32 Longer distance**	**E32 Chemical resistant**
Key features	• standard and high-flex fibers • sizes M3 to M6	• 3 or 4 mm thin housing • models in X,Y or Z-axis • direct mounting without bracket	• sizes from dia 500 µm to 3 mm • bendable sleeves	• built in focal lenses	• fluoroplastic cover or coating
Through-beam	760 mm	760 mm	750 mm	20 m	3 m
Retro-reflective	250 mm	–	–	1.5 m	–
Diffuse-reflective	300 mm	300 mm	300 mm	700 mm	170 mm
Page	187	189	190	192	193

Note: all sensing distances measured with E3X-DA-SE-S. Longer sensing distances up to 80% can be achieved with E3X-DA-S.

Fiber amplifiers

Type	Easy teach	Potentiometer adjuster	High functionality	Double amplifier
				
Model	**E3X-DA-SE-S, E3X-SD**	**E3X-NA**	**E3X-DA-S**	**E3X-MDA**
Key features	• 1 button object teaching • auto teach during operation	• easy adjustment by potentiometer	• High functionality signal processing (timer, counter, power tuning, etc. • up to 80% longer sensing distances	• 2 inputs and AND, OR signal comparison
Response time (min.)	1 ms	200 µs	1 ms (80 µs in high speed mode)	1 ms (130 µs in high speed mode)
Page	204	205	207	209

Heat resistant	Vacuum resistant	Robot applications	Precision detection	Area monitoring	Special application
					
E32 Heat resistant	**E32 Vacuum resistant**	**E32 Robot**	**E32 Precision detection**	**E32 Area monitoring**	**E32 Special**
• heat resistant up to 400°C	• leakage rate of $1x10^{-10}$ $Pa*m^3/s$ max	• free moving multicore fibers for >1 Mio bending cycles	• detection accuracy up to 100 µm • coaxial fibers • adjustable focal points	• area monitoring up to 70 mm	• detection of special objects (wafer, liquid level, flat glass, print mark,..)
1.3 m	480 mm	680 mm	1.9 m	2.8 m	1.9 m
–	–	–	–	–	–
280 mm	–	170 mm	300 mm	150 mm	300 mm
194	196	197	198	200	201

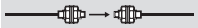
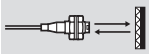
High speed	Colour/print mark detection	Infrared LED
		
E3X-NA-F	**E3X-DAC-S**	**E3X-DAH-S**
• Short turn on time of 20 µs	• White LED and RGB ratio comparison	• Infrared LED
20 µs	1 ms (60 µs in super high speed	1ms (55µs in super high speed
210	211	213

Standard cylindrical fiber sensor heads

The standard cylindrical fiber optic sensing heads provide reliable object detection, easy installation and long sensor lifetime for all general applications.

- High-flex fibers and 90° cable exit for fiber breakage prevention
- Models with hexagonal back for simplified one-nut mounting
- Sizes M3 to M6

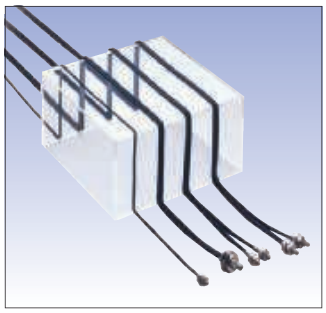
Ordering information

Sensor type	Size	Sensing distance (in mm) *1		Order code	
		Standard	High-flex	Standard	High-flex
	M4	760	530	E32-TC200 2M	E32-ET11R 2M
	M3	220	130	E32-TC200E 2M	E32-ET21R 2M
	dia 4 mm	760	–	E32-ETC220 2M	–
 easy mount	M4	–	530	–	E32-T11N 2M
	M6	250 *2	–	E32-R21	–
	M6	300	170	E32-DC200 2M	E32-ED11R 2M
	M4	80	30	E32-D211 2M	E32-D211R 2M
	M3	80	30	E32-DC200E 2M	E32-ED21R 2M
 easy mount	M6	–	170	–	E32-D11N 2M
	dia 6 mm	110	45	E32-D14L 2M	E32-D14LR 2M

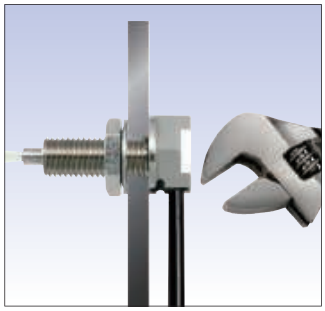
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 Measured with E39-R3

Specifications

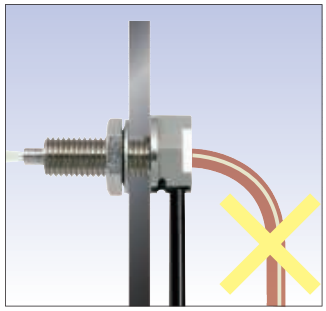
Item		Standard					High Flex			
		E32-_C200 E32-_C220	E32-D14L	E32-_C200E	E32-D211	E32-R21	E32-E_R	E32-D14LR	E32-D211R	E32-_11N
Permissible bending radius		R25		R10			R1			
Cut to length		Yes								
Ambient temperature		-40°C to 70°C								
Material	Head	Brass-nickel plated	Stainless steel	Brass-nickel plated	Stainless steel	Plastic (ABS)	Brass-nickel plated	Stainless steel		Brass-nickel plated
	Fiber	PMMA								
	Sheath	Polyethylene coating					PVC coating			
Degree of protection		IEC 60529 IP67								



Hi-flex multicore fibers for flexibility in installation without fiber breakage



Models with hexagonal back for simple one-nut mounting



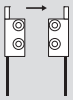
Cable exit shifted by 90° for preventing fiber breakage

Square shape fiber sensor heads

The fiber heads in square shaped housing provide fast and easy installation on flat surfaces.

- Models with sensing direction in X, Y or Z axis
- 3 or 4mm thick housings for minimal height requirement
- Standard or high-flex fibers

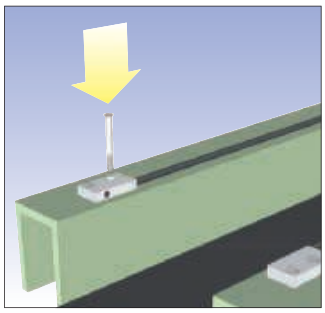
Ordering information

Sensor type	Size (in mm) (Standard/High-flex)	Sensing distance (in mm) *1		Order code	
		Standard	High-flex	Standard	High-flex
	15x8x3/ 15x10x4	760	560	E32-T15X 2M	E32-ETS10R 2M
	15x8x3	460	210	E32-T15Y 2M	E32-T15YR 2M
	15x8x3/ 15x9x4	460	480	E32-T15Z 2M	E32-ETS14R 2M
	15x10x3	300	170	E32-D15X 2M	E32-D15XR 2M
	15x10x3	100	40	E32-D15Y 2M	E32-D15YR 2M
	15x10x3/ 13x6x2.3	100	60	E32-D15Z 2M	E32-EDS24R 2M
	24.5x10x3	890	–	E32-A03-1 2M	–
	20.5x2x2	340	–	E32-A04-1 2M	–

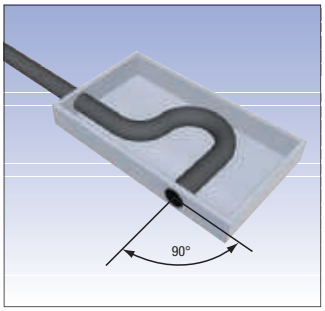
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

Specifications

Item		Standard			High flex	
		E32-_15	E32-A03_	E32-A04_	E32-E	E32-_15_R
Permissible bending radius		R25	R10		R1	
Cut to length		Yes				
Ambient temperature		-40°C to 70°C				
Material	Head	Aluminium	Brass-nickel plated	Stainless steel	Aluminium	
	Fiber	PMMA				
	Sheath	Polyethylene coating				PVC coating
Degree of protection		IEC 60529 IP67	IEC 60529 IP50		IEC 60529 IP67	



Space saving and fast mounting without additional brackets



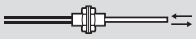
Precise positioning during manufacturing for 90° optics to achieve minimal tolerance variations in optical output axis angle

Miniature fiber sensor heads

The miniature fiber heads provide high accuracy in smallest spaces and reliable detection of minute objects.

- Sizes from dia 500 µm to 3 mm
- Side view models with precision axis alignment for highest accuracy
- Bendable sleeves for precision positioning

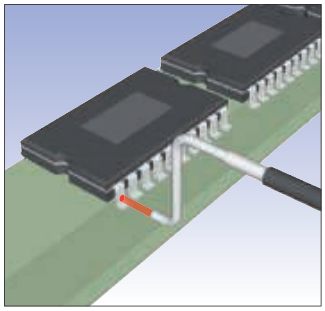
Ordering information

Sensor type	Size	Sensing distance (in mm)*1		Order code	
		Standard	High-flex	Standard	High-flex
	dia 3 mm	750	530	E32-T12 2M	E32-T12R 2M
	dia 2 mm	220	130	E32-T22 2M	E32-T22R 2M
	dia 1.5 mm	220	130	E32-T222 2M	E32-T222R 2M
	dia 1 mm	–	130	–	E32-T223R 2M
	dia 3 mm	460	210	E32-T14L 2M	E32-T14LR 2M
	dia 2 mm	340	–	E32-A04 2M	–
	dia 1 mm	130	50	E32-T24	E32-T24R 2M
*2 	dia 1.2 mm	750	530	E32-TC200B	E32-TC200BR
	dia 0.9 mm	220	130	E32-TC200F	E32-TC200FR
	dia 3 mm	80	30	E32-D22 2M	E32-D22R 2M
	dia 2 mm	75	40	E32-D32 2M	E32-D32R 2M
	dia 1.5 mm	–	30	–	E32-D22B 2M
	dia 2 mm	30	15	E32-D24	E32-D24R 2M
*2 	dia 2.5 mm	300	170	E32-DC200B 2M *3	E32-DC200BR *3
	dia 1.2 mm	80	30	E32-DC200F	E32-DC200FR
	dia 0.8 mm	–	16	–	E32-D33 2M
	dia 0.5 mm	–	3	–	E32-D331 2M

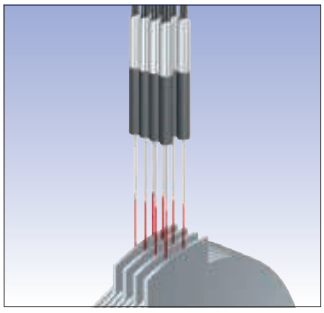
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 Models with 40 mm sleeve instead of 90 mm sleeve are available by adding '4' to the order code at the end, e.g. E32-TC200B4
*3 Sleeve cannot be bent

Specifications

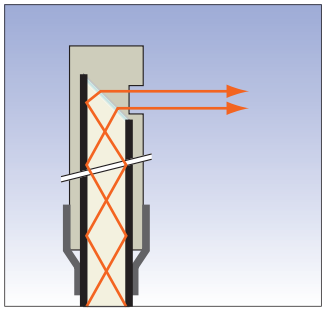
Item		Standard						High-flex				
		E32-DC200B E32-T12 E32-TC200B	E32-T14L	E32-D32	E32-D22 E32-T222 E32-TC200F	E32-D24 E32-DC200F E32-T22 E32-T24	E32-A04	E32-D32R E32-D33 E32-D331	E32-D22B	E32-DC200BR E32-T12R E32-TC200BR	E32-D22R E32-T222R E32-TC200FR	E32-D24R E32-DC200FR E32-T14LR E32-T22R E32-T223R E32-T24R
Permissible bending radius		R25			R10			R4		R1		
Cut to length		Yes										
Ambient temperature		-40°C to 70°C										
Material	Head	Brass-nickel plated	Stainless steel		Brass-nickel plated	Stainless steel				Brass-nickel plated		Stainless steel
	Fiber	PMMA										
	Sheath	Polyethylene coating		PVC and polyethylene	Polyethylene coating			PVC and polyethylene	PVC coating		Polyethylene coating	
Degree of protection		IEC 60529 IP67					IEC 60529 IP50	IEC 60529 IP67				



Bendable metal sleeves for precision positioning of sensors after installation



0.5 mm diameter (diffuse reflective) or 1 mm diameter (through beam) when mounting space is crucial



High precision fiber surface cutting and positioning during manufacturing to achieve minimal deviation of optical output axis angle

Longer distance fiber sensor heads

With built-in focal lenses the longer distance fiber heads provide enhanced operational stability in dusty environments or long distance applications

- Sensing distance up to 20 m
- Built-in focal lens
- Sizes from dia 2 mm to M14

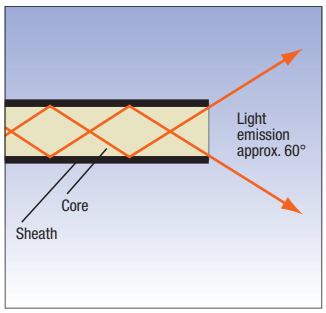
Ordering information

Sensor type	Size	Sensing distance (in mm)*1	Order code
	M14	20000	E32-T17L
	25,2x10.5x8 mm	3400	E32-T14
	M4	1330	E32-T11L 2M
	M3	680	E32-TC200A 2M
	dia 3 mm	1330	E32-T12L 2M
	dia 2 mm	440	E32-T22L 2M
Reflector	21.5x27x10 mm	1500 *2	E32-R16 2M
	22x17.5x9 mm	700	E32-D16 2M
	M6	400	E32-D11L 2M
	M4	130	E32-D21L 2M
	dia 3 mm	230	E32-D12 2M

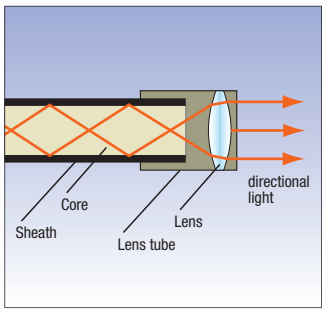
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 Measured with E39-R1

Specifications

Item		Through-beam				Retro-reflective	Diffuse-reflective			
		E32-T17L/ E32-T14	E32-T11L/ E32-T12L	E32-TC200A	E32-T22L	E32-R16	E32-D16	E32-D11L	E32-D21L	E32-D12
Permissible bending radius		R25			R10	R25	R4	R25	R10	R25
Cut to length		Yes								
Ambient temperature		-40°C to 70°C								
Material	Head	ABS	Brass-nickel plated		Stainless steel	ABS	Aluminium	Brass-nickel plated		Stainless steel
	Fiber	PMMA								
	Sheath	Polyethylene coating					PVC coating	Polyethylene coating		
Degree of protection		IEC 60529 IP67					IEC 60529 IP40	IEC 60529 IP67		



Light emission of conventional fibers



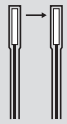
With built-in focal lenses, longer sensing distances can be achieved up to 5 times longer compared to conventional sensors

Chemical resistant fiber sensor heads

The chemical resistant fibers provide long sensor lifetime in areas with frequent cleaning, usage of chemicals and higher temperatures.

- fluoroplastic cover for highest chemical resistance
- temperature resistance up to 200°C

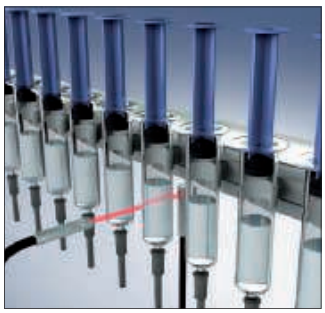
Ordering information

Sensor type	Size	Sensing distance (in mm)*1	Key feature	Order code
	M4	680	Fluororesin coating	E32-T11U 2M
	dia 5 mm	500	Fluororesin cover	E32-ET11F 2M
		3,000		E32-T12F
	dia 5 mm	1,400	Fluororesin cover	E32-T14F 2M
	M6	170	Fluororesin coating	E32-D11U 2M
	dia 7 mm	80	Fluororesin cover	E32-ED11F 2M
	dia 6 mm	95		E32-D12F
	dia 6 mm	40	Fluororesin cover	E32-D14F 2M
	dia 6 mm	700	Fluororesin cover Heat resistant to 200°C	E32-T81F-S 2M
	dia 5 mm	3,000	Fluororesin cover Heat resistant to 150°C	E32-T51F 2M

*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

Specifications

Item		Fluororesin coating		Full fluororesin cover		Full fluororesin cover and heat resistance	
		E32-T11U	E32-D11U	E32-E_11F	E32-_12F/E32-_14F	E32-T51F	E32-T81F-S
Permissible bending radius (in mm)		R1	R4	R75	R40		R10
Cut to length		yes					no
Ambient temperature		-40°C to 70°C				-40°C to 150°C	-40°C to 200°C
Material	Head	Brass-nickel plated		Fluororesin			
	Fiber	PMMA					Glass
	Sheath	Fluororesin coating		Fluororesin cover			
Degree of protection		IEC60529 IP67					



The fluororesin cover provides highest chemical resistance for longest lifetime in frequently cleaned environments like aseptic filling in pharmaceutical applications

Enhanced temperature resistant models

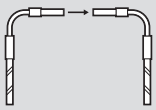
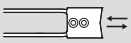
Highest chemical resistance

Heat resistant fiber sensor heads

The wide range of heat resistant fibers provides long sensor lifetime with highest protection in demanding environments

- heat resistant up to 400°C
- sizes from dia 2 mm to M6
- models for long distances or high detection accuracy

Ordering information

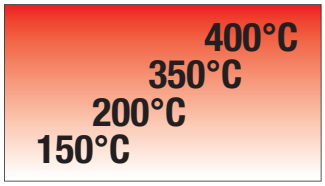
Sensor type	Size	Sensing distance (in mm)*1	Key feature	Order code	
				For E3X-DA-S teachable amplifier	for E3X-NA amplifier with potentiometer adjustment
	M4	450	-40°C to 150°C	E32-ET51 2M	
		425	-40°C to 100°C*2, high-flex	E32-T51R 2M	
		280	-40°C to 200°C	E32-T81R-S 2M	
		450	-60°C to 350°C	E32-T61-S 2M	
	dia 2 mm	230	-40°C to 150°C	E32-T54 2M	
	dia 3 mm	1300	-40°C to 200°C	E32-T84S-S 2M	
	M6	230	-40°C to 150°C	E32-ED51 2M	
		135	-40°C to 100°C*2, high-flex	E32-D51R 2M	
		280	-40°C to 200°C	E32-D81R-S 2M	E32-D81R 2M
		150	-60°C to 350°C	E32-D61-S 2M	E32-D61
	M4	60	-40°C to 400°C	E32-D73-S 2M	E32-D73
	23x20x9 mm	35	-40°C to 150°C	E32-A09H 2M	
	30x24x9 mm	25	-40°C to 300°C	E32-A09H2 2M	
	25x18x5 mm	5	-40 to 300°C	E32-L64 2M	
	36x18x5 mm	18		E32-L66 2M	

*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 Short term resistance. For continous operation -40°C to 90°C

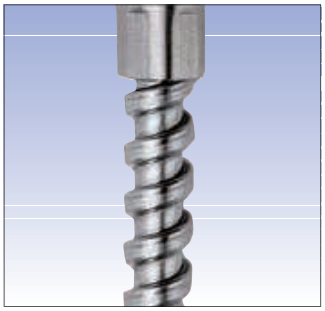
E32 Heat resistant

Specifications

Item		-40°C to 150°C	-40°C to 100°C	-40°C to 150°C		-40°C to 200°C		-40°C to 300°C		-60°C to 350°C	-40°C to 400°C
		E32-E_51	E32-D51R/ T51R	E32-T54	E32-A09H	E32-_81_	E32-T84_	E32-A09H2	E32-L6_	E32-_61_	E32-D73_
Permissible bending radius (in mm)		R35	R2	R35		R10	R25				
Cut to length		Yes				No					
Material	Head	Brass-nickel plated	Stainless steel		Aluminium	Stainless steel					
	Fiber	PMMA	Acrylate resin	PMMA		Glass					
	Sheath	Fluoro resin	Polyurethane resin	Fluoro resin			Stainless steel spiral coating	Stainless steel tube	Stainless steel spiral coating		Stainless steel tube
Degree of protection		IEC 60529 IP67	IEC 60529 IP50	IEC 60529 IP67					IP40	IEC 60529 IP67	



The temperature range optimised material selection provides best application fit and value - performance ratio.



Stainless steel spiral coating for flexibility with highest mechanical protection.

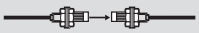
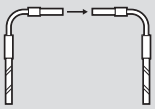
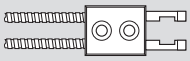
Vacuum resistant fiber sensor heads

For applications in cleanest and hot environments the vacuum resistant fibers and connecting flanges provide long operational lifetime and vacuum integrity.

- Leakage rate of $1x10^{-10}$ Pa*m^3/s max
- Heat resistance up to 200°C
- Detergent resistant fluororesin or stainless steel fiber sheath

Ordering information

Sensor

Sensor type	Size	Sensing distance (in mm) *1	Temperature range	Order code
	M4	200	-40°C to 120°C	E32-T51V 1M
	dia 3	130	-40°C to 120°C	E32-T54V 1M
	dia 3	480	-60°C to 200°C	E32-T84SV 1M
	33x18x5.5 mm	5	-40°C to 70°C	E32-G86V-13M

*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

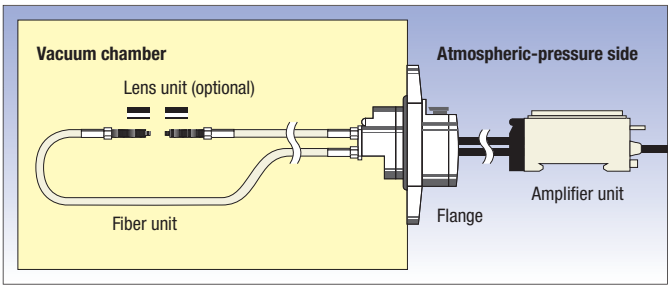
Flange

Type	Size	Order code
4 channel flange	80x80x49 mm	E32-VF4
1 channel flange	96 x dia30 mm max.	E32-VF1
Flange-to-amplifier connection fiber	2 m length	E32-T10V 2M

Specifications

Item		Fiber sensor heads				Flange-to-amplifier fiber
		E32-T51V	E32-T54V	E32-T84SV	E32-G86V-1	E32-T10V
Permissible bending radius		R30		R25		
Cut to length		No				Yes
Material	Head	Aluminium	Stainless steel			–
	Fiber	Glass				PMMA
	Sheath	Fluororesin coating		Stainless steel spiral coating		Polyethylene coating
Degree of protection		–				

Item		Flange	
		E32-VF1	E32-VF4
Leakage rate		1x10-10 Pa*m^3/s max	
Ambient temperature		-25°C to 55°C	
Material	Flange	Aluminium and stainless steel	Aluminium
	Seal	Fluorocarbon rubber (viton)	



The vacuum resistant fiber heads and flanges are sealed to prevent gas leakage into vacuum areas

Robot application fiber sensor heads

For applications on frequently or fast moving parts, the robot fibers reduce the risk of fiber breakage with a guaranteed operational life of more than 1 million bending cycles

- Free moving multicore fibers for > 1 mio bending cycles
- Square shapes for easy surface installation
- Cylindrical sizes from dia 1.5 mm to M6

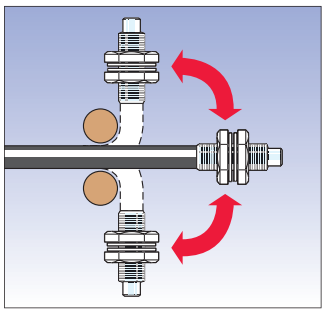
Ordering information

Sensor type	Size	Sensing distance (in mm) *1	Order code
	M4	680	E32-T11 2M
	M3	200	E32-T21 2M
	dia 3 mm	680	E32-T12B
	dia 2 mm	200	E32-T221B
	dia 1.5 mm	200	E32-T22B
	15x18x3 mm	680	E32-T15XB 2M
	M6	170	E32-D11 2M
	M4	70	E32-D21B 2M
	M3	30	E32-D21 2M
	dia 1.5 mm	30	E32-D22B 2M
	15x10x3 mm	170	E32-D15XB 2M

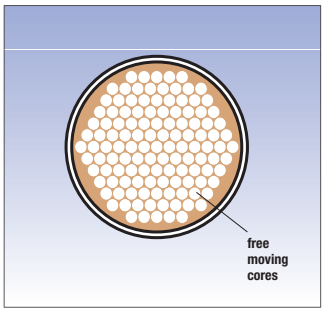
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

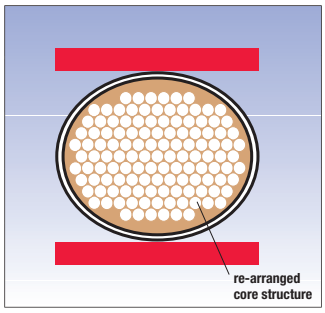
Specifications

Item		Square	Cylindrical			
		E32-D15XB E32-T15XB	E32-T21	E32-D11 E32-T11	E32-D21 E32-T12B E32-T22B	E32-D21B E32-D22B E32-T221B
Permissible bending radius		R4				
Cut to length		Yes				
Material	Head	Aluminium	Brass-nickel plated			Stainless steel
	Fiber	PMMA				
	Sheath	PVC coating	Polyethylene coating	PVC coating		
Degree of protection		IEC 60529 IP67				



Guaranteed more than 1 mio bending operations





Free moving fiber cores prevent fiber breakage and light intensity loss when the fiber is bent.

Precision detection fiber sensor heads

Highest precision in design and manufacturing of the fibers and focal lenses ensure highest beam and spot accuracy allowing the detection of smallest objects and height differences of less than 100 µm.

- Coaxial fibers with focal lenses for spot diamters of 100 µm
- Through-beam models with highly focused beam and precise optical axis alignment
- Limited reflective models for height difference detection of less than 100 µm

Ordering information

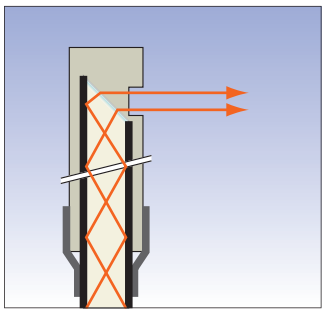
Sensor type	Preferred usage	Size	Key feature	Sensing distance (in mm)*1	Order code
	Precise thin object detection / accurate positioning	dia 3 mm	- High precision optical axis adjustment - Very focused beam	1900	E32-T22S
				890	E32-A03 2M
		dia 2 mm		340	E32-A04 2M
	Very small object detection	M6	–	300	E32-CC200 2M *2
		M3	Spot dia 0.5 mm	20	E32-EC31 2M
			Spot dia 0.2 mm	17	E32-EC41 1M + E39-F3B
			Spot dia 0.1 mm	7	E32-EC41 1M + E39-F3A-5
		dia 3 mm	–	150	E32-D32L
		dia 2 mm	–	75	E32-D32 2M *2
easy mount		M6	- 90° cable exit - Hexagonal back	170	E32-C11N 2M
		M3		25	E32-C31N 2M
			Small spot	8-25 m adjustable	E32-EC31 2M + E39-EF51
		dia 2 mm	Spot dia 0.7 to 3 mm	10 to 30 mm	E32-D32 2M + E39-F16
			Spot dia 0.3 to 1.6 mm		E32-C42 1M + E39-F16
			Spot dia 0.5 to 1 mm	6-15 mm adjustable	E32-D32 2M + E39-F3A
			Spot dia 0.1 to 0.6 mm	6-15 mm adjustable	E32-C42 1M + E39-F3A
	Precision height difference detection / flat surface detection	23x20x9 mm	–	35	E32-A09 2M
		16x18x4 mm	–	7.2	E32-L25L *2
		20x20x5 mm	–	3.3	E32-L25
		18x20x4 mm	Precise spot e.g. for detection of a flat / reflective surface	4	E32-L24L *2
		34x25x8 mm	High precision (detection accuracy 100 µm)	2.4	E32-EL24-1 2M
	Object detection in front of background	20.5x14x3.8 mm	Wide beam e.g. for object detection on a flat surface	15	E32-L16-N 2M

*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 A high flex cable version is available. Add 'R' to the order code, e.g. E32-CC200R

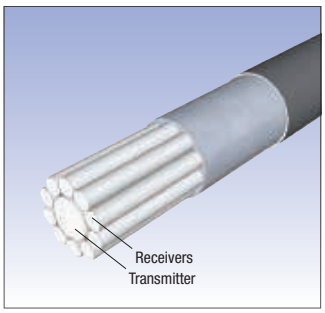
E32 Precision detection

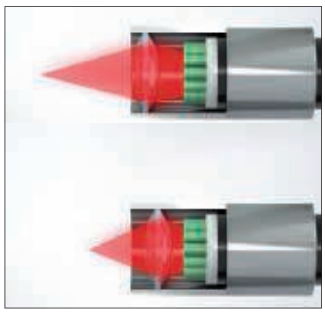
Specifications

Item		Through-beam			Diffuse reflective (coaxial)			Limited reflective				
		E32-T22S	E32-A03	E32-A04	E32-C11N E32-C31N	E32-CC200	E32-C42 E32-D32/-D32L E32-EC31/-EC41	E32-EL24-1	E32-L24L E32-L25L	E32-L25	E32-L16	E32-A09
Permissable bending radius		R10	R1	R10	R4	R25		R10		R25		
Cut to length		Yes										
Material	Head	Brass-nickel plated		Stainless steel	Brass-nickel plated		Brass nickel plated	Brass-nickel plated and aluminium	Polycarbonate	ABS		Aluminium
	Fiber	PMMA										
	Sheath	PVC coating	Polyethylene coating		PVC coating	PVC, polyethylene and polyolefin coating		Polyethylene coating				
Degree of protection		IEC 60529 IP67	IEC 60529 IP50		IEC 60529 IP67				IEC 60529 IP50		IEC 60529 IP40	

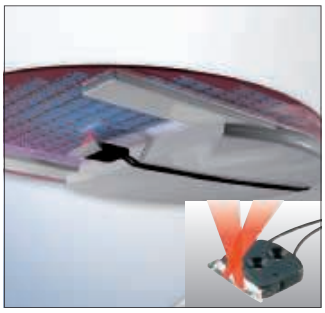


Focused and high precision beam alignment during manufacturing. Models available with typical deviation of 0.1° for very precise detections





Coaxial fibers provide an enhanced positioning and detection accuracy and allow the easy adjustment of the focal point using adjustable focal lenses



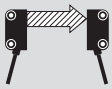
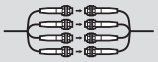
Limited reflective fibers utilize the total reflection on shiny surfaces to detect height differences or objects at a pre-defined distance.

Area monitoring fiber sensor heads

The area monitoring fibers allow the detection of objects passing anywhere through the detection range and can be used for height comparisons of different objects.

- Area monitoring up to 70 mm height
- Multi-beam sensor with 4 separate heads for flexible detection points
- Standard or high flex fibers

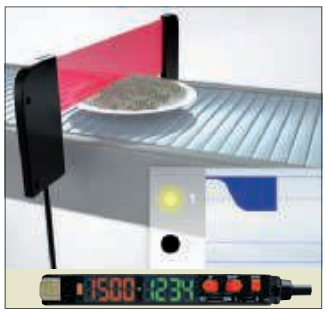
Ordering information

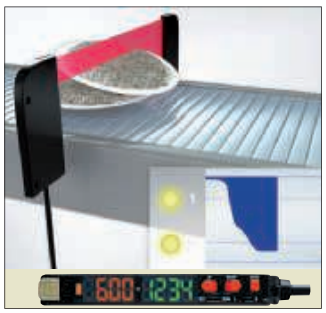
Sensor type	Area hight (in mm)	Sensing distance (in mm)*1		Order code	
		Standard	High-flex	Standard	High-flex
	10	2800	–	E32-T16	–
 *2	11	1100	840	E32-T16P	E32-T16PR 2M
	30	1800	1300	E32-T16W 2M	E32-T16WR 2M
	50	–	1800	–	E32-ET16WR-2 2M
	70	–	2000	–	E32-ET16WR-1 2M
	11	1000	750	E32-T16J 2M	E32-T16JR 2M
	4* seperate M3 heads	610	–	E32-M21	–
	11	–	150	–	E32-D36P1 2M

*1 Sensing distance measured with E3X-DA-SE-S. Longer sensing distances up to 80% can be achieved with E3X-DA-S.
*2 Sensing area aligned to top of housing.

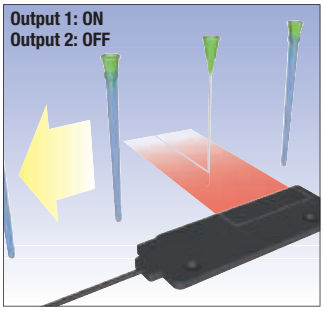
Specifications

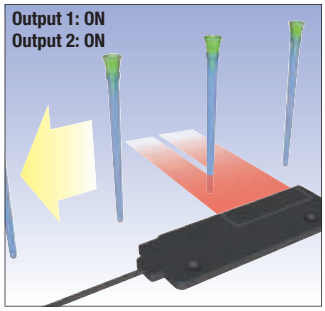
Item		Standard			High-flex		
		E32-T16	E32-M21	E32-T16J E32-T16P E32-T16W	E32-D36P1	E32-ET16WR-1 E32-ET16WR-2	E32-T16JR E32-T16PR E32-T16WR
Permissible bending radius		R25		R10	R4	R1	
Cut to length		Yes					
Material	Head	ABS	Stainless steel	ABS	Brass-nickel plated	Aluminium	ABS
	Fiber	PMMA					
	Sheath	Polyethylene coating		PVC coating	Polyethylene coating		PVC coating
Degree of protection		IEC 60529 IP67		IEC 60529 IP50		IEC 60529 IP54	IEC 60529 IP50





The two outputs of the E3X-DA-S can be used to detect two different light levels





In combination with the twin output function of the E3X-DA-S amplifier, the diffuse reflective area monitoring fibers can detect very small objects (e.g. needles) and a second state (e.g cover present). The area beam compensates for position variations at high speed.

Special application fiber sensor heads

For a wide range of special applications, the task optimised fiber heads provide best fitting sensing performance and adaption to environmental requirements.

- Detection of special objects (liquids, labels on foils, etc.)
- Fiber heads ideal for colour mark detection
- Fiber heads optimised for special tasks (wafer mapping, flat glass, etc.)

Ordering information

Sensor type		Size	Sensing distance (in mm) *1	Comment	Order code
	Fork shape	36x24x8 mm	10	–	E32-G14
	Wafer mapping	dia 3	1900	–	E32-T22S
		dia 3	1300	–	E32-T24S
		dia 3	890	–	E32-A03 2M
		dia 2	340	–	E32-A04 2M
	Liquid level sensor	dia 6	liquid contact	Liquid level contact	E32-D82F1 4M
		15x23.5x5 mm	tube contact	Liquid level detection through transparent tube or container	E32-D36T 2M
	Glass detection	21x16.5x4 mm	8 mm	Metal housing	E32-A10 2M
		20.5x14x3.8 mm	15 mm	Plastic housing	E32-L16-N 2M
	Glass detection in hot environment	25x18x5 mm	5 mm	Heat resistant up to 300°C	E32-L64 2M
		36x18x5.5 mm	18 mm		E32-L66 2M
	Glass detection in wet processes	38.5x39x17.5 mm	8 to 20 (recommended: 11 mm)	- Heat resistant up to 85°C - Recommended usage with 'tough mode' of E3X-DA-S	E32-L11FS 2M
	Label detection	20x20x5 mm	7.2	–	E32-L25L
		18x20x4 mm	4	–	E32-L24L
		34x25x8 mm	2.4	Very precise spot (detection accuracy 100 µm)	E32-EL24-1 2M
	Colour/print mark detection *2	M6	300	Recommended for standard colour and colour mark detection	E32-CC200 2M
		29x25.5x11.2	55	Recommended for challenging colour and colour mark detection	E32-L15 2M
		23x20x9 mm	35		E32-A09 2M
		M3	20	Recommended for very precise colour mark detection	E32-EC31 2M

*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 With amplifier E3X-DAC-S

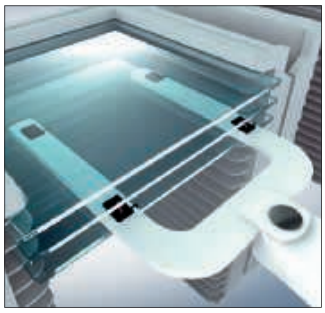
E32 Special application

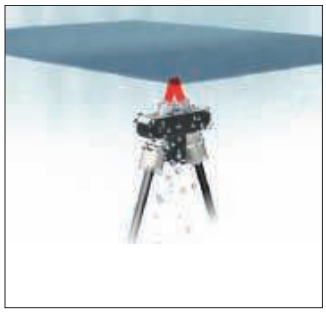
Specifications

Item		E32-D82F1 E32-L11FS	E32-G14	E32-A09	E32-A10	E32-L15	E32-L16-N	E32-CC200	E32-EC31	E32-L66	E32-L64
Permissable bending radius		R40	R25								
Cut to length		Yes								No	
Material	Head	PFA	ABS	Aluminium	ABS	PAR	PVC	Brass-nickel plated	Stainless steel		
	Fiber	PMMA								Glass	
	Sheath	Polyethylene coating						PVC, polyethylene and polyolefin coating		Stainless steel spiral coating	
Degree of protection		IEC 60529 IP67		IEC 60529 IP40	IEC 60529 IP30	IEC 60529 IP50	IEC 60529 IP40	IEC 60529 IP67		IEC 60529 IP40	IEC 60529 IP50

Item		E32-EL24-1	E32-T24S	E32-L24L E32-L25L	E32-A04	E32-D36T	E32-A03	E32-T22S
Permissable bending radius		R10				R4	R1	
Cut to length		Yes						
Material	Head	Brass-nickel plated and alu-minium	Stainless steel	Brass-nickel plated	Stainless steel	ABS	Brass-nickel plated	
	Fiber	PMMA						
	Sheath	Polyethylene coating	PVC coating	Polyethylene coating		PVC coating	Polyethylene coating	PVC coating
Degree of protection		IEC 60529 IP67		IEC 60529 IP50		IEC 60529 IP67	IEC 60529 IP50	IEC 60529 IP67

In combination with the colour/mark detection amplifier E3X-DAC-S, the recommended fibers for colour/mark detection allow the detection of standard and challenging marks even for complex designs or with small contrast.

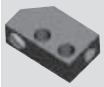
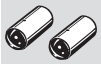
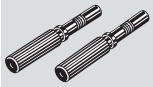
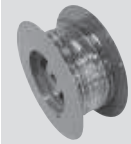




The limited reflective fiber heads for glass detection provide a stable detection of flat glass in standard, hot or wet environment. The shapes and materials are optimized to provide the best value - performance ratio depending on the requirements.

For the detection of very small height differences like labels on foils in applications where space is crucial, the small sized limited reflective sensors provide accurate detection up to 100µm resolution.

Accessories

Shape	Type	Comment	Order code
	Focal lens	- Extends sensing distance by more than 500% - For M4 Through beam fibers E32-TC200, E32-ET11R, E32-T11 (fits M2.6 thread) - 2 pcs per set	E39-F1
	Focal lens (side view)	- For M4 through beam fibers E32-TC200, E32-ET11R, E32-T11, E32-T61-S, E32-T81R-S (fits M2.6 thread) - Temperature range -40°C to +200°C - 2 pcs per set	E39-F2
	Focal lens (variable)	- For precision detection with E32-D32, EC41	E39-F3A
			E39-F16
	Focal lens	- For precision detection with E32-EC41	E39-F3A-5
		- For precision detection with E32-EC41	E39-F3B
		- For precision detection with M6 coaxial diffuse reflective fibers (e.g. E32-CC200)	E39-F18
	Focal lens (side view, variable)	- For precision detection with E32-EC31	E39-EF51
	Focal lens (heat resistant)	- Extends sensing distance by more than 500% - For M4 through beam fibers E32-ET51, E32-T61, E32-T61-S, E32-T81R, E32-T81R-S (fits M4 thread) - Temperature range -60°C to +350°C - 2 pcs per set	E39-EF1-37-2
	Focal lens (vacuum resistant, heat resistant)	- Fits E32-T51V and E32-T54V (fits M2.6 thread) - 2 units per set - Heat resistant up to 120°C	E39-F1V
	Fiber cutter	- Included in applicable fiber	E39-F4
	Thin fiber attachment	- Amplifier adapter for thin fibers - Included in applicable fiber (2 sets)	E39-F9
	Sleeve bender	- For E32-TC200B(4) - For E32-TC200F(4) - For E32-DC200F(4)	E39-F11
	Single fiber extension connector	- Fiber extension connector for 2.2 mm dia standard fibers - One unit	E39-F10
	Dual fiber extension connector	- For fibers with dia 2.2	E39-F13
		- For fiber with dia 1.0	E39-F14
		- For fibers with dia between 1.0 and 2.2	E39-F15
	Protective spiral tube *1	- For M3 diffuse type sensors - Length 1 m	E39-F32A
		- For M3 through beam type sensors - Length 1 m	E39-F32B
		- For M4 through beam type sensors - Length 1 m	E39-F32C
		- For M6 diffuse type sensors - Length 1 m	E39-F32D
	Fiber on roll *2	- Dia 2.2 mm - Standard monocore, 10 mm bending radius - -40°C to 80°C	E32-E01 100M
		- Dia 1.1 mm - Standard monocore, 15 mm bending radius - -40°C to 80°C	E32-E02 100M
		- Dia 2.2 mm - High flex multicore, 1 mm bending radius - -40°C to 80°C	E32-E01R 100M
		- Dia 1.1 mm - High flex multicore, 1 mm bending radius - -40°C to 80°C	E32-E02R 100M
		- Dia 2.2 mm - High temperature monocore, 20 mm bending radius - -60°C to 150°C	E32-E05 100M

*1 Protective spiral tubes with 0.5 m length are available. Add '5' to order code…e.g. E39-F32A5
*2 Fiber length 100 m on a roll - cut to length

Easy-teach digital fiber amplifier

E3X-DA-SE-S and E3X-SD allow easy one button setting and provide the best value performance ratio for standard applications.

- Auto-teaching during machine operation
- Object or 2-point teaching within a few seconds
- Simple threshold adjustment with up/down keys
- Digital double display for incident level and threshold (E3X-DA-SE-S) or reduced size with one display (E3X-SD)

Ordering information

Item	Order code			
	Double display		Single display	
	NPN output	PNP output	NPN output	PNP output
Pre-wired	E3X-DA11SE-S 2M	E3X-DA41SE-S 2M	E3X-SD21	E3X-SD51
Fiber amplifier connector*1	E3X-DA6SE-S	E3X-DA8SE-S	E3X-SD7	E3X-SD9

*1 Order connector separately. For M8 connector models see E3X-DA-S.

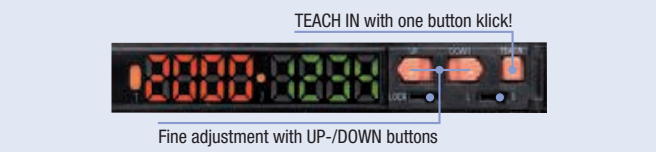
Specifications

Item		E3X-DA_SE-S	E3X-SD
Light source (wave length)		Red LED (650 nm)	Red, 4-element LED (625 nm)
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p): 10% max.	
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		Operation or reset: 1 ms	Operation or reset: 200 µs max
Sensitivity setting		Teaching and digital up/down keys	
Functions	Auto power control	High-speed control method for emission current	
	Mutual interference prevention	Optical communications sync, possible for up to 10 units	Optical communication sync. possible for up to 5 units
Digital displays		Incident level + threshold	Incident level or threshold
Degree of protection		IEC 60529 IP50 (with protective cover attached)	

Fiber amplifier connectors

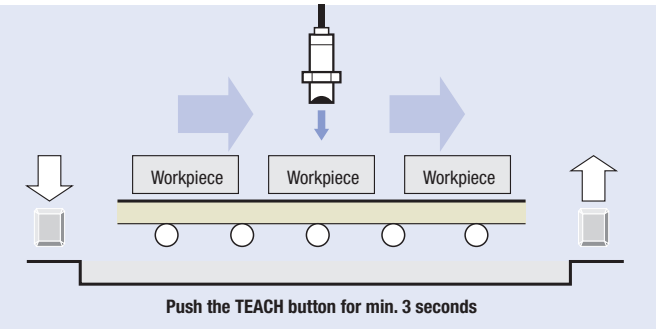
Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

Easy view double display (E3X-DA-SE-S)

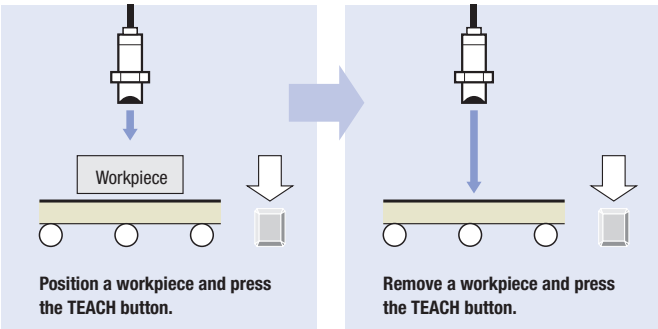


Space saving single display (E3X-SD)

1-button auto-teaching



2-point teaching



Digital fiber amplifier with potentiometer adjustment

The E3X-NA is the ideal amplifier for standard fiber applications providing quick & easy potentiometer adjustment and bargraph display.

- Easy adjustment with potentiometer
- Mutual interference prevention
- Enhanced water resistance types

Ordering information

Pre-wired

Item	Order code (for pre-wired types with 2 m cable length)	
	NPN output	PNP output
Standard	E3X-NA11 2M	E3X-NA41 2M
Enhanced water resistance	E3X-NA11V 2M	E3X-NA41V 2M

Connector version

Item	Order code	
	NPN output	PNP output
Standard (fiber amplifier connector)*1	E3X-NA6	E3X-NA8
Enhanced water resistance (M8 4-pin connector)	E3X-NA14V	E3X-NA44V

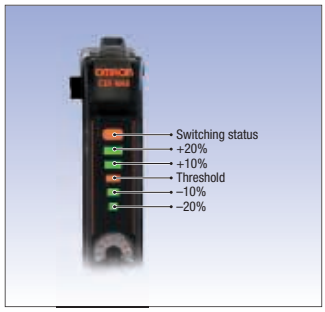
*1 Order connector separately.

Specifications

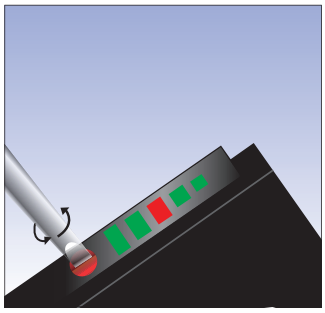
Item		Standard	Enhanced water resistance
Output	NPN output	E3X-NA11, E3X-NA6	E3X-NA11V, E3X-NA14V
	PNP output	E3X-NA41, E3X-NA8	E3X-NA41V, E3X-NA44V
Light source (wave length)		Red LED (625 nm)	
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p): 10% max.	
Protective circuit		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		Operation or reset: 200 µs max.	
Sensitivity setting		8-turn endless adjuster (potentiometer)	
Functions		OFF-delay timer: 40 ms (fixed)	
Degree of protection		IEC 60529 IP50 (with protective cover attached)	IEC 60529 IP66 (with protective cover attached)

Fiber amplifier connectors

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



Bargraph display with light level, switching status and threshold indicators



Simple sensitivity adjustment by potentiometer

High functionality digital fiber amplifier

High functionality digital fiber amplifier with advanced timing, LED power control and signal processing functionality providing highest detection accuracy and stability even for the most challenging objects and settings.

- Power tuning function to adjust the received light to a maximum, minimum or pre-defined value
- Auto power and threshold adjustment functions for highest operational stability
- Two outputs for window monitoring or two level detections (e.g. object + object state change)

Ordering information

Item		Function								Order code	
		Power tuning	Timer	Auto-threshold compensation (ATC)	Twin output	External input	Differential operation	Wet process 'tough mode'	Power saving 'Eco' functions (display/LED off)	NPN	PNP
Pre-wired		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	E3X-DA21-S 2M	E3X-DA51-S 2M
Fiber amplifier connector*1		Yes	Yes	Yes	Yes - selectable		Yes	Yes	Yes	E3X-DA7-S	E3X-DA9-S
M8 connector	3 pin	Yes	Yes	*2						E3X-DA13-S	E3X-DA43-S
	4 pin									E3X-DA14-S	E3X-DA44-S

*1 Order fiber amplifier connector E3X-CN_ separately
*2 For fiber amplifiers with these functions and connecting with M8 connector, contact your OMRON representative.

Specifications

Item		Pre-wired models	Fiber amplifier connector models	M8 connector models
		E3X-DA_1-S	E3X-DA7-S, E3X-DA9-S	E3X-DA_3-S, E3X-DA_4-S
Light source (wave length)		Red LED (650 nm)		Red LED (625 nm)
Power supply voltage		12 to 24 VDC ± 10%; ripple (p-p): 10% max		
Protective circuits		Reverse polarity protection, output short circuit protection, mutual interference prevention*1		
Response time	Super-high-speed mode	80 µs for operation and reset max.		55 µs for operation and reset max.
	Standard mode	1 ms for operation and reset		
	High resolution mode	4 ms for operation and reset		
	Wet process 'tough mode'	16 ms for operation and reset		*2
Sensitivity setting		Teaching and digital up/down keys		
Functions	Power tuning	Light emission power and reception gain, digital control method		
	Timer	OFF-delay, ON-delay, 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)		
	Auto power control (APC)	LED power monitoring and auto-control function by LED emission current adjustment.		
	Active-threshold control (ATC)	Monitoring of received light average and deviation adjustment of threshold for output 1		*2
	Twin output	Output 1: incident level Output 2: incident level or alarm output	Output 1: incident level Output 2: incident level or alarm output (not available if external input is used)	*2
	External input	External teach or function trigger (power tuning, emitter OFF, ATC start)	External teach or function trigger (power tuning, emitter OFF, ATC start) (not available if output 2 is used)	*2
	Differential operation	Single edge or double edge detection mode		*2
	Wet process 'tough mode'	Incident level triggering on floating average of received light.		*2
	Power saving 'Eco' functions	LED: ON/OFF switchable (external input) Display: ON/ DIM / OFF selectable		*2
Digital display		Incident level + threshold or user specific		
Degree of protection		IEC 60529 IP50 (with protective cover attached)		

*1 The reverse polarity protection for the pre-wired and fiber amplifier connector models is for the power supply and the output. For M8 connector models the reverse polarity protection is for the power supply.
*2 For fiber amplifiers with these functions and connecting with M8 connector, contact your OMRON representative.

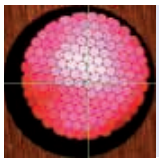
Fiber amplifier connectors

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

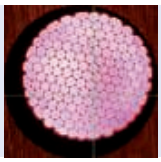
Power tuning

Increase or decrease the LED power and received light intensity to the desired level e.g. a pre-defined value for easy sensor malfunction detection.

Light coupling

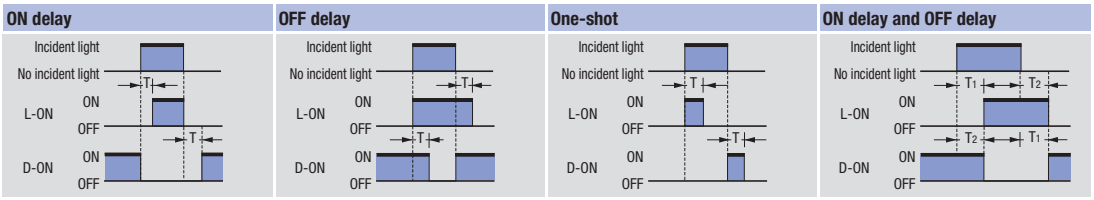


Light distribution in multi-core-fibers with conventional fiber amplifiers



Light distribution in the new E3X-DA-S amplifier generation

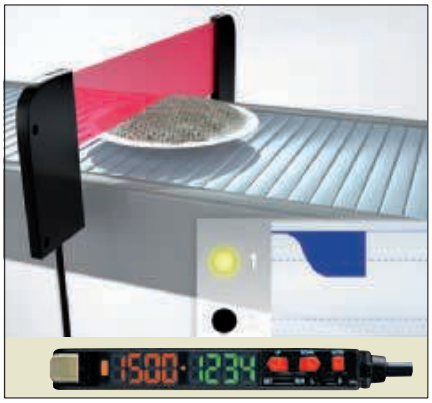
Timer functions



T_1: ON-delay set time
T_2: OFF-delay set time
T_1 and T_2 can be set separately.

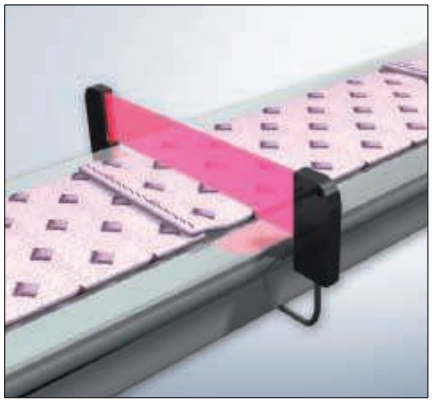
Adjust the output signal length and timing

Twin output



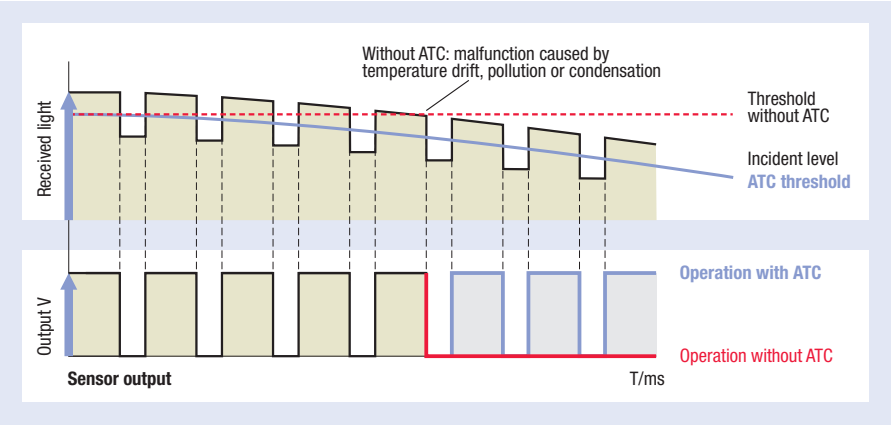
The two outputs can be used to detect two different light levels

Differential detection



Triggering on single or double signal edges

Active-threshold control (ATC)



Higher signal stability compensating for power reduction caused by temperature drift, dust or condensation.

2-in-1 Digital fiber amplifier

E3X-MDA incorporates 2 digital fiber amplifiers in one slimline housing. For applications requiring the detection of two objects simultanously the E3X-MDA provides an easy to use operation saving space and set-up time.

- Two digital amplifiers in one slimline housing
- Twin output models – on/off or area (between two threshold values)
- Signal comparison functions (AND, OR, etc.)

Ordering information

Item	Functions	Order code	
		NPN output	PNP output
Pre-wired	AND/OR output	E3X-MDA11	E3X-MDA41
Fiber amplifier connector*1	AND/OR output	E3X-MDA6	E3X-MDA8

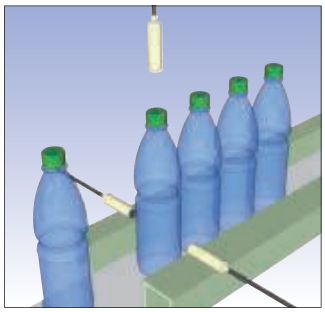
*1 Order connector separately.

Specifications

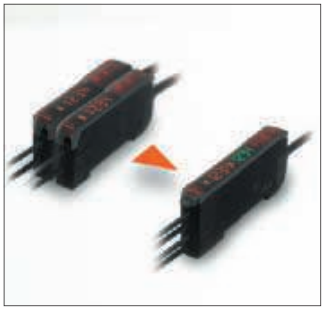
Item		E3X-MDA
Light source (wave length)		Red LED (650 nm)
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, mutual interference prevention
Response time	Super-high-speed mode	130 µs for operation and reset respectively
	Standard mode	1 ms for operation and reset respectively
	High-resolution mode	4 ms for operation and reset respectively
Sensitivity setting		Teaching and digital up/down keys
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)
	I/O settings	Output setting (select from channel 2 output, AND, OR, leading edge sync, falling edge sync, or differential output)
Digital displays		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
Degree of protection		IEC 60529 IP50 (with protective cover attached)

Fiber amplifier connectors

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



The AND and OR functionality for the two fiber channels allows simple signal processing without the need for a PLC.
This allows the addition of sensor checks to machines without reprogramming the PLC.



The 2 in 1 amplifier replaces two standard amplifiers reducing space requirements and hardware cost.

Fast response digital amplifier with potentiometer

The E3X-NA_F provides a very fast response time and is the ideal amplifier for high speed detection applications.

- Short turn on time of only 20 µs
- Easy adjustment with potentiometer

Ordering information

Item	Order code	
	NPN output	PNP output
Pre-wired	E3X-NA11F	E3X-NA41F
M8 connector (4 pin)	-*1	E3X-NA44FV

*1 Contact your OMRON representative

Specifications

Item			
	NPN output	E3X-NA11F	-
	PNP output	E3X-NA41F	E3X-NA44FV
Light source (wave length)		Red LED (680 nm)	
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p): 10% max.	
Protective circuit		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		Operation: 20 µs max. Reset: 30 µs max.	
Sensitivity adjustment		8-turn endless adjuster (potentiometer)	
Functions		OFF-delay timer: 40 ms (fixed)	
Degree of protection		IEC 60529 IP50 (with protective cover attached)	IEC 60529 IP66 (with protective cover attached)

Note: For teachable fast response fiber amplifiers with a digital display contact your OMRON representative.

E3X-DAC-S colour (RGB) digital fiber amplifier

The E3X-DAC-S detects the colour and returned light intensity of a mark or object and compares it with a stored RGB ratio or intensity value. The RGB ratio or contrast difference allows the stable detection of differently coloured, black, grey or white marks or objects.

- White LED for colour independence
- Fast response time of min. 60 µs
- Timer function for variable ON or OFF delay up to 5 s
- Remote teaching or easy one-button teaching

Ordering information

Pre-wired

Item	Functions	Order code (for pre-wired types with 2 m cable lenght)	
		NPN output	PNP output
Standard models	Timer, response speed change	E3X-DAC11-S	E3X-DAC41-S
Advanced models	Standard models + simultaneous determination (2 colours) AND/OR output, remote setting	E3X-DAC21-S	E3X-DAC51-S

Connector versions

Item	Functions	Order code	
		NPN output	PNP output
Standard models (fiber amplifier connector) *1	Timer, response speed change	E3X-DAC6-S	E3X-DAC8-S

*1 Order connector separately

Specifications

Item		Standard models	Advanced models
		E3X-DAC1, E3X-DAC4 E3X-DAC6, E3X-DAC8	E3X-DAC2, E3X-DAC5
Light source (wave length)		White LED (420 to 700 nm)	
Number of registered colours		1	2 (simultaneous determination)
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.	
Protective circuits		Power supply reverse polarity protection, output short circuit protection, output reverse polarity protection, mutual interference prevention	
Response time	Super-high-speed mode	Operation or reset: 60 µs	Operation or reset: 120 µs
	High-speed mode	Operation or reset: 300 µs	Operation or reset: 600 µs
	Standard mode	Operation or reset: 1 ms	Operation or reset: 2 ms
	High-resolution mode	Operation or reset: 4 ms	Operation or reset: 8 ms
Sensitivity setting (colour registration, allowable range)		Teaching (one-point teaching or teaching with/without workpiece) or manual adjustment	
Functions	Detection mode	Automode (automatic selection of C-mode or I-mode) C-mode (RGB ratio) I-mode (light intensity) Mark mode (Intensity and ratio of RGB values)	
	Operating mode	ON for match (ON for same colour as registered colour) or ON for mismatch (ON for different colour from registered colour)	
	Timer function	Timer type: OFF delay, ON delay, or one-short Timer time: 1 ms to 5 s (variable)	
	Control outputs	–	Output for each channel, AND output, and OR output
	Remote control	–	One-point teaching, teaching with/without workpiece, zero reset, and light emission OFF
Degree of protection		IEC60529 IP50 (with protective cover attached)	

Fiber amplifier connectors

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

Detection of differently coloured objects or marks by RGB ratio comparison.

Contrast detection by returned light intensity comparison.

Easy to operate detection of coloured marks or objects (1 or 2 per amplifier). The scalability allows multi-colour identification e.g. for sorting applications with high cost efficiency compared to conventional colour sensors.

Detection of challenging marks

Digital fiber amplifier with infrared LED

The digital fiber amplifiers with infrared LED are ideal for water detection applications or where visible light is not desired.

- Infrared LED
- LED power control and signal processing function

Ordering information

Pre-wired

Item	Order code (for pre-wired types with 2 m cable length)	
	NPN output	PNP output
Infrared light	E3X-DAH11-S 2M	E3X-DAH41-S 2M

Connector version

Item	Order code	
	NPN output	PNP output
Infrared light (fiber amplifier connector)*1	E3X-DAH6-S	E3X-DAH8-S

*1 Order connector separately

Specifications

Amplifier units with cables

Item			NPN output	E3X-DAH11-S, E3X-DAH6-S
			PNP output	E3X-DAH41-S, E3X-DAH8-S
Light source (wave length)				Infrared LED
Power supply voltage				12 to 24 VDC ±10%, ripple (p-p) 10% max.
Protective circuits				Power supply reverse polarity protection, output short circuit protection, mutual interference prevention
Responce time	Super-high-speed mode	NPN		48 µs for operation and 50 µs for reset
		PNP		53 µs for operation and 55 µs for reset
	Standard mode			1 ms for operation and reset respectively
	High-resolution mode			4 ms for operation and reset respectively
Sensitivity setting				Teaching and digital up/down keys
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)
Digital displays				Incident level + threshold or user specific
Degree of protection				IEC 60529 IP50 (with protective cover attached)

Fiber amplifier connectors

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