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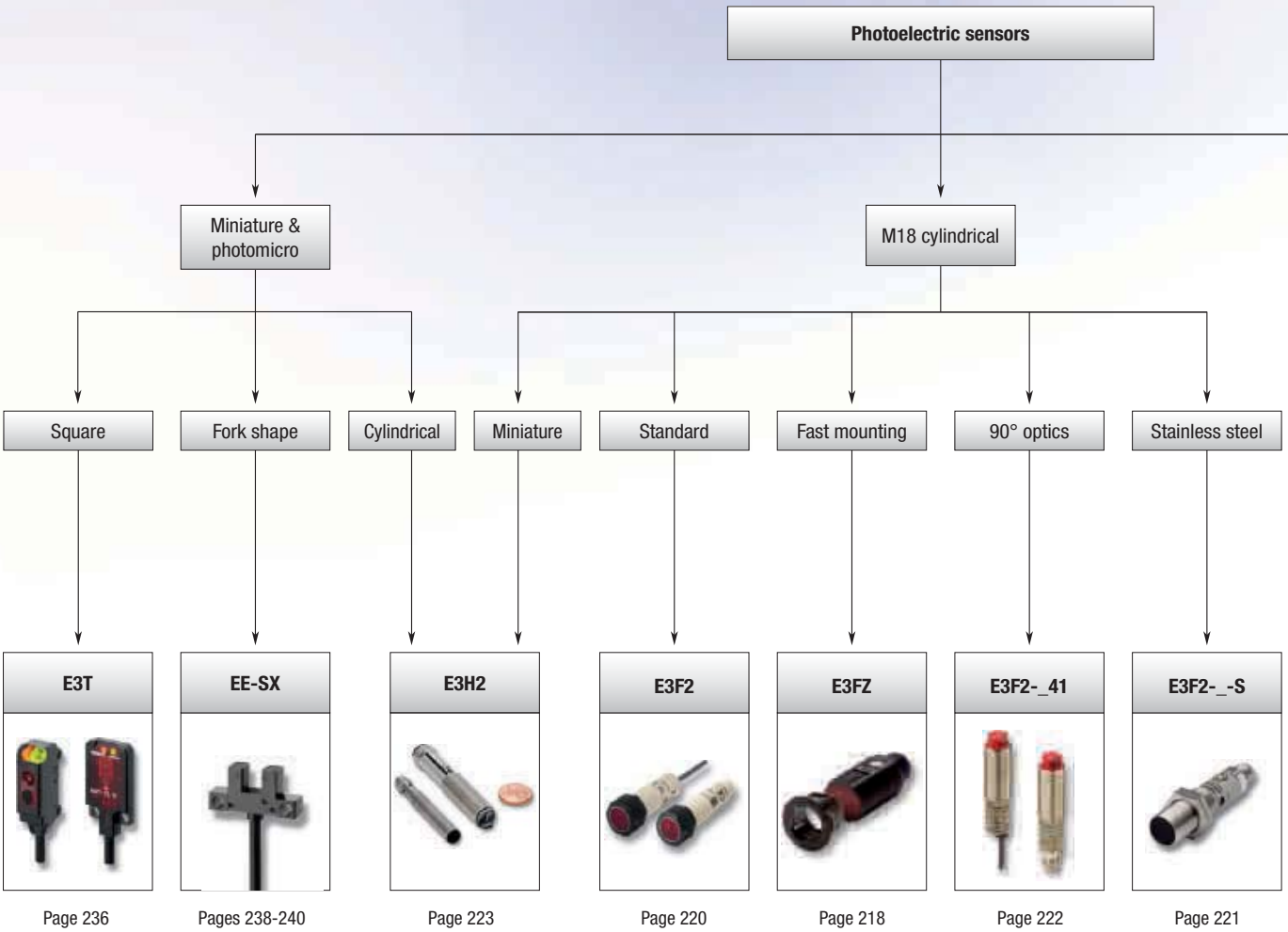
Cable connectors	XS2, XS3, Y92E	301

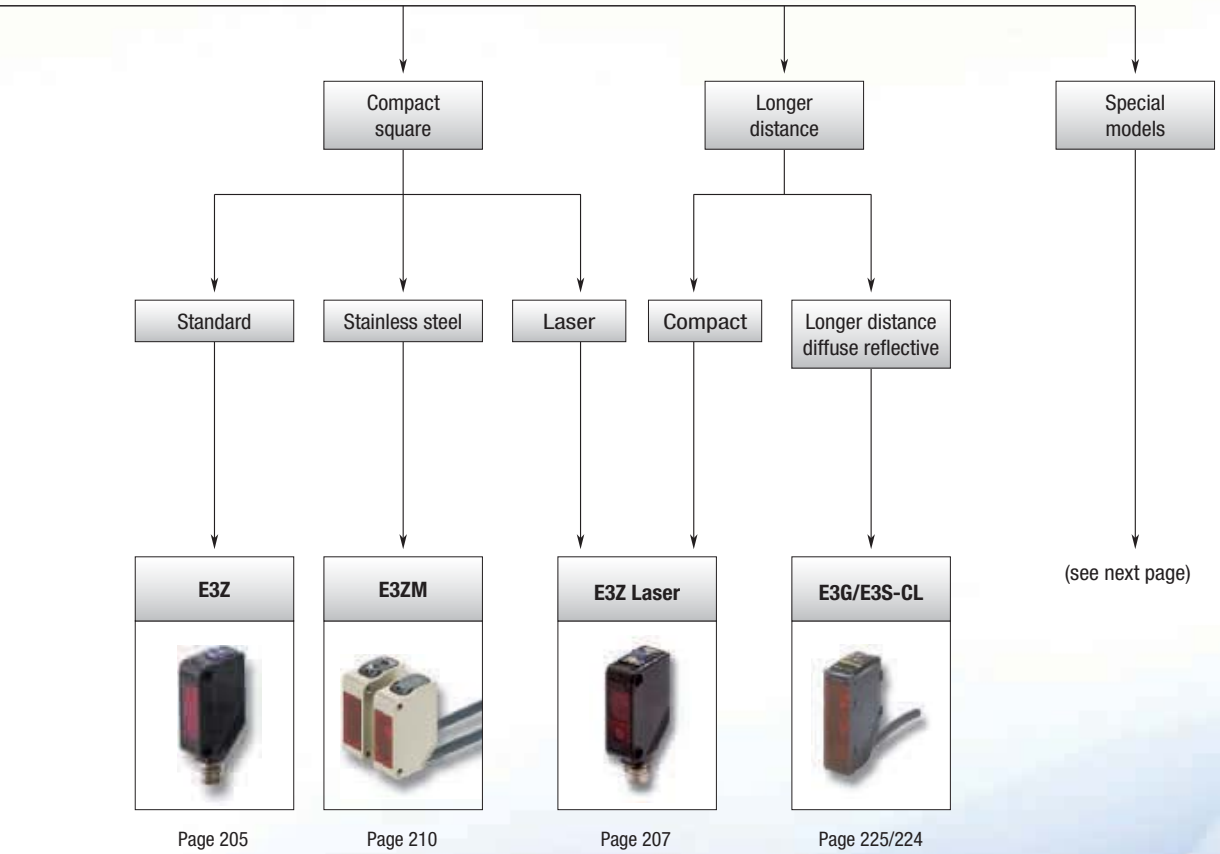
FOR MACHINES BUILT TO LAST

Reliability and accuracy confirmed by millions… every day

With more than one million units sold, the E3Z is among the world's most popular and successful photoelectric sensors.
Manufactured to exceptionally high engineering standards, you can take the performance reliability for granted.

- Optimal sensing performance tuned to your application
- Various housing designs fitting your application concept
- Proven performance and unmatched reliability




Compact square
Longer distance
Special models
Standard
Stainless steel
Laser
Compact
Longer distance diffuse reflective
E3Z
E3ZM
E3Z Laser
E3G/E3S-CL
(see next page)
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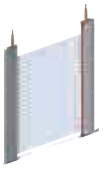
Selection table

Type	Compact Square			Longer distance	
Model	**E3Z**	**E3ZM**	**E3Z Laser**	**E3S-CL**	**E3G**
Housing	PBT	Stainless steel	PBT	Zinc diecast	PBT
Through-beam	15 m, 30 m	15 m	60 m	–	–
Retro-reflective with M.S.R.	5 m	4 m	15 m	–	(10 m)
Diffuse-reflective (energetic)	1 m	1 m	–	–	2 m
Diffuse-reflective (background suppression)	200 mm	200 mm	300 mm	500 mm	1.2 m
Page	205	210	207	224	225

Type	Oil resistant	Mark detection	Transparent detection		
Model	**E3ZM-C**	**E3ZM-V**	**E3ZM-B**	**E3Z-B**	**E3FZ-B**
Key features	Oil and lubricant resistant stainless steel housing	White LED for optimal contrast	Optimised optical system for all transparent objects	Optical system for standard transparent objects	Optimised optical system for all transparent objects
Housing	Stainless steel	Stainless steel	Stainless steel	PBT	M18 PBT
Through-beam	20 m	–	–	–	–
Retro-reflective with M.S.R.	4 m		500 mm	500 mm, 2 m	700 mm
Diffuse-reflective	1 m	12mm±2mm	–	–	–
Diffuse-reflective (background suppression)	200 mm	–	–	–	–
Page	212	214	215	216	217

Cylindrical				Miniature	
E3F2	**E3F2-_-S**	**E3FZ**	**E3H2**	**E3T**	**EE-SX**
M18 PBT, brass	M18 stainless steel	M18 PBT	M12 brass, M8 stainless steel	PBT	PBT
7 m	7 m	15 m	4 m, 2 m	1 m	5 mm (slot width)
4 m	4 m	4 m	2 m	200 mm	–
1 m	1 m	1 m	300 mm	30 mm	–
100 mm	100 mm	200 mm	–	30 mm	–
220	221	218	223	236	238

90° optics	High precision positioning	Fork shape	Structured object detection	Multi voltage power supply	Light curtains	
						
E3F2-_41, E3FR	**E3C-LDA**	**E3Z-G**	**E3S-LS3**	**E3JK, E3JM, E3G-_M**	**F3E, F3ET**	**F3EM**
Radial (90°) optics	Up to 10 µm accuracy	Slot width 25 mm	Wide beam	AC/DC power supply and relay output	Area monitoring up to 2100 mm	Height measurement up to 2100 mm
M18 PBT, Brass	PBT	PBT	PBT	ABS, ABS, PBT	Aluminium	Aluminium
–,15 m	–	25 mm	–	5 m, 10 m, -	5 m, 3 m/ 15 m	3 m , 15 m
2 m, 4 m	7 m	–	–	4 m, 4 m, 10 m	–	–
300 mm, 1 m	1 m	–	60 mm	300 mm, 700 mm, 2 m	–	–
–, 200 mm	–	–	–	-, -, 1.2 m	–	–
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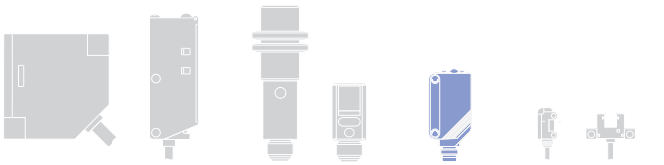
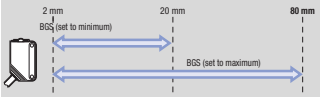
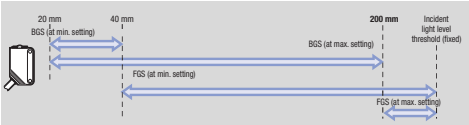
General purpose sensor in compact plastic housing

Compact housing size and high-power LED for excellent performance-size ratio and best value-performance ratio for standard applications.

- Minimal optical axis deviation for easy alignment
- IP67 and IP69K for highest water resistance
- Intensive shielding for highest noise immunity (EMC)
- Multiple moulding housing for high mechanical resistance



Ordering information

Sensor type		Sensing distance	Connection method				Order code	
							NPN output	PNP output
Through-beam		30 m (Infrared light)	–	–	2 m	For ordering pigtail versions replace '2M' of cable types with: - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	E3Z-T62 2M	E3Z-T82 2M
			■	–	–		E3Z-T67	E3Z-T87
		10 m (Red light)	–	–	2 m		E3Z-T61A 2M	E3Z-T81A 2M
			■	–	–		E3Z-T66A	E3Z-T86A
Retro-reflective with M.S.R.		0.1 to 4 m*1 (Red light)	–	–	2 m		E3Z-R61 2M	E3Z-R81 2M
			■	–	–		E3Z-R66	E3Z-R86
Retro-reflective without M.S.R.		0.1 to 5 m*1 (Infrared light)	–	–	2 m		E3Z-R61-4 2M	E3Z-R81-4 2M
			■	–	–		E3Z-R66-4	E3Z-R86-4
Diffuse-reflective		1 m (adjustable) (Infrared light)	–	–	2 m		E3Z-D62 2M	E3Z-D82 2M
			■	–	–		E3Z-D67	E3Z-D87
Diffuse-reflective wide beam		100 mm (adjustable) (Infrared light)	–	–	2 m		E3Z-D61 2M	E3Z-D81 2M
			■	–	–		E3Z-D66	E3Z-D86
Distance-settable (background suppression)*2	Small spot (Red light)		–	–	2 m		E3Z-LS63 2M	E3Z-LS83 2M
			■	–	–		E3Z-LS68	E3Z-LS88
	Standard (Red light)		–	–	2 m		E3Z-LS61 2M*2	E3Z-LS81 2M*2
			■	–	–		E3Z-LS66*2	E3Z-LS86*2

*1 Measured with E39-R1S
*2 For infrared LED models contact your Omron representative

Specifications

Item		Through-beam		Retro-reflective without M.S.R		Diffuse-reflective	Diffuse-reflective (wide beam)	Distance-settable (background suppression)	
				Red LED	Infrared LED			Standard	Small spot
	NPN	E3Z-T62/T67	E3Z-T61A/T66A	E3Z-R61/R66	E3Z-R6_-4	E3Z-D62/D67	E3Z-D61/D66	E3Z-LS61/66	E3Z-LS63/68
	PNP	E3Z-T82/T87	E3Z-T81A/T86A	E3Z-R81/R86	E3Z-R8_-4	E3Z-D82/D87	E3Z-D81/D86	E3Z-LS81/86	E3Z-LS83/88
Sensing distance		30 m	10 m	0.1 to 4 m (with E39-R1S)	0.1 to 5m (with E39-R1S)	1 m (adjustable)	100 mm (adjustable)	200 mm max.	80 mm max.
Directional angle		Both emitter and receiver: 3° to 15°		2° to 10°		–			
Black/white error		–						10% of set distance max.	5% of set distance max.
Light source (wave length)		Infrared LED (870 nm)	RED LED (700 nm)	Red LED (680 nm)	Infrared LED (870 nm)	Infrared LED (860 nm)		Red LED (680 nm)	Red LED (650 nm)
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p): 10% max.							
Control output		Load power supply voltage 26.4 VDC max., load current 100 mA max. (residual voltage 2 V max.) Open collector output type (depends on the NPN/PNP output format) Light-ON/Dark-ON switch selectable							
Protective circuits		Reverse polarity protection, short-circuit protection, output reverse polarity protection	Output short-circuit protection, power supply, reverse polarity protection	Reverse polarity protection, output short-circuit protection, mutual interference prevention, output reverse polarity protection				Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		Operation or reset: 2 ms max.	Operation or reset: 1 ms max.						
Ambient temperature		Operating: -25 to 55°C, Storage: -40 to 70°C (with no icing or condensation)							
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9							
Material	Case	PBT (polybutylene terephthalate)							
	Lens	Denatured polyacrylate resin		Methacrylate resin		Denatured polyacrylate resin			

High ambient light immunity

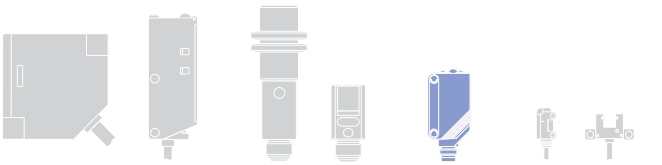
High electromagnetic noise immunity

Robust and tight housing construction

LASER sensor in compact plastic housing

The E3Z LASER sensor in compact plastic housing features visible LASER light for precision positioning and detection applications.

- Visible LASER light for precision positioning and small object detection
- High power LD for long range precision
- Class 1 LASER
- Precise background suppression and low black/white error for accurate detection



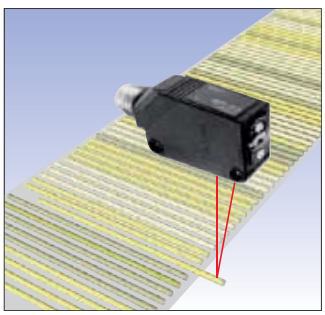
Ordering information

Sensor type	Sensing distance	Response time	Connection method				Order code	
			⊙	⊙			NPN output	PNP output
Through-beam	60 m	1 ms	–	–	2 m	For ordering pigtail versions replace '2M' of cable types with: - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	E3Z-LT61 2M	E3Z-LT81 2M
			■	–	–		E3Z-LT66	E3Z-LT86
Retro-reflective with M.S.R.	0.3 to 15 m*1		–	–	2 m		E3Z-LR61 2M	E3Z-LR81 2M
			■	–	–		E3Z-LR66	E3Z-LR86
Distance-settable (background suppression)	20 to 300 mm		–	–	2 m		E3Z-LL61 2M	E3Z-LL81 2M
			■	–	–		E3Z-LL66	E3Z-LL86
	25 to 300 mm	0.5 ms	–	–	2 m		E3Z-LL63 2M	E3Z-LL83 2M
			■	–	–		E3Z-LL68	E3Z-LL88

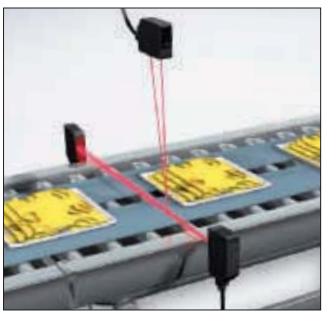
*1 Measured with E39-R1

Specifications

Item		Through-beam	Retro-reflective with M.S.R.	Distance settable (background suppression)	
		Standard model			High-speed model
	NPN output	E3Z-LT61/-LT66	E3Z-LR61/-LR66	E3Z-LL61/-LL66	E3Z-LL63/-LL68
	PNP output	E3Z-LT81/-LT86	E3Z-LR81/-LR86	E3Z-LL81/-LL86	E3Z-LL83/-LL88
Sensing distance		60 m	0.3 to 15 m (with E39-R1S)	20 to 300 mm	25 to 300 mm
Black/white error		–		5% (at 160 mm)	5% (at 100 mm)
Light source (wave length)		Red LD (655 nm), JIS Class 1, IEC Class 1, FDA Class II			
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p): 10% max.			
Protective circuits		Power supply reverse polarity, protection, short circuit protection, output reverse polarity protection	Power supply reverse polarity protection, short circuit protection, output reverse polarity protection, mutual interference prevention		
Response time		Operation or reset: 1 ms max.			Operation or reset 0.5 ms max.
Ambient temperature range		Operating: -10 to 55°C, Storage: -25 to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9			
Material	Case	PBT (polybutylene terephthalate)			
	Lens	Modified polyacrylate resin	Methacrylate	Modified polyacrylate resin	



Low black/white error for precise detection



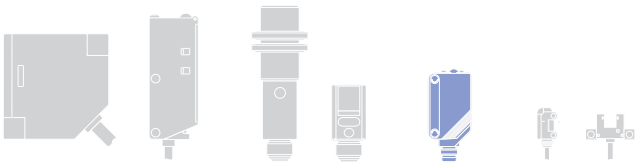
Visible laser light for precision positioning

Class 1 laser

Photoelectric sensor with anti-tampering protection in compact plastic housing

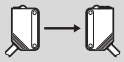
The E3Z-_H line is part of the compact size E3Z family and features sensors without sensitivity adjusters for maximum tampering protection.

- Compact housing size and high-power LED for excellent performance-size ratio
- IP67 and IP69K for highest water resistance
- Intensive shielding for highest noise immunity (EMC)
- Tough PBT housing for high mechanical resistance



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Output configuration	Connection method				Order code
							Anti-tampering
Through-beam 	15 m	NPN	–	–	■	For ordering pigtail versions replace '2M' of cable types with: - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	E3Z-T61H 2M
			■	–	–		E3Z-T66H
		PNP	–	–	■		E3Z-T81H 2M
			■	–	–		E3Z-T86H
Retro-reflective with M.S.R.	0.1 to 4 m*1	NPN	–	–	■		E3Z-R61H 2M
			■	–	–		E3Z-R66H
		PNP	–	–	■		E3Z-R81H 2M
			■	–	–		E3Z-R86H

*1 Measured with E39-R1S

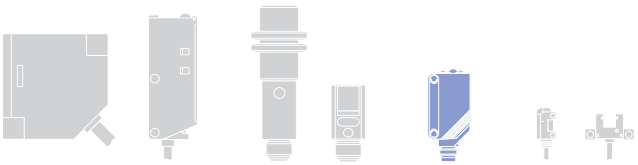
Specifications

Item		Through-beam	Retro-reflective with M.S.R.
		E3Z-T_	E3Z-R_
Sensing distance		15 m	0.1 to 4m (with E39-R1S)
Light source (wave length)		Infrared LED (870 nm)	Red LED (660 nm)
Power supply voltage		12 to 24 VDC ±10%	
Ambient temperature		Operating: -25 to 55°C, Storage: -40 to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Material	Case	PBT	
	Lens	Denatured polyacrylate resin	Methacrylate resin

Photoelectric sensor for condition monitoring in compact plastic housing

The E3Z 'condition monitoring' family features active or passive sensor function checking capabilities detecting misalignments, dirt covers, defective sensors, etc.

- E3Z-_-J0: Self-diagnostic alarm output on unstable signal
- E3Z-_-G2: Detection of dirt cover by power reduction
- E3Z-_-G0: Active sensor functionality check by test input forcing state change at receiver (emission stop)



Ordering information

Sensor type	Sensing distance	Output configuration	Connection method	Order code*1		
				Self diagnosis	Emission stop	Light intensity switching
Through-beam	15 m	NPN	2 m	E3Z-T61-J0SHW-P2	E3Z-T61-G0SHW-P2	E3Z-T61-G2SHW-P2
		PNP	2 m	E3Z-T81-J0SHW-P2	E3Z-T81-G0SHW-P2	E3Z-T81-G2SHW-P2
Retro-reflective with M.S.R.	0.1 to 4 m	NPN	2 m	E3Z-R61-J0SRW-P2	E3Z-R61-G0SRW-P2	E3Z-R61-G2SRW-P2
		PNP	2 m	E3Z-R81-J0SRW-P2	E3Z-R81-G0SRW-P2	E3Z-R81-G2SRW-P2
Diffuse-reflective	1 m (adjustable)	NPN	2 m	E3Z-D62-J0SHW-P2	E3Z-D62-G0SHW-P2	E3Z-D62-G2SHW-P2
		PNP	2 m	E3Z-D82-J0SHW-P2	E3Z-D82-G0SHW-P2	E3Z-D82-G2SHW-P2

*1 For ordering M8 4-pin connector versions replace '-P2' by '-CN'.

Specifications

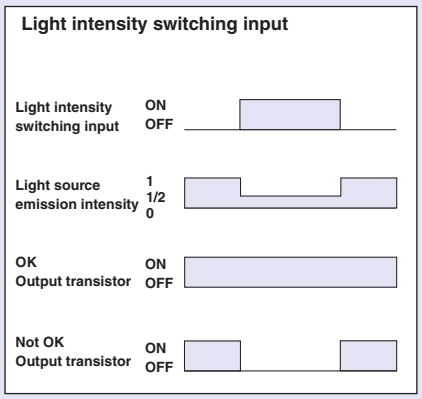
Item	Through-beam	Retro-reflective with M.S.R.	Diffuse-reflective
	E3Z-T_	E3Z-R_	E3Z-D_
Sensing distance	15 m	0.1 to 4m (with E39-R1S)	1 m (adjustable)
Light source	Infrared LED (870 nm)	Red LED (660 nm)	Infrared LED (860 nm)
Power supply voltage	12 to 24 VDC ±10%		
Ambient temperature	Operating: -25 to 55°C, Storage: -40 to 70°C (with no icing or condensation)		
Degree of protection	IEC 60529 IP67, IP69K after DIN 40050 part 9		
Material	PBT		

Light intensity switching/self diagnostic output

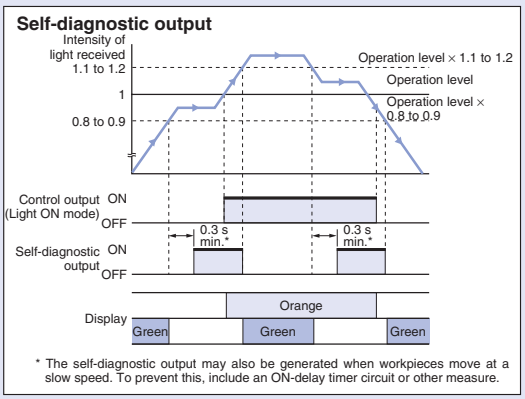
Errors might be caused by a dusty or dirty lens.

The E3Z with light intensity switching can prevent malfunctions by ensuring that sufficient functional reserve is available. At startup the light intensity is reduced by 50% and continued operation in this state indicates sufficient reserve when power is switched back to 100%.

Also, when light reception becomes unstable during operation, the E3Z with self-diagnostic output function outputs an alert to enable early maintenance.



Note: for light ON mode with workpiece

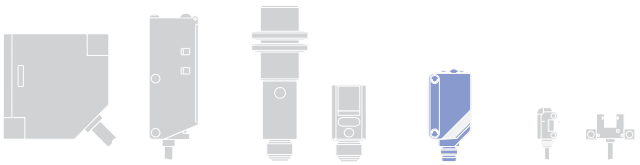


* The self-diagnostic output may also be generated when workpieces move at a slow speed. To prevent this, include an ON-delay timer circuit or other measure.

Photoelectric sensor in compact stainless steel housing

Compact housing size and high power LED for excellent performance-size ratio in a rugged, detergent-resistant stainless steel housing for demanding environments.

- High grade stainless steel housing (SUS316L)
- IP67 and IP69k for highest water resistance
- ECOLAB tested and certified detergent resistance



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method				Order code	
		●	●	2 m		NPN output	PNP output
Through-beam	15 m	–	–	2 m	*1	E3ZM-T61 2M	E3ZM-T81 2M
		■	–	–		E3ZM-T66	E3ZM-T86
	0.8 m with built-in slit	–	–	2 m		E3ZM-T63 2M	E3ZM-T83 2M
		■	–	–		E3ZM-T68	E3ZM-T88
Retro-reflective with M.S.R.	0.1 to 4 m	–	–	2 m		E3ZM-R61 2M	E3ZM-R81 2M
		■	–	–		E3ZM-R66	E3ZM-R86
Diffuse-reflective	1 m (adjustable)	–	–	2 m		E3ZM-D62 2M	E3ZM-D82 2M
		■	–	–		E3ZM-D67	E3ZM-D87
Diffuse-reflective (background suppression)	10 to 100 mm (fixed)	–	–	2 m		E3ZM-LS61X 2M*2	E3ZM-LS81X 2M*2
		■	–	–		E3ZM-LS66X*2	E3ZM-LS86X*2
	10 to 200 mm (fixed)	–	–	2 m		E3ZM-LS64X 2M*2	E3ZM-LS84X 2M*2
		■	–	–		E3ZM-LS69X*2	E3ZM-LS89X*2

*1 For ordering pigtail versions replace '2M' of the cable types with:
- S1J: for M12 stainless steel plug with 30 cm cable
- S3J: for M8 4-pin stainless steel plug with 30cm cable
- S5J: for M8 3-pin stainless steel plug with 30cm cable (except for background suppression types)
- M1J: for M12 brass plug with 30cm cable
- M3J: for M8 4-pin brass plug with 30cm cable
- M5J: for M8 3-pin brass plug with 30cm cable (except for background suppression types)

*2 E3ZM-LS_X are fixed LIGHT-ON models. For fixed DARK-ON models please order E3ZM-LS_Y and for L-ON/D-ON selectable by wire please order E3ZM-LS_H.

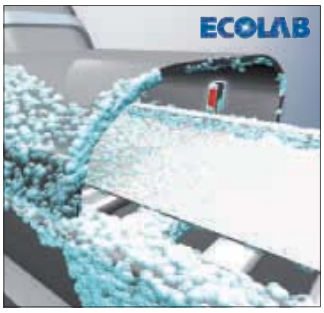
Specifications

Item		Through-beam		Retro-reflective with M.S.R.	Diffuse-reflective
	NPN	E3ZM-T61 E3ZM-T66	E3ZM-T63 E3ZM-T68	E3ZM-R61 E3ZM-R66	E3ZM-D62 E3ZM-D67
	PNP	E3ZM-T81 E3ZM-T86	E3ZM-T83 E3ZM-T88	E3ZM-R81 E3ZM-R86	E3ZM-D82 E3ZM-D87
Sensing distance		15 m	0.8 m	0.1 to 4m (with E39-R1S)	1 m (adjustable)
Light source (wave length)		Infrared LED (870 nm)		Red LED (660 nm)	Infrared LED (860 nm)
Power supply voltage		10 to 30 VDC, ±10% ripple (p-p)			
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection		Power supply reverse polarity protection, output short-circuit protection, mutual interference prevention, output reverse polarity protection	
Ambient temperature range		Operating: -25°C to 55°C, storage: -40°C to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9			
Materials	Case	SUS316L			
	Lens	Methacrylic resin			
	Display	PES (polyether sulfone)			
	Sensitivity adjustment and operation switch	PEEK (polyether ether ketone)			
	Seals	Fluoro rubber			

Item		Diffuse-reflective with background suppression (fixed distance)	
	NPN	E3ZM-LS61X E3ZM-LS66X	E3ZM-LS64X E3ZM-LS69X
	PNP	E3ZM-LS81X E3ZM-LS86X	E3ZM-LS84X E3ZM-LS89X
Sensing distance		10 to 100 mm (fixed)	10 to 200 mm (fixed)
Light source (adjustable)		Red LED (650 nm)	Red LED (660 nm)
Black/white error		5% of sensing distance max.	20% of sensing distance max.
Power supply voltage		10 to 30 VDC, ±10% ripple (p-p): 10% max.	
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection, mutual interference protection	
Ambient temperature range		Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Materials	Case	SUS316L	
	Lens	Methacrylic resin	
	Display	PES (polyether sulfone)	
	Sensitivity adjustment and operation switch	PEEK (polyether ether ketone)	
	Seals	Fluoro rubber	

Robust construction

Tight housing

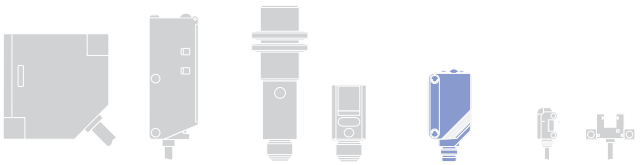


Detergent resistant

Oil-resistant photoelectric sensor in compact stainless steel housing

The oil-resistant compact photoelectric sensor in a robust stainless steel housing features an enhanced functional reserve for reliable object detection in dirty and mechanically demanding environments such as automotive assembly lines.

- Oil-resistant stainless steel housing
- IP67 and IP69k for highest water resistance
- High visibility orange LED in through-beam model for easy alignment



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method				Order code	
		○	○	2 m	–	NPN output	PNP output
Through-beam	15 m (Infrared light)	–	–	2 m	–	E3ZM-CT61 2M	E3ZM-CT81 2M
		–	–	–	■*1	E3ZM-CT61-M1TJ	E3ZM-CT81-M1TJ
		■	–	–	–	E3ZM-CT66	E3ZM-CT86
	20 m (Orange light)	–	–	2 m	–	E3ZM-CT62B 2M	E3ZM-CT82B 2M
		–	–	–	■*1	E3ZM-CT62B-M1TJ	E3ZM-CT82B-M1TJ
		■	–	–	–	E3ZM-CT67B	E3ZM-CT87B
Retro-reflective with M.S.R.	0.1 to 4m*2	–	–	2 m	–	E3ZM-CR61 2M	E3ZM-CR81 2M
		–	–	–	■*1	E3ZM-CR61-M1TJ	E3ZM-CR81-M1TJ
		■	–	–	–	E3ZM-CR66	E3ZM-CR86
Diffuse-reflective	1 m (adjustable)	–	–	2 m	–	E3ZM-CD62 2M	E3ZM-CD82 2M
		–	–	–	■*1	E3ZM-CD62-M1TJ	E3ZM-CD82-M1TJ
		■	–	–	–	E3ZM-CD67	E3ZM-CD87
Diffuse-reflective (background suppression)	10 to 100 mm (fixed)	–	–	2 m	–	E3ZM-CL61H 2M	E3ZM-CL81H 2M
		–	–	–	■*1	E3ZM-CL61H-M1TJ	E3ZM-CL81H-M1TJ
		■	–	–	–	E3ZM-CL66H	E3ZM-CL86H
	10 to 200 mm (fixed)	–	–	2 m	–	E3ZM-CL64H 2M	E3ZM-CL84H 2M
		–	–	–	■*1	E3ZM-CL64H-M1TJ	E3ZM-CL84H-M1TJ
		■	–	–	–	E3ZM-CL69H	E3ZM-CL89H

*1 uses Omron's Twist & Click M12 connector XS5.
*2 Measured with E39-R1S

Specifications

Item		Through-beam		Retro-reflective with M.S.R.	Diffuse-reflective
	NPN	E3ZM-CT61 (-M1TJ) E3ZM-CT66	E3ZM-CT62B (-M1TJ) E3ZM-CT67B	E3ZM-CR61 (-M1TJ) E3ZM-CR66	E3ZM-CD62 (-M1TJ) E3ZM-CD67
	PNP	E3ZM-CT81 (-M1TJ) E3ZM-CT86	E3ZM-CT82B (-M1TJ) E3ZM-CT87B	E3ZM-CR81 (-M1TJ) E3ZM-CR86	E3ZM-CD82 (-M1TJ) E3ZM-CD87
Sensing distance		15 m	20 m	0.1 to 4 m (with E39-R1S)	1 m (adjustable)
Light source (wave length)		Infrared LED (870 nm)	Orange LED (615 nm)	Red LED (660 nm)	Infrared LED (860 nm)
Power supply voltage		10 to 30 VDC, including 10% ripple (p-p)			
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection, and mutual interference prevention	
Ambient temperature range		Operating: -25°C to 55°C, storage: -40°C to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9			
Materials	Case	SUS316L			
	Lens	PMMA (polymethylmethacrylate)			
	Display	PES (polyether sulfone)			
	Sensitivity adjustment and operation switch	PEEK (polyether ether ketone)			
	Seals	Fluoro rubber			

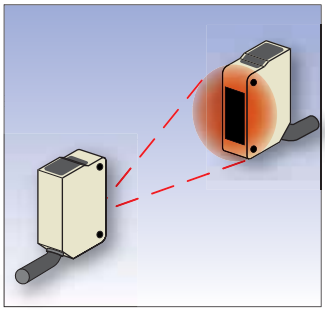
Item		Diffuse-reflective with background suppression (fixed distance)	
	NPN	E3ZM-CL61H (-M1TJ) E3ZM-CL66H	E3ZM-CL64H (-M1TJ) E3ZM-CL69H
	PNP	E3ZM-CL81H (-M1TJ) E3ZM-CL86H	E3ZM-CL84H (-M1TJ) E3ZM-CL89H
Sensing distance		10 to 100 mm (fixed)	10 to 200 mm (fixed)
Light source (wave length)		Red LED (650 nm)	Red LED (660 nm)
Power supply voltage		10 to 30 VDC, ±10% ripple (p-p): 10% max.	
Protective circuits		Reversed power supply polarity protection, output short-circuit protection, reversed output polarity protection, mutual interference protection	
Ambient temperature range		Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Materials	Case	SUS316L	
	Cable	Oil-resistant vinyl cable	
	Lens	PMMA (polymethylmethacrylate)	
	Display	PES (polyethersulfone)	
	Seals	Fluoro rubber	

Tested oil and lubricant resistance

Oil Resistance

Test oil type	Product name	Kinetic viscosity at 40°C (mm²/s)	pH (dilution rate)
Lubricants	Velocity Oil No. 3	2.02	–
Non-water-soluble cutting oils	Yushiron Oil No.2 AC	Less than 10	–
Water-soluble cutting oils	Yushiroken EC50T3	–	10.1 (×30)
	Yushiroken EC50T5		9.9 (×30)
	Yushiroken S46D		9.9 (×50)
	Yushiroken S50N		8.6 (×50)
	Yushiron Lubic HWC68		9.1 (×30)
	Yushiroken Synthetic #770TG		9.9 (×20)
	Emulcut FA-900ST		9.7 (×30)
	Multicool CSF-9000		9.7 (×20)
	Sugicut CS-68JS-1		9.6 (×20)
	Toyocool 3A-666		9.6 (×20)
	Gryton 1700		9.1 (×10)
	Gryton 1700D		9.3 (×3)

1. The Sensor was immersed in the above oils for 240 h at 55°C and then passed an insulation resistance test at 100 MΩ.
2. Use the kinetic viscosities and pHs in the above table as a guide when using the Sensor in environments containing oils not listed in the table. Additives in the oil may also affect performance. Always test applicability in advance.

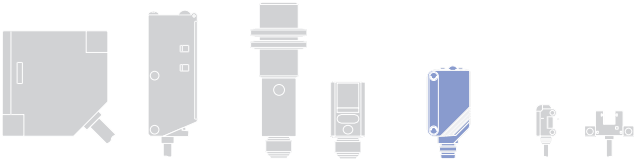


Highly visible orange LED

Print mark detection photoelectric sensor in compact stainless steel housing

The detergent resistant photoelectric sensor in a robust stainless steel housing provides reliable detection of all common print marks in food packaging applications.

- White LED for stable detection of differently coloured or black print marks
- SUS 316L stainless steel housing
- Easy-to-use teach-in button or remote teach
- Fast response time of 50 µs



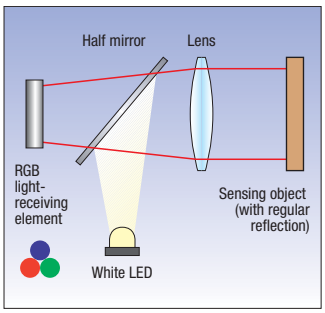
Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Mark sensor	12±2 mm	–	–	2 m	–	E3ZM-V61 2M	E3ZM-V81 2M
		■	–	–	–	E3ZM-V66	E3ZM-V86

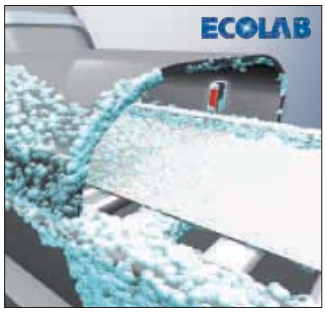
Specifications

Item		NPN	E3ZM-V6_
		PNP	E3ZM-V8_
Sensing distance			12±2 mm
Light source (wave length)			White LED (450 to 700 nm)
Power supply voltage			10 to 30 VDC ±10%, ripple (p-p) 10% max.
Protective circuits			Reversed power supply polarity protection, output short-circuit protection, Reversed output polarity protection, and mutual interference prevention
Ambient temperature range			Operating: -25°C to 55°C, storage: -40°C to 70°C (with no icing or condensation)
Response time			50 µs
Degree of protection			IEC: IP67, DIN 40050-9: IP69K
Materials	Case		SUS316L
	Lens		PMMA (polymethylmethacrylate)
	Display		PES (polyether sulfone)
	Sensitivity adjustment and operation switch		PEEK (polyether ether ketone)
	Seals		Fluoro rubber



Coaxial optical system with white LED

Remote teaching

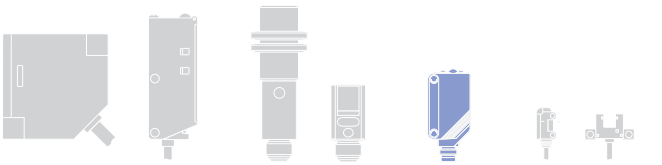


Detergent resistant

Transparent object detection sensor in compact stainless steel housing

The E3ZM-B family provides models for the general transparent material detection and specialized models providing highest stability for the detection of PET bottles.

- Stable PET detection using double refraction and AC[3] power control technology
- Detergent resistant compact SUS316L housing



Ordering information

Sensor type		Sensing distance	Special reflector	Connection method				Order code	
								NPN output	PNP output
Retro-reflective with M.S.R.	Optimised for PET bottles and trays	100 to 500 mm (teachable)	Order separately*1	–	–	2 m	–	E3ZM-B61 2M	E3ZM-B81 2M
				■	–	–	–	E3ZM-B66	E3ZM-B86
			E39-RP1 included	–	–	2 m	–	E3ZM-B61-C 2M	E3ZM-B81-C 2M
				■	–	–	–	E3ZM-B66-C	E3ZM-B86-C
Retro-reflective with M.S.R.	For all transparent media (glass, PET, foils)	100 to 500 mm (potentiometer adjustment)*2	Order separately*3	–	–	2 m	–	E3ZM-B61T 2M	E3ZM-B81T 2M
				■	–	–	–	E3ZM-B66T	E3ZM-B86T

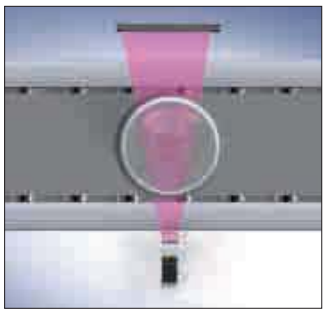
*1 For higher signal stability using circular polarisation functionality for PET bottles, order special reflector E39-RP1 separately
*2 Teachable all-transparent-media types are available. Contact your OMRON representative
*3 Order reflector separately

Specifications

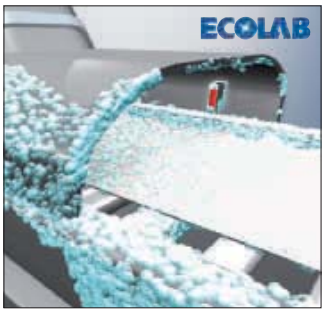
Item		PET optimised	all-transparent-media*1
	NPN	E3ZM-B61(-C)/-B66(-C)	E3ZM-B6_T
	PNP	E3ZM-B81(-C)/-B86(-C)	E3ZM-B8_T
Sensing distance		100 to 500 mm (with E39-RP1)	
Light source (wave length)		Red LED (650 nm)	
Power supply voltage		10 to 30 VDC, ±10% ripple (p-p): 10% max.	
Protective circuits		Reversed power supply polarity protection, output short-circuit protection, mutual interference prevention, and reversed output polarity protection	
Response time		Operation or reset: 1 ms max.	
Ambient temperature range		Operating: -40°C to 60°C, storage: -40°C to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Materials	Case	SUS316L	
	Lens	PMMA (polymethylmethacrylate)	
	Display	PES (polyether sulfone)	
	Seals	Fluoro rubber	
	Cable	PVC (polyvinyl chloride)	

*1 Contact your Omron representative for details on all-transparent-media types (potentiometer adjustment or teachable)

Utilisation of double reflection effect in PET for higher detection stability (PET optimised models)



Automatic LED power adjustment (AC[3]) to compensate for soiling and temperature fluctuations

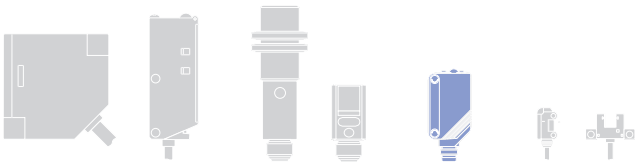


Detergent resistant

Transparent bottle detection photoelectric sensor in compact plastic housing

The E3Z-B provides easy adjustment for the detection of a large variety of standard transparent objects.

- Detects a wide range of bottles from single bottles to sets of stocked bottles
- IP67/IP69K tested for highest water resistance



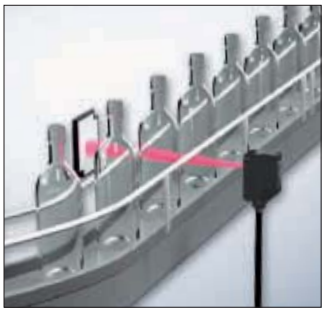
Ordering information

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Retro-reflective without M.S.R.	80 to 500 mm*1 (adjustable)	–	–	2 m	–	E3Z-B61 2M	E3Z-B81 2M
		■	–	–	–	E3Z-B66	E3Z-B86
	0.5 to 2 m*1 (adjustable)	–	–	2 m	–	E3Z-B62 2M	E3Z-B82 2M
		■	–	–	–	E3Z-B67	E3Z-B87

*1 Measured with E39-R1S

Specifications

Item		Retro-reflective without M.S.R.	
	NPN output	E3Z-B61/E3Z-B66	E3Z-B62/E3Z-B67
	PNP output	E3Z-B81/E3Z-B86	E3Z-B82/E3Z-B87
Sensing distance		80 to 500 mm (with E39-R1) (adjustable)	0.1 to 2 m (with E39-R1S) (adjustable)
Light source (wave length)		Red LED (680 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	
Response time		Operation or reset: 1 ms max.	
Ambient temperature		Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Material	Case	PBT (polybutylene terephthalate)	
	Lens	Methacrylate resin	

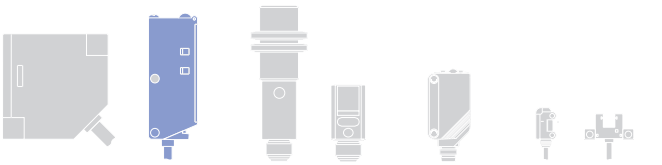


Easy adjustment for the detection of a large variety of transparent objects

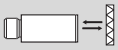
Transparent object detection sensor in compact M18 housing

The E3FZ-B provides enhanced detection stability for the detection of transparent objects. It allows an easy and intuitive adjustment by potentiometer to adjust to individual requirements.

- Easy adjustment to individual requirements for all transparent materials
- Easy mounting due to short M18 housing
- Coaxial optics for stable, distance-independent detection



Ordering Information

Sensor type	Sensing distance	Connection method				Order code	
					*1	NPN output	PNP output
Retro-reflective with M.S.R. 	0 to 700 mm *2	–	–	2 m	–	E3FZ-B61 2M	E3FZ-B81 2M
		–	■	–	–	E3FZ-B66	E3FZ-B86

*1 For ordering pigtail versions contact your OMRON representative. Available options on request are:
- M3J:for M8 4-pin pigtail connector with 30 cm cable
- M5J:for M8 3-pin pigtail connector with 30 cm cable
- M1TJ: for M12 4-pin XS5 smart-click connector with 30 cm cable.

*2 Sensing distance is rated on reflector E39-R1S. Reflector is sold separately.

Mounting Brackets

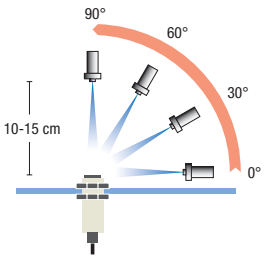
Type	Material	Order code
90° Mounting Bracket *1	Stainless Steel	E39-EL12

*1 Bracket fitting to M18 screw mounting.

Ratings and Specifications

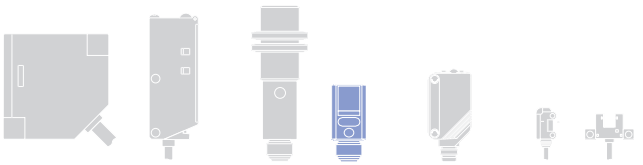
Item		E3FZ-B_
Sensing distance		0 to 700 mm (Using E39-R1S, other reflectors see diagram operating range)
Light source (wavelength)		Red LED (650 nm)
Power supply voltage		10 to 30 VDC, including 10% ripple (p-p)
Protective circuits		Reversed power supply polarity, load short-circuit protection, mutual interference prevention, reversed output polarity protection
Response time		Operation or reset: 1 ms max.
Ambient temperature range		Operating: –25 to 55°C, Storage: –40 to 70°C (with no icing or condensation)
Degree of protection		IEC 60529: IP67, DIN 40050-9: IP69K *1
Materials	Housing	ABS
	Lens	PMMA (polymethylmethacrylate)
	Cable	PVC (polyvinyl chloride)

*1 IP69K is a protection standard against high temperature and high-pressure water defined in the German standard DIN 40050, Part 9. The test piece is sprayed with water at 80°C at a water pressure of 80 to 100 BAR using a specified nozzle shape at a rate of 14 to 16 liters/min.
The distance between the test piece and nozzle is 10 to 15 cm, and water is sprayed horizontally for 30 seconds each at 0°, 30°, 60°, and 90° while rotating the test piece on a horizontal plane.



Easy Mounting photoelectric sensor in short plastic M18 housing

- High power LED for enhanced sensing distance
- SecureClick snap mounting for fast installation



Ordering information

Snap mounting - E3FZ[*1]

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Through-beam	15 m	–	–	2 m	–[*2]	E3FZ-T61H 2M	E3FZ-T81H 2M
		–	■	–	–[*2]	E3FZ-T66H	E3FZ-T86H
Retro-reflective with M.S.R.	0.1 to 4 m[*3]	–	–	2 m	–[*2]	E3FZ-R61H 2M	E3FZ-R81H 2M
		–	■	–	–[*2]	E3FZ-R66H	E3FZ-R86H
Diffuse-reflective	1 m (adjustable)	–	–	2 m	–[*2]	E3FZ-D62 2M	E3FZ-D82 2M
		–	■	–	–[*2]	E3FZ-D67	E3FZ-D87
Diffuse-reflective (background suppression)	100 mm (fixed)	–	–	2 m	–[*2]	E3FZ-LS61H 2M	E3FZ-LS81H 2M
		–	■	–	–[*2]	E3FZ-LS66H	E3FZ-LS86H
	200 mm (fixed)	–	–	2 m	–[*2]	E3FZ-LS64H 2M	E3FZ-LS84H 2M
		–	■	–	–[*2]	E3FZ-LS69H	E3FZ-LS89H

Radial mounting - E3FR

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Through-beam	15 m	–	–	2 m	–[*2]	E3FR-T61H 2M	E3FR-T81H 2M
		–	■	–	–[*2]	E3FR-T66H	E3FR-T86H
Retro-reflective with M.S.R.	0.1 to 4 m[*3]	–	–	2 m	–[*2]	E3FR-R61H 2M	E3FR-R81H 2M
		–	■	–	–[*2]	E3FR-R66H	E3FR-R86H
Diffuse-reflective	1 m (adjustable)	–	–	2 m	–[*2]	E3FR-D62 2M	E3FR-D82 2M
		–	■	–	–[*2]	E3FR-D67	E3FR-D87
Diffuse-reflective (background suppression)	100 mm (fixed)	–	–	2 m	–[*2]	E3FR-LS61H 2M	E3FR-LS81H 2M
		–	■	–	–[*2]	E3FR-LS66H	E3FR-LS86H
	200 mm (fixed)	–	–	2 m	–[*2]	E3FR-LS64H 2M	E3FR-LS84H 2M
		–	■	–	–[*2]	E3FR-LS69H	E3FR-LS89H

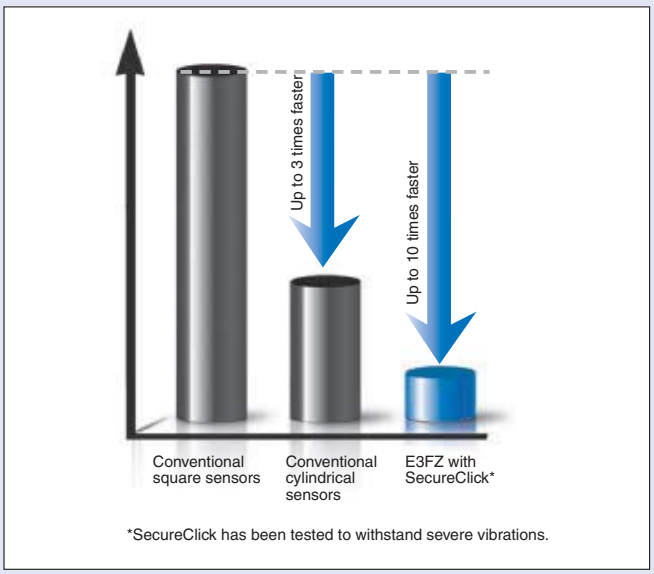
*1. Mounting with snap holder (provided with product) or M18 nuts (provided with product) possible.
*2. Pigtail connectors are available on request
*3. Measured with reflector E39-R1S

Specifications

	Through-beam	Retro-reflective with M.S.R.	Diffuse-reflective	Diffuse-reflective with background suppression	
Item	**E3FZ-T/E3FR-T**	**E3FZ-R/E3FR-R**	**E3FZ-D/E3FR-D**	**E3F_-LS_1H/E3F_-LS_6H**	**E3F_-LS_4H/E3F_-LS_9H**
Light source (wave length)	Infrared LED (870 nm)	Red LED (660 nm)	Infrared LED (860 nm)	Red LED (650 nm)	Red LED (660 nm)
Power supply voltage	10 to 30 VDC ±10% ripple (p-p): 10% max.				
Protective circuits	Output short-circuit and power supply reverse polarity protection				
Ambient temperature	Operating: -25 to 55°C/Storage: -40 to +70°C (with no icing or condensation)				
Degree of protection	IEC 60529 IP67, IP69K after DIN 40050 part 9				
Material	Plastic (case: ABS; lens: PMMA)				

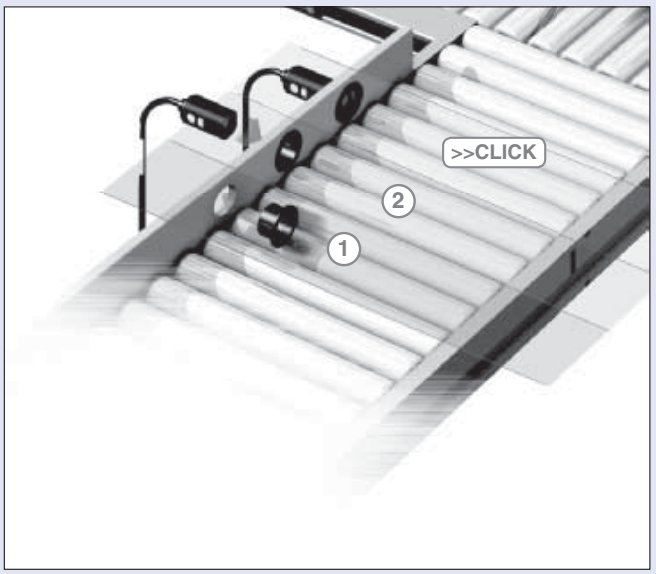
Easy and fast installation

Installation time can be reduced by up to 10 times compared to conventional sensors.



*SecureClick has been tested to withstand severe vibrations.

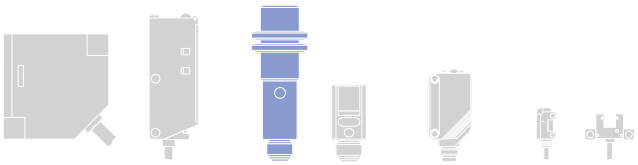
The **SecureClick** snap mounting mechanism provides easy installation in 2 steps and enhanced protection against vibration.



Photoelectric sensor in plastic or brass M18 housing

The E3F2 sensors in cylindrical M18 plastic or brass housings are ideally suited for a wide range of standard applications providing high reliability and long sensor lifetime with excellent price-performance ratio.

- Plastic or metal (brass) housings
- IP67, IP69K for highest water resistance
- Special beam models available (see complete datasheet)



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

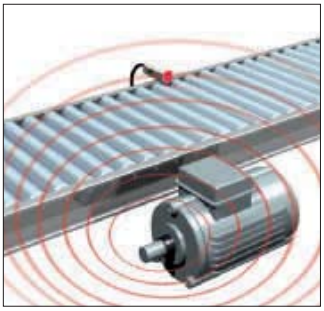
Sensor type	Sensing distance	Housing material	Connection method				Order code	
							NPN output	PNP output
Through-beam	7 m	Plastic	–	–	2 m	–	E3F2-7C4 2M	E3F2-7B4 2M
		Brass					E3F2-7C4-M 2M	E3F2-7B4-M 2M
		Plastic	–	■	–	–	E3F2-7C4-P1	E3F2-7B4-P1
		Brass					E3F2-7C4-M1-M	E3F2-7B4-M1-M
Retro-reflective with M.S.R.	0.1 to 4 m*1 (adjustable)	Plastic	–	–	2 m	–	E3F2-R4C4-E 2M	E4F2-R4B4-E 2M
		Brass					E3F2-R4C4-M-E 2M	E3F2-R4B4-M-E 2M
		Plastic	–	■	–	–	E3F2-R4C4-P1-E	E3F2-R4B4-P1-E
		Brass					E3F2-R4C4-M1-M-E	E3F2-R4B4-M1-M-E
Diffuse-reflective	0.3 m (adjustable)	Plastic	–	–	2 m	–	E3F2-DS30C4 2M	E3F2-DS30B4 2M
		Brass					E3F2-DS30C4-M 2M	E3F2-DS30B4-M 2M
		Plastic	–	■	–	–	E3F2-DS30C4-P1	E3F2-DS30B4-P1
		Brass					E3F2-DS30C4-M1-M	E3F2-DS30B4-M1-M
	1 m (adjustable)	Plastic	–	–	2 m	–	E3F2-D1C4 2M	E3FR-D1B4 2M
		Brass					E3F2-D1C4-M 2M	E3F2-D1B4-M 2M
		Plastic	–	■	–	–	E3F2-D1C4-P1	E3F2-D1B4-P1
		Brass					E3F2-D1C4-M1-M	E3F2-D1B4-M1-M
Diffuse-reflective (background suppression)	100 mm (fixed)	Plastic	–	–	2 m	–	E3F2-LS10C4 2M	E3F2-LS10B4 2M
		Brass					E3F2-LS10C4-M 2M	E3F2-LS10B4-M 2M
		Plastic	–	■	–	–	E3F2-LS10C4-P1	E3F2-LS10B4-P1
		Brass					E3F2-LS10C4-M1-M	E3F2-LS10B4-M1-M

*1 Measured using E39-R1S

Specifications

Item		Through-beam	Retro-reflective with M.S.R.	Diffuse-reflective		Diffuse-reflective (background suppression)
		E3F2-7_	E3F2-R4_	E3F2-D1_	E3F2-DS30_	E3F2-LS10_4-_
Light source (wave length)		Infrared LED (950 nm)	Red LED (660 nm)	Infrared LED (880 nm)		Red LED (660 nm)
Power supply voltage		10 to 30 VDC				
Protective circuits		Output short-circuit protection and power supply reverse polarity protection				
Ambient temperature		Operating: -25 to 55°C/Storage: -30 to 70°C (with no icing or condensation)				
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9				
Material	Case	Plastic ABS Nickel plated brass				
	Lens	PMMA				

High ambient light immunity

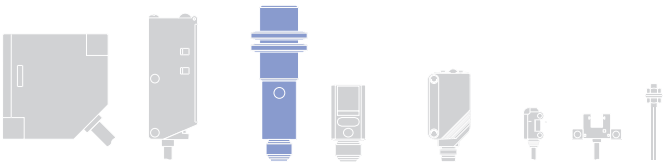


High electromagnetic noise immunity

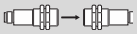
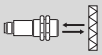
Photoelectric sensor in stainless steel M18 housing

For areas that undergo frequent cleaning the stainless steel housing of the E3F2-_-S provides enhanced detergent resistance and longer sensor lifetime.

- IP67, IP69K for highest water resistance
- Enhanced detergent resistance certified by ECOLAB



Ordering information

Sensor type	Sensing distance	Housing material	Connection method				Order code	
							NPN output	PNP output
Through-beam 	7 m	Stainless steel	–	–	2 m	–	E3F2-7C4-S 2M	E3F2-7B4-S 2M
			–	■	–	–	E3F2-7C4-M1-S	E3F2-7B4-M1-S
Retro-reflective with M.S.R. 	0.1 to 4 m*1 (adjustable)	Stainless steel	–	–	2 m	–	E3F2-R4C4-S-E 2M	E3F2-R4B4-S-E 2M
			–	■	–	–	E3F2-R4C4-M1-S-E	E3F2-R4B4-M1-S-E
Diffuse-reflective	0.3 m (adjustable)	Stainless steel	–	–	2 m	–	E3F2-DS30C4-S 2M	E3F2-DS30B4-S 2M
			–	■	–	–	E3F2-DS30C4-M1-S	E3F2-DS30B4-M1-S
	1 m (adjustable)	Stainless steel	–	–	2 m	–	E3F2-D1C4-S 2M	E3F2-D1B4-S 2M
			–	■	–	–	E3F2-D1C4-M1-S	E3F2-D1B4-M1-S
Diffuse-reflective (background suppression)	100 mm (fixed)	Stainless steel	–	–	2 m	–	E3F2-LS10C4-S 2M	E3F2-LS10B4-S 2M
			–	■	–	–	E3F2-LS10C4-M1-S	E3F2-LS10B4-M1-S

*1 Measured using E39-R1S

Specifications

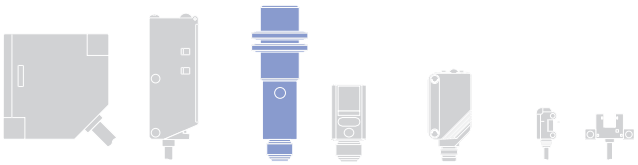
Item		Through-beam	Retro-reflective with M.S.R.	Diffuse-reflective		Diffuse-reflective (background suppression)
		E3F2-7_	E3F2-R4_	E3F2-D1_	E3F2-DS30_	E3F2-LS10_4-_
Light source (wave length)		Infrared LED (950 nm)	Red LED (660 nm)	Infrared LED (880 nm)		Red LED (660 nm)
Power supply voltage		10 to 30 VDC				
Protective circuits		Output short-circuit protection and power supply reverse polarity protection				
Ambient temperature		Operating: -25 to 55°C/Storage: -30 to 70°C (with no icing or condensation)				
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9				
Material	Case	Stainless steel				
	Lens	PMMA				

High water and detergent resistance

Photoelectric sensor in plastic or brass radial M18 housing

Radial (angled) optics for easy mounting, installation and adjustment

- Diffuse-reflective and retro-reflective models
- IP67 and IP69K



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Housing material	Connection method				Order code	
							NPN output	PNP output
Retro-reflective with M.S.R.	0.1 to 2 m *1	Plastic	–	–	2 m	–	E3F2-R2RC41-E 2M	E3F2-R2RB41-E 2M
		Brass					E3F2-R2RC41-M-E 2M	E3F2-R2RB41-M-E 2M
		Plastic	–	■	–	–	E3F2-R2RC41-P1-E	E3F2-R2RB41-P1-E
		Brass					E3F2-R2RC41-M1-M-E	E3F2-R2RB41-M1-M-E
Diffuse-reflective	300 mm (adjustable)	Plastic	–	–	2 m	–	E3F2-DS30C41 2M	E3F2-DS30B41 2M
		Brass					E3F2-DS30C41-M 2M	E3F2-DS30B41-M 2M
		Plastic	–	■	–	–	E3F2-DS30C41-P1	E3F2-DS30B41-P1
		Brass					E3F2-DS30C41-M1-M	E3F2-DS30B41-M1-M

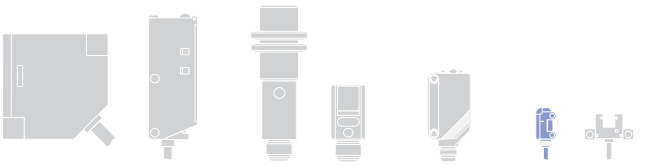
*1 Measured with E39-R1S.

Specifications

Item		Retro-reflective with M.S.R.	Diffuse-reflective
		E3F2-R2R_41-_	E3F2-DS30_41-_
Light source (wave length)		Red LED (660 nm)	Infrared LED (880 nm)
Power supply voltage		10 to 30 VDC	
Protective circuits		Output short-circuit protection and power supply reverse polarity protection	
Response time		Operation or reset: 2.5 ms max.	
Ambient temperature		Operating: -25 to 55°C/Storage: -30 to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Material	Case	Nickel plated brass	
		Plastic (ABS)	
	Lens	PMMA	

Miniature photoelectric sensors in cylindrical M8 and M12 housing

- M8 or M12 sized cylindrical housings when mounting space is crucial
- Retro-reflective models with two teaching modes for standard and semi-transparent objects
- pre-wired and connector models



Ordering information

M12 cylindrical housing

Sensor type	Sensing distance	Operation mode	Connection method				Order code	
							NPN output	PNP output
Through-beam	4 m (adjustable)	light on / dark on selectable	–	–	2 m	–	E3H2-T4C4M 2M	E3H2-T4B4M 2M
			–	■	–	–	E3H2-T4C4M-M1	E3H2-T4B4M-M1
Retro-reflective with M.S.R.	2 m (teachable*1)		–	–	2 m	–	E3H2-R2C4M 2M*2	E3H2-R2B4M 2M*2
			–	■	–	–	E3H2-R2C4M-M1*2	E3H2-R2B4M-M1*2
Diffuse-reflective	300 mm (teachable)		–	–	2 m	–	E3H2-DS30C4M 2M	E3H2-DS30B4M 2M
			–	■	–	–	E3H2-DS30C4M-M1	E3H2-DS30B4M-M1
	100 mm (fixed)		–	–	2 m	–	E3H2-DS10C4M 2M	E3H2-DS10B4M 2M
			–	■	–	–	E3H2-DS10C4M-M1	E3H2-DS10B4M-M1

*1 Models without teach-button are available. Contact your OMRON representative.
*2 Without reflector; order reflector separately

M8 cylindrical housing

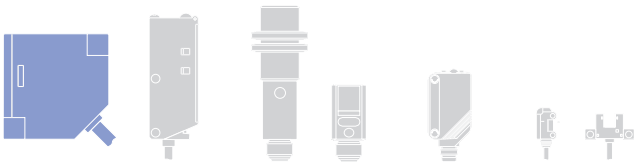
Sensor type	Sensing distance	Operation mode	Connection method				Order code	
							NPN output	PNP output
Through-beam	2 m	dark on	–	–	2 m	–	E3H2-T2C2S 2M	E3H2-T2B2S 2M
			■	–	–	–	E3H2-T2C2S-M5	E3H2-T2B2S-M5
		light on	–	–	2 m	–	E3H2-T2C1S 2M	E3H2-T2B1S 2M
			■	–	–	–	E3H2-T2C1S-M5	E3H2-T2B1S-M5

Specifications

Item		Through-beam		Retro-reflective with M.S.R.	Diffuse-reflective	
		E3H2-T4	E3H2-T2	E3H2-R	E3H2-DS30	E3H2-DS10
Sensing distance		4 m (adjustable)	2 m	2 m (teachable) (when using E39-R1S)	300 mm (teachable)	100 mm (fixed)
Light source (wave length)		Infrared LED (880 nm)		Red LED (660 nm)	Infrared LED (880 nm)	
Power supply voltage		10 to 30 VDC, 10% ripple				
Control output		Load current: 100 mA max. (residual voltage 2 V max.); E3H2-_C_: NPN E3H2-_B_: PNP				
		Light-on/dark-on selectable by wire	E3H2-T2_2_: dark on E3H2-T2_1_: light on	Light-on/dark-on selectable by wire		
Protective circuits		Power supply reverse polarity protection, output short circuit protection				
Response time		Operation or reset: 2.5 ms max	Operation or reset: 1 ms max.	Operation or reset: 1.1 ms max		
Sensitivity adjustment		Potentiometer adjuster	–	Teach-in		–
Ambient temperature		Operating: -25 to +55°C	Operating: -25 to +50°C	Operating: -25 to +55°C		
Degree of protection		EN 60529: IP67				
Material	case	nickel-plated brass	stainless steel	nickel-plated brass		
	lens	plastic	plastic	plastic		

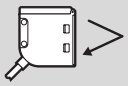
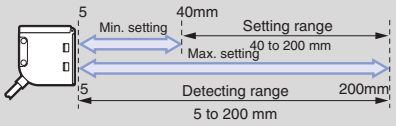
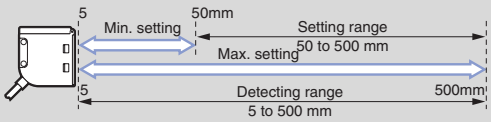
Distance-settable photoelectric sensor in metal housing

- Minimal black/white error for highest reliability detecting differently coloured objects (E3S-CL1)
- Setting distance up to 500 mm with reliable background suppression



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensortype	Sensing distance	Connection method				Order code
Distance-settable (background suppression) 		–	–	■	–	E3S-CL1 2M
		–	–	–	■ M12	E3S-CL1-M1J
		–	–	■	–	E3S-CL2 2M
		–	–	–	■ M12	E3S-CL2-M1J

Specifications

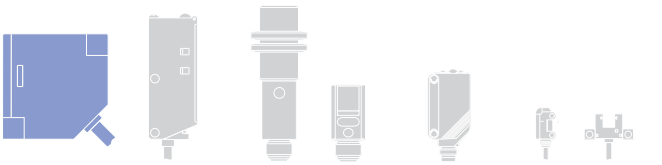
Item		Distance-settable (background suppression)	
		E3S-CL1	E3S-CL2
Sensing distance		5 to 200 mm	5 to 500 mm
Light source (wave length)		Red LED (700 nm)	Infrared LED (860 nm)
Black/white error*1		2% max.	10% max.
Power supply voltage		10 to 30 VDC [ripple (p-p) 10% included]	
Protective circuits		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		Operation or reset: 1 ms max.	Operation or reset: 2 ms max.
Ambient temperature		Operating/Storage: -25 to 55°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67	
Materials	Case	Zinc diecast	
	Operation panel cover	Polyethyl sulfon	
	Lens	Acrylics	

*1 Sensing distance difference between standard white paper (reflectivity 90%) and standard black paper (reflectivity 5%)

Long distance photoelectric sensor in plastic housing

Long distance retro-reflective and teachable distance-settable sensors in plastic housing.

- Distance-settable model with 1.2 m maximum setting distance
- M12 rotary connector or pre-wired models



Ordering information

Sensor type	Sensing distance	Connection method				Order code
						NPN/PNP selector
Retro-reflective with M.S.R.	0.5 to 10 m*1	–	–	2 m	–	E3G-R13-G 2M
		–	■	–	–	E3G-R17-G
Distance-settable (background suppression)	0.2 to 2 m (0.2 to 1.2 m distance settable)	–	–	2 m	–	E3G-L73 2M
		–	■	–	–	E3G-L77

*1 Measured with E39-R2

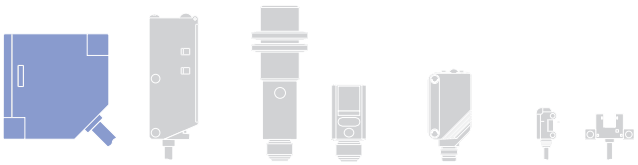
Specifications

Item		Retro-reflective with M.S.R.		Distance-settable (background suppression)	
		E3G-R13-G	E3G-R17-G	E3G-L73	E3G-L77
Sensing distance		0.5 to 10 m (with E39-R2)		0.2 to 2 m (setting distance 0.2 to 1.2 m)	
Light source (wave length)		Red LED (700 nm)		Infrared LED (860 nm)	
Power supply voltage		10 to 30 VDC (Ripple (p-p) 10% included)		10 to 30 VDC (Ripple (p-p) 10% included)	
Protective circuits		Reverse polarity protection, output short-circuit protection, mutual interference prevention		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Ambient temperature		Operating: -25 to 55°C, Storage: -30 to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67 (with Protective Cover attached)			
Materials	Case	PBT (polybutylene terephthalate)			
	Lens	Acrylics (PMMA)			

All voltage photoelectric sensor in plastic housing

The square sized E3JK family provides 12 to 240 VDC and 24 to 240 VAC power supply voltage.

- 12 to 240 VDC and 24 to 240 VAC supply voltage
- Relay outputs with long life expectancy and high switching capacity (3 A, 250 VAC)
- cUL recognized



Special models M18 cylindrical Compact Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method				Operation mode	Order code
Through-beam	5 m	–	–	2 m	–	Light ON	E3JK-5M1 2M
						Dark ON	E3JK-5M2 2M
Retro-reflective with M.S.R.	2 m					Light ON	E3JK-R2M1 2M
						Dark ON	E3JK-R2M2 2M
Retro-reflective without M.S.R.	4 m (adjustable)					Light ON	E3JK-R4M1 2M
						Dark ON	E3JK-R4M2 2M
Diffuse-reflective	300 mm (adjustable)					Light ON	E3JK-DS30M1 2M
						Dark ON	E3JK-DS30M2 2M

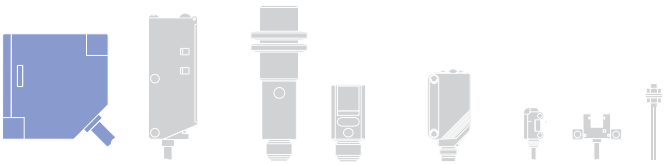
Specifications

Item		Through-beam	Retro-reflective with M.S.R.	Retro-reflective without M.S.R.	Diffuse-reflective
		E3JK-5M_	E3JK-R2M_	E3JK-R4M_	E3JK-DS30M_
Sensing distance		5 m	2 m (with E39-R1)	4 m (with E39-R1)	300 mm
Light source (wave length)		Infrared LED (870 nm)	Red LED (660 nm)		Infrared LED (870 nm)
Power supply voltage		12 to 240 VDC ±10% ripple (p-p) : 10% max. 24 to 240 VAC ±10% 50/60 Hz			
Control output		Relay output 3A max. at 250VAC/10m A at 5VDC min.			–
Response time		≤ 30 ms			
Ambient temperature		Operating: -25 to 55°C, Storage: -30 to 70°C (with no icing or condensation)			
Degree of protection		IEC60529 IP64			
Material	Case	ABS			
	Lens	Acrylics (PMMA)			

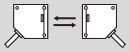
All voltage photoelectric sensor in plastic housing with timer function

The square sized E3JM family provides 12 to 240 VDC and 24 to 240 VAC power supply voltage, an enhanced sensing distance and a timer function.

- 12 to 240 VDC and 24 to 240 VAC supply voltage
- Relay or solid state relay output
- Timer function



Ordering information

Sensor type	Sensing distance	Connection method	Timer function	Order code		
				Relay output	DC SSR output	
					minus common	plus common
Through-beam 	10 m	Terminal block (with PG 13.5)	–	E3JM-10M4-G-N	E3JM-10S4-G-N	E3JM-10R4-G-N
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-10M4T-G-N	E3JM-10S4T-G-N	E3JM-10R4T-G-N
Retro-reflective with M.S.R.	4 m		–	E3JM-R4M4-G	E3JM-R4S4-G	E3JM-R4R4-G
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-R4M4T-G	E3JM-R4S4T-G	E3JM-R4R4T-G
Diffuse-reflective	700 mm (adjustable)		–	E3JM-DS70M4-G	E3JM-DS70S4-G	E3JM-DS70R4-G
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-DS70M4T-G	E3JM-DS70S4T-G	E3JM-DS70R4T-G

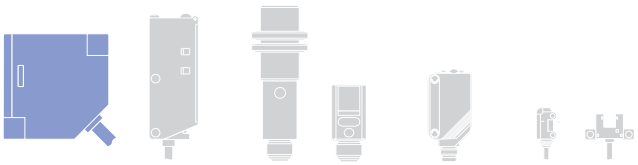
Specifications

Item		Through-beam		Retro-reflective with M.S.R.		Diffuse-reflective	
		E3JM-10	E3JM-10_T	E3JM-R	E3JM-R_T	E3JM-D	E3JM-D_T
Sensing distance		10 m		4 m (with E39-R1)		700 mm	
Light source (wave length)		Infrared LED (950 nm)		Red LED (660 nm)		Infrared LED (950 nm)	
Power supply voltage		12 to 240 VDC ±10% ripple (p-p) : 10% max. 24 to 240 VAC ±10% 50/60 Hz					
Control output	Relay output	250 VAC, 3 A max.; 5 VDC, 10 mA min.					
	DC SSR output	48 VDC, 100 mA max.; residual voltage 2V					
Response time	Relay output	≤ 30 ms					
	DC SSR output	≤ 5 ms					
Timer function	ON/OFF delay	–	0.1 s to 5 s	–	0.1 s to 5 s	–	0.1 s to 5 s
Ambient temperature		Operating: -25 to 55°C, Storage: -30 to 70°C (with no icing or condensation)					
Degree of protection		IEC60529 IP66					
Material	Case	ABS					
	Lens	Methacrylate resin					

Long distance multi-voltage photoelectric sensor in plastic housing

The E3G-M series offers the long sensing distance of the E3G family for all voltage (AC and DC) installations.

- 12 to 240 VDC and 24 to 240 VAC power supply
- Terminal block connection



Special models M18 cylindrical Compact Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method	Timer function	Order code
				Relay output
Retro-reflective with M.S.R.	0.5 to 10 m*1 (Red light)	Terminal block	–	E3G-MR19-G
			ON or OFF delay 0 to 5 s (adjustable)	E3G-MR19T-G
Distance-settable (background suppression)	0.2 to 2 m (0.2 to 1.2 m distance settable)		–	E3G-ML79-G
			ON or OFF delay 0 to 5 s (adjustable)	E3G-ML79T-G

*1 Measured with E39-R2

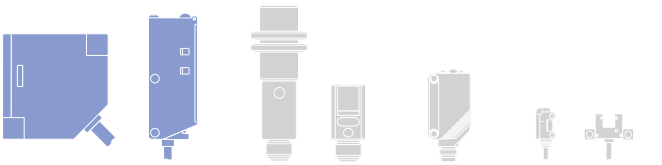
Specifications

Item		Retro-reflective with M.S.R.		Distance-settable (background suppression)	
		E3G-MR19-G	E3G-MR19T-G	E3G-ML79-G	E3G-ML79T-G
Sensing distance		0.5 to 10 m (with E39-R2)		0.2 to 2 m (0.2 to 1.2m distance settable)	
Light source (wave length)		Red LED (700 nm)		Infrared LED (860 nm)	
Power supply voltage		12 to 240 VDC ±10% ripple (p-p): 10% max. 24 to 240 VAC ±10% 50/60 Hz		12 to 240 VDC ±10% ripple (p-p): 10% max. 24 to 240 VAC ±10% 50/60 Hz	
Response time		Operation/reset: 30 ms		Operation/reset: 30 ms	
Timer function		–	ON delay/OFF delay 0 to 5 s (Adjuster variable system)	–	ON delay/OFF delay 0 to 5 s (Adjuster variable system)
Ambient temperature		Operating: -25 to 55°C, Storage: -30 to 70°C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67 (with protective cover attached)			
Material	Case	PBT (polybutylene terephthalate)			
	Lens	Acrylics (PMMA)			

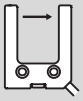
Photoelectric sensor in plastic fork shape housing

The forked shape optical through-beam sensors combine simple installation with reliable passage detection of object, machine parts or transportation elements like garment handling racks.

- Fork shape for simple installation
- 1 or 2 axis models



Ordering information

Sensor type	Sensing distance	Number of optical axes	Connection method				Order code	
							NPN output	PNP output
Through-beam 	25 mm (Infrared light)	1	–	–	2 m	–	E3Z-G61 2M	E3Z-G81 2M
			–	–	–	■ M8 4-pin	E3Z-G61-M3J	E3Z-G81-M3J
		2	–	–	2 m	–	E3Z-G62 2M	E3Z-G822M
			–	–	–	■ M8 4-pin	E3Z-G62-M3J	E3Z-G82-M3J

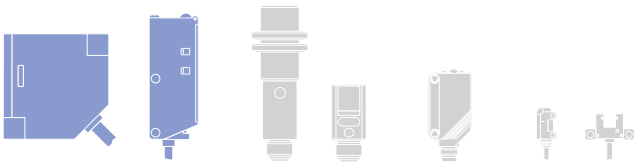
Specifications

Item		Through-beam			
	NPN output	E3Z-G61	E3Z-G61-M3J	E3Z-G62	E3Z-G62-M3J
	PNP output	E3Z-G81	E3Z-G81-M3J	E3Z-G82	E3Z-G2-M3J
Number of optical axes		1		2	
Sensing distance		25 mm (distance between arms of fork)			
Power supply voltage		12 to 24 VDC ±10% max. ripple (p-p): 10%			
Protective circuits		Output short-circuit protection, and mutual interference. prevention, power supply, reverse polarity protection			
Response time		Operation or reset: 1 ms max.			
Ambient temperature		Operating: -25 to +55°C, Storage: -40 to +70°C (with no icing or condensation)			
Degree of protection		IEC60529 IP64			
Material		ABS			

Photoelectric sensor for structured object detection in plastic housing

The special wide beam and limited-reflective optics of the E3S-LS3 ensures reliable detection of structured objects (with holes or different heights) and can be used for example to detect printed circuit boards (PCBs).

- Wide beam and limited-reflective for reliable detection of structured, shiny and irregularly shaped objects



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Output configurations	Sensing distance	Connection method				Timer function	Order code
								Light ON
Limited-reflective	NPN	20 to 35 mm (Red light)	–	–	2 m	–	No	E3S-LS3N 2M
		10 to 60 mm (Red light)						E3S-LS3NW 2M
	PNP	20 to 35 mm	–	–	2 m	–	No	E3S-LS3P 2M
							Yes	E3S-LS3PT 2M
			–	–	–	■ M8 3-pin	No	E3S-LS3P-M5J
							Yes	E3S-LS3PT-M5J
			–	–	–	■ M8 4-pin	No	E3S-LS3P-M3J
							Yes	E3S-LS3PT-M3J
		10 to 60 mm	–	–	2 m	–	No	E3S-LS3PW 2M
							Yes	E3S-LS3PWT 2M
			–	–	–	■ M8 3-pin	No	E3S-LS3PW-M5J
							Yes	E3S-LS3PWT-M5J
			–	–	–	■ M8 4-pin	No	E3S-LS3PW-M3J
							Yes	E3S-LS3PWT-M3J

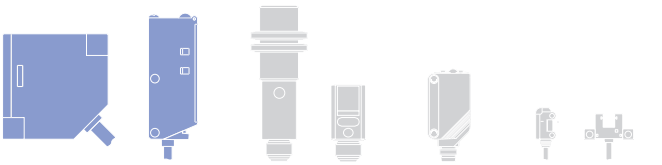
Specifications

Item		Limited-reflective	
		E3S-LS3_	E3S-LS3_W
Sensing distance		20 to 35 mm	10 to 60 mm
Light source (wave length)		Red LED (660 nm)	
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.	
Response time		Operation or reset: 1 ms max.	
Timer function		Available with E3S-LS3P(W)T models only. Time range: 0.1 to 1.0 s (adjustable)	
Ambient temperature		Operating: -10 to 55°C (with no icing or condensation) Storage: -25 to 70°C (with no icing or condensation)	
Degree of protection		IEC60529 IP40	
Material	Case	ABS	
	Lens	Acrylic	

High precision Laser sensor with separate amplifier

The separate amplifier high precision photoelectric sensors feature a large variety of different LASER sensing heads for highest precision positioning and detection applications.

- Easy installation due to adjustable focus point and optical axis
- Wide range sensor head portfolio with different laser beam shapes
- Controller functions with easy wiring concept and power tuning function



Ordering information

Sensor heads

Sensor type	Beam type	Remarks	Order code
Diffuse-reflective	Spot	Mounting a beam unit (sold separately) allows the use of line and area beams.	E3C-LD11 2M
	Line	This model number is for the set consisting of the E39-P11 mounted to the E3C-LD11.	E3C-LD21 2M
	Area	This model number is for the set consisting of the E39-P21 mounted to the E3C-LD11.	E3C-LD31 2M
Retro-reflective with M.S.R. (coaxial)	Spot (variable)	Mounting a beam unit (sold separately) allows the use of line and area beams.	E3C-LR11 2M
	Spot (2.0 mm fixed dia.)	–	E3C-LR12 2M

Amplifier units

Item	Functions	Order code			
		pre-wired		with connector*1	
		NPN output	PNP output	NPN output	PNP output
Twin-output models	Area output, self-diagnosis, differential operation	E3C-LDA11	E3C-LDA41	E3C-LDA6	E3C-LDA8
External-input models	Remote setting, counter, differential operation	E3C-LDA21	E3C-LDA51	E3C-LDA7	E3C-LDA9
ATC models	Active threshold control	E3C-LDA11AT	E3C-LDA41AT	E3C-LDA6AT	E3C-LDA8AT

*1 order connector (E3X-CN21_) separately from accessories

Specifications

Sensor heads

Item	Diffuse-reflective			Retro-reflective with M.S.R. (coaxial)			
	E3C-LD11	E3C-LD21	E3C-LD31	E3C-LR11	E3C-LR11 + E39-P31	E3C-LR11 + E39-P41	E3C-LR12
Light source (emission wave length)	Red semiconductor laser diode (650 nm), 2.5 mW max. (JIS standard: Class 2, FDA standard: Class II)						1 mW max. (JIS standard Class 1)
Sensing distance	High-resolution mode: 30 to 1,000 mm Standard mode: 30 to 700 mm Super-high-speed mode: 30 to 250 mm			7 m 5 m 2 m	1,700 mm, 1,300 mm 700 mm	900 mm 700 mm 400 mm	7 m 5 m 2 m
Beam size (typical)	0.8 mm max. (at distances up to 300 mm)	33 mm (at 150 mm)	33x15 mm (at 150 mm)	0.8 mm max. (at distances up to 1,000 mm)	28 mm (at 150 mm)	28x16 mm (at 150 mm)	2.0 mm dia. (at distances up to 1,000 mm)
Functions	Variable focal point mechanism (beam size adjustment) , optical axis adjustment mechanism (axis adjustment)						
Degree of protection	IEC60529 IP40						

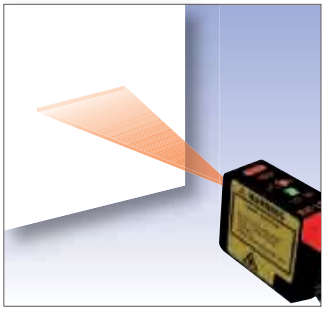
Amplifier units

Item		External-input models		Twin-output models		ATC-output models	
	NPN output	E3C-LDA21	E3C-LDA7	E3C-LDA11	E3C-LDA6	E3C-LDA11AT	E3C-LDA6AT
	PNP output	E3C-LDA51	E3C-LDA9	E3C-LDA41	E3C-LDA8	E3C-LDA41AT	E3C-LDA8AT
Supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.					
Response time	Super-high-speed mode	80 µs for operation and reset		100 µs for operation and reset			
	High-speed mode	250 µs for operation and reset					
	Standard mode	1 ms for operation and reset					
	High-resolution mode	4 ms for operation and reset					
Functions	Differential detection	Switchable between single edge and double edge detection mode. Single edge: Can be set to 250 µs, 500 µs, 1 ms, 10 ms, or 100 ms. Double edge: Can be set to 500 µs, 1 ms, 2 ms, 20 ms, or 200 ms.					
	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)					
	Counter	Switchable between up counter and down counter. Set count: 0 to 9,999,999					
	I/O settings	External input setting (Select from teaching, power tuning, zero reset, light OFF,or counter reset.)		Output setting (Select from channel 2 output, area output, or self-diagnosis.)		Output setting (Select from channel 2 output, area output, self-diagnosis, or ATC error output.)	
Digital display		Select from digital incident level + threshold or six other patterns.					
Display orientation		Switching between normal/reversed display is possible.					
Degree of protection		IP50 (IEC 60529)					

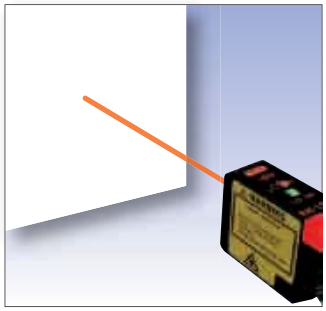
Amplifier Connectors

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

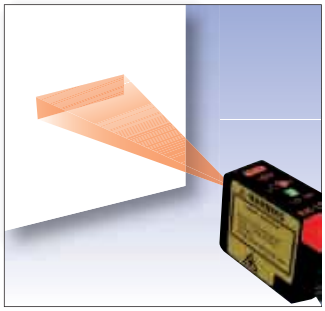
Full control over the beam shape



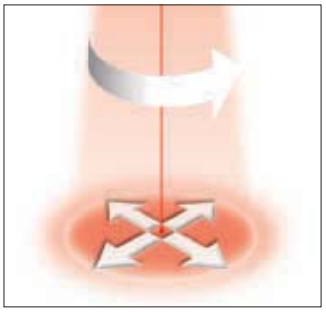
Line beam



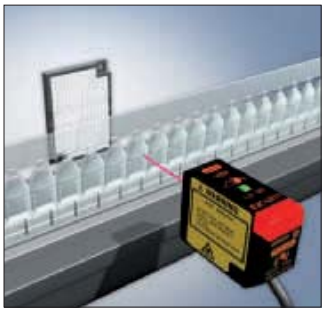
Spot beam



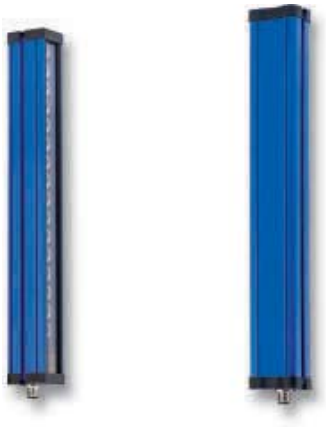
Area beam



Axis and focal point adjustment



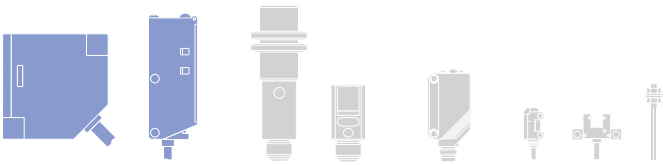
High precision positioning and detection over long range
Diffuse reflective: 1 m
Retro-reflective: 7 m



Light curtain in robust aluminium housing

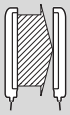
The F3ET light curtains provide a reliable area monitoring in a robust housing. The M12 5-pin connectors and optical synchronisation between emitter and receiver allow a fast and simple installation without special requirements.

- Optical synchronisation for reliable operation without additional wiring
- Robust aluminium housing
- NPN/PNP and light on/dark on selectable



Special models M18 cylindrical Compact Miniature & Photomicro

Ordering information

Sensor type	Detection area (Max_M)	Pitch	Sensing distance	Channels	Connection method				Output	Order code
Through-beam 	150	5 mm	3 m	30	–	5 pin	–	–	NPN/PNP	F3ET-005-150
		18 mm	15 m	8	–		–	–		F3ET-018-150
	300	5 mm	3 m	60	–		–	–		F3ET-005-300
		18 mm	15 m	16	–		–	–		F3ET-018-300
	600	5 mm	3 m	120	–		–	–		F3ET-005-600
		18 mm	15 m	32	–		–	–		F3ET-018-600
	900	5 mm	3 m	180	–		–	–		F3ET-005-900
		18 mm	15 m	48	–		–	–		F3ET-018-900
	2100	18 mm	15 m	112	–		–	–		F3ET-018-2100

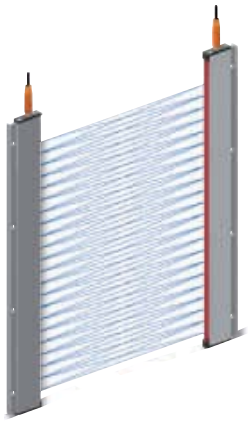
Lightcurtain accessories

Shape	Type	Comment	Order Code
	Laser alignment kit	snap-on Laser beam generator and level	F39-TGR-LLK2-SB
	Protective tube	for F3ET-_ -150	F3ET-IP150
		for F3ET-_ -300	F3ET-IP300
		for F3ET-_ -600	F3ET-IP600
		for F3ET-_ -900	F3ET-IP900

Specifications

Item		Through-beam	
		F3ET-005_	F3ET-018_
Sensing distance		0 to 3 m	0 to 15 m
Vertical detection area		0 to Max_M mm; Max_M: 150, 300, 600, 900, (2000)*1	0 to Max_M mm; Max_M: 150, 300, 600, 900, 2100*2
Minimum detectable object size		10 mm	30 mm
Pitch		5 mm	18 mm
Response time		t=5 ms + 0,18 x Channels ms	
Light source (wave length)		Infrared LED (950 nm)	
Power supply voltage		24 VDC ±10%	
Ambient temperature		0 to 50°C	
Degree of protection		IEC 60529 IP65	
Dimensions		35 x 45 x (55 + 1.06 x Max_M) mm	35 x 45 x (55 + 0.98 x Max_M) mm
Material	Case	Aluminium	

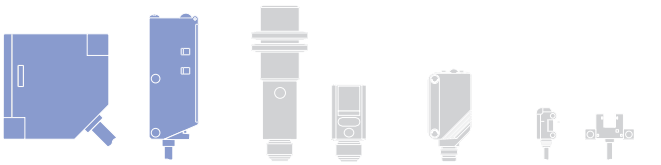
*1 Models with different detection ranges between 150 mm and 2000 mm are available in 50 mm intervals.
*2 Models with different detection ranges between 150 mm and 2100 mm are available in 150 mm intervals.



Light curtain in thin aluminium housing

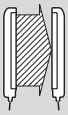
The crossing of the multiple sensor beams provides a reliable area monitoring in a thin, easy to install housing. The thin housing makes the light curtain ideal for the installation where space is crucial.

- Thin 9 mm shape for easy design-in in elevator constructions
- High ambient light immunity
- Robust aluminium housing
- Fulfils requirements of EN81-70 (1800 mm models) for mounting in elevators



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Detection area	Pitch	Sensing distance	Channels	Number of optical axis	Connection method				Output	Order code
Through-beam 	200 mm	40 mm	5 m	6	16	–	–	5 m	–	potential free output	F3E-06-T1 5M
						■	–	–	–		F3E-06-T6
	1320 mm	120 mm		12	34	–	–	5 m	–		F3E-12-T1 5M
						■	–	–	–		F3E-12-T6
	1800 mm	120 mm		16	46	–	–	5 m	–		F3E-16-T1 5M
						■	–	–	–		F3E-16-T6
		40 mm		46	136	–	–	5 m	–		F3E-46-T1 5M
						■	–	–	–		F3E-46-T6

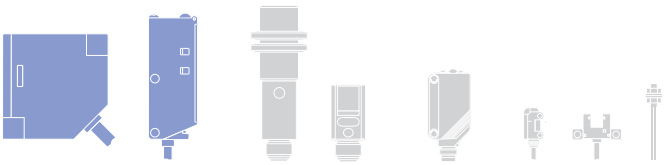
Specifications

Item		Through-beam			
		F3E-06-T_	F3E-12-T_	F3E-16-T_	F3E-46-T_
Sensing distance		0 to 5 m			
Number of LEDs		6	12	16	46
Number of optical axes		16	34	46	136
Pitch		40 mm	120 mm	120 mm	40 mm
Vertical detection range		20 to 200 mm	20 to 1320 mm	20 to 1820 mm	
Response time		max. 110 ms (signal interruption)			
Light source (wave length)		Infrared LED (880 nm)			
Power supply voltage		10 to 30 VDC			
Ambient temperature		-20 to +60°C (operation), -40 to +70°C (storage)			
EMC conformity/standards		73/23/EWG; 89/336/EWG; 95/16/EG; EN81-1; EN81-2; EN12015; EN12016; EN61000-6-x			
Degree of protection		IEC 60529 IP54			
Dimensions		400x40.7x9 mm	1590x40.7x9 mm	2070x40.7x9 mm	2000x40.7x9 mm
Material	Case	Aluminium			

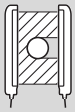
Measuring light curtain in robust aluminium housing

The F3EM provides easy to install and set up height and profile measurement. The analogue output provides a simple overall height detection and the serial output models provide single beam evaluation for profile measurements.

- Robust aluminium housing
- Analogue output for simple height detections
- Serial output with single beam evaluation for profile measurement



Ordering information

Sensor type	Measurement range (Max_M)	Pitch*1	Sensing distance	Channels	Connection method				Order code	
									Analogue output	RS232 output*2
Through-beam (measuring) 	150	5 mm	3 m	30	–	5 pin	–	–	F3EM-005-150-AV	F3EM-005-150-D2
		18 mm	15 m	8	–		–	–	F3EM-018-150-AV	F3EM-018-150-D2
	300	5 mm	3 m	60	–		–	–	F3EM-005-300-AV	F3EM-005-300-D2
		18 mm	15 m	16	–		–	–	F3EM-018-300-AV	F3EM-018-300-D2
	600	5 mm	3 m	120	–		–	–	F3EM-005-600-AV	F3EM-005-600-D2
		18 mm	15 m	32	–		–	–	F3EM-018-600-AV	F3EM-018-600-D2
	900	5 mm	3 m	180	–		–	–	F3EM-005-900-AV	F3EM-005-900-D2
		18 mm	15 m	48	–		–	–	F3EM-018-900-AV	F3EM-018-900-D2
	2000	5 mm	3 m	400	–		–	–	–	F3EM-005-2000-D2
	2100	18 mm	15 m	112	–		–	–	F3EM-018-2100-AV	F3EM-018-2100-D2

*1 Models with 7.5 mm pitch are available. Contact your Omron representative.
*2 Models with RS485 serial output are available. Contact your Omron representative.

Lightcurtain accessories

Shape	Type	Comment	Order Code
	Laser alignment kit	snap-on Laser beam generator and level	F39-TGR-LLK2-SB
	Protective tube	for F3EM-_ -150	F3ET-IP150
		for F3EM-_ -300	F3ET-IP300
		for F3EM-_ -600	F3ET-IP600
		for F3EM-_ -900	F3ET-IP900

Specifications

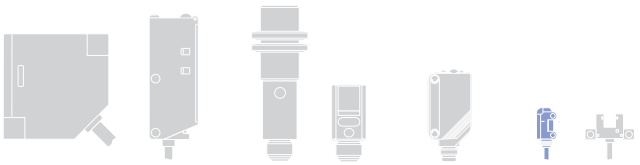
Item		Through-beam	
		F3EM-005_	F3EM-018_
Sensing distance		0 to 3 m	0 to 15 m
Vertical measurement range		0 to Max_M mm; Max_M: 150, 300, 600, 900, (2000)*1	0 to Max_M mm; Max_M: 150, 300, 600, 900, 2100*2
Minimum detectable object size		10 mm	30 mm
Pitch		5 mm	18 mm
Response time		Analogue output: 5 ms + 0,18 x Channels; Serial output: 4.5 ms + 0.38 x Channels at 4800 bps	
Light source (wave length)		Infrared LED (950 nm)	
Power supply voltage		24 VDC ±10%	
Ambient temperature		0 to 50°C	
Degree of protection		IEC 60529 IP65	
Dimensions		35 x 45 x (55 + 1.06 x Max_M) mm	35 x 45 x (55 + 0.98 x Max_M) mm
Material	Case	Aluminium	

*1 Models with different measurement ranges between 150 mm and 2000 mm are available in 50 mm intervals. Please note that measurement ranges between 1000 mm and 2000 mm are only available for serial output models.
*2 Models with different measurement ranges between 150 mm and 2100 mm are available in 150 mm intervals.

Photoelectric sensor in miniature plastic housing

Small sized photoelectric sensors in flat and side view shape for demanding mounting conditions.

- Small size with precision pinpoint LED where space is crucial
- 3.5 mm flat model with reliable background suppression and small black/white error
- Unique optical alignment technology ensuring minimal deviation of optical axis
- High EMC and ambient light immunity



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method				Operation mode	Order code[*1]	
							NPN output	PNP output
Through-beam	1 m	–	–	2 m	For ordering pigtail versions replace '2M' of cable types with: - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	Light-ON	E3T-ST11 2M	E3T-ST13 2M
						Dark-ON	E3T-ST12 2M	E3T-ST14 2M
	300 mm					Light-ON	E3T-ST21 2M	E3T-ST23 2M
						Dark-ON	E3T-ST22 2M	E3T-ST24 2M
Through-beam	500 mm					Light-ON	E3T-FT11 2M	E3T-FT13 2M
						Dark-ON	E3T-FT12 2M	E3T-FT14 2M
	300 mm					Light-ON	E3T-FT21 2M	E3T-FT23 2M
						Dark-ON	E3T-FT22 2M	E3T-FT24 2M
Retro-reflective	30 to 200 mm[*2] on reflectors/ 10 to 100 mm[*2] on reflective foils					Light-ON	E3T-SR41-C 2M[*3]	E3T-SR43-C 2M[*3]
						Dark-ON	E3T-SR42-C 2M[*3]	E3T-SR44-C 2M[*3]
Diffuse-reflective	5 to 30 mm					Light-ON	E3T-FD11 2M	E3T-FD13 2M
						Dark-ON	E3T-FD12 2M	E3T-FD14 2M
Limited-reflective	5 to 15 mm					Light-ON	E3T-SL11 2M	E3T-SL13 2M
						Dark-ON	E3T-SL12 2M	E3T-SL14 2M
	5 to 30 mm					Light-ON	E3T-SL21 2M	E3T-SL23 2M
						Dark-ON	E3T-SL22 2M	E3T-SL24 2M
Diffuse-reflective (background suppression)	1 to 15 mm					Light-ON	E3T-FL11 2M	E3T-FL13 2M
						Dark-ON	E3T-FL12 2M	E3T-FL14 2M
	1 to 30 mm					Light-ON	E3T-FL21 2M	E3T-FL23 2M
						Dark-ON	E3T-FL22 2M	E3T-FL24 2M

*1 For pre-wired models with robotic cables add '-R' to the order code (example: E3T-FT21R 2M)
*2 The distances are measured with reflector E39-R4 and reflective foil E39-R37-CA. For applications with shorter distances between the sensor and the reflector contact your OMRON representative.
*3 Order reflector separately. Models with included reflectors are available.

Specifications

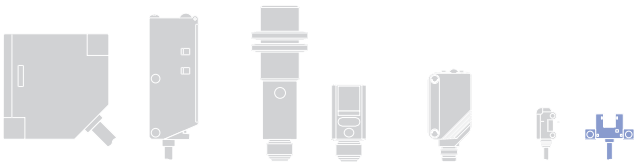
Item		Through-beam				Retro-reflective	
		Side-view		Flat		Side-view	
		NPN	PNP	NPN	PNP	NPN	PNP
		E3T-ST11 E3T-ST12 E3T-ST21 E3T-ST22	E3T-ST13 E3T-ST14 E3T-ST23 E3T-ST24	E3T-FT11 E3T-FT12 E3T-FT21 E3T-FT22	E3T-FT13 E3T-FT14 E3T-FT23 E3T-FT24	E3T-SR41 E3T-SR42	E3T-SR43 E3T-SR44
Sensing distance		E3T-ST1_: 1 m E3T-ST2_: 300 mm		E3T-FT1_: 500 mm E3T-FT2_: 300 mm		30 to 200 mm (with E39-R4) 10 to 100 mm (with E39-R37-CA)	
Light source (wave length)		Red LED (“Pin-point” LED) λ = 650 nm					
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.					
Protective circuits		Power supply and control output reverse polarity protection Output short-circuit protection				Power supply and control output reverse polarity protection Output short-circuit protection, mutual interference prevention, surge suppressor	
Ambient temperature range		Operating: -25 to 55°C (with no icing or condensation) Storage: -40 to 70°C (with no icing or condensation)					
Degree of protection		IP67 (IEC60529)					
Materials	Case	PBT (polybutylene terephthalate)					
	Display window	Denatured polyarylate					
	Lens	Denatured polyarylate				Methacrylic resin	

Item		Diffuse-reflective		Limited-reflective				Diffuse-reflective (background suppression)			
		Flat		Side-view				Flat			
		NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
		E3T-FD11 E3T-FD12	E3T-FD13 E3T-FD14	E3T-SL11 E3T-SL12	E3T-SL13 E3T-SL14	E3T-SL21 E3T-SL22	E3T-SL23 E3T-SL24	E3T-FL11 E3T-FL12	E3T-FL13 E3T-FL14	E3T-FL21 E3T-FL22	E3T-FL23 E3T-FL24
Sensing distance		5 to 30 mm		5 to 15 mm		5 to 30 mm		1 to 15 mm		1 to 30 mm	
Black/white error		–						15% max.			
Light source (wave length)		Red LED (“Pin-point” LED) λ = 650 nm									
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.									
Protective circuits		Power supply and control output reverse polarity protection Output short-circuit protection, Mutual interference prevention									
Ambient temperature		Operating: -25 to 55°C Storage: -40 to 70°C (with no icing or condensation)									
Degree of protection		IEC60529 IP67									
Materials	Case	PBT (polybutylene terephthalate)									
	Display window	Denatured polyarylate									
	Lens	Denatured polyarylate									

Photo microsensor in plastic fork shape housing

Standard photo microsensors with 50 to 100 mA direct switching capacity for best value-performance ratio to detect machine parts or small objects independent of material or magnetic fields.

- Response frequency up to 1 kHz
- Wide operating voltage range: 5 to 24 VDC



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Connector models

Sensor type	Sensing distance	Connection method	Operation Mode	Shape*1	Order code *2	
					NPN output	PNP output
Through-beam with slot	5 mm (slot width) (Infrared light)	Connector (4 pin)*3	Dark-ON/Light-ON (selectable)	Standard	EE-SX670	EE-SX670P
				L-shaped	EE-SX671	EE-SX671P
				T-shaped, 7 mm	EE-SX672	EE-SX672P
				Close-mounting	EE-SX673	EE-SX673P
					EE-SX674	EE-SX674P
				T-shaped, 10 mm	EE-SX675	EE-SX675P
				F-shaped	EE-SX676	EE-SX676P
				R-shaped	EE-SX677	EESX-677P

*1 For shape dimensions and variations refer to www.industrial.omron.eu
*2 For pre-wired models with 1 m cable add '-WR' to order reference (e.g. EE-SX670-WR) and for models with 30 cm cable and plug connector add '-C1J-R' to order reference (e.g. EE-SX670-C1J-R)
*3 Order connector separately from accessories

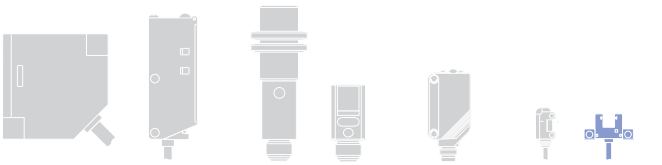
Specifications

Item		Through-beam							
		Standard	L-shaped	T-shaped, slot center: 7 mm	Close-mounting		T-shaped, slot center: 10 mm	F-shaped	R-shaped
	NPN	EE-SX670	EE-SX671	EE-SX672	EE-SX673	EE-SX674	EE-SX675	EE-SX676	EE-SX677
	PNP	EE-SX670P	EE-SX671P	EE-SX672P	EE-SX673P	EE-SX674P	EE-SX675P	EE-SX676P	EE-SX677P
Sensing distance		5 mm (slot width)							
Power supply voltage		5 to 24 VDC ±10%, ripple (p-p): 10% max.							
Response frequency		1 kHz min. (3 kHz average)							
Ambient temperature		Operating: -25 to +55°C, Storage: -30 to +80°C							
Degree of protection		IEC60529 IP50							
Material	Case	PBT (polybutylene terephthalate)							
	Lens	Polycarbonate							

Photo microsensor in thin fork shape plastic housing

Thin shaped photo microsensor for space saving mounting.

- Compact, thin profile enables mounting where space is crucial
- Indicator is visible from both sides
- Operating voltage range: 5 to 24 VDC



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Pre-wired models

Sensor type	Sensing distance	Connection method				Shape*1	Operation mode	Order code	
								NPN output	PNP output
Through-beam with slot	5 mm (slot width) (Infrared light)	–	–	2 m	–	Standard	Dark-ON	EE-SX770	EE-SX770P
							Light-ON	EE-SX870	EE-SX870P
						L-shaped	Dark-ON	EE-SX771	EE-SX771P
							Light-ON	EE-SX871	EE-SX871P
						T-shaped	Dark-ON	EE-SX772	EE-SX772P
							Light-ON	EE-SX872	EE-SX872P

*1 For shape dimensions refer to www.industrial.omron.eu

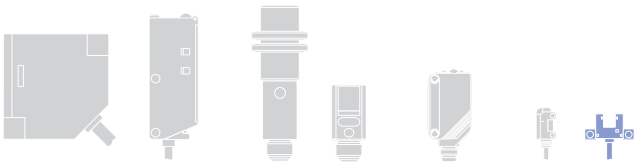
Specifications

Item		Through-beam		
		Standard	L-shaped	T-shaped
	NPN	EE-SX770/EE-SX870	EE-SX771/EE-SX871	EE-SX772/EE-SX872
	PNP	EE-SX770P/EE-SX870P	EE-SX771P/EE-SX871P	EE-SX772P/EE-SX872P
Sensing distance		5 mm (slot width)		
Power supply voltage		5 to 24 VDC ±10%, ripple (p-p): 10% max.		
Response frequency		1 kHz min. (3 kHz average)		
Ambient temperature		Operating: -25 to +55°C, Storage: -30 to +80°C (with no icing)		
Degree of protection		IEC60529 IP60		
Material	Case	PBT (polybutylene terephthalate)		
	Lens	Polycarbonate		

High frequency photo microsensor in fork shape plastic housing

The small sized photo microsensors are ideally suited for the detection of machine parts where space is crucial.

- Min. 3 kHz (8 kHz average) switching frequency



Special models | M18 cylindrical | Compact | Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Connection method				Operation mode	Shape[*1]	Order code	
								NPN output	PNP output
Through-beam with slot	5 mm (slot width) (Infrared light)	–	–	1 m	replace '-R' with '-C1J-R' in order code (example: EE-SX910-C1J-R)[*2]	Light-ON Dark-ON (2 outputs)	Standard	EE-SX910-R	EE-SX910P-R
							L-shaped	EE-SX911-R	EE-SX911P-R
							F-shaped	EE-SX912-R	EE-SX912P-R
							R-shaped	EE-SX913-R	EE-SX913P-R
							U-shaped	EE-SX914-R	EE-SX914P-R

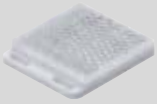
[*1] For shape dimensions refer to www.industrial.omron.eu
[*2] Order special cable connector separately from accessories

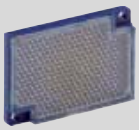
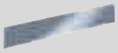
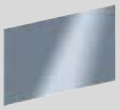
Specifications

Item		Through-beam				
		Standard	L-shaped	F-shaped	R-shaped	U-shaped
	NPN	EE-SX910-R	EE-SX911-R	EE-SX912-R	EE-SX913-R	EE-SX914-R
	PNP	EE-SX910P-R	EE-SX911P-R	EE-SX912P-R	EE-SX913P-R	EE-SX914P-R
Sensing distance		5 mm (slot width)				
Power supply voltage		5 to 24 VDC ±10%, ripple (p-p): 10% max.				
Protective circuits		Power supply reverse polarity protection; output reverse polarity protection				
Response frequency		3 kHz min. (8 kHz average) Light incident: 15 μs average; light interrupted: 40μs average				
Ambient temperature		Operating: -25 to +55°C, Storage: -30 to +80°C (with no icing or condensation)				
Degree of protection		IEC60529 IP50				
Material	Case	PBT (Polybutylene terephthalate)				
	Lens	Polycarbonate				

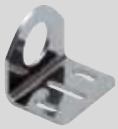
Accessories

Reflectors for retro-reflective photoelectric sensors

Shape	Type	Housing material	Features	Size in mm	Applicable Sensor	Order code
	General purpose reflectors	• ABS base • Acrylic surface	Surface screw mounting (diagonal holes)	40x60x7.5	• Retro-reflective photoelectric sensors - without M.S.R • Retro-reflective photoelectric sensors - with M.S.R.	E39-R1S
			Surface screw mounting (holes on one side only)	35.4x42.3x8		E39-R9
				51.4x60.3x8.5		E39-R42
	Small size		Side screw mounting or surface selfadhesive	41.8x22.5x11		E39-R3
			Surface screw mounting	23x13.7x4.9		E39-R4
	Large size			100x100x9		E39-R8
				84.5x84.5x8.7		E39-R40
	High precision		Microtripel for improved performance with fine beam sensors	52x40x4.8	Recommended for fine beam coaxial models (E3C-LR, E3S-CR62/67, E3T-SR4)	E39-R6
				30x45		E39-R12 E39-R14
				14x23x1		E39-R37-CA
				12x24		E39-R13
	Simple mounting		Round shape with centered mounting hole for simple screw mounting	Diameter: 84 Depth: 7.4	Photoelectric sensors with and without M.S.R.	E39-R7
	Snap mounting		Snap mounting for fast installation	Diameter: 30 Diameter of snap mount tool: 5	Recommended for snap mounting sensor E3FZ	E39-R49

Shape	Type	Housing material	Features	Size in mm	Applicable Sensor	Order code
	**Enhanced detergent resistance**	• PVC	• Surface screw mounting • IP69k after DIN 40050 part 9	40x60x7.5	Recommended for harsh environment sensors	E39-R50
				20x60x6		E39-R51
	Highest detergent resistance	• SUS316L • Borosilicat	• Surface screw mounting	43x30x5		E39-R16
	Heat resistant	• Borosilicat	• Surface screw mounting • 450°C heat resistance • Suitable for vacuum environment	95x51x8		E39-R47
	Non-fogging reflector	• ABS • Acrylic surface	Anti-fogging coating	40x60x7.5		E39-R1K
	General purpose tape reflectors	• Acrylic	• Self adhesive • Pre cut	35x10x0.6	Photoelectric sensors with and without M.S.R.	E39-RS1
					Optimised for E3T-SR4	E39-RS1-CA
				40x35x0.6		E39-RS2
					Optimised for E3T-SR4	E39-RS2-CA
				80x70x0.6		E39-RS3
					Optimised for E3T-SR4	E39-RS3-CA
			• Self adhesive • Self cut/roll material	25 mm x 5 m		E39-RS25 5 m
				25 mm x 22.8 m		E39-RS25 22.8 m
				50 mm x 5 m		E39-RS50 5 m
				50 mm x 22.8 m		E39-RS50 22.8 m
	**High precision tape reflectors**		• Self adhesive • Pre cut	195x22	Recommended for fine beam and laser sensors (E3S-CR62/67, E3C, E3X)	E39-RS4
				108x46		E39-RS5

Mounting brackets

Shape	Type	Order code
	Quick access - snap fix for cylindrical sensors; sizes M8, M12, M18, M30	Y92E-BC08 Y92E-BC12 Y92E-BC18 Y92E-BC30
	Surface mounting for snap mount sensor E3FZ	E39-EL8
	Telescope mounting for 12 mm rod for snap mount sensor E3FZ	E39-EL9
	Standard-surface mounting (for pre-wired or pigtail models)	E39-L104 *1
	Standard-backwall mounting	E39-L44 *1
	Protection-wall mounting (for pre-wired or pigtail models)	E39-L142 *1
	Protection-surface mounting	E39-L98 *1
	Telescope mounting	E39-L93FH
	3D rotation mounting	E39-EL4

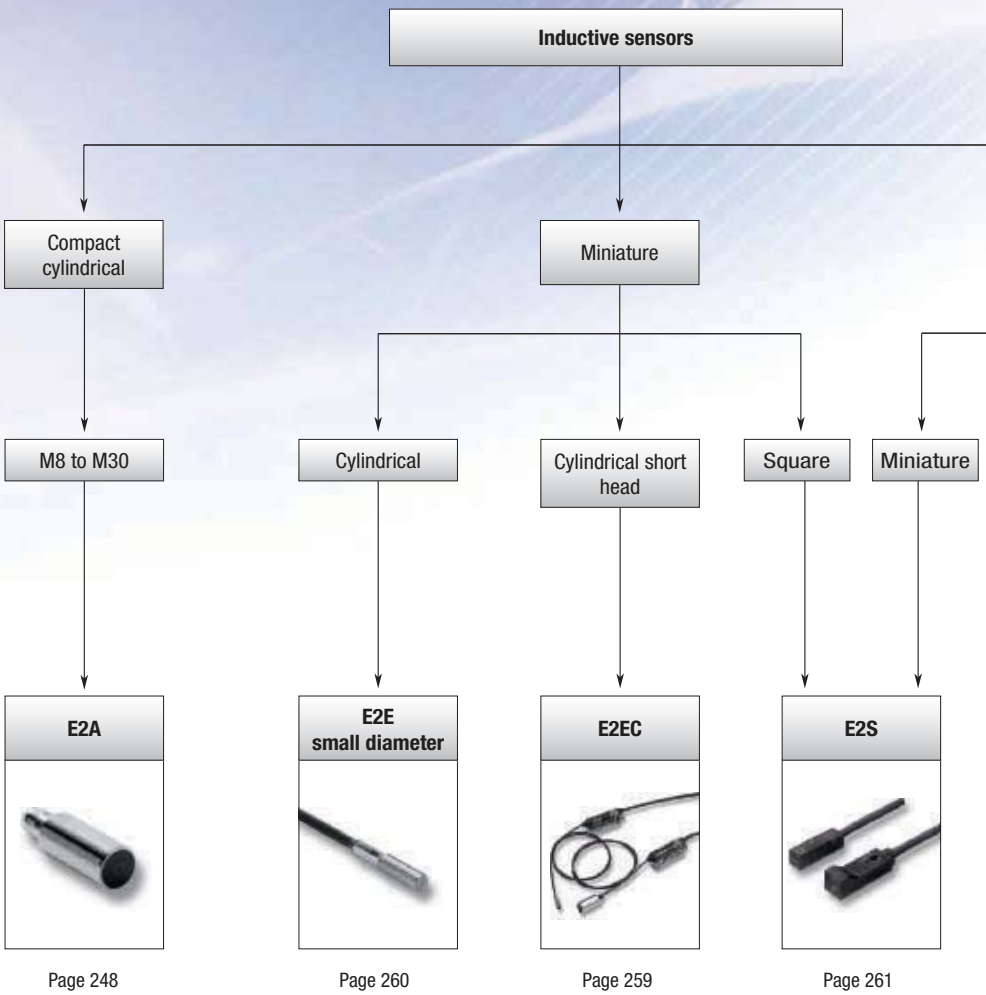
*1 The order references are examples for the E3Z sensor family. Refer to the sensor accessory datasheet E26E for the complete list of mounting brackets.

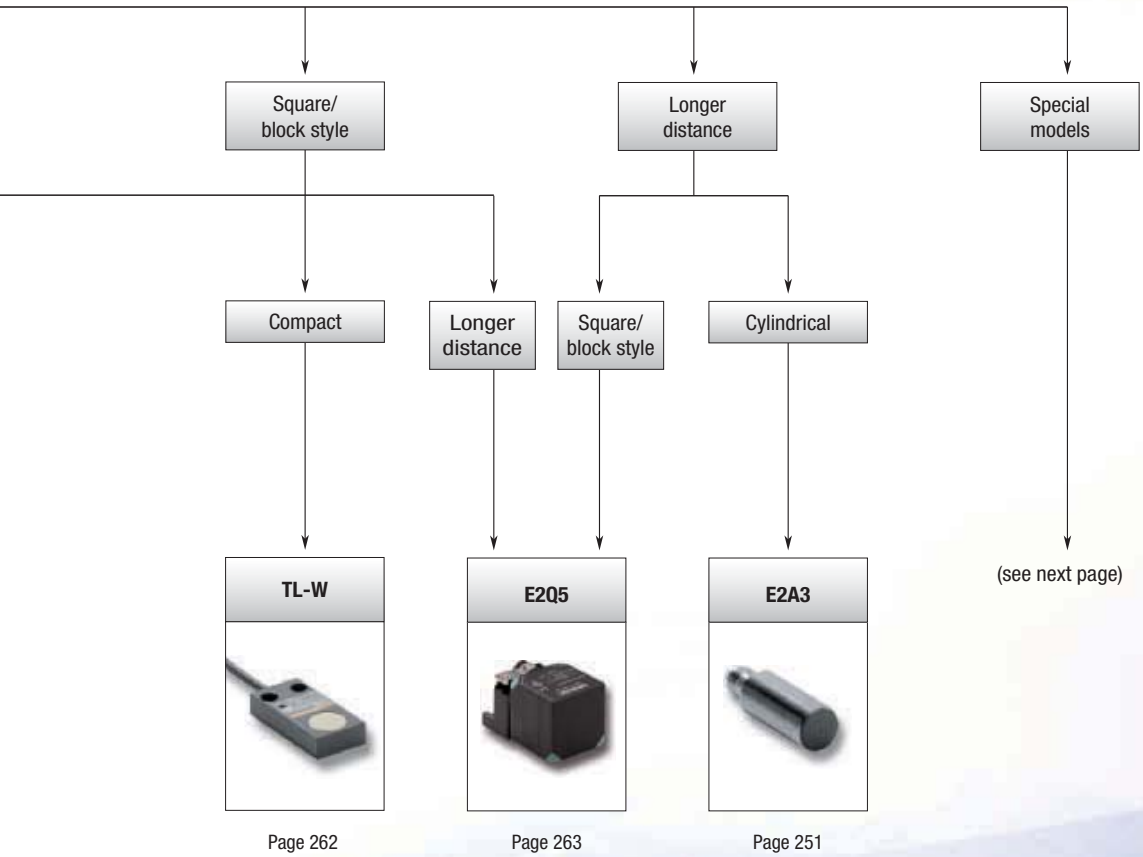
ZERO TOLERANCE ON FAILURE

Tested reliability for demanding conditions

Our inductive sensors are designed and tested to ensure a long service life and to achieve maximum machine availability even in the harshest environments.
This trusted reliability makes the E2A one of the world's most popular and successful inductive proximity sensors with more than one million units sold every year.

- Wide portfolio and application range
- Highest reliability even in demanding environments
- Designed for flexibility - modular housing design for best performance fit




Square/ block style
Longer distance
Special models
Compact
Longer distance
Square/ block style
Cylindrical
TL-W
E2Q5
E2A3
(see next page)
Page 262
Page 263
Page 251

Selection table

		Cylindrical				
Model		**E2A**	**E2A DC 2-wire**	**E2A3**	**E2EC**	**E2E small diameter**
Type		Compact	Compact	Long distance	Miniature – short head	Miniature
Material		Brass, SUS	Brass, SUS	Brass	Brass, SUS	Brass, SUS
Max. sensing distance	**dia 3**	–	–	–	0.8 mm	0.6 mm
	dia 4	–	–	–	–	0.8 mm
	M5	–	–	–	–	1 mm
	dia 5.4	–	–	–	1.5 mm	1 mm
	M8	2/4 mm	2/4 mm	3mm / –	–	–
	M12	4/8 mm	4/8 mm	6mm / –	4 mm	–
	M18	8/16 mm	8/16 mm	11mm / –	–	–
	M30	15/30 mm	15/30 mm	20mm / –	–	–
	19x6x6	–	–	–	–	–
	22x8x6	–	–	–	–	–
	31x18x10	–	–	–	–	–
	53x40x23	–	–	–	–	–
	67x40x40	–	–	–	–	–
Mount.	**Shielded**	■	■	■	■	■
	Non-shielded	■	■	–	–	–
Oper. mode	**NO**	■	■	■	■	■
	NC	■	■	■	■	■
	NO + NC	■	–	–	–	–
Wiring	**DC 2-wire**	–	■	–	■	–
	DC 3-wire	■	–	■	■	■
	DC 4-wire	■	–	–	–	–
	AC 2-wire	–	□	–	–	–
Voltage	**10-30 VDC**	■	■	■	■	■
	12-240 VAC	–	□	–	–	–
IP rating	**IP67**	■	■	■	■	■
	IP69K	■	■	■	–	–
	Page	248	250	251	259	260

Special models

Type	**Vehicle usage certified**	**ATEX 3D certified**	**Detergent and heat resistant**	**Chemical resistant**	**Full metal face**
Model	**E2AU**	**E2AX**	**E2EH**	**E2FQ**	**E2FM**
Key features	• e1 type approval (according to automotive directive 2005/83/EC)	• ATEX certification Group II category 3D (94/9/EC Appendix VIII) • typically for explosive areas zone 22 with non-leading dust	• stainless steel housing • 120°C heat resistance	• PTFE housing	• immune to aluminium and cast iron chips on sensing surface • oil resistant
3 mm	–	–	–	–	–
5.4 mm	–	–	–	–	–
M8	–	–	–	–	■
M12	■	■	■	■	■
M18	■	■	■	■	■
M30	■	■	■	■	■
Page	252	253	255	257	256

Format		Square		
Model		TL-W	E2S	E2Q5
Type		Compact	Miniature	Long distance
Material		ABS	Polyarylate	PBT
Max. sensing distance	dia 3	–	–	–
	dia 4	–	–	–
	M5	–	–	–
	dia 5.4	–	–	–
	M8	–	–	–
	M12	–	–	–
	M18	–	–	–
	M30	–	–	–
	19x6x6	–	1.6 mm	–
	22x8x6	3 mm	2.5 mm	–
	31x18x10	5 mm	–	–
	53x40x23	20 mm	–	–
	67x40x40	–	–	40 mm
Mount.	Shielded	■	–	■
	Non-shielded	■	■	■
Oper. mode	NO	■	■	■
	NC	■	■	–
	NO + NC	–	–	■
Wiring	DC 2-wire	■	■	–
	DC 3-wire	■	■	■
	DC 4-wire	–	–	■
	AC 2-wire	–	–	–
Voltage	10-30 VDC	■	■	■
	12-240 VAC	–	–	–
IP rating	IP67	■	■	■
	IP69K	–	–	■
	Page	262	261	263

Special models

Type		Oil resistant	High precision positioning
Model		E2E	E2C-EDA
Key features		• tested oil resistance on commonly used lubricants	• distance teaching up to µm accuracy
3 mm		–	■
5.4 mm		–	■
M8		■	–
M12		■	■
M18		■	■
M30		■	–
Page		254	258

■ Standard ☐ Available – No/not available

Extended sensing range inductive sensor in cylindrical brass housing

The high quality and the long-life design of the E2A extended sensing distance provides the best value performance ratio for standard applications

- Extended (double) sensing distance
- IP67 and IP69k for highest water protection
- DC 3-wire (NO, NC), DC 4-wire (NO+NC)
- Wide installation and connectivity range through modular concept

Ordering information

Pre-wired

(For different cable materials and lengths, special housing length or special connectors, please refer to complete datasheet.)

Size			Sensing distance	Thread length (overall length)	Output configuration	Order code (for pre-wired types with 2m cable length)		
						Operation mode NO	Operation mode NC	Operation mode NO + NC
M8	■	–	2.0 mm	27 (40) mm	PNP*1	E2A-S08KS02-WP-B1 2M	E2A-S08KS02-WP-B2 2M	E2A-S08LS02-WP-B3 2M*2
	–	■	4.0 mm	21 (40) mm	PNP*1	E2A-S08KN04-WP-B1 2M	E2A-S08KN04-WP-B2 2M	E2A-S08LN04-WP-B3 2M*2
M12	■	–	4.0 mm	34 (50) mm	PNP*1	E2A-M12KS04-WP-B1 2M	E2A-M12KS04-WP-B2 2M	E2A-M12KS04-WP-B3 2M
	–	■	8.0 mm	27 (50) mm	PNP*1	E2A-M12KN08-WP-B1 2M	E2A-M12KN08-WP-B2 2M	E2A-M12KN08-WP-B3 2M
M18	■	–	8.0 mm	39 (59) mm	PNP*1	E2A-M18KS08-WP-B1 2M	E2A-M18KS08-WP-B2 2M	E2A-M18KS08-WP-B3 2M
	–	■	16.0 mm	29 (59) mm	PNP*1	E2A-M18KN16-WP-B1 2M	E2A-M18KN16-WP-B2 2M	E2A-M18KN16-WP-B3 2M
M30	■	–	15.0 mm	44 (64) mm	PNP*1	E2A-M30KS15-WP-B1 2M	E2A-M30KS15-WP-B2 2M	E2A-M30KS15-WP-B3 2M
	–	■	20.0 mm	29 (64) mm	PNP*1	E2A-M30KN20-WP-B1 2M	E2A-M30KN20-WP-B2 2M	E2A-M30KN20-WP-B3 2M

Connector versions (M12)

Size			Sensing distance	Thread length (overall length)	Output configuration	Order code (for M12 connector types)		
						Operation mode NO	Operation mode NC	Operation mode NO + NC
M8	■	–	2.0 mm	27 (43) mm	PNP *1	E2A-S08KS02-M1-B1	E2A-S08KS02-M1-B2	E2A-S08LS02-M1-B3*2
	–	■	4.0 mm	21 (43) mm	PNP *1	E2A-S08KN04-M1-B1	E2A-S08KN04-M1-B2	E2A-S08LN04-M1-B3*2
M12	■	–	4.0 mm	24 (48) mm	PNP *1	E2A-M12KS04-M1-B1	E2A-M12KS04-M1-B2	E2A-M12KS04-M1-B3
	–	■	8.0 mm	27 (48) mm	PNP *1	E2A-M12KN08-M1-B1	E2A-M12KN08-M1-B2	E2A-M12KN08-M1-B3
M18	■	–	8.0 mm	39 (53) mm	PNP *1	E2A-M18KS08-M1-B1	E2A-M18KS08-M1-B2	E2A-M18KS08-M1-B3
	–	■	16.0 mm	29 (53) mm	PNP *1	E2A-M18KN16-M1-B1	E2A-M18KN16-M1-B2	E2A-M18KN16-M1-B3
M30	■	–	15.0 mm	44 (58) mm	PNP *1	E2A-M30KS15-M1-B1	E2A-M30KS15-M1-B2	E2A-M30KS15-M1-B3
	–	■	20.0 mm	29 (58) mm	PNP *1	E2A-M30KN20-M1-B1	E2A-M30KN20-M1-B2	E2A-M30KN20-M1-B3

*1 NPN models are also available.
*2 Longer housing models.

Specifications

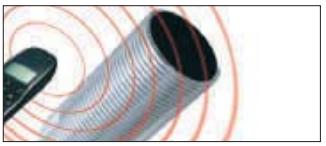
(Exemplary for shielded versions. Sensing distance is double for non-shielded version

Item		M8	M12	M18	M30
		E2A-S08KS	E2A-M12KS	E2A-M18KS	E2A-M30KS
Sensing distance		2 mm ±10%	4 mm ±10%	8 mm±10%	15 mm±10%
Response frequency		1,500 Hz	1,000 Hz	500 Hz	250 Hz
Power supply voltage (operating voltage)		12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)			
Protective circuit		Power supply reverse polarity protection, surge suppressor, short-circuit protection	Output reverse polarity protection, power supply reverse polarity protection, surge suppressor, short-circuit protection		
Ambient temperature		Operating: -40°C to 70°C, storage: -40°C to 85°C (with no icing or condensation)			
Degree of protection		IP67 after IEC 60529; IP69K after DIN 40050 part 9			
Material	Case	Stainless steel	Brass-nickel plated		
	Sensing surface	PBT			

High water resistance

Cable breakage protection

High mechanical resistance



High electro-magnetic noise immunity

High resistance against temperature change

High vibration resistance

DC 2-wire inductive sensor in cylindrical brass housing

The DC 2-wire models of the E2A family are easy to install and allow the detection of cable breakage.

- Extended (double) sensing distance
- IP67 and IP69k for highest protection in wet environments
- DC 2-wire

Ordering information

Pre-wired

(For different cable materials and lengths, special housing length or special connectors, please refer to complete datasheet.)

Size			Sensing distance	Thread length (overall length)	Order code (for pre-wired types with 2m cable length)	
					Operation mode NO	Operation mode NC
M8	■	–	2.0 mm	27 (40) mm*1	E2A-S08KS02-WP-D1 2M	E2A-S08KS02-WP-D2 2M
	–	■	4.0 mm	21 (40) mm*1	E2A-S08KN04-WP-D1 2M	E2A-S08KN04-WP-D2 2M
M12	■	–	4.0 mm	34 (50) mm*1	E2A-M12KS04-WP-D1 2M	E2A-M12KS04-WP-D2 2M
	–	■	8.0 mm	27 (50) mm*1	E2A-M12KN08-WP-D1 2M	E2A-M12KN08-WP-D2 2M
M18	■	–	8.0 mm	39 (59) mm*1	E2A-M18KS08-WP-D1 2M	E2A-M18KS08-WP-D2 2M
	–	■	16.0 mm	29 (59) mm*1	E2A-M18KN16-WP-D1 2M	E2A-M18KN16-WP-D2 2M
M30	■	–	15.0 mm	44 (64) mm*1	E2A-M30KS15-WP-D1 2M	E2A-M30KS15-WP-D2 2M
	–	■	20.0 mm	29 (64) mm*1	E2A-M30KN20-WP-D1 2M	E2A-M30KN20-WP-D2 2M

Connector versions (M12)

Size			Sensing distance	Thread length (overall length)	Order code (for M12 connector types)	
					Operation mode NO	Operation mode NC
M8	■	–	2.0 mm	27 (43) mm*1	E2A-S08KS02-M1G-D1	E2A-S08KS02-M1G-D2
	–	■	4.0 mm	21 (43) mm*1	E2A-S08KN04-M1G-D1	E2A-S08KN04-M1G-D2
M12	■	–	4.0 mm	34 (48) mm*1	E2A-M12KS04-M1G-D1	E2A-M12KS04-M1G-D2
	–	■	8.0 mm	27 (48) mm*1	E2A-M12KN08-M1G-D1	E2A-M12KN08-M1G-D2
M18	■	–	8.0 mm	39 (53) mm*1	E2A-M18KS08-M1G-D1	E2A-M18KS08-M1G-D2
	–	■	16.0 mm	29 (53) mm*1	E2A-M18KN16-M1G-D1	E2A-M18KN16-M1G-D2
M30	■	–	15.0 mm	44 (58) mm*1	E2A-M30KS15-M1G-D1	E2A-M30KS15-M1G-D2
	–	■	20.0 mm	29 (58) mm*1	E2A-M30KN20-M1G-D1	E2A-M30KN20-M1G-D2

*1 Longer housing models are available.

Specifications

(Exemplary for shielded versions. Sensing distance is double for non-shielded version)

Item		M8	M12	M18	M30
		E2A-S08KS	E2A-M12KS	E2A-M18KS	E2A-M30KS
Sensing distance		2 mm ±10%	4 mm ±10%	8 mm±10%	15 mm±10%
Response frequency		1,500 Hz	1,000 Hz	500 Hz	250 Hz
Power supply voltage (operating voltage)		12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)			
Protective circuit		Surge suppressor, short-circuit protection			
Ambient temperature		Operating: –40 °C to 70 °C, storage: –40 °C to 85 °C (with no icing or condensation)			
Standard and listings (Degree of protection)		IP67 after IEC 60529; IP69K after DIN 40050 part 9			
Material	Case	Stainless steel	Brass-nickel plated		
	Sensing surface	PBT			

Long (triple) distance inductive sensor in cylindrical brass housing

The E2A3 family features an optimised sensing performance to achieve triple sensing distance for flush mounting requirements.

- Triple distance for enhanced sensor protection from mechanical damage
- IP67 and IP69k

Ordering information

Pre-wired

(For different cable materials and lengths, special housing length or special connectors, please refer to complete datasheet.)

Size			Sensing distance	Thread length (overall length)	Output configuration	Order code (for pre-wired types with 2 m cable length)	
						Operation mode: NO	Operation mode: NC
M8	■	–	3.0 mm	27 (40) mm	PNP	E2A3-S08KS03-WP-B1 2M	E2A3-S08KS03-WP-B2 2M
					NPN	E2A3-S08KS03-WP-C1 2M	E2A3-S08KS03-WP-C2 2M
M12	■	–	6.0 mm	34 (50) mm	PNP	E2A3-M12KS06-WP-B1 2M	E2A3-M12KS06-WP-B2 2M
					NPN	E2A3-M12KS06-WP-C1 2M	E2A3-M12KS06-WP-C2 2M
M18	■	–	11.0 mm	39 (60) mm	PNP	E2A3-M18KS11-WP-B1 2M	E2A3-M18KS11-WP-B2 2M
					NPN	E2A3-M18KS11-WP-C1 2M	E2A3-M18KS11-WP-C2 2M
M30	■	–	20.0 mm	44 (65) mm	PNP	E2A3-M30KS20-WP-B1 2M	E2A3-M30KS20-WP-B2 2M
					NPN	E2A3-M30KS20-WP-C1 2M	E2A3-M30KS20-WP-C2 2M

Connector versions (M12)

Size			Sensing distance	Connection	Thread length (overall length)	Output configuration	Order code (for M12 connector types)	
							Operation mode: NO	Operation mode: NC
M8	■	–	3.0 mm	M12 Connector	27 (44) mm	PNP	E2A3-S08KS03-M1-B1	E2A3-S08KS03-M1-B2
						NPN	E2A3-S08KS03-M1-C1	E2A3-S08KS03-M1-C2
M12	■	–	6.0 mm	M12 Connector	34 (49) mm	PNP	E2A3-M12KS06-M1-B1	E2A3-M12KS06-M1-B2
						NPN	E2A3-M12KS06-M1-C1	E2A3-M12KS06-M1-C2
M18	■	–	11.0 mm	M12 Connector	39 (54) mm	PNP	E2A3-M18KS11-M1-B1	E2A3-M18KS11-M1-B2
						NPN	E2A3-M18KS11-M1-C1	E2A3-M18KS11-M1-C2
M30	■	–	20.0 mm	M12 Connector	44 (59) mm	PNP	E2A3-M30KS20-M1-B1	E2A3-M30KS20-M1-B2
						NPN	E2A3-M30KS20-M1-C1	E2A3-M30KS20-M1-C2

Specifications

Item		M8	M12	M18	M30
		E2A3-S08KS03	E2A3-M12KS06-	E2A3-M18KS11	E2A3-M30KS20
Sensing distance		3 mm ±10%	6 mm ±10%	11 mm ±10%	20 mm ±10%
Response frequency		700 Hz	350 Hz	250 Hz	80 Hz
Power supply voltage (operating voltage)		12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)			
Protective circuit		Power supply reverse polarity protection, surge suppressor, short-circuit protection	Output reverse polarity protection, power supply reverse polarity protection, surge suppressor, short-circuit protection		
Ambient temperature		Operating: -25 to 70°C, storage: -25 to 70°C			
Degree of protection		IP67 after IEC 60529; IP69K after DIN 40050 part 9			
Material	Case	Stainless steel	Brass-nickel plated		
	Sensing surface	PBT			

Inductive sensor for mobile usage in cylindrical brass housing

Designed and tested to keep your mobile machines moving.

- IP69k tested and certified for highest water resistance
- e1 type approval (according to Automotive Directive 2005/83/EC)
- Cable breakage protection

Ordering information

Pre-wired

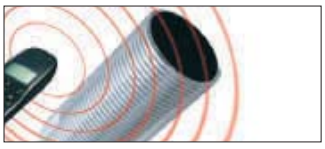
Size			Sensing distance	Output configuration	Order code (for pre-wired with 2m cable length) Operation mode: NO
M12	■	–	4.0 mm	PNP	E2AU-M12KS04-WP-B1 2M
				PNP	E2AU-M12LS04-WP-B1 2M
M18	■	–	8.0 mm	PNP	E2AU-M18KS08-WP-B1 2M
				PNP	E2AU-M18LS08-WP-B1 2M
M30	■	–	15.0 mm	PNP	E2AU-M30KS15-WP-B1 2M
				PNP	E2AU-M30LS15-WP-B1 2M

Connector versions (M12)

Size			Sensing distance	Output configuration	Order code (for M12 connector types) Operation mode: NO
M12	■	–	4.0 mm	PNP	E2AU-M12KS04-M1-B1
				PNP	E2AU-M12LS04-M1-B1
M18	■	–	8.0 mm	PNP	E2AU-M18KS08-M1-B1
				PNP	E2AU-M18LS08-M1-B1
M30	■	–	15.0 mm	PNP	E2AU-M30KS15-M1-B1
				PNP	E2AU-M30LS15-M1-B1

Specifications

Item		M12	M18	M30
		E2AU-M12_	E2AU-M18_	E2AU-M30_
Sensing distance		4 mm ±10%	8 mm ±10%	15 mm ±10%
Response frequency		1,000 Hz	500 Hz	250 Hz
Power supply voltage (operating voltage)		12 to 24 VDC. Ripple (p-p): 10% max.(10 to 32 VDC)		
Protective circuit		Output reverse polarity protection, power supply reverse polarity protection, surge suppressor, short-circuit protection		
Ambient temperature		Operating: -40 to 70°C, storage: -40 to 85°C (with no icing or condensation)		
Degree of protection		IP67 after IEC 60529, IP69K after DIN 40050 part 9		
Material	Case	Brass-nickel plated		
	Sensing surface	PBT		



High electro-magnetic noise immunity

e1

e1 type approval after 2005/83/EC

Inductive sensor for explosive environments in cylindrical brass housing

The high-reliability and robustness of the E2A family is also available for explosive environments. The protective structure of the E2A family (based on EN50014 and EN50281-1-1/2) allows the ATEX certification Group II category 3D (94/9/EC Appendix VIII) typically for explosive areas zone 22 with non-leading dust [e.g. flour].

- Protective connector cover to avoid disconnection under power
- Certified ATEX Group II category 3D (94/9/EC Appendix VIII)
- Rugged housing construction based on EN50014 and EN50281-1-1/2

Ordering information

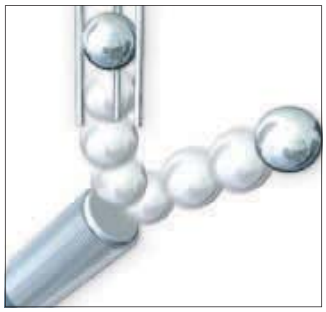
Connector versions (M12)

Size			Sensing distance	Thread length (overall length)	Output configuration	Order code (for M12 connector types)*1		
						Operation mode NO	Operation mode NC	Operation mode NO + NC
M12	■	–	4.0 mm	34 (48) mm	PNP	E2AX-M12KS04-M1-B1	E2AX-M12KS04-M1-B2	E2AX-M12KS04-M1-B3
					NPN	E2AX-M12KS04-M1-C1	E2AX-M12KS04-M1-C2	E2AX-M12KS04-M1-C3
	–	■	8.0 mm	27 (48) mm	PNP	E2AX-M12KN08-M1-B1	E2AX-M12KN08-M1-B2	E2AX-M12KN08-M1-B3
					NPN	E2AX-M12KN08-M1-C1	E2AX-M12KN08-M1-C2	E2AX-M12KN08-M1-C3
M18	■	–	8.0 mm	39 (53) mm	PNP	E2AX-M18KS08-M1-B1	E2AX-M18KS08-M1-B2	E2AX-M18KS08-M1-B3
					NPN	E2AX-M18KS08-M1-C1	E2AX-M18KS08-M1-C2	E2AX-M18KS08-M1-C3
	–	■	16.0 mm	29 (53) mm	PNP	E2AX-M18KN16-M1-B1	E2AX-M18KN16-M1-B2	E2AX-M18KN16-M1-B3
					NPN	E2AX-M18KN16-M1-C1	E2AX-M18KN16-M1-C2	E2AX-M18KN16-M1-C3
M30	■	–	15.0 mm	44 (58) mm	PNP	E2AX-M30KS15-M1-B1	E2AX-M30KS15-M1-B2	E2AX-M30KS15-M1-B3
					NPN	E2AX-M30KS15-M1-C1	E2AX-M30KS15-M1-C2	E2AX-M30KS15-M1-C3
	–	■	20.0 mm	29 (58) mm	PNP	E2AX-M30KN20-M1-B1	E2AX-M30KN20-M1-B2	E2AX-M30KN20-M1-B3
					NPN	E2AX-M30KN20-M1-C1	E2AX-M30KN20-M1-C2	E2AX-M30KN20-M1-C3

*1 Protective connector cover is included. Order cable connectors separately.

Specifications

Item		M12		M18		M30		
		E2AX-M12KS	E2AX-M12KN	E2AX-M18KS	E2AX-M18KN	E2AX-M30K S	E2AX-M30KN	E2AX-M30KN
Sensing distance		4 mm ±10%	8 mm ±10%	8 mm ±10%	16 mm ±10%	15 mm ±10%	20 mm ±10%	30 mm ±10%
Response frequency		1,000 Hz	800 Hz	500 Hz	400 Hz	250 Hz	100 Hz	100 Hz
Power supply voltage (operating voltage range)		12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)						
Protective circuit		Output reverse polarity protection, power supply reverse polarity protection, surge suppressor, short-circuit protection						
Ambient air temperature		Operating: -40 to 70°C, storage: -40 to 85°C (with no icing or condensation)						
Degree of protection		IP67 after IEC 60529 EMC after EN60947-5-2 ATEX afterEN50014 EN50281-1-1/2						
Material	Case	Brass-nickel plated						
	Sensing surface	PBT						



Mechanical protection of electronic part proven in ball drop test

Protective cable connector cover to prevent disconnection under power

ATEX certified Group II cat. 3D

Oil resistant inductive sensor in cylindrical brass housing

The standard E2E family offers tested oil resistance on commonly used oils in the automotive industry for reliable long-life operation in automotive assembly lines.

- Oil resistant PUR cable
- M8, M12, M18 and M30 standard sizes
- IP67g (water and oil resistance)

Ordering information

DC 2-wire (pre-wired)

Size			Sensing distance	Order code (for pre-wired types with 2 m cable length)	
				Operation mode NO	Operation mode NC
M8	■	–	2 mm	E2E-X2D1-U	E2E-X2D2-U
M12			3 mm	E2E-X3D1-U	E2E-X3D2-U
M18			7 mm	E2E-X7D1-U	E2E-X7D2-U
M30			10 mm	E2E-X10D1-U	E2E-X10D2-U

DC 2-wire (pre-wired with M12)

Size			Sensing distance	Order code (for pre-wired types with 30 cm cable length an M12 connector)	
				Operation mode NO	Operation mode NC
M8	■	–	2 mm	E2E-X2D1-M1TGJ-U 0.3M	E2E-X2D2-M1TGJ-U 0.3M
M12			3 mm	E2E-X3D1-M1TGJ-U 0.3M	E2E-X3D2-M1TGJ-U 0.3M
M18			7 mm	E2E-X7D1-M1TGJ-U 0.3M	E2E-X7D2-M1TGJ-U 0.3M
M30			10 mm	E2E-X10D1-M1TGJ-U 0.3M	E2E-X10D2-M1TGJ-U 0.3M

Specifications

Item		M8	M12	M18	M30
		E2E-X2D_	E2E-X3D_	E2E-X7D_	E2E-X10D_
Sensing distance		2 mm ±10%	3 mm ±10%	7 mm ±10%	10 mm ±10%
Response frequency		1.5 kHz	1.0 kHz	0.5 kHz	0.4 kHz
Power supply voltage (operating voltage)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.			
Protective circuit		Surge suppressor, output short-circuit protection (for control and diagnostic output)			
Ambient temperature		Operating: -25 °C to 70 °C, storage: -40 °C to 85 °C (with no icing or condensation)			
Degree of protection		IEC 60529 IP67 (JEM standard IP67g (waterproof and oil-proof))			
Material	Case	Stainless steel (SUS303)	Brass-nickel plated		
	Sensing surface	PBT (polybutylene terephthalate)			
	Cable	PUR for jacket, PE			

Heat and detergent resistant inductive sensor in cylindrical stainless steel housing

The heat and detergent resistant inductive sensors allow reliable metal object or machine part detection in demanding environments such as food processing.

- Temperature resistant up to 120°C
- SUS316L housing with heat resistant plastic sensing face
- IP69k for highest water resistance
- ECOLAB tested and certified detergent resistance

Ordering information

Pre-wired

Size			Sensing distance	Output configuration	Order code (for pre-wired types with 2 m cable length)	
					Operation mode NO	Operation mode NC
M12	■	–	3 mm	PNP	E2EH-X3B1 2M	E2EH-X3B2 2M
				NPN	E2EH-X3C1 2M	E2EH-X3C2 2M
				DC 2-wire	E2EH-X3D1 2M	E2EH-X3D2 2M
M18			7 mm	PNP	E2EH-X7B1 2M	E2EH-X7B2 2M
				NPN	E2EH-X7C1 2M	E2EH-X7C2 2M
				DC 2-wire	E2EH-X7D1 2M	E2EH-X7D2 2M
M30			12 mm	PNP	E2EH-X12B1 2M	E2EH-X12B2 2M
				NPN	E2EH-X12C1 2M	E2EH-X12C2 2M
				DC 2-wire	E2EH-X12D1 2M	E2EH-X12D2 2M

Connector versions (M12)

Size			Sensing distance	Output	Order code (for M12 connector types)	
					Operation mode NO	Operation mode NC
M12	■	–	3 mm	PNP	E2EH-X3B1-M1	E2EH-X3B2-M1
				NPN	E2EH-X3C1-M1	E2EH-X3C2-M1
				DC 2-wire	E2EH-X3D1-M1G	E2EH-X3D2-M1G
M18			7 mm	PNP	E2EH-X7B1-M1	E2EH-X7B2-M1
				NPN	E2EH-X7C1-M1	E2EH-X7C2-M1
				DC 2-wire	E2EH-X7D1-M1G	E2EH-X7D2-M1G
M30			12 mm	PNP	E2EH-X12B1-M1	E2EH-X12B2-M1
				NPN	E2EH-X12C1-M1	E2EH-X12C2-M1
				DC 2-wire	E2EH-X12D1-M1G	E2EH-X12D2-M1G

Specifications

Item		M12	M18	M30
		E2EH-X3_ _	E2EH-X7_ _	E2EH-X12_ _
Sensing distance		3 mm±10%	7 mm±10%	12 mm±10%
Response frequency (average)		500 Hz	300 Hz	100 Hz
Power supply voltage (operating voltage range)		12 to 24 VDC, ripple (p-p): 10% max. (10 to 32 VDC) (24 VDC max. at 100°C or higher)		
Protective circuit		Surge suppression, short circuit protection, power supply reverse polarity protection, output reverse polarity protection		
Ambient temperature*1		DC 3-wire models: 0 to 100°C (0 to 120°C for 1,000 hours), DC 2-wire models: 0 to 100°C (0 to 110°C for 1,000 hours)		
Degree of protection		IEC 60529 IP67, IP69k after DIN 40050-9		
Materials	Case, clamping nuts	Stainless steel (SUS316L)		
	Sensing surface	PBT (polybutylene terephthalate)		
	Cable	Heat-resistant PVC		

*1 Operation with power supplied for 1,000 h has been verified at 120°C for DC 3-wire models and at 110°C for DC 2-wire models. Do not bend the cable repeatedly at 100°C or higher.

120°C

Enhanced temperature resistance

Inductive proximity sensor in cylindrical full metal housing

The high durability stainless steel sensing face provides more than 20 times longer protection against mechanical damage than Conventional sensors. The high mineral oil and coolant resistance and the immunity against small metal chips on the surface make this sensor ideal for metal cutting or drilling applications.

- Full body stainless steel housing for highest mechanical protection
- Low frequency modulation for metal chip immunity
- Flame retardant cable for high protection against welding spatter damage

Ordering information

DC 2-wire (with M12 pigtail connector)

Size			Sensing distance	Output configuration	Order code (for pre-wired types with 30 cm cable length and M12 connector)
					Operation mode NO
M8	■	–	1.5 mm	DC 2-wire with polarity (pins 1-4)	E2FM-X1R5D1-M1GJ
M12			2 mm		E2FM-X2D1-M1GJ
M18			5 mm		E2FM-X5D1-M1GJ
M30			10 mm		E2FM-X10D1-M1GJ

DC 3-wire, M12 Connector versions

Size			Sensing distance	Output configuration	Order code (for M12 connector types)
					Operation mode NO
M8	■	–	1.5 mm	DC 3-wire, PNP	E2FM-X1R5B1-M1
M12			2 mm		E2FM-X2B1-M1
M18			5 mm		E2FM-X5B1-M1
M30			10 mm		E2FM-X10B1-M1

Specifications

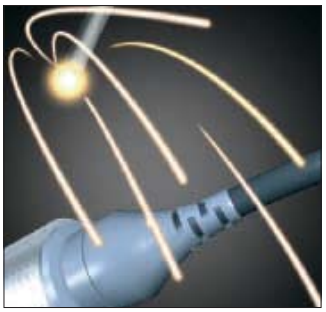
(Exemplary for DC 2-wire)

Item		M8	M12	M18	M30
		E2FM-X1R5D1	E2FM-X2D1	E2FM-X5D1	E2FM-X10D1
Sensing distance		1.5 mm±10%	2 mm±10%	5 mm±10%	10 mm±10%
Response frequency		200 Hz	100 Hz	100 Hz	50 Hz
Power supply voltage (operating voltage range)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.			
Protective circuits		Surge suppressor, output short-circuit protection			
Ambient temperature range		Operating/Storage: -25°C to +70°C (with no icing or condensation)			
Degree of protection		IEC60529 IP67, IP69k after DIN 40050 part 9			
Materials	Case	Stainless steel (SUS303)			
	Sensing surface	Stainless steel (SUS303)			
	Cable	PVC (flame retardant)			

E2FM extra strong sensing face

Conventional metal face product

No interference from small metal chips on sensing surface


Cable resistant to welding spatter

Chemical resistant inductive sensor in cylindrical PTFE housing

The E2FQ features a full-body fluoro plastic housing for chemical resistance (e.g. against cleaning agents used in the semiconductor industry).

- Full body fluoro plastic housing for chemical resistance
- DC 2-wire and DC 3-wire models

Ordering information

DC 2-wire (pre-wired)

Size			Sensing distance	Output configuration	Order code (for pre-wired types with 2 m cable length)
					Operation mode NO
M12	■	–	2 mm	DC 2-wire with polarity	E2FQ-X2D1
M18			5 mm		E2FQ-X5D1
M30			10 mm		E2FQ-X10D1

DC 3-wire (pre-wired)

Size			Sensing distance	Output configuration	Order code (for pre-wired types with 2 m cable length)
					Operation mode NO
M12	■	–	2 mm	PNP	E2FQ-X2F1
				NPN	E2FQ-X2E1
M18			5 mm	PNP	E2FQ-X5F1
				NPN	E2FQ-X5E1
M30			10 mm	PNP	E2FQ-X10F1
				NPN	E2FQ-X10E1

Specifications

Item		M12	M18	M30
		E2FQ-X2_	E2FQ-X5_	E2FQ-X10_
Sensing distance		2 mm ±10%	5 mm ±10%	10 mm ±10%
Response frequency		E1, F1 models: 1.5 kHz D1 models: 800 Hz	E1, F1 models: 600 Hz, D1 models: 500 Hz	E1, F1 models: 400 Hz, D1 models: 300 Hz
Power supply voltage (Operating voltage)		E1, F1 models: 12 to 24 VDC, ripple (p-p) : 10% max., (10 to 30 VDC) D1 models: 12 to 24 VDC, ripple (p-p) : 20% max., (10 to 36 VDC)		
Protective circuit		D1 models: surge suppressor E1, F1 models: power supply, reverse polarity protection, short circuit protection, surge suppressor		
Ambient temperature		Operating/Storage: -25 to 70°C (with no icing or condensation)		
Degree of protection		IEC60529 IP67		
Material	Case	PTFE		
	Sensing surface	PTFE		

High precision positioning inductive proximity sensor with separate amplifier

The separate amplifier inductive sensor family E2C-EDA offers high precision distance positioning and detection. The teach-in function allows simple installation, and with the window function (2 outputs) production tolerance checks can easily be set up and modified.

- Typically several hundred µm detection precision
- Precision distance teaching
- Window function (2 outputs) for production tolerance checks

Ordering information

Sensor heads

Appearance				Sensing distance	Repeat accuracy	Order code
Cylindrical	3 dia.×18	■	–	0.6 mm	1 µm	E2C-EDR6-F
	5.4 dia.×18			1 mm	1 µm	E2C-ED01*1
	8 dia.×22			2 mm	2 µm	E2C-ED02*1
Screw	M10×22			2 mm	2 µm	E2C-EM02*1
Flat	30×14×4.8			5 mm	2 µm	E2C-EV05*1
Screw	M18×46.3	–	■	7 mm	5 µm	E2C-EM07M*1
Screw (heat resistant)	M12×22	■	–	2 mm	2 µm	E2C-EM02H

*1 For models with cut-to-length cables add '-F' for example E2C-ED01-F
For models with protective stainless steel spiral tubes add '-S' for example E2C-ED01-S

Amplifier units with cables

Item	Functions	Order code	
		NPN output	PNP output
Twin-output models	Area output, open circuit detection, differential operation	E2C-EDA11	E2C-EDA41
External-input models	Remote setting, differential operation	E2C-EDA21	E2C-EDA51

Amplifier units with connectors*1

Item	Functions	Order code	
		NPN output	PNP output
Twin-output models	Area output, open circuit detection, differential operation	E2C-EDA6	E2C-EDA8
External-input models	Remote setting, differential operation	E2C-EDA7	E2C-EDA9

*1 Order fitting connector (E3X-CN21_) separately from accessories.

Specifications

Sensor heads

Item		3 dia.	5.4 dia.	8 dia.	M10	M18	30×14×4.8 mm	M12
		E2C-EDR6-F	E2C-ED01(-_)	E2C-ED02(-_)	E2C-EM02(-_)	E2C-EM07(-_)	E2C-EV05(-_)	E2C-EM02H
Sensing distance		0.6 mm	1 mm	2 mm		7 mm	5 mm	2 mm
Ambient temperature		Operating/Storage: -10°C to 60°C (with no icing or condensation)						Operating / storage: -10°C to 200°C
Degree of protection		IEC60529 IP67						IEC60529 IP60
Material	Case	Brass	Stainless steel	Brass			Zinc	Brass
	Sensing surface	Heat-resistant ABS						PEEK

Miniature short head inductive sensor for demanding mounting conditions with remote amplifier

The E2EC family features the smallest sensor heads for reliable sensing in areas where mounting space is crucial. The miniature sizes of the sensing heads are achieved by separating the sensing part from the amplifier. In contrast to standard separate amplifier models the E2EC family simplifies the installation as the amplifier is built into the cable.

- 3 mm diameter sensing head for smallest spaces
- 18 mm long ultra short M12 size housing
- Full metal housing model for highest resistance in demanding environments

Ordering information

Standard (plastic sensing surface) DC 2-wire

Size			Order code (pre-wired types with 2 m cable length)	
			Operation mode NO	Operation mode NC
3-mm dia.	■	–	E2EC-CR8D1	E2EC-CR8D2
5.4-mm dia.			E2EC-C1R5D1	E2EC-C1R5D2
8-mm dia.			E2EC-C3D1	E2EC-C3D2
M12			E2EC-X4D1	E2EC-X4D2

High protection (all metal face) DC 3-wire and DC 2-wire

Size			Order code (pre-wired types with 2 m cable length)	
			DC 3-wire Operation mode NO	DC 2-wire Operation mode NO
8-mm dia.	■	–	E2EC-MC2B1	E2EC-MC2D1
				E2EC-QC2D1-M1GJ-T (fluoroplastic coating)

*1 The remote amplifier is equipped with a M12 connector with 30 cm cable. Cable length from sensor head to remote amplifier is 0.5 m

Specifications

Item		dia 3	dia 5.4	dia 8		M12
		E2EC-CR8D_	E2EC-C1R5D_	E2EC-MC E2EC-QC	E2EC-C3D_	E2EC-X4D_
Sensing distance		0.8 mm ±15%	1.5 mm ±10%	2 mm ±10%	3 mm ±10%	4 mm ±10%
Response frequency		1.5 kHz		100 Hz	1 kHz	
Power supply voltage (Operating voltage)		12 to 24 VDC (10 to 30 VDC) ripple (p-p): 10% max.				
Protective circuit		Surge absorber, short-circuit protection				
Degree of protection		IEC60529 IP67				
Material	Case	Brass		Stainless steel (SUS303)	Brass	
	Sensing surface	ABS		Stainless steel (SUS303)	ABS	

Miniature inductive proximity sensor in cylindrical metal housing

The E2E Small Diameter line with housing sizes from dia 3 mm to dia 5.4 mm is part of the E2E family and is the ideal solution where space is crucial. The metal housing provides high mechanical protection.

- Miniature housing sizes from dia 3 mm to dia 5.4 mm
- Stainless steel or brass housing
- 3 kHz switching frequency

Ordering information

Pre-wired

Size			Sensing distance	Housing material	Output configuration	Order code (for pre-wired types with 2 m cable length)	
						Operation mode NO	Operation mode NC
dia 3 mm	■	–	0.6 mm	Stainless steel	PNP	E2E-CR6B1	E2E-CR6B2
					NPN	E2E-CR6C1	E2E-CR6C2
dia 4 mm			0.8 mm		PNP	E2E-CR8B1	E2E-CR8B2
					NPN	E2E-CR8C1	E2E-CR8C2
M5			1 mm	brass	PNP	E2E-X1B1	E2E-X1B2
					NPN	E2E-X1C1	E2E-X1C2
dia 5.4 mm					PNP	E2E-C1B1	E2E-C1B2
					NPN	E2E-C1C1	E2E-C1C2

Connector versions (M8, 3-pin)

Size			Sensing distance	Housing material	Output configuration	Order code (for M8 3-pin connector types)	
						Operation mode NO	Operation mode NC
dia 4 mm	■	–	0.8 mm	Stainless steel	PNP	E2E-CR8B1-M5	E2E-CR8B2-M5
					NPN	E2E-CR8C1-M5	E2E-CR8C2-M5
M5			1 mm	brass	PNP	E2E-X1B1-M5	E2E-X1B2-M5
					NPN	E2E-X1C1-M5	E2E-X1C2-M5

Specifications

Item		4 dia.	M5	5.4 dia.
		E2E-CR8C_/B_	E2E-X1C_/B_	E2E-C1C_/B_
Sensing distance		0.8 mm ±15%	1 mm ±15%	
Response frequency		3 kHz		
Power supply voltage (operating voltage)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.		
Protective circuit		Power supply reverse polarity protection, surge suppressor		
Ambient temperature		Operating/Storage: -25 °C to 70 °C (with no icing or condensation)		
Degree of protection		IEC 60529 IP67		
Material	Case	Stainless steel (SUS303)	Brass-nickel plated	
	Sensing surface	Heat-resistant ABS		

Miniature square inductive sensor in plastic housing

The E2S family features miniature block style plastic housings for simple mounting on flat surfaces. The durable plastic housing with front or side facing sensing surfaces, provides best value-performance ratio for machine part movement detection.

- Miniature housing with long sensing ranges
- Front and side facing sensing surfaces
- Models with simple one-screw mounting
- IP67

Ordering information

DC 2-wire models

Size in mm (HxWxD)			Sensing distance	Sensing surface	Order code (pre-wired types with 1 m cable length)	
					Operating status NO	Operating status NC
19x6x6	–	■	1.6 mm	Front face	E2S-W11 1M	E2S-W12 1M
				End face	E2S-Q11 1M	E2S-Q12 1M
23x8x8			2.5 mm	Front face	E2S-W21 1M	E2S-W22 1M
				End face	E2S-Q21 1M	E2S-Q22 1M

DC 3-wire models

Size in mm (HxWxD)			Sensing distance	Sensing surface	Output specifications	Order code	
						Operating status NO	Operating status NC
19x6x6	–	■	1.6 mm	Front face	NPN	E2S-W13 1M	E2S-W14 1M
				End face		E2S-Q13 1M	E2S-Q14 1M
27x8x8			2.5 mm	Front face		E2S-W23 1M	E2S-W24 1M
				End face		E2S-Q23 1M	E2S-Q24 1M
19x6x6			1.6 mm	Front face	PNP	E2S-W15 1M	E2S-W16 1M
				End face		E2S-Q15 1M	E2S-Q16 1M
23x8x8			2.5 mm	Front face		E2S-W25 1M	E2S-W26 1M
				End face		E2S-Q25 1M	E2S-Q26 1M

Specifications

DC 2-wire models

Item	E2S-W11 E2S-W12	E2S-Q11 E2S-Q12	E2S-W21 E2S-W22	E2S-Q21 E2S-Q22
Sensing surface	Front face	End face	Front face	End face
Sensing distance	1.6 mm ±10%		2.5 mm ±15%	
Response frequency	1 kHz min.			
Power supply voltage (operating voltage)	12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.			
Protective circuit	Surge suppressor; power supply reverse polarity protection			

DC 3-wire models

Item	E2S-W13 E2S-W14	E2S-Q13 E2S-Q14	E2S-W23 E2S-W24	E2S-Q23 E2S-Q24	E2S-W15 E2S-W16	E2S-Q15 E2S-Q16	E2S-W25 E2S-W26	E2S-Q25 E2S-Q26
Sensing surface	Front face	End face	Front face	End face	Front face	End face	Front face	End face
Sensing distance	1.6 mm ±10%		2.5 mm ±15%		1.6 mm ±10%		2.5 mm ±15%	
Response frequency	1 kHz min.							
Power supply voltage (operating voltage)	12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.							
Protective circuit	Surge suppressor; power supply reverse polarity protection							
Ambient temperature	Operating: -25 to 70°C, storage: -40 to 85°C (with no icing or condensation)							
Degree of protection	IEC60529 IP67							
Material Case	Polyarylate							

Flat shape inductive sensor in compact plastic housing

The TL-W family offers a wide range of block style inductive sensors for simple mounting on flat surfaces. With sensing distances from 1.5 mm to 20 mm the TL-W is the ideal solution for all standard applications.

- Front and side facing surface
- IP67
- DC 2-wire and DC 3-wire models
- Sensing distances from 1.5 mm to 20 mm

Ordering information

DC 2-wire models (pre-wired)

Size in mm (HxWxD)			Sensing distance	Order code (for pre-wired types with 2 m cable length)	
				Operation mode NO	Operation mode NC
71x18x10	–	■	5 mm	TL-W5MD1	TL-W5MD2

DC 3-wire models

Size in mm (HxWxD)			Sensing distance	Order code			
				Output and operation mode			
				PNP-NO	PNP-NC	NPN-NO	NPN-NC
25x8x5	–	■	1.5 mm	TL-W1R5MB1	–	TL-W1R5MC1	–
22x8x6			3 mm	TL-W3MB1	TL-W3MB2	TL-W3MC1	TL-W3MC2
31x18x10			5 mm	TL-W5MB1	TL-W5MB2	TL-W5MC1	TL-W5MC2
53x40x23			20 mm	–	–	TL-W20ME1	TL-W20ME2
31x18x10	■	–	5 mm	TL-W5F1	TL-W5F2	TL-W5E1	TL-W5E2

Specifications

Item		TL-W5MD_	TL-W1R5M_1	TL-W3M_ _	TL-W5M_ _	TL-W5E_/F_	TL-W20ME_
Sensing distance		5 mm ±10%	1.5 mm ±10%	3 mm ±10%	5 mm ±10%		20 mm ±10%
Response frequency		0.5 kHz	1 kHz min.	600 Hz min.	500 Hz min.	300 Hz min.	40 Hz min.
Power supply voltage (operating voltage)		12 to 24 VDC (10 to 30 VDC) ripple (p-p): 10% max.				10 to 30 VDC with a ripple (p-p) of 20% max.	12 to 24 VDC (10 to 30 VDC) ripple (p-p): 10% max.
Protective circuit		Surge absorber; short-circuit protection	Surge suppressor; power supply reverse polarity protection				
Ambient temperature		Operating/Storage: -25 to 70°C (with no icing or condensation)					
Degree of protection		IEC60529 IP67					
Material	Case	Heat-resistant ABS resin				Diecast aluminium	Heat-resistant ABS resin
	Sensing surface	Heat-resistant ABS resin					

Long distance inductive proximity sensor in plastic housing

The long sensing distance and simple installation on flat surfaces make the E2Q5 ideal for the detection of large metal objects for example in automotive assembly lines.

- M12 Plug-in connection
- Integrated short circuit and reverse polarity protection
- Active face positioning: Y-axis 15°, X-axis 90° increments

Ordering information

Connector versions (M12)

Size in mm (HxWxD)			Sensing distance	Active face	Output configuration	Order code (for M12 connector types)	
						Operation mode NO	Operation mode NO + NC
67x40x40	■	–	20 mm	Changeable	NPN	E2Q5-N20E1-M1	E2Q5-N20E3-M1
					PNP	E2Q5-N20F1-M1	E2Q5-N20F3-M1
	–	■	40 mm		NPN	E2Q5-N40ME1-M1	E2Q5-N40ME3-M1
					PNP	E2Q5-N40MF1-M1	E2Q5-N40MF3-M1

Specifications

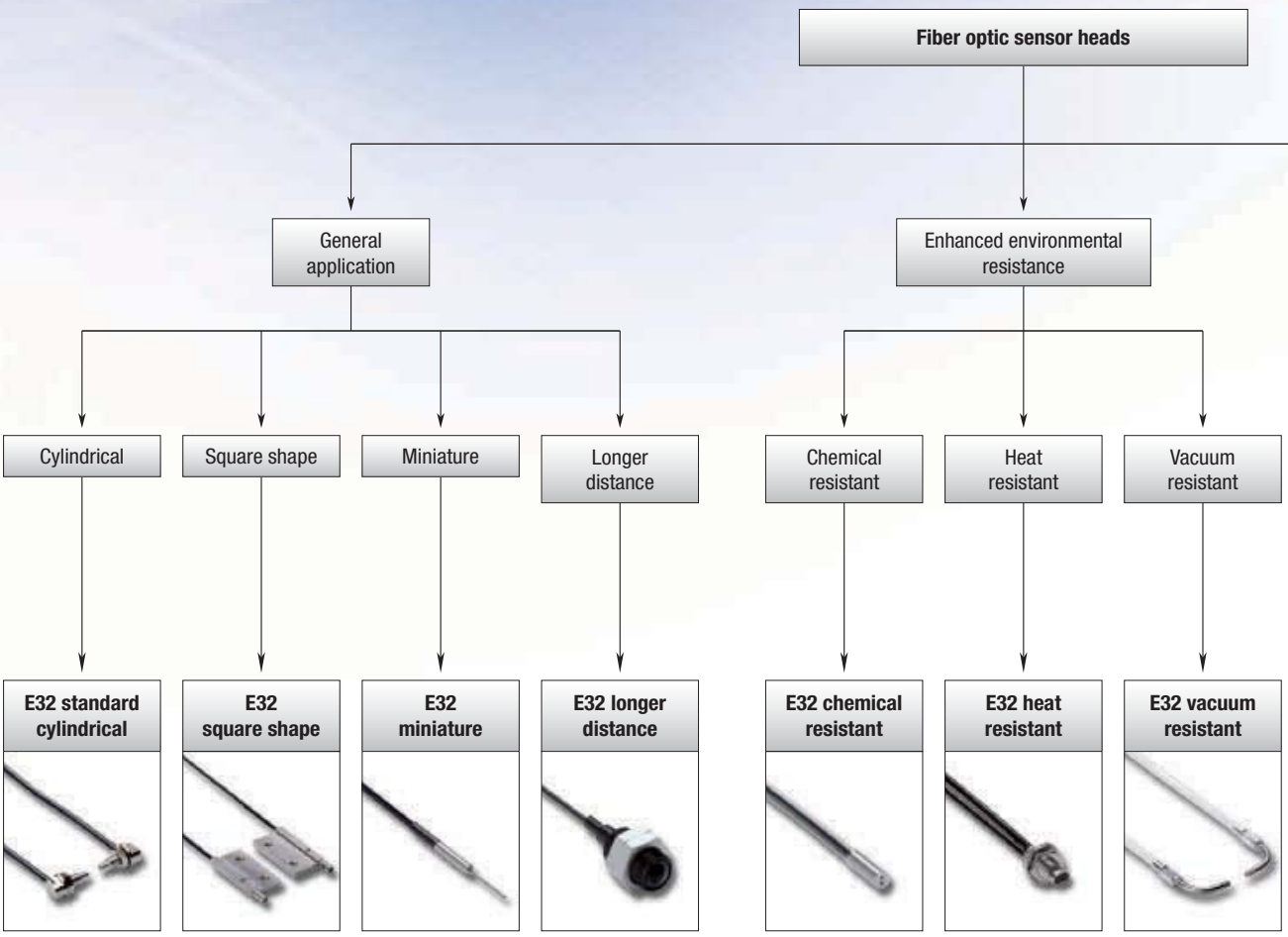
Item		E2Q5-N20__-M1	E2Q5-N40M_3-M1
Sensing distance		20 mm±10%	40 mm±10%
Response frequency		150 Hz	
Power supply voltage (operating voltage		10 to 30 VDC	
Protective circuit		Output reverse polarity protection, short-circuit protection	
Ambient temperature		Operating: -25 to 85°C	
Degree of protection		IEC 60529 IP 67; IP69k after DIN 40050 part 9	
Material	Case	PBT	
	Sensing face	PBT	

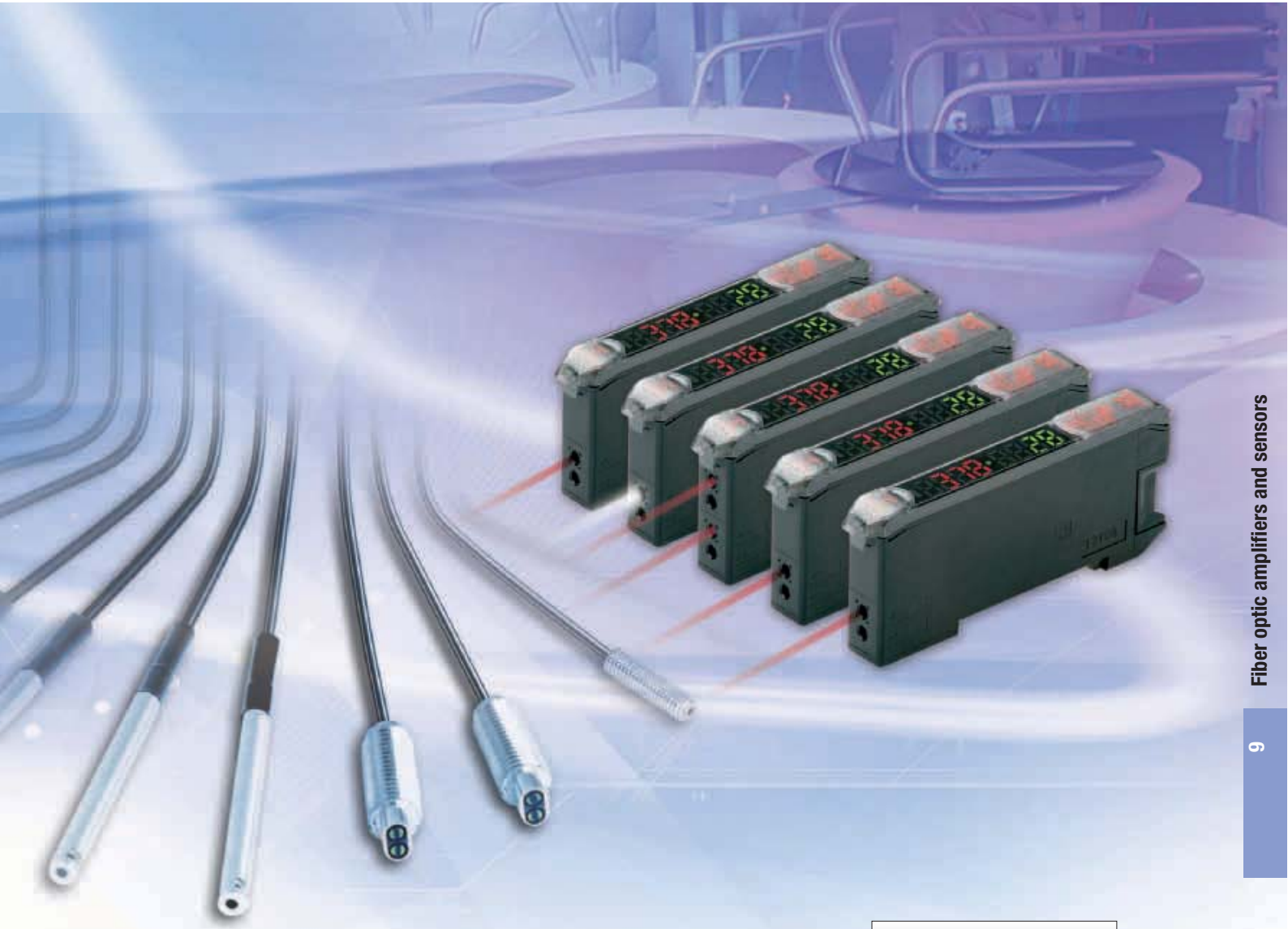
HIGH PRECISION IN SMALL SPACES

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





Fiber amplifiers

- **Special objects or installations**
  - Robot applications → **E32 robot** Page 277
  - Precision detection → **E32 precision detection** Page 278
  - Area monitoring → **E32 area monitoring** Page 280
  - Special applications → **E32 special** Page 281
- **Easy usage**
  - Easy-teach → **E3X-DA-SE-S** Page 284
  - Potentiometer adjuster → **E3X-NA** Page 285
- **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

  Page 287-293

Selection table

Fiber sensors

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	269	270	271	273	274

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

Fiber optic amplifiers

Type	Easy teach	Potentiometer adjuster	High functionality	Double amplifier
Model	**E3X-DA-SE-S**	**E3X-NA, E3X-SD**	**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	284	285	287	289

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
275	276	277	278	280	281

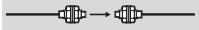
High speed	Colour/print mark detection	Infrared LED
E3X-NA-F	**E3X-DAC-S**	**E3X-DAH-S**
• Short turn on time of 20 µs	• White LED and RGB ratio comparison	• Infrared LED
20 µs	1 ms (60 µs in super high speed	1ms (55µs in super high speed
290	291	293

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

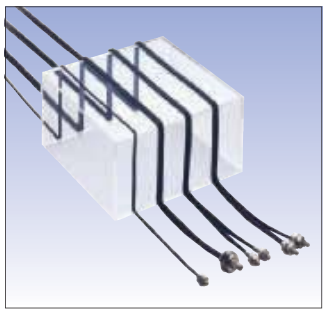
Ordering information

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
	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
	M6	–	170	–	E32-D11N 2M
	dia 6 mm	110	45	E32-D14L 2M	E32-D14LR 2M

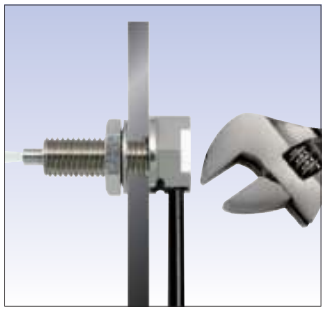
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 Measured with E39-R3

Specifications

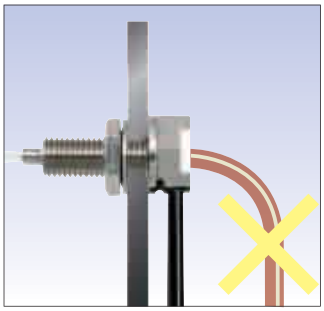
Item		Standard					High Flex			
		E32-_C200	E32-D14L	E32-_C200E	E32-D211	E32-R21	E32-E_R	E32-D14LR	E32-D211R	E32-_11N
Permissible bending radius		R25		R10			R1			
Cut to length		Yes								
Material	Head	Brass-nickel plated	Stainless steel	Brass-nickel plated	Stainless steel	Plastic (ABS)	Brass-nickel 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



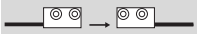
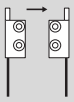
Cable exit shifted by 90° for preventing fiber breakage

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

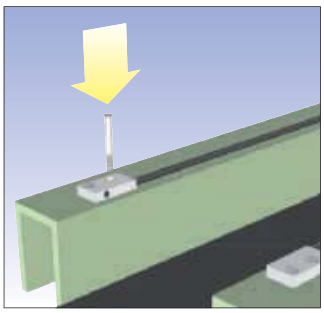
Ordering information

Sensor type	Size (in mm)	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	–

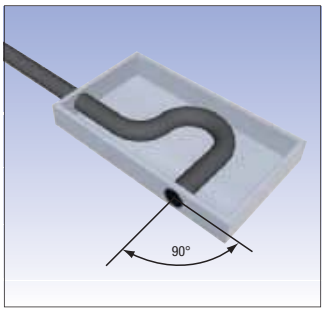
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

Specifications

Item		Standard		High flex	
		E32-_15	E32-A	E32-E	E32-_15_R
Permissible bending radius		R25	R10	R1	
Cut to length		Yes			
Material	Head	Aluminium	Brass-nickel plated	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



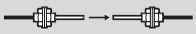
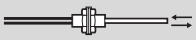
Precise positioning during manufacturing for 90° optics to achieve minimal tolerance variations in optical output axis angle

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

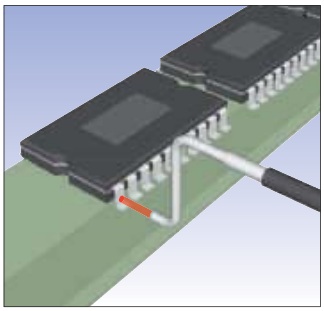
Ordering information

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

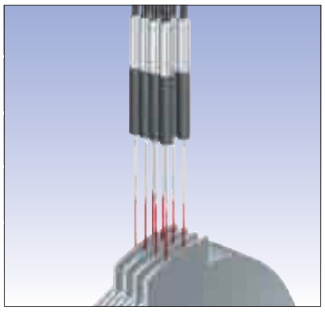
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 Models with 40 mm sleeve instead of 90 mm sleeve are available by adding '4' to the order code at the end, e.g. E32-TC200B4
*3 Sleeve cannot be bent

Specifications

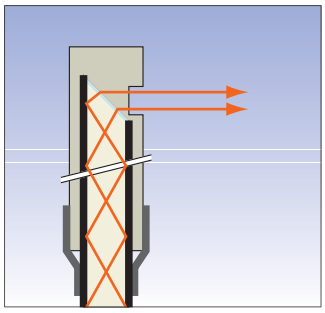
Item		Standard						High-flex				
		E32-DC200B E32-T12 E32-TC200B	E32-T14L	E32-D32	E32-D22 E32-T222 E32-TC200F	E32-D24 E32-DC200F E32-T22 E32-T24	E32-A04	E32-D32R E32-D33 E32-D331	E32-D22B	E32-DC200BR E32-T12R E32-TC200BR	E32-D22R E32-T222R E32-TC200FR	E32-D24R E32-DC200FR E32-T14LR E32-T22R E32-T223R E32-T24R
Permissible bending radius		R25			R10			R4		R1		
Cut to length		Yes										
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



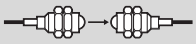
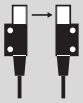
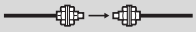
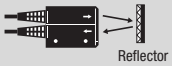
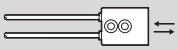
High precision fiber surface cutting and positioning during manufacturing to achieve minimal deviation of optical output axis angle

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

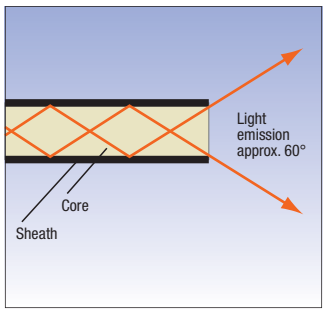
Ordering information

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

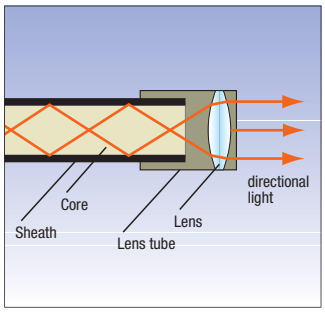
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 Measured with E39-R1

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								
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	3,000	Fluororesin cover	E32-T12F
	dia 5 mm	1,400	Fluororesin cover	E32-T14F 2M
	M6	170	Fluororesin coating	E32-D11U 2M
	dia 6 mm	95	Fluororesin cover	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-_12F/E32-_14F	E32-T51F	E32-T81F-S
Permissible bending radius (in mm)		1	4	40		10
Cut to length		yes				no
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

200°C

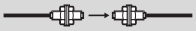
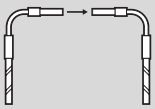
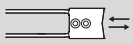
Enhanced temperature resistant models

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

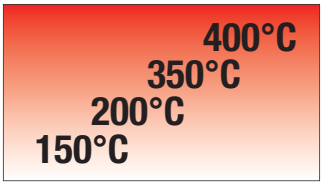
Ordering information

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	
	M4	280	-40°C to 200°C	E32-T81R-S 2M	
	M4	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	
	M6	280	-40°C to 200°C	E32-D81R-S 2M	E32-D81R 2M
	M6	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	

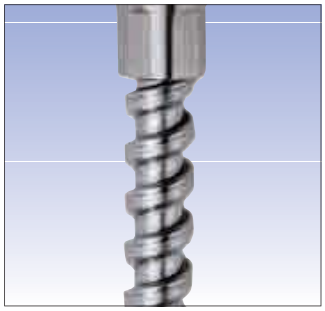
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

Specifications

Item		-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-T54	E32-A09H	E32-_ 81_	E32-T84_	E32-A09H2	E32-L6_	E32-_ 61_	E32-D73_
Permissible bending radius (in mm)		R35			R10	R25				
Cut to length		Yes			No					
Material	Head	Brass-nickel plated	Stainless steel	Aluminium	Stainless steel					
	Fiber	PMMA			Glass					
	Sheath	Fluoro resin				Stainless steel spiral coating	Stainless steel tube	Stainless steel spiral coating		Stainless steel tube
Degree of protection		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.

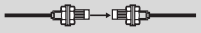
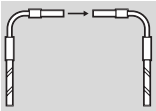
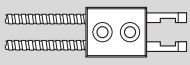
Vacuum resistant fiber sensor heads

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.

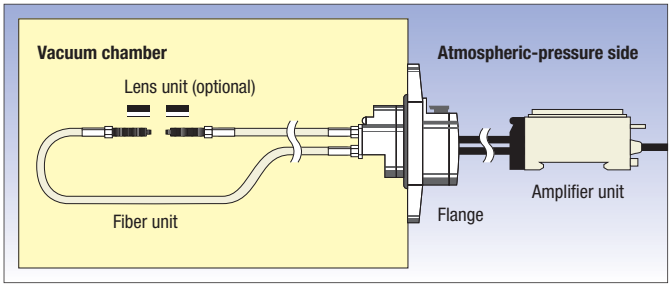
Flange

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)	



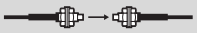
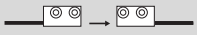
The vacuum resistant fiber heads and flanges are sealed to prevent gas leakage into vacuum areas

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 million bending cycles
- Square shapes for easy surface installation
- Cylindrical sizes from dia 1.5 mm to M6

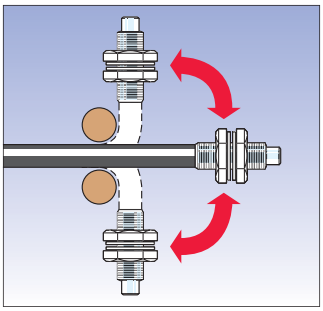
Ordering information

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

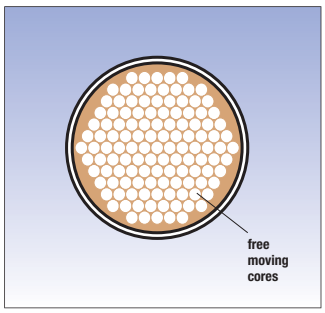
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.

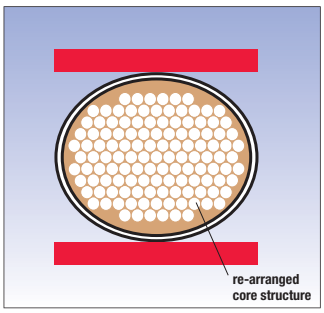
Specifications

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 million 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 diameters 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

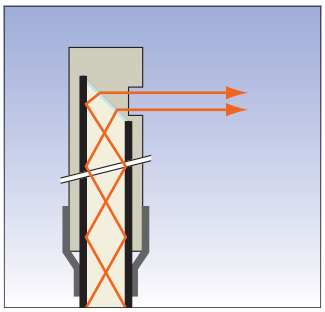
Ordering information

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
		dia 3 mm		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
		M3	Spot dia 0.2 mm	17	E32-EC41 1M + E39-F3B
		M3	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
		M6	- 90° cable exit - Hexagonal back	170	E32-C11N 2M
		M3		25	E32-C31N 2M
		M3	Small spot	8-25 m adjustable	E32-EC31 2M + E39-EF51
		dia 2 mm	Spot dia 0.5 to 1 mm	6-15 mm adjustable	E32-D32 2M + E39-F3A
		dia 2 mm	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

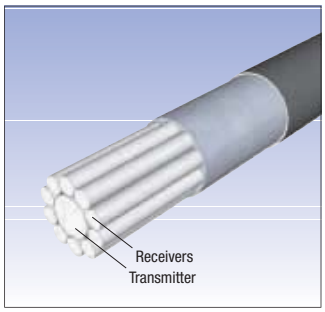
*1 Sensing distance measured with E3X-DA-SE-S family. Longer sensing distance up to 80% can be achieved with E3X-DA-S.
*2 A high flex cable version is available. Add 'R' to the order code, e.g. E32-CC200R

Specifications

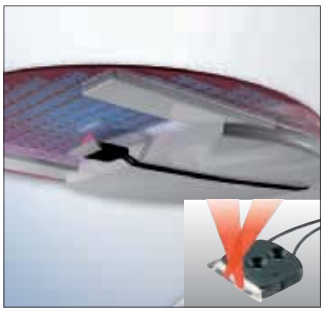
Item		Through-beam			Diffuse reflective (coaxial)			Limited reflective				
		E32-T22S	E32-A03	E32-A04	E32-C11N E32-C31N	E32-CC200	E32-C42 E32-D32/-D32L E32-EC31/-EC41	E32-EL24-1	E32-L24L E32-L25L	E32-L25	E32-L16	E32-A09
Permissible bending radius		R10	R1	R10	R4	R25		R10		R25		
Cut to length		Yes										
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



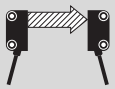
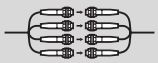
Limited reflective fibers utilize the total reflection on shiny surfaces to detect height differences or objects at a pre-defined distance.

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

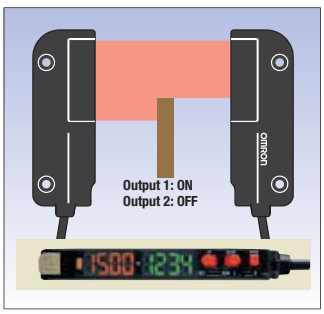
Ordering information

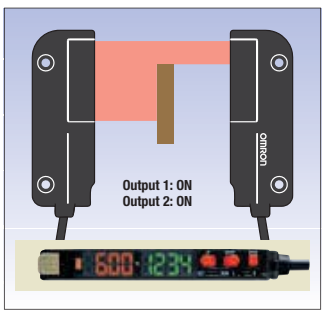
Sensor type	Area height (in mm)	Sensing distance (in mm)*1		Order code	
		Standard	High-flex	Standard	High-flex
	10	2800	–	E32-T16	–
 *2	11	1100	840	E32-T16P	E32-T16PR 2M
	30	1800	1300	E32-T16W 2M	E32-T16WR 2M
	50	–	1800	–	E32-ET16WR-2 2M
	70	–	2000	–	E32-ET16WR-1 2M
	11	1000	750	E32-T16J 2M	E32-T16JR 2M
	4* separate 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.

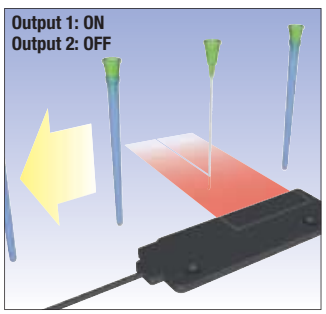
Specifications

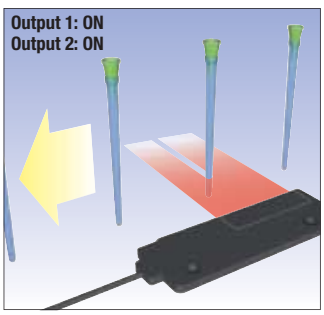
Item		Standard			High-flex		
		E32-T16	E32-M21	E32-T16J E32-T16P E32-T16W	E32-D36P1	E32-ET16WR-1 E32-ET16WR-2	E32-T16JR E32-T16PR E32-T16WR
Permissible bending radius		R25		R10	R4	R1	
Cut to length		Yes					
Material	Head	ABS	Stainless steel	ABS	Brass-nickel plated	Aluminium	ABS
	Fiber	PMMA					
	Sheath	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





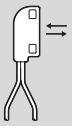
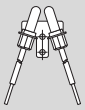
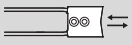
In combination with the twin output function of the E3X-DA-S amplifier, the diffuse reflective area monitoring fibers can detect very small objects (e.g. needles) and a second state (e.g cover present). The area beam compensates for position variations at high speed.

Special application fiber sensor heads

For a wide range of special applications, the task optimised fiber heads provide best fitting sensing performance and adaptation 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

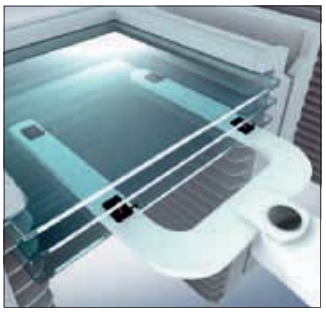
Sensor type		Size	Sensing distance (in mm) *1	Comment	Order code
	Fork shape	36x24x8 mm	10	–	E32-G14
	Wafer mapping	dia 3	1900	–	E32-T22S
		dia 3	1300	–	E32-T24S
		dia 3	890	–	E32-A03 2M
		dia 2	340	–	E32-A04 2M
	Liquid level sensor	dia 6	liquid contact	Liquid level contact	E32-D82F1 4M
		15x23.5x5 mm	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

Specifications

Item		E32-D82F1 E32-L11FS	E32-G14	E32-A09	E32-L15	E32-CC200	E32-EC31	E32-L66	E32-EL24-1	E32-T24S	E32-L24L E32-L25L	E32-A04	E32-D36T	E32-A03	E32-ET11R E32-T22S
Permissible bending radius		R40	R25						R10				R4	R1	
Cut to length		Yes						No	Yes						
Material	Head	PFA	ABS	Aluminium	PAR	Brass-nickel plated	Stainless steel		Brass-nickel plated and aluminium	Stainless steel	Brass-nickel plated	Stainless steel	ABS	Brass-nickel plated	
	Fiber	PMMA						Glass	PMMA						
	Sheath	Polyethylene coating				PVC, polyethylene and polyolefin coating		Stainless steel spiral coating	Polyethylene coating	PVC coating	Polyethylene coating		PVC coating	Polyethylene coating	PVC coating
Degree of protection		IEC 60529 IP67		IEC 60529 IP40	IEC 60529 IP50	IEC 60529 IP67		IEC 60529 IP40	IEC 60529 IP67		IEC 60529 IP50		IEC 60529 IP67	IEC 60529 IP50	IEC 60529 IP67

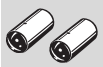
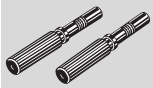
In combination with the colour/mark detection amplifier E3X-DAC-S, the recommended fibers for colour/mark detection fiber heads allow the detection of standard and challenging marks even for complex designs or with small contrast.



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	E39-F3A
	Focal lens	- For precision detection with E32-EC41	E39-F3A-5
	Focal lens	- For precision detection with E32-EC41	E39-F3B
	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 - cuttable

Digital fiber amplifier with one button teaching

E3X-DA-SE-S allows easy one button setting and provides the best value performance ratio for standard applications.

- Auto-teaching during machine operation
- Digital double display for incident level and threshold
- Object or 2-point teaching within a few seconds

Ordering information

Item	Order code	
	NPN output	PNP output
Pre-wired	E3X-DA11SE-S 2M	E3X-DA41SE-S 2M
Fiber amplifier connector*1	E3X-DA6SE-S	E3X-DA8SE-S

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

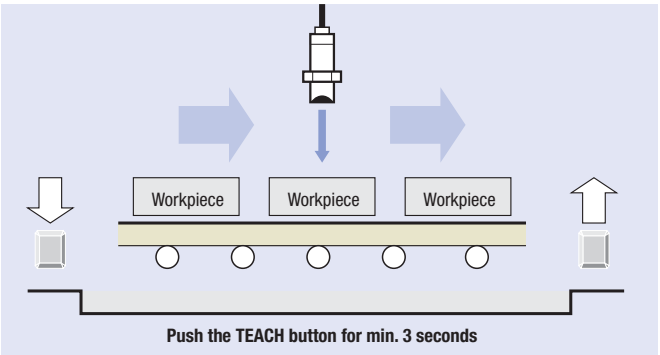
Specifications

Item		E3X-DA_SE-S
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		Operation or reset: 1 ms
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
Digital displays		Incident level + threshold

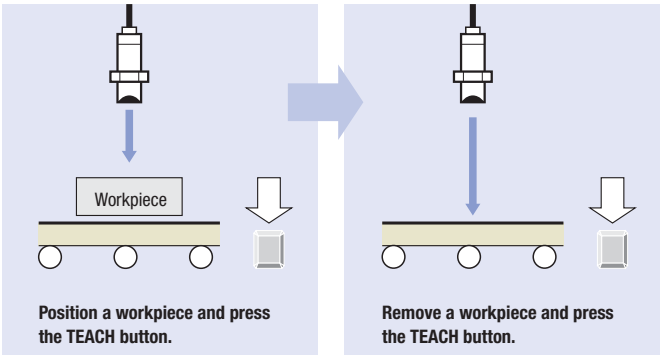
Fiber amplifier connectors

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

1-button auto-teaching



2-point teaching



Fiber amplifier for basic applications

The E3X-NA/E3X-SD is the ideal amplifier for basic fiber applications providing quick & easy adjustment.

- Easy adjustment with potentiometer (E3X-NA) or up/down keys (E3X-SD)
- Mutual interference prevention
- Enhanced water resistance types
- Bar graph display

Ordering information

Pre-wired

Item	Order code (for pre-wired types with 2 m cable length)			
	Manual adjuster		Up/down keys	
	NPN output	PNP output	NPN output	PNP output
Standard	E3X-NA11 2M	E3X-NA41 2M	E3X-SD11 2M	E3X-SD41 2M
Enhanced water resistance	E3X-NA11V 2M	E3X-NA41V 2M	-	-

Connector version

Item	Order code			
	NPN output	PNP output	Up/down keys	
			NPN output	PNP output
Standard (fiber amplifier connector)*1	E3X-NA6	E3X-NA8	E3X-SD6	E3X-SD8
Enhanced water resistance (M8 4-pin connector)	E3X-NA14V	E3X-NA44V	-	-

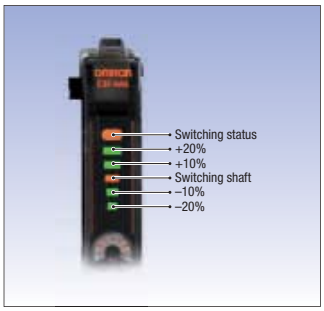
*1 Order connector separately.

Specifications

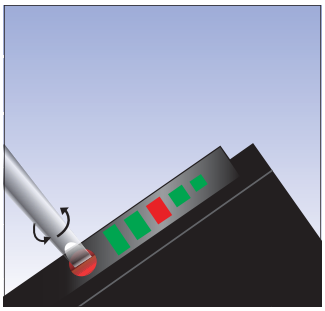
Item		Manual adjuster		Up/down keys
		Standard	Enhanced water resistance	Standard
Output	NPN output	E3X-NA11, E3X-NA6	E3X-NA11V, E3X-NA14V	E3X-SD6/E3X-SD11
	PNP output	E3X-NA41, E3X-NA8	E3X-NA41V, E3X-NA44V	E3X-SD8/E3X-SD41
Light source (wave length)		Red LED (680 nm)		Red LED (620 nm)
Power supply voltage		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)		Digital up/down keys
Functions		OFF-delay timer: 40 ms (fixed)		ON/OFF delay timer: 10 ms (fixed)
Degree of protection		IEC 60529 IP50 (with protective cover attached)	IEC 60529 IP66 (with protective cover attached)	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



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, order the fiber amplifier connector models above and the pigtail connector E3X-CN21-M3J-2 with 30cm PVC cable and M8 plug.

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		

*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, order the fiber amplifier connector models above and the pigtail connector E3X-CN21-M3J-2 with 30 cm PVC cable and M8 plug.

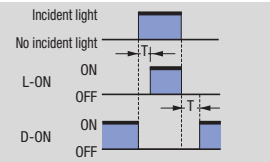
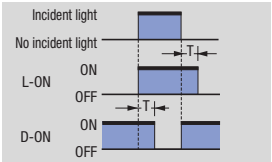
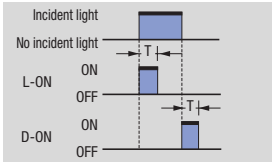
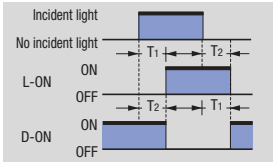
Fiber amplifier connectors

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.

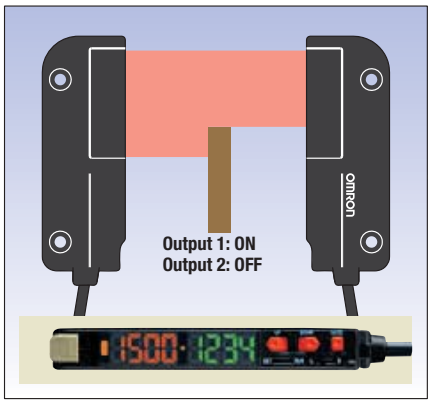
Timer functions

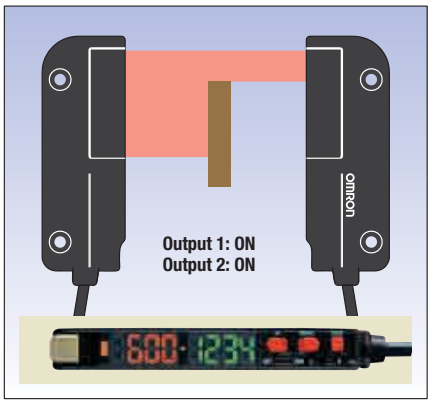
ON delay	OFF delay	One-shot	ON delay and OFF delay
			

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



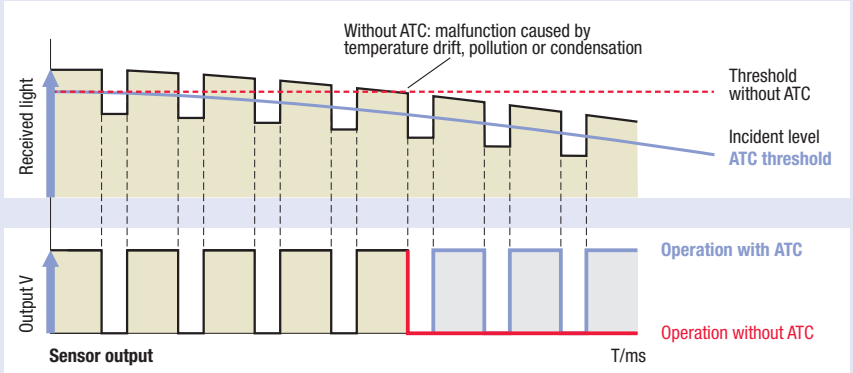


The two outputs can be used to detect two different light levels

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 simultaneously 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

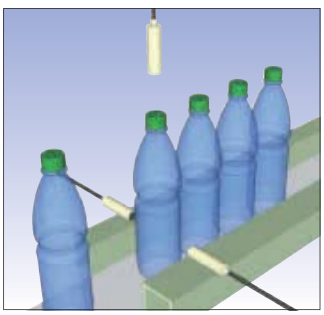
*1 Order connector separately.

Specifications

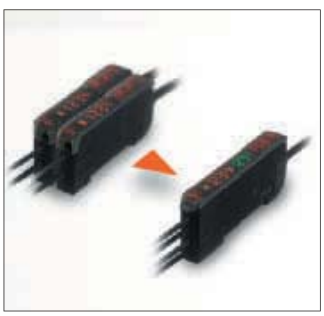
Item		E3X-MDA
Light source (wave length)		Red LED (650 nm)
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, mutual interference prevention
Response time	Super-high-speed mode	130 µs for operation 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

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 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
- Bar graph display

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)

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 length)	
		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.

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
Response 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

Fiber amplifier connectors

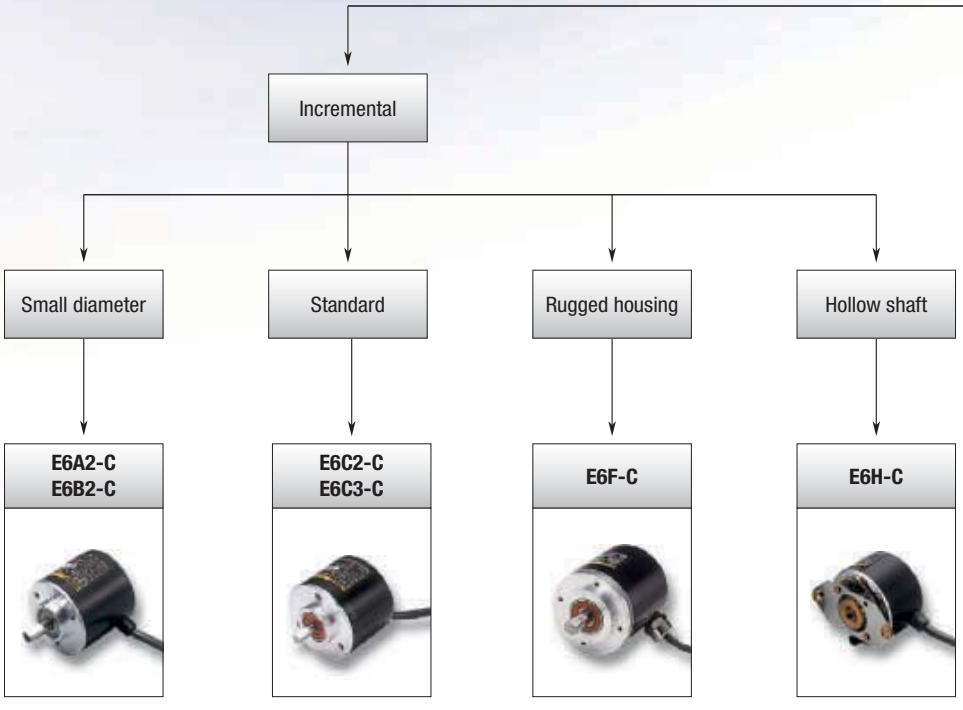
Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

ACCURACY AND ROBUSTNESS MADE RELIABLE

Close the loop – angle, position and velocity on hand

Rotary encoders create information which represent the movement of your application. To meet challenging demands, Omron offers a wide range of absolute and incremental encoders.

- Wide resolution variety
- Models with rugged housing
- Models for multi- turn applications



Rotary encoders

- Absolute
  - Multi-turn → **E6C-N** Page 299
  - Standard → **E6C3-A** Page 300
  - Rugged housing → **E6F-A** Page 300

Output		Incremental				
Model		E6A2-C	E6B2-C	E6C2-C	E6C3-C	E6F-C
Type		Small diameter shaft		Standard		Rugged housing
Resolution range	Min	10			100	
	Max	500	2,000		3,600	1,000
Output	NPN	■	■	■	■	■
	PNP	–	■	■	–	–
Size dia. in mm		25	40	50	50	60
Max force	radial	10	30	50	80	120
	axial	5	20	30	50	50
IP rating	IP50	■	■	–	–	–
	IP64	–	–	■	–	–
	IP65	–	–	–	■	■
Max. rotation frequency		5,000	6,000		5,000	
Page		297		298		

Output		Incremental	Absolute			
Model		E6H-C	E6C-N	E6C3-A	E6F-A	
Type		Hollow shaft	Multiturn	Standard	Rugged housing	
Resolution Range	Min	300	500	6	256	
	Max	3,600	500	1,024		
Output	NPN	■	■	■	■	
	PNP	–	–	■	■	
Size dia. in mm		40 (hollow)	50 (full and hollow)	50	60	
Max force	radial	29.4	30	80	120	
	axial	4.9	20	50	50	
IP rating	IP50	■	■	–	–	
	IP64	–	–	–	–	
	IP65	–	–	■	■	
Max. rotation frequency		10,000	1,500	5,000	5,000	
Page		299		300		

■ Standard ☐ Available – No/not available

Incremental rotary encoder in miniature housing

The E6A family of rotary encoders features a small sized dia 25 mm housing.

- Small sized dia 25 mm housing

Ordering information

Size dia. in mm	Output phase	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
25	A	5 to 12 VDC	NPN voltage output	10, 20, 60, 100, 200, 300, 360, 500	E6A2-CS3E
			NPN open collector	10, 20, 60, 100, 200, 300, 360, 500	E6A2-CS3C
		12 to 24VDC			E6A2-CS5C
	A, B	5 to 12 VDC	NPN voltage output	100, 200, 360, 500	E6A2-CW3E
			NPN open collector	100, 200, 360, 500	E6A2-CW3C
		12 to 24VDC			E6A2-CW5C
	A, B, Z	5 to 12 VDC	NPN voltage output	100, 200, 360, 500	E6A2-CWZ3E
			NPN open collector	100, 200, 360, 500	E6A2-CWZ3C
		12 to 24VDC			E6A2-CWZ5C

E6B2-C

Incremental rotary encoder in compact housing

The E6B family of incremental rotary encoders features a housing size dia 40 mm.

- Line driver output models available

Ordering information

Size dia. in mm	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
40	5 to 24 VDC	NPN open collector output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500 1,800, 2,000	E6B2-CWZ6C
	12 to 24VDC	PNP open collector output	100, 200, 360, 500, 600, 1,000, 2,000	E6B2-CWZ5B
	5 to 12 VDC	NPN voltage output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 1,000, 1,200, 1,500 1,800, 2,000	E6B2-CWZ3E
	5 VDC	Line driver output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 1,000, 1,024, 1,200, 1,500 1,800, 2,000	E6B2-CWZ1X

Incremental rotary encoder with enhanced water resistance

The E6C family of dia 50 mm incremental rotary encoders features an improved water resistance compared to standard models.

- IP64F or IP65F drip-proof, oil-proof construction

Ordering information

	Size dia. in mm	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
Standard models	50	5 to 24 VDC	NPN open collector output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000	E6C2-CWZ6C
		12 to 24VDC	PNP open collector output	100, 200, 360, 500, 600, 1,000, 2,000	E6C2-CWZ5B
		5 to 12 VDC	NPN voltage output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000	E6C2-CWZ3E
		5 VDC	Line driver output	10, 20, 30, 40, 50, 60, 100, 200, 300, 360, 400, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000	E6C2-CWZ1X
8 dia. tough model		12 to 24VDC	Complimentary output	100, 200, 300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6C3-CWZ5GH
		5 to 12 VDC	NPN voltage output	100, 200, 300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6C3-CWZ3EH
		5 to 12 VDC	Line driver output	100, 200, 300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6C3-CWZ3XH

E6F-C

Incremental rotary encoder in rugged housing

The E6F family of dia 60 mm rotary encoders features a rugged housing.

- Strong shaft for max 120 N in radial direction and max 50 N in thrust direction)
- Water- and oil-proof structure (IP65F)

Ordering information

Size dia. in mm	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
60	12 to 24VDC	Complimentary output	100, 200, 360, 500, 600, 1000	E6F-CWZ5G

Incremental rotary encoder with hollow shaft

The E6H family of incremental encoders features a dia 40 mm housing with hollow shaft.

- Wide operating voltage range from 5 to 24 VDC
- Line drive output available (100 m max.)

Ordering information

Size dia. in mm	Power supply voltage	Output form	Resolution (pulse/rotation)	Order code
40	5 to 24 VDC	Open collector output	300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6H-CWZ6C
	5 to 12 VDC	Voltage output	300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6H-CWZ3E
	5 to 12 VDC	Line drive output	300, 360, 500, 600, 720, 800, 1,000, 1,024, 1,200, 1,500, 1,800, 2,000, 2,048, 2,500, 3,600	E6H-CWZ3X

E6C-N

Multi-turn rotary encoder

The E6C-N rotary encoder provides a multi-turn function for applications with rotations over 360°.

- Multi-turn function

Ordering information

Size dia. in mm	Name	Order code
50	Shaft model with cable	E6C-NN5C
	Hollow-shaft model with cable	E6C-NN5CA
	Shaft model with connector	E6C-NN5C-C
	Hollow-shaft model with connector	E6C-NN5CA-C

Absolute rotary encoder with enhanced water resistance

The E6C family of dia 50 mm incremental rotary encoders features an improved water resistance compared to standard models.

- IP65F drip-proof, oil-proof construction

Ordering information

Size dia. in mm	Power supply voltage	Output form	Output code	Resolution (pulse/rotation)	Connection method	Order code
50	12 to 24VDC	NPN open collector output	Gray code	256, 360	Connector type	E6C3-AG5C-C
				256, 360, 720, 1,024	Pre-wired type	E6C3-AG5C
			Binary	32, 40		E6C3-AN5C
			BCD	6, 8, 12		E6C3-AB5C
		PNP open collector output	Gray code	256, 360, 720, 1,024		E6C3-AG5B
			Binary	32, 40		E6C3-AN5B
			BCD	6, 8, 12		E6C3-AB5B
	5 VDC	NPN voltage output	Binary	256		E6C3-AN1E
	12 VDC					E6C3-AN2E

E6F-A

Absolute rotary encoder in rugged housing

The E6F family of dia 60 mm rotary encoders features a rugged housing.

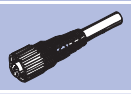
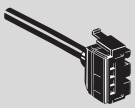
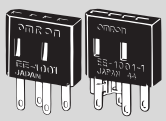
- Stronger shaft and higher durability (120 N in radial direction and 50 N in thrust direction) than previous E6F Encoders
- Drip-proof construction meets IP64F standards
- High resolution models (1024 pulses max. per revolution)
- Faster response for high speed control applications (grey code: 20 kHz)

Ordering information

Size dia. in mm	Power supply voltage	Output form	Output code	Resolution (pulses/revolution)	Connection method	Order code
60	12 to 24 VDC	NPN open collector	BCD	360	Pre-wired	E6F-AB5C
					Connector type*1	E6F-AB5C-C
			Gray code	256, 360, 720, 1,024	Pre-wired	E6F-AG5C
		PNP open collector	BCD	360	Pre-wired	E6F-AB5B
			Gray code	256, 360, 720, 1,024	Pre-wired	E6F-AG5B

*1 For extension cables order E69-DF5 (5M) or E69-DF10 (10M).

Cable connectors

Size	Shape	Type	Features	Material		Order code	
				Nut	Cable		
M8		**General purpose (screw)**	• 3 pin (LED optionally)	Brass (CuZn)	PVC 2 m PUR 2 m	XS3F-M08PVC3S2M XS3F-M08PUR3S2M	XS3F-M08PVC3A2M XS3F-M08PUR3A2M
			• 4pin		PVC 2 m PUR 2 m	XS3F-M08PVC4S2M XS3F-M08PUR4S2M	XS3F-M08PVC4A2M XS3F-M08PUR4A2M
		Detergent resistant	4 pin	Stainless steel (SUS316L)	PVC 2 m	Y92E-S08PVC4S2M-L	Y92E-S08PVC4A2M-L
		Robotic	4 pin	Brass (CuZn)	Robotic PVC 2m	XS3F-M421-402-R	XS3F-M422-402-R
M12		**General purpose (screw)**	• 3 wire (LED optionally)	Brass (CuZn)	PVC 2 m PUR 2 m	XS2F-M12PVC3S2M XS2F-M12PUR3S2M	XS2F-M12PVC3A2M XS2F-M12PUR3A2M
			• 4 wire		PVC 2 m PUR 2 m	XS2F-M12PVC4S2M XS2F-M12PUR4S2M	XS2F-M12PVC4A2M XS2F-M12PUR4A2M
			• 5 wire		PVC 2 m PUR 2 m	XS2F-M12PVC5S2M XS2F-M12PUR5S2M	XS2F-M12PVC5A2M XS2F-M12PUR5S2M
		Detergent resistant	4 wire	Stainless steel (SUS316L)	PVC 2 m	Y92E-S12PVC4S2M-L	Y92E-S12PVC4A2M-L
		105°C Heat resistant	4 wire	Stainless steel (SUS316L)	Heat resistant PVC 2 m	XS2F-E421-D80-E	XS2F-E422-D80-E
		Twist & click	4 wire	Nickel plated Zinc	PVC 2m PUR 2m	XS5F-D421-D80-A XS5F-D421-D80-P	XS5F-D422-D80-A XS5F-D422-D80-P
		Robotic	4 wire	Brass (CuZn)	Robotic PVC 2M	XS2F-D421-D80-R	XS2F-D422-D80-R
Fiber amplifier (E3X) connector		**Fiber amplifier connectors**	Special fiber connector - 4 wire	PBT	PVC 2 m	E3X-CN21	
			Special fiber connector + M8 plug	Plug: Zinc diecast	PVC 30 cm with M8 4-pin plug	E3X-CN21-M3J-2 0.3M	
			Special fiber connector + M12 plug		PVC 30 cm with M12 4-pin plug	E3X-CN21-M1J 0.3M	
Photo-micro-sensor (EE-SX) connector		**Pin connector for soldering**	For dark-on usage	Nylon	-	EE-1001	
			For light-on usage			EE-1001-1	
		Cable connector	standard cable		PVC 2m	EE-1010 2M	
			robotic cable			EE-1010-R 2M	
		Cable connector for sensors with cable+plug (pigtail)	robotic cable			EE-1016-R	

Note: Refer to accessory datasheet E26E for specification details and the extended product range including:
- AC 2-wire cable connectors
- DC 2-wire cable connectors
- T-connectors
- customisable plugs and connectors
- I/O field boxes
- Flame retardant cable connectors
- welding spatter proof cable connectors