

Industrial Sensing Guide 2008

For machines that Never Stop!







Content

Tested Reliability for machines that Never Stop!

Machine availability is critical to meet the demands expected from today's tough production schedules. With the ever increasing complexity of machines, even the smallest component failure can cause costly down time. With this in mind, Omron design and intensively test our sensors to the highest standards, to allow you to achieve the highest production performance and reliability.

- · Highest water resistance
- · Resistance against temperature change
- · Highest mechanical resistance
- · Electro-magnetic noise immunity

2 Overview

Selected industry applications

- 4 Sensing in material handling & logistics
- 6 Sensing in food packaging
- 8 Sensing in the beverage industry
- 10 Sensing in the automotive parts industry
- 12 Sensing in the semiconductor and electronics industry

Special object detection

- 14 Small/flat objects
- 16 Objects with irregular shape
- 18 Transparent objects
- 20 Objects with structured or shiny surfaces
- 22 Object detection in harsh environments

Product overview

- 24 Photoelectric sensors
- 58 Inductive sensors
- 76 Fiber optic amplifiers and sensors
- 86 Rotary encoders
- 92 Accessories
- 96 Technical information and product dimensions
- 116 Index



SPECIAL OBJECT DETECTION

SELECTED INDUSTRY APPLICATIONS



Small/flat objects

page 14



Material handling

page 4



Irregular shapes

page 16



Food packaging

page 6



Transparent objects

page 18



Beverage

page 8



Structured/shiny surfaces

page 20



Automotive parts

page 10



Objects in harsh environments

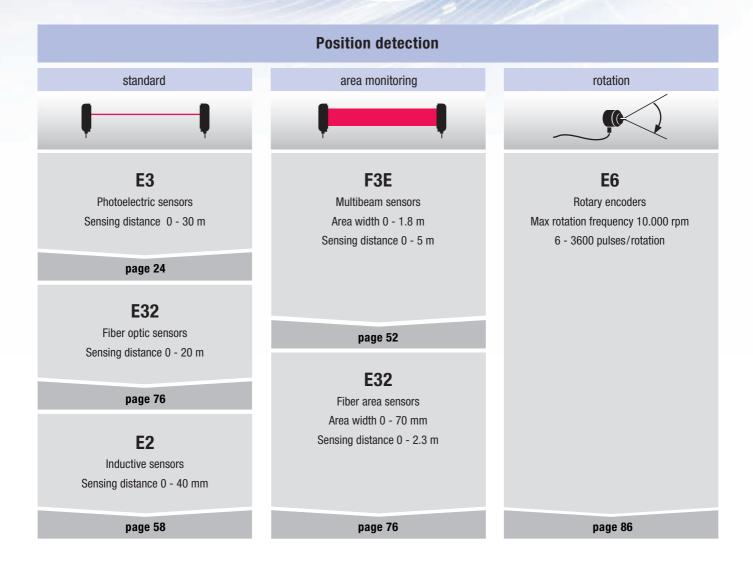
page 22

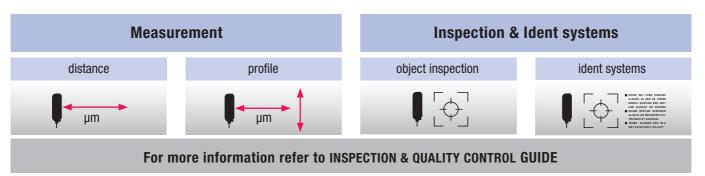


Semiconductor & Electronics

page 12

PRODUCT INFORMATION





SENSING IN MATERIAL HANDLING & LOGISTICS

For distribution systems that Never Stop

A smooth and disturbance free operation is key for today's distribution systems.

- · Avoid malfunctions due to ambient light or reflective backgrounds
- Minimize re-adjustment and maintenance during operation

INSTALLATION AND ADJUSTMENT

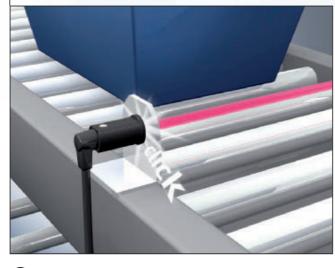
Ensure fast installation and avoid time consuming re-adjustments

- · Fast click-mounting of the E3FZ photoelectric sensor
- High accuracy of E3Z/E3F optical systems for fast and simple alignment

ENVIRONMENTAL INFLUENCES

Avoid disturbances from artificial light sources and electromagnetic noise e.g. from inverters

- · Pulse synchronisation for ambient light immunity
- Intensive shielding for high EMC

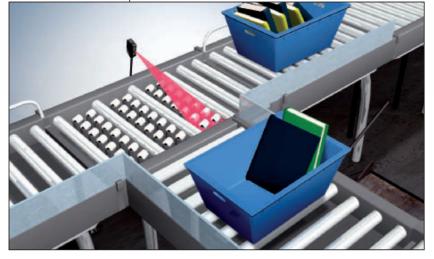


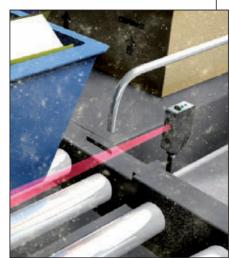














SENSING IN FOOD PACKAGING

Reliable sensing for flexible machines

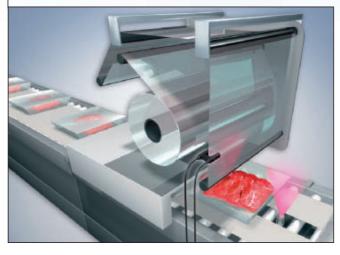
Enhanced hygiene and an increasing variety of packaging materials and shapes require easy-to-clean yet flexible packaging machine designs. A high re-usability in design and maximum efficiency during production is key to ensure a competitive food production.

- High detergent resistance for longer lifetime
- · Platform concept for enhanced flexibility
- · Proven reliability

PACKAGING MATERIAL VARIETY

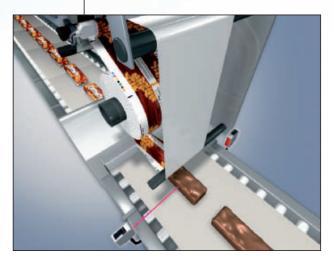
Food products are filled into a large variety of packaging materials. Transparent materials, uneven or shiny surfaces result in the usage of many special sensors in filling and wrapping machines.

- Simplify your machine design: one platform one usage concept one mounting
- Choose the performance you need
 E3Z platform reliability, simplicity and variety
 E3X platform for smallest spaces and flexible mounting





More on the detection of different materials see "special object detection - transparent materials" or "shiny surfaces"



9

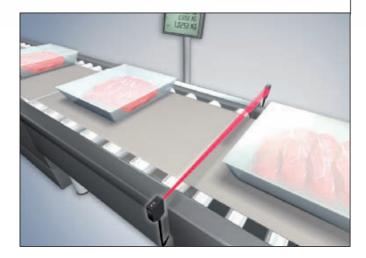
More on special task sensors (mark detection, color detection, etc) within the E3Z or E3X platform see photoelectric sensors and fiber optics



DETECTING DIFFERENT PACKAGED OBJECTS

Not only the packaging material but also the food comes in different shapes and sizes. Finding the best solution to reliably detect the packaged food is a combination of sensor type, application, mounting and environmental conditions.

- · Best practice solutions
- Application solution support



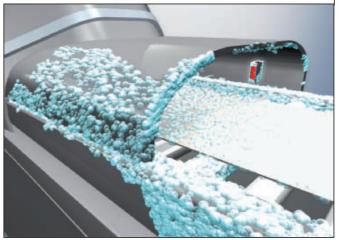
9

More on the detection of differently shaped objects see "objects with irregular shapes"

HYGIENE AND FREQUENT CLEANING

Frequent cleaning with harsh detergents and high water pressure significantly reduces the lifetime of machine components. To avoid machine downtime during the processing of fresh food, sensors are frequently replaced resulting in high maintenance cost.

- Enhanced sensor lifetime with stainless steel sensors lasting up to 20 times longer than conventional sensors
- SUS 316L and smooth housing design for enhanced hygiene



9

More on detergent resistant sensors see "objects in harsh environments". For stainless steel safety non-contact switches see SAFETY SOLUTIONS GUIDE

SENSING IN THE BEVERAGE INDUSTRY

For flexible and hygienic machines that Never Stop

For beverages and pharmaceutical liquids the shapes and sizes of containers – especially of PET bottles – are very diverse.

In spite of this diversity the common aspects to beverage filling are observing the high hygienic requirements, ensuring that containers are perfectly closed and appealing to customers and that the production can be realised with high cost efficiency

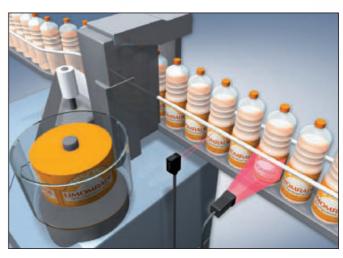


REDUCED DIVERSITY - FITTING PERFORMANCE

Reduce the variety of housings and usage concepts for the detection of transparent materials, labels, cartons or foils.

- Standardised sensor platforms for common and special operation models in one housing
- E3Z platform for highest reliability and accuracy for standard tasks
- E3X platform for enhanced detection, processing and communication functionality
- Vision and Measurement platform for advanced inspection solutions







More on E3Z platform page 24, more on E3X platform page 77
More on Inspection solutions in INSPECTION AND QUALITY CONTROL GUIDE



HYGIENE AND FREQUENT CLEANING

Increased sensor life expectancy in regularly cleaned environments.

- Ecolab certified high detergent resistance for increased lifetime
- New production process for affordable SUS316L housings

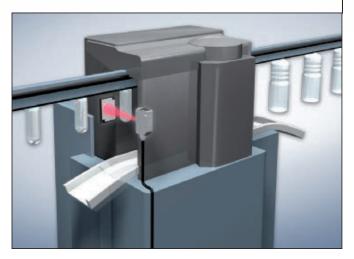


More on sensors for harsh environments page 22

ENHANCED DETECTION STABILITY

Enhance the stability of the detection of transparent bottles or foils compensating for the influence of ambient light, dust, LED aging or temperature.

• Autocompensation functions for enhanced detection stability



9

More on detection of transparent objects page 18

SENSING IN THE AUTOMOTIVE PARTS INDUSTRY

Zero defect production

Producing high quality parts to order for the automotive industry requires highest precision and machine availability during production. Error-free identification and inspection assures that all parts are within tolerance requirements.

MACHINE AVAILABILITY

Avoid malfunctions due to changing ambient light, dust or sensor misalignment.

- · Pulse synchronisation for reliable ambient light immunity
- · High functional reserve and precise optical alignment

HARSH ENVIROMENTS

Enhance sensor lifetime and detection reliability in environments with aggressive lubricants or metal chips.

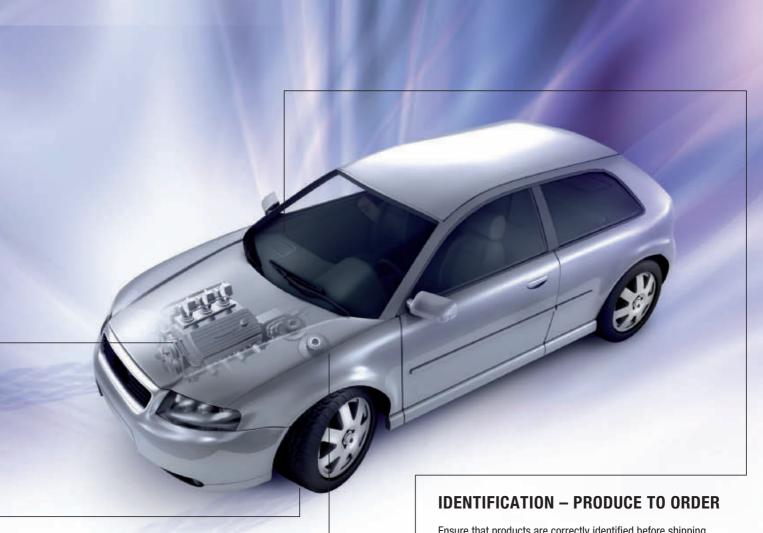
• Tested resistance against oil, welding spatters and mechanical damage







More on E3Z platform page 24, more on E3X platform page 77
More on Inspection solutions in INSPECTION AND QUALITY CONTROL GUIDE



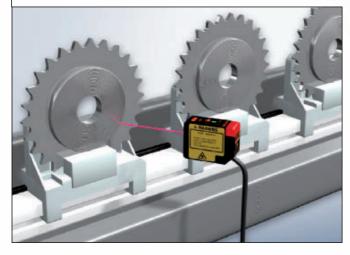
INSPECTION – QUALITY CONTROL

Verify the presence of product details and ensure that product dimensions are within tolerances.

- High precision laser and inductive sensors for detail presence verification
- High precision measurement systems for dimension tolerance verification

Ensure that products are correctly identified before shipping.

- Distance independent color identification with color (RGB) ratio comparison sensor
- · Advanced color and shape identification with full color vision sensors
- Full item and production data monitoring with RF-ID solutions





More on E3C Laser page 51, on E2C-EDA inductive page 69 More on ZS/ZX measurement systems in INSPECTION & QUALITY CONTROL GUIDE



More on E3X-DAC-S RGB sensor page 85 More on ZFV color vision system and V680 RF-ID in INSPECTION & QUALITY CONTROL GUIDE

SENSING IN THE SEMICONDUCTOR & ELECTRONICS INDUSTRY

For small, fast and flexible machines

Continuous miniaturisation and higher performance of electronic components and the ever increasing pressure to increase productivity, result in the demand for small sized, specialised sensors with highest value-performance ratio.

- · Wide portfolio of sensors optimized for dedicated applications
- Choose the platform performance you need:

EE Photomicrosensors – best value performance ratio and simple mounting for object and machine part detection E32 Fiber Optics – highest performance in small size for dedicated applications and harsh environments



HARSH ENVIRONMENTS

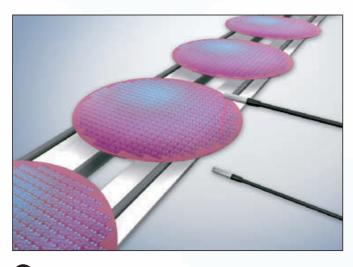
The front end processes involve aggressive chemicals and in some cases high temperatures or very low air pressure (vacuum).

· Long sensor lifetime with high chemical, vacuum and temperature resistance

DYNAMIC HANDLING

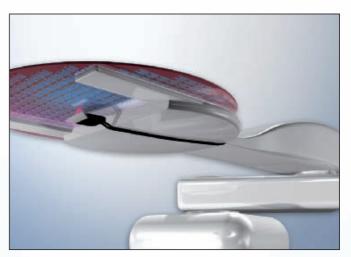
The dynamic handling of wafers with highly reflective surfaces requires small, flexible and accurate sensors.

- · High accuracy wafer positioning with wafer mapping fiber sensors
- · High flexibility cables for cable breakage protection



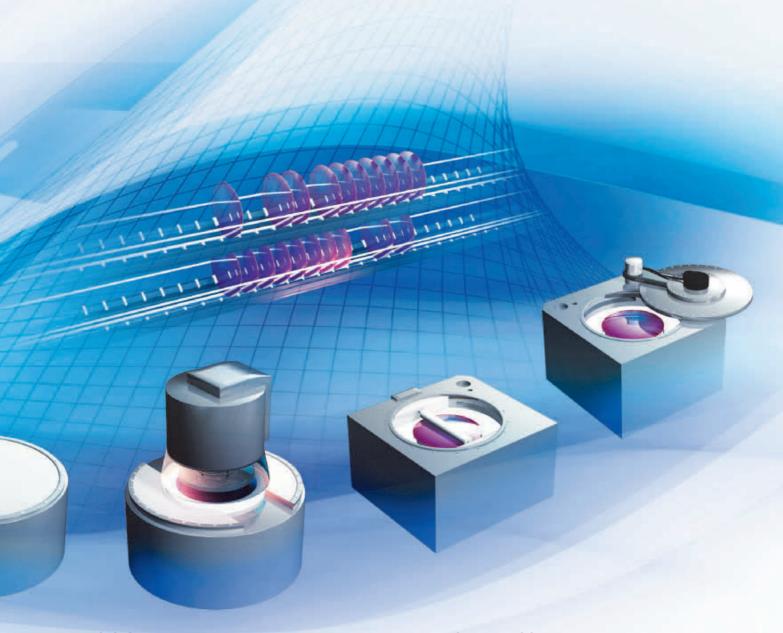


More on special environment fibers on page 78





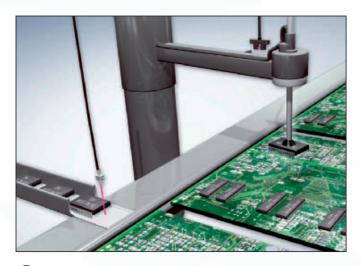
More on waver mapping fiber sensors see page 78 More on color (RGB) fiber amplifier see page 85



PRECISION

Chip sizes and assembly machines are continuously becoming smaller.

- \bullet Detection of smallest objects (100 $\mu m)$ with precision fiber heads
- Easy to use photomicrosensors for the detection of moving machine parts



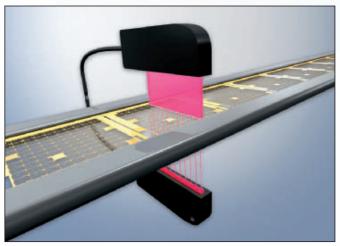


More on the detection of small objects see page 14

FIT FOR PURPOSE

Standard machines often have to be adapted to special requirements. The E3X separate amplifier platform provides the flexibility in machine design for a fast and cost efficient realisation of special sensing needs.

- Wide range of standard and application specific fiber heads
- Application solution support



9

For application specific solutions contact your Omron representative

DETECTION OF FLAT OBJECTS

Similar tasks – several solutions

For photoelectric sensors flat objects are often difficult to distinguish from the surface they are lying on. Varying colors of the object or the background can provide a further challenge to standard photoelectric sensors and often require special solutions.

- Simplify your machine design: one platform one usage concept one mounting
- Choose the performance you need:

E3Z platform - reliability, simplicity and variety

Remote amplifier platform - for precise detection when mounting space is limited



INSTALLATION BETWEEN CONVEYOR SEGMENTS

For detecting flat objects on a conveyor system, it is possible to install the sensors to look through the gaps between the conveyor segments. This enables detection of products with a very small profile, although this solution is not always mechanically possible.

- Best value performance ratio with E3Z platform
- · Flexible mounting in small spaces with E3X platform

SEVERAL MM THICKNESS

For the detection of flat objects a small and focused beam is required. To reliably distinguish between the background and the object when detecting from above, the influence of color and surface finish need to be minimized.

- · Focused and thin beam of the E3Z LASER
- Small black / white error of background suppression model E3Z-LL
- Full control over size and shape of beam with E3C LASER sensing heads of the remote amplifier platform







For E3Z Laser see page 29
For E3C Remote amplifier LASER see page 51











size

shape

transparent

shiny environment



DOWN TO 100 PM THICKNESS

For the detection of very small objects or height differences a precise optical and mechanical solution is required. The detection of miniature height differences is often combined with mounting in small spaces.

- Precise triangulation models E32-EL24-1 for the detection of small heights differences (e.g. labels)
- Coaxial optics of the high performance fiber optic sensor E32-EC41 for the detection of smallest diameters (100 μ m)

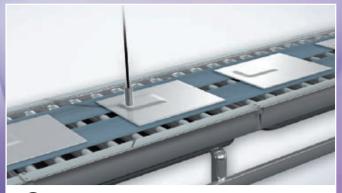
SMALL HEIGHT DIFFERENCES IN METAL OBJECTS

On shiny metallic surfaces or in dirty environments teachable high precision inductive sensors can be used for the detection of height differences of several 100 $\mu m.$

 High repeat accuracy of the E2C high performance inductive sensor heads



For E32 fiber heads of the E3X remote amplifier platform see page 78, for higher precision see the measurement platform in INSPECTION & QUALITY CONTROL GUIDE



For E2C inductive sensor heads see page 69, for higher precision or non-metal object height detection see tactile sensors ZX-T in INSPECTION & QUALITY CONTROL GUIDE

OBJECTS WITH IRREGULAR SHAPE

Similar tasks - several solutions

Objects with varying heights or holes can create multiple signals when using single beam sensors. These objects (e.g. bikes or complete hams) are then wrongly classified as multiple smaller items instead of a single large item.



STACKING SENSORS

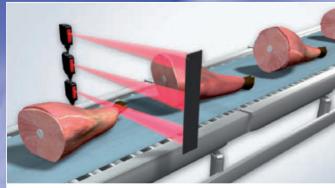
Mounting two or more sensors next to each other and combining the output signals by an OR-function is a simple way of monitoring an area. To ensure reliable detection mutual interference needs to be prevented.

- Pulse synchronisation function of E3Z platform for mutual interference prevention (R,D and LS types)
- Amplifier timing synchronisation (PLL) of E3X platform (all types)

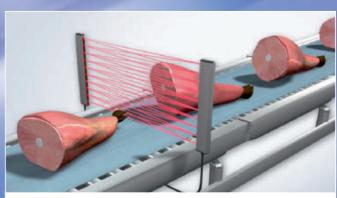
MULTIBEAM SENSORS (LIGHTCURTAINS)

Multibeam sensors consist of several synchronised senders and receivers in one housing for simplified installation and enhanced resolution in the monitored range.

- Simple mounting for ranges of 200 mm, 1.2 m and 1.8 m
- · Crossing beams for enhanced resolution



More on E3Z platform page 24
More on E3X platform page 77



More on F3E page 52









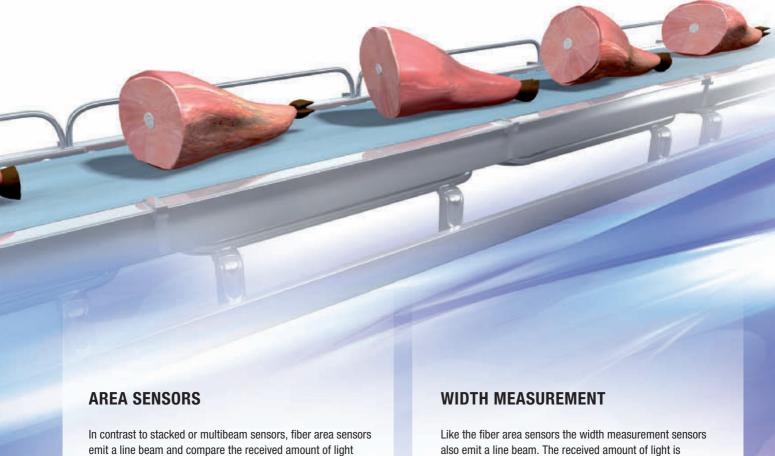


size

hane

transparent

shiny environment



• Window function for discrimination of 2 heights

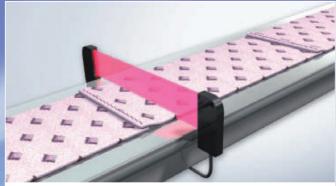
different light levels.

• Differential edge function for detection fast height changes

with pre-set values. This allows the relative comparison of

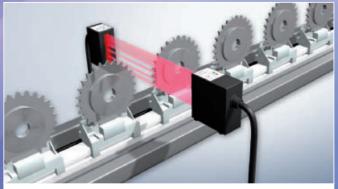
Like the fiber area sensors the width measurement sensors also emit a line beam. The received amount of light is linearised and put in reference to absolute height differences. This allows the precise measurement of heights.

- 10 µm resolution accuracy
- Profile measurement up to 28 mm





More on fiber area sensors page 78





More on ZX-GT in INSPECTION & QUALITY CONTROL GUIDE

TRANSPARENT OBJECTS

Similar tasks – several solutions

Transparent objects are produced with the goal to provide best visibility of the objects they contain. This makes these objects also difficult to detect with photoelectric sensors though they are still the preferred choice for precise detection compared to capacitive, ultrasonic or tactile sensors. Due to the large variety of transparent objects, a number of different sensors are available.

- Simplify your machine design: one platform one usage concept one housing
- Choose the performance your need:

E3Z platform: reliability, simplicity and variety

E3X platform: mounting flexibility and advanced signal processing

TRANSPARENT BOTTLE DETECTION

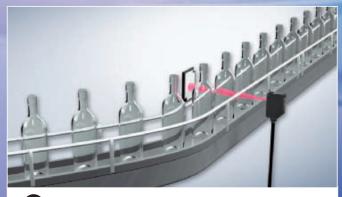
For standard glass or PET bottle detection, retroreflective solutions with high sensitivity adjustment provide a stable detection as the beam goes through the bottle twice reducing the emitted light. Alternatively a wide beam diffuse reflective sensor can be used detecting the diffuse reflected light from a large area of the bottle.

- Stable detection for standard objects and environments
- Easy mounting and simple sensitivity adjustment

ENHANCED DETECTION RELIABILITY FOR PET BOTTLES

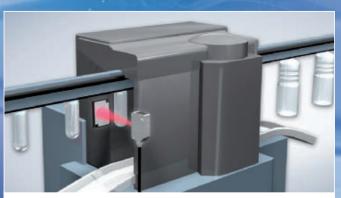
Using the polarizing effect of PET bottles a higher signal margin can be achieved. In combination with compensating the LED output power to keep the amount of received light stable, the detection stability for PET bottles can be enhanced even in changing conditions.

- P-opaquing function for higher signal margin
- · Auto power compensation for enhanced detection stability





More on E3Z-B page 38





More on E3ZM-B page 37











size

shape

transparent

shiny environment



HIGHEST ACCURACY FOR TRANSPARENT MEDIA

The amount of returned light varies with the shape, surface and material of each bottle. But best results for the detection of transparent media are achieved when the amount of received light can be evaluated with highest receiver sensitivity.

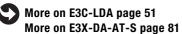
- · LED powertuning for optimal receiver setting for varying bottle types
- · Auto-compensation function for long term detection stability

MOUNTING FLEXIBILITY

For the detection of differently shaped transparent objects like foils, trays, bottles, etc at varying points in processes like food packaging or bottling, different mountings may be required or desirable. With the remote fiber amplifier platform the setting and adjustment of the sensor is always the same while the fiber sensing head is selected according to application and mounting requirements.

- · Enhanced design flexibility selecting the fiber sensor that fits
- · One platform one usage concept









More on E3X platform page 77

OBJECTS WITH STRUCTURED OR SHINY SURFACES

Similar tasks – several solutions

Objects with very reflective or structured surfaces can cause unpredictable reflections. This may influence the stable detection of the objects with photoelectric sensors.

THROUGH BEAM SENSORS AND RETRO-REFLECTIVE SOLUTIONS WITH MSR

Using a through beam sensor with a separate sender and receiver is the most reliable solution as the object blocks the emitted light independent of color or surface.

Retroreflective sensors work on the same principle but direct reflections from shiny surfaces acting like a reflector are compensated by the mirror surface rejection (MSR) function.

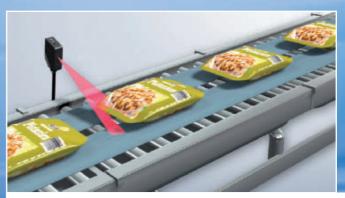
DIFFUSE REFLECTIVE WITH BACKGROUND SUPPRESSION

For applications with shiny or structured surfaces and where a separate receiver or a reflector cannot be mounted, different solutions with diffuse reflective sensors with background suppression, wide beams, etc can be used.

• Background suppression sensors with small black/white error for stable detection independent of color or background







For application specific solutions please contact your OMRON sales representative











size

shape

transparent

shiny environment



• Wide beam for stable detection independent of indents and direct reflections

- Stable detection of metal objects independent of object surface with inductive sensors
- Object detection and inspection at the same time with vision sensors







More on inductive sensors page 58 More on vision sensors in INSPECTION & QUALITY CONTROL GUIDE

OBJECT DETECTION IN HARSH ENVIRONMENTS

Enhanced resistance for a longer lifetime

Environmental influences like high temperatures, chemicals, water or electromagnetic noise can reduce the lifetime of sensors or influence the stable operation. For highest reliability and long lifetime, each Omron sensor is designed and tested to withstand conditions exceeding legal requirements and standard industrial environmental conditions.

For details about individual tests please contact your Omron representative.

HIGH RESISTANCE TESTS FOR STANDARD SENSORS



Water, oil and chemical resistance

- Water resistance (details see technical section)
- · Salt spray resistance
- · Oil resistance



Temperature resistance

- High / low continuous temperatures
- Temperature shock (hot/cold air and water)



Electromagnetic noise immunity

- Inverter noise
- · Mobile communication equipment
- · Electrical circuit disturbances
- · Electrostatic discharge



Mechanical resistance

- Vibration
- Shock (hammering)



Ambient light immunity/mutual interference prevention



Protective circuits









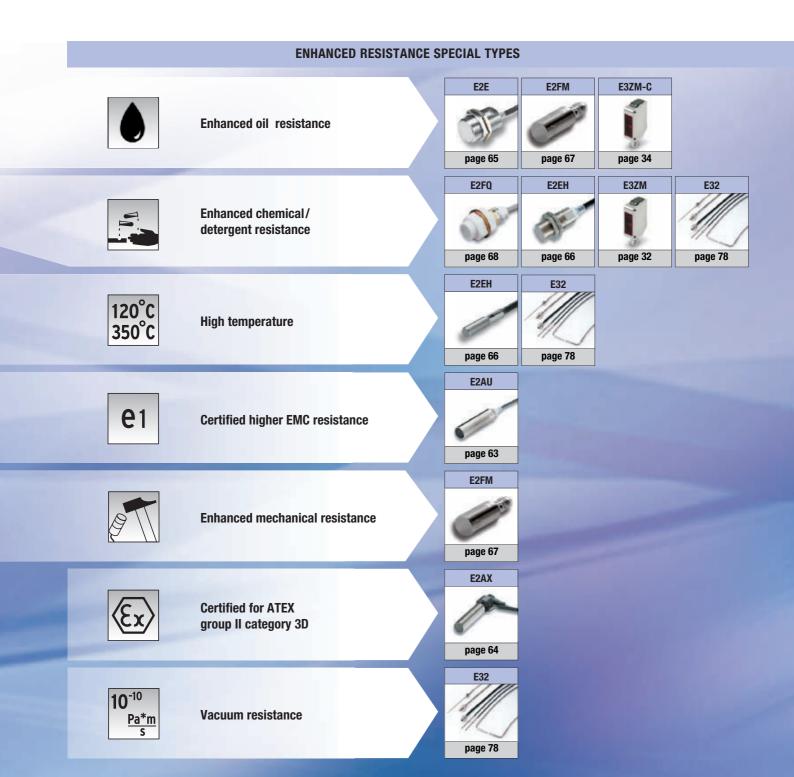


size

shape

transparent

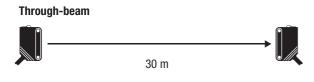
shiny environment



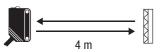
PHOTOELECTRIC SENSORS

For machines that Never Stop

Omron's photoelectric sensor range is designed and tested to achieve the maximum levels of reliability and detection performance. Utilising the latest sensor technology, our sensors ensure your machines Never Stop.



Retroreflective (with MSR)



Diffuse-reflective



Distance-settable with background suppression





Compact square plastic housing

E3Z see page 27



· Highest water resistance



· Highest electromagnetic noise immunity (e.g. from inverters)



· Pulse synchronisation for reliable ambient light immunity

			SPECIAL AF	PPLICATIONS			
Precision positioning and detection	Object detection and sensor condition monitoring	Anti-tampering	Detergent resistant	Oil resistant	Print mark detection	PET bottle detection	Transparent bottle detection
E3Z Laser	E3Z- G, E3Z- J	E3Z- H	E3ZM	E3ZM-C	E3ZM-V	E3ZM-B	E3Z-B
Small visible light spot	Alarm output or active sensor test input	Without sensitivity adjustor to prevent tampering	Detergent resistant stainless steel housing	Oil resistant stainless steel housing	Autoteach and white LED	P-opaquing and power compensation	Transparent bottle optimised optical system
see page 29	see page 31	see page 30	see page 32	see page 34	see page 36	see page 37	see page 38



longer distance:

miniature housing:

cylindrical M18 housing:

	SPECIAL APPLICATIONS										
Glass bottle detection	Fork sensor	Multi voltage	power supply	Structured object detection	High precision positioning	Multibeam sensor					
	PA										
E3S-CR62/67	E3Z-G	E3JK	E3GM	E3S-LS3	E3C-LDA	F3E					
Glass optimised optical system	Slot width 25 mm	AC/DC power supply and relay output	AC/DC power supply and relay output	Wide beam	Up to 10 µm accuracy	Area monitoring from 200 mm to 1800 mm					
		AC/DC	AC/DC								
see page 39	see page 49	see page 48	see page 47	see page 50	see page 51	see page 52					



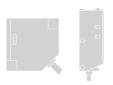




General purpose sensor in compact plastic housing

 $\label{lem:compact} \textbf{Compact housing size and high-power LED for excellent performance-size ratio and} \\$ 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 molding housing for high mechanical resistance









Special models

M18 cylindrical

Orderin	g infor	mation

Sensor type	Sensing distance	Connection m	ethod			Order code	
		8	600	Ш	Ť	NPN output	PNP output
Through-beam	30 m (Infrared light)	-	-	2 m		E3Z-T62 2M	E3Z-T82 2M
	(illiand agin)	-	-	-		E3Z-T67	E3Z-T87
,	10 m (Red light)	-	-	2 m		E3Z-T61A 2M	E3Z-T81A 2M
	(Not light)	-	-	-		E3Z-T66A	E3Z-T86A
Retroreflective model with M.S.R.	4 m (100 mm)*1 (Red light)	-	-	2 m		E3Z-R61 2M	E3Z-R81 2M
	(Red light)		-	-		E3Z-R66	E3Z-R86
Diffuse-reflective	1 m (adjustable) (Infrared light)	-	-	2 m		E3Z-D62 2M	E3Z-D82 2M
↓	(illiand light)		-	-		E3Z-D67	E3Z-D87
Diffuse-reflective wide beam	100 mm (adjustable) (Infrafred light)	-	-	2 m	ss with	E3Z-D61	E3Z-D81
→	, mande ng. nj		-	-	able type	E3Z-D66	E3Z-D86
Distance-settable (background suppres- sion)	(Red light) 2 mm 20 mm 80 mm BGS (set to minimum)	-	-	2 m	ace '2M' of le le	E3Z-LS63 2M	E3Z-LS83 2M
	BGS (set to maximum)		-	-	rsions repla m cable 30 cm cab 30 cm cab	E3Z-LS68	E3Z-LS88
	(Red light) 20 mm 40 mm 200 mm Incident BBGS (ith rin. setting) 1 the setting 1 the s	-	-	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-LS61 2M	E3Z-LS81 2M
	FGS (at min. setting)		-	-	For orderir - M1J: M1 - M3J: M8 - M5J: M8	E3Z-LS66	E3Z-LS86

^{*1} The sensing distance specified is possible when the E39-R1S used. Figure in parentheses indicate the minimum required distance between the sensor and reflector.

For higher precision and longer distance see E3Z-Laser		More about the usage in conveying see 'sensing in material handling'.	Reflectors and cable connectors see 'accessories'
General purpose		Material handling	Accessories



Specifications

ltem		Through-beam		Retroreflective with M.S.R.	Diffuse-reflective	Diffuse-reflective (wide beam)	Diffuse reflective wit suppression (distant	
	NPN	E3Z-T62/T67	E3Z-T61A/T66A	E3Z-R61/R66	E3Z-D62/D67	E3Z-D61/D66	E3Z-LS61/66	E3Z-LS63/68
	PNP	E3Z-T82/T87	E3Z-T81A/T86A	E3Z-R81/R86	E3Z-D82/D87	E3Z-D81/D86	E3Z-LS81/86	E3Z-LS83/88
Sensing d	listance	30 m	10 m	4 m (100 mm) *1 (When using the E39-R1S)	1 m (adjustable)	100 mm (adjustable)	200 mm max.	80 mm max.
Directiona	al angle	Both emitter and receive	er: 3° to 15°	2° to 10°	-			
Light sou (wave len		Infrared LED (870 nm)	RED LED (700 nm)	Red LED (680 nm)	Infrared LED (860 nm)		Red LED (680 nm)	Red LED (650 nm)
Power su voltage	pply	12 to 24 VDC ±10%, rip	ple (p-p): 10% max.					
Control o	ıtput	Load power supply volta Light-ON/Dark-ON switch	ige 26.4 VDC max., load o	current 100 mA max. (res	sidual voltage 2 V max.) (pen collector output type	e (depends on the NPN/I	PNP output format)
Protective	e circuits	Reverse polarity protec- tion, shortcircuit protec- tion, output reverse polarity protection	Output short-circuit pro- tection, power supply, reverse polarity protec- tion	output short-circuit prot	ection, vention,		Reverse polarity prote output short-circuit pr mutual interference pr	otection,
Response	time	Operation or reset: 2 ms max.	Operation or reset: 1 ms	max.				
Ambient temperati	ure	Operating: -25 to 55°C,	Storage: -40 to 70°C (wit	th no icing or condensation	on)			
Degree of protection IEC 60529 IP67, IP69K after DIN 40050 part 9								
		PBT (polybutylene terephthalate)						
Material	Case	PBT (polybutylene terep	hthalate)					

 $^{^{\}star 1}$ Values in parentheses indicate the minimum required distance between the sensor and reflector.



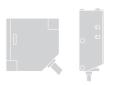




LASER sensor in compact plastic housing

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 high functional reserve
- Class 1 LASER
- Precise background suppression and low black/white error for accurate detection









Special models

M18 cylindrical

Sensor type		Response	Connection m	ethod		Order code			
		time	8		Щ		NPN output	PNP output	
Through-beam	60 m	1 ms	-	-	2 m		E3Z-LT61	E3Z-LT81	
				-	-	'2M' of cable types with:	E3Z-LT66	E3Z-LT86	
Retroreflective with M.S.R.	0.3 to 15 m (using E39-R1)	0.3 to 15 m (using E39-R1)		-	-	2 m	cable ty	E3Z-LR61	E3Z-LR81
				-	-	e '2M' of	E3Z-LR66	E3Z-LR86	
Distance-settable (background suppression)	20 to 300 mm		-	-	2 m	ns replac able om cable om cable	E3Z-LL61	E3Z-LL81	
				-	-	30 cm ci with 30 c	E3Z-LL66	E3Z-LL86	
	25 to 300 mm	0.5 ms	-	-	2 m	ring pigt 112 with 18 4-pin 18 3-pin	E3Z-LL63	E3Z-LL83	
			•	-	-	For ordering pigtail versions replace '2 - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	E3Z-LL68	E3Z-LL88	

Specifications

Item		Through-beam	Retroreflective with M.S.R.	Diffuse reflective with bac	kground suppression (distance settable)			
		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	Sensing distance 60 m		0.3 to 15 m (when using E39-R1S)	20 to 300 mm	25 to 300 mm			
Black/white error		- 5% (at 160 mm)			5% (at 100 mm)			
Light source (waveler	gth)	Red LD (655 nm), JIS Class 1, IEC Cl	ass 1, FDA Class II					
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p): 10	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, mutu ence prevention					
Response time		Operation or reset: 1 ms max.			Operation on reset 0.5 ms max.			
Ambient temperature range Operating: -10 to 55°C, S		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				

For more info on the detection of small objects see 'solutions for small/flat objects'

For higher precision detection see E3C

General purpose

Reflectors and cable connectors see 'accessories'.

Accessories





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









Ordering information

Special models M18 cylindrical Compact Miniature & Photomicro

Sensor type	Sensing	Output configuration	Connection method				Order code
	distance		8		Ш	Ť	Anti-tampering
Through-beam	15 m	NPN	-	-	-		E3Z-T61H
				-	-	s with	E3Z-T66H
		PNP	-	-	-	type	E3Z-T81H
			-	-	-	'2M' of cable types with:	E3Z-T86H
Retroreflective model with M.S.R.	4 m	NPN	-	-	•	_ _M	E3Z-R61H
WILLI W.S.N.				-	-	ace '2 le le	E3Z-R66H
		PNP	-	-	-	s replande	E3Z-R81H
				-	-	rsions m cat 30 cr 30 cr	E3Z-R86H
Diffuse-reflective	1 m	NPN	-	-		bail ve 130 c with with	E3Z-D62H
∫ 			-	-	-	g pigi 2 with 4-pin 3-pin	E3Z-D66H
<i></i>		PNP	-	-		rderin J: M1; J: M8 J: M8	E3Z-D82H
			-	-	-	For ordering pigtall versions replace '2 - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	E3Z-D86H

Specifications

General purpose

30

Item		Through-beam	Retroreflective with M.S.R.	Diffuse reflective				
		E3Z-T_	E3Z-R_	E3Z-D_				
Sensing distance		15 m	4 m (100 mm) (when using E39-R1S)	1 m				
Light source (wavelength)		Infrared LED (870 nm)	Red LED (660 nm)	Infrared LED (860 nm)				
Power suppl	y voltage	12 to 24 VDC ±10%						
Ambient tem	perature	Operating: -25 to 55°C, Storage: -40 to 70°C (with no icing or condensation)						
Degree of pr	otection	IEC 60529 IP67, IP69K after DIN 40050 part 9						
Material Case		PBT						
	Lens	Denatured polyacrylate resin	Methacrylate resin	Denatured poly acrylate resin				





Photoelectric sensor for condition monitoring in compact plastic housing

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

- E3Z-_-J0: Self-diagnostic alarm output on instable 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)









Special models

Compact

Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Output configuration	Connection method	n Order code*1					
			Щ	Self diagnosis	Emission stop	Light intensivity 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			
Retroreflective with M.S.R.	4 m	NPN	2 m	E3Z-R61-J0SRW-P2	E3Z-R61-GOSRW-P2	E3Z-R61-G2SRW-P2			
		PNP	2 m	E3Z-R81-JOSRW-P2	E3Z-R81-GOSRW-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			

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

Specifications

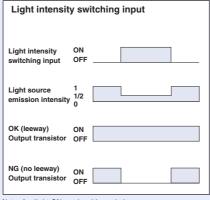
Item	Through-beam	Retroreflective with M.S.R.	Diffuse reflective					
	E3Z-T_	E3Z-R_	E3Z-D_					
Sensing distance	15 m	4 m (100 mm) (when using E39-R15)	1 m (adjustable)					
Light source	Infrared LED (870 nm)	Red LED (660 nm)	Infrared LED (860 nm)					
Power supply voltage	12 to 24 VDC ±10%	12 to 24 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

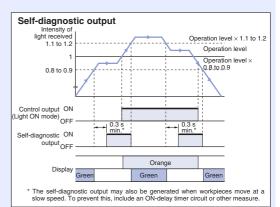
Errors might be caused by a dusty or dirty lens.

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.







For auto compensation of dust or dirt see E3X-DA-AT-S

General purpose





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









Ordering information

Special models M18 cylindrical Compact

Sensor type	Sensing distance	Connection n	nethod			Order code		
		8		Щ		NPN output	PNP output	
Through-beam	15 m	-	-	2 m	j‡	E3ZM-T61	E3ZM-T81	
	(Infrared LED)		-	-	Se w	E3ZM-T66	E3ZM-T86	
	0.8 m with built-in slit (Infrared LED)	-	-	2 m	typ	E3ZM-T63	E3ZM-T83	
			-	-	aple	E3ZM-T68	E3ZM-T88	
Retroreflective with M.S.R.	4 m (100 mm) (Red LED)	-	-	2 m	g pigtail versions replace 'ZM' of cable types with: 2 with 30 cm cable 4-pin with 30 cm cable 3-pin with 30 cm cable	E3ZM-R61	E3ZM-R81	
			-	=		E3ZM-R66	E3ZM-R86	
Diffuse-reflective	1 m (adjustable) (Infrared LED)	-	-	2 m		E3ZM-D62	E3ZM-D82	
□ ===			-	=		E3ZM-D67	E3ZM-D87	
Diffuse reflective (BGS)	10 to 100 mm (fixed)	-	-	2 m		E3ZM-LS61X*1	E3ZM-LS81X*1	
	(Red LED)		-	-	g pig 2 wit 4-pi 3-pi	E3ZM-LS66X*1	E3ZM-LS86X ^{*1}	
	10 to 200 mm (fixed)	-	-	2 m	For ordering - M1J: M12 - M3J: M8 4 - M5J: M8 3-	E3ZM-LS64X*1	E3ZM-LS84X ^{*1}	
	(Red LED)	•	-	-		E3ZM-LS69X*1	E3ZM-LS89X ^{*1}	

^{*1} 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		Retroreflective with M.S.R. function	Diffuse-reflective Models			
		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 di	istance		15 m	0.8 m	4 m [100 mm] (Using 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		10 to 30 VDC, ±10% ripple (p-p)							
Protective circuits			Power supply reverse polarity protection, output short-circuit protection, output short-circuit protection, mutual interference prevention, output reverse polarity protection output reverse polarity protection						
Ambient te	emperatur	e range	Operating: -25°C to 55°C,	storage: -40°C to 70°C (wit	th no icing or condensation)				
Degree of	protection		IEC 60529 IP67, IP69K after	, IP69K after DIN 40050 part 9					
Materials	Case		SUS316L						
	Lens		Methacrylic resin						
Display PES (polyether sulfone) Sensitivity adjustment and operation switch			PES (polyether sulfone)						
			,, ,	ne)					
	Seals Fluoro rubber								

	Other SUS316L models see 'sensing in food packaging'		SUS cable connectors see Accessories
General purpose	Food and Beverage		Accessories



Item			Diffuse reflective with background suppression (fixed distance)					
			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 sour	Light source (adjustable)		Red LED (650 mm)	Red LED (660 mm)				
Black/whi	Black/white error		5% of sensing distance max.	20% of sensing distance max.				
Power sup	Power supply voltage		10 to 30 VDC, ±10% ripple (p-p): 10% max.					
Protection	Protection circuits		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection, mutual interference protection					
Ambient to	emperatur	e range	Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation)					
Degree of	protection	1	IEC 60529 IP67, IP69K after DIN 40050 part 9					
Materials	Case		SUS316L					
	Lens		Methacrylic resin					
	Display		PES (polyether sulfone)					
Sensitivity adjustment and operation switch		nt and	PEEK (polyether ether ketone)					
	Seals		Fluoro rubber					

Other SUS316L models see 'sensing in food packaging' SUS cable connectors see Accessories Food and Beverage **General purpose** Accessories





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









Ordering information Special

Special models M18 cylindrical Compact Miniature & Photom	icro	

Sensor type	Sensing distance	Connection n	nethod			Order code	
		8		Щ		NPN output	PNP output
Through-beam	15 m	-	-	2 m	-	E3ZM-CT61	E3ZM-CT81
	(Infrared light)	-	-	-	■ *1	E3ZM-CT61-M1TJ	E3ZM-CT81-M1TJ
			-	-	-	E3ZM-CT66	E3ZM-CT86
	20 m	-	-	2 m	-	E3ZM-CT62B	E3ZM-CT82B
	(Orange light)	-	-	-	■ *1	E3ZM-CT62B-M1TJ	E3ZM-CT82B-M1TJ
			-	-	-	E3ZM-CT67B	E3ZM-CT87B
Retroreflective with M.S.R.	4 m (100 mm) using E39-R1S (Red light)	-	-	2 m	-	E3ZM-CR61	E3ZM-CR81
		-	-	-	■ *1	E3ZM-CR61-M1TJ	E3ZM-CR81-M1TJ
			-	-	-	E3ZM-CR66	E3ZM-CR86
Diffuse-reflective	1 m (adjustable) (Infrared light)	-	-	2 m	-	E3ZM-CD62	E3ZM-CD82
☐ 		-	-	-	■ *1	E3ZM-CD62-M1TJ	E3ZM-CD82-M1TJ
			-	-	-	E3ZM-CD67	E3ZM-CD87
Diffuse reflective (BGS)	10 to 100 mm (fixed) (Red light)	-	-	2 m	-	E3ZM-CL61H	E3ZM-CL81H
		-	-	-	■ *1	E3ZM-CL61H-M1TJ	E3ZM-CL81H-M1TJ
			-	-	-	E3ZM-CL66H	E3ZM-CL86H
	10 to 200 mm (fixed)	-	-	2 m	-	E3ZM-CL64H	E3ZM-CL84H
	(Red light)	-	-	-	■ *1	E3ZM-CL64H-M1TJ	E3ZM-CL84H-M1TJ
			-	-	-	E3ZM-CL69H	E3ZM-CL89H

 $^{^{\}star1}$ uses OMRON's unique Twist & Click M12 connector XS5.

Specifications

Item			Through-beam		Retroreflective with M.S.R.	Diffuse-reflective			
N		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 di	istance		15 m	20 m	4 m [100 mm] (Using E39-R1S)	1 m (adjustable)			
Light sour	Light source (wave length)		Infrared LED (870 nm)	Orange LED (615 nm)	Red LED (660 nm)	Infrared LED (860 nm)			
Power sup	oply voltage	•	10 to 30 VDC, including 10% ripple (p-p)						
Protective	Protective circuits		Power supply reverse polarity protection, output reverse polarity protection, output short-circuit protection, output reverse polarity protection, and mutual interference prevention						
Ambient to	emperature	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 (polymethylmethac	rylate)					
Display PES (polyether sulfone)			PES (polyether sulfone)						
	Sensitivity PEEK (polyether ether ketone) adjustment and operation switch			ne)					
Seals Fluoro rubber									

	Other oil resistant models see 'sensing in Automotive'		For twist and click connectors see Accessories
General purpose	Automotive		Accessories



General purpose

Š
_
ŭ
Ë
æ
Ũ.
<u>. :</u>
_
-
- 6
Œ.
_
ď
ō
-
6
=
<u> </u>
ᅀ

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 di	istance		10 to 100 mm (fixed)	10 to 200 mm (fixed)			
Light sour	ce (wave l	ength)	Red LED (650 nm)	Red LED (660 nm)			
Power sup	oply voltag	е	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 to	emperatur	e 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				

Other oil resistant models see 'sensing in Automotive'

Automotive

For twist and click connectors see Accessories





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 colored print marks
- · SUS 316L stainless steel housing
- Easy-to-use teach-in button or remote teach



Ordering information

Sensor type	Sensing distance	Connection method				Order code		
		%		Ш		NPN output	PNP output	
Mark sensor	12±1 mm	-	-	2 m	-	E3ZM-V61 2M	E3ZM-V81 2M	
		-	-	-	-	E3ZM-V66	E3ZM-V86	

Specifications

•					
Item	NPN	E3ZM-V6_			
	PNP	E3ZM-V8_			
Sensing di	stance	12±1mm			
Light sour	ce (wave length)	White LED (450 to 700nm)			
Power sup	ply voltage	10 to 30 VDC ±10%, ripple (p-p) 10% max.			
Protection 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			

	For other stainless steel sensors see 'sensing in food packaging'		For stainless steel cable connectors see Accessories
General purpose	Food and Beverage		Accessories





PET bottle detection sensor in compact stainless steel housing

The p-opaquing optical system and the AC³ power control technology ensure highest stability for PET detection compensating dust on lenses and structured PET bottle

- Stable PET detection using double refraction and AC³ power control technology
- Detergent resistand compact SUS316L housing
- Easy-to-use teach-in function









Special models

M18 cylindrical

Miniature & Photomicro

Ordering information

Sensor type	Sensing distance	Special reflector	Connection m	ethod			Order code		
			8		Ā		NPN output	PNP output	
Retroreflective (with M.S.R.)	(teachable)	Purchase separately*2	-	-	2 m	-	E3ZM-B61	E3ZM-B81	
				-	-	-	E3ZM-B66	E3ZM-B86	
		E39-RP1 included	-	-	2 m	-	E3ZM-B61-C	E3ZM-B81-C	
				-	-	-	E3ZM-B66-C	E3ZM-B86-C	

^{*1} Values in parentheses indicate the minimum required distance between the Sensor and Reflector.

Specifications

Item		Retroreflective with P-opaquing and M.S.R. functions				
	NP	N E3ZM-B61(-C)/-B66(-C)				
	PN	P E3ZM-B81(-C)/-B86(-C)				
Sensing di	istance	100 to 500 mm (using E39-RP1) (teachable)				
Light sour	ce (wave lengt	h) Red LED (650 nm)				
Power sup	ply 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				
Repsonse	time	Operation or reset: 1 ms max.				
Ambient to	emperature ran	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)				

For more information on solutions for Food & Beverage, see 'sensing in beverage' and 'sensing in food packaging'

Food and Beverage

SUS cable connectors and special reflectors see



^{*2} For higher signal stability order special reflector E39-RP1 seperately



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		
		8	600	Ш		NPN output	PNP output	
Retroreflective without M.S.R.	80 to 500 mm*1 (adjustable) (Red light)	-	-	2 m	-	E3Z-B61	E3Z-B81	
			-	-	-	E3Z-B66	E3Z-B86	
	0.5 to 2 m ^{*1} (adjustable) (Red light)	-	-	2 m	-	E3Z-B62	E3Z-B82	
			-	-	-	E3Z-B67	E3Z-B87	

 $^{^{\}star1}$ The specified sensing distance is possible when the E39-R1S is used.

Specifications

Item		Retroreflective 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	500 mm (80 mm) ^{*1} (When using the E39-R1S) (adjustable)	2 m (100 mm)*1 (When using the E39-R1S) (adjustable)				
Light sou	rce (wave length)	Red LED (680 nm)					
Power su	pply voltage	12 to 24 VDC ±10%, ripple (p-p): 10% max.					
Protectiv	e circuits	Reverse polarity protection, output short-circuit protection, mutual interference production and the protection of the p	evention				
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	1)				
Degree o	f protection	IEC 60529 IP67, IP69K after DIN 40050 part 9					
Material	Case	PBT (polybutylene terephthalate)					
	Lens	Methacylate resin					

^{*1} Figures in parentheses indicate the minimum required distances between the sensors and reflectors.

For enhanced performance on glass see E3S-CR62/67 For enhanced performance

on PET see E3ZM-B

purpose Food and Beverage

Automotiv

Semiconducto

Material handling

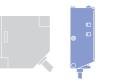




Glass bottle detection photoelectric sensor in metal housing

The special optical design of the E3S-CR62/67 ensures reliable detection of glass bottles compensating the often noticed 'double-detection-effect' when using

- Special optical system for reliable bottle detection preventing 'lens effect'
- Thin beam for reliable bottle counting









Special models

Ordering information

	Sensing distance	Connection method				Order code	
	(Reflector E39-R1)	(Reflector E39-R1)	8		M	•	NPN/PNP selector
		0.25 to 1 m (adjustable) (Red light)	-	-	2 m	-	E3S-CR62-C
			-	-	-	-	E3S-CR67-C

Specifications

Item		Retroreflective				
		E3S-CR62-C	E3S-CR67-C			
Sensing distance		250 mm (When using the E39-R6), 1 m (250 mm) ^{*1} (When using the E39-R1)				
Light source (way	ve length)	Red LED (660 nm)				
Power supply vol	tage	10 to 30 VDC, ripple (p-p) : 10% max.				
Protective circuit	s	Output short circuit protection, reverse output polarity protection, mutual interference prevention				
Response time		Operation or reset: 1 ms max.				
Ambient tempera	ture	Operating: -25 to 55°C, Storage: -40 to 70°C (with no icing or condensation)				
Degree of protect	tion	IEC 60529 IP67				
Materials	Case	Zinc diecast				
	Lens	Acrylics				
	Display operation panel	Polyethyl sulfon				

 $^{^{\}star1}$ Values in parentheses indicate the minimum required distance between the sensor and reflector.

For enhanced PET bottle detection see E3ZM-B

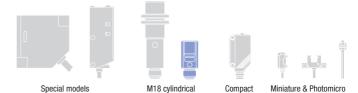






Easy Mounting photoelectric sensor in short plastic M18 housing

- High power LED for enhanced sensing distance
- · Secure-click snap mounting for fast installation



Ordering information

Snap mounting								
Sensor type	Sensing distance	Connection i	nethod			Order code		
		8	600	Щ		NPN output	PNP output	
Through-beam	15 m	-	-	2 m	-	E3FZ-T61	E3FZ-T81	
		-		-	-	E3FZ-T66	E3FZ-T86	
Retro-reflective with M.S.R.	0.1 to 4 m ^{*1}	-	-	2 m	-	E3FZ-R61H	E3FZ-R81H	
		-		-	_	E3FZ-R66H	E3FZ-R86H	
Diffuse reflective	1 m (adjustable)	-	-	2 m	-	E3FZ-D62	E3FZ-D82	
[]=		-		_	-	E3FZ-D67	E3FZ-D87	
Diffuse reflective (BGS)	100 mm (fixed)	-	-	2 m	-	E3FZ-LS61H	E3FZ-LS81H	
U>		-		-	-	E3FZ-LS66H	E3FZ-LS86H	

Radial mounting

Kadiai mounting	naulai iliuuliung						
Sensor type	Sensing distance	Connection method				Order code	
		8	©	Щ		NPN output	PNP output
Through-beam — — — —	15 m	-	_	2 m	_	E3FR-T61	E3FR-T81
		-		-	_	E3FR-T66	E3FR-T86
Retro-reflective with M.S.R.	0.1 to 4 m*1	-	-	2 m	-	E3FR-R61H	E3FR-R81H
		-		-	_	E3FR-R66H	E3FR-R86H
Diffuse reflective	1 m (adjustable)	-	_	2 m	_	E3FR-D62	E3FR-D82
		-		-	-	E3FR-D67	E3FR-D87
Diffuse reflective (BGS)	0.1 m	-	_	2 m	_	E3FR-LS61H	E3FR-LS81H
		-		-	-	E3FR-LS66H	E3FR-LS86H

^{*1} Measured with reflector E39-R1S

For radial mounting with smaller head see E3F2-_41 More about the usage in For metall housing conveying see 'sensing in material handling'. see E3F2 **General purpose Material handling**



Specifications

E3FZ/E3FR

	Through-beam	Retroreflective with M.S.R.	Diffuse reflective	Diffuse reflective with background suppression	
Item	E3FZ-T/E3FR-T	E3FZ-R/E3FR-R	E3FZ-D/E3FR-D	E3FZ-LS/E3FR-LS	
Light source (wave length)	Infrared LED (870 nm)	Red LED (660 nm)	Infrared LED (860 nm)	Red LED (650 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 t	to +70°C (with no icing or condensatio	n)		
Degree of protection	IEC 60529 IP67, IP69K after DIN 40050 part 9				
Material	Plastic (case: ABS; lens: PMMA)				

For radial mounting with smaller head see E3F2-_41 For metall housing see E3F2 General purpose

More about the usage in conveying see 'sensing in material handling'.

Material handling





Photoelectric sensor in plastic, brass or stainless steel M18 housing

The cylindrical M18 size family offers a large standard portfolio in plastic, brass or stainless steel housings for through-beam, retro-reflective, diffuse-reflective and background-suppression models. For excellent price-performance for your standard applications.

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



Ordering information

Sensor type	Sensing distance	Housing material	Connection m	ethod			Order code	
			8	(°)	W W		NPN output	PNP output
Through-beam	7 m	Plastic	-	-	2 m	-	E3F2-7C4	E3F2-7B4
	(Infrared LED)	Brass					E3F2-7C4-M	E3F2-7B4-M
55 55		Stainless steel					E3F2-7C4-S	E3F2-7B4-S
		Plastic	-		-	-	E3F2-7C4-P1	E3F2-7B4-P1
		Brass					E3F2-7C4-M1-M	E3F2-7B4-M1-M
		Stainless steel					E3F2-7C4-M1-S	E3F2-7B4-M1-S
Retroreflective	0.1 to 4 m*1	Plastic	-	-	2 m	-	E3F2-R4C4-E	E4F2-R4B4-E
(with M.S.R.)		Brass					E3F2-R4C4-M-E	E3F2-R4B4-M-E
		Stainless steel					E3F2-R4C4-S-E	E3F2-R4B4-S-E
D		Plastic	-	-	-	-	E3F2-R4C4-M1-E	E3F2-R4B4-M1-E
		Brass					E3F2-R4C4-M1-M-E	E3F2-R4B4-M1-M-E
		Stainless steel					E3F2-R4C4-M1-S-E	E3F2-R4B4-M1-S-E
Diffuse reflective	0.3 m (adjustable)	Plastic	-	-	2 m	-	E3F2-DS30C4	E3F2-DS30B4
□ □		Brass					E3F2-DS30C4-M	E3F2-DS30B4-M
		Stainless steel					E3F2-DS30C4-S	E3F2-DS30B4-S
		Plastic	-	•	-	-	E3F2-DS30C4-P1	E3F2-DS30B4-P1
		Brass					E3F2-DS30C4-M1-M	E3F2-DS30B4-M1-M
		Stainless steel					E3F2-DS30C4-M1-S	E3F2-DS30B4-M1-S
	1 m (adjustable)	Plastic	-	-	2 m	-	E3F2-D1C4	E3FR-D1B4
		Brass					E3F2-D1C4-M	E3F2-D1B4-M
		Stainless steel					E3F2-D1C4-S	E3F2-D1B4-S
		Plastic	-		-	-	E3F2-D1C4-P1	E3F2-D1B4-P1
		Brass					E3F2-D1C4-M1-M	E3F2-D1B4-M1-M
		Stainless steel					E3F2-D1C4-M1-S	E3F2-D1B4-M1-S
Diffuse reflective	100 mm (fixed)	Plastic	-	-	2 m	-	E3F2-LS10C4	E3F2-LS10B4
(BGS)		Brass					E3F2-LS10C4-M	E3F2-LS10B4-M
		Stainless steel					E3F2-LS10C4-S	E3F2-LS10B4-S
		Plastic	-		-	-	E3F2-LS10C4-P1	E3F2-LS10B4-P1
		Brass					E3F2-LS10C4-M1-M	E3F2-LS10B4-M1-M
		Stainless steel					E3F2-LS10C4-M1-S	E3F2-LS10B4-M1-S

^{*1} Measured using E39-R1S





Specifications

Item		Through-beam	Retroreflective with M.S.R.	Diffuse reflective		Diffuse reflective with background suppression	
		E3F2-7_	E3F2-R4	E3F2-D1_	E3F2-DS30_	E3F2-LS10_4	
Light source (wave	e length)	Infrared LED (950 mm)	Red LED (660 nm)	Infrared LED (880 nm)		Red LED (660 nm)	
Power supply volta	ige	10 to 30 VDC					
Protective circuits Output short-circuit protection and power supply reverse polarity protection							
Ambient temperatu	ıre	Operating: -25 to 55°C/Storage: -30 to 70°C (with no icing or condensation)					
Degree of protection	on	IEC 60529 IP67, IP69K after D	IEC 60529 IP67, IP69K after DIN 40050 part 9				
Material	Case	Plastic ABS					
		Nickel brass					
Stainless steel Stainless steel							
	Lens	PMMA					

For shorter housing see E3FZ			Reflectors and cable connectors see 'accessories'.
General purpose			Accessories





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







Compact



Accessories

Ordering information

Sensor type	Sensing distance	Housing material	Connection n	Connection method 0			Order code		
			8	© <u></u>	П		NPN output	PNP output	
Retro-reflective	0.1 to 2 m ^{*1}	Plastic	-	-	2 m	_	E3F2-R2RC41-E	E3F2-R2RB41-E	
with M.S.R.	vith M.S.R.	Brass					E3F2-R2RC41-M-E	E3F2-R2RB41-M-E	
₽≠		Plastic	-		-	-	E3F2-R2RC41-P1-E	E3F2-R2RB41-P1-E	
		Brass					E3F2-R2RC41-M1-M-E	E3F2-R2RB41-M1-M-E	
Diffuse reflective	700 mm (adjustable)	Plastic	-	-	2 m	-	E3F2-DS30C41	E3F2-DS30B41	
₽		Brass					E3F2-DS30C41-M	E3F2-DS30B41-M	
		Plastic	-		-	-	E3F2-DS30C41-P1	E3F2-DS30B41-P1	
8		Brass					E3F2-DS30C41-M1-M	E3F2-DS30B41-M1-M	

^{*1} With reflector E39-R1S.

Specifications

Item		Retroreflective 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 sup voltage	pply	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 temperatu	ure	Operating: -25 to 55°C/Storage: -30 to 70°C (with no icing or condensation)				
Enclosure ratings IEC 60529 IP67, IP69K after DIN 40050 part 9						
Material	Case	Nickel brass				
		Plastic (ABS)				
	Lens	PMMA				

For longer sensing distances, through-beam or BGS see E3FR

General purpose

Reflectors and cable connectors see 'accessories'.





Distance setting photoelectric sensor in metal housing

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





Ordering information

Sensortype	Sensing distance	Connection n	nethod			Order code
		8		Щ		
Distance settable (background suppression)	5 Min. setting Setting range Max. setting Max. setting	-	-	•	-	E3S-CL1
		-	-	-	■ M12	E3S-CL1-M1J
	5 Min. setting Setting range Max. setting 50 to 500 mm	-	-		-	E3S-CL2
	5 Detecting range 500mm	-	-	-	■ M12	E3S-CL2-M1J

Specifications

Item		Diffuse reflective with background suppression	Diffuse reflective with background suppression			
		E3S-CL1	E3S-CL2			
Sensing dis	stance	5 to 200 mm	5 to 500 mm			
Light sourc	e (wave length)	Red LED (700 nm)	Infrared LED (860 nm)			
Black/white	e error ^{*1}	2% max.	10% max.			
Power supp	ply voltage	10 to 30 VDC [ripple (p-p) 10% included]				
Protective of	circuits	Reverse polarity protection, output short-circuit protection, mutual interference prevention				
Response t	time	Operation or reset: 1 ms max. Operation or reset: 2 ms max.				
Ambient te	mperature	Operating/Storage: -25 to 55°C (with no icing or condensation)				
Degree of p	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%)

For longer distance BGS see E3G

General purpose Food and Beverage				
-----------------------------------	--	--	--	--





Long distance photoelectric sensor in plastic housing

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

- Diffuse reflective model with 1.2 m teachable setting distance
- . M12 rotary connector or pre-wired models









M18 cylindrical Special models Miniature & Photomicro Compact **Ordering information**

Sensor type	Sensing distance	Connection m	Order code			
		8	<u></u>	П	f	NPN/PNP selector
Retroreflective with M.S.R.	troreflective with M.S.R. 0.5 to 10 m (Red light)		-	2 m	-	E3G-R13-G
		-		-	-	E3G-R17-G
Distance settable (background suppression)	0.2 to 2 m (0.2 to 1.2 m distance settable) (Infrared light)	-	-	2 m	-	E3G-L73
		-	•	-	-	E3G-L77

Specifications

Item		Retroreflective with M.S.R.		Diffuse reflective with background suppression (distance settable)		
		E3G-R13-G	E3G-R13-G E3G-R17-G E3		E3G-L77	
Sensing dista	ance			0.2 to 2 m (White paper 300x300 mm) (setting distance 0.5 to 1.2 m)		
Light source (wave length) Red LED (700 nm)		Infrared LED (860 nm)				
Power supply	y voltage	10 to 30 VDC (Ripple (p-p) 10% included)		10 to 30 VDC (Ripple (p-p) 10% included)		
Protective ci	rcuits	Reverse polarity protection, output short-circuit protection, mutual interference prevention		Reverse polarity protection, output short-circuit protection, mutual interference prevention		
Ambient tem	perature	Operating: -25 to 55°C, Storage: -3	0 to 70°C (with no icing or condens	ation)		
Degree of protection		IEC 60529 IP67 (with Protective Cov	ver attached)			
Materials Case PBT (polybutylene terephthalate)						
Lens Acrylics (PMMA)						

 $^{^{\}star 1}$ Values in parentheses indicate the minimum required distance between the sensor and reflector.

For long distance throughbeam see E3Z Laser







Long distance all 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

Ordering information

Sensor type	Sensing distance	Connection method	Timer function	Order code
				Relay output
Distance settable (background suppression) (Red light) 0.2 to 2 n (0.2 to 1.2)	10 m (500 mm) *1 (Red light)	Terminal block	-	E3G-MR19-G
			ON or OFF delay 0 to 5 s (adjustable)	E3G-MR19T-G
	0.2 to 2 m (0.2 to 1.2 m distance settable) (Infrared light)		-	E3G-ML79-G
			ON or OFF delay 0 to 5 s (adjustable)	E3G-ML79T-G

 $^{^{\}star 1}$ Values in parentheses indicate the minimum required distance between the sensor and reflector.

Specifications

Item	Retroreflective with M.S.R.		Diffuse reflective with background supre	ssion		
	E3G-MR19-G	E3G-MR19T-G	E3G-ML79-G	E3G-ML79T-G		
Sensing distance	10 m (500 mm) *1 (When using the E39-R2)	0.2 to 2 m				
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 V.	AC ±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 icin	ng or condensation)				
Protective structure	IEC 60529 IP67 (with protective cover attached)					

 $^{^{\}star1}$ Values in parentheses indicate the minimum required distance between the sensor and reflector.

For smaller size and AC/DC see E3JK







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)









Ordering information

Special models

M18 cylindrical

Compact Miniature & Photomicro

Sensor type	Sensing distance	Connection method				Operation mode	Order code
		8		Ш	Ť		
Through-beam	5 m (Infrared light)	_	-	2 m	_	Light ON	E3JK-5M1
						Dark ON	E3JK-5M2
Retroreflective with M.S.R. □ □ □ □ □ □	2 m (Red light)					Light ON	E3JK-R2M1
						Dark ON	E3JK-R2M2
Retroreflective without M.S.R.	4 m (adjustable) (Red light)					Light ON	E3JK-R4M1
						Dark ON	E3JK-R4M2
Diffuse-reflective □ □ □ □ □	300 mm (adjustable) (Infrared light)					Light ON	E3JK-DS30M1
						Dark ON	E3JK-DS30M2

Specifications

Item		Through-beam	Retroflective with M.S.R.	Retroflective without M.S.R.	Diffuse-reflective			
		E3JK-5M_	E3JK-R2M_	E3JK-R4M_	E3JK-DS30M_			
Sensing distance		5 m 2 m 4 m (When using the E39-R1) (When using the E39-R1)		300 mm				
Light source (wave le	ength)	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 7	°C, Storage: -30 to 70°C (with no icing or condensation)					
Degree of protection		IEC60529 IP64						
Material	Case	ABS						

For longer distance and AC/DC see E3G-M

General purpose Food and Beverage Automotive Semiconductor Material handling Accessories

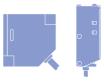




Photoelectric sensor in plastic fork shape housing

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

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









Special models

Ordering information

Sensor type	Sensing distance	Number of	Connection method				Order code		
		optical axes	8		П	Î	NPN output	PNP output	
	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		
Sensing method	Through-beam						
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					

For a smaller size fork shape see EE-SX

General purpose

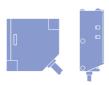




Photoelectric sensor for structured object detection in plastic housing

The special wide beam 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 for reliable detection of structured, shiny and irregularly shaped objects









Ordering information

Special models M18 cylindrical

Compact Miniature & Photomicro

Sensor type	Output	Sensing distance	Connection n	nethod			Timer function	Order code
	configurations		8		Щ	Ī		Light ON
Limited reflective	NPN	20 to 35 mm (Red light)	-	-	2 m	-	No	E3S-LS3N
		10 to 60 mm (Red light)						E3S-LS3NW
	PNP	20 to 35 mm	-	-	2 m	-	No	E3S-LS3P
		(Red light)					Yes	E3S-LS3PT
			-	-	-	■ 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
		(Red light)					Yes	E3S-LS3PWT
			-	-	-	■ M8 3-pin	No	E3S-LS3PW-M5J
							Yes	E3S-LS3PWT-M5J
			-	-	-	■ M8 4-pin	No	E3S-LS3PW-M3J
							Yes	F3S-I S3PWT-M3.I

Specifications

Item		Limited reflective					
		E3S-LS3_	E3S-LS3_W				
Sensing distance		20 to 35 mm	10 to 60 mm				
Light source (wave l	ength)	Red LED (660 nm)					
Power supply voltage	e	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	e	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					

For wide beam models in cylindrical housing see E3F2

General purpose

For other solutions in semiconductor and electronics see 'sensing in SEI'

Semiconductor

Material handling



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

- 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

	-	-	-		•		_	-	_	
í	٠.,			h	~~4	_				

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
]=	Line	This model number is for the set consisting of the E39-P11 mounted to the E3C-LD11.	E3C-LD21
	Area	This model number is for the set consisting of the E39-P21 mounted to the E3C-LD11.	E3C-LD31
Coaxial retroreflective with M.S.R.	Spot (variable)	Mounting a beam unit (sold separately) allows the use of line and area beams.	E3C-LR11
	Spot (2.0 mm fixed dia.)	-	E3C-LR12

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	

^{*1} order connector E3X-CN21 seperately

Specifications

Sensor heads Item Diffuse reflective Coaxial retroreflective with M.S.R. E3C-LR11 + E39-P31 E3C-LD11 E3C-LD21 E3C-LD31 E3C-LR11 E3C-LR11 + E3C-LR12 E39-P41 **Light source** Red semiconductor laser diode (650 nm), 2.5 mW max. (JIS standard: Class 2, FDA standard: Class II) 1 mW max. (emission wavelength) (JIS standard Class 1) High-resolution mode: 30 to 1,000 mm 1,700 mm, 900 mm Sensing distance 7 m 7 m Standard mode: 30 to 700 mm 700 mm 5 m 2 m 5 m 1.300 mm 2 m 700 mm 400 mm Super-high-speed mode: 30 to 250 mm Beam size (typical) 0.8 mm max. 33 mm 33x15 mm 0.8 mm max. 28 mm 28x16 mm 2.0 mm dia. (at distances up to (at distances up to (at 150 mm) (at 150 mm) (at 150 mm) (at 150 mm) (at distances up to 300 mm) 1,000 mm) 1,000 mm) **Functions** Variable focal point mechanism (beam size adjustment), optical axis adjustment mechanism (axis adjustment) **Degree of protection** IEC60529 IP40

More solutions for the detection of small objects see 'solutions for small objects'

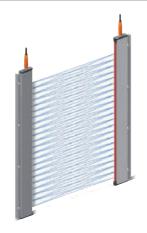
For highest precision and measurement see ZX-L in 'Inspection & Quality Control'

General purpose

Reflectors and connectors see 'accessories'.



For more area monitoring sensors see 'solutions for



Multi-beam sensor in flat aluminium housing

The crossing of the multiple sensorheads provide a reliable area monitoring in a flat easy to install housing. Three models from 20 cm length up to 1.8 m are available.

- Flat 9 mm shape for easy design-in in elevator constructions
- Highest ambient light immunity (200,000 lux) for installations with direct sunlight exposition
- · Robust aluminium housing
- Fulfills requirements of EN81-70 (1800 mm models) for mounting in elevators



Ordering information

Sensor type	Pitch	Detection area	Channels	Number of Connection method					Output	Order code
				optical axis	8		Щ			
Throughbeam	40 mm	200 mm	6	16	-	-	5 m	-	potentialfree output	F3E-06-T1 5M
						-	-	-		F3E-06-T6
	120 mm	1320 mm	12	34	-	-	5 m	-		F3E-12-T1 5M
						-	-	-		F3E-12-T6
Am A	120 mm	1800 mm	16	46	-	-	5 m	-		F3E-16-T1 5M
						-	-	-		F3E-16-T6
	40 mm	1800 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_				
Rated sensing dista	nce	0 to 5 m							
Number LEDs		6	12	16	46				
Number of optical axis		16	34	46	136				
Pitch		40 mm	120 mm	120 mm	40 mm				
Vertical detection ar	rea	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 voltag	je	10 to 30 VDC							
Ambient temperatur	e	-20 to +60°C (operation), -40 to +70°C (storage)							
EMC conformity/sta	ndards	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							

For connectors see 'accessories'

irregular shaped objects'. **General purpose**





Photoelectric sensor in miniature plastic housing

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

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



Ordering information

Sensor type	Sensing distance	Connection n	nethod			Operation mode	Order code	
		8	000	Ш			NPN output	PNP output
Through-beam	1 m	-	-	2 m		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
$\Pi \longrightarrow \Pi$						Dark-ON	E3T-FT12 2M	E3T-FT14 2M
<u> </u>	300 mm					Light-ON	E3T-FT21 2M	E3T-FT23 2M
ПП						Dark-ON	E3T-FT22 2M	E3T-FT24 2M
Retro-reflective for	200 mm					Light-ON	E3T-SR21 2M	E3T-SR23 2M
reflectors	[10 mm] ^{*1}					Dark-ON	E3T-SR22 2M	E3T-SR24 2M
for reflec-	100 mm				with	Light-ON	E3T-SR31 2M	E3T-SR33 2M
tive foils	[10 mm] ^{*1}				sad/	Dark-ON	E3T-SR32 2M	E3T-SR34 2M
Diffuse-reflective	5 to 30 mm				le ty	Light-ON	E3T-FD11 2M	E3T-FD13 2M
 ≒					or ordering pigtail versions replace '2M' of cable types with: M11: M12 with 30 cm cable M31: M8 4-pin with 30 cm cable M51: M8 3-pin with 30 cm cable	Dark-ON	E3T-FD12 2M	E3T-FD14 2M
Limited reflective	5 to 15 mm				apla able	Light-ON	E3T-SL11 2M	E3T-SL13 2M
ก 🕻					able cm c	Dark-ON	E3T-SL12 2M	E3T-SL14 2M
	5 to 30 mm				rsio m c 30 (Light-ON	E3T-SL21 2M	E3T-SL23 2M
					ail ve 130 c with with	Dark-ON	E3T-SL22 2M	E3T-SL24 2M
Diffuse reflective with BGS	1 to 15 mm				pigi with 4-pin 3-pin	Light-ON	E3T-FL11 2M	E3T-FL13 2M
					M12 M8	Dark-ON	E3T-FL12 2M	E3T-FL14 2M
	1 to 30 mm				ord 11:1 33:1	Light-ON	E3T-FL21 2M	E3T-FL23 2M
П					- M3	Dark-ON	E3T-FL22 2M	E3T-FL24 2M

 $^{^{\}star 1}$ Values in parentheses indicate the minimum required distance between the sensor and reflector.

For smaller size see E32 **General purpose**



Specifications

Item		Through-beam				Retro-reflective				
		Side-view		Flat		Side-view				
		NPN	PNP	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-SR21 E3T-SR22	E3T-SR23 E3T-SR24	E3T-SR31 E3T-SR32	E3T-SR33 E3T-SR34	
Sensing distance		E3T-ST1_: 1 m E3T-ST2_: 300 mn	n	E3T-FT1_: 500 mm E3T-FT2_: 300 mm		E3T-SR2_200 mm (10 mm)				
Light source	e (wavelength)	Red LED ("Pin-point" LED) $\lambda = 650 \text{ nm}$								
Power supp	ly voltage	12 to 24 VDC ±10%, ripple (p-p) 10% max.								
Protection of	circuits	Power supply and o Output short-circui		se polarity protection	1	Power supply and control output reverse polarity protection Output short-circuit protection, Mutual interreference prevention				
Ambient temperature range				cing or condensatior cing or condensatior						
Degree of protection		IP67 (IEC60529)								
Materials Case		PBT (polybutylene	terephthalate)							
Display window		Denatured polyaryl	ate							
	Lens	Denatured polyaryl	ate			Methacrylic resin				

Item		Diffuse-reflec	tive	Limited reflec	tive			Diffuse reflec	tive with BGS (fixed distance)		
		Flat		Side-view	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 dist	ance	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	(wavelength)	Red LED ("Pin-point" LED) $\lambda = 650 \text{ nm}$										
Power suppl	y voltage	12 to 24 VDC ±10%, ripple (p-p) 10% max.										
Protective ci	rcuits	Power supply and control output reverse polarity protection Output short-circuit protection, Mutual interference prevention										
Ambient tem	perature	Operating: -25 to 55°C Storage: -40 to 70°C (with no icing or condensation)										
Degree of pr	Degree of protection											
Materials Case		PBT (polybutyle	ene terephthalai	e)								
	Display window	Denatured poly	/arylate									
	Lens	Denatured poly	/arylate									

For	small	er siz	ze see	E32

General purpose Food and Beverage Automotive Semiconductor Material handling Accessories





Photomicrosensor in plastic fork shape housing

Standard photomicrosensors with 50 to 100 mA direct switching capacity for best value-performance ratio to detect machine parts or small objects.

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









Special models

M18 cylindrical

Ordering information

Connector models

Outliector iniducis						
Sensor type	Sensing distance	Connection method	Operation Mode	Shape	Order code	
					NPN output	PNP output
Through-beam with slot	5 mm	Connector (4 poles) (use E1001 connector)	Dark-ON/Light-ON	Standard	EE-SX670	EE-SX670P
	(slot width)		(selectable)	L-shaped	EE-SX671	EE-SX671P
	(Infrared light)			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

Note: For shape dimensions refer to www.omron-industrial.com

Specifications

Item			Through-beam									
			Standard	L-shaped	T-shaped, slot center: 7 mm	Close-mounting	ng	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 di	stance		5 mm (slot width)	5 mm (slot width)								
Power sup	ply voltaç	je	5 to 24 VDC ±10%, ripple (p-p): 10% max.									
Response t	frequency	1	1 kHz min. (3 kHz average)									
Ambient te	emperatui	re	Operating: -25 to +55°C, Storage: -30 to +80°C									
Degree of protection			IEC60529 IP50									
Material Case		PBT (polybutylene terephthalate)										
	Lens		Polycarbonate									

For higher frequency or smaller size see EE-SX91 or E32







Photomicrosensor in thin fork shape plastic housing

Thin shaped photomicrosensor for space saving mounting.

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









Ordering information

Special models

M18 cylindrical

Compact

Miniature & Photomicro

Pre-wired models

Sensor type	Sensing distance	Connection n	nethod			Shape	Operation	Order code	
		<u></u>	000	Ш			mode	NPN output	PNP output
Through-beam with slot	5 mm (slot width) (Infrared light)			2 m		Standard	Dark-ON	EE-SX770	EE-SX770P
						L-shaped	Light-ON	EE-SX870	EE-SX870P
							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

Note: For shape dimensions refer to www.omron-industrial.com

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 d	listance	5 mm (slot width)							
Power su	pply voltage	5 to 24 VDC ±10%, ripple (p-p): 10% max.							
Response	frequency	1 kHz min. (3 kHz average)							
Ambient 1	temperature	Operating: -25 to +55°C, Storage: -30 to +80°C (wi	ith no icing)						
Degree of	protection	IEC60529 IP60							
Material	Case	PBT (polybutylene terephthalate)							
	Lens	Polycarbonate							

For the complete range of photomicrosensors please visit our website at www.omron-industrial.com

General purpose

A

Semiconducto

Material handling



High-frequency photomicrosensor in fork shape plastic housing

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

• Up to 3 kHz (8 kHz average) switching frequency











Ordering information

Special models M18 cylindrical Compact Miniature & Photomic

Sensor type	Sensing distance	Connection n	nethod			Operation	Shape	Order code	
		8		Щ		mode		NPN output	PNP output
Through-beam with slot	5 mm			Light-ON	Standard	EE-SX910-R	EE-SX910P-R		
	(slot width)					Dark-ON	L-shaped	EE-SX911-R	EE-SX911P-R
	(Infrared light)					(2 outputs)	F-shaped	EE-SX912-R	EE-SX912P-R
							R-shaped	EE-SX913-R	EE-SX913P-R
							U-shaped	EE-SX914-R	EE-SX914P-R

Note: For shape dimensions refer to www.omron-industrial.com

Specifications

Item		Through-beam								
		Standard	L-shaped	F-shaped	R-shaped	U-shaped				
	NPN	EE-SX910-R	(910-R EE-SX911-R EE-SX912-R			EE-SX914-R				
	PNP	EE-SX910P-R	EE-SX911P-R	EE-SX912P-R	EE-SX913P-R	EE-SX914P-R				
Sensing dista	ince	5 mm (slot width)								
Power supply	voltage	5 to 24 VDC ±10%, rij	5 to 24 VDC ±10%, ripple (p-p): 10% max.							
Protective cir	cuits	Power supply reverse	Power supply reverse polarity protection; output reverse polarity protection							
Response fre	quency	3 kHz min. (8 kHz ave	3 kHz min. (8 kHz average) Light incident: 15 µs average; light interrupted: 40µs average							
Ambient tem	perature	Operating: -25 to +55	Operating: -25 to +55°C, Storage: -30 to +80°C (with no icing or condensation)							
Degree of pro	tection	IEC60529 IP50	IEC60529 IP50							
Material	Case	PBT (Polybutylene tere	PBT (Polybutylene terephthalate)							
	Lens	Polycarbonate	Polycarbonate							

For smaller size see E32

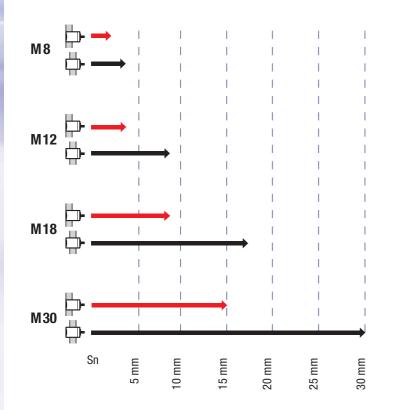
General purpose Food and Beverage Automotive Semiconductor Material handling Accessories



INDUCTIVE SENSORS

For machines that Never Stop

Our inductive sensors are designed and tested to ensure a long service life and achieve maximum machine availability even in the harshest environments.





Cylindrical brass housing, DC3-wire and antivalent

E2A see page 60



- · Highest water resistance
- Highest electromagnetic noise immunity (e.g. from inverters)
- · Antivalent output for cable breakage detection



Wide connection range

SPECIAL APPLICATIONS

















Extended sensing range inductive sensor in cylindrical brass housing

The high quality and the long-life design of the E2A extended sensing distance provide 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			Order code (for pre-wired types	with 2m cable length)	
	<u> </u>		distance	(overall length)	configuration	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) ⁽⁽⁾



^{*1} NPN models are also 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		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 tempe	rature	Operating: -40 $^{\circ}$ C to 70 $^{\circ}$ C, storage: -40 $^{\circ}$ C to 85 $^{\circ}$	°C (with no icing or condensation)			
Degree of prote	ection	IP67 after IEC 60529; IP69K after DIN 40050 part 9				
Material	Case	Stainless steel	Brass-nickel plated			
	Sensing surface	PBT				





^{*2} Longer housing models.



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)
	<u> </u>	-			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)		Thread length (overall length)	Order code (for M12 connector types)	
		<u></u>			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		-		- (-)	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 dis	stance	2 mm ±10%	4 mm ±10%	8 mm±10%	15 mm±10%	
Response 1	frequency	1,500 Hz	1,000 Hz	500 Hz	250 Hz	
Power sup (operating	ply voltage voltage)	12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)				
Protective	circuit	Surge suppressor, short-circuit protection				
Ambient te	emperature	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 40	C 60529; IP69K after DIN 40050 part 9			
Material	Case	Stainless steel	Brass-nickel plated			
	Sensing surface	PBT				

M8 connectors and different cables? Go to www.omron- industrial.com/E2A			For cable connectors see accessories
General purpose			Accessories



E2A3 Inductive sensors



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	Size				Output	Order code (for pre-wiredtypes with 2m cable length)	
	<u> </u>			(overall length)	configuration	Operation mode: NO	Operation mode: NC
M8	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	M12 ■	-	6.0 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	()	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			Order code (for M12 connector t	ypes)
	-				(overall length)		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	M12 ■	-	6.0 mm	M12 Connector	- ((-)	PNP	E2A3-M12KS06-M1-B1	E2A3-M12KS06-M1-B2
						NPN	E2A3-M12KS06-M1-C1	E2A3-M12KS06-M1-C2
M18		-	11.0 mm	M12 Connector	(- 1, 11111	PNP	E2A3-M18KS11-M1-B1	E2A3-M18KS11-M1-B2
						NPN	E2A3-M18KS11-M1-C1	E2A3-M18KS11-M1-C2
M30		-	20.0 mm	M12 Connector	()	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 dista	ance	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 ci		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 tem	perature	Operating: -25 to 70°C, storage: -25 to 70°C				
Degree of pro	otection	IP67 after IEC 60529; IP69K after DIN 40050 pa	rt 9			
Material	Case	Stainless steel	Brass-nickel plated			
Sensing surface		PBT				

For longer sensing distance see E2Q5			For cable connectors see accessories
General purpose			Accessories





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)
- EMC noise tested after ISO 11452-2 and ISO 7637-2:2004
- 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		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	M30 ■ -	-		PNP	E2AU-M30KS15-WP-B1 2M
				PNP	E2AU-M30LS15-WP-B1 2M

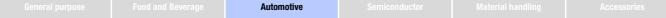
Connector versions (M12)

Size		<u> </u>	Sensing distance	Output configuration	Order code (for M12 connector types) Operation mode: NO
	1 1				
M12		-		PNP	E2AU-M12KS04-M1-B1
				PNP	E2AU-M12LS04-M1-B1
M18		-		PNP	E2AU-M18KS08-M1-B1
				PNP	E2AU-M18LS08-M1-B1
M30	M30 ■ -	-		PNP	E2AU-M30KS15-M1-B1
				PNP	E2AU-M30LS15-M1-B1

Specifications

Item		M12	M18	M30		
		E2AU-M12_	E2AU-M18_	E2AU-M30_		
Sensing dis	stance	4 mm ±10%	8 mm ±10%	15 mm ±10%		
Response 1	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 te	emperature	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-nic		Brass-nickel plated				
	Sensing surface	PBT				

For more automotive solutions see 'sensing in automotive parts'





Inductive sensors



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

E2AX

Connector versions (M12)

Size					(accessed law settle)	Order code (for M12 connect	or types) ^{*1}	
		—		(overall length)		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	()	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

 $^{^{\}star1}$ Protective connector cover is included. Order cable connectors seperately.

Specifications

Item		M12		M18	M18		M30	
		E2AX-M12KS	E2AX-M12KN	E2AX-M18KS	E2AX-M18KN	E2AX-M30KS	E2AX-M30KN	E2AX-M30KN
Sensing d	listance	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
	pply voltage g voltage range)	12 to 24 VDC. Ripple (p (10 to 32 VDC)	p-p): 10% max.					
Protective	circuit	Output reverse polarity	protection, power supp	ly reverse polarity protec	ction, surge suppressor,	short-circuit protection		
Ambient a	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- ATEX afterEN50014 EN50281-1-						
Material	Case	Brass-nickel plated						
Sensing surface		PBT						

For more solutions for food industry see 'sensing in food packaging'

General purpose Food and Beverage Automotive Semiconductor Material handling Accessories





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	e		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 dis	stance	2 mm ±10%	3 mm ±10%	7 mm ±10%	10 mm ±10%		
Response f	requency	1.5 kHz	1.0 kHz	0.5 kHz	0.4 kHz		
Power supp (operating v		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.					
Protective of	circuit	Surge suppressor, output short-circuit protection (for control and diagnostic output)					
Ambient ter	mperature	Operating: -25 ° C to 70 ° C, storage: -40 ° C to 85 ° C (with no icing or condensation)					
Degree of p	rotection	IEC 60529 IP67 (JEM standard IP67g (v	vaterproof and oil-proof))				
Material	Case	Stainless steel (SUS303) Brass-nickel plated					
	Sensing surface	PBT (polybutylene terephthalate)					
Cable		PUR for jacket, PE					

For more oil resistant sensors see 'sensing in automotive'

For DC3-wire and extended range go to www.omronindustrial.com/E2E

Automotive

For oil resistant connectors see accessories

Accessories

OMRON

Inductive sensors



Heat and detergent resistant inductive sensor in cylindrical stainless steel housing

The heat and detergent resistant inductive sensors enable 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			· ·	Output configuration	Order code (for pre-wired types with 2 m cable length)		
				Comiguration	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	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-M1	E2EH-X7D2-M1G	
M30	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 dis	tance	3 mm±10%	7 mm±10%	12 mm±10%			
Response fi	requency (average)	500 Hz	300 Hz	100 Hz			
Power supp (operating v	oly voltage voltage range)	12 to 24 VDC, ripple (p-p): 10% max. (10 to 32 VDC) (24 VDC max. at 100°C or higher)					
Protective of	circuit	Surge suppression, short circuit protection, power supply reverse polarity protection, output reverse polarity protection					
Ambient ter	mperature ^{*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 p	rotection	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 varied 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.

For more stainless steel sensors see 'sensing in food packaging'

See Food and Beverage Automotive Semiconductor Material handling Accessories





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 convential 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		Order code (for pre-wired types with 30 cm cable length and M12 connector) Operation mode NO
M8	_	1.5 mm		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 dis	tance	1.5 mm±10%	2 mm±10%	5 mm±10%	10 mm±10%		
Response fi	requency	200 Hz	100 Hz	100 Hz	50 Hz		
Power supp (operating v	oly voltage voltage range)	12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.					
Protection of	circuits	Surge suppressor, output short-circuit protection					
Ambient ter	nperature range	Operating/Storage: -25°C to +70°C (with no icing or condensation)					
Degree of p	rotection	IEC60529 IP67, IP69k after DIN 40050	part 9				
Materials	Case	Stainless steel (SUS303)					
	Sensing surface	Stainless steel (SUS303)					
Cable		PVC (flame retardant)					

For more solutions in metal cutting and processing applications see 'sensing in automotive parts'

For oil resistant connectors see accessories

Automotive Accessories



E2FQ Inductive sensors



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		<u></u>	Sensing distance		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		Order code (for pre-wired types with 2 m cable length)	
				Operation mode NO
M12	-		PNP	E2FQ-X2F1
			NPN	E2FQ-X2E1
M18		5 mm	PNP	E2FQ-X5F1
			NPN	E2FQ-X5E1
M30			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, shirt 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				

For smaller chemical resistant sensors see 'sensing in semiconductor and electronics'







High precision positioning inductive proximity sensor with seperate 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 1 mm 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
<i><</i>	8 dia.×22			2 mm	2 μm	E2C-ED02
Screw	M10×22			2 mm	2 µm	E2C-EM02
Flat	30×14×4.8			5 mm	2 µm	E2C-EV05
Screw	M18×46.3	-	•	7 mm	5 μm	E2C-EM07M
Screw (heat resistant)	M12×22	-	-	2 mm	2 µm	E2C-EM02H

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 E3X-CN21 seperately

Specifications

Sensor heads

0011001 1	loudo							
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)						
Degree o	f protection	IEC60529 IP67						IEC60529 IP60
Material	Case	Brass	Stainless steel	Brass			Zinc	Brass
	Sensing surface	Heat-resistant ABS						PEEK

Higher precision and thickness measurement see ZX-E in 'Inspection & Quality Control' guide'

General purpose

Food and Beverage

Automotive

Semiconducto

For connectors see accessories

Accessories

OMRON

E2EC Inductive sensors



Sub-miniature 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 resistence in demanding environments

Ordering information

Standard (plastic sensing surface) DC 2-wire

—	—	(pre-wired types with 2 m cable length)		
		Operation mode NO	Operation mode NC	
•	-	E2EC-CR8D1	E2EC-CR8D2	
		E2EC-C1R5D1	E2EC-C1R5D2	
n dia.		E2EC-C3D1	E2EC-C3D2	
112		E2EC-X4D1	E2EC-X4D2	
	•	-	■ - E2EC-CR8D1 E2EC-C1R5D1 E2EC-C3D1	

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

Size	<u> </u>	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} Models ending with -M16J-T provide an M12 connector with 30 cm cable. Cable length from sensor head to remote amplifier is 0.5 m

Specifications

		dia 3	dia 5.4	dia 9		M12	
		E2EC-CR8D_	E2EC-C1R5D_	E2EC-MC E2EC-QC	E2EC-C3D_	E2EC-X4D_	
Sensing d	listance	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 su (Operating	pply voltage g voltage)	12 to 24 VDC (10 to 30 VDC) ripple (p-p): 10% max.					
Protective	e 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		

For miniature sizes with built-in amplifier see E2E small diameter

For miniature sizes with seperate amplifiers see E2C

General purpose

More solutions for assembly machines see 'sensing in automotive parts

Automotive

For connectors see accessories





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 ist 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 v	vith 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) ③

Size	Sensing distance		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

		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 frequen	ісу	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 temperat	ture	Operating/Storage: -25 ° C to 70 ° C (with no icing or condensation)					
Degree of protect	ion	IEC 60529 IP67					
Material Case		Stainless steel (SUS303)	s steel (SUS303) Brass-nickel plated				
	Sensing surface	Heat-resistant ABS					

Smaller size and longer sensing distance see E2EC			For cable connectors see accessories
General purpose			Accessories



E2S Inductive sensors



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, provide best value-performance ratio for machine part movement detection.

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

Ordering information

	_				
m	7-	wire	mor	lar	c

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

DC 3-wire models

Size in mm			Sensing distance		Output	Order code		
(HxWxD)	-				specifications	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				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 supressor; power supply reverse po	larity 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 su	ırface	Front face	End face	Front face	End face	Front face	End face	Front face	End face	
Sensing dis	stance	1.6 mm ±10% 2.5 mm ±15% 1.6 mm ±10% 2.5 mm ±15%								
Response f	frequency	1 kHz min.								
Power suppoperating		2 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.								
Protective	circuit	Surge suppressor; pov	er supply reverse polar	ity protection						
Ambient te	mperature	Operating: -25 to 70°C	s, storage: -40 to 85°C (with no icing or cond	lensation)					
Degree of protection IEC60529 IP67										
Material	Case	Polyarylate								

For the detection of non-metallic machine parts see EE-SX

General purpose					
-----------------	--	--	--	--	--





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

DC 3-wire models

Size in mm				Order code			
(HxWxD)				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 distar	псе	5 mm ±10%	1.5 mm ±10%	3 mm ±10%	5 mm ±10%		20 mm ±10%	
Response freq	uency	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 VD	C) 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-cir- Surge suppressor; power supply reverse polarity protection cuit protection						
Ambient temp	erature	Operating/Storage: -25 to 70°C (with no icing or condensation)						
Degree of prot	tection	IEC60529 IP67						
Material	Case	Heat-resistant ABS resin	Diecast aluminum	Heat-resistant ABS resin				
	Sensing surface	Heat-resistant ABS resin						

For thin shape square sensors or higher switching frequencies see TL-T





TL-T Inductive sensors



Thin shape inductive sensor in compact plastic housing

The TL-T features a 12mm thin housing for space saving direct wall mounting.

- 12 mm thin housing
- Direct side wall mounting for bracket-less installation
- Up to 3 kHz response frequency

Ordering information

Pre-wired							
Size in mm			Sensing distance	aanfinuvation	Order code (for pre-wired types with 2 m cable length)		
(HxWxD)					Operation mode NO	Operation mode NC	Operation mode (NO + NC)
26x40x12	-	-	2.0 mm	NPN	TL-T2E1-E 2M	TL-T2E2-E 2M	TL-T2E3-E 2M
				PNP	TL-T2F1-E 2M	TL-T2F2-E 2M	TL-T2F3-E 2M
	-	-	4.0 mm	NPN	TL-T4ME1-E 2M	TL-T4ME2-E 2M	TL-T4ME3-E 2M
				PNP	TL-T4MF1-E 2M	TL-T4MF2-E 2M	TL-T4MF3-E 2M

Connector versions (M8, 3-pin) 🚳

Size in mm		4	Sensing distance	Output			
(HxWxD)	<u> </u>		configurati	configuration	Operation mode NO	Operation mode NC	
26x40x12		-	2.0 mm	NPN	TL-T2E1-M5-E	TL-T2E2-M5-E	
				PNP	TL-T2F1-M5-E	TL-T2F2-M5-E	
	-	-	4.0 mm	NPN	TL-T4ME1-M5-E	TL-T4ME2-M5-E	
				PNP	TL-T4MF1-M5-E	TL-T4MF2-M5-E	

Specifications

Item	TL-T2	TL-T4			
Sensing distance	2 mm ±10%	4 mm ±10%			
Response frequency	3000 Hz	1500 Hz			
Power supply voltage (operating voltage)	24 VDC. ripple (p-p): 10% max. (10 to 35 VDC)				
Protective circuit	Output reverse polarity protection, power supply reverse polarity protection, surge suppressor, short-circuit protection				
Ambient temperature	Operating/Storage: -25 to 70°C (with no icing or condensation)				
Degree of protection	IEC 60529: pre-wired models: IP67; M8 Connector models: IP65				
Material Case	PBT				

For flat shape square sensors see TL-W			For cable connectors see accessories
General purpose			Accessories





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° incremets

Ordering information

Connector versions (M12)



Size in mm		<u> </u>	Sensing distance			Order code (for M12 connector types)	
(HxWxD)						Operation mode NO	Operation mode NO + NC
67x40x40		-	20 mm	Changable	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-N20M1	E2Q5-N40M_3-M1			
Sensing o	distance	20 mm±10%	40 mm±10%			
Response	e frequency	150 Hz				
Power su (operatin		10 to 30 VDC				
Protective	e circuit	Output reverse polarity protection, short-circuit protection				
Ambient 1	temperature	Operating: -25 to 85°C				
Degree of	f protection	IEC 60529 IP 67 after DIN 40050 part 9				
Material	Case	PBT				
	Sensing face	PBT				

For other solutions in automotive assembly lines see 'sensing in automotive parts'

Automotive

Accessories

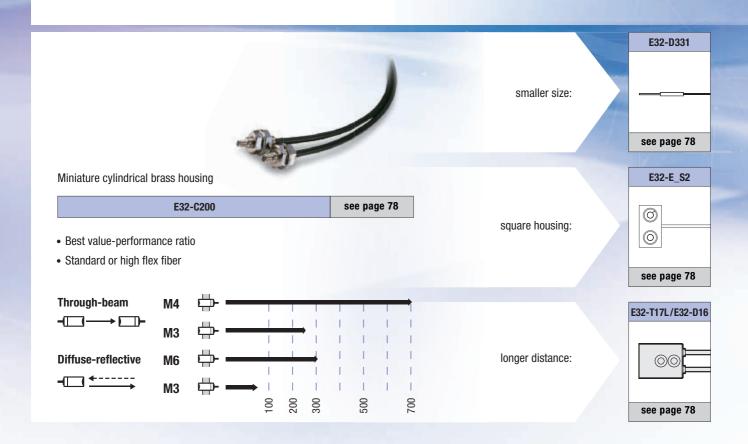
For cable connectors see

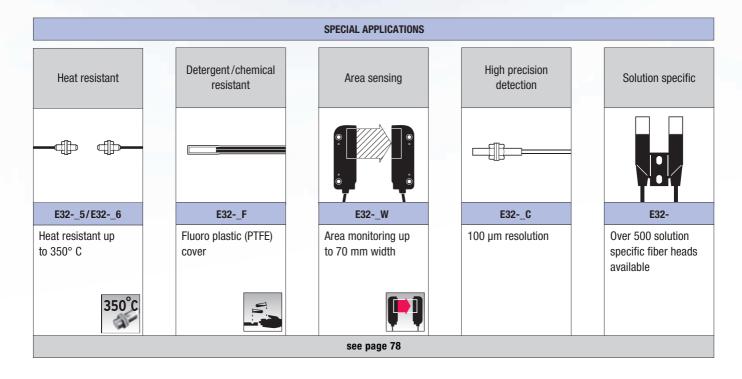


FIBER OPTIC AMPLIFIERS AND SENSORS

The simplicity of high performance in challenging areas

With over 500 different fiber heads we offer one of the most comprehensive fiber portfolios bringing reliable detection to smallest spaces or most challenging environments. The easy usage and auto adjustment features of the fiber amplifiers provide highest stability and performance reducing setup and adjustment times.







Digital amplifier dual display

E3X-DA-SE-S

see page 79

E3X-NA/E3X-SD

see page 83

- Easy 1-button teaching
- · Auto-teaching during operation
- Auto power control for long term stability

high functionality:

basic functionality:



SPECIAL APPLICATIONS





E3X-DA-AT-S

Active threshold control for higher stability in dirty environments

see page 81

2 in 1 double amplifier



E3X-MDA

AND, OR signal comparison of two input signals saving space and set-up time

see page 82





E3X-NA-F

Short turn on time of 20 μs

see page 84

Color (RGB) amplifier



E3X-DAC-S

White LED and RGB ratio comparison for distance independent color detection

see page 85

Selection Table Fiber optic

Fiber sensing heads

Category	Shape	Sensor type	Sensing distance in mm	Key feature	Order code	
			(Reference with E3X-DA-S)		Standard fiber	High flex fiber
	—————————————————————————————————————	Through-beam	750	M4 screw	E32-TC200	E32-ET11R
	—————————————————————————————————————		220	M3 screw	E32-TC200E	E32-T21R
	M6 Screw	Diffuse reflective	300	M6 screw	E32-DC200	E32-ED11R
	M3 screw		80	M3 screw	E32-DC200E	E32-ED21R
ø	3 mm Ø	Through-beam	530 (210 for high-flex)	Dia 3 mm side-view	E32-T14L	E32-T14LR
General purpose models	6 mm Ø	Diffuse reflective	110 (45 for high-flex)	Dia 6 mm side-view	E32-D14L	E32-D14LR
ral purp	M4	Through-beam	280	M4 (hexagonal back)	E32-T11N	-
Gene	M6	Diffuse reflective	90	M6 (hexagonal back)	E32-D11N	-
	(a) 15x8x3	Through-beam	190	Flat shape (front view)	_	E32-ETS20R
	13x6x2.3	Diffuse reflective	60	Flat shape, side view	-	E32-EDS24R
		Through-beam	20 m	Long distance	E32-T17L	-
	—	Diffuse reflective	700	Long distance	E32-D16	-
ø	—————————————————————————————————————	Through-beam	760	Heat-resistance up to 150°C	E32-ET51+ E39-EF1-37	-
Heat resistant models	—————————————————————————————————————	Diffuse reflective	230	Heat-resistance up to 150°C	E32-ED51	-
leat resis	<u></u>	Through-beam	450	Heat-resistance up to 350°C	E32-T61S+ E39-EF1-37	-
		Diffuse reflective	150	Heat-resistance up to 350°C	E32-D61S	-
Chemical resistant models	† † † 6 dia.	Diffuse reflective	95	Fluoroplastic (PTFE) cover, chemical resistant	E32-D12F	-
on lels		Limited reflective	3,3	Small level differences, high power, side view	E32-L25	-
High precision detection models	M6 screw	Diffuse reflective, coaxial beam	300 (150)	coaxial M6	E32-CC200	E32-CC200R
High	M3 screw	Diffuse reflective, coaxial beam	7 (recommended)	Coaxial M3 screw High precision detection (100 µm object size)	-	E32-EC41+ E39-F3A-5
Area sensing models		Through-beam, area sensing	1800 (1300 for high-flex)	30 mm area width	E32-T16W	E32-T16WR
Area sı moc			2340	70 mm area width	_	E32-ET16WR-1
dels	Ø 2 mm Ø 0,5 mm	Diffuse reflective, sub miniature	3	Dia. 2 mm (0.5 dia, sleeve)	E32-D331	-
lution mo	3-mm Ø +	Through-beam, wafer mapping	890	Opening angle: 1,5° (optical axis adjusted before delivery)	_	E32-A03
Application solution models	B	Through-beam	10	Fork sensor (no adjustment for optical axis required)	E32-G14	-
Appl		Diffuse reflective, liquid level detection	-	Heat resistance up to 200°C, Fluoroplastic (PTFE) cover, liquid level detection	E32-D82F1	-

Automotive Semiconductor Material handling Accessories

For lenses see accessories



For our industry specific fiber solutions and the extended range of more than 500 fiber heads, see the industry solution pages and on www.omron-industrial.com

Food and Beverage

General purpose



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

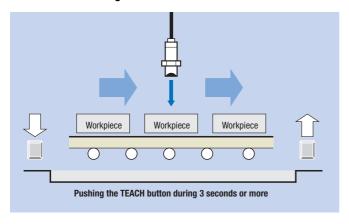
Item	Order code				
	NPN output	PNP output			
Pre-wired	E3X-DA11SE-S 2M	E3X-DA41SE-S 2M			
Connector version*1	E3X-DA6SE-S	E3X-DA8SE-S			

^{*1} Order connector separately from accessories.

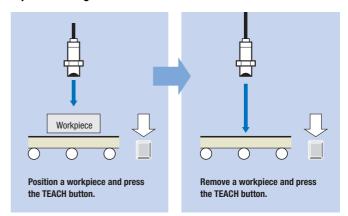
Specifications

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 ti	me	Operation or reset: 1 ms		
Sensitivity s	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 displ	lays	Incident level + threshold		

1-button auto-teaching



2-point teaching



For more signal processing functionality see E3X-DA-S			For connectors see accessories
General purpose			Accessories



E3X-DA-S Fiber optic



High functionality digital fiber amplifier

High functionality digital fiber amplifier with two large displays for excellent visibility even from a distance.

- High resolution for long sensing distances and accurate settings
- · 4 element LED and Auto Power Control for high and long-term stability
- Mutual interference suppression for simultaneous sensor operations

Ordering information

Pre-wired

Item			Order code (for pre-wired types with 2 m cable length)			
			NPN output	PNP output		
	Standard models	Red light	E3X-DA11-S 2M	E3X-DA41-S 2M		
		Infrared light	E3X-DAH11-S 2M	E3X-DAH41-S 2M		
	Advanced models	Twin-output models	E3X-DA11TW-S 2M	E3X-DA41TW-S 2M		
		External-input models	E3X-DA11RM-S 2M	E3X-DA41RM-S 2M		

Connector version (order connector separately)

Item		Order code		
		NPN output	PNP output	
Standard models	Red light	E3X-DA6-S	E3X-DA8-S	
	Infrared light	E3X-DAH6-S	E3X-DAH8-S	
Advanced models	Twin-output models	E3X-DA6TW-S	E3X-DA8TW-S	
	External-input models	E3X-DA6RM-S	E3X-DA8RM-S	

Specifications

Amplifier units with cables

Item			Standard models		Advanced, twin-output models	Advanced, external-input models	
		NPN output	E3X-DA11-S, E3X-DA6-S	E3X-DAH11-S, E3X-DAH6-S	E3X-DA11TW-S, E3X-DA6TW-S	E3X-DA11RM-S, E3X-DA6RM-S	
PNP output		E3X-DA41-S, E3X-DA8-S	E3X-DAH41-S, E3X-DAH8-S	E3X-DA41TW-S, E3X-DA8TW-S	E3X-DA41RM-S, E3X-DA8RM-S		
Light source (wavelength)		Red LED (650 nm)	Infrared LED	Red LED (650 nm)			
Power supply	voltage		12 to 24 VDC ±10%, ripple (p-p) 10%	6 max.			
Protective circ	uits		Power supply reverse polarity protect	tion, output short circuit protection, r	nutual interference prevention		
Response time	Super-high- speed mode	NPN	48 μs for operation and 50 μs for res	48 μs for operation and 50 μs for reset		48 μs for operation and 50 μs for reset	
	PNP		53 μs for operation and 55 μs for reset			53 μs for operation and 55 μs for reset	
	Standard mod	de	1 ms for operation and reset respectively				
	High-resolution	on mode	4 ms for operation and reset respect	ively			
Sensitivity set	ting		Teaching and digital up/down keys				
Functions	Power tuning		Light emission power and reception	gain, digital control method			
	Timer functio	n	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-m 200 ms to 1 s set in 100-ms increments, and 1 to 5 s set in 1 s-incremen				
I/O settings		-		Output setting (Select from channel 2 output, area output, or self-diagnosis.)	External input setting (Select from teaching, power tuning, zero reset, light OFF, or counter reset.)		
Digital display	S		Incident level + threshold or user sp	ecific			

For advanced communication via DeviceNet see fiber amplifier communication unit E3X-DRT21-S at www.omron-industrial.com

General purpose Food and Bevera

Automotiv

Semiconducto

For connectors see accessories.

aterial handling Accessories





Digital Fiber Amplifier with active threshold control for dust and dirt compensation

The active threshold E3X-DA-AT-S digital fiber amplifier ignores a certain level of dirt or pollution and makes readjustments of thresholds unnecessary. Combined with APC* function you can always be assured of stable sensing characteristics.

- · Active threshold control for high stability
- Area detection function for quality inspection or sensing range control
- · Power tuning for accurate level control
- Short response time of only 80 µs (turn on time)
- Alarm output for maintenance warning
- * APC: Auto Power Control = Regulator for constant optic LED output power

Ordering information

Digital fiber sensor

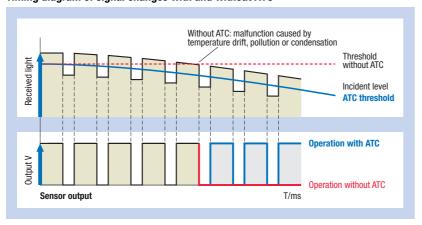
Item	Functions	Order code	
		NPN output	PNP output
Pre-wired version	ATC	E3X-DA11AT-S	E3X-DA41AT-S
Connector version*1	ATC error alarm output	E3X-DA6AT-S	E3X-DA8AT-S

^{*1} Please order connector separately from accessories.

Specifications

Item		Digital fiber sensor			
Output	NPN output	E3X-DA11AT-S	E3X-DA6AT-S		
	PNP output	E3X-DA41AT-S	E3X-DA8AT-S		
Light source	(wave length)	Red LED (650 nm)			
Power supp	ly voltage	12 to 24 VDC ±10%, ripple (p-p): 10% max.			
Protective c	ircuits	Power supply reverse polarity protection, output short circuit protection, mutual	al interference prevention		
Response time	Super-high-speed mode	Operation or reset: 80 µs			
	High-speed mode	Operation or reset: 250 µs			
	Standard mode	Operation or reset: 1 ms			
	High-resolution mode	Operation or reset: 4 ms			
Sensitivity s	etting	Teaching and digital up/down keys			
Functions	ATC	Active threshold control (used for output 1)			
	I/O settings	Used for output 1: ATC alarm output			
	Startup operation	The operation when power is turned ON can be selected: No operation, power tuning or power tuning + ATC			
Digital displ	ay	Incident level + threshold or user specific			

Timing diagram of signal changes with and without ATC



More information on ATC in the technical solution part of E3X-DA-AT-S at www.omron-industrial.com

General purpose

More information on solutions for enhanced detection stability of transparent materials see 'sensing in food packing'

Food and Beverage

als see cking'

utomotive

Semiconductor

Material handling

For connectors see accessories

Accessories



E3X-MDA Fiber optic



2-in-1 Digital fiber amplifier

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

For connectors see accessories

- 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
Connector version*1	AND/OR output	E3X-MDA6	E3X-MDA8

^{*1} Please order connector separately from accessories.

Specifications

Item		E3X-MDA	
Light source (wa	velength)	Red LED (650 nm)	
Supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.	
Protective circui	ts	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	g	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	

For advanced communication via DeviceNet see fiber amplifier communication unit E3X-DRT21-S at www.omron-industrial.com.





Digital 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

Ordering information

Pre-wired

Item	Order code (for pre-wired types with 2 m cable lenght)				
	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			
			Up/down keys	
	NPN output	PNP output	NPN output	PNP output
Standard*1	E3X-NA6	E3X-NA8	E3X-SD6	E3X-SD8
Enhanced water resistance*1 (M8 connector)	E3X-NA14V	E3X-NA44V	-	-

^{*1} Please order connector separately from accessories.

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 le	ngth)	Red LED (680 nm)		Red LED (620 nm)		
Power supply voltage	1	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)				
Degree of protection		IEC 60529 IP50 (with protective cover attached)	IEC 60529 IP66 (with protective cover attached)	IEC 60529 IP50 (with protective cover attached)		

For best value performance ratio fibers see E32-TC200 and E32-DC200. For higher switching frequency see E3X-NA_F.

For connectors see accessories



E3X-NA_F Fiber optic



Fast response digital amplifier with manual adjuster

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

- · Easy adjustment with potentiometer
- $\bullet~$ Short turn on time of only 20 μs

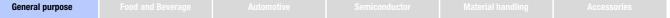
Ordering information

Pre-wired

Item	Order code		
	NPN output	PNP output	
High-speed detection models	E3X-NA11F	E3X-NA41F	

Specifications

Item		High-speed detection
Output	NPN output	E3X-NA11F
	PNP output	E3X-NA41F
Light source (wave le	ength)	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 adjustmen	nt	8-turn endless adjuster (potentiometer)
Functions OFF-delay timer: 40 ms (fixed)		OFF-delay timer: 40 ms (fixed)
Degree of protection		IEC 60529 IP50 (with protective cover attached)







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

The E3X-DAS-C detects the color of a workpiece and enables it to be compared with a stored RGB ratio to identify coloured marks or workpieces. Moreover, it does this independent of the light intensity and any sensing distance variations.

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

Ordering information

Pre-wired

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

Connectors versions (Please order connectors separately)

Item	Functions	Order code	
		NPN output	PNP output
Standard models	Timer, Response speed change	E3X-DAC6-S	E3X-DAC8-S

Specifications

Item		Standard models	Advanced models		
		E3X-DAC1, E3X-DAC4 E3X-DAC6, E3X-DAC8	E3X-DAC2, E3X-DAC5		
Light source (wa	ive length)	White LED (420 to 700 nm)			
Sensing method		C Mode: RGB ration determination (or I Mode: Light intensity determination	ation for red, green, or blue)		
	Number of registered colors	1	2 (simultaneous determination)		
Power supply vo	ltage	12 to 24 VDC ±10%, ripple (p-p) 10% max.			
Protective circuit	ts	Power supply reverse polarity protection, output short circuit protection, output reverse polarity p, mutual interference prevention			
Response time	Super-high-speed mode High-speed mode Standard mode High-resolution mode	Operation or reset: 60 µs Operation or reset: 300 µs Operation or reset: 1 ms Operation or reset: 4 ms	Operation or reset: 120 µs Operation or reset: 600 µs Operation or reset: 2 ms Operation or reset: 8 ms		
Sensitivity settin (color registration	ig on, allowable range)	Teaching (one-point teaching or teaching with/without workpiece) or manual adjustment			
Functions	Operating mode	ON for match (ON for same color as registered color) or ON for mismatch (ON for different color from registered color)			
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 protec	tion	IEC60529 IP50 (with protective cover attached)			

For be	est value performance ratio	
use co	paxial fiber E32-CC200. For	
loi	nger distance or smaller	
obje	ects refer to www.omron-	
	industrial.com.	

General purpose

For more information on transparent foil detection with E32-G14 see sensing in food packaging.

Food and Beverage

For more solutions for wafer detection see sensing in semiconductor and electronics

For cable connectors see accessories

Semiconductor

Accessories

ROTARY ENCODERS

For machines that Never Stop

The accurate coordination of object and machine part movement is mandatory for the production of high quality products. The high signal repeat accuracy of our incremental and absolute encoders ensures reliable detection of machine part movement.



E6C2-C, E6C3-C	see page 89		E6A2-C	E6B2-C
• Dia 50 mm housing		smaller size:		
• 5000 rpm max rotation frequency				
			page 88	page 88
Resolution range from 10 to 3600 pulses / rotation				
			E6F-C	
	enhanced r	nechanical resistance:	5	
			page 89	
			E6H-C	
	higl	ner rotation frequency:	1997	
			page 90	



page 91





page 90



see page 91

Absolute encoder in compact housing

E6C3-A

Dia 50 mm housing

• 5000 rpm max rotation frequency

• Resolution range from 6 to 1024 pulses / rotation

enhanced mechanical resistance:

multiturn:

E6A2-C Rotary encoders



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
	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
	А, В	5 to 12 VDC 12 to 24VDC	NPN voltage output	100, 200, 360, 500	E6A2-CW3E
			NPN open collector	100, 200, 360, 500	E6A2-CW3C
					E6A2-CW5C
	A, B, Z	5 to 12 VDC 12 to 24VDC	NPN voltage output	100, 200, 360, 500	E6A2-CWZ3E
			NPN open collector	100, 200, 360, 500	E6A2-CWZ3C
					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
	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 resistant

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
8 dia. tough model		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
		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

General purpose



Rotary encoders



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

E6H-C

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



Multiturn rotary encoder

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

• Multiturn 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 collect	·	Gray code	256, 360, 720, 1,024		E6C3-AG5B
			Binary	32, 40		E6C3-AN5B
			BCD	6, 8, 12		E6C3-AB5B
	5 VDC 12 VDC		Binary	256		E6C3-AN1E
						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		NPN open collector	BCD	360	Pre-wired	E6F-AB5C
					Connector type	E6F-AB5C-C
			Gray code	256, 360, 720, 1,024	Pre-wired	E6F-AG5C
			BCD	360	Pre-wired	E6F-AB5B
			Gray code	256, 360, 720, 1,024	Pre-wired	E6F-AG5B



Cable connectors

Shape	Туре	Features	Size	Material		Order code
				Nut	Cable	
	General purpose (screw)	• 4 pin • optionally: - LED - 3 pin	M8	Brass (CuZn)	PUR 2 m, angled PUR 2 m, straight PVC 2 m, angled PVC 2 m, straight	Y92E-M08PUR4A2M-L Y92E-M08PUR4S2M-L Y92E-M08PVC4A2M-L Y92E-M08PVC4S2M-L
60		• 4 wire • optionally: - 3 or 5 wire - LED	M12		PUR 2 m, angled PUR 2 m, straight PVC 2 m, angled PVC 2 m, straight	Y92E-M12PUR4A2M-L Y92E-M12PUR4S2M-L Y92E-M12PVC4A2M-L Y92E-M12PVC4S2M-L
	Detergent resistant	4 pin	M8	Stainless steel (SUS316L)	PVC 2 m, angled PVC 2 m, straight	Y92E-S08PVC4A2M-L Y92E-S08PVC4S2M-L
-		4 wire	M12	Stainless steel (SUS316L)	PVC 2 m, angled PVC 2 m, straight	Y92E-S12PVC4A2M-L Y92E-S12PVC4S2M-L
No.	105°C Heat resistant	4 wire	M12	Stainless steel (SUS316L)	Heat resistant PVC 2 m, straight	XS2F-E421-D80-E
	Twist & click (oil resistant)	4 wire	M12	Nickel plated Zinc	PUR 2 m, straight	XS5F-D421-D80-P
	Small size (screw)	4 pin	M8	Brass (CuZn)	PVC 2 m, straight PVC 2 m, angled	XS3F-M421-402-A XS3F-M422-402-A
	Small size: - Snap - Robot	4 pin	M8	PUR	PVC or PUR	XS3FR ^{*1} Y92E-MS08 ^{*1}
	Extended wiring: - AC - Fire retardant - Spatter proof - Robot cable	2, 3, 4 or 5 wire	M12	Brass (CuZn)	PVC or Polyethylene	XS2F* ¹
	Fiber amplifier connectors	4 wire	Special	-	PVC 2 m	E3X-CN21
		4 pin	Special + M8 4-pin	Plug: Zinc diecast	PVC 30 cm with M8 4-pin connector	E3X-CN21-M3J-1 0.3m

 $^{^{\}star 1}~$ For full order information on accessories, please visit our website at www.omron-industrial.com

For more information see www.omron-industrial.com



Reflectors for retroreflective photoelectric sensors

Shape	Туре	Housing material	Features	Size in mm	Applicable Sensor	Order code
	General purpose reflectors	ABS base Acrylic surface	Surface screw mounting (diagonal holes)	59.9x40.3x7.5	Retroreflective photo electric sensors - non polarizing Retroreflective photo electric sensors - polarizing (MSR)	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
	Large size		Surface screw mounting	23x13.7x4.9	Recommended for fine beam and laser sensors (E3S-CR62/67, E3C, E3X)	E39-R4
				100x100x9		E39-R8
				84.5x84.5x8.7		E39-R40
	High precision	ecision Microtripel performant sensors	performance with small beam	52x40x4.8		E39-R6
9 S				30x45		E39-R12 E39-R14
200				12x24		E39-R13
	Simple mounting		Round shape with centered mounting hole for simple screw mounting	Diameter: 84 Depth: 7.4	Polarizing and non-polarizing photoelectric sensors	E39-R7

For more information see www.omron-industrial.com



Shape	Туре	Housing material	Features	Size in mm	Applicable Sensor	Order code
	Enhanced detergent resistance	Mounting plate stainless steel Reflector acrylic	Surface screw mounting	14x1x1	Recommended for harsh environment sensors	E39-R37
	Enhanced detergent resistance	• PVC	Surface screw mounting	60x40x7.5		E39-R48
	Heat resistant	Borosilicat	Surface screw mounting 350°C heat resistance	95x51x8		E39-R47
	Non-fogging reflector	ABS Acrylic surface	Anti-fogging coating	40x60x7.5		E39-R1K
3333	General purpose tape reflectors	Acrylic	• Self adhesive • Pre cut	35x10x0.6	Polarizing and non-polarizing photo- electric sensors	E39-RS1
				40x35x0.6		E39-RS2
			Self adhesive Self cut/roll material	80x70x0.6		E39-RS3
4 9				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
1				108x46		E39-RS5

For more information see www.omron-industrial.com



Fiber optic accessories*1

Shape	Types of fibre	Material	Applicable products	Order code
90		Body: Aluminium Lens: Optical glass	E32-TC200 through-beam fiber heads	E39-F1
		Body: Aluminium Lens: Optical glass	E32-EC31 E32-EC41	E39-F3A-5
	High temperature lens unit	Stainless steel	M4 screw fitting up to 350°C	E39-EF1-37
	Fibre cutter	-	-	E39-F4

^{*1} For more lens units, please visit our website at www.omron-industrial.com

Mounting brackets

Shape	Туре	Order code
6	Quick access - snap fix for cylindrical sensors	Y92E-BC
	Standard-surface mounting	E39-L104 *1
	Standard-backwall mounting	E39-L44 *1
	Protection-wall mounting	E39-L142 *1
	Protection-surface mounting	E39-L98 *1
	Telescope mounting	E39-L93
	3D rotation mounting	E39-EL4

^{*1} For sensor families E3T, E3S, E3G and E32 the order references for the mounting brackets may differ. Please refer to the sensor accessory datasheet E26E-EN2 for the complete list of mounting brackets.

For more information see www.omron-industrial.com

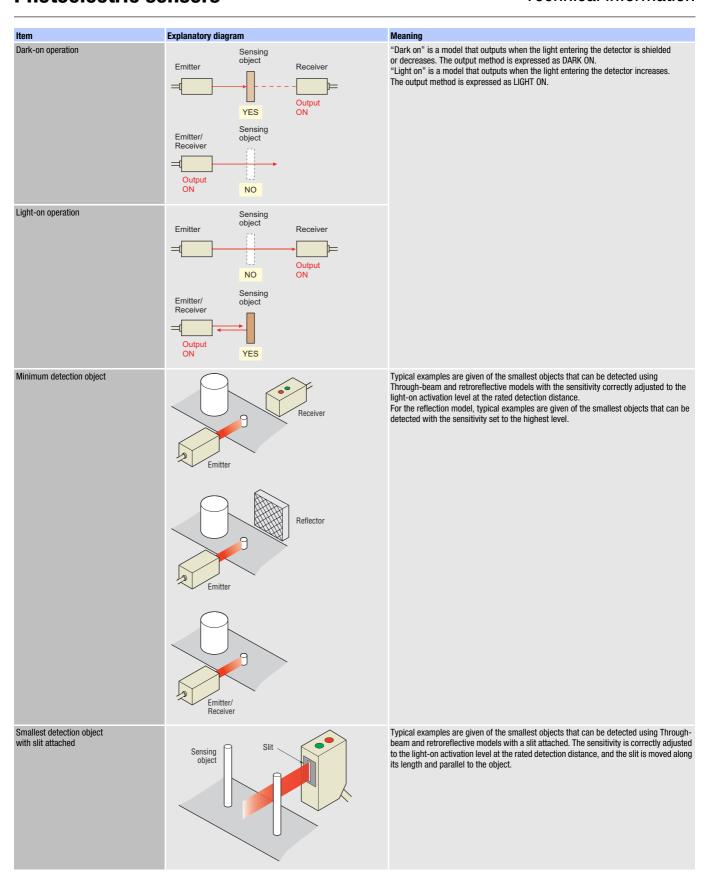


Explanation of terms

Item		Explanatory diagram	Meaning
Sensing distance	Throughbeam	Sensing distance	This is the maximum detection distance that can be set with stability for through-beam and retroreflective models, taking into account product deviations and temperature fluctuations. Actual distances in standard conditions will be longer than the rated detection distances for both models.
	Retroreflective	Sensing distance	
	Diffuse reflective	Sensing range	This is the maximum detection distance that can be set with stability for the diffuse reflective models, taking into account product deviations and temperature fluctuations, using the standard test object (white drawing paper). Actual distances in standard conditions will be longer than the rated detection distance.
Detection range/ Set range	Distance setting	Setting distance Light emitting diode (LED) Sensing distance	In contrast to non distance-setting photoelectric sensors, which detect the presense (or not) of an object by means of the amount of light reflected back and thus have difficulty detecting objects with low reflectance, the distance-setting type detects the presense of the object based on the position, not the amount, of the reflected light. Suffering little from the effects of background objects and color, this type enables stable detection. A PSD (Position Detection Device) is used in the detector. Detection range: The range where detection is possible. Set range: A range where the distance to the detected object can be set.
Directional angle		Emitter Receiver Angle of beam spread	Through-beam models, retroreflective models The range of angles where operation as a photoelectric sensor is possible.
Differential distance		Emitter Operating distance Operating distance ON OFF Hysteresis distance	Diffuse-reflective model The difference between the operating distance and the reset distance. Generally expressed in catalogs as a percentage of the detection distance.
Dead zone		Dead zone Triple reflector	The "Dead zone" is the non-operational area outside of the emission and detection areas near the lens surface in mark sensors, the distancesetting type, the limited reflective model, the diffuse-reflective model, and the retroreflective model. Detection is not possible in this area.
Response time		Control output Operating time (T on) (T off)	The "response time" is the lag time from the on/off of the light input to activation or reset of the control output. In general, for photoelectric sensors, activation time (Ton) \approx release time (Toff).



Photoelectric sensors





M.S.R. function

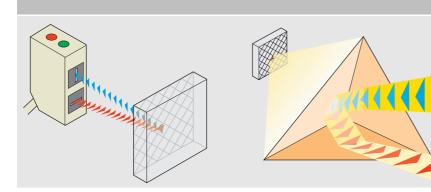
The Mirror Surface Rejection (MSR) is a function using the effect that light can be polarized and filtered according to the polarization direction. This effect can be used to avoid wrong detection of objects with smooth glossy surfaces like aluminium cans.

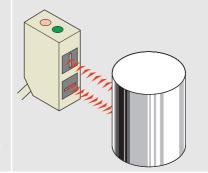
No object	Non-glossy object	Object with a smooth, glossy surface
The light from the emitter hits the reflective plate and returns to the detector.	the reflective plate, and does not return to the detector.	(Example: battery, can, etc.) Light from the emitter is reflected by the object and returns to the detector.

A direct reflection to the receiver from the surface of the object can be avoided by mounting the sensor at an angle. But for higher detection reliability the M.S.R. (Mirror Surface Rejection) function provides a solution for this type of application.

The light from the emitter is now polarized. The polarization plane is turned 90° by a reflector consisting of many small mirrors aligned so the light is reflected three times (triple reflector).

If an object with a smooth, glossy surface passes the emitted polarized light is returned to the receiver. As the polarization plane is not turned 90° the light does not pass the polarization filter in front of the receiver and the objects can be detected independant of their surface.





Inductive sensors

Inductive proximity switch

Item Principle of operation An inductive proximity sensor consists of a coil wound around a ferrite core at the sensing head. A high frequency is applied to this, generating an oscillating electromagnetic field around it. This is monitored by internal circuitry. Copper coil When a metallic object travels toward the field, electric currents are created in the object (eddy currents). As the target approaches the sensing face these increase These currents cause a transformer like effect, as a result the energy in the detecting coil lessens and the oscillations reduce. As the object moves in closer the os-Electrical circuit cillation finally stops. The monitoring circuitry detects the stopping of the oscillations and then switches the output on. The object has now been detected. Because the operating principle uses an electromagnetic field, proximity sensors excel over the likes of photoelectric sensors in environmental resistance. The likes of water, oil or dirt generally have no influence on the operation of the sensor making the use on machine tools etc. common place. Shielded sensors Shielded sensors are made with a shielding plate around the ferrite core. This has the effect of limiting the electromagnetic field to the front of the head. The sensor can be mounted flush in metal surfaces. This gives the advantage of mechanical $% \left(1\right) =\left(1\right) \left(1\right) \left($ protection, along with sensing directly adjacent to the sensing face. This limits the sensing range, but the sensor can be mounted with ease with surrounding metals taking no effect. Unshielded sensors Unlike the shielded sensor there is no shielding around the ferrite core. This gives a greater sensing range than the equivalent diameter shielded proximity sensor. For the same diameter the range is generally doubled. As the field extends to the side of the proximity switch it can be influenced by metals in this area. Thus it cannot be flush mounted and requires more distance to other proximity sensors or metal parts. Sensing distance The sensing distances quoted in the specifications for the proximity sensors are Standard target based on a standard target. This target (known as a standard object) is a square plate of mild steel 1 mm thick, a primarily ferrous object. Bring the target towards the sensor When the target reaches the point where the sensor operates, this is the sensing distance. The sensor will release (i.e. turn off) at a point lightly further from the sensing face (hysteresis). Sensing distance (operating position) Release position Operating position



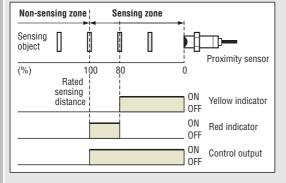
Item

Output and Connection

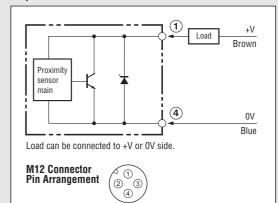
For the output mode NO (normally open) the control output is OFF if no object is present.

DC 2-wire

Timing chart for NO (normally open)



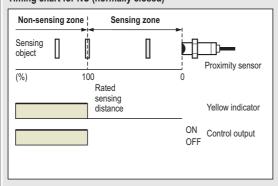
Output circuit



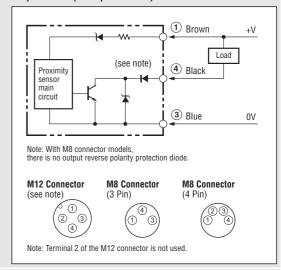
DC 3-wire

For the output mode NC (normally closed) the control output is ON if no object is present.

Timing chart for NC (normally closed)



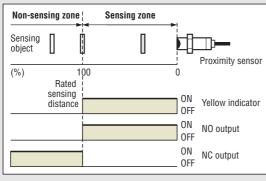
Output circuit (example for NPN)



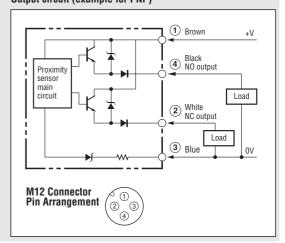
For the output mode NO+NC (antivalent) the NO output is OFF and the NC output is ON if no object is present.

DC 4-wire

Timing chart for NO+NC (antivalent)



Output circuit (example for PNP)



Fiber optics

Fiber optics

Item		
Principle of operation		Fiber optic photoelectric sensors comprise two parts, the amplifier and the sensing head. The amplifier contains the emitter (the light source) and receiver (detector) along with their associated electronics. The fiber optic cable is the means used to transfer the light to the sensing head.
	Sheath Core Light approx. 60°	The light source (an LED) transmits the light beam down the fiber optic cable by repeatedly reflecting the light off the boundary between the fiber core and its sheath. When it reaches the end of the fiber the light is dispersed at the end.
		When the light is dispersed it spreads out and forms a beam much like that of other sensors, but on a smaller scale. With smaller light sources and lens areas the sensing ranges are on the whole much shorter.
Types of fibre		Fiber optic heads mainly split into two types, through-beam and diffuse (although there are a few retro-reflective types). The principle of operation of both types is exactly that of standard photoelectric sensors.
	Matchstick	
Construction	Fiber	Standard fiber: Most fiber optic sensing heads use this configuration of fiber (i.e. a single fiber covered by a protective sheath). The fibers are usually plastic, 0.5 to 1 mm in diameter and covered in a plastic protective sheath.
	Receivers Transmitter	Coaxial fiber: This gives greater accuracy. The core is used as the transmitter and the surrounding fibers are bundled together to form the receiver. This gives better accuracy, the target can enter the detecting area from any direction.
	Fibers Sheath	Multicore: These consist of large numbers of small fibers. This results in a more flexible cable (E32-R types) which can literally be tied in a knot.



Item		
Using fiber optic sensors		The main advantage of fiber optics is that they are small. This means that they can be mounted in places where other sensors couldn't fit.
	manaa	As the sensor heads are extremely compact, they are ideal for the stable detection of small objects. As a result of the less light that is emitted they generally do have smaller ranges than conventional photoelectric sensors.
	Target object HAZARDOUS AREA Seal SAFE AREA Partition	Fiber optic sensor heads can be used in areas that standard sensors are unable to go, for instance hazardous areas, This is because no electric current flows through them. This also means they are totally unaffected by electrical noise (provided the amplifier is suitably positioned). By using glass fibers instead of plastic they can be used in areas of up to 350°C.
	Lens (E39-F3A-5) Fiber unit (E32-EC41) Insertion	Extremely small objects can be detected with a diffuse coaxial sensor and additional focal lens. Using these, objects as small as 100 μm can be detected.

Laser classes

Laser classes

Laser products are defined by class types which are set in European and international standards. The table below refers to standard EN 60825.

Requirements: Sub-clause	Classification				
	Class 1	Class 2	Class 3A	Class 38	Class 4
Description of Hazard Class	Safe inherently by engineering design	Low power: eye protection normally afforded by aversion responses	Same as class 2, Direct intrabeam viewing with optical aids may be hazardous	Direct intrabeam viewing with optical aids may be hazardous	High power; diffused reflection may be hazardous
Protective Housing	Required for each laser product	; limits access necessary for per	formance of functions of the prod	ucts,	
Safety Interlock in Protective Housing	Designed to prevent removal of	the panel until accessible emissi	ion values are below the AEL for t	he class assigned	
Remote Control	Not required			Permits easy addition of externa	al interlock in laser installation
Key Control	Not required			Laser inoperative when key is re	emoved
Emission Warning Device	Not required Give audible or visible warning when laser is switched on if capacitor bank of pulsed laser is being charged				
Attenuator	Not required			Give means beside ON/OFF swi	tch to temporarily block beam
Location Controls	Not required		Controls located so adjustment	does not require exposure to AEL	above class 1 or 2
Viewing Optics	Emission from all viewing system	ms must be below class 1 AEL's	as applicable		
Scanning	Scan failure shall not cause pro	duct to exceed its classification			
Class Label	Required wording	Warning and explanatory labels	and specified wording		
Aperture Label	Required wording			Specified wording required	
Service Entry Label	Required as appropriate to the o	class of laser used			
Override Interlock Label	Required under certain condition	ns as appropriate' to the class of	laser used		
User Information	Operation manuals must contain instructions for safe use				
Purchasing and Service Information	Promotion brochures must reproduce classification labels; service manuals must contain safety information				
Medical Products	Special calibration instructions required Special calibration instructions, means for measurement and target-indicator required				
Fibre Optic	Cable service connections requi	re tool to disconnect if disconnec	ction breaks protective housing ar	nd permits access above class 1	

For safety purposes all laser products are labelied clearly with a safety warning message.



Protective Structure

Protective Structure

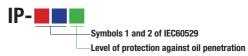
Note: IP-XX is based on the following testing method. Please verify sealing in the actual environment and conditions of use before using.

IEC (International Electrotechnical Commission) Standards (IEC60529:2001)

Protective characteristic symbol (International Protection) Symbol 1: Level of protection against solid objects

Level		Amount of protection
0	£::3	No protection
1	•[]•	Solid objects 50 mm or larger in diameter (hand, etc.) do not penetrate.
2	·[:]·	Solid objects 12.5 mm or larger in diameter do not penetrate.
3	=[]];	Wires or other solid objects 2.5 mm or larger in diameter do not penetrate.
4	=[Wires or other solid objects 1 mm or larger in diameter do not penetrate.
5		An amount of dust suffi cient to interfere with normal operation of the device or create a safety problem does not enter.
6		Dust does not enter.

JEM (Japan Electrical Manufacturers Association) Standards (JEM1030:1991)



Level		Amount of protection
f	Oil resistant	Suffers no damaging effects from oil drop or oil spray incident from any direction
g	Oil proof	Oil drops or oil spray incident from any irection does not penetrate.

Note: Other levels (h, c, d and e) also exist.

NEMA (National Electrical Manufacturers Association)

Table for converting NEMA enclosures to IEC60529 (conversion from IEC60529 to NEMA is not possible)

Nema 250	IEC 60529	
1	IP10	
2	IP11	
3	IP54	
3R	IP14	
3\$	IP54	

Nema 250	IEC 60529	
4, 4X	IP56	
5	IP52	
6, 6P	IP67	
12, 12K	IP52	
13	IP54	

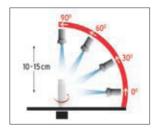
Note: From Appendix A of NEMA standard 250. NEMA enclosure levels and IEC60529 differ in the areas of corrosion resistance, rust resistance, and icing characteristics.

Symbol 2: Level of protection against water penetration

Level		Amount of protection	Summary of test method (test uses fresh water)		
0	No special protection	No protection against water penetration.	No test		
1		Suffers no damaging effects from vertically dripping water.	Placed under vertically dripping water from a dripping tester for 10 minutes.		
2	1111111	Suffers no damaging effects from water dripping no more than 15° out of plumb.	Placed at an inclination of 15° under dripping water from a dripping tester for 10 minutes (2.5 minutes in each direction).	19	
3		Suffers no damaging effects from water sprayed from an angle up to 60° from plumb.	Using the tester at right, the device is sprayed from each side up to an angle of 60° from plumb for 10 minutes).		
4		Suffers no damaging effects from water sprayed from all directions.	Using the tester at right, the device is sprayed from all directons for 10 minutes.		
5		Suffers no damaging effects from and direct jet spray from all directions.	Using the tester at right, each square meter of the case is sprayed from all directions for 1 minute, for a total of at least 3 minutes.		
6		Suffers no damaging effects from strong and direct jet spray from all directions.	Using the tester at right, each square meter of the case is sprayed from all directions for 1 minute, for a total of at least 3 minutes.		
7		Water does not penetrate when the device is submerged for a specified amount of time at a specified pressure.	The device is submerged for 10 minutes at depth of 1 m in water (if the height of the device is less than 850 mm)	1m	
8		The device can be used on a regular basis under water.	Decided by the manufacturer and the user of the device.		

IP69k according to DIN40 050/9

The IP69k test according to DIN 40 050 part 9 is intended to simulate high pressure / steam cleaning. During the test 14-16 I/min water at 80°C is sprayed onto the sensor from different angles with 8000-10000 kPa. The sensor may not suffer any damaging effects from high pressure water in appearance and functionality.





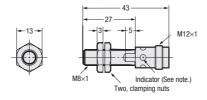
Product dimensions

Inductive sensors

Models: E2A, E2AU, E2AX, E2A DC 2-wire

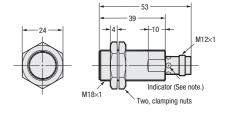


E2A-S08KS02-M1-



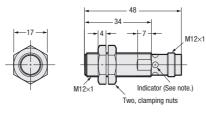
Note: Operation indicator (yellow LED, 4×90°)

E2A-M18KS08-M1-DD/E2A-S18KS08-M1-D



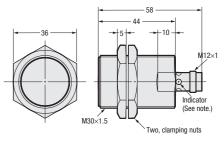
Note: Operation indicator (yellow LED, 4×90°)

E2A-M12KS04-M1-DD/E2A-S12KS04-M1-D



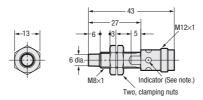
Note 1: Operation indicator (yellow LED, 4×90°)
Note 2: for NO+NC (-B3 / -C3) models the total
length is 4 mm longer

E2A-M30KS15-M1-\(\Box\)/E2A-S30KS15-M1-\(\Box\)

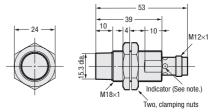


Note: Operation indicator (yellow LED, 4×90°)

E2A-S08KN04-M1-

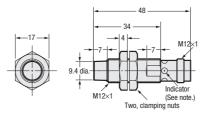


Note: Operation indicator (yellow LED, 4×90°)



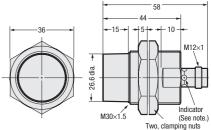
Note: Operation indicator (yellow LED, 4×90°)

E2A-M12KN08-M1- - | E2A-S12KN08-M1-



Note 1: Operation indicator (yellow LED, 4×90°)
Note 2: for NO+NC (-B3 / -C3) models the total length is 4 mm longer

E2A-M30KN20-M1- $\square\square$ /E2A-S30KN20-M1- \square

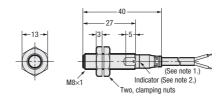


Note: Operation indicator (yellow LED, 4×90°)





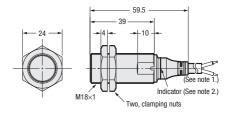
E2A-S08KS02-WP-



Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m

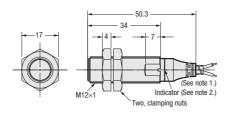
2. Operation indicator (yellow)

E2A-M18KS08-WP- | | | /E2A-S18KS08-WP- |



4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
2. Operation indicator (yellow)

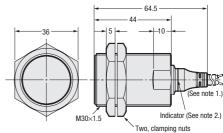
E2A-M12KS04-WP-DD/E2A-S12KS04-WP-D



4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm2; insulator diameter: 1.3 mm); standard length: 2 m

2. Operation indicator (yellow)

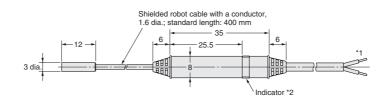
3. for NO+NC (-B3 / -C3) models the total length is 4 mm longer



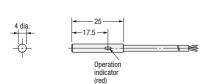
4-dia. vinyl-insulated round cable with 3 conductors (conductor cross section: 0.3 mm²; insulator diameter: 1.3 mm); standard length: 2 m
2. Operation indicator (yellow)

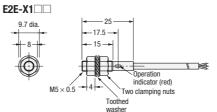
Models: E2EC, E2E Small diameter E2EC-CR8D_

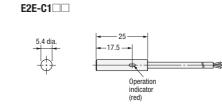










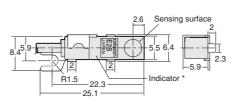


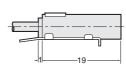
(Examples: pre-wired versions, please note that minor variations of the dimensions are possible for different models e.g. for connector models)

Models: E2S

E2S-W1_

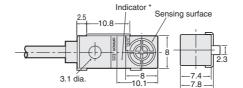


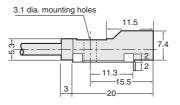




E2S-W2







TL-W5E_ TL-W5F_



Operation indicator (red)

10.5

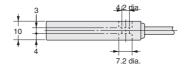
8

24.9 0.4

15

16 dia. Sensing surface 50

(2)

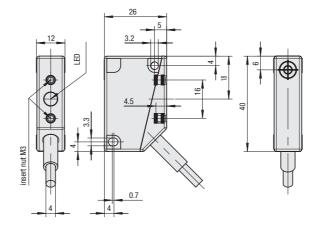


(Example: E2S-W and TL-W5 (sensing face on side) - for other models (e.g. front facing models) please see complete datasheet for details)

Models: TL-T

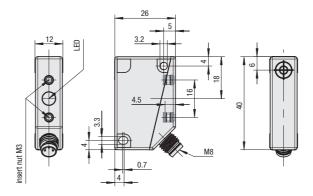
TL-T2_-E 2M TL-T4M_-E 2M





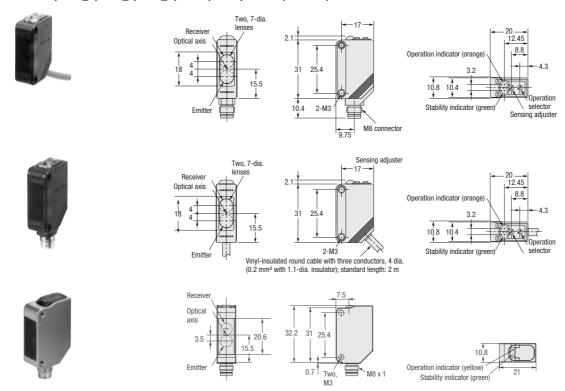
TL-T2_-M5E TL-T4M_-M5E





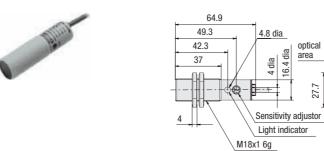
Photoelectric sensors

Models: E3Z, E3Z LASER, E3Z-_G, E3Z-_J, E3Z-_H, E3Z-B, E3ZM, E3ZM-C, E3ZM-B, E3ZM-V



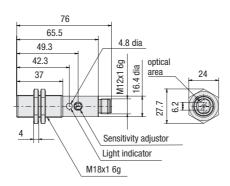
(Example: E3Z-R and E3ZM-LS, please note that minor variations of the dimensions are possible for different models e.g. position of indicator, etc. - please see complete datasheet for details)

Models: E3F2





(Example: E3F2-R4 metal housing, please note that minor variations of the dimensions are possible for different models e.g. position of indicator, etc. - please see complete datasheet for details)



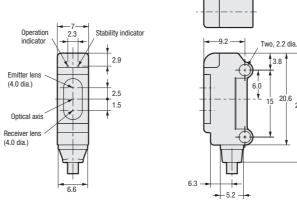
20.6

Product dimensions

Models: E3T

E3T-SR2_ E3T-SR3_

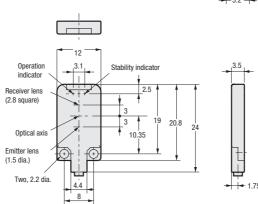




E3T-FL1_ E3T-FL2_



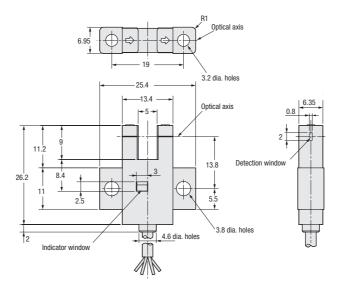
(Example: E3T-SR and E3T-FL, please note that minor variations of the dimensions are possible for different models e.g. position of indicator, etc. - please see complete datasheet for details)



Models: EE-SX

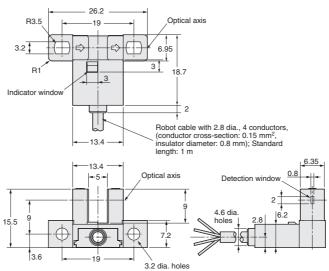
EE-SX670





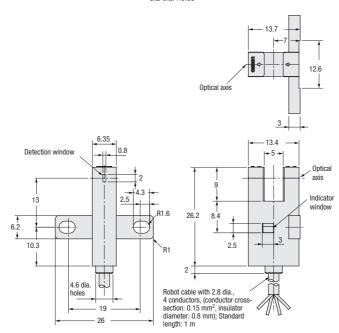
EE-SX671





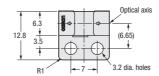
EE-SX672

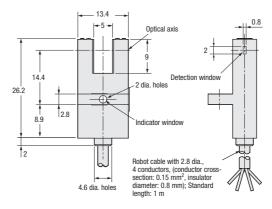




EE-SX673

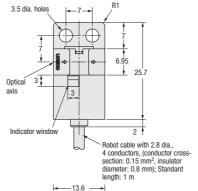


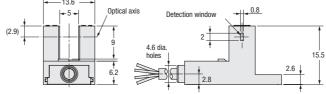




EE-SX674

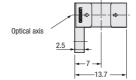


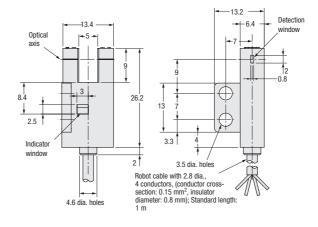




EE-SX676







(Example: EE-SX67 pre-wired, - please see datasheet for details on connector versions and complete range)



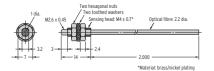
Models: E3X and E32



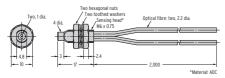
(Example: E3X-DA-S pre-wired, please note that minor variations of the dimensions are possible for different models e.g. adjuster, etc. - please see complete datasheet for details)

With Mounting Bracket Attached 32.8 32.8 15.1 15.1 32.5 The Mounting Bracket can also be used on this side. 10 Two, 2.4 dia. 11 12.5 13.7 14.3 Two, 3.2 dia. holes Two, 3.2 dia. holes 34.4 Two, M3 Two, M3 Two, M3 Two, M3

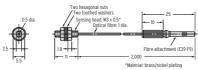
E32-TC200



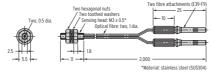
E32-DC200



E32-TC200E



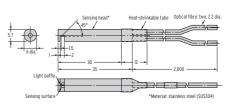
E32-DC200E



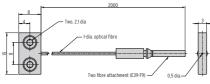
E32-T14L | E32-T14LR



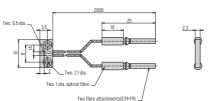
E32-D14L | E32-D14LR



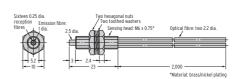
E32-ETS20R 2M



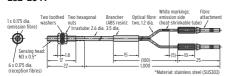
E32-E32-EDS24R



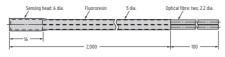
E32-CC200 | E32-CC200R



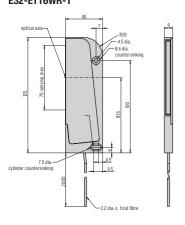
E32-EC41



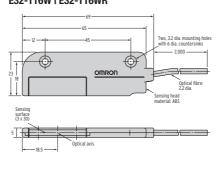
E32-D12F



E32-ET16WR-1



E32-T16W | E32-T16WR









Index

Α																					
Accessorie	es																				9
E2																					
E2A																					61
E2A DC 2-	wi	ire	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	6
E2A3			Ċ	•	•	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	•	•	Ċ	Ċ	•	Ċ	•	Ċ	Ċ	6:
E2AU			Ċ	•	•	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	Ċ	6
E2AX			Ċ			·		Ċ	·		Ċ	·		·	Ċ		Ċ		Ċ	Ċ	6
E2C-EDA																					6
E2E																					6
E2E Small	Di	iar	ne	te	r																7
E2EC																					7
E2EH																					6
E2FM .																					6
E2FQ																					6
E2Q5																					7
E2S																					7
E3																					
																					7
E32 E3C-LDA		•	•	٠	•	•	•	•	•	•	•	٠	•	•	٠	•	•	٠	•	•	7
E3F2 E3F241		•	٠	•	•	•	•	٠	•	•	٠	•	•	•	٠	•	•	•	٠	٠	4.
E3FR E3FZ		•	٠	•	•	•	•	٠	•	•	٠	•	•	•	٠	•	•	•	٠	٠	41
E3G E3G-M		٠	٠	•	•	•	•	٠	•	•	٠	•	•	٠	٠	•	٠	•	٠	٠	41
E3JK E3S-CL		٠	٠	•	•	•	•	٠	•	•	٠	•	•	٠	٠	•	٠	•	٠	٠	4
E3S-CR62 E3S-CR67		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0
E3S-LS3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	5
E3T		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	51
E3X-DA-A	 т (٠.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Q.
E3X-DA-A	. I -	J	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠	Q
E3X-DAG- E3X-DA-S	J	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠	Q
E3X-DA-S	F-	٠.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	7
E3X-DA-3	L-,	3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Q.
E3X-NA																					
E3X-NA_F		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Q.
E3X-SD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Q.
E3Z		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0
E3ZG		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
E3ZH		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
E3ZJ .		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
E3Z-B .		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
E3Z-G .																					
E3Z-Laser																					
E3ZM .																					
																		•	•	•	3
																	Ċ	•	•	•	3
E3ZM-V		-	Ċ					Ċ			Ċ	Ċ				•	Ċ	•	•	Ċ	3
		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
E 6																					
E6A2-C																					8
E6B2-C																					8
																					8
																					9
																					8
																					9
																					9
																					8
E6H-C .																					9
EE																					
FF 0V47																					5
01/0-		•	•		•							•				•		•	•	•	5
					•	•			•			•				•		•	•	•	5
												•				•		•	•		5
EE-SX87 EE-SX91																•		•	•		5
				•	•	•	•		•	•		•	•		•	•		•	•	•	J
F																					
F3E																					5
T																					_
TL-T				•								•						•			7





Note:

Although we do strive for perfection, Omron Europe BV and/or its subsidiary and affiliated companies do not warrant or make any representations regarding the correctness or completeness of information described in this catalogue. Product information in this catalogue is provided ,as is' without warranty of any kind, either express or implied, including, but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. In a jurisdiction where the exclusion of implied warranties is not valid, the exclusion shall be deemed to be replaced by such valid exclusion, which most closely matches the intent and purpose of the original exclusion. Omron Europe BV and/or its subsidiary and affiliated companies reserve the right to make any changes to the products, their specifications, data at its sole discretion at any time without prior notice. The material contained in this catalogue may be out of date and Omron Europe BV and/or its subsidiary and affiliated companies make no commitment to update such material.



OMRON EUROPE B.V. Wegalaan 67-69, NL-2132 JD, Hoofddorp, The Netherlands Tel: +31 (0) 23 568 13 00 Fax: +31 (0) 23 568 13 88 www.industrial.omron.eu

Austria

Tel: +43 (0) 2236 377 800 www.industrial.omron.at

Belgium

Tel: +32 (0) 2 466 24 80 www.industrial.omron.be

Czech Republic

Tel: +420 234 602 602 www.industrial.omron.cz

Denmark

Tel: +45 43 44 00 11 www.industrial.omron.dk

Finland

Tel: +358 (0) 207 464 200 www.industrial.omron.fi

France

Tel: +33 (0) 1 56 63 70 00 www.industrial.omron.fr

Germany

Tel: +49 (0) 2173 680 00 www.industrial.omron.de

Hungary

Tel: +36 1 399 30 50 www.industrial.omron.hu

Italy

Tel: +39 02 326 81 www.industrial.omron.it

Middle East & Africa

Tel: +31 (0) 23 568 11 00 www.industrial.omron.eu

Netherlands

Tel: +31 (0) 23 568 11 00 www.industrial.omron.nl

Norway

Tel: +47 (0) 22 65 75 00 www.industrial.omron.no

Poland

Tel: +48 (0) 22 645 78 60 www.industrial.omron.pl

Portugal

Tel: +351 21 942 94 00 www.industrial.omron.pt

Russia

Tel: +7 495 648 94 50 www.industrial.omron.ru Spain

Tel: +34 913 777 900 www.industrial.omron.es

Sweden

Tel: +46 (0) 8 632 35 00 www.industrial.omron.se

Switzerland

Tel: +41 (0) 41 748 13 13 www.industrial.omron.ch

Turkey

Tel: +90 (0) 216 474 00 40 www.industrial.omron.com.tr

United Kingdom

Tel: +44 (0) 870 752 08 61 www.industrial.omron.co.uk

More Omron representatives www.industrial.omron.eu

Authorised Distributor:

ADVANCED INDUSTRIAL AUTOMATION

Automation Systems

- Programmable logic controllers Human-machine interfaces
- Remote I/O

Motion & Drives

• Motion controllers • Servo systems • Inverters

Control & Switching Components

- Temperature controllers Power supplies Timers
- Counters Programmable relays Digital panel indicators
- Electromechanical relays Monitoring products
- Solid-state relays Limit switches Pushbutton switches
- Low voltage switch gear

Sensing & Safety

- Photoelectric sensors Inductive sensors
- Capacitive & pressure sensors Cable connectors
- Displacement & width-measuring sensors
 Vision systems
 Safety networks
 Safety sensors
- Safety units/relay units Safety door/guard lock switches

Cat.No. Y206-EN2-01A-IndSenGuide2008