

Industrial Automation Guide 2016



Industrial Products & Systems

Targeted Technologies

Creating maximum output with minimum input

By identifying the many ways of innovation in specific industries we developed the 'targeted technologies' concept. It's a way of thinking about technology in a prioritized format. Prioritized according to our customers' most pressing needs. The result? A set of solutions that make immediate impact on the core of our customers' businesses. A set of solutions that hit the target every time. Take a look at the examples on our website.

industrial.omron.eu/technologies



PROplus Line

If you have a complex application or one where you need to address special needs, then the PROplus Line is the answer. That's because PROplus products are designed to be customisable.

The possibility to modify a PROplus product means that your application is unique. However, this does not mean that the PROplus Line is not a ready-made solution. On the contrary, it is a challenge.

For example, the PROplus 4000 series is designed to be modified to meet your needs. It can be modified to meet your needs in terms of I/O, communication, and more. This makes the PROplus 4000 series a challenge.

EE-NH temperature controller

The new EE-NH series is the most powerful and precise temperature controller. It features a 16-bit ADC and a 16-bit DAC. It also has a 16-bit timer and a 16-bit counter. It is designed to be modified to meet your needs.

The 361° Approach



OMRON

Industrial Automation Europe

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Technologies

Creating maximum output with minimum input

Whatever type of automated machinery you are specialized in, you know that there are many ways to innovate. You are already aware that there are many possible areas for improvement. But where do you start? Where do you focus your efforts? Where can you make the biggest difference with the least amount of effort?

At Omron, we asked ourselves these questions too. And by identifying the answers in specific industries we developed the 'targeted technologies' concept. It's a way of thinking about technology in a prioritized format. Prioritized according to our customers' most pressing needs. The result? A set of solutions that make immediate impact on the core of our customers' businesses. A set of solutions that hit the target every time. Take a look at the examples below.

Technologies

Sysmac: the all-in-one platform

We know that machine builders prefer different product solutions for different challenges. But this can cause hierarchy headaches and communications issues. That's why we developed Sysmac: a single unified platform that is open, scalable, flexible, and totally focused on maximising the speed and flexibility of machines. A platform that integrates robotic, motion and sequential logic control into a single multitasking system.

[Learn more](#)



361°: the perfect match

When it comes to sensors and components, we know that our customers all have different needs. That's why our product development in this area is driven by the 361° Approach. It produces product families that offer a total all-round choice. From quality products suited to standard environments to specialist devices that can handle extremes. A full circle of choice, all with an extra degree of quality and proven reliability.

[Learn more](#)



The 361° portfolio

PROplus
PROplus products are designed for specific applications or customer demands.

[Learn more](#)



LITE

LITE sensors are the most effective without any compromise in quality.

[Learn more](#)



PRO

If you want extra performance in your sensors and components the Omron PRO Line is your perfect choice.

[Learn more](#)



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realizing

Grinding made easy

Sysmac controller provides a flexible platform. With Sysmac, you can manage the entire grinding process. It is designed to be modified to meet your needs.

Product groups

Sysmac controller

The Sysmac controller is the heart of the Sysmac system. It is designed to be modified to meet your needs.

Robotics

Omron's robotics solutions are designed to be modified to meet your needs.

Sensors

Omron's sensors are designed to be modified to meet your needs.

Relays

Omron's relays are designed to be modified to meet your needs.

PLC

Omron's PLCs are designed to be modified to meet your needs.

Related product news



With new G2B sensors, you only pay for what you need. They are designed to be modified to meet your needs.

[Learn more](#)

Related product news



ES16 - Omron's new photo sensors combine simplicity with performance. They are designed to be modified to meet your needs.

[Learn more](#)

Related product news



With new G2B sensors, you only pay for what you need. They are designed to be modified to meet your needs.

[Learn more](#)

Welcome to our world

Our best-in-class devices for your automation system

Welcome to Omron's world of advanced industrial automation. The INDUSTRIAL AUTOMATION GUIDE is your essential tool to select best-in-class devices for your automation system. It highlights our core competences in sensing, control, visualisation, motion and panel components.

Of course, Omron offers a much larger range of products than you can find on the attached DVD. For more information on services and company competence visit our website.

Here you will find:

- Latest product news
- Technical product specifications
- 2D / 3D CAD Library
- Customer references
- Technology concepts
- Supporting product documentation
- Knowledge Base - "myOmron"
- Events Calendar
- Contact information

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“To the machine the work of the machine,
to man the thrill of further creation.”

Kazuma Tateisi, founder of Omron

Omron at a glance

200.000 products ranging
input, logic and output

Sensing, Control Systems, Visualization, Drives, Robots, Safety,
Quality Control & Inspection, Control and Switching Components

7%

Investment in Research & Development

Innovation track
record of 80 years

Top 150 global patent assignee

1.200 employees dedicated to R&D

11.000 + issued and pending patents

37.000

Employees worldwide

210

Locations worldwide

22

Countries in EMEA

Working for the
benefit of society



Close to your needs

Technical training & seminars, technical support, Automation Technology Centers, online community (MyOmron), online catalogues and technical documentation, customer service & sales support, inter-operability labs (Tsunagi), safety services, repairs.

Your needs, our focus

Solutions perfectly matching your needs

We asked ourselves: 'What do you need in sensors and components?' Well, first you need reliability. Then a variety and choice of performance levels. You may also want advanced functionality, with special features defined by you – or you may want standardized solutions, with highly competitive prices.

Whatever it is, it can all add up to a wish list that is difficult to fulfil. Until now. That's because our new 361° Approach not only provides a complete all-round offer without gaps, it also puts you at the very centre of the product selection process. It's an approach that leads to a Perfect Match – one with the extra degree of confidence that comes from choosing Omron.

361° in one view



Quality



Line-up



Application



Customization



Global availability



Specs

	Quality	Line-up	Application	Customization	Global availability	Specs
PRO^{plus}	Premium	Tailored	Special	Yes	Yes	Application oriented
PRO	Premium	Complete	Advanced	Yes	Yes	Above Standard
LITE	Premium	Standard	Basic	No	No	Basic
	'Quality' refers to the standard of manufacturing and the materials used – this translates into reliability	'Line-up' refers to the number of model types	'Application' indicates the complexity of the automation	'Customization' is the possibility to modify the product		'Specs' refers to the choice of performance levels

The extra degree of advantage

Three distinct lines of sensors and components

Three distinct lines

361° Approach offers three distinct lines within each sensor or component product category. LITE products are cost-effective without any compromise in quality. PRO products represent the “install & forget” option, offering longer lifetime, higher protection, and more features. While PROplus products are designed for specific applications or customer demands.

Optimized reliability

All three lines are backed by the Omron commitment to quality, so even when you need a price-competitive advantage, you can be confident that they will never let you down.

Solutions that perfectly match your needs

The 361° Approach ensures that you can quickly and easily identify the perfect match solution to your needs – nothing more, nothing less.

Optimized costs

Your sensor and component costs are also minimized – because it eliminates over-specification.

Why an extra 1°?

The extra degree is what you get when you do business with Omron, and that means different things to different customers – all depending on their needs. For example, if you need specification advice, the extra degree is ‘service’. But ultimately, to everyone it means “an extra degree of confidence in the perfect match”.



Sysmac: A fully integrated platform

Integration and Functionality

Sysmac is an integrated automation platform dedicated to providing complete control and management of your automation plant. At the core of this platform, the Machine Controller series offers synchronous control of all machine devices and advanced functionality such as motion, robotics and database connectivity. This multidisciplinary concept allows you to simplify solution architecture, reduce programming and optimize productivity.



Machine Automation Controller

FACTORY
AUTOMATION

MACHINE
CONTROL

Motion



Filling line

- Motion Control: Integrated within the IDE, and operating in real-time
- Standard PLCopen Function Blocks plus Omron generated motion FB's
- Direct Synchronous control for Position, Speed and Torque

Safety



Assembly

- All safety related data is synchronized with the whole network
- Safety functions such as muting, guard locking, EDM and valve monitoring are simple to manage

- ✓ **One Integrated Development Environment software** for Configuration, Programming, Simulation and Monitoring



Information



- Sysmac communicates in real-time with Databases such as SQL
- Secure Data: In the event of a server going down or losing communications, data is automatically stored in internal memory
- Sysmac operates with Databases at high speed [1000 table element/ 100 ms] ensuring realistic Big Data Processing to improve productivity and aid predictive maintenance etc.

✓ Integrated Automation Control:

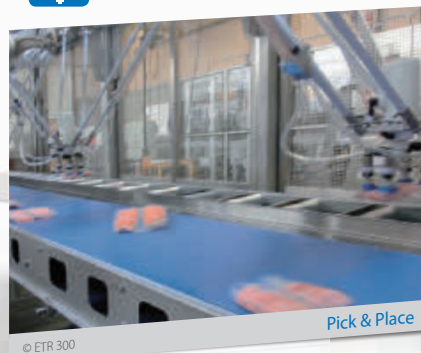
The Sysmac platform is scalable and provides the performance and functionality for a wide range of solutions from simple machines through to manufacturing cells

Vision



- Higher resolution images available without increasing the vision processing time
- Shape search technology: Provides more stable and accurate object detection for Pick & Place projects

Robotics



- Up to 8 Delta robots with one controller
- Time-based Robotic Function Blocks make programming easier

Sensing



- Full control of the process parameter setting and predictive maintenance functions
- High precision detection and positioning data synchronized on the network

Product selection table

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Software				

Sensing

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		Cable connectors	
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Photoelectric sensors

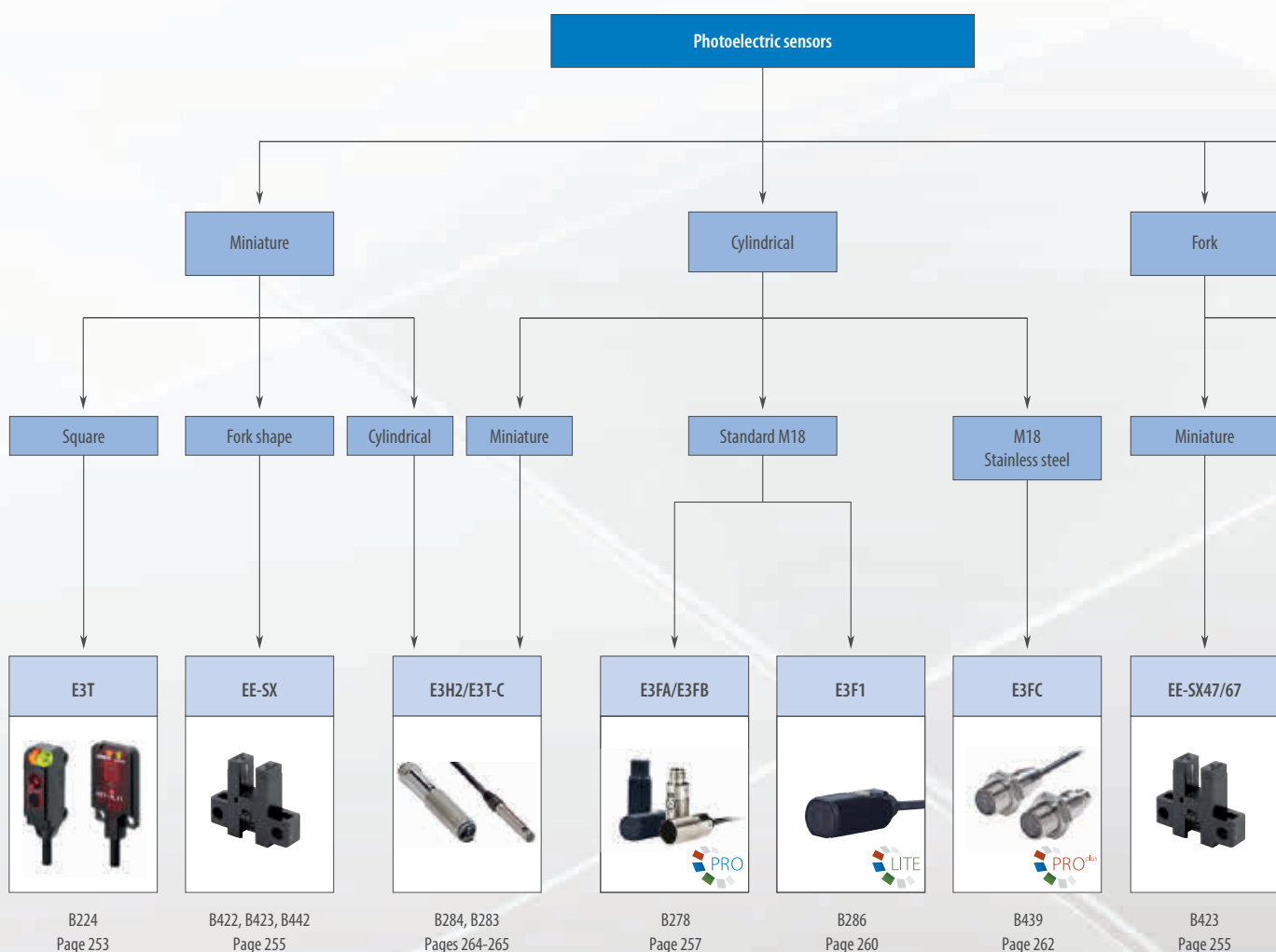
FOR MACHINES BUILT TO LAST

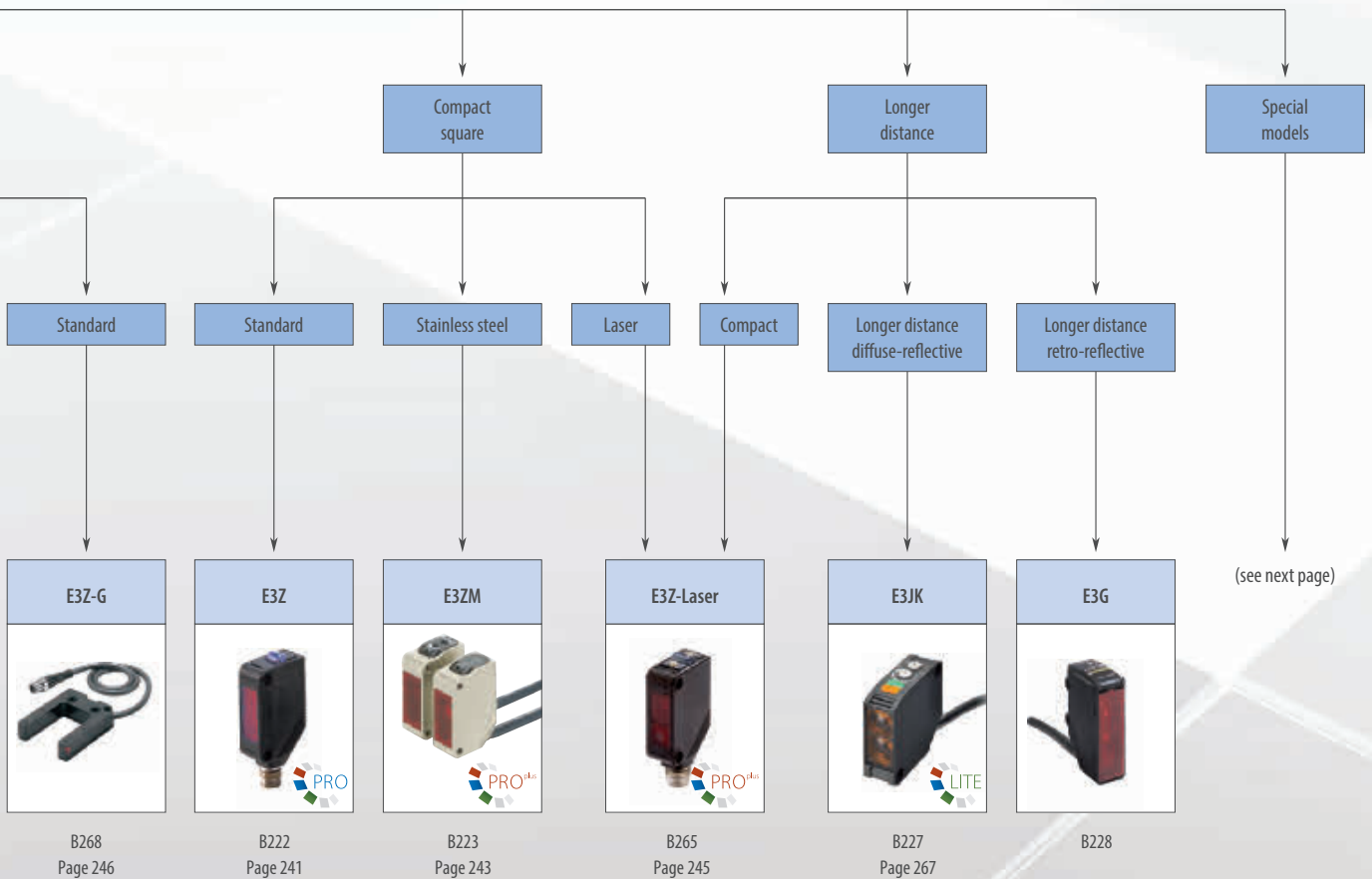
Reliability and accuracy confirmed by millions ... every day

With more than one million units sold, OMRON Photoelectric sensors are among the world's most popular and successful photoelectric sensors.

Manufactured to exceptionally high engineering standards, you can take the performance reliability for granted.

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















Selection table

Type	Compact square			Longer distance	
					
Model	E3Z	E3ZM	E3Z Laser	E3S-CL	E3JK
361°	PRO	PRO ^{plus}	PRO ^{plus}	n.a.	LITE
Housing	PBT	Stainless steel	PBT	Zinc diecast	ABS
Through-beam	15 m, 30 m	15 m	60 m	–	40 m
Retro-reflective with M.S.R.	5 m	4 m	15 m	–	7 m
Diffuse-reflective (energetic)	1 m	1 m	–	–	2.5 m
Diffuse-reflective (background suppression)	200 mm	200 mm	300 mm	500 mm	–
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Type	Cylindrical			
				
Model	E3FA/E3FB	E3F1	E3FC	E3H2
361°	PRO	LITE	PRO ^{plus}	n.a.
Housing	M18 PBT, metal	ABS	M18 stainless steel	M12 metal, M8 stainless steel
Through-beam	20 m	15 m	20 m	4 m, 2 m
Retro-reflective with M.S.R.	4 m	3 m	4 m	2 m
Diffuse-reflective (energetic)	1 m	300 mm	1 m	300 mm
Diffuse-reflective (background suppression)	200 mm	–	200 mm	–
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Type	Miniature			Fork
				
Model	E3T-C	E3T	EE-SX47/67	E3Z-G
361°	n.a.	n.a.	n.a.	n.a.
Housing	M5, M6 stainless steel	PBT	PBT	PBT
Through-beam	1 m	1 m, 2 m	5 mm (slot width)	25 mm
Retro-reflective with M.S.R.	–	200 mm	–	–
Diffuse-reflective (energetic)	50 mm	30 mm	–	–
Diffuse-reflective (background suppression)	–	30 mm	–	–
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Type	Oil resistant	Mark detection	Transparent detection			
						
Model	E3ZM-C	E3ZM-V	E3ZM-B	E3Z-B	E3F-B/-V	E3S-DB
361°	PRO ^{plus}	PRO ^{plus}	PRO ^{plus}	PRO ^{plus}	PRO ^{plus}	PRO ^{plus}
Key features	Oil and lubricant resistant stainless steel housing	White LED for optimal contrast recognition	Optimised optical system for all transparent objects	Optical system for standard transparent objects	Optimised optical system for all transparent objects	Enhanced performance for all transparent objects, SmartTeach, Narrow spot
Housing	Stainless steel	Stainless steel	Stainless steel	PBT	M18 PBT/metal	PBT/ABS
Through-beam	20 m	–	–	–	–	–
Retro-reflective with M.S.R.	4 m	–	500 mm	500 mm, 2 m	2 m	4.5 m
Diffuse-reflective	1 m	12mm±2mm	–	–	–	–
Diffuse-reflective (background suppression)	200 mm	–	–	–	50 mm	–
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Type	High precision positioning	Structured object detection	Multi voltage power supply
			
Model	E3NC Laser Sensors	E3S-LS3	E3JK, E3JM, E3G-_M
361°	n.a.	n.a.	n.a.
Key features	0.1 mm Laser spot, line beam, CMOS BGS, EtherCAT connectivity	Wide beam	AC/DC power supply and relay output
Housing	PBT	PBT	ABS, ABS, PBT
Through-beam	–	–	40 m, 10 m, –
Retro-reflective with M.S.R.	8 m	–	9 m, 4 m, 10 m
Diffuse-reflective	1.2 m	60 mm	2.5 m, 700 mm, 2 m
Diffuse-reflective (background suppression)	250 mm	–	–, –, 1.2 m
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General purpose sensor in compact plastic housing

The compact housing size and the high-power LED provide an excellent performance-size ratio and the high optical precision and long sensor lifetime make the sensor the first choice for standard and challenging 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



Ordering information

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

*1 Light-ON/Dark-ON switch selectable

*2 Measured with E39-R1S

*3 For infrared LED models contact your Omron representative

Specifications

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



High ambient light immunity



High electromagnetic noise immunity



Robust and tight housing construction

For more information, please enter "B222" in the search field on our website industrial.omron.eu.



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

Sensor type	Sensing distance	Connection method				Order code ^{*1}	
						NPN output	PNP output
Through-beam 	15 m	—	—	2 m	^{*2}	E3ZM-T61 2M	E3ZM-T81 2M
		■	—	—		E3ZM-T66	E3ZM-T86
	0.8 m with built-in slit	—	—	2 m		E3ZM-T63 2M	E3ZM-T83 2M
		■	—	—		E3ZM-T68	E3ZM-T88
Retro-reflective with M.S.R. 	0.1 to 4 m	—	—	2 m		E3ZM-R61 2M	E3ZM-R81 2M
		■	—	—		E3ZM-R66	E3ZM-R86
Diffuse-reflective 	1 m (adjustable)	—	—	2 m		E3ZM-D62 2M	E3ZM-D82 2M
		■	—	—		E3ZM-D67	E3ZM-D87
Diffuse-reflective (background suppression) 	10 to 100 mm (fixed)	—	—	2 m		E3ZM-LS61X 2M ^{*3}	E3ZM-LS81X 2M ^{*3}
		■	—	—		E3ZM-LS66X ^{*3}	E3ZM-LS86X ^{*3}
	10 to 200 mm (fixed)	—	—	2 m		E3ZM-LS64X 2M ^{*3}	E3ZM-LS84X 2M ^{*3}
		■	—	—		E3ZM-LS69X ^{*3}	E3ZM-LS89X ^{*3}

^{*1} Light-ON / Dark-ON switch selectable except for E3ZM-LS

^{*2} For ordering pigtail versions replace '2M' of the cable types with:

- S1J: for M12 stainless steel plug with 30 cm cable
- S3J: for M8 4-pin stainless steel plug with 30cm cable
- S5J: for M8 3-pin stainless steel plug with 30cm cable (except for background suppression types)
- M1J: for M12 brass plug with 30cm cable
- M3J: for M8 4-pin brass plug with 30cm cable
- M5J: for M8 3-pin brass plug with 30cm cable (except for background suppression types)

^{*3} E3ZM-LS_X are fixed LIGHT-ON models. For fixed DARK-ON models please order E3ZM-LS_Y and for L-ON/D-ON selectable by wire please order E3ZM-LS_H.

Specifications

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

Item		Diffuse-reflective with background suppression (fixed distance)	
		NPN	
		E3ZM-LS61X E3ZM-LS66X	E3ZM-LS64X E3ZM-LS69X
		PNP	
		E3ZM-LS81X E3ZM-LS86X	E3ZM-LS84X E3ZM-LS89X
Light source (adjustable)		Red LED (650 nm)	Red LED (660 nm)
Black/white error		5% of sensing distance max.	20% of sensing distance max.
Power supply voltage		10 to 30 VDC, $\pm 10\%$ ripple (p-p): 10% max.	
Protective circuits		Power supply reverse polarity protection, output short-circuit protection, output reverse polarity protection, mutual interference protection	
Response time		1 ms max.	
Ambient temperature range	Operating	-25 to 55°C	
	Storage	-40 to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Material	Case	SUS316L	
	Lens	Methacrylic resin	
	Display	PES (polyether sulfone)	
	Sensitivity adjustment and operation switch	PEEK (polyether ether ketone)	
	Seals	Fluoro rubber	



Robust construction



Tight housing



Detergent resistant



Pre-wired models with stainless steel plug connectors for best combination of highest water ingress protection with fast connect & disconnect..





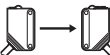
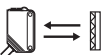







LASER sensor in compact plastic housing

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

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

Ordering information

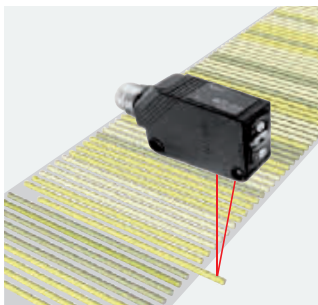
Sensor type	Sensing distance	Response time	Connection method				Order code*1	
							NPN output	PNP output
Through-beam 	60 m	1 ms	–	–	2 m	For ordering pigtail versions replace '2M' of cable types with: - M1J: M12 with 30 cm cable - M3J: M8 4-pin with 30 cm cable - M5J: M8 3-pin with 30 cm cable	E3Z-LT61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

*1 Light-ON/Dark-ON switch selectable

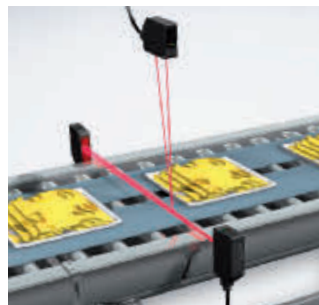
*2 Measured with E39-R1

Specifications

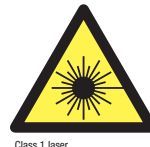
Item		Through-beam	Retro-reflective with M.S.R.	Distance settable (background suppression)	
		Standard model		High-speed model	
	NPN output	E3Z-LT61/-LT66	E3Z-LR61/-LR66	E3Z-LL61/-LL66	E3Z-LL63/-LL68
	PNP output	E3Z-LT81/-LT86	E3Z-LR81/-LR86	E3Z-LL81/-LL86	E3Z-LL83/-LL88
Black/white error		–		5% (at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



Low black/white error for precise detection



Visible laser light for precision positioning



Class 1 laser



Photoelectric sensor in 25 mm 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 hanggliders.

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

Ordering information

Sensor type	Sensing distance	Number of optical axes	Connection method				Order code*1	
							NPN output	PNP output
<div>Through-beam</div>	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

*1 Light-ON/Dark-ON switch selectable

Specifications

Item		Through-beam
		E3Z-G
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		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



Transparent object detection sensor in compact stainless steel housing

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

- Stable PET detection using double refraction and AC³ power control technology
- Detergent resistant compact SUS316L housing

Ordering information

Sensor type		Sensing distance	Special reflector	Connection method				Order code ^{*1}	
								NPN output	PNP output
Retro-reflective with M.S.R. 	Optimised for PET bottles and trays	100 to 500 mm (teachable)	Order separately ^{*2}	—	—	2 m	—	E3ZM-B61 2M	E3ZM-B81 2M
					—	—	—	E3ZM-B66	E3ZM-B86
			E39-RP1 included	—	—	2 m	—	E3ZM-B61-C 2M	E3ZM-B81-C 2M
					—	—	—	E3ZM-B66-C	E3ZM-B86-C
Retro-reflective with M.S.R. 	For all transparent media (glass, PET, foils)	100 to 500 mm (potentiometer adjustment) ^{*3}	Order separately ^{*4}	—	—	2 m	—	E3ZM-B61T 2M	E3ZM-B81T 2M
					—	—	—	E3ZM-B66T	E3ZM-B86T

^{*1} PET optimised models are Light-ON/Dark-ON selectable by wire. E3ZM-B_T all transparent media types are Light-ON/ Dark-ON switch selectable

^{*2} For higher signal stability using circular polarisation functionality for PET bottles, order special reflector E39-RP1 separately

^{*3} Teachable all-transparent-media types are available. Contact your OMRON representative

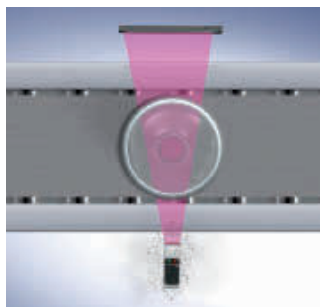
^{*4} Order reflector separately

Specifications

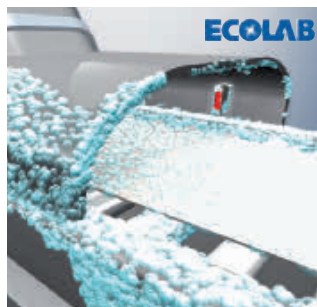
Item	PET optimised (teachable)		all-transparent-media (potentiometer adjustment)	
	NPN	E3ZM-B61(-C)/-B66(-C)	E3ZM-B6_T	
	PNP	E3ZM-B81(-C)/-B86(-C)	E3ZM-B8_T	
Light source (wave length)		Red LED (650 nm)		
Power supply voltage		10 to 30 VDC, ±10% ripple (p-p): 10% max.		
Protective circuits		Reversed power supply polarity protection, output short-circuit protection, mutual interference prevention, and reversed output polarity protection		
Repsonse time		1 ms max.		
Ambient temperature	Operating	-40 to 60°C		-25 to 55°C
	Storage	-40 to 70°C (with no icing or condensation)		
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9		
Material	Case	SUS316L		
	Lens	PMMA (polymethylmethacrylate)		
	Display	PES (polyether sulfone)		
	Seals	Fluoro rubber		
	Cable	PVC (polyvinyl chloride)		



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



Automatic LED power adjustment (AC³) to compensate for soiling and temperature fluctuations (PET optimised models)



Detergent resistant

Transparent object 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*1	
						NPN output	PNP output
Retro-reflective without M.S.R.	80 to 500 mm*2 (adjustable)	—	—	2 m	—	E3Z-B61 2M	E3Z-B81 2M
			—	—	—	E3Z-B66	E3Z-B86
	0.5 to 2 m*2 (adjustable)	—	—	2 m	—	E3Z-B62 2M	E3Z-B82 2M
			—	—	—	E3Z-B67	E3Z-B87

*1 Light-ON / Dark-ON switch selectable
*2 Measured with E39-R15

Specifications

Item		Retro-reflective without M.S.R.	
	NPN output	E3Z-B61/E3Z-B66	E3Z-B62/E3Z-B67
	PNP output	E3Z-B81/E3Z-B86	E3Z-B82/E3Z-B87
Light source (wave length)		Red LED (680 nm)	
Power supply voltage		12 to 24 VDC±10%, ripple (p-p) : 10% max.	
Protective circuits		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		1 ms max.	
Ambient temperature	Operating	-25 to 55°C	
	Storage	-40 to 70°C (with no icing or condensation)	
Degree of protection		IEC 60529 IP67, IP69K after DIN 40050 part 9	
Material	Case	PBT (polybutylene terephthalate)	
	Lens	Methacrylate resin	



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



Distance-settable photoelectric sensor in metal housing

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

Ordering information

Sensortype	Sensing distance	Connection method				Order code ^{*1}
Distance-settable (background suppression) 		—	—	■	—	E3S-CL1 2M
		—	—	—	■ M12	E3S-CL1-M1J
		—	—	■	—	E3S-CL2 2M
		—	—	—	■ M12	E3S-CL2-M1J

^{*1} Light-ON/Dark-ON switch selectable. NPN/PNP switch selectable

Specifications

Item		Distance-settable (background suppression)	
		E3S-CL1	E3S-CL2
Light source (wave length)		Red LED (700 nm)	Infrared LED (860 nm)
Black/white error ^{*1}		2% max.	10% max.
Power supply voltage		10 to 30 VDC [ripple (p-p) 10% included]	
Protective circuits		Reverse polarity protection, output short-circuit protection, mutual interference prevention	
Response time		1 ms max.	2 ms max.
Ambient temperature	Operating	-25 to 55°C (with no icing or condensation)	
	Storage		
Degree of protection		IEC 60529 IP67	
Material	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%)



Photoelectric sensor for structured object detection in plastic housing

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

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

Ordering information

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

Specifications

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





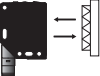


Transparent object sensor

E3S-DB sensor provides the most reliable detection of all kinds of transparent objects such as plastics, glass and transparent films.

- Most reliable detection of all transparent objects
- SmartTeach enabling fast set up and optimum threshold setting
- Narrow beam types detecting smallest object gaps (min. 3 mm)
- Proven for environments in Food & Beverage industry

Ordering information

Sensor type			Sensing distance recommended (max.)	Connection method				Order code ^{*1}	
							 ^{*2}	NPN output	PNP output
<div>Retro-reflective with MSR function</div> 	Smart teach	Standard	3.5 m (4.5 m) ^{*3}	—	—	■	—	E3S-DBN11 2M	E3S-DBP11 2M
				—	■	—	—	E3S-DBN21	E3S-DBP21
				—	—	—	■	E3S-DBN31	E3S-DBP31
		Narrow beam ^{*4}	0.5 m (0.7 m) ^{*5}	—	—	■	—	E3S-DBN12 2M	E3S-DBP12 2M
				—	■	—	—	E3S-DBN22	E3S-DBP22
				—	—	—	■	E3S-DBN32	E3S-DBP32
	Trimmer	Standard	3.5 m (4.5 m) ^{*3}	—	—	■	—	E3S-DBN11T 2M	E3S-DBP11T 2M
				—	■	—	—	E3S-DBN21T	E3S-DBP21T
				—	—	—	■	E3S-DBN31T	E3S-DBP31T
		Narrow beam ^{*4}	0.5 m (0.7 m) ^{*5}	—	—	■	—	E3S-DBN12T 2M	E3S-DBP12T 2M
				—	■	—	—	E3S-DBN22T	E3S-DBP22T
				—	—	—	■	E3S-DBN32T	E3S-DBP32T

^{*1} Please order reflector separately.

^{*2} M12-4 pin pigtail connector (Smart Click)

^{*3} Rated with E39-R8

^{*4} For narrow beam type please use micro-triple reflector (e.g. E39-R21)

^{*5} Rated with E39-R21

Interface for PC-Monitor tool

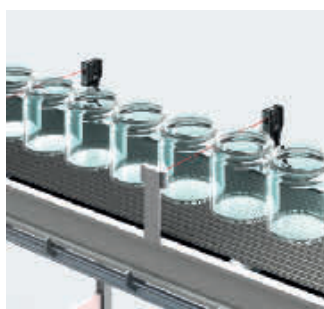
Appearance	Type	Comment	Order Code
	USB-Interface	Suitable for Windows PC Including M12-M12 cable (2M) and USB cable	E39-USB1

Specifications

Item	Model	Sensing method	Retro-reflective with MSR function			
		NPN output	E3S-DBN_1	E3S-DBN_1T	E3S-DBN_2	E3S-DBN_2T
		PNP output	E3S-DBP_1	E3S-DBP_1T	E3S-DBP_2	E3S-DBP_2T
Sensing distance, typ. max		0 to 4.5 m (with E39-R8)			0 to 700 mm (with E39-R21)	
Sensing distance, recommended		0 to 3.5 m (with E39-R8)			0 to 500 mm (with E39-R21)	
Light source (wavelength)		Red LED (624 nm)				
Power supply voltage		10 to 30 VDC, including 10% ripple (p-p)				
Operating modes		OUT1: L-ON/OUT2: D-ON (antivalent output)				
Protection circuits		Reversed power supply polarity protection, Output short-circuit protection, Reversed output polarity protection, Missconnection protection, Mutual interference suppression				
Response time		0.5 ms				
Sensitivity adjustment		SmartTeach		11-turn trimmer	SmartTeach	11-turn trimmer
Degree of protection		IEC: IP67, DIN 40050-9: IP69K				
Connection method		Pre-wired cable (standard length: 2 m) or M12 4-pin connector or Pigtail (0.3 m/M12 4-pin)				
Indicators		Light indicator (orange), Stability indicator (green)				



SmartTeach providing fast & easy setting of optimum thresholds



Narrow beam models for detecting gaps down to 3 mm



PC Tool enables detailed identification of object attenuation level and optimizing sensor set up



Auto-compensation-control for contamination keeps light level stable in harsh environments





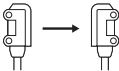


Photoelectric sensor in miniature plastic housing

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

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

Ordering information

Sensor type	Sensing distance	Connection method				Operation mode	Mounting screw size	Order code ^{*1}		
								NPN output	PNP output	
<div>Through-beam</div> 	2 m	-	-	2 m	<div>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</div>	Light-ON	M2	E3T-ST31 2M	E3T-ST33 2M	
	1 m					Dark-ON	M2	E3T-ST32 2M	E3T-ST34 2M	
						Light-ON	M2	E3T-ST11 2M	E3T-ST13 2M	
							M3	E3T-ST11M 2M	E3T-ST13M 2M	
						Dark-ON	M2	E3T-ST12 2M	E3T-ST14 2M	
							M3	E3T-ST12M 2M	E3T-ST14M 2M	
	300 mm					Light-ON	M2	E3T-ST21 2M	E3T-ST23 2M	
						M3	E3T-ST21M 2M	E3T-ST23M 2M		
	Dark-ON					M2	E3T-ST22 2M	E3T-ST24 2M		
						M3	E3T-ST22M 2M	E3T-ST24M 2M		
	Through-beam					500 mm	Light-ON	M2	E3T-FT11 2M	E3T-FT13 2M
						300 mm	Dark-ON	M2	E3T-FT12 2M	E3T-FT14 2M
Light-ON							M2	E3T-FT21 2M	E3T-FT23 2M	
Dark-ON							M2	E3T-FT22 2M	E3T-FT24 2M	
Retro-reflective	30 to 200 mm ^{*2} on reflectors/ 10 to 100 mm ^{*2} on reflective foils					Light-ON	M2	E3T-SR41-C 2M ^{*3}	E3T-SR43-C 2M ^{*3}	
	Dark-ON					M2	E3T-SR42-C 2M ^{*3}	E3T-SR44-C 2M ^{*3}		
Diffuse-reflective	5 to 30 mm					Light-ON	M2	E3T-FD11 2M	E3T-FD13 2M	
						M3	E3T-FD11M 2M	E3T-FD13M 2M		
						Dark-ON	M2	E3T-FD12 2M	E3T-FD14 2M	
						M3	E3T-FD12M 2M	E3T-FD14M 2M		
Limited-reflective	5 to 15 mm 5 to 30 mm					Light-ON	M2	E3T-SL11 2M	E3T-SL13 2M	
						M3	E3T-SL11M 2M	E3T-SL13M 2M		
						Dark-ON	M2	E3T-SL12 2M	E3T-SL14 2M	
							M3	E3T-SL12M 2M	E3T-SL14M 2M	
						Light-ON	M2	E3T-SL21 2M	E3T-SL23 2M	
							M3	E3T-SL21M 2M	E3T-SL23M 2M	
						Dark-ON	M2	E3T-SL22 2M	E3T-SL24 2M	
							M3	E3T-SL22M 2M	E3T-SL24M 2M	
Diffuse-reflective (background suppression)	1 to 15 mm					Light-ON	M2	E3T-FL11 2M	E3T-FL13 2M	
	1 to 30 mm					Dark-ON	M2	E3T-FL12 2M	E3T-FL14 2M	
						Light-ON	M2	E3T-FL21 2M	E3T-FL23 2M	
						Dark-ON	M2	E3T-FL22 2M	E3T-FL24 2M	

^{*1} For pre-wired models with robotic cables add '-R' to the order code (example: E3T-FT21R 2M)

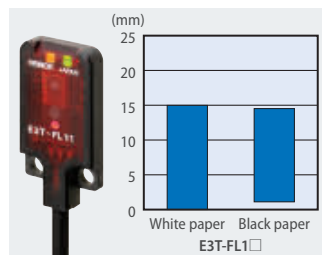
^{*2} The distances are measured with reflector E39-R4 and reflective foil E39-R37-CA. For applications with shorter distances between the sensor and the reflector contact your OMRON representative.

^{*3} Order reflector separately. Models with included reflectors are available.

Specifications

Item		Through-beam		Retro-reflective
		Side-view	Flat	Side-view
		E3T-ST1 E3T-ST2 E3T-ST3	E3T-FT1 E3T-FT2	E3T-SR4
Sensing distance		E3T-ST3_: 2 m E3T-ST1_: 1 m E3T-ST2_: 300 mm	E3T-FT1_: 500 mm E3T-FT2_: 300 mm	30 to 200 mm (with E39-R4) 10 to 100 mm (with E39-R37-CA)
Light source (wave length)		Red LED ("Pin-point" LED) λ = 650 nm		
Power supply voltage		12 to 24 VDC±10%, ripple (p-p) 10% max.		
Protective circuits		Power supply and control output reverse polarity protection Output short-circuit protection		Power supply and control output reverse polarity protection Output short-circuit protection, mutual interference prevention, surge suppressor
Response time		1 ms max.		
Ambient temperature	Operating	−25 to 55°C (with no icing or condensation)		
	Storage	−40 to 70°C (with no icing or condensation)		
Degree of protection		IEC60529 IP67		
Material	Case	PBT (polybutylene terephthalate)		
	Display window	Denatured polyarylate		
	Lens	Denatured polyarylate		Methacrylic resin

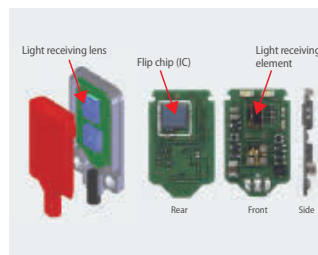
Item	Diffuse-reflective		Limited-reflective		Diffuse-reflective (background suppression)	
	Flat		Side-view		Flat	
	E3T-FD1		E3T-SL1	E3T-SL2	E3T-FL1	E3T-FL2
Sensing distance	5 to 30 mm		5 to 15 mm	5 to 30 mm	1 to 15 mm	1 to 30 mm
Black/white error	–				15% max.	
Light source (wave length)	Red LED (“Pin-point” LED) λ = 650 nm					
Power supply voltage	12 to 24 VDC±10%, ripple (p-p) 10% max.					
Protective circuits	Power supply and control output reverse polarity protection Output short-circuit protection, Mutual interference prevention					
Response time	1 ms max.					
Ambient temperature	Operating	–25 to 55°C				
	Storage	–40 to 70°C (with no icing or condensation)				
Degree of protection	IEC60529 IP67					
Material	Case	PBT (polybutylene terephthalate)				
	Display window	Denatured polyarylate				
	Lens	Denatured polyarylate				



Minimal black / white error



The coaxial optics and the small focal lens of the retro-reflective models allow the detection of small (dia 2 mm) objects or through small holes (dia 2 mm).



The unique light receiving lens shape and the chip mounting technology, provide appropriate sensing distances for very precise and reliable detection even through smallest slits and gaps with e.g. 0.5 mm dia.



Models with mounting holes for M2 or M3 screws

Photo microsensor in plastic fork shape housing



- Standard photo microsensors with 50 to 100 mA direct switching capacity for best value-performance ratio to detect machine parts or end positions independent of material or magnetic fields.
- Response frequency up to 1 kHz
 - Wide operating voltage range: 5 to 24 VDC

Ordering information

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

^{*1} For shape dimensions refer to datasheet on www.industrial.omron.eu
^{*2} For pre-wired models with 1 m cable add '-WR' to order reference (e.g. EE-SX670-WR)
^{*3} Order connector separately from accessories

Specifications

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

Accessories (order separately)

Type	Cable length	Material	Order code
Connector with Cable	2 m	PVC	EE-1010 2M
Connector with Robot Cable	2 m	PVC	EE-1010R 2M

Note: For mechanical limit switches see page 304



Easy to mount end position detection/limit sensors (contactless).



High performance photoelectric sensor in compact M18 housing

E3FA/E3FB series represents a new generation of OMRON photoelectric sensors with large varieties of reliable and easy-to-use photoelectric sensors. Featuring many standard and special functions this line is addressing many kinds of industries such as packaging, ceramics and material handling.





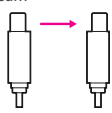
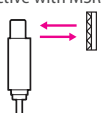
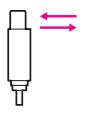
- Large variety of standard and special types
- High power and visible red LED enabling easy alignment and long sensing distance
- Compact and robust housing for easy integration into machines

Ordering information

Straight types

Sensor type	Sensing distance	Connection method				Order code			
						E3FA (plastic housing)		E3FB (metal housing)	
						NPN output	PNP output	NPN output	PNP output
Through-beam (Red LED) 	20 m	—	—	2 m	—	E3FA-TN11 2M	E3FA-TP11 2M	E3FB-TN11 2M	E3FB-TP11 2M
		—	■	—	—	E3FA-TN21	E3FA-TP21	E3FB-TN21	E3FB-TP21
Through-beam (Infrared LED) 	15 m	—	—	2 m	—	E3FA-TN12 2M	E3FA-TP12 2M	—	—
		—	■	—	—	E3FA-TN22	E3FA-TP22	—	—
Retro-reflective with MSR ^{*1} 	0.1 to 4 m (with E39-R1S)	—	—	2 m	—	E3FA-RN11 2M	E3FA-RP11 2M	E3FB-RN11 2M	E3FB-RP11 2M
		—	■	—	—	E3FA-RN21	E3FA-RP21	E3FB-RN21	E3FB-RP21
Coaxial Retro-reflective with MSR ^{*1} 	0 to 500 mm (with E39-R1S)	—	—	2 m	—	E3FA-RN12 2M	E3FA-RP12 2M	E3FB-RN12 2M	E3FB-RP12 2M
		—	■	—	—	E3FA-RN22	E3FA-RP22	E3FB-RN22	E3FB-RP22
Diffuse-reflective (Red LED) 	100 mm	—	—	2 m	—	E3FA-DN11 2M	E3FA-DP11 2M	E3FB-DN11 2M	E3FB-DP11 2M
		—	■	—	—	E3FA-DN21	E3FA-DP21	E3FB-DN21	E3FB-DP21
	300 mm	—	—	2 m	—	E3FA-DN12 2M	E3FA-DP12 2M	E3FB-DN12 2M	E3FB-DP12 2M
		—	■	—	—	E3FA-DN22	E3FA-DP22	E3FB-DN22	E3FB-DP22
	1 m	—	—	2 m	—	E3FA-DN13 2M	E3FA-DP13 2M	E3FB-DN13 2M	E3FB-DP13 2M
		—	■	—	—	E3FA-DN23	E3FA-DP23	E3FB-DN23	E3FB-DP23
Diffuse-reflective (Infrared LED) 	100 mm	—	—	2 m	—	E3FA-DN14 2M	E3FA-DP14 2M	—	—
		—	■	—	—	E3FA-DN24	E3FA-DP24	—	—
	300 mm	—	—	2 m	—	E3FA-DN15 2M	E3FA-DP15 2M	—	—
		—	■	—	—	E3FA-DN25	E3FA-DP25	—	—
	1 m	—	—	2 m	—	E3FA-DN16 2M	E3FA-DP16 2M	—	—
		—	■	—	—	E3FA-DN26	E3FA-DP26	—	—
BGS (background suppression) 	100 mm	—	—	2 m	—	E3FA-LN11 2M	E3FA-LP11 2M	E3FB-LN11 2M	E3FB-LP11 2M
		—	■	—	—	E3FA-LN21	E3FA-LP21	E3FB-LN21	E3FB-LP21
	200 mm	—	—	2 m	—	E3FA-LN12 2M	E3FA-LP12 2M	E3FB-LN12 2M	E3FB-LP12 2M
		—	■	—	—	E3FA-LN22	E3FA-LP22	E3FB-LN22	E3FB-LP22

Radial types

Sensor type	Sensing distance	Connection method				Order code			
						E3RA (plastic housing)		E3RB (metal housing)	
						NPN output	PNP output	NPN output	PNP output
Through-beam 	15 m	—	—	2 m	—	E3RA-TN11 2M	E3RA-TP11 2M	E3RB-TN11 2M	E3RB-TP11 2M
		—	■	—	—	E3RA-TN21	E3RA-TP21	E3RB-TN21	E3RB-TP21
Retro-reflective with MSR ^{*1} 	0.1 to 3 m (with E39-R1S)	—	—	2 m	—	E3RA-RN11 2M	E3RA-RP11 2M	E3RB-RN11 2M	E3RB-RP11 2M
		—	■	—	—	E3RA-RN21	E3RA-RP21	E3RB-RN21	E3RB-RP21
Diffuse reflective 	100 mm	—	—	2 m	—	E3RA-DN11 2M	E3RA-DP11 2M	E3RB-DN11 2M	E3RB-DP11 2M
		—	■	—	—	E3RA-DN21	E3RA-DP21	E3RB-DN21	E3RB-DP21
	300 mm	—	—	2 m	—	E3RA-DN12 2M	E3RA-DP12 2M	E3RB-DN12 2M	E3RB-DP12 2M
		—	■	—	—	E3RA-DN22	E3RA-DP22	E3RB-DN22	E3RB-DP22
	700 mm	—	—	2 m	—	E3RA-DN13 2M	E3RA-DP13 2M	E3RB-DN13 2M	E3RB-DP13 2M
		—	■	—	—	E3RA-DN23	E3RA-DP23	E3RB-DN23	E3RB-DP23

^{*1} The Reflector is sold separately. Select the Reflector model most suited to the application.



Compact size and shape. Can be installed almost anywhere.



Visible LED light for easy alignment.

Specifications

Straight type

Model	Sensing method		Through-beam (Red LED)	Through-beam (Infrared LED)	Retro-reflective	Coaxial Retro-reflective	Diffuse-reflective		
	NPN output	Pre-wired	E3F_-TN11 2M	E3F_-TN12 2M	E3F_-RN11 2M	E3F_-RN12 2M	E3F_-DN11 2M	E3F_-DN12 2M	E3F_-DN13 2M
		M12 Connector	E3F_-TN21	E3F_-TN22	E3F_-RN21	E3F_-RN22	E3F_-DN21	E3F_-DN22	E3F_-DN23
	Item	PNP output	Pre-wired	E3F_-TP11 2M	E3F_-TP12 2M	E3F_-RP11 2M	E3F_-RP12 2M	E3F_-DP11 2M	E3F_-DP12 2M
M12 Connector			E3F_-TP21	E3F_-TP22	E3F_-RP21	E3F_-RP22	E3F_-DP21	E3F_-DP22	E3F_-DP23
Sensing distance			20 m	15 m	0.1 to 4 m	0 to 500 mm	100 mm	300 mm	1 m
Light source (wavelength)			Red LED (624 nm)	Infrared LED (850 nm)	Red LED (624 nm)				
Power supply voltage			10 to 30 VDC (include voltage ripple of 10%(p-p) max.)						
Operation mode			Light-ON/Dark-ON selectable by wiring						
Sensitivity adjustment			One-turn adjuster						
Protection circuits			Reversed power supply polarity protection, Output short-circuit protection and Reversed output polarity protection						
Response time			0.5 ms						
Ambient temperature	Operating		-25 to 55°C						
	Storage		-30 to 70°C (with no icing or condensation)						
Degree of protection			IEC: IP67, DIN 40050-9: IP69K						
Material	Case and Nut		E3FA: ABS, E3FB: Nickel brass						
	Lens and Display		PMMA						
	Adjuster		POM						

Model	Sensing method		Diffuse-reflective			BGS (Background suppression)	
	NPN output	Pre-wired	E3F_-DN14 2M	E3F_-DN15 2M	E3F_-DN16 2M	E3F_-LN11 2M	E3F_-LN12 2M
		M12 Connector	E3F_-DN24	E3F_-DN25	E3F_-DN26	E3F_-LN21	E3F_-LN22
Item	PNP output	Pre-wired	E3F_-DP14 2M	E3F_-DP15 2M	E3F_-DP16 2M	E3F_-LP11 2M	E3F_-LP12 2M
		M12 Connector	E3F_-DP24	E3F_-DP25	E3F_-DP26	E3F_-LP21	E3F_-LP22
Sensing distance			100 mm	300 mm	1 m	100 mm	200 mm
Light source (wavelength)			Infrared LED (850 nm)			Red LED (624 nm)	
Power supply voltage			10 to 30 VDC (include voltage ripple of 10%(p-p) max.)				
Operation mode			Light-ON/Dark-ON selectable by wiring				
Sensitivity adjustment			One-turn adjuster			Fixed	
Protection circuits			Reversed power supply polarity protection, Output short-circuit protection and Reversed output polarity protection				
Response time			0.5 ms				
Ambient temperature	Operating		-25 to 55°C				
	Storage		-30 to 70°C (with no icing or condensation)				
Degree of protection			IEC: IP67, DIN 40050-9: IP69K				
Material	Case and Nut		E3FA: ABS, E3FB: Nickel brass				
	Lens and Display		PMMA				
	Adjuster		POM				

Radial type

Model	Sensing method		Through-beam	Retro-reflective	Diffuse-reflective		
	NPN output	Pre-wired	E3R_-TN11 2M	E3R_-RN11 2M	E3R_-DN11 2M	E3R_-DN12 2M	E3R_-DN13 2M
		M12 Connector	E3R_-TN21	E3R_-RN21	E3R_-DN21	E3R_-DN22	E3R_-DN23
	PNP output	Pre-wired	E3R_-TP11 2M	E3R_-RP11 2M	E3R_-DP11 2M	E3R_-DP12 2M	E3R_-DP13 2M
M12 Connector		E3R_-TP21	E3R_-RP21	E3R_-DP21	E3R_-DP22	E3R_-DP23	
Item							
Sensing distance			15 m	0.1 to 3 m	100 mm	300 mm	700 mm
Light source (wavelength)			Red LED (624 nm)				
Power supply voltage			10 to 30 VDC (include voltage ripple of 10%(p-p) max.)				
Operation mode			Light-ON/Dark-ON selectable by wiring				
Sensitivity adjustment			One-turn adjuster				
Protection circuits			Reversed power supply polarity protection, Output short-circuit protection and Reversed output polarity protection				
Response time			0.5 ms				
Ambient temperature	Operating		-25 to 55°C				
	Storage		-30 to 70°C (with no icing or condensation)				
Degree of protection			IEC: IP67, DIN 40050-9: IP69K				
Material	Case and Nut		E3FA: ABS, E3FB: Nickel brass				
	Lens and Display		PMMA				
	Adjuster		POM				

Standard M18 Photosensor with best price-value ratio

OMRON E3F1 series represents an M18 size Photoelectric sensor with best value at competitive price. It features the same compact housing as E3FA and meets all requirements for standard industrial applications.

- Bright visible red LED enabling easy alignment
- Reliable operation in all industrial environments
- Compact and robust housing for easy integration into machines



Ordering information

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Through-beam 	15 m	—	—	2 m	—	E3F1-TN11 2M ^{*1}	E3F1-TP11 2M ^{*1}
		—	■	—	—	E3F1-TN21 ^{*1}	E3F1-TP21 ^{*1}
Retro-reflective ^{*2} 	0.1 to 3 m (with E39-R1S)	—	—	2 m	—	E3F1-RN11 2M	E3F1-RP11 2M
		—	■	—	—	E3F1-RN21	E3F1-RP21
Diffuse-reflective 	100 mm	—	—	2 m	—	E3F1-DN11 2M	E3F1-DP11 2M
		—	■	—	—	E3F1-DN21	E3F1-DP21
	300 mm	—	—	2 m	—	E3F1-DN12 2M	E3F1-DP12 2M
		—	■	—	—	E3F1-DN22	E3F1-DP22

^{*1} Includes the emitter and receiver.

^{*2} The Reflector is sold separately.

Specifications

Model	Sensing method		Through-beam	Retro-reflective	Diffuse-reflective	
	NPN output	Pre-wired	E3F1-TN11 2M	E3F1-RN11 2M	E3F1-DN11 2M	E3F1-DN12 2M
		M12 Connector	E3F1-TN21	E3F1-RN21	E3F1-DN21	E3F1-DN22
Item	PNP output	Pre-wired	E3F1-TP11 2M	E3F1-RP11 2M	E3F1-DP11 2M	E3F1-DP12 2M
		M12 Connector	E3F1-TP21	E3F1-RP21	E3F1-DP21	E3F1-DP22
Sensing distance			15 m	0.1 to 3 m	100 mm	300 mm
Light source (wavelength)			Red LED (624 nm)			
Power supply voltage			10 to 30 VDC (include voltage ripple of 10%(p-p) max.)			
Operation mode			Light-ON/Dark-ON selectable by wiring			
Sensitivity adjustment			One-turn adjuster			
Protection circuits			Reversed power supply polarity protection, Output short-circuit protection and Reversed output polarity protection			
Response time			0.5 ms			
Ambient temperature		Operating	-25 to 55°C			
		Storage	-30 to 70°C (with no icing or condensation)			
Degree of protection			IEC: IP66			
Material	Case		ABS			
	Lens and Display		PMMA			



Compact size and shape. Can be installed almost anywhere.



Visible LED light for easy alignment.

Transparent object detection sensor in compact M18 housing

The E3F_-B/-V provide enhanced detection stability for the detection of transparent objects. It allows an easy and intuitive adjustment to individual requirements.

- Easy adjustment to individual requirements for all transparent materials
- P-opaquiring technology enables reliable detection of PET bottles also in dusty environments
- Coaxial optics (E3F_-B___1) for stable, position-independent detection



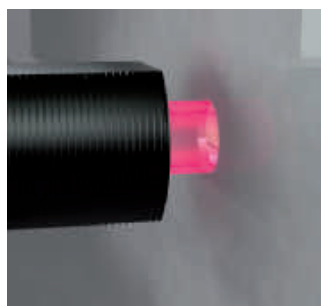
Ordering Information

Sensor type	Sensing distance	Connection method				Order code			
						E3FA (plastic housing)		E3FB (metal housing)	
						NPN output	PNP output	NPN output	PNP output
Limited distance reflective 	10 to 50 mm	—	—	2 m	—	E3FA-VN11 2M	E3FA-VP11 2M	E3FB-VN11 2M	E3FB-VP11 2M
		—	■	—	—	E3FA-VN21	E3FA-VP21	E3FB-VN21	E3FB-VP21
Coaxial retro-reflective with P-opaquiring function*1 	0 to 500 mm (with E39-RP1)	—	—	2 m	—	E3FA-BN11 2M	E3FA-BP11 2M	E3FB-BN11 2M	E3FB-BP11 2M
		—	■	—	—	E3FA-BN21	E3FA-BP21	E3FB-BN21	E3FB-BP21
Retro-reflective with P-opaquiring function*1 	0.1 to 2m (with E39-RP1)	—	—	2 m	—	E3FA-BN12 2M	E3FA-BP12 2M	E3FB-BN12 2M	E3FB-BP12 2M
		—	■	—	—	E3FA-BN22	E3FA-BP22	E3FB-BN22	E3FB-BP22

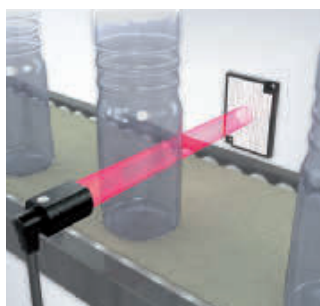
*1 The Reflector is sold separately. Select the Reflector model most suited to the application. For PET detection E39-RP1 is recommended for best detection stability.

Ratings and Specifications

Model	Sensing method		Limited distance reflective	Retro-reflective with P-opaquiring function	
	NPN output	Pre-wired	E3F_-VN11 2M	E3F_-BN11 2M	E3F_-BN12 2M
		M12 Connector	E3F_-VN21	E3F_-BN21	E3F_-BN22
Item	PNP output	Pre-wired	E3F_-VP11 2M	E3F_-BP11 2M	E3F_-BP12 2M
		M12 Connector	E3F_-VP21	E3F_-BP21	E3F_-BP22
Sensing distance			10 to 50 mm	0 to 500 mm (coaxial)	0.1 to 2 m
Light source (wavelength)			Red LED (624 nm)		
Power supply voltage			10 to 30 VDC (include voltage ripple of 10%(p-p) max.)		
Operation mode			Light-ON/Dark-ON selectable by wiring		
Sensitivity adjustment			One-turn adjuster		
Protection circuits			Reversed power supply polarity protection, Output short-circuit protection and Reversed output polarity protection		
Response time			0.5 ms		
Ambient temperature		Operating	-25 to 55°C		
		Storage	-30 to 70°C (with no icing or condensation)		
Degree of protection			IEC: IP67, DIN 40050-9: IP69K		
Material	Case and Nut		E3FA: ABS, E3FB: Nickel brass		
	Lens and Display		PMMA		



Coaxial optics (E3F_-B) for detection through small holes



Reliable detection of PET bottles by unique p-opaquiring technology



Limited-reflective types suitable for detecting transparent film to shiny, mirror film.



M18 Photosensor in high-grade stainless steel housing

OMRON E3FC represents a compact M18 sensor with high housing protection for wash-down applications in Food & Beverage industry.

- High grade steel housing (SUS316L)
- Proven with various industrial detergents of Ecolab and Diversey
- Withstands heat shock conditions
- Epoxy resin at connector/cable end preventing water ingress
- Bright visible red LED enabling easy alignment



Ordering information

Sensor type	Sensing distance	Connection method				Order code	
						NPN output	PNP output
Through-beam 	20 m	—	—	2 m	—	E3FC-TN11 2M	E3FC-TP11 2M
		—	■	—	—	E3FC-TN21	E3FC-TP21
Retro-reflective with MSR ^{*1} 	0.1 to 4 m (with E39-R15)	—	—	2 m	—	E3FC-RN11 2M	E3FC-RP11 2M
		—	■	—	—	E3FC-RN21	E3FC-RP21
Diffuse-reflective ^{*2} 	300 mm (adjustable, red LED)	—	—	2 m	—	E3FC-DN12 2M	E3FC-DP12 2M
	1 m (adjustable, red LED)	—	■	—	—	E3FC-DN22	E3FC-DP22
		—	—	2 m	—	E3FC-DN13 2M	E3FC-DP13 2M
	300 mm (adjustable, IR LED)	—	■	—	—	E3FC-DN23	E3FC-DP23
		—	—	2 m	—	E3FC-DN15 2M	E3FC-DP15 2M
	1 m (adjustable, IR LED)	—	■	—	—	E3FC-DN25	E3FC-DP25
		—	—	2 m	—	E3FC-DN16 2M	E3FC-DP16 2M
	—	—	■	—	—	E3FC-DN26	E3FC-DP26
BGS ^{*2} (Background suppression) 	100 mm	—	—	2 m	—	E3FC-LN11 2M	E3FC-LP11 2M
	200 mm	—	■	—	—	E3FC-LN21	E3FC-LP21
		—	—	2 m	—	E3FC-LN12 2M	E3FC-LP12 2M
		—	■	—	—	E3FC-LN22	E3FC-LP22
Transparent object detection (coaxial retro-reflective with MSR ^{*1}) 	500 mm	—	—	2 m	—	E3FC-BN11 2M	E3FC-BP11 2M
		—	■	—	—	E3FC-BN21	E3FC-BP21

^{*1} The Reflector is sold separately.

^{*2} Models with default L-On output logic for diffuse and BGS available. Please check with your OMRON representative.

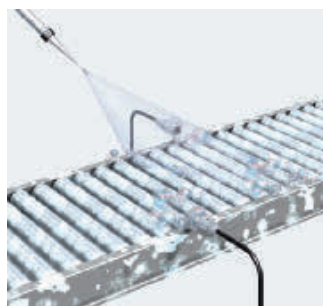
Specifications

Model	Sensing method		Through-beam	Retro-reflective	Diffuse reflective			
	NPN output	Pre-wired	E3FC-TN11 2M	E3FC-RN11 2M	E3FC-DN12 2M	E3FC-DN13 2M	E3FC-DN15 2M	E3FC-DN16 2M
		M12 connector	E3FC-TN21	E3FC-RN21	E3FC-DN22	E3FC-DN23	E3FC-DN25	E3FC-DN26
	PNP output	Pre-wired	E3FC-TP11 2M	E3FC-RP11 2M	E3FC-DP12 2M	E3FC-DP13 2M	E3FC-DP15 2M	E3FC-DP16 2M
M12 connector		E3FC-TP21	E3FC-RP21	E3FC-DP22	E3FC-DP23	E3FC-DP25	E3FC-DP26	
Item								
Sensing distance			20 m	0.1 to 4 m	300 mm	1 m	300 mm	1 m
Light source (wavelength)			red LED (624 nm)				Infrared LED (850 nm)	
Power supply voltage			10 to 30 VDC (include voltage ripple of 10%(p-p) max.)					
Operation mode			Light-ON/Dark-ON selectable by wiring					
Indicator			Operation indicator (orange) Stability indicator (green)					
Sensitivity adjustment			no adjuster		One-turn adjuster			
Protection circuits			Reversed power supply polarity protection, Output short-circuit protection and Reversed output polarity protection					
Response time			0.5 ms					
Ambient temperature	Operating	−25 to 55°C						
	Storage	−30 to 70°C (with no icing or condensation)						
Degree of protection			IP67, IP68 ^{*1} , IP69K					
Material	Case	Stainless Steel (SUS 316L)						
	Lens	PMMA						
	Cable	PVC						
	Adjuster	−			POM			

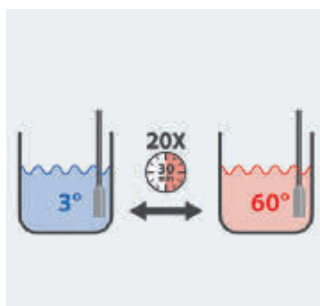
^{*1} IP68 test definition: Heat shock cycles in 3° and 60°C surface tensioned water (20 cycles with 30 min.)

Model	Sensing method		BGS (Background suppression)		Retro-reflective for transparent objects
	NPN output	Pre-wired	E3FC-LN11 2M	E3FC-LN12 2M	E3FC-BN11 2M
		M12 connector	E3FC-LN21	E3FC-LN22	E3FC-BN21
	Item	PNP output	Pre-wired	E3FC-LP11 2M	E3FC-LP12 2M
M12 connector		E3FC-LP21	E3FC-LP22	E3FC-BP21	
Sensing distance			100 mm	200 mm	500 mm
Light source (wavelength)			red LED (624 nm)		
Power supply voltage			10 to 30 VDC (include voltage ripple of 10%(p-p) max.)		
Operation mode			Light-ON/Dark-ON selectable by wiring		
Indicator			Operation indicator (orange) Stability indicator (green)		
Sensitivity adjustment			no adjuster		One-turn adjuster
Protection circuits			Reversed power supply polarity protection, Output short-circuit protection and Reversed output polarity protection		
Response time			0.5 ms		
Ambient temperature	Operating		-25 to 55°C		
	Storage		-30 to 70°C (with no icing or condensation)		
Degree of protection			IP67, IP68 ^{*1} , IP69K		
Material	Case		Stainless Steel (SUS 316L)		
	Lens		PMMA		
	Cable		PVC		
	Adjuster		-		POM

^{*1} IP68 test definition: Heat shock cycles in 3° and 60°C surface tensioned water (20 cycles with 30 min.)



Best fit for wash-down applications.



Proven in heat shock tests with surface tensioned water.



Compact size and shape. Can be installed almost anywhere.



Visible LED light for easy alignment.



Miniature photoelectric sensors in cylindrical M8 and M12 housing

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

Ordering information

M12 cylindrical housing

Sensor type	Sensing distance	Connection method				Order code ^{*1}	
						NPN output	PNP output
Through-beam 	4 m (adjustable)	–	–	2 m	–	E3H2-T4C4M 2M	E3H2-T4B4M 2M
		–	■	–	–	E3H2-T4C4M-M1	E3H2-T4B4M-M1
Retro-reflective with M.S.R. 	2 m (teachable ^{*2})	–	–	2 m	–	E3H2-R2C4M 2M ^{*3}	E3H2-R2B4M 2M ^{*3}
		–	■	–	–	E3H2-R2C4M-M1 ^{*3}	E3H2-R2B4M-M1 ^{*3}
Diffuse-reflective 	300 mm (teachable)	–	–	2 m	–	E3H2-DS30C4M 2M	E3H2-DS30B4M 2M
		–	■	–	–	E3H2-DS30C4M-M1	E3H2-DS30B4M-M1
	100 mm (fixed)	–	–	2 m	–	E3H2-DS10C4M 2M	E3H2-DS10B4M 2M
		–	■	–	–	E3H2-DS10C4M-M1	E3H2-DS10B4M-M1

^{*1} Light-ON/Dark-ON selectable by wire

^{*2} Models without teach-button are available. Contact your OMRON representative.

^{*3} Without reflector; order reflector separately

M8 cylindrical housing

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

Specifications

Item		Through-beam		Retro-reflective with M.S.R.	Diffuse-reflective	
		E3H2-T4	E3H2-T2	E3H2-R	E3H2-DS30	E3H2-DS10
Light source (wave length)		Infrared LED (880 nm)		Red LED (660 nm)	Infrared LED (880 nm)	
Power supply voltage		10 to 30 VDC, 10% ripple				
Protective circuits		Power supply reverse polarity protection, output short circuit protection				
Response time		2.5 ms max	1 ms max.	1.1 ms max		
Sensitivity adjustment		Potentiometer adjuster	–		Teach-in	–
Ambient temperature	Operating	–25 to 55°C	–25 to 50°C	–25 to 55°C		
Degree of protection		EN 60529: IP67				
Material	Case	nickel-plated brass	stainless steel	nickel-plated brass		
	Lens	plastic				



Miniature photoelectric sensors in M5 and M6 sized housing

The E3T-C family of miniature photoelectric sensors is the ideal solution when mounting space is crucial.

- axial and radial M5 sized through-beam sensors
- axial M6 sized diffuse-reflective sensors
- pre-wired models in stainless steel housing

Ordering information

M5 cylindrical housing

Sensor type	Sensing distance	Connection method				Operation mode	Order code	
							NPN output	PNP output
Through-beam (axial) 	1 m	—	—	2 m	—	dark on	E3T-CT12 2M	E3T-CT14 2M
Through-beam (radial) 	500 mm	—	—	2 m	—		E3T-CT22S 2M	E3T-CT24S 2M

M6 cylindrical housing

Sensor type	Sensing distance	Connection method				Operation mode	Order code	
							NPN output	PNP output
Diffuse-reflective 	50 mm (adjustable)	—	—	2 m	—	light on	E3T-CD11 2M	E3T-CD13 2M

Specifications

Item		E3T-CT1_	E3T-CT2_	E3T-CD1_
Light source (wave length)		Red LED (630 nm)	Red LED (625 nm)	Infrared LED (870 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		
Response time		0.5 ms max.		
Ambient temperature	Operating	-25 to 55°C		
	Storage	-30 to 70°C (with no icing or condensation)		
Degree of protection		IEC 60529 IP65		
Material	Case	SUS303		
	Display window	Polysulfone Epoxy		
	Lens	Polysulfone		





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

Ordering information

Sensor type	Sensing distance	Connection method	Timer function	Order code *1
				Relay output
Retro-reflective with M.S.R. 	0.5 to 10 m *2 (Red light)	Terminal block (with PG 13.5 conduit)	—	E3G-MR19-G
			ON or OFF delay 0 to 5 s (adjustable)	E3G-MR19T-G
Distance-settable (background suppression) 	0.2 to 2 m (0.2 to 1.2 m distance settable)		—	E3G-ML79-G
			ON or OFF delay 0 to 5 s (adjustable)	E3G-ML79T-G

*1 Light-ON/Dark-ON switch selectable

*2 Measured with E39-R2

Specifications

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



All voltage photoelectric sensor with long sensing distance

The new generation of square sized E3JK family provides significantly enhanced sensing performance and ease of operation. The family features 24 to 240 VAC power models as well as models with PNP/NPN transistor output.

- High power and visible red LED for all models enabling easy alignment and long sensing distance
- Bright indicator LEDs that are visible even at a large distance
- Best price-value ratio

Ordering information

Sensor type	Sensing distance	Connection method				Order code		
						Relay models (AC/DC)	NPN models	PNP models
Through-beam 	40 m (adjustable)	–	–	2 m	–	E3JK-TR11 2M	E3JK-TN11 2M	E3JK-TP11 2M
Retro-reflective without M.S.R. 	9 m ^{*1} (adjustable)					E3JK-RR11 2M	E3JK-RN11 2M	E3JK-RP11 2M
Retro-reflective with M.S.R. 	7 m ^{*1} (adjustable)					E3JK-RR12 2M	E3JK-RN12 2M	E3JK-RP12 2M
Diffuse-reflective 	2.5 m (adjustable)					E3JK-DR11 2M	E3JK-DN11 2M	E3JK-DP11 2M
	300 mm (adjustable)					E3JK-DR12 2M	E3JK-DN12 2M	E3JK-DP12 2M

^{*1} Measured with E39-R1S. Please order reflector separately.

Accessories

Appearance	Description	Order code
	Mounting bracket ^{*1} (A mounting bracket is not provided with the sensor. Order a mounting bracket separately if required.)	E39-L40

^{*1} When using a through-beam sensor, order one mounting bracket for the receiver and one for the emitter.

Specifications

AC models

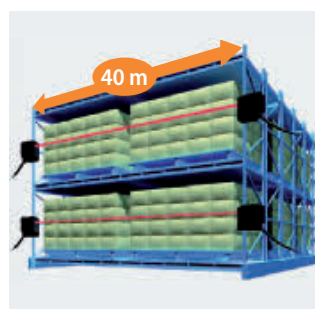
Item		Through-beam	Retro-reflective without M.S.R.	Retro-reflective with M.S.R.	Diffuse-reflective	
		E3JK-TR11	E3JK-RR11	E3JK-RR12	E3JK-DR11	E3JK-DR12
Sensing distance		40 m	9 m	7 m	2.5 m	300 mm
Light source (wave length)		Red LED (624 nm)				
Power supply voltage		24 to 240 VDC±10% ripple (p-p): 10% max. 24 to 240 VAC±10% 50/60 Hz				
Control output		Relay output SPDT, 250 VAC, 3 A max. (cosφ= 1), 5 VDC, 10 mA min., Light-ON/Dark-ON selectable				
Response time		20 ms max.				
Sensitivity adjustment		One-turn adjuster				
Ambient temperature	Operating	–25 to 55°C				
	Storage	–30 to 70°C (with no icing or condensation)				
Degree of protection		IEC60529 IP64				
Material	Case	ABS				
	Lens	Methacrylics (PMMA)				

DC models

Item		Through-beam	Retro-reflective without M.S.R.	Retro-reflective with M.S.R.	Diffuse-reflective	
	NPN output	E3JK-TN11	E3JK-RN11	E3JK-RN12	E3JK-DN11	E3JK-DN12
	PNP output	E3JK-TP11	E3JK-RP11	E3JK-RP12	E3JK-DP11	E3JK-DP12
Sensing distance		40 m	9 m	7 m	2.5 m	300 mm
Light source (wave length)		Red LED (624 nm)				
Power supply voltage		10 to 30 VDC, including ripple (p-p): 10%				
Control output		Open collector output (NPN/PNP), Load current: 100 mA max., Light-ON/Dark-ON selectable				
Response time		1 ms max.				
Sensitivity adjustment		One-turn adjuster				
Ambient temperature	Operating	-25 to 55°C				
	Storage	-30 to 70°C (with no icing or condensation)				
Degree of protection		IEC60529 IP64				
Material	Case	ABS				
	Lens	Methacrylics (PMMA)				



AC power-supply fits for building installations like industrial doors, elevators or car parks



Long sensing distance up to 40 m

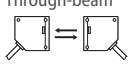




All voltage photoelectric sensor in plastic housing with timer function

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

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

Ordering information

Sensor type	Sensing distance	Connection method	Timer function	Order code ^{*1}		
				Relay output	DC SSR output	
					minus common	plus common
Through-beam 	10 m	Terminal block (with PG 13.5)	–	E3JM-10M4-G-N	E3JM-10S4-G-N	E3JM-10R4-G-N
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-10M4T-G-N	E3JM-10S4T-G-N	E3JM-10R4T-G-N
Retro-reflective with M.S.R. 	4 m		–	E3JM-R4M4-G	E3JM-R4S4-G	E3JM-R4R4-G
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-R4M4T-G	E3JM-R4S4T-G	E3JM-R4R4T-G
Diffuse-reflective 	700 mm (adjustable)		–	E3JM-DS70M4-G	E3JM-DS70S4-G	E3JM-DS70R4-G
			ON or OFF delay 0.1 s to 5 s (adjustable)	E3JM-DS70M4T-G	E3JM-DS70S4T-G	E3JM-DS70R4T-G

^{*1} Light-ON / Dark-ON switch selectable

Specifications

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



High precision laser sensor with separate amplifier

The separate amplifier laser sensors feature a comprehensive range of sensing heads with variable spot and advanced CMOS sensing heads for high precision positioning and demanding applications.

- High detection stability independent from color or surface structure
- Lens attachments for line beam applications
- Easy installation due to adjustable focus and smart tune functions
- Sensor heads with up to 1.2 m sensing distance covering a wide range of applications
- High speed network connectivity to EtherCat fieldbus

Ordering information

Sensor heads E3NC-L Sensor Series

Sensor type	Sensing distance	Remarks	Order code
Diffuse-reflective 	1,200 mm	Variable spot (diffuse reflective)	E3NC-LH02 2M
	70±15 mm	Fixed spot (limited reflective)	E3NC-LH01 2M
Coaxial retro-reflective with M.S.R. 	8 m ^{*1}	Fixed spot	E3NC-LH03 2M

^{*1} A Reflector is not included. Purchase a Reflector separately.

Sensor heads E3NC-S CMOS Laser Sensor Series

Sensor type	Sensing distance	Laser class	Order code
Diffuse-reflective (distance-settable) 	35 to 100 mm	1	E3NC-SH100 2M
	35 to 250 mm	1	E3NC-SH250 2M
	35 to 250 mm	2	E3NC-SH250H 2M

Amplifier units E3NC-L Sensor Series

Item	Order code					
	pre-wired		with connector ^{*1}		M8 connector	
	NPN output	PNP output	NPN output	PNP output	NPN output	PNP output
2 outputs + 1 input models	E3NC-LA21 2M	E3NC-LA51 2M	—	—	—	—
1 output + 1 input models	—	—	E3NC-LA7	E3NC-LA9	E3NC-LA24	E3NC-LA54
Networking model ^{*2}	E3NC-LA0					

^{*1} Order connector (E3X-CN21_) separately from accessories

^{*2} For network connection please order networking unit E3NW



Amplifier units E3NC-S CMOS Laser Sensor Series

Item	Order code					
	pre-wired		with connector ^{*1}		M8 connector	
	NPN output	PNP output	NPN output	PNP output	NPN output	PNP output
2 outputs + 1 input models	E3NC-SA21 2M	E3NC-SA51 2M	—	—	—	—
1 output + 1 input models	—	—	E3NC-SA7	E3NC-SA9	E3NC-SA24	E3NC-SA54
Networking model ^{*2}	E3NC-SA0					



^{*1} Order connector (E3X-CN21_) separately from accessories

^{*2} For network connection please order networking unit E3NW





Amplifier connectors

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



Communication units

Shape	Communications method	Applicable Amplifier Units	Order code
	Sensor communication unit for EtherCAT	E3NX-FA0 E3NC-LA0 E3NC-SA0	E3NW-ECT
	Sensor dispersion (slave) unit		E3NW-DS






Reflectors

Appearance	Type	Size	Applicable sensor	Order code
	Micro-triple reflector	30 × 35 mm	E3NC-LH03	E39-R21
	Micro-triple reflector	55 × 40 mm		E39-R22
	Micro-triple reflector self-adhesive	25 × 25 mm		E39-RS10
	Micro-triple reflector self-adhesive	50 × 50 mm		E39-RS11

Lens Attachments for Sensor Heads

Appearance	Comment	Applicable sensor	Order code
	Lens attachment to create line beam	E3NC-LH03	E39-P51
	Lens attachment to create line beam	E3NC-LH02	E39-P52

Mounting Brackets for Sensor Heads

Appearance	Type	Applicable sensor	Order code
	L-shape mounting bracket	E3NC-LH03	E39-L190
	L-shape mounting bracket	E3NC-LH02	E39-L185
	L-shape mounting bracket	E3NC-LH01	E39-L186
	L-shape mounting bracket	E3NC-SH250 E3NC-SH250 E3NC-SH100	E39-L187
	L-shape mounting bracket		E39-L188

Specifications

Sensor heads E3NC-L Sensor Series

Item	Coaxial Retro-reflective (M.S.R.)	Diffuse-reflective	
	E3NC-LH03	E3NC-LH02	E3NC-LH01
Light source (emission wave length)	Red laser diode (660 nm), 315 μ W max. (JIS Class 1, IEC/EN Class 1, and FDA Class 1)		
Sensing distance	Giga-power mode (GIGA): 8 m Standard mode (Std): 6 m High-speed mode (HS): 3.5 m Super-high-speed mode (SHS): 2 m	Giga-power mode (GIGA): 1,200 mm Standard mode (Std): 750 mm High-speed mode (HS): 250 mm Super-high-speed mode (SHS): 200 mm	70 \pm 15 mm
Beam size (typical)	2 mm dia. (at 1 m)	0.8 mm max. (at distances up to 300 mm)	0.1 mm (at 70 mm)
Degree of protection	IP67	IP65	

Amplifier units E3NC-L Sensor Series

Item		2 output/1 input models		1 output/1 input models	Networking models
		NPN output	E3NC-LA21	E3NC-LA7/E3NC-LA24	E3NC-LA0
		PNP output	E3NC-LA51	E3NC-LA9/E3NC-LA54	
Outputs		2 outputs		1 output	—*
Inputs		1 input			—*
Supply voltage		10 to 30 VDC±10%, ripple (p-p) 10% max.			
Response time	Super-high-speed mode	80 μs			
	High-speed mode	250 μs			
	Standard mode	1 ms			
	Giga-power mode	16 ms			
Functions	Smart tuning	2-point tuning, full auto tuning, position tuning, maximum sensitivity tuning, power tuning, or percentage tuning (–99% to 99%)			
	Timer function	Select from timer disabled, OFF-delay, ON-delay, one-shot, or ON-delay + OFF-delay timer: 1 to 9,999 ms			
	Eco mode	Select from OFF (digital displays lit) or ECO (digital displays not lit)			
	Bank switching	Select from banks 1 to 4			
	Dynamic Power Control (DPC)	Provided (automatically controls light intensity and compensates incident level changes)			
Ambient temperature range	Operating	–10 to 55°C			
	Storage	–25 to 70°C (with no icing or condensation)			
Digital display		7-segment displays (sub digital display: green, main digital display: white) Display direction: switchable between normal and reversed			
Degree of protection		IP50 (IEC 60529)			

* Two sensor outputs are allocated in the programmable logic controller PLC I/O table. PLC operation via Communications Unit enables reading detected values and changing settings.

Sensor heads E3NC-SH CMOS Laser Sensor series

Item	Diffuse-reflective (distance-settable)		
	E3NC-SH250H	E3NC-SH250	E3NC-SH100
Light source (emission wave length)	Red laser diode (660 nm), 1 mW (average output: 220 μW), (JIS Class 2, IEC/EN Class 2, and FDA Class 2)	Red laser diode (660 nm), 100 μW max. (JIS Class 1, IEC/EN Class 1, and FDA Class 1)	
Measurement range	35 to 250 mm (display value: 350 to 2,500)		35 to 100 mm (display value: 350 to 1,000)
Spot diameter	1 mm (at 250 mm)		0.5 mm (at 100 mm)
Degree of protection	IEC60529 IP67		

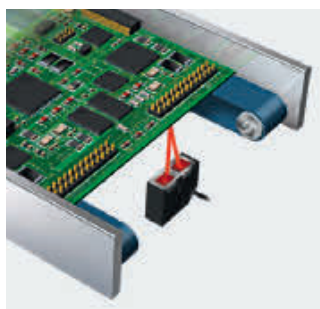
Amplifier units E3NC-SH CMOS Laser Sensor series

Item	2 output/1 input models		1 output/1 input models	Networking models
	NPN output	E3NC-SA21	E3NC-SA7/E3NC-SA24	E3NC-SA0
	PNP output	E3NC-SA51	E3NC-SA9/E3NC-SA54	
Outputs		2 outputs	1 output	—*
Inputs		1 input		—*
Supply voltage		10 to 30 VDC±10%, ripple (p-p) 10% max.		
Response time	Super-high-speed mode	1.5 ms		
	High-speed mode	5 ms		
	Standard mode	10 ms		
	Giga-power mode	50 ms		
Functions	Smart tuning	2-point tuning, full auto tuning, 1-point tuning, tuning without workpiece, 2-point area tuning, 1-point area tuning, or area tuning without workpiece		
	Timer function	Select from timer disabled, OFF-delay, ON-delay, one-shot, or ON-delay + OFF-delay timer: 1 to 9,999 ms		
	Bank switching	Select from banks 1 to 4		
Ambient temperature range	Operating	−10 to 55°C		
	Storage	−25 to 70°C (with no icing or condensation)		
Digital display		7-segment displays (sub digital display: green, main digital display: white) Display direction: switchable between normal and reversed.		
Degree of protection		IP50 (IEC 60529)		

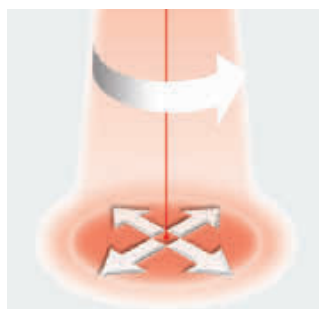
* Two sensor outputs are allocated in the programmable logic controller PLC I/O table. PLC operation via Communications Unit enables reading detected values and changing settings.



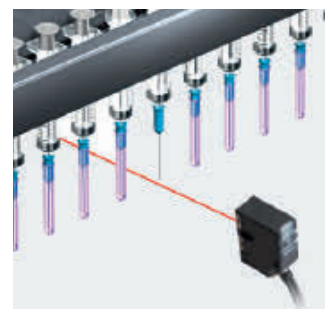
Integration into N-Smart platform



High precision positioning



Focal point adjustment



High precision detection over long range

Reflectors for retro-reflective photoelectric sensors



Shape	Type	Housing material	Features	Size in mm	Applicable Sensor	Order code
	General purpose reflectors	<ul style="list-style-type: none"> ABS base Acrylic surface 	Surface screw mounting (diagonal holes)	40 × 60 × 7.5	<ul style="list-style-type: none"> Retro-reflective photoelectric sensors with and without M.S.R 	E39-R1S
			Surface screw mounting (holes on one side only)	35.4 × 42.3 × 8		E39-R9
				51.4 × 60.3 × 8.5		E39-R42
	Small size		Side screw mounting or surface selfadhesive	41.8 × 22.5 × 11		E39-R3
			Surface screw mounting	23 × 13.7 × 4.9		E39-R4
	Large size			100 × 100 × 9		E39-R8
				84.5 × 84.5 × 8.7		E39-R40
	High precision		Microtripel for improved performance with fine beam sensors	52 × 40 × 4.8	Recommended for fine beam coaxial models (E3NC-LH03, E3S-DB, E3T-SR4)	E39-R6
				30 × 45		E39-R12
				14 × 23 × 1		E39-R37-CA
				12 × 24		E39-R13
	Simple mounting		Round shape with centered mounting hole for simple screw mounting	Diameter: 84 Depth: 7.4	Photoelectric sensors with and without M.S.R.	E39-R7

Note: the ambient operating temperature is -25°C to 55°C unless otherwise specified









Shape	Type	Housing material	Features	Size in mm	Applicable Sensor	Order code
	Enhanced detergent resistance	• PVC	• Surface screw mounting • IP69k after DIN 40050 part 9	40 × 60 × 7.5	Recommended for harsh environment sensors	E39-R50
				20 × 60 × 6		E39-R51
	Highest detergent resistance	• SUS316L • Borosilicat	• Surface screw mounting	43 × 30 × 5		E39-R16
	Heat resistant	• Borosilicat	• Surface screw mounting • 450°C heat resistance • Suitable for vacuum environment	95 × 51 × 8		E39-R47
	Non-fogging reflector	• ABS • Acrylic surface	Anti-fogging coating	40 × 60 × 7.5		E39-R1K
	Special polarizing	• ABS base • PMMA surface	Special polarizing filter to PET	44 × 80 × 8.5	E3ZM-B, E3FA-B, E3FB-B, E3S-DB	E39-RP1
	General purpose tape reflectors	• Acrylic	• Self adhesive • Pre cut	35 × 10 × 0.6	Photoelectric sensors with and without M.S.R.	E39-RS1
				40 × 35 × 0.6	Optimised for E3T-SR4	E39-RS1-CA
				80 × 70 × 0.6	Optimised for E3T-SR4	E39-RS2
				80 × 70 × 0.6	Optimised for E3T-SR4	E39-RS2-CA
			• Self adhesive • Cut-to-length, roll material	25 mm × 5 m		E39-RS3
				25 mm × 22.8 m		E39-RS3-CA
				50 mm × 5 m		E39-RS25 5 m
				50 mm × 22.8 m		E39-RS25 22.8 m
			• Self adhesive • Pre cut	195 × 22	Recommended for fine beam and laser sensors (E3NC-LH03, E3Z-LR, E3S-DB_2)	E39-RS50 5 m
				108 × 46		E39-RS50 22.8 m
	High precision tape reflectors		• Self adhesive • Pre cut	195 × 22	Recommended for fine beam and laser sensors (E3NC-LH03, E3Z-LR, E3S-DB_2)	E39-RS4
				108 × 46		E39-RS5

Note: Note: the ambient operating temperature is -25°C to 55°C unless otherwise specified

Mounting brackets

Shape	Type	Material	Features	Order code
	M8 nuts	brass	100 pcs	ASMM0800
		stainless steel		ASMM0801
	M12 nuts	brass		ASMM1200
	M18 nuts			ASMM1800
		stainless steel		ASMM1802
		plastic	1 pc	ASMK1802 (8 mm thickness)
			100 pcs	ASMK1801 (4 mm thickness)
	M30 nuts	brass	100 pcs	ASMM3000
		M8 Washer	brass	1,000 pcs
M12 Washer				ASZA1200
		stainless steel	500pcs	ASZA1201
M18 Washer		brass	100 pcs	ASZA1801
		stainless steel	200 pcs	ASZA1802
M30 Washer		brass	100 pcs	ASZA3001

Mounting brackets

Shape	Type	Order code
	Quick access – snap fix for cylindrical sensors; sizes M8, M12, M18, M30	Y92E-BC08 Y92E-BC12 Y92E-BC18 Y92E-BC30
	Surface mounting for M18 cylindrical sensors (dia 18mm)	E39-L183
	Standard-surface mounting (for pre-wired or pigtail models)	E39-L104 ^{*1}
	Standard-backwall mounting	E39-L44 ^{*1}
	Protection-wall mounting (for pre-wired or pigtail models)	E39-L142 ^{*1}
	Protection-surface mounting	E39-L98 ^{*1}
	Telescope mounting	E39-L93FH
	3D rotation mounting	E39-EL4

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