

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



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Products > Technologies

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

PRO sensors offer extra performance in your sensors and components. The Omron PRO Line is your perfect choice.

[Learn more](#)



Product groups

Sysmac controller

The Sysmac controller 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.

Sensors

Omron sensors are the most effective without any compromise in quality. They are designed to be modified to meet your needs.

Relays

Omron relays are the most effective without any compromise in quality. They are designed to be modified to meet your needs.

Robotics

Omron robotics are the most effective without any compromise in quality. They are designed to be modified to meet your needs.



Related product news



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

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

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

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realizing

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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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Industrial Automation Guide 2016

	Omron at a glance	3
	The 361° Approach	4
	Sysmac: A fully integrated platform	6
	Product selection table	8
Automation systems	Machine automation controller	12
	Programmable logic controllers (PLC)	26
	Remote I/O	54
	Human machine interfaces (HMI)	68
	I/O cables and terminal blocks	82
	Ethernet cables and accessories	91
Motion & Drives	Motion controllers	96
	Servo systems	112
	Robots	170
	Frequency inverters	202
Sensing	Photoelectric sensors	236
	Mark and Color sensors	278
	Lightcurtains and area sensors	284
	Fiber optic sensors and amplifiers	292
	Inductive sensors	324
	Mechanical sensors/Limit switches	344
	Rotary encoders	358
	Cable connectors	366
Quality control & Inspection	Inspection & Ident systems	370
	Measurement sensors	426
Safety	Emergency stop and control devices	462
	Safety limit switches	472
	Safety door switches	480
	Safety sensors	506
	Safety logic control systems	544
	Safety outputs	566
Control components	Temperature controllers	574
	Power supplies	596
	Uninterruptible power supplies (UPS)	614
	Timers	622
	Counters	632
	Programmable relays	642
	Digital panel indicators	650
	Energy monitoring devices	660
	Photovoltaic	674
Switching components	Electromechanical relays	682
	Solid state relays	696
	Low voltage switchgear	706
	Monitoring products	722
	Pushbutton switches	750
Software	Software	766
	Outline of Major Standards	772
	Index	775

“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

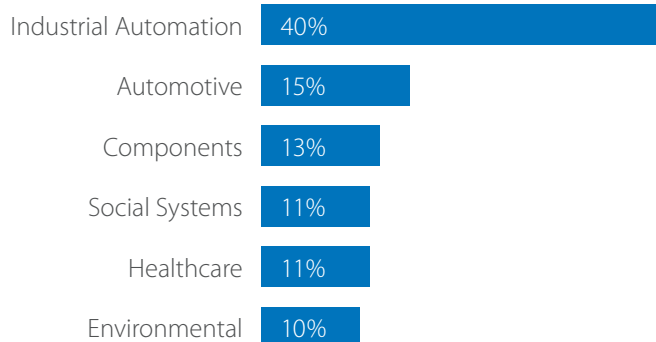
210

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:

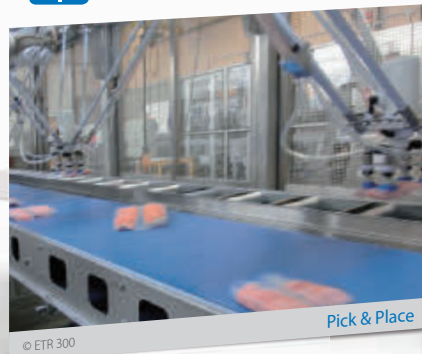
The Sysmac platform is scalable and provides the performance and functionality for a wide range of solutions from simple machines through to manufacturing cells

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

Automation systems				
	12 Machine automation controller	26 Programmable logic controllers (PLC)	54 Remote I/O	68 Human machine interfaces (HMI)
				
	96 Motion controllers	112 Servo systems	170 Robots	202 Frequency inverters
Sensing				
	236 Photoelectric sensors	278 Mark and Color sensors	284 Lightcurtains and area sensors	292 Fiber optic sensors and amplifiers
				
	370 Inspection & Ident systems	426 Measurement sensors		
Safety				
	462 Emergency stop and control devices	472 Safety limit switches	480 Safety door switches	506 Safety sensors
				
	574 Temperature controllers	596 Power supplies	614 Uninterruptible power supplies (UPS)	622 Timers
Switching components				
	682 Electromechanical relays	696 Solid state relays	706 Low voltage switchgear	722 Monitoring products
				
	766 Software			
Software				

Sensing

Find information fast!

Quick Links shortens your search. Quick Links are unique codes assigned to Omron products listed in this guide. Enter Quick Link codes in the search box on industrial.omron.eu to access detailed information on products in this guide.



Quick Link

Sensing

Photoelectric sensors	236	Fiber optic sensors and amplifiers	292
Selection table	238	Selection table	294
Compact square		Fiber sensor heads	
Multi-purpose		E32 Standard cylindrical	296
E3Z	241	E32 Square shape	298
E3ZM	243	E32 Miniature	300
E3Z-Laser	245	E32 Longer distance	302
Special applications		E32 Chemical resistant	304
E3Z-G	246	E32 Heat resistant	305
E3ZM-B	247	E32 Vacuum resistant	307
E3Z-B	248	E32 Robot application	309
E3S-CL	249	E32 Precision detection	310
E3S-LS3	250	E32 Special application	312
E3S-DB	251	Fiber amplifiers	
E3ZM-C	239	E3X-HD	314
Miniature and Photomicro		E3X-SD	317
Multi-purpose		E3X-NA	318
E3T	253	E3NX-FA	320
E3H2	264	E3X-DAC-S	282
Special applications		E3X-NA_F	293
EE-SX47/67	255	E3X-MDA	293
Cylindrical		E3X-DAH-S	293
Multi-purpose		Fiber accessories	
E3FA/E3FB	257	E39/E32	323
E3F1	260	Inductive sensors	324
Special applications		Selection table	326
E3F_-B/-V	261	Compact – cylindrical	
E3FC	262	E2A	328
E3H2	264	E2A-S	330
E3T-C	265	E2A3	331
Square type		E2B	332
Multi-purpose		μPROX E2E Small Diameter	334
E3G-M	266	Square/block style	
E3JK	267	TL-W	335
E3JM	269	E2S	336
Special applications		E2Q5	337
E3G-M	266	Special models	
Separated amplifier		E2EH	338
E3NC	270	E2E_-U	339
Reflectors		E2FM	340
E39	274	E2C-EDA	342
Accessories		E2Q6	343
AS	276	E2FQ	326
E39/Y92E-B	277	Mechanical sensors/Limit switches	344
Mark and Color sensors	278	Selection table	347
Selection table	280	Limit switches	
Mark detection		D4N	348
E3ZM-V	281	D4B	475
E3X-DAC-S	282	WL-N	350
FQ	279	D4C	352
FZ	279	ZC	354
Color detection		Z	356
Xpectia lite	279	EE-SX47/67	255
Lightcurtains and area sensors	284	ZX-T	451
Selection table	286	D4C, D4E, X, Z, ZC	345
Lightcurtains and area sensors		D4MC, HL, WL	345
F3ET2	287	D4E, SHL, WL	345
F3E	288	D5B	347
E32 Area monitoring	289	Rotary encoders	358
E32-M21	289	Selection table	361
F3EM2	290	Rotary encoders	
E3Z	241	E6A2-C, E6B2-C	362
ZX-GT	457	E6C2-C/E6C3-C, E6F-C	363
		E6H-C	364
		E6C3-A, E6F-A	365
		Cable connectors	
		Cable connectors	
		XS2, XS3, Y92E	366

Fiber optic sensors and amplifiers

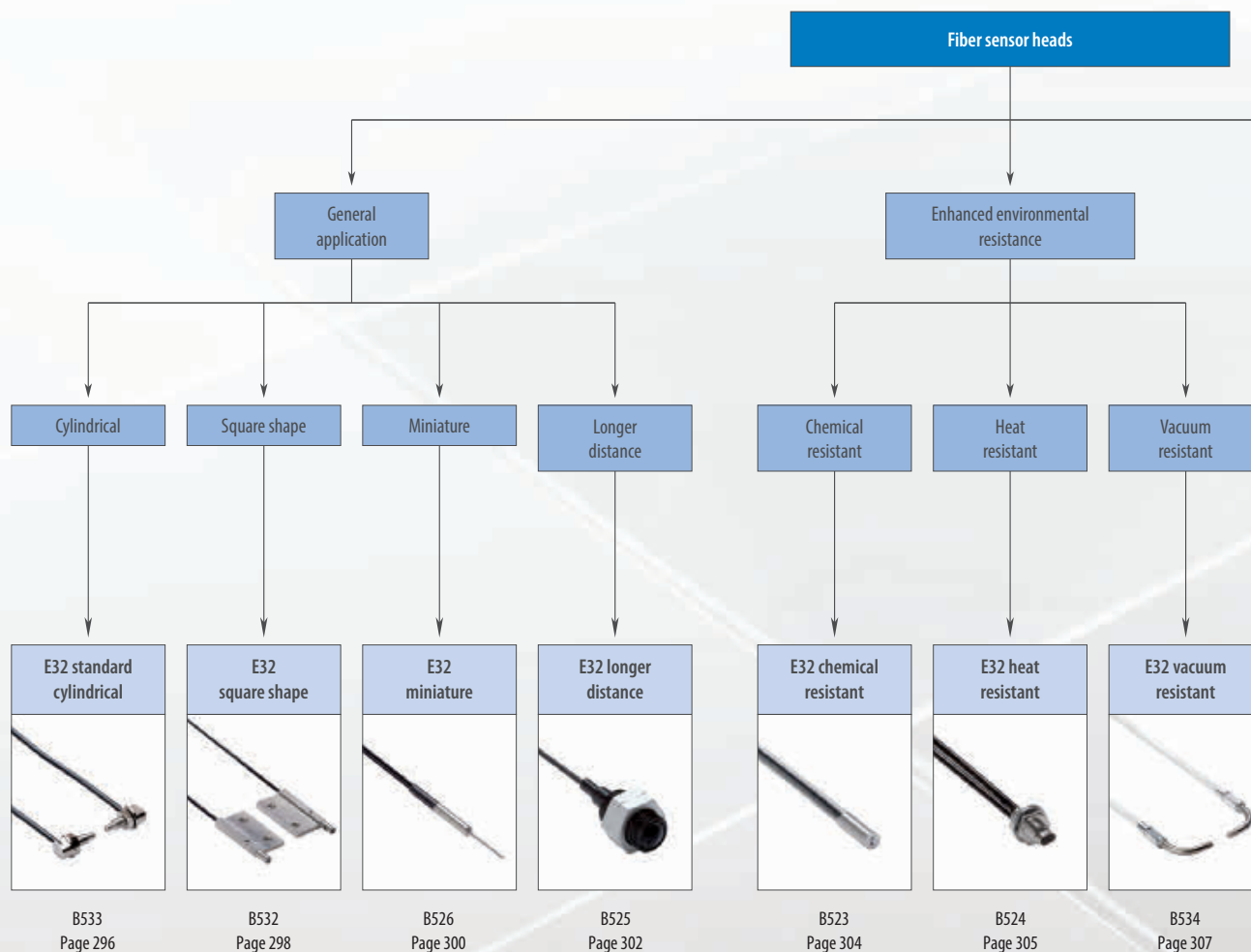
HIGH PRECISION IN SMALL SPACES

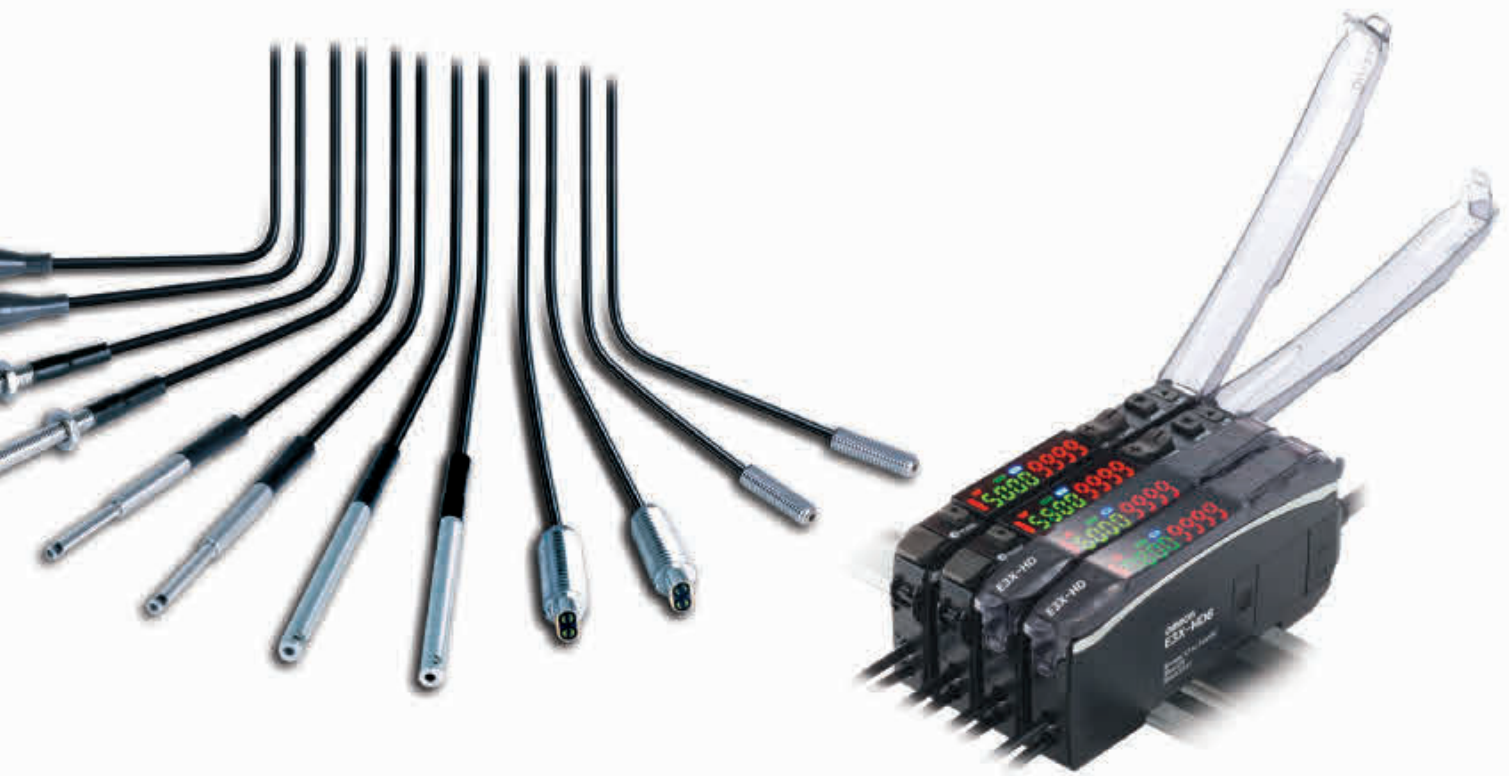
Precision and performance you can rely on

The requirements for fiber optic solutions can be very demanding particularly for applications with extreme temperatures and aggressive chemicals or for applications requiring highest precision with limited mounting space.

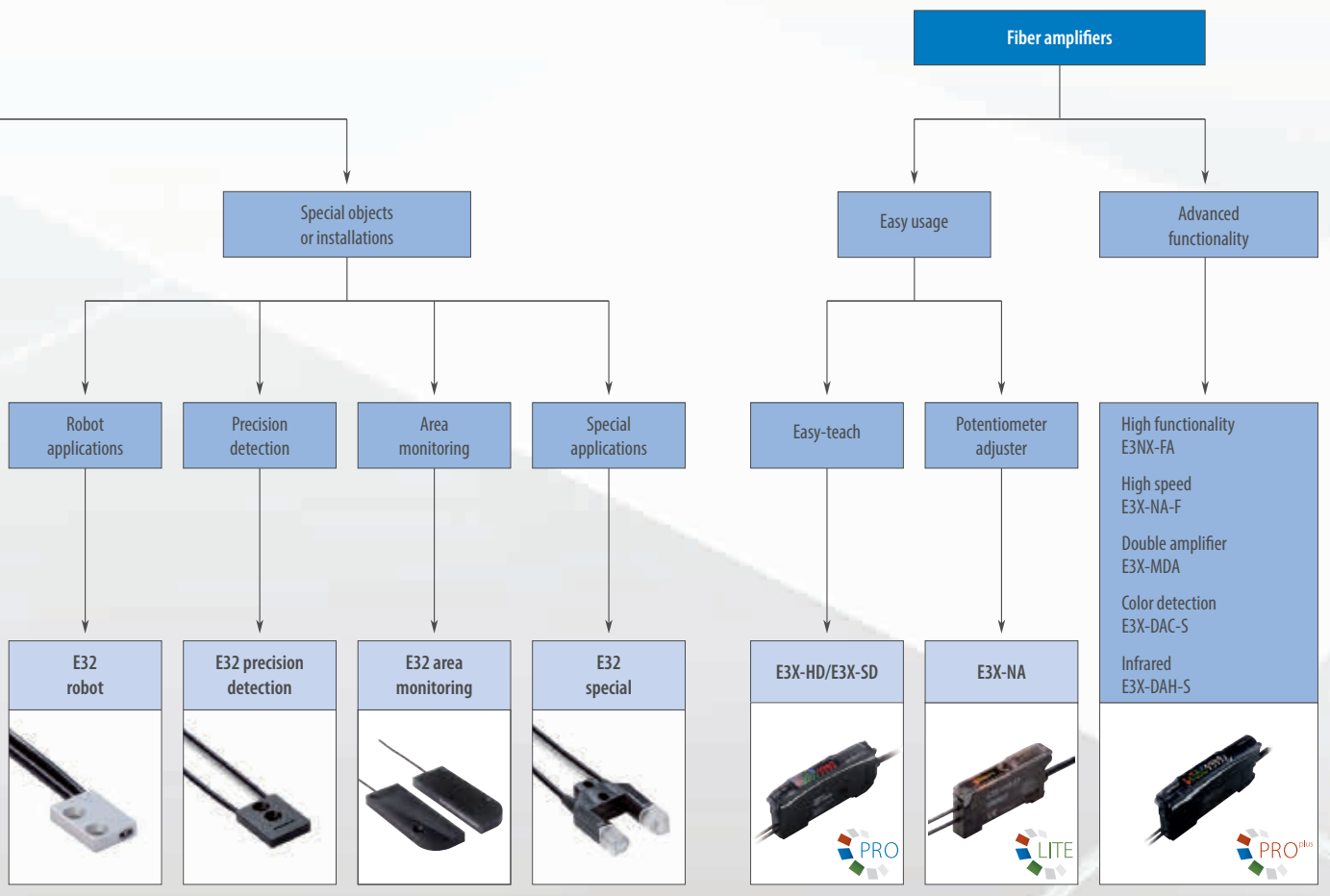
With the wide range of E32 fiber heads and the easy-usage amplifiers, the best performance fit for your application can be provided. The highest quality control procedures in design and manufacturing ensure that you get the precision and long service life that you can rely on.

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





Explanation of 361° concept see page 4



B528
Page 309

B527
Page 310

B522
Page 289

B529
Page 312

B342, B334
Page 314/317

B328
Page 318

E3NX-FA
E3X-NA_F
E3X-MDA
E3X-DAC-S
E3X-DAH-S



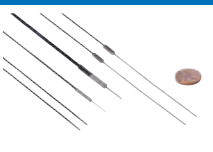


B345
B339
B326
B325
B338

Page 320

Page 282






Selection table






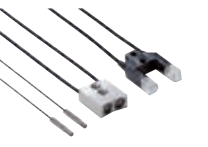
Fiber sensor heads


Type	Cylindrical	Square shape	Miniature	Longer distance	Chemical resistant
					
Model	E32 standard cylindrical	E32 square shape	E32 miniature	E32 longer distance	E32 chemical resistant
Key features	<ul style="list-style-type: none"> Standard and high-flex fibers Sizes M3 to M6 	<ul style="list-style-type: none"> 3 or 4 mm thin housing Models in X,Y or Z-axis Direct mounting without bracket 	<ul style="list-style-type: none"> Sizes from dia 500 µm to 3 mm Bendable sleeves 	<ul style="list-style-type: none"> Built in focal lenses 	<ul style="list-style-type: none"> Fluoroplastic cover or coating
Through-beam	1,550 mm	1,550 mm	1,550 mm	20 m	4 m
Retro-reflective	250 mm	—	—	1.5 m	—
Diffuse-reflective	650 mm	600 mm	600 mm	1.4 m	350 mm
Page/Quick Link	296/B533	298/B532	300/B526	302/B525	304/B523

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

Fiber amplifiers

Type	Easy teach/double display	Easy teach/single display	Potentiometer adjuster	High performance	Double amplifier
					
Model	E3X-HD	E3X-SD	E3X-NA	E3NX-FA	E3X-MDA
361°	PRO	LITE	LITE	PRO ^{plus}	n.a.
Key features	<ul style="list-style-type: none"> Easy operation by smart tuning Dynamic power control Fieldbus connectivity 	<ul style="list-style-type: none"> 1 button object teaching Auto teach during operation 	<ul style="list-style-type: none"> Easy adjustment by potentiometer 	<ul style="list-style-type: none"> High functionality signal processing (timer, counter, dynamic power control, etc.) High signal resolution Increased sensing distance Double output/external input Fieldbus connectivity 	<ul style="list-style-type: none"> 2 inputs and AND, OR signal comparison
Response time (min.)	1 ms (50 µs in super-high-speed mode)	1 ms	200 µs	1 ms (30 µs in super-high-speed mode)	1 ms (130 µs in high speed mode)
Page/Quick Link	314/B342	317/B334	318/B328	320/B345	B326

Heat resistant	Vacuum resistant	Robot applications	Precision detection	Area monitoring	Special application
					
E32 heat resistant	E32 vacuum resistant	E32 robot	E32 precision detection	E32 area monitoring	E32 special
<ul style="list-style-type: none"> Heat resistant up to 400°C 	<ul style="list-style-type: none"> Leakage rate of 1×10^{-10} Pa·m³/s max 	<ul style="list-style-type: none"> Free moving multicore fibers for >1 Mio bending cycles 	<ul style="list-style-type: none"> Detection accuracy up to 100 µm Coaxial fibers Adjustable focal points 	<ul style="list-style-type: none"> Area monitoring up to 70 mm 	<ul style="list-style-type: none"> Detection of special objects (wafer, liquid level, flat glass, print mark ...)
3 m	950 mm	1,350 mm	3.8 m	4 m	3.8 m
–	–	–	–	–	–
500 mm	–	350 mm	600 mm	300 mm	20 mm
305/B524	307/B534	309/B528	310/B527	289/B522	312/B529

High speed	Color/print mark detection	Infrared LED
		
E3X-NA-F	E3X-DAC-S	E3X-DAH-S
n.a.	n.a.	n.a.
<ul style="list-style-type: none"> Short turn on time of 20 µs 	<ul style="list-style-type: none"> White LED and RGB ratio comparison 	<ul style="list-style-type: none"> Infrared LED
20 µs	1 ms (60 µs in super high speed mode)	1 ms (55 µs in super high speed mode)
B339	282/B325	B338

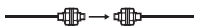









Standard cylindrical fiber sensor heads

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

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

Ordering information

Sensor type	Size	Sensing distance (in mm) ^{*1}				Order code	
		Standard fiber		High-flex fiber		Standard fiber	High-flex fiber
		E3X-HD	E3NX-FA	E3X-HD	E3NX-FA		
	M4	1550	2300	1400	1400	E32-TC200 2M	E32-T11R 2M
	M3	450	670	130	190	E32-TC200E 2M	E32-T21R 2M
	dia 4 mm	1500	2300	—	—	E32-ETC220 2M	—
 easy mount	M4	—	—	1000	1500	—	E32-T11N 2M
 easy mount	M6	—	—	1200	1800	—	E32-LR11NP 2M
	M6	250	370	—	—	E32-R21	—
	M6	600	900	550	820	E32-DC200 2M	E32-D11R 2M
	M4	160	240	60	90	E32-D211 2M	E32-D211R 2M
	M3	160	240	150	220	E32-DC200E 2M	E32-D21R 2M
 easy mount	M6	—	—	350	520	—	E32-D11N 2M
	M4	—	—	350	520	—	E32-D21N 2M
	dia 6 mm	220	300	100	150	E32-D14L 2M	E32-D14LR 2M

^{*1} Sensing distance measured with Standard Mode

Specifications

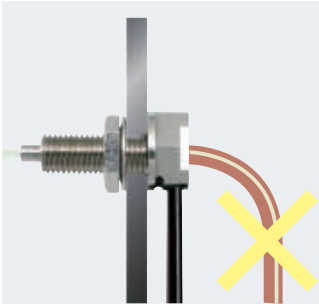
Item		Standard					High Flex				
		E32-_C200 E32-_C220	E32-D14L	E32-_C200E	E32-D211	E32-R21	E32-_R E32-T11N E32-D11N	E32-D14LR E32-D211R	E32-D21N	E32-LR11NP	
Permissible bending radius		R25		R10			R1		R2		
Cut to length		Yes									
Ambient temperature		-40°C to 70°C									
Material	Head	Brass-nickel plated	Stainless steel	Brass-nickel plated	Stainless steel	Plastic (ABS)	Brass-nickel plated	Stainless steel	Brass-nickel plated		
	Fiber	PMMA									
	Sheath	Polyethylene coating					PVC coating				
Degree of protection		IEC 60529 IP67								IP50	



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



Models with hexagonal back for simple one-nut mounting



Cable exit shifted by 90° for preventing fiber breakage



Square shape fiber sensor heads

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

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

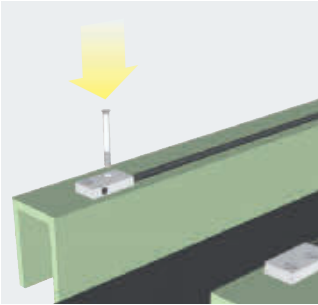
Ordering information

Sensor type	Size in mm (standard / high-flex)	Sensing distance (in mm) ^{*1}				Order code	
		Standard fiber		High-flex fiber		Standard fiber	High-flex fiber
		E3X-HD	E3NX-FA	E3X-HD	E3NX-FA		
	15×8×3 / 15×10×4	1550	1550	1400	2100	E32-T15X 2M	E32-ETS10R 2M
	15×8×3	950	1400	450	670	E32-T15Y 2M	E32-T15YR 2M
	15×8×3 / 15×9×4	950	1400	1300	1800	E32-T15Z 2M	E32-ETS14R 2M
	13×9×4	—		1300	1800	—	E32-ET15YR 2M
		—		1300	1800	—	E32-ET15ZR 2M
	15×10×3	600	900	350	520	E32-D15X 2M	E32-D15XR 2M
	15×10×3	200	300	100	150	E32-D15Y 2M	E32-D15YR 2M
	15×10×3 / 13×6×2.3	200	300	100	150	E32-D15Z 2M	E32-EDS24R 2M
	24.5×10×3	—		1780	2600	—	E32-A03-1 2M
	21×9×2	—		680	1000	—	E32-A04-1 2M

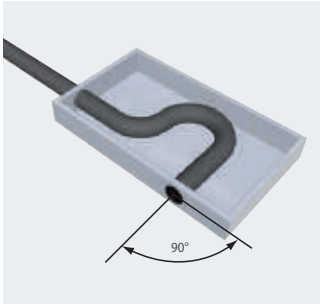
^{*1} Sensing distance measured with Standard Mode

Specifications

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



Space saving and fast mounting without additional brackets



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



Miniature fiber sensor heads

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

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

Ordering information

Sensor type	Size	Sensing distance (in mm) ^{*1}				Order code	
		Standard fiber		High-flex fiber		Standard fiber	High-flex fiber
		E3X-HD	E3NX-FA	E3X-HD	E3NX-FA		
	dia 3 mm	1550	2300	1000	1500	E32-T12 2M	E32-T12R 2M
	dia 2 mm	450	670	250	370	E32-T22 2M	E32-T22R 2M
	dia 1.5 mm	450	670	450	670	E32-T222 2M	E32-T222R 2M
	dia 1 mm	–	–	250	370	–	E32-T223R 2M
	dia 3 mm	950	1420	450	670	E32-T14L 2M	E32-T14LR 2M
	dia 2 mm	680	1020	–	–	E32-A04 2M	–
	dia 1 mm	250	370	100	150	E32-T24	E32-T24R 2M
	dia 1.2 mm	1550	2300	1000	1500	E32-TC200B ^{*2}	E32-TC200BR ^{*2}
	dia 0.9 mm	450	670	250	370	E32-TC200F ^{*2}	E32-TC200FR ^{*2}
	dia 3 mm	160	240	60	90	E32-D22 2M	E32-D22R 2M
	dia 2 mm	150	220	80	120	E32-D32 2M	E32-D32R 2M
	dia 1.5 mm	–	–	60	90	–	E32-D22B 2M
	dia 2 mm	60	90	30	40	E32-D24	E32-D24R 2M
	dia 2.5 mm	600	900	350	520	E32-DC200B 2M ^{*2 *3}	E32-DC200BR ^{*2 *3}
	dia 1.2 mm	160	240	60	90	E32-DC200F ^{*2}	E32-DC200FR ^{*2}
	dia 0.8 mm	–	–	30	40	–	E32-D33 2M
	dia 0.5 mm	–	–	6	9	–	E32-D331 2M

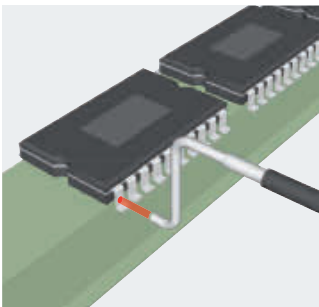
^{*1} Sensing distance measured in Standard Mode

^{*2} Models with 40 mm sleeve instead of 90 mm sleeve are available by adding '4' to the order code at the end, e.g. E32-TC200B4

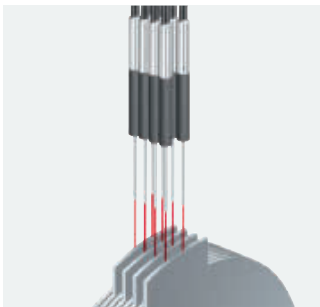
^{*3} Sleeve cannot be bent

Specifications

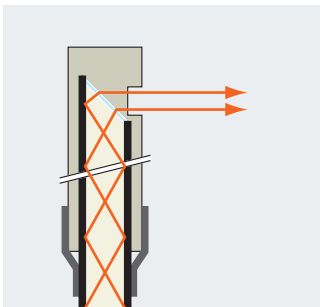
Item		Standard						High-flex					
		E32-DC200B E32-T12 E32-TC200B	E32-T14L	E32-D32	E32-D22 E32-T222 E32-TC200F	E32-D24 E32-DC200F E32-T22 E32-T24	E32-A04	E32-D32R E32-D33 E32-D331	E32-D22B	E32-DC200BR E32-T12R E32-TC200BR	E32-D22R E32-T222R E32-TC200FR	E32-D24R E32-DC200FR E32-T14LR E32-T22R E32-T223R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



Bendable metal sleeves for precision positioning of sensors after installation



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



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

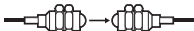


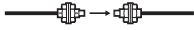




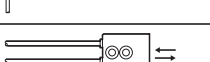






Longer distance fiber sensor heads

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

- Sensing distance up to 20 m
- Built-in focal lens
- Sizes from dia 2 mm to M14
- Easy installation - no need to attach auxiliary lenses

Ordering information

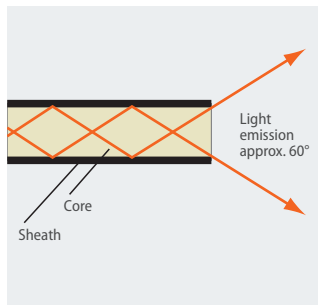
Sensor type	Size	Sensing distance (in mm) ^{*1}				Order code	
		Standard fiber		High-flex fiber		Standard fiber	High-flex fiber
		E3X-HD	E3NX-FA	E3X-HD	E3NX-FA		
	M14	20000	20000	—	—	E32-T17L	—
	25.2 × 10.5 × 8 mm	4000	4000	—	—	E32-T14	—
	M4	—	—	3500	4000	—	E32-LT11N 2M
	M4	4000	4000	3500	4000	E32-LT11 2M	E32-LT11R 2M
	M3	1350	2000	—	—	E32-TC200A 2M	—
	dia 3 mm	2600	3900	—	—	E32-T12L 2M	—
	dia 2 mm	850	1200	—	—	E32-T22L 2M	—
	21.5 × 27 × 10 mm	1500	2250	—	—	E32-R16 2M	—
	M6	—	—	350	520	—	E32-LD11N 2M
	22 × 17.5 × 9 mm	1400	2100	—	—	E32-D16 2M	—
	M6	360	540	350	520	E32-LD11 2M	E32-LD11R 2M
	M4	260	390	—	—	E32-D21L 2M	—
	dia 3 mm	450	670	—	—	E32-D12 2M	—

^{*1} Sensing distance measured in Standard Mode

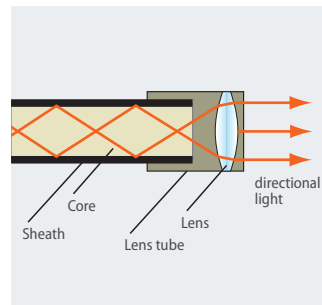
Specifications

Item	Through-beam						
	E32-T17L/ E32-T14	E32-LT11N	E32-LT11	E32-T12L	E32-TC200A	E32-LT11R	E32-T22L
Permissible bending radius	R25	R2	R25			R1	R10
Cut to length	Yes						
Ambient temperature	-40°C to 70°C						
Material	Head	Brass-nickel plated					Stainless steel
	Fiber	PMMA					
	Sheath	Polyethylene coating					
Degree of protection	IP67	IP50		IP67		IP50	IP67

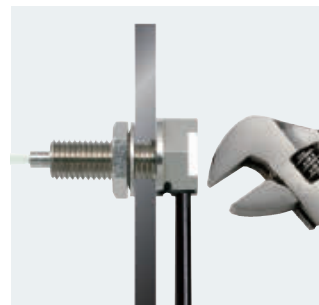
Item		Retro-reflective	Diffuse-reflective					
		E32-R16	E32-D16	E32-LD11N	E32-LD11	E32-LD11R	E32-D21L	E32-D12
Permissible bending radius		R25	R4	R2	R25	R10	R10	R25
Cut to length		Yes						
Ambient temperature		−40°C to 70°C						
Material	Head	ABS	Aluminium	Brass-nickel plated				Stainless steel
	Fiber	PMMA						
	Sheath	Polyethylene coating	PVC coating	Polyethylene coating				
Degree of protection		IP67	IP40	IP50			IP67	



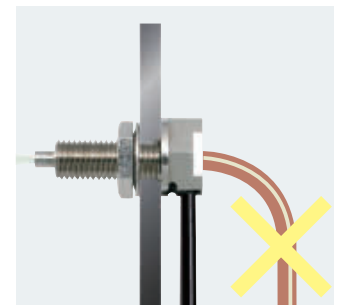
Light emission of conventional fibers



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



Models with hexagonal back for simple one-nut mounting



Cable exit shifted by 90° for preventing fiber breakage



Chemical resistant fiber sensor heads

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

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

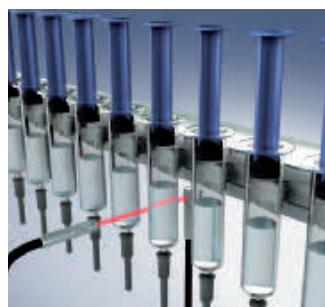
Ordering information

Sensor type	Size	Sensing distance (in mm) ^{*1}		Key feature	Order code
		E3X-HD	E3NX-FA		
	M4	1350	2000	Fluororesin coating	E32-T11U 2M
	dia 5 mm	4000	4000	Fluororesin cover	E32-T12F
		800	1200		E32-T14F 2M
	M6	350	520	Fluororesin coating	E32-D11U 2M
	dia 7 mm	300	450	Fluororesin cover	E32-ED11F 2M
	dia 6 mm	190	280		E32-D12F
		80	120		E32-D14F 2M
		1400	2100	Fluororesin cover Heat resistant to 200°C	E32-T81F-S 2M
	dia 5 mm	2800	4000	Fluororesin cover Heat resistant to 150°C	E32-T51F 2M

^{*1} Sensing distance measured in Standard Mode

Specifications

Item	Fluororesin coating		Full fluororesin cover		Full fluororesin cover and heat resistance	
	E32-T11U	E32-D11U	E32-ED11F	E32-_12F/E32-_14F	E32-T51F	E32-T81F-S
Permissible bending radius (in mm)	R1	R4	R75	R40		R10
Cut to length	yes					no
Ambient temperature	-40°C to 70°C				-40°C to 150°C	-40°C to 200°C
Material	Head	Brass-nickel plated		Fluororesin		
	Fiber	PMMA				Glass
	Sheath	Fluororesin coating		Fluororesin cover		
Degree of protection	IEC60529 IP67					



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



Enhanced temperature resistant models



Highest chemical resistance

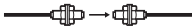

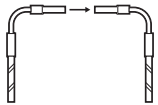








Heat resistant fiber sensor heads

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

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

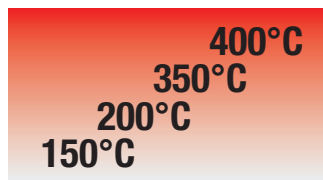
Ordering information

Sensor type	Size	Sensing distance (in mm) ^{*1}		Key feature	Order code	
		E3X-HD	E3NX-FA		For E3NX-FA and E3X-HD amplifiers	For E3X-NA amplifier
	M4	3000	4000	–40°C to 150°C	E32-T51 2M	
		800	1200	–40°C to 100°C ^{*2} , high-flex	E32-T51R 2M	
		550	820	–40°C to 200°C	E32-T81R-S 2M	
		900	1350	–60°C to 350°C	E32-T61-S 2M	
	dia 2 mm	450	670	–40°C to 150°C	E32-T54 2M	
	dia 3 mm	2600	3900	–40°C to 200°C	E32-T84S-S 2M	
	M6	500	750	–40°C to 150°C	E32-D51 2M	
		280	420	–40°C to 100°C ^{*2} , high-flex	E32-D51R 2M	
		180	270	–40°C to 200°C	E32-D81R-S 2M	E32-D81R 2M
	M4	180	270	–60°C to 350°C	E32-D61-S 2M	E32-D61
		120	180	–40°C to 400°C	E32-D73-S 2M	E32-D73
	23×20×9 mm	15–38		–40°C to 150°C	E32-A09H 2M	
	30×24×9 mm	20–30		–40°C to 300°C	E32-A09H2 2M	
	25×18×5 mm	1–5		–40°C to 300°C	E32-L64 2M	
	36×18×5 mm	5–18			E32-L66 2M	

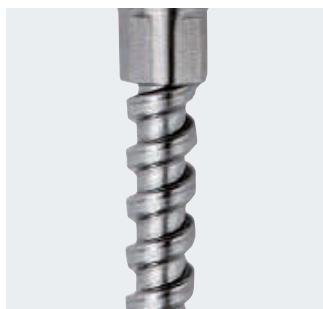
^{*1} Sensing distance measured in Standard Mode
^{*2} Short term resistance. For continuous operation –40°C to 90°C

Specifications

Item		-40°C to 150°C	-40°C to 100°C	-40°C to 150°C		-40°C to 200°C		-40°C to 300°C		-60°C to 350°C	-40°C to 400°C
		E32-_51	E32-D51R/ T51R	E32-T54	E32-A09H	E32-_ 81_	E32-T84_	E32-A09H2	E32-L6_	E32-_ 61_	E32-D73_
Permissible bending radius (in mm)		R35	R2	R35		R10	R25				
Cut to length		Yes				No					
Material	Head	Brass-nickel plated	Stainless steel		Aluminium	Stainless steel					
	Fiber	PMMA	Acrylate resin	PMMA		Glass					
	Sheath	Fluoro resin	Polyurethane resin	Fluoro resin			Stainless steel spiral coating	Stainless steel tube	Stainless steel spiral coating		Stainless steel tube
Degree of protection		IEC 60529 IP67	IEC 60529 IP50	IEC 60529 IP67				IEC 60529 IP40		IEC 60529 IP67	



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



Stainless steel spiral coating for flexibility with highest mechanical protection.


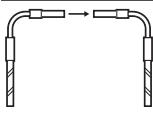



Vacuum resistant fiber sensor heads

- For applications in cleanest and hot environments the vacuum resistant fibers and connecting flanges provide long operational lifetime and vacuum integrity.
- Leakage rate of 1×10^{-10} Pa*m³/s max
 - Heat resistance up to 200°C
 - Detergent resistant fluororesin or stainless steel fiber sheath

Ordering information

Sensor

Sensor type	Size	Sensing distance (in mm) ^{*1}		Temperature range	Order code
		E3X-HD	E3NX-FA		
	M4	400	600	-40°C to 120°C	E32-T51V 1M
	dia 3	250	370	-40°C to 120°C	E32-T54V 1M
	dia 3	950	1400	-60°C to 200°C	E32-T84SV 1M
	33 × 18 × 5.5 mm	5		-40°C to 70°C	E32-G86V-1 3M

^{*1} Sensing distance measured with Standard Mode

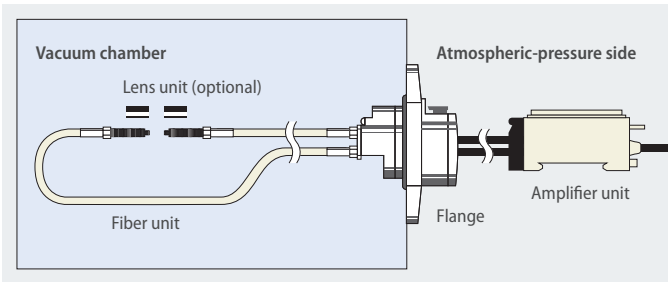
Flange

Type	Size	Order code
4 channel flange	80 × 80 × 49 mm	E32-VF4
1 channel flange	96 × dia 30 mm max.	E32-VF1
Flange-to-amplifier connection fiber	2 m length	E32-T10V 2M

Specifications

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

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



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



Robot application fiber sensor heads

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

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

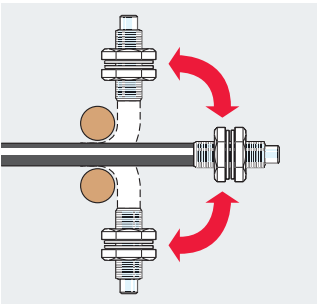
Ordering information

Sensor type	Size	Sensing distance (in mm) ^{*1}		Order code
		E3X-HD	E3NX-FA	
	M4	1350	2000	E32-T11 2M
	M3	400	600	E32-T21 2M
	dia 3 mm	1350	2000	E32-T12B
	dia 2 mm	400	600	E32-T221B
	dia 1.5 mm	400	600	E32-T22B
	15 × 18 × 3 mm	1350	2000	E32-T15XB 2M
	M6	350	520	E32-D11 2M
	M4	140	210	E32-D21B 2M
	M3	60	90	E32-D21 2M
	dia 1.5 mm	60	90	E32-D22B 2M
	15 × 10 × 3 mm	350	520	E32-D15XB 2M

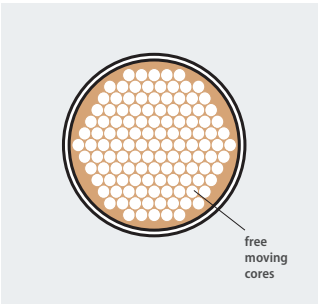
^{*1} Sensing distance measured in Standard Mode

Specifications

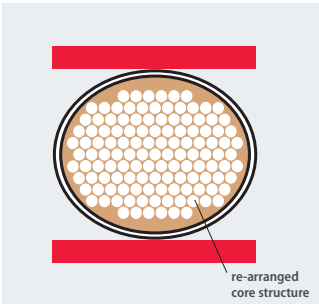
Item	Square		Cylindrical			
	E32-D15XB E32-T15XB	E32-T21	E32-D11 E32-T11	E32-D21 E32-T12B E32-T22B	E32-D21B E32-D22B E32-T221B	
Permissible bending radius	R4					
Cut to length	Yes					
Ambient temperature	-40°C to 70°C					
Material	Head	Aluminium	Brass-nickel plated			Stainless steel
	Fiber	PMMA				
	Sheath	PVC coating	Polyethylene coating	PVC coating		
Degree of protection	IEC 60529 IP67					



Guaranteed more than 1 mio bending operations



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
















Precision detection fiber sensor heads

Highest precision in design and manufacturing of the fibers and focal lenses ensure superior beam and spot accuracy allowing the detection of the smallest objects and height differences, even down to 100 µm.

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

Ordering information

Sensor type	Preferred usage	Size	Key feature	Sensing distance ^{*1} (in mm)		Order code
				E3X-HD	E3NX-FA	
	Precise thin object detection /accurate positioning	dia 3 mm	<ul style="list-style-type: none">• High precision optical axis adjustment• Very focused beam	3800	4000	E32-T22S
		dia 2 mm		1780	2650	E32-A03 2M
				680	1000	E32-A04 2M
	Very small object detection	M6	–	600	900	E32-CC200 2M ^{*2}
		M3	Spot dia 0.5 mm	120	180	E32-C31 2M
			Spot dia 0.2 mm	17		E32-C41 1M + E39-F3B
			Spot dia 0.1 mm	7		E32-C41 1M + E39-F3A-5
		dia 3 mm	–	300	450	E32-D32L
		dia 2 mm	–	150	220	E32-D32 2M ^{*2}
 <div>easy mount</div>		M6	<ul style="list-style-type: none">• 90° cable exit• Hexagonal back	350	520	E32-C11N 2M
		M3	90° cable exit	130	190	E32-C21N 2M
				50	70	E32-C31N 2M
		M3	Spot dia 0.5 to 3mm	8 - 25 adjustable		E32-C31 2M + E39-EF51
	dia 2 mm ^{*3}	Spot dia 0.5 to 1 mm	6 - 15 adjustable		E32-D32 2M + E39-F3A	
			Spot dia 0.1 to 0.6 mm	6 - 15 adjustable		E32-C42 1M + E39-F3A
	Precision height difference detection / flat surface detection Object detection in front of background	23 × 20 × 9 mm	–	26.5±11.5		E32-A09 2M
		16 × 18 × 4 mm	–	7.2±1.8		E32-L25L ^{*2}
		20 × 20 × 5 mm	–	3.3		E32-L25
		18 × 20 × 4 mm	Precise spot e.g. for detection of a flat / reflective surface	4±2		E32-L24L ^{*2}
		34 × 25 × 8 mm	High precision (detection accuracy 100 μm)	2.4		E32-EL24-1 2M
		20.5 × 14 × 3.8 mm	Limited reflective wide beam e.g. for object detection on a flat surface	15		E32-L16-N 2M

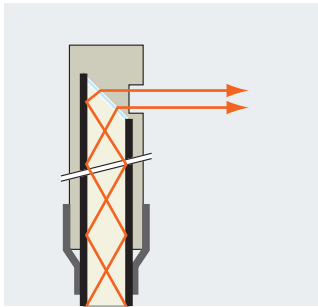
^{*1} Sensing distance measured in Standard Mode

^{*2} A high flex cable version is available. Add 'R' to the order code, e.g. E32-CC200R

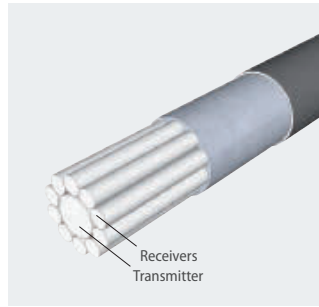
^{*3} Outer diameter of the fiber. Outer diameter of the focal lens is dia 4mm (front part)

Specifications

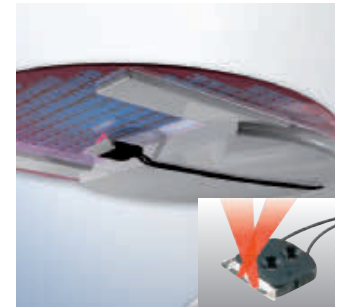
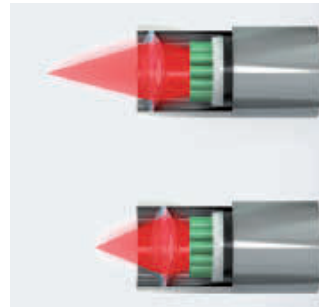
Item		Through-beam			Diffuse reflective (coaxial)				Limited reflective					
		E32-T22S	E32-A03	E32-A04	E32-C11N E32-C31N	E32-C21N	E32-CC200	E32-C42 E32-D32/-D32L E32-C31/-C41	E32-EL24-1	E32-L24L E32-L25L	E32-L25	E32-L16	E32-A09	
Permissible bending radius		R10	R1	R10	R4	R2	R25		R10		R25			
Cut to length		Yes												
Ambient temperature		-40°C to 70°C												
Material	Head	Brass-nickel plated		Stainless steel	Brass-nickel plated			Brass nickel plated	Brass-nickel plated and aluminium	Polycarbonate	ABS		Aluminium	
	Fiber	PMMA												
	Sheath	PVC coating	Polyethylene coating		PVC coating		PVC, polyethylene and polyolefin coating		Polyethylene coating					
Degree of protection		IEC 60529 IP67	IEC 60529 IP50		IEC 60529 IP67					IEC 60529 IP50		IEC 60529 IP40		



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



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



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





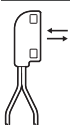







Special application fiber sensor heads

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

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

Ordering information

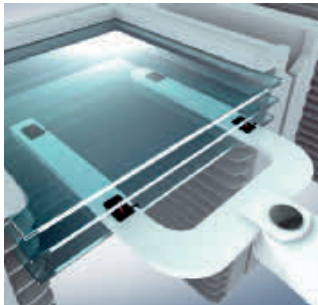
Sensor type		Size	Sensing distance (in mm) ^{*1}		Comment	Order code
			E3X-HD	E3NX-FA		
	Fork shape	36 × 24 × 8 mm	10		–	E32-G14
	Wafer mapping	dia 3 mm	3800	4000	–	E32-T22S
		dia 3 mm	2600	3900	–	E32-T24S
		dia 3 mm	1780	2650	–	E32-A03 2M
		dia 2 mm	680	1000	–	E32-A04 2M
	Liquid level sensor	dia 6 mm	liquid contact		Liquid level contact	E32-D82F1 4M
		15 × 23.5 × 5 mm	tube contact		Liquid level detection through transparent tube or container	E32-D36T 2M
	Glass detection	21 × 16.5 × 4 mm	8		Metal housing	E32-A10 2M
		20.5 × 14 × 3.8 mm	15		Plastic housing	E32-L16-N 2M
	Glass detection in hot environment	25 × 18 × 5 mm	1–5		Heat resistant up to 300°C	E32-L64 2M
		36 × 18 × 5.5 mm	5–18			E32-L66 2M
	Glass detection in wet processes	38.5 × 39 × 17.5 mm	8 to 20 (recommended: 11)		Heat resistant up to 85°C	E32-L11FS 2M
	Label detection	20 × 20 × 5 mm	7.2±1.8		–	E32-L25L
		18 × 20 × 4 mm	4±2		–	E32-L24L
		34 × 25 × 8 mm	2.4		Very precise spot (detection accuracy 100 µm)	E32-EL24-1 2M

^{*1} Sensing distance measured in Standard Mode

Specifications

Item		E32-D82F1 E32-L11FS	E32-G14	E32-A10	E32-L16-N	E32-L66	E32-L64
Permissible bending radius		R40	R25				
Cut to length		Yes				No	
Ambient temperature		−40°C to 70°C				−40°C to 300°C	
Material	Head	PFA	ABS	ABS	PVC	Stainless steel	
	Fiber	PMMA				Glass	
	Sheath	Polyethylene coating				Stainless steel spiral coating	
Degree of protection		IEC 60529 IP67		IEC 60529 IP30	IEC 60529 IP40	IEC 60529 IP40	IEC 60529 IP50

Item		E32-EL24-1	E32-T24S	E32-L24L E32-L25L	E32-A04	E32-D36T	E32-A03	E32-T22S
Permissible bending radius		R10				R4	R1	
Cut to length		Yes						
Ambient temperature		−40°C to 70°C						
Material	Head	Brass-nickel plated and aluminum	Stainless steel	Brass-nickel plated	Stainless steel	ABS	Brass-nickel plated	
	Fiber	PMMA						
	Sheath	Polyethylene coating	PVC coating	Polyethylene coating		PVC coating	Polyethylene coating	PVC coating
Degree of protection		IEC 60529 IP67		IEC 60529 IP50		IEC 60529 IP67	IEC 60529 IP50	IEC 60529 IP67



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



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



Easy-teach digital fiber amplifier

The E3X-HD with 1-button Smart tune set-up provides fast and simple teaching. Dual digital display and advanced features make the E3X-HD ideal even for demanding applications.

- Easy teaching by Smart tuning within a few seconds
- Dynamic Power Control (DPC) for highest operational stability for changing environmental conditions or challenging objects
- M8 connector models
- EtherCAT and CompoNet Communication units for high-speed field bus connectivity

Ordering information

Item	Order code		
	Transistor output models		Communication unit model ^{*1}
	NPN output	PNP output	
Pre-wired	E3X-HD11 2M	E3X-HD41 2M	–
Fiber amplifier connector	E3X-HD6	E3X-HD8	E3X-HD0
M8 connector (4pin)	E3X-HD14	E3X-HD44	–

^{*1} For field bus connection please chose Communication unit E3X-ECT for EtherCAT or E3X-CRT for CompoNet.

Fiber amplifier connectors

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN11
		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

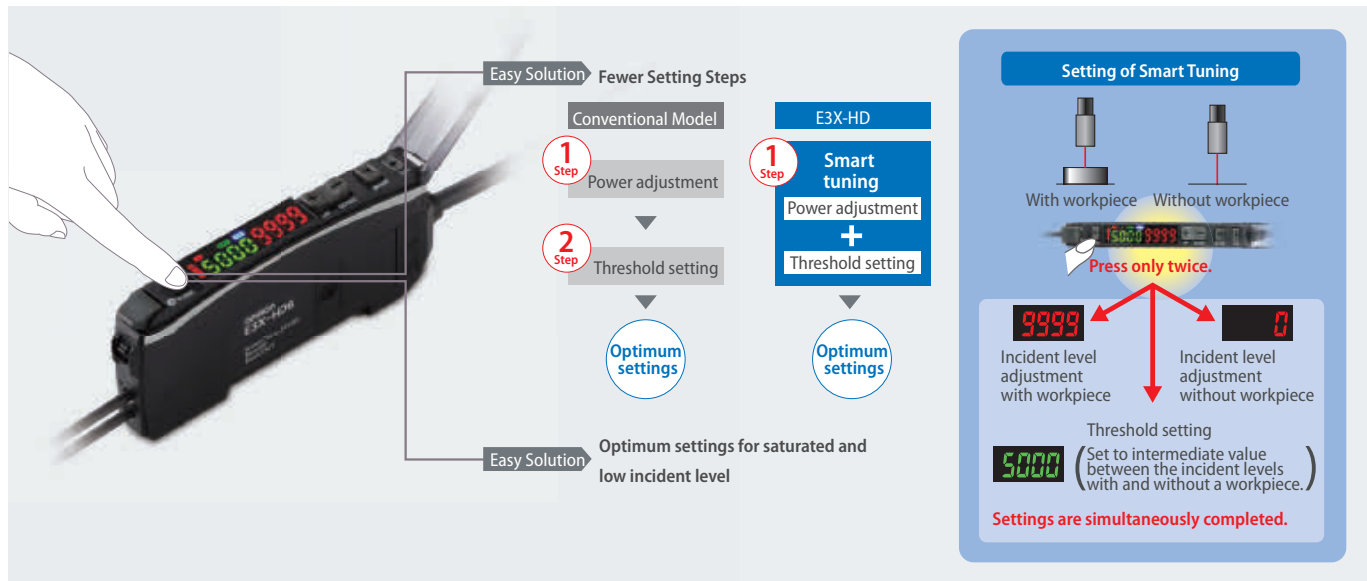
Communication units

Shape	Communications method	Applicable Fiber Amplifier Units	Order code
	CompoNet	E3X-HD0 E3X-MDA0 E3X-DA0-S	E3X-CRT
	EtherCAT		E3X-ECT

Specifications

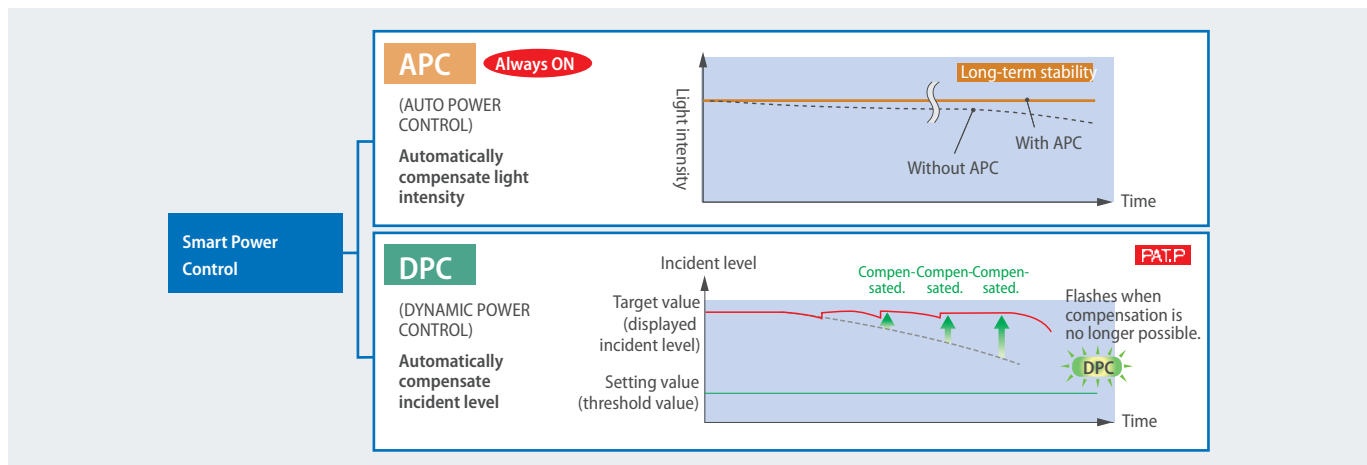
Item	Type	Standard models						For Communications Unit
	Model	E3X-HD11	E3X-HD41	E3X-HD6	E3X-HD8	E3X-HD14	E3X-HD44	E3X-HD0
	Connection method	Pre-wired		Wire-saving connector		M8-4pin connector		Communications unit connector
	Control output	NPN output	PNP output	NPN output	PNP output	NPN output	PNP output	–
Light source (wavelength)		Red, 4-element LED (625 nm)						
Power supply voltage		12 to 24 VDC±10%, ripple (p-p) 10% max.						
Power consumption		Normal Mode: 720 mW max. (Current consumption: 30 mA max. at 24 VDC, 60 mA max. at 12 VDC.) Power Saving Eco Mode: 530 mW max. (Current consumption: 22 mA max. at 24 VDC, 44 mA max. at 12 VDC.)						
Control output		Load power supply voltage: 26.4 VDC max., open-collector output (Varies with the model depending on output is PNP or NPN.)Load current: 50 mA max. (residual voltage: 2 V max.), OFF current: 0.5 mA max.						–
Response time	Super-high-speed Mode (SHS)	Operate or reset: 50 μs (NPN models) or 55 μs (PNP models)						
	High-speed Mode (HS)	Operate or reset: 250 μs						
	Standard Mode (STND)	Operate or reset: 1 ms						
	Giga-power Mode (GIGA)	Operate or reset: 1 ms						
Mutual interference prevention		Possible for up to 10 units						
Maximum connectable Units		16 units						with E3X-CRT: 16 units with E3X-ECT: 30 units

Easy One-Button-Teaching/Smart Tuning



Easy setting of optimum power and threshold by pushing tune button twice.

Smart power control



Enhanced signal stability control for compensating power reductions caused by temperature drift, dust or aging of LED.

Field bus connectivity



Field bus communication allows control by an external device to simplify setup and reduce wiring effort.



Single display digital fiber amplifier

E3X-SD allows easy one button setting and provide the best value performance ratio for standard applications.

- Auto-teaching during machine operation
- 2-point teaching within a few seconds
- Simple threshold adjustment with up/down keys

Ordering information

Item	Order code	
	NPN output	PNP output
Pre-wired	E3X-SD21 2M	E3X-SD51 2M
Fiber amplifier connector*1	E3X-SD7	E3X-SD9

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

Fiber amplifier connectors

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN11
		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

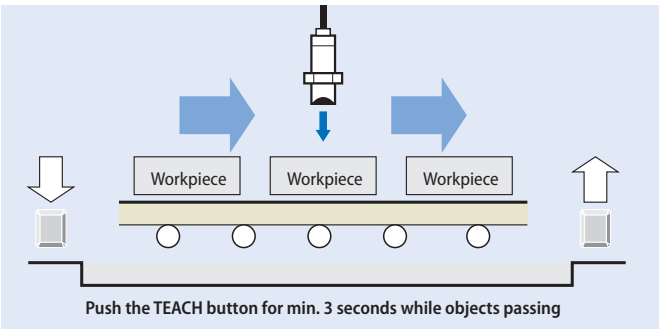
Specifications

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

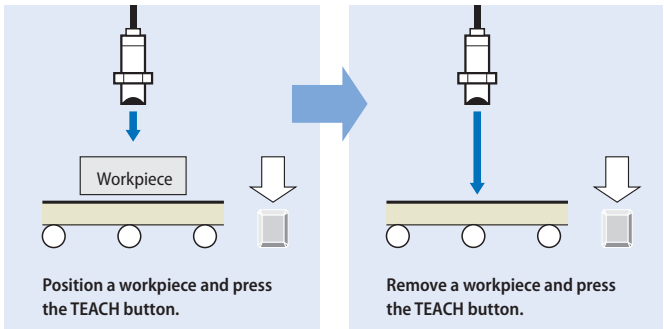
Easy operation by ergonomic buttons



Auto-teaching



2-point teaching





Digital fiber amplifier with potentiometer adjustment

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

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

Ordering information

Pre-wired

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

Connector version

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

*1 Order connector separately.

Fiber amplifier connectors

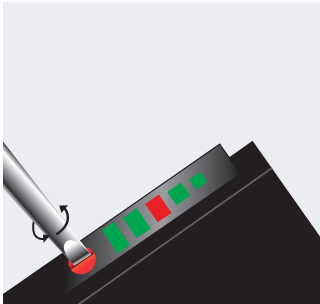
Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable	E3X-CN21
		30 cm PVC cable with M12 plug connector (4 pin)	E3X-CN21-M1J 0.3M
		30 cm PVC cable with M8 plug connector (4 pin)	E3X-CN21-M3J-2 0.3M

Specifications

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



Bargraph display with light level, switching status and threshold indicators



Simple sensitivity adjustment by potentiometer



High-performance digital fiber amplifier

The E3NX-FA amplifier is best choice for most challenging fiber applications in terms of long sensing distance, minute object detection or high speed processes.

- Easy teaching by Smart tuning within a few seconds
- New N-Smart technology provides significant improvement for sensing distance, minimum object detection and speed
- Easy and transparent information about sensor status by Solution Viewer and Change Finder function
- EtherCAT Communication unit for high-speed field bus connectivity

Ordering information

Item	Connection	Inputs/Outputs	Order code	
			NPN output	PNP output
Standard models	Pre-wired	1 output	E3NX-FA11 2M	E3NX-FA41 2M
	Fiber amplifier connector		E3NX-FA6	E3NX-FA8
Advanced models	Pre-wired	2 outputs + 1 input	E3NX-FA21 2M	E3NX-FA51 2M
	Fiber amplifier connector	1 output + 1 input	E3NX-FA7	E3NX-FA9
		2 outputs	E3NX-FA7TW	E3NX-FA9TW
	M8 connector	1 output + 1 input	E3NX-FA24	E3NX-FA54
		2 output	–	E3NX-FA54TW
Networking model ^{*1}	Connector for communication unit	via com. protocol	E3NX-FA0	

^{*1} For field bus connection please chose communication unit E3NW-ECT for EtherCAT.

Fiber amplifier connectors

Shape	Type	Comment	Order code
	Fiber amplifier connector	2 m PVC cable (4 pin)	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

Specifications

Item	Type	Standard models		Advanced models					Model for sensor communications unit
	NPN output	E3NX-FA11	E3NX-FA6	E3NX-FA21	E3NX-FA7	E3NX-FA7TW	E3NX-FA24	–	E3NX-FA0
	PNP output	E3NX-FA41	E3NX-FA8	E3NX-FA51	E3NX-FA9	E3NX-FA9TW	E3NX-FA54	E3NX-FA54TW	
	Connection method	Pre-wired	Wire-saving connector	Pre-wired	Wire-saving connector		M8 connector		Connector for sensor communications unit
Inputs/outputs	Outputs	1 output		2 outputs	1 output	2 outputs	1 output	2 outputs	via com. protocol
	External inputs	–		1 input	1 input	–	1 input	–	–
Light source (wavelength)		Red, 4-element LED (625 nm)							
Power supply voltage		10 to 30 VDC, including 10% ripple (p-p)							
Power consumption		At power supply voltage of 24 VDC Standard model or model for sensor communications unit: Normal mode: 960 mW max. (current consumption: 40 mA max.), Power saving eco mode: 840 mW max. (current consumption: 35 mA max.) Advanced model: Normal mode: 1,080 mW max. (current consumption: 45 mA max.), Power saving eco mode: 930 mW max. (current consumption: 40 mA max.)							
Control output		Load power supply voltage: 30 VDC max., open-collector output Load current: groups of 1 to 3 amplifiers: 100 mA max., groups of 4 to 30 amplifiers: 20 mA max. Residual voltage: at load current of less than 10 mA: 1 V max. at load current of 10 to 100 mA: 2 V max. OFF current: 0.1 mA max.							–
Response time	Super-high-speed Mode (SHS) ^{*1}	Operate or reset for model with 1 output: 30 µs, with 2 outputs: 32 µs							
	High-speed Mode (HS)	Operate or reset: 250 µs							
	Standard Mode (Stnd)	Operate or reset: 1 ms							
	Giga-power Mode (GIGA)	Operate or reset: 16 ms							
No. of units for mutual interference prevention	Super-high-speed Mode (SHS) ^{*1}	0							
	High-speed Mode (HS)	10							
	Standard Mode (Stnd)	10							
	Giga-power Mode (GIGA)	10							
Functions		Auto power control (APC), dynamic power control (DPC), timer, zero reset, resetting settings, eco mode, bank switching, power tuning, and hysteresis width							
Maximum connectable units		30							

^{*1} The mutual interference prevention function is disabled if the detection mode is set to super-high-speed mode.

Easy One-Button-Teaching/Smart Tuning



Automatic setting of optimum values

Threshold + Incident level

5000 **9999**

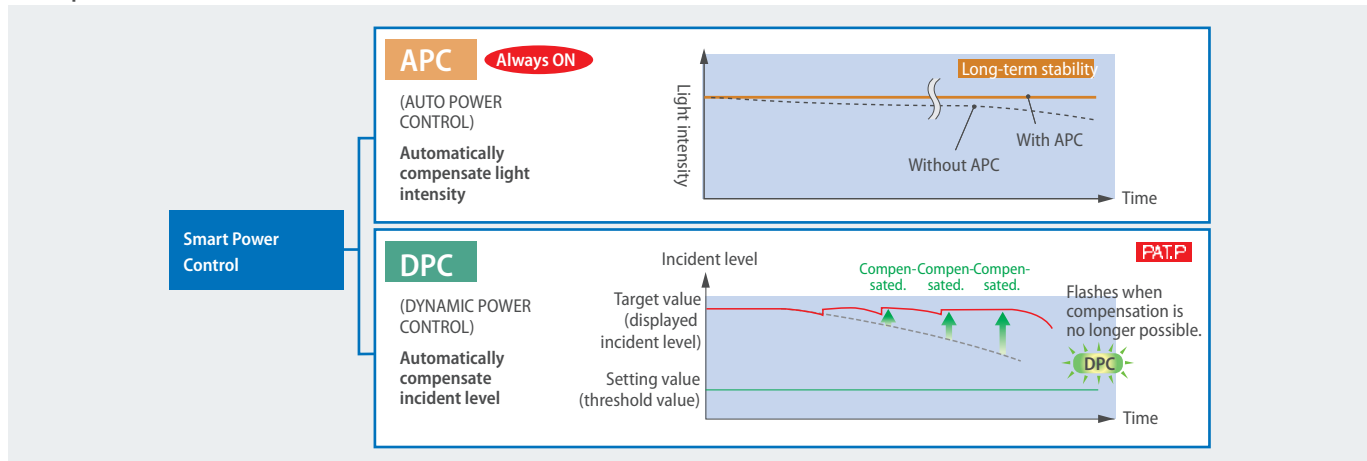
Set to the intermediate value between the incident levels with and without a workpiece.

Incident level adjustment with and without a workpiece

Dynamic range increased by a factor of 40,000

Easy setting of optimum power and threshold by pushing tune button twice.

Smart power control



















Enhanced signal stability control for compensating power reductions caused by temperature drift, dust or aging of LED. Alarm output added for predictive maintenance.

N-Smart platform



The N-Smart platform provides wide portfolio of advanced sensors – all with the same intuitive operation concept and field bus connectivity.

Accessories

Shape	Type	Comment	Order code
	Focal lens	<ul style="list-style-type: none"> Extends sensing distance by more than 500% For M4 Through beam fibers E32-TC200, E32-ET11R, E32-T11 (fits M2.6 thread) 2 pcs per set 	E39-F1
	Focal lens (side view)	<ul style="list-style-type: none"> For M4 through beam fibers E32-TC200, E32-ET11R, E32-T11, E32-T61-S, E32-T81R-S (fits M2.6 thread) Temperature range -40 to 200°C 2 pcs per set 	E39-F2
	Focal lens (variable)	<ul style="list-style-type: none"> For precision detection with E32-D32 	E39-F3A
	Focal lens	<ul style="list-style-type: none"> For precision detection with E32-EC41 	E39-F3A-5
		<ul style="list-style-type: none"> For precision detection with E32-EC41 	E39-F3B
		<ul style="list-style-type: none"> For precision detection with M6 coaxial diffuse reflective fibers (e.g. E32-CC200) 	E39-F18
	Focal lens (side view, variable)	<ul style="list-style-type: none"> For precision detection with E32-EC31 	E39-EF51
	Focal lens (heat resistant)	<ul style="list-style-type: none"> Extends sensing distance by more than 500% For M4 through beam fibers E32-ET51, E32-T61, E32-T61-S, E32-T81R, E32-T81R-S (fits M4 thread) Temperature range -60 to 350°C 2 pcs per set 	E39-EF1-37-2 E39-F16
	Focal lens (vacuum resistant, heat resistant)	<ul style="list-style-type: none"> Fits E32-T51V and E32-T54V (fits M2.6 thread) 2 units per set Heat resistant up to 120°C 	E39-F1V
	Fiber cutter	<ul style="list-style-type: none"> Included in applicable fiber 	E39-F4
	Thin fiber attachment	<ul style="list-style-type: none"> Amplifier adapter for thin fibers Included in applicable fiber (2 sets) 	E39-F9
	Sleeve bender	<ul style="list-style-type: none"> For E32-TC200B(4) For E32-TC200F(4) For E32-DC200F(4) 	E39-F11
	Single fiber extension connector	<ul style="list-style-type: none"> Fiber extension connector for 2.2 mm dia standard fibers One unit 	E39-F10
	Dual fiber extension connector	<ul style="list-style-type: none"> For fibers with dia 2.2 	E39-F13
		<ul style="list-style-type: none"> For fiber with dia 1.0 	E39-F14
		<ul style="list-style-type: none"> For fibers with dia between 1.0 and 2.2 	E39-F15
	Protective spiral tube ^{*1}	<ul style="list-style-type: none"> For M3 diffuse type sensors Length 1 m 	E39-F32A
		<ul style="list-style-type: none"> For M3 through beam type sensors Length 1 m 	E39-F32B
		<ul style="list-style-type: none"> For M4 through beam type sensors Length 1 m 	E39-F32C
		<ul style="list-style-type: none"> For M6 diffuse type sensors Length 1 m 	E39-F32D
	Fiber on roll ^{*2}	<ul style="list-style-type: none"> Dia 2.2 mm Standard moncore, 10 mm bending radius -40 to 80°C 	E32-E01 100M
		<ul style="list-style-type: none"> Dia 1.1 mm Standard moncore, 15 mm bending radius -40 to 80°C 	E32-E02 100M
		<ul style="list-style-type: none"> Dia 2.2 mm High flex multicore, 1 mm bending radius -40 to 80°C 	E32-E01R 100M
		<ul style="list-style-type: none"> Dia 1.1 mm High flex multicore, 1 mm bending radius -40 to 80°C 	E32-E02R 100M
		<ul style="list-style-type: none"> Dia 2.2 mm High temperature moncore, 20 mm bending radius -60 to 150°C 	E32-E05 100M

^{*1} Protective spiral tubes with 0.5 m length are available. Add 'S' to order code ... e.g. E39-F32A5

^{*2} Fiber length 100 m on a roll – cut to length