< < < Read on for details of Omron's proprietary technology

GIGA RAY
High Power device
Four times the light intensity with the same power

APC
Automatic Power Control
Power to overflow to the long-term stabilization

"Lines that do not stop" realized through Omron's proprietary technology

PT
Power Tuning
Optimum incident level setting in only one click

ATC
Active Threshold Control
Tracks ambient environment to prevent malfunctions

Ordering Information

Amplifier Units

Type	Connection method	Model		Applicable connectors
		NPN output	PNP output	
Standard models	Pre-wired(2m)	E3X-DA21-S 2M	E3X-DA51-S 2M	–
	Wire-saving connector	E3X-DA7-S	E3X-DA9-S	Master connector E3X-CN21 Slave connector E3X-CN22
Ultra-long-term APC models	Pre-wired(2m)	E3X-DA21R-S 2M	E3X-DA51R-S 2M	–
	Wire-saving connector	E3X-DA7R-S	E3X-DA9R-S	Master connector E3X-CN21 Slave connector E3X-CN22
High-speed response models	Pre-wired(2m)	E3X-DA21F-S 2M	E3X-DA51F-S 2M	–
	Wire-saving connector	E3X-DA7F-S	E3X-DA9F-S	Master connector E3X-CN11 Slave connector E3X-CN12

Specification

The datasheet is also available. Refer to the datasheet (Cat. No. E396) for details.

Item	model	E3X-DA□-S(□21/51/7/9)	E3X-DA□R-S(□21/51/7/9)	E3X-DA□F-S(□21/51/7/9)
Output		2 outputs	1 output and 1 APC alarm output	1 output
Control output / APC alarm output		Load power supply voltage : 26.4 VDC max.; NPN/PNP open collector; load current : 50 mA max.; residual voltage: 2 V max.		
External input×1		No-voltage input(contact/transistor)×2		–
Light source(wavelength)		Red, 4-element LED(625nm)		
Power supply voltage		12 to 24 VDC±10%, ripple(p-p)10% max.		
Power consumption		Normal mode : 960 mW max.(Current consumption : 40 mA max. at 24 VDC, 80 mA max. at 12 VDC) Power saving ECO1 : 720 mW max.(Current consumption : 30 mA max. at 24 VDC, 60 mA max. at 12 VDC) Power saving ECO2 : 600 mW max.(Current consumption : 25 mA max. at 24 VDC, 50 mA max. at 12 VDC)		
Protection circuits		Power supply reverse polarity protection, output short-circuit protection and output reverse polarity protection		
Response time	Super-high-speed Mode×3	Operate or reset : 80µs		NPN output : Operate : 46 µs, Reset : 48 µs PNP output : Operate :51 µs, Reset : 53 µs
	High-speed Mode	Operate or reset : 250µs		–
	Standard Mode	Operate or reset : 1ms		
	High-resolution Mode	Operate or reset : 4ms		
	Tough Mode	Operate or reset : 16ms		
Functions	Power tuning	Light emission power and reception gain, digital control method		
	Automatic power control(APC)	High-speed control of emission current, Wide-range APC for the E3X-DADR-S		
	Timer	Select form timer disabled, OFF-delay, ON-delay, One-shot, or ON-delay+OFF-delay timer. 1ms to 5s(1 to 20ms set in 1-ms increments, 20 to 200ms set in 10-ms increments, 200ms to 1s set in 100-ms increments, and 1 to 5 s set in 1-s increments)		
	Mutual interference prevention	Possible for up to 10 units×4		–
	ECO mode×5	Select from OFF(digital display lit), ECO1(digital display dimmed), and ECO2(digital display OFF).		
	External input settings×1	Select from teaching operations, power tuning, zero reset, emitter OFF, or ATC start.		–

×1 Only for Pre-wired models.
×2 The following details apply to inputs.

	Contact input (relay or switch)	Non-contact input (transistor)
NPN	ON : Shorted to 0 V (sourcing current: 1 mA max.). OFF : Open or shorted to Vcc.	ON : 1.5 V max. (sourcing current: 1 mA max.) OFF : Vcc - 1.5 V to Vcc (leakage current: 0.1 mA max.)
PNP	ON : Shorted to Vcc (sinking current: 3 mA max.). OFF : Open or shorted to 0 V.	ON : Vcc - 1.5 V to Vcc (sinking current: 3 mA max.) OFF : 1.5 V max. (leakage current: 0.1 mA max.)

×3 The communications function and mutual interference prevention function are disabled if detection is set to Super-high-speed mode.
×4 Mutual interference prevention is enabled if Amplifier Units are connected together. It is also enabled in the same way if E3X-DA-S-series Units and E3C-LDA-series Units are used together.
If power tuning is enabled, mutual interference prevention can be used for up to 6 units.
×5 For the E3X-DA□-S (□ : 21/51/7/9), the rated sensing distance is approximately 1/2 and the incident level is approximately 1/3 of the normal level when ECO mode is enabled.
Note : The mobile console model E3X-MC11-SV2 does not currently support new functions such as tough mode, ON delay + OFF delay timer. In addition, model E3X-MC11-S cannot be used.

OMRON Corporation Industrial Automation Company
Tokyo, JAPAN
Contact : www.ia.omron.com

Regional Headquarters
OMRON EUROPE B.V.
Sensor Business Unit
Carl-Benz-Str. 4, D-71154 Nufringen, Germany
Tel: (49) 7032-811-0/Fax: (49) 7032-811-199

OMRON ASIA PACIFIC PTE. LTD.
No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON ELECTRONICS LLC
One Commerce Drive Schaumburg,
IL 60173-5302 U.S.A.
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON (CHINA) CO., LTD.
Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

Authorized Distributor:

CSM_3_1_0911
Cat. No. E395-E1-02
Printed in Japan
(0510)

OMRON

NEW

High Functionality Digital Fiber Sensor

E3X-DA-S Series

Line Stoppages a thing of the past with GIGA RAY

GIGA Power Lighting Element
GIGA RAY inside!

Tough Fiber Sensor
Standard models E3X-DA21-S

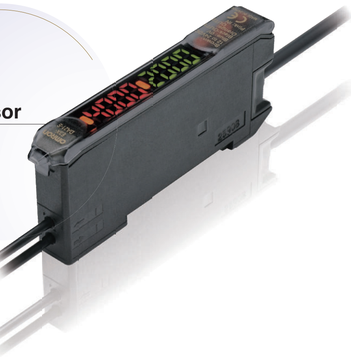
realizing

People on site at factory choose the tough fiber

that won't stop the line

Tough Fiber Sensor The E3X-DA21-S series achieves line unstoppability through stable detection performance even in severe environments, combining high functionality with fully prioritized ease of use. Since their release, these high functionality digital fiber sensors have been adopted into a range of equipment in factories across the globe and become the global standard.

Tough Fiber Sensor
Standard models
E3X-DA21-S



World's Highest Stable Detection Performance

×

Excellent Usability & High Functionality

New lineup released! > > >

“Won’t stop the line”

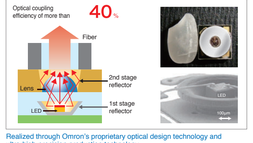
on all sites, any scene

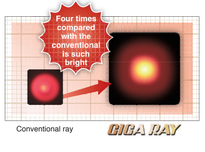
*1 M4 transmissive fiber unit E32-T11L 2.5m
*2 Reflective fiber unit E32-D24R(theoretical value)

GIGA RAY PAT.P

Unparalleled Giga power obtains the world’s highest stable detection

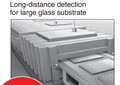
Even in severe environments in which oil or dust adhere to the sensor, detection margin is ensured by the unparalleled power of the GIGA RAY. This reduces the number of times maintenance needs to be performed and prevents equipment stoppage due to malfunction. Whatś more, even large workpieces and low-reflective workpieces such as black rubber whose detection was traditionally unstable can now be detected stably.

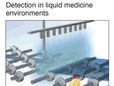




Realized through Omron’s proprietary optical design technology and ultra-high-precision production technology

Pleased especially on such a site of the factory



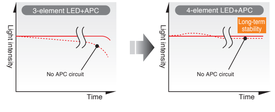


Topics For example, digital values up to 4,000 are maintained even over the distance of approximately 13 m that is required to detect G11 glass in FPD manufacturing.

APC Long-term stable performance APC (Automatic Power Control)

Long-term stable light intensity reduces equipment maintenance

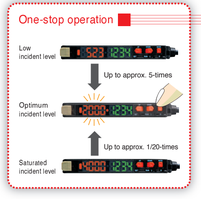
Even having strong power means nothing if the quality quickly deteriorates. Since the release of the E3X-DA-N series, Omron’s proprietary APC circuits continue to deliver more piece of mind. Long-term stable detection is our promise. This is another reason our products are selected by customers.



PT Pleasing and reassuring Power Tuning PAT

Easy operation makes for assured line quality

Only one click of the Mode key! There are no complicated settings to perform—Incident level is adjusted automatically to suit any application. In addition, the meaning of the display will not change as the sensor is operated, so it is possible to help the equipment to return to the operation intended by its designer.

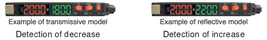


This is pleasing 1 Easy maintenance!

Even if the incident level changes as a result of dirt or mechanical vibration, it is returned to its original setting in one go by performing power tuning again. It is also possible to perform event maintenance at equipment startup by using an external input terminal.

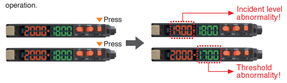
This is pleasing 2 No need to select the application

As the default setting value is 2,000, which is the middle of the possible range of measurement (0–4,000), it is the optimum setting for both transmissive and refrective models. Whatever the application, try the pleasantness of PT first.



This is pleasing 3 Easy to detect abnormalities

Incident level and threshold can be unified, which makes it possible to easily detect incident level abnormalities or threshold abnormalities due to incorrect operation.



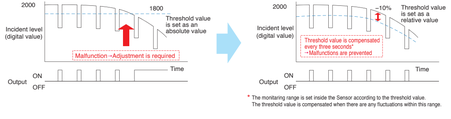
This is pleasing 4 Difficult variations also displayed in real time

As the display is not shifted and scale not changed, any changes in incident level due to the workpieces are displayed accurately. Even when difficult workpieces are passed through, all amplifiers display the same value. Even designers will be satisfied with this function.

ATC World’s first ATC (Active Threshold Control) function PAT

Equipment’s stable operating time is extended

In applications with a severe threshold, such as glass detecton, even a small amount of dirt can bring the equipment to a halt. In these situations, it is possible to prevent equipment malfunction due to dust or other dirt by actuating the active threshold control function.



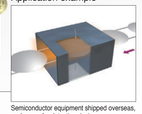
* The monitoring range is set inside the Sensor according to the threshold value. The threshold value is compensated when there are any fluctuations within this range.

APC term of approximately 20 years + APC margin display function

Ultra-long-term APC
E3X-DA21R-S
NEW

APC term 3 times longer than conventional models
Maintenance period Visible!

Application example



Semiconductor equipment shipped overseas, such as wafer detecting devices

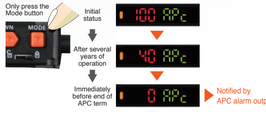
Visible amplifier Type 1

APC term margin can be seen!

Ultra-long-term APC is reassuring in equipment for which frequent maintenance is not possible. What’s more, the margin for APC term can be checked, making planned maintenance possible.

APC term margin monitor display function

APC term can be checked simply by pressing the Mode button. This makes it possible to set up a maintenance plan.



Maintenance notice function

APC alarm output notifies the user before the APC is shut down. This makes it possible to replace amplifier before the equipment stops.

Incorrect operation prevention function

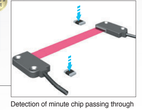
By locking the slide switch after settings are completed, the amplifier can be shipped with reassurance. This also eliminates any concerns about incorrect operation when maintenance is being performed.

Two-fold faster response time + Slowmotion display function

High speed & high power
E3X-DA21F-S
NEW

Two times faster 46μs
An instant can be seen in slow motion!

Application example

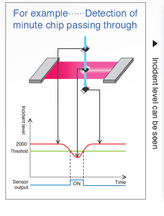


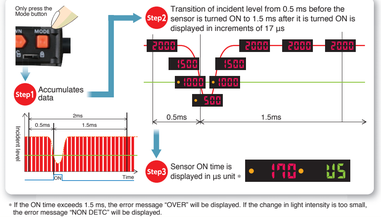
Detection of minute chip passing through

Visible amplifier Type 2

Incident level of high-speed workpieces can be seen! PAT.P

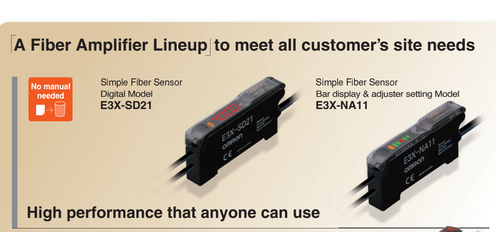
With detection of high-speed workpieces, whether or not there is any margin with the response time can be a concern. However, digital displays not being in real time, it has been impossible to tell incident level in the instant when the detected object passes the sensor. The slowmotion display function displays the history of incident level before and after the workpiece passed through the sensor in slow motion. In addition, the sensor’s ON time is displayed in microseconds (μs)unit, making it possible to check the response time margin.





* If the ON time exceeds 1.5 ms, the error message “OVER” will be displayed. If the change in light intensity is too small, the error message “NON DETC” will be displayed.

A Fiber Amplifier Lineup to meet all customer’s site needs



No manual needed

Simple Fiber Sensor
Digital Model
E3X-SD21

Simple Fiber Sensor
Bar display & adjuster setting Model
E3X-NA11

High performance that anyone can use

Only half the space

Digital Fiber Sensor
Two-channel Model
E3X-MDA11

Compact and low-cost

Digital Fiber Sensor
Full color Model
E3X-DAC11-S

Color sensing with white LED

E3X Series Ratings and Performance List

●: Provided, –: Not provided

	Representative model	E3X-DA21-S	E3X-DA21R-S	E3X-DA21F-S	E3X-SD21	E3X-NA11	E3X-MDA11	E3X-DAC11-S
	Features	Standard High power	Ultra-long-term APC Visible amplifier	High-speed response Visible amplifier	Simple Digital	Simple Adjuster	2-channel	Color sensing
Basic functions	4-digit digital incident level display	●	●	●	–	–	●	●*1
	4-digit digital threshold display	●	●	●	Displayed during operation	–	Can be set	●
	5-level bar display	–	–	–	–	●	–	–
	GIGA RAY	●	●	●	●	●	–	–
	APC	●	○*2	●	–	–	●	–
	ATC	●	●	●	–	–	–	–
	Power tuning	●	●	●	–	–	●	–
	Quick tuning	–	–	–	●	–	–	–
	8 rotation endless adjuster	–	–	–	–	●	–	–
	Timer	●	●	●	–	●	●	●
	Differential detection	●	●	–	–	–	–	–
	DeviceNet Slave E3X-DRT21-S VER.3 support	●	–	–	–	–	●	–
	Wire-saving connector	●*3	●*3	●*3	●*3	●*3	●*3	●*3
	Mutual interference prevention *4	Up to 10 units *5 (Group A)	Up to 10 units *5 (Group A)	–	Up to 5 units (Group B)	Up to 5 units (Group B)	Up to 9 units *5 (Group A)	Up to 10 units (Group C)
Detection performance	Response time	1ms (80μs≤16ms)	1ms (80μs~16ms)	46μs	200μs	200μs	1ms (130μs~4ms)	1ms (60μs~4ms)
	Sensing distance (unit : mm) When E32-T11R is used	1,000 (280~2,000)	530 (140~1,000)	280	560	560	350 (140~450)	110 (50~150)
	When E32-T21R is used	250 (60~450)	130 (30~220)	60	120	120	75 (30~100)	×6
	When E32-D11R is used	350 (100~640)	170 (50~420)	100	180	180	120 (50~170)	×6
	When E32-D21R is used	60 (16~140)	30 (8~70)	16	30	30	22 (8~30)	×6
	No. of outputs	2 outputs (setting can be changed)	1 output and 1 APC alarm output	1 output	1 output	1 output	2 outputs (setting can be changed)	1 output (DAC21 has 2 outputs)
Expansion and control	No. of external inputs	1 input	1 input	–	–	–	–	–*(DAC21 has 1 input)
	Supports ROHS commands	●	●	●	●	●	●	●
	CE mark certification	●	●	●	●	●	●	●

*1 Can select between degree of coincidence display and margin display *2 Installed Ultra-long-term APC *3 The connector model is different of the representative model noted in the table. Further, applicable connectors differ between amplifier models. *4 Mutual interference protection is effective when group A Sensors are used together. It is not effective if a group A Sensor is used with a Sensor from a different group. *5 When power tuning is activated, the E3X-MDA supports up to 6 units and all other models supports up to 6 units. *6 As the incident level is extremely low, the color sensing performance cannot be sufficiently exercised. As a result, this is not recommended.