

Smart Fiber Sensor  
E3X-HD



## Surprisingly Stable Detection with Your Finger tip

Exceptionally easy operation and stabilizing  
technology reduce maintenance cost.



# Long-term Stable Detection with No Maintenance

Optimum Settings with the Press of a Button

## Stable

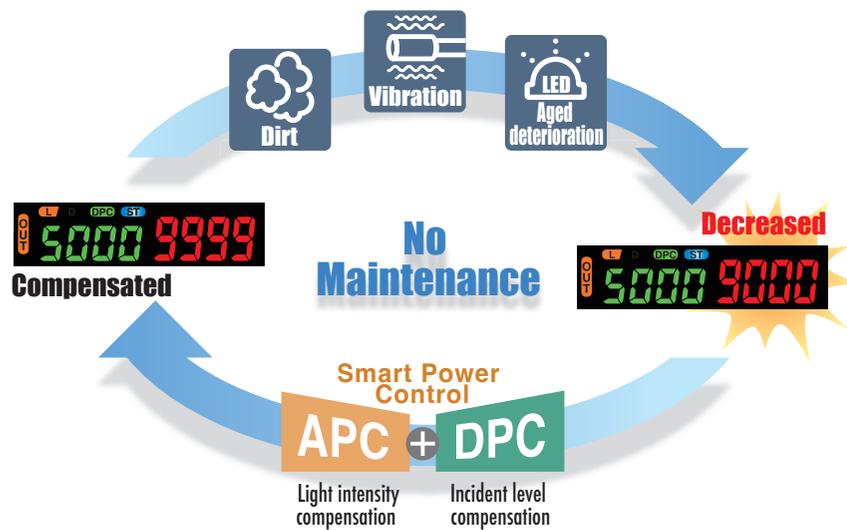
### No Maintenance

**Smart Power Control** Long-term stable detection with no maintenance

Smart Power Control function detects the decrease in light intensity due to LED aged deterioration and the decrease in incident level due to dirt, then automatically compensates the optimum detection condition. You get maintenance-free operation that withstands the ambient environments.



■ Maintenance-free operation by double compensation of light intensity and incident level



### Detect Workpieces compensation without concern for Color and Size

Lighting element GIGA RAY II is equipped that margin of detection on all scenes has been realized



Unparalleled power of GIGA RAY II, with the highest level stably detects large workpieces and low-reflective workpieces such as black rubber whose detection was unstable before.

Long-distance detection for large workpieces



Detection in oily environments



Detection in water and liquid medicine environments



Detection of low-reflective workpieces such as black rubber



Use the Fiber Heads that are suitable for the application environment.



**E3X-HD** Series

[Stable] and [Easy] operation realized through Ultimate Usability

# Stable

**Smart Power Control** Long-term stable detection with no maintenance



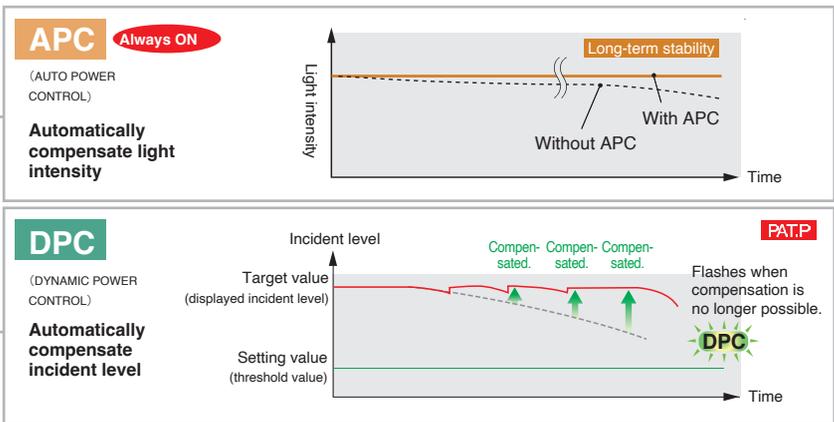
Even if the incident level is decreased due to dirt or mechanical vibration, Omron's proprietary Smart Power Control combines APC and DPC to automatically compensate the power so that high-precision detection with no maintenance is performed. And if compensation is not possible, the DPC indicator flashes to let you know that maintenance is required. You get reliable operation with long-term stable detection and visible abnormality.

**Point**



APC can be used always on for E3X-HD. The GIGA RAY II, which is described below, widely reduces the load with a low-power consumption LED. Furthermore comfortable long-term reliability has been realized.

**OMRON's APC is the No.1 for long-term reliability!**



## Advanced newly-developed GIGA RAY II for long-term stability and energy savings

The GIGA RAY has evolved into the newly-developed GIGA RAY II to achieve 1.5 times the power efficiency of conventional models. This effect is utilized to enhance APC service life for long-term stability and energy-saving effect more than enhancing the sensing distance. It contributes to the reliability and energy saving of your equipment.



## Maintenance cost is furthermore reduced! Open network is supported

CompoNet EtherCAT

- Greatly reduce wiring work for Fiber Amplifiers with zero-line connection.
- You can change settings from an external device to greatly reduce setup work.
- Connection of multiple units is available. (E3X-CRT: 16 units, E3X-ECT: 30 units)



\*1. Have been discontinued at the end of October 2024.

Make the following search to access information on network standards and products.

Access keyword from search engines :

Omron Field Network



# Easy

## Consistent Settings for All Users

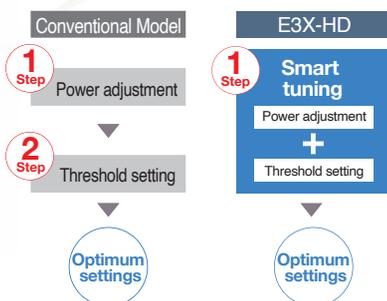
PAT.P

**Smart Tuning** Easy and optimum settings for anyone

Just press the **S TUNE** button once with a workpiece and once without a workpiece to automatically set the optimum incident level and threshold regardless of the workpiece. The optimum settings can be performed regardless of skills and languages. The setting dispersion of the Sensors is also eliminated to enable smoothly shifting from trial production to mass production, which contributes to the reduction of introduction cost.



**Easy Solution** Fewer Setting Steps



**Easy Solution** Optimum settings for saturated and low incident level

**Setting of Smart Tuning**

With workpiece: 9999  
Without workpiece: 0

Incident level adjustment with workpiece

Incident level adjustment without workpiece

Threshold setting (Set to intermediate value between the incident levels with and without a workpiece.)

5000

**Settings are simultaneously completed.**

**Saturated incident level** (Short distance)

With workpiece: 9999  
Without workpiece: 9999

**Low incident level** (Black rubber)

With workpiece: 600  
Without workpiece: 100

**Smart Tuning**

With workpiece: 8000  
Without workpiece: 9999 (Optimum setting)

With workpiece: 9999  
Without workpiece: 1600

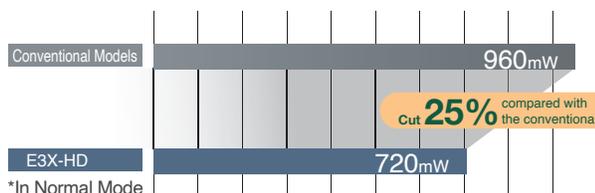
**Point**

Smart Tuning evolved from the popular power tuning feature of conventional Amplifiers, and yet is easier to use. It enables easily reproducing stable detection conditions by newcomers or by operators on a site of the factory overseas. The incident level is displayed without modification (0 to 9,999) to make it easier to understand and to provide operators with a sense of ease with the larger numbers.

## Let the E3X-HD Help You Save Energy

**Smart Eco Drive** Contribute to energy saving of equipment

The increased power efficiency of the newly developed GIGA RAY II and the new circuit design reduce power consumption by 25% over conventional models. This supports saving energy and power in your equipment. Power consumption of only 720 mW has been realized in operation in Normal Mode. And there are no restrictions to sensing distance and response time.



**Point**

You can use more Sensors with the same power supply capacity as before.

# Easy

## Greater operability and visibility are realized by a universal design

The universal design makes operation much easier and allows you to reliably communicate with operators when starting up or maintaining systems overseas.

### Operations

Symbolic buttons are easy to remember anywhere even for operators overseas.



Compatibility for easy operation and incorrect operation prevention.



Pleasant operation even with gloves on.



**Conventional Models**  
Sliding switches

**E3X-HD**  
Pushbutton switches (no sliding switches)

### Smart Tuning

Smart tuning for the optimum settings with just one button.

### Easy Fiber Insertion

Insertion performance is improved with a large insertion guide.

**Point**

Instruction Manuals are included in English, Japanese, and simplified Chinese.

### Arc Design

A strong accent line gives a compact look to improve equipment design.

### Easy-to-operate Cover

Cover with an overhanging structure for easy opening that clicks securely back in place.

### Three-position Cover Stopper

Set to best of three positions: 90°, 135°, or 170°.

### Space for I/O labels

Space for attaching I/O labels to make easy check.



### Indications

Visibility is improved with digital displays and visible indicators.

#### New Concept: Visible Indicators

- L D**: Operation mode indicator to prevent incorrect settings.
- DPC**: Flashing indicator enables preventive maintenance.
- ST**: Indicates that the optimum settings have been made.



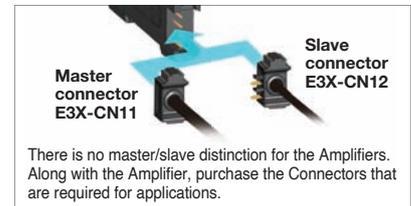
# Ordering Information

## E3X-HD Series Amplifier Units

Type	Appearance	Connection method	Model	
			NPN output	PNP output
Standard models		Pre-wired (2 m)	<b>E3X-HD11 2M</b>	<b>E3X-HD41 2M</b>
		Wire-saving connector	<b>E3X-HD6</b>	<b>E3X-HD8</b>
		M8 connector	<b>E3X-HD14</b>	<b>E3X-HD44</b>
For Communications Unit connection		Communications Unit	<b>E3X-HD0 *1</b>	

**Wire-saving Connectors** (Order Separately) (An Amplifier Unit with a wire-saving connector is required.)  
Connectors are not provided with the Amplifier Units.

Type	Appearance	Cable length	Number of conductors	Model
Master connector		2 m	3	<b>E3X-CN11</b>
Slave connector			1	<b>E3X-CN12</b>



**Sensor I/O Connectors** (Order Separately) (An Amplifier Unit with a M8 connector is required.)  
Connectors are not provided with the Amplifier Units.

Appearance	Cable length	Number of conductors	Model
Straight 	2 m	4	<b>XS3F-M421-402-A</b>
Right-angle 			<b>XS3F-M422-402-A</b>

## Communications Units

Communications method	Appearance	Applicable Fiber Amplifier Units	Model
CompoNet		<b>E3X-HD0 *1</b> <b>E3X-MDAO *2</b>	<b>E3X-CRT *1</b>
EtherCAT			<b>E3X-ECT *1</b>

\*1. Have been discontinued at the end of October 2024.  
\*2. Have been discontinued at the end of August 2021.

## Ratings and Specifications



Item	Type	Standard models			For Communications Unit
	NPN output	<b>E3X-HD11</b>	<b>E3X-HD6</b>	<b>E3X-HD14</b>	<b>E3X-HD0</b>
	PNP output	<b>E3X-HD41</b>	<b>E3X-HD8</b>	<b>E3X-HD44</b>	
Connection method	Pre-wired	Wire-saving connector	M8 connector	Communications Unit connector	
Light source (wavelength)	Red, 4-element LED (625 nm)				
Power supply voltage	12 to 24 VDC ±10%, ripple (p-p)10% max.			Supplied from the connector through the Communications Unit	
Power consumption	Nominal Mode	720mW max. (Current consumption: 30 mA max. at 24 VDC, 60 mA max. at 12 VDC)			
	Eco ON	530 mW max. (Current consumption: 22 mA max. at 24 VDC, 44 mA max. at 12 VDC)			
	Eco LO	640 mW max. (Current consumption 26 mA max. at 24 VDC, 53 mA max. at 12 VDC)			—
Control output	Load power supply voltage: 26.4 VDC max., open-collector output Load current: Groups of 1 to 3 Amplifier Units: 100 mA max., Groups of 4 to 16 Amplifier Units: 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.			—	
Protective circuits	Reverse power supply connection protection, output short-circuit protection, and reverse output connection protection				
Response time	Super-high-speed Mode (SHS)	NPN output: Operate or reset: 50 μs PNP output: Operate or reset: 55 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			
Mutual interference prevention	Possible for up to 10 units				
Maximum connectable Units	16 units			with E3X-CRT: 16 units with E3X-ECT: 30 units	

**Note: Do not use this document to operate the Unit.**

## OMRON Corporation Industrial Automation Company

Kyoto, JAPAN

Contact : [www.ia.omron.com](http://www.ia.omron.com)

### Regional Headquarters

**OMRON EUROPE B.V.**  
Wegalaan 67-69, 2132 JD Hoofddorp  
The Netherlands  
Tel: (31) 2356-81-300 Fax: (31) 2356-81-388

**OMRON ELECTRONICS LLC**  
2895 Greenspoint Parkway, Suite 200  
Hoffman Estates, IL 60169 U.S.A.  
Tel: (1) 847-843-7900 Fax: (1) 847-843-7787

**OMRON ASIA PACIFIC PTE. LTD.**  
438B Alexandra Road, #08-01/02 Alexandra  
Technopark, Singapore 119968  
Tel: (65) 6835-3011 Fax: (65) 6835-3011

**OMRON (CHINA) CO., LTD.**  
Room 2211, Bank of China Tower,  
200 Yin Cheng Zhong Road,  
PuDong New Area, Shanghai, 200120, China  
Tel: (86) 21-6023-0333 Fax: (86) 21-5037-2388

**Authorized Distributor:**

©OMRON Corporation 2011-2024 All Rights Reserved.  
In the interest of product improvement,  
specifications are subject to change without notice.

**CSM\_5\_2**

**Cat. No. E417-E1-02** 1224 (1111)