

# 型号 E3X-NA系列

光纤放大器

## 使用说明书

感谢您选择本产品。本说明书主要记载在安装和使用本产品过程中所需要注意的事项。请仔细阅读本说明书，充分了解产品。为了您的方便，请妥善保管好本说明书。

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### 安全上的注意

#### 警告表示的意思

**注意** 如果不正确使用的话，有可能引起轻伤、中等程度的伤害还有可能带来同样重大的物质损害。

#### 警告表示

**注意**

不可将传感器连接交流电源，有爆裂的危险。

### 安全上的要点

为了确保您的安全，使用时请务必遵守以下条例：

- 1) 请勿在易燃、易爆气体的环境下使用。
- 2) 请勿擅自拆卸、修理、改造本产品。
- 3) 使用时请勿超出额定电压范围。
- 4) 请注意工作电源的极性，勿接错线。
- 5) 请使用额定范围内的负载。
- 6) 请勿让负载短路。

### 使用上的注意

- 1) 传感器的导线和动力线或者电力线装在同一配管中使用时，会受到干扰，有误动作甚至被损坏，原则上传感器导线必须单独放置或者被屏蔽。
- 2) 延长导线必须使用截面积0.3mm<sup>2</sup>以上、长度100m以下的导线。
- 3) 接通电源时的动作  
E3X-NA系列将在接通电源后100ms以内处于可检测状态，所以如果负载和产品连接在不同的电源上，必须先接通传感器的电源。
- 4) 断开电源时的动作  
当传感器上的电源被断开时，传感器上会有一个脉冲信号，所以必须先断开负载上的电源。
- 5) 必须安装保护罩后，产品才能使用。

### ■ 额定值 / 性能

连接方式	导线引出式					连接器型(*)			M8 连接器型
形式	NPN	NA11	NA21	NA11F	NA11V	NAG11	NA6	NAG6	NA14V
(E3X-)	PNP	NA41	NA51	NA41F	NA41V	NAG41	NA8	NAG8	NA44V
投光灯	红色发光二极管					绿色发光二极管	红色发光二极管	绿色发光二极管	红色发光二极管
电源电压	DC12~24V ±10% 脉动(p-p) 10%以下								
消费电流	35mA 以下(电源电压 24VDC 时)								
控制输出	集电极开路(DC26.4V以下) 负载电流: 50mA以下、残留电压: 1V以下								
自诊断输出	无	有(***)			无				
应答时间	动作·复位: 各 200μs以下(**)		动作时: 20μs以下 复位时: 30μs以下		动作·复位: 各200μs以下(**)				
延时功能	OFF延时定时器: 40ms								

(\*) 适用连接器: E3X-CN11(母接插件 3芯)、E3X-CN12(子接插件 1芯)

(\*\*) 连接配置8台以上, 为350μs以下。

(\*\*\*) 集电极开路(DC26.4V以下) 负载电流: 50mA以下、残留电压: 1V以下

### ■ 表示灯输出

E3X-NA系列有一个动作表示灯(橙)和五个入光量等级表示灯(4个绿色的, 1个红色的)。

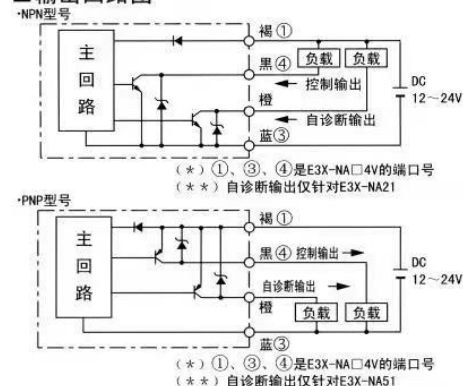
E3X-NA21/NA51有自诊断功能。自诊断功能可以在入光量等级不稳定时向使用者发出警报。当入光量处在80~120%这个不稳定区域达到0.3秒以上时, 自诊断功能就会发出警报。

当入光量由于灰尘或光轴偏差等情况而下降时, 请维护传感器和重新调整感度VR, 尽可能调整入光量水平后再使用

表示灯的状态 (ON的场合)	动作表示灯 (*)	入光量等级表示灯	动作水平的80%以下	动作水平的80~90%	动作水平的90~110%	动作水平的110~120%	动作水平的约120%以上
灯熄	灯熄	灯熄or灯亮	灯亮	灯亮	灯亮	灯亮	灯亮
自诊断输出(***)	OFF	ON	OFF	OFF	OFF	OFF	OFF

(\*) 最底下的灯作为电源表示灯, 即使入光量为“0”时, 也会被点亮。  
(\*\*) 只有E3X-NA21/NA51有自诊断功能  
(\*\*\*) 当检出物体移动缓慢时, 自诊断功能可能会处于「ON」状态, 在这种情况下, 最好与ON-DELAY定时回路一起使用。

### ■ 输出回路图



### ■ 正确的使用方法

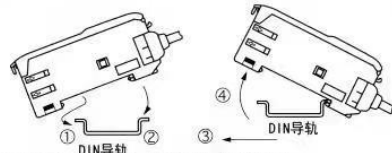
(1) 放大器的安装和拆卸(使用DIN导轨的时候)

安装

- ①先将放大器前部嵌入金属安装配件(另售)或者DIN导轨上。
- ②然后再将放大器压入金属安装配件(另售)或DIN导轨。(注意)安装时①②的顺序不能相反, 如果逆向安装, 会降低安装强度。

拆卸

将放大器单元向③的方向压入, 并把光纤插入部向④的方向抬起, 这样就可简单地拆下放大器。



(2) 防止相互干扰的功能(E3X-NA□□F除外)

E3X-NA系列的放大器在外壳两侧都有一个用来防止相互干扰的通讯窗口。请注意, E3X-NA系列不能使用另售的手机式控制器型号E3X-MC11。

另外, 当与E3X-DA-N系列连接后使用时, 相互干扰防止功能不动作。

(3) 连接器的安装与拆卸

E3X-NA□6/NA□8是连接器型的, 当接通电源的情况下, 请不要安装或者拆卸连接器, 有可能造成放大器产生误动作, 甚至损坏产品。

(4) 连接器型的夹钳

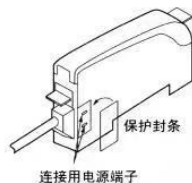
E3X-NA□6/NA□8的本体侧面下部有一个突出的起连接作用的夹钳。当不使用它的时候, 可以用钳子等工具将其去除

(5) 最大连接台数

E3X-NA□6/NA□8的最大连接的台数为16台。

(6) 连接器型的短路保护

为了防止电源终端连接时的电流脉冲的冲击或者短路引起的电流冲击, 必须将能起保护作用的封条(E3X-CN系列)贴在最外面的那个放大器的接线端, 或者贴在单个使用的放大器的接线端。



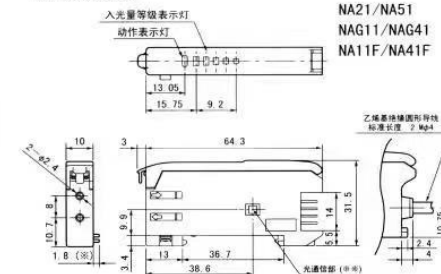
### ■ 外形尺寸 [mm]

·E3X-NA6/8

E3X-NAG6/NAG8

·E3X-NA11/NA41

NA21/NA51  
NAG11/NAG41  
NA11F/NA41F

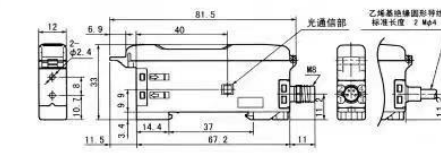
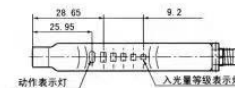


※只有E3X-NA□6/NA□8有

※※E3X-NA□□F除外

·E3X-NA14V/44V

·E3X-NA11V/41V



## 使用时的承诺事项

①为了确保安全, 请勿将本产品直接或间接用于人体检测。需要使用该用途时, 请选用本公司传感器综合样本中刊登的安全传感器。

②使用于下列用途时, 请与本公司营业担当商谈, 并根据规格书等确认后, 采用相对于额定性能留有一定余裕度的使用方法或者采取即使出现故障也能使危险度降低到最小的安全电路的对策。

- a) 屋外使用、用于有潜在的化学污染或者有电气妨害时, 或者是产品手册、使用说明书等没有记载的条件或环境中使用时
- b) 用于原子能控制设备、焚烧设备、铁路·航空·车辆设备、医疗设备、娱乐器械、安全装置以及按照行政机关或个别业界规定制造的设备时
- c) 用于可能危及生命、财产的系统·机械·装置时
- d) 用于煤气、水道、电力供给系统或者24小时连续运转系统的高可靠性设备时
- e) 用于其他, 以上述a)~d)为基准, 需要高度安全性的用途时

\*上述内容是适用条件的一部分。请参阅本公司综合产品手册·数据等最新版商品目录、手册中记载的保证·免费事项内容后再使用。

# Model E3X-NA

## OPTICAL FIBER PHOTOELECTRIC SENSOR

### INSTRUCTION SHEET

Thank you for selecting Company product. This sheet primarily describes precautions required in installing and operating the product.

Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

The following notice applies only to products that carry the CE mark:  
 Notice:  
 This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

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### PRECAUTIONS FOR SAFETY NOTE

#### ● Meaning of Signal Words

**CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

#### ● Alert statements

**CAUTION**

Do not connect sensor to AC power supply.  
 Risk of explosion.

### PRECAUTIONS ON SAFETY

- Do not use the sensor in explosive or ignition gas.
- Never disassemble, repair nor tamper with the sensor.
- Do not apply excess voltage and current over rating.
- Do not wire improperly such as reversing polarity.
- Connect the load correctly.
- Do not short-circuit the load.

### PRECAUTIONS FOR CORRECT USE

- There are some cases where the photoelectric switch cable is unavoidably wired in a tube or duct together with a noisy or power line. This causes an induction, possibly resulting in malfunction or damage. In principal, the cable should be wired separately or shielded.
- To extend the cable, use a wire of 0.3mm<sup>2</sup> or more. However do not extend it more than 100m.
- Operation after the power is turned on.  
 The E3X-NA will begin sensing no later than 100ms after the power is turned on. If the load and the E3X-NA connect to different power supply, the E3X-NA must be always turned on first.
- Operation when the power is turned off.  
 When the power of the sensor is turned off, the sensor may make a pulse signal. The power of the load must be turned off first.
- When using the sensor, protective cover must be put on the sensor.

### RATINGS/PERFORMANCE AMPLIFIER UNIT

Connecting type		Prewire type					Connector type(*)			M8 connector
Type (E3X-)	NPN	NA11	NA21	NA11F	NA11V	NAG11	NA6	NAG6	NA14V	
	PNP	NA41	NA51	NA41F	NA41V	NAG41	NA8	NAG8	NA44V	
Light source	Red LED					Green LED	Red LED	Green LED	Red LED	
Supply voltage	DC 12 to 24V ±10% ripple 10% max.									
Current consumption	35mA max. (at supply voltage 24V DC)									
Control output	Open collector 26.4V DC max.; Load current: 50mA max.; Residual Voltage: 1V max.									
Alarm output	None	Have (***)					None			
Response time	200µs max. (**)	ON:20µs max. OFF:30µs max.					200µs max. (**)			
Timer function	Off-delay Timer: 40ms									

(\*)Applied connector :E3X-CN11(Main connector 3 cores); E3X-CN12 (Extension connector 1core)  
 (\*\*)When more than 8 sensors are connected, the response time is 350µs max.  
 (\*\*\*)Open collector 26.4V DC max.; Load current: 50mA max.; Residual Voltage: 1V max.

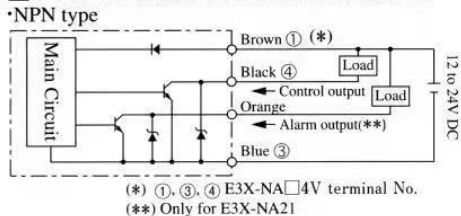
### Indicators/Alarm output

E3X-NA series carry an operating indicator (orange) and light level indicators (4 greens, 1 red).  
 E3X-NA21/NA51 has a self-diagnostic function. This function alerts the user to unstable state of the receiving light level. The self-diagnostic output (Alarm output) turns ON when the receiving light level is continued for 0.3 sec. or more in the unstable state which is between about 80% and about 120% for ON level.  
 When light level goes down by dust, change of optical axis and so on, maintain the sensor or readjust the sensitivity adjuster.

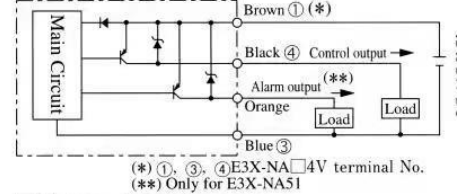
Indicators (The case of L/ON)	Operating indicator				
	(*) Light level indicator				
Receiving light level	Less than about 80% for ON level	Between about 80% and about 90% for ON level	Between about 90% and about 110% for ON level	Between about 110% and about 120% for ON level	More than about 120% for ON level
Indicator (The case of L/ON)	OFF	OFF	OFF or ON	ON	ON
Alarm output (**)	OFF	ON It continues for 0.3 sec. min.(***)			OFF

(\*)The bottom indicator is ON as power indicator, even the light level is "0".  
 (\*\*\*) Only E3X-NA21 and E3X-NA51.  
 (\*\*\*)The alarm output may be given also when a detectable object moves slowly. In such a case, it is advisable to incorporate an on-delay timer circuit or the like.

### OUTPUT STAGE CIRCUIT DIAGRAM



### •PNP type



### Precautions for use

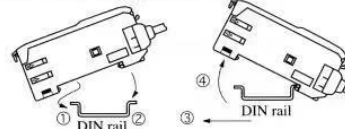
#### (1) Mounting of the amplifier unit (Using the DIN rail)

##### Mounting

- Engage the front slot of the amplifier on to the DIN rail. Push the back slot on to the DIN rail.
- Note: Engage the front slot ① first, otherwise it may cause deterioration of mechanical strength.

##### Removing

•Push forward ③ and raise the front slot ④.



#### (2) Mutual interference preventing function

E3X-NA series except for E3X-NA□□F has the small windows on the both side of the case. These are for preventing mutual interference, when connecting the sensors. So, the mo-bile console E3X-MC11 can not be used with E3X-NA series. When E3X-NA series is used with E3X-DA-N series, the function does not work.

#### (3) Putting and removing the connector

Do not put or remove the connector to E3X-NA connector type, as the power is ON. It may cause malfunction or damage to the sensor.

#### (4) Chip of the connector type

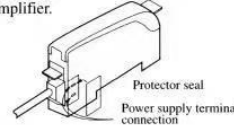
There is a chip on the pointed end of the connector type to connect amplifier. If it's unnecessary, wrench the chip by nippers.

#### (5) The connectable number

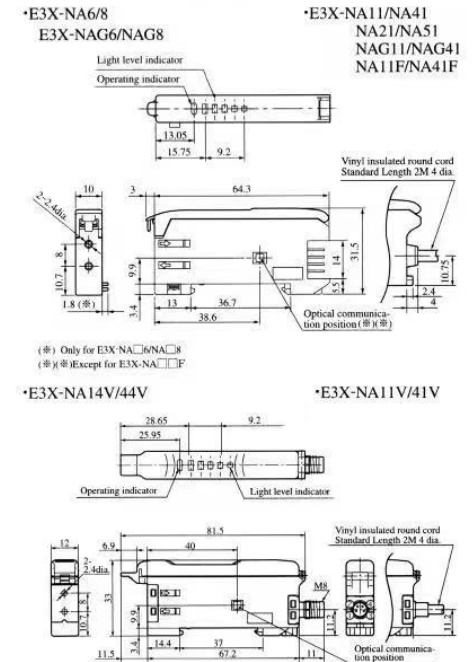
Less than 16 sensors are available to connect for the connector type.

#### (6) Protecting from short-circuit for the connector type

To protect from electric shock by power supply terminal connection or short-circuit, put the protector seal (accessory of the E3X-CN series) on the terminal of the outermost amplifier or single use amplifier.



### OUTLINE DRAWING



### Suitability for Use

THE PRODUCTS CONTAINED IN THIS SHEET ARE NOT SAFETY RATED. THEY ARE NOT DESIGNED OR RATED FOR ENSURING SAFETY OF PERSONS, AND SHOULD NOT BE RELIED UPON AS A SAFETY COMPONENT OR PROTECTIVE DEVICE FOR SUCH PURPOSES. Please refer to separate catalogs for safety rated products.

Company shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used. Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE COMPANY PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM. See also Product catalog for Warranty and Limitation of Liability.