

OMRON

数字式光纤传感器

# 型E3X-DA-S系列 单机能型 (型E3X-DA□SE-S)

## 使用说明书

感谢您选择欧姆龙产品。使用时，请务必遵守以下内容。  
 ·由具备一定电气知识的人员使用。  
 ·使用本产品前，请仔细阅读本说明书，在充分了解产品后，正确使用。  
 ·为了您的方便，请妥善保管好本说明书，以便随时查阅。

欧姆龙公司  
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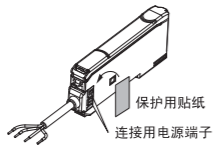
## 安全上的要点

为了确保您的安全，请务必遵守以下内容：

- 1) 请勿在有易燃、易爆气体的环境下使用。
- 2) 请勿在有水、油、化学药品飞沫的环境、及接触到蒸汽的环境下使用。
- 3) 请勿擅自拆卸、修理、改造本产品。
- 4) 使用时请勿超出额定电压、电流的范围。
- 5) 请注意工作电源的极性，勿接错线。
- 6) 请正确连接负载。
- 7) 请勿让负载短路。
- 8) 请不要在外壳破损的状态下使用。
- 9) 废弃时，请作为工业废弃物处理。

## 使用上的注意

- 1) 传感器导线和动力线或电力线装在同一配管中使用，会受到干扰，有误动作甚至被破坏。
- 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。  
将韩国S-mark认定机种作为认定品使用时，导线的长度要在10m以下（不含10m）。
- 3) 加在导线上的力请按下記值。  
拉力80N以下，扭矩0.1N·m以下，压力20N以下，弯曲3kg以下
- 4) 接通电源后，200ms以内本产品处于可以检测的状态。所以如果负载和产品连接在不同的电源上时，必须先接通产品的电源。
- 5) 导线引出型产品连接使用时，请同时投入电源。  
连接的传感器之间、电源投入的时间差在30ms以上的时候，相互干涉防止功能将无法正常工作。另外，也会出现不能使用遥控器的情况。
- 6) 请务必在安装保护盖的状态下使用。
- 7) 关于连接器部的短路保护（使用连接器型时）为了防止触电和短路，请将保护用贴纸（连接器：属于E3X-CN系列）贴在不使用的连接用电源端子上。
- 8) 拆除或者增加放大器时，请务必先切断电源。
- 9) 由于电源切断或者静电等干扰发生写入错误时（ERR/EEP闪烁），请通过本体上的设定键进行初始化处理。
- 10) 使用手持式控制器操作时请使用E3X-MC11-SV2手持式控制器。不能使用E3X-MC11。
- 11) 不能与E3X-DA-N系列进行光通信。
- 12) 有时在接通电源后，需要花费一定的时间，使放大器通过适应使用环境来使受光量达到安定状态。
- 13) 切断电源时，可能会发生输出脉冲，所以请先切断负载或者是负载线的电源。
- 14) 请勿使用稀释剂、汽油、丙酮、及煤油类来清扫本产品。
- 15) 请勿强行对光纤单元施加拉伸、压缩的力。光纤单元只能承受9.8N·m以内的力。
- 16) 有无工件各自数字值4000以上的情况下无法使用。这时请再设定光纤单元，使受光量变小，或者使用能够调整光量的型号。（本机种是单机能型，不能光量调整。）
- 17) 由于电源遮断或者静电等噪音而导致发生写入错误（请参照下图的存储错误）时，请进行如下图内容的设定初始化处理。



## 包装内容确认

·放大器单元 1台 ·使用说明书（本说明书） 1份

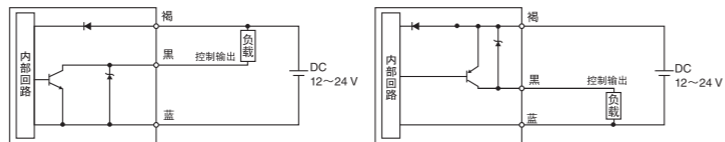
## 额定 / 性能

连接方式	导线引出型		连接器型*
型号	NPN	E3X-DA11SE-S	E3X-DA6SE-S
	PNP	E3X-DA41SE-S	E3X-DA8SE-S
电源电压	DC12~24V±10% 波动10%以下		
消费功率	消费功率 960mW以下(24V时40mA)		
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、漏电流10μA以下		
应答速度	1ms		
防相互干扰功能	10台<光通信同期式>		

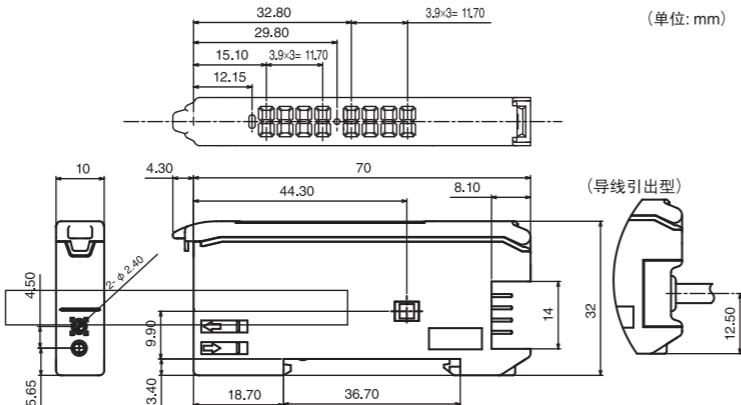
\* 作为单品或者作为母机使用时，请使用连接器E3X-CN21（母连接器3芯）；作为子机使用时，请另外使用E3X-CN22（子连接器2芯）。无论哪种连接器都可以使用。

## 输出段回路图

■形E3X-DA11SE-S、形E3X-DA6SE-S(NPN型) ■形E3X-DA41SE-S、形E3X-DA8SE-S(PNP型)



## 外形尺寸图



## 设置方法

### 放大器单元的设置

■安装  
将光纤单元插入部侧的卡槽卡在导轨上，一直接到卡槽扣住为止。

请务必将光纤单元插入部侧搭在导轨上安装。如果反装的话，会降低安装强度。

■拆卸  
朝方向1按下，光纤单元朝方向2提起。

■连接使用时（连接器型）  
可以连接最多16台。

1. 放大器单元各自安装在DIN导轨上。
2. 在导轨上滑动放大器单元，将连接器插入放大器单元，插紧到发出“咔”的一声为止。

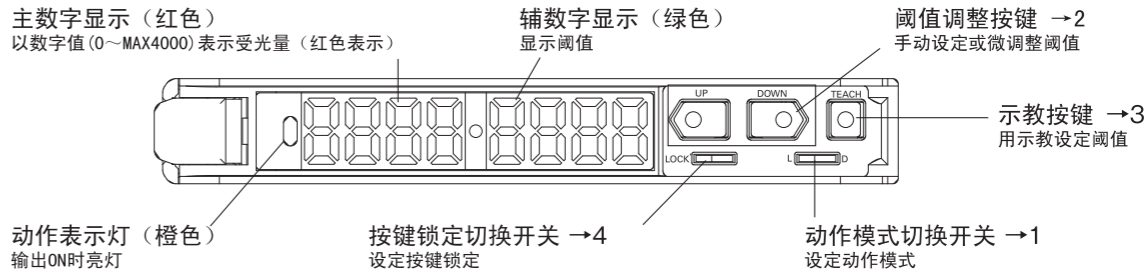
因振动等原因导致放大器移动时，请安装另售的边缘导轨进行固定（型号PFP-M）。

拆卸时请按照相反的顺序进行。  
请务必先拆开放大器单元间的连接后，再从DIN导轨上拆卸。

### 光纤单元的安装

1. 打开保护盖。
2. 提起Lock拨杆。
3. 将光纤牢牢插入光纤单元插入口。
4. 将Lock拨杆拉回原来的方向，固定光纤。  
拆除时请按照相反的顺序进行。

## 显示·操作



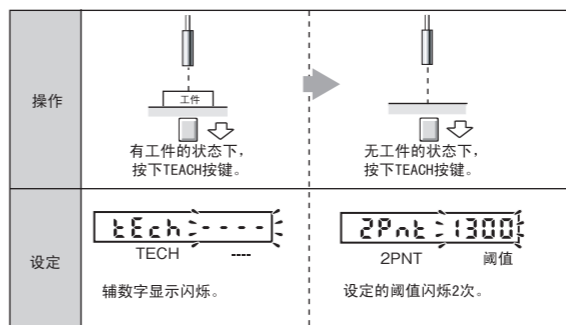
### 1.动作模式切换设定

动作模式	LON (入光时ON)	DON (避光时ON)
设定		

### 3.阈值的示教设定

#### ①工件有无示教（用静止工件设定）

各自检测有工件和无工件的2点，将其中间值光量设定为阈值。



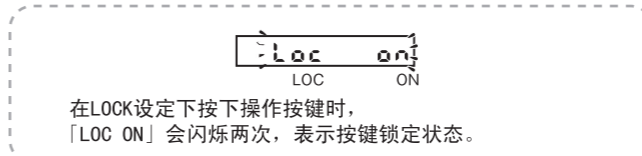
#### ·示教错误

实行示教后，辅数字显示板上显示下列内容是表示发生错误。

	<b>OVER ERROR</b> 受光量过大。阈值会被设定为上限值，但可能无法正确进行检测。 请设定头部，使受光量变小，然后再度实行示教。
	<b>LOW ERROR</b> 受光量过小。阈值会被设定为下限值，但可能无法正确进行检测。 请设定头部，使受光量变大，然后再度实行示教。
	<b>NEAR ERROR</b> 受光量的变化过小。阈值会被设定为中间值，但可能无法正确进行检测。 请设定头部，使受光量的变化变大，然后再度实行示教。

### 4.按键锁定切换设定

按键锁定	LOCK	LOCK解除
设定		
表示	 LOC ON 主、辅数字显示板闪烁两次， 按键输入无效。	 LOC OFF 主、辅数字显示板闪烁两次， 按键输入恢复。

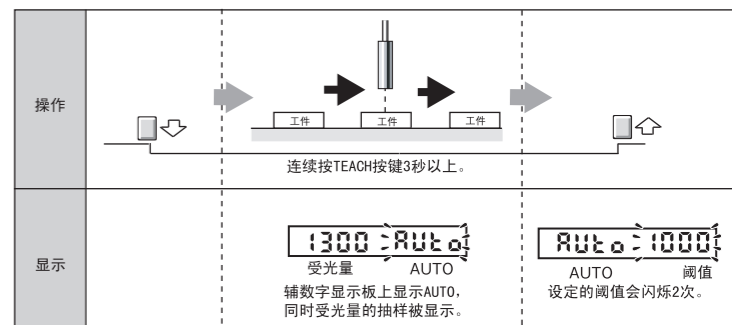


### 2.手动设定阈值

按键	UP键	DOWN键
操作	阈值变大	阈值变小

#### ②自动示教（通过移动工件设定）

在连续按按键的过程中检测微受光量，可以设定其最大值和最小值的中间值为阈值。



## 使用时的承诺事项

- ①为了确保安全，直接或间接用于人体检测时，请勿使用本产品。需使用该用途时，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，与本公司营业担当商谈之后，根据规格书等确认的同时，对额定值性能方面请想出有充裕度的使用方法及采取即使万一出故障也能使危险降低到最小的安全回路等的安全对策。
    - a) 屋外的用途、潜在化学污染或者受到电气的妨害的用途或者在商品目录、使用说明书中没有记载的条件及环境下使用。
    - b) 原子力控制设备、焚烧设备、铁道·航空·车辆设备、医用设备、娱乐机械、安全装置及行政机关及根据个别业界的规定制造的设备。
    - c) 可能危及生命、财产的系统·机械·装置
    - d) 煤气、水道、电气的供给系统记24小时连续运转系统等需要高信赖的设备。
    - e) 其他，以上述的 a) ~ d) 为基准，需要高度安全性的用途。
- \* 上述内容是适用条件的一部分。仔细阅读本公司的综合商品目录、数据表等最新版商品目录、手册中记载的保证免责事项的内容后再使用。

## 联络处所在地

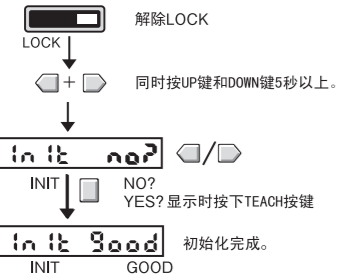
■技术支持  
 欧姆龙（中国）有限公司  
 地址：中国上海浦东新区银城中路200号  
 中银大厦2211室  
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 技术咨询热线：800-820-4535  
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 地址：中国上海浦东新区金桥  
 出口加工区金吉路789号  
 电话：86-21-5050-9988  
 邮编：201206

### 存储错误



### 设定初始化处理



no?	NO?	不实行初始化
YES?	YES?	实行初始化

Digital Fiber Sensor  
**E3X-DA-S Series**  
Single functional type(E3X-DA□□SE-S)

**INSTRUCTION SHEET**

Thank you for selecting an OMRON product. This sheet primarily describes precautions required in installing and operating the product.  
 • The specialist who has the knowledge of electricity must treat.  
 • Please often read this manual, and use it correctly after it understands enough.  
 • Please keep this manual importantly to refer at any time.

TRACEABILITY INFORMATION:  
 Representative in EU: Omron Europe B.V., Wegalaan 67-69, 2132 JD Hoofddorp, The Netherlands  
 Manufacturer: Omron Corporation, Shiokoji Horikawa, Shimogyo-ku, Kyoto 600-8530 JAPAN  
 Shanghai Factory, No.789 Jinji Road, Jinqiao Export Processing District, Pudong New Area, Shanghai, 201206 CHINA

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 SAFE USE**

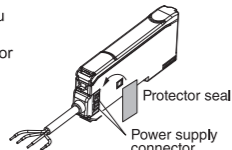
Please observe the following precautions for safe use of the product.

- 1) Do not use the Amplifier Unit in environments subject to flammable or explosive gases.
- 2) Do not use the Amplifier Unit in environments subject to exposure to water, oil, chemicals, etc.
- 3) Do not attempt to disassemble, repair, or modify the Amplifier Unit in any way.
- 4) Do not apply voltages or currents that exceed the rated ranges.
- 5) Wire the Amplifier Unit correctly, e.g., do not reverse the polarity of the power supply.
- 6) Connect the load correctly.
- 7) Do not short both ends of the load.
- 8) Do not use the Amplifier Unit if the case is damaged.
- 9) When disposing of the Amplifier Unit, treat it as industrial waste.

**PRECAUTIONS FOR CORRECT USE**

Please observe the following precautions to prevent failure to operate, malfunction, or undesirable effects on product performance.

- 1) The optical fibers are made out of methacrylic resin. Do not use them in atmospheres where organic solvents are present.
- 2) Wire the Amplifier Unit separately from power supply or high-voltage lines. If the Amplifier Unit wiring is wired together with or placed in the same duct as high-power lines, inductive noise may cause operating errors or damage the Amplifier Unit.
- 3) For extending wires, use a cable 0.3mm<sup>2</sup> min., and 100m max. in length. When using the cable as a Korea's S-mark certified product, use the cable of less than 10m in length.
- 4) Do not exceed the following force values applied to the cable. Tensile : 80N max., torque : 0.1N·m max., pressure : 20N max., flexure : 3kg max.
- 5) The Amplifier Unit is ready to operate 200 ms after the power supply is turned ON. If the Amplifier Unit and load are connected to power supplies separately, turn ON the power supply to the Amplifier Unit first.
- 6) Please turn on the power supply at the same time when you connecting the amplifier units with cables.  
 Mutual interference prevention might not operate normally or mobile console might not be able to be used when the difference between connected amplifiers at the power supply turning on time is 30ms or more.
- 7) Always keep the protective cover in place when using the Amplifier Unit.
- 8) Connector Short-circuit Protection (for Amplifier Units with Connectors) To prevent electric shock or short-circuits, attach the protector seal provided with E3X-CN-series Connectors to the sides of power supply connectors that are not being used.
- 9) Always turn OFF the power supply before connecting, separating, or adding Amplifier Units.
- 10) Using a Mobile Console  
 Use the E3X-MC11-S Mobile Console for the E3X-DA-S-series Amplifier Units. Other Mobile Consoles, such as the E3X-MC11, cannot be used.
- 11) Optical communications are not possible with an E3X-DA-N Amplifier Unit.
- 12) Depending on the application environment, time may be required for the incident light level to stabilize after the power supply is turned ON.
- 13) Please do not use thinner, benzene, acetone, and lamp oil for cleaning.
- 14) The optical fibers are made out of methacrylic resin. Do not use them in atmospheres where organic solvents are present.
- 15) Do not pull or apply excessive pressure or force (exceeding 9.8 N·m) on the Fiber Unit when it is mounted to the Amplifier Unit.
- 16) It cannot be used, when you have With and Without a Workpiece, it becomes 4000 or more digital values by each. In this case, please examine the type which re-sets up fiber unit or can perform power adjustment so that light level may become small. (This model is a single functional type and power adjustment cannot be performed.)
- 17) If the data is not written to the EEPROM correctly due to a power failure or static electric noise, as shown in the following figure, please perform setting initialization.



**Confirming the Package Contents**

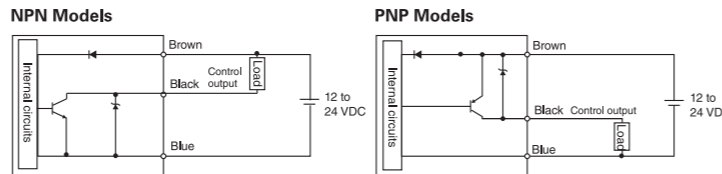
Amplifier Unit : 1 Instruction Sheet (this sheet) : 1

**Ratings and Specifications**

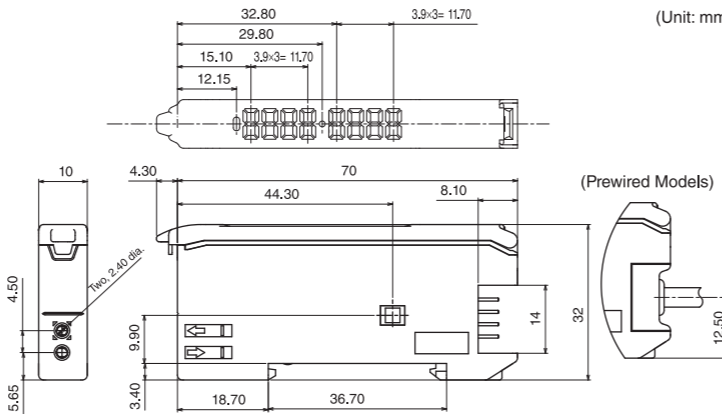
Connection method	Prewired	Separate connector *	
Model	NPN	E3X-DA11SE-S	E3X-DA6SE-S
	PNP	E3X-DA41SE-S	E3X-DA8SE-S
Supply voltage	DC12~24V ±10% ripple(p-p)10% max.		
Power consumption	960 mW max. (40 mA max. at 24 V)		
Control output	Open collector (26.4 VDC max.); load current: 50 mA max.; residual voltage: 1 V max.; off-state current: 10µA max.		
Response time	1ms		
Mutual interference prevention	Possible for up to 10 Units (optical communications sync method)		

\* Either the E3X-CN11 Master Connector (3-conductor) or the E3X-CN12 Slave Connector (1-conductor) can be used.

**I/O Circuits**



**Dimensions**

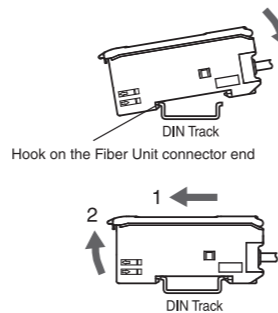


**The installation method**

**Mounting Units**

Catch the hook on the Fiber Unit connector end of the Unit on the DIN Track and then press down on the other end of the Unit until it locks into place.

Always attach the Fiber Unit connector end first. If the incorrect end is attached first, the mounting strength will be reduced.



**Removing Units**

Press the Unit in the direction indicated by "1" and then lift up on the Fiber Unit connector end of the Unit in the direction indicated by "2."

**Joining Amplifier Units (for Units with Connectors)**

Up to 16 Units can be joined.

1. Mount the Amplifier Units one at a time onto the DIN Track.
2. Slide the Amplifier Units together and press the Amplifier Units together until they click into place.

Secure the Units with an End Plate (PFP-M) if there is a possibility of the Amplifier Units moving, e.g., due to vibration.

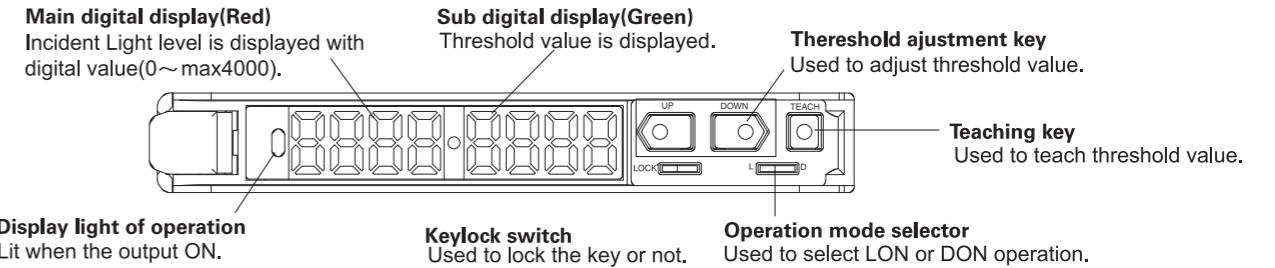
Reverse the above procedure to separate and remove the Units. Do not attempt to remove Amplifier Units from the DIN Track without separating them first.

**Connecting the Fiber Unit**

1. Open the protective cover
2. Press up the lock button.
3. Insert the fibers all the way to the back of the connector insertion openings.
4. Return the lock button to its original position to secure the fibers.

Reverse the above procedure to disconnect the Fiber Unit.

**Display/Operation**



**1. Basic Settings**

LON(light-ON)	DON(dark-ON)
The output will turn ON when the incident light level is above the threshold.	The output will turn ON when the incident light level is below the threshold.

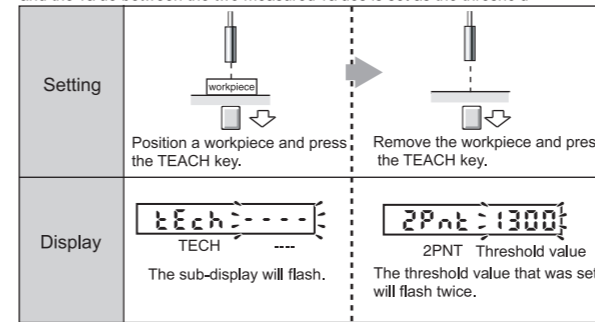
**2. Threshold values Manually setting**

Key	UP key	DOWN key
Setting	Increases the threshold value.	Decreases the threshold value.

**3. Threshold values Setting by Teaching**

**① Teaching With and Without a Workpiece(It sets up at workpiece that doesn't move.)**

Teaching can be performed twice, once with and once without a workpiece, and the value between the two measured values is set as the threshold.



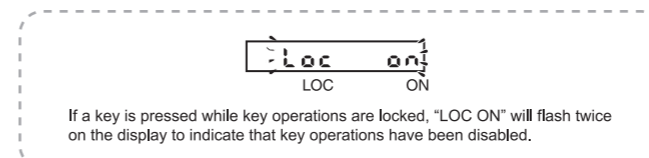
**• Teaching error**

After performing teaching, when the following is displayed on a sub digital display, the error has occurred.

	<b>OVER Error</b> Light level is too large. Detection may be correctly impossible, although threshold value is set as a maximum value. Adjust the Head to decrease the incident light level.
	<b>LOW Error</b> Light level is too small. Detection may be correctly impossible, although threshold value is set as a maximum value. Adjust the Head to increase the incident light level.
	<b>NEAR Error</b> Change of light level is small. Detection may be correctly impossible, although a threshold is set as a maximum value. Adjust the Head to increase the difference between the two incident light level.

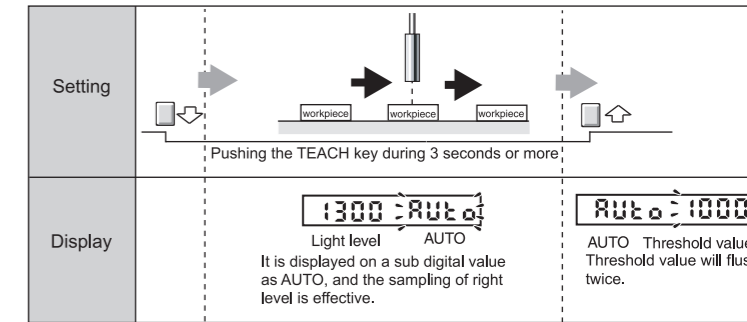
**4. Keylock Setting**

LOCK	UNLOCK
The main-display and sub-display will flash twice and key input will be disabled.	The main-display and sub-display will flash twice and key input will be enabled.



**② Automatic-teaching(It sets up at move work.)**

While continuing pushing a key, the middle of the detected maximum and the minimum value can be set up as a threshold.



**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 OMRON's safety rated products.

OMRON 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.

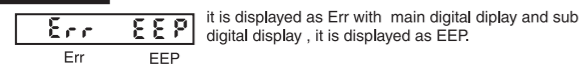
NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM. See also Product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

- EUROPE  
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