

激光型

# 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。 ·使用本品前,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。 根据国际电气基准(IEC), JIS C 6802:2014规定了 「激光产品的放射安全规格」。 The following notice applies only to products that carry the CE mark 型号E3Z- L□□□划分在该规格中的JIS规格 In a residential environment, this product may cause radio

CLASS 1里。 erence, in which case the user may be required to take adequate (2)美国 搭载在机器上出口美国时, 受到美国的安全规格

FDA(food and Drug Administration) 所规定。 型号E3Z- L□□□划分在该规格中的1里。 在美国使用搭载本产品的设备时,请在相关设备上 © OMRON Corporation 2005–2025 All Rights Reserved. 粘贴 FDA 认证标签。

造成伤害.

■使用上的注意

・使用上的注意

激光不影响到肉眼。

请将光束圈在内。

情况进行简单说明。

formance with IEC 60825-1 Ed. 3., as descrit aser Notice No. 56, dated May 8, 2019.

Shiokoji Horikawa,Shimogyo-ku, Kyoto 600-8530 JAPAN

Shanghai Factory, OMRON Corp. Manufactured in

开肉眼的高度。

请将激光束的光路作为终端使用。

终端材料请考虑使用反射少的抛光涂面,以使

如光路中有镜面反射体的话,则对于反射光路,

必须将激光开放出来使用时, 其光路请务必避

•对于激光机器,国内外激光安全对策有所规定。

以下分在国内使用和在国内组装出口海外两种

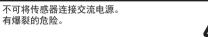
为了防止由于激光产品不同而导致有时会对使用者

# 证明标签 his laser product complies with 1 CFR 1040. 10 and 1040. 11 except for

## ●警告表示的意思

1果不正确使用,有可能导致死亡或重大伤 ⚠ 注意

### ●警告表示



安全上的注意

(3) 美国除外的其他国家 有关激光安全 中国国内使用场合,适用GB/T 7247.1-2024 (IEC60825-1:2014), 划分在Class1里。 其他国家使用的场合,适用IEC60825-1:2014/ 型号E3Z-L□□□放射的是可视激光。请勿直视。

回归反射型

0.3~15m(型E39-R1使用时)

0. 2~7m(型E39-R12使用时) 0. 2~7m(型E39-R6使用时)

型E3Z-LR61/-LR66

型E3Z-LR81/-LR86

JIS/IEC CLASS1,FDA CLASS 1 JIS/IEC CLASS1,FDA CLASS 1

| ★ DC12~24|

100mA以下

(控制输出) 负载

DC12~24V

②是空端子

④是空端子

1mW以下

对射型

型E3Z-LT81/-LT86

投光器: 15mA以下

受光器: 20mA以下

电源逆接保护/负载短路保护

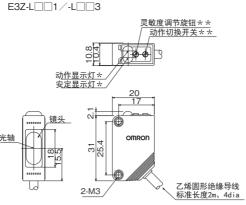
聚酯合橡胶

か作显示灯 (橙)

连接器PIN番号

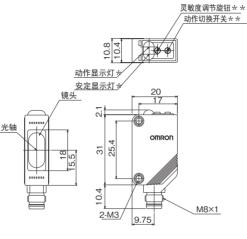
安定显示灯(绿)

EN60825-1:2014+A11:2021, 划分在Class1里。

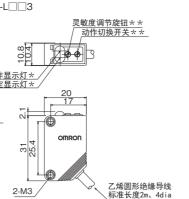


# E3Z-L 6/-L 8

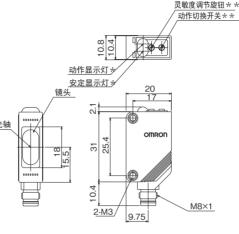
■外形尺寸图



\*\*对射型投光器没有感度调节旋钮和动作切换开关,



\*对射型投光器仅有电源表示灯 \*\*对射型投光器没有感度调节旋钮和动作切换开关, 所以外形有所不同。



\*对射型投光器仅有由源表示灯

#### Laser Safety

# ■Handling Precautions

## Handling precaution

OMRON

PHOTOELECTRIC SENSOR

**INSTRUCTION SHEET** 

Thank you for selecting OMRON product. This sheet pri-

marily describes precautions required in installing and

Before operating the product, read the sheet thoroughly to

acquire sufficient knowledge of the product. For your con-

201206
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.

**Precautions on Safety** 

Indicates a potentially hazardous situation

moderate injury or in property damage

which, if not avoided, may result in minor or

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Manufacturer: Omron Corporation, Shiokoji Horikawa, Shimogyo-ku, Kyoto 600-8530 JAPAN Shanghai Factory NO.789,Jinji Road,

China(Shanghai)Pilot Free Trade Zone

LASER TYPE

venience, keep the sheet at your disposal.

operating the product.

TRACEABILITY INFORMATION: Representative in EU: Omron Europe B.V. Wegalaan 67-69 2132 JD Hoofddorp,

Meaning of Signal Words

Do not connect sensor to AC power supply

Risk of explosion

The E3Z-L emits a visible laser beam. Never stare into the beam. Be sure that the end of the beam path is terminated. The best material for terminating the beam is a surface painted with matt paint. If there are refractive surface in the beam path, be sure that the reflected beam path is contained. If containment is not possible for the application, do not allow the beam to travel at eye level.

•Laser safety measures for laser devices are stipulated both in Japan and overseas. Hear, two cases are described: Application in Japan and Application in a device to be shipped overseas.

#### (1)Application in Japan

According to JIS C6802:2014, the safety measures required of the user are stipulated according to the class of the laser device. The E3Z- L□□□ is classified as a class-1 laser according to

When a laser device is exported to the USA, it falls the laser regulations of the FDA (Food and Drug Administration). The E3Z- L is classified as a class-1 laser by the FDA, and it has already been registered with the CDRH (Center for Devices and Radiological Health). Ask your OMRON representative for Laser Labels

## Technical standards have been provided with the product.

When using a device equipped with the product in the U.S., attach an FDA certification label near the sensor mounted on

It is assumed that the E3Z- L will be incorporated into a

final system device. When incorporating the E3Z-  $L\Box\Box\Box$ , comply with the

following technical standard: US Federal Low 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No.56, dated May 8, 2019

#### Certification and Identification labels

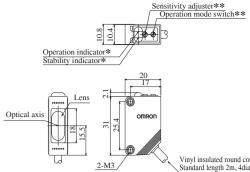
Inis laser product complies with 21 CFR 1040, 10 and 1040, 11 except for conformance with IEC 60825-1 Ed. 3, as descri n Laser Notice No. 56, dated May 8, 2019. SMRON Corporation Shiokoji Hortikawa, Shimogyo-ku, (yoto 600-8530 JAPAN 2 Place of manufacture: Shanghai Factory, OMRON Corp

When using in China, GB/T 7247.1-2024 (IEC60825-1:2014) applies to this product, it is classified as a Class 1 laser product. When using in other countries, IEC60825-1: 2014/ EN60825-1:2014+A11:2021applies to this product, it is

(3) Regions except the USA

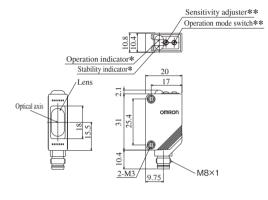
classified as a Class 1 laser product.

**DIMENSIONS** 



\*Only power indicator is on a light source of Separate type. \*\*The form differs because a light source of Separate type does not have it.

### E3Z-L $\square$ 6/-L $\square$ 8



\*Only power indicator is on a light source of Separate type \*\*The form differs because a light source of Separate type does not have it.

# 安全上的要点

(2)请勿拆卸、修理、改造本产品

①日光直射场所 ②湿度高或易结露场所

(2)连接和安装

电压小于最大允许电压。

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屏蔽。

异线。 ④ 导线请勿用力拉扯。

⑤安装传感器时,请勿使传感器受剧烈外力(如用锤击

⑦插拔连接头时请握住传感器的外壳部位。

(3)清扫 因为稀释剂类会溶化产品表面,所以请避免使用。

(4)电源

使用市场上销售的开关整流器时,请将FG (Frame・Ground端子)接地。

时,一定要先接通传感器的电源。

(6)电源关闭 电源关闭时,可能会出现输出脉冲,所以我们建议先关闭 负载或负载线的电源。

负载时确保通过的电流小于额定负载电流的1.8倍。

虽然防水等级为IP67,但最好避免在水中、雨中和室外

(9)废弃时,请作为工业废弃物处理。

# ■规格性能

(4) 请使用额定值以下的负载。

(1)请勿在以下场所使用。

③含腐蚀性气体场所 ④振动或冲击能直接传送到传感器场所

③延长导线必须使用截面积0.3mm<sup>2</sup>以上、长度100m以下

安装时请使用M3螺栓固定。 ◎M8连接器方面 ⑥连接器的插拔必须在传感器电源切断情况下进行。

⑧一定要用手作为固定工具,如果用钳子拧会破坏产品。 ⑨合适的扭矩为0.3~0.4N m。如果扭矩不够,会失去

(5)电源重置时间

(7)负载短路保护 本类传感器具有负载短路保护功能、请勿将负载短路。 勿使超过额定的电流通过负载。发生负载短路时,输出 会变成0FF,请对回路进行修正后再接通电源。短路保护 回路也会重新调整。另外, 当回路中通过1.8倍以上的 额定负载电流时,负载短路保护功能也会动作。所以接L

# 检出方式

检出距离

黑白误差

电源电压

消费电流

控制输出

保护回路

响应时间

周围温度

保护构造

输出回路

对射型的投光器

材质

使用周围湿度

输出残留电压

设定距离范围

光源(发光波长)

以下项目在安全确保方面非常重要, 请务必遵守。 (1)请不要在具有可燃性、爆炸性气体的环境下使用。 (3)电源电压必须在额定值内(DC12~24V±10%)。

使用上的注意

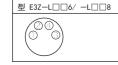
①传感器最大允许电压是DC26.4V。通电前请确认供电 ②传感器导线和动力线或电力线装在同一配管中使用时,

打等),这样就有可能破坏传感器耐水保护性能。

耐水保护功能,且会在有振动情况下容易松动。

从接通电源到传感器可正常进行检出的时间是100ms, 所以请在通电100ms后再使用。负载和传感器接不同电源

# 连接器PIN配置



开关

主回路

# ■安装图

扭矩应为



# 0.5N·m以下

距离设定型

额定检出距离的5%以下

JIS/IEC CLASS1, FDA CLASS

聚酯合橡胶

型E3Z-LL83/-LL88

i~300mm(白纸□100mm

i~100mm (黑纸□100mm)

40~300mm (白纸□100mm)

40~100mm (黑纸□100mm)

5%(距离100mm)

型E3Z-LL81/-LL86

~300mm(白纸□100mm)

~160mm (黑纸□100mm)

40~300mm(白纸□100mm)

40~160mm (黑纸□100mm)

5%(距离160mm)

30mA以下

电源逆接保护/负载短路保护/相互干涉防止功能/输出逆接保护

DC12~24V±10% 波动 (P-P) 10%以下

负载电源电压DC26.4V以下,负载电流100mA以下

入光时0N/遮光时0N开关切换式

集电极开路输出

动作时: 湿度35~85%RH、保存时: 湿度35~95%RH(但不结冰、结露)

聚对苯二甲酸丁二醇酯(PBT

IEC60529规格 IP67

残留电压1V以下(负载电流小于10mA): 残留电压2V以下(负载电流小于10~100mA

聚甲基丙烯酸甲酯(PMMA)

4.5mW以下

D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。 霊使用该用途时, 请洗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,与本公司营业担当者商谈之后,根据规格书等确 认的同时,对额定值性能方面请想出有余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、使用说明书等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。

■制造商 欧姆龙(上海)有限公司 地址:中国(上海)自由贸易试验区金吉路789号 电话: (86) 21-5050-9988 ■技术咨询 欧姆龙(中国)有限公司

# 地址:中国上海市浦东新区银城中路200号中银大厦2211室 电话: (86) 21-6023-0333 技术咨询热线: 400-820-4535 网址: http://www.fa.omron.com.cn OMRON Corporation

### **Precautions for Safe Use** Be sure to follow the safety precautions below for added safety.

(1)Do not use the sensor under the environment with explosive or ignition gas.

(2) Never disassemble, repair nor tamper with the product. (3)Keep the supply voltage within the specified range. (12to24V DC±10%) (4)Do not use the sensor over the rated values.

# **Precautions for Correct Use**

4Do not pull the wire strongly.

(1)Do not use the product under the following conditions 1 In the place exposed to the direct sunlight.

②In the place where humidity is high and condensation may occur. ③In the place where corrosive gas exists. 4In the place where vibration or shock is directly transmitted to the product.

(2)Connection and Mounting ①Be sure that before making supply the supply voltage is less than the maximum rated supply voltage. (26.4V DC) ②There are some cases where the photoelectric switch cable is unavoidably laid in a tube or duct together with a

hightension or power line. 3 This causes an induction, possibly resulting in malfunction

In principal, the cable should be separately laid or shielded. For extending wires, use a cable 0.3mm<sup>2</sup> min. and 100m max, in length.

5 Excessive force (hitting by hammer, etc.) should not be put

on the photoelectric switch because it may damage its water-resistance characteristic. Use M3 screws to mount the photoelectric switch. ©M8metal connector

6 Plug in or out the connector after surly turning off a power Plug in or out the connector with a cover part of i

®Fasten a fixed implement by hand. If you use a plaier, it may be cause of malfunction or damage to it. <sup>⑤</sup>Proper bolting torque is 0.3 to 0.4N m to keepwater-resistance.

Do not use thinner such as alcohol and benzine because it may melt a surface of a product. (4)Power supply When using a commercially available switching regulator, be

sure to ground the FG (Frame Ground) terminals. (5)Power supply reset time The photoelectric switch will begin sensing no later than 100ms

after the power is turned on. If the load and the photoelectric switch is connected to different power supply, the photoelectric switch must be always turned on first. (6)Turning off the power supply

When turning off the power, output pulse may be generated. We recommend turning off the power supply of the load or load line first. (7)Load short circuit protection

This product is provided with function of load short circuit protection. However, be never short-circuited of the load. Please do not throw the current that exceeds ratings into the load. Control output is turned off when this function operates. After checking of wiring and load current, make power supply again. Then the circuit is reset. Load short circuit protection operates when the current is 1.8 times over than the rated load current. The inrush current should be 1.8 times less than the

(8)Water resistance Though this is type IP67, do not use in the water, rain or

(9)Please process it as industrial waste.

rated load current when L load is used.

#### Detection system Separate type Retroreflective type Distance-setting type E3Z-LT61/-LT66 E3Z-LR61/-LR66 E3Z-LL63/-LL68 20 to 300mm white paper 100X100mm) 20 to 160mm 25 to 300mm (white paper 100X100mm 25 to 100mm (Black paper 100X100mm 0.3 to 15m(with E39-R1) etecting distance 0.2 to 7m(with E39-R12) 0.2 to 7m(with E39-R6) Black paper 100X100mm) (white paper 100X100mm) (Black paper 100X100mm) (Black paper 100X100mm) (Black paper 100X100mm) Setting distance 5% of setting distance max ack/white erro Visble wavelength for the semiconductor laser: 655 nm JIS/IEC Class1, FDA CLASS Light source JIS/IEC Class1, FDA CLASS 1 JIS/IEC Class1, FDA CLASS 1 1mW max. Supply voltage 12 to 24 V DC +/- 10%, ripple (p-p): 10% max. Light sauce: 15mA max. Receiver: 20mA max. Current consumption 30mA max. Load power supply voltage 26.4 VDC max., load current 100mA max Control output Open collector output Light-ON/Dark-ON switch selectable esidual voltage 1 V or less: Load current less than 10mA. 2 V or less: Load current less than 10 to 100mA. sponse time 1ms max.

Operating -10 to +55°C, Storage -25 to +70°C(no freezing and condensation)

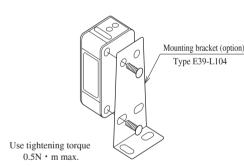
Denatured Polyarylate resi

Operating 35 to 85%, Storage 35 to 95% (no freezing and condensation)

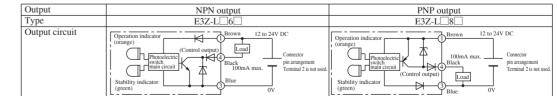
Polybutylene Terephthalate resin (PBT)

Denatured Polyarylate resin

# **■**MOUNTING



# ■OUTPUT CIRCUIT DIAGRAM

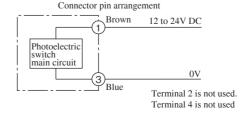


Light source of Separate type

nbient Temperature

rial Display Lens

mbient humidity



CONNECTOR PIN ARRANGEMENT

THE PRODUCTS CONTAINED IN THIS SHEET ARE NOT SAFETY RATED THEY ARE NOT DESIGNED OR RATED FOR ENSURING SAFETY OF PER-SONS, AND SHOULD NOT BE RELIED UPON AS A SAFETY COMP-ONENT OR PROTECTIVE DEVICE FOR SUCH PURPOSES.

SUITABILITY FOR USE

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 ENSU-RING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO

Please refer to separate catalogs for OMRON's saftey rated products.

CT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSYTEM. See also Product catalog for Warranty and limitation of Liability OMRON Corporation Industrial Automation Company

ADDRESS THE RISKS, AND THAT THE OMRON PRODU-

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Tel: (86) 21-6023-0333 Fax: (86) 21-5037-238