

STANDARD **OMRON**

# 型 E3Z-LS


光电传感器

## 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。

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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### 安全上的注意


●警告表示的意思

**注意** 如果不正确使用，有可能导致死亡或重大伤害。

●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

以下项目在安全确保方面非常重要，请务必遵守。

- 请不要在具有可燃性、爆炸性气体的环境下使用。
- 请勿拆卸、修理、改造本产品。
- 电源电压必须在额定值内（DC12~24V±10%）。
- 请使用额定值以下的负载。

STANDARD **OMRON**

# Model E3Z-LS

PHOTOELECTRIC SENSOR

## INSTRUCTION SHEET

Thank you for selecting OMRON 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.

TRACEABILITY INFORMATION:  
Representative in EU: OMRON EUROPE B.V., Wegalaan 67-69, 2132 JD Hooftdorp, The Netherlands  
Manufacturer: OMRON CORPORATION, Shiohji Horikawa, Shimogyo-ku, Kyoto 600-8530 JAPAN  
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### Precautions on Safety


●Meanings 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 for Safe Use

Be sure to follow the safety precautions below for added safety.

- Do not use the sensor under the environment with explosive or ignition gas.
- Never disassemble, repair nor tamper with the product.
- Keep the supply voltage within the specified range. (12to24V DC±10%)
- Do not use the sensor over the rated values.

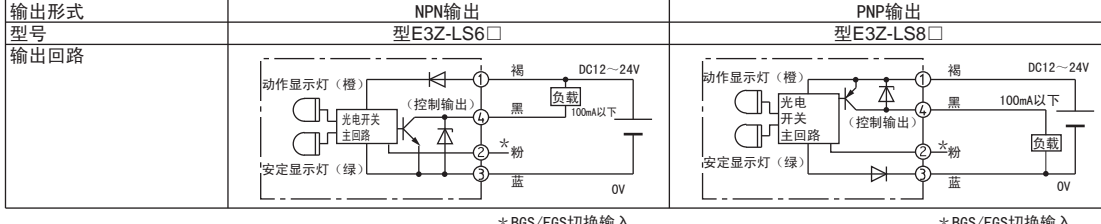
### 使用上的注意

- 请勿在以下场所使用。
  - 日光直射场所
  - 湿度高或易结露场所
  - 含腐蚀性气体场所
  - 振动或冲击能直接传送到传感器场所
- 连接和安装
  - 传感器最大允许电压是DC26.4V。通电前请确认供电电压小于最大允许电压。
  - 传感器导线和动力线或电力线在同一配管中使用，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屏蔽。
  - 延长导线必须使用截面积0.3mm<sup>2</sup>以上、长度100m以下导线。韩国S-mark认证种作为认证品使用时，请使用10m以下的导线。
  - 加在导线上的力请按下列值。
    - 拉伸80N以下、扭矩0.1N·m以下、押压20N以下、弯曲3kg以下
  - 安装传感器时，请勿使传感器受剧烈外力（如用锤子打等），这样就有可能破坏传感器防水性能。安装时请使用M3螺栓固定。
- M8连接器方面
  - 连接器的插拔必须在传感器电源切断情况下进行。
  - 插拔连接头时请握住传感器的外壳部位。
- 一定要用手作为固定工具，如果用钳子拧会破坏产品。
- 合适的扭矩为0.3~0.4N·m。如果扭矩不够，会失去防水保护功能，且在有振动情况下容易松动。
- 清扫
  - 因为稀释剂类会溶化产品表面，所以请避免使用。
- 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。
  - 电源重置时间
    - 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时，一定要先接通传感器的电源。
  - 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。勿使超过额定电流通过负载。发生负载短路时，输出会变成OFF。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负载时确保通过的电流小于额定负载电流的1.8倍。
    - 防水性
      - 虽然防水等级为IP67，但最好避免在水中、雨中及室外使用。
    - 废弃时，请作为工业废弃物处理。

### 规格性能

检出方式		距离设定型	
型号	NPN输出 PNP输出	E3Z-LS61 / -LS66 E3Z-LS81 / -LS86	E3Z-LS63 / -LS68 E3Z-LS83 / -LS88
检测模式切换		BGS机能: OPEN或者连接GND FGS机能: 连接Vcc	
设定距离范围		40~200mm (白画纸10cm×10cm) 40~160mm (黑画纸10cm×10cm)	20~80mm (白画纸2.5cm×2.5cm) 20~80mm (黑画纸2.5cm×2.5cm)
检出距离范围		BGS 20mm~设定距离 (10cm×10cm)	2mm~设定距离 (2.5cm×2.5cm)
		FGS 设定距离~200mm以上 (白画纸10cm×10cm) 设定距离~160mm以上 (黑画纸10cm×10cm)	设定距离~80mm以上 (白画纸2.5cm×2.5cm)
光源(发光波长)		红色发光二极管 (680nm) / 红色发光二极管 (650nm)	
电源电压		DC12~24V±10% 波动(P-P) 10%以下	
消费电流		30mA以下	
控制输出		负载电源电压DC26.4V以下, 负载电流100mA以下 (残留电压1V以下), 漏电流10μA以下 集电极开路输出 (NPN/PNP输出根据形式而不同) 入光时ON/遮光时ON开关切换式 动作·复归: 各1ms以下	
响应时间		旋钮最大旋转5圈	
灵敏度调整		动作时: -25~+55℃, 保存时: -40~+70℃ (但不结冰、结露)	
周围温度		动作时: 湿度35~85%RH, 保存时: 湿度35~95%RH (但不结冰、结露)	
周围湿度		IEC60529规格 IP67	
保护构造		外壳: 聚对苯二甲酸丁二醇酯 (PBT) 操作部及镜头外壳部: 聚氨酯橡胶	

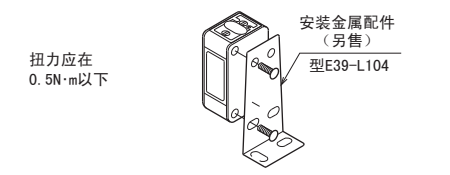
### 输出回路图



### 连接PIN配置



### 安装图



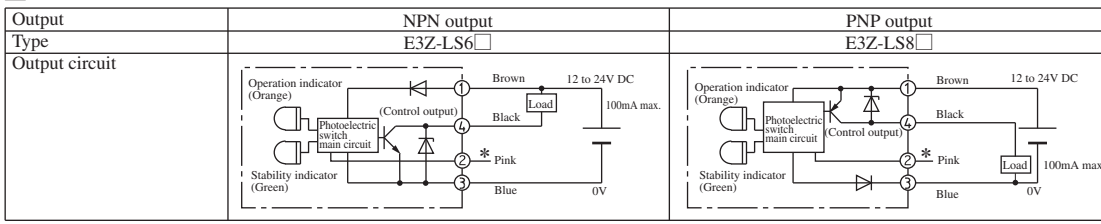
### Precautions for Correct Use

- Do not use the product under the following conditions.
  - In the place exposed to the direct sunlight.
  - In the place where humidity is high and condensation may occur.
  - In the place where corrosive gas exists.
  - In the place where vibration or shock is directly transmitted to the product.
- Connection and Mounting
  - Be sure that before making supply the supply voltage is less than the maximum rated supply voltage. (26.4V DC)
  - There are some cases where the photoelectric switch cable is unavoidably laid in a tube or duct together with a hightension or power line. This causes an induction, possibly resulting in malfunction or damage. 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. When using the cable as a Korea's S-mark certified product, use the cable of less than 10m in length.
  - 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.
  - 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.
- M8 metal connector
  - Plug in or out the connector after surly turning off a power supply.
  - Plug in or out the connector with a cover part of it.
  - Fasten a fixed implement by hand. If you use a plier, it may be cause of malfunction or damage to it.
  - Proper bolting torque is 0.3 to 0.4N·m to keep water-resistance.
- Cleaning
  - Do not use thinner such as alcohol and benzine because it may melt a surface of a product.
- Power supply
  - When using a commercially available switching regulator, be sure to ground the FG (Frame Ground) terminals.
- 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.
- 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.
- 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 rated load current when L load is used.
- Water resistance
  - Though this is type IP67, do not use in the water, rain or outdoors.
- Please process it as industrial waste.

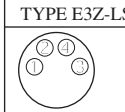
### RATING / PERFORMANCE

Method of detection		Distance-setting type	
Type	NPN output PNP output	E3Z-LS61/-LS66 E3Z-LS81/-LS86	E3Z-LS63/-LS68 E3Z-LS83/-LS88
Detection mode		BGS(Background Suppression) / FGS(Foreground Suppression)wire selectable BGS mode: Open or short-circuited to 0V FGS mode: Short-circuited to supplied power voltage	
Setting distance		40 to 200mm variable ( White paper 10cm×10cm) 40 to 160mm variable (Black paper 10cm×10cm)	20 to 80mm variable ( White paper 2.5cm×2.5cm) 20 to 80mm variable (Black paper 2.5cm×2.5cm)
Detection distance		BGS 20mm to setting distance (Paper size 10cm×10cm)	2mm to setting distance (Paper size 2.5cm×2.5cm)
		FGS setting distance to 200mm min. (White paper 10cm×10cm) setting distance to 160mm min. (Black paper 10cm×10cm)	setting distance to 80mm min. (White paper 2.5cm×2.5cm)
Light source (Wavelength)		Red LED (680nm) / Red LED (650nm)	
Supply voltage		12 to 24V DC±10%. Ripple (p-p) 10% max	
Current consumption		30mA max.	
Control output		Load supply voltage: 26.4V DC max., Load current: 100mA max. (Residual voltage 1V max.), Off-state current: 10μA max.	
Response time		Open collector output (NPN/PNP transistor output) Light-ON/Dark-ON switch selectable 1ms max. for both operation and release	
Distance adjustment		Five-turn endless adjuster	
Ambient temperature		operating: -25 to +55℃ storage: -40 to +70℃ (There should be no freezing and condensation)	
Ambient humidity		operating: 35 to 85%RH. Storage: 35 to 95%RH (There should be no condensation)	
Degree of protection		IEC60529: IP67	
Materials		Case: Polybutylene Terephthalate resin (PBT), Operation part and Lens cover: Denatured Polyarylate resin	

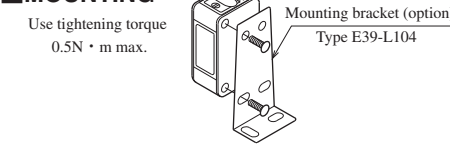
### OUTPUT CIRCUIT DIAGRAM



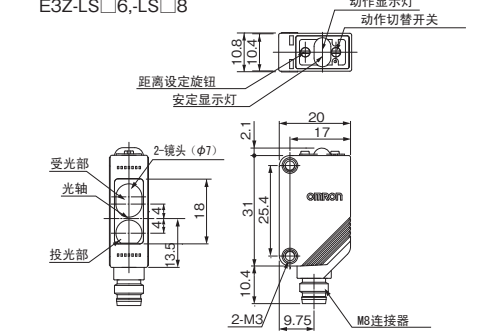
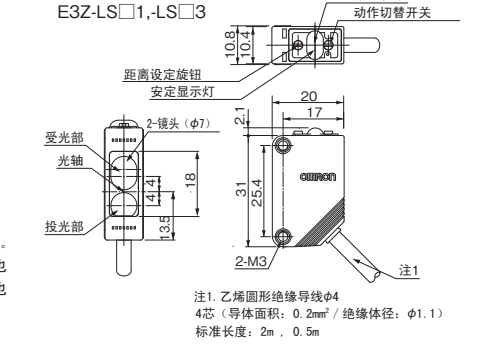
### CONNECTOR PIN ARANGMENT



### MOUNTING



### 外形尺寸图



### 使用时的承诺事项

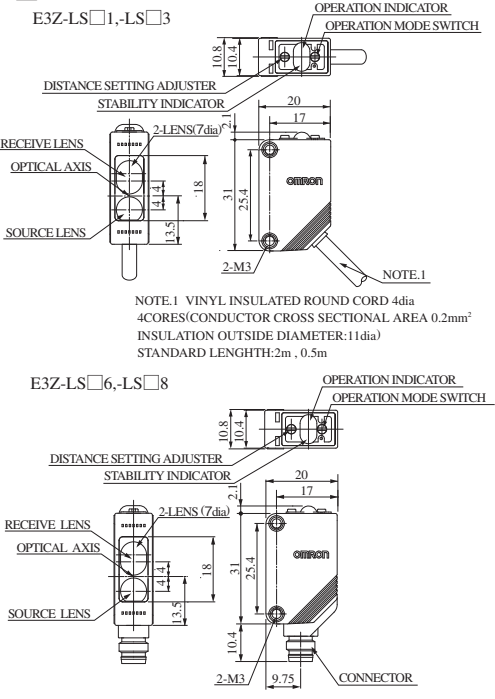
- 为了确保安全，直接或间接用于人体检测时，请勿使用本产品。需使用该用途时，请选用本公司传感器综合样本中刊登的安全传感器。
- 用于下列用途时，与本公司营业担当者商谈之后，根据规格书等确认的同时，对额定性能方面请出有裕度的使用方法和采取即使万一出现故障也能使危险降低到最小的安全回路等的安全对策。
  - 屋外的用途、潜在化学污染或者受到电气的妨害的用途或者在商品目录、使用说明书中没有记载的条件及环境下使用。
  - 原子力控制设备、焚烧设备、铁道、航空、车辆设备、医疗设备、娱乐机械、安全装置及行政机关及根据个别业界的规定制造的设备。
  - 可能危及生命、财产的系统·机械·装置
  - 煤气、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。
  - 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费事项的内容后再使用。

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OMRON Corporation

### DIMENSIONS



### 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, 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.

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