

防油

OMRON


型 E3Z-LS□□K

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。

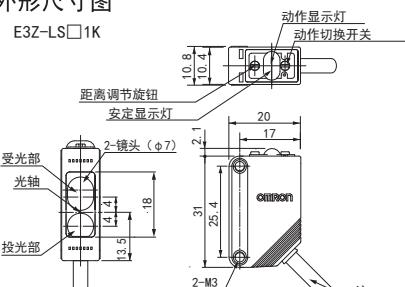


The following notice applies only to products that carry the CE mark:
Notice:
This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

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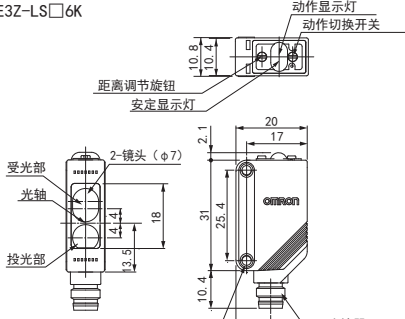
■外形尺寸图

E3Z-LS□□K



注1. 乙烷圆形绝缘导线 φ4
4芯(导体面积: 0.2mm²/绝缘体径: φ1.1)
标准长度: 2m, 0.5m

E3Z-LS□□6K



OMRON

Model E3Z-LS□□K

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.

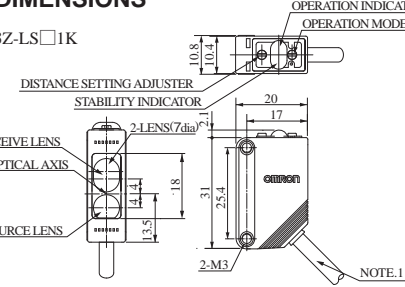
TRACEABILITY INFORMATION:
Representative in EU: OMRON EUROPE B.V. Wegalaan 67-69 2132 JD Hoofddorp, The Netherlands
Manufacturer: OMRON CORPORATION, Sensing Devices Division H.Q. Industrial Sensors Division Shikokji Horikawa, Shimogyo-ku, Kyoto, 600-8530 JAPAN

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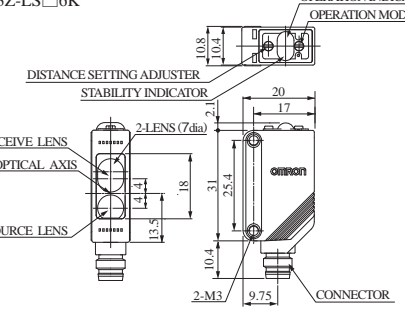
■DIMENSIONS

E3Z-LS□□K



NOTE 1. VINYL INSULATED ROUND CORD 4dia 4CORES/CONDUCTOR CROSS SECTIONAL AREA 0.2mm² INSULATION OUTSIDE DIAMETER: 1.1dia) STANDARD LENGTH: 2m, 0.5m

E3Z-LS□□6K



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

不可将传感器连接交流电源。有爆裂的危险。

规格性能

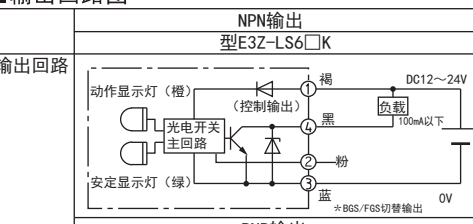
检出方式	距离设定型
型号	NPN E3Z-LS61K/LS66K PNP E3Z-LS81K/LS86K
检测模式切换	BGS机能: OPEN或者连接GND FGS机能: 连接Vcc
设定距离范围	40~200mm (白画纸10cm×10cm) 40~160mm (黑画纸10cm×10cm)
检出距离范围	BGS 20mm~设定距离 (10cm×10cm) FGS 设定距离~200mm以上 (白画纸10cm×10cm) 设定距离~160mm以上 (黑画纸10cm×10cm)
光源(发光波长)	红色发光二极管 (670nm)
电源电压	DC12~24V±10% 波动(P-P) 10%以下
消费电流	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) 集电极开路输出(NPN/PNP输出根据形式不同) 入光时ON/透光时ON开关切换式
响应时间	动作·复归: 各1ms以下
灵敏度调整	旋钮最大旋转5圈
周围温度	动作时: -25~+55℃, 保存时: -40~+70℃ (但不结冰、结露)
周围湿度	动作时: 35~85%RH, 保存时: 35~95%RH (但不结冰、结露)
保护构造	IEC60529规格 IP67 (JEM规格 IP67 导线和连接器除外)*1
材质	外壳 聚对苯二甲酸丁二醇酯(PBT) 操作部及镜头外壳部: PAR

*1 适用 JEM1030 : 1991年

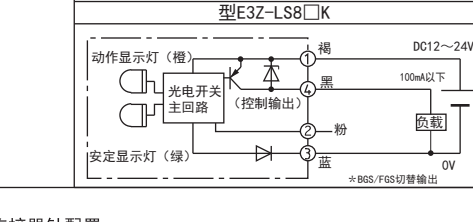
■输出回路图

输出回路

NPN输出 型E3Z-LS6□K




PNP输出 型E3Z-LS8□K



连接器针配置

型 E3Z-LS□□6K



PRECAUTIONS ON SAFETY

●Meanings of Signal Words

CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be to alert against unsafe practices.

●Alert Statement

Do not connect sensor to AC power supply. Minor explosion may occasionally occur.

■RATING / PERFORMANCE

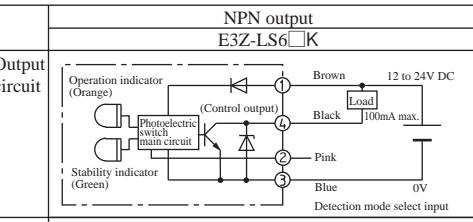
Method of detection	Distance-setting type
Type	NPN output E3Z-LS61K/LS66K PNP output E3Z-LS81K/LS86K
Detection mode	BGS(Background Suppression)/FGS(Foreground Suppression)wire selectable BGS mode: Open or short-circuited to 0V FGS mode: Short-circuited to supplied power voltage
Setting distance	40 to 200mm variable (White paper 10cm×10cm) 40 to 160mm variable (Black paper 10cm×10cm)
Detection distance	BGS 20mm to setting distance (Paper size 10cm×10cm) FGS setting distance to 200mm min. (White paper 10cm×10cm) setting distance to 160mm min. (Black paper 10cm×10cm)
Light source (Wavelength)	Red LED (670nm)
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.) Open collector output (NPN/PNP transistor output) Light-ON/Dark-ON switch selectable
Response time	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 (JEM: IP67. A cable and a connector are not include)*1
Materials	Case: Polybutylene Terephthalate resin (PBT), Operation part and Lens cover: Denatured Polyarylate resin

*1 JEM1030 : 1991

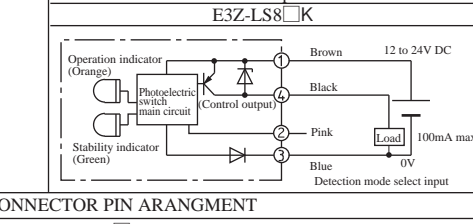
■OUTPUT CIRCUIT DIAGRAM

Output circuit

NPN output 型E3Z-LS6□K




PNP output 型E3Z-LS8□K

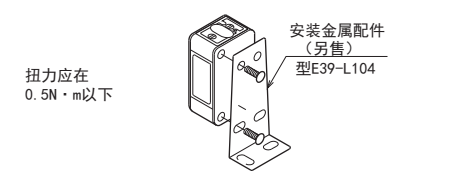


CONNECTOR PIN ARRANGMENT

TYPE E3Z-LS□□6K



■安装图



扭力应在 0.5N·m以下

安装金属配件(另售) 型E39-L104

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荷。

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屏蔽。
 - 延长导线必须使用截面积0.3mm²以上、长度100m以下导线。
 - 导线请勿用力拉扯。
 - 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保护性能。安装时使用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，如果用钳子钳会破坏产品。
 - 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。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。
 - 耐水性
 - 虽然防水等级为IP67，但最好避免在水中、雨中和室外使用。

E3Z-□□□K使用上的注意点

- 本体
 - 本传感器采用特殊涂层，提高了防油性，所以使用时请注意表面不要划伤。另外，由于涂层膜，检测距离下降了。详细内容请参考商品目录。
 - 如在本体表面贴上粘胶带，然后再撕下来，会损伤到涂层的。
 - 调整感度旋钮时，虽然涂层有时会剥落下来一部分，但性能方面是没问题的。

■MOUNTING

Use tightening torque 0.5N·m max.



Mounting bracket (option) Type E39-L104

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.

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 high-tension or power line. This causes an induction, possibly resulting in malfunction or damage. In principle, the cable should be separately laid or shielded.
 - For extending wires, use a cable 0.3mm² min. and 100m max. in length. Do not pull the wire strongly.
 - Excessive force (hitting by hammer, etc.) should not be put on the photoelectric switch because it may damage its detecting characteristic.
 - Use M3 screws to mount the photoelectric switch.
- M8metal connector
 - Plug in or out the connector after surely 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 fixation.
- Cleaning
 - Do not use thinner alcohol and benzene because they 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 are 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. 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.
- A product
 - Since this product improved for oil tight by special coating, handle with care for not scratched.
 - If you try to remove adhesive tape that was attached on the enclosure, the coat may be damaged.
 - When you adjust the sensitivity, a part of the coat around the adjuster may be peeled off, however, the oil-proof performance is not deteriorated.
- A cable
 - Since a part of cables sheath is coated, a cable may wrinkle when bend.
 - Since cable material is the same PVC (Polyvinyl Chloride) as standard E3Z, be careful of the following points.
 - Protect cable from oil.

- 导线
 - 导线根部也有涂层，所以弯曲导线时就会产生褶皱。
 - 导线材料同标准型E3Z，是氯化塑料混合物，所以请注意以下事项。
 - 勿让导线碰到油
 - 如在油环境中使用，请加上保护外罩等，勿让导线直接碰到。
 - 在油环境中，勿将导线使用在可动部上。
 - 导线外皮经硬化，已无柔软性，断线动作不良、外皮破损会导致短路。
- 镜头
 - 经防油涂层处理，镜头表面有时虽会起白油，但防油性·检测距离等额定/性能完全没问题。
 - 涂层有可能会被损伤，所以勿使镜头受到摩擦。
- 防油性
 - 虽确保了耐油性，但由于油的种类不同，有时不能全部发挥其性能，所以使用前请先探讨。
 - 下表所示的各种油经试验，都是合格的，故在探讨所使用的油时，请参考。

试验油分类	JIS分类	商品名	动粘度 (mm ² /s) at 40℃	PH
润滑油	—	Velocite No.3	2.02	—
不溶水的切削油	2种5号	Daphnecut AS-30D	10以上50以下	—
	2种11号	Yushiron Oil No.2ac	10以下	—
水溶性切削油	W1种1号	Yushiroken ECS0T-3	—	7~9.5
	—	Yshiron LubiCHWC68	—	7~9.9
	W1种2号	Gryton 1700D	—	7~9.2
—	W2种1号	Yushiroken S50N	—	7~9.8

注1. 上表中的油，做过240H滴水试验，绝缘电阻100Ω以上的试验，合格了。
注2. 在上表以外的油雾中使用，要以上表的动粘度和PH值为标准。另外，油中添加剂等也会造成一定影响，故请事前探讨。

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裕度的使用方法及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。
 - 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、手册中记载的保证负责事项的内容后再使用。

联络处所在地

■技术支持

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When using in the environment where cable is in oil, please provide a protection cover to a cable to protect from oil.

When using in the oily environment, do not use the cable as the mechanical movement to avoid from electrical shortage of wire caused by chemical damage for cable sheath.

If cable is in oil, the cable sheath will harden and pliability will be lost.

(10)Lens

- Even when blur remains on the lens, there is no problem on the rated performance such as detecting distance and oil resistance.
- Do not rub the lens, because the lens may be damaged.

(11)Lens

- Even when blur remains on the lens, there is no problem on the rated performance such as detecting distance and oil resistance.
- Do not rub the lens, because the lens may be damaged.

(12)Oil resistance

- Since oil-proof performance may not be good enough according of the type of oil, please evaluate the availability in advance.
- The Oil resistance of E3Z-□□□K has been evaluated and it passes the test against oils in the following table. Please refer to the table when considering the oil to be used.

Testing oil classification	JIS classification	Product name	Dynamic viscosity (mm ² /s) at 40℃	PH
Lubricant	—	Velocity No.3	2.02	—
Water insoluble coolant	Class 2 No.5	Daphne Cut AS-30D	Not less than 10 to less than 50	—
	Class 2 No.11	Yushiron Oil No.2ac	Less than 10	—
Water soluble coolant	Class W1 No.1	Yushiroken ECS0T-3	—	7~9.5
	—	Yushiron LubiCHWC68	—	7~9.9
	Class W1 No.2	Gryton 1700D	—	7~9.2
—	Class W2 No.1	Yushiroken S50N	—	7~9.8

Note 1. Each oil was trickled onto the E3Z-□□□K for 240 hour, and passed the test of 100Ω or more insulation resistance.
2. When the E3Z-□□□K is exposed to the oil other than those in the above table, refer to the dynamic viscosity and PH in the table. Also, please re-examine the oil since the sensor may be affected by additives and the like in the oil.

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.

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