

OMRON

型号

E3F3-□□□□

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。

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（请阅读后使用）

感谢您购买本公司的产品。
为了能安全、正确的使用，请务必充分领会本说明书。阅读完请妥善保管，以备随时查阅。

安全上的注意

警告表示的意思

警告 如果不正确使用的话，有可能引起轻伤、中等程度的伤害，甚至万一的时候可能引起重伤和死亡。还有可能带来同样重大的物质损害。

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

警告 不可将传感器连接交流电源，有爆裂，起火的危险。

注意 不可将此产品作为安全装置或安全设备的一部分使用。

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。
1. 请不要在具有可燃性、爆炸性气体的环境下使用。
 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，否则可能引起产品破裂或烧毁。
 4. 请使用在额定范围内的负载。
 5. 请勿让负载短路，以免引起产品破裂或烧毁。
 6. 请注意工作电源的极性，勿接错线，否则可能引起产品破裂或烧毁。

使用上的注意

1. 为避免对传感器产生干扰，配线时请勿接近高压线、强电流线。
2. 请使用适当工具正确安装传感器，以避免造成损坏。
3. 安装时，旋紧塑料外壳上的螺帽时，所用扭矩不应超过2.0N·m(20kgf·cm)
4. 安装时，旋紧金属外壳上的螺帽时，所用扭矩不应超过20.0N·m(200kgf·cm)



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·免责事项内容后再使用。

技术咨询

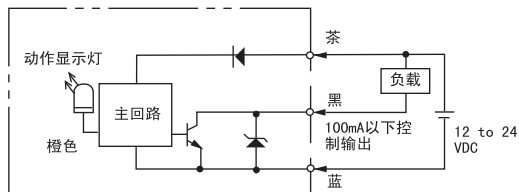
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中银大厦2211室
电话：（86）21-5037-2222
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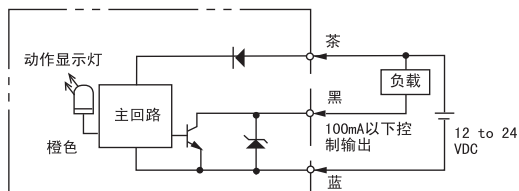
输出回路图

NPN 型输出

(Light-ON) E3F3-T1□□, R1□□, D1□□

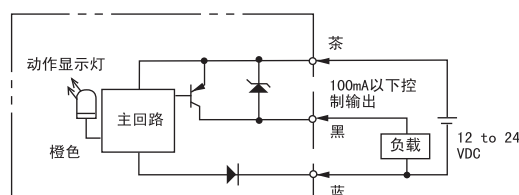


(Dark-ON) E3F3-T6□□, R6□□, D6□□

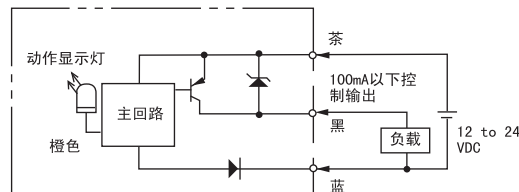


PNP 型输出

(Light-ON) E3F3-T3□□, R3□□, D3□□



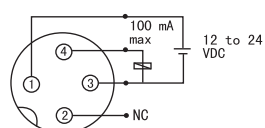
(Dark-ON) E3F3-T8□□, R8□□, D8□□



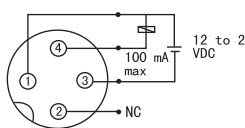
额定/性能

型号	E3F3				
	-T□1	-R□1	-R□2	-D□1	-D□2
	-T□1M	-R□1M	-R□2M	-D□1M	-D□2M
检测方式	对射型	回归反射型		扩散反射型	
		无M, S, R机能	有M, S, R机能	无感度调整	有感度调整
电源电压	直流12V到24V±10% (p-p10%) 以下				
消费电流	45mA以下	25mA以下	25mA以下		
检测距离	5m	3m	2m	10cm	30cm
标准检测物体	Φ11mm以上不透明物体	Φ56mm以上不透明物体		10*10cm白画纸	
指向角	3° ~ 20°	3° ~ 20°		—	
应差距离	—			检测距离的20%以下	
响应时间	1ms以下				
控制输出	无触点式，负载电流100mA以下；残余电压1V以下				
电源复位时间	100 ms以下				
使用环境照明	受光面照度：白炽灯3000lx以下 太阳光10000lx以下				
环境温度	动作时：-25℃~55℃ (但不结冰，结露) 保存时：-30℃~70℃ (但不结冰，结露)				
环境湿度	动作时：45%~85%RH 保存时：35%~95%RH				
绝缘电阻	20MΩ以上，500VDC加在所有充电部和外壳之间				
耐电压	施加1000VAC，50/60Hz持续1分钟，在所有充电部和外壳之间				
保护构造	IEC 60529 IP66				

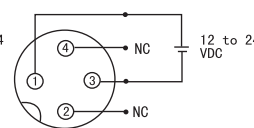
连接器配置 PNP



连接器配置 NPN



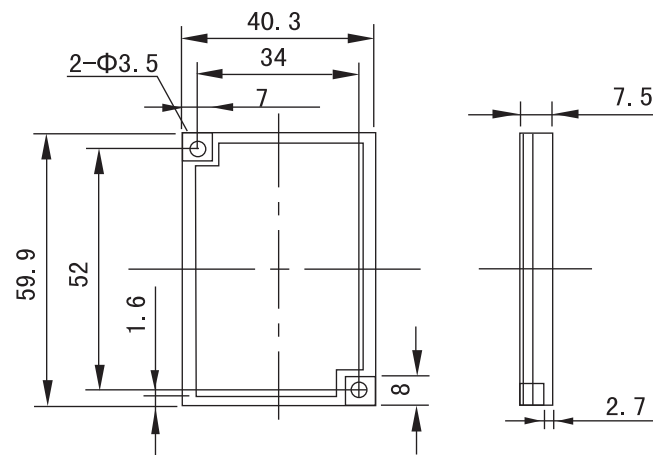
连接头配置 T□□□-L



动作图表

型号	E3F3-T1□□, T3□□, R1□□, R3□□, D1□□, D3□□	E3F3-T6□□, T8□□, R6□□, R8□□, D6□□, D8□□
动作模式	入光时ON	遮光时ON
时间图	<p>入光 遮光</p> <p>灯亮 灯熄</p> <p>输出 ON OFF</p> <p>负载 (继电器等) 动作 复位</p>	<p>入光 遮光</p> <p>灯亮 灯熄</p> <p>输出 ON OFF</p> <p>负载 (继电器等) 动作 复位</p>

反射板 E39-R1 (回归反射型用)



外形尺寸

	导线型	连接头型	导线型	连接头型
耐热 ABS 外壳	E3F3-D□2	E3F3-D□7	E3F3-T□1 E3F3-R□1 E3F3-R□2 E3F3-D□1	E3F3-T□6 E3F3-R□6 E3F3-R□7 E3F3-D□6
金属 BRASS 外壳	E3F3-D□2M	E3F3-D□7M	E3F3-T□1M E3F3-R□1M E3F3-R□2M E3F3-D□1M	E3F3-T□6M E3F3-R□6M E3F3-R□7M E3F3-D□6M

OMRON

Model **E3F3-□□□□**
PHOTOELECTRIC SENSOR

INSTRUCTION MANUAL

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. Weglaan 67-69, 2132 JD Hoofddorp, The Netherlands
Manufacturer: OMRON CORPORATION, Shikokji 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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(READ AND UNDERSTAND THIS MANUAL)

Please read and understand this manual before using the product. Please consult your OMRON representative if you have any questions or comments.

PRECAUTIONS ON SAFETY

● Meaning of warning symbol

WARNING Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.

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

● Warning symbol

WARNING

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

CAUTION

Do not use this product as a safety device or not as part of a safety system.

PRECAUTIONS FOR SAFE USE

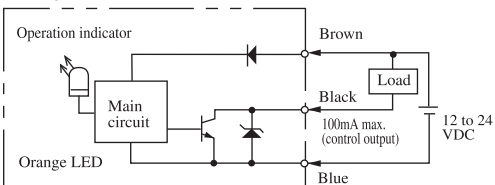
- Be sure to follow the safety precautions below for added safety.
- Do not use the sensor under the environment with explosive or ignition gas.
 - Never disassemble, repair nor tamper with the product.
 - Do not use the product in excess of the rated voltage. Applying voltages beyond the rated voltage range may cause the product to break or burn.
 - Do not use the sensor over the rated values.
 - Do not short-circuit the load. Doing so may break or burn the product.
 - Be careful when wiring, such as being careful with the polarities of the power supply. Incorrect wiring may break or burn the product.

Output circuit diagram

NPN output type

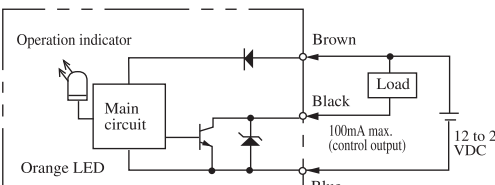
E3F3-T1 □□, R1 □□, D1 □□

Light ON



E3F3-T6 □□, R6 □□, D6 □□

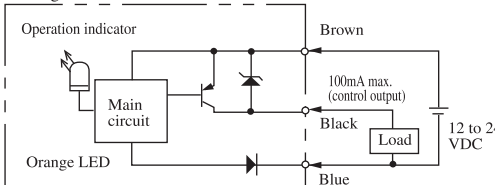
Dark ON



PNP output type

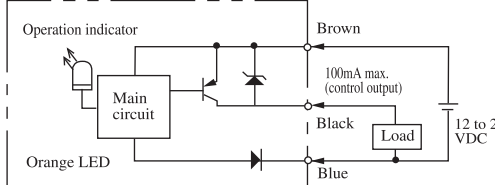
E3F3-T3 □□, R3 □□, D3 □□

Light ON



E3F3-T8 □□, R8 □□, D8 □□

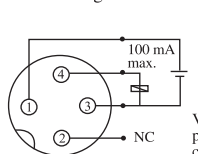
Dark ON



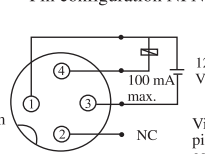
Ratings

Type	E3F3				
	-T□1	-R□1	-R□2	-D□1	-D□2
Sensing method	Separate through beam	Retroreflective without M.S.R function with M.S.R function		Diffuse reflective Without sens. adjust. With sens. adjust.	
Power supply voltage	12 to 24VDC±10%, p-p10%				
Current consumption	45mA max.	25mA max.		25mA max.	
Rated sensing distance	5m	3m	2m	10cm	30cm
Standard object	Opaque 11mm min	Opaque 56mm min		10*10cm, white mat	
Operating angle	3° to 20°	3° to 20°		—	
Differential travel (Hysteresis)	—			20% max.	
Response time	1ms max				
Control output	Open collector, max. 100mA; residual voltage: max. 1V at 100mA (for PNP and NPN)				
Power reset time	100 ms max				
Ambient illumination	Incandescent lamp: illumination on optical spot: 3000lx max Sunlight: illumination on optical spot: 10000lx max				
Ambient temperature	Operating: -25°C to 55°C (with no icing) Storage: -30°C to 70°C (with no icing)				
Ambient humidity	Operating: 45% to 85%RH Storage: 35% to 95%RH				
Insulation resistance	20MΩ min. (at 500VDC) between current carrying parts and case				
Dielectric strength	1000VAC, 50/60Hz, 1 min. between current carrying parts and case				
Enclosure rating	IEC 60529 IP66				

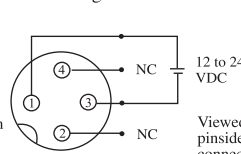
Pin configuration PNP



Pin configuration NPN



Pin configuration T□□□-L



Outline drawing

	Prewired types	M12 CN types	Prewired types	M12 CN types
Plastic	E3F3-D□2	E3F3-D□7	E3F3-T□1 E3F3-R□1 E3F3-R□2 E3F3-D□1	E3F3-T□6 E3F3-R□6 E3F3-R□7 E3F3-D□6
	E3F3-D□2M	E3F3-D□7M	E3F3-T□1M E3F3-R□1M E3F3-R□2M E3F3-D□1M	E3F3-T□6M E3F3-R□6M E3F3-R□7M E3F3-D□6M
Metal	E3F3-D□2M	E3F3-D□7M	E3F3-T□1M E3F3-R□1M E3F3-R□2M E3F3-D□1M	E3F3-T□6M E3F3-R□6M E3F3-R□7M E3F3-D□6M
	E3F3-D□2M	E3F3-D□7M	E3F3-T□1M E3F3-R□1M E3F3-R□2M E3F3-D□1M	E3F3-T□6M E3F3-R□6M E3F3-R□7M E3F3-D□6M

PRECAUTIONS FOR CORRECT USE

- Do not mount the sensor's cable to high voltage supply cables to prevent interference to the device.
- Use the correct tools to mount & set-up the Sensor, otherwise damage will occur.
- Do not exceed a torque of 2.0N • m (20kgf • cm) when tightening mounting nuts for plastic models.
- Do not exceed a torque of 20.0N • m (200kgf • cm) when tightening mounting nuts for metal models.



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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OMRON Corporation

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Operating chart

Type	E3F3-T1 □□, T3 □□, R1 □□, R3 □□, D1 □□, D3 □□	E3F3-T6 □□, T8 □□, R6 □□, R8 □□, D6 □□, D8 □□
Mode of output transistor	ON when incident (Light ON)	ON when interrupted (Dark ON)
Timing chart	indicator interrupted	indicator interrupted
	Operation indicator (Orange LED) ON OFF	Operation indicator (Orange LED) ON OFF
	Output transistor ON OFF	Output transistor ON OFF
	Load (relay) ON OFF	Load (relay) ON OFF

Reflector E39-R1S (for E3F3-R type)

