

OMRON

ModelE3FA-□□□□

PHOTOELECTRIC SENSOR

INSTRUCTION MANUAL

Thank for you 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:
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Manufacturer:
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The following notice applies only to products that carry the CE mark:
Notice:
In a residential environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

5844945-2A

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Precautions on safety

●Meaning of Signal Words

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.

●Alert statements in this Manual

WARNING

This product is not designed or rated for directly or indirectly ensuring safety of persons. Do not use it for such a purpose.

CAUTION

Never use the product with an AC power supply. Do not use the product with voltage in excess of the rated voltage.
Do not use the product with incorrect wiring. Otherwise, explosion, fire, malfunction may result.

OMRON

型号E3FA-□□□□

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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安全上的注意

●警告表示的意思

警告

如果不正确使用的话，此危险会导致轻度或者中度的伤害，也可能导致重伤或者死亡的发生，并且造成重大的财物损失。

注意

如果不正确使用的话，此危险会导致轻度或者中度的伤害，并且造成财物损失。

●警告表示

警告

禁止将本品作为直接或间接确保人身安全的用途使用。

注意

请勿将本产品连接AC电源。
电源电压必须在额定值内。
使用时如不正确接线，可能会引发爆炸、火灾、机器故障。

Rating Performance & Nomenclature

Control output (open-collector type)
N NPN type, 100 mA max.
P PNP type, 100 mA max.

E3FA-TN11-L

Connection method
1 Pre-wired cable
2 M12-connector

Emitter/Receiver for only T type
-L Emitter
-D Receiver

Sensing distance (light source is red LED, types with ** is infrared LED.)
1 2 3 4 5 6

Sensing method
T Through-beam type 20 m (**)15 m
D Diffuse-reflective type 0.1 m 0.3 m 1.0 m (**)0.1 m (**)0.3 m (**)1.0 m with white paper
R Retro-reflective type (with M.S.R.) 0.1 to 4 m (*)0.5 m with E39-R1S
L BGS (Background-suppression) type 0.1 m 0.2 m with white paper
V Limited-distance type 0.01 to 0.05 m with glass (t=1mm)
B Transparent-detection type (with P-opaqing) (*)0.1 to 0.5 m 0.1 to 2 m with E39-RP1

* Coaxial optics

Common
Supply voltage 10 to 30 VDC
Current Consumption Through-beam type: 40 mA max. Other types: 25 mA max. (See. Specification for details)
Operation Mode Light-On or Dark-On selectable by wiring
Sensitivity Adjustment One turn trimmer (except for BGS type, and Emitter type)
Ambient Temperature Operation: Prewired cable -25 to 55 °C, M12-connector -40 to 55 °C, Storage: -40 to 70 °C
Ambient Humidity Operation: 35 to 85 %RH, Storage: 35 to 95 %RH
Ambient illumination Incandescent lamp: 3,000 lx max., Sunlight: 10,000 lx max.
Degree of Protection IP67, IP69K

Output Circuit diagram

NPN-type
Operation indicator (orange)
Stability indicator (green)
1 Brown 10 to 30 VDC
4 Black Load
3 Blue 100 mA max.
2 Pink 0 V
Light-On
Dark-On

PNP-type
Operation indicator (orange)
Stability indicator (green)
1 Brown 10 to 30 VDC
4 Black 100 mA max.
3 Blue Load
2 Pink 0 V
Light-On
Dark-On

Emitter (Through-beam type)
Power supply indicator (green)
1 Brown 10 to 30 VDC
4
3 Blue 0 V
2
Light-On

Dimensions

Pre-wired cable type

Suitable type
E3FA-T□1□
E3FA-R□12
E3FA-B□11

Suitable type
E3FA-R□11
E3FA-D□1□
E3FA-L□1□
E3FA-V□11
E3FA-B□12

*Suitable type
E3FA-T□1□
E3FA-R□12
E3FA-D□1□
E3FA-V□11
E3FA-B□12

M12-Connector type

Suitable type
E3FA-T□2□
E3FA-R□22
E3FA-B□21

Suitable type
E3FA-R□21
E3FA-D□2□
E3FA-L□2□
E3FA-V□21
E3FA-B□22

*Suitable type
E3FA-T□2□
E3FA-R□22
E3FA-D□2□
E3FA-V□21
E3FA-B□22

Mounting Hole Dimensions

Attached Nut

Reflectors

Terminal No.

Specification

额定性能及命名规则

控制输出 (集电极开路型)
N NPN型, 100 mA 以下
P PNP型, 100 mA 以下

E3FA-TN11-L

连接方式
1 导线
2 M12-连接器

仅T型分为投光器/受光器
-L 投光器
-D 受光器

检测距离 (光源是红色LED,**表示的型号是红外光LED)
1 2 3 4 5 6

检测方式
T 对射型 20 m (**)15 m
D 扩散反射型 0.1 m 0.3 m 1.0 m (**)0.1 m (**)0.3 m (**)1.0 m 使用白纸
R 回归反射型 (带M.S.R.) 0.1至4 m (*)0.5 m 使用E39-R1S
L BGS (背景抑制)型 0.1 m 0.2 m 使用白纸
V 距离限定型 0.01至0.05 m 使用玻璃 (t=1mm)
B 透明物检出型 (带 P-opaqing) (*)0.1至0.5 m 0.1至2 m 使用E39-RP1

* 同轴光学系

性能
电源电压 10~30 VDC
消费电流 对射型: 40 mA 以下 其他: 25 mA 以下 (详情参见规格书)
动作模式 可通过接线选择Light-On 或 Dark-On
感度调节 单回调节旋钮 (BGS型及投光器除外)
环境温度 动作时: 导线 -25 ~ 55 °C, M12-连接器 -40 ~ 55 °C, 保存时: -40 ~ 70 °C
环境湿度 动作时: 35 ~ 85 %RH, 保存时: 35 ~ 95 %RH
环境照度 白炽灯: 3,000 lx 以下, 太阳光: 10,000 lx 以下
保护构造 IP67, IP69K

输出回路

NPN型
动作 稳定
指示灯 (橙色) (绿色)
1 褐 10~30 VDC
4 黑 负载
3 蓝 100 mA以下
2 粉 0 V
Light-On
Dark-On

PNP型
动作 稳定
指示灯 (橙色) (绿色)
1 褐 10~30 VDC
4 黑 100 mA以下
3 蓝 负载
2 粉 0 V
Light-On
Dark-On

投光器 (对射型)
电源 指示灯 (绿色)
1 褐 10~30 VDC
4
3 蓝 0 V
2
Light-On

外形尺寸

导线型

适用型号
E3FA-T□1□
E3FA-R□12
E3FA-B□11

适用型号
E3FA-R□11
E3FA-D□1□
E3FA-L□1□
E3FA-V□11
E3FA-B□12

*适用型号
E3FA-T□1□
E3FA-R□12
E3FA-D□1□
E3FA-V□11
E3FA-B□12

M12-连接器型

适用型号
E3FA-T□2□
E3FA-R□22
E3FA-B□21

适用型号
E3FA-R□21
E3FA-D□2□
E3FA-L□2□
E3FA-V□21
E3FA-B□22

*适用型号
E3FA-T□2□
E3FA-R□22
E3FA-D□2□
E3FA-V□21
E3FA-B□22

安装孔尺寸

螺母

反射板

端子 No.

规格

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, flammable or corrosive gas.

2.Do not use the sensor under the oil or chemical environment.

3.Do not use the sensor in the water, rain or outdoors.

4.Do not use the sensor in the environment where humidity is high and condensation may occur.

5.Do not use the sensor under the environment under the other conditions in excess of rated.

6.Do not use the sensor in place that is exposed by direct sunlight.

7.Do not use the sensor in place where the sensor may receive direct vibration or shock.

8.Do not use the thinner, alcohol, or other organic solvents.

9.Never disassemble, repair nor tamper with the sensor.

10.Please process it as industrial waste.

Precautions for correct use

1.Laying Sensor wiring in the same conduit or duct as high-voltage wires or power lines may result in malfunction or damage due to conduit or use shielded cable.

2.Do not pull on the cable with excessive force.

3.If a commercial switching regulator is used, ground the FG (frame ground) terminal.

4.The sensor will be available 100 ms after the power supply is tuned ON. Start to use the sensor 100ms or more after turning ON the power supply. If the load and the sensor are connected to separate power supplies, be sure to turn ON the sensor first.

5.Output pulses may be generated even when the power supply is OFF. Therefore, it is recommended to first turn OFF the power supply for the load or the load line.

Precautions for Compliance with UL Standards and CSA Standards

Notice to Users of the E3FA in the USA and Canada
Please use the following installation information instead of the general information in the instruction manuals in order to use the product under certified conditions of UL and CSA when the product is installed in the USA or Canada.

• The terminals and wiring lead are not suitable for field wiring. The suitability of the connection (including spacings between factory connectors) shall be determined for end use application.

• These devices should be mounted in the intended manner within an enclosure having adequate strength and thickness and with acceptable spacings being provided.

• Statement of range of conditions as noted below:
Supply voltage: 10 to 26.4V DC,Class2
Current consumption: 100mA max.
Operation ambient: Temperature 40°C max., Humidity 85%RH max.
Output voltage: 26.4V DC max.
Altitude up to: 2000 meters
Pollution Degree: 3
Load type: General purpose
• Enclosure: Type 1 Enclosure for indoor use only
• The Strain Relief Test was not evaluated. The suitability of the leads shall be determined in the end product application.

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT 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(S) 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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D Oct, 2014

安全上的要点

以下项目在安全确保方面非常重要，请必须遵守。

1. 请勿在具有可燃性、爆炸性或腐蚀性气体的环境下使用。

2. 请勿在油或化学品环境下使用。

3. 请勿在水中、雨中和室外使用。

4. 请勿在湿度高的环境条件下使用，可能会产生结露。

5. 请勿在其他超过规格值的环境条件下使用。

6. 请勿在日光直射场所使用。

7. 请勿在振动或冲击能直接传达至传感器的场所使用。

8. 请勿使用稀释剂、酒精、或其他有机溶剂。

9. 请勿擅自拆卸、修理、改造本产品。

10. 废弃时，请作为工业废弃物处理。

使用上的注意

1. 电力线、动力线与传感器使用同一配线管或者配线槽时，会由于感应引起误动作或者产品损坏，原则上请分开配线或者使用屏蔽线。

2. 对导线部施加的力不得超过额定值。

3. 使用市场上销售的开关整流器时，请将FG(frame ground)端子接地。

4. 从接通电源到传感器可正常检测的时间是100ms，所以请在通电100ms后再使用。负载和传感器接不同的电源时，一定要先接通传感器的电源。

5. 由于即使在切断电源时也可能发生输出脉冲，因此建议先切断负载或负载线的电源。

承诺事项

本公司产品是作为工业通用品而设计制造的。因此，不适用于以下用途，当本公司产品被使用于以下用途时，本公司不做任何保证。但若是本公司特意为以下用途而设计、或有过特别协商的情况下，可以用于以下用途。

a) 需要高度安全性的用途 (例：用于原子能控制设备、焚烧设备、航空・宇宙设备、铁道设备、升降设备、娱乐设备、医用机器、安全装置、或其他可能危及到生命・人身安全的用途)

b) 需要高可靠性的用途 (例：煤气・水力・电力等的供给系统、24小时连续运转系统、裁决系统、或其他牵涉到权利・财产的用途)

c) 苛刻条件或环境下的用途 (例：室外设备、易受化学污染的设备、易受电磁干扰的设备、易受震动・冲击的设备等)

d) 产品手册里未记载的条件或环境下的用途

*除上述a)~d)的记载事项，本产品手册等记载的商品不适用于机动车 (包括两轮车，以下相同)。请勿搭载于机动车上使用。机动车搭载用商品请咨询本公司销售人员。

*以上是适用条件的一部分。详情请参阅记载于本公司最新版的综合产品目录、使用手册上的保证・免责事项后再使用。

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