Cylindrical photoelectric sensor with built-in power supply in M18 housing

E3F2-240VAC

- Easy installation by compact M18 housing
- Built-in power supply, suitable for 24-240 VAC; no extra power supply needed
- Through-beam, Retro-reflective and diffuse-reflective types

勝 特 力 材 料 886-3-5753170
胜特力电子(上海) 86-21-34970699
胜特力电子(深圳) 86-755-83298787
Http://www.100y.com.tw

Ordering information

Sensing method	Sensing distance	Connection method				Order code	
						Light-ON	Dark-ON
Through-beam	3 m	–	–	2 m	–	E3F2-3Z1 2M	E3F2-3Z2 2M
Retro-reflective without M.S.R[*1]	0.1 to 2 m[*2]	–	–	2 m	–	E3F2-R2Z1-E 2M	E3F2-R2Z2-E 2M
Diffuse-reflective wide beam	0.1 m (fixed)	–	–	2 m	–	E3F2-DS10Z1-N 2M	E3F2-DS10Z2-N 2M

*1. Order reflector seperately
*2. Measured with E39-R1

Note: Standard cable length is 2 m. Models provided with a 5 m long cable are available. When ordering, specify the cable length by adapting the length of the cable (e.g. E3F2-R2Z1-E 5M). For other cable length please contact your OMRON sales representative.

Accessories (Order Separately)

Name	Sensing distance (typical)	Remark	Model
Reflectors	0.1 - 2 m	60 x 40 mm	E39-R1
	0.1 - 3 m	∅ 84 mm	E39-R7
	0.1 - 4 m	100 x 100 mm	E39-R8
Mounting Bracket		screw mount	Y92E-B18

For detailed information about Accessories, refer to the main chapter “Accessories” at the end of the document.

Specifications

Ratings / Characteristics

Item	E3F2-3Z1 E3F2-3Z2	E3F2-R2Z1 E3F2-R2Z2	E3F2-DS10Z1 E3F2-DS10Z2
Type	Through-beam	Retro-reflective without M.S.R.	Diffuse-reflective (wide-beam)
Power supply voltage	24 to 240 VAC ±10 %, 50 / 60 Hz		
Current consumption	10 mA max.	5 mA max.	
Sensing distance[*1]	3 m	0.1 to 2 m (with E39-R1)	0.1 m (5 x 5 cm white mat paper)
Detectable object	Opaque object: 11 mm min.	Opaque object: 56 mm min.	Opaque objects
Directional angle	3° to 20°		–
Differential travel	–		20 % max.
Response time	30 ms max.		
Control output	AC solid state (SCR) 200 mA max.; residual voltage: 5 V max. at 200 mA		
Power reset time	100 ms		
Ambient illumination	Incandescent lamp: 3000 lx max. Sunlight: 10000 lx max.		
Ambient temperature	Operating: -25 to 55 °C / Storage: -30 to 70 °C (with no icing or condensation)		
Ambient humidity	Operating: 35% to 85% / Storage: 35% to 95% (with no condensation)		
Insulation resistance	20 MΩ min. at 500 V DC between energized parts and case		
Dielectric strength	1500 VAC, 50 / 60 Hz for 1 min between energized parts and case		
Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude for 2 hrs each direction (X, Y, Z)		
Shock resistance	500 m/sqr (approx. 50 g) for each direction (X, Y, Z)		
Degree of protection	IEC 60529: IP66		
Light source (wave length)	Infrared LED (880 nm)		
Indicators	Light incident/power indicator for light source (red)		
Sensitivity adjustment	Fixed		
Connection method	2 m, 5 m pre-wired cable (PVC dia. 4 mm (14 / 0.15) [*2])		
Operation mode	Light-ON or Dark-ON (fixed)		
Circuit protection	None		
Weight (approx.)	110 g (pre-wired 2 m cable)		
Housing materials	Plastic (case: ABS; lens: PMMA)		

*1. For sensing distance in detail, please refer to "Engineering Data"
*2. For other cable materials (e.g. PUR) please contact your OMRON sales representative.

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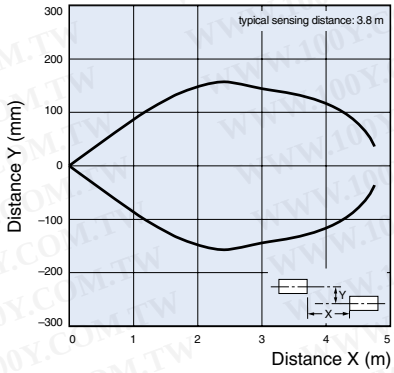
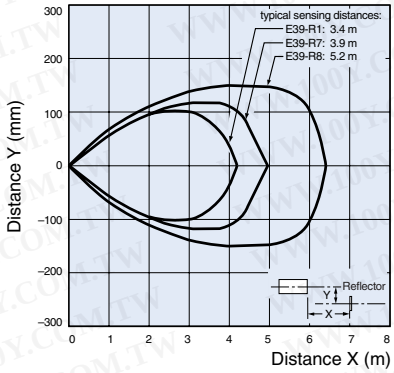
Engineering Data (Typical)

Operating Range (typical)

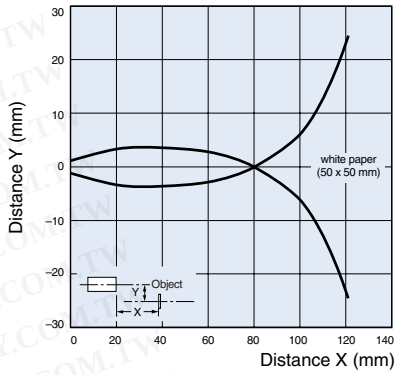
Through-beam Models
E3F2-3Z□



Retro-reflective Models
E3F2-R2Z□ (non polarizing) and reflectors

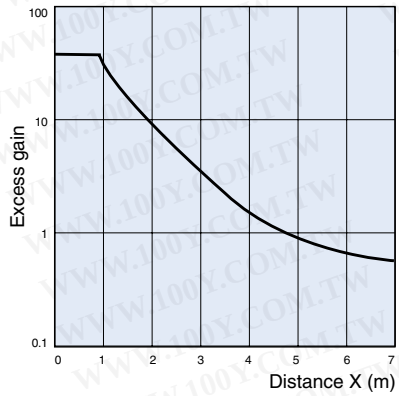


Diffuse-reflective Models
E3F2-DS10Z-□ (wide-beam type)

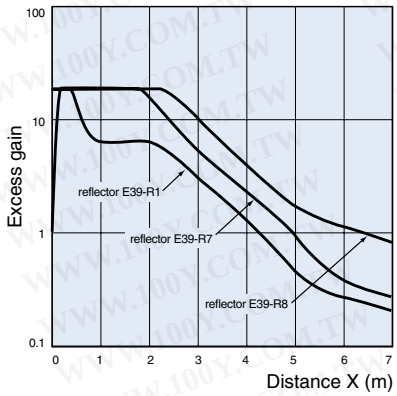


Excess Gain Ratio vs. Distance (typical)

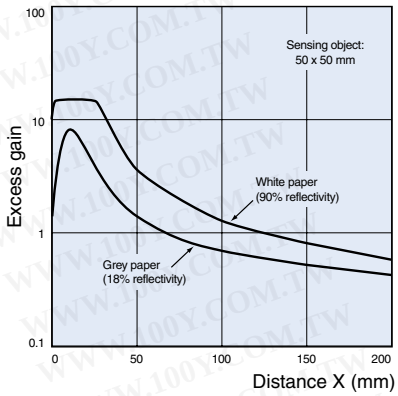
Through-beam Models
E3F2-3Z□



Retro-reflective Models
E3F2-R2Z□ (non polarizing) and reflectors

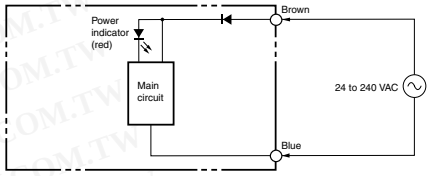
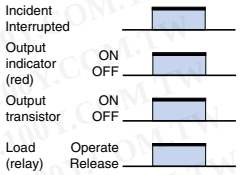
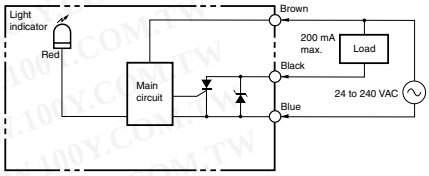
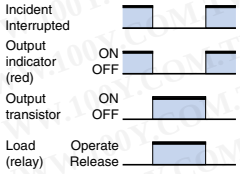


Diffuse-reflective Models
E3F2-DS10Z-□ (wide-beam type)



Operation

AC Output

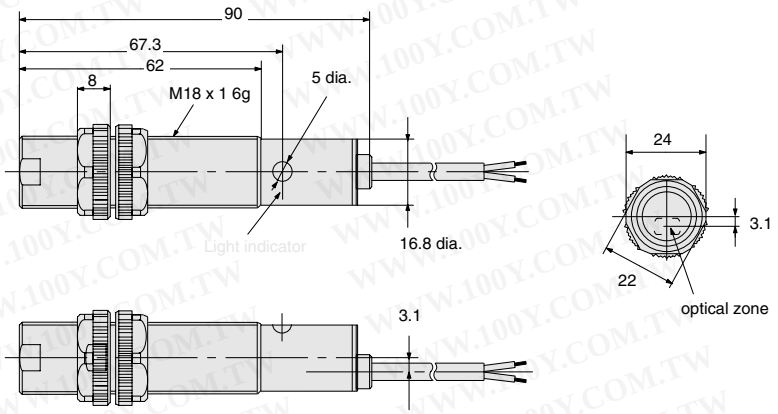
Model	Output transistor status	Timing chart	Connection method	Output circuit
E3F2-3LZ	–	–	–	Through-beam emitter 
E3F2-3Z1 E3F2-R2Z1 E3F2-DS10Z1-N	ON when light is incident. (Light-ON)		–	
E3F2-3Z2 E3F2-R2Z2 E3F2-DS10Z2-N	ON when light is interrupted. (Dark-ON)		–	

Dimensions Note: All units are in millimeters unless otherwise indicated

Cable type

Without potentiometer

E3F2-3Z□
E3F2-R2Z□
E3F2-DS10Z□-N

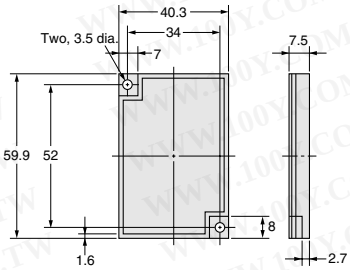


Accessories (Order Separately)

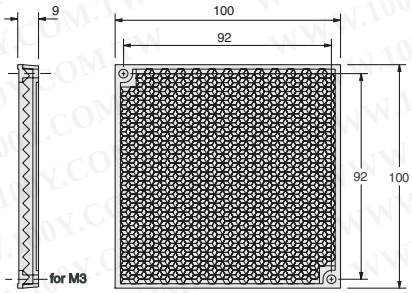
Reflectors

E39-R1
E39-R1S

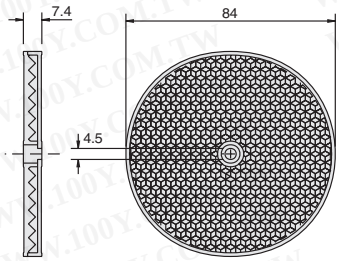
Material, reflective surface: acrylic
Rear surface: ABS



E39-R8

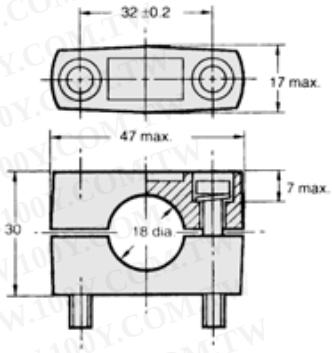


E39-R7



Installation

Mounting Bracket
Y92E-B18



Note:
Hexagon bolt: M5 x 32
Material: plastic

Safety precautions

⚠ 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

Do not use the product with voltage in excess of the rated voltage. Excess voltage may result in malfunction or fire.

When cleaning the product, do not apply a high-pressure spray of water to one part of the product. Otherwise, parts may become damaged and the degree of protection may be degraded.

High-temperature environments may result in burn injury.

Precautions for Safe Use

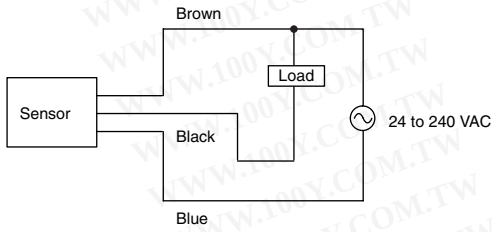
The following precautions must be observed to ensure safe operation of the Sensor.

Operating Environment

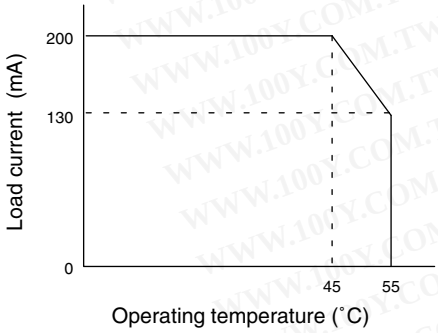
Do not use the Sensor in an environment where explosive or flammable gas is present.

Load

Do not use a load that exceeds the rated load. Do not connect the black wire to the brown wire without a load. Direct connection of these wires may damage the photoelectric sensor



When you use the photoelectric sensor at temperatures exceeding 45°C, the load current must be within the described values as shown in the figure below.



Environements with Cleaners and Disinfectants (e.g., Food Processing Lines)

Do not use the Sensor in environments subject to cleaners and disifectants. They may reduce the degree of protection.

Modifications

Do not attempt to disassemble, repair, or modify the Sensor.

Outdoor Use

Do not use the Sensor in locations subject to direct sunlight.

Cleaning

Do not use thinner, alcohol, or other organic solvents. Otherwise, the optical properties and degree of protection may be degraded.

Surface Temperature

Burn injury may occur. The Sensor surface temperature rises depending on application conditions, such as the surrounding temperature and the power supply voltage. Use caution when operating or washing the Sensor.

Precautions for Correct Use

Do not use the Sensor in any atmosphere or environment that exceeds the ratings.

Do not install the Sensor in the following locations.

(1) Locations subject to direct sunlight
(2) Locations subject to condensation due to high humidity
(3) Locations subject to corrosive gas
(4) Locations where the Sensor may receive direct vibration or shock

Connecting and Mounting

(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 induction. As a general rule, wire the Sensor in a separate conduit or use shielded cable.
(2) Do not pull on the cable with excessive force.
(3) Do not subject the photoelectric sensor to excessive shock when mounting, in keeping with IP66 standards.
(4) Mount the Sensor using a bracket (sold separately). Do not exceed a torque of 2.0 Nm when tightening mounting nuts.

Cleaning

Never use thinner or other solvents. Otherwise, the Sensor surface may be dissolved.

Water Resistance

Do not use the Sensor in water, rainfall, or outdoors.

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- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

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Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

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2009.6

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Industrial Automation Company

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