

# OMRON                      Type    E3D

## AC 2-Wire Photoelectric Switch

### Instruction Manual

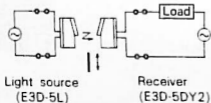
This manual primarily describes precautions required in installing, wiring and handling the Type E3D AC 2-Wire Photoelectric Switch.  
 When using the AC 2-wire photoelectric switch, please refer to the following.

## 1. Precautions

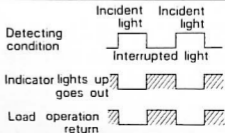
### 1.1 Connection and load operation

#### Connection diagram

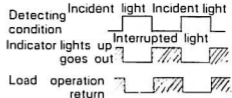
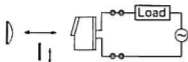
E3D-5Y2 (Transmission type)



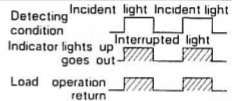
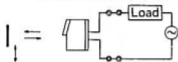
#### Load operation



E3D-R3Y2 (Retroreflective type)



E3D-DS50Y1 (Defused reflective type)



## 1.2 Notes on connection

(a) When feeding power supply directly to the photoelectric switch without any load, a fuse blows. Loads should be connected without fail. However, the light source E3D-5L is excepted. A replacement fuse should be  $\phi 5.2 \times 20$  1A.

(b) In case of a very little load

Even if the photoelectric switch is OFF, a current (leakage current) flows. Therefore, in case of a very little load current, care should be taken because faulty reset (in relay, etc.) may occur by increasing the residual voltage of load. (For the details, refer to the catalog.)

(c) In case of high making current

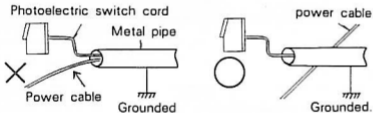
High making current loads-lamp, motor, etc.-deteriorates or damages switching element.

In this case, connect load through relay.

(d) The terminal screw is M3.5. Securely make a connection by means of the solderless terminal.

(e) The length of cord can be up to 200m.

### 1.3 Wiring



When passing near the photoelectric switch cord, a power line should be covered individually with a pipe to avoid the influence of surge or noises.

Avoid wiring through the same pipe.

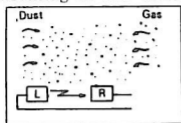
Use cords 9 to 10 mm in outer diameter to maintain water proofness.

The following vinyl cabtyre cable(JIS C 3312) is recommended.

Wire core	Nominal cross sectional area	Outer diameter
2-core	0.75mm <sup>2</sup>	φ 9
	1.25mm <sup>2</sup>	φ 10

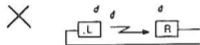
## 1.4 Ambient atmosphere (mounting place)

When mounting in the following places, it may cause malfunction.



Note) L...light source  
R...receiver

- (1) Where it is dusty.
- (2) Where any corrosive gas is present.
- (3) Where it is subject to vibration or impact.
- (4) Where it is possibly splashed with water, oil or chemicals.



## 1.5 Optical axis adjustment and sensitivity adjustment

Transmission type E3D-5Y2

Swing the receiver and light source in all directions and fix them at the center of range in which the indicator lights out.

Retroreflective type E3D-R3Y2

Adjust the reflector and light source and receiver in the same way for the transmission type.

Defused reflective type E3D-DS50Y1

(a) To get scale A

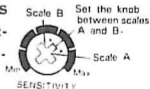
The scale in which the indicator goes out when decreasing the sensitivity adjustment knob gradually from maximum in the state of having removed detecting objects. Maximum scale when the indicator does not light even if the sensitivity adjustment knob is set at maximum.

(b) To get scale B

The scale in which the indicator light when increasing the sensitivity adjustment knob gradually from minimum setting detecting objects to the fixed position.

(c) Setting

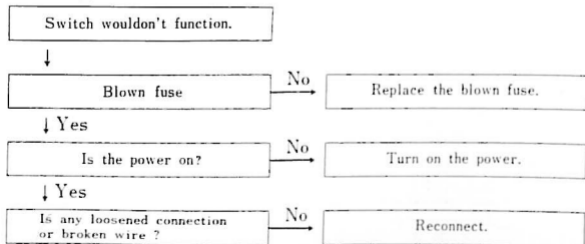
Set the knob between scales A and B. When the difference between scales A and B is more than 2 graduations, it is safe. When the difference between these scales is less than 2 graduations, keep out external factors — changeable detecting position, a variation of temperature, etc.



- Notes: 1. Do not turn the sensitivity adjusting knob excessively. It may be damaged.  
2. After adjusting the sensitivity, be sure to tighten up the cover to keep the adjusting knob waterproof.

## 2. Maintenance and Inspection

- 2.1 Keep the variation of supply voltage within operating supply voltage (AC 90~264V).
- 2.2 Set ambient temperature in operation within the range of  $-10\sim+55^{\circ}\text{C}$ .
- 2.3 Check if the fittings are free from looseness, unsteadiness; due to vibrations, shocks, etc.
- 2.4 When the switch does not work or return, check the following.



↓ Yes

Load voltage is more than operating one.

No

Increase supply voltage.

↓ Yes

Load trouble or faulty connection

No

Replace load and connect.

↓ Yes

Sufficient detecting objects

No

Use larger detecting objects or select a proper photoelectric switch.

Switch wouldn't be reset.

↓

Is the ambient temperature less than 55°C.

No

Set ambient temperature to less than 55°C.

↓ Yes

Sufficient distance between photoelectric switches

No

Keep them apart sufficiently. (Refer to the catalog.)

↓ Yes

Strong lights such as sun light, etc. are entered.

No

Interrupt strong lights or change setting places.

### 3. Type and rating

Item \ Type	E3D-5Y2		E3D-R3Y2	E3D-DS50Y1
Detection	Transmission		Retroreflection	Defused reflection
Detecting distance(m)	5		0.3~3	0.5
Standard detecting object	Opaque material24mm		Opaque material56mm	White mat paper 10×10cm
Angular response	Angle	Horizontal	Vertical	Main body 1.5~5° Reflecting plate OER-06 more than 40°
	Light source	5~20°	8~30°	
	Receiver	2~6°	5~15°	
	Note:Vertical/Horizontal=1:1			
Distance differential	—			Less than 20%
Supply voltage(V)	AC 100~240V±10%			50/60Hz
Current consumption(mA)	1 (light source 5)		1.5	
Response time	Less than 30ms			
Power reset time	Less than 200ms			
Dielectric strength	AC 2000V 50/60 Hz 1 minute			
Insulation resistance	More than 20 Mohm			
Control output	Switching current 5~200mA Residual voltage less than 10V Short-circuit protection fuse method			
Ambient operating temperature, humidity	-10~+55°C			35~85%
Ambient operating illumination	Less than 10000lx			Less than 3000 lx



## 4. External dimensions

