

### Universal AC/DC Photoelectric Sensor with Built-in Timer

- Easy-to-wire terminal block
- Built-in timer offers selectable ON-delay, OFF-delay and one-shot
- Relay or transistor output models
- Polarized, through-beam and diffuse models
- Light-ON/Dark-ON operation switch selectable



## Ordering Information

### ■ SENSORS WITHOUT TIMER

| Method of detection |                | Through-beam        | Polarized retroreflective | Diffuse reflective    |
|---------------------|----------------|---------------------|---------------------------|-----------------------|
| Sensing distance    |                | 10 m (32.8 ft)      | 4 m (13.1 ft)             | 70 cm (2.3 ft)        |
| Output type         | Relay          | <b>E3JM-10M4-US</b> | <b>E3JM-R4M4-US</b>       | <b>E3JM-DS70M4-US</b> |
|                     | NPN transistor | <b>E3JM-10S4-US</b> | <b>E3JM-R4S4-US</b>       | <b>E3JM-DS70S4-US</b> |
|                     | PNP transistor | <b>E3JM-10R4-US</b> | <b>E3JM-R4R4-US</b>       | <b>E3JM-DS70R4-US</b> |

### ■ SENSORS WITH BUILT-IN TIMER

| Method of detection |                | Through-beam         | Polarized retroreflective | Diffuse reflective     |
|---------------------|----------------|----------------------|---------------------------|------------------------|
| Sensing distance    |                | 10 m (32.8 ft)       | 4 m (13.1 ft)             | 70 cm (2.3 ft)         |
| Output type         | Relay          | <b>E3JM-10M4T-US</b> | <b>E3JM-R4M4T-US</b>      | <b>E3JM-DS70M4T-US</b> |
|                     | NPN transistor | <b>E3JM-10S4T-US</b> | <b>E3JM-R4S4T-US</b>      | <b>E3JM-DS70S4T-US</b> |
|                     | PNP transistor | <b>E3JM-10R4T-US</b> | <b>E3JM-R4R4T-US</b>      | <b>E3JM-DS70R4T-US</b> |

### ■ ACCESSORIES

| Description  | Part number    |
|--|----------------|
| Mounting bracket for E39-R1 reflector                              | <b>E39-L7</b>  |
| Small reflector for retroreflective sensors                        | <b>E39-R3</b>  |
| Glass-bead reflector with tape backing for retroreflective sensors | <b>E39-RSB</b> |

### ■ REPLACEMENT PARTS

| Description                                       | Part number    |
|---|----------------|
| Mounting bracket (supplied with each sensor)      | <b>E39-L53</b> |
| Reflector (supplied with retroreflective sensors) | <b>E39-R1</b>  |

# Specifications

|                                |                                  |  |   |   |
|--------------------------------|----------------------------------|--|---|---|
| Part number                    |                                  | E3JM-10□4□-US  | E3JM-R4□4□-US   | E3JM-DS70□4□-US   |
| Method of detection            |                                  | Through-beam   | Polarized retroreflective   | Diffuse reflective  |
| Supply voltage                 |                                  | 24 to 240 VAC ±10%, 50/60 Hz<br>12 to 240 VDC, 10% max. ripple peak-to-peak  |   |   |
| Current consumption            |                                  | Emitter: 1 W max.<br>Receiver: 2 W max.  | 2 W max.  | 2 W max.  |
| Sensing distance               |                                  | 10 m (32.8 ft)   | 4 m (13.1 ft) with E39-R1 reflector (supplied)  | 70 cm (2.3 ft) with 20 x 20 cm (7.9 x 7.9 in) white mat paper |
| Light source                   |                                  | Infrared LED   | Polarized red LED   | Infrared LED  |
| Detectable object type         |                                  | Opaque, 16 mm (0.63 in) minimum  | Opaque, 56 mm (2.2 in) minimum with E39-R1  | Opaque and translucent  |
| Operation mode                 |                                  | Light-ON/Dark-ON, switch selectable  |   |   |
| Sensitivity adjustment         |                                  | Fixed  | Fixed   | Adjustable  |
| Mutual interference protection |                                  | Not provided   |   |   |
| Control output                 | Contact                          | Type   | SPDT relay (E3JM-□□M4□-US)  |   |
|                                |                                  | Max. load  | 3 A, 250 VAC maximum (p.f. = 1)   |   |
|                                |                                  | Min. load  | 10 mA, 5 VDC minimum  |   |
|                                |                                  | Response time  | 30 ms for ON, 30 ms for OFF (models without timer)<br>0.1 to 5 sec (adjustable) ON-delay, OFF-delay or one-shot (models with timer) |   |
|                                | DC solid-state                   | Type   | NPN open collector solid-state output (E3JM-□□S4□-US)<br>PNP open collector solid-state output (E3JM-□□R4□-US)                      |   |
|                                |                                  | Max. load  | 100 mA, 48 VDC max.   |   |
|                                |                                  | Max. ON-state voltage drop   | 2 V max.  |   |
|                                |                                  | Response time  | 5 ms max. (models without timer)<br>0.1 to 5 seconds (adjustable) ON-delay, OFF-delay or one-shot (models with timer)               |   |
| Timing functions               | Type                             | ON-delay, OFF-delay, and one-shot; switch selectable (E3JM-□□□□4T-US)  |   |   |
|                                | Range                            | 0.1 to 5 seconds   |   |   |
| Circuit protection             | Output short-circuit             | Provided on DC solid-state output models (E3JM-□□R4□-US and E3JM-□□S4□-US)   |   |   |
|                                | DC power supply reverse polarity | Not provided   |   |   |
| Indicators                     |                                  | Light Incident (red LED) on models without timer (E3JM-□□□□4-US)<br>Output Operation (red LED) on models with timer (E3JM-□□□□4T-US) |   |   |
| Materials                      | Lens                             | Plastic, PMMA  |   |   |
|                                | Case                             | Plastic, ABS base/PMMA cover   |   |   |
| Mounting                       |                                  | Two side mount through hole or mounting bracket E39-L53 (supplied)   |   |   |
| Connections                    | Conduit                          | 1/2-14 NPT; use 5-conductor cable of 6 to 8 mm (0.24 to 0.32 in) OD  |   |   |
| Weight                         |                                  | Emitter: 110 g (3.9 oz.)<br>Receiver: 130 g (4.6 oz.)  | 130 g (4.6 oz.)   | 130 g (4.6 oz.)   |
| Enclosure ratings              | UL                               | —  |   |   |
|                                | NEMA                             | —  |   |   |
|                                | IEC 144                          | IP66   |   |   |
| Approvals                      | UL                               | Recognized, File Number E41515   |   |   |
|                                | CSA                              | Certified, File Number LR45951   |   |   |
| Ambient temperature            | Operating                        | -25° to 55°C (-13° to 131°F)   |   |   |
|                                | Storage                          | -30° to 70°C (-22° to 158°F)   |   |   |

■ OUTPUT CIRCUIT DIAGRAMS

Relay Output (E3JM-□□M4□-US)



NPN Transistor Output (E3JM-□□S4□-US)

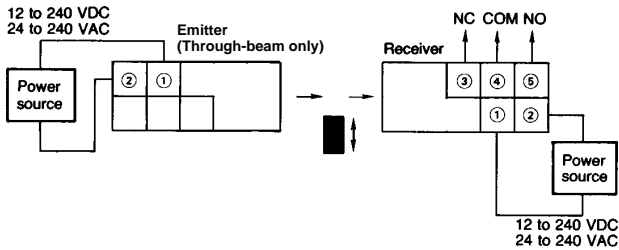


PNP Transistor Output (E3JM-R4□-US)



■ CONNECTIONS

Through-beam type



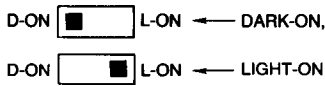
■ TIMING CHARTS

Sensors without Timer

Switch configuration



Switch setting



Timing chart



Sensor with Timer

The timing function cannot be disabled. Allow a minimum 0.1 sec. delay in response time if set for ON-delay.

Switch configuration



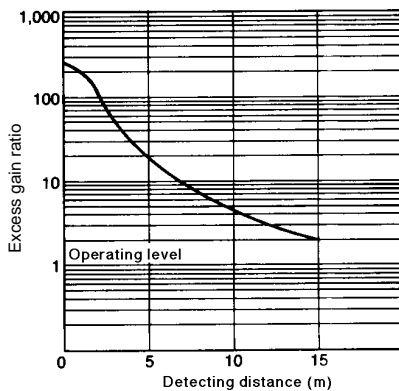
Timer chart and switch setting

|  |  |                        |                         |                              |
|--|--|------------------------|-------------------------|------------------------------|
| <p><b>Timer mode setting</b></p>   |  | <p><b>ON-delay</b></p> | <p><b>OFF-delay</b></p> | <p><b>One-shot delay</b></p> |
| <p><b>Light</b></p> <p><b>Light-ON operation mode</b></p> <p><b>Dark-ON operation mode</b></p> | <p><b>Incident Interrupted</b></p> <p><b>Output (NO circuit)</b></p> <p>ON OFF</p> <p>ON OFF</p> |                        |                         |                              |

Engineering Data

■ EXCESS GAIN

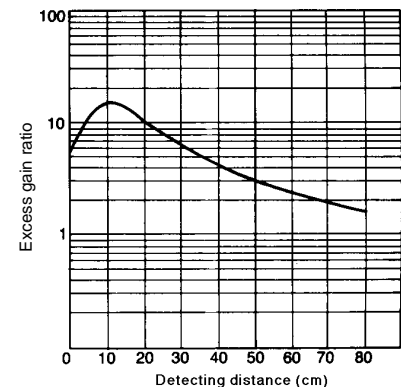
Through-beam type  
E3JM-10□□4□-US



Retroreflective type  
E3JM-R4□□4□-US



Diffuse reflective type  
E3JM-DS70□□4□-US



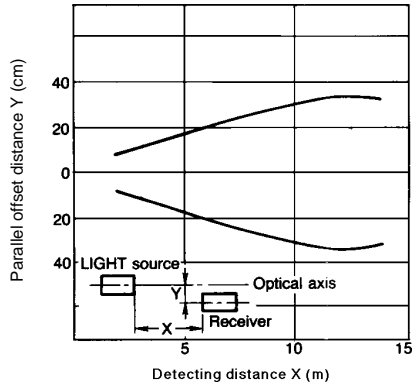
**Excess Gain (continued)**

Retroreflective with Optional reflectors E39-R3 and E39-RSB

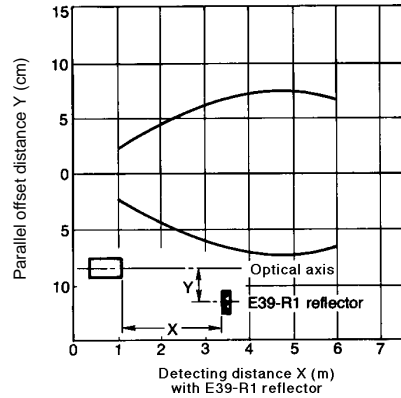


**OPERATING RANGE**

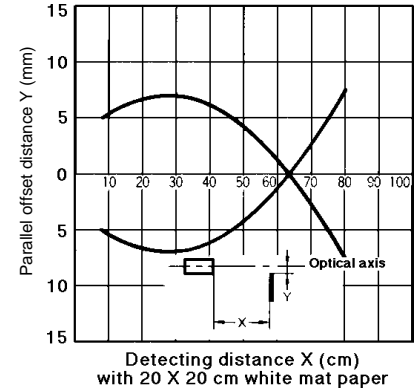
Through-beam type



Retroreflective type



Diffuse reflective type

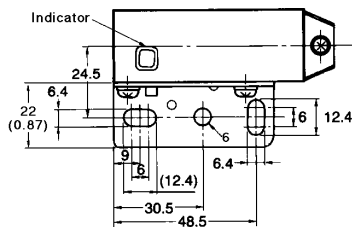
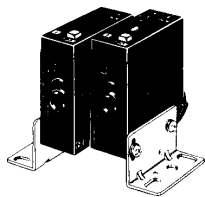


**Dimensions**

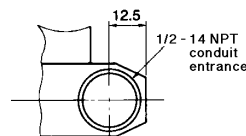
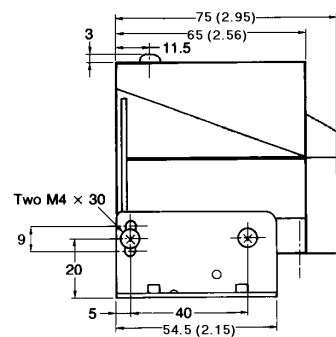
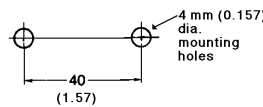
Unit: mm (inch)

**THROUGH-BEAM TYPE**

E3JM-10□4□-US



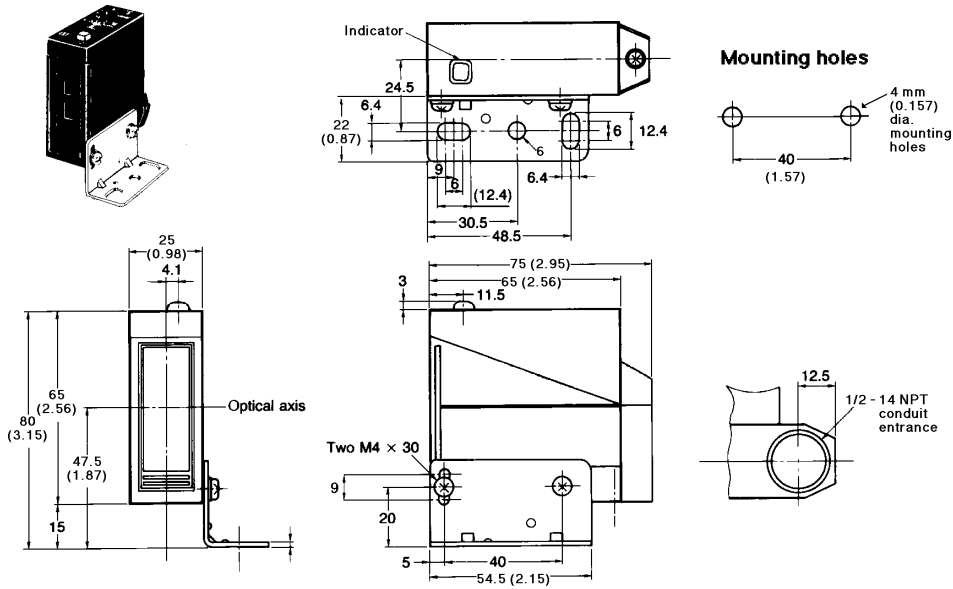
Mounting holes



**DIMENSIONS (continued)**

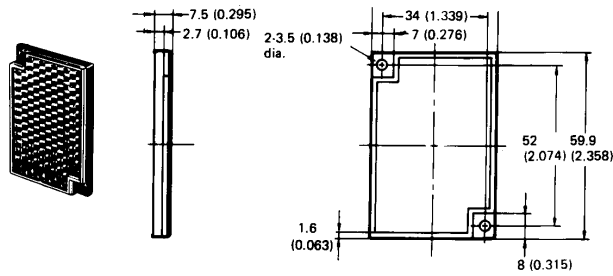
**REFLECTIVE TYPES**

E3JM-R4□4□-US,  
E3JM-DS70□4□-US

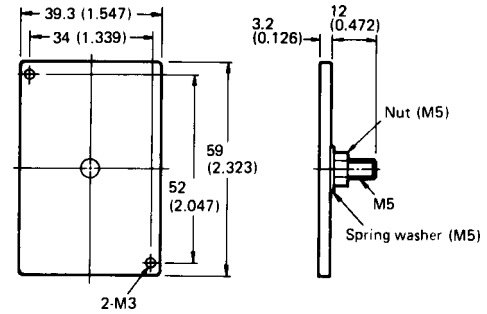


**ACCESSORIES**

**E39-R1 Reflector (supplied with retroreflective sensors)**



**E39-L7 Mounting bracket for E39-R1 reflector**

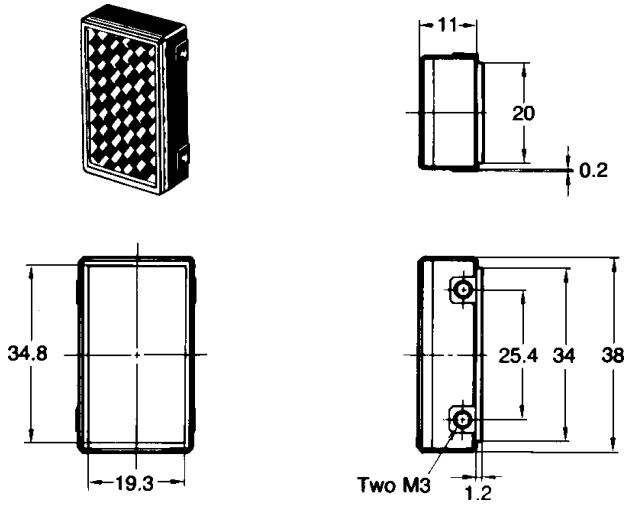


■ OPTIONAL REFLECTORS

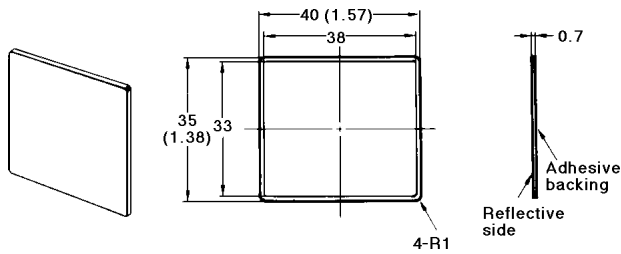
The following optional reflectors for polarized retroreflective sensors provide space saving installation.

E39-R3 Small reflector

| Reflector                       | E39-R3 small    | E39-RSB glass bead               |
|---------------------------------|-----------------|----------------------------------|
| Detecting distance with E3JM-R4 | 3.5 m (11.5 ft) | 25 cm to 1 m 9.8 in. to 3.28 ft. |



E39-RSB Glass Bead, adhesive back reflector





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