

## Plug-in Base, Long Range Sensor

## E3B2

Plug-in Terminal for Easy Maintenance and Installation

- Universal AC/DC supply voltage
- Replace sensing head without rewiring
- Detect shiny objects with polarized retroreflective type
- Long-range diffuse reflective sensors detect dark objects at long distances
- Built-in ON- and OFF-delay timers available
- Switch selectable light-on/dark-on operation
- Mutual interference protection
- Ready-to-use: includes 3 A relay, mounting bracket and reflector for retroreflective types



## Ordering Information

### ■ SENSORS

| Method of detection |                          |               | Retroreflective        |                      | Diffuse reflective     | Long-range diffuse      |
|---------------------|--------------------------|---------------|------------------------|----------------------|------------------------|-------------------------|
| Light source        |                          |               | Polarized IR           | Non-polarized IR     | Non-polarized IR       |                         |
| Sensing distance    |                          |               | 5 m (16.40 ft)         | 7 m (22.97 ft)       | 2 m (6.56 ft)          | 3 m (9.84 ft)           |
| Part number         | Without timers           |               | <b>E3B2-R5M4-US</b>    | <b>E3B2-R7M4-US</b>  | <b>E3B2-D2M4-US</b>    | <b>E3B2-D2M4-US-N</b>   |
|                     | ON- and OFF-delay timers | (0.5 to 20 s) | <b>E3B2-R5M4D-US</b>   | <b>E3B2-R7M4D-US</b> | <b>E3B2-D2M4D-US</b>   | —                       |
|                     |                          | (0.05 to 5 s) | <b>E3B2-R5M4D-US-3</b> | —                    | <b>E3B2-D2M4D-US-3</b> | <b>E3B2-D2M4-US-N-3</b> |

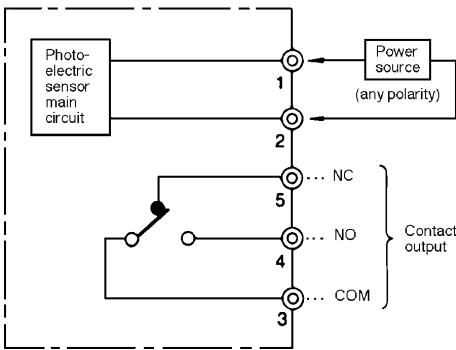
### ■ REPLACEMENT PARTS

| Description                                      | Part number    |
|--------------------------------------------------|----------------|
| Reflector (supplied with retroreflective sensor) | <b>E39-R2</b>  |
| Mounting bracket (supplied with each sensor)     | <b>E39-L35</b> |

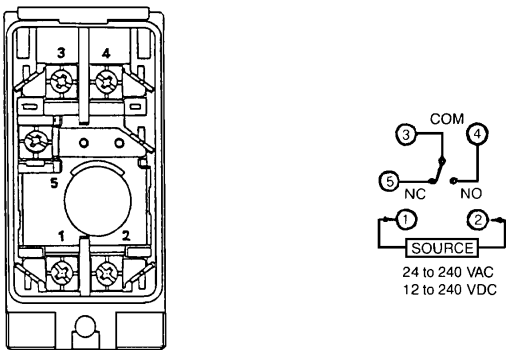
# Specifications

|                                |                                  |                                                                                                                              |                                                                                    |                                                                            |                                                                                |                    |
|--------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------|
| Part number                    |                                  |                                                                                                                              | E3B2-R5M4□-US-□                                                                    | E3B2-R7M4□-US                                                              | E3B2-D2M4□-US-□                                                                | E3B2-D2M4□-US-N-□  |
| Method of detection            |                                  |                                                                                                                              | Retroreflective                                                                    |                                                                            | Diffuse reflective                                                             | Long-range diffuse |
| Supply voltage                 |                                  |                                                                                                                              | 24 to 240 VAC, 50/60 Hz; 12 to 240 VDC                                             |                                                                            |                                                                                |                    |
| Power consumption              | AC operation                     | 2 VA max.                                                                                                                    |                                                                                    |                                                                            |                                                                                |                    |
|                                | DC operation                     | 1.5 W max.                                                                                                                   |                                                                                    |                                                                            |                                                                                |                    |
| Sensing distance               |                                  | 5 m (16.40 ft) with E39-R2 reflector (included)                                                                              | 7 m (22.97 ft) with E39-R2 reflector (included)                                    | 2 m (6.56 ft) with 30x30 cm (11.8x11.8 in) 90% reflectance white mat paper | 3 m (9.84 ft) with 30 x 30 cm (11.8 x 11.8 in) 90% reflectance white mat paper |                    |
| Light source                   |                                  | Pulse modulated infrared LED, polarized                                                                                      | Pulse modulated infrared LED                                                       |                                                                            |                                                                                |                    |
| Detectable object type         |                                  | Shiny and opaque materials, 80 mm (3.15 in) minimum dimension                                                                | Opaque materials, 80 mm (3.15 in) minimum dimension                                | Opaque and transparent materials                                           |                                                                                |                    |
| Operation mode                 |                                  | Light-ON/Dark-ON, switch selectable                                                                                          |                                                                                    |                                                                            |                                                                                |                    |
| Sensitivity                    |                                  | Adjustable                                                                                                                   |                                                                                    |                                                                            |                                                                                |                    |
| Mutual interference protection |                                  | Provided                                                                                                                     |                                                                                    |                                                                            |                                                                                |                    |
| Control output                 | Relay                            | Type                                                                                                                         | SPDT (Form 1C)                                                                     |                                                                            |                                                                                |                    |
|                                |                                  | Max. load                                                                                                                    | 3 A, 250 VAC, (p.f.=1)                                                             |                                                                            |                                                                                |                    |
|                                |                                  | Min. load                                                                                                                    | 10 mA, 5 VDC                                                                       |                                                                            |                                                                                |                    |
| Response time                  | On                               | Without timer                                                                                                                | 30 ms max. (E3B2-□□M4-US-□)                                                        |                                                                            |                                                                                |                    |
|                                |                                  | With timer                                                                                                                   | 0.5 to 20 seconds, adjustable (E3B2-□□M4D-US); 0.05 to 0.5 sec (E3B2-□□M4D-US-□-3) |                                                                            |                                                                                |                    |
|                                | Off                              | Without timer                                                                                                                | 30 ms max. (E3B2-□□M4-US-□)                                                        |                                                                            |                                                                                |                    |
|                                |                                  | With timer                                                                                                                   | 0.5 to 20 seconds, adjustable (E3B2-□□M4D-US); 0.05 to 0.5 sec (E3B2-□□M4D-US-□-3) |                                                                            |                                                                                |                    |
| Timing functions               |                                  | Type                                                                                                                         | Independent ON-delay and OFF-delay (E3B2-□□M4D-US)                                 |                                                                            |                                                                                |                    |
|                                |                                  | Range                                                                                                                        | 0.5 to 20 seconds                                                                  |                                                                            |                                                                                |                    |
| Circuit protection             | Output short-circuit             |                                                                                                                              | Not provided                                                                       |                                                                            |                                                                                |                    |
|                                | DC power supply reverse polarity |                                                                                                                              | Provided                                                                           |                                                                            |                                                                                |                    |
| Indicators                     |                                  | Light incident (red LED), output stability (green LED), and output operation (yellow LED)                                    |                                                                                    |                                                                            |                                                                                |                    |
| Materials                      | Lens cover                       |                                                                                                                              | Plastic, polycarbonate                                                             |                                                                            |                                                                                |                    |
|                                | Body/receptacle                  |                                                                                                                              | Plastic, polymethylmethacrylate (PMMA)                                             |                                                                            |                                                                                |                    |
|                                | Access cover                     |                                                                                                                              | Plastic, polycarbonate                                                             |                                                                            |                                                                                |                    |
| Mounting                       |                                  | Side surface with two through holes or bottom surface with two threaded metal inserts; bracket E39-L35 and hardware included |                                                                                    |                                                                            |                                                                                |                    |
| Connections                    | Conduit                          |                                                                                                                              | 1/2-14 NPT                                                                         |                                                                            |                                                                                |                    |
|                                | Wire                             |                                                                                                                              | Plated steel screw terminals                                                       |                                                                            |                                                                                |                    |
| Weight                         |                                  | 230 g (8.1 oz)                                                                                                               |                                                                                    |                                                                            | 200 g (7.1 oz)                                                                 |                    |
| Enclosure ratings              | UL                               |                                                                                                                              | 1                                                                                  |                                                                            |                                                                                |                    |
|                                | NEMA                             |                                                                                                                              | 1, 3, 4, 12, 13                                                                    |                                                                            |                                                                                |                    |
|                                | IEC 144                          |                                                                                                                              | IP66                                                                               |                                                                            |                                                                                |                    |
| Approvals                      | UL                               |                                                                                                                              | Listed, 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)                                                       |                                                                            |                                                                                |                    |

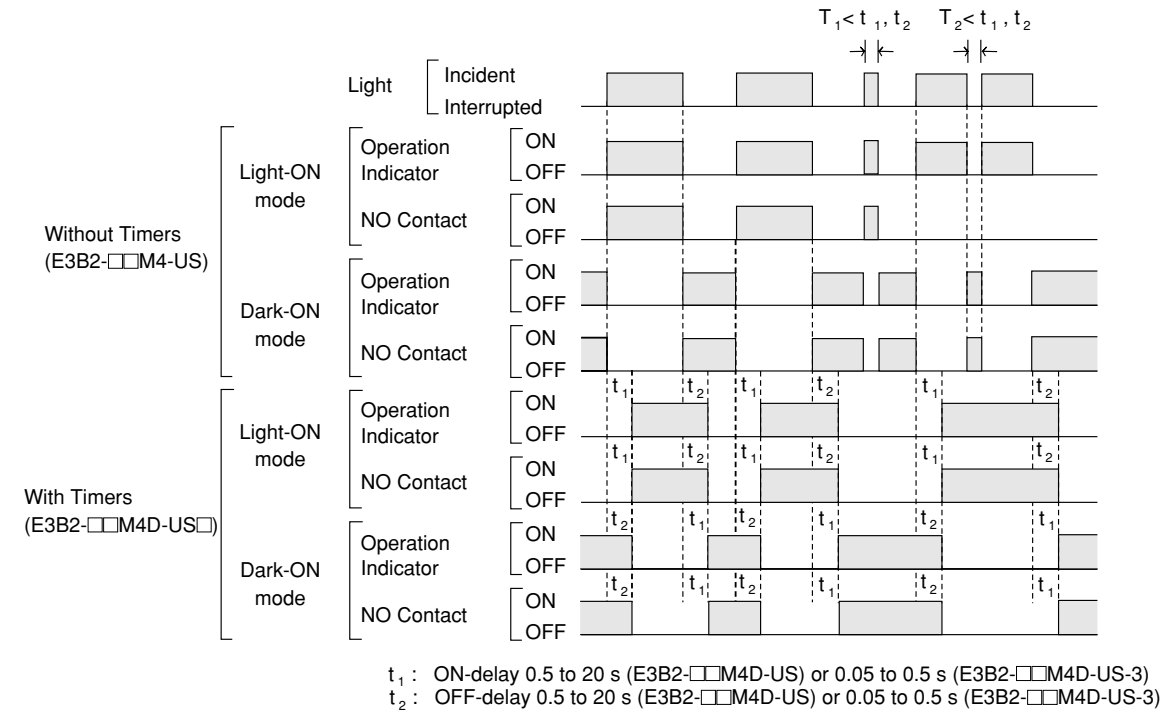
■ OUTPUT CIRCUIT DIAGRAM



■ CONNECTIONS



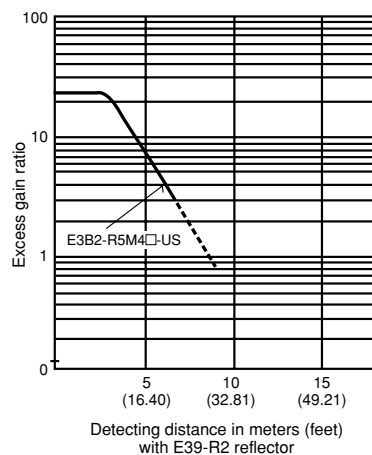
■ TIMING CHART



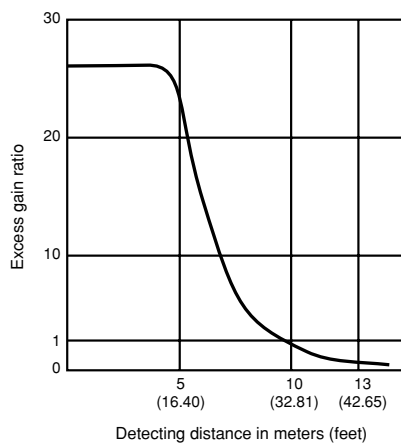
# Engineering Data

## ■ EXCESS GAIN RATIO

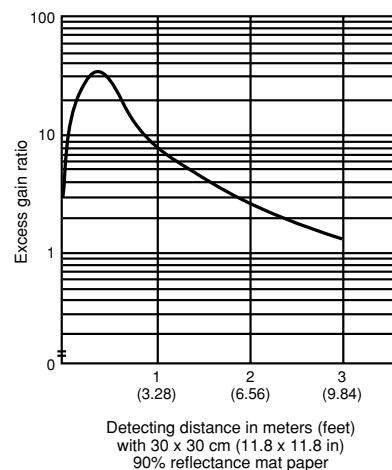
E3B2-R5M4□-US-□



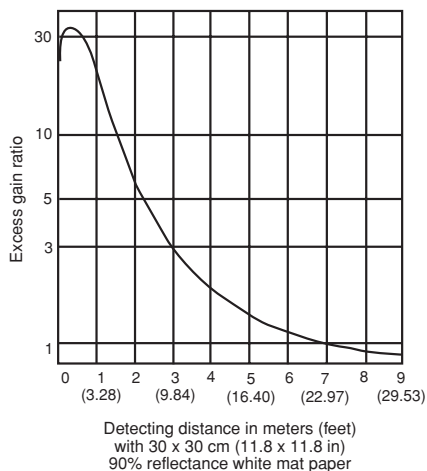
E3B2-R7M4□-US



E3B2-D2M4□US-□

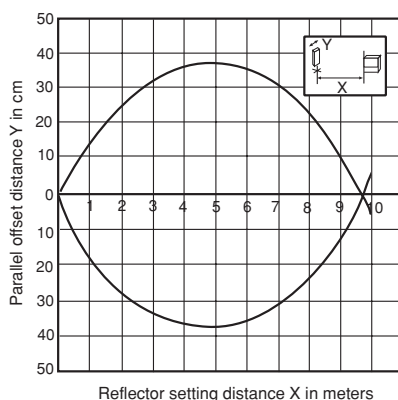


E3B2-D2M4□-US-N-□

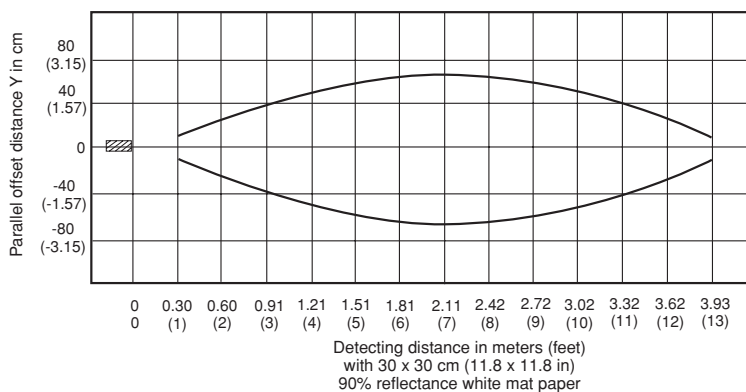


## ■ OPERATING RANGE

E3B2-R5M4□-US-□

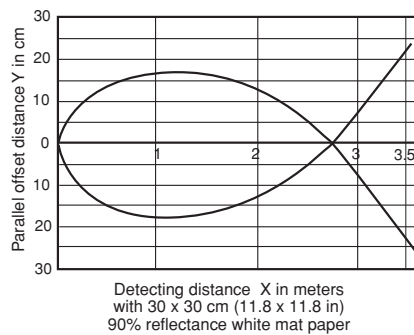


E3B2-D2M4□-US-N-□



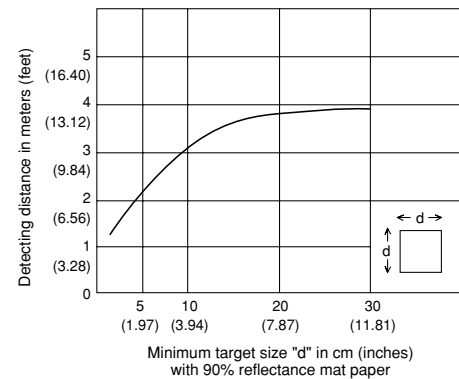
## Operating Range continued

E3B2-D2M4□-US-□



## DETECTING DISTANCE VS. MINIMUM TARGET SIZE (at maximum sensitivity)

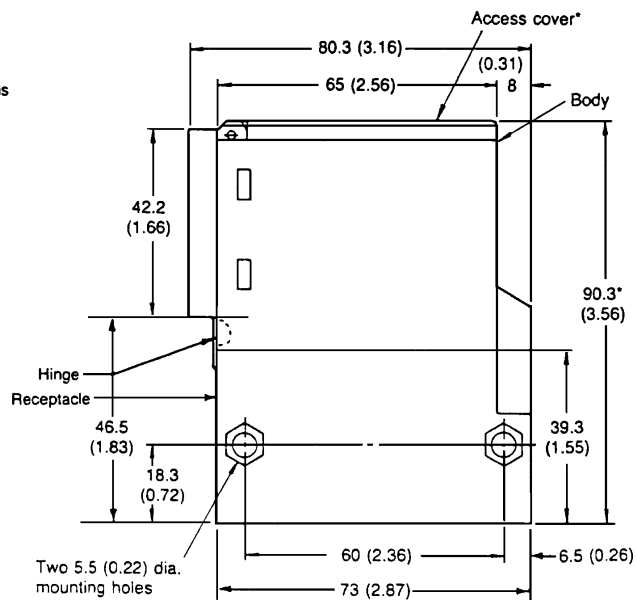
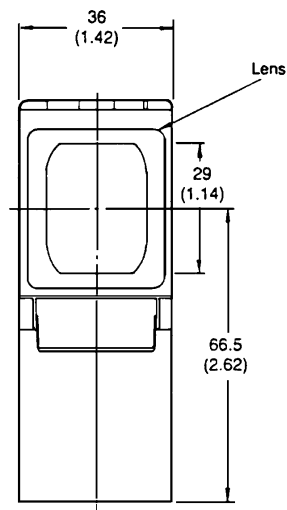
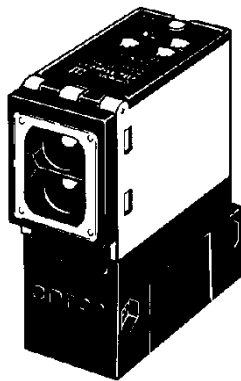
E3B2-D2M4□-US



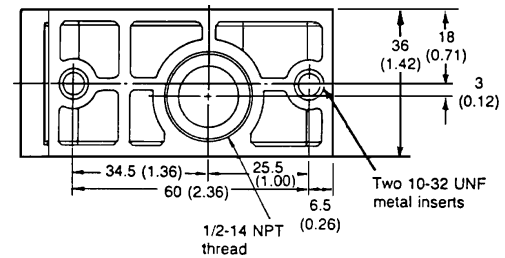
## Dimensions

Unit: mm (inch)

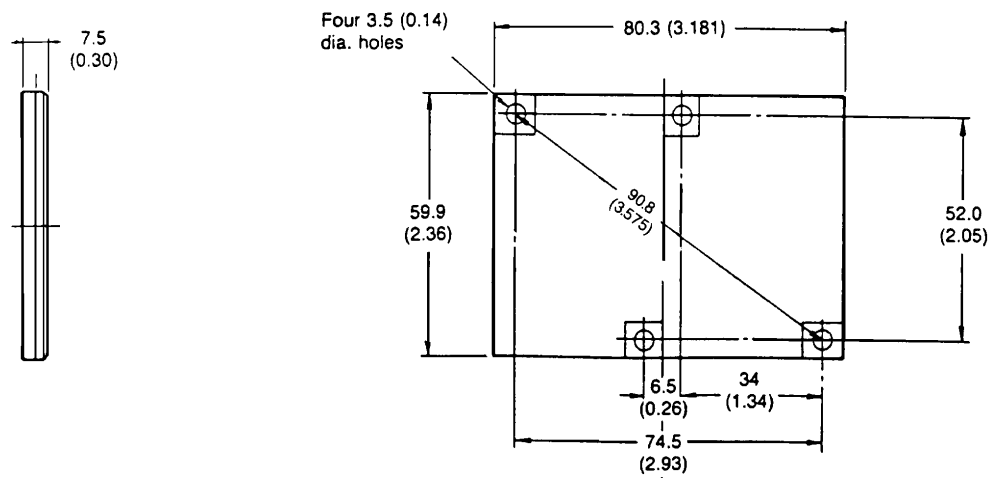
### SENSOR



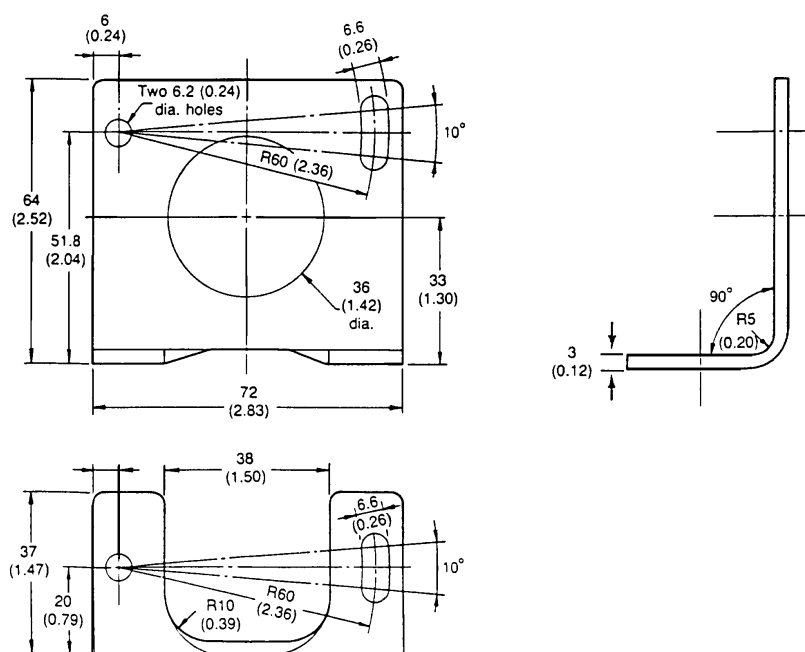
\*Allow for a total height of 150 mm (5.91 inches) to open access cover.



### ■ E39-R2 REFLECTOR (included)



### ■ E39-L35 MOUNTING BRACKET (included)



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