

## Two Models Contribute to Overall Cost Reduction

### E3JM Terminal Block Models

- Easy to wire and adjust.

### E3JK Pre-wired Models

- Slim body is economically priced and full of functions.



Be sure to read *Safety Precautions* on page 10.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

## Ordering Information

**Sensors** (Refer to *Dimensions* on page 12.)

### E3JM

Red light    Infrared light

| Sensing method                         | Appearance                                                                                               | Connection method                                                                             | Sensing distance                                                                            |                                                                                       |                                                                       | Operation mode                             | Output configuration | Functions                                                                             | Model                                                                                 |                   |
|----------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------|----------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------|
| Through-beam<br>(Emitter + Receiver) * |                       | Terminal block                                                                                | <br>10 m |                                                                                       |                                                                       | Light-ON<br>Dark-ON<br>(switch selectable) | Relay                | ---                                                                                   | <b>E3JM-10M4-N</b><br>Emitter: E3JM-10L-N<br>Receiver: E3JM-10DM4-N                   |                   |
|                                        |                                                                                                          |                                                                                               |                                                                                             |                                                                                       |                                                                       |                                            |                      |  | <b>E3JM-10M4T-N</b><br>Emitter: E3JM-10L-N<br>Receiver: E3JM-10DM4T-N                 |                   |
|                                        |                                                                                                          |                                                                                               | DC SSR                                                                                      | ---                                                                                   | <b>E3JM-10S4-N</b><br>Emitter: E3JM-10L-N<br>Receiver: E3JM-10DS4-N   |                                            |                      |                                                                                       |                                                                                       |                   |
|                                        |                                                                                                          |                                                                                               |                                                                                             |  | <b>E3JM-10S4T-N</b><br>Emitter: E3JM-10L-N<br>Receiver: E3JM-10DS4T-N |                                            |                      |                                                                                       |                                                                                       |                   |
| Retro-reflective with MSR function     | <br>E39-R1 (provided) |                                                                                               | <br>4 m  |                                                                                       |                                                                       |                                            |                      | Relay                                                                                 | ---                                                                                   | <b>E3JM-R4M4</b>  |
|                                        |                                                                                                          |                                                                                               |                                                                                             |                                                                                       |                                                                       |                                            |                      |                                                                                       |  | <b>E3JM-R4M4T</b> |
|                                        |                                                                                                          |                                                                                               | DC SSR                                                                                      | ---                                                                                   | <b>E3JM-R4S4</b>                                                      |                                            |                      |                                                                                       |                                                                                       |                   |
|                                        |                                                                                                          |                                                                                               |                                                                                             |  | <b>E3JM-R4S4T</b>                                                     |                                            |                      |                                                                                       |                                                                                       |                   |
| Diffuse-reflective                     |                       | <br>700 mm |                                                                                             |                                                                                       |                                                                       | Relay                                      |                      | ---                                                                                   | <b>E3JM-DS70M4</b>                                                                    |                   |
|                                        |                                                                                                          |                                                                                               |                                                                                             |                                                                                       |                                                                       |                                            |                      |  | <b>E3JM-DS70M4T</b>                                                                   |                   |
|                                        |                                                                                                          | DC SSR                                                                                        | ---                                                                                         | <b>E3JM-DS70S4</b>                                                                    |                                                                       |                                            |                      |                                                                                       |                                                                                       |                   |
|                                        |                                                                                                          |                                                                                               |        | <b>E3JM-DS70S4T</b>                                                                   |                                                                       |                                            |                      |                                                                                       |                                                                                       |                   |

\* Through-beam Sensors are sold in sets that include both the Emitter and Receiver.

## E3JK

| Sensing method                           | Appearance           | Connection method  | Sensing distance |                |    | Operation mode      |                     | Output configuration                                                      | Model                                                                     |                     |
|------------------------------------------|----------------------|--------------------|------------------|----------------|----|---------------------|---------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------|
| Through-beam<br>(Emitter + Receiver) *1  |                      | Pre-wired<br>(2 m) |                  | 5 m            |    | Light-ON            | Relay               | <b>E3JK-5M1-N 2M</b><br>Emitter: E3JK-5L-N 2M<br>Receiver: E3JK-5DM1-N 2M |                                                                           |                     |
|                                          |                      |                    |                  |                |    | Dark-ON             |                     | <b>E3JK-5M2-N 2M</b><br>Emitter: E3JK-5L-N 2M<br>Receiver: E3JK-5DM2-N 2M |                                                                           |                     |
|                                          |                      |                    |                  |                |    | Light-ON<br>Dark-ON | Both<br>selectable  | DC SSR                                                                    | <b>E3JK-5S3-N 2M</b><br>Emitter: E3JK-5L-N 2M<br>Receiver: E3JK-5DS3-N 2M |                     |
| Retro-reflective with MSR<br>function    |                      |                    |                  | 2.5 m<br>(3 m) | *2 |                     | Light-ON            | Relay                                                                     | <b>E3JK-R2M1 2M</b>                                                       |                     |
|                                          |                      |                    |                  |                |    |                     | Dark-ON             |                                                                           | <b>E3JK-R2M2 2M</b>                                                       |                     |
| Retro-reflective without<br>MSR function | E39-R1<br>(provided) |                    |                  | 4 m<br>(5 m)   | *2 |                     | Light-ON            | Relay                                                                     | <b>E3JK-R4M1 2M</b>                                                       |                     |
|                                          |                      |                    |                  |                |    |                     | Dark-ON             |                                                                           | <b>E3JK-R4M2 2M</b>                                                       |                     |
|                                          |                      |                    |                  |                |    |                     | Light-ON<br>Dark-ON | Both<br>selectable                                                        | DC SSR                                                                    | <b>E3JK-R4S3 2M</b> |
|                                          |                      |                    |                  |                |    |                     | Light-ON<br>Dark-ON |                                                                           |                                                                           | <b>E3JK-R4S3 2M</b> |
| Diffuse-reflective                       |                      |                    |                  | 300 mm         |    | Light-ON            | Relay               | <b>E3JK-DS30M1 2M</b>                                                     |                                                                           |                     |
|                                          |                      |                    |                  |                |    | Dark-ON             |                     | <b>E3JK-DS30M2 2M</b>                                                     |                                                                           |                     |
|                                          |                      |                    |                  |                |    | Light-ON<br>Dark-ON | Both<br>selectable  | DC SSR                                                                    | <b>E3JK-DS30S3 2M</b>                                                     |                     |

Note: UL-listed models have the -US suffix. The model number for an E3JM Through-beam Sensor ends in "-US" (and not in "-N"). (Example: E3JM-10M4-US). The model number for an E3JK Through-beam Sensor has "-US" after "-N". (Example: E3JK-5M1-N-US 2M). Tightening nuts, washers, and rubber bushings are not provided with these models.

Change: Shape of the E3JM conduit socket

Note, however, that DC-type E3JK SSR Output Models are not UL-listed.

\*1. Through-beam Sensors are sold in sets that include both the Emitter and Receiver.

\*2. Values in parentheses indicate the sensing distance when using E39-R2 Reflectors.

## Accessories (Order Separately)

**Slit** (A Slit is not provided with the Sensor for through-beam. Order a Slit separately if required.) (Refer to *Dimensions* on page 12.)

| Slit width   | Sensing distance | Minimum detect-<br>able object<br>(reference value) | Model          | Quantity                                                          | Remarks                                                                                                |
|--------------|------------------|-----------------------------------------------------|----------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 1 mm × 20 mm | E3JM-10□4(T)-N   | 1.2 m                                               | <b>E39-S39</b> | 1 Slit each for<br>the Emitter and<br>Receiver (2 Slits<br>total) | (Seal-type long slit)<br>Can be used with the E3JM-10□4(T)-N<br>and E3JK-5□□-N Through-beam<br>Models. |
|              | E3JK-5□□-N       | 0.7 m                                               |                |                                                                   |                                                                                                        |

## Reflectors (A Reflector is required for Retroreflective Sensors.)

A Reflector is provided with the E39-R1 Sensor. For other Sensors, order a Reflector separately if required. (Refer to *Dimensions* on E39-L/E39-S/E39-R.)

| Name       | Sensing distance | Model         | Quantity | Remarks                        |
|------------|------------------|---------------|----------|--------------------------------|
| Reflectors | E3JM-R4□4(T)     | <b>E39-R1</b> | 1        | Provided with the E3JM-R4□4(T) |
|            | E3JK-R2□□        |               |          | Provided with the E3JK-R2□□    |
|            | E3JK-R4□□        |               |          | Provided with the E3JK-R4□□    |

Note: Refer to *Reflectors* on E39-L/E39-S/E39-R for details.

### Mounting Bracket

Some Mounting Brackets are provided with the Sensor. Order other Mounting Brackets separately if required. (Refer to E39-L/E39-S/E39-R)

| Appearance                                                                        | Model          | Quantity | Remarks                                                                                        |
|-----------------------------------------------------------------------------------|----------------|----------|------------------------------------------------------------------------------------------------|
|  | <b>E39-L53</b> | 1        | Provided with the E3JM.                                                                        |
|  | <b>E39-L40</b> | 1        | Provided with the E3JK.                                                                        |
|  | <b>E39-L51</b> | 1        | Mounting Bracket designed for changing from the E3A-M, E3A2, E3A3, OA-5, or OA-5N to the E3JM. |

Note: 1. When using a Through-beam Sensor, order one Connector for the Receiver and one for the Emitter.  
 2. Refer to *Mounting Brackets* on E39-L/E39-S/E39-R for details.

## Ratings and Specifications

### E3JM

| Sensing method                          |                  | Through-beam model                                                                                                                                                                                             | Retro-reflective model<br>(with MSR function) | Diffuse-reflective model              |
|-----------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------|
| Item                                    | Model            | E3JM-10□4(T)-N                                                                                                                                                                                                 | E3JM-R4□4(T)                                  | E3JM-DS70□4(T)                        |
| Sensing distance                        |                  | 10 m                                                                                                                                                                                                           | 4 m (When using E39-R1)                       | White paper (200 × 200 mm):<br>700 mm |
| Standard sensing object                 |                  | Opaque: 14.8-mm dia. min.                                                                                                                                                                                      | Opaque: 75-mm dia. min.                       | ---                                   |
| Differential travel                     |                  | ---                                                                                                                                                                                                            |                                               | 20% max. of sensing distance          |
| Directional angle                       |                  | Both Emitter and Receiver 3° to 20°                                                                                                                                                                            | 1° to 5°                                      | ---                                   |
| Light source (wavelength)               |                  | Infrared LED (950 nm)                                                                                                                                                                                          | Red LED (660 nm)                              | Infrared LED (950 nm)                 |
| Power supply voltage                    |                  | 12 to 240 VDC±10%, ripple (p-p): 10% max.<br>24 to 240 VAC±10%, 50/60 Hz                                                                                                                                       |                                               |                                       |
| Power consumption                       | DC               | 3 W max. (Emitter 1.5 W max.<br>Receiver 1.5 W max.)                                                                                                                                                           | 2 W max.                                      |                                       |
|                                         | AC               | 3 W max. (Emitter 1.5 W max.<br>Receiver 1.5 W max.)                                                                                                                                                           | 2 W max.                                      |                                       |
| Control output                          |                  | Relay output (E3JM-□□M4 (T) model): SPDT, 250 VAC, 3A (cosφ=1) max., 5 VDC, 10 mA min.<br>DC SSR output (E3JM-□□S4 (T) model): 48 VDC, 100 mA max. (residual voltage: 2 V max.)<br>Light-ON/Dark-ON selectable |                                               |                                       |
| Life expectancy<br>(relay output)       | Mechanical       | 50,000,000 times min. (switching frequency: 18,000 times/h)                                                                                                                                                    |                                               |                                       |
|                                         | Electrical       | 100,000 times min. (switching frequency: 1,800 times/h)                                                                                                                                                        |                                               |                                       |
| Response time                           | Relay output     | (E3JM-□□M4 (T) models) Operate or reset: 30 ms max.                                                                                                                                                            |                                               |                                       |
|                                         | DC SSR output    | (E3JM-□□S4 (T) models) Operate or reset: 5 ms max.                                                                                                                                                             |                                               |                                       |
| Sensitivity adjustment                  |                  | ---                                                                                                                                                                                                            |                                               | One-turn adjuster                     |
| Timer function *                        |                  | ON-delay/OFF-delay/One-shot delay switch selectable<br>Delay time: 0.1 to 5 s (adjustable), only for E3JM-□□□4T                                                                                                |                                               |                                       |
| Ambient illumination<br>(Receiver side) |                  | Incandescent lamp: 3,000 lx max.                                                                                                                                                                               |                                               |                                       |
| Ambient temperature range               |                  | Operating: -25°C to 55°C, Storage: -30°C to 70°C (with no icing or condensation)                                                                                                                               |                                               |                                       |
| Ambient humidity range                  |                  | Operating: 45% to 85% (with no condensation), Storage: 35% to 95% (with no condensation)                                                                                                                       |                                               |                                       |
| Insulation resistance                   |                  | 20 MΩ min. at 500 VDC                                                                                                                                                                                          |                                               |                                       |
| Dielectric strength                     |                  | 2,000 VAC, 50/60 Hz for 1 min.                                                                                                                                                                                 |                                               |                                       |
| Vibration resistance                    | Destruction      | 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions                                                                                                                                |                                               |                                       |
|                                         | Malfunction      | 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions                                                                                                                                |                                               |                                       |
| Shock resistance                        | Destruction      | 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions                                                                                                                                                    |                                               |                                       |
|                                         | Malfunction      | 100 m/s <sup>2</sup> 3 times each in X, Y, and Z directions                                                                                                                                                    |                                               |                                       |
| Degree of protection                    |                  | IEC 60529: IP66                                                                                                                                                                                                |                                               |                                       |
| Connection method                       |                  | Terminal block                                                                                                                                                                                                 |                                               |                                       |
| Weight (packed state)                   |                  | Approx. 270 g                                                                                                                                                                                                  | Approx. 160 g                                 |                                       |
| Material                                | Case             | ABS (Acrylonitril Butadiene Styrene)                                                                                                                                                                           |                                               |                                       |
|                                         | Lens             | Methacrylic resin                                                                                                                                                                                              |                                               |                                       |
|                                         | Cover            | Polycarbonate                                                                                                                                                                                                  |                                               |                                       |
|                                         | Mounting Bracket | Iron                                                                                                                                                                                                           |                                               |                                       |
| Accessories                             |                  | Mounting Bracket (with screw), Nuts, Terminal Protection Cover, One set of cable connection nuts (excluding -US Models), Instruction manual, Reflector (E39-R1: only for Retro-reflective Sensors)             |                                               |                                       |

\* The timer cannot be disabled for models with timer functions (E3JM-□□□4T).

## E3JK

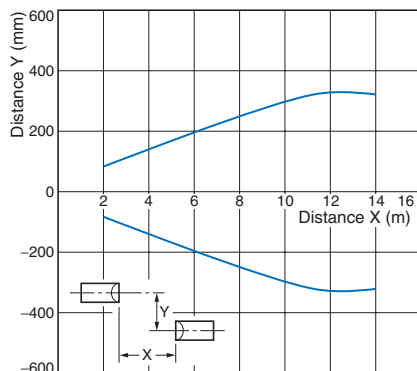
| Sensing method                       |                  | Through-beam model                                                                                 |                                                                                                                     | Retro-reflective model<br>(with MSR function)                    |                                                                                                                     | Retro-reflective model<br>(without MSR function)                 |                                                                                                                     | Diffuse-reflective model                                         |                                                                                                                     |  |
|--------------------------------------|------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--|
| Item                                 | Model            | E3JK<br>-5M□-N                                                                                     | E3JK<br>-5S3-N                                                                                                      | E3JK<br>-R2M□                                                    | E3JK<br>-R2S3                                                                                                       | E3JK<br>-R4M□                                                    | E3JK<br>-R4S3                                                                                                       | E3JK<br>-DS30M□                                                  | E3JK<br>-DS30S3                                                                                                     |  |
| Sensing distance                     |                  | 5 m                                                                                                |                                                                                                                     | 2.5 m (When using E39-R1)                                        |                                                                                                                     | 4 m (When using E39-R1)                                          |                                                                                                                     | White paper (100 × 100 mm):<br>300 mm                            |                                                                                                                     |  |
| Standard sensing object              |                  | Opaque: 14.8-mm dia. min.                                                                          |                                                                                                                     | Opaque: 75-mm dia. min.                                          |                                                                                                                     |                                                                  |                                                                                                                     | ---                                                              |                                                                                                                     |  |
| Differential travel                  |                  | ---                                                                                                |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  | 20% max. of sensing distance                                                                                        |  |
| Directional angle                    |                  | Both Emitter and Receiver 3° to 20°                                                                |                                                                                                                     | 1° to 5°                                                         |                                                                                                                     |                                                                  |                                                                                                                     | ---                                                              |                                                                                                                     |  |
| Light source (wavelength)            |                  | Infrared LED (950 nm)                                                                              |                                                                                                                     | Red LED (660 nm)                                                 |                                                                                                                     |                                                                  |                                                                                                                     | Infrared LED (950 nm)                                            |                                                                                                                     |  |
| Power supply voltage                 |                  | 12 to 240 VDC±10%, ripple (p-p): 10% max.<br>24 to 240 VAC±10%, 50/60 Hz                           |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Power consumption                    | DC               | 3 W max. (Emitter 1.5 W max. Receiver 1.5 W max.)                                                  |                                                                                                                     | 2 W max.                                                         |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
|                                      | AC               | 3 W max. (Emitter 1.5 W max. Receiver 1.5 W max.)                                                  |                                                                                                                     | 2 W max.                                                         |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Control output                       |                  | Relay output SPDT, 250 VAC, 3 A max. (cosφ= 1) 5 VDC, 10 mA min.                                   | DC SSR output, Negative: common 48 VDC, 100 mA max. Leakage current: 0.1 mA max. With load short-circuit protection | Relay output SPDT, 250 VAC, 3 A max. (cosφ= 1) 5 VDC, 10 mA min. | DC SSR output, Negative: common 48 VDC, 100 mA max. Leakage current: 0.1 mA max. With load short-circuit protection | Relay output SPDT, 250 VAC, 3 A max. (cosφ= 1) 5 VDC, 10 mA min. | DC SSR output, Negative: common 48 VDC, 100 mA max. Leakage current: 0.1 mA max. With load short-circuit protection | Relay output SPDT, 250 VAC, 3 A max. (cosφ= 1) 5 VDC, 10 mA min. | DC SSR output, Negative: common 48 VDC, 100 mA max. Leakage current: 0.1 mA max. With load short-circuit protection |  |
| Life expectancy (relay output)       | Mechanical       | 50,000,000 times min. (switching frequency: 18,000 times/h)                                        |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
|                                      | Electrical       | 100,000 times min. (switching frequency: 1,800 times/h)                                            |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Response time                        |                  | 30 ms max.                                                                                         | 10 ms max.                                                                                                          | 30 ms max.                                                       | 5 ms max.                                                                                                           | 30 ms max.                                                       | 5 ms max.                                                                                                           | 30 ms max.                                                       | 5 ms max.                                                                                                           |  |
| Sensitivity adjustment               |                  | ---                                                                                                |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  | One-turn adjuster                                                                                                   |  |
| Ambient illumination (Receiver side) |                  | Incandescent lamp: 3,000 lx max.                                                                   |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Ambient temperature range            |                  | Operating: -25°C to 55°C, Storage: -30°C to 70°C (with no icing or condensation)                   |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Ambient humidity range               |                  | Operating: 45% to 85% (with no condensation), Storage: 35% to 95% (with no condensation)           |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Insulation resistance                |                  | 20 MΩ min. at 500 VDC                                                                              |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Dielectric strength                  |                  | 1,500 VAC, 50/60 Hz for 1 min.                                                                     |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Vibration resistance                 | Destruction      | 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions                    |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
|                                      | Malfunction      | 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions                    |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Shock resistance                     | Destruction      | 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions                                        |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
|                                      | Malfunction      | 100 m/s <sup>2</sup> 3 times each in X, Y, and Z directions                                        | 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions                                                         | 100 m/s <sup>2</sup> 3 times each in X, Y, and Z directions      | 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions                                                         | 100 m/s <sup>2</sup> 3 times each in X, Y, and Z directions      | 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions                                                         | 100 m/s <sup>2</sup> 3 times each in X, Y, and Z directions      | 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions                                                         |  |
| Degree of protection                 |                  | IEC 60529 IP64                                                                                     |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Connection method                    |                  | Pre-wired (standard length: 2 m)                                                                   |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Weight (packed state)                |                  | Approx. 420 g                                                                                      |                                                                                                                     | Approx. 250 g                                                    |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Material                             | Case             | ABS (Acrylonitril Butadiene Styrene)                                                               |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
|                                      | Lens             | Methacrylic resin                                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
|                                      | Mounting Bracket | Iron                                                                                               |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |
| Accessories                          |                  | Mounting Bracket (with screws), Nuts, Instruction manual, Reflector (Retro-reflective Models only) |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |                                                                  |                                                                                                                     |  |

## Engineering Data (Reference Value)

### Parallel Operating Range

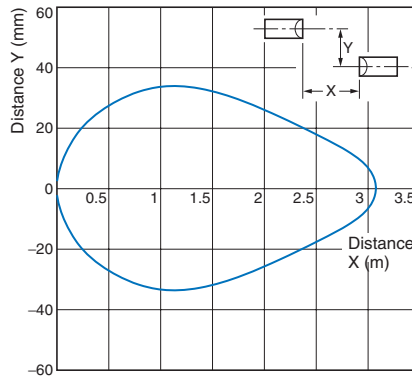
#### Through-beam

E3JM-10□4(T)-N



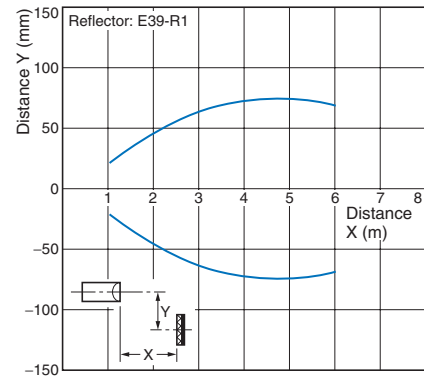
#### Through-beam

E3JM-10□4(T)-N + E39-S39 (Optional Slit)  
(A Slit is mounted to the Emitter and Receiver.)



#### Retro-reflective

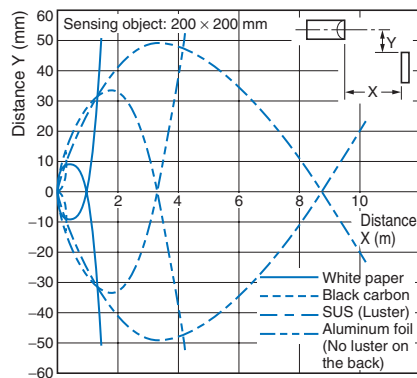
E3JM-R4□4(T) + E39-R1  
(Supplied Reflector)



### Operating Range

#### Diffuse-reflective

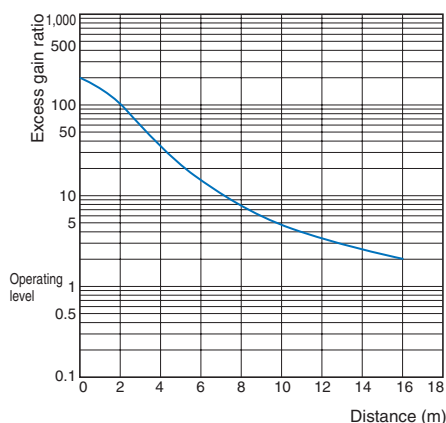
E3JM-DS70□4(T)



### Excess Gain Ratio vs. Set Distance

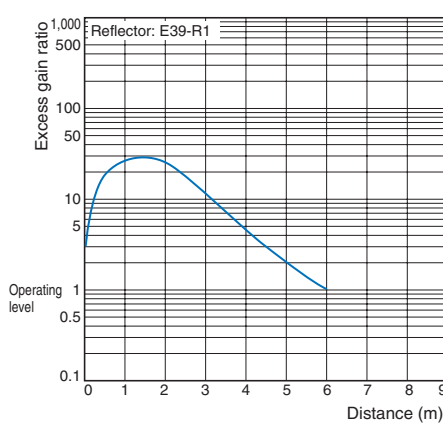
#### Through-beam

E3JM-10□4(T)-N

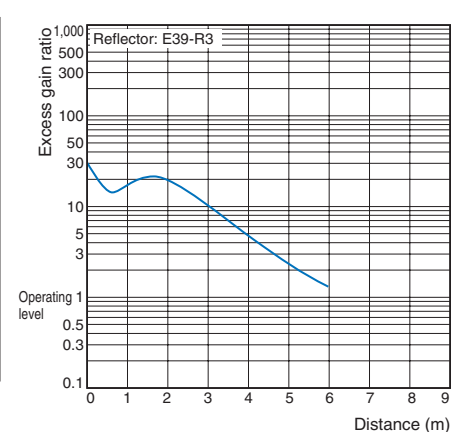


#### Retro-reflective

E3JM-R4□4(T) + E39-R1  
(Supplied Reflector)

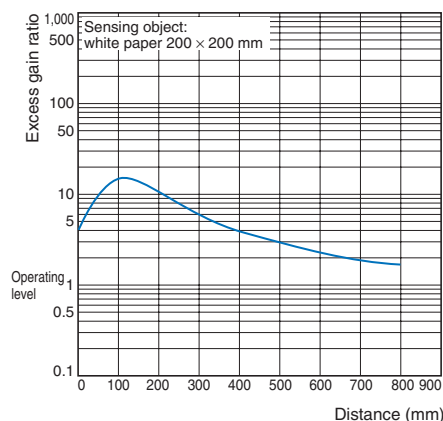


E3JM-R4□4(T) + E39-R3  
(Optional Reflector)



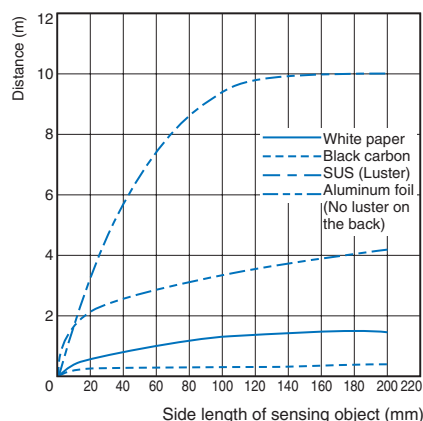
## Diffuse-reflective

### E3JM-DS70□4(T)



## Sensing Object Size vs. Sensing Distance

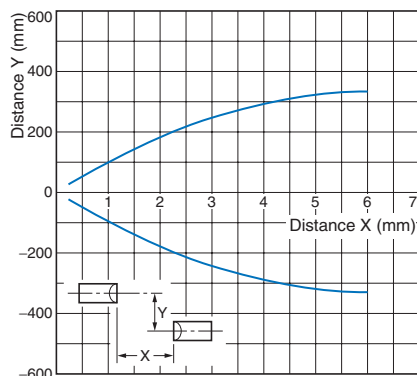
### E3JM-DS70□4(T)



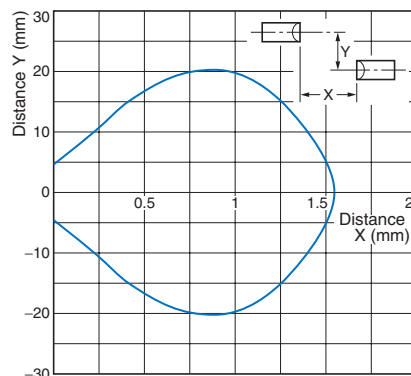
## Parallel Operating Range

### Through-beam

#### E3JK-5□□-N



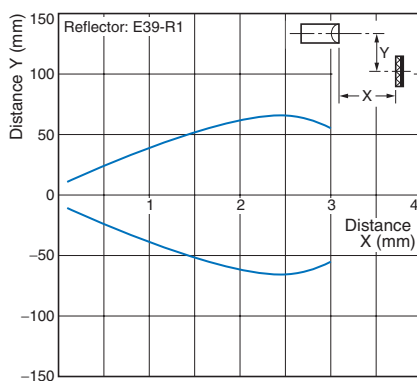
#### E3JK-5□□-N + E39-S39 (Optional Slit) (A Slit is mounted to the Emitter and Receiver.)



## Retro-reflective

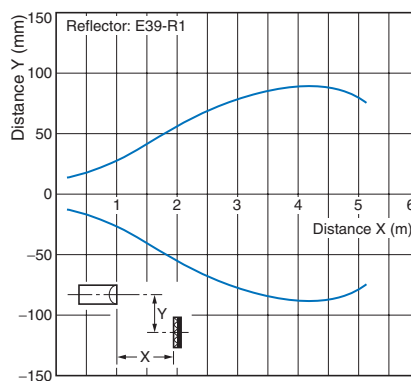
### E3JK-R2□□ + E39-R1

#### (Supplied Reflector)



### E3JK-R4□□ + E39-R1

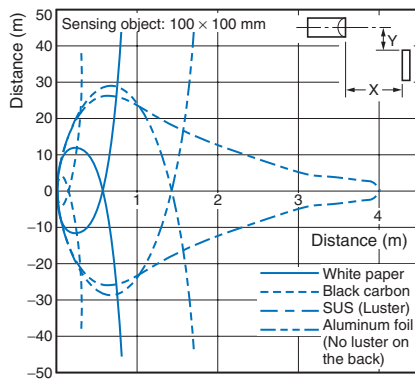
#### (Supplied Reflector)



## Operating Range

### Diffuse-reflective

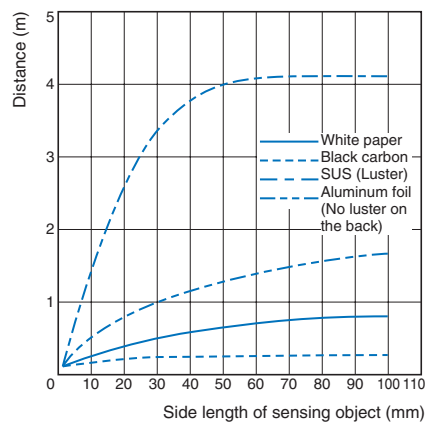
E3JK-DS30□□



## Sensing Object Size vs. Sensing Distance

### Diffuse-reflective

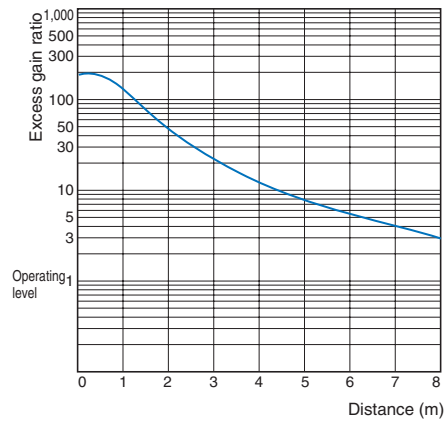
E3JK-DS30□□



## Excess Gain Ratio vs. Set Distance

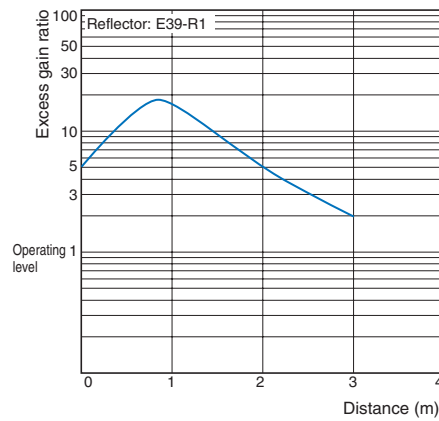
### Through-beam

E3JK-5□□-N

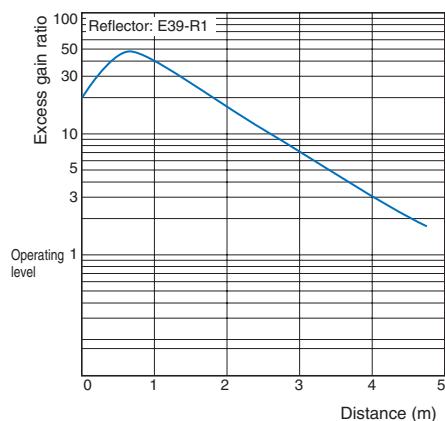


### Retro-reflective

E3JK-R2□□ + E39-R1 (Supplied Reflector)

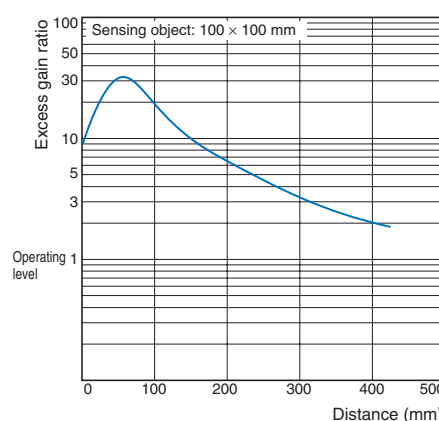


E3JK-R4□□ + E39-R1  
(Supplied Reflector)



### Diffuse-reflective

E3JK-DS30□□





## I/O Circuit Diagrams

## E3JM

## Relay Output Models

| Model                                               | Timing chart                                                        | Output circuit |
|-----------------------------------------------------|---------------------------------------------------------------------|----------------|
| E3JM-10M4(T)-N *1<br>E3JM-R4M4(T)<br>E3JM-DS70M4(T) | <p>Refer to page 10 for information on Sensors with timers (T).</p> |                |

## DC SSR Output Models

| Model                                               | Timing chart                                                        | Output circuit |
|-----------------------------------------------------|---------------------------------------------------------------------|----------------|
| E3JM-10S4(T)-N *1<br>E3JM-R4S4(T)<br>E3JM-DS70S4(T) | <p>Refer to page 10 for information on Sensors with timers (T).</p> |                |

Note: Connect terminal 1 to any polarity and terminal 2 to the power supply because there is no polarity on the Emitter side.

\*1. Models numbers for Through-beam Sensors (E3JM-10□4(T)-N) are for sets that include both the Emitter and Receiver.

The model number of the Emitter is always E3JM-10L-N. Add a "D" to get the model number of the Receiver (example: E3JM-10DM4-N). Confirm the model numbers of the Emitter and Receiver in *Ordering Information*.

\*2. This is the light indicator on Sensors without a timer and the operation indicator on Sensors with a timer.

## E3JK

## Relay Output Models

| Model                                                                                                          | Timing chart | Output circuit |
|----------------------------------------------------------------------------------------------------------------|--------------|----------------|
| E3JK-5M1-N *<br>E3JK-5M2-N *<br>E3JK-R2M1<br>E3JK-R2M2<br>E3JK-R4M1<br>E3JK-R4M2<br>E3JK-DS30M1<br>E3JK-DS30M2 |              |                |

## DC SSR Output Models

| Model                                                 | Timing chart | Output circuit                                                                |
|-------------------------------------------------------|--------------|-------------------------------------------------------------------------------|
| E3JK-5S3-N *<br>E3JK-R2S3<br>E3JK-R4S3<br>E3JK-DS30S3 |              | <p>Note: The output stage leakage currents are 0.1 mA max., respectively.</p> |

Note: Connect the brown cable to any polarity and the blue cable to the power supply because there is no polarity on the Emitter side.

\* Models numbers for Through-beam Sensors (E3JK-5□□-N 2M) are for sets that include both the Emitter and Receiver.

The model number of the Emitter is always E3JK-5L-N 2M. Add a "D" to get the model number of the Receiver (example: E3JK-5DM1-N 2M). Confirm the model numbers of the Emitter and Receiver in *Ordering Information*.

## Safety Precautions

Refer to *Warranty and Limitations of Liability*.

### WARNING

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



### Precautions for Correct Use

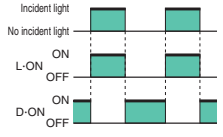
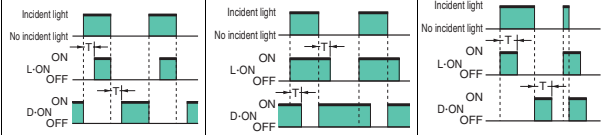
Do not use the product in atmospheres or environments that exceed product ratings.

#### E3JM

#### ● Designing

#### Operation

Note:  The white part of the DIP switch indicates which setting is selected.

|                             | Switch configuration                                                                                                                                                                                                                                                                                                                                         | Switch selection                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                   | Timing charts                                                                       |           |                |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------|----------------|
| <b>Models without timer</b> | MODE 0 ↔ 1<br>D-ON  L-ON<br>↑<br>Operation selector                                                                                                                                                                                                                         | MODE 0 ↔ 1<br>D-ON  L-ON ← Light-ON, Relay ON, DC output switching element ON<br><br>MODE 0 ↔ 1<br>D-ON  L-ON ← Dark-ON, Relay ON, DC output switching element ON          |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                   |  |           |                |
| <b>Models with timer</b>    | MODE 0 ↔ 1<br>D-ON  L-ON<br>TIMER  SW1<br> SW2<br>Operation Selector<br>Selector switch for timer mode | ON-delay<br>MODE 0 ↔ 1<br>D-ON  L-ON<br>TIMER  SW1<br> SW2<br>Both SW1 and SW2 at "0." | OFF-delay<br>MODE 0 ↔ 1<br>D-ON  L-ON<br>TIMER  SW1<br> SW2<br>Only SW2 at "1." | One-shot delay<br>MODE 0 ↔ 1<br>D-ON  L-ON<br>TIMER  SW1<br> SW2<br>Only SW1 at "1," which overrides either setting of SW2. | ON-delay                                                                            | OFF-delay | One-shot delay |
|                             |                                                                                                                                                                                                                                                                                                                                                              | Note: The operation selector is the same as that for models without a timer.                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                   |  |           |                |

#### Output Relay Contact

If E3JM/E3JK is connected to a load with contacts that spark when the load is turned OFF (e.g., a contactor or valve), the normally-closed side may be turned ON before the normally-open side is turned OFF or vice-versa. If both normally-open output and normally-closed output are used simultaneously, apply a surge suppressor to the load.

Refer to *OMRON's PCB Relays Catalog (X33)* for typical examples of surge suppressors.

## ● Wiring

### Connecting and Wiring

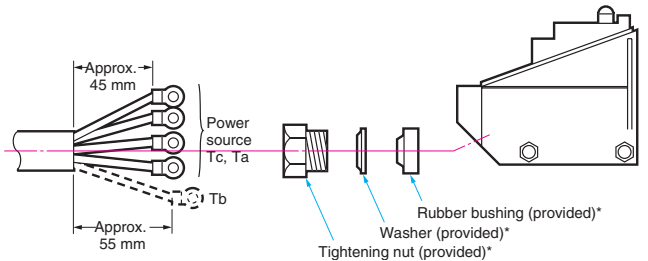
- We recommend connecting a cable with a conductor cross-section of 0.3 mm<sup>2</sup> and an outer diameter of 6 to 8 mm.
- Be sure to firmly tighten the cover in order to maintain waterproof and dustproof properties. The screw size of the conduit sockets is shown in the following table.

| Model  | Conduit socket thread size |
|--------|----------------------------|
| E3JM-□ | PF1/2                      |

### Cable End Treatment

Adjust the four wires to the same length when the Ta output is to be used only. If both the Ta and Tb outputs are to be used, treat them as shown in the following diagram.

#### Recommended example



\* These parts are not provided with models with a -US suffix.

### Recommended Crimp Terminal Dimensions (Unit: mm)

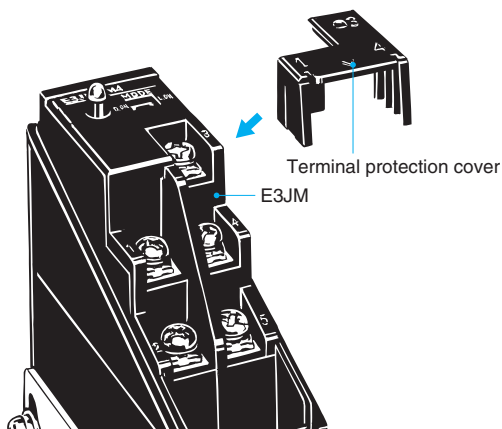
| Round type       | Fork type        |
|------------------|------------------|
|                  |                  |
| (After crimping) | (After crimping) |

Note: Use terminals with insulation tube (recommended crimp terminal: 1.25 to 3.5).

## ● Others

### Terminal Protection Cover (Provided)

The terminal protection cover is designed to improve safety by maintaining the sensitivity properties of the product and by preventing any contact with charged sections while it is being operated with the mode set to the timer mode. Mount the product as shown in the following diagram (mount the Through-beam Model on the Receiver side).



## E3JK

## ● Designing

### Power Reset Time

The Sensor is ready to detect within 200 ms after it is turned ON. If the Sensor and load are connected to separate power supplies, be sure to turn ON the Sensor first.

## Items Common to E3JM and E3JK

## ● Wiring

### Connecting and Wiring DC SSR Output Models

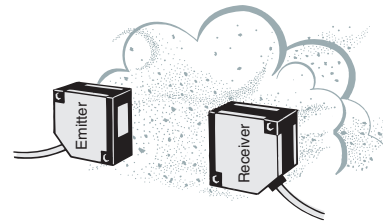
When using the DC SSR output model, the total of the load current for the Light-ON output (NO) and that for the Dark-ON (NC) should be 100 mA max. If the total exceeds 100 mA, the load short-circuit protection function will be activated (this function will be reset when the power of the Photoelectric Sensor is turned OFF).

## ● Others

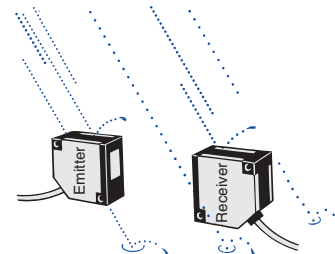
### Ambient Conditions (Installation Area)

The E3JM will malfunction if installed in the following places.

- Places where the E3JM is exposed to a dusty environment.
- Places where corrosive gases are produced.



- Places where the E3JM is directly exposed to water, oil, or chemicals.



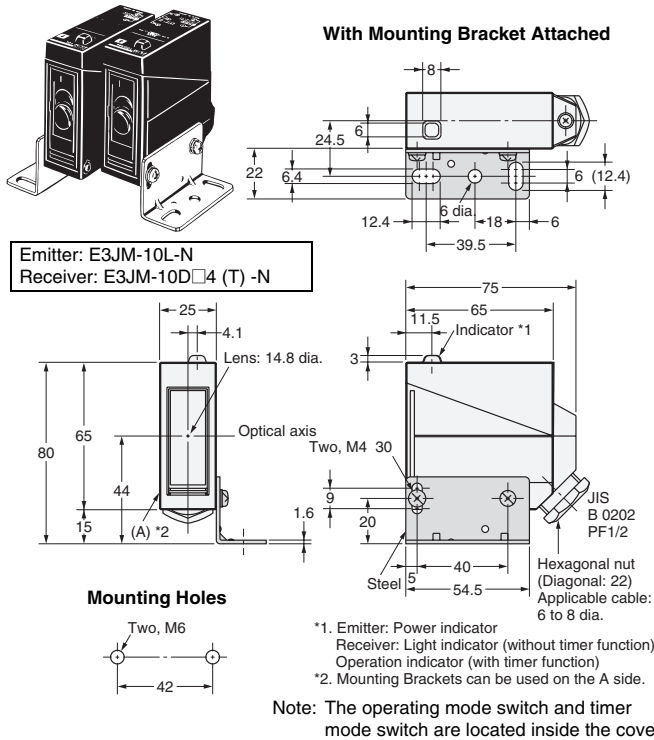
## Dimensions

(Unit: mm)

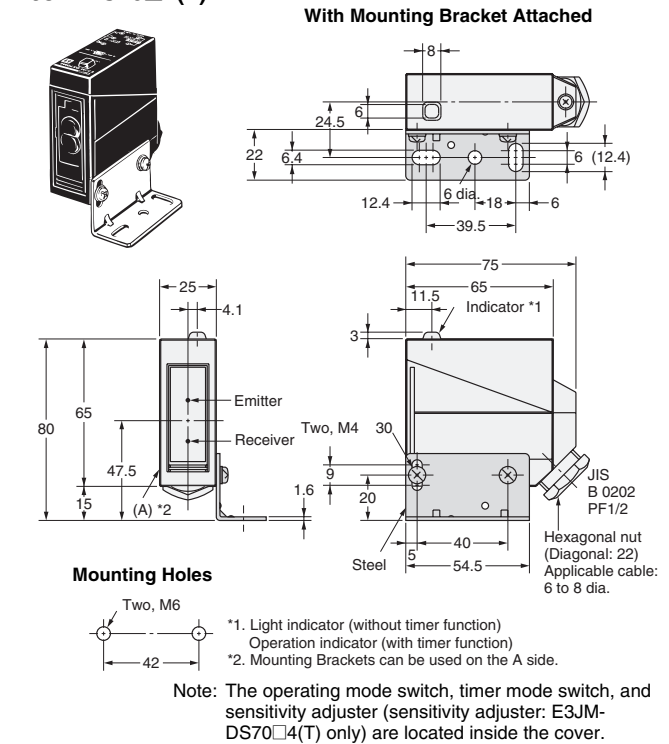
Tolerance class IT16 applies to dimensions in this datasheet unless otherwise specified.

### Sensors

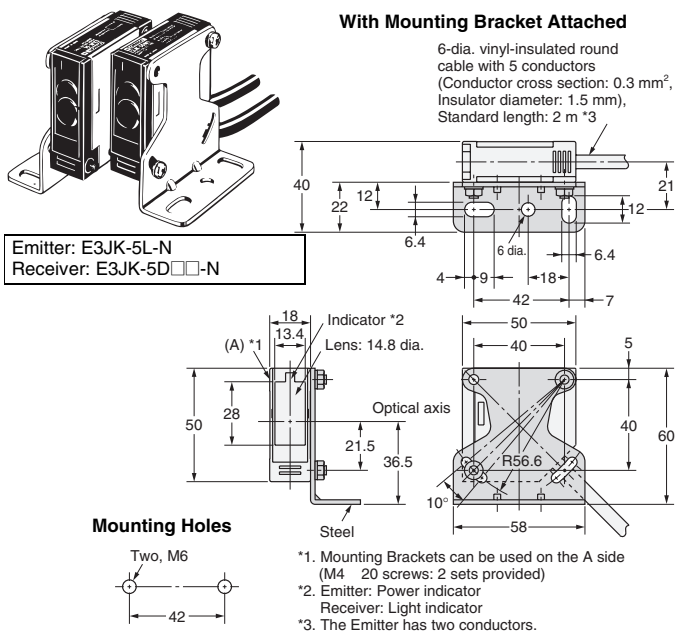
#### E3JM-10□4(T)-N \*1



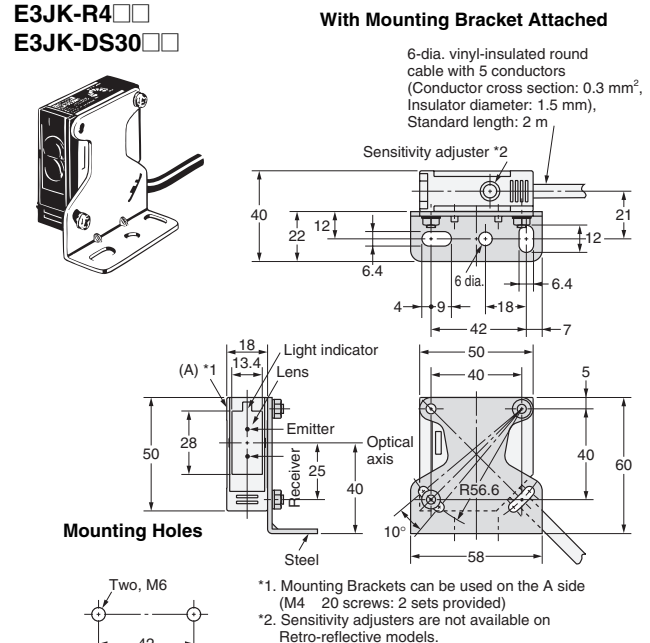
#### E3JM-R4□4(T) E3JM-DS70□4(T)



#### E3JK-5□□-N \*2



#### E3JK-R2□□ E3JK-R4□□ E3JK-DS30□□



\*1. Models numbers for Through-beam Sensors (E3JM-10□4(T)-N) are for sets that include both the Emitter and Receiver.

The model number of the Emitter is always E3JM-10L-N. Add a "D" to get the model number of the Receiver (example: EE3JM-10DM4-N). Confirm the model numbers of the Emitter and Receiver in *Ordering Information*.

\*2. Models numbers for Through-beam Sensors (E3JK-5□□-N) are for sets that include both the Emitter and Receiver.

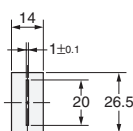
The model number of the Emitter is always E3JK-5L-N 2M. Add a "D" to get the model number of the Receiver (example: E3JK-5DM1-N 2M). Confirm the model numbers of the Emitter and Receiver in *Ordering Information*.

### Accessories (Order separately)

#### Seal-type Long Slit (For E3JM/E3JK)

##### E39-S39

Materials: Polyester  
0.1-mm thick



#### Mounting Brackets

Refer to E39-L/E39-S/E39-R for details.

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