

# Built-in Power Supply Photoelectric Sensor E3JK <NEW>

## Long-distance Photoelectric Sensor That Supports AC/DC Power Supplies



- Long sensing distance that is approximately 8 times that of our conventional model (for the Through-beam and Diffuse-reflective models). (Through-beam: 40 m, Retro-reflective: 7 m, and Diffuse-reflective: 2.5 m.)
- Improved visibility:
  - A red LED that makes the spot visible.
  - Large indicators that can be seen even from a distance.
- Improved operability.  
(Enlarged sensitivity adjuster and operation selector)
- Freely selectable power supply input (24 to 240 VDC, 24 to 240 VAC).
- (Additional types added to the DC type lineup.)
- Models with infrared LEDs are also available.



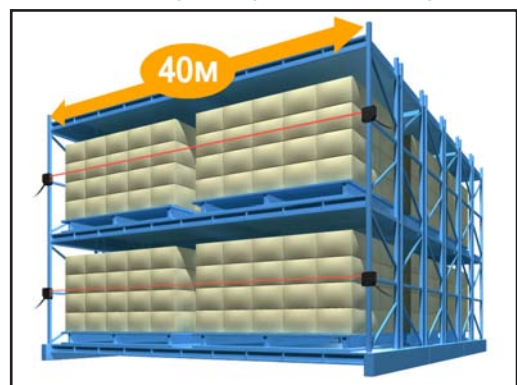
For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

## Applications

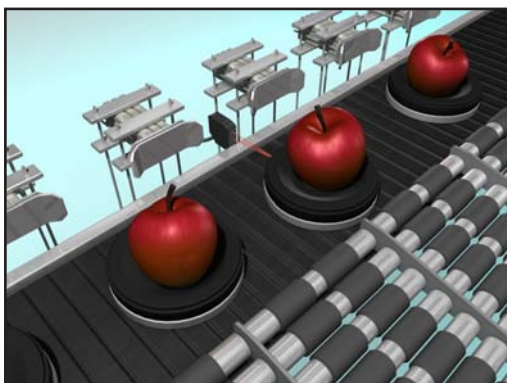
Elevator cage detection



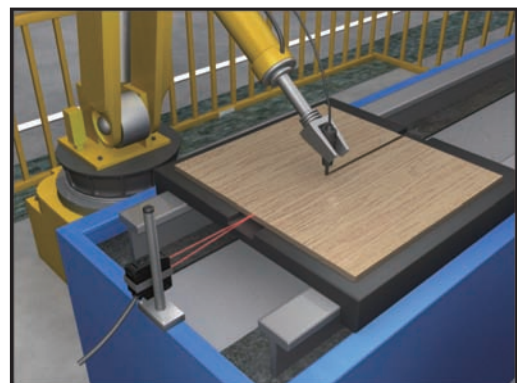
Detection of packages jutting out from their storage location



Pallet detection for agricultural produce conveyors



Workpiece detection for woodworking machines



# E3JK

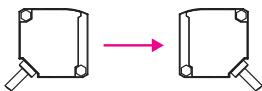
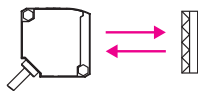
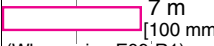
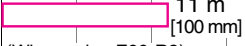
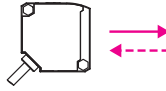
## Ordering Information

### Sensors

 Red light  Infrared light

#### Sensors with Mounting Brackets and Reflectors (The model numbers contain ("-C."))

A Mounting Bracket (E39-L40) is included. A Reflector (E39-R1) is included with Retro-reflective models.

| Power supply voltage               | Sensing method                          | Appearance                                                                          | Sensing distance                                                                                                             | Output configuration | Model                                                                        |
|------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------------------------------------------|
| AC/DC power supply selectable type | Through-beam *1<br>(Emitter + Receiver) |    |  40m                                        | Relay                | <b>E3JK-TR11-C 2M</b><br>Emitter: E3JK-TR11-L 2M<br>Receiver: E3JK-TR11-D 2M |
|                                    |                                         |                                                                                     |  5m                                         |                      | <b>E3JK-TR12-C 2M</b><br>Emitter: E3JK-TR12-L 2M<br>Receiver: E3JK-TR12-D 2M |
|                                    |                                         |                                                                                     |  40 m                                       |                      | <b>E3JK-TR13-C 2M</b><br>Emitter: E3JK-TR13-L 2M<br>Receiver: E3JK-TR13-D 2M |
|                                    |                                         |                                                                                     |  5 m                                        |                      | <b>E3JK-TR14-C 2M</b><br>Emitter: E3JK-TR14-L 2M<br>Receiver: E3JK-TR14-D 2M |
|                                    | Retro-reflective without MSR function   |   |  7m *2<br>[100mm]<br>(When using E39-R1)    |                      | <b>E3JK-RR11-C 2M</b>                                                        |
|                                    |                                         |                                                                                     |  11m<br>[100mm]<br>(When using E39-R2)     |                      |                                                                              |
|                                    |                                         |                                                                                     |  7 m *2<br>[100 mm]<br>(When using E39-R1)  |                      | <b>E3JK-RR13-C 2M</b>                                                        |
|                                    |                                         |                                                                                     |  11 m<br>[100 mm]<br>(When using E39-R2) |                      |                                                                              |
|                                    | Retro-reflective with MSR function      |                                                                                     |  6m *2<br>[100mm]<br>(When using E39-R1)  |                      | <b>E3JK-RR12-C 2M</b>                                                        |
|                                    |                                         |                                                                                     |  10m<br>[100mm]<br>(When using E39-R2)   |                      |                                                                              |
|                                    | Diffuse-reflective                      |  |  2.5m                                     |                      | <b>E3JK-DR11-C 2M</b>                                                        |
|                                    |                                         |                                                                                     |  300mm                                    |                      | <b>E3JK-DR12-C 2M</b>                                                        |
|                                    |                                         |                                                                                     |  2.5 m                                    |                      | <b>E3JK-DR13-C 2M</b>                                                        |
|                                    |                                         |                                                                                     |  300 mm                                   |                      | <b>E3JK-DR14-C 2M</b>                                                        |

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

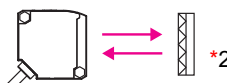
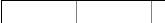
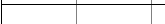
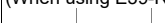
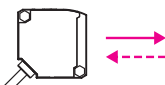
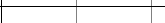
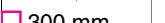
\*2. Values in parentheses indicate the minimum required distances between the Sensors and Reflectors.

## Sensors

## Sensors without Mounting Brackets or Reflectors

A Mounting Bracket and Reflector are not included. Purchase a Mounting Bracket and Reflector separately to match the intended use of the Sensor.

 Red light  Infrared light

| Power supply voltage               | Sensing method                          | Appearance                                                                                 | Sensing distance                                                                                                                          | Output configuration | Model                                                                                      |                     |
|------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------|---------------------|
| AC/DC power supply selectable type | Through-beam *1<br>(Emitter + Receiver) |           |  40 m                                                    | Relay                | <b>E3JK-TR11 2M</b><br>Emitter: E3JK-TR11-L 2M<br>Receiver: E3JK-TR11-D 2M                 |                     |
|                                    |                                         |                                                                                            |  5 m                                                     |                      | <b>E3JK-TR12 2M</b><br>Emitter: E3JK-TR12-L 2M<br>Receiver: E3JK-TR12-D 2M                 |                     |
|                                    |                                         |                                                                                            |  40 m                                                    |                      | <b>E3JK-TR13 2M</b><br>Emitter: E3JK-TR13-L 2M<br>Receiver: E3JK-TR13-D 2M                 |                     |
|                                    |                                         |                                                                                            |  5 m                                                     |                      | <b>E3JK-TR14 2M</b><br>Emitter: E3JK-TR14-L 2M<br>Receiver: E3JK-TR14-D 2M                 |                     |
|                                    | Retro-reflective without MSR function   |         |  7 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R1)    |                      | <b>E3JK-RR11 2M</b>                                                                        |                     |
|                                    |                                         |                                                                                            |  11 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R2)   |                      |                                                                                            |                     |
|                                    |                                         |                                                                                            |  7 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R1)    |                      | <b>E3JK-RR13 2M</b>                                                                        |                     |
|                                    |                                         |                                                                                            |  11 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R2) |                      |                                                                                            |                     |
|                                    | Retro-reflective with MSR function      |                                                                                            |  6 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R1)  |                      | <b>E3JK-RR12 2M</b>                                                                        |                     |
|                                    |                                         |                                                                                            |  10 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R2) |                      |                                                                                            |                     |
|                                    | Diffuse-reflective                      |                                                                                            |                                                        |                      |  2.5 m  | <b>E3JK-DR11 2M</b> |
|                                    |                                         |                                                                                            |                                                                                                                                           |                      |  300 mm | <b>E3JK-DR12 2M</b> |
|                                    |                                         |  2.5 m  |                                                                                                                                           |                      | <b>E3JK-DR13 2M</b>                                                                        |                     |
|                                    |                                         |  300 mm |                                                                                                                                           |                      | <b>E3JK-DR14 2M</b>                                                                        |                     |

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

\*2. A Reflector is not included. Purchase a Reflector separately to match the intended use of the Sensor.

\*3. Values in parentheses indicate the minimum required distances between the Sensors and Reflectors.

Red light Infrared light

A Mounting Bracket and Reflector are not included. Purchase a Mounting Bracket and Reflector separately to match the intended use of the Sensor.

| Power supply voltage | Sensing method                                     | Appearance | Sensing distance                                      | Output configuration | Model                                                                      |
|----------------------|----------------------------------------------------|------------|-------------------------------------------------------|----------------------|----------------------------------------------------------------------------|
| DC                   | Through-beam <sup>*1</sup><br>(Emitter + Receiver) |            | 40 m                                                  | NPN                  | <b>E3JK-TN11 2M</b><br>Emitter: E3JK-TN11-L 2M<br>Receiver: E3JK-TN11-D 2M |
|                      |                                                    |            |                                                       | PNP                  | <b>E3JK-TP11 2M</b><br>Emitter: E3JK-TP11-L 2M<br>Receiver: E3JK-TP11-D 2M |
|                      |                                                    |            | 5 m                                                   | NPN                  | <b>E3JK-TN12 2M</b><br>Emitter: E3JK-TN12-L 2M<br>Receiver: E3JK-TN12-D 2M |
|                      |                                                    |            |                                                       | PNP                  | <b>E3JK-TP12 2M</b><br>Emitter: E3JK-TP12-L 2M<br>Receiver: E3JK-TP12-D 2M |
|                      |                                                    |            | 40 m                                                  | NPN                  | <b>E3JK-TN13 2M</b><br>Emitter: E3JK-TN13-L 2M<br>Receiver: E3JK-TN13-D 2M |
|                      |                                                    |            |                                                       | PNP                  | <b>E3JK-TP13 2M</b><br>Emitter: E3JK-TP13-L 2M<br>Receiver: E3JK-TP13-D 2M |
|                      |                                                    |            | 5 m                                                   | NPN                  | <b>E3JK-TN14 2M</b><br>Emitter: E3JK-TN14-L 2M<br>Receiver: E3JK-TN14-D 2M |
|                      |                                                    |            |                                                       | PNP                  | <b>E3JK-TP14 2M</b><br>Emitter: E3JK-TP14-L 2M<br>Receiver: E3JK-TP14-D 2M |
|                      | Retro-reflective<br>without MSR function           |            | 7 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R1)  | NPN                  | <b>E3JK-RN11 2M</b>                                                        |
|                      |                                                    |            | 11 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R2) | PNP                  | <b>E3JK-RP11 2M</b>                                                        |
|                      |                                                    |            | 7 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R1)  | NPN                  | <b>E3JK-RN13 2M</b>                                                        |
|                      |                                                    |            | 11 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R2) | PNP                  | <b>E3JK-RP13 2M</b>                                                        |
|                      | Retro-reflective<br>with MSR function              |            | 6 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R1)  | NPN                  | <b>E3JK-RN12 2M</b>                                                        |
|                      |                                                    |            | 10 m <sup>*3</sup><br>[100 mm]<br>(When using E39-R2) | PNP                  | <b>E3JK-RP12 2M</b>                                                        |
|                      | Diffuse-reflective                                 |            | 2.5 m                                                 | NPN                  | <b>E3JK-DN11 2M</b>                                                        |
|                      |                                                    |            |                                                       | PNP                  | <b>E3JK-DP11 2M</b>                                                        |
|                      |                                                    |            | 300 mm                                                | NPN                  | <b>E3JK-DN12 2M</b>                                                        |
|                      |                                                    |            |                                                       | PNP                  | <b>E3JK-DP12 2M</b>                                                        |
|                      |                                                    |            | 2.5 m                                                 | NPN                  | <b>E3JK-DN13 2M</b>                                                        |
|                      |                                                    |            |                                                       | PNP                  | <b>E3JK-DP13 2M</b>                                                        |
|                      |                                                    |            | 300 mm                                                | NPN                  | <b>E3JK-DN14 2M</b>                                                        |
|                      |                                                    |            |                                                       | PNP                  | <b>E3JK-DP14 2M</b>                                                        |

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

\*2. A Reflector is not included. Purchase a Reflector separately to match the intended use of the Sensor.

\*3. Values in parentheses indicate the minimum required distances between the Sensors and Reflectors.

## Accessories (Order Separately)

**Reflectors** (A Reflector is required for each Retro-reflective Sensor.) [Refer to *Dimensions* on page 17.]

The E39-R1 is enclosed with Sensors with model numbers that contain “-C.”

| Name       | Sensing distance (rated value) |                 | Model   | Quantity |
|------------|--------------------------------|-----------------|---------|----------|
| Reflectors | E3JK-R□11                      | 7 m [100 mm] *  | E39-R1  | 1        |
|            | E3JK-R□12                      | 6 m [100 mm] *  |         |          |
|            | E3JK-R□13                      | 7 m [100 mm] *  |         |          |
|            | E3JK-R□11                      | 9 m [100 mm] *  | E39-R1S | 1        |
|            | E3JK-R□12                      | 7 m [100 mm] *  |         |          |
|            | E3JK-R□13                      | 9 m [100 mm] *  |         |          |
|            | E3JK-R□11                      | 11 m [100 mm] * | E39-R2  | 1        |
|            | E3JK-R□12                      | 10 m [100 mm] * |         |          |
|            | E3JK-R□13                      | 11 m [100 mm] * |         |          |

**Note:** Refer to *Engineering Data* on page 12 for details.

\*Values in parentheses indicate the minimum required distances between the Sensors and Reflectors.

## Mounting Bracket [Refer to *Dimensions* on page 17.]

A Mounting Bracket is enclosed with Sensors with model numbers that contain “-C.”

| Appearance                                                                        | Model   | Quantity |
|-----------------------------------------------------------------------------------|---------|----------|
|  | E39-L40 | 1        |

**Note:** 1. When using a Through-beam Sensor, order one Mounting Bracket for the Receiver and one for the Emitter.

2. For details, refer to *Mounting Brackets* on E39-L/E39-S/E39-R which can be accessed from your OMRON website.

# E3JK

## Ratings and Specifications

| Sensing method                       |                     | Through-beam                                                                                         |             |                       |             |
|--------------------------------------|---------------------|------------------------------------------------------------------------------------------------------|-------------|-----------------------|-------------|
| Item                                 | Model               | E3JK-TR11-□                                                                                          | E3JK-TR12-□ | E3JK-TR13-□           | E3JK-TR14-□ |
| Sensing distance                     |                     | 40 m                                                                                                 | 5 m         | 40 m                  | 5 m         |
| Standard sensing object              |                     | Opaque: 17-mm dia. min.                                                                              |             |                       |             |
| Differential travel                  |                     | —                                                                                                    |             |                       |             |
| Directional angle                    |                     | Both Emitter and Receiver 3° min.                                                                    |             |                       |             |
| Light source (wavelength)            |                     | Red LED (624 nm)                                                                                     |             | Infrared LED (850 nm) |             |
| Power supply voltage                 |                     | 24 to 240 VDC ±10%,<br>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.)                                                    |             |                       |             |
|                                      | AC                  | 3 W max. (Emitter 1.5 W max. Receiver 1.5 W max.)                                                    |             |                       |             |
| Control output                       |                     | Relay output SPDT, 250 VAC, 3 A max. (cosφ= 1),<br>5 VDC, 10 mA min.,<br>Light-ON/Dark-ON selectable |             |                       |             |
| Protection circuits                  |                     | —                                                                                                    |             |                       |             |
| 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                        |                     | 20 ms max.                                                                                           |             |                       |             |
| Sensitivity adjustment               |                     | One-turn adjuster   Receiver (E3JK-TR1□-D) only                                                      |             |                       |             |
| Ambient illumination (Receiver side) |                     | Incandescent lamp: 3,000 lx max., Sunlight: 11,000 lx max.                                           |             |                       |             |
| Ambient temperature range            |                     | Operating: –25°C to 55°C, Storage: –40°C to 70°C (with no icing or condensation)                     |             |                       |             |
| Ambient humidity range               |                     | Operating: 35% to 85%, 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 with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions                |             |                       |             |
|                                      | Malfunction         | 10 to 55 Hz with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions                |             |                       |             |
| Shock resistance                     | Destruction         | 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions                                      |             |                       |             |
|                                      | Malfunction         | 100 m/s <sup>2</sup> for 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. 350 g                                                                                        |             |                       |             |
| Material                             | Case                | ABS (Acrylonitrile Butadiene Styrene)                                                                |             |                       |             |
|                                      | Lens/Display window | Methacrylic resin                                                                                    |             |                       |             |
|                                      | Adjuster            | POM                                                                                                  |             |                       |             |
|                                      | Cable               | PVC                                                                                                  |             |                       |             |
| Bending radius of cable              |                     | R18                                                                                                  |             |                       |             |
| Accessories                          |                     | Instruction manual and Mounting Bracket (E3JK-TR1□-C only)                                           |             |                       |             |

| Sensing method                       |                     | Retro-reflective (without MSR function)                                                        |                       | Retro-reflective (with MSR function)                                  |
|--------------------------------------|---------------------|------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------------------|
| Item                                 | Model               | E3JK-RR11-□                                                                                    | E3JK-RR13-□           | E3JK-RR12-□                                                           |
| Sensing distance                     |                     | 7 m [100 mm]* (When using E39-R1), 11 m [100 mm]* (When using E39-R2)                          |                       | 6 m [100 mm]* (When using E39-R1), 10 m [100 mm]* (When using E39-R2) |
| Standard sensing object              |                     | Opaque: 75-mm dia. min. (When using E39-R1), Opaque: 100-mm dia. min. (When using E39-R2)      |                       |                                                                       |
| Differential travel                  |                     | —                                                                                              |                       |                                                                       |
| Directional angle                    |                     | 1.5° min.                                                                                      |                       |                                                                       |
| Light source (wavelength)            |                     | Red LED (624 nm)                                                                               | Infrared LED (850 nm) | Red LED (624 nm)                                                      |
| Power supply voltage                 |                     | 24 to 240 VDC ±10%, ripple (p-p): 10% max.<br>24 to 240 VAC ±10%, 50/60 Hz                     |                       |                                                                       |
| Power consumption                    | DC                  | 2 W max.                                                                                       |                       |                                                                       |
|                                      | AC                  | 2 W max.                                                                                       |                       |                                                                       |
| Control output                       |                     | Relay output SPDT, 250 VAC, 3 A max. (cosφ= 1), 5 VDC, 10 mA min., Light-ON/Dark-ON selectable |                       |                                                                       |
| Protection circuits                  |                     | Mutual interference prevention function                                                        |                       |                                                                       |
| 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                        |                     | 20 ms max.                                                                                     |                       |                                                                       |
| Sensitivity adjustment               |                     | One-turn adjuster                                                                              |                       |                                                                       |
| Ambient illumination (Receiver side) |                     | Incandescent lamp: 3,000 lx max., Sunlight: 11,000 lx max.                                     |                       |                                                                       |
| Ambient temperature range            |                     | Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation)               |                       |                                                                       |
| Ambient humidity range               |                     | Operating: 35% to 85%, 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 with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions          |                       |                                                                       |
|                                      | Malfunction         | 10 to 55 Hz with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions          |                       |                                                                       |
| Shock resistance                     | Destruction         | 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions                                |                       |                                                                       |
|                                      | Malfunction         | 100 m/s <sup>2</sup> for 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. 180 g                                                                                  |                       |                                                                       |
| Material                             | Case                | ABS (Acrylonitrile Butadiene Styrene)                                                          |                       |                                                                       |
|                                      | Lens/Display window | Methacrylic resin                                                                              |                       |                                                                       |
|                                      | Adjuster            | POM                                                                                            |                       |                                                                       |
|                                      | Cable               | PVC                                                                                            |                       |                                                                       |
| Bending radius of cable              |                     | R18                                                                                            |                       |                                                                       |
| Accessories                          |                     | Instruction manual, Mounting Bracket (E3JK-RR1□-C only), and Reflector (E3JK-RR1□-C only)      |                       |                                                                       |

\*Values in parentheses indicate the minimum required distances between the Sensors and Reflectors.

| Sensing method                       |                     | Diffuse-reflective                                                                                   |                                    |                                   |                                    |
|--------------------------------------|---------------------|------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------|------------------------------------|
| Item                                 | Model               | E3JK-DR11-□                                                                                          | E3JK-DR12-□                        | E3JK-DR13-□                       | E3JK-DR14-□                        |
| Sensing distance                     |                     | White paper (300 × 300 mm): 2.5 m                                                                    | White paper (100 × 100 mm): 300 mm | White paper (300 × 300 mm): 2.5 m | White paper (100 × 100 mm): 300 mm |
| Standard sensing object              |                     | —                                                                                                    |                                    |                                   |                                    |
| Differential travel                  |                     | 20% max. of sensing distance                                                                         |                                    |                                   |                                    |
| Directional angle                    |                     | —                                                                                                    |                                    |                                   |                                    |
| Light source (wavelength)            |                     | Red LED (624 nm)                                                                                     |                                    | Infrared LED (850 nm)             |                                    |
| Power supply voltage                 |                     | 24 to 240 VDC ±10%,<br>ripple (p-p): 10% max.<br>24 to 240 VAC ±10%, 50/60 Hz                        |                                    |                                   |                                    |
| Power consumption                    | DC                  | 2 W max.                                                                                             |                                    |                                   |                                    |
|                                      | AC                  | 2 W max.                                                                                             |                                    |                                   |                                    |
| Control output                       |                     | Relay output SPDT, 250 VAC, 3 A max. (cosφ= 1),<br>5 VDC, 10 mA min.,<br>Light-ON/Dark-ON selectable |                                    |                                   |                                    |
| Protection circuits                  |                     | Mutual interference prevention function                                                              |                                    |                                   |                                    |
| 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                        |                     | 20 ms max.                                                                                           |                                    |                                   |                                    |
| Sensitivity adjustment               |                     | One-turn adjuster                                                                                    |                                    |                                   |                                    |
| Ambient illumination (Receiver side) |                     | Incandescent lamp: 3,000 lx max., Sunlight: 11,000 lx max.                                           |                                    |                                   |                                    |
| Ambient temperature range            |                     | Operating: −25°C to 55°C, Storage: −40°C to 70°C (with no icing or condensation)                     |                                    |                                   |                                    |
| Ambient humidity range               |                     | Operating: 35% to 85%, 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 with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions                |                                    |                                   |                                    |
|                                      | Malfunction         | 10 to 55 Hz with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions                |                                    |                                   |                                    |
| Shock resistance                     | Destruction         | 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions                                      |                                    |                                   |                                    |
|                                      | Malfunction         | 100 m/s <sup>2</sup> for 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. 180 g                                                                                        |                                    |                                   |                                    |
| Material                             | Case                | ABS (Acrylonitrile Butadiene Styrene)                                                                |                                    |                                   |                                    |
|                                      | Lens/Display window | Methacrylic resin                                                                                    |                                    |                                   |                                    |
|                                      | Adjuster            | POM                                                                                                  |                                    |                                   |                                    |
|                                      | Cable               | PVC                                                                                                  |                                    |                                   |                                    |
| Bending radius of cable              |                     | R18                                                                                                  |                                    |                                   |                                    |
| Accessories                          |                     | Instruction manual and Mounting Bracket (E3JK-DR1□-C only)                                           |                                    |                                   |                                    |

| Sensing method                       |                     | Through-beam                                                                                                                                                                        |           |                       |           |
|--------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|
| Model                                | NPN output          | E3JK-TN11                                                                                                                                                                           | E3JK-TN12 | E3JK-TN13             | E3JK-TN14 |
| Item                                 | PNP output          | E3JK-TP11                                                                                                                                                                           | E3JK-TP12 | E3JK-TP13             | E3JK-TP14 |
| Sensing distance                     |                     | 40 m                                                                                                                                                                                | 5 m       | 40 m                  | 5 m       |
| Standard sensing object              |                     | Opaque: 17-mm dia. min.                                                                                                                                                             |           |                       |           |
| Differential travel                  |                     | —                                                                                                                                                                                   |           |                       |           |
| Directional angle                    |                     | Both Emitter and Receiver 3° min.                                                                                                                                                   |           |                       |           |
| Light source (wavelength)            |                     | Red LED (624 nm)                                                                                                                                                                    |           | Infrared LED (850 nm) |           |
| Power supply voltage                 |                     | 10 to 30 VDC, including ripple (p-p): 10%                                                                                                                                           |           |                       |           |
| Power consumption                    | DC                  | 40 mA max. (Emitter 25 mA max. Receiver 15 mA max.)                                                                                                                                 |           |                       |           |
|                                      | AC                  | —                                                                                                                                                                                   |           |                       |           |
| Control output                       |                     | Load power supply voltage: 30 V max., Load current: 100 mA max., Residual voltage: 3 V max., open-collector output (NPN/PNP output depending on model), Light-ON/Dark-ON selectable |           |                       |           |
| Protection circuits                  |                     | Power supply reverse polarity protection, Output short-circuit protection, and Output reverse polarity protection                                                                   |           |                       |           |
| Life expectancy (relay output)       | Mechanical          | —                                                                                                                                                                                   |           |                       |           |
|                                      | Electrical          | —                                                                                                                                                                                   |           |                       |           |
| Response time                        |                     | 1 ms max.                                                                                                                                                                           |           |                       |           |
| Sensitivity adjustment               |                     | One-turn adjuster   Receiver (E3JK-T□□□-D) only                                                                                                                                     |           |                       |           |
| Ambient illumination (Receiver side) |                     | Incandescent lamp: 3,000 lx max., Sunlight: 11,000 lx max.                                                                                                                          |           |                       |           |
| Ambient temperature range            |                     | Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation)                                                                                                    |           |                       |           |
| Ambient humidity range               |                     | Operating: 35% to 85%, 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 with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions                                                                                               |           |                       |           |
|                                      | Malfunction         | 10 to 55 Hz with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions                                                                                               |           |                       |           |
| Shock resistance                     | Destruction         | 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions                                                                                                                     |           |                       |           |
|                                      | Malfunction         | 500 m/s <sup>2</sup> for 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. 300 g                                                                                                                                                                       |           |                       |           |
| Material                             | Case                | ABS (Acrylonitrile Butadiene Styrene)                                                                                                                                               |           |                       |           |
|                                      | Lens/Display window | Methacrylic resin                                                                                                                                                                   |           |                       |           |
|                                      | Adjuster            | POM                                                                                                                                                                                 |           |                       |           |
|                                      | Cable               | PVC                                                                                                                                                                                 |           |                       |           |
| Bending radius of cable              |                     | R18                                                                                                                                                                                 |           |                       |           |
| Accessories                          |                     | Instruction manual                                                                                                                                                                  |           |                       |           |

| Sensing method                       |                     | Retro-reflective (without MSR function)                                                                                                                                             |                       | Retro-reflective (with MSR function)                                  |
|--------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------------------|
| Model                                | NPN output          | E3JK-RN11                                                                                                                                                                           | E3JK-RN13             | E3JK-RN12                                                             |
| Item                                 | PNP output          | E3JK-RP11                                                                                                                                                                           | E3JK-RP13             | E3JK-RP12                                                             |
| Sensing distance                     |                     | 7 m [100 mm]* (When using E39-R1), 11 m [100 mm]* (When using E39-R2)                                                                                                               |                       | 6 m [100 mm]* (When using E39-R1), 10 m [100 mm]* (When using E39-R2) |
| Standard sensing object              |                     | Opaque: 75-mm dia. min.                                                                                                                                                             |                       |                                                                       |
| Differential travel                  |                     | —                                                                                                                                                                                   |                       |                                                                       |
| Directional angle                    |                     | 1.5° min.                                                                                                                                                                           |                       |                                                                       |
| Light source (wavelength)            |                     | Red LED (624 nm)                                                                                                                                                                    | Infrared LED (850 nm) | Red LED (624 nm)                                                      |
| Power supply voltage                 |                     | 10 to 30 VDC, including ripple (p-p): 10%                                                                                                                                           |                       |                                                                       |
| Power consumption                    | DC                  | 30 mA max.                                                                                                                                                                          |                       |                                                                       |
|                                      | AC                  | —                                                                                                                                                                                   |                       |                                                                       |
| Control output                       |                     | Load power supply voltage: 30 V max., Load current: 100 mA max., Residual voltage: 3 V max., open-collector output (NPN/PNP output depending on model), Light-ON/Dark-ON selectable |                       |                                                                       |
| Protection circuits                  |                     | Power supply reverse polarity protection, Output short-circuit protection, Mutual interference prevention function, and Output reverse polarity protection                          |                       |                                                                       |
| Life expectancy (relay output)       | Mechanical          | —                                                                                                                                                                                   |                       |                                                                       |
|                                      | Electrical          | —                                                                                                                                                                                   |                       |                                                                       |
| Response time                        |                     | 1 ms max.                                                                                                                                                                           |                       |                                                                       |
| Sensitivity adjustment               |                     | One-turn adjuster                                                                                                                                                                   |                       |                                                                       |
| Ambient illumination (Receiver side) |                     | Incandescent lamp: 3,000 lx max., Sunlight: 11,000 lx max.                                                                                                                          |                       |                                                                       |
| Ambient temperature range            |                     | Operating: −25°C to 55°C, Storage: −40°C to 70°C (with no icing or condensation)                                                                                                    |                       |                                                                       |
| Ambient humidity range               |                     | Operating: 35% to 85%, 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 with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions                                                                                               |                       |                                                                       |
|                                      | Malfunction         | 10 to 55 Hz with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions                                                                                               |                       |                                                                       |
| Shock resistance                     | Destruction         | 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions                                                                                                                     |                       |                                                                       |
|                                      | Malfunction         | 500 m/s <sup>2</sup> for 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. 160 g                                                                                                                                                                       |                       |                                                                       |
| Material                             | Case                | ABS (Acrylonitrile Butadiene Styrene)                                                                                                                                               |                       |                                                                       |
|                                      | Lens/Display window | Methacrylic resin                                                                                                                                                                   |                       |                                                                       |
|                                      | Adjuster            | POM                                                                                                                                                                                 |                       |                                                                       |
|                                      | Cable               | PVC                                                                                                                                                                                 |                       |                                                                       |
| Bending radius of cable              |                     | R18                                                                                                                                                                                 |                       |                                                                       |
| Accessories                          |                     | Instruction manual                                                                                                                                                                  |                       |                                                                       |

\*Values in parentheses indicate the minimum required distances between the Sensors and Reflectors.

| Sensing method                       |                     | Diffuse-reflective                                                                                                                                                                  |                                    |                                   |                                    |
|--------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------|------------------------------------|
| Model                                | NPN output          | E3JK-DN11                                                                                                                                                                           | E3JK-DN12                          | E3JK-DN13                         | E3JK-DN14                          |
| Item                                 | PNP output          | E3JK-DP11                                                                                                                                                                           | E3JK-DP12                          | E3JK-DP13                         | E3JK-DP14                          |
| Sensing distance                     |                     | White paper (300 × 300 mm): 2.5 m                                                                                                                                                   | White paper (100 × 100 mm): 300 mm | White paper (300 × 300 mm): 2.5 m | White paper (100 × 100 mm): 300 mm |
| Standard sensing object              |                     | —                                                                                                                                                                                   |                                    |                                   |                                    |
| Differential travel                  |                     | 20% max. of sensing distance                                                                                                                                                        |                                    |                                   |                                    |
| Directional angle                    |                     | —                                                                                                                                                                                   |                                    |                                   |                                    |
| Light source (wavelength)            |                     | Red LED (624 nm)                                                                                                                                                                    |                                    | Infrared LED (850 nm)             |                                    |
| Power supply voltage                 |                     | 10 to 30 VDC, including ripple (p-p): 10%                                                                                                                                           |                                    |                                   |                                    |
| Power consumption                    | DC                  | 30 mA max.                                                                                                                                                                          |                                    |                                   |                                    |
|                                      | AC                  | —                                                                                                                                                                                   |                                    |                                   |                                    |
| Control output                       |                     | Load power supply voltage: 30 V max., Load current: 100 mA max., Residual voltage: 3 V max., open-collector output (NPN/PNP output depending on model), Light-ON/Dark-ON selectable |                                    |                                   |                                    |
| Protection circuits                  |                     | Power supply reverse polarity protection, Output short-circuit protection, Mutual interference prevention function, and Output reverse polarity protection                          |                                    |                                   |                                    |
| Life expectancy (relay output)       | Mechanical          | —                                                                                                                                                                                   |                                    |                                   |                                    |
|                                      | Electrical          | —                                                                                                                                                                                   |                                    |                                   |                                    |
| Response time                        |                     | 1 ms max.                                                                                                                                                                           |                                    |                                   |                                    |
| Sensitivity adjustment               |                     | One-turn adjuster                                                                                                                                                                   |                                    |                                   |                                    |
| Ambient illumination (Receiver side) |                     | Incandescent lamp: 3,000 lx max., Sunlight: 11,000 lx max.                                                                                                                          |                                    |                                   |                                    |
| Ambient temperature range            |                     | Operating: −25°C to 55°C, Storage: −40°C to 70°C (with no icing or condensation)                                                                                                    |                                    |                                   |                                    |
| Ambient humidity range               |                     | Operating: 35% to 85%, 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 with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions                                                                                               |                                    |                                   |                                    |
|                                      | Malfunction         | 10 to 55 Hz with a 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions                                                                                               |                                    |                                   |                                    |
| Shock resistance                     | Destruction         | 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions                                                                                                                     |                                    |                                   |                                    |
|                                      | Malfunction         | 500 m/s <sup>2</sup> for 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. 160 g                                                                                                                                                                       |                                    |                                   |                                    |
| Material                             | Case                | ABS (Acrylonitrile Butadiene Styrene)                                                                                                                                               |                                    |                                   |                                    |
|                                      | Lens/Display window | Methacrylic resin                                                                                                                                                                   |                                    |                                   |                                    |
|                                      | Adjuster            | POM                                                                                                                                                                                 |                                    |                                   |                                    |
|                                      | Cable               | PVC                                                                                                                                                                                 |                                    |                                   |                                    |
| Bending radius of cable              |                     | R18                                                                                                                                                                                 |                                    |                                   |                                    |
| Accessories                          |                     | Instruction manual                                                                                                                                                                  |                                    |                                   |                                    |

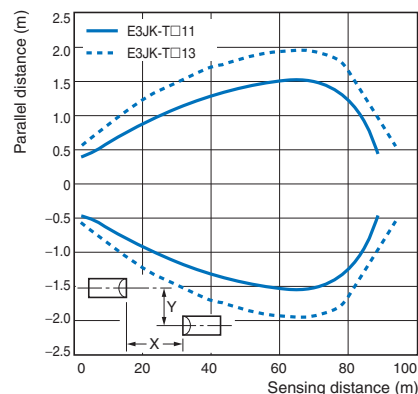
# E3JK

## Engineering Data (Reference Value)

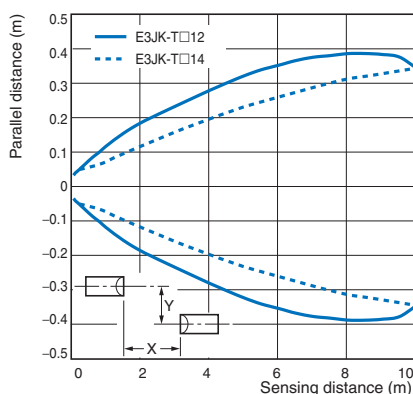
### Parallel Operating Range

#### Through-beam

##### E3JK-T□11/T□13



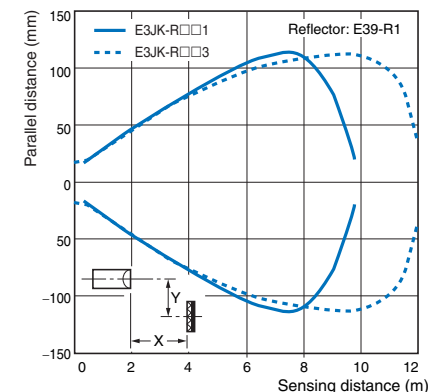
##### E3JK-T□12/T□14



#### Retro-reflective

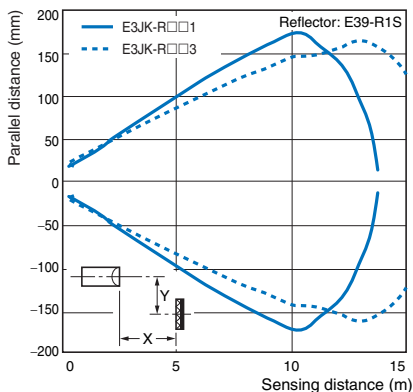
##### E3JK-R□□1+E39-R1/

##### E3JK-R□□3+E39-R1



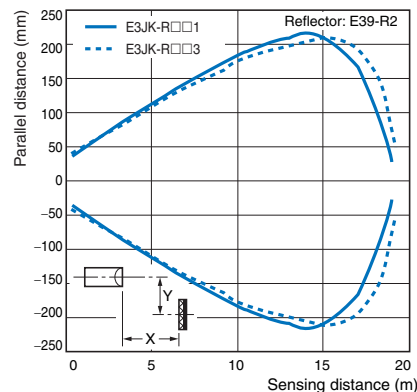
##### E3JK-R□□1+E39-R1S/

##### E3JK-R□□3+E39-R1S

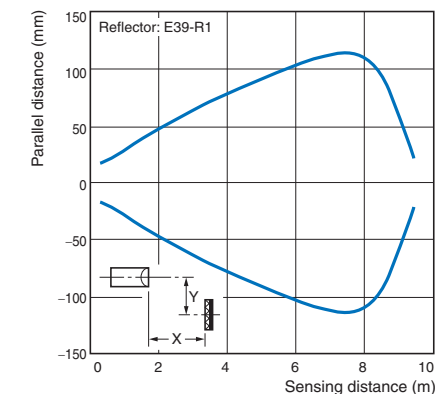


##### E3JK-R□□1+E39-R2/

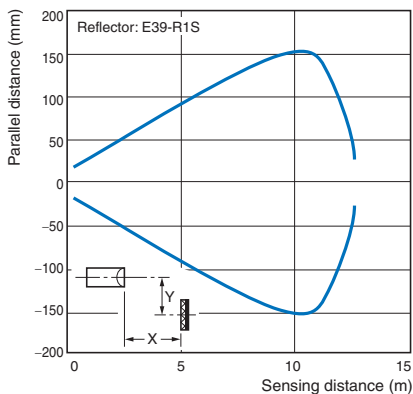
##### E3JK-R□□3+E39-R2



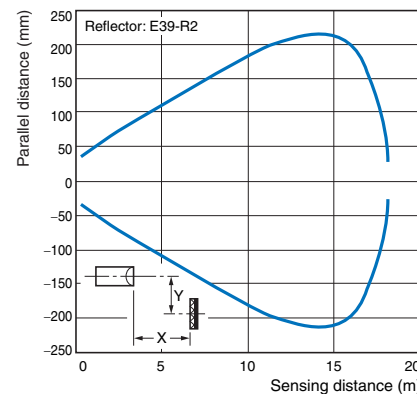
##### E3JK-R□□2+E39-R1



##### E3JK-R□□2+E39-R1S



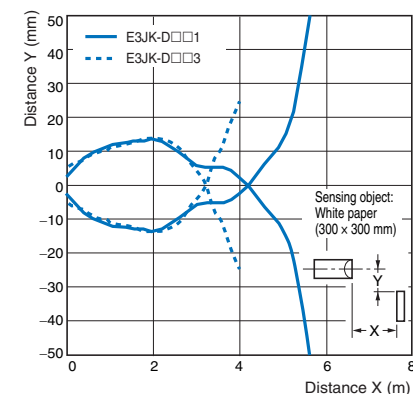
##### E3JK-R□□2+E39-R2



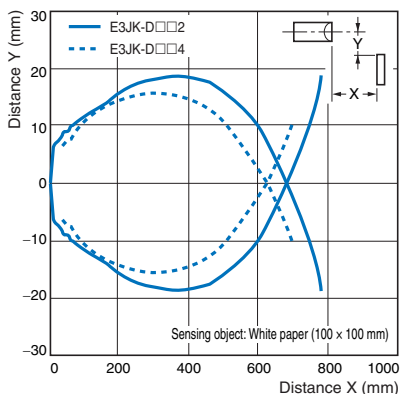
### Operating Range

#### Diffuse-reflective

##### E3JK-D□□1/D□□3



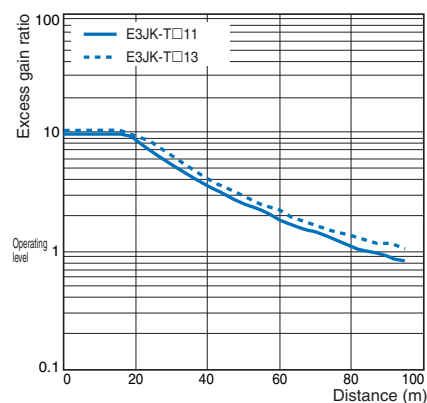
##### E3JK-D□□2/D□□4



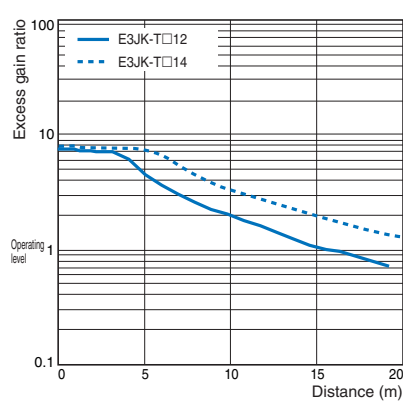
## Excess Gain Ratio vs. Set Distance

## Through-beam

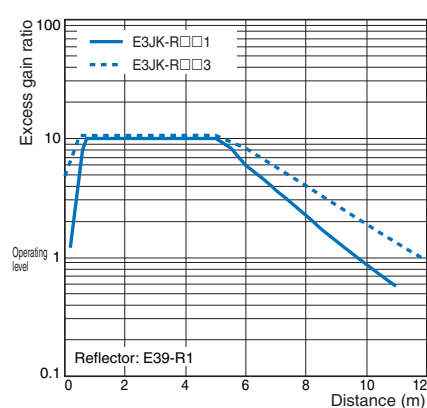
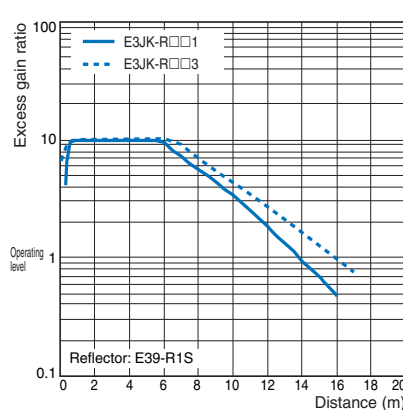
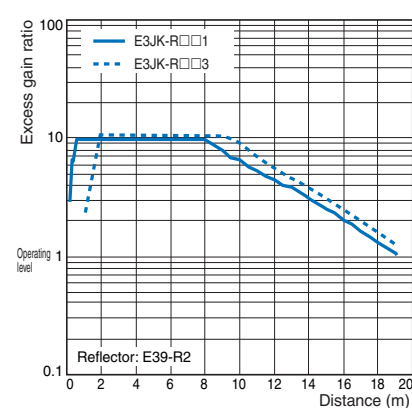
## E3JK-T□11/T□13



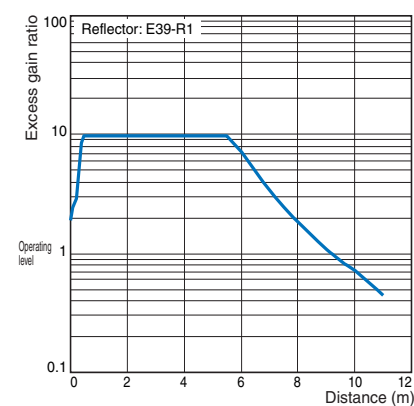
## E3JK-T□12/T□14



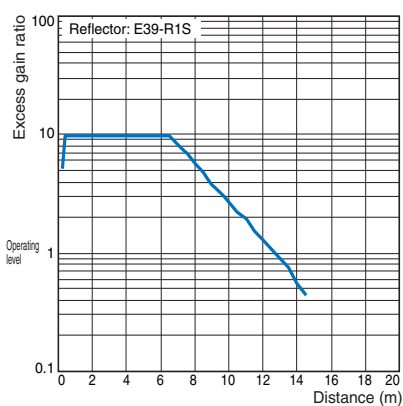
## Retro-reflective

E3JK-R□□1+E39-R1/  
E3JK-R□□3+E39-R1E3JK-R□□1+E39-R1S/  
E3JK-R□□3+E39-R1SE3JK-R□□1+E39-R2/  
E3JK-R□□3+E39-R2

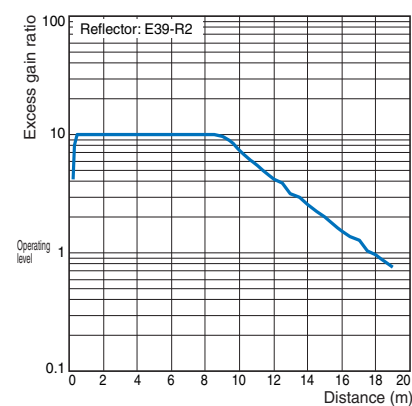
## E3JK-R□□2+E39-R1



## E3JK-R□□2+E39-R1S

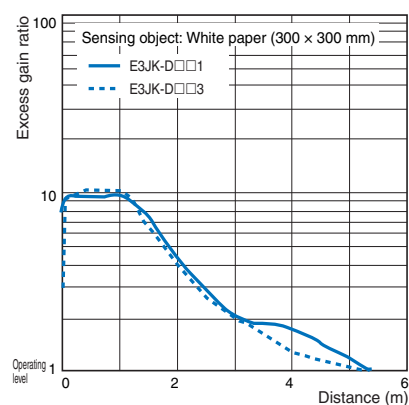


## E3JK-R□□2+E39-R2

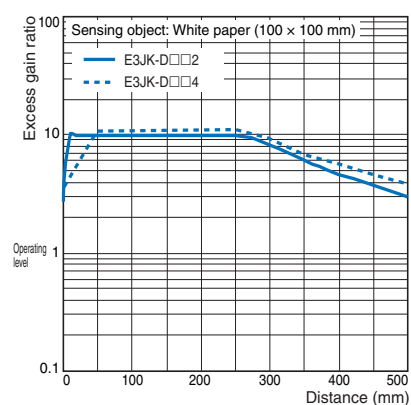


## Diffuse-reflective

## E3JK-D□□1/D□□3



## E3JK-D□□2/D□□4



# E3JK

## I/O Circuit Diagrams

### Relay Output Models

| Model                                                                                                                                                       | Timing chart |         | Output circuit |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------|----------------|
|                                                                                                                                                             | Light-ON     | Dark-ON |                |
| E3JK-TR11-L *<br>E3JK-TR12-L *<br>E3JK-TR13-L *<br>E3JK-TR14-L *                                                                                            |              |         |                |
| E3JK-TR11-D *<br>E3JK-TR12-D *<br>E3JK-TR13-D *<br>E3JK-TR14-D *<br>E3JK-RR11<br>E3JK-RR12<br>E3JK-RR13<br>E3JK-DR11<br>E3JK-DR12<br>E3JK-DR13<br>E3JK-DR14 |              |         |                |

### DC SSR Output Models

| Model                                                                                                                                                       | Timing chart |         | Output circuit |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------|----------------|
|                                                                                                                                                             | Light-ON     | Dark-ON |                |
| E3JK-TN11-L *<br>E3JK-TP11-L *<br>E3JK-TN12-L *<br>E3JK-TP12-L *<br>E3JK-TN13-L *<br>E3JK-TP13-L *<br>E3JK-TN14-L *<br>E3JK-TP14-L *                        |              |         |                |
| E3JK-TN11-D *<br>E3JK-TN12-D *<br>E3JK-TN13-D *<br>E3JK-TN14-D *<br>E3JK-RN11<br>E3JK-RN12<br>E3JK-RN13<br>E3JK-DN11<br>E3JK-DN12<br>E3JK-DN13<br>E3JK-DN14 |              |         |                |
| E3JK-TP11-D *<br>E3JK-TP12-D *<br>E3JK-TP13-D *<br>E3JK-TP14-D *<br>E3JK-RP11<br>E3JK-RP12<br>E3JK-RP13<br>E3JK-DP11<br>E3JK-DP12<br>E3JK-DP13<br>E3JK-DP14 |              |         |                |

**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.

\*For the Through-beam Sensor, the Emitter is listed as E3JK-T□11-L, E3JK-T□12-L and the Receiver is listed as E3JK-T□11-D, E3JK-T□12-D in the table. Confirm the models to order in "Ordering Information."

# E3JK

## Dimensions

(Unit: mm)

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

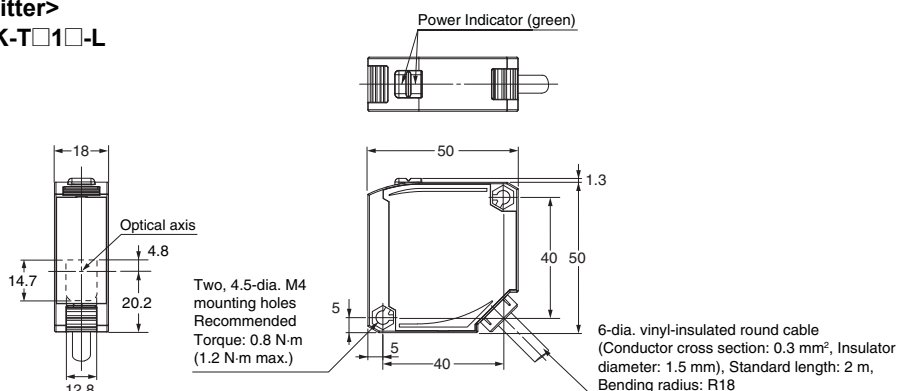
### Sensors

#### Through-beam

E3JK-T□1□

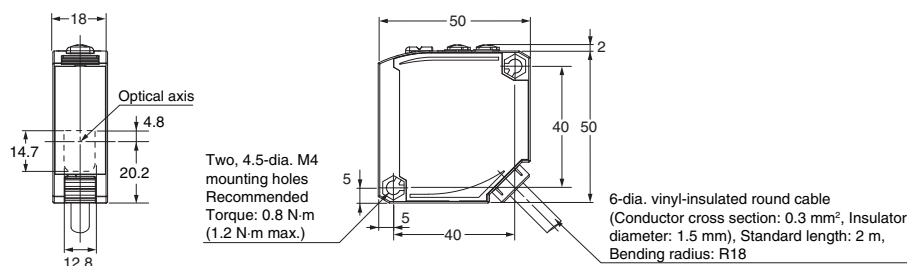
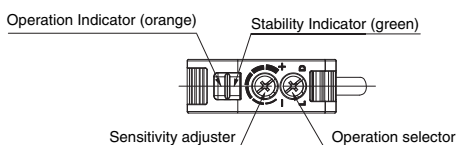
#### <Emitter>

E3JK-T□1□-L



#### <Receiver>

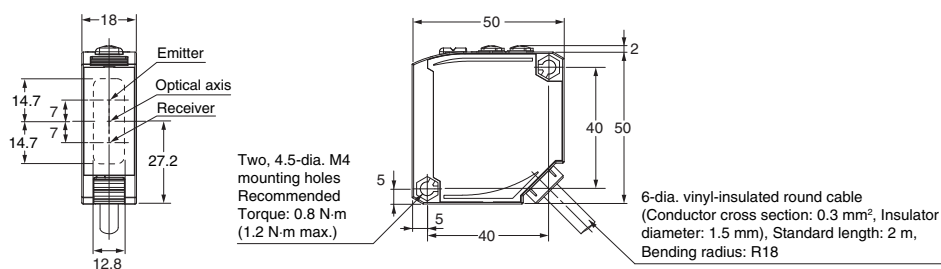
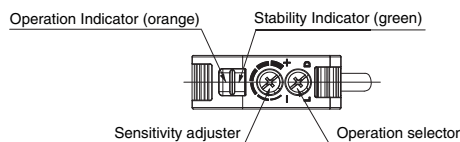
E3JK-T□1□-D



#### Retro-reflective/ Diffuse-reflective

E3JK-R□1□

E3JK-D□1□

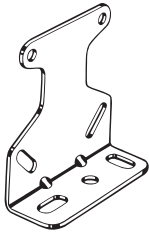


Accessories

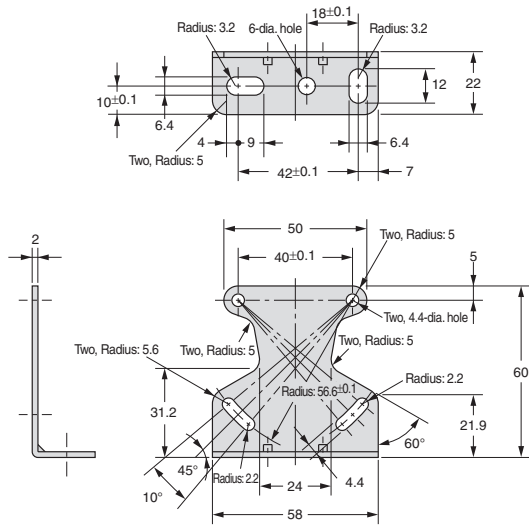
Mounting Bracket (Order separately)

Mounting Bracket

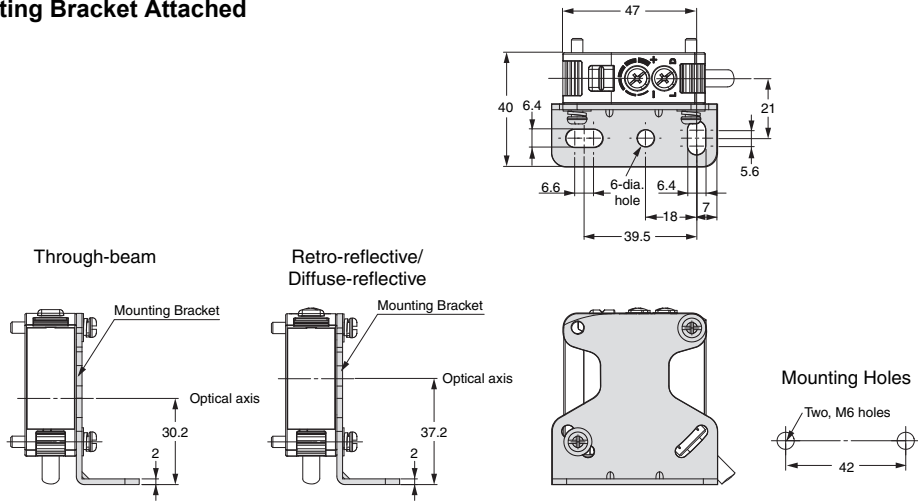
E39-L40



Material: Iron



With Mounting Bracket Attached



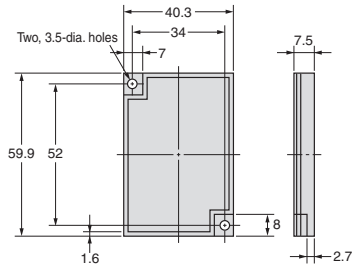
Reflector (Order separately)

E39-R1

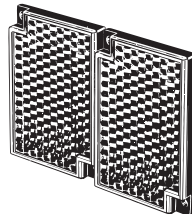
E39-R1S



Material:  
Reflective surface: acrylic  
Rear surface: ABS



E39-R2



Material:  
Reflective surface: acrylic  
Rear surface: ABS

