New Product

OMRON

# 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.**

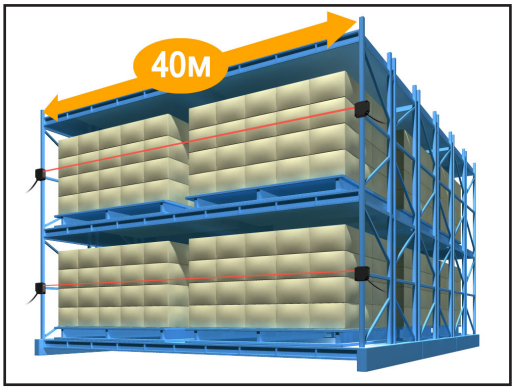
⚠ **Refer to the *Safety Precautions* on page 15.**

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

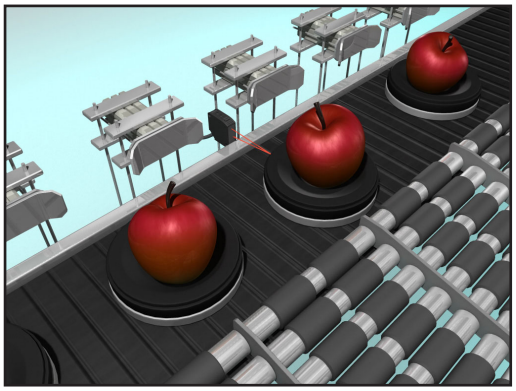
## Applications

Elevator cage detection

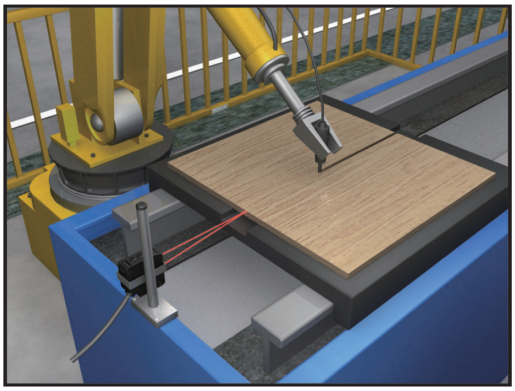
Detection of packages jutting out from their storage location




Pallet detection for agricultural produce conveyors



Workpiece detection for woodworking machines



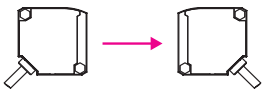
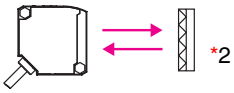
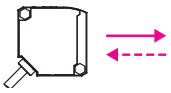
# E3JK

## Ordering Information

### Sensors

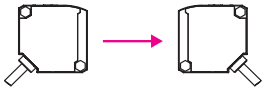
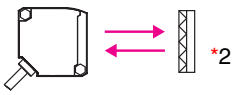
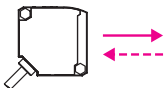
Red light  Infrared light

#### Sensors without Brackets or Reflectors

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

*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

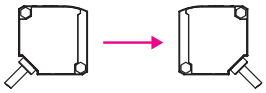
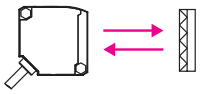
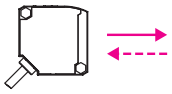
| Power supply voltage | Sensing method | Appearance | Sensing distance | Output configuration | Model |
|---|---|---|---|---|---|
| DC | Through-beam *1 (Emitter + Receiver) |  | 40 m | NPN | **E3JK-TN11 2M**<br>Emitter: E3JK-TN11-L 2M<br>Receiver: E3JK-TN11-D 2M |
| | | | | PNP | **E3JK-TP11 2M**<br>Emitter: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

*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.

## Sensors

Red light Infrared light

### Sensors with Brackets and Reflectors (The model numbers contain (“-C.”)

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

*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.

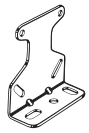
## Accessories (Order Separately)

**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 $m/s^2$ for 3 times each in X, Y, and Z directions | | | |
| | Malfunction | 100 $m/s^2$ 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) | | | |

| Item \ 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. | | |
| 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 $m/s^2$ for 3 times each in X, Y, and Z directions | | |
| | Malfunction | 100 $m/s^2$ 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.

| Item \ Model | | E3JK-DR11-□ | E3JK-DR12-□ | E3JK-DR13-□ | E3JK-DR14-□ |
|---|---|---|---|---|---|
| Sensing method | | Diffuse-reflective | | | |
| 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%, 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.,<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$^2$ for 3 times each in X, Y, and Z directions | | | |
| | Malfunction | 100 m/s$^2$ 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) | | | |

| Item | Model / Sensing method | | | | |
|---|---|---|---|---|---|
| | Sensing method | Through-beam | | | |
| | NPN output | E3JK-TN11 | E3JK-TN12 | E3JK-TN13 | E3JK-TN14 |
| | 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$^2$ for 3 times each in X, Y, and Z directions | | | |
| | Malfunction | 500 m/s$^2$ 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 | | | |

| Item | Model | Sensing method | Retro-reflective (without MSR function) | | Retro-reflective (with MSR function) |
|---|---|---|---|---|---|
| | | NPN output | E3JK-RN11 | E3JK-RN13 | E3JK-RN12 |
| | | 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 $m/s^2$ for 3 times each in X, Y, and Z directions | | |
| | Malfunction | | 500 $m/s^2$ 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.

| Item | Model / Sensing method | | | | |
|---|---|---|---|---|---|
| | Sensing method | Diffuse-reflective | | | |
| | NPN output | E3JK-DN11 | E3JK-DN12 | E3JK-DN13 | E3JK-DN14 |
| | 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$^2$ for 3 times each in X, Y, and Z directions | | | |
| | Malfunction | 500 m/s$^2$ 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 | | | |

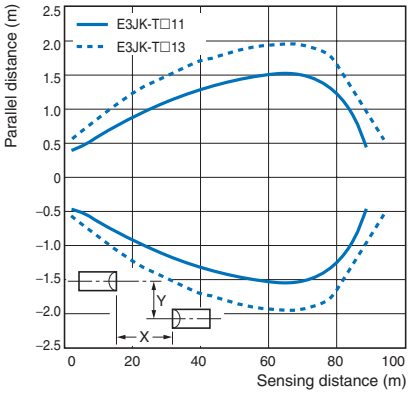
# E3JK

## Engineering Data (Reference Value)

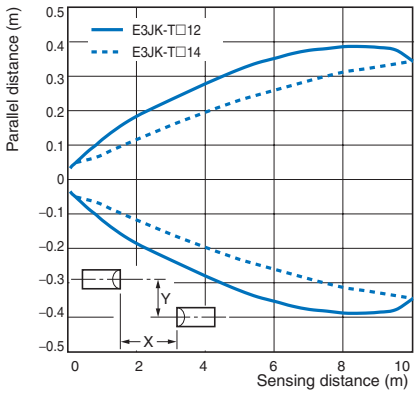
### Parallel Operating Range

#### Through-beam

**E3JK-T□11/T□13**

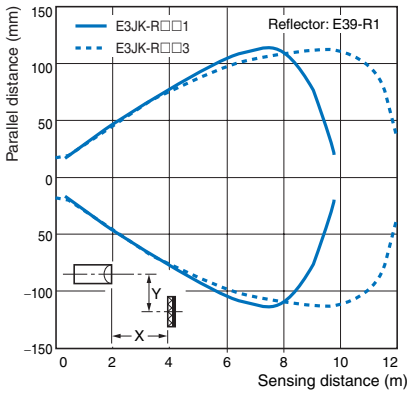



**E3JK-T□12/T□14**

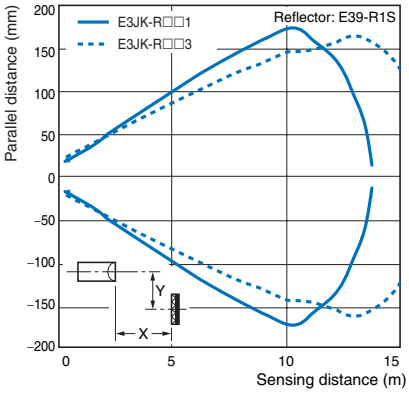



#### Retro-reflective

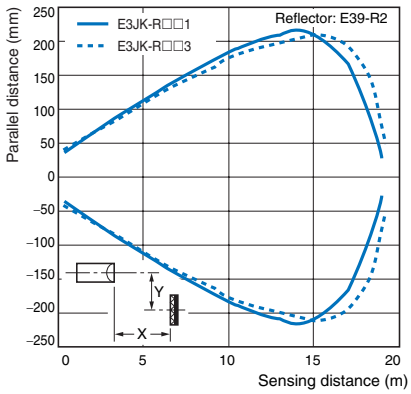
**E3JK-R□□1+E39-R1/ E3JK-R□□3+E39-R1**



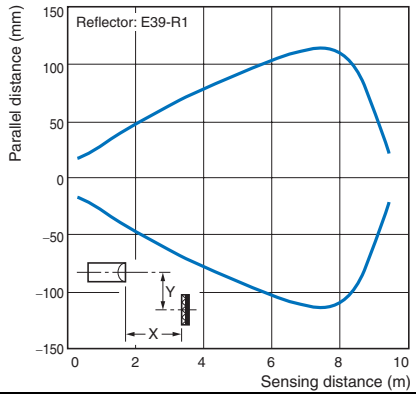

**E3JK-R□□1+E39-R1S/ E3JK-R□□3+E39-R1S**



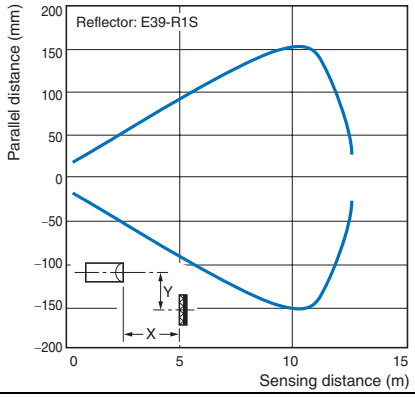

**E3JK-R□□1+E39-R2/ E3JK-R□□3+E39-R2**



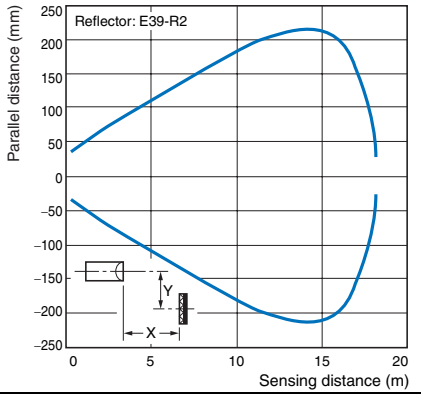

**E3JK-R□□2+E39-R1**




**E3JK-R□□2+E39-R1S**



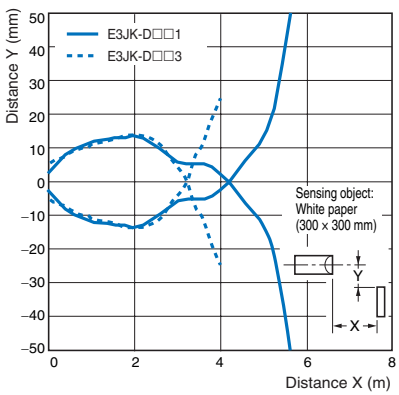

**E3JK-R□□2+E39-R2**



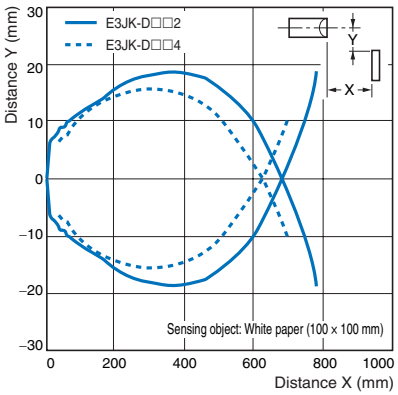

### Operating Range

#### Diffuse-reflective

**E3JK-D□□1/D□□3**



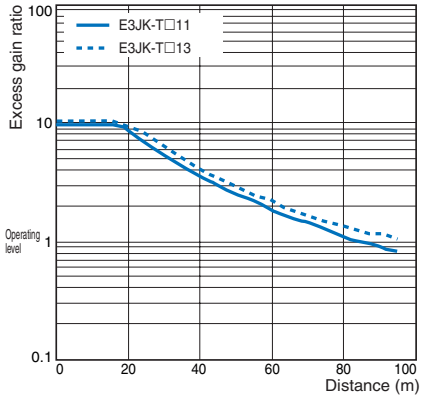

**E3JK-D□□2/D□□4**



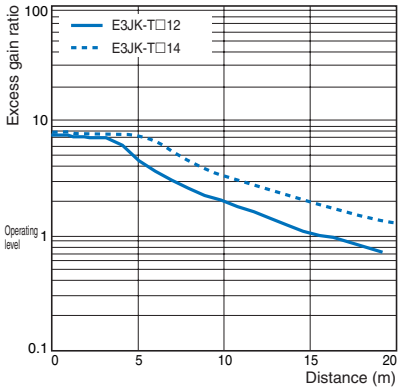
## Excess Gain Ratio vs. Set Distance

### Through-beam

**E3JK-T□11/T□13**

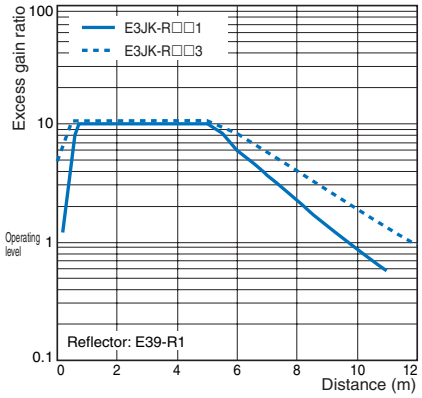



**E3JK-T□12/T□14**

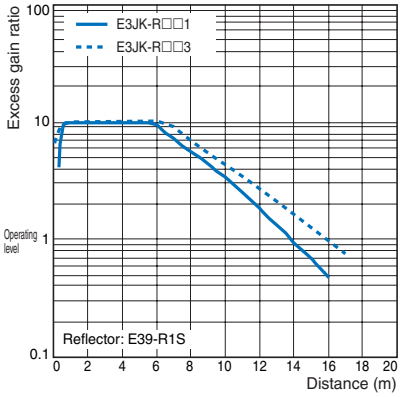



### Retro-reflective

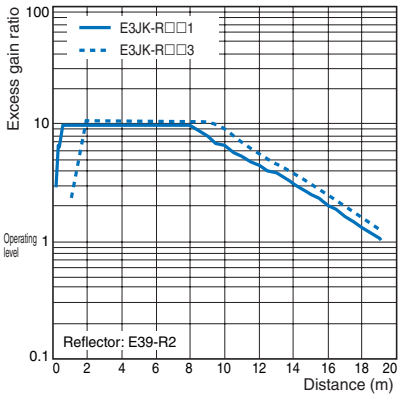
**E3JK-R□□1+E39-R1/ E3JK-R□□3+E39-R1**



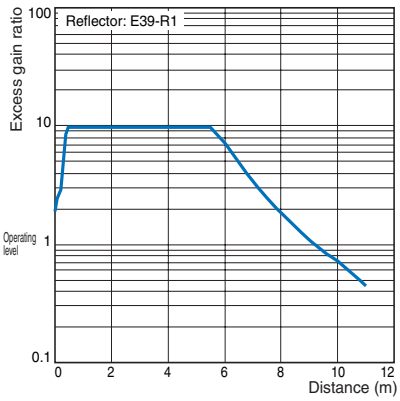

**E3JK-R□□1+E39-R1S/ E3JK-R□□3+E39-R1S**



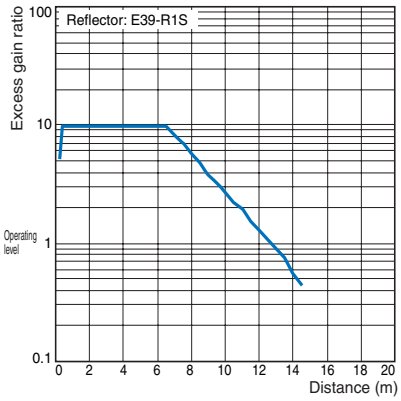

**E3JK-R□□1+E39-R2/ E3JK-R□□3+E39-R2**



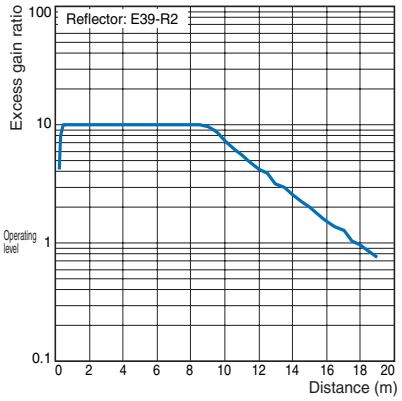

**E3JK-R□□2+E39-R1**




**E3JK-R□□2+E39-R1S**

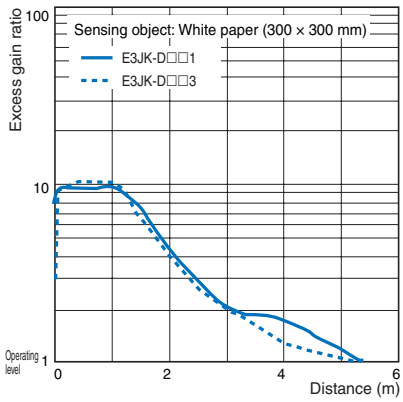



**E3JK-R□□2+E39-R2**

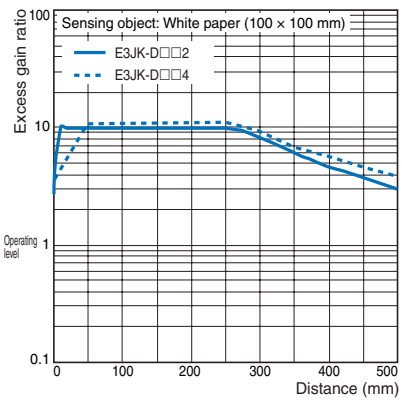



### Diffuse-reflective

**E3JK-D□□1/D□□3**



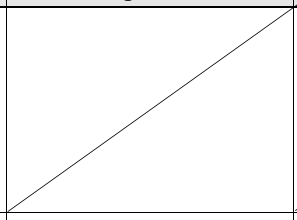
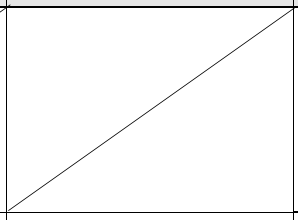
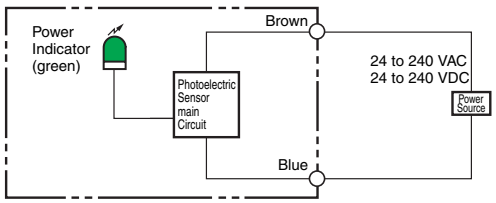
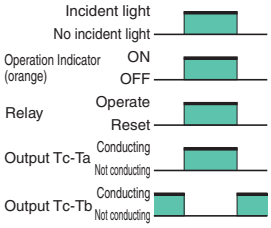
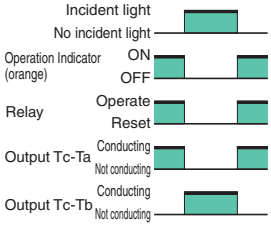
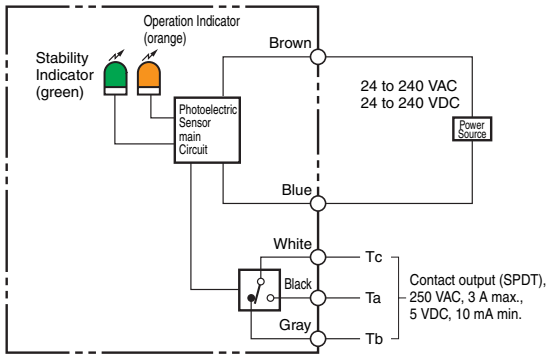

**E3JK-D□□2/D□□4**



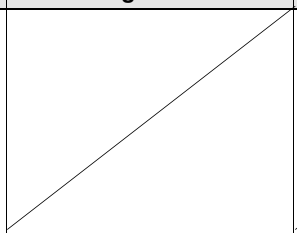
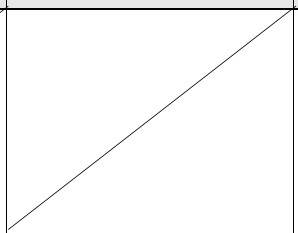
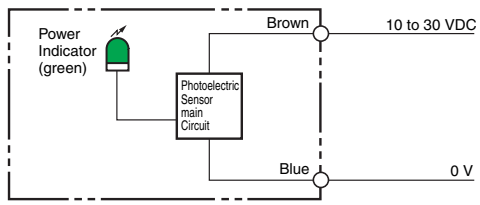
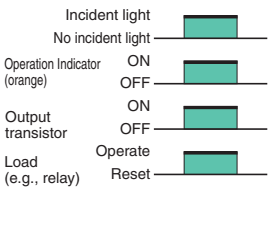
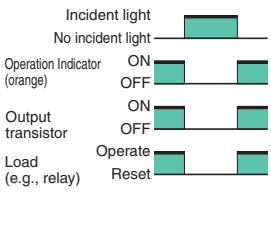
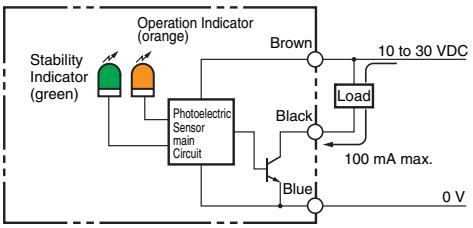
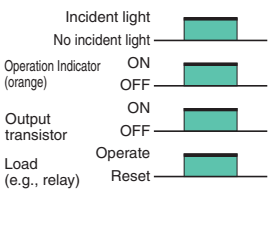
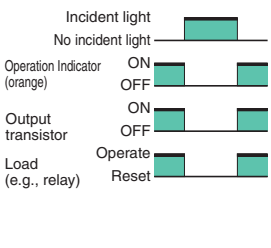
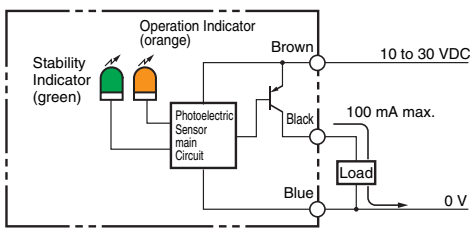
# E3JK

## 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.”

## Safety Precautions

**Refer to *Warranty and Limitations of Liability*.**

**⚠ WARNING**

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

**⚠ Caution**

**Do not wire the product incorrectly.**
**Do not use this product with a damaged case or cable.**

**Do not disassemble, repair, or modify this product.**
**Doing so may lead to explosion, fire, or product failure.**

### Precautions for Safe Use

The following precautions must be observed to ensure safe operation of the Sensor.

1. Do not use the Sensor in environments subject to flammable, explosive or corrosive gases.
2. Do not use this product in an environment in which oil or chemicals are present.
3. Do not use this product under water, in the rain, or outdoors.
4. Do not use this product under conditions that exceed or in an environment that exceeds the ratings.
5. When using an AC power supply, do not use a power supply that includes high frequencies (such as an inverter).
6. Do not use this product in a location subject to direct sunlight.
7. Do not use this product in a location in which the product will be subject to direct vibrations or impacts.
8. Do not use thinner, alcohol, or other organic solvents with this product.
9. When disposing of the Sensor, treat it as industrial waste.

### Precautions for Correct Use

- If the product is wired to high-voltage power lines and power lines in the same pipe or the same duct, the product may malfunction or be damaged due to induction. Therefore, in principle, perform these two types of wiring separately or use shielded cords.
- Do not apply excessive force to the cables.
- When using a commercially available switching regulator, be sure to install an FG (frame ground terminal).
- The time between the product being turned ON and sensing being possible is 100 ms, so wait at least 100 ms after turning the product ON before using it. If the load and the product are connected to different power supplies, be sure to turn the product ON first.
- An output pulse may be generated when the product is turned OFF, so we recommend turning the load or the load line OFF first.

# E3JK

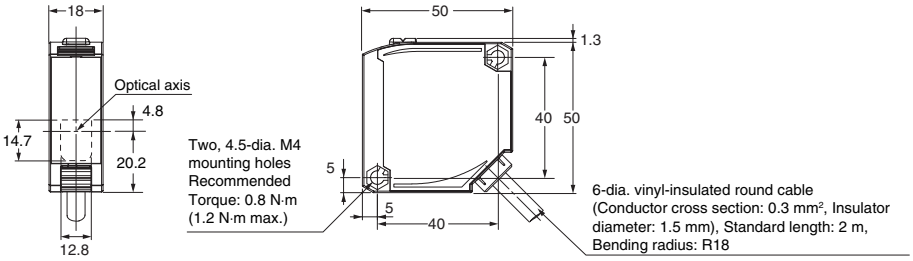
## Dimensions

(Unit: mm)
Tolerance class IT16 applies to dimensions in this datasheet unless otherwise specified.

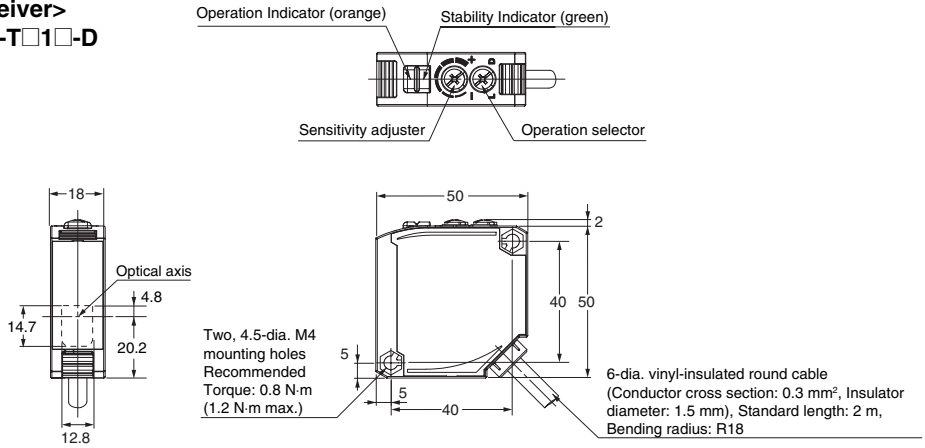
### Sensors

**Through-beam**
**E3JK-T□1□**

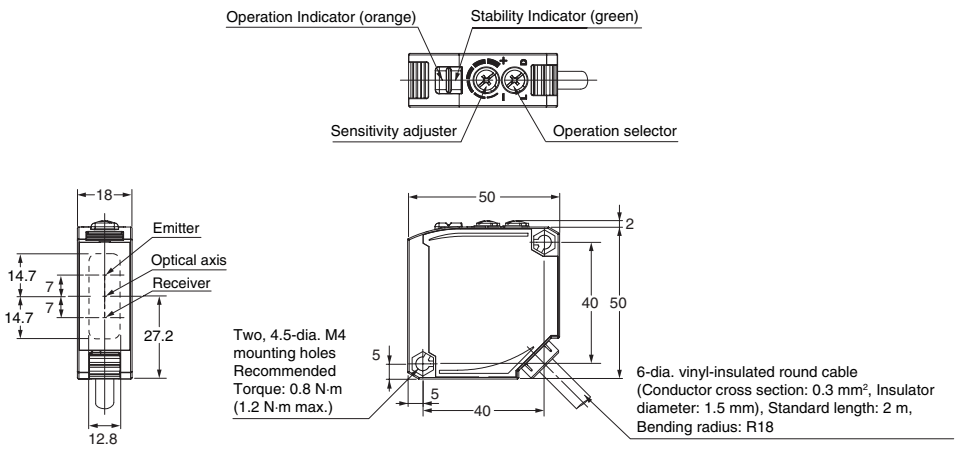
**<Emitter>**
**E3JK-T□1□-L**




**<Receiver>**
**E3JK-T□1□-D**



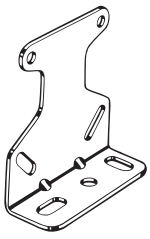

**Retro-reflective/**
**Diffuse-reflective**
**E3JK-R□1□**
**E3JK-D□1□**



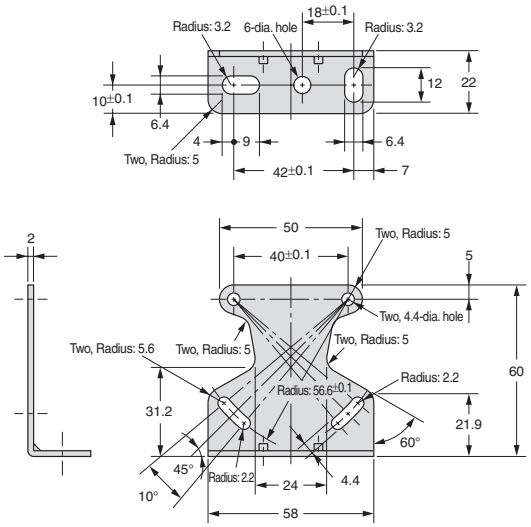
## Accessories

### Mounting Bracket (Order separately)

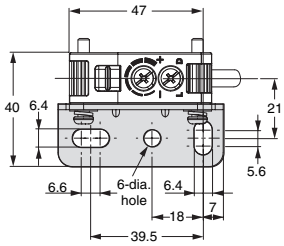
**Mounting Bracket**
**E39-L40**

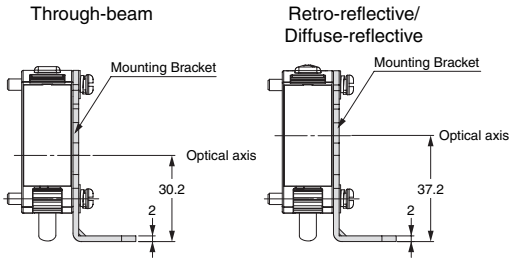


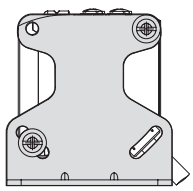
Material: Iron

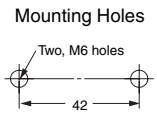



### With Mounting Bracket Attached



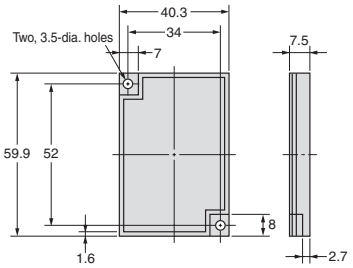





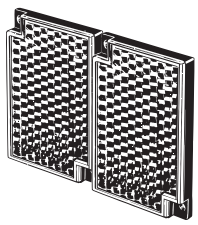

### Reflector (Order separately)

**E39-R1**
**E39-R1S**

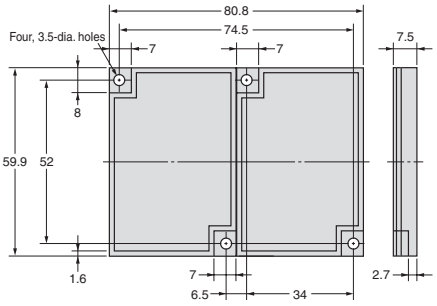
Material:
Reflective surface: acrylic
Rear surface: ABS




**E39-R2**



Material:
Reflective surface: acrylic
Rear surface: ABS



**MEMO**

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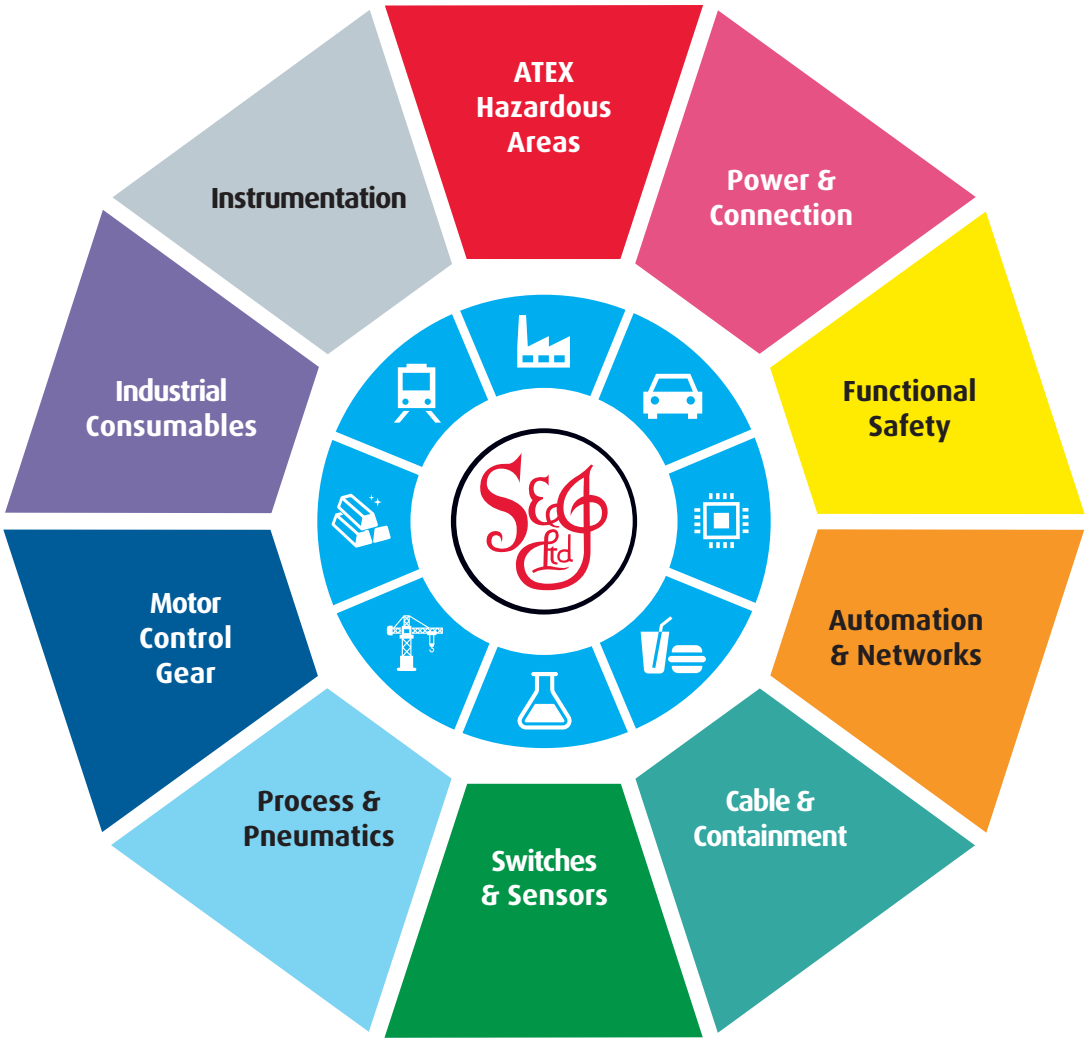


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