

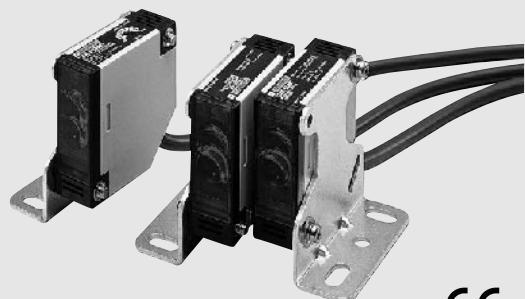
Built-in power supply photoelectric sensor

# E3JK

*Wide range voltage  
power supply*

## Pre-wired type/E3JK

- Slim body full of functions and economically available



CE

Sensor type	Shape	Connection method	Sensing distance	Output form	Output	Model
Through-beam		Pre-wired models	5m	Light ON	Relay output	E3JK-5M1
				Dark ON		E3JK-5M2
				Light ON/ Dark ON (selectable)	DC transistor output	NPN: E3JK-5S3
Retroreflective model (with M.S.R. function)			* 2.5m (3m)	Light ON	Relay output	E3JK-R2M1
				Dark ON		E3JK-R2M2
				Light ON/Dark ON (selectable)	DC transistor output NPN	E3JK-R2S3
Retroreflective model (without M.S.R. function)			* 4m (5m)	Light ON	Relay output	E3JK-R4M1
				Dark ON		E3JK-R4M2
				Light ON/Dark ON (selectable)	DC transistor output (NPN)	E3JK-R4S3
Diffuse-reflective			300mm	Light ON	Relay output	E3JK-DS30M1
				Dark ON		E3JK-DS30M2
				Light ON/Dark ON (selectable)	DC transistor output (NPN)	E3JK-DS30S3

\* The value within the parentheses indicates the sensing distance applied when the E39-R2 reflector is used.

Note: The UL-listed model ends with "-US". (Example: E3JK-5M1-US). Note that the DC transistor type of the E3JK is UL-unlisted.

## Accessories (Order Separately)

## Slits

Slit width	Sensing distance	Minimum sensing object (typical)	Model	Quantity	Remarks
Width 1 mm x 20 mm	E3JK-5□□	0.7 m	1 mm dia.	E39-S39	1 pc. each for emitter and receiver (total 2 pcs.) (Seal type long slit) Can be used with the through-beam model E3JK-5□□.

## Reflectors

Name	Sensing distance (typical)		Model	Quantity	Remarks
Reflectors	E3JK-R2□□	2.5 m (rated value)	E39-R1	1	Attached to the E3JK-R2□□.
	E3JK-R4□□	4 m (rated value)			Attached to the E3JK-R4□□.
	E3JK-R2□□	3 m	E39-R2	1	---
	E3JK-R4□□	5 m			---
Small reflector	E3JK-R2□□	1 m (5 mm) *	E39-R3	1	---
Tape Reflector	E3JK-R2□□	750 mm (200 mm) *	E39-RS1	1	The M.S.R. function is available.
	E3JK-R2□□	1.2 m (200 mm) *	E39-RS2		
	E3JK-R2□□	1.5 m (200 mm) *	E39-RS3		

\* Values in parentheses indicate the minimum required distance between the sensor and reflector.

Note: When the reflector used is other than the supplied one, set the sensing distance to about 0.7 times of the typical example as a guideline.

## Mounting Brackets

Shape	Model	Quantity	Remarks
	E39-L40	1	Supplied with E3JK

Note: If a through-beam model is used, order two Mounting Brackets for the emitter and receiver respectively.

## Rating/Performance

## E3JK

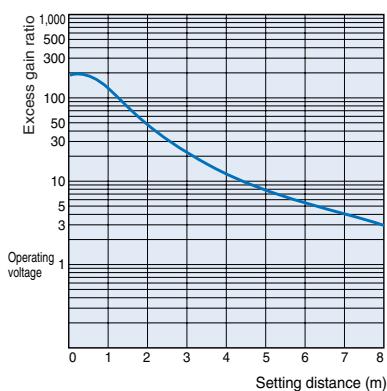
Item	Sensor type Model	Through-beam		Retroreflective model (with M.S.R. function)		Retroreflective model (without M.S.R. function)		Diffuse-reflective							
		E3JK-5M□	E3JK-5S3	E3JK-R2M□	E3JK-R2□3	E3JK-R4M□	E3JK-R4S3	E3JK-DS30M□	E3JK-DS30S3						
Sensing distance	5 m	2.5 m (When using the E39-R1)		4 m (When using the E39-R1)		300 mm (White paper 100x100 mm)		---							
Standard sensing object	Opaque 14.8 dia. min.	Opaque: 75 mm dia. min.		---		20% max. of sensing distance		---							
Differential distance		---		---		---		---							
Directional angle	Both emitter and receiver: 3°C to 20°C	1° to 5°		---		---		---							
Light source (wave length)	Infrared LED (950 nm)	Red LED (660 nm)		Infrared LED (950 nm)		Infrared LED (950 nm)		Infrared LED (950 nm)							
Power supply voltage	12 to 240 VDC ±10% ripple (p-p) : 10% max. 24 to 240 VAC ±10% 50/60 Hz														
Current consumption	DC	3 W max.		2 W max.		---		---							
	AC	3 W max.		2 W max.		---		---							
Control output		Relay output: 250VAC 3 A ( $\cos\phi=1$ ) max., 5 VDC 10 mA min.	DC SSR Negative common 48 VDC 100 mA max. Leak current 0.1 mA max. With load short-circuit protection	Relay output: 250VAC 3 A ( $\cos\phi=1$ ) max., 5 VDC 10 mA min.	DC SSR Negative or positive common 48 VDC 100 mA max. Leak current 0.1 mA max. With load short-circuit protection	Relay output: 250VAC 3 A ( $\cos\phi=1$ ) max., 5 VDC 10 mA min.	DC SSR Negative common 48 VDC 100 mA max. Leak current 0.1 mA max. With load short-circuit protection	Relay output: 250VAC 3 A ( $\cos\phi=1$ ) max., 5 VDC 10 mA min.	DC SSR Negative common 48 VDC 100 mA max. Leak current 0.1 mA max. With load short-circuit protection						
Life expectancy (relay output)	Mechanical	50 million times or more (switching frequency 18,000 times/hour)													
	Electrical	100 thousand times or more (switching frequency 18,000 times/hour)													
Response time		30 ms max.	10 ms max.	30 ms max.	5 ms max.	30 ms max.	5 ms max.	30 ms max.	5 ms max.						
Sensitivity adjustment		---		Single-turn adjustment		---		---							
Ambient illuminance		Incandescent lamp: 3,000 lux max.													
Ambient temperature		Operating: -25°C to 55°C, Storage: -30°C to 70°C (with no icing or condensation)													
Ambient humidity		Operating: 45% to 85%RH, Storage: 35% to 95%RH (with no condensation)													
Insulation resistance		20 M Ω min. at 500 VDC													
Dielectric strength		1,500 VAC at 50/60 Hz for 1 minute													
Vibration resistance	Destruction	10 to 55 Hz, 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions													
	Malfunction	10 to 55 Hz, 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions													

Item	Sensor type Model	Through-beam		Retroreflective model (with M.S.R. function)		Retroreflective model (without M.S.R. function)		Diffuse-reflective							
		E3JK-5M□	E3JK-5S3	E3JK-R2M□	E3JK-R2□3	E3JK-R4M□	E3JK-R4S3	E3JK-DS30M□	E3JK-DS30S3						
Shock resistance	Destruction	Destruction: 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions													
	Mal-function	Destruction: 100m/s <sup>2</sup> (approx. 10G) 3 times each in X, Y, and Z directions	Destruction: 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions	Destruction: 100m/s <sup>2</sup> (approx. 10G) 3 times each in X, Y, and Z direc tions	Destruction: 500 m/s <sup>2</sup> for 3 times each in X, Y and Z directions	Destruction: 100m/s <sup>2</sup> (approx. 10G) 3 times each in X, Y, and Z direc tions	Destruction: 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions	Destruction: 100m/s <sup>2</sup> (approx. 10G) 3 times each in X, Y, and Z direc tions	Destruction: 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions						
Protective structure		IEC60529 IP64													
Connection method		Pre-wired models (standard length: 2 m)													
Weight (Packed state)		Approx. 420 g		Approx. 250 g											
Material	Case	ABS													
	Lens	Acrylics													
	Mounting bracket	Steel													
Accessories		Mounting bracket (with screws), nuts, instruction manual, reflector (retroreflective model only)													

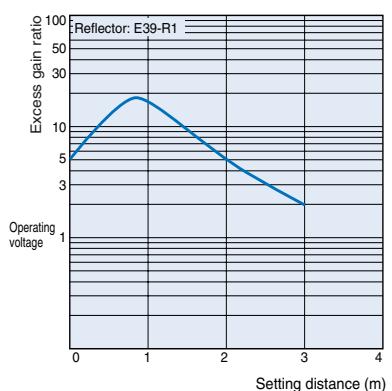
## Characteristic data (typical)

### Excess Gain Ratio vs. Setting Distance

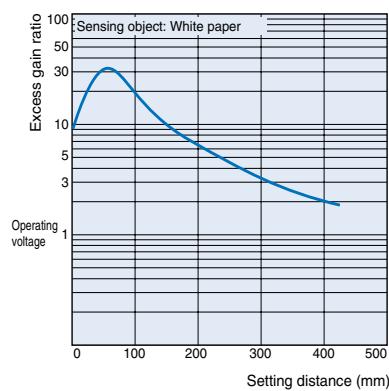
Through-beam model  
E3JK-5□□



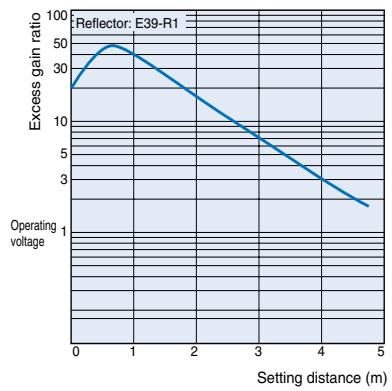
Retroreflective Models  
E3JK-R2□□ + E39-R1 (supplied reflector)



Diffuse-reflective  
E3JK-DS30□□



E3JK-R4□□ + E39-R1 (supplied reflector)



## Output Circuit Diagram

E3JK

Relay output

E3JK

Model	Timing chart	Output circuit
E3JK-5M1 E3JK-5M2  E3JK-R2M1 E3JK-R2M2 E3JK-R4M1 E3JK-R4M2  E3JK-DS30M1 E3JK-DS30M2	<p>Incident Interrupted</p> <p>Light indicator (red) ON OFF</p> <p>L-ON(Ta) (E3JK-□□M1) ON OFF</p> <p>D-ON(Ta) (E3JK-□□M2) ON OFF</p>	<p>24 to 240 VAC 12 to 240 VDC</p> <p>Main circuit</p> <p>Brown Power source</p> <p>Blue (Polarity Optional)</p> <p>White</p> <p>Black Contact output</p> <p>Tc Tb Ta Gray</p> <p>Built-in relay: G6C</p>

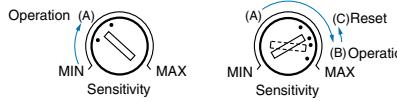
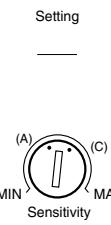
DC transistor output

Model	Timing chart	Output circuit
E3JK-5S3  E3JK-R2S3 E3JK-R4S3  E3JK-DS30S3	<p>Incident Interrupted</p> <p>Light indicator (red) ON OFF</p> <p>L-ON mode ON OFF</p> <p>D-ON mode ON OFF</p>	<p>24 to 240 VAC 12 to 240 VDC</p> <p>Main circuit</p> <p>Brown Power source</p> <p>Blue</p> <p>White</p> <p>Black (L-ON) Load</p> <p>Gray (D-ON) Load</p>
E3JK-R2R3	<p>Incident Interrupted</p> <p>Light indicator (red) ON OFF</p> <p>L-ON mode ON OFF</p> <p>D-ON mode ON OFF</p>	<p>24 to 240 VAC 12 to 240 VDC</p> <p>Main circuit</p> <p>Brown Power source</p> <p>Blue</p> <p>D/ON Load</p> <p>Gray I<sub>1</sub> Load</p> <p>L/ON Load</p> <p>Black I<sub>2</sub> Load</p> <p>White</p> <p>Note: The output stage leakage currents are 0.1 mA max., respectively.</p>

Note: Connect to brown and blue on the emitter side.

## Operation

### Adjustment

Item Model	Through-beam	Retroreflective Models	Diffuse-reflective		
E3JK	Swing the receiver and emitter vertically and/or horizontally and set the adjuster in the center of the range where the indicator of the receiver turns ON.	Like the through-beam model, adjust the reflector and emitter/receiver. Since the directional angle of the emitter/receiver is 1 to 5°, adjust the emitter/receiver especially carefully.	 		<p>(1) If you have a sensing object as shown in the figure, turn the sensitivity adjuster clockwise (increase the sensitivity) until the indicator is turned ON, and define this adjuster position as (A).</p> <p>(2) Remove the sensing object, turn the sensitivity adjuster clockwise until the indicator is turned ON by a background object, and define this position as (B).</p> <p>(3) Turn the sensitivity adjuster counterclockwise (decrease the sensitivity) from (B) until the indicator is turned OFF, and define this position as (C).</p> <p>(4) The position in the middle of (A) and (C) is the optimum position. If the indicator is not turned ON by the background object at the maximum sensitivity, set the adjuster in the middle of (A) and maximum sensitivity.</p> <ul style="list-style-type: none"> <li>The sensitivity adjuster may be damaged if an excessive force is applied.</li> </ul>

## Precautions

### Correct Use

#### E3JK

##### Design

##### Power Reset Time

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

##### Wiring Considerations

##### Connection/Wiring

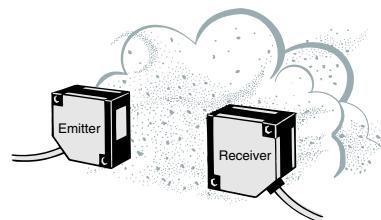
If the DC transistor output type is used, the sum of load currents of L-ON output (NO) and D-ON output (NC) should be within 100 mA. If the sum of load currents exceeds 100 mA, the load short-circuit protection may be activated. (The load short-circuit protection is reset by turning OFF the power of the photoelectric sensor.)

##### Miscellaneous

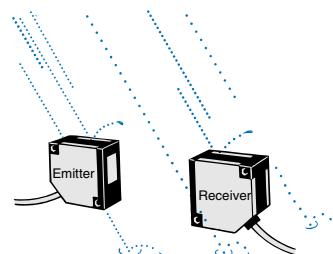
##### Ambient Conditions (Installation Area)

The E3JK will malfunction if installed in the following places.

- Places where the E3JK is exposed to a dusty environment.
- Places where corrosive gases are produced.



- Places where the E3JK is directly exposed to water, oil, or chemicals.

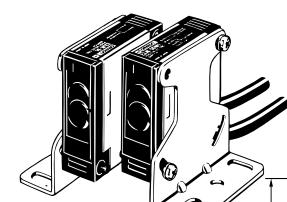


## Dimensions (Unit: mm)

### Sensors

E3JK-5□□

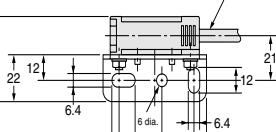
CAD file E3JK\_01



Emitter: E3JK-5L  
Receiver: E3JK-5D□□

#### With Mounting Bracket Attached

6-dia., 5-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.3 mm<sup>2</sup>; insulation diameter: 1.5 mm). Standard length: 2 m. \* 3



#### Mounting Holes



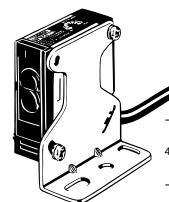
\* 1. Mounting brackets can be used on the A side (Two, M4 x 20 attached).

\* 2. Emitter: Power indicator

Receiver: Light indicator

\* 3. Emitter includes 2-conductor.

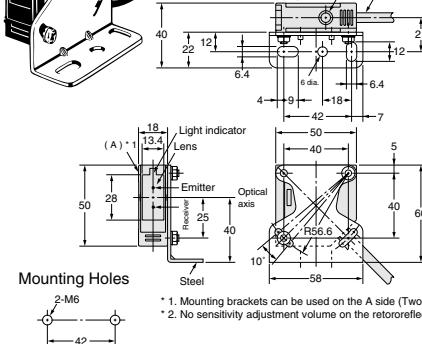
CAD file E3JK\_02  
E3JK-R2□□  
E3JK-R4□□  
E3JK-DS30□□



#### With Mounting Bracket Attached

6-dia., 5-conductor, vinyl-insulated round cable (conductor cross-sectional area: 0.3 mm<sup>2</sup>; insulation diameter: 1.5 mm). Standard length: 2 m. \* 3

Sensitivity adjustment volume \* 2



\* 1. Mounting brackets can be used on the A side (Two, M4 x 20 attached).

\* 2. No sensitivity adjustment volume on the retroreflective model.

### Accessories (Order Separately)

Seal type long slit (for E3JK)

E39-S39



Material: Polyester  
0.1 mm thick

