

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.



Refer to the *Safety Precautions* on page 15.

Applications

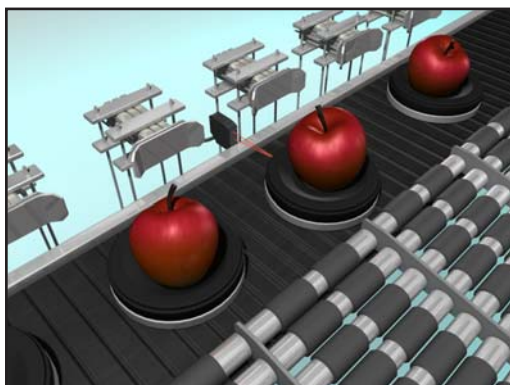
Elevator cage detection



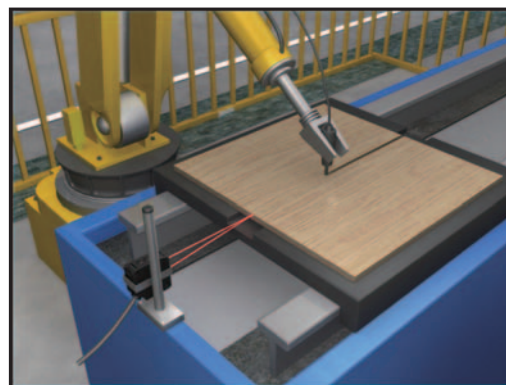
Detection of packages jutting out from their storage location



Pallet detection for agricultural produce conveyors



Workpiece detection for woodworking machines



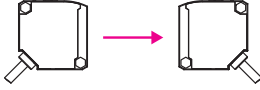




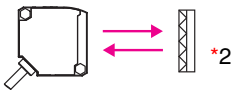




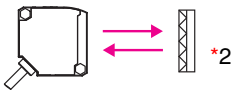


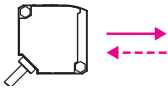



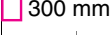
E3JK

Ordering Information

Sensors

Sensors without Brackets or Reflectors

 Red light  Infrared light






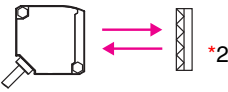






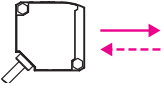



Power supply voltage	Sensing method	Appearance	Sensing distance	Output configuration	Model		
AC/DC power supply selectable type	Through-beam *1 (Emitter + Receiver)		 40 m	Relay	E3JK-TR11 2M Emitter: E3JK-TR11-L 2M Receiver: E3JK-TR11-D 2M		
			 5 m		E3JK-TR12 2M Emitter: E3JK-TR12-L 2M Receiver: E3JK-TR12-D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

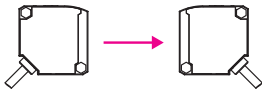




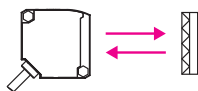

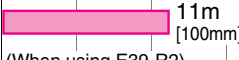
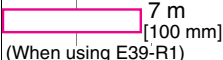
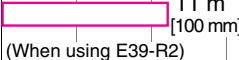
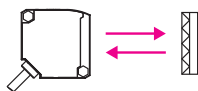


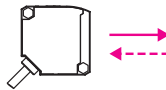

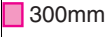

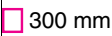
Power supply voltage	Sensing method	Appearance	Sensing distance	Output configuration	Model	
DC	Through-beam *1 (Emitter + Receiver)		 40 m	NPN	E3JK-TN11 2M Emitter: E3JK-TN11-L 2M Receiver: E3JK-TN11-D 2M	
				PNP	E3JK-TP11 2M Emitter: E3JK-TP11-L 2M Receiver: E3JK-TP11-D 2M	
			 5 m	NPN	E3JK-TN12 2M Emitter: E3JK-TN12-L 2M Receiver: E3JK-TN12-D 2M	
				PNP	E3JK-TP12 2M Emitter: E3JK-TP12-L 2M Receiver: E3JK-TP12-D 2M	
			 40 m	NPN	E3JK-TN13 2M Emitter: E3JK-TN13-L 2M Receiver: E3JK-TN13-D 2M	
				PNP	E3JK-TP13 2M Emitter: E3JK-TP13-L 2M Receiver: E3JK-TP13-D 2M	
			 5 m	NPN	E3JK-TN14 2M Emitter: E3JK-TN14-L 2M Receiver: E3JK-TN14-D 2M	
				PNP	E3JK-TP14 2M Emitter: E3JK-TP14-L 2M Receiver: E3JK-TP14-D 2M	
	Retro-reflective without MSR function		 7 m ^{*3} [100 mm] (When using E39-R1)	NPN	E3JK-RN11 2M	
			 11 m ^{*3} [100 mm] (When using E39-R2)	PNP	E3JK-RP11 2M	
			 7 m ^{*3} [100 mm] (When using E39-R1)	NPN	E3JK-RN13 2M	
			 11 m ^{*3} [100 mm] (When using E39-R2)	PNP	E3JK-RP13 2M	
			Retro-reflective with MSR function	 6 m ^{*3} [100 mm] (When using E39-R1)	NPN	E3JK-RN12 2M
				 10 m ^{*3} [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	
	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 configuration	Model	
AC/DC power supply selectable type	Through-beam *1 (Emitter + Receiver)		 40m	Relay	E3JK-TR11-C 2M Emitter: E3JK-TR11-L 2M Receiver: E3JK-TR11-D 2M	
			 5m		E3JK-TR12-C 2M Emitter: E3JK-TR12-L 2M Receiver: E3JK-TR12-D 2M	
			 40 m		E3JK-TR13-C 2M Emitter: E3JK-TR13-L 2M Receiver: E3JK-TR13-D 2M	
			 5 m		E3JK-TR14-C 2M Emitter: E3JK-TR14-L 2M Receiver: E3JK-TR14-D 2M	
	Retro-reflective without MSR function		 7m *2 [100mm] (When using E39-R1)		Relay	E3JK-RR11-C 2M
			 11m [100mm] (When using E39-R2)			
			 7 m *2 [100 mm] (When using E39-R1)			
			 11 m [100 mm] (When using E39-R2)			
	Retro-reflective with MSR function		 6m *2 [100mm] (When using E39-R1)		Relay	E3JK-RR12-C 2M
			 10m [100mm] (When using E39-R2)			
	Diffuse-reflective		 2.5m		Relay	E3JK-DR11-C 2M
			 300mm			
			 2.5 m			
			 300 mm			

*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%, ripple (p-p): 10% max. 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), 5 VDC, 10 mA min., 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)			

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. 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.

E3JK

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%, ripple (p-p): 10% max. 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 and Mounting Bracket (E3JK-DR1□-C only)			

Item	Sensing method		Through-beam			
	Model	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				

E3JK

Sensing method		Retro-reflective (without MSR function)		Retro-reflective (with MSR function)
Item	Model	E3JK-RN11	E3JK-RN13	E3JK-RN12
	NPN output			
	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.

Model		Sensing method	Diffuse-reflective			
			NPN output	E3JK-DN11	E3JK-DN12	E3JK-DN13
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 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				