E3JM

CSM_E3JM_DS_E_12_9

Model Contribute to Overall Cost Reduction

E3JM Terminal Block Models

· Easy to wire and adjust.



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



Ordering Information

Sensors (Refer to Dimensions on page 8.)

								[Red light	Infrared light			
									Model				
Sensing method	Appearance	Connection method	Sensing di	stance	Operation mode	Output configuration	Functions	Conduit socket thread size: PF1/2	Conduit socket thread size: PG13.5	Conduit socket thread size: 1/2-14NPT UL-listed models			
Through-						Relay		E3JM-10M4-NN	E3JM-10M4-G-NN	E3JM-10M4-NN-US			
beam					Itelay	Timer	E3JM-10M4T-NN	E3JM-10M4T-G-NN	E3JM-10M4T-NN-US				
(Emitter + Receiver)						DC SSR		E3JM-10S4-NN *2	E3JM-10S4-G-NN*2	E3JM-10S4-NN-US *2			
*1				10 m			Timer	E3JM-10S4T-NN *2	E3JM-10S4T-G-NN*2	E3JM-10S4T-NN-US *2			
Retro-		Terminal block						Light-ON	Relay		E3JM-R4M4	E3JM-R4M4-G	E3JM-R4M4-US
reflective					Dark-ON	Relay	Timer	E3JM-R4M4T	E3JM-R4M4T-G	E3JM-R4M4T-US			
with MSR				4 m	(switch selectable)			E3JM-R4S4 *2	E3JM-R4S4-G *2	E3JM-R4S4-US *2			
function	E39-R1 (provided)					selectable)	selectable)	DC SSR	Timer	E3JM-R4S4T *2	E3JM-R4S4T-G *2	E3JM-R4S4T-US *2	
		700 mm				Delay		E3JM-DS70M4	E3JM-DS70M4-G	E3JM-DS70M4-US			
Diffuse-					Relay	Timer	E3JM-DS70M4T	E3JM-DS70M4T-G	E3JM-DS70M4T-US				
reflective	↓			DC SSR		E3JM-DS70S4 *2	E3JM-DS70S4-G *2	E3JM-DS70S4-US *2					
	*					DC 33K	Timer	E3JM-DS70S4T *2	E3JM-DS70S4T-G *2	E3JM-DS70S4T-US *2			

*1. Through-beam Sensors are sold in sets that include both the Emitter and Receiver. An order for the Emitter or Receiver alone cannot be accepted. *2. Have been discontinued at December 2023.

Note: Tightening nuts, washers, and rubber bushings are not provided with UL-listed models.

Accessories (Order Separately)

Slit (A Slit is not provided with the Sensor for through-beam. Order a Slit separately if required.) (Refer to Dimensions on page 8.)

Slit width	Sensing distance		Minimum detectable object (reference value)	Model	Quantity	Remarks
1 mm × 20 mm	E3JM-10□4(T)-NN	1.2 m	1-mm dia.	E39-S39	1 Slit each for the Emitter and Re- ceiver (2 Slits total)	(Seal-type long slit) Can be used with the E3JM-10□4(T)-NN, E3JM-10□4(T)-G-NN and E3JM-10□4(T)-NN-US Models.

Reflectors (A Reflector is required for each Retro-reflective Sensor.)

The E39-R1 Reflector is provided with the Sensor. Order other Reflectors separately if required. (Refer to Dimensions on E39-L/E39-S/E39-R.)

Name	Sensi	ng distance	Model	Quantity	Remarks
Reflectors	E3JM-R4□4(T)	4 m	E39-R1	1	Provided with the E3JM-R4□4(T), E3JM-R4□4(T)-G and E3JM-R4□4(T)-US Models.

Note: Refer to Reflectors on E39-L/E39-S/E39-R on your OMRON website for details.

Mounting Bracket

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

Mounting Bracket

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

Appearance	Model	Quantity	Remarks
	E39-L53	1	Provided with the E3JM.
	E39-L51	1	Height of optical axis can be adjusted.

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

Ratings and Specifications

	Sensing method	Through-beam model	Retro-reflective model (with MSR function)	Diffuse-reflective model				
ltem	Model	E3JM-10□4(T)-NN E3JM-10□4(T)-G-NN E3JM-10□4(T)-NN-US	E3JM-R4□4(T) E3JM-R4□4(T)-G E3JM-R4□4(T)-US	E3JM-DS70□4(T) E3JM-DS70□4(T)-G E3JM-DS70□4(T)-US				
Sensing distanc	e	10 m	4 m (When using E39-R1)	White paper (200 × 200 mm): 700 mm				
Standard sensir Differential trave	• •	Opaque: 14.8-mm dia. min.	Opaque: 75-mm dia. min.	 20% max. of sensing distance				
Directional angl	e	Both Emitter and Receiver 3° to 20°	1° to 5°					
Light source (wa	avelength)	Infrared LED (950 nm)	Red LED (660 nm)	Infrared LED (940 nm)				
Power supply ve	oltage	100 to 240 VAC±10%, 50/60 Hz	model): 24 to 240 VDC±10%, ripple □) model): 12 to 240 VDC±10%, rip					
Power con-	DC	3 W max. (Emitter 1 W max. Receiver 2 W max.)	2 W max.					
sumption	AC	3 W max. (Emitter 1 W max. Receiver 2 W max.)	2 W max.					
Control output		Relay output (E3JM-□M4 (T)(-□) model): SPDT, 250 VAC, 3A (cosφ=1) max., 5 VDC, 10 mA min. DC SSR output (E3JM-□S4 (T)(-□) model): 48 VDC, 100 mA max. (residual voltage: 2 V max.) Light-ON/Dark-ON selectable						
Life	Mechanical	50,000,000 times min. (switching frequency: 18,000 times/h)						
expectancy relay output)	Electrical	100,000 times min. (switching frequency: 1,800 times/h)						
Posponso timo	Relay output	(E3JM-□□M4 (T)(-□) models) Ope	erate or reset: 30 ms max.					
Response time DC SSR output		(E3JM-□□S4 (T)(-□) models) Ope	rate or reset: 5 ms max.					
Sensitivity adjustment		One-turn adjuster						
Timer function *		ON-delay/OFF-delay/One-shot delay switch selectable Delay time: 0.1 to 5 s (adjustable), only for E3JM-□□□4T(-□)						
Ambient illumin (Receiver side)	ation	Incandescent lamp: 3,000 lx max.						
Ambient temper	ature range	Operating: -25°C to 55°C, Storage: -30°C to 70°C (with no icing or condensation)						
Ambient humidi	ty range	Operating: 45% to 85% (with no condensation), Storage: 35% to 95% (with no condensation)						
nsulation resist	tance	20 MΩ min. at 500 VDC						
Dielectric streng	gth	2,000 VAC, 50/60 Hz for 1 min.						
Vibration	Destruction	10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions						
resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions						
Shock	Destruction	500 m/s ² 3 times each in X, Y, and Z directions						
resistance	Malfunction	100 m/s ² 3 times each in X, Y, and Z directions						
Degree of protection		IEC 60529: IP66						
Connection method		Terminal block						
Weight (packed state)		Approx. 270 g	Approx. 160 g					
	Case	ABS (Acrylonitril Butadiene Styrene)						
	Lens	Methacrylic resin						
Material	Cover	Polycarbonate						
	Mounting	Iron						
	Bracket	Iron						

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

Engineering Data (Reference Value)

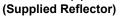
Parallel Operating Range

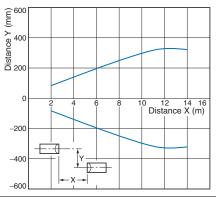
Through-beam E3JM-10 4(T)-NN

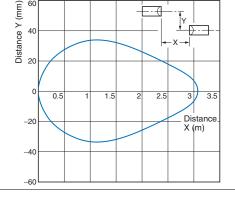
Through-beam

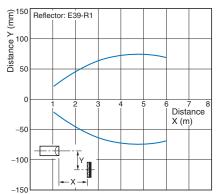
E3JM-10□4(T)-NN + E39-S39 (Optional Slit) E3JM-R4□4(T) + E39-R1 (A Slit is mounted to the Emitter and Receiver.)

Retro-reflective





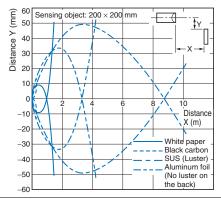




Operating Range

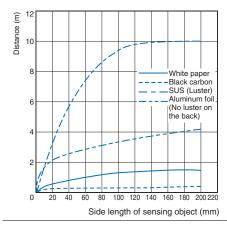
Diffuse-reflective

E3JM-DS70 4(T)



Sensing Object Size vs. Sensing Distance

E3JM-DS70 4(T)



I/O Circuit Diagrams

Relay Output Models

Model	Timing chart	Output circuit		
E3JM-10M4(T)(-G)-NN(-US) E3JM-R4M4(T)(-G)(-US) E3JM-DS70M4(T)(-G)(-US)	Incident light No incident light Indicator (red) * OFF L-ON (Ta) D-ON (Ta) OFF D-ON (Ta) OFF OFF D-ON (Ta) OFF OFF OFF OFF OFF OFF OFF OFF OFF OF	100 to 240 VAC 24 to 240 VDC Sensor main circuit Ta (Built-in Relay: G6C)		

DC SSR Output Models

Model	Timing chart	Output circuit			
E3JM-10S4(T)(-G)-NN(-US) E3JM-R4S4(T)(-G)(-US) E3JM-DS70S4(T)(-G)(-US)	Incident light No incident light Indicator (red) * OFF L-ON (Ta) ON D-ON (Ta) ON OFF D-ON (Ta) ON OFF Refer to page 6 for information on Sensors with timers (T).	24 to 240 VAC 12 to 240 VDC			

Note: Connect terminal 1 to any polarity and terminal 2 to the power supply because there is no polarity on the Emitter side. * This is the light indicator on Sensors without a timer and the operation indicator on Sensors with a timer.

Safety Precautions

Refer to Warranty and Limitations of Liability.

🕂 WARNING

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

Precautions for Correct Use

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

Designing

Operation

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

	Switch configuration	Switch selection				Timing charts	
Models without timer	MODE 0++1 D-ON L-ON Operation selector	D-ON LON Coutput element C		, Relay ON It switching		Incident light No incident light L-ON OFF D-ON OFF	
Models with timer	MODE 0++1 D-ON TIMER D-ON TIMER D-ON Switch Selector Selector switch for timer mode	ON-delay MODE 0++1 D-ON L-ON SW1 SW2 Both SW1 and SW2 at "0." Note: The operation without a time		One-shot delay MODE 0++1 D-ON TIMER Only SW1 at "1," which overrides either setting of SW2. Delay SW2 Only SW1 at "1," which overrides either setting of SW2.	ON-delay	OFF-delay	One-shot delay

Output Relay Contact

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

• Wiring

Connecting and Wiring

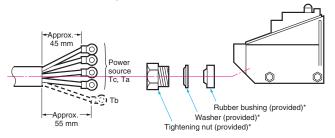
- We recommend connecting a cable with a conductor cross-section of 0.3 mm² and an outer diameter of 6 to 8 mm.
- Be sure to firmly tighten the cover in order to maintain waterproof and dustproof properties. The screw size of the conduit sockets is shown in the following table.

Model	Conduit socket thread size
E3JM-	PF1/2
E3JM-□-G	PG13.5
E3JM-□-US	1/2-14NPT

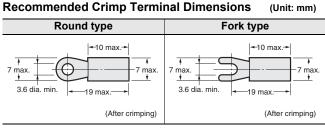
• When using the DC SSR output model, the total of the load current for the Light-ON output (NO) and that for the Dark-ON (NC) should be 100 mA max. If the total exceeds 100 mA, the load short-circuit protection function will be activated (this function will be reset when the power of the Photoelectric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

Cable End Treatment

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



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



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

LED Safety

1

E3JM-R4□4(T) is classified RISK GROUP 1, based on IEC 62471.

	RISK GROUP 1				
NOTICE	IR emitted from this product.				
Use appropriate shielding or eye protection.					

E3JM-10 4(T)-NN and E3JM-DS70 4(T) are classified RISK GROUP 2, based on IEC 62471.

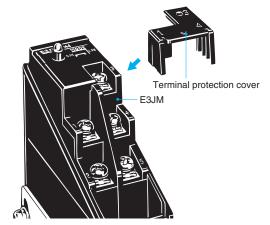
RISK GROUP 2

CAUTION IR emitted from this product, Avoid eye exposure. Use appropriate shielding or eye protection.

Others

Terminal Protection Cover (Provided)

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



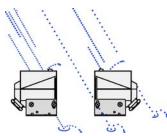
Ambient Conditions (Installation Area)

The E3JM will malfunction if installed in the following places. • Places where the E3JM is exposed to a dusty environment.

• Places where corrosive gases are produced.



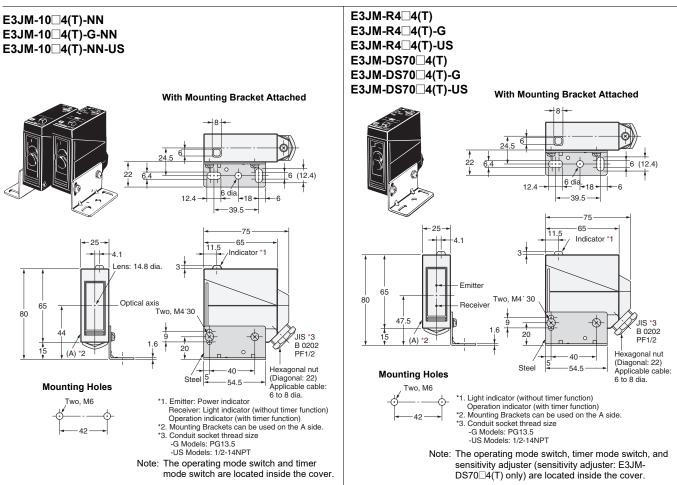
• Places where the E3JM is directly exposed to water, oil, or chemicals.



Dimensions

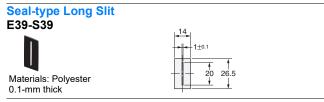
(Unit: mm) Tolerance class IT16 applies to dimensions in this datasheet unless otherwise specified.

Sensors



Note: Models numbers for Through-beam Sensors (E3JM-10□4(T)(-G)-NN(-US)) are for sets that include both the Emitter and Receiver.

Accessories (Order separately)



Mounting Brackets

Refer to E39-L/E39-S/E39-R on your OMRON website for details.

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