## E3JM

CSM\_E3JM\_DS\_E\_12\_3

## 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.



Be sure to read *Safety Precautions* on page 6.

## **Ordering Information**

Sensors (Refer to Dimensions on page 8.)

								[	Red light	Infrared light
									Model	
Sensing method	Appearance	Connection method	Sensing	distance	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						neiay	Timer	E3JM-10M4T-NN	E3JM-10M4T-G-NN	E3JM-10M4T-NN-US
(Emitter +						DC SSR		E3JM-10S4-NN	E3JM-10S4-G-NN	E3JM-10S4-NN-US
Receiver) *				10 m	ا		Timer	E3JM-10S4T-NN	E3JM-10S4T-G-NN	E3JM-10S4T-NN-US
Retro- reflective	E39-R1 (provided)	Terminal block		Light-ON	Light-ON			E3JM-R4M4	E3JM-R4M4-G	E3JM-R4M4-US
			4 m		Dark-ON (switch		Timer	E3JM-R4M4T	E3JM-R4M4T-G	E3JM-R4M4T-US
with MSR				4 m		(switch		E3JM-R4S4	E3JM-R4S4-G	E3JM-R4S4-US
function				selectable)	e) DC SSR	Timer	E3JM-R4S4T	E3JM-R4S4T-G	E3JM-R4S4T-US	
-	<b>***</b>		700			Relay		E3JM-DS70M4	E3JM-DS70M4-G	E3JM-DS70M4-US
Diffuse-						nelay	Timer	E3JM-DS70M4T	E3JM-DS70M4T-G	E3JM-DS70M4T-US
reflective			700 mm	1111		DC CCD		E3JM-DS70S4	E3JM-DS70S4-G	E3JM-DS70S4-US
					DC SSR	Timer	E3JM-DS70S4T	E3JM-DS70S4T-G	E3JM-DS70S4T-US	

\*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. 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	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	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  $\it Reflectors$  on  $\it E39-L/E39-S/E39-R$  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)

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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				
Item 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 distand	ce	10 m 4 m (When using E39-R1)		White paper (200 × 200 mm): 700 mm				
Standard sensi	ng object	Opaque: 14.8-mm dia. min.	Opaque: 75-mm dia. min.					
Differential trav	el			20% max. of sensing distance				
Directional angl	e	Both Emitter and Receiver 3° to 20°	1° to 5°					
Light source (w	avelength)	Infrared LED (950 nm)	Red LED (660 nm)	Infrared LED (950 nm)				
Power supply v	oltage	12 to 240 VDC±10%, ripple (p-p): 10% max. 24 to 240 VAC±10%, 50/60 Hz						
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)						
	Relay output	(E3JM-□□M4 (T)(-□) models) Operate or reset: 30 ms max.						
Response time	DC SSR output	(E3JM-□□S4 (T)(-□) models) Operate or reset: 5 ms max.						
Sensitivity adju	stment	-		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 illumination (Receiver side)		Incandescent lamp: 3,000 lx max.						
Ambient temper	rature range	Operating: -25°C to 55°C, Storage: -30°C to 70°C (with no icing or condensation)						
Ambient humid	ity range	Operating: 45% to 85% (with no condensation), Storage: 35% to 95% (with no condensation)						
nsulation resis	tance	20 MΩ min. at 500 VDC						
Dielectric stren	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 <sup>2</sup> 3 times each in X, Y, and Z directions						
resistance	Malfunction	100 m/s <sup>2</sup> 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		~0,				
	Mounting Bracket	Iron	47.					
Accessories			s, Terminal Protection Cover, One s					

<sup>\*</sup>The timer cannot be disabled for models with timer functions (E3JM- $\square\square$ 4T(- $\square$ )).

## **Engineering Data (Reference Value)**

#### **Parallel Operating Range**

## Through-beam

Distance Y (mm) 000 000 000

-200

-400

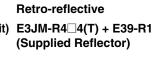
-600

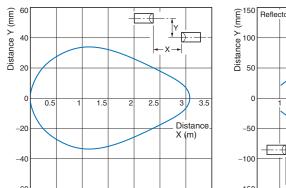
E3JM-10□4(T)-NN

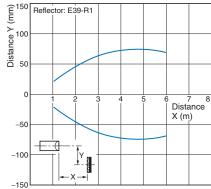
# Receiver.) Distance Y (mm) 12 14 16 Distance X (m)

## 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



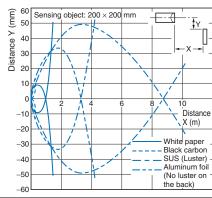




#### **Operating Range**

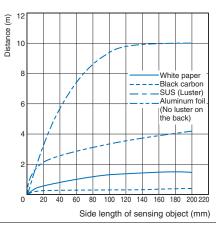
#### Diffuse-reflective

### E3JM-DS70□4(T)



#### **Sensing Object Size vs. Sensing Distance**

#### E3JM-DS70□4(T)



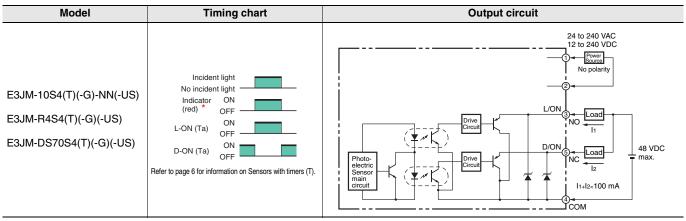
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## I/O Circuit Diagrams

#### **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) ON OFF D-ON (Ta) ON OFF Refer to page 6 for information on Sensors with timers (T).	Photoelectric Sensor main circuit  3 Tb  Contact output  (Built-in Relay: G6C)		

#### **DC SSR Output Models**



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.



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



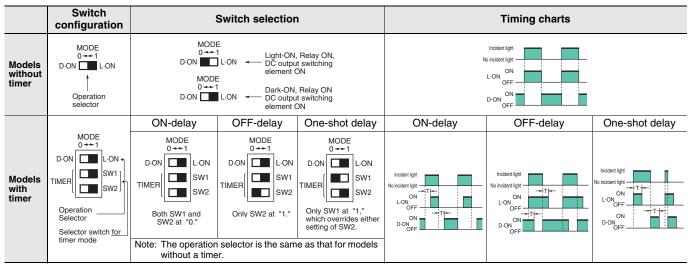
#### **Precautions for Correct Use**

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.



#### **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

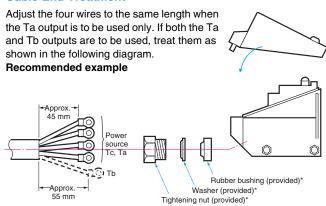
#### **Connecting and Wiring**

- 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**



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

#### Recommended Crimp Terminal Dimensions (Unit: mm)

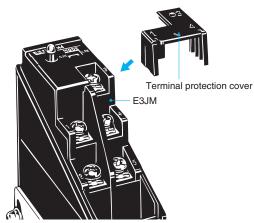
Round type	Fork type
7 max	7 max. 3.6 dia. min. 19 max.
(After crimping)	(After crimping)

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

#### 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).



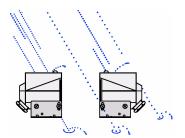
#### **Ambient Conditions (Installation Area)**

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**

### Sensors

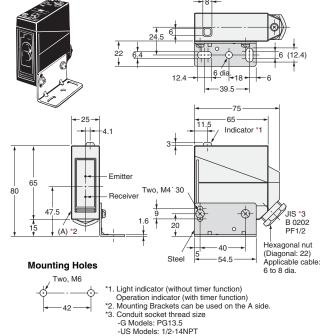
E3JM-10 4(T)-NN E3JM-10 4(T)-G-NN E3JM-10 4(T)-NN-US

### With Mounting Bracket Attached 39.5 -65 Indicator \*1 Lens: 14.8 dia. Two. M4'30 JIS \*3 B 0202 (A) \*2 PF1/2 kagonal nut 40 (Diagonal: 22) Steel 5 54.5 **Mounting Holes** Applicable cable: 6 to 8 dia Two, M6 \*1. Emitter: Power indicator Receiver: Light indicator (without timer function) Operation indicator (with timer function) \*2. Mounting Brackets can be used on the A side. \*3. Conduit socket thread size -G Models: PG13.5 -US Models: 1/2-14NPT

Note: The operating mode switch and timer mode switch are located inside the cover.

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

## With Mounting Bracket Attached



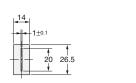
Note: The operating mode switch, timer mode switch, and sensitivity adjuster (sensitivity adjuster: E3JM-DS70□4(T) only) are located inside the cover.

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)**

Seal-type Long Slit E39-S39

Materials: Polyester 0.1-mm thick



#### **Mounting Brackets**

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



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