

OMRON

# TYPE E3A2 PHOTOELECTRIC SWITCH

## INSTRUCTION MANUAL

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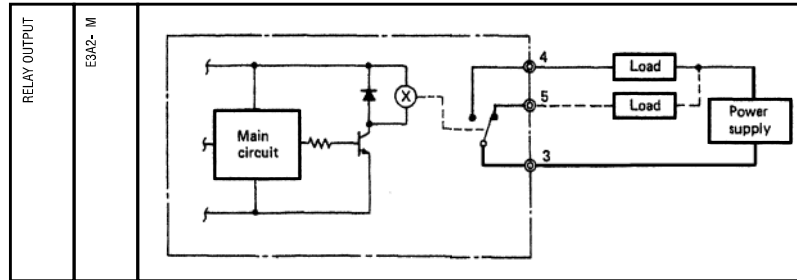
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### AVAILABLE TYPES

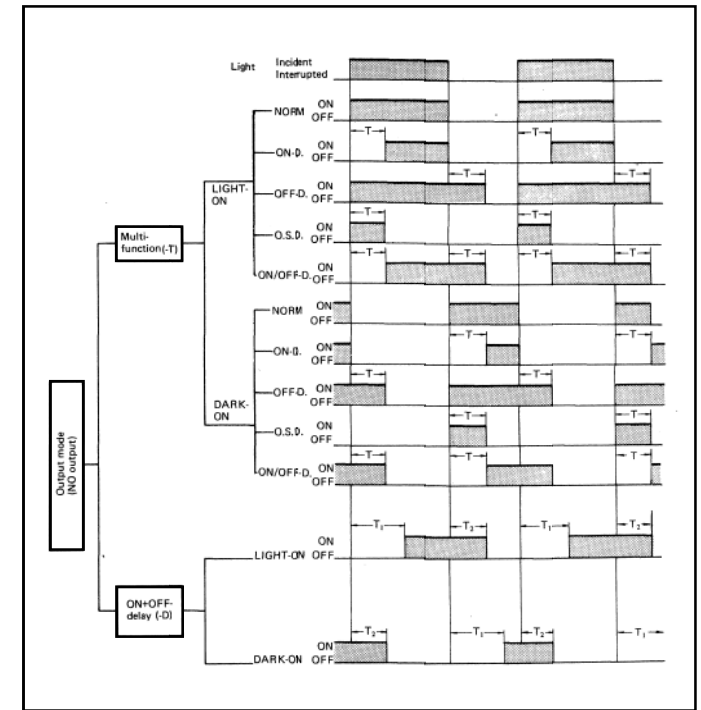
TIMER FUNCTION	DETECTION METHOD	SEPARATE	RETROREFLECTIVE*	DIFFUSE REFLECTION	FIBER OPTIC**
	DETECTING DISTANCE	10m (32.8')	3m (9.8')	70cm (27.56")	5cm TO 12cm (1.97" TO 4.72")
	OUTPUT UNIT	E3A2-10M4	E3A2-R3M4	E3A2-DS70M4	E3A2-XCM4
ON DELAY, OFF-DELAY, ONE-SHOT DELAY, ON+OFF DELAY**	PLUG-IN RELAY	E3A2-10M4T	E3A2-R3M4T	E3A2-DS70M4T	E3A2-XCM4T
ON+OFF DELAY	PLUG-IN RELAY	E3A2-10M4D	E3A2-R3M4D	E3A2-DS70M4D	E3A2-XCM4D

NOTE: \* INCLUDES TYPE E39-R1 RETROREFLECTIVE TARGET  
 \*\* FOR ON+OFF-DELAY TIMER FUNCTION, ON-DELAY AND OFF-DELAY TIMES ARE EQUAL. IF INDEPENDENT SETTING OF THESE DELAYS IS NEEDED, USE "D" TYPE PRODUCTS.  
 \*\*\* FIBER OPTIC CABLES ORDERED SEPARATELY.

### OUTPUT STAGE CIRCUIT DIAGRAM



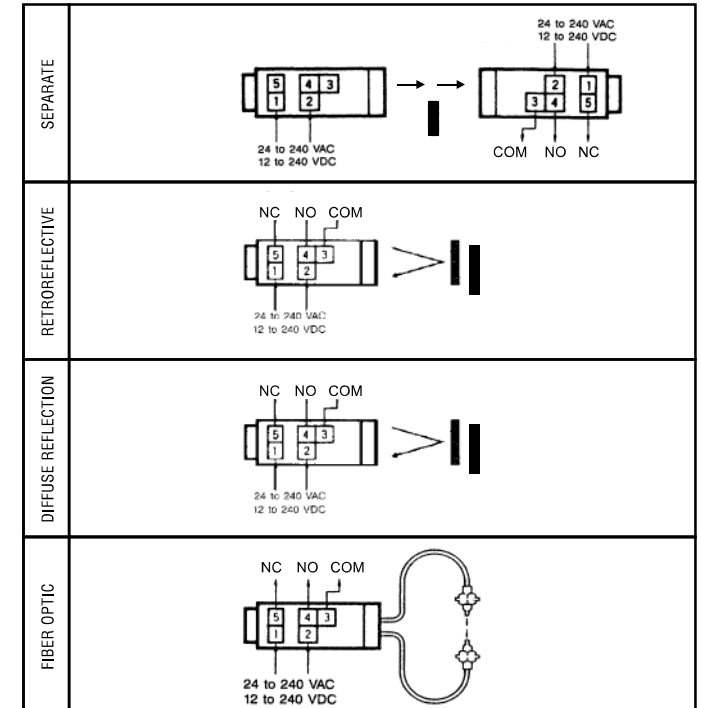
### TIMING CHART



### RATINGS

DETECTION METHOD		SEPARATE TYPE	RETROREFLECTIVE TYPE	DIFFUSE REFLECTION TYPE	FIBER OPTIC TYPE
DETECTION DISTANCE		10m	3m	70cm	5cm TO 12cm
ITEM	TYPE	E3A2-10□□□□	E3A2-R3□□□□	E3A2-DS70□□□□	E3A2-XC□□□□
SUPPLY VOLTAGE		DC12 TO 240V ± 10%, AC24 TO 240V ± 10% 50/60Hz			
POWER CONSUMPTION	DC	3W MAX (1W AT 24VDC)	1.5W MAX (0.7W AT 24VDC)		
	AC	3W MAX	2W MAX		
DETECTING DISTANCE		10m	3m (TYPE E39-R1 REFLECTOR)	70cm (10x10cm WHITE MATTE PAPER)	12cm (TYPE E32-TC200 FIBER UNIT) 5cm (TYPE E32-DC200 FIBER UNIT) (5x5cm WHITE MATTE PAPER)
DETECTABLE OBJECT		OPAQUE MATERIALS 16mm MIN.	OPAQUE MATERIALS 56mm MIN.	TRANSPARENT AND OPAQUE MATERIALS	
DETECTION ANGLE		3° TO 12°	DETECTOR: 1° TO 6° REFLECTOR: 40° MAX.		10° TO 90° (TYPE E32-TC200)
DIFFERENTIAL TRAVEL				20% MAX	20% MAX. (TYPE E32-DC200)
CONTROL OUTPUT		RELAY OUTPUT: 250VAC 3A (cosφ = 1) MAX., 10mA MIN.			
OPERATION MODE		LIGHT-ON/DARK-ON SELECTABLE			
INDICATOR		LIGHT INDICATOR (RED), STABILITY INDICATOR (GREEN), OPERATION INDICATOR (YELLOW) (SOME INDICATORS MAY BE EXCEPTED DEPENDING ON TYPE)			
RESPONSE TIME	RELAY OUTPUT	30ms MAX			
LIGHT SOURCE		INFRARED L.E.D.	RED L.E.D.	INFRARED L.E.D.	RED L.E.D.
TIMER		T: MULTI TIMER (ON-DELAY, OFF-DELAY, ONE-SHOT DELAY, ON/OFF DELAY) CHANGEOVER: 0.1 TO 5 SEC. D: DUAL TIMER (ON+OFF-DELAY) 0.1 TO 5 SEC.			
SENSITIVITY ADJUSTMENT		NONE		EXIST	
CONNECTION METHOD		TERMINAL BLOCK SYSTEM			
AMBIENT OPERATING ILLUMINATION		RECEIVING SURFACE ILLUMINATION 3,000lx X MAX. (INCANDESCENT LAMP)			
AMBIENT OPERATING TEMPERATURE		OPERATING TIME: -25°C TO 55°C (NO FREEZING ALLOWED) STORAGE TIME: -30°C TO 70°C			
AMBIENT OPERATING HUMIDITY		OPERATING TIME: 45% TO 85% RELATIVE HUMIDITY STORAGE TIME: 35% TO 95% RELATIVE HUMIDITY			

### CONNECTION

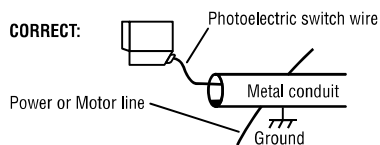
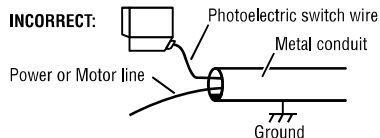


## CAUTIONS ON CONNECTIONS

As wrong wiring may cause burn-out or damage, check all connections carefully before use.

- In case of wiring E3A2 to the terminal block, securely fasten the lead wire without contact with adjacent terminals.
- Securely fasten a cover to maintain waterproof of dust-proof characteristics.
- Use a wire 9mm to 10mm in diameter to maintain water-resistant characteristics.
- If a power line or motor line is near the wire of the photoelectric switch, be sure to route the switch wire through an exclusive metal conduit to prevent malfunction or damage.

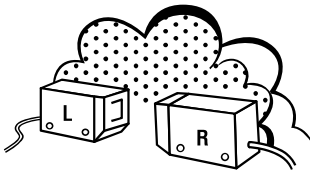
DO NOT route in the same conduit.



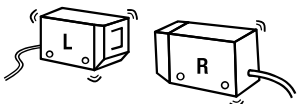
## AMBIENT CONDITIONS (INSTALLATION PLACE)

Note that the following installation places may cause malfunction:

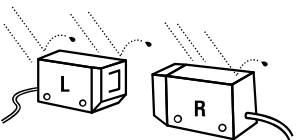
- Dusty place.
- Place where any corrosive gas occurs.



- Place with vibration or shock.



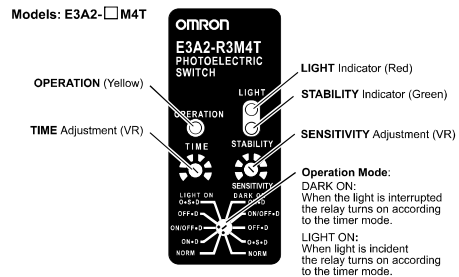
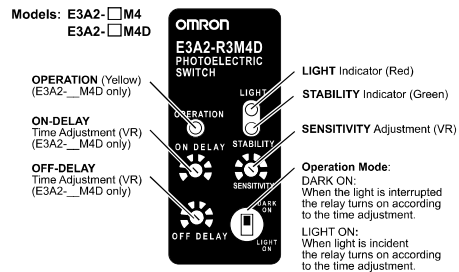
- Place where water, oil or chemicals directly splash.



## OTHER CAUTIONS

- As the lens case is made of plastic, wipe stains lightly with a dry cloth.
- Do not use alkali, aromatic hydrocarbons or fatty chloride hydrocarbons.

## OPERATION MODE SETTING & SWITCHING



## OPTICAL AXIS & SENSITIVITY ADJUSTMENT

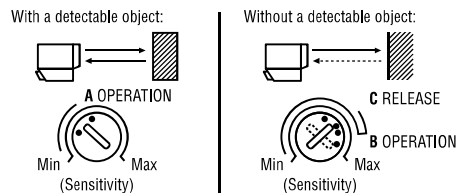
### SEPARATE TYPE

Move the receiver and light source vertically and horizontally and set them at the center of the range where the LIGHT indicator (red) of the receiver lights.

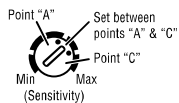
### RETROREFLECTIVE TYPE

Adjust the reflector and Switch as the separate type.

### DIFFUSE REFLECTION TYPE:



- When there is a detectable object as in the figure, turn the sensitivity adjuster (VR) to the right (to increase sensitivity) and make the position where the LIGHT indicator (red) lights point "A".
- Remove the detectable object and turn the sensitivity adjuster (VR) to the right until the LIGHT indicator (red) lights by the background object and make this position point "B".
- Turn the sensitivity adjuster (VR) to the left from point "B" (to reduce sensitivity) and make the position where the LIGHT indicator (red) extinguishes point "C".
- The middle position of points "A" and "C" is the best setting position. When sensitivity is maximum and the LIGHT indicator (red) does not light by the background object, set the sensitivity adjuster (VR) at the center point between "A" and the maximum sensitivity.
- If the difference of scale between points "A" and "C" is more than two scale values, the switch is in a stable condition. If the difference of scale is less than two scale values, check the external factors such as a shift of the detecting position or temperature fluctuation, etc.

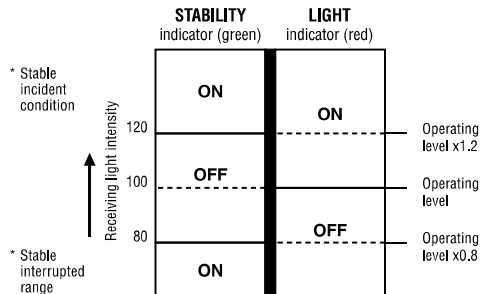


**Note 1: Turn the sensitivity adjuster (VR) gently using the attached screwdriver, or damage may result.**

## INDICATOR

- The STABILITY indicator (green) and the LIGHT indicator (red) indicate the level condition shown in the chart below.

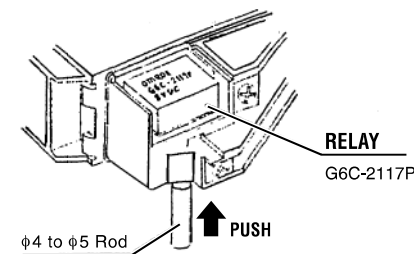
- Repeat incident light and interrupted light by the detectable object several times after the optical axis adjustment and the sensitivity adjustment, and verify that the switch is within the stable incident and interrupted light range.



\* If the switch is set within the stable range, the reliability against changes in ambient conditions (temperature, voltage, dust, shift of setting, etc.) increases. Be careful of changes in the ambient conditions for which a stable range cannot be obtained.

## EXCHANGE OF RELAY

- Type E3A2 allows exchange of the relay. When the service life of the relay has expired, exchange the relay according to the procedure shown in the figure below, after taking off the relay cover.

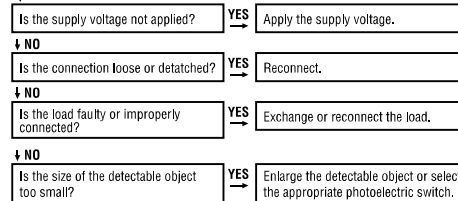


- After the exchange, slide the cover back on.

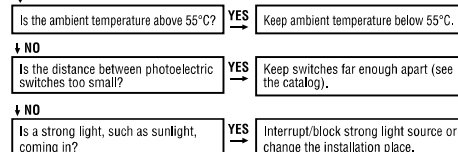
## MAINTENANCE & INSPECTION

- Use a supply voltage within the specified range (24V to 240V AC, 12V to 240V DC).
- Keep the ambient temperature within the range of -10°C to 55°C.
- Check that the fitting is not loose or unsteady due to shock or vibration.
- If the switch doesn't operate or reset, check the following:

The photoelectric switch does not operate.

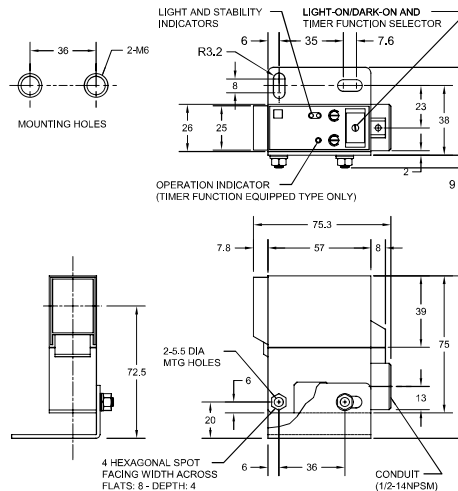


The photoelectric switch does not reset.



## DIMENSIONS (mm)

### E3A2-□□□-



### E39-R1

