

# INSTRUCTION SHEET

## Miniature Photoelectric Switches SA2E Series

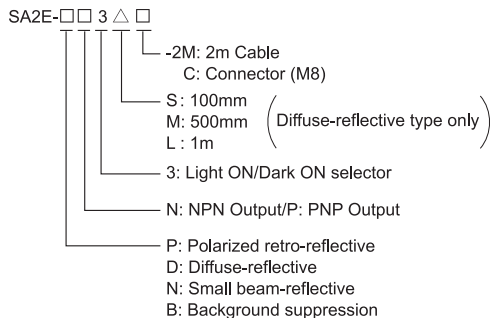
Confirm that the delivered product is what you have ordered. Read this instruction sheet to make sure of correct operation. Make sure that the instruction sheet is kept by the end user.

### SAFETY PRECAUTIONS

#### CAUTION

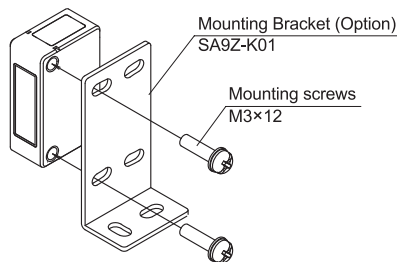
Caution notices are used where inattention might cause personal injury or damage to equipment.

### 1 Type



### 2 Installation

- To install the SA2E, tighten the mounting screws to a torque of 0.4 to 0.5N-m.
- Do not apply excessive impact on the SA2E during the installation process, so as to prevent damage or deterioration in the SA2E.



### 3 Specifications

Detection System	Polarized retro-reflective	Diffuse-reflective			Small beam-reflective	Background suppression	
TYPE	NPN Output	SA2E-PN3	SA2E-DN3S	SA2E-DN3M	SA2E-DN3L	SA2E-NN3	SA2E-BN3
No.	PNP Output	SA2E-PP3	SA2E-DP3S	SA2E-DP3M	SA2E-DP3L	SA2E-NP3	SA2E-BP3
Sensing Range		5m	100mm	500mm	1m	50 to 150mm	10 to 350mm
Standard Detector		(Reflector: IAC-R5/R8)*1	(White paper: 200×200mm)			(White paper: 100×100mm)	(White paper: 200×200mm)
Detection Distance		-	-	-	-	-	20 to 350mm
Light Source		Red LED	Infrared LED	Red LED	Infrared LED	Red LED	Red LED
Power Voltage		12 to 24V DC Ripple p-p 10% maximum (Operation range 10 to 30V DC (including Ripple))					
Current Consumption		20mA maximum					
Control Output		Open collector output (NPN/PNP output selectable) Load voltage: 30V DC maximum, Load current: 100mA maximum Voltage drop: 1.2V maximum (Load current: 10mA maximum) Voltage drop: 2V maximum (Load current: 100mA maximum)					
Protection Circuit		Reverse polarity, Load short circuit, Reverse output polarity circuit, Interference prevention					
Response Time		0.5ms maximum					
Ambient Temperature		Operating: -30 to +55°C, Storage: -40 to +70°C (no freezing and condensation)					
Ambient Humidity		Operating: 35 to 95%RH, Storage: 35 to 95%RH (no condensation)					
Degree of protection		IP67 (IEC60529)					
Material		Housing: PBT, Lens: PMMA, Display: PC					
Cable		ø3.5mm, 3-core (2-core for emitter of through-beam type), 0.2mm <sup>2</sup> , 2m cabtyre cable					

\*1 Maintain at least the following distance between the SA2E and reflector.  
IAC-R5/R6/R8: 50mm, IAC-R7: 100mm, IAC-RS1/RS2: 150mm

### 4 Notes for Operation

- Do not use the SA2E during the transient time of 100ms after turning on the power supply.
- If the SA2E and the load are connected to different power supplies, the SA2E must always be turned on first.
- Do not install the SA2E outdoors, nearby induction device, or heat source. Choose locations free from frequent vibrations, shocks, dust, toxic gases, water, oil, and chemicals, so as to prevent malfunctions and damage.
- Do not expose the SA2E to sunlight or other direct light projections.
- Do not use the SA2E with drops of water remaining on the lens or aperture of slits. To remove dust and moisture build-up, use soft dry cloth. PMMA is used for optical elements. Do not use organic solvents such as ammonia, caustic soda, alcohol or thinner for cleaning.

#### CAUTION

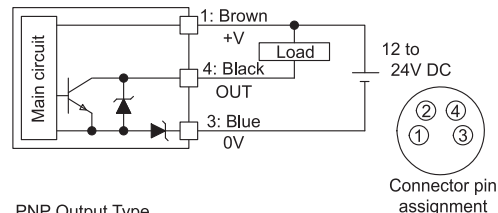
- Do not apply the voltage over the rated range or AC voltage, otherwise the switch may blow out or burn.

### 5 Wiring

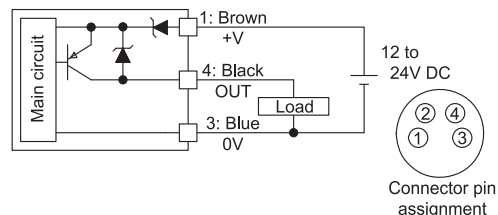
- Turn off the power supply before wiring.
- Connect correctly to prevent damage.
- The power voltage must not exceed the rated range.
- When using a switching power supply, be sure to ground the FG (frame ground) terminal.
- Do not install the SA2E wiring in the same conduit with high-voltage lines and power lines.
- Cable extension is allowed up to 100m using a cabtyre cable with core wires of 0.3mm<sup>2</sup> or more.
- To connect the SA2E with connector cable, tighten connector to a torque of 0.2 to 0.4N-m.

#### WIRING DIAGRAM

##### NPN Output Type



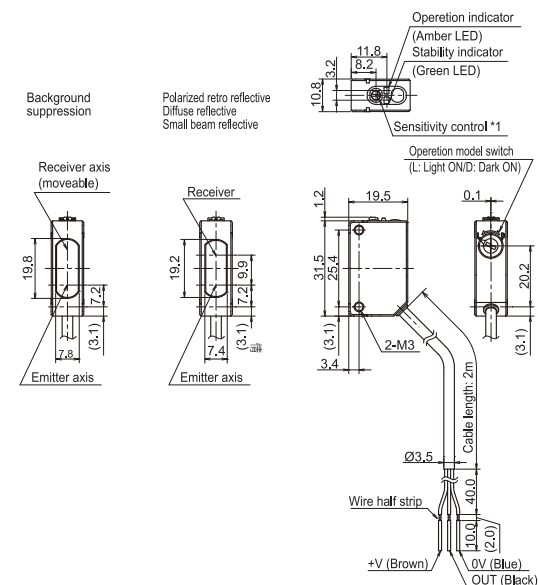
##### PNP Output Type



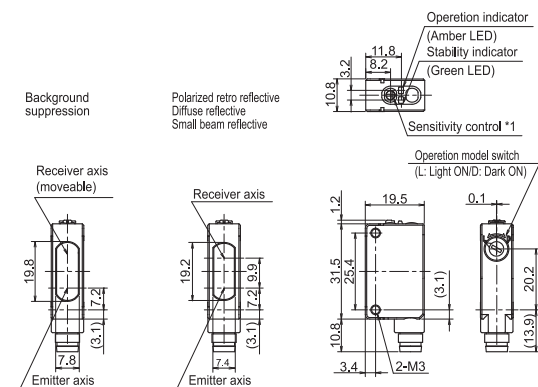
### 6 Dimensions

#### CABLE TYPE

All dimensions in mm.



#### CONNECTOR TYPE



\*1 Distance control (approx 7-turn endless) for Background suppression type.

### 7 Precaution for Disposal

- Dispose of the SA2E as an industrial waste.

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