

## INSTRUCTION SHEET

### Miniature Photoelectric Switches SA1N Series Convergent reflective type

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 user.

## SAFETY PRECAUTIONS

### CAUTION

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

## 1 TYPE

SA1N-G□1VF50-2M

N: NPN Output  
P: PNP Output

## 2 Specification

Detection system	Convergent-reflective	
Operation mode	Light ON	
Type No.	NPN Output	SA1N-GN1V50-2M
	PNP Output	SA1N-GP1V50-2M
Sensing range	3 to 50mm	
Standard detector	White paper: 50×50mm	
Light source	Red LED(640nm)	
Power voltage	12 to 24V DC Ripple p-p 10% maximum (Operating range 10.2 to 26.4V DC (including Ripple))	
Current consumption (Receiver)	NPN output: 27mA approx PNP output: 35mA approx	
Control output	Open collector output (NPN/PNP output selectable) Load voltage: 30V DC maximum Load current: 80mA maximum	
Response time	0.5ms maximum	
Hysteresis	10% or less of the detecting distance	
Indicator	Operation indicator: Red LED Stability indicator: Green LED	
Sensitivity control	Potentiometer *1	
Material	Case: LCP (Filler: PP), Lens: PC	
Cable	Permanently attached cord outer dimension: Ø2.8mm, length: 2m, 0.15mm <sup>2</sup> , 3-core	
Weight (approx)	40g	
Accessory	Screw, nuts, washers, mounting screws and a screwdriver for adjustment	

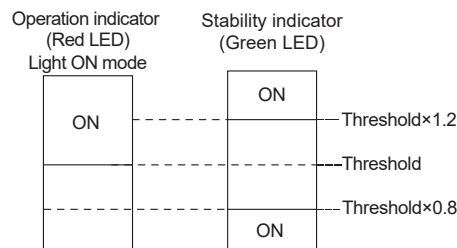
\*1 Do not apply a torque beyond 0.1N·m to the Sensitivity adjustment volume with Output converter.

### Environmental specification

Ambient temperature	Operating : -25 to +55°C Storage : -40 to +70°C (no freezing and condensation)
Ambient humidity	Operating :35 to 85%RH (no condensation)
Ambient light	Operating :3,000lx maximum
Insulation resistance	500V DC mega 20MΩ minimum
Dielectric withstanding	500V AC for 1 minute
Vibration resistance	10 to 55Hz, 1.5mm amplitude 2 hour each in 3 direction
Shock resistance	500 m/s <sup>2</sup> , 3 times each in 3 directions
Degree of protection	IP64 (IEC60529)

## 3 Indicators

- The operation indicator (Red LED) and stability indicator (Green LED) show the levels of received light intensity as described in the figure.
- After aligning the optical axis and adjusting the sensitivity, use a detection object to block and unblock the light beam several times to make sure that the both operation are within the range that allows stable activation and deactivation.
- Setting in the range which allows stable operation achieves higher reliability against changes in the operating environment generated after installation.



## 4 Notes for operation

- Clean the lens and the case by a soft and dry cloth eriodically. Do not use organic solvents such as ammonia, caustic soda, alcohol or thinner for cleaning.
- Check the mounting position and the optical axis before fixing the SA1N. Once the sensor is fixed, the mounting angle is not adjustable.
- Be sure to route the sensor cables separate from any power transmission or high voltage line, or else use shielded cables. Using the same conduit or duct as high voltage or power lines will cause malfunctions or damage because of electromagnetic induction.
- Turn off the power supply before the load, because the SA1N will start to operate 20ms from turning on.
- Turn off the power supply, side of the load first. The SA1N may generate an output pulse when the power is turned off.
- Avoid turning the power on and off consecutively.
- Though the SA1N has IP64 rated housing, do not use the SA1N where water is splashing constantly.
- Mounting brackets are not attaches.
- Use attached screws (M2.6×12mm) nuts and washer for mounting the SA1N. Tighten the nuts with a torque of 0.1 N·m or less. The thread may be stripped if an excess torque is applied.

- High frequency fluorescent lamps or inverters may cause faulty operation as these equipment may emit light or noise of similar modulated frequency that photo sensors generate. Do not install the SA1N in the vicinity of high frequipment.
- A transient overcurrent may flow in when a capacitor or a coil is connected to the load.
- When using the power supply with a large power supply capacity, insert a fuse or breaker according to the number of sensors used.

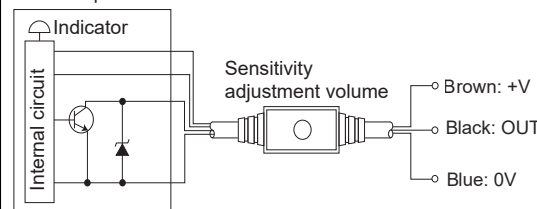
### CAUTION

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

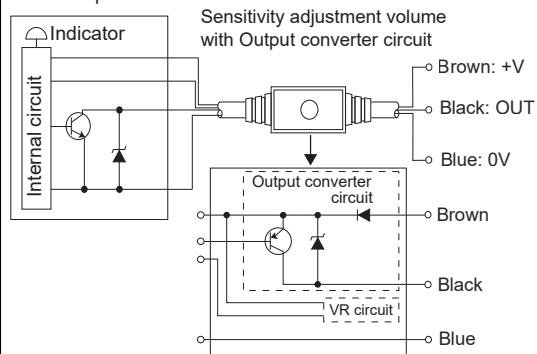
## 5 Wiring

- The output transistor becomes OFF when the SA1N short circuit or overload. Make sure all connections are correct before turning the power on.
- When using a DC power unit with an insulated transformer or a power supply, be sure to ground the frame ground (FG) terminal.
- When extending the cables, use conductors of 0.3mm<sup>2</sup> cross-sectional area of more and check the voltage drop. The length should not exceed 10m.
- Limit the current of the power supply to 1A.

### NPN output

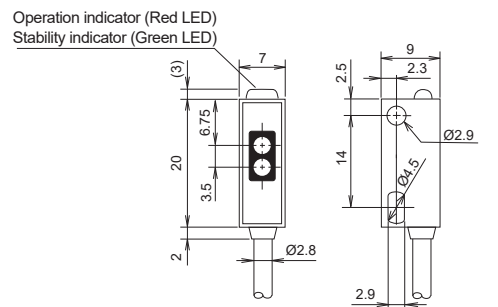


### PNP output

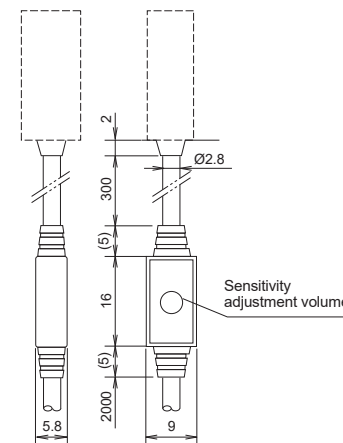


## 6 Dimensions

### Main unit



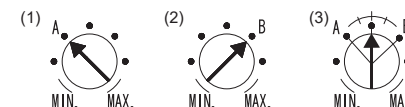
### Sensitivity adjustment volume



## 7 Installation

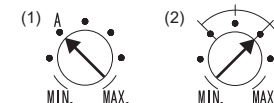
- Keep any background away from the detection position. If necessary use black surface with low reflectance.
- When any light reflecting object is in the background.

- Place a detection object at a given position and turn up the Sensitivity adjustment volume from MIN. until the Operation indicator (Red) turns on (Point A).
- Remove the object and turn down the Volume from MAX. until the Operation indicator (Red) turns off (Point B). (MAX. is regarded as Point B if the Operation indicator doesn't turn off at MAX.)
- Set the Volume at the middle point between Points A and B.



- When no light reflecting object is in the background.

  - Place a detection object at a given position and turn up the Volume from MIN. until the Operation indicator turns on (Point A).
  - Set the Volume at the middle point between Point A and MAX.



- After setting complete, make sure that both the Operation indicator(Red) and Stability indicator (Green) and turns on when the detection object is placed at the given position.

## 8 Precaution for Disposal

- Dispose of the SA1N as an industrial waste.

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