
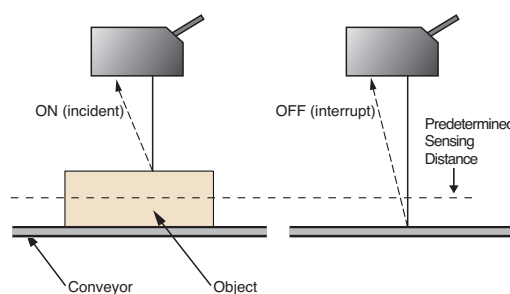


SA1E

Miniature Photoelectric Switches Background Suppression Type

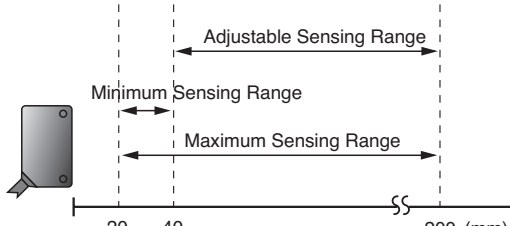


Background Suppression



The background suppression (BGS) type sensor determines ON/OFF status depending on the distance from the object, and detects only the object.

Sensing Range

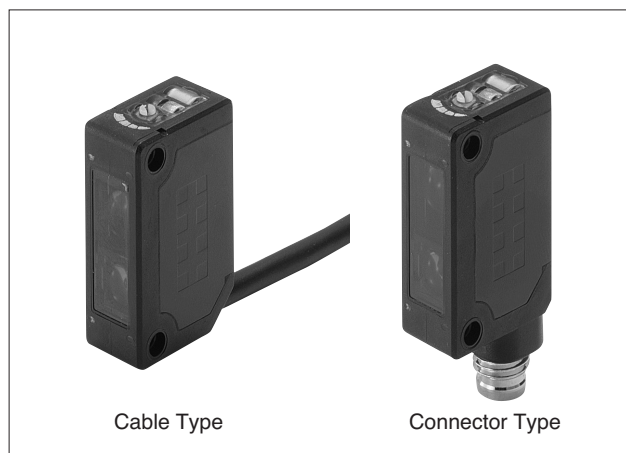


The sensing range can be adjusted using a control knob on the housing.

SA1E Miniature Photoelectric Switches (BGS Type)

**Background suppression (BGS) detects objects only.
Sensing range can be selected to ignore the background.**

- The maximum sensing range is 20 to 200 mm.
- Two connection styles: Cable and M8 connector
- NPN output, PNP output, light ON, and dark ON are available.
- Red LED is employed for easy optical adjustment in long distance applications.
- UL/c-UL listed (File No.: E222927)
- CE marked



Types

Sensing Method		Sensing Range	Connection	Cable Length	Operation Mode	Type No.	
						NPN Output	PNP Output
Background Suppression Type	Red LED w/Sensing Range Adjustment	<p>20 to 200 mm Adjustable Sensing Range See the characteristics on page 3.</p>	Cable	1m	Light ON	SA1E-BN1	SA1E-BP1
					Dark ON	SA1E-BN2	SA1E-BP2
				2m	Light ON	SA1E-BN1-2M	SA1E-BP1-2M
					Dark ON	SA1E-BN2-2M	SA1E-BP2-2M
				5m	Light ON	SA1E-BN1-5M	SA1E-BP1-5M
					Dark ON	SA1E-BN2-5M	SA1E-BP2-5M
Connector	-	Light ON	SA1E-BN1C	SA1E-BP1C			
		Dark ON	SA1E-BN2C	SA1E-BP2C			

Specifications

Power Voltage	12 to 24V DC (operating range: 10 to 30V DC) (with reverse-polarity protection)	
Power Consumption	30 mA	
Sensing Range	20 mm to the selected distance (200 mm maximum) (using 200 × 200 mm white mat paper)	
Detectable Object	Opaque	
Hysteresis	20% maximum	
Response Time	1 ms maximum	
Sensing Range Adjustment	6-turn control knob	
Light Source Element	Red LED	
Operation Mode	Light ON/Dark ON	
Control Output	NPN open collector or PNP open collector 30V DC, 100 mA maximum Voltage drop: 1.2V maximum With short-circuit protection	
LED Indicator	Operation LED: Yellow (stable LED is not provided)	
Interference Prevention	Two units can be mounted in close proximity.	
Degree of Protection	IP67 (IEC60529)	
Extraneous Light Immunity	Sunlight: 10,000 lux maximum, Incandescent lamp: 3,000 lux maximum (at receiver)	
Operating Temperature	-25 to +55°C (no freezing)	
Operating Humidity	35 to 85% RH (no condensation)	
Storage Temperature	-40 to +70°C (no freezing)	
Insulation Resistance	Between live part and mounting bracket: 20 MΩ maximum (500V DC megger)	
Dielectric Strength	Between live part and mounting bracket: 1000V AC, 50/60 Hz, 1 minute	
Vibration Resistance	Damage limits: 10 to 55 Hz, Amplitude 0.75 mm, 20 cycles in each of 3 axes	
Shock Resistance	Damage limits: 500 m/s ² , 10 shocks in each of 3 axes	
Material	Housing: PC/PBT, Lens: PC, Indicator cover: PC	
Attachments	Instruction sheet, Sensing range control screwdriver	
Weight (approx.)	Cable Type	35g (cable length 1m), 55g (cable length 2m), 120g (cable length 5m)
	Connector Type	20g
Connection Method	Cable Type	ø3.5 mm, 3-core, 0.2 mm ² , vinyl cabtyre cable
	Connector Type	M8 connector (4-pin)

SA1E Miniature Photoelectric Switches (BGS Type)

Accessories (Optional)

• Mounting Brackets

Item	Type No.	Package Quantity
Mounting Bracket	Vertical Mounting	SA9Z-K01
	Horizontal Mounting	SA9Z-K02
	Cover type	SA9Z-K03
		1

- Two mounting screws (M3 × 12 mm sems screw) are attached to the SA9Z-K01 and SA9Z-K02.
- Two mounting screws (M3 × 14 mm sems screw) are attached to the SA9Z-K03.
- The SA9Z-K02 cannot be used with the connector type.
- Contact IDEC about mounting brackets for the connector type.

For details about accessories, see the SA1E catalog (EP1076).

• Air Blower Mounting Block

Item	Type No.	Package Quantity
Air Blower Mounting Block	SA9Z-A02	1

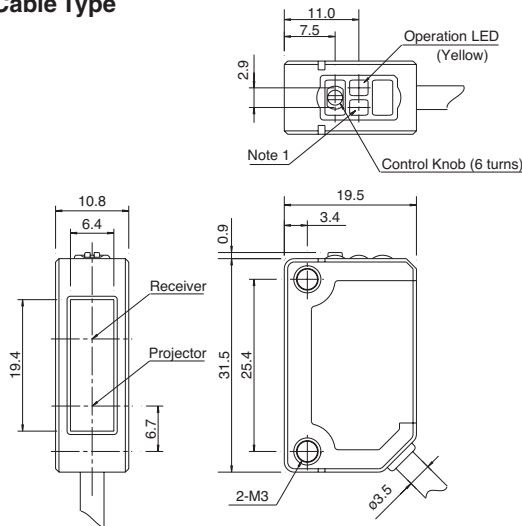
- Two mounting screws (M3 × 20 mm sems screw), one M5 × 6 mm screw for plugging the air supply port, and one gasket (0.5 mm thick) are supplied.
- An air tube fitting and mounting bracket are not supplied and must be ordered separately (recommended mounting bracket: SA9Z-K01).
- Material: Anodized aluminum

• Connector Cable (for connector type)

Number of Core Wires	Type & Length	Type No.	Package Quantity
4	Straight, 2m	SA9Z-CM8K-4S2	1
	Straight, 5m	SA9Z-CM8K-4S5	
	Right angle, 2m	SA9Z-CM8K-4L2	
	Right angle, 5m	SA9Z-CM8K-4L5	

Dimensions

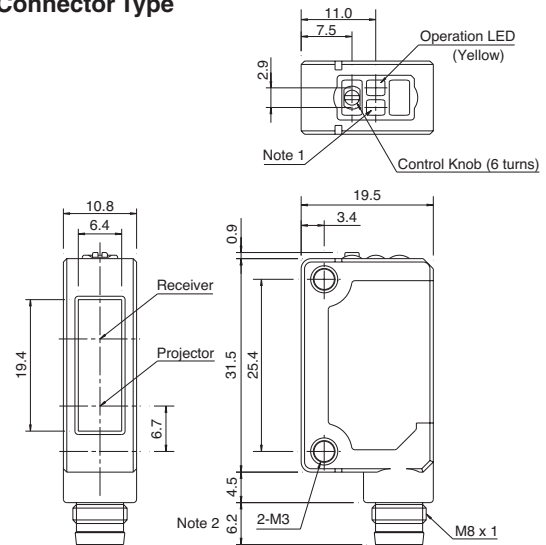
• Cable Type



Note 1: Stable LED is not provided on the background suppression type.

Note 2: The connector length is 18 mm when a right-angle connector cable (SA9Z-CM8K-4L*) is attached.

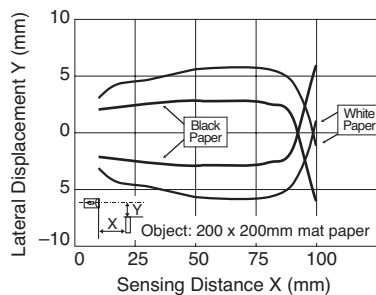
• Connector Type



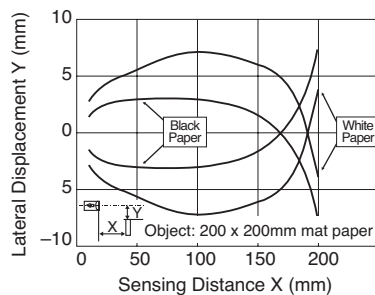
All dimensions in mm.

Characteristics (Typical)

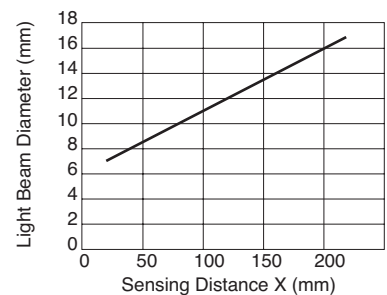
• Lateral Displacement (Preset 100 mm)



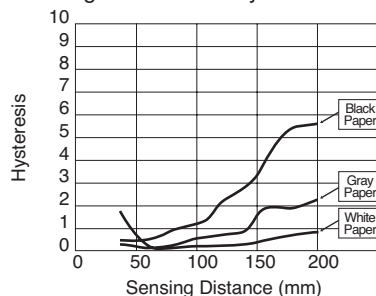
• Lateral Displacement (Preset 200 mm)



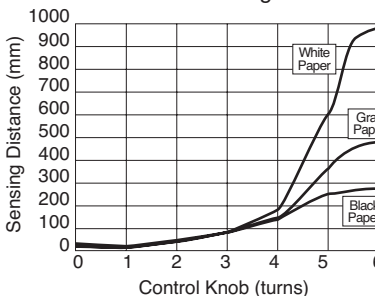
• Light Beam Diameter



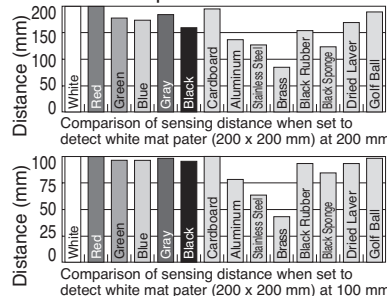
• Sensing Distance vs. Hysteresis



• Control Knob vs. Sensing Distance



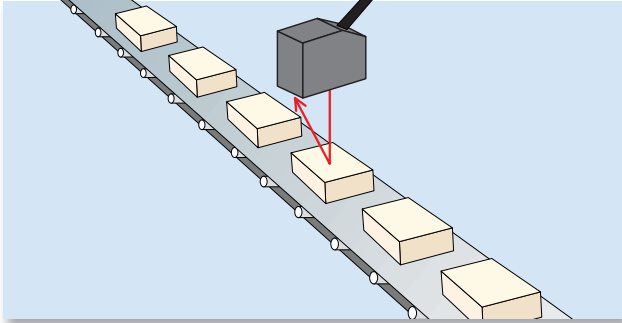
• Color Mat Paper and Other Materials



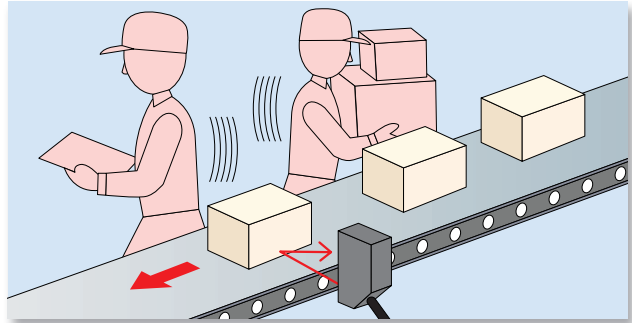
SA1E Miniature Photoelectric Switches (BGS Type)

Application Examples

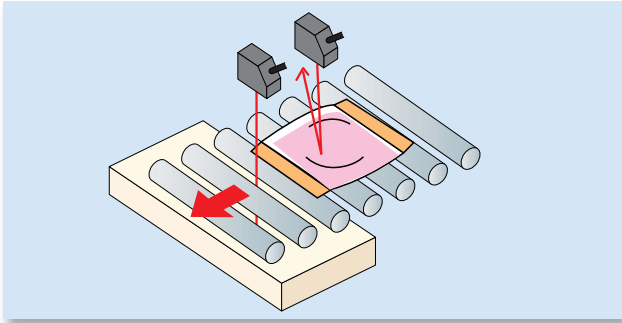
Detecting objects on a belt conveyor, ignoring the belt conveyor



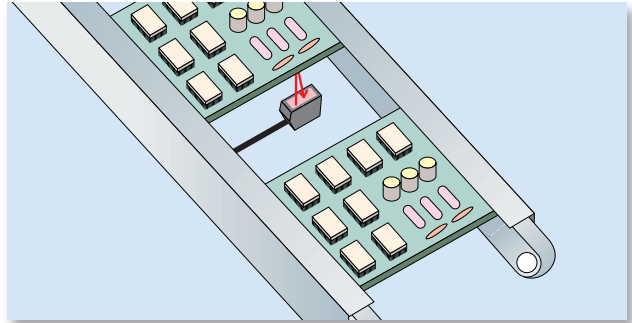
Detecting objects in different colors, ignoring workers in the background



Detecting objects on a roller conveyor, ignoring other objects below



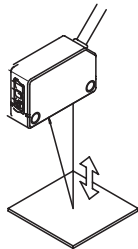
Detecting PC boards in an inspection line, ignoring other objects above the PC boards



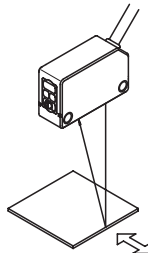
Sensing Directions

- This sensor can detect objects correctly when the sensor head is installed perpendicular to the moving object. Install the sensor head as shown below to minimize sensing errors.

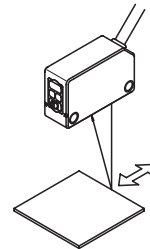
Correct



Correct



Incorrect



Specifications and other descriptions in this catalog are subject to change without notice.



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