

SA1E: Photoelectric Switches

Simple, compact design for world-wide usage.

Key features of the SA1E photoelectric sensor include:

- Four sensing methods
- Cable types and M8 connector types available
- NPN output, PNP output, light ON, dark ON options
- Long sensing ranges, high speed response
- CE marked



			Through-beam Type	Polarized Retroreflective Type	Diffuse-reflective Type	Small-beam Reflective Type
Cable Type	NPN output	Light ON	SA1E-TN1	SA1E-PN1	SA1E-DN1	SA1E-NN1
		Dark ON	SA1E-TN2	SA1E-PN2	SA1E-DN2	SA1E-NN2
	PNP output	Light ON	SA1E-TP1	SA1E-PP1	SA1E-DP1	SA1E-NP1
		Dark ON	SA1E-TP2	SA1E-PP2	SA1E-DP2	SA1E-NP2
Connector Type	NPN output	Light ON	SA1E-TN1C	SA1E-PN1C	SA1E-DN1C	SA1E-NN1C
		Dark ON	SA1E-TN2C	SA1E-PN2C	SA1E-DN2C	SA1E-NN2C
	PNP output	Light ON	SA1E-TP1C	SA1E-PP1C	SA1E-DP1C	SA1E-NP1C
		Dark ON	SA1E-TP2C	SA1E-PP2C	SA1E-DP2C	SA1E-NP2C
Applicable Standard			IEC606947-5-2			
Rated Operational Voltage			12 to 24V DC			
Operating Limits			10 to 30V DC			
Rated Insulation Voltage			30V DC			
Power Consumption / Current Draw			Emitter: 15 mA Receiver: 20 mA	30 mA		
Sensing Range			10 m	2.5 m (IAC-R5) 1.5 m (IAC-R6) (Note) 1 m (IAC-RS1)	700 mm (using 200 × 200 mm white matt paper)	50 to 150 mm (using 100 × 100 mm white matt paper)
Detectable Object			Opaque		Opaque/Transparent	
Hysteresis			—		20% maximum	
Response Time			1 ms maximum			
Sensitivity Control			Adjustable using a potentiometer (approx. 260°)			
Light Source Element			Infrared LED	Red LED	Infrared LED	Red LED
Operation Mode			Light ON/Dark ON			
Control Output			NPN open collector/PNP open collector 30V DC, 100 mA maximum Voltage drop: 1.2V maximum Short-circuit protection			
LED Indicators			Operation LED: Yellow Stable LED: Green Power LED: Green (Through-beam type emitter)			
Interference Prevention			—		Two units can be mounted close together	
Degree of Protection			IP67 (IEC60529)			



1. Maintain at least 100 mm clearance between the SA1E photoelectric switch and reflector. Reflectors are not attached to the photoelectric switch and must be ordered separately.

2. Standard cable length for cable type is 1 meter. Contact IDEC for longer cable lengths.

		Through-beam Type	Polarized Retroreflective Type	Diffuse-reflective Type	Small-beam Reflective Type	
General Specifications con't	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 and dead parts: 20 MΩ maximum (500V DC megger)				
	Dielectric Strength	Between live and dead parts: 1000V AC, 50/60 Hz, 1 minute				
	Vibration Resistance	Damage limits: 10 to 55 Hz, Amplitude 0.75 mm p-p, 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 (Polarized retroreflective type: PMMA), Indicator cover: PC				
	Accessories Included	Instruction sheet, Sensitivity control screwdriver				
	Weight (approx)	Cable Type	Emitter: 30g Receiver: 30g	30 g		
		Connector Type	Emitter: 10g Receiver: 10g	10 g		
Connection Method	Cable Type	ø3.5 mm, 3-core, 0.2 mm ² , 1-m vinyl cabtyre cable (2-core for the emitter of through-beam type)				
	Connector Type	M8 connector (4-pin)				

SA1E Accessories

Mounting Brackets

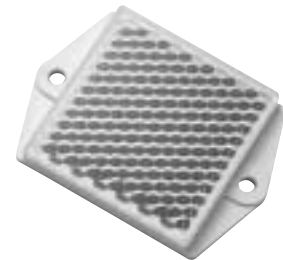
Part Number	Type	Package Quantity
SA9Z-K01	Vertical	1
SA9Z-K02	Horizontal	

Connector Cable for connector type

Part Number	Core Wires	Type & Length	Package Quantity
SA9Z-CM8K-4S2	4	Straight, 2m	1
SA9Z-CM8K-4L2		Right angle, 2m	
SA9Z-CM8K-4S5		Straight, 5m	
SA9Z-CM8K-4L5		Right angle, 5m	

Reflectors for polarized retroreflective type

Part Number	Type	Package Quantity	Type & Length	Applicable Mounting Bracket
IAC-R5	Standard	1	Straight, 2m	IAC-L2
IAC-R6	Small		Right angle, 2m	IAC-L3
IAC-RS1	Tape type		Straight, 5m	—

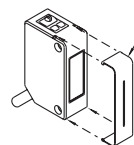


Slits for through-beam type

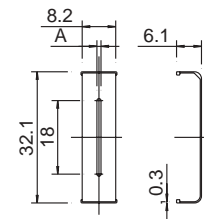
Part Number	Slit Width	Package Quantity	Sensing Range (m)		Maximum Detectable Object Width (mm)	
			One side	Both sides	One side	Both sides
SA9Z-S06	0.5 mm	2	2.5	1.0	7.0	0.5
SA9Z-S07	1.0 mm		3.5	1.5	7.0	1.0
SA9Z-S08	2.0 mm		6.0	3.5	7.0	2.0

Dimensions

The slit can be pressed to fit on the front easily in one touch.

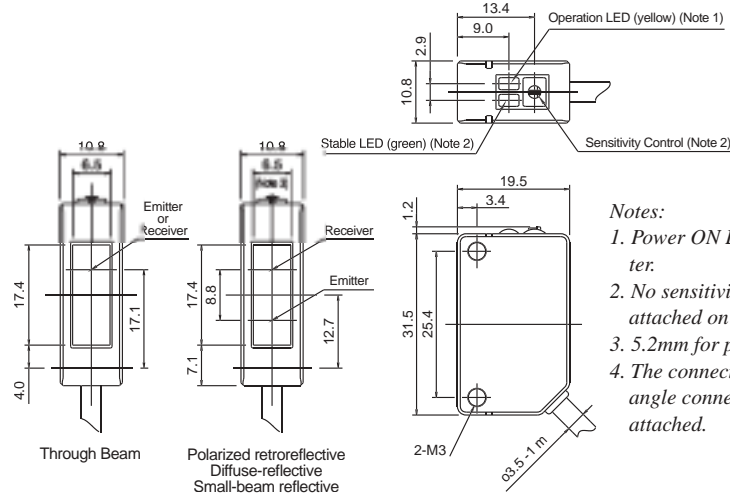


Slit (Stainless Steel)



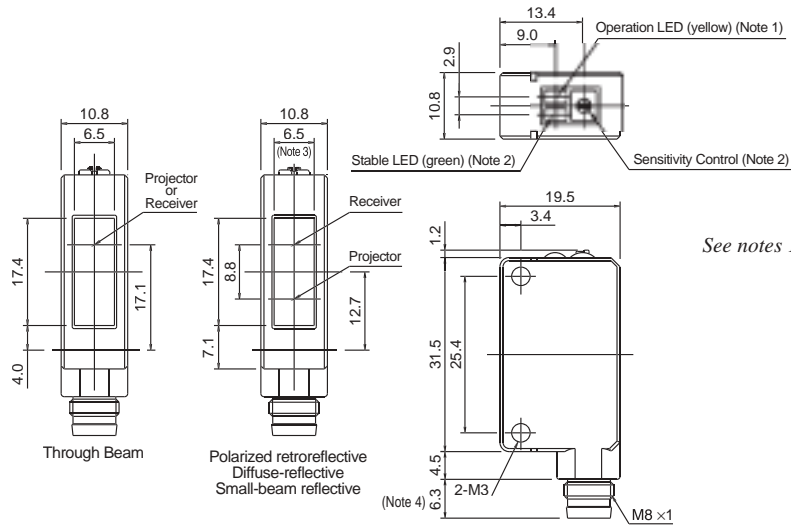
Dimensions

Cable Type



- Notes:**
1. Power ON LED (green) for through-beam emitter.
 2. No sensitivity control and stable LED are attached on the through-beam emitter.
 3. 5.2mm for polarized retroreflective type.
 4. The connector length is 18mm when a right-angle connector cable (SA9Z-CM8K-4L) is attached.

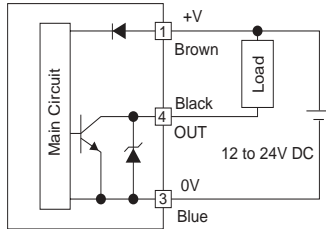
Connector Type



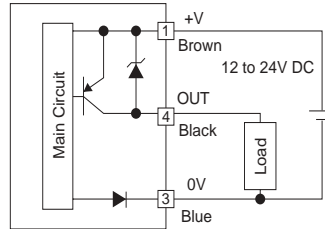
See notes 1 through 4 above.

Output Circuit and Wiring Diagram

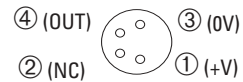
• NPN Output



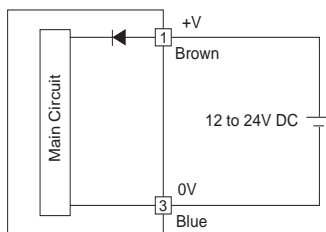
• PNP Output



Connector Pin Assignment



• Through-beam Type Emitter



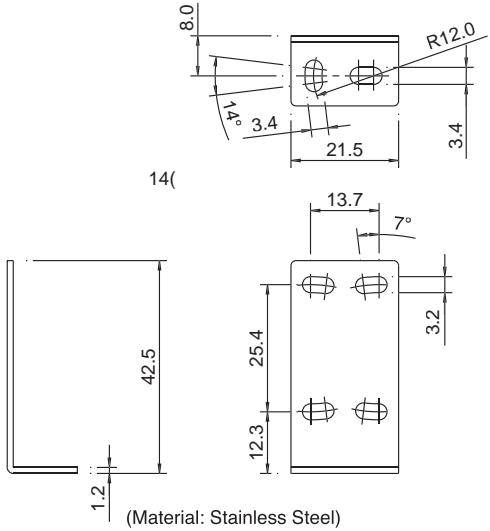
Connector Pin Assignment



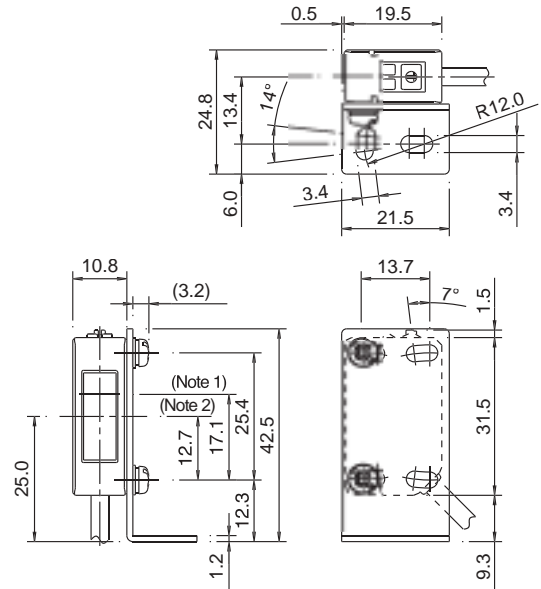
Dimensions, continued

Mounting Bracket

SA9Z-K01

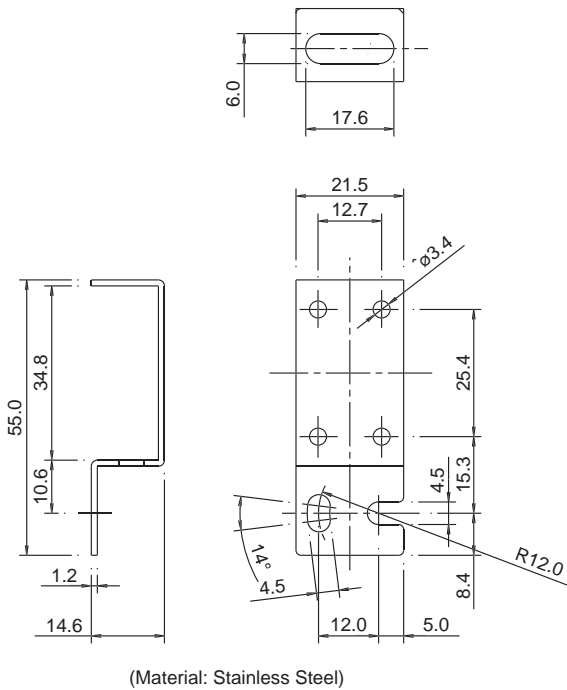


With Mounting Bracket

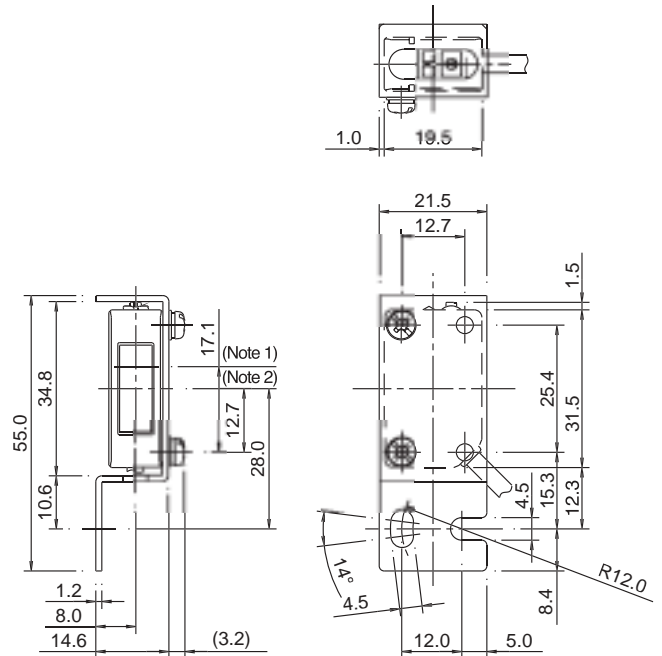


Note 1: Center of optical axis (through-beam type)
 Note 2: Center of optical axis (polarized retroreflective, diffuse reflective, and small-beam reflective type)

SA9Z-K02



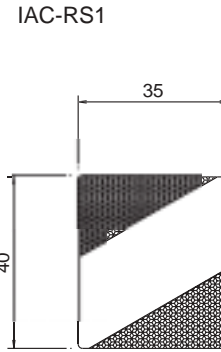
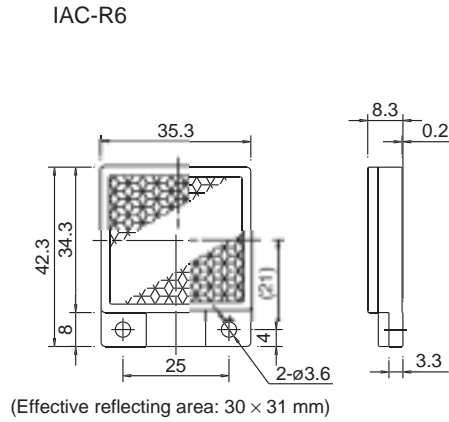
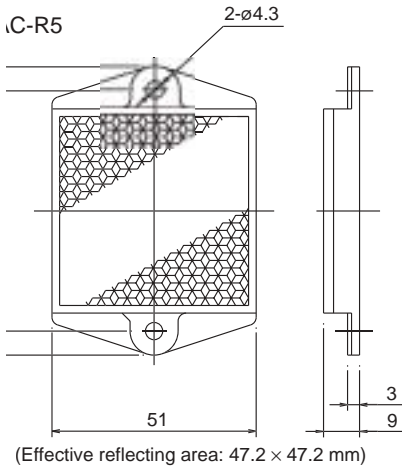
With Mounting Bracket



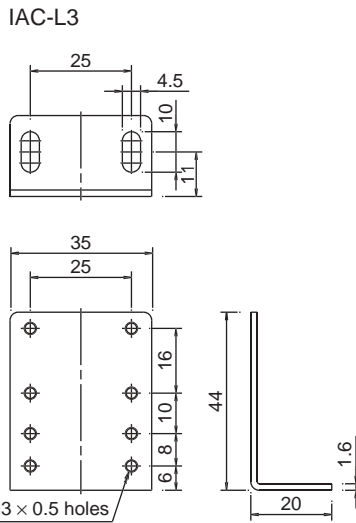
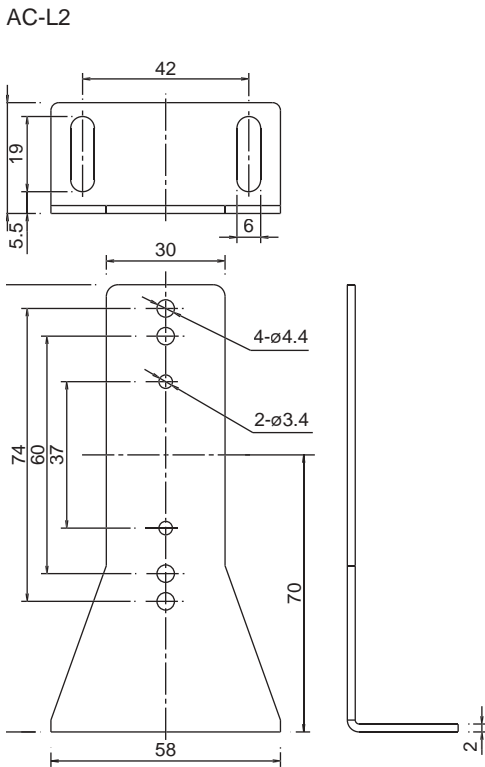
Note 1: Center of optical axis (through-beam type)
 Note 2: Center of optical axis (polarized retroreflective, diffuse reflective, and small-beam reflective type)

Dimensions, continued

Reflector



Reflector Mounting Bracket



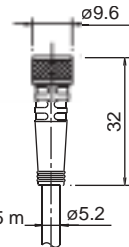
Material: SPCC (zinc plating)

Connector Cable (one-side connector)

Straight Type

SA9Z-CM8K-4S□

- ① Black
- ② Blue
- ③ White
- ④ Brown



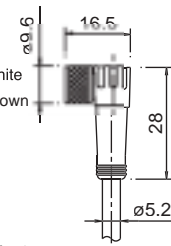
Cable length: 2 or 5 m

Note: Dielectric strength when installed on the switch
Between live part and mounting bracket: 1000V AC (except between live part and clamping ring)

Right-angle Type

SA9Z-CM8K-4L□

- ① Black
- ② Blue
- ③ White
- ④ Brown



Cable length: 2 or 5 m

Note: Dielectric strength when installed on the switch
Between live part and mounting bracket: 1000V AC (except between live part and clamping ring)

Material: SPCC (zinc chromate plating, black)