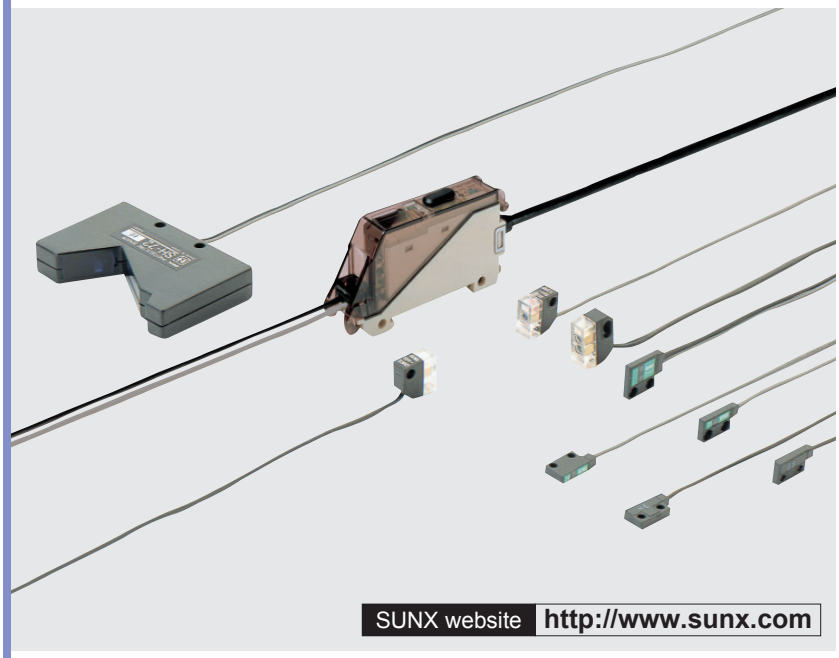
Manually Sensitivity Set Photoelectric Sensor **Amplifier-separated**

SS-A5 SERIES SH SERIES

Related Information
■ General terms and conditions..... P.1
■ Sensor selection guide .....P.11~ / P.229~
■ SH Specifications / Precautions / Dimensions .. P.385~
■ Glossary of terms / General precautions ...P.983~ / P.986~



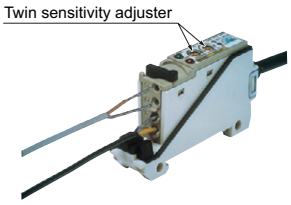
SUNX website http://www.sunx.com

Self-diagnosis | Timer | Light intensity monitor | Interference prevention

Twin adjuster enables delicate sensitivity setting

Twin adjuster

Its twin adjuster enables easy optimum setting to suit the application.



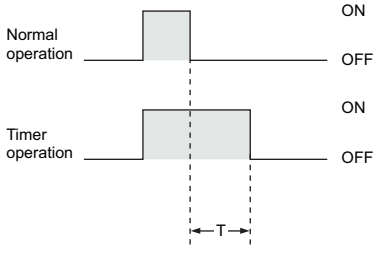
FUNCTIONS

Automatic interference prevention

The **SS-A5** amplifier is incorporated with an automatic interference prevention function. Mutual interference does not occur even if two sensors are mounted adjacently.

OFF-delay timer

An OFF-delay timer which extends the output signal by a fixed period is incorporated. This is useful when the connected device has a slow response time or when small objects are being sensed and the output signal width is too small.



Timer period: T = 40 ms approx.

VARIETIES

Ultra-slim type — SH-2□

Compact size: 0.3 cm³
Thickness: 3 mm 0.118 in
Versatile mounting

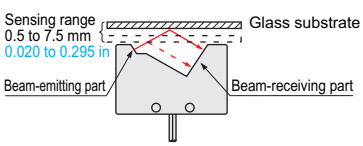
Diffuse reflective type sensor head
• Front sensing
Thru-beam type sensor head
• Front sensing •Side sensing

Ultra-small type — SH-3□

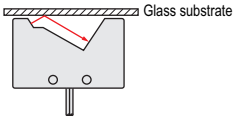
Sensor head with indicator
An operation indicator, which enables an easy check of the operation at site, has been incorporated.
2 m 6.562 ft long sensing range with red LED beam (SH-33R)
Visible red LED beam makes alignment easy.

Glass substrate detection sensor — SH-72

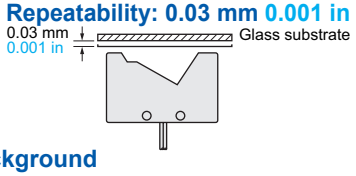
Reliable glass substrate detection
Its unique optical system enables stable detection of transparent glass substrate, as well as, specular film deposited glass substrate at the same distance.



No dead zone

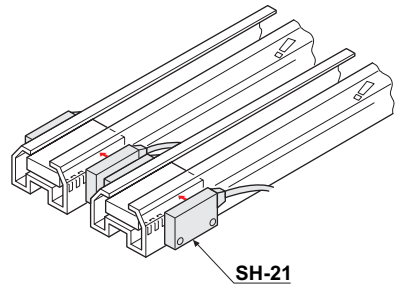


Repeatability: 0.03 mm 0.001 in

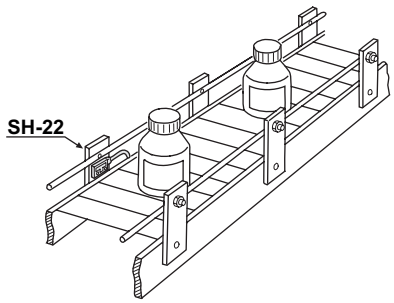


APPLICATIONS

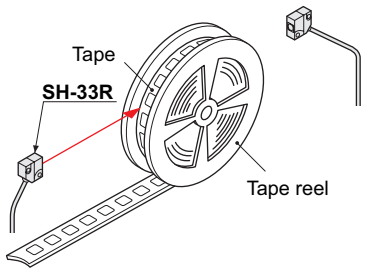
Detecting ICs in transparent sticks



Detecting small bottles



Sensing remaining tape



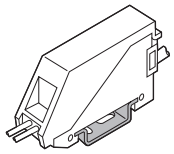
ORDER GUIDE

Amplifiers

Type	Appearance	Model No.	Sensing output
3 m 9.843 ft cable length type		**SS-A5**	NPN open-collector transistor
5 m 16.404 ft cable length type		**SS-A5-C5**	

Accessory

• **MS-DIN-1** (Amplifier mounting bracket)



Sensor heads

Type			Appearance	Sensing range	Model No. (Note 1)	Emitting element	Operation indicator
Ultra-slim	Thru-beam	Front sensing		300 mm 11.811 in	**SH-21**	Infrared LED	—
		Side sensing			**SH-21E**		
	Diffuse reflective	Front sensing		50 mm 1.969 in	**SH-22**		
Ultra-small	Thru-beam			1 m 3.281 ft	**SH-31R**	Red LED	Incorporated
				100 mm 3.937 in	**SH-31G**	Green LED	
				2 m 6.562 ft	**SH-33R**	Red LED	
	Diffuse reflective			100 mm 3.937 in	**SH-32R**		
Glass substrate detection sensor				0.5 to 7.5 mm 0.020 to 0.295 in (with transparent glass sheet)	**SH-72**	Infrared LED	—

Notes: 1) The model No. with suffix "**P**" shown on the label affixed to the thru-beam type sensor is the emitter, "**D**" shown on the label is the receiver.
(e.g.) Emitter of **SH-31R**: **SH-31RP**, Receiver of **SH-31R**: **SH-31RD**
2) Refer to p.385~ for specifications of sensor head, p.390 for precautions of sensor head and p.393~ for dimensions of sensor head.

SUNX

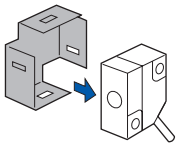
OPTIONS

Designation	Model No.	Description					
Slit mask (For **SH-31R**, **SH-31G** and **SH-33R** only)	**OS-SS3**	This is a convenient slit mask having four types of slit masks.					
		Slit size	Fitting	Sensing range			Min. sensing object
				SH-31R	**SH-31G**	**SH-33R**	
		0.5 × 3 mm 0.020 × 0.118 in	One side	500 mm 19.685 in	50 mm 1.969 in	750 mm 29.528 in	ø3 mm ø0.118 in
			Both sides	250 mm 9.843 in	25 mm 0.984 in	400 mm 15.748 in	0.5 × 3 mm 0.020 × 0.118 in
		1 × 3 mm 0.039 × 0.118 in	One side	700 mm 27.559 in	70 mm 2.756 in	1,000 mm 39.370 in	ø3 mm ø0.118 in
			Both sides	500 mm 19.685 in	50 mm 1.969 in	750 mm 29.528 in	1 × 3 mm 0.039 × 0.118 in
Sensor head mounting bracket (For the ultra-small type only)	**MS-SS3-1**	Mounting bracket for the ultra-small sensor head (The thru-beam type sensor head needs two brackets.) (Note 2)					
Amplifier mounting bracket	**MS-FX-1**	Mounting bracket for **SS-A5**					
Sensor checker (Note 1)	**CHX-SC2**	It is useful for beam alignment of thru-beam type sensors. The optimum receiver position is given by indicators, as well as an audio signal.					

Notes: 1) Refer to p.800 for details of the sensor checker **CHX-SC2**.
2) Refer to p.394 for dimensions of **MS-SS3-1**.

Slit mask

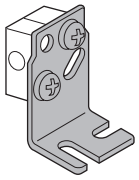
• **OS-SS3**



The sensor head and the slit mask are mounted together.

Sensor head mounting bracket

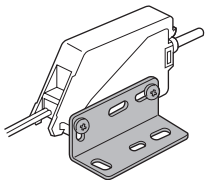
• **MS-SS3-1**



Two M3 (length 12 mm 0.472 in) screws with washers are attached.

Amplifier mounting bracket

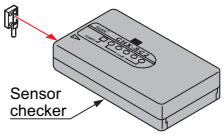
• **MS-FX-1**



Two M3 (length 20 mm 0.787 in) screws with washers are attached.

Sensor checker

• **CHX-SC2**



SPECIFICATIONS

Refer to p.385~ for specifications of sensor head.

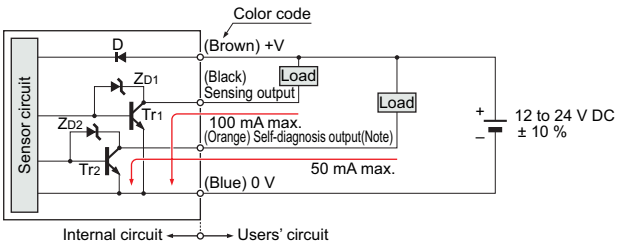
Amplifier

Item \ Type	Model No.	Cable type · slim **SS-A5**
Applicable sensor heads		**SH-2□, SH-3□, SH-72**
Supply voltage		12 to 24 V DC ± 10 % Ripple P-P 10 % or less
Current consumption		40 mA or less
Sensing output		NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between sensing output and 0 V) • Residual voltage: 1.5 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)
	Output operation	Selectable either Light-ON or Dark-ON with the operation mode switch
	Short-circuit protection	Incorporated
Self-diagnosis output		NPN open-collector transistor • Maximum sink current: 50 mA • Applied voltage: 30 V DC or less (between self-diagnosis output and 0 V) • Residual voltage: 1 V or less (at 50 mA sink current) 0.4 V or less (at 16 mA sink current)
	Output operation	ON under stable sensing condition
	Short-circuit protection	———
Response time		1 ms or less
Operation indicator		Red LED (lights up when the sensing output is ON)
Stability indicator		Green LED (lights up under stable light received condition or stable dark condition)
Sensitivity adjuster		Continuously variable twin adjusters
Automatic interference prevention function		Incorporated (Two units of sensors can be mounted close together.)
Timer function		Approx. 40 ms fixed OFF-delay timer, selectable either effective or ineffective
Environmental resistance	Ambient temperature	–25 to +60 °C –13 to +140 °F (No dew condensation or icing allowed), Storage: –30 to +70 °C –22 to +158 °F
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure
	Insulation resistance	20 MΩ, or more, with 500 V DC megger between all supply terminals connected together and enclosure
	Vibration resistance	10 to 55 Hz frequency, 1.5 mm 0.059 in amplitude in X, Y and Z directions for two hours each
	Shock resistance	100 m/s² acceleration (10 G approx.) in X, Y and Z directions for three times each
Material		Enclosure: Heat-resistant ABS, Cover: Polyethersulfone
Cable		0.2 mm² 4-core cabtyre cable, 3 m 9.843 ft long
Cable extension		Extension up to total 100 m 328.084 ft is possible with 0.3 mm², or more, cable.
Weight		Net weight: 120 g approx.
Accessories		**MS-DIN-1** (Amplifier mounting bracket): 1pc., Adjusting screwdriver: 1 pc., Adjuster cap: 1 pc.

Note: Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73.4 °F.

I/O CIRCUIT AND WIRING DIAGRAMS

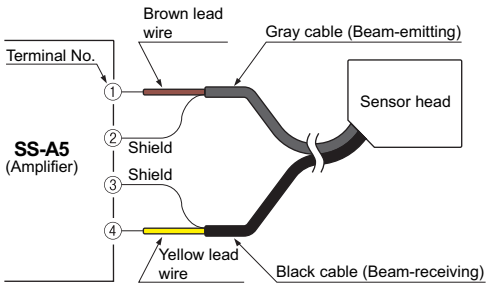
I/O circuit diagram



Note: The self-diagnosis output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load.

Symbols ... D: Reverse supply polarity protection diode
Z_{D1}, Z_{D2}: Surge absorption zener diode
Tr_1, Tr_2 : NPN output transistor

Wiring diagram to sensor head



PRECAUTIONS FOR PROPER USE

Refer to p.986~ for general precautions and p.390 for precautions of sensor head.

- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

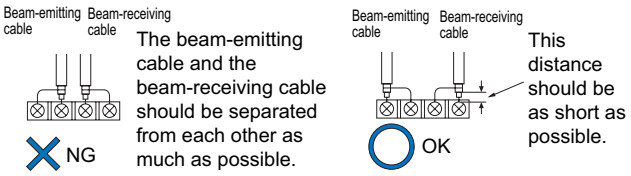
- Always use the sensor head and the exclusive amplifier together as a set.

Cable extension for sensor head

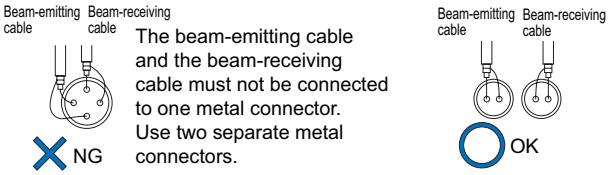
- If the attached sensor head cables need to be extended, use two single core shielded cables of at least equivalent quality. If a joint terminal or connector is used for extension, refer to the figures below.

(The shielded extension cable must be of ø1.45 mm ø0.057 in outer diameter.)

Connection with joint terminal

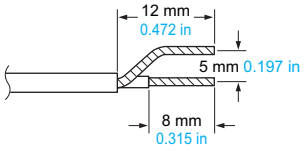


Connection with metal connector

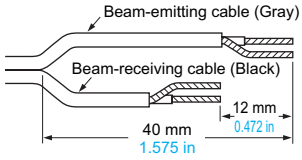


Trimming sensor head cables

- Trim the ends of sensor head cables as follows.



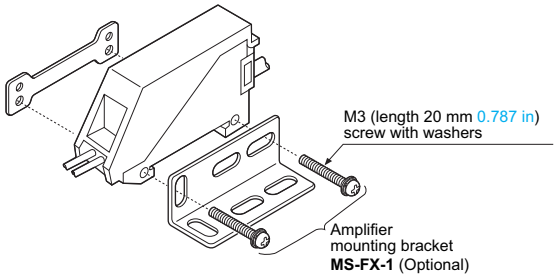
- In case of the reflective type sensor heads, with two parallel cables, the beam-emitting cable must be longer than the beam-receiving cable as shown below.



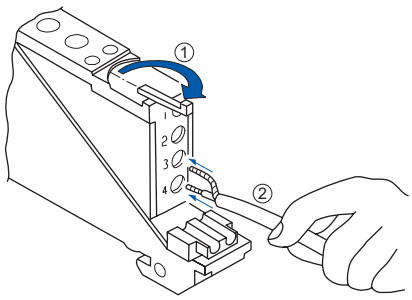
Note: Do not solder the cable ends.

Mounting

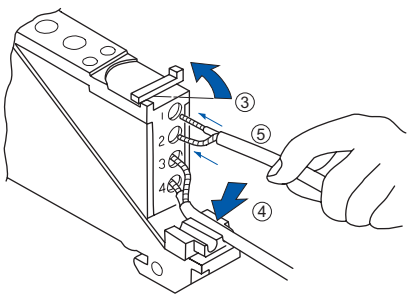
- When the amplifier is fixed with screws and nuts, the tightening torque should be 0.58 N·m or less.



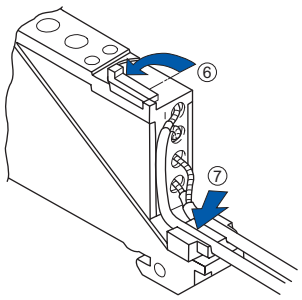
Connection to sensor head



①Rotate the cable lock lever approx. 160° clockwise.
②Insert the black beam-receiving cable's yellow inner wire into terminal No. 4 and the outer woven shield wire into terminal No. 3.



③Rotate the cable lock lever approx. 90° counterclockwise. (The beam-receiving cable is hooked up.)
④Press the beam-receiving cable into the rubber retainer.
⑤Insert the gray beam-emitting cable's brown inner wire into terminal No. 1 and the outer woven shield wire into terminal No. 2.



⑥Rotate the cable lock lever back to the "LOCK" position. (The beam-emitting cable is hooked up.)
⑦Press the beam-emitting cable into the rubber retainer.

Note: Close the case cover firmly. Not doing so will weaken the shield cable clamp.

Wiring

- The self-diagnosis output does not incorporate a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load.

Others

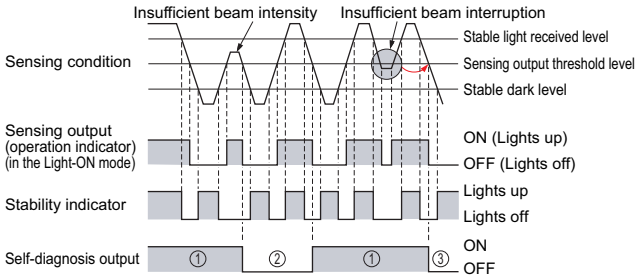
- Do not use during the initial transient time (30 ms) after the power supply is switched on.

PRECAUTIONS FOR PROPER USE

Refer to p.986~ for general precautions and p.390 for precautions of sensor head.

Self-diagnosis function

- The sensor checks the incident light intensity, and if it is reduced due to dirt or dust, or beam misalignment, an output is generated.



①The self-diagnosis output transistor stays in the "ON" state during stable sensing.
②When the sensing output changes, if the incident light intensity does not reach the stable light received level or the stable dark level, the self-diagnosis output becomes OFF. Further, the self-diagnosis output changes state when the sensing output changes from Light to Dark state. (It is not affected by the operation mode switch).
③In case of insufficient beam interruption, there will be a time lag before the self-diagnosis output turns OFF.

Timer operation

- If the timer operation mode switch is set to "OFD", approx. 40 ms fixed OFF-delay timer operation is obtained. This function is useful if the output signal is so short that the connected device cannot respond.

Operation of timer operation mode switch

Timer operation mode switch setting		Sensing condition / Operation	Beam received / Beam interrupted
Timer operation mode selection	Sensing mode selection		
OFD	MODE L. D.	Light-ON normal operation	ON / OFF
OFD	MODE L. D.	Light-ON OFF-delay	ON / OFF (T, T, T)
OFD	MODE L. D.	Dark-ON normal operation	ON / OFF
OFD	MODE L. D.	Dark-ON OFF-delay	ON / OFF (T)

Timer period: T = 40 ms approx.

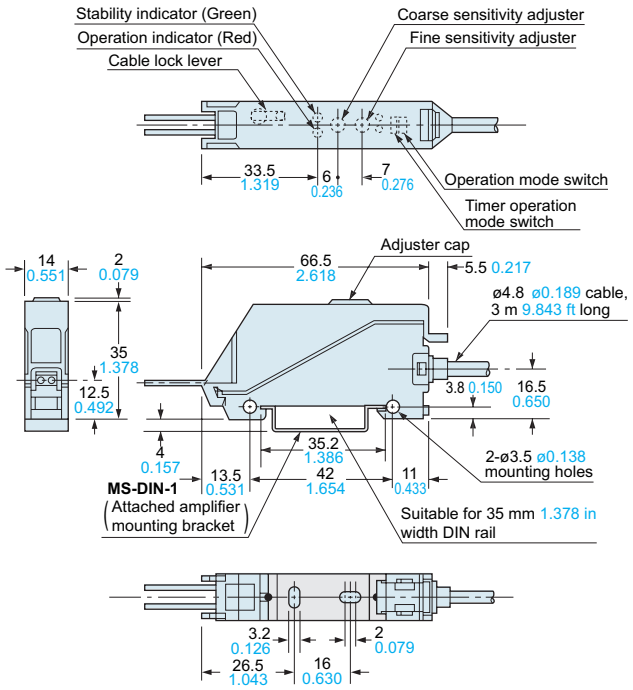
DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from the SUNX website: http://www.sunx.com

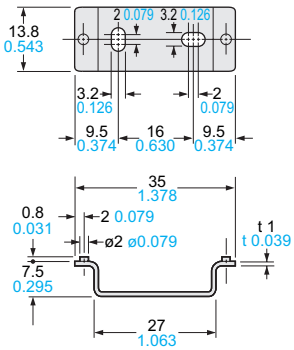
Refer to p.393~ for dimensions of sensor head.

SS-A5 Amplifier

Assembly dimensions with attached amplifier mounting bracket



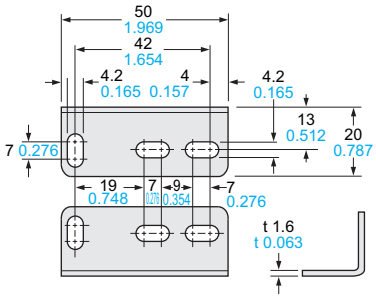
MS-DIN-1 Amplifier mounting bracket (Accessory for Amplifier)



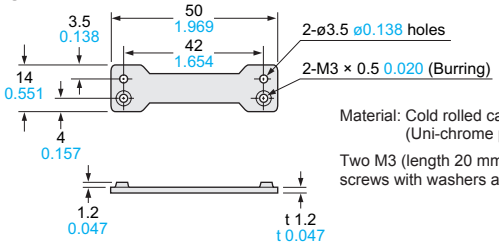
Material: Cold rolled carbon steel (SPCC) (Uni-chrome plated)

MS-FX-1 Amplifier mounting bracket (Optional)

①



②



Material: Cold rolled carbon steel (SPCC) (Uni-chrome plated)

Two M3 (length 20 mm 0.787 in) screws with washers are attached.

单击下面可查看定价，库存，交付和生命周期等信息

>>Panasonic(松下)