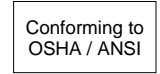




SMALL • GLOBAL SAFETY LIGHT CURTAIN **Type4**

New

SF4-AH SERIES



Industry's smallest Type 4



Achieving a new standard of safety assurance: SUNX proves the reliability of the SF4-AH series, through compliance with international standards.

Upon the enactment of "ISO 12100", which is based on European Standards (ENs), there are now urgent requirements for the industry to establish safety standards in accordance with technological innovations.

Even as this interest in safety has been growing, the SUNX / SF4-AH series has been dedicated to the complete pursuit of safety and has achieved the highest safety standards.

Compliant with international safety standards



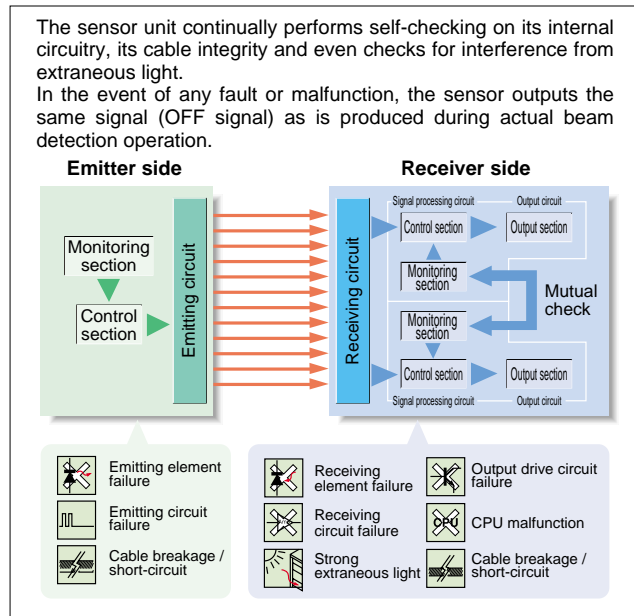
The SF4-AH series has surpassed the most stringent international safety levels and is compliant with the machinery directive and OSHA / ANSI standards. This series has been certified for usage in any workplace around the world.

Europe	CE marking based on Machine Directive and EMC Directive has been obtained, so that the sensors can be used in Safety Category 4 equipment. [Type 4 based on IEC 61496-1/2, EN 61496-1 and Category 4 based on EN 954-1]
North America	c-UL-us listings (IEC 61496-1/2) which are required for use in the United States and Canada have been obtained. The SF4-AH series is also compatible with mechanical equipment that conforms to the following regulations and standards: OSHA (1910.212/217), ANSI (B11.1 to B11.20) and ANSI/RIA 15.06.

The highest standards of safety have now been achieved

It uses two independent CPUs, which mutually check the safety conditions. High reliability safety design is realized by incorporating dual circuits for signal processing and output. Further, in order to ensure safety, FMEA (Failure Mode & Effect Analysis) has been used to prove safe operation.

* FMEA: Failure Mode & Effects Analysis



The most stringent Category 4 safety standards have now been achieved, in an amazingly compact size.

Industry's smallest size & fastest response speed contribute to facility miniaturization

Industry's smallest size

The Type 4 achieves the smallest size in the industry, thus contributing to facility miniaturization.

Thickness
21 mm 0.827 in

Width
28 mm 1.102 in



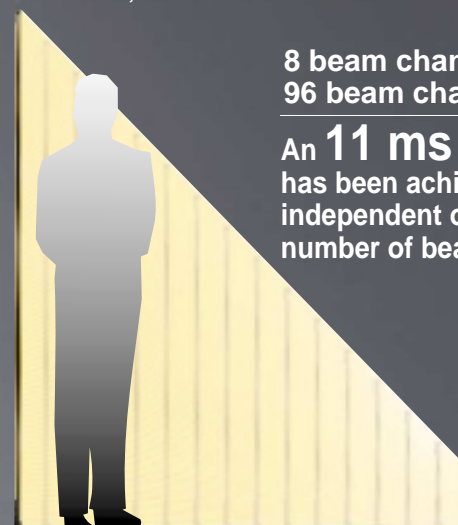
Actual size

Reduced requirements for safety distance calculations

As a high-speed 11 ms response has been achieved, regardless of the number of beam channels, the calculation of safety distances for each individual sensor is no longer necessary. This high-speed response simplifies the entire process of safety distance calculation.

Increasing the safety distance response speed allows the safe distance between the danger areas and the light curtain to be reduced, thus allowing for miniaturization of the equipment.

Maximum 1,950 mm 76.772 in



**8 beam channels to
96 beam channels**

**An 11 ms response
has been achieved,
independent of the
number of beam channels**

Minimum
190 mm 7.48 in

Can be utilized with equipment of all sizes – from small to large

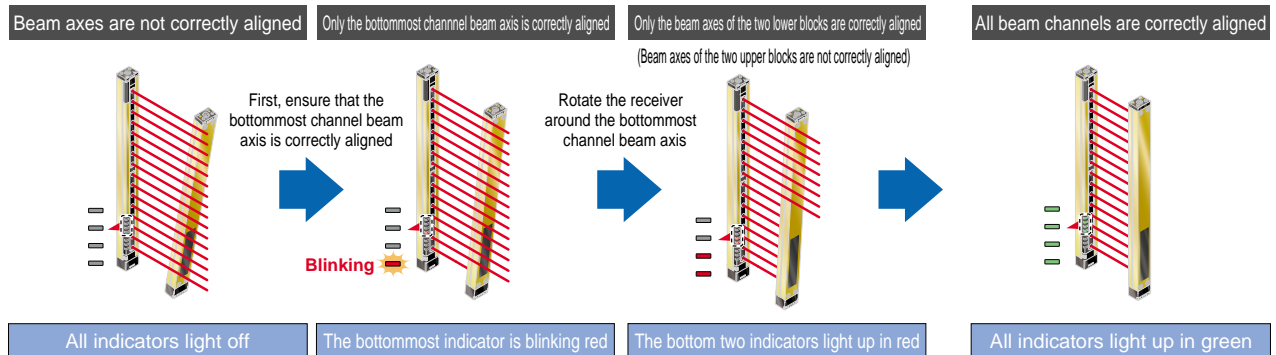
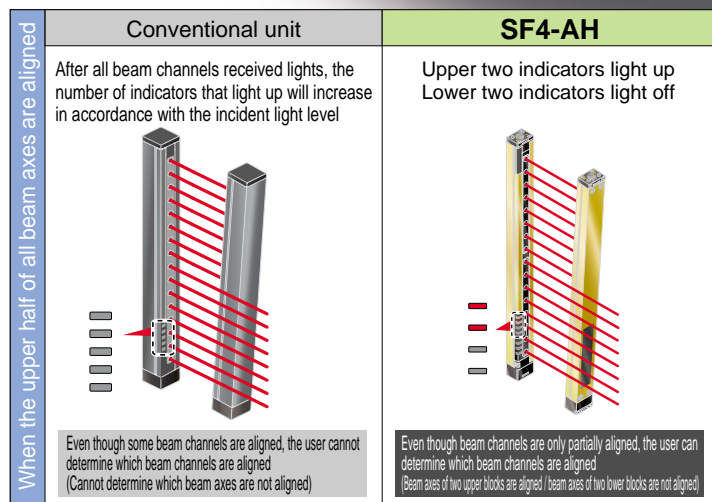
A safety light curtain that can be used in a variety of work environments Providing 'safety + α ' to every workplace in the world

The SF4-AH series integrates reliability, economy and ease of installation, with excellent specifications, fully compliant with Safety category 4 .
This versatile light curtain is well suited for a wide variety of safety-related applications, allowing it to be utilized by almost any workplace.

Convenient tool facilitates easy beam alignment Reduces installation time significantly

Unaligned beam axes can be seen at a glance

The beam-axis alignment indicators are distributed on the sensors in four sections. As the indicators of the sections whose beams are aligned light up in red, allowing the user to easily verify which beam axes have become aligned. Once all beams have become aligned, the indicators light up in green. Upon the beginning of alignment, the indicators light up in green. Upon the beginning of alignment, as soon as the bottommost or the topmost beam axis (the standard beam axis) becomes aligned, then the corresponding bottommost or topmost alignment indicator light will begin blinking red. Therefore, beam axes can be easily aligned by performing the initial beam axis alignment on either the bottommost or the topmost beam axis, then rotating the light curtain around the axis of this beam. The beam-axis alignment indicators are provided on both the emitter and the receiver, so that you can see at a glance which beams are not aligned.



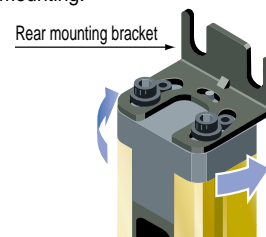
Alignment of beam axes can be accurately performed prior to power-up

If the SF-LAT-2N Laster Alignment Tool is utilized, then beam axes alignment can be quickly and easily performed, using the easy-to-see laster beam spot, even when light curtain units are installed long distances apart. In addition, as the SF-LAT-2N Laster Alignment Tool is battery-operated; beam axes alignment can be performed before actual power-up of the light curtain itself.



Mounting bracket enables easy beam-axis alignment

The beam-axis alignment is easy since angle adjustment is possible with the enclosed rear mounting bracket (MS-SF2N-1). Furthermore, the optional side mounting bracket (MS-SF2N-3) can also be used for side mounting.





Incorporates advanced ELCA function that prevents mutual interference and reduces interference from extraneous light

Recognizes extraneous light and prevents malfunctions

This function allows the sensor to recognize and reject interferences of instantaneous extraneous light emitted from peripheral equipment, thus preventing malfunctions caused by a variety of sources, including: other sensor beams in the vicinity of the operating sensor, beam spatter, AGV and rotating light sources. By reducing the number of malfunctions caused by extraneous light, detection operations will be interrupted less frequently, resulting in tremendous improvements to work efficiency.

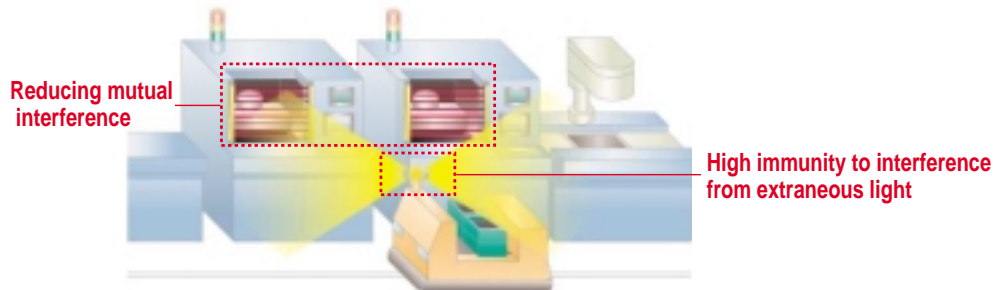
Mutual interference is reduced without the need for interference prevention lines

The ELCA (Extraneous Light Check & Avoid) function enhances the mutual interference prevention function.

ELCA decreases interference from extraneous light having a similar frequency as the light used by the SF4-AH series, thereby also minimizing mutual interference among nearby SF4-AH series sensor units.

The SF4-AH series is equipped with emitting light amount control function, thus minimizing interference with peripheral sensors

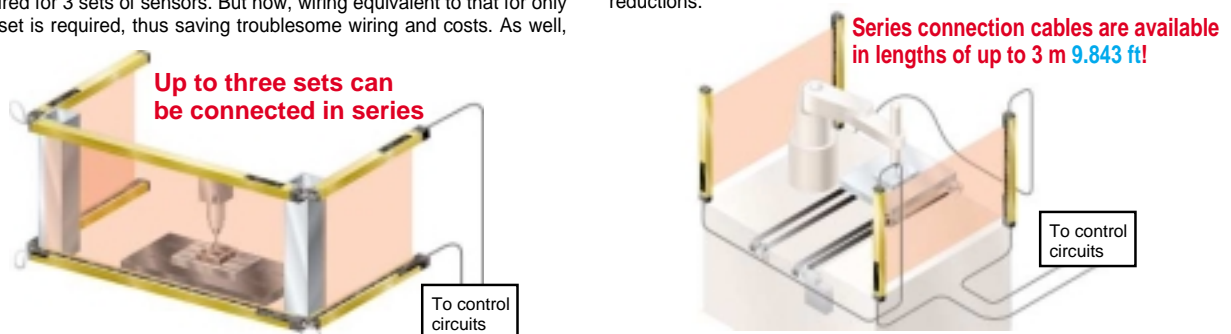
Reducing the amount of light emitted from the emitter facilitates the minimization of any effects of such emitted light on peripheral equipment. (This function can be selected by using the Handy-controller.)



Reductions in total costs are possible by using series connections

Using the optional serial connection cable, a maximum of 3 sets of sensors can be connected in series. Previously, separate wiring was required for 3 sets of sensors. But now, wiring equivalent to that for only one set is required, thus saving troublesome wiring and costs. As well,

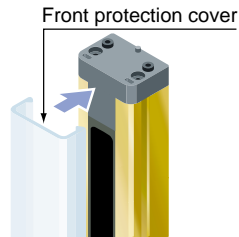
fewer power connections are required, thus reducing the number of safety relay units needed to a single unit, resulting in tremendous cost reductions.



Thorough sensor protection measures have also been implemented

Front protection cover protects the sensing surface

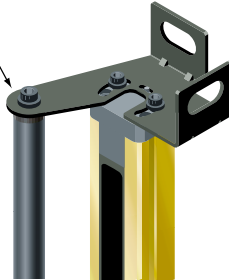
In the event that the SF4-AH series is installed in a harsh environment, the use of the front protection cover (FC-SF4A-H□, optional) will protect the sensing surface from damage.



Impact protection for the sensing surface

A front protection unit is now available that will prevent damage to the sensing surface, due to impacts from objects sensed (optional).

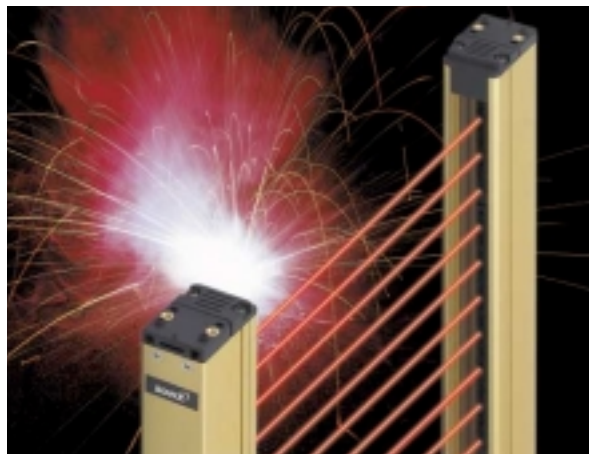
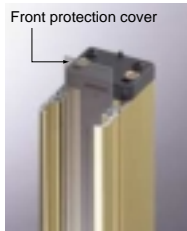
Front protection unit



Spatter protection for the sensing surface

The spatter protection hood type, now available, protects the sensing surface from welding machine spatter. Moreover, a front protection cover that can be installed within the sensor casing is also available, completely preventing spatter from adhering to the sensing surface.

In addition, even though sensed objects may contact the sensor, the sensing surface will be protected. As well, the ELCA function implements all possible measures to prevent malfunctions caused by spatter.

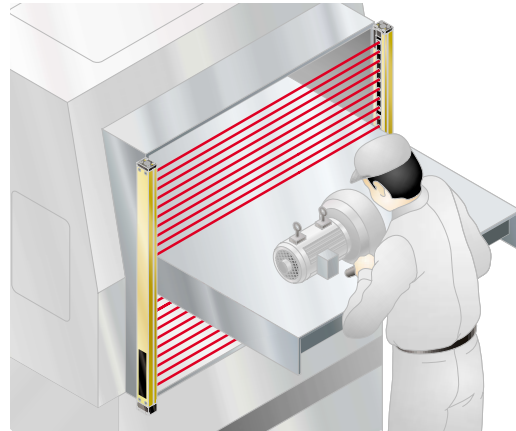


Our product line-up now includes a Handy-controller that enables the user to select a variety of settings. Function settings can be easily performed by anyone.

Any valid beam channels can be selected!

The SF4-AH series now incorporates a fixed blanking function.

The SF4-AH series is equipped with a fixed blanking function that allows specific beam channels to be selectively blocked, without causing the control output (OSSD) to output the OFF signal. This function is convenient for use with applications in which certain fixed obstacles always block specific beam channels. Furthermore, this function provides greater safety, as the control output (OSSD) will automatically output the OFF signal if the fixed obstacles are subsequently removed from the sensing area.



Automatic blanking of beam channels!

The SF4-AH series now incorporates a floating blanking function.

1, 2 or 3 non-specified beam channels can be deactivated. If the number of beam channels that are blocked is less than or equal to the number of preset beam channels, then the control output (OSSD) will not output the OFF signal. This function is useful in the event that the positions of obstacles within the sensing area must be changed during work-piece re-arrangement, or when material must be thrown through the light curtain's sensing area.



Minimum size of objects detected

When 1 beam channel has been preset: ϕ 50 mm ϕ 1.969 in

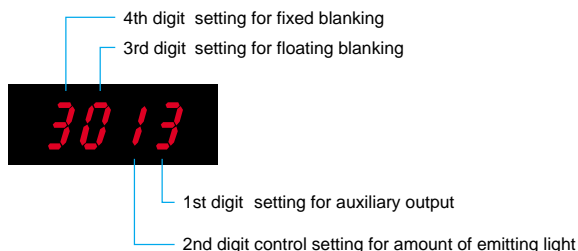
When 2 beam channels have been preset: ϕ 70 mm ϕ 2.756 in

When 3 beam channels have been preset: ϕ 90 mm ϕ 3.543 in

Each function can be directly preset using numeric input!

Code selection function

Each function can be selected directly by using only a 4-digit code (numeral) in accordance with the code table.



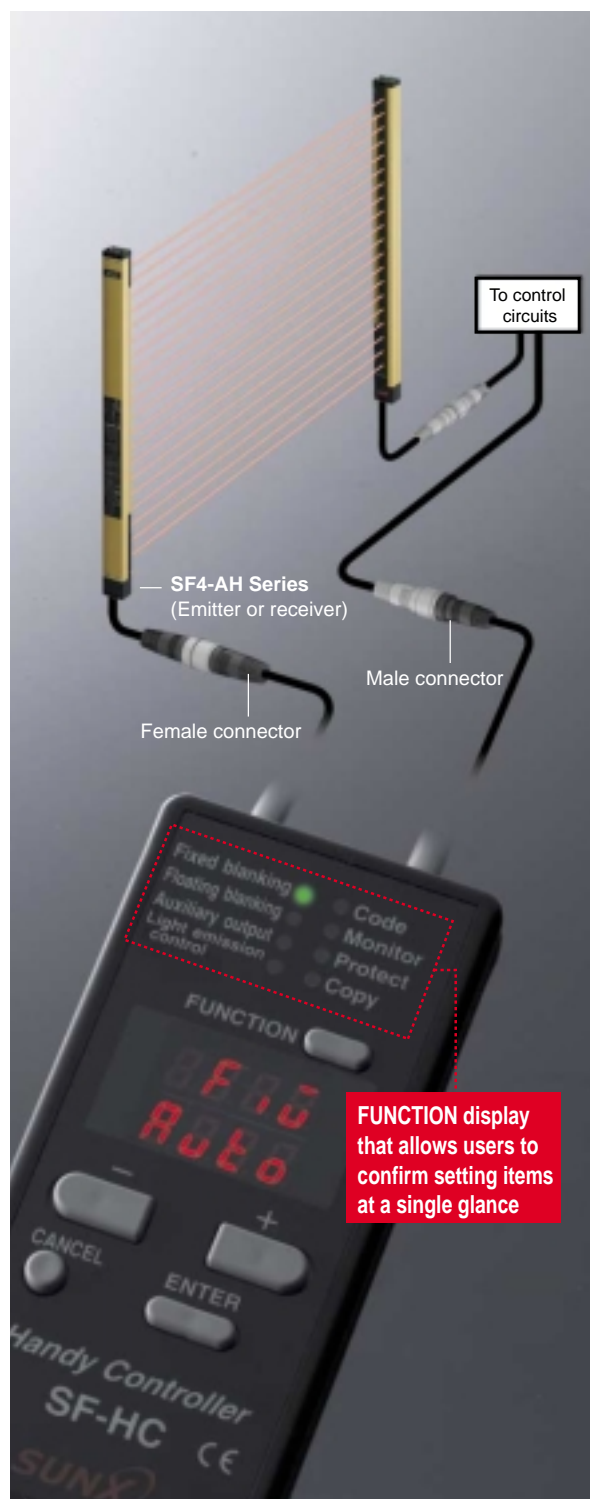
Code	4th digit Fixed blanking	3rd digit Floating blanking	2nd digit Control for amount of emitting light	1st digit Auxiliary output
0	Invalid	Invalid	Invalid	Reverse action of control output
1	Valid / auto setting	Number of beam channel preset = 1 Invalid setting for both beam channel ends = invalid	Valid	Same action as control output
2	—	Number of beam channel preset = 2 Invalid setting for both beam channel ends = invalid	—	When light is not being emitted (at time of lockout): ON
3	—	Number of beam channel preset = 3 Invalid setting for both beam channel ends = invalid	—	When light is not being emitted (at time of lockout): OFF
1	—	Number of beam channel preset = 1 Invalid setting for both beam channel ends = valid	—	—
2	—	Number of beam channel preset = 2 Invalid setting for both beam channel ends = valid	—	—
3	—	Number of beam channel preset = 3 Invalid setting for both beam channel ends = valid	—	—

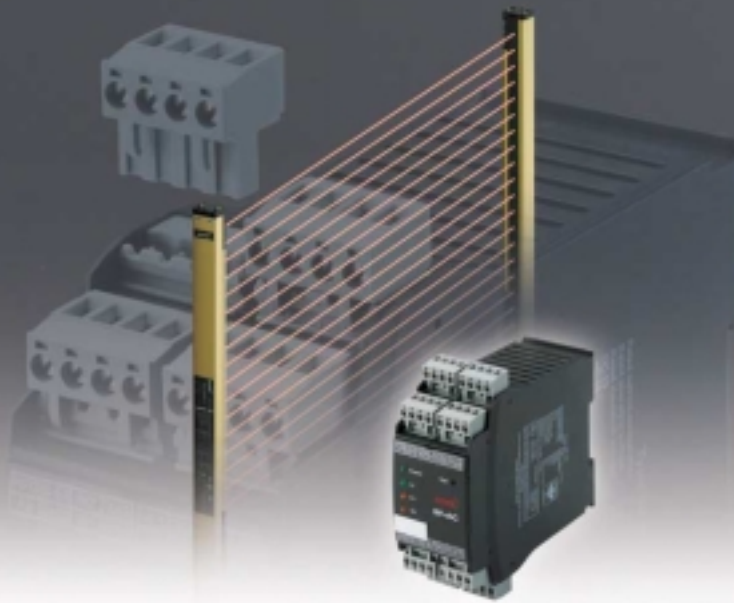
Auxiliary output has selectable output configuration

The output configuration of the auxiliary output can be changed. The output is selectable from among the following configurations: same action as control output; reverse action of control output; ON when light is not being emitted (at time of lockout); and OFF when light is not being emitted (at time of lockout).

A variety of other functions can be selected

- Control for amount of emitting light**
 This function reduces the amount of emitting light. It is useful when the effects from emitted light on other equipment must be minimized. (operating range 5 m 16.404 ft)
- Monitoring function of settings details**
 This function allows the user to confirm the details of each sensor setting.
- Protection function**
 This function locks the sensor using a four-digit password. This function will not allow changes to sensor function settings unless the password is input, thus preventing third parties from accidentally changing the settings.
- Copy function**
 Allows settings details to be copied into other sensors. In the event that the same setting must be input several times into different sensors, this function will reduce the time required for the input of settings.

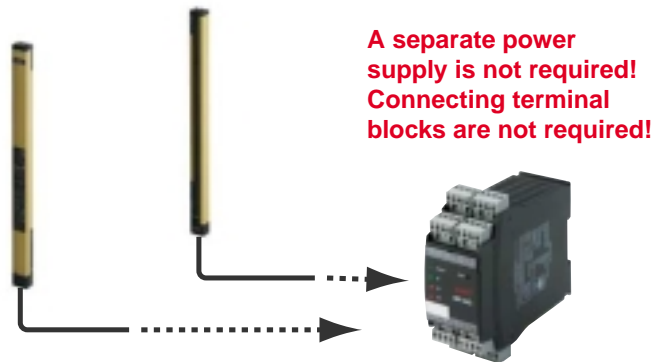




The SF-AC, a exclusive safety relay unit for the light curtain, will be also available Safety will be enhanced even further

A separate power supply and connecting terminal blocks are not needed

As **SF-AC** incorporates a power supply for the light curtain, as well as terminals for synchronization lines, neither a separate power supply nor terminal blocks are required.



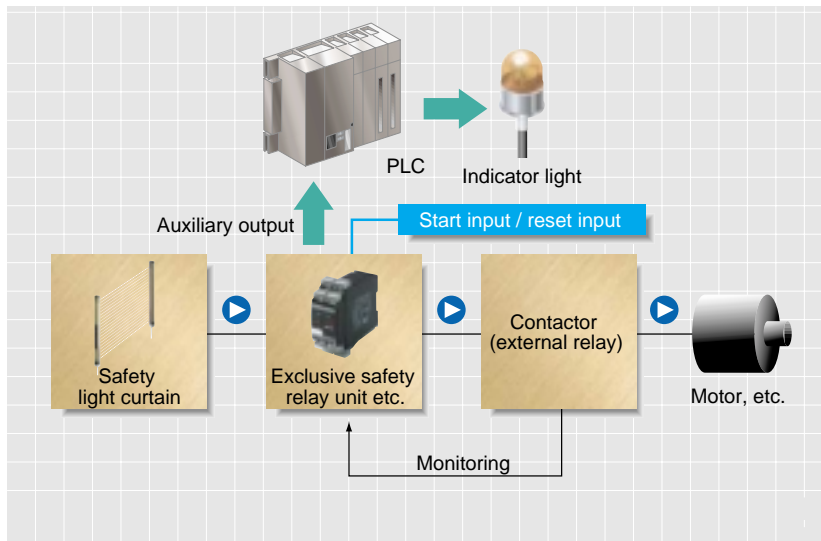
Installation time and labor can be saved due to the usage of detachable terminal blocks

As wiring can be performed with the terminal blocks removed, it is not necessary to detach the controller from the control panel when performing maintenance, thus reducing the number of installation procedures required.



Incorporates a 2-channel auxiliary output

SF-AC incorporates both an auxiliary output that operates together with the light curtain's OSSD, and an alarm output that functions together with the light curtain's auxiliary output (non-safety output). These features allow for monitoring of light curtain activity.



Maintenance free

As **SF-AC** employs hybrid fuses, fuse replacement is not necessary.

10 ms high-speed response

The fastest response time for a relay output, 10 ms, has now been achieved. **SF-AC**, together with the fast-responding the **SF4-AH** series, further improves sensor safety.

A contact point mechanical lifetime of 10 million operations has now been achieved

Longer usage is possible due to the long contact point lifetime.

ORDER GUIDE

Sensors Mating cable is not supplied with the sensor. Please order it separately.

Type	Appearance	Operating range	Model No.	Number of beam channels	Protective height (mm) (in)			
Normal case		<div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></div> 0.3 to 7 m 0.984 to 22.966 ft	SF4-AH8	8	190 7.48			
			SF4-AH12	12	270 10.63			
			SF4-AH16	16	350 13.78			
			SF4-AH20	20	430 16.929			
			SF4-AH24	24	510 20.079			
			SF4-AH28	28	590 23.228			
			SF4-AH32	32	670 26.378			
			SF4-AH36	36	750 29.528			
			SF4-AH40	40	830 32.677			
			SF4-AH48	48	990 38.976			
			SF4-AH56	56	1,150 45.276			
			SF4-AH64	64	1,310 51.575			
			SF4-AH72	72	1,470 57.874			
			SF4-AH80	80	1,630 64.173			
			SF4-AH88	88	1,790 70.472			
			SF4-AH96	96	1,950 76.772			
			With spatter protection hood		<div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></div> 0.3 to 7 m 0.984 to 22.966 ft	SF4-AH8-H	8	190 7.48
						SF4-AH12-H	12	270 10.63
SF4-AH16-H	16	350 13.78						
SF4-AH20-H	20	430 16.929						
SF4-AH24-H	24	510 20.079						
SF4-AH28-H	28	590 23.228						
SF4-AH32-H	32	670 36.378						
SF4-AH36-H	36	750 29.528						
SF4-AH40-H	40	830 32.677						
SF4-AH48-H	48	990 38.976						
SF4-AH56-H	56	1,150 45.276						
SF4-AH64-H	64	1,310 51.575						
SF4-AH72-H	72	1,470 57.874						
SF4-AH80-H	80	1,630 64.173						
SF4-AH88-H	88	1,790 70.472						
SF4-AH96-H	96	1,950 76.772						

Exclusive safety relay unit

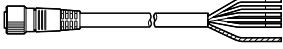
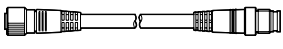
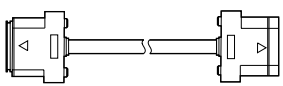
Designation	Appearance	Model No.
Safety relay unit		SF-AC

Handy-controller

Designation	Appearance	Model No.
Handy-controller		SF-HC

ORDER GUIDE

Mating cables

Designation	Appearance	Model No.	Description
Cable with connector on one end		SF4A-CC3	Length: 3 m 9.843 ft Weight: 190 g 6.702 oz approx. (one cable)
		SF4A-CC7	Length: 7 m 22.966 ft Weight: 400 g 14.11 oz approx. (one cable)
		SF4A-CC10	Length: 10 m 32.808 ft Weight: 570 g 20.106 oz approx. (one cable)
Cable with connector on both ends		SF4A-CCJ10	Length: 10 m 32.808 ft Weight: 590 g 20.812 oz approx. (one cable)
Cable for series connection		SF4A-CSL02	Length: 200 mm 7.874 in Weight: 35 g 1.235 oz approx. (one cable)
		SF4A-CSL05	Length: 500 mm 19.685 in Weight: 50 g 1.764 oz approx. (one cable)
		SF4A-CSL10	Length: 1 m 3.281 ft Weight: 80 g 2.822 oz approx. (one cable)
		SF4A-CSL30	Length: 3 m 9.843 ft Weight: 190 g 6.702 oz approx. (one cable)

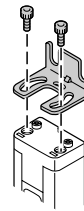
Note: Note that the dimensions of the **SF4-AH** series will change when using the cable for series connection (**SF4A-CSL□**). Refer to **'DIMENSIONS'** on P.20 and P.22.

Spare parts (Accessories for sensor)

Designation	Model No.	Description
Rear mounting bracket	MS-SF2N-1	Used to mount the sensor on the rear surface (1 set for emitter and receiver)
U-shaped rear mounting intermediate supporting bracket (Note)	MS-SF2N-2	For SF4-AH□ Used to hold the sensor at the intermediate position for protection against vibration (for rear surface mounting) (1 set for emitter and receiver)
	MS-SF4A-H2	For SF4-AH□-H
L-shaped intermediate supporting bracket (Note)	MS-SF2N-L	Used to install the intermediate supporting bracket on the wall side, etc. (1 set for emitter and receiver)
Test rod	SF4-AH-TR	Used for standard sensing to detect the smallest objects ($\phi 30$ mm $\phi 1.181$ in), with 20 mm 0.787 in beam pitch

Note: The number of sets required varies depending on the product. Refer to **'DIMENSIONS'** on P.23 and P.24 for further details.

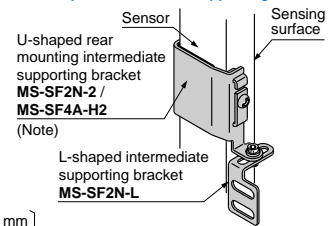
Rear mounting bracket



Four bracket set

Eight M3 (length 5 mm **0.197 in**) hexagon-socket-head bolts are attached.

U-shaped rear mounting intermediate supporting bracket L-shaped intermediate supporting bracket



Note: The above diagram is only applicable to the **MS-SF2N-2**. The **MS-SF4A-H2** has a different shape.

- **MS-SF2N-2 / MS-SF4A-H2**
Set of 2 Nos. each of U-shaped rear supporting bracket and retaining plate
- **MS-SF2N-L**
Two L-shaped bracket set
(Two M3 (length 10 mm **0.394 in**) pan head screws, two M4 (length 10 mm **0.394 in**) hexagon-socket-head bolts and two nuts are attached.)

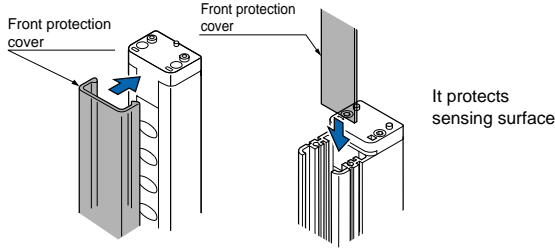
OPTIONS

Applicable beam channels		8 beam channels	12 beam channels	16 beam channels	20 beam channels	24 beam channels	28 beam channels	32 beam channels	36 beam channels	40 beam channels	48 beam channels	56 beam channels	64 beam channels	72 beam channels	80 beam channels	88 beam channels	96 beam channels
Front protection cover	For SF4-AH□	Model No. FC-SF4A-H8	FC-SF4A-H12	FC-SF4A-H16	FC-SF4A-H20	FC-SF4A-H24	FC-SF4A-H28	FC-SF4A-H32	FC-SF4A-H36	FC-SF4A-H40	FC-SF4A-H48	FC-SF4A-H56	FC-SF4A-H64	FC-SF4A-H72	FC-SF4A-H80	FC-SF4A-H88	FC-SF4A-H96
	For SF4-AH□-H	Model No. FC-SF4A-H8-H	FC-SF4A-H12-H	FC-SF4A-H16-H	FC-SF4A-H20-H	FC-SF4A-H24-H	FC-SF4A-H28-H	FC-SF4A-H32-H	FC-SF4A-H36-H	FC-SF4A-H40-H	FC-SF4A-H48-H	FC-SF4A-H56-H	FC-SF4A-H64-H	FC-SF4A-H72-H	FC-SF4A-H80-H	FC-SF4A-H88-H	FC-SF4A-H96-H
Slit mask	For SF4-AH□	Model No. OS-SF4A-H8	OS-SF4A-H12	OS-SF4A-H16	OS-SF4A-H20	OS-SF4A-H24	OS-SF4A-H28	OS-SF4A-H32	OS-SF4A-H36	OS-SF4A-H40	OS-SF4A-H48	OS-SF4A-H56	OS-SF4A-H64	OS-SF4A-H72	OS-SF4A-H80	OS-SF4A-H88	OS-SF4A-H96
	For SF4-AH□-H	Model No. OS-SF4A-H8-H	OS-SF4A-H12-H	OS-SF4A-H16-H	OS-SF4A-H20-H	OS-SF4A-H24-H	OS-SF4A-H28-H	OS-SF4A-H32-H	OS-SF4A-H36-H	OS-SF4A-H40-H	OS-SF4A-H48-H	OS-SF4A-H56-H	OS-SF4A-H64-H	OS-SF4A-H72-H	OS-SF4A-H80-H	OS-SF4A-H88-H	OS-SF4A-H96-H
Front protection unit	Model No. MC-SF4AH-8	MC-SF4AH-12	MC-SF4AH-16	MC-SF4AH-20	MC-SF4AH-24	MC-SF4AH-28	MC-SF4AH-32	MC-SF4AH-36	MC-SF4AH-40	MC-SF4AH-48	MC-SF4AH-56	MC-SF4AH-64	MC-SF4AH-72	MC-SF4AH-80	MC-SF4AH-88	MC-SF4AH-96	

Note: The model Nos. given above denote a single unit, not a pair of units. 2 Nos. (2 sets) are required for use in mounting to the emitter / receiver.

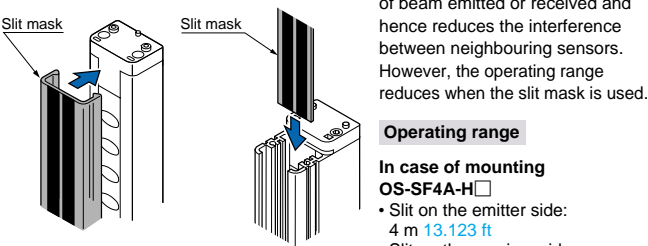
Front protection cover

- FC-SF4A-H□
- FC-SF4A-H□-H



Slit mask

- OS-SF4A-H□
- OS-SF4A-H□-H



Operating range

In case of mounting OS-SF4A-H□

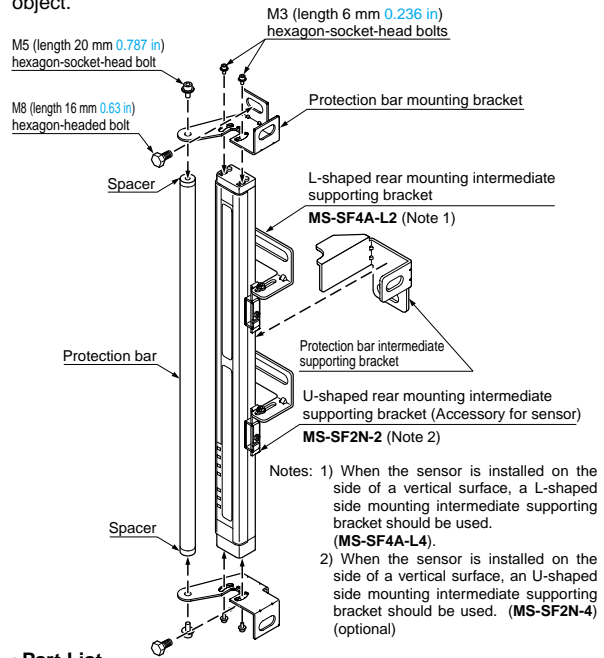
- Slit on the emitter side: 4 m 13.123 ft
- Slit on the receiver side: 3 m 9.843 ft
- Slit on both sides: 2 m 6.562 ft

In case of mounting OS-SF4A-H□-H

- Slit on the emitter side: 3 m 9.843 ft
- Slit on the receiver side: 3 m 9.843 ft
- Slit on both sides: 1.5 m 4.921 ft

Front protection unit

It protects sensing surface from damage due to striking of an object.



- Notes: 1) When the sensor is installed on the side of a vertical surface, a L-shaped side mounting intermediate supporting bracket should be used. (MS-SF4A-L4).
 2) When the sensor is installed on the side of a vertical surface, an U-shaped side mounting intermediate supporting bracket should be used. (MS-SF2N-4) (optional)

Part List

Designation	Model No.	Number	Remarks
Protection bar	—	1 No.	Material: Aluminum
Protection bar mounting bracket	—	2 Nos.	Material: Cold rolled carbon steel (SPCC)
Protection bar intermediate supporting bracket	—	1 No. (Note 1)	Material: Cold rolled carbon steel (SPCC)
L-shaped rear mounting intermediate supporting bracket	MS-SF4A-L2	0 to 5 Nos. (Note 2)	Material: Cold rolled carbon steel (SPCC)
L-shaped side mounting intermediate supporting bracket	MS-SF4A-L4	0 to 5 Nos. (Note 2)	Material: Cold rolled carbon steel (SPCC)
Spacer	—	2 Nos.	Material: Aluminum
M5 hexagon-socket-head bolt	—	2 Nos.	Length 20 mm 0.787 in
M3 hexagon-socket-head bolt	—	4 Nos.	Length 6 mm 0.236 in
M8 hexagon-headed bolt	—	2 to 8 Nos. (Note 2)	Length 16 mm 0.63 in

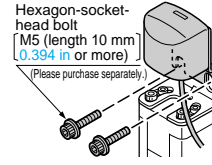
- Notes: 1) The protection bar intermediate supporting bracket is attached with the front protection unit for 40 beam channels or more.
 2) The number of accessories varies depending on the product. Refer to 'DIMENSIONS' on P.26 for further details.

OPTIONS

Designation	Model No.	Description
Large display unit for light curtain	SF-IND-2	<p>With the large indicators put on the light curtain, the operation is easily observable from various directions.</p> <p>Specifications</p> <ul style="list-style-type: none"> • Supply voltage: 24 V DC $\pm 15\%$ • Current consumption: 12 mA or less • Indicators: Orange LED (8 Nos. used) [Light up when external contact is ON] (No dew condensation or icing allowed) • Ambient temperature: -10 to $+55$ °C $+14$ to $+55$ °F • Material: POM (Base) Polycarbonate (Cover) Cold rolled carbon steel (SPCC) (Bracket) • Cable: 0.3 mm² 2-core cabtyre cable, 3 m 9.843 ft long • Weight: 70 g 2.469 oz approx. (including bracket) <p>I/O circuit diagrams</p> <p><In case of connection to NPN output type></p> <p><In case of connection to PNP output type></p>
Side mounting bracket	MS-SF2N-3	Used for side-mounting of sensors (four bracket set for emitter and receiver)
U-shaped side mounting intermediate supporting bracket (Note 1)	MS-SF2N-4	For SF4-AH□ Used to hold the sensor at the intermediate position for protection against vibration (for side mounting)
	MS-SF4A-H4	For SF4-AH□-H (1 set for emitter and receiver)
Center sensor mounting bracket (Note 2)	MS-SF2N-5	Used for one-point rear mounting Convenient for mounting on an aluminum frame (four bracket set for emitter and receiver)
Laser alignment tool (Note 3)	SF-LAT-2N	Easy to align the beam axis with the visible laser beam

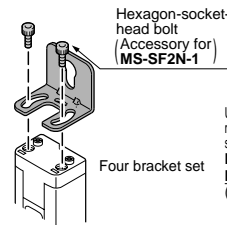
- Notes: 1) The number of sets required varies depending on the product. Refer to 'DIMENSIONS' on P.25 for further details.
 2) Multiple beam channel sensors requiring the intermediate supporting bracket (36 beam channels or more) cannot mount on an aluminum frame with the center sensor mounting bracket.
 3) Refer to the SF-LAT-2N catalog for further details about the laser alignment tool.

Large display unit for area sensor

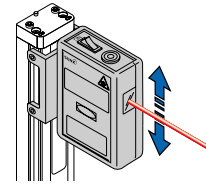


Attaches to upper edge of light curtain.
Tighten together the mounting bracket provided with the area sensor and the mounting bracket of SF-IND-2.

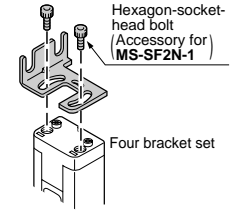
Center sensor mounting bracket



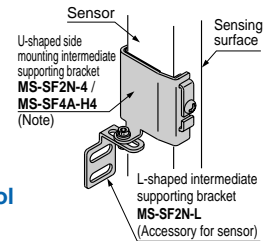
Laser alignment tool



Side mounting bracket



U-shaped side mounting intermediate supporting bracket L-shaped intermediate supporting bracket



Note: The above diagram is only applicable to the MS-SF2N-4. The MS-SF4A-H4 has a different shape.

- **MS-SF2N-4 / MS-SF4A-H4**
Set of 2 Nos. each of U-shaped side supporting bracket and retaining plate
- **MS-SF2N-L** (Accessory for sensor)
Two L-shaped bracket set
Two M3 (length 10 mm 0.394 in) pan head screws,
two M4 (length 10 mm 0.394 in) hexagon-socket-head bolts and two nuts are attached.

SPECIFICATIONS

Individual specifications

Model No.		SF4-AH8(-H)	SF4-AH12(-H)	SF4-AH16(-H)	SF4-AH20(-H)	SF4-AH24(-H)	SF4-AH28(-H)	SF4-AH32(-H)	SF4-AH36(-H)
Item	Model No.	SF4-AH8(-H)	SF4-AH12(-H)	SF4-AH16(-H)	SF4-AH20(-H)	SF4-AH24(-H)	SF4-AH28(-H)	SF4-AH32(-H)	SF4-AH36(-H)
No. of beam channels		8	12	16	20	24	28	32	36
Beam pitch		20 mm 0.787 in							
Protective height		190 mm 7.48 in	270 mm 10.63 in	350 mm 13.78 in	430 mm 16.929 in	510 mm 20.079 in	590 mm 23.228 in	670 mm 26.378 in	750 mm 29.528 in
Current consumption		Emitter: 55 mA or less, Receiver: 80 mA or less				Emitter: 75 mA or less, Receiver: 90 mA or less,			
Weight (total of emitter and receiver)	SF4-AH□	390 g 13.757 oz approx.	490 g 17.284 oz approx.	600 g 21.164 oz approx.	710 g 25.045 oz approx.	810 g 28.572 oz approx.	880 g 31.041 oz approx.	950 g 33.51 oz approx.	1,000 g 35.274 oz approx.
	SF4-AH□-H	490 g 17.284 oz approx.	640 g 22.575 oz approx.	800 g 28.219 oz approx.	950 g 33.51 oz approx.	1,100 g 38.801 oz approx.	1,200 g 42.329 oz approx.	1,400 g 49.384 oz approx.	1,500 g 52.911 oz approx.

Model No.		SF4-AH40(-H)	SF4-AH48(-H)	SF4-AH56(-H)	SF4-AH64(-H)	SF4-AH72(-H)	SF4-AH80(-H)	SF4-AH88(-H)	SF4-AH96(-H)
Item	Model No.	SF4-AH40(-H)	SF4-AH48(-H)	SF4-AH56(-H)	SF4-AH64(-H)	SF4-AH72(-H)	SF4-AH80(-H)	SF4-AH88(-H)	SF4-AH96(-H)
No. of beam channels		40	48	56	64	72	80	88	96
Beam pitch		20 mm 0.787 in							
Protective height		830 mm 32.677 in	990 mm 38.976 in	1,150 mm 45.276 in	1,310 mm 51.575 in	1,470 mm 57.874 in	1,630 mm 64.173 in	1,790 mm 70.472 in	1,950 mm 76.772 in
Current consumption		Emitter: 90 mA or less, Receiver: 100 mA or less		Emitter: 110 mA or less, Receiver: 115 mA or less		Emitter: 130 mA or less, Receiver: 125 mA or less		Emitter: 150 mA or less, Receiver: 135 mA or less	
Weight (total of emitter and receiver)	SF4-AH□	1,100 g 38.801 oz approx.	1,400 g 49.384 oz approx.	1,700 g 59.966 oz approx.	1,900 g 67.021 oz approx.	2,100 g 74.075 oz approx.	2,300 g 81.13 oz approx.	2,500 g 88.185 oz approx.	2,700 g 95.24 oz approx.
	SF4-AH□-H	1,600 g 56.438 oz approx.	1,800 g 63.493 oz approx.	2,000 g 70.548 oz approx.	2,600 g 91.712 oz approx.	2,900 g 102.295 oz approx.	3,100 g 109.349 oz approx.	3,300 g 116.404 oz approx.	3,900 g 137.569 oz approx.

Common specifications

Model No.		SF4-AH□ (-H)
Item	Model No.	SF4-AH□ (-H)
Applicable standards		EN 954-1 (Category 4), EN 61496-1 (Type 4), IEC 61496-1/2 (Type 4), UL 61496-1/2 (Type 4), UL 1998
Operating range		0.3 to 7 m 0.984 to 22.966 ft
Detection capability		φ 30 mm φ 1.181 in opaque object (Note 1)
Effective aperture angle		± 2.5 ° or less [for an operating range exceeding 3 m 9.843 ft (conforming to IEC 61496-2 / UL 61496-2)]
Supply voltage		24 V DC ± 10 % Ripple P-P 10 % or less
Control output (OSSD1, OSSD2)		Semiconductor output (PNP output equivalent) 2 outputs <ul style="list-style-type: none"> • Maximum source current: 200 mA • Applied voltage: same as supply voltage (between control output and + V) • Residual voltage: 2.5 V or less (at 200 mA source current)
	Operation mode	ON when all beam channels are received, OFF when one or more beam channels are interrupted (OFF also in case of any malfunction in the sensor or the synchronization signal)
Protection circuit		Incorporated
Response time		In normal operation: OFF response 11 ms or less, ON response 70 ms or less In the blanking function set condition: OFF response 15 ms or less, ON response 70 ms or less (Note 2)
	Series connection	In normal operation: OFF response 20 ms or less, ON response 70 ms or less In the blanking function set condition: OFF response 20 ms or less, ON response 70 ms or less (Note 2)
Auxiliary output (Non-safety output)		PNP open-collector transistor <ul style="list-style-type: none"> • Maximum source current: 60 mA • Applied voltage: same as supply voltage (between auxiliary output and + V) • Residual voltage: 2.5 V or less (at 60 mA source current)
	Operation mode	OFF when control outputs are ON, ON when control outputs are OFF
Protection circuit		Incorporated
Indicators	Emitter	Beam-axis alignment indicators: 2-color (Red / Green) LED × 4 (light up in red when the each beam channel receives light, blinks in red when the topmost or bottommost beam channel receives light, light up in green when all beam channels are received), Operation indicator (Note 1): 2-color (Red / Green) LED (lights up in red when control outputs are OFF, lights up in green when control outputs are ON), Emission halt / Emission amount control indicator: Orange LED (emission in normal mode: lights off, emission in short mode: lights up, blinks when emission halts), Fault indicator: Yellow LED (lights up or blinks if a fault occurs in the sensor)
	Receiver	Beam-axis alignment indicators: 2-color (Red / Green) LED × 4 (light up in red when the each beam channel receives light, blinks in red when the topmost or bottommost beam channel receives light, light up in green when all beam channels are received), OSSD indicator: 2-color (Red / Green) LED (lights up in red when control outputs are OFF, light up in green when control outputs are ON), Blanking indicator: Orange LED (lights up when blanking function is used, blinks when connecting Handy-controller), Fault indicator: Yellow LED (lights up or blinks if a fault occurs in the sensor)
Interference prevention function		Incorporated (In case of series connection: 3 sets max., Max. beam channels 192 beam channels)
Emission halt function		Incorporated
Emission halt input		Emission: + 9 V to Vs (sink current: 2 mA or less) (Note 4) Emission halt: open, or 0 to + 1.5 V
Environmental resistance	Degree of protection	IP65 (IEC)
	Ambient temperature / Ambient humidity	- 10 to + 55 °C + 14 to + 131 °F (No dew condensation or icing allowed), Storage: - 25 to + 70 °C - 13 to + 158 °F / 30 to 85 % RH, Storage: 30 to 95 % RH
	Ambient illuminance	Sunlight: 20,000 lx at the light-receiving face, Incandescent light: 3,500 lx at the light-receiving face
	Dielectric strength voltage / Insulation resistance	1,000 V AC for one min. between all supply terminals connected together and enclosure / 20MΩ, or more, with 500 V DC megger between all supply terminals connected together and enclosure
Vibration resistance / Shock resistance	10 to 55 Hz frequency, 0.75 mm 0.03 in amplitude in X, Y and Z directions for two hours each / 300 m/s ² acceleration (30 G approx.) in X, Y and Z directions for three times each	
Emitting element		Infrared LED (Peak emission wavelength: 870 nm 0.034 mil)
Material		Enclosure: Aluminium, Front case: Polycarbonate, Lens: Polycarbonate, Cap: Polycarbonate
Cable		Emitter: 6-core (0.3 mm ² × 4-core, 0.2 mm ² × 2-core) oil resistant shielded cable, 0.5 m 1.64 ft long, with a connector at the end Receiver: 6-core (0.3 mm ² × 4-core, 0.2 mm ² × 2-core) oil resistant shielded cable, 0.5 m 1.64 ft long, with a connector at the end
Cable extension		Extension up to total 20.5 m 67.257 ft is possible, for both emitter and receiver, with optional mating cables.
Accessories		MS-SF2N-1 (Rear sensor mounting bracket): 1 set for emitter and receiver, MS-SF2N-2 (U-shaped rear mounting intermediate supporting bracket, MS-SF4A-H2 for '-H' type): (Note 5), MS-SF2N-L (L-shaped intermediate supporting bracket): (Note 5), SF4-AH-TR (Test rod): 1 No.

Notes: 1) In this device, the floating blanking function can be set by using the Handy-controller (SF-HC)(optional). When the floating blanking function is used, the size of the min. sensing object is changed. For details of the floating blanking function, refer to P.5 to P.6.

2) Refer to P.5 to P.6 for the detail of the emission amount control function and the blanking function.

3) Since the color of the operation indicator changes according to the ON / OFF state of the control outputs (OSSD1, OSSD2), the operation indicator is marked as [OSSD] on the sensor.

4) Vs is the same value as the voltage of the used power supply to be used.

5) MS-SF2N-2 / MS-SF4A-H2 (U-shaped rear mounting intermediate supporting bracket) and MS-SF2N-L (L-shaped intermediate supporting bracket) are attached with the following sensors.

The number of attached U-shaped rear mounting intermediate supporting bracket and L-shaped intermediate supporting bracket are different depending on the sensor as follows.

SF4-AH36 (-H), SF4-AH40 (-H): 1set, SF4-AH48 (-H): 2sets, SF4-AH56 (-H), SF4-AH64 (-H), SF4-AH72 (-H): 3sets

SF4-AH80 (-H): 4sets, SF4-AH88 (-H), SF4-AH96 (-H): 5sets

SPECIFICATIONS

Exclusive safety relay unit

Model No.		SF-AC
Item		
Standards		BG, UL and CSA (application currently in process)
Control category		ISO 13849-1 (EN 954-1) compliance up to Category 4 standards
Supply voltage		24 V DC \pm 10 % Ripple P-P 10 % or less
Fuse (power supply)		Hybrid fuse, triggering current: 0.6 A or more, Reset after power down
Power consumption		1.7 W approx. (without light curtain)
Power supply for light curtain		24 V DC \pm 10 % Ripple P-P 10 % or less
Enabling path		NO contact \times 3
	Switching current (13-14, 23-24, 33-34)	Max. 6 A 30 V DC / 6 A 230 V AC, resistive load
	Fuse	6 A (slow blow)
Auxiliary output		NC contact \times 1
	Switching current (41-42)	Max. 1A 24 V DC
	Fuse	1 A (slow blow)
Alarm output		NC contact \times 1 (Non-safety contact, related to input 'Alarm in')
	Switching current (51-52)	Max. 1 A 24 V DC, Min. 5 mA 24 V DC
	Fuse	1 A (slow blow)
Application category		AC-15, DC-13 (EN 60947-5-1)
Pick-up delay		40 ms or less / 50 ms or less (Auto / Manual)
Drop-out delay		10 ms or less
Contact material / contacts		AgSnO, Self cleaning, positively driven
Contact resistance		100 m Ω or less
Mechanical lifetime		10 million times (switching frequency 180 times/min.)
Electrical lifetime		100,000 times (switching frequency 20 times/min, rated load)
Indicators	Power	Green LED (lights up when power is supplied)
	Ui	Green LED (lights up when both conditions are present: unit is powered up and hybrid fuse is at normal state)
	K1 / K2	Orange LED \times 2 (lights up when enabling contacts are closed)
	Test	Yellow LED (lights up when X11-X12 is opened)
Trailing edge function		Incorporated
Test input polarity selection function		Incorporated (Selectable PNP or NPN test input polarity by internal switch)
Environmental resistance	Protection	Enclosure: IP40, Terminal: IP20
	Ambient temperature / Ambient humidity	- 10 to + 55 °C + 14 to + 131 °F, Storage: - 10 to + 55 °C + 14 to + 131 °F / 35 to 85 % RH, Storage: 35 to 85 % RH
	Vibration resistance	10 to 55 Hz frequency, 0.35 mm 0.014 in amplitude in X, Y, Z directions for three times each (in power OFF state)
Connection terminal		Removable European terminal
	Tightening torque	0.6 N·m
Weight		460 g 16.226 oz approx.
Material		Enclosure: Polycarbonate

Handy-controller

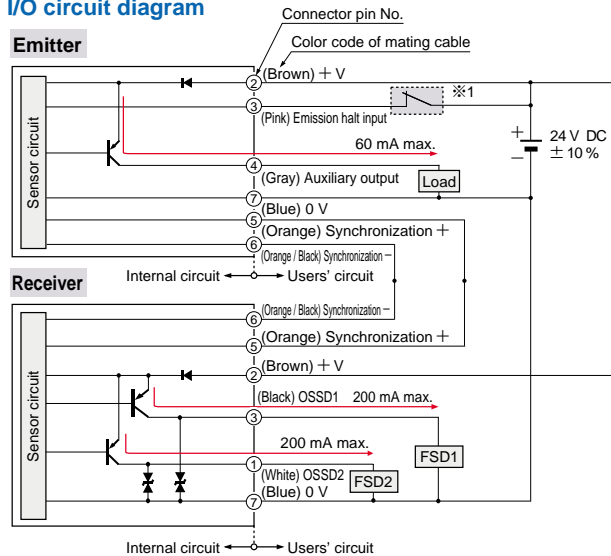
Model No.		SF-HC
Item		
Supply voltage		24 V DC \pm 10 % Ripple P-P 10 % or less (common to sensor power supply)
Current consumption		45 mA or less
Communication method		RS-485 two-way communications (Specific procedure)
Digital display		4-digit red LED \times 2 (Selected beam channels, setting contents etc. are displayed.)
Function indicator		Green LED \times 8 (set function is displayed.)
Functions		Fixed blanking (shipping setting status: ineffective) / Floating blanking (shipping setting status: ineffective) / Auxiliary output (shipping setting status: Negative Logic of OSSD) / Emitting light amount control (shipping setting status: ineffective) / Code setting / Setting contents monitoring / Protecting (shipping setting status: ineffective) (the preset password at shipping is '0000') / Copy function
Ambient temperature		- 10 to + 55 °C + 14 to + 131 °F (No dew condensation or icing allowed), Storage: - 25 to + 70 °C - 13 to + 158 °F
Ambient humidity		30 to 85 % RH, Storage: 30 to 85 % RH
Voltage withstandability		1,000 V AC for one min. between all supply terminals connected together and enclosure
Insulation resistance		20 M Ω or more, with 500 V DC megger between all supply terminals connected together and enclosure
Cable		Shielded cable, 0.5 m 1.64 ft long, with a connector at the end (2 cables)
Weight		190 g 6.702 oz approx.

Laser alignment tool

Model No.		SF-LAT-2N
Item		
Supply voltage		3 V (AA size battery \times 2 Nos.)
Battery		1.5 V (AA size battery) \times 2 Nos. (replaceable)
Battery lifetime		10 hours approx. of continuous operation (Manganese battery, at + 25 °C + 77 °F ambient temperature)
Light source		Red semiconductor laser: class 2 (JIS / IEC / FDA) (Max. output: 1mW, Peak emission wavelength: 650 nm 0.026 mil)
Spot diameter		10 mm 0.394 in approx. (at 5 m 16.404 ft distance)
Ambient temperature		0 to + 40 °C + 32 to + 104 °F (No dew condensation), Storage: 0 to + 55 °C + 32 to + 131 °F
Ambient humidity		35 to 85 % RH, Storage: 35 to 85 % RH
Material		Enclosure: ABS, Mounting part: Aluminum
Weight		200 g 7.055 oz approx. (including batteries)
Accessories		AA size battery: 2 Nos.

I/O CIRCUIT AND WIRING DIAGRAMS

I/O circuit diagram



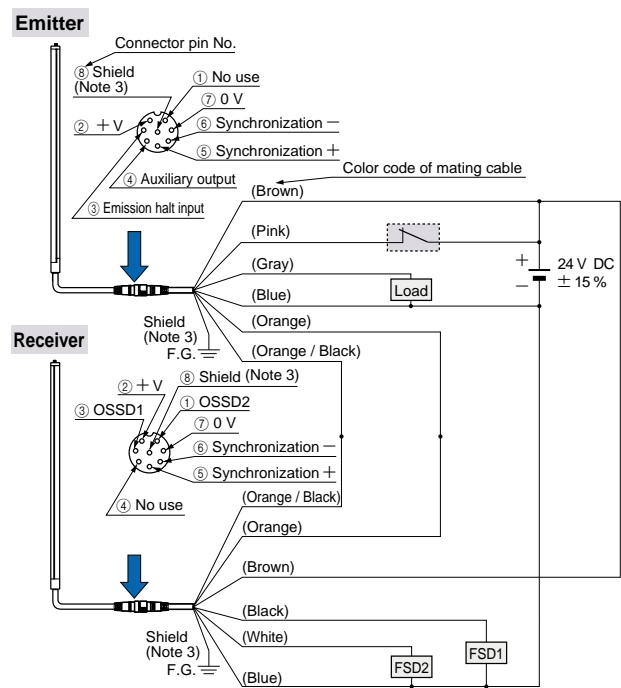
CAUTION
Use the safety relay unit or an equivalent safety control circuit for FSD.

※1
Non-voltage contact or PNP open-collector transistor

Low (open or 0 to +1.5 V) : emission halt
High (+9 V to Vs) : emission (sink current: 2 mA or less) (Note 1)

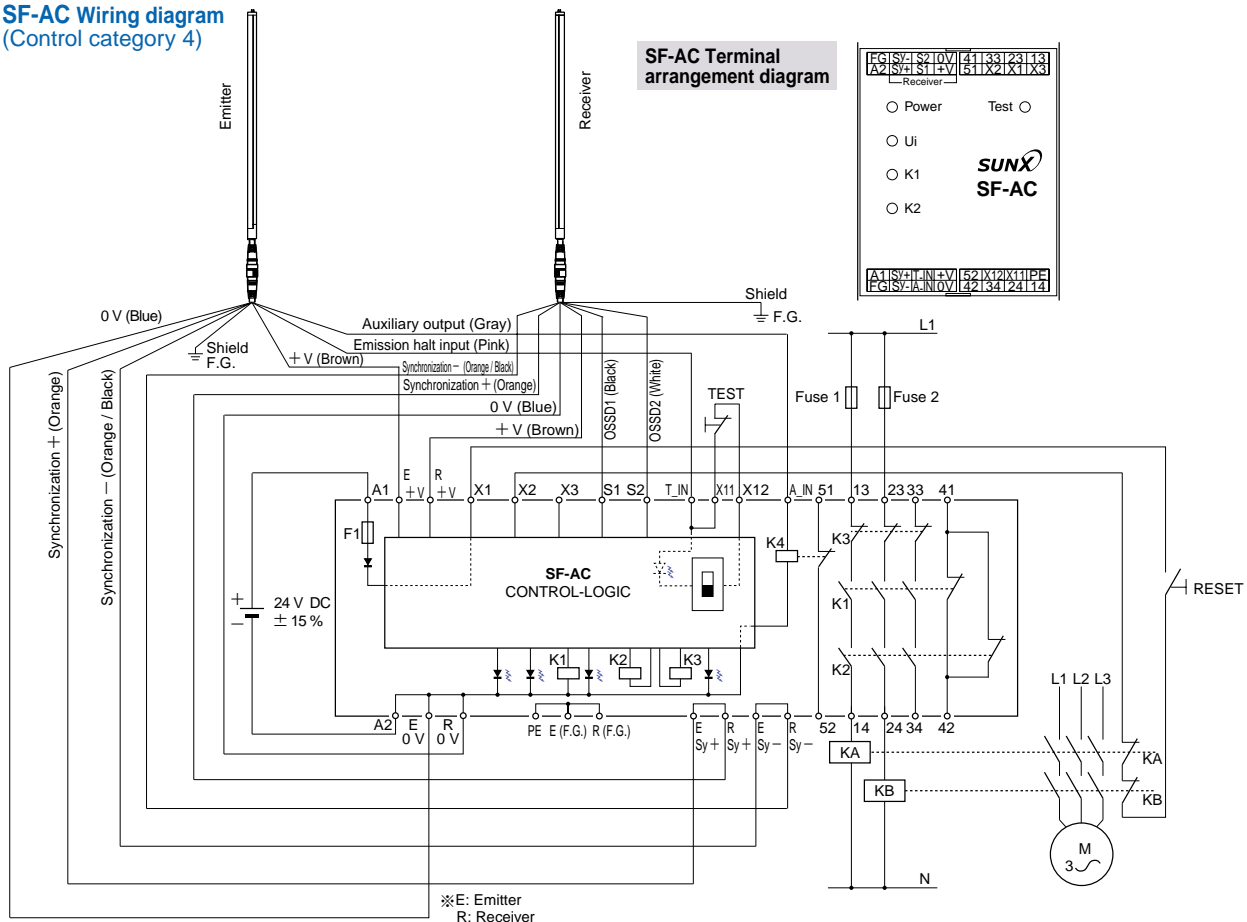
Note: Vs is same voltage as the voltage of the power supply to be used.

Wiring diagram



- Notes: 1) Unused wires must be insulated to ensure that they do not come into contact with wires already in use.
2) Conductor's section area of cord of mating cables are 0.2 mm² (synchronization wire) and 0.3 mm² (exclude synchronization wire).
3) Connect the shield wire to the frame ground (F.G.) without fail.

SF-AC Wiring diagram (Control category 4)

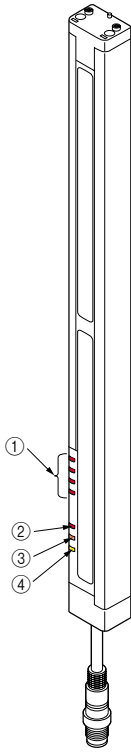


SF-AC Terminal arrangement diagram

EG1S1	S2	0V	41	13	23	13	
A2	S1	+V	51	X2	X1	X3	
Receiver							
○ Power	○ Test	○					
○ Ui							
○ K1							
○ K2							
SUNX SF-AC							
A1	S1	IN	+V	S2	X2	X1	PE
EG1S2	A	IN	0V	I2	34	14	

PRECAUTIONS FOR PROPER USE

Part description and function



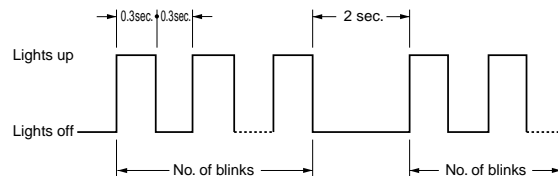
	Description	Function
Emitter	① Beam-axis alignment indicators [RECEPTION] (Red / Green LED)	Top: Blinks in red when the topmost beam channel receives light. Lights up in red when sensor top receives light. Upper middle: Lights up in red when sensor upper middle receives light. Lower middle: Lights up in red when sensor lower middle receives light. Bottom: Blinks in red when the bottommost beam channel receives light. Lights up in red when sensor bottom receives light. Lights up in green when all beam channels (top, upper middle, lower middle and bottom) receive light.
	② Operation indicator [OSSD] (Note 1) (Red / Green LED)	Lights up in red when the control outputs are OFF, lights up in green when the control outputs are ON.
	③ Emission halt / Emission amount control indicator [CTRL] (Orange LED)	Emission in normal mode: lights off, emission in short mode: lights on (Note 2), emission halt: blinks
	④ Fault indicator [FAULT] (Yellow LED)	Lights up or blinks when a fault occurs in the sensor. (Note 3) Lights up: Setting data of the sensor is error (Noise is present around the sensor) 1 blink: Beam channel No. error (The end cap is not connected correctly.) 2 blinks: Series connection error (The cable for series connection is not connected correctly.) 3 blinks: Total unit No. / total beam channel No. error (When exceeding 3 sets of sensors are serial connected, or when there are a total of exceeding 192 beam channels) 6 blinks: Effect from noise / power supply or failure of internal circuit
Receiver	① Beam-axis alignment indicators [RECEPTION] (Red / Green LED)	Top: Blinks in red when the topmost beam channel receives light. Lights up in red when sensor top receives light. Upper middle: Lights up in red when sensor upper middle receives light. Lower middle: Lights up in red when sensor lower middle receives light. Bottom: Blinks in red when the bottommost beam channel receives light. Lights up in red when sensor bottom receives light. Lights up in green when all beam channels (top, upper middle, lower middle and bottom) receive light.
	② OSSD indicator [OSSD] (Note 1) (Red / Green LED)	Lights up in red when the control outputs are OFF, lights up in green when the control outputs are ON.
	③ Blanking indicator [BLANK] (Orange LED)	Lights up when the blanking function is used (Note 2), blinks when connecting the Handy-controller.
	④ Fault indicator [FAULT] (Yellow LED)	Lights up or blinks when a fault occurs in the sensor. (Note 3) Lights up: Setting data of the sensor is error (Noise is present around the sensor) 1 blink: Beam channel No. error (The end cap is not connected correctly.) 2 blinks: Series connection error (The cable for series connection is not connected correctly.) 3 blinks: Total unit No. / total beam channel No. error (When exceeding 3 sets of sensors are serial connected, or when there are a total of exceeding 192 beam channels) 4 blinks: Received extraneous light error 5 blinks: Control output (OSSD1, OSSD2) error (The control output lines are not connected correctly.) 6 blinks: Effect from noise / power supply or failure of internal circuit

Notes: 1) Since the color of the operation indicator changes according to the ON / OFF state of OSSD, the operation indicator is marked as OSSD on the sensor.

2) Emitting light amount control function and blanking function must both be set using the Handy-controller, **SF-HC** (optional).

3) Blink cycle of the fault indicator shows as below. Please check the number of blinks after the fault indicator lights off while 1 sec. approx.

Blink cycle of fault indicator



Others

Wiring

- Make sure to carry out the wiring in the power supply off condition.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this sensor, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.

- Do not use during the initial transient time (2 sec.) after the power supply is switched on.
- Avoid dust, dirt and steam.
- Take care that the sensor does not come in direct contact with water, oil, grease, or organic solvents, such as, thinner, etc.
- Take care that the sensor is not directly exposed to fluorescent light from a rapid-starter lamp or a high frequency lighting device, as it may affect the sensing performance.

PRECAUTIONS FOR PROPER USE



Do not utilize this sensor in 'PSDI Mode', in which the sensor is utilized as an activator for machinery.

Refer to the instruction manual enclosed with this product for detailed instructions.

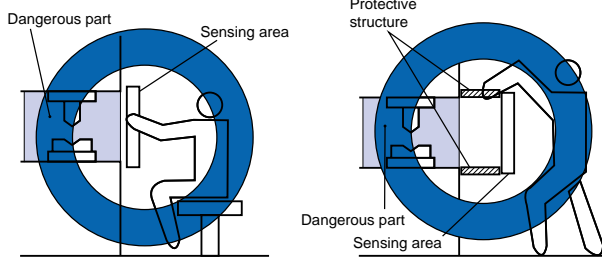
- Make sure to carry out the test run before regular operation.
- This safety system is for use only on machinery in which the dangerous parts can be stopped immediately, either by an emergency stop unit or by disconnecting the power supply. Do not use this system with machinery which cannot be stopped at any point in its operation cycle.

Sensing area

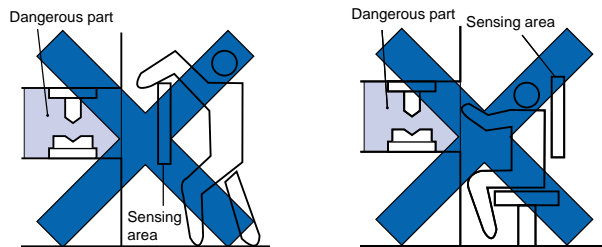


- Make sure to install this product such that any part of the human body must pass through its sensing area in order to reach the dangerous parts of the machinery. If the human body is not detected, there is a danger of serious injury or death.
- Do not use any reflective type or retroreflective type arrangement.

Correct mounting method



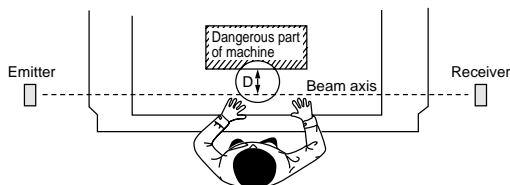
Wrong mounting method



Safety distance



- Calculate the safety distance correctly, and always maintain a distance which is equal to or greater than the safety distance, between the sensing area of this sensor and the dangerous parts of the machinery. If the safety distance is miscalculated or if sufficient distance is not maintained, there is a danger of serious injury or death.
- Before designing the system, refer to the relevant standards of the region where this device is to be used and then install this device.



- Safety distance is calculated based on the following equation when a person moves perpendicular (normal intrusion) to the sensing area of the sensor. (Please check the latest standards for the equation.)

For use in Europe (as per EN 999)

Equation ① $D = K \times T + C$

D: Safety distance (mm)

Minimum required distance between the surface of the sensing area and dangerous part of machine.

K: Intrusion speed of operator's body (mm/sec.)

Normally taken as 2,000 (mm/sec.) for calculation. [When the floating blanking function is being utilized, a speed of 1,600 (mm/sec.) should be used.]

T: Response time of total equipment (sec.)

$T = T_m + T_{SF4}$

T_m : Maximum halt time of device (sec.)

T_{SF4} : Response time of the SF4-AH series 0.011 (sec.)

[0.015 (sec.) if the blanking function has been selected and 0.02 (sec.) for series connections]

C: Additional distance calculated from the size of the minimum sensing object of the sensor (mm)

Note that the value of C is not 0 or less.

$C = 8 \times (d - 14)$

d: Minimum sensing object diameter

30 (mm) 1.181 (in)

When using the floating blanking function $C = 850$ mm 33.465 in

For use in U.S.A. (as per ANSI B11.19)

Equation ② $D = K \times (T_s + T_c + T_{SF4} + T_{bm}) + D_{pf}$

D: Safety distance (mm)

Minimum required distance between the surface of the sensing area and dangerous part of machine.

K: Intrusion speed (Recommended value in OSHA is 63 (inch/sec.)

[$\approx 1,600$ (mm/sec.)])

ANSI B11.19 does not define the intrusion speed (K). When determining K, consider possible factors including physical ability of operators.

T_s : Halt time calculated from the operation time of the control element (air valve, etc.) (sec.)

T_c : Maximum response time of the control circuit required for functioning the brake. (sec.)

T_{SF4} : Response time of the SF4-AH series 0.011 (sec.)

[0.015 (sec.) if the blanking function has been selected and 0.02 (sec.) for series connections]

T_{bm} : Additional halt time tolerance for the brake monitor (sec.)

$T_{bm} = T_a - (T_s + T_c)$

T_a : Setting time of brake monitor (sec.)

When the machine is not equipped with a break monitor, it is recommended that 20 %, or more, of ($T_s + T_c$) is taken as additional halting time.

D_{pf} : Additional distance calculated from the size of the minimum sensing object of the sensor (mm)

$D_{pf} = 78.2$ mm 3.079 in

$D_{pf} = 3.4 \times (d - 0.276)$ (inch)

$D_{pf} = 3.4 \times (d - 7)$ (mm)

d: Minimum sensing object diameter 1.2 (inch) ≈ 30 (mm)

(When the floating blanking function is being utilized, the minimum detectable sizes of objects will vary. ($\phi 50$ $\phi 1.969$ / $\phi 70$ $\phi 2.756$ / $\phi 90$ $\phi 3.543$ mm in))

Note that the value of D_{pf} is not 0 or less.

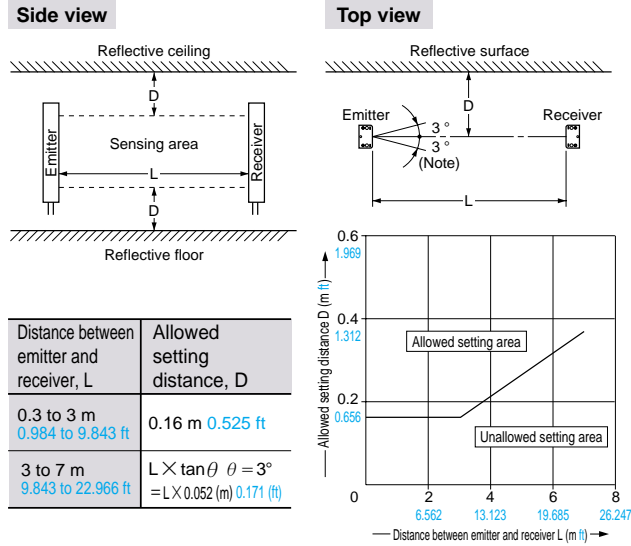
PRECAUTIONS FOR PROPER USE

Influence of reflective surface



Install the sensor by considering the effect of nearby reflective surfaces and taking suitable countermeasures. Failure to do so may cause the sensor not to detect, resulting in serious injury or death.

- Keep the minimum distance given below, between the sensor and a reflective surface.



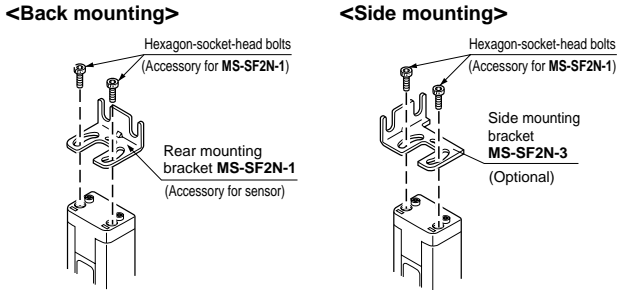
Note: The effective aperture angle for this sensor is $\pm 2.5^\circ$ (with $L > 3 \text{ m } 9.843 \text{ ft}$) as required by IEC 61496-2. However, install this sensor away from the reflective surfaces, assuming a effective aperture angle of $\pm 3^\circ$ to provide for misalignment, etc., during installation.

Mounting

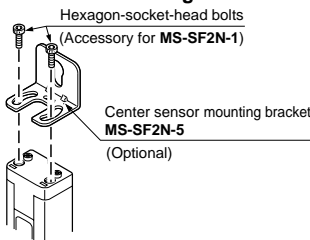
- The minimum bending radius of the cable is R30 mm 1.181 in. Mount the sensor considering the cable bending radius.

Mounting of sensor mounting bracket (MS-SF2-1/3/5)

- Choose the sensor mounting bracket based on the mounting direction (side or rear), and temporarily tighten the brackets with two M3 (length 5 mm 0.197 in) hexagon-socket-head bolts for adjusting the mounting angle. After the beam-axis alignment, tighten then bolts completely. When mounting the sensor, the tightening torque should be 0.6 N-m or less.



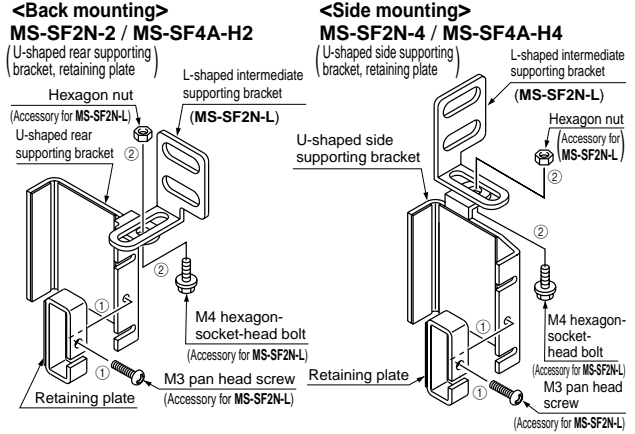
<Center sensor mounting bracket>



Note: Multiple beam channel sensors requiring the intermediate supporting bracket (36 beam channels or more) cannot mount on an aluminum frame with the center sensor mounting bracket (MS-SF2N-5).

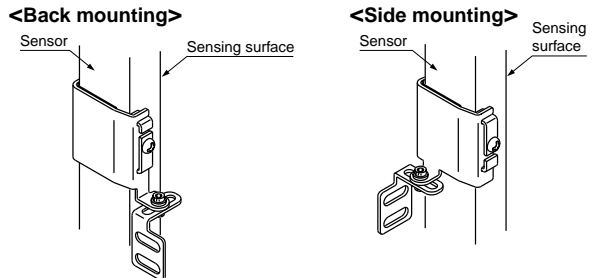
Mounting of intermediate supporting bracket (MS-SF2N-2/4, MS-SF4A-H2/H4)

- ① Place the retaining plate on the U-shaped rear / side supporting bracket and temporarily tighten them with M3 (length 10 mm 0.394 in) pan head screw.
- ② Temporarily tighten the L-shaped intermediate supporting bracket to the U-shaped rear / side supporting bracket with a M4 (length 10 mm 0.394 in) hexagon-socket-head bolt.



Note: The above diagrams are only applicable to the MS-SF2N-2/4. The MS-SF4A-H2/H4 have different shapes.

- ③ Clamp the sensor main body with the U-shaped rear / side supporting bracket and completely tighten M3 pan head screw that secures the retaining plate. (Tightening torque: 0.4 N-m or less)
- After the beam-axis alignment, ensure that the M4 hexagon-socket-head bolt, which was used to temporarily attach the L-shaped intermediate supporting bracket to the U-shaped rear / side supporting bracket, is now fully tightened. (Tightening torque: 1.8 N-m or less)



Note: The above illustrations show how to mount the emitter onto the intermediate supporting brackets. Note that the top and bottom orientation will be reversed when mounting the receiver to the supporting brackets.

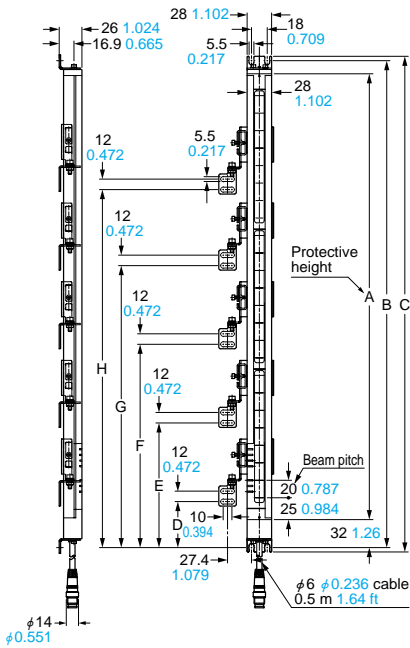
DIMENSIONS (Unit: mm in)

SF4-AH Sensor

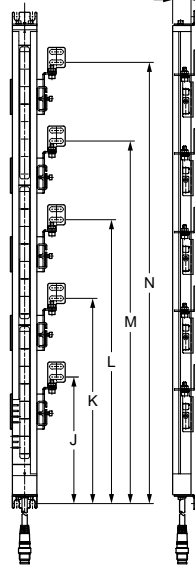
Assembly dimensions

Mounting drawing for the sensor on which the sensor mounting brackets and the intermediate supporting brackets are mounted.

<Back mounting>

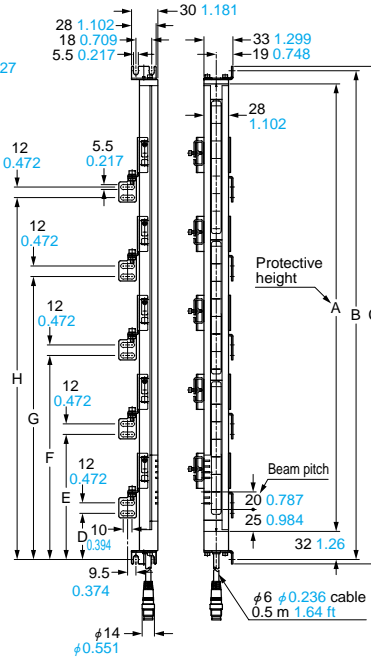


Emitter

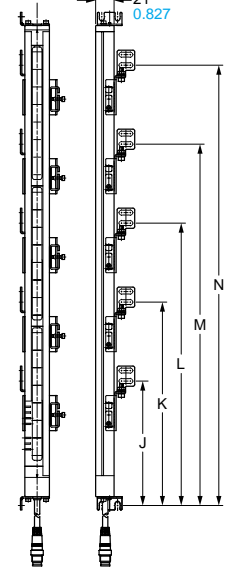


Receiver

<Side mounting>



Emitter



Receiver

Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N
SF4-AH8	190 7.48	237 9.331	247 9.724	-	-	-	-	-	-	-	-	-	-
SF4-AH12	270 10.63	317 12.48	327 12.874	-	-	-	-	-	-	-	-	-	-
SF4-AH16	350 13.78	397 15.63	407 16.024	-	-	-	-	-	-	-	-	-	-
SF4-AH20	430 16.929	477 18.779	487 19.173	-	-	-	-	-	-	-	-	-	-
SF4-AH24	510 20.079	557 21.929	567 22.323	-	-	-	-	-	-	-	-	-	-
SF4-AH28	590 23.228	637 25.079	647 25.472	-	-	-	-	-	-	-	-	-	-
SF4-AH32	670 26.378	717 28.228	727 28.622	-	-	-	-	-	-	-	-	-	-
SF4-AH36	750 29.528	797 31.378	807 31.772	350 13.78	-	-	-	-	440 17.323	-	-	-	-
SF4-AH40	830 32.677	877 34.527	887 34.921	390 15.354	-	-	-	-	480 18.898	-	-	-	-
SF4-AH48	990 38.976	1,037 40.827	1,047 41.22	390 15.354	550 21.654	-	-	-	480 18.898	640 25.197	-	-	-
SF4-AH56	1,150 45.276	1,197 47.126	1,207 47.52	390 15.354	550 21.654	710 27.953	-	-	480 18.898	640 25.197	800 31.496	-	-
SF4-AH64	1,310 51.575	1,357 53.425	1,367 53.819	470 18.504	630 24.803	790 31.102	-	-	560 22.047	720 28.346	880 34.646	-	-
SF4-AH72	1,470 57.874	1,517 59.724	1,527 60.118	550 21.654	710 27.953	870 34.252	-	-	640 25.197	800 31.496	960 37.795	-	-
SF4-AH80	1,630 64.173	1,677 66.023	1,687 66.417	550 21.654	710 27.953	870 34.252	1,030 40.551	-	640 25.197	800 31.496	960 37.795	1,120 44.094	-
SF4-AH88	1,790 70.472	1,837 72.323	1,847 72.716	550 21.654	710 27.953	870 34.252	1,030 40.551	1,190 46.85	640 25.197	800 31.496	960 37.795	1,120 44.094	1,280 50.394
SF4-AH96	1,950 76.772	1,997 78.622	2,007 79.016	630 24.803	790 31.102	950 37.402	1,110 43.701	1,270 50	720 28.346	880 34.646	1,040 40.945	1,200 47.244	1,360 53.543

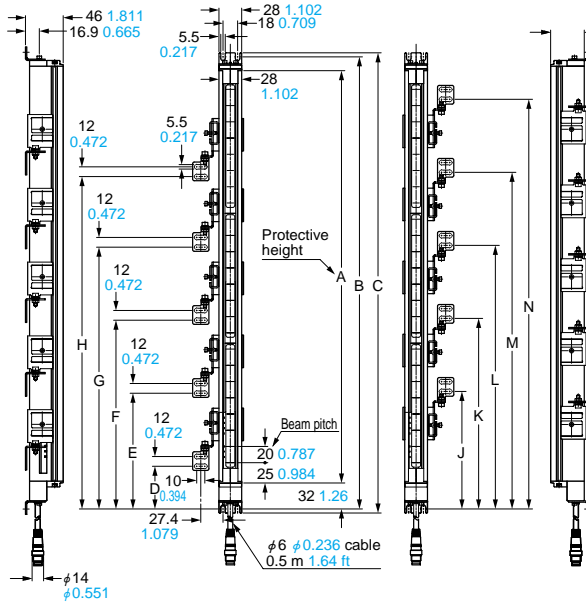
DIMENSIONS (Unit: mm in)

SF4-AH□-H Sensor

Assembly dimensions

Mounting drawing for the sensor on which the sensor mounting brackets and the intermediate supporting brackets are mounted.

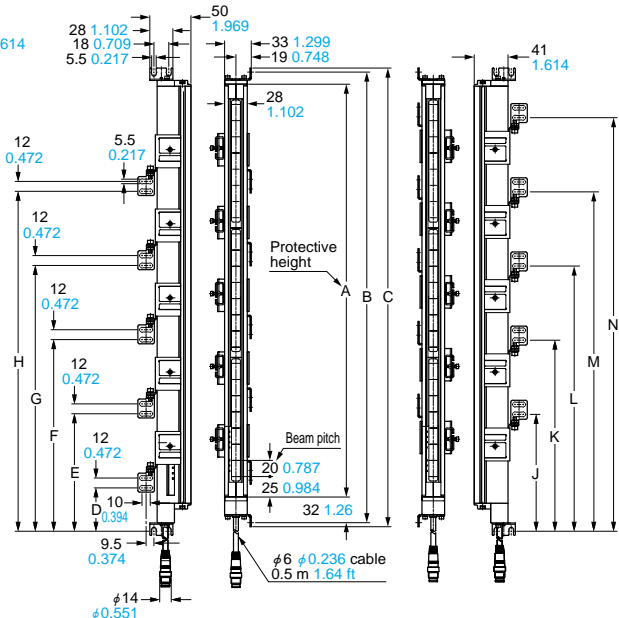
<Back mounting>



Emitter

Receiver

<Side mounting>



Emitter

Receiver

Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N
SF4-AH8-H	190 7.48	237 9.331	247 9.724	—	—	—	—	—	—	—	—	—	—
SF4-AH12-H	270 10.63	317 12.48	327 12.874	—	—	—	—	—	—	—	—	—	—
SF4-AH16-H	350 13.78	397 15.63	407 16.024	—	—	—	—	—	—	—	—	—	—
SF4-AH20-H	430 16.929	477 18.779	487 19.173	—	—	—	—	—	—	—	—	—	—
SF4-AH24-H	510 20.079	557 21.929	567 22.323	—	—	—	—	—	—	—	—	—	—
SF4-AH28-H	590 23.228	637 25.079	647 25.472	—	—	—	—	—	—	—	—	—	—
SF4-AH32-H	670 26.378	717 28.228	727 28.622	—	—	—	—	—	—	—	—	—	—
SF4-AH36-H	750 29.528	797 31.378	807 31.772	350 13.78	—	—	—	—	440 17.323	—	—	—	—
SF4-AH40-H	830 32.677	877 34.527	887 34.921	390 15.354	—	—	—	—	480 18.898	—	—	—	—
SF4-AH48-H	990 38.976	1,037 40.827	1,047 41.22	390 15.354	550 21.654	—	—	—	480 18.898	640 25.197	—	—	—
SF4-AH56-H	1,150 45.276	1,197 47.126	1,207 47.52	390 15.354	550 21.654	710 27.953	—	—	480 18.898	640 25.197	800 31.496	—	—
SF4-AH64-H	1,310 51.575	1,357 53.425	1,367 53.819	470 18.504	630 24.803	790 31.102	—	—	560 22.047	720 28.346	880 34.646	—	—
SF4-AH72-H	1,470 57.874	1,517 59.724	1,527 60.118	550 21.654	710 27.953	870 34.252	—	—	640 25.197	800 31.496	960 37.795	—	—
SF4-AH80-H	1,630 64.173	1,677 66.023	1,687 66.417	550 21.654	710 27.953	870 34.252	1,030 40.551	—	640 25.197	800 31.496	960 37.795	1,120 44.094	—
SF4-AH88-H	1,790 70.472	1,837 72.323	1,847 72.716	550 21.654	710 27.953	870 34.252	1,030 40.551	1,190 46.85	640 25.197	800 31.496	960 37.795	1,120 44.094	1,280 50.394
SF4-AH96-H	1,950 76.772	1,997 78.622	2,007 79.016	630 24.803	790 31.102	950 37.402	1,110 43.701	1,270 50	640 25.197	800 31.496	960 37.795	1,200 47.244	1,360 53.543

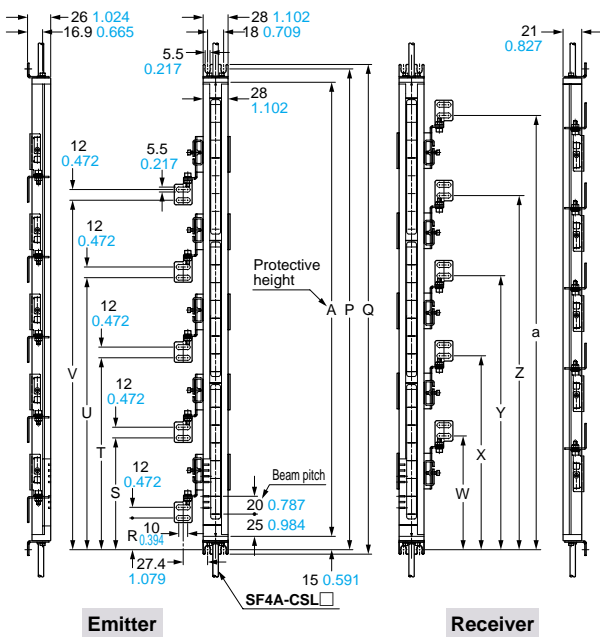
DIMENSIONS (Unit: mm in)

**SF4-AH□
SF4-AH□-H** Sensor

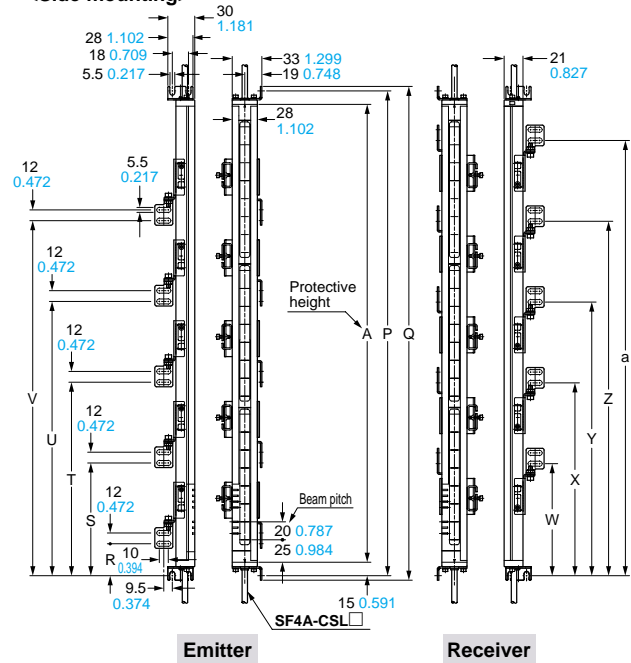
In case of using cable for series connection

Mounting drawing for SF4-AH□ on which the cables for series connection, the mounting brackets and the intermediate supporting brackets are mounted. When utilizing SF4-AH□-H, although the shape is different, all dimensions listed in the table below are exactly the same as those of SF4-AH□.

<Back mounting>



<Side mounting>



Model No.	A	P	Q	R	S	T	U	V	W	X	Y	Z	a
SF4-AH8(-H)	190 7.48	220 8.661	230 9.055	-	-	-	-	-	-	-	-	-	-
SF4-AH12(-H)	270 10.63	300 11.811	310 12.205	-	-	-	-	-	-	-	-	-	-
SF4-AH16(-H)	350 13.78	380 14.961	390 15.354	-	-	-	-	-	-	-	-	-	-
SF4-AH20(-H)	430 16.929	460 18.11	470 18.504	-	-	-	-	-	-	-	-	-	-
SF4-AH24(-H)	510 20.079	540 21.26	550 21.654	-	-	-	-	-	-	-	-	-	-
SF4-AH28(-H)	590 23.228	620 24.409	630 24.803	-	-	-	-	-	-	-	-	-	-
SF4-AH32(-H)	670 26.378	700 27.559	710 27.953	-	-	-	-	-	-	-	-	-	-
SF4-AH36(-H)	750 29.528	780 30.709	790 31.102	340 13.386	-	-	-	-	430 16.929	-	-	-	-
SF4-AH40(-H)	830 32.677	860 33.858	870 34.252	380 14.961	-	-	-	-	470 18.504	-	-	-	-
SF4-AH48(-H)	990 38.976	1,020 40.157	1,030 40.551	380 14.961	540 21.26	-	-	-	470 18.504	630 24.803	-	-	-
SF4-AH56(-H)	1,150 45.276	1,180 46.457	1,190 46.85	380 14.961	540 21.26	700 27.559	-	-	470 18.504	630 24.803	790 31.102	-	-
SF4-AH64(-H)	1,310 51.575	1,340 52.756	1,350 53.15	460 18.11	620 24.409	780 30.709	-	-	550 21.654	710 27.953	870 34.252	-	-
SF4-AH72(-H)	1,470 57.874	1,500 59.055	1,510 59.449	540 21.26	700 27.559	860 33.858	-	-	630 24.803	790 31.102	950 37.402	-	-
SF4-AH80(-H)	1,630 64.173	1,660 65.354	1,670 65.748	540 21.26	700 27.559	860 33.858	1,020 40.157	-	630 24.803	790 31.102	950 37.402	1,110 43.701	-
SF4-AH88(-H)	1,790 70.472	1,820 71.653	1,830 72.047	540 21.26	700 27.559	860 33.858	1,020 40.157	1,180 46.457	630 24.803	790 31.102	950 37.402	1,110 43.701	1,270 50
SF4-AH96(-H)	1,950 76.772	1,980 77.953	1,990 78.346	620 24.409	780 30.709	940 37.008	1,100 43.307	1,260 49.606	710 27.953	870 34.252	1,030 40.551	1,190 46.85	1,350 53.15

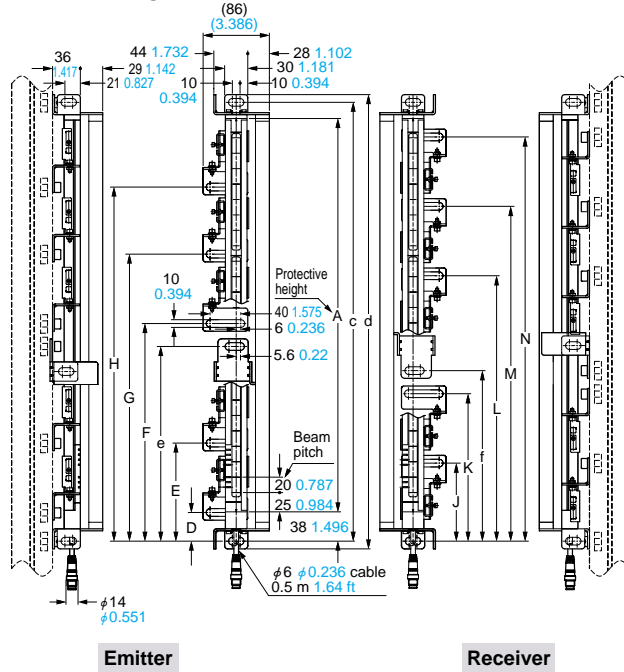
DIMENSIONS (Unit: mm in)

SF4-AH □ Sensor

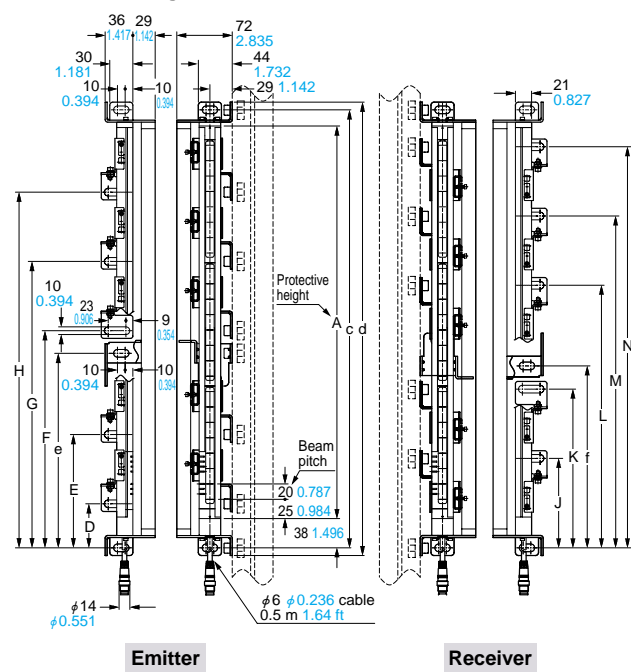
In case of mounting front protection unit

Mounting drawing for the sensor on which the U-shaped intermediate supporting brackets and the front protection unit are mounted.

<Back mounting>



<Side mounting>



Model No.	A	c	d	D	E	F	G	H	J	K	L	M	N	e	f
SF4-AH8	190 7.48	249 9.803	269 10.591	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH12	270 10.63	329 12.953	349 13.74	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH16	350 13.78	409 16.102	429 16.89	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH20	430 16.929	489 19.252	509 20.039	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH24	510 20.079	569 22.402	589 23.189	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH28	590 23.228	649 25.551	669 26.339	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH32	670 26.378	729 28.701	749 29.488	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH36	750 29.528	809 31.85	829 32.638	350 13.78	-	-	-	-	440 17.323	-	-	-	-	-	-
SF4-AH40	830 32.677	889 35	909 35.787	390 15.354	-	-	-	-	480 18.898	-	-	-	-	520 20.472	510 20.079
SF4-AH48	990 38.976	1,049 41.299	1,069 42.087	390 15.354	550 21.654	-	-	-	480 18.898	640 25.197	-	-	-	520 20.472	510 20.079
SF4-AH56	1,150 45.276	1,209 47.598	1,229 48.386	390 15.354	550 21.654	710 27.953	-	-	480 18.898	640 25.197	800 31.496	-	-	680 26.772	670 26.378
SF4-AH64	1,310 51.575	1,369 53.898	1,389 54.685	470 18.504	630 24.803	790 31.102	-	-	560 22.047	720 28.346	880 34.646	-	-	760 29.921	750 29.528
SF4-AH72	1,470 57.874	1,529 60.197	1,549 60.984	550 21.654	710 27.953	870 34.252	-	-	640 25.197	800 31.496	960 37.795	-	-	840 33.071	830 32.677
SF4-AH80	1,630 64.173	1,689 66.496	1,709 67.283	550 21.654	710 27.953	870 34.252	1,030 40.551	-	640 25.197	800 31.496	960 37.795	1,120 44.094	-	840 33.071	830 32.677
SF4-AH88	1,790 70.472	1,849 72.795	1,869 73.583	550 21.654	710 27.953	870 34.252	1,030 40.551	1,190 46.85	640 25.197	800 31.496	960 37.795	1,120 44.094	1,280 50.394	1,000 39.37	990 38.976
SF4-AH96	1,950 76.772	2,009 79.094	2,029 79.882	630 24.803	790 31.102	950 37.402	1,110 43.701	1,270 50	720 28.346	880 34.646	1,040 40.945	1,200 47.244	1,360 53.543	1,080 42.52	1,070 42.126

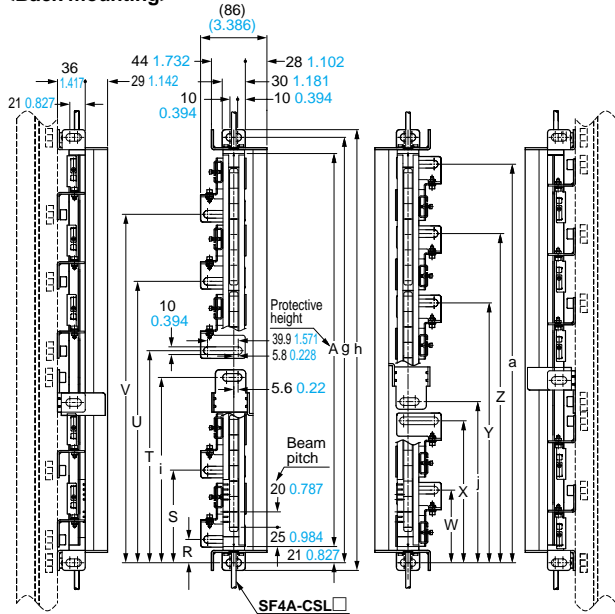
DIMENSIONS (Unit: mm in)

SF4-AH Sensor

In case of mounting front protection unit and using cable for series connection

Mounting drawing for the sensor on which the U-shaped intermediate supporting brackets, the front protection unit and the cables for series connection are mounted.

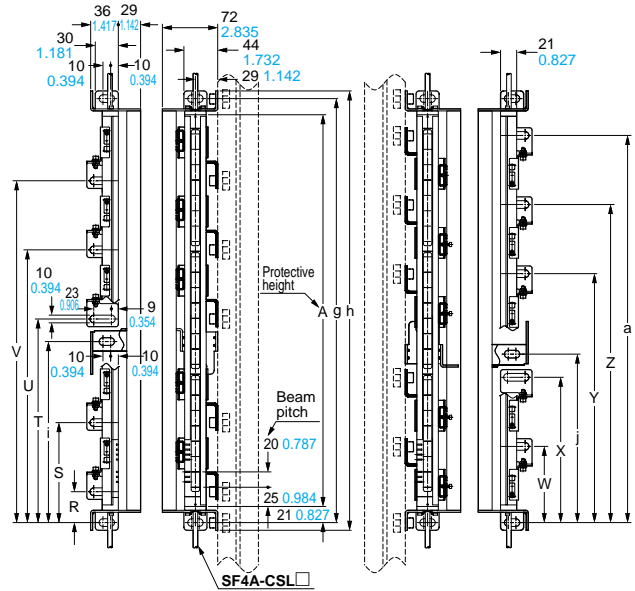
<Back mounting>



Emitter

Receiver

<Side mounting>



Emitter

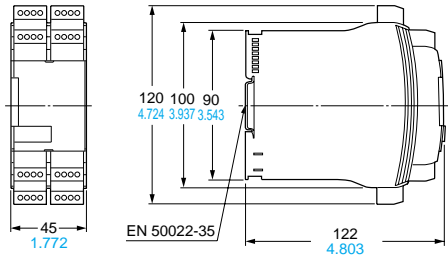
Receiver

Model No.	A	g	h	R	S	T	U	V	W	X	Y	Z	a	i	j
SF4-AH8	190 7.48	232 9.134	252 9.921	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH12	270 10.63	312 12.283	332 13.071	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH16	350 13.78	392 15.433	412 16.22	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH20	430 16.929	472 18.583	492 19.37	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH24	510 20.079	552 21.732	572 22.52	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH28	590 23.228	632 24.882	652 25.669	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH32	670 26.378	712 28.031	732 28.819	-	-	-	-	-	-	-	-	-	-	-	-
SF4-AH36	750 29.528	792 31.181	812 31.968	340 13.386	-	-	-	-	430 16.929	-	-	-	-	-	-
SF4-AH40	830 32.677	872 34.331	892 35.118	380 14.961	-	-	-	-	470 18.504	-	-	-	-	510 20.079	500 19.685
SF4-AH48	990 38.976	1,032 40.63	1,052 41.417	380 14.961	540 21.26	-	-	-	470 18.504	630 24.803	-	-	-	510 20.079	500 19.685
SF4-AH56	1,150 45.276	1,192 46.929	1,212 47.716	380 14.961	540 21.26	700 27.559	-	-	470 18.504	630 24.803	790 31.102	-	-	670 26.378	660 25.984
SF4-AH64	1,310 51.575	1,352 53.228	1,372 54.016	460 18.11	620 24.409	780 30.709	-	-	550 21.654	710 27.953	870 34.252	-	-	750 29.528	740 29.134
SF4-AH72	1,470 57.874	1,512 59.527	1,532 60.315	540 21.26	700 27.559	860 33.858	-	-	630 24.803	790 31.102	950 37.402	-	-	830 32.677	820 32.283
SF4-AH80	1,630 64.173	1,672 65.827	1,692 66.614	540 21.26	700 27.559	860 33.858	1,020 40.157	-	630 24.803	790 31.102	950 37.402	1,110 43.701	-	830 32.677	820 32.283
SF4-AH88	1,790 70.472	1,832 72.126	1,852 72.913	540 21.26	700 27.559	860 33.858	1,020 40.157	1,180 46.457	630 24.803	790 31.102	950 37.402	1,110 43.701	1,270 50	990 38.976	980 38.583
SF4-AH96	1,950 76.772	1,992 78.425	2,012 79.212	620 24.409	780 30.709	940 37.008	1,100 43.307	1,260 49.606	710 27.953	870 34.252	1,030 40.551	1,190 46.85	1,350 53.15	1,070 42.126	1,060 41.732

DIMENSIONS (Unit: mm in)

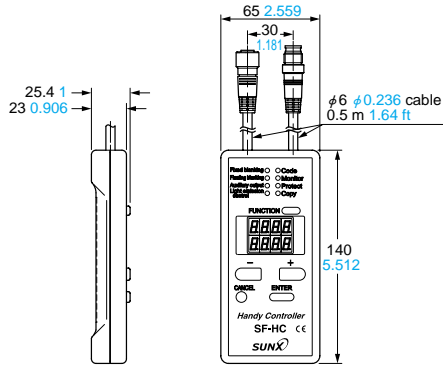
SF-AC

Exclusive safety relay unit (Optional)



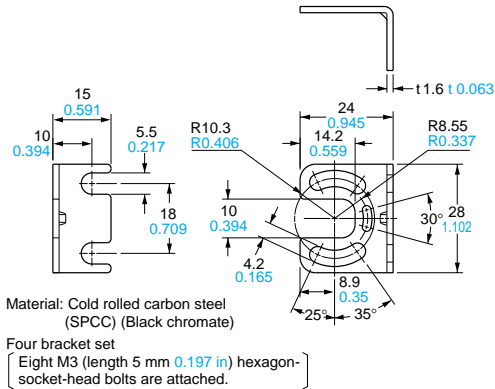
SF-HC

Handy-controller (Optional)



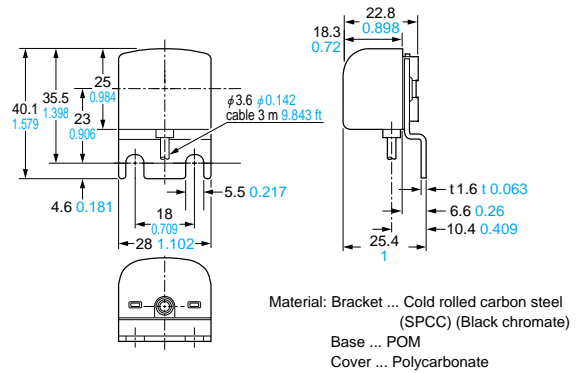
MS-SF2N-1

Rear mounting bracket (Accessory for sensor)



SF-IND-2

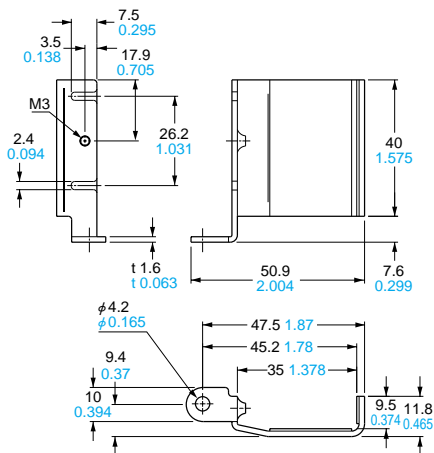
Large display unit for light curtain (Optional)



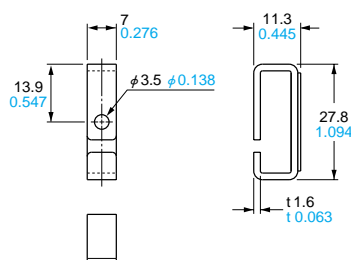
MS-SF2N-2

U-shaped rear mounting intermediate supporting bracket for SF4-AH□ (Accessory for SF4-AH□ having 36 beam channels or more)

U-shaped rear supporting bracket



Retaining plate



Material: Cold rolled carbon steel (SPCC) (Black chromate)

Set of 2 Nos. each of U-shaped rear supporting bracket and retaining plate (Note)

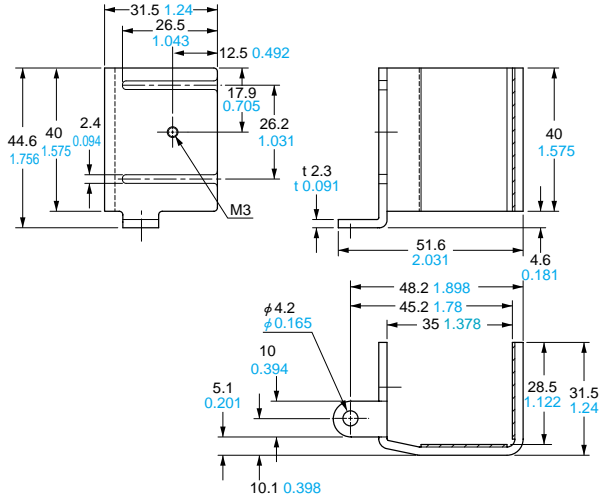
Note: MS-SF2N-2 (U-shaped rear mounting intermediate supporting bracket) is attached with the following sensors. The number of attached U-shaped rear mounting intermediate supporting brackets is different depending on the sensor as follows.

- SF4-AH36, SF4-AH40: 1 set
- SF4-AH48: 2 sets
- SF4-AH56, SF4-AH64, SF4-AH72: 3 sets
- SF4-AH80: 4 sets
- SF4-AH88, SF4-AH96: 5 sets

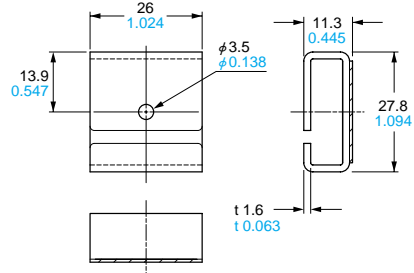
DIMENSIONS (Unit: mm in)

MS-SF4A-H2 U-shaped rear mounting intermediate supporting bracket for SF4-AH□-H (Accessory for SF4-AH□-H having 36 beam channels or more)

U-shaped rear supporting bracket



Retaining plate



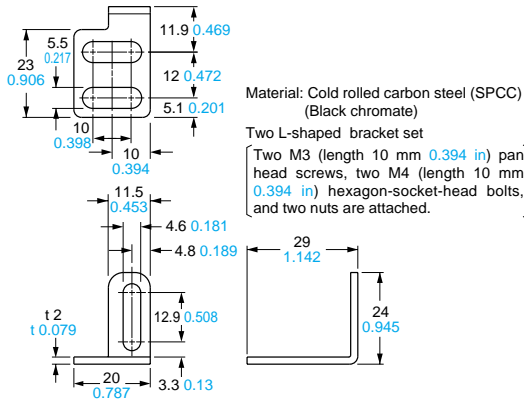
Material: Cold rolled carbon steel (SPCC) (Black chromate)

Set of 2 Nos. each of U-shaped rear supporting bracket and retaining plate (Note)

Note: MS-SF4A-H2 (U-shaped rear mounting intermediate supporting bracket) is attached with the following sensors. The number of attached U-shaped rear mounting intermediate supporting brackets is different depending on the sensor as follows.

- SF4-AH36-H, SF4-AH40-H: 1 set
- SF4-AH48-H: 2 sets
- SF4-AH56-H, SF4-AH64-H, SF4-AH72: 3 sets
- SF4-AH80-H: 4 sets
- SF4-AH88-H, SF4-AH96-H: 5 sets

MS-SF2N-L L-shaped intermediate supporting bracket (Accessory for SF4-AH□(-H) having 36 beam channels or more)



Material: Cold rolled carbon steel (SPCC) (Black chromate)

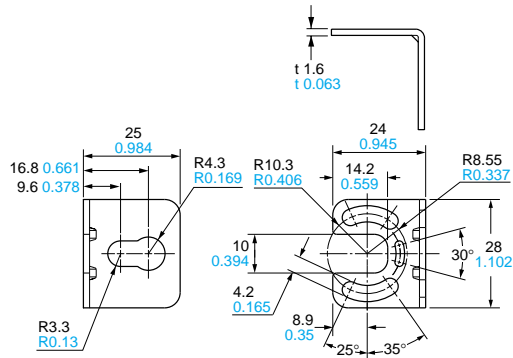
Two L-shaped bracket set

Two M3 (length 10 mm 0.394 in) pan head screws, two M4 (length 10 mm 0.394 in) hexagon-socket-head bolts, and two nuts are attached.

Note: MS-SF2N-L (L-shaped intermediate supporting bracket) is attached with the following sensors. The number of attached L-shaped intermediate supporting brackets is different depending on the sensor as follows.

- SF4-AH36(-H), SF4-AH40(-H): 1 set
- SF4-AH48(-H): 2 sets
- SF4-AH56(-H), SF4-AH64(-H), SF4-AH72(-H): 3 sets
- SF4-AH80(-H): 4 sets
- SF4-AH88(-H), SF4-AH96(-H): 5 sets

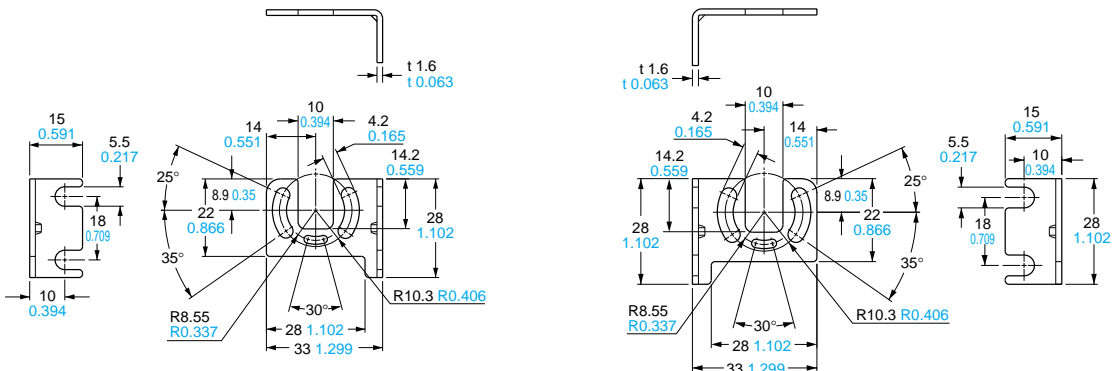
MS-SF2N-5 Center sensor mounting bracket (Optional)



Material: Cold rolled carbon steel (SPCC) (Black chromate)

Four bracket set

MS-SF2N-3 Side mounting bracket (Optional)



Material: Cold rolled carbon steel (SPCC) (Black chromate)

Four bracket set

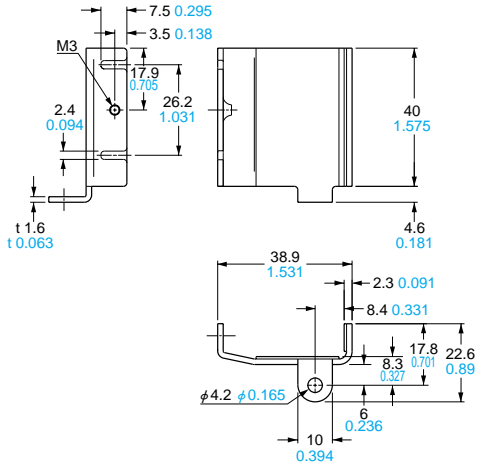
Right side-mounting of sensors

Left side-mounting of sensors

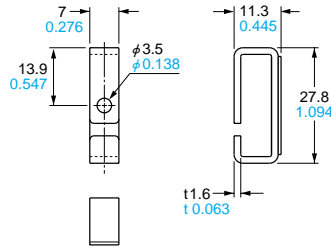
DIMENSIONS (Unit: mm in)

MS-SF2N-4 U-shaped side mounting intermediate supporting bracket for SF4-AH□ (Optional)

U-shaped side supporting bracket



Retaining plate



Material: Cold rolled carbon steel (SPCC) (Black chromate)

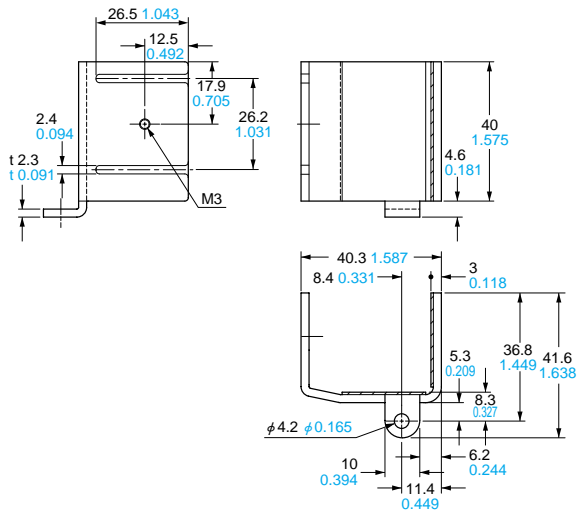
Set of 2 Nos. each of U-shaped side supporting bracket and retaining plate (Note)

Note: **MS-SF2N-4** (U-shaped side mounting intermediate supporting bracket) is attached with the following sensors. The number of attached U-shaped side mounting intermediate supporting bracket is different depending on the sensor as follows.

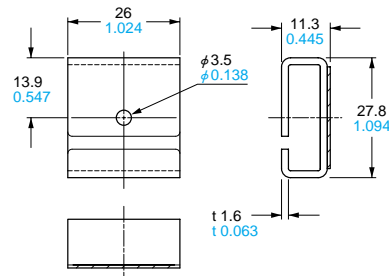
- SF4-AH36, SF4-AH40:** 1 set
- SF4-AH48:** 2 sets
- SF4-AH56, SF4-AH64, SF4-AH72:** 3 sets
- SF4-AH80:** 4 sets
- SF4-AH88, SF4-AH96:** 5 sets

MS-SF4A-H4 U-shaped side mounting intermediate supporting bracket for SF4-AH□-H (Optional)

U-shaped side supporting bracket



Retaining plate



Material: Cold rolled carbon steel (SPCC) (Black chromate)

Set of 2 Nos. each of U-shaped side supporting bracket and retaining plate (Note)

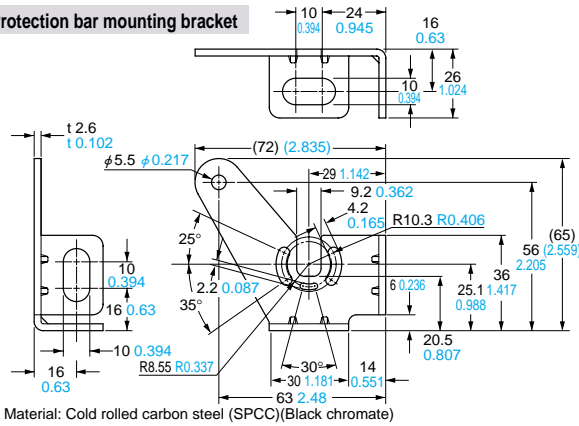
Note: **MS-SF4A-H4** (U-shaped side mounting intermediate supporting bracket) is attached with the following sensors. The number of attached U-shaped side mounting intermediate supporting bracket is different depending on the sensor as follows.

- SF4-AH36-H, SF4-AH40-H:** 1 set
- SF4-AH48-H:** 2 sets
- SF4-AH56-H, SF4-AH64-H, SF4-AH72-H:** 3 sets
- SF4-AH80-H:** 4 sets
- SF4-AH88-H, SF4-AH96-H:** 5 sets

DIMENSIONS (Unit: mm in)

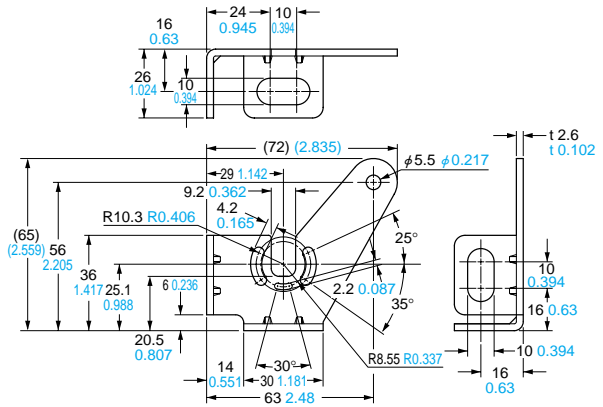
MC-SF4AH-□ Front protection unit (Optional)

Protection bar mounting bracket



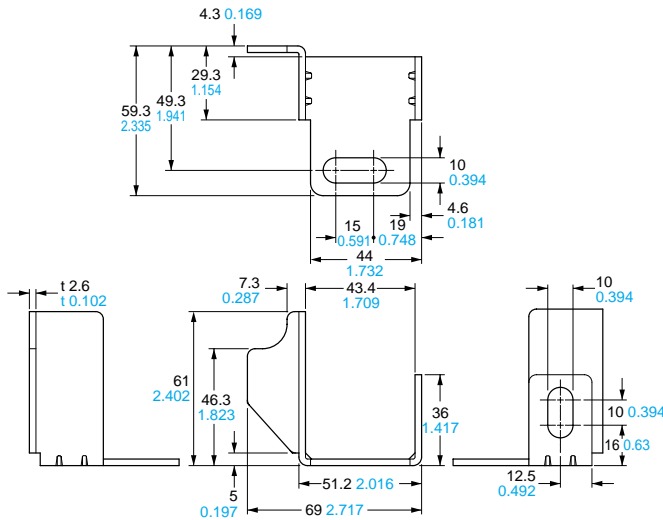
Material: Cold rolled carbon steel (SPCC)(Black chromate)

Right side-mounting of sensors



Left side-mounting of sensors

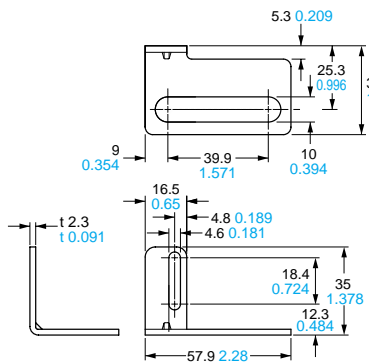
Protection bar intermediate supporting bracket



Material: Cold rolled carbon steel (SPCC)(Black chromate)

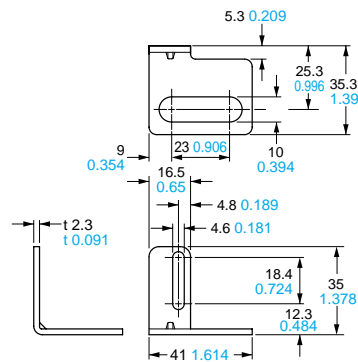
Note: 1 No. protection bar intermediate supporting bracket is attached with the front protection bracket for 40 beam channels or more.

L-shaped rear mounting intermediate supporting bracket for front protection unit MS-SF4A-L2



Note: 1) The number of **MS-SF4A-L2** (L-shaped rear mounting intermediate supporting bracket for front protection unit) is different depending on the product as follows.
MC-SF4AH-36, MC-SF4AH-40: 1 No.
MC-SF4AH-48: 2 Nos.
MC-SF4AH-56, MC-SF4AH-64, MC-SF4AH-72: 3 Nos.
MC-SF4AH-80: 4 Nos.
MC-SF4AH-88, MC-SF4AH-96: 5 Nos.

L-shaped side mounting intermediate supporting bracket for front protection unit MS-SF4A-L4



Note: 1) The number of **MS-SF4A-L4** (L-shaped side mounting intermediate supporting bracket for front protection unit) is different depending on the product as follows.
MC-SF4AH-36, MC-SF4AH-40: 1 No.
MC-SF4AH-48: 2 Nos.
MC-SF4AH-56, MC-SF4AH-64, MC-SF4AH-72: 3 Nos.
MC-SF4AH-80: 4 Nos.
MC-SF4AH-88, MC-SF4AH-96: 5 Nos.

Two M5 (length 20 mm 0.787 in) hexagon-socket-head bolts, four M3 (length 6 mm 0.236 in) hexagon-socket-head bolts, M8 (length 16 mm 0.63 in) hexagon-headed bolt (Note 2) and two spacers are attached.

Note: 2) The number of M8 (length 16 mm 0.63 in) hexagon-socket-head bolt is different depending on the product as follows.

MC-SF4AH-8/12/16/20/24/28/32: 2 Nos.
MC-SF4AH-36: 3 Nos.
MC-SF4AH-40: 4 Nos.
MC-SF4AH-48: 5 Nos.
MC-SF4AH-56/64/72: 6 Nos.
MC-SF4AH-80: 7 Nos.
MC-SF4AH-88/96: 8 Nos.

SMALL • GLOBAL SAFETY LIGHT CURTAIN Type2

Introducing SF2-A/N SERIES

Compact design, 28 mm 1.102 in wide and 19 mm 0.748 in thick
Minimum space is required for installation.

- Application of IEC 61496 (Type2) international standard.
- The beam-axis alignment indicators that unaligned beam axes can be seen at a glance are provided.
- Incorporates ELCA function that prevents mutual interference and reduces interference from extraneous light.
- The spatter protection hood type, now available, protects the sensing surface from spatter.

Specifications

Operating range	: 0.3 to 7 m 0.984 to 22.966 ft
Beam pitch	: 20 mm 0.787 in or 40 mm 1.575 in
Protective height (max.)	: 1,950 mm 76.772 in (96 beam channels)
Supply voltage	: 24 V DC \pm 10 %
Output	: NPN open-collector transistor or PNP open-collector transistor



GLOBAL SAFETY LIGHT CURTAIN Type4

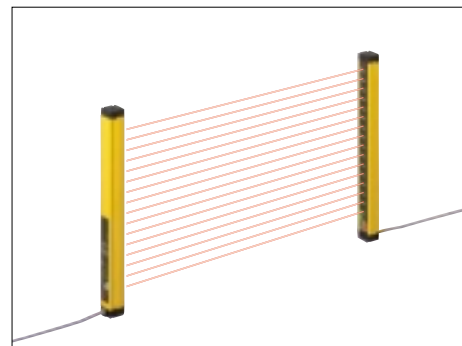
Introducing SF2-EH SERIES

Conforming to latest international safety standards

- CE marking based on Machine Directive and EMC Directive have been obtained. (Type4)
- C-UL listings has been obtained.
- Exclusive controller not required.
- Wide area 1,580 mm 62.205 in \times 10 m 32.808 ft

Specifications

Operating range	: 0.3 to 10 m 0.984 to 32.808 ft
Beam pitch	: 20 mm 0.787 in
Protective height (max.)	: 1,580 mm 62.205 in (80 beam channels)
Detection capability	: ϕ 30 mm ϕ 1.181 in or more opaque object
Supply voltage	: 24 V DC \pm 15 %
Output	: Semiconductor output (PNP output equivalent) 2 outputs or Semiconductor output (NPN output equivalent) 2 outputs



All information is subject to change without prior notice.



<http://www.sunx.co.jp/>

SUNX Limited

2431-1 Ushiyama-cho, Kasugai-shi, Aichi,
486-0901, Japan
Phone: +81-(0)568-33-7211
FAX: +81-(0)568-33-2631

Overseas Sales Dept.

Phone: +81-(0)568-33-7861
FAX: +81-(0)568-33-8591