

## SF4B SERIES Ver.2 SF4B-G SERIES Ver.2

## Related Information

■ General terms and conditions..... F-3

■ Selection guide..... P.457~

■ Glossary of terms / General precautions ... P.1549~ / P.1595

■ Korea's S-mark / KC-mark..... P.1602

Ver.2



Category 4 PLe SIL3

panasonic.net/id/pidsx/global

CE

UL US  
ListingConforming to  
OSHA / ANSI

GB

Conforming to GB/T 4584  
(Excluding SF4B-□03<V2>)

S

Certified  
(SF4B-□<V2> only)

KCs

(SF4B-□03&lt;V2&gt; only)

The control category differs depending on the configuration and wiring of the external circuit.

## Protection structure IP67

## New version with improved environmental resistance performance

It is possible to select from each three types of standard / robust types depending on the worksite

A wide range of variations are available with protective heights of 230 to 1,910 mm 9.055 to 75.197 in (1,270 mm 50.000 in for the finger protection type). Mixing six types in a series connection is also possible.

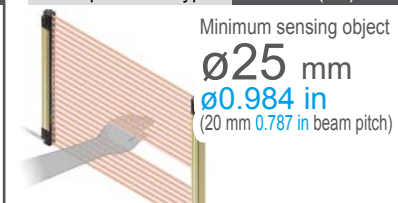
Finger protection type

SF4B-F□(G□)&lt;V2&gt;

Minimum sensing object  
ø14 mm  
ø0.551 in  
(10 mm 0.394 in beam pitch)

Hand protection type

SF4B-H□(G□)&lt;V2&gt;

Minimum sensing object  
ø25 mm  
ø0.984 in  
(20 mm 0.787 in beam pitch)

Arm / Foot protection type

SF4B-A□(G□)&lt;V2&gt;

Minimum sensing object  
ø45 mm  
ø1.772 in  
(40 mm 1.575 in beam pitch)

\* In the case of "When used as safety device for presses in China", the protective height differs. For details, refer to p.509~ / p.534~ and "Definition of sensing heights" (p.645).

## Global support for the safety of press machines or shear (paper cutting) machines

Can be widely used for press machines and other types of equipment from Japan, Europe, North America, South Korea, and China.

● : Available

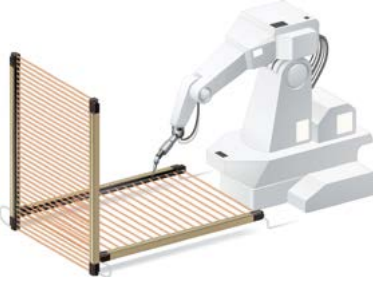
Type	Model No.	Machinery Directive	EMC Directive	UL Certified	Japanese Press Machine Support	Japanese Shear (Paper Cutter) Support	S-mark certification	Korean Press / Cutting Machine	Chinese GB Compatibility
Safety light curtains	SF4B-□<V2>	●	●	●	—	—	●	—	●
	SF4B-□G<V2>	●	●	●	—	—	—	—	●
	SF4B-A□-01<V2>	●	●	●	● (No.TA523)	● (No.TA521)	—	—	●
	SF4B-H□-01<V2>				● (No.TA524)	● (No.TA522)	—	—	●
	SF4B-H□G-01<V2>								
	SF4B-F□-01<V2>				—	—	—	● (No.09-AV4BI-0001 to 0009)	—
	SF4B-□03<V2>	●	●	●	—	—	—		
Control units	SF-C11	●	●	●	● (No.TA525) (Note 1) ● (No.TA526) (Note 2)	—	●	—	—
	SF-C12	●	●	●	—	—	—	—	—
	SF-C13	●	●	●	● (No.TA527) (Note 1) ● (No.TA528) (Note 2)	—	●	—	—
	SF-C14EX	●	●	●	—	—	—	—	—
	SF-C14EX-01	●	●	●	● (No.TA529) (Note 1) ● (No.TA530) (Note 2)	—	—	—	—

Notes: 1) In combination with SF4B-A□-01&lt;V2&gt;.

2) In combination with SF4B-H□-01&lt;V2&gt; / SF4B-H□G-01&lt;V2&gt; / SF4B-F□-01&lt;V2&gt;.

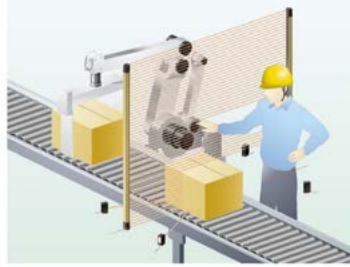
## APPLICATIONS

### Detecting the intrusion and presence of a human being



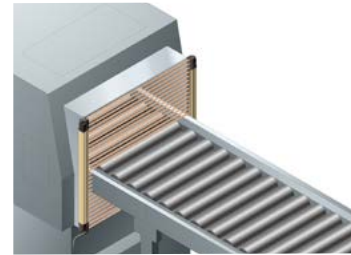
### Detecting the intrusion of a human being: Example 1

The safety light curtains allow you to discriminate between a workpiece and a human being by performing muting control for each beam axis.



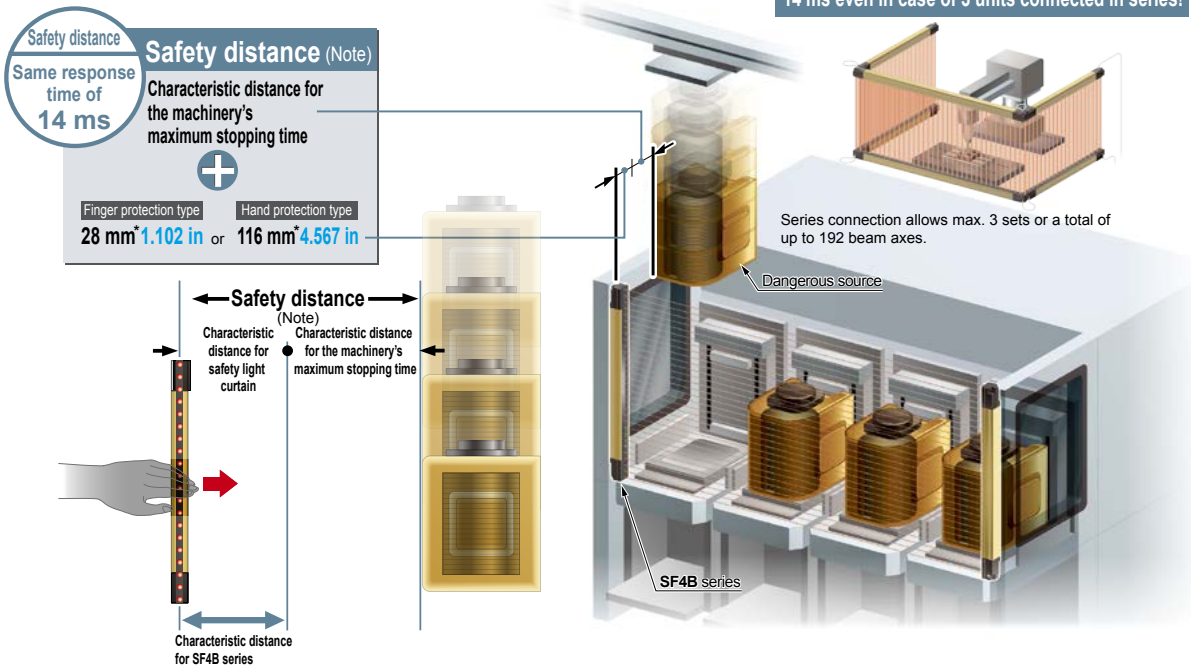
### Detecting the intrusion of a human being: Example 2

By using the fixed blanking function, obstacles that always exist are ignored.



## A unified response time of 14 ms for all models makes calculation work easy

A fast response time of 14 ms has been achieved regardless of the number of beam channels, the beam axis pitches and the number of units connected in series. This reduces calculation work required for the safety distance.



\* It is the characteristic distance for safety light curtain based on ISO 13855.

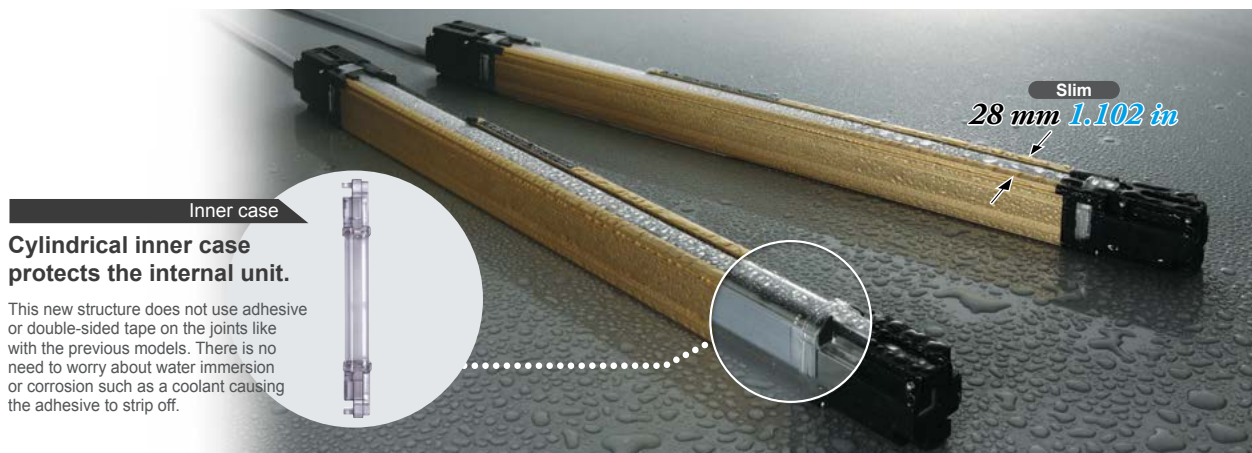
Note: Calculate the safety distance based on the distance depending on the safety light curtain and the distance depending on the maximum halting time of machinery. Install the safety light curtain according to the relevant standards of the region where the safety light curtain is used.

## Improved environmental resistance performance and easier operability

**New structure**

### Protection structure IP67 in a very compact size

A seamless structure with minimal joints has now been developed. The inner unit is protected by a cylindrical inner case. Seams on the unit and lens surfaces have been greatly reduced so that particles such as oil mists and dust are prevented from penetrating the case. Thus, the environmental resistance performance could be raised.



SF4B / SF4B-G series Ver.2 has passed the tests of IP65 and IP67 as specified by IEC / JIS standards.

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SENSORS

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AREA  
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CURTAINS /  
SAFETY COMPONENTS

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FLOW  
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PROXIMITY  
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PARTICULAR  
USE SENSORS

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SF4B-C

SF4C

BSF4-AH80

SF2B

SF2C

Definition of  
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SENSORSMICRO  
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SENSORSAREA  
SENSORSSAFETY LIGHT  
CURTAINS /  
SAFETY COMPONENTSPRESSURE /  
FLOW  
SENSORSINDUCTIVE  
PROXIMITY  
SENSORSPARTICULAR  
USE SENSORSSENSOR  
OPTIONSSIMPLE  
WIRE-SAVING  
UNITSWIRE-SAVING  
SYSTEMSMEASUREMENT  
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DEVICESLASER  
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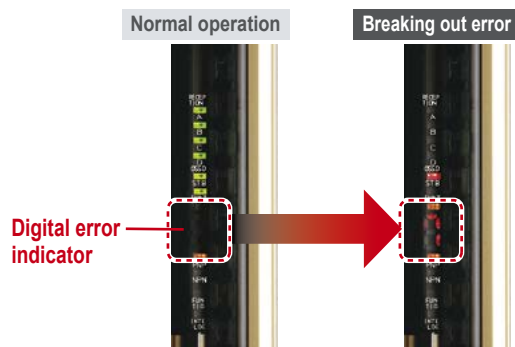
MACHINE VISION  
SYSTEMSUV CURING  
SYSTEMS

## Error details can be understood at a glance with a digital error indicator

The system constantly checks the safety light curtain for problems such as incorrect cable wiring, disconnection, short-circuits, internal circuit problems, and incoming light problems. Details of any electrical problems such as at equipment startup will appear on the digital display. It is no longer necessary to count the number of times the LED blinks, making the system much more convenient.



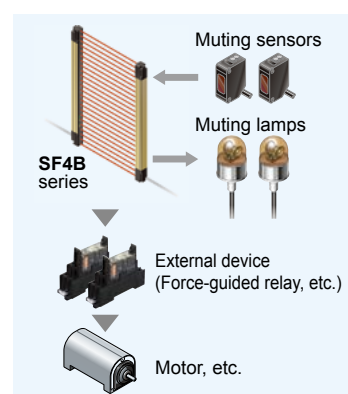
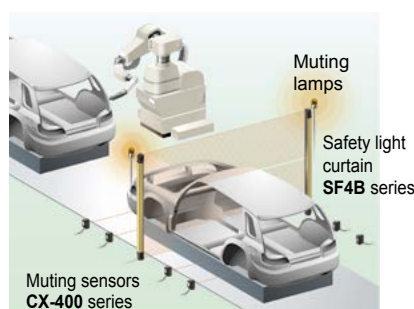
Error number notification means smooth support via telephone



## A muting control function is provided to increase both safety and productivity

(excluding SF4B-□-03<V2>)

The safety light curtain is equipped with a muting control function that causes the line to stop only when a person passes through the safety light curtain, and does not stop the line when an object passes through. The muting sensors and muting lamps can be connected directly to the safety light curtain so that a exclusive controller is not required for muting. This both reduces costs and increases safety and productivity.

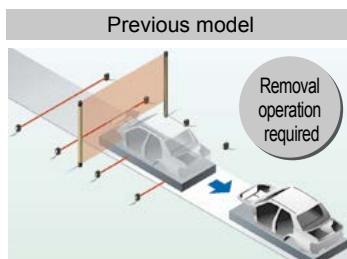


## Override function allows the line to be restarted smoothly after it has stopped while muting control was active

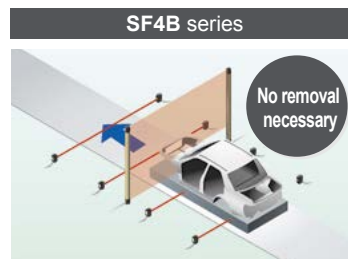
(excluding SF4B-□-03<V2>)

In case the power turns off while the safety light curtain has been interrupted by an object or in case the line stops before the muting conditions have been established (if only one muting sensor has been interrupted), the line can be restarted smoothly without having to remove the object that is interrupting the safety light curtain.

Example: When power turns off while safety light curtain was interrupted



Object must be removed before restart



Smooth restart

Selection  
GuideSafety Light  
CurtainsSafety  
Control UnitsSafety  
Components

SF4D

SF4B/  
SF4B-G

SF4B-C

SF4C

BSF4-AH80

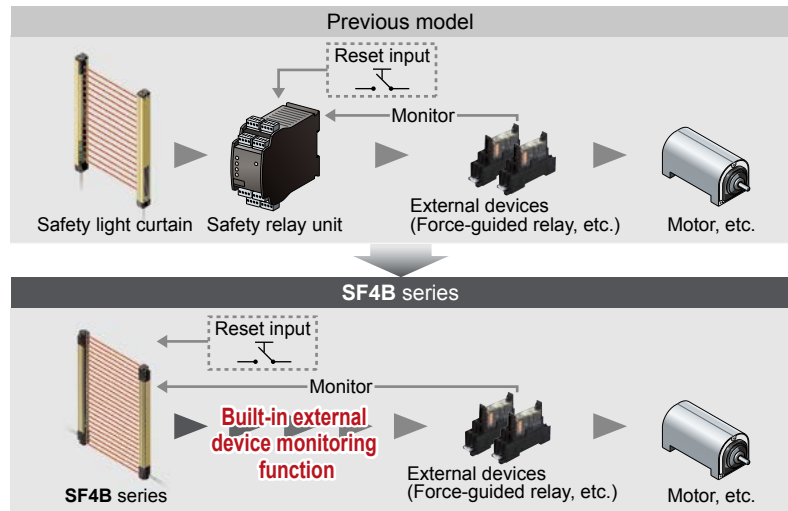
SF2B

SF2C

Definition of  
Sensing Heights

## Equipped with a safety circuit that does not require an exclusive safety relay unit

The safety light curtain has a built-in external device monitoring function (such as for monitoring whether relays have fused) and an interlock function. The safety circuit is built without safety relay unit and size reduction of a control board is achieved, which contributes to cost reduction.



- Safety relay  
Panasonic Corporation  
SF relay, slim type



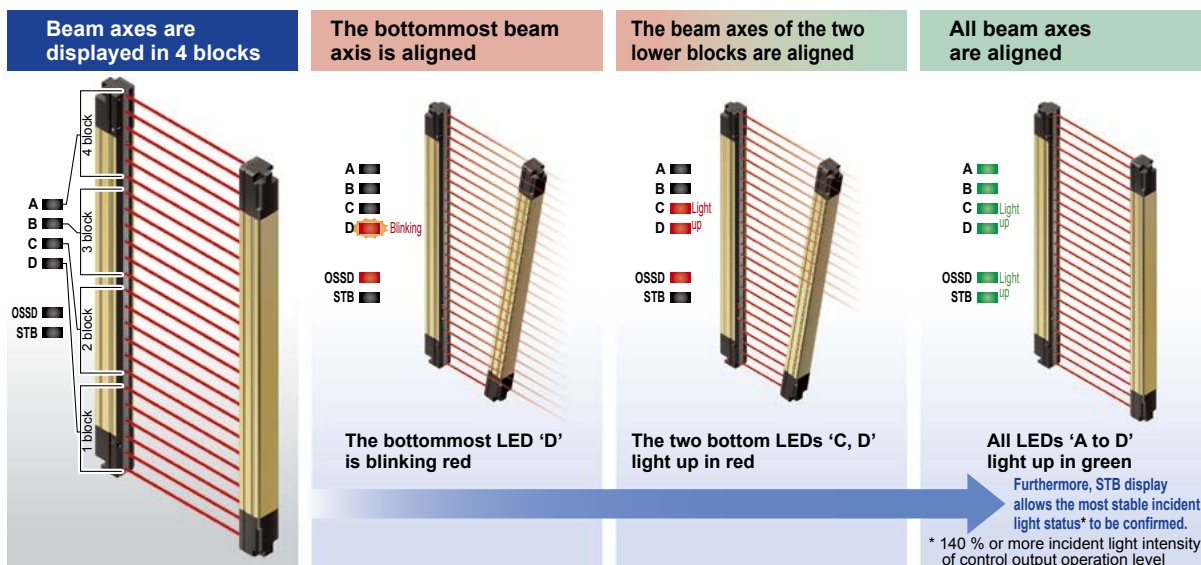
SF relay, slim type  
SFS3-L-DC24V (AG1S132)  
SFS4-L-DC24V (AG1S142)

DIN terminal block  
SFS4-SFD (AG1S847) [4-poles type]  
SFS6-SFD (AG1S867) [6-poles type]

Note: Contact Panasonic Corporation for details on the recommended products.

## Beam-axis alignment indicators show the incident light position at a glance

Beam-axis alignment indicators display the beam channels of the safety light curtain in four blocks. When the beam channel at the bottommost channel (or topmost channel), which is used as a reference for beam-axis alignments, is correctly aligned, the LED blinks red. After this, each block lights red as the beam axes successively become aligned. When all channel beam axes are aligned, all LEDs light green. The display also has an additional stability indicator (STB) so that setup can be carried out with greater stability.



FIBER SENSORS

LASER SENSORS

PHOTOELECTRIC SENSORS

MICRO PHOTOELECTRIC SENSORS

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USE SENSORSSENSOR  
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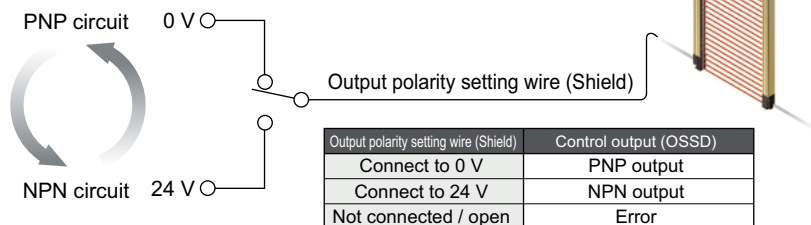
MACHINE VISION  
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SF4B-G****SF4B-C****SF4C****BSF4-AH80****SF2B****SF2C**Definition of  
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## Supports both PNP and NPN polarities in a single model

The **SF4B / SF4B-G** series combines PNP transistor output and NPN transistor output in a single model. Overseas equipment that uses PNP, replacement with NPN sensors, factories that are positively grounded, and transfer of equipment overseas are all situations where the control circuits for a single model are suitable for use a.

### ■ Polarity can be changed easily by changing wiring

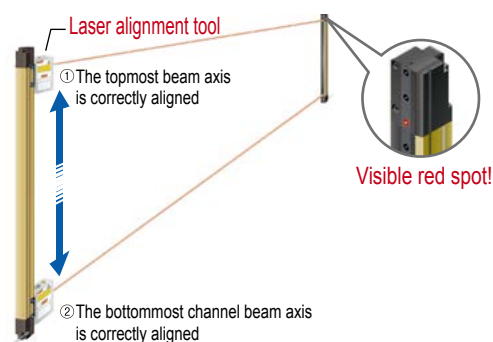
When the output polarity setting wire (shielded) is connected to 0 V, PNP output is selected, and when it is connected to 24 V, it switches to NPN output.



**PNP/NPN polarity indicator**  
Either PNP or NPN side lights depending on which is selected.

## Laser alignment tool for easy installation

The tool performs beam-axis alignment using a laser beam spot. As the tool is battery-operated, it is possible to perform beam-axis alignment before supplying power to the equipment.



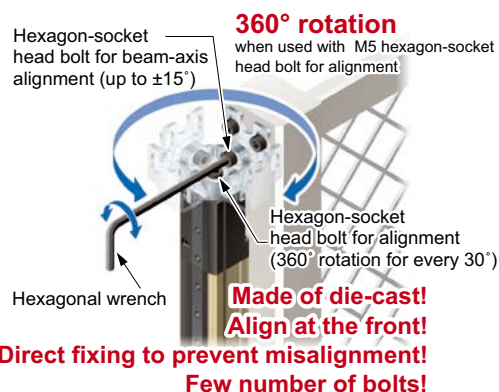
## Greatly improved ease of installation

(excluding **SF4B-□G□<V2>**)

**New structure**

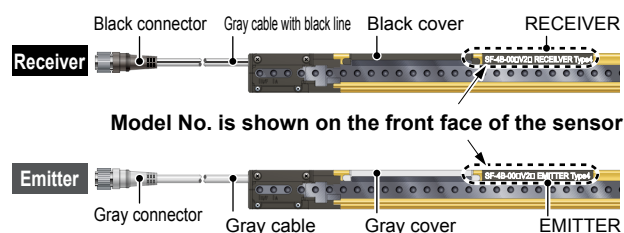
The hexagon-socket head bolts used for aligning the beam axis can be accessed from the front of the safety light curtain. Beam adjustment can be carried out easily while turning the bolts.

Also, the beam-axis alignment part is directly and firmly fixed with M5 bolts so that beam axes misalignment can be prevented.



## Easy to distinguish receiver and emitter

Emitter is gray, receiver is black. Whether during startup or maintenance, troubles due to incorrect wiring or false recognition can be greatly reduced. Moreover, the model No. can be checked at the front face of the safety light curtain.



## Mutual interference is reduced without needing interference prevention lines

The safety light curtain is equipped with the ELCA (Extraneous Light Check & Avoid) function. Because it automatically shifts the scan timing of the safety light curtain in order to avoid interference, it is not necessary to wire interference prevention lines between machineries.

## Reducing the number of malfunctions caused by extraneous light

Double scanning method and retry processing are two new functions exclusive to our company, which successfully eliminate the effects of momentary extraneous light from peripheral equipment. The reduction in operating errors caused by extraneous light reduces frequent stopping of machinery.

## Resistant to impact, less damage to workpiece

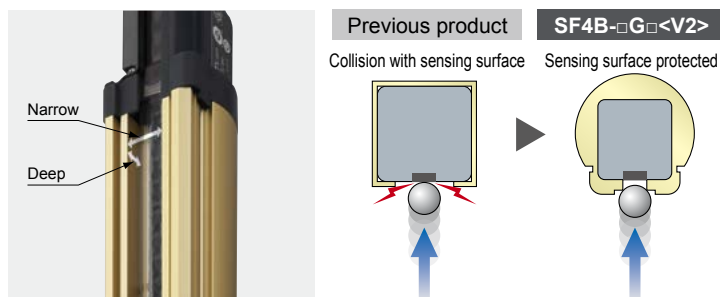
### Thick and robust housing resistant to impact

The **SF4B-G** series safety light curtain is enclosed in a 5 mm **0.197 in** thick robust metal case, protecting the workpiece from various types of impact, such as collision or being stepped on.



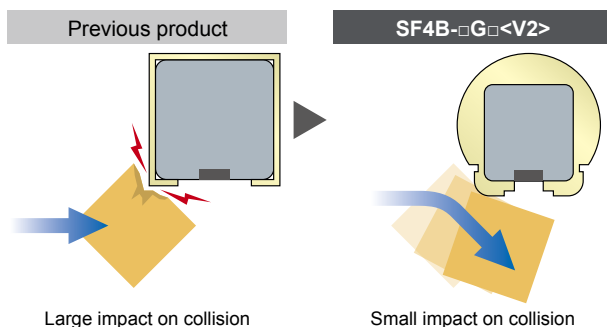
### Fully protected sensing surface

The sensing surface is fully protected by narrowing and deepening the exposed area of the sensing surface.



### Round design minimizes damage to the workpiece

The case is designed so that shock upon impact is dissipated alleviating potential damage to the workpiece in the event of a collision.

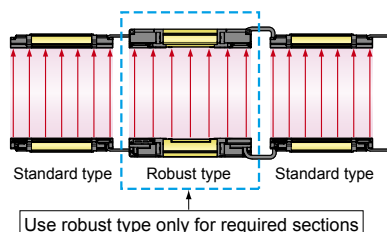


### Workpiece not contaminated with paint

The body has an alumite-treated case so that paint does not stick to the workpiece in the event of a collision.

### Enables series connection with standard type possible

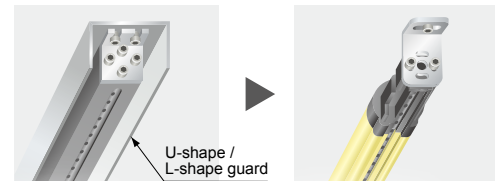
The mating cable is standard, allowing the robust and standard types to be connected in series.



## Robust type SF4B-G<V2>

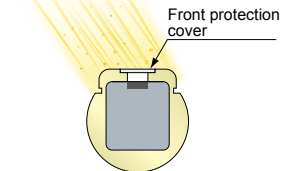
### No guard needed

The robust type can be used without an L-shape or U-shape guard, reducing installation and maintenance.



### Front protection cover

The front protection cover protects the sensing surface from welding spatter and reduces damage due to collisions. The beam axis adjuster can be attached without removing the front protection cover.



### Protection structure IP67

The seamless structure protects the sensor from being exposed to water.

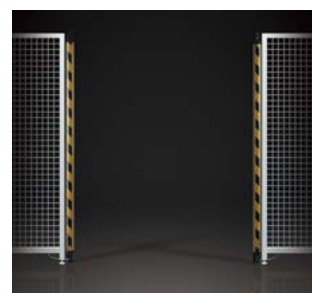
### Mounting bracket for simple & secure installation

The safety light curtain and the mounting bracket are firmly secured with just two bolts. The safety light curtain is situated in the center of the mounting bracket, preventing beam axis deviation. The dimple structure makes alignment easy to adjust.



### Black and yellow caution tape

Black and yellow striped attention tape is attached to the side of the safety light curtain, alerting workers to use caution. Hazardous openings are very obvious.



Caution tape  
• SF-TP-BG10



Special tape  
• Fit to width of safety light curtain  
• Made of fabric, making it easy to cut  
• Prevent damage at the time of collision

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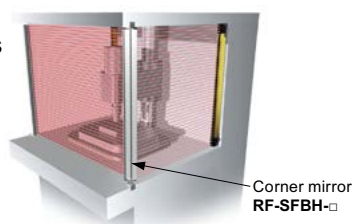
HUMAN MACHINE  
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## A large reduction in cost by using corner mirror (optional)

A single corner mirror makes it possible to eliminate one safety light curtain set and its associated peripheral safety circuits. This enables costs to be greatly reduced, and also eliminates wiring needs. The control category is unchanged.



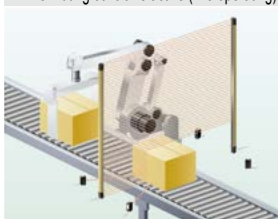
Normally for L-shaped or U-shaped installation, 2 or 3 sets of safety light curtains are needed. With the use of a corner mirror reflecting the light, one set of safety light curtain is possible for L-shaped or U-shaped installation.

## Handy-controller SFB-HC (optional) that enables the user to select a variety of settings

### Separate muting control function for each beam channel

The handy-controller **SFB-HC\*** (optional) can be used to carry out muting control for specified beam axes only. Because individual beam axes can be specified to suit the object, separate guards to prevent entry do not need to be set up.

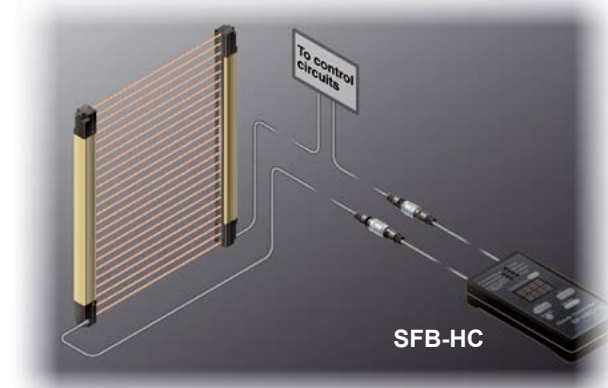
While muting control is active (line operating)



Line stopped



For example, depending on the height of the object, the muting function can be activated for 10 beam channels starting from the bottom, so that if the 11th or subsequent beam channels are interrupted, it is judged that a person has entered the area and the line stops.

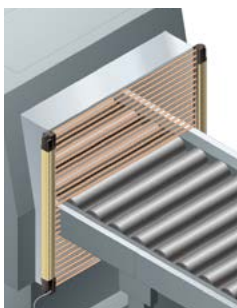


\* A handy-controller cannot be used with the **SF4B-□-01<V2>** (p.509), **SF4B-□-03<V2>** (p.509) and the **SF-C14EX-01** (p.514 / p.663).

### Specific beam axes can be deactivated

The **SF4B / SF4B-G series** incorporates a fixed blanking function.

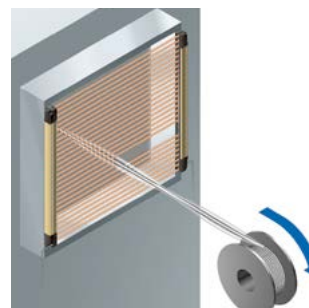
The **SF4B / SF4B-G series** is equipped with a fixed blanking function which allows specific beam channels to be selectively interrupted without causing the control output (OSSD) to output the OFF signal. This function is convenient for use with applications in which certain fixed obstacles tend to 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.



### A variable number of beam axes can be deactivated

The **SF4B / SF4B-G series** 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 set number of beam channels, then the control output (OSSD) will not output the OFF signal. This function is useful in the event when the positions of obstacles within the sensing area must be changed during object rearrangement, or when an object passes through the safety light curtain's sensing area.



Note: When the floating blanking function is used, the acceptable size for the minimum sensing object changes.

## Selectable configuration for auxiliary output

Mode No.	Description
0	Negative logic of the control output (OSSD 1, OSSD 2) (factory setting)
1	Positive logic of the control output (OSSD 1, OSSD 2)
2	For emission: output ON, For non-emission: output OFF
3	For emission: output OFF, For non-emission: output ON
4	For unstable incident beam: OFF (Note 1)
5	For unstable incident beam: ON (Note 1)
6	For muting: ON
7	For muting: OFF
8	For beam received: ON, For beam interrupted: OFF (Note 2)
9	For beam received: OFF, For beam interrupted: ON (Note 2)

Notes: 1) The output cannot be used while the fix blanking function, floating blanking function or the muting function is activated.  
2) This device outputs the beam received/interrupted state at the detectable area regardless of fixed blanking function, floating blanking function, and muting function.

## A variety of other functions can be selected

### Emission intensity control function

This function reduces the amount of emitting light. The two modes, normal mode and short mode, can be selected (factory setting: normal mode).

### Monitoring function

This function allows the user to confirm the details of each safety light curtain setting.

### Protection function

A password protection can be used to avoid unauthorized changes of the settings (factory setting: no password protection).

### Copy function

Setting details can be copied to other safety light curtains. This is helpful if you need the same settings on different devices.

### Muting lamp diagnosis setting

When the muting lamp diagnosis is disabled, the muting function will continue to operate even if the lamp is blown.

\* Refer to the instruction manual for details.  
The instruction manual can be download from our website.



## Lineup of exclusive control units



SF-C10 series

### Supports both PNP and NPN polarities **SF-C10 series**

The **SF4B / SF4B-G** series enables the changeover of PNP/ NPN inputs in a single model for reduction of registered model No.

### Connector connection control unit **SF-C11**

The wiring with the safety light curtain is simple connector connection. It reduces time for installation and replacement.

### Robust type control unit **SF-C12**

The safety relay is built in the robust metal casing. As the protection structure is IP65, it is possible to install **SF-C12** independently without putting it into the control board.

### Thin control unit **SF-C13**

22.5 mm **0.886 in** thickness has been realized. Possible to install in a small space of the board.

### Application expansion unit **SF-C14EX(-01)**

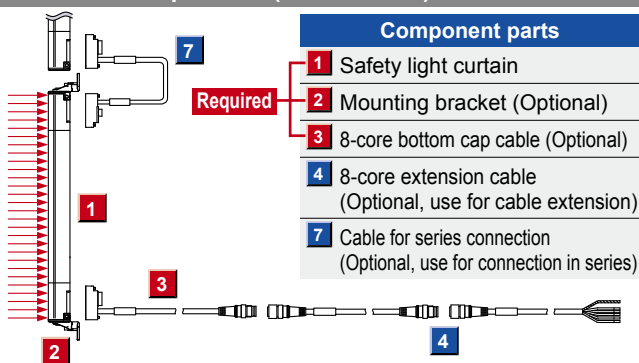
The three safety systems; safety light curtain output, muting control, emergency stop button have been integrated into a single unit.

## PRODUCT CONFIGURATION

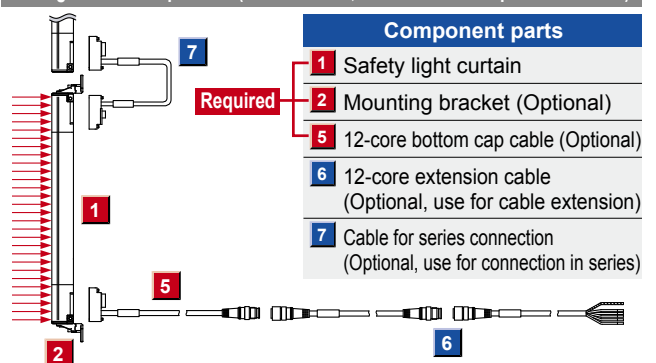


Mounting bracket and mating cable are optional.

### Standard components (8-core cable)



### Muting control components (12-core cable, with interference prevention wire)



FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

SAFETY LIGHT CURTAINS/ SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

ENERGY MANAGEMENT SOLUTIONS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide

Safety Light Curtains

Safety Control Units

Safety Components

SF4D

SF4B/ SF4B-G

SF4B-C

SF4C

BSF4-AH80

SF2B

SF2C

Definition of Sensing Heights

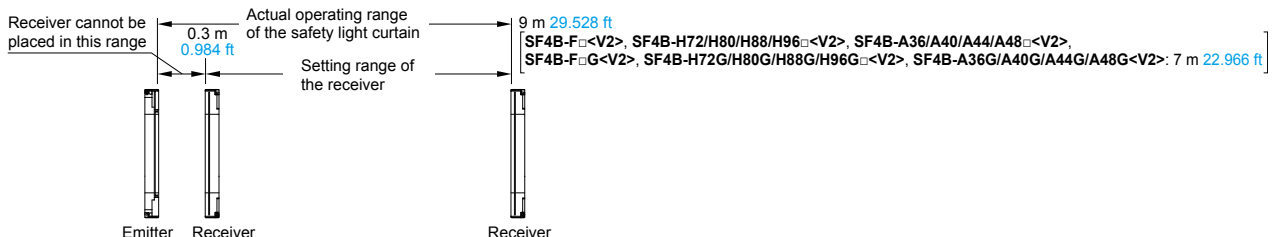
## ORDER GUIDE

## 1 Safety light curtains (Standard type)

Mounting bracket and bottom cap cable are not supplied with the safety light curtain. Be sure to order them separately.

Type		Appearance	Operating range (Note 1)	Model No. (Note 2)			Number of beam channels	Protective height (mm in)					
				SFB-HC non-compatible	Korean Press compliant (SFB-HC non-compatible)	China Press compliant (GB/T 4584)(Note 3)							
Finger protection type Min. sensing object $\phi 14$ mm $\phi 0.551$ in (10 mm 0.394 in beam pitch)			SF4B-F23<V2>	SF4B-F23-01<V2>	SF4B-F23-03<V2>	23	230	9.055	220	8.661			
			SF4B-F31<V2>	SF4B-F31-01<V2>	SF4B-F31-03<V2>	31	310	12.205	300	11.811			
			SF4B-F39<V2>	SF4B-F39-01<V2>	SF4B-F39-03<V2>	39	390	15.354	380	14.960			
			SF4B-F47<V2>	SF4B-F47-01<V2>	SF4B-F47-03<V2>	47	470	18.504	460	18.110			
			SF4B-F55<V2>	SF4B-F55-01<V2>	SF4B-F55-03<V2>	55	550	21.654	540	21.260			
			SF4B-F63<V2>	SF4B-F63-01<V2>	SF4B-F63-03<V2>	63	630	24.803	620	24.409			
			SF4B-F71<V2>	SF4B-F71-01<V2>	SF4B-F71-03<V2>	71	710	27.953	700	27.559			
			SF4B-F79<V2>	SF4B-F79-01<V2>	SF4B-F79-03<V2>	79	790	31.102	780	30.708			
			SF4B-F95<V2>	SF4B-F95-01<V2>	SF4B-F95-03<V2>	95	950	37.402	940	37.007			
			SF4B-F111<V2>	SF4B-F111-01<V2>	SF4B-F111-03<V2>	111	1,110	43.701	1,100	43.306			
			SF4B-F127<V2>	SF4B-F127-01<V2>	SF4B-F127-03<V2>	127	1,270	50.000	1,260	49.606			
			Hand protection type Min. sensing object $\phi 25$ mm $\phi 0.984$ in (20 mm 0.787 in beam pitch)			SF4B-H12<V2>	SF4B-H12-01<V2>	SF4B-H12-03<V2>	12	230	9.055	220	8.661
SF4B-H16<V2>	SF4B-H16-01<V2>	SF4B-H16-03<V2>				16	310	12.205	300	11.811			
SF4B-H20<V2>	SF4B-H20-01<V2>	SF4B-H20-03<V2>				20	390	15.354	380	14.960			
SF4B-H24<V2>	SF4B-H24-01<V2>	SF4B-H24-03<V2>				24	470	18.504	460	18.110			
SF4B-H28<V2>	SF4B-H28-01<V2>	SF4B-H28-03<V2>				28	550	21.654	540	21.260			
SF4B-H32<V2>	SF4B-H32-01<V2>	SF4B-H32-03<V2>				32	630	24.803	620	24.409			
SF4B-H36<V2>	SF4B-H36-01<V2>	SF4B-H36-03<V2>				36	710	27.953	700	27.559			
SF4B-H40<V2>	SF4B-H40-01<V2>	SF4B-H40-03<V2>				40	790	31.102	780	30.708			
SF4B-H48<V2>	SF4B-H48-01<V2>	SF4B-H48-03<V2>				48	950	37.402	940	37.007			
SF4B-H56<V2>	SF4B-H56-01<V2>	SF4B-H56-03<V2>				56	1,110	43.701	1,100	43.306			
SF4B-H64<V2>	SF4B-H64-01<V2>	SF4B-H64-03<V2>				64	1,270	50.000	1,260	49.606			
SF4B-H72<V2>	SF4B-H72-01<V2>	SF4B-H72-03<V2>				72	1,430	56.299	1,420	55.905			
SF4B-H80<V2>	SF4B-H80-01<V2>	SF4B-H80-03<V2>				80	1,590	62.598	1,580	62.205			
SF4B-H88<V2>	SF4B-H88-01<V2>	SF4B-H88-03<V2>				88	1,750	68.898	1,740	68.503			
SF4B-H96<V2>	SF4B-H96-01<V2>	SF4B-H96-03<V2>				96	1,910	75.197	1,900	74.803			
Arm / Foot protection type Min. sensing object $\phi 45$ mm $\phi 1.772$ in (40 mm 1.575 in beam pitch)						SF4B-A6<V2>	SF4B-A6-01<V2>	—	6	230	9.055	200	7.874
						SF4B-A8<V2>	SF4B-A8-01<V2>	—	8	310	12.205	280	11.024
						SF4B-A10<V2>	SF4B-A10-01<V2>	—	10	390	15.354	360	14.173
			SF4B-A12<V2>	SF4B-A12-01<V2>	—	12	470	18.504	440	17.323			
			SF4B-A14<V2>	SF4B-A14-01<V2>	—	14	550	21.654	520	20.472			
			SF4B-A16<V2>	SF4B-A16-01<V2>	—	16	630	24.803	600	23.622			
			SF4B-A18<V2>	SF4B-A18-01<V2>	—	18	710	27.953	680	26.772			
			SF4B-A20<V2>	SF4B-A20-01<V2>	—	20	790	31.102	760	29.921			
			SF4B-A24<V2>	SF4B-A24-01<V2>	—	24	950	37.402	920	36.220			
			SF4B-A28<V2>	SF4B-A28-01<V2>	—	28	1,110	43.701	1,080	42.520			
			SF4B-A32<V2>	SF4B-A32-01<V2>	—	32	1,270	50.000	1,240	48.819			
			SF4B-A36<V2>	SF4B-A36-01<V2>	—	36	1,430	56.299	1,400	55.118			
			SF4B-A40<V2>	SF4B-A40-01<V2>	—	40	1,590	62.598	1,560	61.417			
			SF4B-A44<V2>	SF4B-A44-01<V2>	—	44	1,750	68.898	1,720	67.716			
			SF4B-A48<V2>	SF4B-A48-01<V2>	—	48	1,910	75.197	1,880	74.016			

Notes: 1) The operating range is the possible setting distance between the emitter and the receiver.



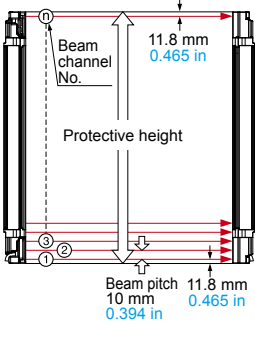
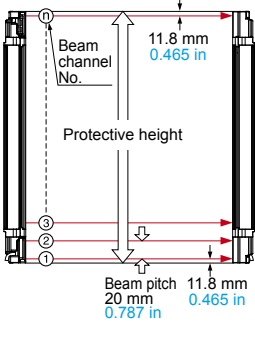
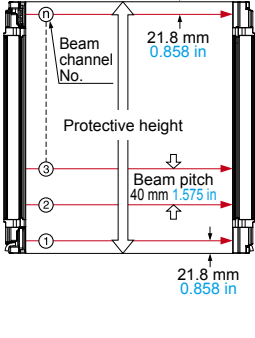
2) The model No. with "E" on the product label is the emitter, "D" on the label is the receiver.

3) In the case of "When used as safety device for presses in China" the distance between the center of the first beam axis and the center of the last beam axis of the device becomes the protective height. The Korean press compliant type SF4B-□-03&lt;V2&gt; does not apply. For details, refer to "Definition of sensing heights" (p.645).

## ORDER GUIDE

## 1 Safety light curtains (Robust type)

Mounting bracket and bottom cap cable are not supplied with the safety light curtain. Be sure to order them separately.

Type	Appearance	Operating range (Note 1)	Model No. (Note 2)	Number of beam channels	Protective height (mm in)	China Press compliant (GB/T 4584) (Note 3)
Finger protection type Min. sensing object $\phi 14$ mm $\phi 0.551$ in (10 mm $0.394$ in beam pitch)		0.3 to 7 m 0.984 to 22.966 ft	SF4B-F23G<V2>	—	23	244 9.606 220 8.661
			SF4B-F31G<V2>	—	31	324 12.756 300 11.811
			SF4B-F39G<V2>	—	39	404 15.906 380 14.960
			SF4B-F47G<V2>	—	47	484 19.055 460 18.110
			SF4B-F55G<V2>	—	55	564 22.205 540 21.260
			SF4B-F63G<V2>	—	63	644 25.354 620 24.409
			SF4B-F71G<V2>	—	71	724 28.504 700 27.559
			SF4B-F79G<V2>	—	79	804 31.654 780 30.708
			SF4B-F95G<V2>	—	95	964 37.953 940 37.007
			SF4B-F111G<V2>	—	111	1,124 44.252 1,100 43.306
			SF4B-F127G<V2>	—	127	1,284 50.551 1,260 49.606
Hand protection type Min. sensing object $\phi 25$ mm $\phi 0.984$ in (20 mm $0.787$ in beam pitch)		0.3 to 9 m 0.984 to 29.528 ft	SF4B-H12G<V2>	SF4B-H12G-01<V2>	12	244 9.606 220 8.661
			SF4B-H16G<V2>	SF4B-H16G-01<V2>	16	324 12.756 300 11.811
			SF4B-H20G<V2>	SF4B-H20G-01<V2>	20	404 15.906 380 14.960
			SF4B-H24G<V2>	SF4B-H24G-01<V2>	24	484 19.055 460 18.110
			SF4B-H28G<V2>	SF4B-H28G-01<V2>	28	564 22.205 540 21.260
			SF4B-H32G<V2>	SF4B-H32G-01<V2>	32	644 25.354 620 24.409
			SF4B-H36G<V2>	SF4B-H36G-01<V2>	36	724 28.504 700 27.559
			SF4B-H40G<V2>	SF4B-H40G-01<V2>	40	804 31.654 780 30.708
		0.3 to 7 m 0.984 to 22.966 ft	SF4B-H48G<V2>	SF4B-H48G-01<V2>	48	964 37.953 940 37.007
			SF4B-H56G<V2>	SF4B-H56G-01<V2>	56	1,124 44.252 1,100 43.306
			SF4B-H64G<V2>	SF4B-H64G-01<V2>	64	1,284 50.551 1,260 49.606
			SF4B-H72G<V2>	SF4B-H72G-01<V2>	72	1,444 56.850 1,420 55.905
			SF4B-H80G<V2>	SF4B-H80G-01<V2>	80	1,604 63.150 1,580 62.205
			SF4B-H88G<V2>	SF4B-H88G-01<V2>	88	1,764 69.449 1,740 68.503
			SF4B-H96G<V2>	SF4B-H96G-01<V2>	96	1,924 75.748 1,900 74.803
Arm / Foot protection type Min. sensing object $\phi 45$ mm $\phi 1.772$ in (40 mm $1.575$ in beam pitch)		0.3 to 9 m 0.984 to 29.528 ft	SF4B-A6G<V2>	—	6	244 9.606 200 7.874
			SF4B-A8G<V2>	—	8	324 12.756 280 11.024
			SF4B-A10G<V2>	—	10	404 15.906 360 14.173
			SF4B-A12G<V2>	—	12	484 19.055 440 17.323
			SF4B-A14G<V2>	—	14	564 22.205 520 20.472
			SF4B-A16G<V2>	—	16	644 25.354 600 23.622
			SF4B-A18G<V2>	—	18	724 28.504 680 26.772
			SF4B-A20G<V2>	—	20	804 31.654 760 29.921
		0.3 to 7 m 0.984 to 22.966 ft	SF4B-A24G<V2>	—	24	964 37.953 920 36.220
			SF4B-A28G<V2>	—	28	1,124 44.252 1,080 42.520
			SF4B-A32G<V2>	—	32	1,284 50.551 1,240 48.819
			SF4B-A36G<V2>	—	36	1,444 56.850 1,400 55.118
			SF4B-A40G<V2>	—	40	1,604 63.150 1,560 61.417
			SF4B-A44G<V2>	—	44	1,764 69.449 1,720 67.716
			SF4B-A48G<V2>	—	48	1,924 75.748 1,880 74.016

## Differences from standard type

The robust type SF4B-□G□&lt;V2&gt; is different from the standard type SF4B-□&lt;V2&gt; in the following ways:

- Sensing width (protective height) (Note 1) • Profile • Net weight • Mounting bracket • Front protection cover
- Laser alignment tool • Noncompliant with Japanese and Korean press standard (Note 2)
- Noncompliant with Korean regulations

Other specifications, input/output circuits, and options are the same as for the standard type.

Notes: 1) In the case of "When used as safety device for presses in China", there is no change in the protective height.

2) SF4B-H□G-01&lt;V2&gt; does not comply with Korean press standard only.

3) In the case of "When used as safety device for presses in China" the distance between the center of the first beam axis and the center of the last beam axis of the device becomes the protective height. For details, refer to "Definition of sensing heights" (p.645).

FIBER  
SENSORSLASER  
SENSORSPHOTO-  
ELECTRIC  
SENSORSMICRO  
PHOTO-  
ELECTRIC  
SENSORSAREA  
SENSORSSAFETY LIGHT  
CURTAINS/  
SAFETY  
COMPONENTSPRESSURE /  
FLOW  
SENSORSINDUCTIVE  
PROXIMITY  
SENSORSPARTICULAR  
USE  
SENSORSSENSOR  
OPTIONSSIMPLE  
WIRE-SAVING  
UNITSWIRE-SAVING  
SYSTEMSMEASURE-  
MENT  
SENSORSSTATIC  
CONTROL  
DEVICESLASER  
MARKERS

PLC

HUMAN  
MACHINE  
INTERFACESENERGY  
MANAGEMENT  
SOLUTIONSFA  
COMPONENTSMACHINE  
VISION  
SYSTEMSUV  
CURING  
SYSTEMSSelection  
GuideSafety Light  
CurtainsSafety  
Control UnitsSafety  
Components

SF4D

SF4B/  
SF4B-G

SF4B-C

SF4C

BSF4-AH80

SF2B

SF2C

Definition of  
Sensing Heights



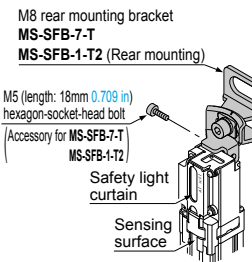
## ORDER GUIDE

**2 Mounting brackets** Mounting bracket is not supplied with the safety light curtain. Be sure to order it separately.

Designation	Model No.	Description
Rear/side mounting bracket (Excluding <b>SF4B-□G□&lt;V2&gt;</b> ) [Material: Cold rolled carbon steel (SPCC)]	M8 rear mounting bracket	<b>MS-SFB-7-T</b>
	M8 side mounting bracket	<b>MS-SFB-8-T</b>
	M8 rear/side mounting bracket set	<b>MS-SFB-1-T2</b>
360° mounting bracket (Excluding <b>SF4B-□G□&lt;V2&gt;</b> ) (Material: Die-cast zinc alloy)	Standard mounting bracket	<b>MS-SFB-1</b>
	M8 mounting bracket	<b>MS-SFB-1-T</b>
	Pitch adapter bracket	<b>MS-SFB-4</b>
* Safety light curtain can revolve 360° horizontally.	M8 pitch adapter bracket	<b>MS-SFB-4-T</b>
Dead zoneless mounting bracket (Excluding <b>SF4B-□G□&lt;V2&gt;</b> ) (Material: Die-cast zinc alloy)		<b>MS-SFB-3</b>
Standard L mounting bracket (For <b>SF4B-□G□&lt;V2&gt;</b> ) [Material: Cold rolled carbon steel (SPCC)] (Trivalent chrome plated)		<b>MS-SF4BG-1</b>
Dead zoneless mounting bracket (For <b>SF4B-□G□&lt;V2&gt;</b> ) [Material: Cold rolled carbon steel (SPCC)] (Trivalent chrome plated) Supporting bracket ...PPS		<b>MS-SF4BG-3</b>

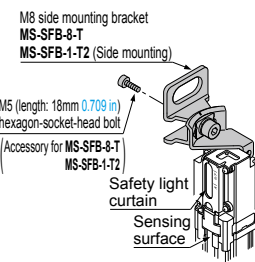
**M8 rear mounting bracket   M8 side mounting bracket   Standard mounting bracket   M8 mounting bracket   Pitch adapter bracket**

- **MS-SFB-7-T**
- **MS-SFB-1-T2**

**(Rear mounting)**


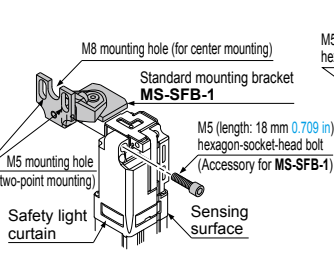
Four bracket set  
Four M5 (length: 18 mm 0.709 in) hexagon-socket-head bolts are attached.

- **MS-SFB-8-T**
- **MS-SFB-1-T2**

**(Side mounting)**


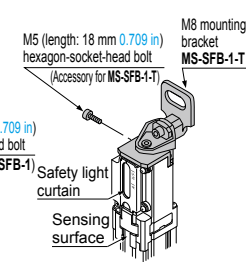
Four bracket set  
Four M5 (length: 18 mm 0.709 in) hexagon-socket-head bolts are attached.

- **MS-SFB-1**



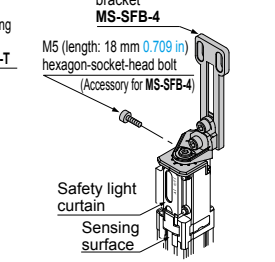
Four bracket set  
Four M5 (length: 18 mm 0.709 in) hexagon-socket-head bolts are attached.

- **MS-SFB-1-T**



Four bracket set  
Four M5 (length: 18 mm 0.709 in) hexagon-socket-head bolts are attached.

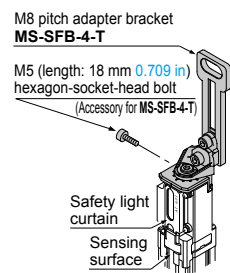
- **MS-SFB-4**



Four bracket set  
Four M5 (length: 18 mm 0.709 in) hexagon-socket-head bolts are attached.

**M8 pitch adapter bracket**

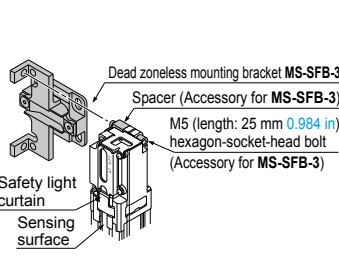
- **MS-SFB-4-T**



Four bracket set  
Four M5 (length: 18 mm 0.709 in) hexagon-socket-head bolts are attached.

**Dead zoneless mounting bracket**

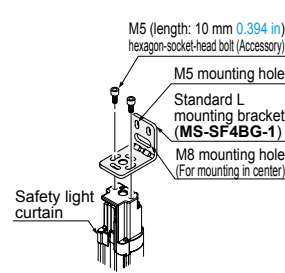
- **MS-SFB-3**



Four bracket set  
Four M5 (length: 25 mm 0.984 in) hexagon-socket-head bolts and four spacers are attached.

**Standard L mounting bracket (For SF4B-□G□<V2>)**

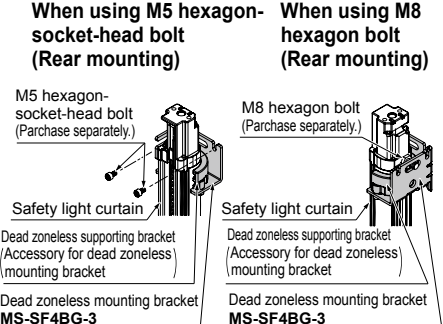
- **MS-SF4BG-1**



Four bracket set  
Eight M5 (length: 10 mm 0.394 in) hexagon-socket-head bolts are attached.

**Dead zoneless mounting bracket (For SF4B-□G□<V2>)**

- **MS-SF4BG-3**

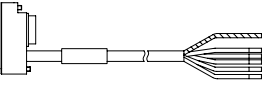
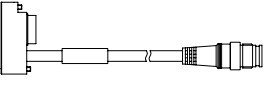
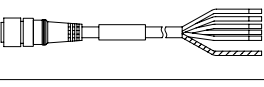
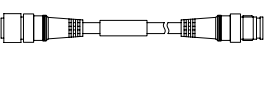
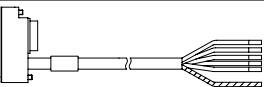
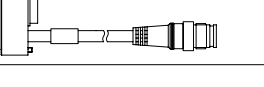
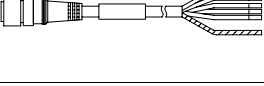
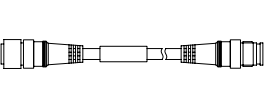
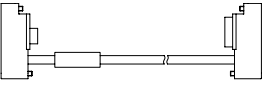
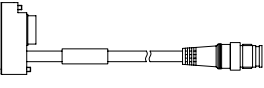
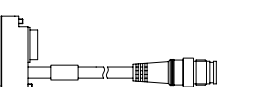


Four bracket set  
Twelve M5 (length: 8 mm 0.315 in) hexagon-socket-head bolts and four nut slots are attached.

## ORDER GUIDE

**3 4 5 6 7** Mating cable / Extension cable / Cables for series connection

Mating cable is not supplied with the safety light curtain. Be sure to order it separately.

Type	Appearance	Model No.	Description (Note 1)
Standard components (8-core cable)		<b>SFB-CCB3</b>	Length: 3 m <b>9.843 ft</b> Net weight: 370 g approx. (2 cables)
		<b>SFB-CCB7</b>	Length: 7 m <b>22.966 ft</b> Net weight: 820 g approx. (2 cables)
		<b>SFB-CCB10</b>	Length: 10 m <b>32.808 ft</b> Net weight: 1,160 g approx. (2 cables)
		<b>SFB-CCB15</b>	Length: 15 m <b>49.213 ft</b> Net weight: 1,710 g approx. (2 cables)
		<b>SFB-CB05</b>	Length: 0.5 m <b>1.640 ft</b> Net weight: 95 g approx. (2 cables)
		<b>SFB-CB5</b>	Length: 5 m <b>16.404 ft</b> Net weight: 620 g approx. (2 cables)
		<b>SFB-CB10</b>	Length: 10 m <b>32.808 ft</b> Net weight: 1,200 g approx. (2 cables)
		<b>SFB-CC3</b>	Length: 3 m <b>9.843 ft</b> Net weight: 380 g approx. (2 cables)
		<b>SFB-CC10</b>	Length: 10 m <b>32.808 ft</b> Net weight: 1,200 g approx. (2 cables)
		<b>SFB-CCJ3E</b>	Length: 3 m <b>9.843 ft</b> Net weight: 190 g approx. (1 cable)
		<b>SFB-CCJ10E</b>	Length: 10 m <b>32.808 ft</b> Net weight: 580 g approx. (1 cable)
		<b>SFB-CCJ3D</b>	Length: 3 m <b>9.843 ft</b> Net weight: 210 g approx. (1 cable)
		<b>SFB-CCJ10D</b>	Length: 10 m <b>32.808 ft</b> Net weight: 600 g approx. (1 cable)
Mating control components (12-core cable, with interference prevention wire)		<b>SFB-CCB3-MU</b>	Length: 3 m <b>9.843 ft</b> Net weight: 420 g approx. (2 cables)
		<b>SFB-CCB7-MU</b>	Length: 7 m <b>22.966 ft</b> Net weight: 930 g approx. (2 cables)
		<b>SFB-CB05-MU</b>	Length: 0.5 m <b>1.640 ft</b> Net weight: 110 g approx. (2 cables)
		<b>SFB-CC3-MU</b>	Length: 3 m <b>9.843 ft</b> Net weight: 430 g approx. (2 cables)
		<b>SFB-CC7-MU</b>	Length: 7 m <b>22.966 ft</b> Net weight: 1,000 g approx. (2 cables)
		<b>SFB-CC10-MU</b>	Length: 10 m <b>32.808 ft</b> Net weight: 1,300 g approx. (2 cables)
		<b>SFB-CCJ3E-MU</b>	Length: 3 m <b>9.843 ft</b> Net weight: 190 g approx. (1 cable)
		<b>SFB-CCJ10E-MU</b>	Length: 10 m <b>32.808 ft</b> Net weight: 660 g approx. (1 cable)
		<b>SFB-CCJ3D-MU</b>	Length: 3 m <b>9.843 ft</b> Net weight: 210 g approx. (1 cable)
		<b>SFB-CCJ10D-MU</b>	Length: 10 m <b>32.808 ft</b> Net weight: 680 g approx. (1 cable)
Cable for series connection		<b>SFB-CSL01</b>	Length: 0.1 m <b>0.328 ft</b> Net weight: 45 g approx. (2 cables)
		<b>SFB-CSL05</b>	Length: 0.5 m <b>1.640 ft</b> Net weight: 95 g approx. (2 cables)
		<b>SFB-CSL1</b>	Length: 1 m <b>3.281 ft</b> Net weight: 150 g approx. (2 cables)
		<b>SFB-CSL5</b>	Length: 5 m <b>16.404 ft</b> Net weight: 630 g approx. (2 cables)
Exclusive mating cable for SF-C14EX		<b>SFB-CB05-EX</b>	Length: 0.5 m <b>1.640 ft</b> Net weight: 95 g approx. (2 cables)
		<b>SFB-CB5-EX</b>	Length: 5 m <b>16.404 ft</b> Net weight: 620 g approx. (2 cables)
		<b>SFB-CB10-EX</b>	Length: 10 m <b>32.808 ft</b> Net weight: 1,200 g approx. (2 cables)
Adapter cable		<b>SFB-CB05-A-P</b>	Length: 0.5 m <b>1.640 ft</b> Net weight: 110 g approx. (2 cables)
		<b>SFB-CB05-A-N</b>	
		<b>SFB-CB05-B-P</b>	
		<b>SFB-CB05-B-N</b>	

Note: Where the cable color has not been specified, it is black for emitter, gray with black line for outer diameter is  $\phi 6$  mm **0.236 in**, min. bending radius is R6 mm **R0.236 in**.

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## ORDER GUIDE

### Spare parts (Accessories for safety light curtain)

Designation	Model No.	Description
Intermediate supporting bracket (Excluding <b>SF4B-G□&lt;V2&gt;</b> ) (Note 1)	<b>MS-SFB-2</b>	This bracket holds the safety light curtain at the middle. (2 pcs./set for emitter and receiver) Mounting is possible behind or at the side of the safety light curtain.
Intermediate supporting bracket (Note 2) (For <b>SF4B-G□&lt;V2&gt;</b> )	<b>MS-SF4BG-2</b>	This bracket holds the safety light curtain at the middle. (2 pcs./set for emitter and receiver) Mounting is possible behind or at the side of the safety light curtain.
Test rod ø14	<b>SF4B-TR14</b>	Min. sensing object for regular checking (ø14 mm <b>ø0.551 in</b> ), with finger protection type (min. sensing object ø14 mm <b>ø0.551 in</b> )
Test rod ø25	<b>SF4B-TR25</b>	Min. sensing object for regular checking (ø25 mm <b>ø0.984 in</b> ), with hand protection type (min. sensing object ø25 mm <b>ø0.984 in</b> )

Notes: 1) The number of sets required varies depending on the product.

- 1 set: **SF4B-F□<V2>** ..... 79 to 111 beam channels  
**SF4B-H□<V2>** ..... 40 to 56 beam channels  
**SF4B-A□<V2>** ..... 20 to 28 beam channels
- 2 sets: **SF4B-F127□<V2>**  
**SF4B-H□<V2>** ..... 64 to 80 beam channels  
**SF4B-A□<V2>** ..... 32 to 40 beam channels
- 3 sets: **SF4B-H□<V2>** ..... 88 to 96 beam channels  
**SF4B-A□<V2>** ..... 44 to 48 beam channels

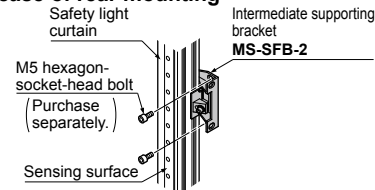
2) The number of sets required varies depending on the product.

- 1 set: **SF4B-F□G□<V2>** ..... 79 to 127 beam channels  
**SF4B-H□G□<V2>** ..... 40 to 64 beam channels  
**SF4B-A□G□<V2>** ..... 20 to 32 beam channels
- 2 set: **SF4B-H□G□<V2>** ..... 72 to 96 beam channels  
**SF4B-A□G□<V2>** ..... 36 to 48 beam channels

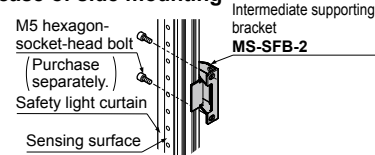
### Intermediate supporting bracket

#### • MS-SFB-2

#### <In case of rear mounting>

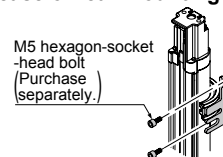


#### <In case of side mounting>

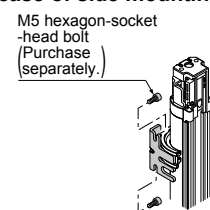


#### • MS-SF4BG-2

#### <In case of rear mounting>



#### <In case of side mounting>



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SF2B

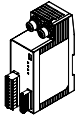
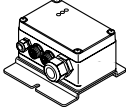
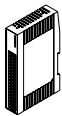
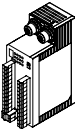
SF2C

Definition of Sensing Heights



## OPTIONS

### Control units

Designation	Appearance	Model No.	Application cable	Description
Connector connection type control unit		<b>SF-C11</b>	Bottom cap cable: <b>SFB-CB□</b> Extension cable: <b>SFB-CCJ10□</b>	Use 8-core cable with connector to connect to the safety light curtain. Compatible with up to Control Category 4. Interference prevention wires and muting function cannot be used.
Robust type control unit		<b>SF-C12</b>	Bottom cap cable: <b>SFB-CB05-MU</b> Extension cable: <b>SFB-CCJ10□-MU</b>	Use 12-core cable with connector to connect to the safety light curtain. Compatible with up to Control Category 4. Muting function cannot be used. Interference prevention wires can be used.
Slim type control unit		<b>SF-C13</b>	Bottom cap cable: <b>SFB-CCB□(-MU)</b> Extension cable: <b>SFB-CC□(-MU)</b>	Use a discrete wire cable to connect to the safety light curtain. Compatible with up to Control Category 4. Interference prevention wires and muting function can be used.
Application expansion unit for <b>SF4B / SF4B-G</b> series		<b>SF-C14EX</b>	Bottom cap cable: <b>SFB-CB□-EX</b>	The muting control function and emergency stop input expand the applications of the safety light curtains. Use exclusive cable to connect to the safety light curtain. Compatible with up to Control Category 4. The handy-controller <b>SFB-HC</b> (optional) cannot be used with <b>SF-C14EX-01</b> .
Handy-controller non-compatible type		<b>SF-C14EX-01</b>	Extension cable: <b>SFB-CCJ10□</b>	

Note: Refer to **SF-C10** series pages (p.663~) for the control units.

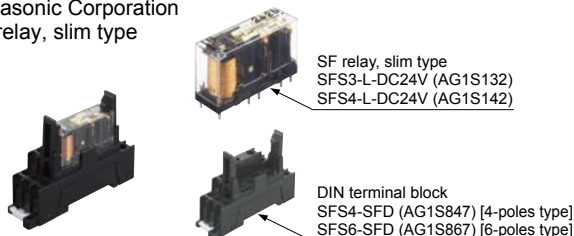
### SF-C12 spare relay set

A set of spare relays (2 safety relays and 1 removal tool) is available for the safety relay that is built into the **SF-C12**.

Model No.: **SF-C12-RY**

#### • Recommended safety relay

Panasonic Corporation  
SF relay, slim type



Note: Contact Panasonic Corporation for details on the recommended products.

Type		With LED indicator	
Item	Model No.	SFS3-L-DC24V	SFS4-L-DC24V
	Part No.	AG1S132	AG1S142
Contact arrangement		3a1b	4a2b
Rated nominal switching capacity		6 A / 250 V AC, 6 A / 30 V DC	
Min. switching capacity		1 mA / 5 V DC	
Coil rating		15 mA / 24 V DC	20.8 mA / 24 V DC
Rated power consumption		360 mW	500 mW
Operation time		20 ms or less	
Release time		20 ms or less	
Ambient temperature		-40 to +85 °C <b>-40 to +185 °F</b> (Humidity: 5 to 85 % RH)	
Applicable standards		UL/c-UL, TÜV, Korea's S-mark	

### Safety control unit

Creating safety circuits is easier than ever.

## SF-C21



Safety control unit  
**SF-C21**

▶ P.647~

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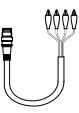
Safety Components

**SF4D****SF4B/ SF4B-G****SF4B-C****SF4C****BSF4-AH80****SF2B****SF2C**

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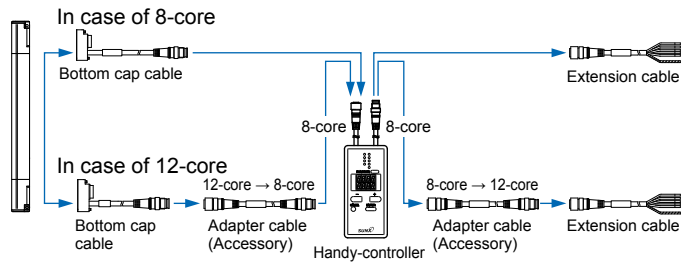
## OPTIONS

### Handy-controller

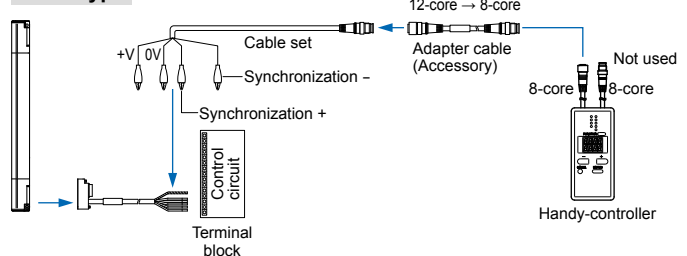
Designation	Appearance	Model No.
Handy-controller	 * Includes 2 adapter cables	<b>SFB-HC</b> (Note)
Cable set for cable type connection		<b>SFC-WNC1</b> (Note)

Note: A handy-controller cannot be used with the **SF4B-□-01<V2>** (p.509~), the **SF4B-□-03<V2>** (p.509) and the **SF-C14EX-01** (p.514).

#### Pigtailed type



#### Cable type



### Safety light curtain diagnosis software


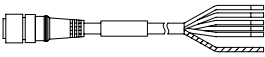
Simply input the error number of the safety light curtain on the screen, and the section of maintenance needed will be located and coping process will be displayed.

\* Can be downloaded free from our website.



Safety light curtain diagnosis software

### Y-shaped connector

Type	Appearance	Model No.	Description	
Wire-saving Y-shaped connector		<b>SFB-WY1</b> (Note)	Wire-saving connector for standard components (8-core cable). Cables of emitter and receiver are consolidated into one cable for wire-saving. Wiring has +24 V, 0 V, OSSD 1, OSSD 2, output polarity setting wire (shield). Net weight: 35 g approx. [ Power wire and synchronization wire are connected inside the connector. ] [ Interlock is disabled (automatic reset). ]	
Cable with connector on one side		<b>WY1-CCN3</b> (Note)	Cable length: 3 m <b>9.843 ft</b> Net weight: 200 g approx. (1 cable)	Mating cable for Y-shaped connector Cable color: Gray (with black line) Connector color: Black The min. bending radius: R6 mm <b>R0.236 in</b>
		<b>WY1-CCN10</b> (Note)	Cable length: 10 m <b>32.808 ft</b> Net weight: 620 g approx. (1 cable)	

Note: Not available for **SF4B-□-01<V2>**.

By using the Y-shaped connector, the least required wires such as power or safety output are consolidated into one cable. Man-hours taken for wiring is eliminated to the minimum. Construction times as well as wiring mistakes are greatly reduced.

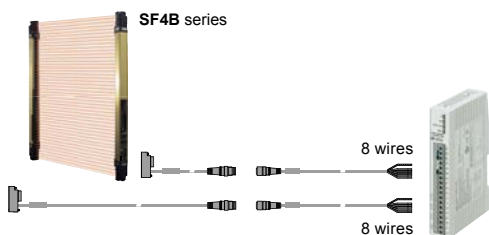
#### Previous

A total of 16 wires

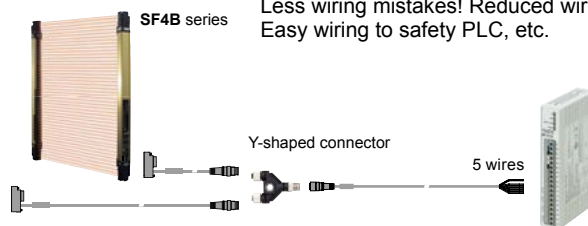
#### Y-shaped connector

Only 5 wires

Less wiring mistakes! Reduced wiring time!  
Easy wiring to safety PLC, etc.



Control unit SF-C13



Control unit SF-C13

Refer to the instruction manual for more details such as installation of Y-shaped connector, terminal wiring, and wiring example.

## OPTIONS

### Front protection cover (excluding SF4B-□G□<V2>) / Protection bar set (excluding SF4B-□G□<V2>) / Corner mirror

Designation			Front protection cover	Protection bar set	Rear/side protection bar set	Corner mirror			
Applicable beam axes	Finger	Hand				Arm / Foot	Model No.	Model No.	Model No.
	23	12	6	FC-SFBH-12	MC-SFBH-12	MC-SFBH-12-T	RF-SFBH-12	236 × 72 mm	9.291 × 2.835 in
	31	16	8	FC-SFBH-16	MC-SFBH-16	MC-SFBH-16-T	RF-SFBH-16	316 × 72 mm	12.441 × 2.835 in
	39	20	10	FC-SFBH-20	MC-SFBH-20	MC-SFBH-20-T	RF-SFBH-20	396 × 72 mm	15.591 × 2.835 in
	47	24	12	FC-SFBH-24	MC-SFBH-24	MC-SFBH-24-T	RF-SFBH-24	476 × 72 mm	18.740 × 2.835 in
	55	28	14	FC-SFBH-28	MC-SFBH-28	MC-SFBH-28-T	RF-SFBH-28	556 × 72 mm	21.890 × 2.835 in
	63	32	16	FC-SFBH-32	MC-SFBH-32	MC-SFBH-32-T	RF-SFBH-32	636 × 72 mm	25.039 × 2.835 in
	71	36	18	FC-SFBH-36	MC-SFBH-36	MC-SFBH-36-T	RF-SFBH-36	716 × 72 mm	28.189 × 2.835 in
	79	40	20	FC-SFBH-40	MC-SFBH-40	MC-SFBH-40-T	RF-SFBH-40	796 × 72 mm	31.339 × 2.835 in
	95	48	24	FC-SFBH-48	MC-SFBH-48	MC-SFBH-48-T	RF-SFBH-48	956 × 72 mm	37.638 × 2.835 in
	111	56	28	FC-SFBH-56	MC-SFBH-56	MC-SFBH-56-T	RF-SFBH-56	1,116 × 72 mm	43.937 × 2.835 in
	127	64	32	FC-SFBH-64	MC-SFBH-64	MC-SFBH-64-T	RF-SFBH-64	1,276 × 72 mm	50.236 × 2.835 in
	—	72	36	FC-SFBH-72	MC-SFBH-72	MC-SFBH-72-T	RF-SFBH-72	1,436 × 72 mm	56.535 × 2.835 in
	—	80	40	FC-SFBH-80	MC-SFBH-80	MC-SFBH-80-T	RF-SFBH-80	1,596 × 72 mm	62.835 × 2.835 in
	—	88	44	FC-SFBH-88	MC-SFBH-88	MC-SFBH-88-T	RF-SFBH-88	1,756 × 72 mm	69.134 × 2.835 in
	—	96	48	FC-SFBH-96	MC-SFBH-96	MC-SFBH-96-T	RF-SFBH-96	1,916 × 72 mm	75.433 × 2.835 in

Note: The model Nos. given above denote a single unit. 2 units are required for use in mounting to the emitter/receiver (excluding corner mirror).

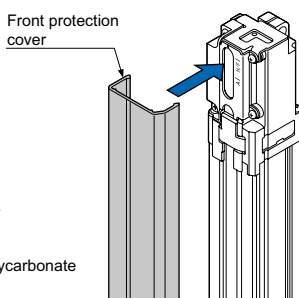
#### Front protection cover

##### • FC-SFBH-□

Protects sensing surface of the safety light curtain from flying objects such as welding spatter. The operating range reduces when the front protection cover is used.

Note: Not available for SF4B-□G□<V2>.

Material: Polycarbonate



#### Operating range

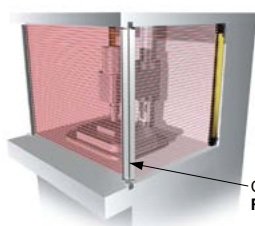
	SF4B-F□	SF4B-H□		SF4B-A□	
		12 to 64 beam axes type	72 to 96 beam axes type	6 to 32 beam axes type	36 to 48 beam axes type
Only emitter installed	0.3 to 6 m 0.984 to 19.685 ft	0.3 to 7.5 m 0.984 to 24.606 ft	0.3 to 6 m 0.984 to 19.685 ft	0.3 to 7.5 m 0.984 to 24.606 ft	0.3 to 6 m 0.984 to 19.685 ft
Only receiver installed	0.3 to 6 m 0.984 to 19.685 ft	0.3 to 7.5 m 0.984 to 24.606 ft	0.3 to 6 m 0.984 to 19.685 ft	0.3 to 7.5 m 0.984 to 24.606 ft	0.3 to 6 m 0.984 to 19.685 ft
Both emitter and receiver installed	0.3 to 5.5 m 0.984 to 18.045 ft	0.3 to 7 m 0.984 to 22.966 ft	0.3 to 5.5 m 0.984 to 18.045 ft	0.3 to 7 m 0.984 to 22.966 ft	0.3 to 5.5 m 0.984 to 18.045 ft

Note: The operating range is the possible setting distance between the emitter and the receiver.

#### Corner mirror

##### • RF-SFBH-□

Normally for L-shaped or U-shaped installation, 2 or 3 sets of safety light curtains are needed. With the use of a corner mirror reflecting the light, one set of safety light curtain is possible for L-shaped or U-shaped installation.



Corner mirror  
RF-SFBH-□

#### Operating range

With 1 corner mirror	Declined to 90 %
With 2 corner mirror	Declined to 80 %

#### Protection bar set

##### • MC-SFBH-□

Note 1: Not available for SF4B-□G□<V2>.

M5 hexagon-socket-head bolt with washers

Protection bar mounting bracket

Protection bar

Safety light curtain

M5 hexagon-socket-head bolt

Protection bar intermediate supporting bracket MS-SFB-6 (Optional) (Note 3)

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

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M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

#### Rear/side protection bar set

##### • MC-SFBH-□-T

Note 1: Not available for SF4B-□G□<V2>.

<Rear mounting>

<Side mounting>

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

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M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

M5 hexagon-socket-head bolt

#### • Parts List

Designation	MC-SFBH-□		MC-SFBH-□-T	
	Number	Remarks	Number	Remarks
Protection bar	1 pc.	Material: Aluminum	1 pc.	Material: Aluminum
Protection bar mounting bracket (For left side, for right side)	1 pc. each	Material: Die-cast zinc alloy	1 pc. each (Note 2)	Material: Cold rolled carbon steel (SPCC) (Trivalent chrome plated)
Hexagon-socket-head bolt with washers	2 pcs.	M5 (length: 20 mm 0.787 in)	2 pcs.	M5 (length: 20 mm 0.787 in)
Hexagon-socket-head bolt	2 pcs.	M5 (length: 16 mm 0.630 in)	2 pcs.	M5 (length: 18 mm 0.709 in)

Notes: 2) Available as a spare part. Model No.: MS-MCSFB-1-T

3) The protection bar intermediate supporting bracket MS-SFB-6 (optional) is installed to protection bars that are longer than the MC-SFBH-48(-T). Use if there is much flexure bending in the protection bar. Please contact our office for details.

• Protection bar intermediate supporting bracket MS-SFB-6 (Optional)  
Material: Cold rolled carbon steel (SPCC) (Trivalent chrome plated)

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MICRO PHOTO-ELECTRIC SENSORS

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SF4B-C

SF4C

BSF4-AH80

SF2B

SF2C

Definition of Sensing Heights

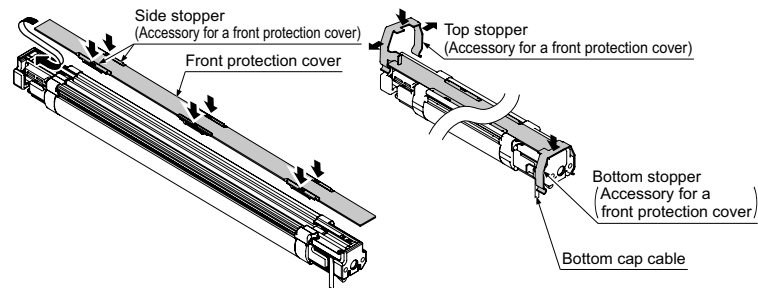


## OPTIONS

### Front protection cover (For SF4B-□G□<V2>)

Applicable beam axes			Designation	Front protection cover
Finger	Hand	Arm / foot	Model No.	
23	12	6	<b>FC-SF4BG-H12</b>	
31	16	8	<b>FC-SF4BG-H16</b>	
39	20	10	<b>FC-SF4BG-H20</b>	
47	24	12	<b>FC-SF4BG-H24</b>	
55	28	14	<b>FC-SF4BG-H28</b>	
63	32	16	<b>FC-SF4BG-H32</b>	
71	36	18	<b>FC-SF4BG-H36</b>	
79	40	20	<b>FC-SF4BG-H40</b>	
95	48	24	<b>FC-SF4BG-H48</b>	
111	56	28	<b>FC-SF4BG-H56</b>	
127	64	32	<b>FC-SF4BG-H64</b>	
—	72	36	<b>FC-SF4BG-H72</b>	
—	80	40	<b>FC-SF4BG-H80</b>	
—	88	44	<b>FC-SF4BG-H88</b>	
—	96	48	<b>FC-SF4BG-H96</b>	

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



Material: Front protection cover ... Polycarbonate  
Top / Side / Bottom stopper ... Stainless steel (SUS304)

### Operating range

	SF4B-F□G□<V2>	SF4B-H□G□<V2>		SF4B-A□G□<V2>	
		12 to 64 beam axes type	72 to 96 beam axes type	6 to 32 beam axes type	36 to 48 beam axes type
Only emitter installed	0.3 to 6 m 0.984 to 19.685 ft	0.3 to 7.5 m 0.984 to 24.606 ft	0.3 to 6 m 0.984 to 19.685 ft	0.3 to 7.5 m 0.984 to 24.606 ft	0.3 to 6 m 0.984 to 19.685 ft
Only receiver installed					
Both emitter and receiver installed	0.3 to 5.5 m 0.984 to 18.045 ft	0.3 to 7 m 0.984 to 22.966 ft	0.3 to 5.5 m 0.984 to 18.045 ft	0.3 to 7 m 0.984 to 22.966 ft	0.3 to 5.5 m 0.984 to 18.045 ft

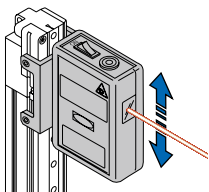
Note: The operating range is the possible setting distance between the emitter and the receiver.

### Others

Designation	Model No.	Description
Test rod ø45	<b>SF4B-TR45</b>	Min. sensing object for regular checking (ø45 mm ø1.772 in), with arm / foot protection type (min. sensing object ø45 mm ø1.772 in)
Laser alignment tool (Excluding SF4B-□G□<V2>)	<b>SF-LAT-2N</b>	Allows easy beam axis alignment using easy-to-see laser beam
Laser alignment tool (For SF4B-□G□<V2>)	<b>SF-LAT-4BG</b>	Allows easy beam axis alignment using easy-to-see laser beam
Caution tape	<b>SF-TP-BG10</b>	Attached to the side of the safety light curtain to alert workers to hazards (10 m 32.8 ft long)

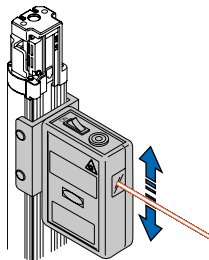
### Laser alignment tool (Excluding SF4B-□G□<V2>)

• SF-LAT-2N



### Laser alignment tool (For SF4B-□G□<V2>)

• SF-LAT-4BG



### Caution tape

• SF-TP-BG10



SF4D

SF4B/  
SF4B-G

SF4B-C

SF4C

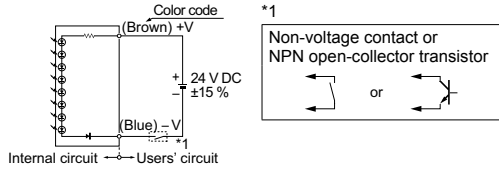
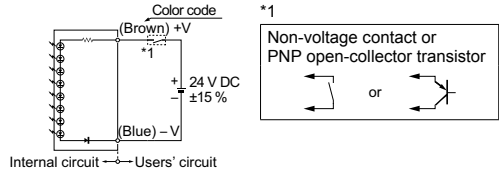
BSF4-AH80

SF2B

SF2C

Definition of  
Sensing Heights

## OPTIONS

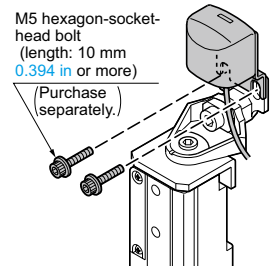
Designation	Model No.	Description
Large display unit for safety light curtain	<b>SF-IND-2</b>	<p>With the auxiliary output of the safety light curtain, the operation is easily observable from various directions.</p> <p><b>Specifications</b></p> <ul style="list-style-type: none"> <li>Supply voltage: 24 V DC <math>\pm 15\%</math></li> <li>Current consumption: 12 mA or less</li> <li>Indicators: Orange LED (8 pcs. used) [Light up when external contact is ON]</li> <li>Ambient temperature: <math>-10</math> to <math>+55\text{ }^{\circ}\text{C}</math> <math>+14</math> to <math>+131\text{ }^{\circ}\text{F}</math> (No dew condensation or icing allowed)</li> <li>Material: POM (Enclosure) Polycarbonate (Cover) Cold rolled carbon steel (SPCC) (Bracket)</li> <li>Cable: 0.3 mm<sup>2</sup> 2-core cabtyre cable, 3 m <b>9.843 ft</b> long</li> <li>Weight: 70 g approx. (including bracket)</li> </ul> <p><b>I/O circuit diagrams</b></p> <p><b>With NPN output type</b></p>  <p><b>With PNP output type</b></p> 

## Large display unit for safety light curtain

## • SF-IND-2

M5 hexagon-socket-head bolt  
(length: 10 mm **0.394 in** or more)

(Purchase separately.)



Attaches to top of safety light curtain. Tighten together the mounting bracket provided with the safety light curtain **MS-SFB-1/4**, **MS-SFBG-1** and the attached mounting bracket of **SF-IND-2**.

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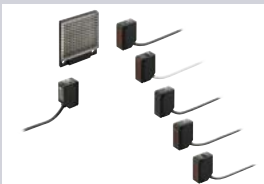
BSF4-AH80

SF2B

SF2C

Definition of Sensing Heights

## Introduction to Panasonic Industrial Devices SUNX sensors that can be used as muting sensors

Compact Photoelectric Sensor  
**CX-400 SERIES Ver.2**

- World standard size
- Wide variation

▶ P.245~

Ultra-slim Photoelectric Sensor  
**EX-10 SERIES Ver.2**

- 3.5 mm **0.138 in** thickness
- Long sensing range: 1 m **3.281 ft** (thru-beam type: **EX-19**)
- \* The **EX-20** series that is compatible with M3 mounting screws is also available.

▶ P.279~

U-shaped Micro Photoelectric Sensor  
**PM-25/45/65 SERIES**

- Three protection circuits standard on all models
- Ample beam emitting / receiving distance of 6 mm **0.236 in**
- Easy to mount with M3 screws

▶ P.395~

Rectangular-shaped Inductive Proximity Sensor  
**GX-F/H SERIES**

- Industry longest in stable sensing range
- 10 times the durability (Compared to previous models)
- IP68G rating

▶ P.785~

SPECIFICATIONS

Safety light curtain individual specifications

SF4B-F□(G)<V2>

Type		Min. sensing object ø14 mm ø0.551 in type (10 mm 0.394 in beam pitch)									
Item	Model No.	SF4B-F23□<V2>	SF4B-F23G<V2>	SF4B-F31□<V2>	SF4B-F31G<V2>	SF4B-F39□<V2>	SF4B-F39G<V2>	SF4B-F47□<V2>	SF4B-F47G<V2>	SF4B-F55□<V2>	SF4B-F55G<V2>
Number of beam channels		23		31		39		47		55	
Protective height (Note 2)		230 mm 9.055 in	244 mm 9.606 in	310 mm 12.205 in	324 mm 12.756 in	390 mm 15.354 in	404 mm 15.906 in	470 mm 18.504 in	484 mm 19.055 in	550 mm 21.654 in	564 mm 22.205 in
	China Press compliant (GB/T 4584)	220 mm 8.661 in		300 mm 11.811 in		380 mm 14.960 in		460 mm 18.110 in		540 mm 21.260 in	
Current consumption		Emitter: 80 mA or less, Receiver: 120 mA or less						Emitter: 100 mA or less, Receiver: 160 mA or less			
PFHd		2.4 × 10 <sup>-9</sup>		2.8 × 10 <sup>-9</sup>		3.2 × 10 <sup>-9</sup>		3.6 × 10 <sup>-9</sup>		4.0 × 10 <sup>-9</sup>	
MTTFd		100 years or more									
Net weight (Total of emitter and receiver)		510 g approx.	980 g approx.	660 g approx.	1,340 g approx.	810 g approx.	1,700 g approx.	960 g approx.	2,000 g approx.	1,110 g approx.	2,400 g approx.

Type		Min. sensing object ø14 mm <b>ø0.551 in</b> type (10 mm <b>0.394 in</b> beam pitch)							
Item	Model No.	SF4B-F63□<V2>	SF4B-F63G<V2>	SF4B-F71□<V2>	SF4B-F71G<V2>	SF4B-F79□<V2>	SF4B-F79G<V2>	SF4B-F95□<V2>	SF4B-F95G<V2>
Number of beam channels		63		71		79		95	
Protective height (Note 2)		630 mm 24.803 in	644 mm 25.354 in	710 mm 27.953 in	724 mm 28.504 in	790 mm 31.102 in	804 mm 31.654 in	950 mm 37.402 in	964 mm 37.953 in
	China Press compliant (GB/T 4584)	620 mm 24.409 in		700 mm 27.559 in		780 mm 30.708 in		940 mm 37.007 in	
Current consumption		Emitter: 100 mA or less, Receiver: 160 mA or less				Emitter: 115 mA or less, Receiver: 190 mA or less			
PFHd		4.4 × 10 <sup>-9</sup>		4.8 × 10 <sup>-9</sup>		5.2 × 10 <sup>-9</sup>		6.0 × 10 <sup>-9</sup>	
MTTFd		100 years or more							
Net weight (Total of emitter and receiver)		1,260 g approx.	2,800 g approx.	1,420 g approx.	3,200 g approx.	1,570 g approx.	3,400 g approx.	1,870 g approx.	4,200 g approx.

Type		Min. sensing object ø14 mm ø0.551 in type (10 mm 0.394 in beam pitch)			
Item	Model No.	SF4B-F111□<V2>	SF4B-F111G<V2>	SF4B-F127□<V2>	SF4B-F127G<V2>
Number of beam channels		111		127	
Protective height (Note 2)		1,110 mm 43.701 in	1,124 mm 44.252 in	1,270 mm 50.000 in	1,284 mm 50.551 in
	China Press compliant (GB/T 4584)	1,100 mm 43.306 in		1,260 mm 49.606 in	
Current consumption		Emitter: 135 mA or less, Receiver: 230 mA or less			
PFHD		6.8 × 10 <sup>-9</sup>		7.6 × 10 <sup>-9</sup>	
MTTFd		100 years or more			
Net weight (Total of emitter and receiver)		2,170 g approx.	5,000 g approx.	2,470 g approx.	5,600 g approx.

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F. The model No. with "G" is a robust type.  
PFHd: Probability of dangerous failure per hour, MTTFd: Mean time to dangerous failure (in years)  
2) In the case of "When used as safety device for presses in China", the distance between the center of the first beam axis and the center of the last beam axis of the device becomes the protective height. For details, refer to "Definition of sensing heights" (p.645).

SF4D

SF4B/  
SF4B-G

SF4B-C

SF4C

BSF4-AH80

SF2B

SF2C

Definition of  
Sensing Heights



## SPECIFICATIONS

**SF4B-H□(G□)<V2>**

Type		Min. sensing object ø25 mm <b>ø0.984 in</b> type (20 mm <b>0.787 in</b> beam pitch)									
Item	Model No.	SF4B-H12□<V2>	SF4B-H12G□<V2>	SF4B-H16□<V2>	SF4B-H16G□<V2>	SF4B-H20□<V2>	SF4B-H20G□<V2>	SF4B-H24□<V2>	SF4B-H24G□<V2>	SF4B-H28□<V2>	SF4B-H28G□<V2>
Number of beam channels		12		16		20		24		28	
Protective height (Note 2)		230 mm 9.055 in	244 mm 9.606 in	310 mm 12.205 in	324 mm 12.756 in	390 mm 15.354 in	404 mm 15.906 in	470 mm 18.504 in	484 mm 19.055 in	550 mm 21.654 in	564 mm 22.205 in
	China Press compliant (GB/T 4584)	220 mm 8.661 in		300 mm 11.811 in		380 mm 14.960 in		460 mm 18.110 in		540 mm 21.260 in	
Current consumption		Emitter: 70 mA or less, Receiver: 95 mA or less						Emitter: 80 mA or less, Receiver: 115 mA or less			
PFHD		1.8 × 10 <sup>-9</sup>		2.0 × 10 <sup>-9</sup>		2.2 × 10 <sup>-9</sup>		2.4 × 10 <sup>-9</sup>		2.6 × 10 <sup>-9</sup>	
MTTFD		100 years or more									
Net weight (Total of emitter and receiver)		510 g approx.	980 g approx.	660 g approx.	1,340 g approx.	810 g approx.	1,700 g approx.	960 g approx.	2,000 g approx.	1,110 g approx.	2,400 g approx.

Type		Min. sensing object ø25 mm ø0.984 in type (20 mm 0.787 in beam pitch)									
Item	Model No.	SF4B-H32□<V2>	SF4B-H32G□<V2>	SF4B-H36□<V2>	SF4B-H36G□<V2>	SF4B-H40□<V2>	SF4B-H40G□<V2>	SF4B-H48□<V2>	SF4B-H48G□<V2>	SF4B-H56□<V2>	SF4B-H56G□<V2>
Number of beam channels		32		36		40		48		56	
Protective height (Note 2)		630 mm 24.803 in	644 mm 25.354 in	710 mm 27.953 in	724 mm 28.504 in	790 mm 31.102 in	804 mm 31.654 in	950 mm 37.402 in	964 mm 37.953 in	1,110 mm 43.701 in	1,124 mm 44.252 in
	China Press compliant (GB/T 4584)	620 mm 24.409 in		700 mm 27.559 in		780 mm 30.708 in		940 mm 37.007 in		1,100 mm 43.306 in	
Current consumption		Emitter: 80 mA or less, Receiver: 115 mA or less				Emitter: 90 mA or less, Receiver: 140 mA or less				Emitter: 100 mA or less, Receiver: 160 mA or less	
PFHD		2.8 × 10 <sup>-9</sup>		3.0 × 10 <sup>-9</sup>		3.2 × 10 <sup>-9</sup>		3.6 × 10 <sup>-9</sup>		4.0 × 10 <sup>-9</sup>	
MTTFD		100 years or more									
Net weight (Total of emitter and receiver)		1,260 g approx.	2,800 g approx.	1,420 g approx.	3,200 g approx.	1,570 g approx.	3,400 g approx.	1,870 g approx.	4,200 g approx.	2,170 g approx.	5,000 g approx.

Type		Min. sensing object ø25 mm <span>ø0.984 in</span> type (20 mm <span>0.787 in</span> beam pitch)									
Item	Model No.	SF4B-H64□<V2>	SF4B-H64G□<V2>	SF4B-H72□<V2>	SF4B-H72G□<V2>	SF4B-H80□<V2>	SF4B-H80G□<V2>	SF4B-H88□<V2>	SF4B-H88G□<V2>	SF4B-H96□<V2>	SF4B-H96G□<V2>
Number of beam channels		64		72		80		88		96	
Protective height (Note 2)		1,270 mm <span>50.000 in</span>	1,284 mm <span>50.551 in</span>	1,430 mm <span>56.299 in</span>	1,444 mm <span>56.850 in</span>	1,590 mm <span>62.598 in</span>	1,604 mm <span>63.150 in</span>	1,750 mm <span>68.898 in</span>	1,764 mm <span>69.449 in</span>	1,910 mm <span>75.197 in</span>	1,924 mm <span>75.748 in</span>
	China Press compliant (GB/T 4584)	1,260 mm <span>49.606 in</span>		1,420 mm <span>55.905 in</span>		1,580 mm <span>62.205 in</span>		1,740 mm <span>68.503 in</span>		1,900 mm <span>74.803 in</span>	
Current consumption		Emitter: 100 mA or less, Receiver: 160 mA or less		Emitter: 110 mA or less, Receiver: 180 mA or less				Emitter: 120 mA or less, Receiver: 200 mA or less			
PFHD		4.4 × 10 <sup>-9</sup>		4.8 × 10 <sup>-9</sup>		5.2 × 10 <sup>-9</sup>		5.6 × 10 <sup>-9</sup>		6.0 × 10 <sup>-9</sup>	
MTTFd		100 years or more									
Net weight (Total of emitter and receiver)		2,470 g approx.	5,600 g approx.	2,770 g approx.	6,400 g approx.	3,070 g approx.	7,000 g approx.	3,370 g approx.	7,800 g approx.	3,670 g approx.	8,400 g approx.

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F. The model No. with "G" is a robust type.

PFHD: Probability of dangerous failure per hour, MTTFD: Mean time to dangerous failure (in years)

2) In the case of "When used as safety device for presses in China", the distance between the center of the first beam axis and the center of the last beam axis of the device becomes the protective height. For details, refer to "Definition of sensing heights" (p.645).

FIBER  
SENSORSLASER  
SENSORSPHOTO-  
ELECTRIC  
SENSORSMICRO  
PHOTO-  
ELECTRIC  
SENSORSAREA  
SENSORSSAFETY LIGHT  
CURTAINS/  
SAFETY  
COMPONENTSPRESSURE /  
FLOW  
SENSORSINDUCTIVE  
PROXIMITY  
SENSORSPARTICULAR  
USE  
SENSORSSENSOR  
OPTIONSSIMPLE  
WIRE-SAVING  
UNITSWIRE-SAVING  
SYSTEMSMEASURE-  
MENT  
SENSORSSTATIC  
CONTROL  
DEVICESLASER  
MARKERS

PLC

HUMAN  
MACHINE  
INTERFACESENERGY  
MANAGEMENT  
SOLUTIONSFA  
COMPONENTSMACHINE  
VISION  
SYSTEMSUV  
CURING  
SYSTEMSSelection  
GuideSafety Light  
CurtainsSafety  
Control UnitsSafety  
Components**SF4D****SF4B/  
SF4B-G****SF4B-C****SF4C****BSF4-AH80****SF2B****SF2C**Definition of  
Sensing Heights

## SPECIFICATIONS

### SF4B-A□(G)<V2>

Type		Min. sensing object ø45 mm <b>ø1.772 in</b> type (40 mm <b>1.575 in</b> beam pitch)									
Item	Model No.	SF4B-A6□<V2>	SF4B-A6G□<V2>	SF4B-A8□<V2>	SF4B-A8G□<V2>	SF4B-A10□<V2>	SF4B-A10G□<V2>	SF4B-A12□<V2>	SF4B-A12G□<V2>	SF4B-A14□<V2>	SF4B-A14G□<V2>
Number of beam channels		6		8		10		12		14	
Protective height (Note 2)		230 mm 9.055 in	244 mm 9.606 in	310 mm 12.205 in	324 mm 12.756 in	390 mm 15.354 in	404 mm 15.906 in	470 mm 18.504 in	484 mm 19.055 in	550 mm 21.654 in	564 mm 22.205 in
	China Press compliant (GB/T 4584)	200 mm 7.874 in		280 mm 11.024 in		360 mm 14.173 in		440 mm 17.323 in		520 mm 20.472 in	
Current consumption		Emitter: 65 mA or less, Receiver: 85 mA or less						Emitter: 70 mA or less, Receiver: 95 mA or less			
PFHD		1.5 × 10 <sup>-9</sup>		1.6 × 10 <sup>-9</sup>		1.7 × 10 <sup>-9</sup>		1.8 × 10 <sup>-9</sup>		1.9 × 10 <sup>-9</sup>	
MTTFd		100 years or more									
Net weight (Total of emitter and receiver)		510 g approx.	980 g approx.	660 g approx.	1,340 g approx.	810 g approx.	1,700 g approx.	960 g approx.	2,000 g approx.	1,110 g approx.	2,400 g approx.

Type		Min. sensing object ø45 mm <b>ø1.772 in</b> type (40 mm <b>1.575 in</b> beam pitch)									
Item	Model No.	SF4B-A16□<V2>	SF4B-A16G□<V2>	SF4B-A18□<V2>	SF4B-A18G□<V2>	SF4B-A20□<V2>	SF4B-A20G□<V2>	SF4B-A24□<V2>	SF4B-A24G□<V2>	SF4B-A28□<V2>	SF4B-A28G□<V2>
Number of beam channels		16		18		20		24		28	
Protective height (Note 2)		630 mm 24.803 in	644 mm 25.354 in	710 mm 27.953 in	724 mm 28.504 in	790 mm 31.102 in	804 mm 31.654 in	950 mm 37.402 in	964 mm 37.953 in	1,110 mm 43.701 in	1,124 mm 44.252 in
	China Press compliant (GB/T 4584)	600 mm 23.622 in		680 mm 26.772 in		760 mm 29.921 in		920 mm 36.220 in		1,080 mm 42.520 in	
Current consumption		Emitter: 70 mA or less, Receiver: 95 mA or less				Emitter: 75 mA or less, Receiver: 105 mA or less				Emitter: 80 mA or less, Receiver: 120 mA or less	
PFHD		2.0 × 10 <sup>-9</sup>		2.1 × 10 <sup>-9</sup>		2.2 × 10 <sup>-9</sup>		2.4 × 10 <sup>-9</sup>		2.6 × 10 <sup>-9</sup>	
MTTFd		100 years or more									
Net weight (Total of emitter and receiver)		1,260 g approx.	2,800 g approx.	1,420 g approx.	3,200 g approx.	1,570 g approx.	3,400 g approx.	1,870 g approx.	4,200 g approx.	2,170 g approx.	5,000 g approx.

Type		Min. sensing object ø45 mm <b>ø1.772 in</b> type (40 mm <b>1.575 in</b> beam pitch)									
Item	Model No.	SF4B-A32□<V2>	SF4B-A32G□<V2>	SF4B-A36□<V2>	SF4B-A36G□<V2>	SF4B-A40□<V2>	SF4B-A40G□<V2>	SF4B-A44□<V2>	SF4B-A44G□<V2>	SF4B-A48□<V2>	SF4B-A48G□<V2>
Number of beam channels		32		36		40		44		48	
Protective height (Note 2)		1,270 mm <b>50.000 in</b>	1,284 mm <b>50.551 in</b>	1,430 mm <b>56.299 in</b>	1,444 mm <b>56.850 in</b>	1,590 mm <b>62.598 in</b>	1,604 mm <b>63.150 in</b>	1,750 mm <b>68.898 in</b>	1,764 mm <b>69.449 in</b>	1,910 mm <b>75.197 in</b>	1,924 mm <b>75.748 in</b>
	China Press compliant (GB/T 4584)	1,240 mm <b>48.819 in</b>		1,400 mm <b>55.118 in</b>		1,560 mm <b>61.417 in</b>		1,720 mm <b>67.716 in</b>		1,880 mm <b>74.016 in</b>	
Current consumption		Emitter: 80 mA or less, Receiver: 120 mA or less		Emitter: 85 mA or less, Receiver: 130 mA or less				Emitter: 95 mA or less, Receiver: 140 mA or less			
PFHD		2.8 × 10 <sup>-9</sup>		3.0 × 10 <sup>-9</sup>		3.2 × 10 <sup>-9</sup>		3.4 × 10 <sup>-9</sup>		3.6 × 10 <sup>-9</sup>	
MTTFd		100 years or more									
Net weight (Total of emitter and receiver)		2,470 g approx.	5,600 g approx.	2,770 g approx.	6,400 g approx.	3,070 g approx.	7,000 g approx.	3,370 g approx.	7,800 g approx.	3,670 g approx.	8,400 g approx.

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C **+68 °F**. The model No. with "G" is a robust type.

PFHD: Probability of dangerous failure per hour, MTTFd: Mean time to dangerous failure (in years)

2) In the case of "When used as safety device for presses in China", the distance between the center of the first beam axis and the center of the last beam axis of the device becomes the protective height. For details, refer to "Definition of sensing heights" (p.645).

### Safety light curtain common specifications

Type	Min. sensing object ø14 mm <b>ø0.551 in</b> type	Min. sensing object ø25 mm <b>ø0.984 in</b> type	Min. sensing object ø45 mm <b>ø1.772 in</b> type
Model No.	<b>SF4B-F□(G)&lt;V2&gt;</b>	<b>SF4B-H□(G□)&lt;V2&gt;</b>	<b>SF4B-A□(G)&lt;V2&gt;</b>
SFB-HC non-compatible	<b>SF4B-F□-01&lt;V2&gt;</b>	<b>SF4B-H□-01&lt;V2&gt;</b>	<b>SF4B-A□-01&lt;V2&gt;</b>
Korean press compliant	<b>SF4B-F□-03&lt;V2&gt;</b>	<b>SF4B-H□-03&lt;V2&gt;</b>	—
International standard	IEC 61496-1/2 (Type 4), ISO 13849-1 (Category 4, PLe), IEC 61508-1 to 7 (SIL3)		
Japan	JIS B 9704-1/2 (Type 4), JIS B 9705-1 (Category 4), JIS C 0508-1 to 7 (SIL3)		
Europe (EU)	EN 61496-1 (Type 4), EN ISO 13849-1 (Category 4, PLe), EN 61508-1 to 7 (SIL3), EN 55011, EN 50178, EN 61000-6-2		
North America	ANSI/UL 61496-1/2 (Type 4), ANSI/UL 508, UL 1998 (Class 2), CAN/CSA 61496-1/2 (Type 4), CAN/CSA C22.2 No.14, OSHA 1910.212, OSHA 1910.217(C), ANSI B11.1 to B11.19, ANSI/RIA 15.06		
South Korea (S-Mark)	S1-G-35-2005, S2-W-11-2003 ( <b>SF4B-□&lt;V2&gt;</b> only)		
China (GB)	GB/T 4584 (excluding <b>SF4B-□-03&lt;V2&gt;</b> )		
CE marking directive compliance	Machinery Directive, EMC Directive, RoHS Directive		

SF4D

SF4B/  
SF4B-G

SF4B-C

SF4C

BSF4-AH80

SF2B

SF2C

Definition of  
Sensing Heights

### Safety light curtain common specifications

FIBER SENSORS  
 LASER SENSORS  
 PHOTO-ELECTRIC SENSORS  
 MICRO PHOTO-ELECTRIC SENSORS  
 AREA SENSORS  
 SAFETY LIGHT CURTAIN SAFETY COMPONENTS  
 PRESSURE FLOW SENSORS  
 INDUCTIVE PROXIMITY SENSORS  
 PARTICULAR USE SENSORS  
 SENSOR OPTIONS  
 SIMPLE WIRE-SAVING UNITS  
 WIRE-SAVING SYSTEMS  
 MEASUREMENT SENSORS  
 STATIC CONTROL DEVICES  
 LASER MARKERS  
 PLC  
 HUMAN MACHINE INTERFACES  
 ENERGY MANAGEMENT SOLUTIONS  
 FA COMPONENTS  
 MACHINE VISION SYSTEMS  
 UV CURING SYSTEMS  
 Selection Guide  
 Safety Light Curtains  
 Safety Control Units  
 Safety Components  
**SF4D**  
**SF4B/SF4B-G**  
**SF4B-C**  
**SF4C**  
**BSF4-AH80**  
**SF2B**  
**SF2C**  
 Definition of Sensing Head

Model Nos. having the suffix "G" are robust type.

- 2) Please comply with the safety distance setting.
- 3) The operating range is the possible setting distance between the emitter and the receiver.
- 4) When the floating blanking function is used, the size of the min. sensing object is changed. For details, refer to **"Safety distance"** (p.532).
- 5) The outputs are not "OFF" when muting function is active even if the beam channel is interrupted.
- 6) In case the blanking function is valid, the operation mode is changed. For details, refer to **"Safety distance"** (p.532).
- 7) In case of using this function, please use 12-core cable.
- 8) The manual reset and auto reset are possible to be switched depending on the wiring status.
- 9) In case of using optional function, the handy-controller (**SFB-HC**) (optional) is required. However, a handy-controller cannot be used with the **SF4B-□01<V2>**, **SF4B-□03<V2>** and the **SF-C14EX-01**.
- 10) The cable can be extended within 30 m **98.425 ft** (for emitter/receiver) when two safety light curtains are connected in series, within 20 m **65.617 ft** when three safety light curtains are connected in series. Furthermore, when the muting lamp is used, the cable can be extended within 40 m **131.234 ft** (for emitter/receiver).
- 11) The intermediate supporting bracket (**MS-SFB-2**) is enclosed with the following models. The number of sets required varies depending on the product.
 

1 set: <b>SF4B-F□&lt;V2&gt;</b> .....	79 to 111 beam channels, <b>SF4B-H□&lt;V2&gt;</b> .....	40 to 56 beam channels,
<b>SF4B-A□&lt;V2&gt;</b> .....	20 to 28 beam channels	
2 sets: <b>SF4B-F127&lt;V2&gt;</b> , <b>SF4B-H□&lt;V2&gt;</b> .....	64 to 80 beam channels, <b>SF4B-A□&lt;V2&gt;</b> .....	32 to 40 beam channels
3 sets: <b>SF4B-H□&lt;V2&gt;</b> .....	88 to 96 beam channels, <b>SF4B-A□&lt;V2&gt;</b> .....	44 to 48 beam channels
- 12) The intermediate supporting bracket (**MS-SF4BG-2**) is enclosed with the following models.
 

1 set: <b>SF4B-F□G&lt;V2&gt;</b> .....	79 to 127 beam channels, <b>SF4B-H□G&lt;V2&gt;</b> .....	40 to 64 beam channels
<b>SF4B-A□G&lt;V2&gt;</b> .....	20 to 32 beam channels	
2 sets: <b>SF4B-H□G&lt;V2&gt;</b> .....	72 to 96 beam channels, <b>SF4B-A□G&lt;V2&gt;</b> .....	36 to 48 beam channels



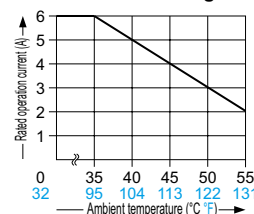
## SPECIFICATIONS

### Control units

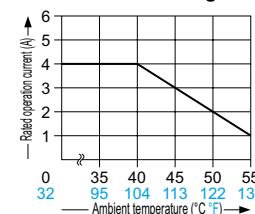
Item	Model No.	SF-C11 (Note 2)	SF-C12	SF-C13 (Note 2)
Connectable safety light curtains		<b>SF4B / SF4B-G / SF4D / SF2B</b> series	<b>SF4B / SF4B-G</b> series	Safety light curtains manufactured by Panasonic Industrial Devices SUNX
Applicable standards		IEC 61496-1, EN 61496-1, ANSI/UL 61496-1, CAN/CSA 61496-1, JIS B 9704-1, etc.		
CE marking directive compliance		Machinery Directive, Low Voltage ( <b>SF-C11/C13</b> only) Directive, EMC Directive, RoHS Directive		
Control category		ISO 13849-1 (EN ISO 13849-1, JIS B 9705-1) compliance up to Category 4, PLe standards		
Supply voltage / Current consumption		24 V DC $\pm 10\%$ Ripple P-P 10 % or less / 100 mA or less (without safety light curtain)		
Fuse (rating)		Built-in electronic fuse, Triggering current: 0.5 A or more, Reset after power down		
Safety output		NO contact $\times 3$ (13-14, 23-24, 33-34)	NO contact $\times 2$ (13-14, 23-24)	NO contact $\times 3$ (13-14, 23-24, 33-34)
Utilization category		AC-15, DC-13 (IEC 60947-5-1)		
Rated operation voltage (Ue) / Rated operation current (Ie)		30 V DC / 6 A, 230 V AC / 6 A, resistive load (For inductive load, during contact protection) Min. applicable load: 10 mA (at 24 V DC) (Note 3)	24 V DC / 1 A, resistive load (For inductive load, during contact protection) Min. applicable load: 15 mA (at 24 V DC)	30 V DC / 4 A, 230 V AC / 4 A, resistive load (For inductive load, during contact protection) Min. applicable load: 10 mA (at 24 V DC) (Note 3)
Contact resistance		100 m $\Omega$ or less (initial value)	50 m $\Omega$ or less (initial value)	100 m $\Omega$ or less (initial value)
Contact protection fuse rating		6 A (slow blow)	3 A (slow blow)	4 A (slow blow)
Pick-up delay (Auto reset/Manual reset)		80 ms or less / 90 ms or less	30 ms or less / 30 ms or less	80 ms or less / 90 ms or less
Response time		10 ms or less	14 ms or less	10 ms or less
Auxiliary output		Safety relay contact (NC contact) $\times 1$ (41-42) (Related to safety output)	Safety relay contact (NC contact) $\times 1$ (31-32) (Related to safety output)	Safety relay contact (NC contact) $\times 1$ (41-42) (Related to safety output)
Rated operation voltage/current		24 V DC / 2 A, Min. applicable load: 10 mA (at 24 V DC)	30 V DC / 3 A, Min. applicable load: 15 mA (at 24 V DC)	24 V DC / 2 A, Min. applicable load: 10 mA (at 24 V DC)
Contact protection fuse rating		2 A (slow blow)	3 A (slow blow)	2 A (slow blow)
Semiconductor auxiliary output (AUX)		<Minus ground (Setting for PNP)> PNP open-collector transistor <Plus ground (Setting for NPN)> NPN open-collector transistor	—	PNP open-collector transistor
Output operation		Related to auxiliary output of safety light curtain	—	ON when the safety light curtain is interrupted
Excess voltage category		II	III	II
Polarity selection function (Note 4)		Incorporated (Sliding switch allows selection of plus/minus ground) Minus ground: Correspond to PNP output safety light curtain Plus ground: Correspond to NPN output safety light curtain	—	Incorporated (Cable connection allows selection of plus/minus ground) Minus ground: Correspond to PNP output safety light curtain Plus ground: Correspond to NPN output safety light curtain
Pollution degree		2		
Protection		Enclosure: IP40, Terminal: IP20	IP65	Enclosure: IP40, Terminal: IP20
Ambient temperature		-10 to +55 °C <b>+14 to +131 °F</b> (No dew condensation or icing allowed), Storage: -25 to +70 °C <b>-13 to +158 °F</b>		
Enclosure material		ABS	Die-cast aluminum	ABS
Weight		Net weight: 320 g approx.	Net weight: 1 kg approx.	Net weight: 200 g approx.

- Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C **+68 °F**.  
 2) **SF-C11** and **SF-C13** have acquired the Korea S-mark.  
 3) If several **SF-C11** or **SF-C13** units are being used in a line together, leave a space of 5 mm **0.197 in** or more between each unit. If the units are touching each other, reduce the rated operating current for safety output in accordance with the ambient operating temperature as shown in the graphs at right.  
 4) Please switch the sliding switch to the PNP side for minus ground and to the NPN side for plus ground.  
 5) Refer to p.667 for details of the specifications for the control unit **SF-C11/C12/C13**.

**Dilating when SF-C11 units are mounted close together**



**Dilating when SF-C13 units are mounted close together**



Item	Model No.	SF-C14EX(-01) (Note 2)
Connectable safety light curtains		<b>SF4B / SF4B-G</b> series
Applicable standards		IEC 61496-1, EN 61496-1, ANSI/UL 61496-1, CAN/CSA 61496-1, JIS B 9704-1, etc.
CE marking directive compliance		Machinery Directive, EMC Directive, RoHS Directive
Control category		ISO 13849-1 (EN ISO 13849-1, JIS B 9705-1) compliance up to Category 4, PLe standards
Supply voltage / Current consumption		24 V DC $\pm 10\%$ Ripple P-P 10 % or less / 0.2 A or less (without safety light curtain and other external connecting device)
Safety output (Safety output 1, 2, 3)		PNP open-collector transistor 2 outputs $\times 3$ or NPN open-collector transistor 2 outputs $\times 3$ (selectable using a slider switch)
Operation mode (Output operation)		Safety output 1: ON when the safety light curtain is in light receiving condition, OFF when the safety light curtain is in light interrupted condition (Note 3) Safety output 2: ON when the safety light curtain is in light receiving condition or the muting function is valid OFF when the safety light curtain is in light interrupted condition and the muting function is invalid (Note 3) Safety output 3: ON when the emergency stop is invalid, OFF when the emergency stop is valid
Response time		OFF response: 14 ms or less (Safety output 1 and 2: including the response time of the safety light curtain) ON response: 90 ms or less (auto-reset) / 140 ms or less (manual reset) (Note 4)
Auxiliary outputs [Auxiliary output 1, 2, 3, 4 (Note 5)]		PNP open-collector transistor $\times 3$ or NPN open-collector transistor $\times 3$ (selectable using a slider switch)
Operation mode (Output operation)		Auxiliary output 1: ON when the muting function is invalid, OFF when the muting function is valid Auxiliary output 2: ON when the override function is invalid, OFF when the override function is valid Auxiliary output 3: ON when the muting lamp is normal, OFF when the muting lamp is error Auxiliary output 4: ON when the safety light curtain is in light interrupted condition, OFF when the safety light curtain is in light receiving condition (Note 5)
Muting lamp output		Applicable muting lamp: 24 V DC, 3.6 to 30 W (L1, L2 of each unit)
Protection		Enclosure: IP40, Terminal: IP20
Ambient temperature		-10 to +55 °C <b>+14 to +131 °F</b> (No dew condensation or icing allowed), Storage: -25 to +70 °C <b>-13 to +158 °F</b>
Material		Enclosure: ABS
Connection terminal		Detachable spring-cage terminal
Weight		Net weight: 250 g approx.

- Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C **+68 °F**.  
 2) **SF-C14EX-01** is Handy-controller **SFB-HC** (optional) non-compatible type.  
 3) Both safety output 1 and 2 are OFF when the emergency stop is valid regardless of whether the safety light curtain is in the light receiving or light interrupted condition.  
 4) The auto-reset cannot be used with safety output 3.  
 5) The auxiliary output incorporated in the **SF4B / SF4B-G** series is outputted.  
 6) Refer to p.668 for details of the specifications for the control unit **SF-C14EX(-01)**.

## SPECIFICATIONS

### Handy-controller

Model No.	SFB-HC
Item	
Supply voltage	24 V DC $\pm 10\%$ Ripple P-P10 % or less (common to safety light curtain power supply)
Current consumption	65 mA or less
Communication method	RS-485 two-way communications (Specific procedure)
Digital display	4-digit red LED display $\times 2$ (Selected beam channels, setting contents etc. are displayed.)
Function indicator	Green LED $\times 9$ (set function is displayed.)
Functions	Fixed blanking (Factory setting: Disabled) / Floating blanking (Factory setting: Disabled) / Auxiliary output change (Factory setting: Negative Logic of OSSD) / Light emitting amount control (Factory setting: Disabled) / Muting setting change [Factory setting: All beam channels enabled, A = B, Setting of the muting lamp diagnosis function enabled (Ver. 2 or later), Muting sensor output operation setting N.O. / N.C. (Ver. 2.1 or later)] / Interlock setting change (Factory setting: start / restart) / External device monitoring setting change (Factory setting: Enabled, 300 ms) / Override setting changing function 60 sec. (Ver. 2.1 or later) / Setting detail monitoring / Protecting (Factory setting: Disabled) (Factory password setting: 0000) / Initialization / Copy
Ambient temperature	$-10$ to $+55\text{ }^{\circ}\text{C}$ $+14$ to $+131\text{ }^{\circ}\text{F}$ (No dew condensation or icing allowed), Storage: $-25$ to $+70\text{ }^{\circ}\text{C}$ $-13$ to $+158\text{ }^{\circ}\text{F}$
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 $\Omega$ , or more, with 500 V DC megger between all supply terminals connected together and enclosure
Cable	8-core shielded cable, 0.5 m 1.640 ft long, with a connector at the end (2 cables)
Material	Enclosure: ABS
Weight	Net weight: 200 g approx.
Accessories	Adapter cable: 2 cables

Note: Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of  $+20\text{ }^{\circ}\text{C}$   $+68\text{ }^{\circ}\text{F}$ .

### Laser alignment tool

Model No.	SF-LAT-2N / SF-LAT-4BG (For SF4B-□G□<V2>)
Item	
Supply voltage	3 V (LR6 battery $\times 2$ pcs.)
Battery	1.5 V (LR6 battery) $\times 2$ pcs. (replaceable) (Note 2)
Battery lifetime	30 hours approx. of continuous operation (LR6 battery, at $+25\text{ }^{\circ}\text{C}$ $+77\text{ }^{\circ}\text{F}$ ambient temperature)
Light source	Red semiconductor laser: Class 2 (IEC / JIS / FDA) (Max. output: 1 mW, Peak emission wavelength: 650 nm 0.026 mil) (Note 3)
Spot diameter	10 mm 0.394 in approx. (at 5 m 16.404 ft distance)
Ambient temperature	$0$ to $+40\text{ }^{\circ}\text{C}$ $+32$ to $+104\text{ }^{\circ}\text{F}$ (No dew condensation), Storage: $0$ to $+55\text{ }^{\circ}\text{C}$ $+32$ to $+131\text{ }^{\circ}\text{F}$
Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH
Material	Enclosure: ABS, Mounting part: Aluminum
Weight	Net weight: 150 g approx. (without batteries)

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of  $+20\text{ }^{\circ}\text{C}$   $+68\text{ }^{\circ}\text{F}$ .

2) LR6 dry cell batteries are not provided with the product. Please purchase them separately.

3) As for FDA regulation, the product complies with 21 CFR 1040.10 and 1040.11 based on Laser Notice No. 50, dated June 24, 2007, issued by CDRH under the FDA.

### Corner mirror

Model No.		RF-SFBH-□
Item		
Attenuation rate of sensing range		With one corner mirror: Declined to 90 %, With two corner mirrors: Declined to 80 % (When used in combination with the <b>SF4B</b> series)
Environmental resistance	Ambient temperature	−10 to +55 °C <b>+14 to +131 °F</b> (No dew condensation or icing allowed), Storage: −25 to +70 °C <b>−13 to +158 °F</b>
	Ambient humidity	30 to 85 % RH, Storage: 30 to 95 % RH
	Vibration resistance	10 to 55 Hz frequency, 0.75 mm <b>0.030 in</b> double amplitude in X, Y and Z directions for two hours each
	Shock resistance	300 m/s <sup>2</sup> acceleration (30 G approx.) in X, Y and Z directions three times each
Material		Enclosure: Aluminum, Mounting bracket: Stainless steel, Mirror (rear surface mirror): Glass, Side cover: EPDM
Accessories		Intermediate supporting bracket: 1 set ( <b>RF-SFBH-40/48/56/64</b> ), 2 sets ( <b>RF-SFBH-72/80/88/96</b> )

Note: Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of  $+20\text{ }^{\circ}\text{C}$   $+68\text{ }^{\circ}\text{F}$ .

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SF4C

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SF2B

SF2C

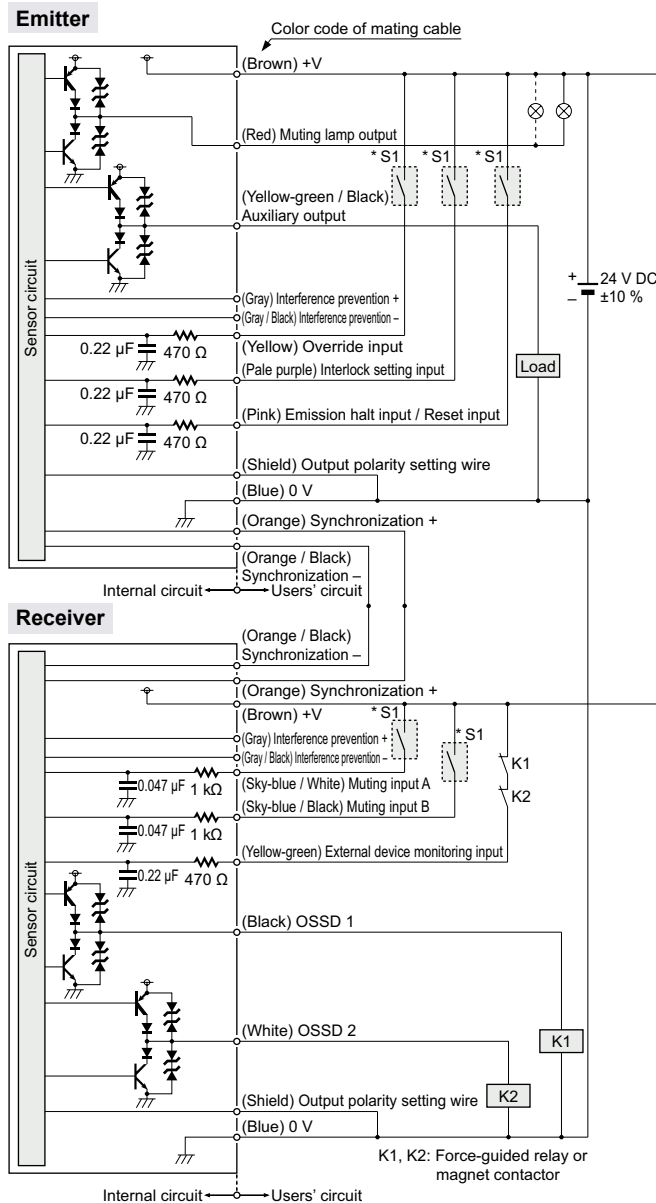
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Refer to the instruction manual for details.

The instruction manual can be download from our website.

**I/O CIRCUIT AND WIRING DIAGRAMS****I/O circuit diagram**

&lt;In case of using I/O circuit for PNP output&gt;



Note: The above diagram is when using a 12-core cable. If an 8-core cable is used, the red, yellow, gray / black, sky-blue / white and sky-blue / black lead wires are absent.

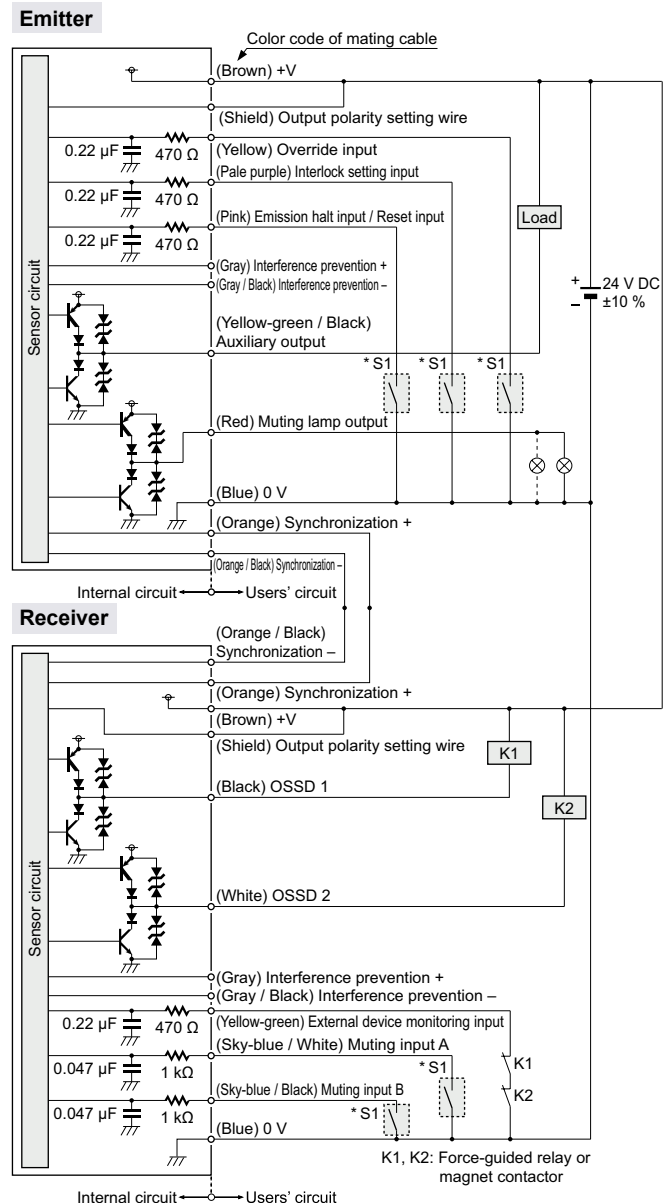
\* S1

**Switch S1**

- Emission halt input / Reset input  
For manual reset  
Vs to Vs - 2.5 V (sink current 5 mA or less): Emission halt (Note 1)  
Open: Emission  
For automatic reset  
Vs to Vs - 2.5 V (sink current 5 mA or less): Emission (Note 1)  
Open: Emission halt
- Interlock setting input, Override input, Muting input A/B, External device monitoring input  
Vs to Vs - 2.5 V (sink current 5 mA or less): Enabled (Note 1)  
Open: Disabled

Note: Vs is the applying supply voltage.

&lt;In case of using I/O circuit for NPN output&gt;



Note: The above diagram is when using a 12-core cable. If an 8-core cable is used, the red, yellow, gray / black, sky-blue / white and sky-blue / black lead wires are absent.

\* S1

**Switch S1**

- Emission halt input / Reset input  
For manual reset  
0 to +1.5 V (source current 5 mA or less): Emission halt  
Open: Emission  
For automatic reset  
0 to +1.5 V (source current 5 mA or less): Emission  
Open: Emission halt
- Interlock setting input, Override input, Muting input A/B, External device monitor input  
0 to +1.5 V (source current 5 mA or less): Enabled  
Open: Disabled

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SYSTEMSUV  
CURING  
SYSTEMSSelection  
GuideSafety Light  
CurtainsSafety  
Control UnitsSafety  
Components**SF4D****SF4B/  
SF4B-G****SF4B-C****SF4C****BSF4-AH80****SF2B****SF2C**Definition of  
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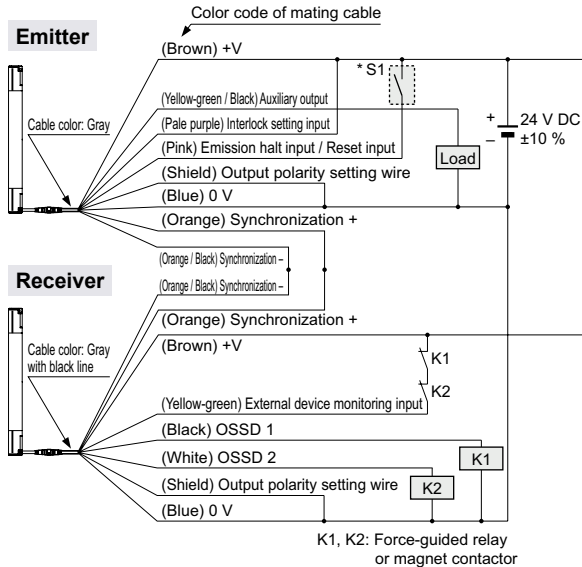


## I/O CIRCUIT AND WIRING DIAGRAMS

### Connection example

**Standard components (8-core cable): Interlock function "enabled (manual reset)", external device monitoring function "enabled"**

<In case of using I/O circuit for PNP output>



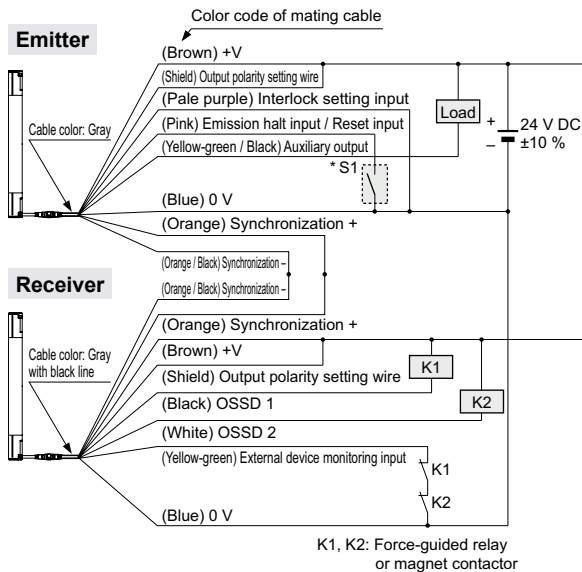
\* S1

Switch S1

- Emission halt input / Reset input
- For manual reset  
Vs to Vs - 2.5 V (sink current 5 mA or less): Emission halt (Note)  
Open: Emission
- For automatic reset  
Vs to Vs - 2.5 V (sink current 5 mA or less): Emission (Note)  
Open: Emission halt

Note: Vs is the applying supply voltage.

<In case of using I/O circuit for NPN output>



\* S1

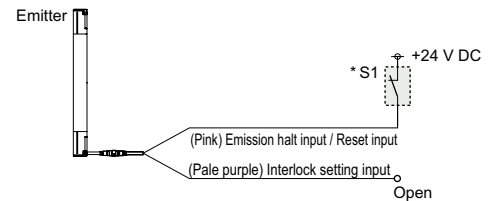
Switch S1

- Emission halt input / Reset input
- For manual reset  
0 to +1.5 V (source current 5 mA or less): Emission halt  
Open: Emission
- For automatic reset  
0 to +1.5 V (source current 5 mA or less): Emission  
Open: Emission halt

Refer to the instruction manual for details.  
The instruction manual can be download from our website.

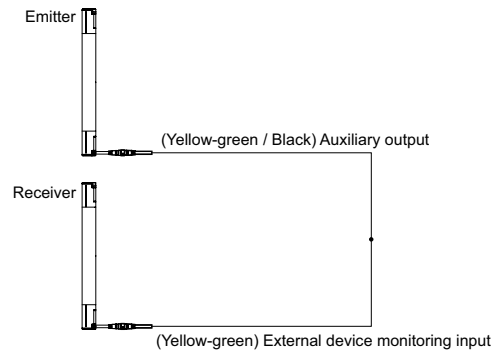
The diagram at left shows the configuration when using PNP output, interlock function "enabled (manual reset)" and external device monitoring function "enabled".

**In case of setting the interlock function to "disabled (automatic reset)"**



\* Refer to the **SF4B / SF4B-G** instruction manual on our website for interlock function.

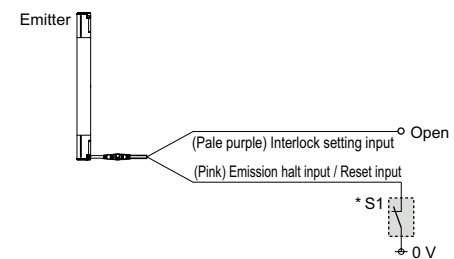
**In case of setting the external device monitoring function to "disabled"**



\* Refer to the **SF4B / SF4B-G** instruction manual on our website for external device monitoring function.

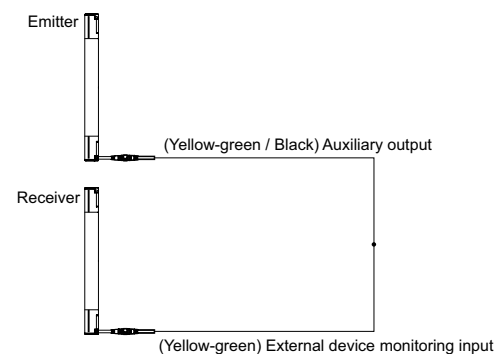
The diagram at left shows the configuration when using NPN output, interlock function "enabled (manual reset)" and external device monitoring function "enabled".

**In case of setting the interlock function to "disabled (automatic reset)"**



\* Refer to the **SF4B / SF4B-G** instruction manual on our website for interlock function.

**In case of setting the external device monitoring function to "disabled"**



\* Refer to the **SF4B / SF4B-G** instruction manual on our website for external device monitoring function.

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**SF4C**

**BSF4-AH80**

**SF2B**

**SF2C**

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## I/O CIRCUIT AND WIRING DIAGRAMS

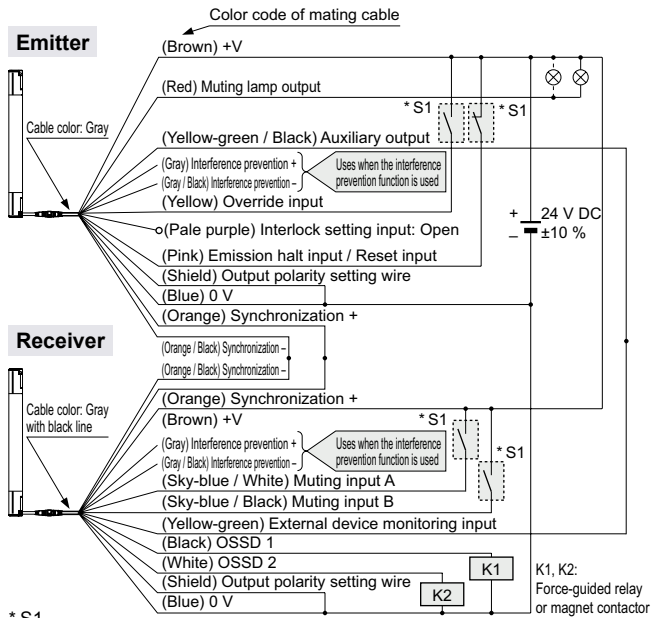
Refer to the instruction manual for details.

The instruction manual can be download from our website.

### Connection example

Muting control components (12-core cable, with interference prevention wires): Interlock function "disabled (automatic reset)", external device monitoring function "disabled"

#### <In case of using I/O circuit for PNP output>



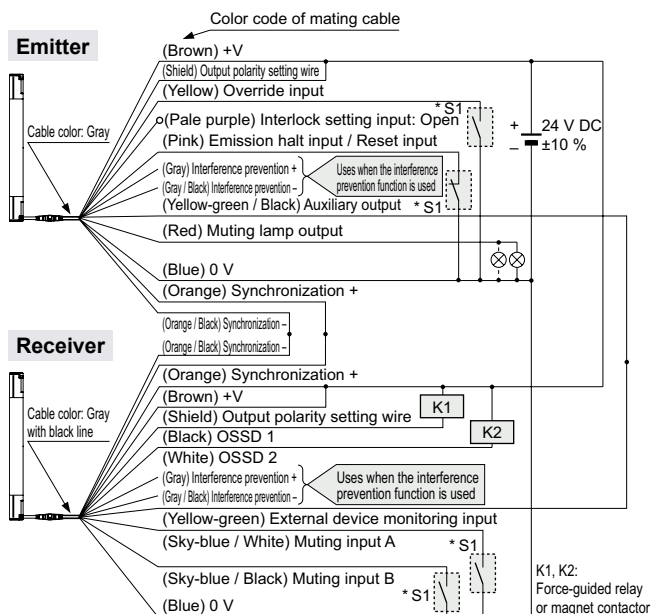
\* S1

Switch S1

- Emission halt input / Reset input  
For manual reset  
Vs to Vs – 2.5 V (sink current 5 mA or less): Emission halt (Note), Open: Emission  
For automatic reset  
Vs to Vs – 2.5 V (sink current 5 mA or less): Emission (Note), Open: Emission halt
- Override input, Muting input A/B, External device monitoring input  
Vs to Vs – 2.5 V (sink current 5 mA or less): Enabled (Note), Open: Disabled

Note: Vs is the applying supply voltage.

#### <In case of using I/O circuit for NPN output>



\* S1

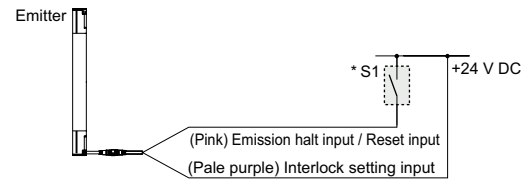
Switch S1

- Emission halt input / Reset input  
For manual reset  
0 to +1.5 V (source current 5 mA or less): Emission halt, Open: Emission  
For automatic reset  
0 to +1.5 V (source current 5 mA or less): Emission, Open: Emission halt
- Override input, Muting input A/B, External device monitoring input  
0 to +1.5 V (source current 5 mA or less): Enabled, Open: Disabled

The diagram at left shows the configuration when using PNP output, interlock function "disabled (automatic reset)" and external device monitoring function "disabled".

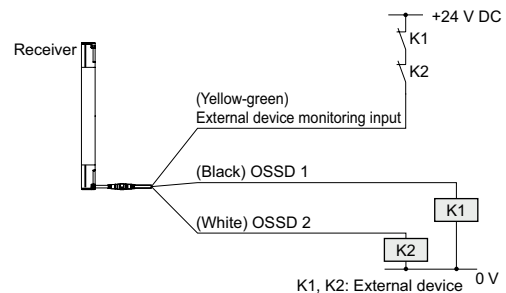
#### In case of setting the interlock function to "enabled (manual reset)"

- When the interlock function is "enabled (manual reset)", the override function cannot be used.



\* Refer to the **SF4B / SF4B-G** instruction manual on our website for interlock function.

#### In case of setting the external device monitoring function to "enabled"

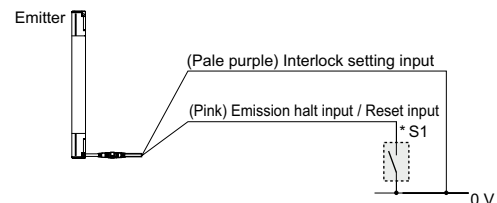


\* Refer to the **SF4B / SF4B-G** instruction manual on our website for external device monitoring function.

The diagram at left shows the configuration when using NPN output, interlock function "disabled (automatic reset)" and external device monitoring function "disabled".

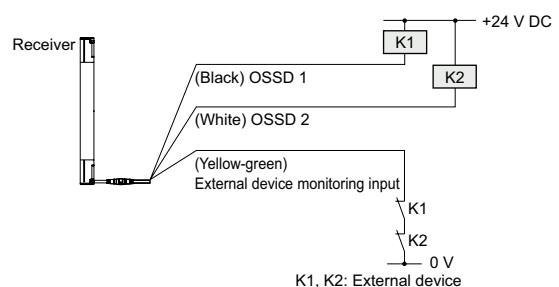
#### In case of setting the interlock function to "enabled (manual reset)"

- When the interlock function is "enabled (manual reset)", the override function cannot be used.



\* Refer to the **SF4B / SF4B-G** instruction manual on our website for interlock function.

#### In case of setting the external device monitoring function to "enabled"



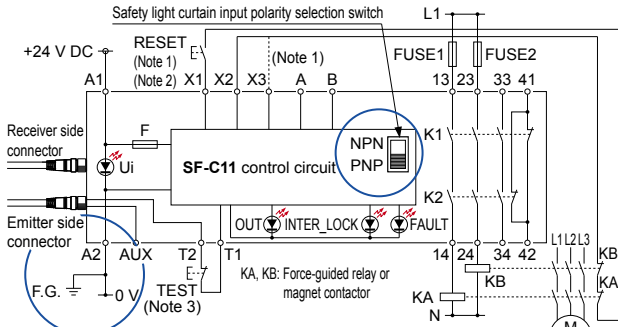
\* Refer to the **SF4B / SF4B-G** instruction manual on our website for external device monitoring function.

**I/O CIRCUIT AND WIRING DIAGRAMS**

Refer to the instruction manual for details.  
The instruction manual can be download from our website.

**SF-C11****SF4B / SF4B-G series wiring diagram (Control Category 4)****For PNP output (minus ground)**

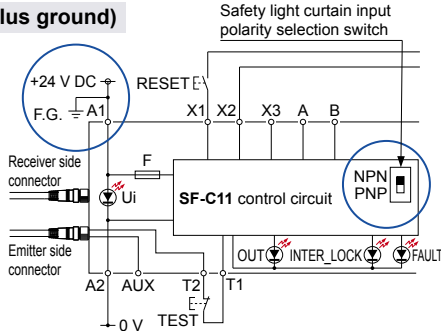
- Set the safety light curtain input polarity selection switch to the PNP side and ground the 0 V line.



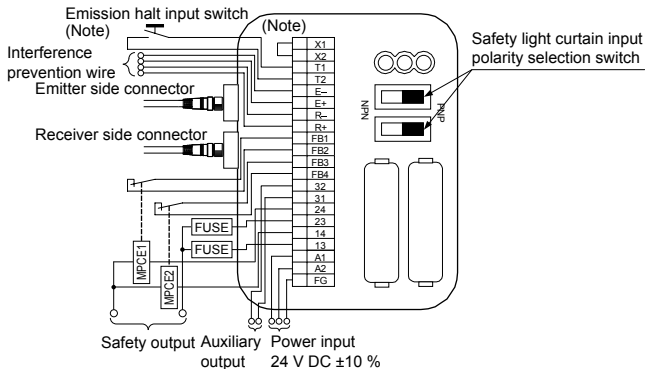
- Notes: 1) The above diagram is when using manual reset. If automatic reset is used, disconnect the lead from X2 and connect it to X3. In this case, a reset (RESET) button is not needed.  
2) Use a momentary-type switch as the reset (RESET) button.  
3) Emission halt occurs when the test (TEST) button is open, and emission occurs when the test (TEST) button is short-circuited. If not using the test (TEST) button, short-circuit T1 and T2.

**For NPN output (plus ground)**

- In the above diagram, set the safety light curtain input polarity selection switch to the NPN side and ground the + side.

**SF-C12****SF4B / SF4B-G series wiring diagram (Control Category 4)****For PNP output (minus ground)**

- Set the two safety light curtain input polarity select switches to the PNP side and connect the FG terminal to the 0 V line.

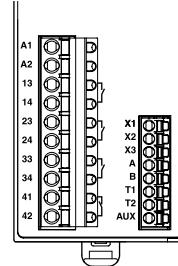


Note: The above diagram is when using manual reset. If automatic reset is used, connect a normally closed type pushbutton switch between T1 and T2 and leave between X1 and X2 open.

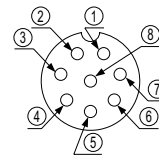
**For NPN output (plus ground)**

- In the above diagram, set the two safety light curtain input polarity selection switches to the NPN side and connect the F.G. terminal to the + side.

When **SF-C11** is connected to the safety light curtain, be sure to use the following mating cable.  
**SFB-CB□, SFB-CCJ10□**

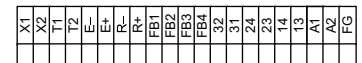
**Terminal arrangement diagram**

Terminal	Function
A1	+24 V DC
A2	0 V
13-14, 23-24, 33-34	Safety output (NO contact × 3)
41-42	Auxiliary output (NC contact × 1)
X1	Reset output terminal
X2	Reset input terminal (Manual)
X3	Reset input terminal (Automatic)
A	Not used
B	Not used
T1	Test output terminal
T2	Test input terminal
AUX	Semiconductor auxiliary output

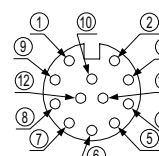
**Pin layout for safety light curtain connectors**

Connector pin No.	Emitter side connector	Receiver side connector
①	Interlock	OSSD 2
②	+24 V DC	+24 V DC
③	Emission halt	OSSD 1
④	Auxiliary output	EDM (External relay monitor)
⑤	Synchronization wire +	Synchronization wire +
⑥	Synchronization wire -	Synchronization wire -
⑦	0 V	0 V
⑧	Shield wire	Shield wire

When **SF-C12** is connected to the safety light curtain, be sure to use the following mating cable.  
**SFB-CB05-MU, SFB-CCJ10□-MU**

**Terminal arrangement diagram**

Terminal	Function	Terminal	Function
FG	Frame ground (F.G.) terminal	R+	Interference prevention wire - (Receiver side)
A2	0 V	R-	Interference prevention wire + (Receiver side)
A1	+24 V DC	E+	Interference prevention wire - (Emitter side)
13-14, 23-24	Safety output (NO contact × 2)	E-	Interference prevention wire + (Emitter side)
31-32	Auxiliary output (NC contact × 1)	T2	Emission halt input terminal
FB4	External relay monitor terminal 2	T1	Automatic reset / manual reset selection terminal
FB3	External relay monitor terminal 1	X2	Manual reset: X1 - X2 short-circuited
FB2		X1	
FB1			

**Pin layout for safety light curtain connectors**

Note: Input and output for pin Nos. ⑪ and ⑫ are not used by this device.

Connector pin No.	Emitter side connector	Receiver side connector
①	Interlock	OSSD 2
②	+24 V DC	+24 V DC
③	Emission halt	OSSD 1
④	Auxiliary output	EDM (External relay monitor)
⑤	Synchronization wire +	Synchronization wire +
⑥	Synchronization wire -	Synchronization wire -
⑦	0 V	0 V
⑧	Shield wire	Shield wire
⑨	Interference prevention wire +	Interference prevention wire +
⑩	Interference prevention wire -	Interference prevention wire -
⑪	(Override input)	(Muting input 1)
⑫	(Muting lamp output)	(Muting input 2)

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LASER SENSORS

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MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

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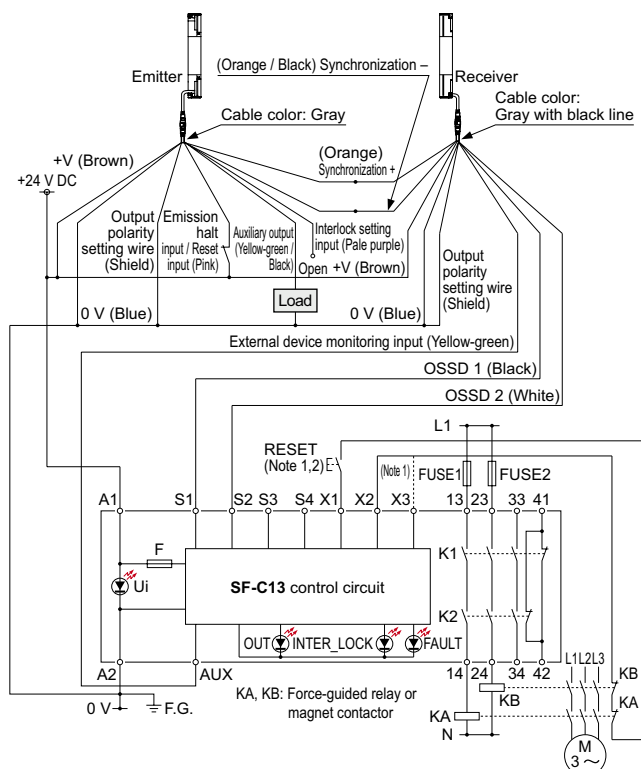


Refer to the instruction manual for details.

The instruction manual can be download from our website.

**I/O CIRCUIT AND WIRING DIAGRAMS****SF-C13****SF4B / SF4B-G series wiring diagram (Control Category 4)****For PNP output (minus ground)**

- Connect the safety light curtain control outputs OSSD 1 and OSSD 2 to S1 and S2 respectively.

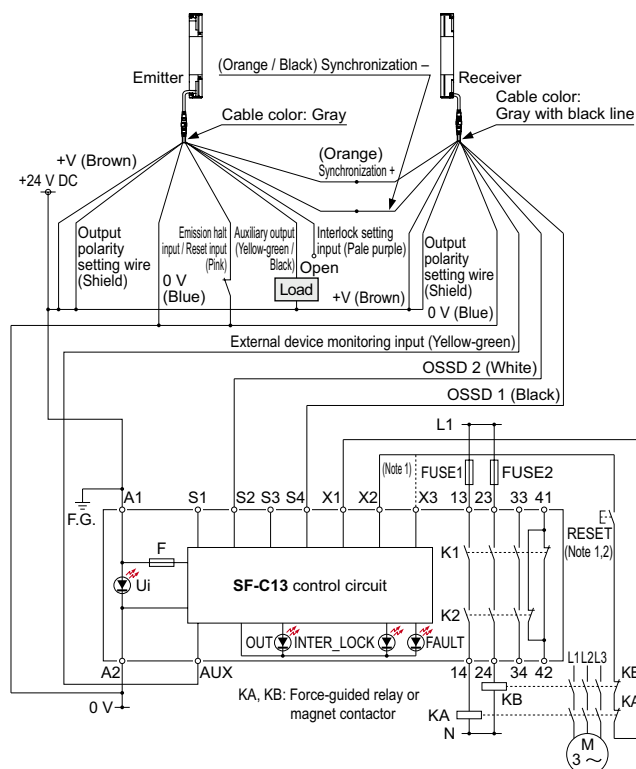


Notes: 1) The above diagram is when using manual reset. If automatic reset is used, disconnect the lead from X2 and connect it to X3. In this case, a reset (RESET) button is not needed.

2) Use a momentary-type switch as the reset (RESET) button.

**For NPN output (plus ground)**

- Connect the safety light curtain control outputs OSSD 1 and OSSD 2 to S4 and S2 respectively and ground the + side.



Notes: 1) The above diagram is when using manual reset. If automatic reset is used, disconnect the lead from X2 and connect it to X3. In this case, a reset (RESET) button is not needed.

2) Use a momentary-type switch as the reset (RESET) button.

**Terminal arrangement diagram**

Terminal	Function
A1	+24 V DC
A2	0 V
S1	Safety light curtain control output (OSSD) input terminal
S2	
S3	
S4	
AUX	Semiconductor auxiliary output
X1	Reset output terminal
X2	Reset input terminal (Manual)
X3	Reset input terminal (Automatic)
13	
14	
23	
24	
33	
34	
41	
42	

A terminal block is required for wiring of safety light curtain side.

When **SF-C13** is connected to the safety light curtain, be sure to use the following discrete wire mating cable.

**SFB-CCB□(-MU), SFB-CC□(-MU)**

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LASER SENSORS

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MICRO PHOTO-ELECTRIC SENSORS

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SF4B-C

SF4C

BSF4-AH80

SF2B

SF2C

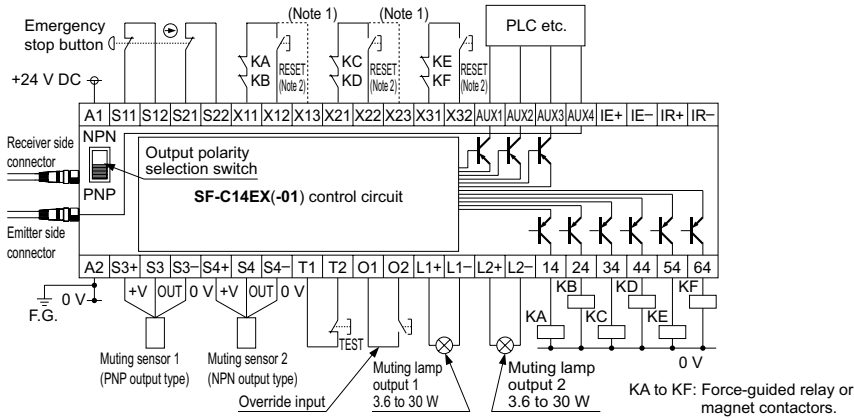
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**I/O CIRCUIT AND WIRING DIAGRAMS**

Refer to the instruction manual for details.  
The instruction manual can be download from our website.

**SF-C14EX(-01)****SF4B / SF4B-G series wiring diagram (Control Category 4)****For PNP output (minus ground)**

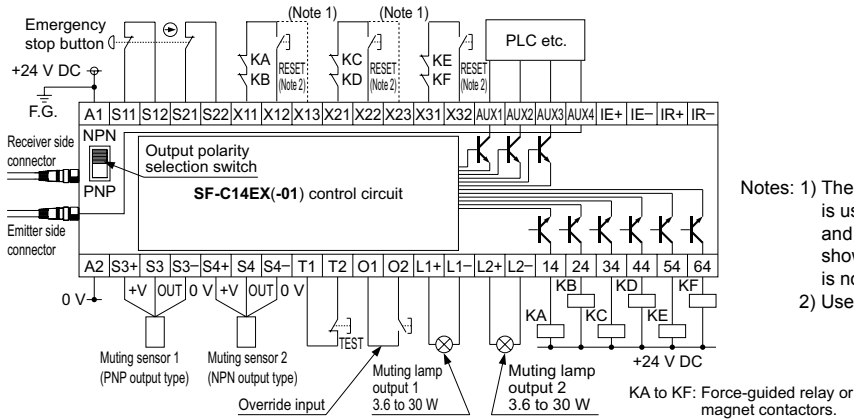
- Set the output polarity selection switch to the PNP side and ground the 0 V line.



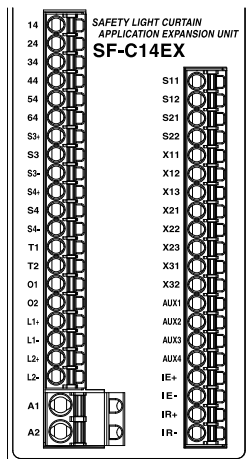
Notes: 1) The above diagram is when using manual reset. If automatic reset is used, disconnect the lead from X12 and connect it to X13, and disconnect the lead from X22 and connect it to X23, as shown by the dotted lines. In this case, a reset (RESET) button is not needed. Terminals X31 to X32 are for manual reset only.  
2) Use a momentary-type switch for the reset (RESET) button.

**For NPN output (plus ground)**

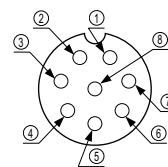
- Set the output polarity selection switch to the NPN side and ground the side of the power supply input.



Notes: 1) The left diagram is when using manual reset. If automatic reset is used, disconnect the lead from X12 and connect it to X13, and disconnect the lead from X22 and connect it to X23, as shown by the dotted lines. In this case, a reset (RESET) button is not needed. Terminals X31 to X32 are for manual reset only.  
2) Use a momentary-type switch for the reset (RESET) button.

**Terminal arrangement diagram**

Terminal	Function	Terminal	Function
14	Safety output 1, Beam received / Beam interrupted output of the safety light curtain	S11	Emergency stop contact input 2 NC input
24		S12	Between S11 and S12
34	Safety output 2, safety light curtain output including the muting function	S21	Between S21 and S22
44		S22	
54	Safety output 3	X11	Safety output 1 reset input
64	Emergency stop output	X12	X11 - X12: Manual reset
		X13	X11 - X13: Automatic reset
S3+	Muting sensor input 1 (PNP output type)	X21	Safety output 2 reset input
S3-	S3+, S3-: Power supply	X22	X21 - X22: Manual reset
S3-	S3-: Sensor output	X23	X21 - X23: Automatic reset
S4+	Muting sensor input 2 (NPN output type)	X31	Safety output 3 reset input
S4-	S4+, S4-: Power supply	X32	X31 - X32: Manual reset
S4-	S4-: Sensor output		
T1	Test input terminal	AUX1	Auxiliary output 1, Muting output
T2	Open: Test mode	AUX2	Auxiliary output 2, Override output
	Short-circuit: Normal operation		
O1	Override input terminal	AUX3	Auxiliary output 3, Blown lamp output
O2	Open: Invalid	AUX4	Auxiliary output 4, safety light curtain auxiliary output
	Short-circuit: Valid		
L1+	Muting lamp output 1	IE+	Interference prevention terminal, Emitter side +
L1-		IE-	Interference prevention terminal, Emitter side -
L2+	Muting lamp output 2	IR+	Interference prevention terminal, Receiver side +
L2-		IR-	Interference prevention terminal, Receiver side -
A1	+24 V DC		
A2	0 V		

**Pin layout for safety light curtain connectors**

Connector pin No.	Emitter side connector	Receiver side connector
①	Interference prevention wire +	Interference prevention wire +
②	+24 V DC	+24 V DC
③	Interference prevention wire -	Interference prevention wire -
④	Auxiliary output	Not used
⑤	Synchronization wire +	Synchronization wire +
⑥	Synchronization wire -	Synchronization wire -
⑦	0 V	0 V
⑧	Shield wire	Shield wire

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Refer to the instruction manual for details.

The instruction manual can be download from our website.

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### Interlock function

- The selection of manual reset / automatic reset is available by applying the interlock input wiring. The interlock becomes available by selecting manual reset. (Refer to the **SF4B / SF4B-G** instruction manual for details.)

### Emission halt function

- This function stops the emission process of the emitter. You can select whether emission is on or halted by means of the connection status for the emission halt input / reset input wire (pink).
- During emission halt, the control outputs (OSSD 1, OSSD 2) become OFF status.
- By using this function, malfunction due to extraneous noise or abnormality in the control outputs (OSSD 1, OSSD 2) and the auxiliary output can be determined even from the machinery side.
- Normal operation is restored when the emission halt input / reset input wire (pink) is connected to 0 V or +V. (Refer to the **SF4B / SF4B-G** instruction manual for details.)

### Auxiliary output (Non-safety output)

- This safety light curtain incorporates the auxiliary output (yellowgreen / black) for the non-safety output. The auxiliary output is incorporated with the emitter. (Refer to the **SF4B / SF4B-G** instruction manual for details.)

### External device monitoring function

- This is the function for checking whether the external safety relay connected to the control outputs (OSSD 1, OSSD 2) perform normally in accordance with the control outputs (OSSD 1, OSSD 2) or not. Monitor the contacting point "b" of the external safety relay, and if any abnormality such as deposit of the contacting point, etc. is detected, change the status of the safety light curtain into lockout one, and turn OFF the control outputs (OSSD 1, OSSD 2). (Refer to the **SF4B / SF4B-G** instruction manual for details.)

### Muting function

- This function turns the safety function of this safety light curtain into disabled temporarily. When the control outputs (OSSD 1, OSSD 2) are ON, this function is available for passing the workpiece through the sensing area of the safety light curtain without stopping the machinery.

The muting function becomes valid when all the conditions listed below are satisfied.

However, this function cannot be used with the **SF4B-□-03<V2>**.

- The control outputs (OSSD 1, OSSD 2) shall be ON.
- The incandescent lamp with 3 to 10 W shall be connected to the muting lamp output (red).
- The output of the muting sensors A and B shall be changed from OFF (open) to ON. At this time, the time difference occurred by changing the output of the muting sensors A and B into ON status shall be within 0.03 to 3 sec.

- The following devices, photoelectric sensor with semiconductor output, inductive proximity sensor, position switch on N.O. (Normally open) contact, etc. are available for applying to the muting sensor.
- In case of using the muting function, please order 12-core cable. (Refer to the **SF4B / SF4B-G** instruction manual for details.)

### Override function

- This function sets the safety function of this safety light curtain enabled forcibly. When using the muting function, the override function can be used to start the machinery at times such as when the control outputs (OSSD 1 and OSSD 2) are OFF or when the muting sensors are ON when the line is to be started. The override function becomes valid when all the conditions listed below are satisfied. However, this function cannot be used with the **SF4B-□-03<V2>**. (Refer to the **SF4B / SF4B-G** instruction manual for details.)

### Series connection

**Connectable up to 3 sets of safety light curtains (however, 192 beam channels max.)**

(Refer to the **SF4B / SF4B-G** instruction manual for details.)

### Parallel connection

**Connectable up to 3 sets of safety light curtains**

(Refer to the **SF4B / SF4B-G** instruction manual for details.)

### Series and parallel mixed connection

**Connectable up to 3 sets of safety light curtains (however, 192 beam channels max.)**

(Refer to the **SF4B / SF4B-G** instruction manual for details.)

### Wiring



Refer to the applicable regulations for the region where this device is to be used when setting up the device. In addition, make sure that all necessary measures are taken to prevent possible dangerous operating errors resulting from earth faults.

- 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.

### Others

- This device has been developed / produced for industrial use only.
- 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 safety light curtain does not come in direct contact with water, oil, grease, or organic solvents, such as, thinner, etc.
- Take care that the safety light curtain 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.

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- When this device is used in the “PSDI mode”, an appropriate control circuit must be configured between this device and the machinery. For details, be sure to refer to the standards or regulations applicable in each region or country.
- To use this device in the U.S.A., refer to OSHA 1910. 212 and OSHA 1910. 217 for installation, and in Europe, refer to EN ISO 13855 as well. Observe your national and local requirements before installing this product.

- This catalog is a guide to select a suitable product. Be sure to read instruction manual prior to its use.
- Both emitter and receiver are adjusted before shipment, please apply both emitter and receiver with the same serial No. The serial No. is indicated on the plates of both emitter and receiver. (Indicated under model No.)

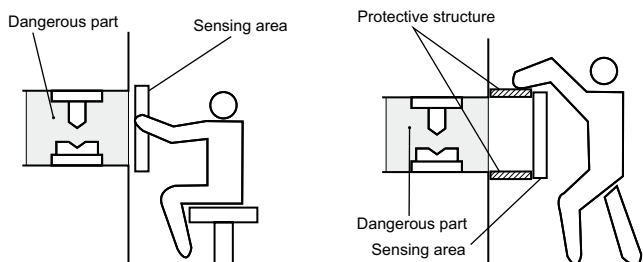
- Make sure to carry out the test run before regular operation.
- This safety system is for use only on machinery in which the dangerous parts can be stopped immediately, either by an emergency stop unit or by disconnecting the power supply. Do not use this system with machinery which cannot be stopped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

### Sensing area

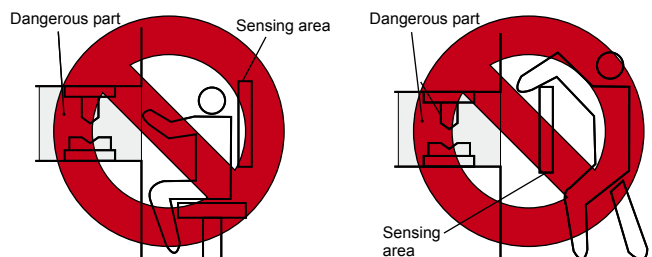


- Make sure to install this device such that any part of the human body must pass through its sensing area in order to reach the dangerous parts of the machinery. If the human body is not detected, there is a danger of serious injury or death.
- Do not use any reflective type or retroreflective type arrangement.
- Multiple receivers (emitters) cannot be connected for use with a single emitter (receiver).

#### Example of correct sensing area setup



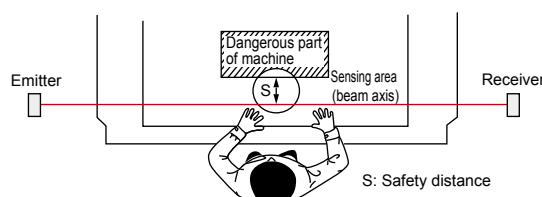
#### Example of incorrect sensing area setup



### 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 safety light curtain and the dangerous parts of the machinery. (Please check the latest standards for the equation.) 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.



The sizes of the minimum sensing objects for this device vary depending on whether or not the floating blanking function is being used. Calculate the safety distance with the proper size of the minimum sensing object and appropriate equation.

#### Size of minimum sensing object when applying floating blanking function

	Min. sensing object when applying floating blanking function			
	Invalid	Setting (Note)		
		1 beam channel	2 beam channels	3 beam channels
SF4B-F $\alpha$ (G) (Min. sensing object $\phi 14$ mm $\phi 0.551$ in)	$\phi 14$ mm $\phi 0.551$ in	$\phi 24$ mm $\phi 0.945$ in	$\phi 34$ mm $\phi 1.339$ in	$\phi 44$ mm $\phi 1.732$ in
SF4B-H $\alpha$ (G) (Min. sensing object $\phi 25$ mm $\phi 0.984$ in)	$\phi 25$ mm $\phi 0.984$ in	$\phi 45$ mm $\phi 1.772$ in	$\phi 65$ mm $\phi 2.559$ in	$\phi 85$ mm $\phi 3.346$ in
SF4B-A $\alpha$ (G) (Min. sensing object $\phi 45$ mm $\phi 1.772$ in)	$\phi 45$ mm $\phi 1.772$ in	$\phi 85$ mm $\phi 3.346$ in	$\phi 125$ mm $\phi 4.921$ in	$\phi 165$ mm $\phi 6.496$ in

Note: Refer to p.507 for the floating blanking function. However, the floating blanking function cannot be used with the SF4B- $\alpha$ -01<V2>, the SF4B- $\alpha$ -03<V2> and the SF-C14EX-01.

- The safety distance is calculated using the equations given on the following pages when a person moves perpendicularly (normal intrusion) into the sensing area of the device. If the intrusion direction is not perpendicular, always check the related standards (regional, machine standards, etc.)

#### For use based on EN ISO 13855 / ISO 13855 / JIS B 9715

For intrusion direction perpendicular to the sensing area  
<In case that the minimum sensing object is  $\phi 40$  mm  $\phi 1.575$  in or less>

- Equation ①  $S = K \times T + C$   
S: Safety distance (mm)  
Minimum required distance between the sensing area surface and the dangerous parts of the machine  
K: Intrusion velocity of operator's body or object (mm/sec.)  
Normally taken as 2,000 (mm/sec.) for calculation  
T: Response time of total equipment (sec.)  
 $T = T_m + T_{SF4B}$   
 $T_m$ : Maximum halting time of machinery (sec.)  
 $T_{SF4B}$ : Response time of the SF4B / SF4B-G series (sec.)  
C: Additional distance calculated from the size of the minimum sensing object of the safety light curtain (mm)  
However, the value of "C" cannot be less than 0.  
 $C = 8 \times (d - 14)$   
d: Minimum sensing object diameter (mm)

Refer to the instruction manual for details.  
The instruction manual can be download from our website.

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Refer to the instruction manual for details.  
The instruction manual can be download from our website.

- For calculating the safety distance "S", there are the following five cases.  
First calculate by substituting the value  $K = 2,000$  (mm/sec.) in the equation above. Then, classify the obtained value of "S" into three cases, 1)  $S < 100$ , 2)  $100 \leq S \leq 500$ , and 3)  $S > 500$ . For Case 3)  $S > 500$ , recalculate by substituting the value  $K = 1,600$  (mm/sec.). After that, classify the calculation result into two cases, 4)  $S \leq 500$  and 5)  $S > 500$ . For details, refer to the instruction manual enclosed with this product. For calculating "Tm" (maximum halt time of the machinery), use a special device called a "brake monitor".  
When this device is used in the "PSDI mode", an appropriate safety distance "S" must be calculated. For details, be sure to refer to the standards or regulations applicable in each region or country.

**<In the case that the minimum sensing object is  $\varnothing 40$  mm  $\varnothing 1.575$  in or more>**

- Equation  $S = K \times T + C$   
S: Safety distance (mm)  
K: Intrusion velocity of operator's body or object (mm/sec.)  
Taken as 1,600 (mm/sec.) for calculation  
T: Response time of total equipment (sec.)  
 $T = T_m + T_{SF4B}$   
Tm: Maximum halting time of machinery (sec.)  
TSF4B: Response time of the **SF4B** / **SF4B-G** series (sec.)  
C: Additional distance calculated from the size of the minimum sensing object of the safety light curtain (mm)  
 $C = 850$  (mm) (Constant)

### For use based on ANSI B11.19

- Equation ②  $S = K \times (T_s + T_c + T_{SF4B} + T_{bm}) + D_{pf}$   
S: Safety distance (mm)  
Minimum required distance between the sensing area surface and the dangerous parts of the machine  
K: Intrusion velocity {Recommended value in OSHA is 63 (inch/sec.)  $\approx$  1,600 (mm/sec.)}  
ANSI B11.19 does not define the intrusion velocity "K". When determining "K", consider possible factors including physical ability of operators.  
Ts: Halting time calculated from the operation time of the control element (air valve, etc.) (sec.)  
Tc: Maximum response time of the control circuit required for functioning the brake (sec.)  
TSF4B: Response time of safety light curtain (sec.)  
Tbm: Additional halting time tolerance for the brake monitor (sec.)  
The following equation holds when the machine is equipped with a brake monitor.  
 $T_{bm} = T_a - (T_s + T_c)$   
Ta: Setting time of brake monitor (sec.)  
When the machine is not equipped with a brake monitor, it is recommended that 20 % or more of  $(T_s + T_c)$  is taken as additional halting time.  
Dpf: Additional distance calculated from the size of the minimum sensing of the safety light curtain (mm)  
**SF4B-F□(G)<V2>**:  $D_{pf} = 23.8$  mm **0.937 in**  
**SF4B-H□(G)<V2>**:  $D_{pf} = 61.2$  mm **2.409 in**  
**SF4B-A□(G)<V2>**:  $D_{pf} = 129.2$  mm **5.087 in**  
 $D_{pf} = 3.4 \times (d - 0.276)$  (inch)  
 $\approx 3.4 \times (d - 7)$  (mm)  
d: Minimum sensing object diameter 0.552 (inch)  $\approx$  14 (mm) **SF4B-F□(G)<V2>**  
Minimum sensing object diameter 0.985 (inch)  $\approx$  25 (mm) **SF4B-H□(G)<V2>**  
Minimum sensing object diameter 1.772 (inch)  $\approx$  45 (mm) **SF4B-A□(G)<V2>**

### Handy-controller



This device enables to set each function using the handy-controller **SFB-HC** (optional). (However, a handy-controller cannot be used with the **SF4B-□01<V2>**, the **SF4B-□03<V2>** and the **SF-C14EX-01**.) Among the functions, the contents related to the safety distance such as the size of the minimum sensing object and response time are varied depending on the setting condition. When setting each function, re-calculate the safety distance, and make enough space larger than the calculated safety distance. Failure to do so might cause the accident that the device cannot stop quickly before reaching the dangerous area of the machinery, resulting in the serious injury or death.

- Refer to the instruction manual of the handy-controller for details of the function settings for using handy-controller **SFB-HC** (optional).

### Corner mirror



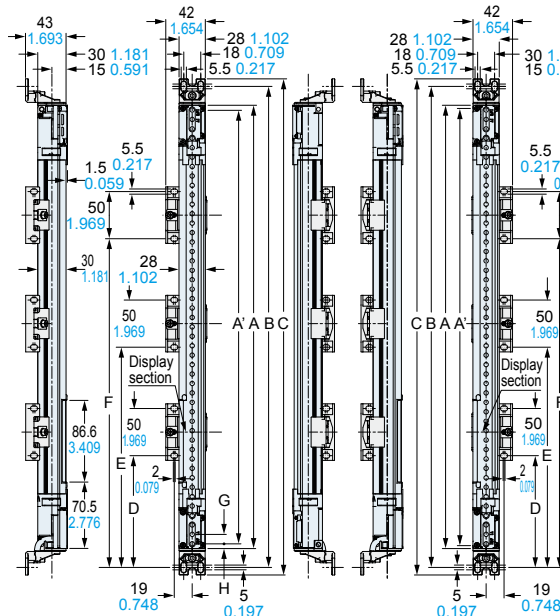
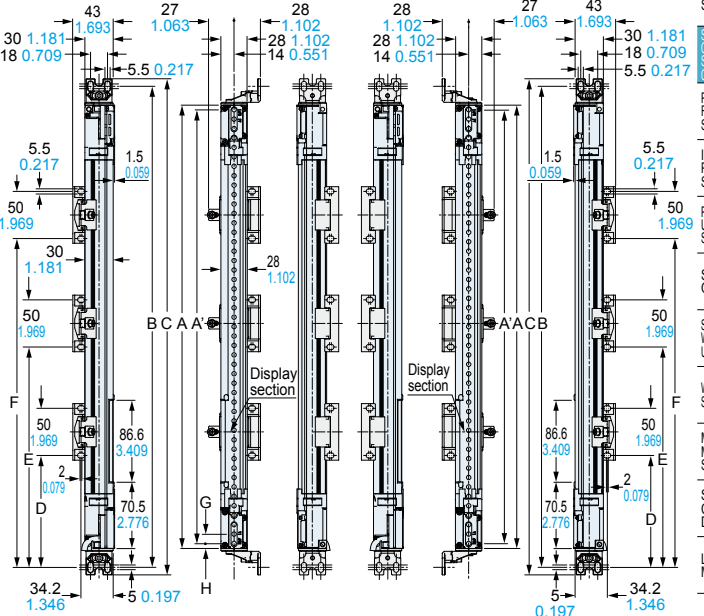
- Be sure to carry out maintenance while referring to the instruction manual for the **SF4B** / **SF4B-G** series of safety light curtains.
- Do not use if dirt, water, or oil, etc. is attached to the reflective surface of this product. Appropriate sensing range may not be maintained due to diffusion or refraction.
- Make sure that you have read the instruction manual for the corner mirror thoroughly before setting up the corner mirrors and safety light curtains, and follow the instructions given. If the equipment is not set up correctly as stipulated in the instruction manual, incident light errors may result in unexpected situations which may result in serious injury or death.
- Please download the instruction manuals from our website.
- Safety light curtain **SF4B** / **SF4B-G** series cannot be used as a retroreflective type. Avoid installing the safety light curtain as a retroreflective type when this product is applied.
- The mirror part of this product is made of glass. Note that if it is broken, the glass shards may fly apart.
- Do not use if crack or breakage appears on the reflective surface of this product. Proper sensing range may not be maintained due to diffusion or refraction. If crack or breakage appears on the reflective surface of this product, replace the product.
- When adjusting beam channels with a laser alignment tool, etc., take sufficient care that the laser beam reflected by this product does not enter the eyes.
- Failure to follow the above items may result in death or serious injury.

**DIMENSIONS (Unit: mm in)**

The CAD data can be downloaded from our website.

**SF4B-□<V2>**Not available for the robust type **SF4B-□G□<V2>**

Safety light curtain

**Assembly dimensions**Mounting drawing for the safety light curtains using the standard mounting brackets **MS-SFB-1** (optional) and the intermediate supporting brackets.**<Rear mounting>****Emitter****Receiver****<Side mounting>****Emitter****Receiver**

Model No.			Protective height			Mounting pitch	Total length	Intermediate supporting bracket mounting pitch				
			A	A' (Note)				B	C	D	E	F
				SF4B-F□<V2> SF4B-H□<V2>	SF4B-A□<V2>							
SF4B-F23□<V2>	SF4B-H12□<V2>	SF4B-A6□<V2>	230 9.055	220 8.661	200 7.874	270 10.630	286 11.260	—	—	—		
SF4B-F31□<V2>	SF4B-H16□<V2>	SF4B-A8□<V2>	310 12.205	300 11.811	280 11.024	350 13.780	366 14.406	—	—	—		
SF4B-F39□<V2>	SF4B-H20□<V2>	SF4B-A10□<V2>	390 15.354	380 14.960	360 14.173	430 16.929	446 17.559	—	—	—		
SF4B-F47□<V2>	SF4B-H24□<V2>	SF4B-A12□<V2>	470 18.504	460 18.110	440 17.323	510 20.079	526 20.709	—	—	—		
SF4B-F55□<V2>	SF4B-H28□<V2>	SF4B-A14□<V2>	550 21.654	540 21.260	520 20.472	590 23.228	606 23.858	—	—	—		
SF4B-F63□<V2>	SF4B-H32□<V2>	SF4B-A16□<V2>	630 24.803	620 24.409	600 23.622	670 26.378	686 27.008	—	—	—		
SF4B-F71□<V2>	SF4B-H36□<V2>	SF4B-A18□<V2>	710 27.953	700 27.559	680 26.772	750 29.528	766 30.157	—	—	—		
SF4B-F79□<V2>	SF4B-H40□<V2>	SF4B-A20□<V2>	790 31.102	780 30.708	760 29.921	830 32.677	846 33.307	390 15.354	—	—		
SF4B-F95□<V2>	SF4B-H48□<V2>	SF4B-A24□<V2>	950 37.402	940 37.007	920 36.220	990 38.976	1,006 39.606	470 18.504	—	—		
SF4B-F111□<V2>	SF4B-H56□<V2>	SF4B-A28□<V2>	1,110 43.701	1,100 43.701	1,080 42.520	1,150 45.276	1,166 45.905	550 21.654	—	—		
SF4B-F127□<V2>	SF4B-H64□<V2>	SF4B-A32□<V2>	1,270 50.000	1,260 49.606	1,240 48.819	1,310 51.575	1,326 52.505	418 16.457	842 33.150	—		
——	SF4B-H72□<V2>	SF4B-A36□<V2>	1,430 56.299	1,420 55.905	1,400 55.118	1,470 57.874	1,486 58.504	472 18.583	948 37.323	—		
——	SF4B-H80□<V2>	SF4B-A40□<V2>	1,590 62.598	1,580 62.205	1,560 61.417	1,630 64.173	1,646 64.803	525 20.669	1,055 41.535	—		
——	SF4B-H88□<V2>	SF4B-A44□<V2>	1,750 68.898	1,740 68.504	1,720 67.716	1,790 70.472	1,806 71.102	433 17.047	870 34.252	1,308 51.496		
——	SF4B-H96□<V2>	SF4B-A48□<V2>	1,910 75.197	1,900 74.803	1,880 74.016	1,950 76.772	1,966 77.401	473 18.622	950 37.402	1,428 56.220		

Model No.	Beam pitch	First beam channel position
	G	H
SF4B-F□<V2>	10 0.394	5 0.197
SF4B-H□<V2>	20 0.787	5 0.197
SF4B-A□<V2>	40 1.575	15 0.591

Note: In the case of "When used as safety device for presses in China", the distance between the center of the first beam axis and the center of the last beam axis of the device becomes the protective height (A'). For details, refer to "Definition of sensing heights" (p.645).

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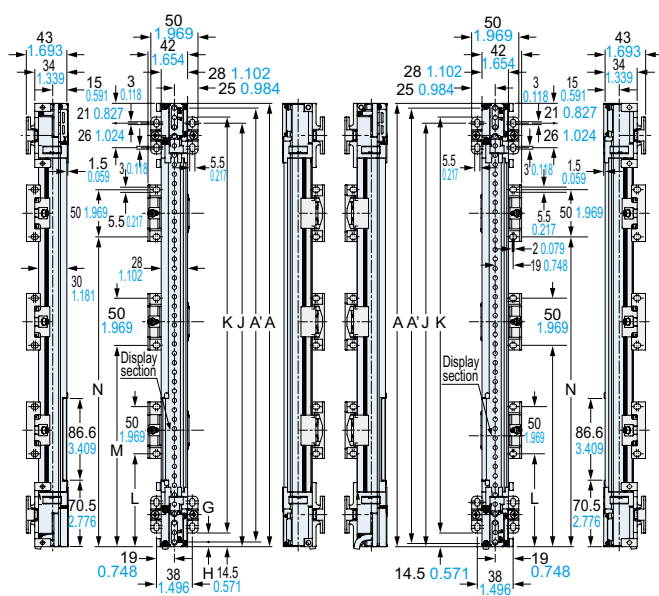
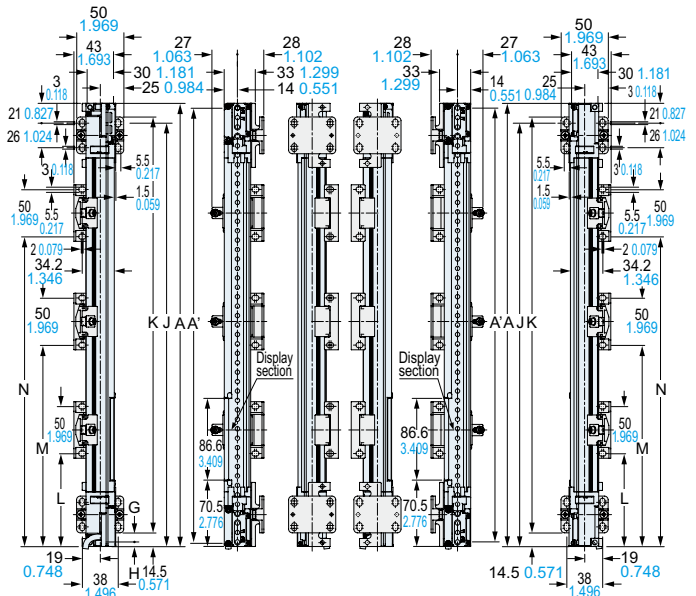
The CAD data can be downloaded from our website.

**SF4B-□<V2>**Not available for the robust type **SF4B-□G□<V2>**

Safety light curtain

**Assembly dimensions**

Mounting drawing for the safety light curtains using the dead zoneless mounting brackets **MS-SFB-3** (optional) and the intermediate supporting brackets.

**<Rear mounting>****<Side mounting>****Emitter****Receiver****Emitter****Receiver**

Model No.			Protective height			MS-SFB-3 Mounting pitch		Intermediate supporting bracket mounting pitch		
			A	A' (Note)		J	K	L	M	N
				SF4B-F□<V2> SF4B-H□<V2>	SF4B-A□<V2>					
SF4B-F23□<V2>	SF4B-H12□<V2>	SF4B-A6□<V2>	230 9.055	220 8.661	200 7.874	209 8.228	201 7.913	—	—	—
SF4B-F31□<V2>	SF4B-H16□<V2>	SF4B-A8□<V2>	310 12.205	300 11.811	280 11.024	289 11.378	281 11.063	—	—	—
SF4B-F39□<V2>	SF4B-H20□<V2>	SF4B-A10□<V2>	390 15.354	380 14.960	360 14.173	369 14.528	361 14.213	—	—	—
SF4B-F47□<V2>	SF4B-H24□<V2>	SF4B-A12□<V2>	470 18.504	460 18.110	440 17.323	449 17.677	441 17.362	—	—	—
SF4B-F55□<V2>	SF4B-H28□<V2>	SF4B-A14□<V2>	550 21.654	540 21.260	520 20.472	529 20.827	521 20.512	—	—	—
SF4B-F63□<V2>	SF4B-H32□<V2>	SF4B-A16□<V2>	630 24.803	620 24.409	600 23.622	609 23.976	601 23.661	—	—	—
SF4B-F71□<V2>	SF4B-H36□<V2>	SF4B-A18□<V2>	710 27.953	700 27.559	680 26.772	689 27.126	681 26.811	—	—	—
SF4B-F79□<V2>	SF4B-H40□<V2>	SF4B-A20□<V2>	790 31.102	780 30.708	760 29.921	769 30.276	761 29.961	370 14.567	—	—
SF4B-F95□<V2>	SF4B-H48□<V2>	SF4B-A24□<V2>	950 37.402	940 37.007	920 36.220	929 36.575	921 36.260	450 17.717	—	—
SF4B-F111□<V2>	SF4B-H56□<V2>	SF4B-A28□<V2>	1,110 43.701	1,100 43.701	1,080 42.520	1,089 42.874	1,081 42.559	530 20.866	—	—
SF4B-F127□<V2>	SF4B-H64□<V2>	SF4B-A32□<V2>	1,270 50.000	1,260 49.606	1,240 48.819	1,249 49.173	1,241 48.858	398 15.669	822 32.362	—
—	SF4B-H72□<V2>	SF4B-A36□<V2>	1,430 56.299	1,420 55.905	1,400 55.118	1,409 55.472	1,401 55.157	452 17.795	928 36.535	—
—	SF4B-H80□<V2>	SF4B-A40□<V2>	1,590 62.598	1,580 62.205	1,560 61.417	1,569 61.772	1,561 61.457	505 19.882	1,035 40.748	—
—	SF4B-H88□<V2>	SF4B-A44□<V2>	1,750 68.898	1,740 68.504	1,720 67.716	1,729 68.071	1,721 67.756	413 16.260	850 33.465	1,288 50.709
—	SF4B-H96□<V2>	SF4B-A48□<V2>	1,910 75.197	1,900 74.803	1,880 74.016	1,889 74.370	1,881 74.055	453 17.835	930 36.614	1,408 55.433

Model No.	Beam pitch	First beam channel position
	G	H
SF4B-F□<V2>	10 0.394	5 0.197
SF4B-H□<V2>	20 0.787	5 0.197
SF4B-A□<V2>	40 1.575	15 0.591

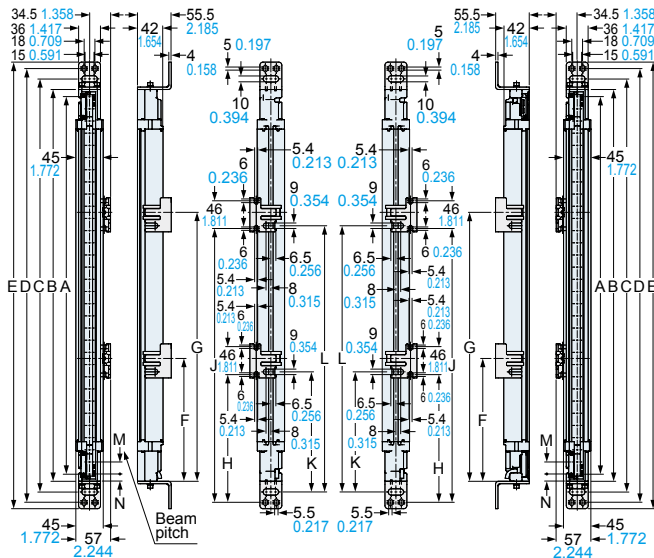
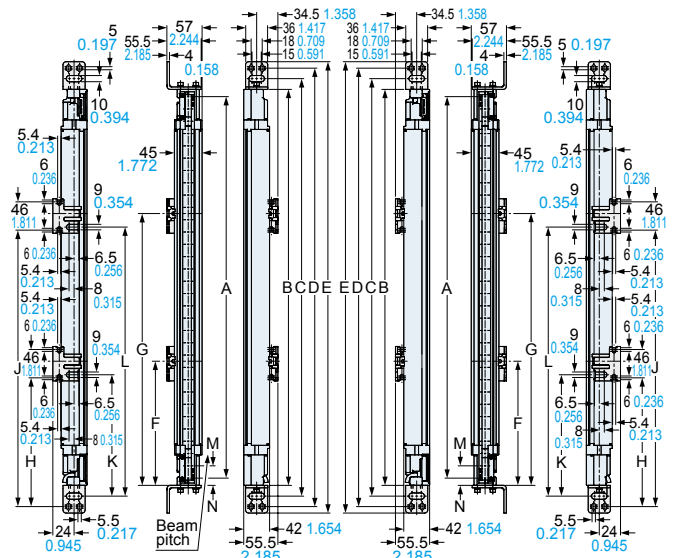
Note: In the case of "When used as safety device for presses in China", the distance between the center of the first beam axis and the center of the last beam axis of the device becomes the protective height (A'). For details, refer to "Definition of sensing heights" (p.645).

**DIMENSIONS (Unit: mm in)**

The CAD data can be downloaded from our website.

**SF4B-□G□<V2>**It is only available for the robust type **SF4B-□G□<V2>**

Safety light curtain

**Assembly dimensions**Mounting drawing for safety light curtains using the standard mounting brackets **MS-SF4BG-1** (optional) and the intermediate supporting brackets.**<Rear mounting>****Emitter****Receiver****<Side mounting>****Emitter****Receiver**

Model No.			Protective height		Mounting pitch		Total length	Intermediate supporting bracket mounting pitch						
								A (Note)		B	C	D	E	F
			SF4B-F□G<V2> SF4B-H□G□<V2>	SF4B-A□G<V2>										
SF4B-F23G<V2>	SF4B-H12G□<V2>	SF4B-A6G<V2>	220 8.661	200 7.874	244 9.606	279 10.984	313 12.323	334 13.150	—	—	—	—	—	—
SF4B-F31G<V2>	SF4B-H16G□<V2>	SF4B-A8G<V2>	300 11.811	280 11.024	324 12.756	359 14.134	393 15.472	414 16.299	—	—	—	—	—	—
SF4B-F39G<V2>	SF4B-H20G□<V2>	SF4B-A10G<V2>	380 14.961	360 14.173	404 15.906	439 17.283	473 18.622	494 19.449	—	—	—	—	—	—
SF4B-F47G<V2>	SF4B-H24G□<V2>	SF4B-A12G<V2>	460 18.110	440 17.323	484 19.055	519 20.433	553 21.772	574 22.598	—	—	—	—	—	—
SF4B-F55G<V2>	SF4B-H28G□<V2>	SF4B-A14G<V2>	540 21.260	520 20.472	564 22.205	599 23.583	633 24.921	654 25.748	—	—	—	—	—	—
SF4B-F63G<V2>	SF4B-H32G□<V2>	SF4B-A16G<V2>	620 24.409	600 23.622	644 25.354	679 26.732	713 28.071	734 28.898	—	—	—	—	—	—
SF4B-F71G<V2>	SF4B-H36G□<V2>	SF4B-A18G<V2>	700 27.559	680 26.772	724 28.504	759 29.882	793 31.220	814 32.047	—	—	—	—	—	—
SF4B-F79G<V2>	SF4B-H40G□<V2>	SF4B-A20G<V2>	780 30.709	760 29.921	804 31.654	839 33.031	873 34.370	894 35.197	441 17.362	—	414 16.299	—	419 16.496	—
SF4B-F95G<V2>	SF4B-H48G□<V2>	SF4B-A24G<V2>	940 37.008	920 36.220	964 37.953	999 39.331	1,033 40.669	1,054 41.496	521 20.512	—	494 19.449	—	499 19.646	—
SF4B-F111G<V2>	SF4B-H56G□<V2>	SF4B-A28G<V2>	1,100 43.307	1,080 42.520	1,124 44.252	1,159 45.630	1,193 46.968	1,214 47.795	601 23.661	—	574 22.598	—	579 22.795	—
SF4B-F127G<V2>	SF4B-H64G□<V2>	SF4B-A32G<V2>	1,260 49.606	1,240 48.819	1,284 50.551	1,319 51.929	1,353 53.268	1,374 54.094	681 26.811	—	654 25.748	—	659 25.945	—
—	SF4B-H72G□<V2>	SF4B-A36G<V2>	1,420 55.905	1,400 55.118	1,444 56.850	1,479 58.228	1,513 59.567	1,534 60.394	520 20.472	1,001 39.409	493 19.409	974 38.346	498 19.606	979 38.543
—	SF4B-H80G□<V2>	SF4B-A40G<V2>	1,580 62.205	1,560 61.417	1,604 63.150	1,639 64.528	1,673 65.866	1,694 66.693	573 22.559	1,108 43.622	546 21.496	1,081 42.559	551 21.693	1,086 42.756
—	SF4B-H88G□<V2>	SF4B-A44G<V2>	1,740 68.504	1,720 67.716	1,764 69.449	1,799 70.827	1,833 72.165	1,854 72.992	627 24.685	1,215 47.835	600 23.622	1,188 46.772	605 23.819	1,193 46.968
—	SF4B-H96G□<V2>	SF4B-A48G<V2>	1,900 74.803	1,880 74.016	1,924 75.748	1,959 77.126	1,993 78.464	2,014 79.291	680 26.772	1,321 52.008	653 25.709	1,294 50.945	658 25.906	1,289 50.748

Model No.	Beam pitch	First beam channel position
	M	N
SF4B-F□G□<V2>	10 0.394	11.8 0.465
SF4B-H□G□<V2>	20 0.787	11.8 0.465
SF4B-A□G□<V2>	40 1.575	21.8 0.858

Note: In the case of "When used as safety device for presses in China", the distance between the center of the first beam axis and the center of the last beam axis of the device becomes the protective height (A). For details, refer to "Definition of sensing heights" (p.645).

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

SAFETY LIGHT CURTAINS/ SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

ENERGY MANAGEMENT SOLUTIONS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide

Safety Light Curtains

Safety Control Units

Safety Components

SF4D

SF4B/ SF4B-G

SF4B-C

SF4C

BSF4-AH80

SF2B

SF2C

Definition of Sensing Heights

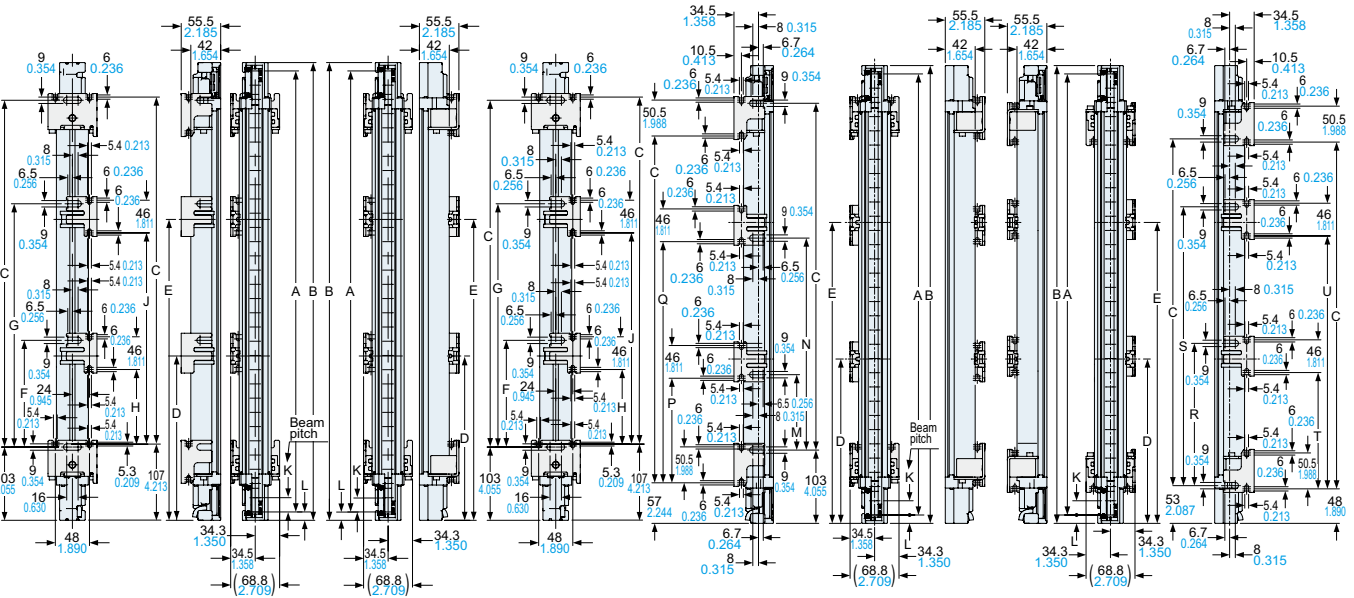


**DIMENSIONS (Unit: mm in)**

The CAD data can be downloaded from our website.

**SF4B-□G□<V2>**It is only available for the robust type **SF4B-□G□<V2>**

Safety light curtain

**Assembly dimensions**Mounting drawing for safety light curtains using the dead zoneless mounting brackets **MS-SF4BG-3** (optional) and the intermediate supporting brackets.**<Rear mounting>****<Side mounting>****Emitter****Receiver****Emitter****Receiver**

Model No.			Protective height			Mounting pitch	Intermediate supporting bracket mounting pitch															
			A (Note)		B		C	D	E	F	G	H	J	M	N	P	Q	R	S	T	U	
			SF4B-F□G□<V2> SF4B-H□G□<V2>	SF4B-A□G□<V2>																		
SF4B-F23G<V2>	SF4B-H12G□<V2>	SF4B-A6G<V2>	220 8.661	200 7.874	244 9.606	64.5 2.539	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
SF4B-F31G<V2>	SF4B-H16G□<V2>	SF4B-A8G<V2>	300 11.811	280 11.024	324 12.756	144.5 5.689	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
SF4B-F39G<V2>	SF4B-H20G□<V2>	SF4B-A10G<V2>	380 14.961	360 14.173	404 15.906	224.5 8.839	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
SF4B-F47G<V2>	SF4B-H24G□<V2>	SF4B-A12G<V2>	460 18.110	440 17.323	484 19.055	304.5 11.988	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
SF4B-F55G<V2>	SF4B-H28G□<V2>	SF4B-A14G<V2>	540 21.260	520 20.472	564 22.205	384.5 15.138	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
SF4B-F63G<V2>	SF4B-H32G□<V2>	SF4B-A16G<V2>	620 24.409	600 23.622	644 25.354	464.5 18.287	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
SF4B-F71G<V2>	SF4B-H36G□<V2>	SF4B-A18G<V2>	700 27.559	680 26.772	724 28.504	544.5 21.437	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
SF4B-F79G<V2>	SF4B-H40G□<V2>	SF4B-A20G<V2>	780 30.709	760 29.921	804 31.654	624.5 24.587	414 16.299	—	333 13.110	—	288 11.339	—	289 11.378	—	330 12.992	—	383 15.079	—	347 13.661	—	—	
SF4B-F95G<V2>	SF4B-H48G□<V2>	SF4B-A24G<V2>	940 37.008	920 36.220	964 37.953	784.5 30.886	494 19.449	—	413 16.260	—	368 14.488	—	369 14.528	—	410 16.142	—	463 18.228	—	427 16.811	—	—	
SF4B-F111G<V2>	SF4B-H56G□<V2>	SF4B-A28G<V2>	1,100 43.307	1,080 42.520	1,124 44.252	944.5 37.185	574 22.598	—	493 19.409	—	448 17.638	—	449 17.677	—	490 19.291	—	543 21.378	—	507 19.961	—	—	
SF4B-F127G<V2>	SF4B-H64G□<V2>	SF4B-A32G<V2>	1,260 49.606	1,240 48.819	1,284 50.551	1,104.5 43.484	654 25.748	—	573 22.559	—	528 20.787	—	529 20.827	—	570 22.441	—	623 24.528	—	587 23.110	—	—	
—	SF4B-H72G□<V2>	SF4B-A36G<V2>	1,420 55.905	1,400 55.118	1,444 56.850	1,264.5 49.783	493 19.409	974 38.346	412 16.220	883 35.157	367 14.449	848 33.386	368 14.488	849 33.425	409 16.102	890 35.039	462 18.189	943 37.126	462 18.772	907 35.709		
—	SF4B-H80G□<V2>	SF4B-A40G<V2>	1,580 62.205	1,560 61.417	1,604 63.150	1,424.5 56.083	546 21.496	1,081 42.559	465 18.307	1,000 39.370	420 16.535	855 33.598	421 16.575	856 33.638	462 18.189	997 39.252	515 20.276	1,050 41.339	479 18.858	1,014 39.921		
—	SF4B-H88G□<V2>	SF4B-A44G<V2>	1,740 68.504	1,720 67.716	1,764 69.449	1,584.5 62.382	600 23.622	1,188 46.772	519 20.433	1,107 43.583	474 18.661	1,062 41.811	475 18.701	1,063 41.850	516 20.315	1,104 43.465	569 22.402	1,157 45.551	533 20.984	1,121 44.134		
—	SF4B-H96G□<V2>	SF4B-A48G<V2>	1,900 74.803	1,880 74.016	1,924 75.748	1,744.5 68.681	653 25.709	1,294 50.945	572 22.520	1,213 47.756	527 20.748	1,168 45.984	528 20.787	1,169 46.024	569 22.402	1,210 47.638	622 24.488	1,263 49.724	586 23.071	1,227 48.307		

Note: In the case of "When used as safety device for presses in China", the distance between the center of the first beam axis and the center of the last beam axis of the device becomes the protective height (A). For details, refer to **Definition of sensing heights** (p.645).

Model No.	Beam pitch	First beam channel position
	K	L
SF4B-F□G□<V2>	10 0.394	11.8 0.465
SF4B-H□G□<V2>	20 0.787	11.8 0.465
SF4B-A□G□<V2>	40 1.575	21.8 0.858

**DIMENSIONS (Unit: mm in)**

The CAD data can be downloaded from our website.

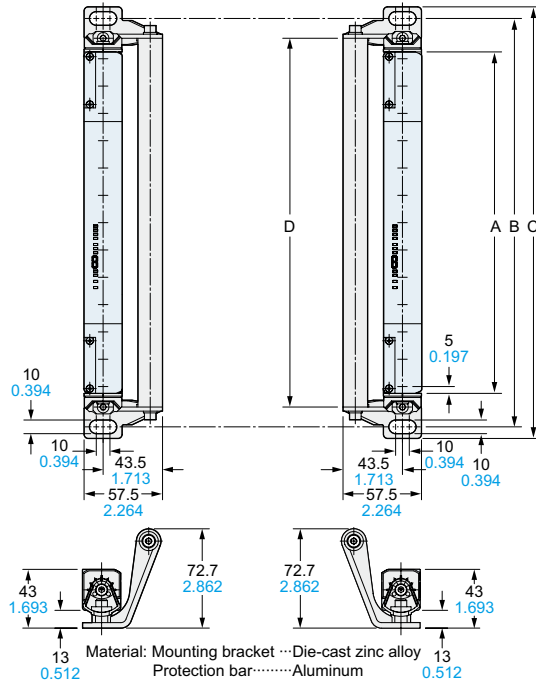
**SF4B-□**Not available for the robust type **SF4B-□G□<V2>**

Safety light curtain

**Protection bar set MC-SFBH-□ assembly dimensions**

## &lt;MC-SFBH-□(L)&gt;

## &lt;MC-SFBH-□(R)&gt;

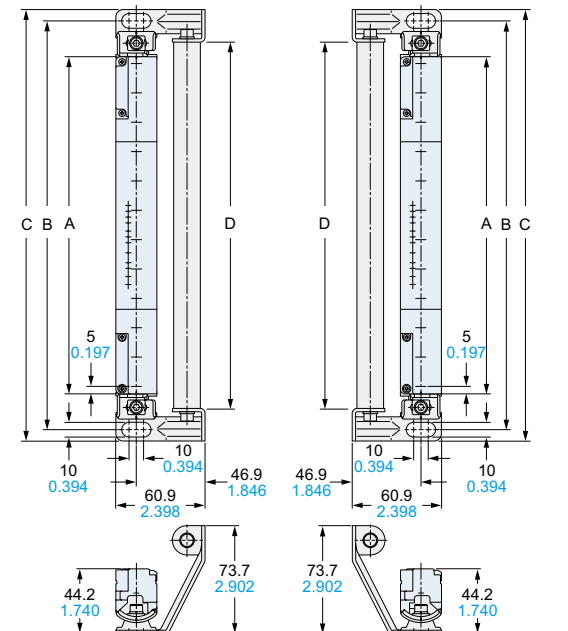
Two brackets (one pc. each of R type and L type),  
one protection barTwo pcs. each of M5 (length 16 mm 0.630 in)  
hexagon-socket-head bolts, M5 (length 20 mm 0.787 in)  
hexagon-socket-head bolt are attached.

Model No.	Applicable safety light curtain model No.			A	B	C	D
MC-SFBH-12(-T)	SF4B-F23□<V2>	SF4B-H12□<V2>	SF4B-A6□<V2>	230 9.055	279 10.984	296 11.654	250 9.843
MC-SFBH-16(-T)	SF4B-F31□<V2>	SF4B-H16□<V2>	SF4B-A8□<V2>	310 12.205	359 14.134	376 14.803	330 12.992
MC-SFBH-20(-T)	SF4B-F39□<V2>	SF4B-H20□<V2>	SF4B-A10□<V2>	390 15.354	439 17.283	456 17.953	410 16.142
MC-SFBH-24(-T)	SF4B-F47□<V2>	SF4B-H24□<V2>	SF4B-A12□<V2>	470 18.504	519 20.433	536 21.102	490 19.291
MC-SFBH-28(-T)	SF4B-F55□<V2>	SF4B-H28□<V2>	SF4B-A14□<V2>	550 21.654	599 23.583	616 24.252	570 22.441
MC-SFBH-32(-T)	SF4B-F63□<V2>	SF4B-H32□<V2>	SF4B-A16□<V2>	630 24.803	679 26.732	696 27.402	650 25.591
MC-SFBH-36(-T)	SF4B-F71□<V2>	SF4B-H36□<V2>	SF4B-A18□<V2>	710 27.953	759 29.882	776 30.551	730 28.740
MC-SFBH-40(-T)	SF4B-F79□<V2>	SF4B-H40□<V2>	SF4B-A20□<V2>	790 31.102	839 33.031	856 33.701	810 31.890
MC-SFBH-48(-T)	SF4B-F95□<V2>	SF4B-H48□<V2>	SF4B-A24□<V2>	950 37.402	999 39.331	1,016 40.000	970 38.189
MC-SFBH-56(-T)	SF4B-F111□<V2>	SF4B-H56□<V2>	SF4B-A28□<V2>	1,110 43.701	1,159 45.630	1,176 46.299	1,130 44.488
MC-SFBH-64(-T)	SF4B-F127□<V2>	SF4B-H64□<V2>	SF4B-A32□<V2>	1,270 50.000	1,319 51.929	1,336 52.598	1,290 50.787
MC-SFBH-72(-T)	—	SF4B-H72□<V2>	SF4B-A36□<V2>	1,430 56.299	1,479 58.228	1,496 58.898	1,450 57.087
MC-SFBH-80(-T)	—	SF4B-H80□<V2>	SF4B-A40□<V2>	1,590 62.598	1,639 64.527	1,656 65.197	1,610 63.386
MC-SFBH-88(-T)	—	SF4B-H88□<V2>	SF4B-A44□<V2>	1,750 68.898	1,799 70.827	1,816 71.496	1,770 69.685
MC-SFBH-96(-T)	—	SF4B-H96□<V2>	SF4B-A48□<V2>	1,910 75.197	1,959 77.126	1,976 77.795	1,930 75.984

**Protection bar set for rear/side mounting  
MC-SFBH-□-T assembly dimensions****Rear mounting**

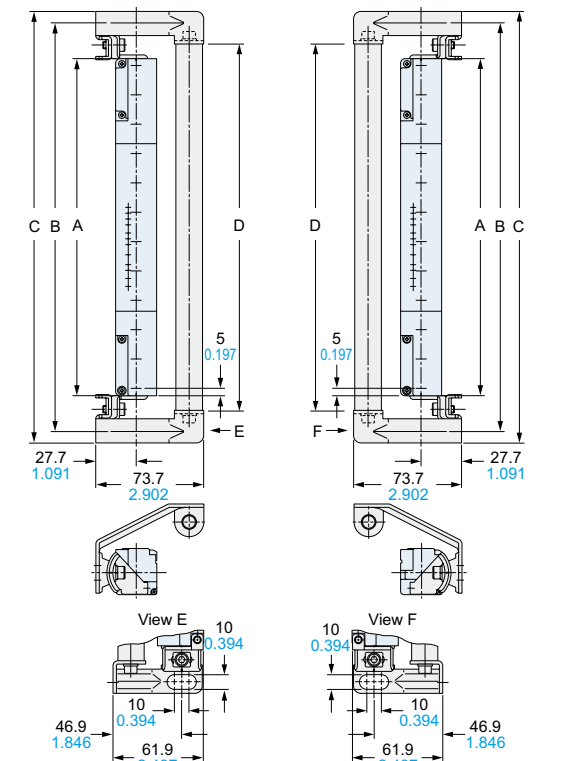
## &lt;MC-SFBH-□-T(L)&gt;

## &lt;MC-SFBH-□-T(R)&gt;

**Side mounting**

## &lt;MC-SFBH-□-T(L)&gt;

## &lt;MC-SFBH-□-T(R)&gt;

Material: Mounting bracket ...Cold rolled carbon steel (SPCC)  
(Trivalent chrome plated)

Protection bar.....Aluminum

Two brackets (one pc. each of R type and L type),  
one protection barTwo pcs. each of M5 (length 18 mm 0.709 in)  
hexagon-socket-head bolts, M5 (length 20 mm 0.787 in)  
hexagon-socket-head bolt are attached.FIBER  
SENSORSLASER  
SENSORSPHOTO-  
ELECTRIC  
SENSORSMICRO  
PHOTO-  
ELECTRIC  
SENSORSAREA  
SENSORSSAFETY LIGHT  
CURTAINS  
SAFETY  
COMPONENTSPRESSURE /  
FLOW  
SENSORSINDUCTIVE  
PROXIMITY  
SENSORSPARTICULAR  
USE  
SENSORSSENSOR  
OPTIONSSIMPLE  
WIRE-SAVING  
UNITSWIRE-SAVING  
SYSTEMSMEASURE-  
MENT  
SENSORSSTATIC  
CONTROL  
DEVICESLASER  
MARKERS

PLC

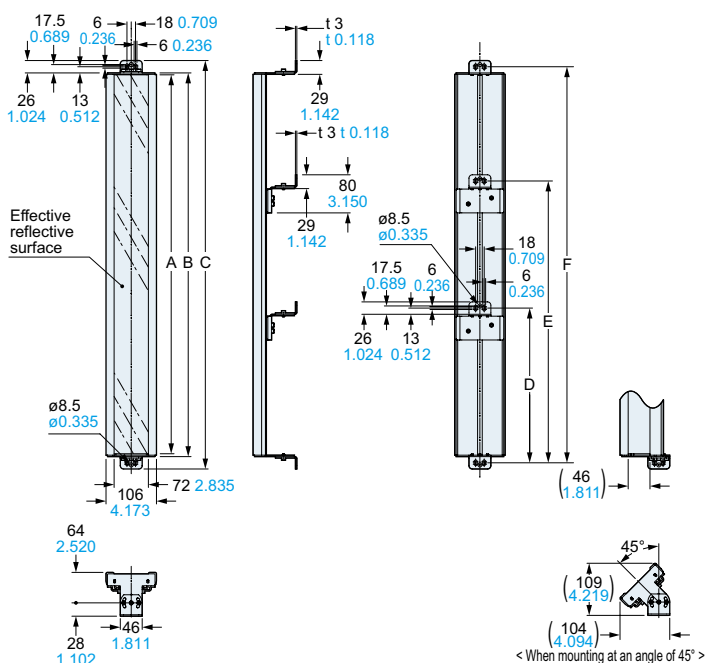
HUMAN  
MACHINE  
INTERFACESENERGY  
MANAGEMENT  
SOLUTIONSFA  
COMPONENTSMACHINE  
VISION  
SYSTEMSUV  
CURING  
SYSTEMSSelection  
GuideSafety Light  
CurtainsSafety  
Control UnitsSafety  
Components**SF4D****SF4B/  
SF4B-G****SF4B-C****SF4C****BSF4-AH80****SF2B****SF2C**Definition of  
Sensing Heights

**DIMENSIONS (Unit: mm in)**

The CAD data can be downloaded from our website.

**RF-SFBH-□**

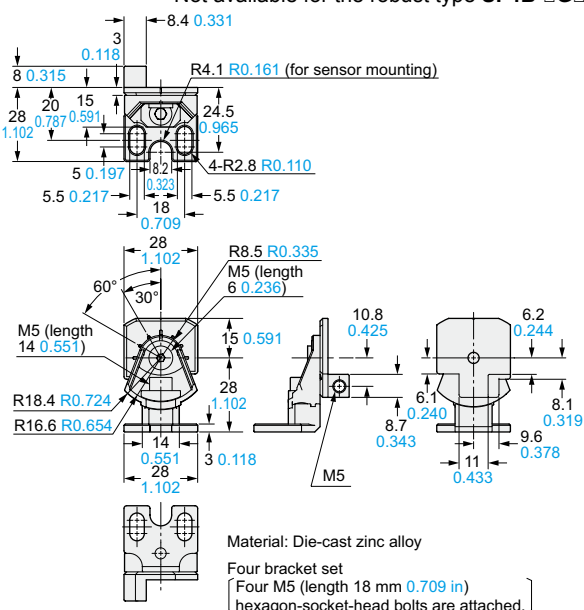
Corner mirror (Optional)



Model No.	A	B	C	D	E	F	Net weight
<b>RF-SFBH-12</b>	236 9.291	246 9.685	298 11.732	—	—	272 10.709	970 g approx.
<b>RF-SFBH-16</b>	316 12.441	326 12.835	378 14.882	—	—	352 13.858	1,170 g approx.
<b>RF-SFBH-20</b>	396 15.591	406 15.984	458 18.031	—	—	432 17.008	1,370 g approx.
<b>RF-SFBH-24</b>	476 18.740	486 19.134	538 21.181	—	—	512 20.157	1,570 g approx.
<b>RF-SFBH-28</b>	556 21.890	566 22.283	618 24.331	—	—	592 23.307	1,770 g approx.
<b>RF-SFBH-32</b>	636 25.039	646 25.433	698 27.480	—	—	672 26.457	1,970 g approx.
<b>RF-SFBH-36</b>	716 28.189	726 28.583	778 30.630	—	—	752 29.606	2,170 g approx.
<b>RF-SFBH-40</b>	796 31.339	806 31.732	858 33.779	458 ±50 18.031 ±1.969	—	832 32.766	2,660 g approx.
<b>RF-SFBH-48</b>	956 37.638	966 38.031	1,018 40.079	538 ±50 21.181 ±1.969	—	992 39.055	3,060 g approx.
<b>RF-SFBH-56</b>	1,116 43.937	1,126 44.331	1,178 46.378	618 ±50 24.331 ±1.969	—	1,152 45.354	3,460 g approx.
<b>RF-SFBH-64</b>	1,276 50.236	1,286 50.630	1,338 52.677	698 ±50 27.480 ±1.969	—	1,312 51.653	3,890 g approx.
<b>RF-SFBH-72</b>	1,436 56.535	1,446 56.929	1,498 58.976	538 ±50 21.181 ±1.969	1,018 ±50 40.079 ±1.969	1,472 57.953	4,550 g approx.
<b>RF-SFBH-80</b>	1,596 62.835	1,606 63.228	1,658 65.275	591 ±50 23.268 ±1.969	1,125 ±50 44.291 ±1.969	1,632 64.252	4,950 g approx.
<b>RF-SFBH-88</b>	1,756 69.134	1,766 69.527	1,818 71.575	645 ±50 25.394 ±1.969	1,231 ±50 48.464 ±1.969	1,792 70.551	5,350 g approx.
<b>RF-SFBH-96</b>	1,916 75.433	1,926 75.827	1,978 77.874	698 ±50 27.480 ±1.969	1,338 ±50 52.677 ±1.969	1,952 76.850	5,750 g approx.

**MS-SFB-1**

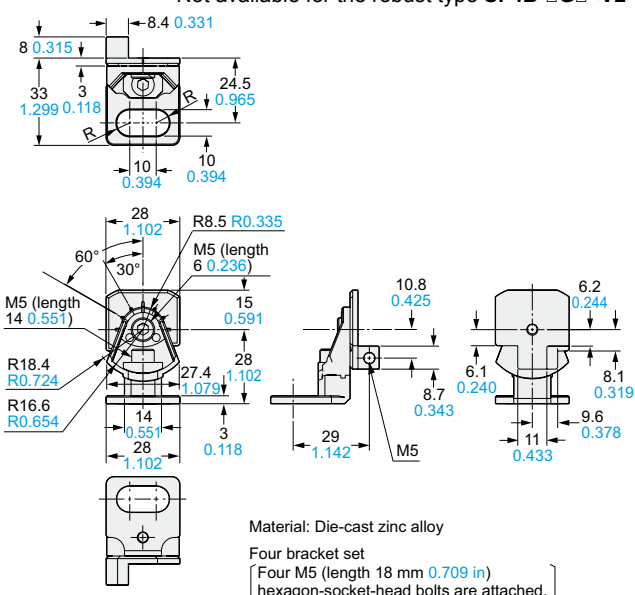
Standard mounting bracket (Optional)

Not available for the robust type **SF4B-□G□<V2>**

Material: Die-cast zinc alloy

Four bracket set  
[Four M5 (length 18 mm 0.709 in)  
hexagon-socket-head bolts are attached.]**MS-SFB-1-T**

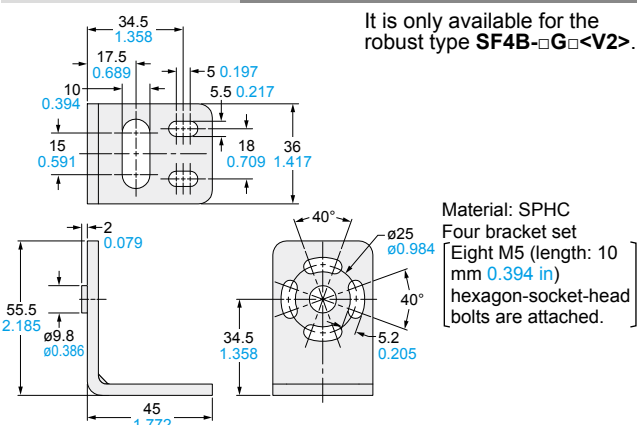
M8 mounting bracket (Optional)

Not available for the robust type **SF4B-□G□<V2>**

Material: Die-cast zinc alloy

Four bracket set  
[Four M5 (length 18 mm 0.709 in)  
hexagon-socket-head bolts are attached.]**MS-SF4BG-1**

Standard L mounting bracket (Optional)

It is only available for the robust type **SF4B-□G□<V2>**.

Material: SPHC

Four bracket set  
[Eight M5 (length: 10 mm 0.394 in)  
hexagon-socket-head  
bolts are attached.]

- 1 set: SF4B-F□G□V2> ... 79 to 127 beam channels  
SF4B-H□G□V2> ... 40 to 64 beam channels  
SF4B-A□G□V2> ... 20 to 32 beam channels  
2 sets: SF4B-H□G□V2> ... 72 to 96 beam channels  
SF4B-A□G□V2> ... 36 to 48 beam channels



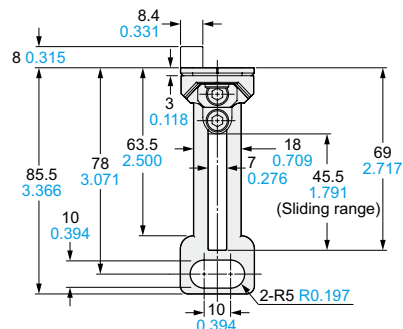


**DIMENSIONS (Unit: mm in)**

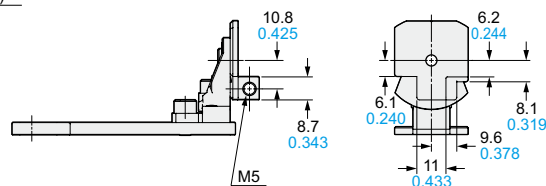
The CAD data can be downloaded from our website.

**MS-SFB-4-T**Not available for the robust type **SF4B-□G□<V2>**

M8 pitch adapter bracket (Optional)

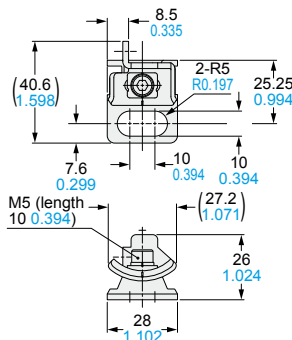


Material: Die-cast zinc alloy

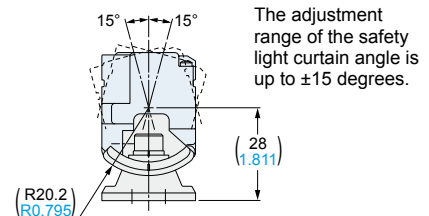
Four bracket set  
[Four M5 (length 18 mm 0.709 in)  
hexagon-socket-head bolts are attached.]**MS-SFB-7-T MS-SFB-1-T2 (Rear mounting)**

M8 rear mounting bracket (Optional)

M8 rear/side mounting brackets set (Optional)

Not available for the robust type **SF4B-□G□<V2>**

Material: Cold rolled carbon steel (SPCC) (Trivalent chrome plated)

Four bracket set  
[Four M5 (length 18 mm 0.709 in)  
hexagon-socket-head bolts are attached.]**Mounting adjustment range****MS-SFB-8-T MS-SFB-1-T2 (Side mounting)**

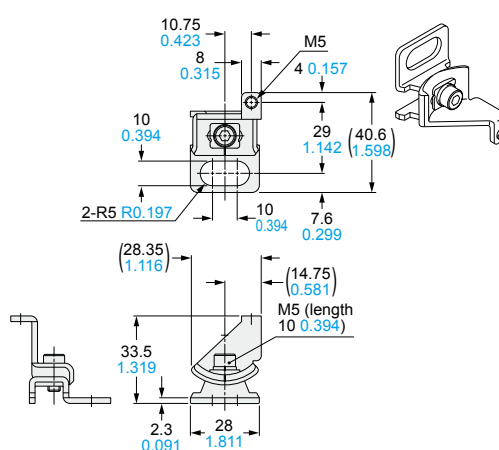
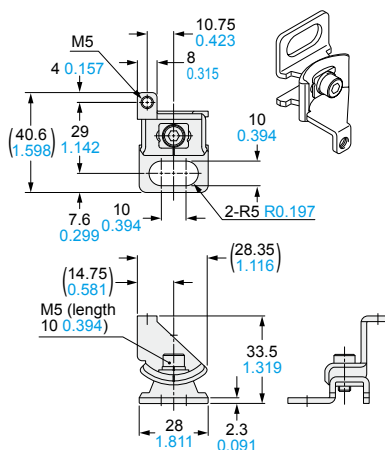
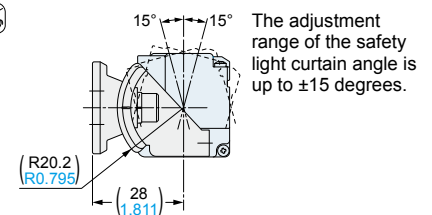
M8 side mounting bracket (Optional)

M8 rear/side mounting brackets set (Optional)

Not available for the robust type **SF4B-□G□<V2>**

## &lt;MS-SFB-8-T(R)&gt;

## &lt;MS-SFB-8-T(L)&gt;

**Mounting adjustment range**Material: Cold rolled carbon steel (SPCC)  
(Trivalent chrome plated)Four bracket  
(two pcs. each of R type and L type) set  
[Four M5 (length 18 mm 0.709 in)  
hexagon-socket-head bolts are attached.]FIBER  
SENSORSLASER  
SENSORSPHOTO-  
ELECTRIC  
SENSORSMICRO  
PHOTO-  
ELECTRIC  
SENSORSAREA  
SENSORSSAFETY LIGHT  
CURTAINS/  
SAFETY  
COMPONENTSPRESSURE /  
FLOW  
SENSORSINDUCTIVE  
PROXIMITY  
SENSORSPARTICULAR  
USE  
SENSORSSENSOR  
OPTIONSSIMPLE  
WIRE-SAVING  
UNITSWIRE-SAVING  
SYSTEMSMEASURE-  
MENT  
SENSORSSTATIC  
CONTROL  
DEVICESLASER  
MARKERS

PLC

HUMAN  
MACHINE  
INTERFACESENERGY  
MANAGEMENT  
SOLUTIONSFA  
COMPONENTSMACHINE  
VISION  
SYSTEMSUV  
CURING  
SYSTEMSSelection  
GuideSafety Light  
CurtainsSafety  
Control UnitsSafety  
Components

SF4D

SF4B/  
SF4B-G

SF4B-C

SF4C

BSF4-AH80

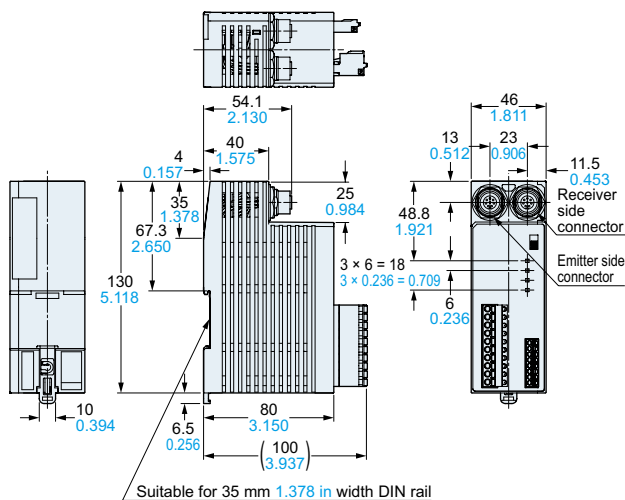
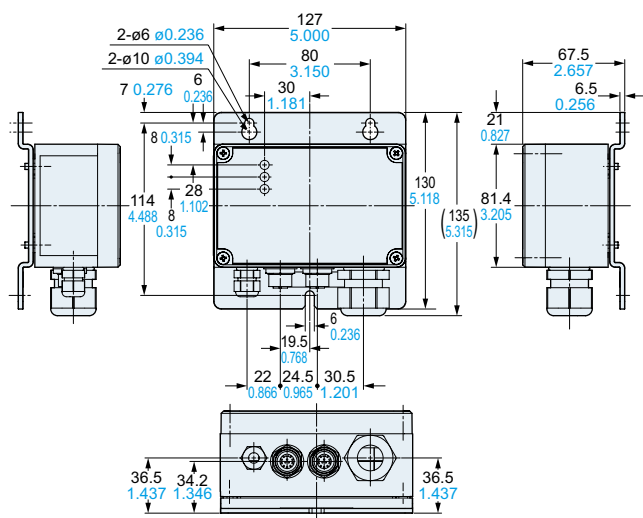
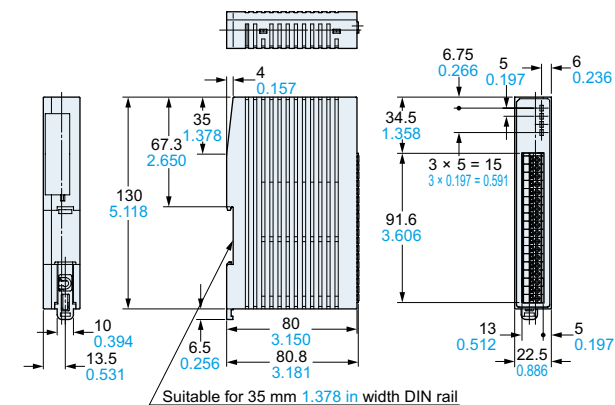
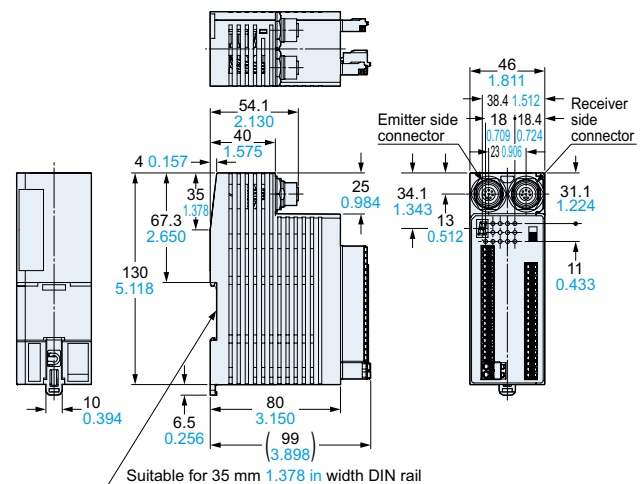
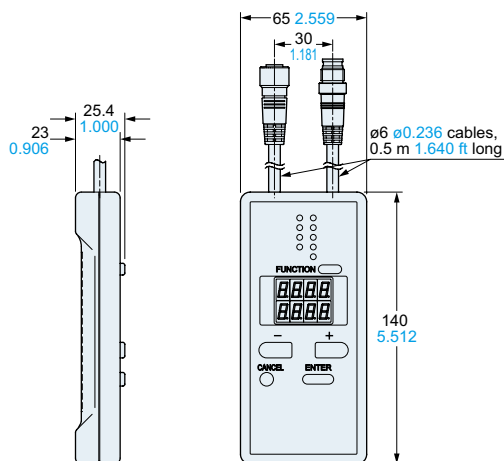
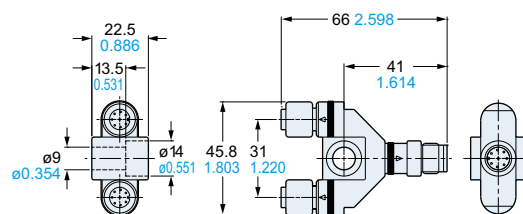
SF2B

SF2C

Definition of  
Sensing Heights

**DIMENSIONS (Unit: mm in)**

The CAD data can be downloaded from our website.

**SF-C11** Control unit (Optional)**SF-C12** Control unit (Optional)**SF-C13** Control unit (Optional)**SF-C14EX(-01)** Application expansion unit (Optional)**SFB-HC** Handy-controller (Optional)**SFB-WY1** Y-shaped connector (Optional)FIBER  
SENSORSLASER  
SENSORSPHOTO-  
ELECTRIC  
SENSORSMICRO  
PHOTO-  
ELECTRIC  
SENSORSAREA  
SENSORSSAFETY LIGHT  
CURTAINS /  
SAFETY  
COMPONENTSPRESSURE /  
FLOW  
SENSORSINDUCTIVE  
PROXIMITY  
SENSORSPARTICULAR  
USE  
SENSORSSENSOR  
OPTIONSSIMPLE  
WIRE-SAVING  
UNITSWIRE-SAVING  
SYSTEMSMEASURE-  
MENT  
SENSORSSTATIC  
CONTROL  
DEVICESLASER  
MARKERS

PLC

HUMAN  
MACHINE  
INTERFACESENERGY  
MANAGEMENT  
SOLUTIONSFA  
COMPONENTSMACHINE  
VISION  
SYSTEMSUV  
CURING  
SYSTEMSSelection  
GuideSafety Light  
CurtainsSafety  
Control UnitsSafety  
Components**SF4D****SF4B/  
SF4B-G****SF4B-C****SF4C****BSF4-AH80****SF2B****SF2C**Definition of  
Sensing Heights

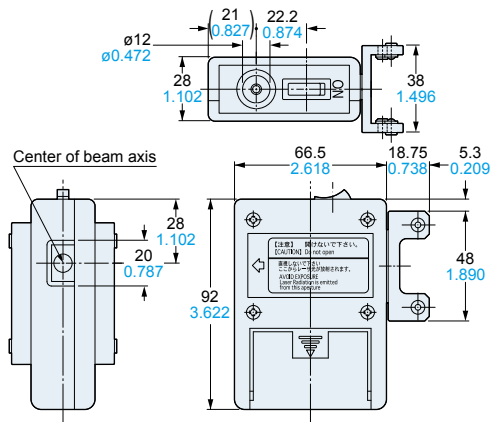
**DIMENSIONS (Unit: mm in)**

The CAD data can be downloaded from our website.

**SF-LAT-2N**

Laser alignment tool (Optional)

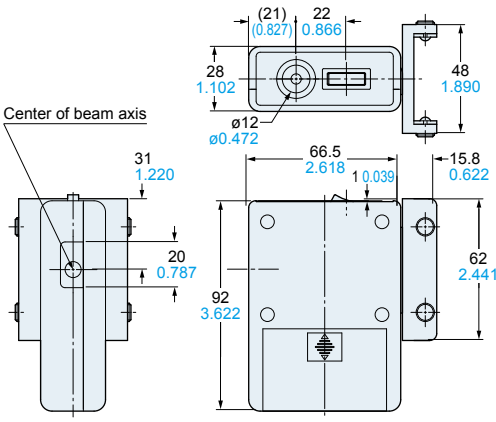
Not available for the robust type **SF4B-□G□<V2>**



**SF-LAT-4BG**

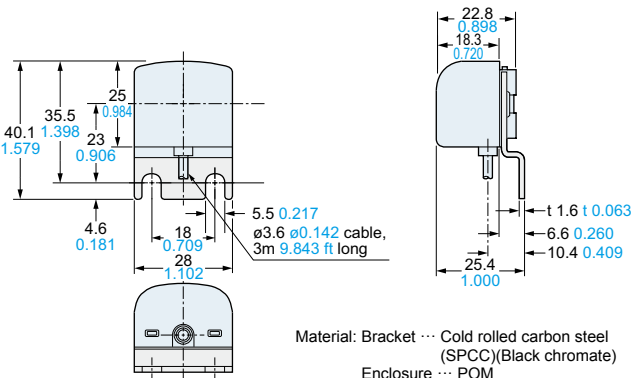
Laser alignment tool (Optional)

It is only available for the robust type **SF4B-□G□<V2>**.



**SF-IND-2**

Large display unit for safety light curtain (Optional)



Material: Bracket ... Cold rolled carbon steel (SPCC)(Black chromate)  
Enclosure ... POM  
Cover ... Polycarbonate

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

SAFETY LIGHT CURTAINS / SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASURE-MENT SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

ENERGY MANAGEMENT SOLUTIONS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide

Safety Light Curtains

Safety Control Units

Safety Components

SF4D

SF4B/ SF4B-G

SF4B-C

SF4C

BSF4-AH80

SF2B

SF2C

Definition of Sensing Heights



# Mouser Electronics

Authorized Distributor

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