Panasonic

CE Conforming to Machine & EMC Directive

TÜV Certified

cULus Approved Listing

Conforming to OSHA / ANSI

S Certified (**SF4B-□<V2>** only)

KCs (**SF4B-□-03<V2>** only)

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

Protection structure
IP67

New version with improved environmental resistance performance
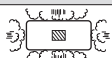
Robust type SF4B-□G□<V2>

Advanced light curtains at the forefront of the industry

Protection structure IP67 in a very compact size

Improved environmental resistance performance and easier operability

New structure

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 series has passed the tests of IP65 and IP67 as specified by IEC / JIS standards. (Ver.2 only)

IEC / JIS	Description	
IP65	No harmful effect from direct water jet from any direction	
IP67	No water penetration from immersion in water under specified conditions	

* Refer to each standard for details of test conditions.

Inner case

Cylindrical inner case protects the internal unit.

This new structure does not use adhesive or double-sided tape on the joints like the previous models. There is no need to worry about water immersion or corrosion such as a coolant causing the adhesive to strip off.

Error details can be understood at a glance

Equipped with a digital error indicator

The system constantly checks the 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.

Angle of view is wider and indicators are even more visible

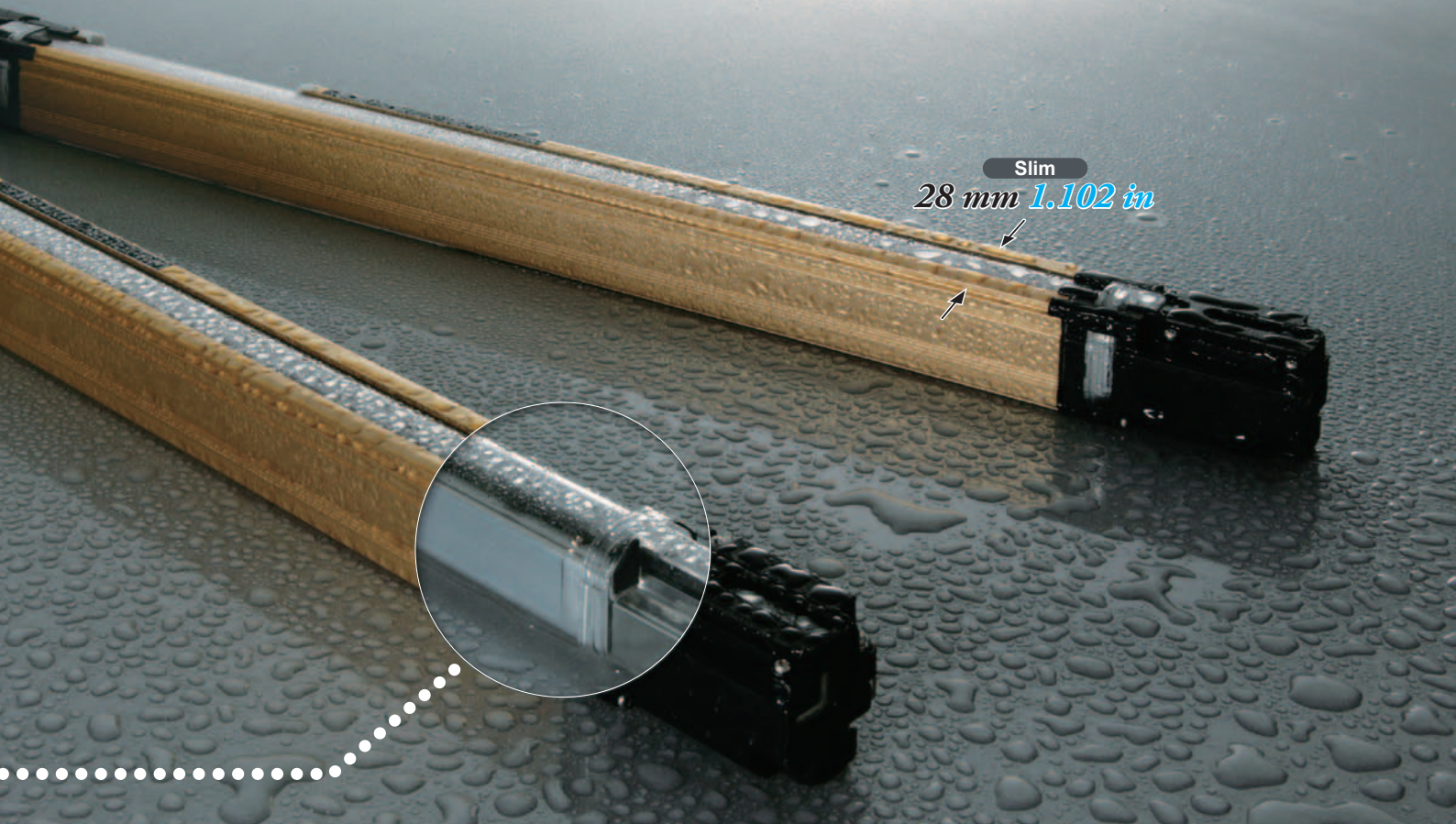Error number notification means smooth support via telephone

Normal operation

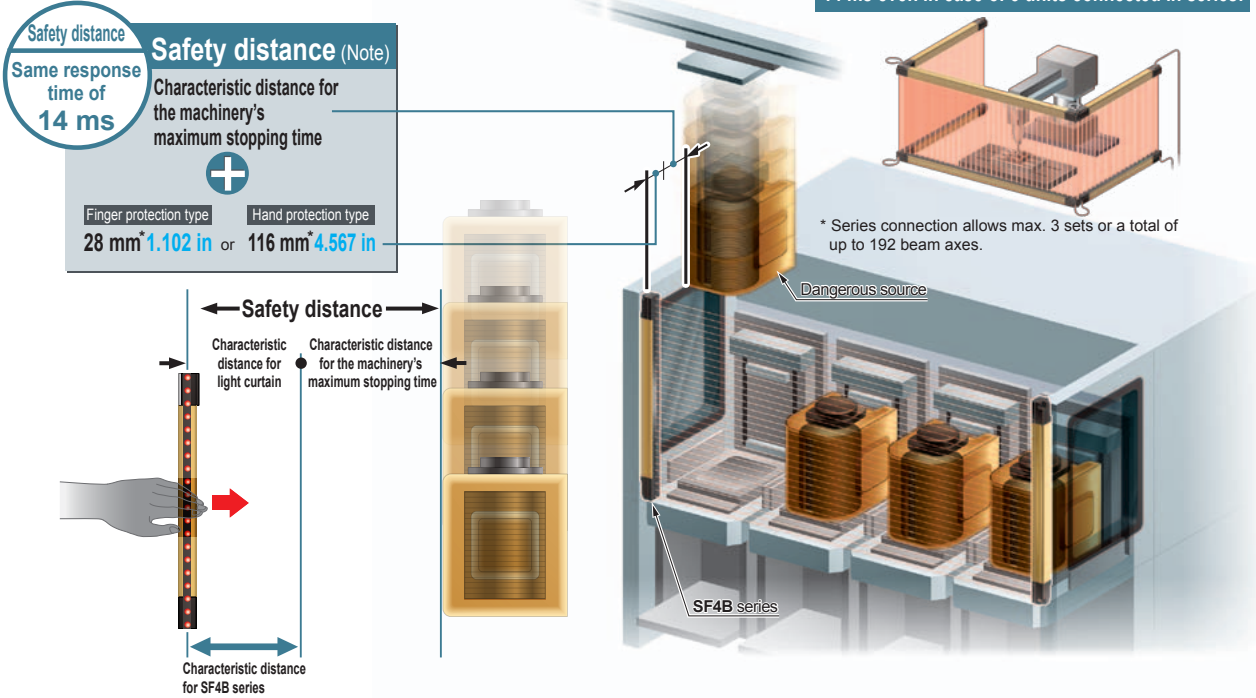Error occurred

Digital error indicator

Slim
28 mm 1.102 in

Unified response time for all models

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.

14 ms even in case of 3 units connected in series!

Safety distance

Same response time of **14 ms**

Safety distance (Note)

Characteristic distance for the machinery's maximum stopping time

+

Finger protection type	Hand protection type
28 mm*1.102 in or	116 mm*4.567 in

* Series connection allows max. 3 sets or a total of up to 192 beam axes.

Dangerous source

← Safety distance →

Characteristic distance for light curtain

Characteristic distance for the machinery's maximum stopping time

Characteristic distance for SF4B series

SF4B series

* This is the characteristic safety distance for the light curtain as defined by ISO 13855.
Note: Calculate the safety distance based on the distance depending on the light curtain and the distance depending on the maximum halting time of machinery. For more details, refer to p.31~. Install the light curtain according to the relevant standards of the region where the light curtain is used.

A universal design that can be used anywhere in the world

In Europe, America and Japan
PNP output and NPN output
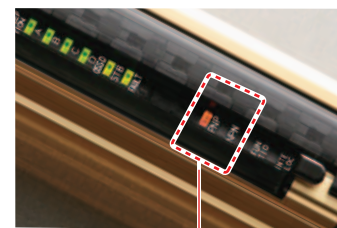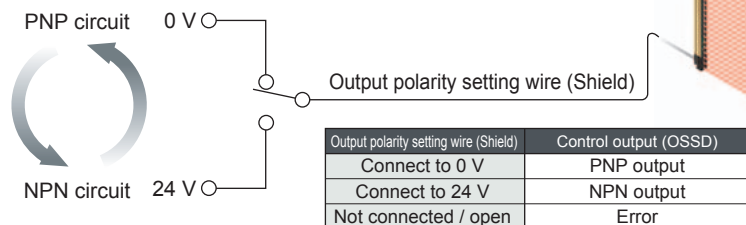in a single model!

PNP

NPN
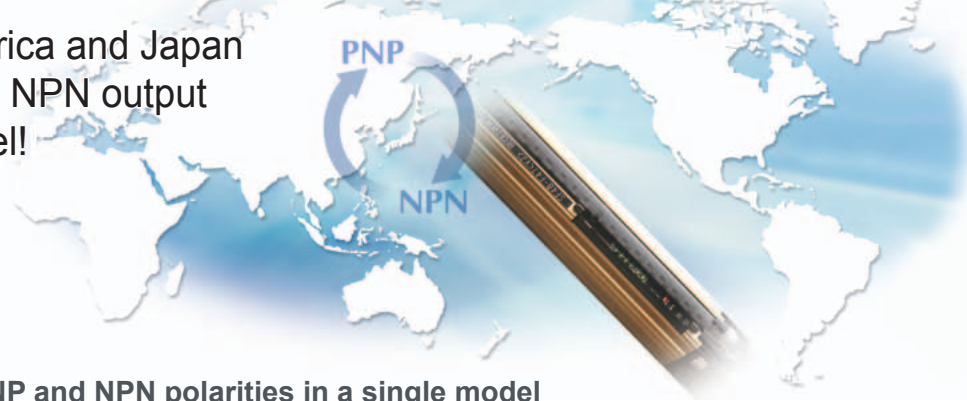
Supports both PNP and NPN polarities in a single model

The **SF4B** 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 worldwide.

■ **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 circuit   0 V

Output polarity setting wire (Shield)

NPN circuit   24 V

Output polarity setting wire (Shield)	Control output (OSSD)
Connect to 0 V	PNP output
Connect to 24 V	NPN output
Not connected / open	Error

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

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
Light curtains	SF4B-□<V2>	●	●	●	●	—	●	—	●
	SF4B-□G<V2>	●	●	●	●	—	—	—	●
	SF4B-A□-01<V2>				● (No.TA523)	● (No.TA521)	—	—	●
	SF4B-H□-01<V2>	●	●	●					
	SF4B-H□G-01<V2>				● (No.TA524)	● (No.TA522)	—	—	●
	SF4B-F□-01<V2>								
	SF4B-□-03<V2>	●	●	●	—	—	—	● (No.09-AV4BI-0001~0009)	—
Control units	SF-C11	●	●	●	● (No.TA525) (Note1) ● (No.TA526) (Note2)	—	●	—	—
	SF-C12	●	●	●	—	—	—	—	—
	SF-C13	●	●	●	● (No.TA527) (Note1) ● (No.TA528) (Note2)	—	●	—	—
	SF-C14EX	●	●	●	—	—	—	—	—
	SF-C14EX-01	●	●	●	● (No.TA529) (Note1) ● (No.TA530) (Note2)	—	—	—	—

Notes: 1) In combination with **SF4B-A□-01<V2>**. (For products produced in or after October 2012)
　　　 2) In combination with **SF4B-H□-01<V2>** / **SF4B-H□G-01<V2>** / **SF4B-F□-01<V2>**. (For products produced in or after October 2012)

It is possible to select from among each three types of standard / robust types depending on the worksite
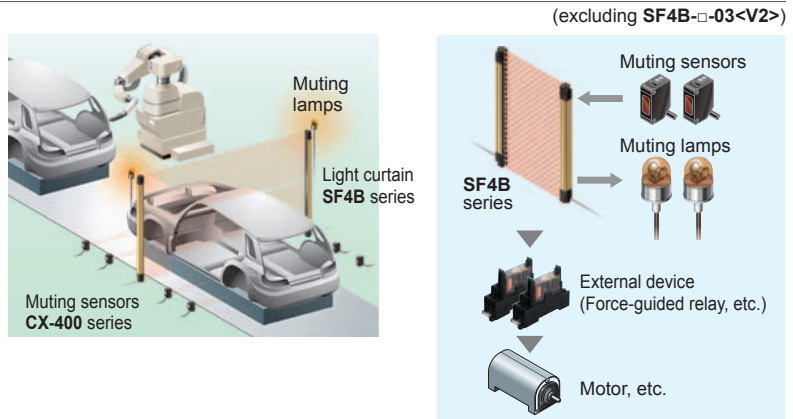
A wide range of variations are available with protective heights of 230 to 1,910 mm 9.055 to 75.197 in (1,270 mm 50.000 in for the finger protection type). Mixing six types in a series connection is also possible.

Finger protection type   **SF4B-F□(G)**

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

Hand protection type   **SF4B-H□(G)**

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

Arm / foot protection type   **SF4B-A□(G)**

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

Muting control function is built into light curtain
Safety circuits are selectable

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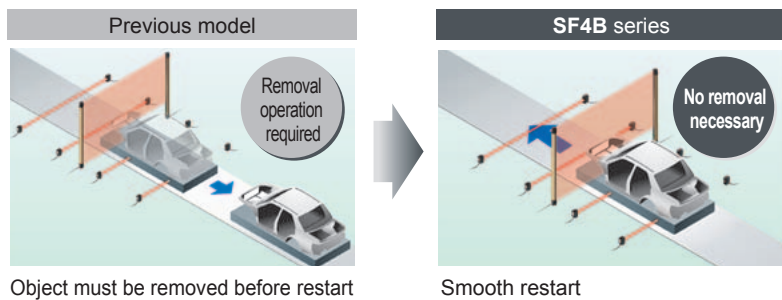
The light curtain is equipped with a muting control function that causes the line to stop only when a person passes through the light curtain, and does not stop the line when an object passes through. The muting sensors and muting lamps can be connected directly to the light curtain so that a exclusive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

(excluding **SF4B-□-03<V2>**)

Muting lamps

Light curtain **SF4B** series

Muting sensors **CX-400** series

Muting sensors

Muting lamps

SF4B series

External device (Force-guided relay, etc.)

Motor, etc.

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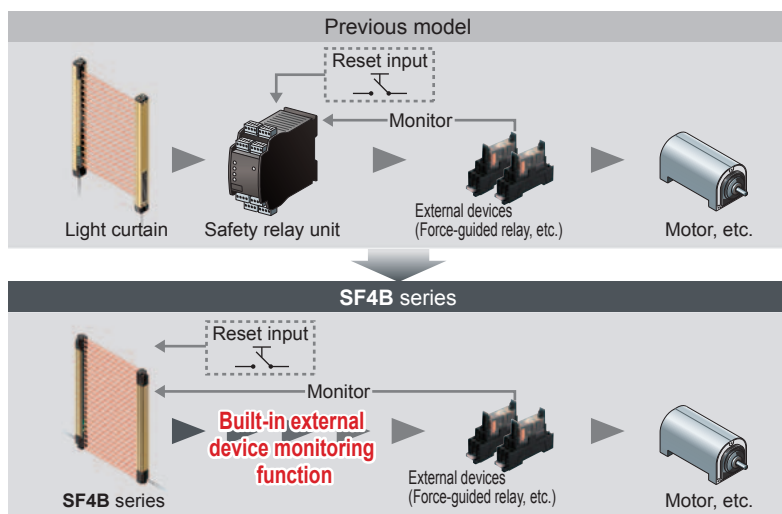
In case the power turns off while the light curtain has been interrupted by an object or in case the line stops before the muting conditions have been established (if only one muting sensor has been interrupted), the line can be restarted smoothly without having to remove the object that is interrupting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

(excluding **SF4B-□-03<V2>**)

Example : When power turns off while light curtain was interrupted

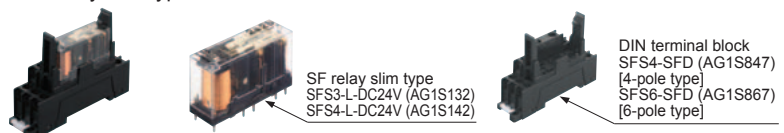| Previous model	**SF4B** series
Removal operation required	No removal necessary
Object must be removed before restart	Smooth restart

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

The 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.

Previous model

Reset input

Monitor

Light curtain   Safety relay unit   External devices (Force-guided relay, etc.)   Motor, etc.

SF4B series

Reset input

Monitor

Built-in external device monitoring function

SF4B series   External devices (Force-guided relay, etc.)   Motor, etc.

No safety relay unit needed

Smaller control board

● **Recommended 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-pole type]
SFS6-SFD (AG1S867)
[6-pole type]

Note: Contact Panasonic Corporation for details on the recommended products.
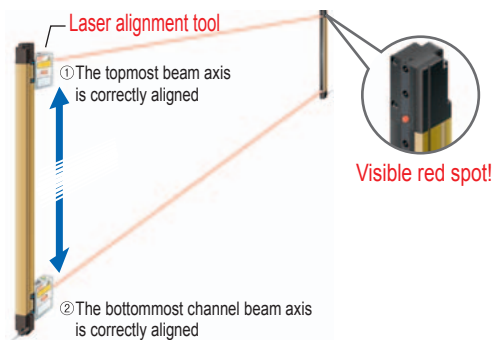
5

A commitment to design that is easy to use

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

Beam-axis alignment indicators display the beam channels of the 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.

Beam axes are displayed in 4 blocks	The bottommost beam axis is aligned	The beam axes of the two lower blocks are aligned	All beam axes are aligned

The bottommost LED 'D' is blinking red

The two bottom LEDs 'C, D' light up in red

All LEDs 'A to D' light up in green

Furthermore, STB display allows the most stable incident light status* to be confirmed.

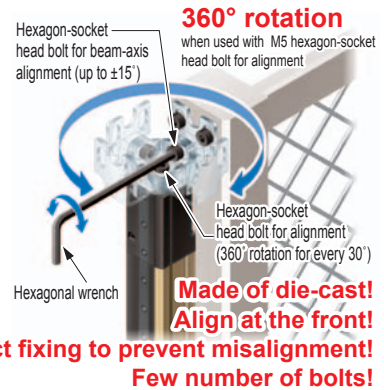* 140 % or more incident light intensity of control output operation level

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.
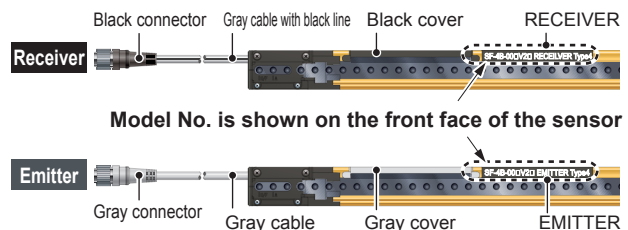

Laser alignment tool

① The topmost beam axis is correctly aligned

Visible red spot!

② The bottommost channel beam axis is correctly aligned

Greatly improved ease of installation (excluding **SF4B-□G□**)

The hexagon-socket head bolts used for aligning the beam axis can be accessed from the front of the 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.

360° rotation when used with M5 hexagon-socket head bolt for alignment

Hexagon-socket head bolt for beam-axis alignment (up to ±15˚)

Hexagon-socket head bolt for alignment (360˚ rotation for every 30˚)

Hexagonal wrench

Made of die-cast!
Align at the front!
Direct fixing to prevent misalignment!
Few number of bolts!

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 light curtain.

Black connector　Gray cable with black line　Black cover　RECEIVER

Receiver

Model No. is shown on the front face of the sensor

Emitter

Gray connector　Gray cable　Gray cover　EMITTER

Mutual interference is reduced without needing interference prevention lines

The light curtain is equipped with the ELCA (Extraneous Light Check & Avoid) function. Because it automatically shifts the scan timing of the 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.
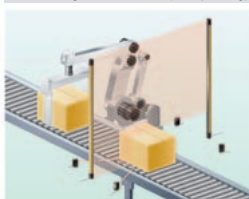
Options exclusive for light curtain are available for an easy construction of safety circuit

Handy-controller SFB-HC* that enables the user to select a variety of settings `SFB-HC`

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 axis can be specified to suit the object, separate guards to prevent entry do not need to be set up.
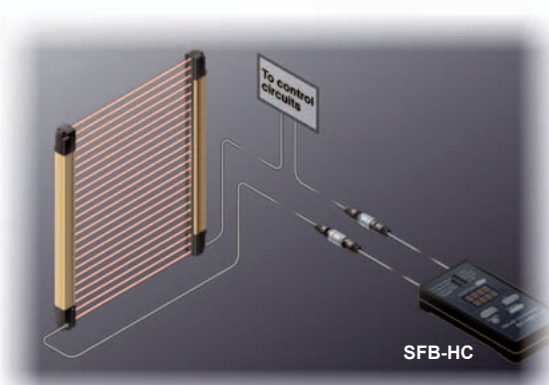
| While muting control is active (line operating)	Line stopped

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.

SFB-HC

* A handy-controller cannot be used with the **SF4B-□-01<V2>**, **SF4B-H□G-01<V2>**, **SF4B-□-03<V2>** and the **SF-C14EX-01**.

Specific beam axes can be deactivated
The SF4B series incorporates a fixed blanking function.

The **SF4B** 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.
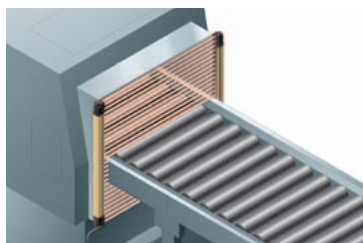
A variable number of beam axes can be deactivated
The SF4B series incorporates a floating blanking function.

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 when the positions of obstacles within the sensing area must be changed during object rearrangement, or when an object passes through the light curtain's sensing area.
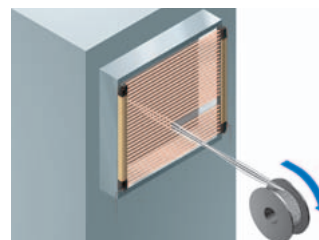
Note: When the floating blanking function is used, the acceptable size for the minimum sensing object changes. Refer to "**PRECAUTIONS FOR PROPER USE**" (p.30) for details.

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 fixed 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 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 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 **SF4B<V2>** manual for details.

# Resistant to impact, less damage to workpiece
Robust type SF4B-□G□<V2>

Thick and robust housing resistant to impact

The **SF4B-□G□<V2>** 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.

Stepped on - Kicked

Collision - Impact

Loads applied - Dropped

Average thickness
5 mm
0.197 in
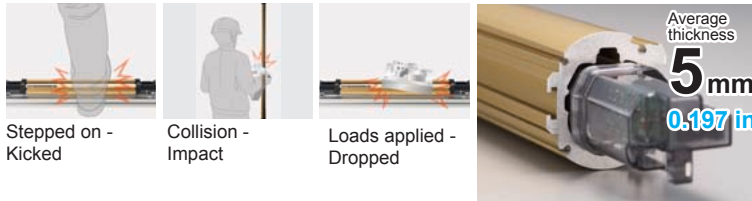
Front protection cover

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.

Front protection cover
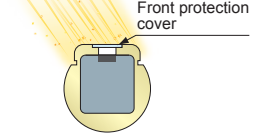
No guard needed

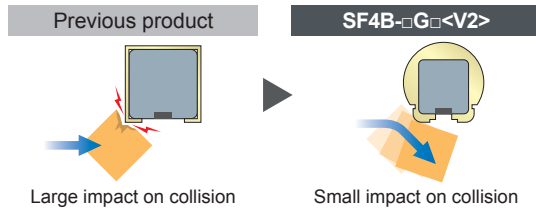The robust light curtain can be used without an L-shape or U-shape guard, reducing installation and maintenance.

U-shape / L-shape guard
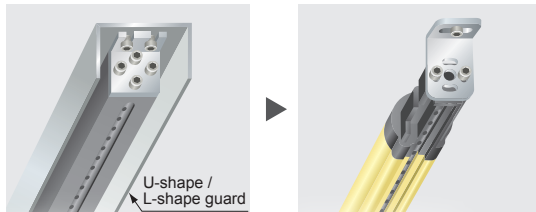
Fully protected sensing surface

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

Narrow

Deep

Previous product | SF4B-□G□<V2>

Collision with sensing surface

Sensing surface protected
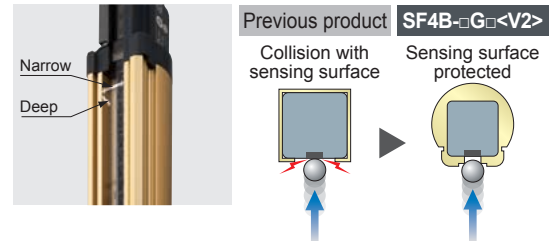
Round design minimizes damage to the workpiece

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

Previous product

SF4B-□G□<V2>

Large impact on collision

Small impact on 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.

Standard type | Robust type | Standard type

Use robust type only for required sections

PRODUCT CONFIGURATION

⚠ Mounting bracket and mating cable are optional.

Standard components (8-core cable)
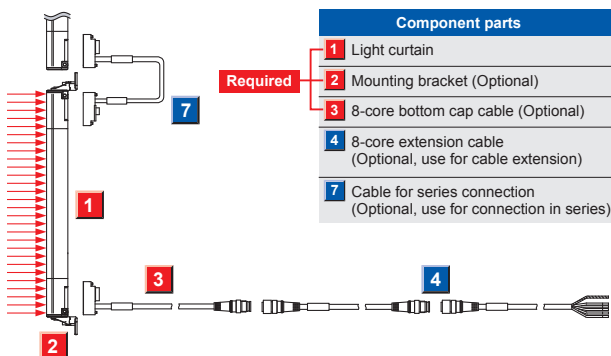
	Component parts
1	Light curtain
2	Mounting bracket (Optional)
3	8-core bottom cap cable (Optional)
4	8-core extension cable (Optional, use for cable extension)
7	Cable for series connection (Optional, use for connection in series)

Required

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

	Component parts
1	Light curtain
2	Mounting bracket (Optional)
5	12-core bottom cap cable (Optional)
6	12-core extension cable (Optional, use for cable extension)
7	Cable for series connection (Optional, use for connection in series)

Required
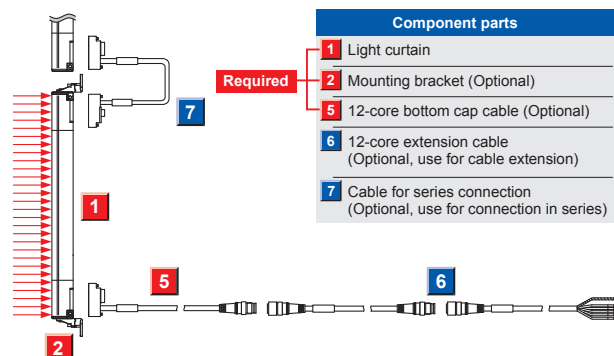
ORDER GUIDE

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

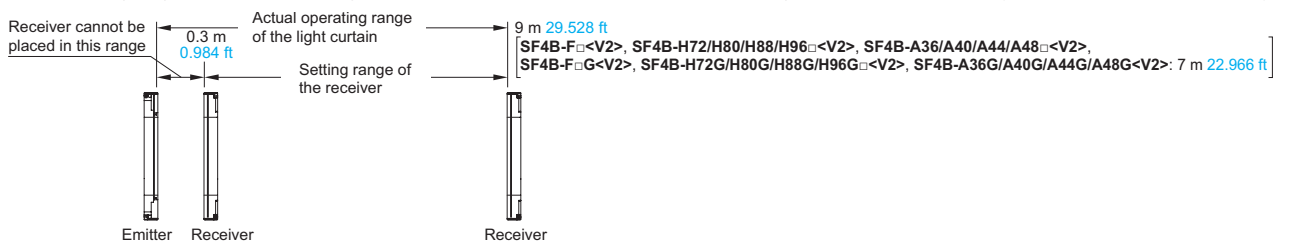| Type	Appearance	Operating range (Note 1)	Model No. (Note 2) SFB-HC non-compatible	Model No. (Note 2) Korean Press compliant (SFB-HC non-ompatible)	Number of beam channels	Protective height (mm in)		China Press compliant (GB4584)(Note 3)	
Finger protection type — Min. sensing object ø14 mm ø0.551 in (10 mm 0.394 in beam pitch)	Beam channel No. / 5 mm 0.197 in / Protective height / Beam pitch 10 mm 0.394 in / 5 mm 0.197 in	0.3 to 7 m 0.984 to 22.966 ft	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 ø25 mm ø0.984 in (20 mm 0.787 in beam pitch)	Beam channel No. / 5 mm 0.197 in / Protective height / Beam pitch 20 mm 0.787 in / 5 mm 0.197 in	0.3 to 9 m 0.984 to 29.528 ft	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
		0.3 to 7 m 0.984 to 22.966 ft	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 ø45 mm ø1.772 in (40 mm 1.575 in beam pitch)	Beam channel No. / 15 mm 0.591 in / Protective height / Beam pitch 40 mm 1.575 in / 15 mm 0.591 in	0.3 to 9 m 0.984 to 29.528 ft	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
		0.3 to 7 m 0.984 to 22.966 ft	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. The light curtain can detect an object less than 0.3 m 0.984 ft away.

Receiver cannot be placed in this range / 0.3 m 0.984 ft / Actual operating range of the light curtain / Setting range of the receiver / 9 m 29.528 ft

Emitter / Receiver / Receiver

SF4B-F□<V2>, SF4B-H72/H80/H88/H96□<V2>, SF4B-A36/A40/A44/A48□<V2>, SF4B-F□G<V2>, SF4B-H72G/H80G/H88G/H96G<V2>, SF4B-A36G/A40G/A44G/A48G<V2>: 7 m 22.966 ft

2) The model No. with "E" on the product label is the emitter, "D" on the label is the receiver.
3) Not conforming to Korean Press (SF4B-□-03<V2>)

ORDER GUIDE

1 Light curtains (Robust type) — Mounting bracket and bottom cap cable are not supplied with the light curtain. Be sure to order them separately.

Type	Appearance	Operating range	Model No.	SFB-HC non-compatible	Number of beam channels	Protective height (mm in)	China Press compliant (GB4584)
Finger protection type Min. sensing object ø14 mm ø0.551 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 ø25 mm ø0.984 in (20 mm 0.787 in beam pitch)		0.3 to 9 m 0.984 to 29.529 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
			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
		0.3 to 7 m 0.984 to 22.966 ft	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 ø45 mm ø1.772 in (40 mm 1.575 in beam pitch)		0.3 to 9 m 0.984 to 29.529 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
			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
		0.3 to 7 m 0.984 to 22.966 ft	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□<V2>** is different from the standard type **SF4B-□<V2>** in the following ways:
• Sensing width (protective height) • Profile • Net weight • Mounting bracket • Front protection cover
• Laser alignment tool • Noncompliant with Japanese and Korean press standard
• Noncompliant with Korean regulations
Other specifications, input/output circuits, and options are the same as for the standard type.
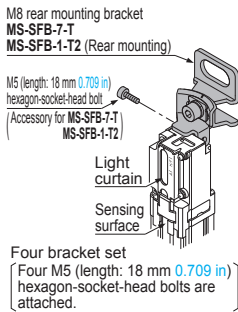
ORDER GUIDE

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

Designation			Model No.	Description
Rear / side mounting bracket [Material: Cold rolled carbon steel (SPCC)]	M8 rear mounting bracket		**MS-SFB-7-T**	For rear mounting. Allows the light curtain to be mounted at the rear with one M8 hexagon-socket-head bolt. (4 pcs. per set for emitter and receiver)
	M8 side mounting bracket		**MS-SFB-8-T**	For side mounting. Allows the light curtain to be mounted at the side with one M8 hexagon-socket-head bolt. (4 pcs. per set for emitter and receiver)
	M8 rear / side mounting bracket set		**MS-SFB-1-T2**	Can be used as either a rear mounting bracket **MS-SFB-7-T** or a side mounting bracket **MS-SFB-8-T** depending on mounting direction. (4 pcs. per set for emitter and receiver)
360° mounting bracket (Material: Die-cast zinc alloy) * Light curtain can revolve 360° horizontally.	Standard mounting bracket		**MS-SFB-1**	Used to mount the light curtain on the rear surface and side surface. (4 pcs. per set for emitter and receiver)
		M8 mounting bracket	**MS-SFB-1-T**	Allows the light curtain to be mounted at the rear and side with one M8 hexagon-socket-head bolt. (4 pcs. per set for emitter and receiver)
	Pitch adapter bracket		**MS-SFB-4**	Used as the mounting bracket when changing over a previous light curtain with a protective height of 200 mm 7.874 in or more to the **SF4B** series. It is installed using two M5 hexagon-socket-head bolts. (4 pcs. per set for emitter and receiver)
		M8 pitch adapter bracket	**MS-SFB-4-T**	Used as the mounting bracket when changing over a previous light curtain with a protective height of 200 mm 7.874 in or more to the **SF4B** series. It is installed using one M8 hexagon-socket-head bolt. (4 pcs. per set for emitter and receiver)
Dead zoneless mounting bracket (Material: Die-cast zinc alloy)			**MS-SFB-3**	Mounting with no dead zone is possible so that the mounting bracket does not project past the protective height. (4 pcs. per set for emitter and receiver)
Standard L mounting bracket (For **SF4B-□G□**) [Material: Cold rolled carbon steel (SPCC) (Trivalent chrome plated)]			**MS-SF4BG-1**	Mounting is possible behind or at the side of the light curtain. Mount with two M5 bolts or one M8 bolt. (4 pcs. per set for emitter and receiver)
Dead zoneless mounting bracket (For **SF4B-□G□**) [Material: Mounting bracket ... Cold rolled carbon steel (SPCC) (Trivalent chrome plated) Supporting bracket ...PPS]			**MS-SF4BG-3**	Allows light curtains to be installed closely together or in locations with installation restrictions due to equipment columns or jigs. (4 pcs. per set for emitter and receiver)

M8 rear mounting bracket
- **MS-SFB-7-T**
- **MS-SFB-1-T2**
  (Rear mounting)

M8 side mounting bracket
- **MS-SFB-8-T**
- **MS-SFB-1-T2**
  (Side mounting)

Standard mounting bracket
- **MS-SFB-1**

M8 mounting bracket
- **MS-SFB-1-T**
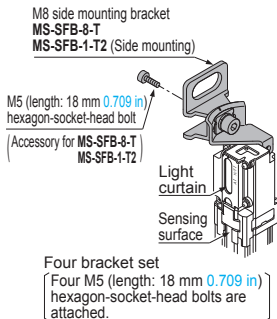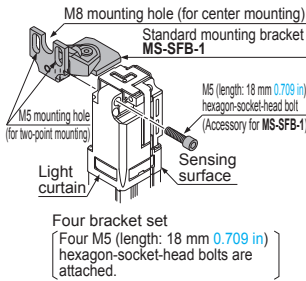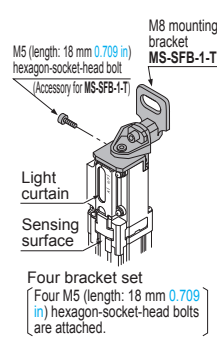
Pitch adapter bracket
- **MS-SFB-4**
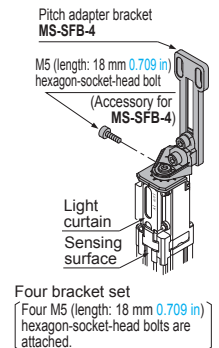
M8 pitch adapter bracket
- **MS-SFB-4-T**
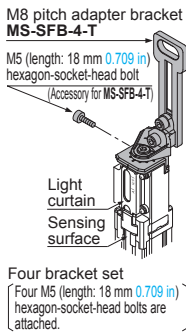
Dead zoneless mounting bracket
- **MS-SFB-3**

Standard L mounting bracket (For SF4B-□G□)
- **MS-SF4BG-1**

Dead zoneless mounting bracket (For SF4B-□G□)
- **MS-SF4BG-3**

When using M5 hexagon-socket-head bolt (Rear mounting)

When using M8 hexagon bolt (Rear mounting)

3 4 5 6 7 Mating cable / Extension cable / Cables for series connection | Mating cable is not supplied with the light curtain. Be sure to order it separately.

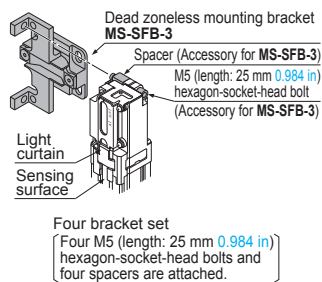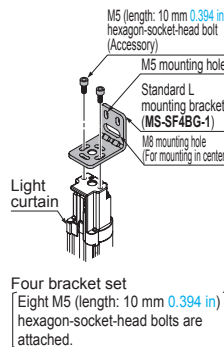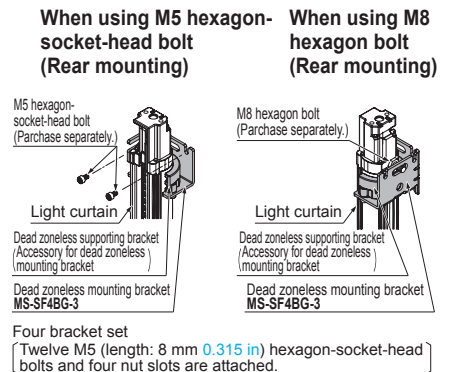| Type			Appearance	Model No.		Description (Note)
Standard components (8-core cable)	**3** Bottom cap cable	Discrete wire		SFB-CCB3	Length: 3 m 9.843 ft Net weight: 370 g approx. (2 cables)	Used for connecting to the light curtain and to other cables or the **SF-C13** control unit. Two cables per set for emitter and receiver
				SFB-CCB7	Length: 7 m 22.966 ft Net weight: 820 g approx. (2 cables)	
				SFB-CCB10	Length: 10 m 32.808 ft Net weight: 1,160 g approx. (2 cables)	
				SFB-CCB15	Length: 15 m 49.213 ft Net weight: 1,710 g approx. (2 cables)	
		Connector		SFB-CB05	Length: 0.5 m 1.640 ft Net weight: 95 g approx. (2 cables)	Used for connecting to the light curtain and to an extension cable or the **SF-C11** control unit. Two cables per set for emitter and receiver Connector outer diameter: ø14 mm ø0.551 in max.
				SFB-CB5	Length: 5 m 16.404 ft Net weight: 620 g approx. (2 cables)	
				SFB-CB10	Length: 10 m 32.808 ft Net weight: 1,200 g approx. (2 cables)	
	4 Extension cable	With connector on one end		SFB-CC3	Length: 3 m 9.843 ft Net weight: 380 g approx. (2 cables)	Used for cable extension or connecting to the **SF-C13** control unit. Two cables per set for emitter and receiver Connector outer diameter: ø14 mm ø0.551 in max.
				SFB-CC10	Length: 10 m 32.808 ft Net weight: 1,200 g approx. (2 cables)	
		With connectors on both ends	For emitter	SFB-CCJ3E	Length: 3 m 9.843 ft Net weight: 190 g approx. (1 cables)	Used for cable extension or connecting to the **SF-C11** and the **SF-C14EX** control unit. One each for emitter and receiver Connector outer diameter: ø14 mm ø0.551 in max. Connector color: Gray (for emitter), Black (for receiver)
				SFB-CCJ10E	Length: 10 m 32.808 ft Net weight: 580 g approx. (1 cable)	
			For receiver	SFB-CCJ3D	Length: 3 m 9.843 ft Net weight: 210 g approx. (1 cables)	
				SFB-CCJ10D	Length: 10 m 32.808 ft Net weight: 600 g approx. (1 cable)	
Muting control components (12-core cable, with interference prevention wire)	**5** Bottom cap cable	Discrete wire		SFB-CCB3-MU	Length: 3 m 9.843 ft Net weight: 420 g approx. (2 cables)	Used for connecting to the light curtain and to other cables or the **SF-C13** control unit. Two cables per set for emitter and receiver
				SFB-CCB7-MU	Length: 7 m 22.966 ft Net weight: 930 g approx. (2 cables)	
		Connector		SFB-CB05-MU	Length: 0.5 m 1.640 ft Net weight: 110 g approx. (2 cables)	Used for connecting to the light curtain and to an extension cable or the **SF-C12** control unit. Two cables per set for emitter and receiver Connector outer diameter: ø16 mm ø0.630 in max.
	6 Extension cable	With connector on one end		SFB-CC3-MU	Length: 3 m 9.843 ft Net weight: 430 g approx. (2 cables)	Used for connecting to an extension cable or the **SF-C13** control unit. Two cables per set for emitter and receiver Connector outer diameter: ø16 mm ø0.630 in max.
				SFB-CC7-MU	Length: 7 m 22.966 ft Net weight: 1,000 g approx. (2 cables)	
				SFB-CC10-MU	Length: 10 m 32.808 ft Net weight: 1,300 g approx. (2 cables)	
		With connectors on both ends	For emitter	SFB-CCJ3E-MU	Length: 3 m 9.843 ft Net weight: 190 g approx. (1 cables)	Used for connecting to an extension cable or the **SF-C12** control unit. One each for emitter and receiver Connector color: Gray (for emitter), Black (for receiver) Connector outer diameter: ø16 mm ø0.630 in max.
				SFB-CCJ10E-MU	Length: 10 m 32.808 ft Net weight: 660 g approx. (1 cable)	
			For receiver	SFB-CCJ3D-MU	Length: 3 m 9.843 ft Net weight: 210 g approx. (1 cables)	
				SFB-CCJ10D-MU	Length: 10 m 32.808 ft Net weight: 680 g approx. (1 cable)	
7 Cable for series connection				SFB-CSL01	Length: 0.1 m 0.328 ft Net weight: 45 g approx. (2 cables)	Used to connect light curtains in series Two cables per set for emitter and receiver (common for emitter and receiver) Cable color: Gray (common for emitter and receiver)
				SFB-CSL05	Length: 0.5 m 1.640 ft Net weight: 95 g approx. (2 cables)	
				SFB-CSL1	Length: 1 m 3.281 ft Net weight: 150 g approx. (2 cables)	
				SFB-CSL5	Length: 5 m 16.404 ft Net weight: 630 g approx. (2 cables)	
3 Exclusive mating cable for **SF-C14EX**				SFB-CB05-EX	Length: 0.5 m 1.640 ft Net weight: 95 g approx. (2 cables)	Used for connecting to the light curtain and to **SF-C14EX** control unit or 8-core extension cable with connectors on both ends Two cables per set for emitter and receiver Connector outer diameter: ø14 mm ø0.551 in max.
				SFB-CB5-EX	Length: 5 m 16.404 ft Net weight: 620 g approx. (2 cables)	
				SFB-CB10-EX	Length: 10 m 32.808 ft Net weight: 1,200 g approx. (2 cables)	
3 Adapter cable	For **SF4-AH□** (PNP type)			SFB-CB05-A-P	Length: 0.5 m 1.640 ft Net weight: 110 g approx. (2 cables)	Used to allow connector cables connected to previous light curtains (at the control circuit side) to be smoothly adapted to the **SF4B** series. Also, **SFB-CB05-A-P** and **SFB-CB05-A-N** are usable even when external device input is not used as the polarity of PNP output or NPN output is fixed. Two cables per set for emitter and receiver Connector outer diameter: ø14 mm ø0.551 in max.
	For **SF4-AH□-N** (NPN type)			SFB-CB05-A-N		
	For **SF2-EH□** (PNP type)			SFB-CB05-B-P		
	For **SF2-EH□-N** (NPN type)			SFB-CB05-B-N		

Note: Where the cable color has not been specified, it is black for emitter, gray with black line for outer diameter is ø6 mm ø0.236 in, min. bending radius is R6 mm R0.236 in.

For details of mating cable of CC-Link Safety system remote I/O unit with connectors for light curtain **SF-CL1T264T**, refer to website.

■ ORDER GUIDE

Spare parts (Accessories for light curtain)

Designation	Model No.	Description
Intermediate supporting bracket (Excluding **SF4B-□G□**) (Note 1)	**MS-SFB-2**	Used to mount the light curtain on the intermediate position. (2 pcs. per set for emitter and receiver) Mounting is possible behind or at the side of the light curtain.
Intermediate supporting bracket (Note 2) (For **SF4B-□G□**)	**MS-SF4BG-2**	Used to mount the light curtain in the intermediate position. (2 pcs. per set for emitter and receiver) Mounting is possible behind or at the side of the light curtain.
Test rod ø14	**SF4B-TR14**	Min. sensing object for regular checking (ø14 mm ø0.551 in), with finger protection type (min. sensing object ø14 mm ø0.551 in)
Test rod ø25	**SF4B-TR25**	Min. sensing object for regular checking (ø25 mm ø0.984 in), with hand protection type (min. sensing object ø25 mm ø0.984 in)

Notes: 1) The number of sets required varies depending on the product.
 1 set: **SF4B-F□<V2>** .... Light curtain with 79 to 111 beam channels
 SF4B-H□<V2> .... Light curtain with 40 to 56 beam channels
 SF4B-A□<V2> .... Light curtain with 20 to 28 beam channels
 2 sets: **SF4B-F127□<V2>**
 SF4B-H□<V2> .... Light curtain with 64 to 80 beam channels
 SF4B-A□<V2> .... Light curtain with 32 to 40 beam channels
 3 sets: **SF4B-H□<V2>** .... Light curtain with 88 to 96 beam channels
 SF4B-A□<V2> .... Light curtain with 44 to 48 beam channels

 2) The number of sets required varies depending on the product.
 1 set: **SF4B-F□G<V2>** .... Light curtain with 79 to 127 beam channels
 SF4B-H□G□<V2> .... Light curtain with 40 to 64 beam channels
 SF4B-A□G<V2> .... Light curtain with 20 to 32 beam channels
 2 set: **SF4B-H□G□<V2>** .... Light curtain with 72 to 96 beam channels
 SF4B-A□G<V2> .... Light curtain with 36 to 48 beam channels
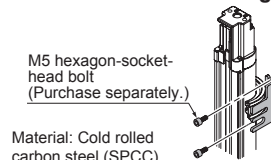
Intermediate supporting bracket

・ **MS-SFB-2**
<In case of rear mounting>

Light curtain
M5 hexagon-socket-head bolt (Purchase separately.)
Sensing surface
Intermediate supporting bracket **MS-SFB-2**

<In case of side mounting>

M5 hexagon-socket-head bolt (Purchase separately.)
Light curtain
Sensing surface
Intermediate supporting bracket **MS-SFB-2**

・ **MS-SF4BG-2**
<In case of rear mounting>

M5 hexagon-socket-head bolt (Purchase separately.)
Material: Cold rolled carbon steel (SPCC)

<In case of side mounting>
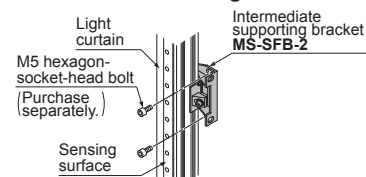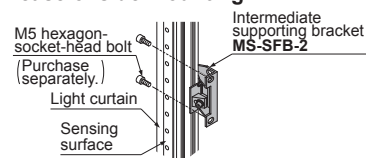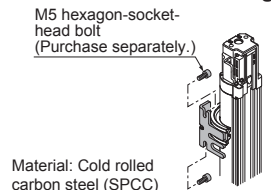
M5 hexagon-socket-head bolt (Purchase separately.)
Material: Cold rolled carbon steel (SPCC)

■ OPTIONS

Exclusive control units

Designation	Appearance	Model No.	Application cable	Description
Connector connection type control unit		**SF-C11**	Bottom cap cable: **SFB-CB□** Extension cable: **SFB-CCJ□**	Use 8-core cable with connector to connect to the light curtain. Compatible with up to Control Category 4. Interference prevention wires and muting function cannot be used.
Robust type control unit		**SF-C12**	Bottom cap cable: **SFB-CB05-MU** Extension cable: **SFB-CCJ□-MU**	Use 12-core cable with connector to connect to the light curtain. Compatible with up to Control Category 4. Muting function cannot be used. Interference prevention wires can be used.
Slim type control unit		**SF-C13**	Bottom cap cable: **SFB-CCB□(-MU)** Extension cable: **SFB-CC□(-MU)**	Use a discrete wire cable to connect to the light curtain. Compatible with up to Control Category 4. Interference prevention wires and muting function can be used.
Application expansion unit for **SF4B** series		**SF-C14EX**	Bottom cap cable: **SFB-CB□-EX** Extension cable: **SFB-CCJ□**	The muting control function and emergency stop input expand the applications of the light curtains. Use exclusive cable to connect to the light curtain. Compatible with up to Control Category 4. The handy-controller **SFB-HC** cannot be used with **SF-C14EX-01**.
Handy-controller non-compatible type		**SF-C14EX-01**		
CC-Link Safety system remote I/O unit for light curtain (Note)		**SF-CL1T264T**	Bottom cap cable: **SFB-CB□-CL** Extension cable: **SFB-CCJ10□-CL**	This is a remote I/O unit that allows the safety field network "CC-Link Safety" to be connected to the light curtains or the safety components. Use exclusive cable to connect to the light curtain. Compatible with up to Control Category 4. Please contact our office for details.

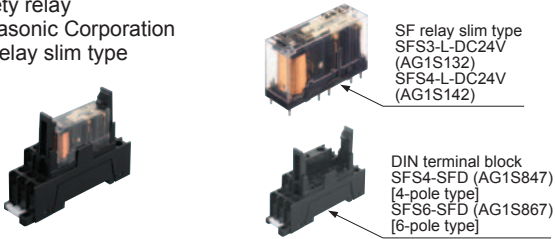Note: Refer to our website for details of the remote I/O unit **SF-CL1T264T**.

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**

■ OPTIONS

● Recommended safety relay

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-pole type]
SFS6-SFD (AG1S867)
[6-pole type]

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

Type		With LED indicator	
	Model No.	SFS3-L-DC24V	SFS4-L-DC24V
Item	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 -40 to +185 °F (Humidity: 5 to 85 % RH)	
Applicable standards		UL, C-UL, TÜV, Korea S-mark	

Handy-controller

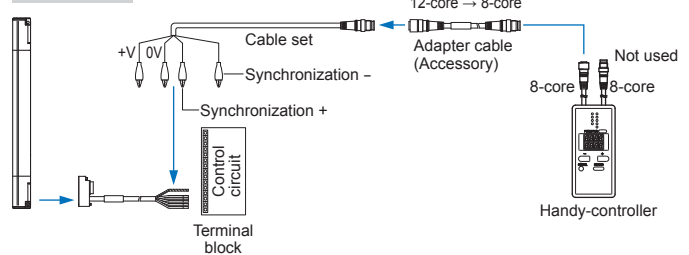| Designation	Appearance	Model No.
Handy-controller	* Includes 2 adapter cables	**SFB-HC** (Note)
Cable set for cable type connection		**SFC-WNC1** (Note)

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

Pigtailed type

In case of 8-core

Bottom cap cable (Note)

Extension cable

8-core   8-core

In case of 12-core

Bottom cap cable (Note)   Adapter cable (Accessory)   Handy-controller   Adapter cable (Accessory)   Extension cable

12-core → 8-core   8-core → 12-core
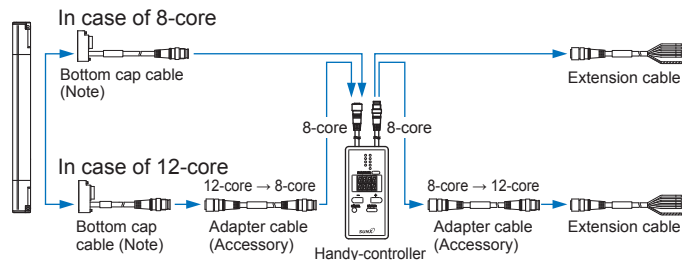
Note: If using a bottom cap cable with discrete wire, please order the **SFB-CC3/CC10** separately. Refer to the instruction manual for the light curtain for details on wiring.
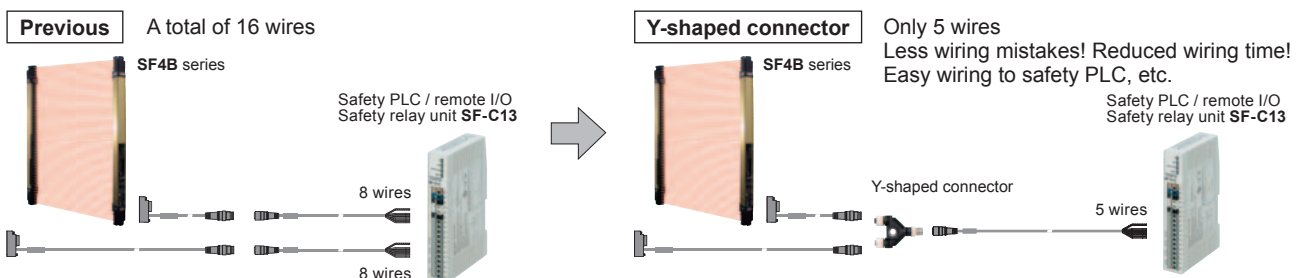
Cable type

12-core → 8-core

+V 0V   Cable set   Adapter cable (Accessory)   Not used

Synchronization –   8-core 8-core

Synchronization +

Control circuit

Terminal block   Handy-controller

Y-shaped connector

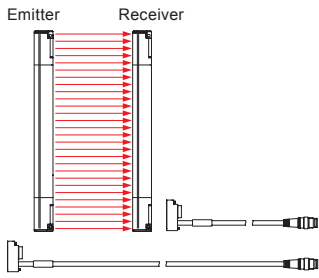| Type	Appearance	Model No.	Description
Wire-saving Y-shaped connector		**SFB-WY1** (Note)	Wire-saving connector for standard components (8-core cable). Cables of emitter and receiver are consolidated into one cable for wire-saving. Wiring has +24 V, 0 V, OSSD 1, OSSD 2, output polarity setting wire (shield). [Power wire and synchronization wire are connected inside the connector. Interlock is disabled (automatic reset).]
Cable with connector on one side		**WY1-CCN3** (Note)	Cable length: 3 m 9.843 ft 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 R0.236 in
		WY1-CCN10 (Note)	Cable length: 10 m 32.808 ft 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

SF4B series

Safety PLC / remote I/O
Safety relay unit **SF-C13**

8 wires

8 wires

Y-shaped connector	Only 5 wires Less wiring mistakes! Reduced wiring time! Easy wiring to safety PLC, etc.

SF4B series

Y-shaped connector

Safety PLC / remote I/O
Safety relay unit **SF-C13**

5 wires

Refer to the operation manual **SF4B <V2>** for more detail such as installation of Y-shaped connector, terminal wiring, and wiring example.

■ OPTIONS

Product configuration

Emitter   Receiver

Bottom cap cable (2 cables for emitter and receiver)
SFB-CB05 (0.5 m 1.64 ft)
SFB-CB5 (5 m 16.404 ft)
SFB-CB10 (10 m 32.808 ft)

Extension cable (1 cable for receiver)
SFB-CCJ3D (3 m 9.843 ft)
SFB-CCJ10D (10 m 32.808 ft)

Extension cable (1 cable for emitter)
SFB-CCJ3E (3 m 9.843 ft)
SFB-CCJ10E (10 m 32.808 ft)

Y-shaped connector SFB-WY1

Extension cable
SFB-CCJ3D (3 m 9.843 ft)
SFB-CCJ10D (10 m 32.808 ft)

Cable with connector on one side (Common for all models)
WY1-CCN3 (3 m 9.843 ft)
WY1-CCN10 (10 m 32.808 ft)

Connector pin No.	Description
①	OSSD 2
②	+24 V
③	OSSD 1
④	Not used
⑤	Not used
⑥	Not used
⑦	0 V
⑧	Output polarity setting wire (Shield)

Connector pin layout

Black connector
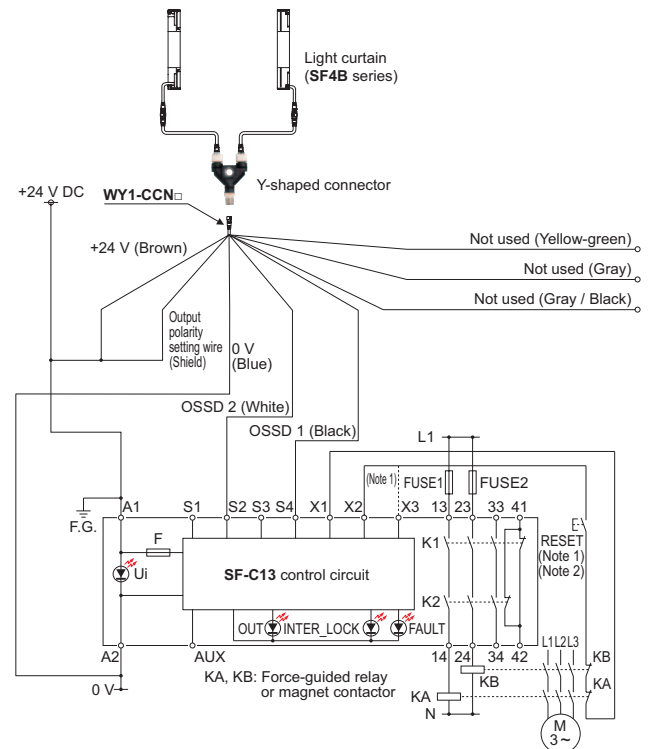Receiver
Emitter
Gray connector

Wiring diagram of control unit SF-C13

For PNP output (minus ground)
• Connect the light curtain control outputs OSSD 1 and OSSD 2 to S1 and S2 respectively.

Light curtain (**SF4B** series)

WY1-CCN□
Y-shaped connector

+24 V (Brown)
+24 V DC

Not used (Yellow-green)
Not used (Gray)
Not used (Gray / Black)

Output polarity setting wire (Shield)

0V (Blue)

OSSD 1 (Black)
OSSD 2 (White)

RESET (Note 1) (Note 2)

L1

A1 S1 S2 S3 S4 X1 X2 X3   13 23   33 41

(Note 1) FUSE1 FUSE2

F
Ui   **SF-C13** control circuit   K1

K2

OUT INTER_LOCK FAULT

A2   AUX   14 24   34 42   L1L2L3   KB

0 V   F.G.   KA, KB: Force-guided relay or magnet contactor   KB   KA

KA
N   M 3~

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) Unused wires must be insulated.

For NPN output (plus ground)
• Connect the light curtain control outputs OSSD 1 and OSSD 2 to S4 and S2 respectively and ground the + side.

Light curtain (**SF4B** series)

+24 V DC   **WY1-CCN□**
Y-shaped connector

+24 V (Brown)

Not used (Yellow-green)
Not used (Gray)
Not used (Gray / Black)

Output polarity setting wire (Shield)   0 V (Blue)

OSSD 2 (White)
OSSD 1 (Black)

L1

F.G.   A1   S1   S2 S3 S4   X1 X2   X3 13 23   33 41

(Note 1) FUSE1 FUSE2   RESET (Note 1) (Note 2)

F
Ui   **SF-C13** control circuit   K1

K2

OUT INTER_LOCK FAULT

A2   AUX   14 24   34 42   L1L2L3   KB

0 V   KA, KB: Force-guided relay or magnet contactor   KB   KA

KA
N   M 3~

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) Unused wires must be insulated.

■ OPTIONS

Front protection cover (except for SF4B-□G□) / Protection bar set (except for SF4B-□G□) / Corner mirror

Applicable beam axes		Designation	Front protection cover	Protection bar set	Rear / side protection bar set	Corner mirror	
Finger	Hand	Arm / foot	Model No.	Model No.	Model No.	Model No.	Effective reflective surface
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, not a pair of units. 2 units are required for use in mounting to the emitter / receiver. (Except for corner mirror)
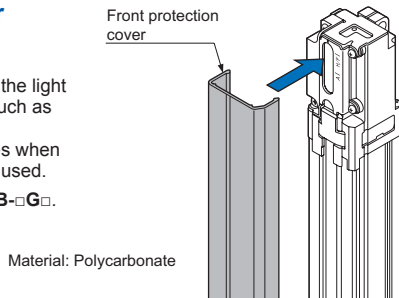
Front protection cover

• FC-SFBH-□

Protects sensing surface of the 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□**.

Material: Polycarbonate

Front protection cover

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

Corner mirror
RF-SFBH-□

Sensing range

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

Protection bar set

• MC-SFBH-□
* Not available for **SF4B-□G□**.

Rear / side protection bar set
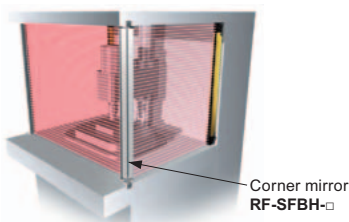
• MC-SFBH-□-T
* Not available for **SF4B-□G□**.

• 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 1)	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)
Protection bar intermediate supporting bracket MS-SFB-6 (Optional) (Note 2)	1 pc.	Material: Cold rolled carbon steel (SPCC) (Trivalent chrome plated)	1 pc.	Material: Cold rolled carbon steel (SPCC) (Trivalent chrome plated)

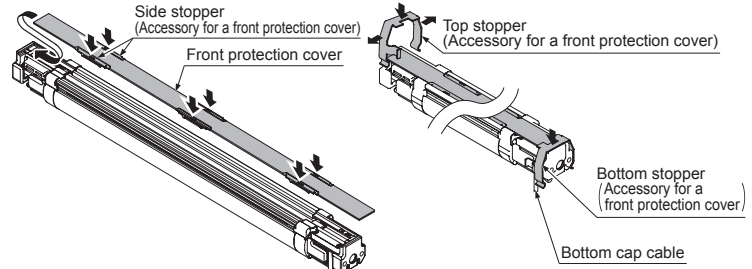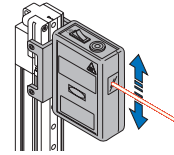Notes: 1) Available as a spare part. Model No.: **MS-MCSFB-1-T**
2) The protection bar intermediate supporting bracket **MS-SFB-6** (optional) is installed to protection bars that are longer than the **MC-SFBH-48(-T)**. Use if there is much flexure bending in the protection bar. Please contact our office for details.

Front protection cover (For SF4B-□G□)

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

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.

Side stopper (Accessory for a front protection cover)
Top stopper (Accessory for a front protection cover)
Front protection cover
Bottom stopper (Accessory for a front protection cover)
Bottom cap cable

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

Sensing 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.

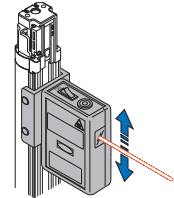| Designation	Model No.	Description
Test rod ø45	**SF4B-TR45**	Min. sensing object for regular checking (ø45 mm ø1.772 in), with arm / foot protection type (min. sensing object ø45 mm ø1.772 in)
Laser alignment tool (Excluding **SF4B-□G□**)	**SF-LAT-2N**	Allows easy beam axis alignment using easy-to-see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

Designation	Model No.	Description
Large display unit for light curtain	**SF-IND-2**	With the auxiliary output of the light curtain, the operation is easily observable from various directions. **Specifications** • Supply voltage: 24 V DC ±15 % • Current consumption: 12 mA or less • Indicators: Orange LED (8 pcs. used) [Light up when external contact is ON] • Ambient temperature: –10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed) • Material: POM (Enclosure) Polycarbonate (Cover) Cold rolled carbon steel (SPCC) (Bracket) • Cable: 0.3 mm² 2-core cabtyre cable, 3 m 9.843 ft long • Weight: 70 g approx. (including bracket) **I/O circuit diagrams** **With NPN output type** Color code (Brown) +V *1 / Non-voltage contact or NPN open-collector transistor / + 24 V DC ±15 % – / or / (Blue) – V *1 / Internal circuit — Users' circuit **With PNP output type** Color code (Brown) +V *1 / Non-voltage contact or PNP open-collector transistor / + 24 V DC ±15 % – / or / (Blue) – V / Internal circuit — Users' circuit

Laser alignment tool (Excluding SF4B-□G□)
• **SF-LAT-2N**

Laser alignment tool (For SF4B-□G□)
• **SF-LAT-4BG**

Caution tape
• **SF-TP-BG10**

Large display unit for light curtain
• **SF-IND-2**

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

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

SPECIFICATIONS

Light curtain individual specifications

SF4B-F□(G)<V2>

Item / Model No. (Note 2)	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>
Type	Min. sensing object ø14 mm ø0.551 in type (10 mm 0.394 in beam pitch)									
Number of beam channels	23		31		39		47		55	
Protective height	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 (GB4584)	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^{-9}		2.8×10^{-9}		3.2×10^{-9}		3.6×10^{-9}		4.0×10^{-9}	
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.

Item / Model No. (Note 2)	SF4B-F63□<V2>	SF4B-F63G<V2>	SF4B-F71□<V2>	SF4B-F71G<V2>	SF4B-F79□<V2>	SF4B-F79G<V2>	SF4B-F95□<V2>)	SF4B-F95G<V2>
Type	Min. sensing object ø14 mm ø0.551 in type (10 mm 0.394 in beam pitch)							
Number of beam channels	63		71		79		95	
Protective height	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 (GB4584)	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^{-9}		4.8×10^{-9}		5.2×10^{-9}		6.0×10^{-9}	
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.

Item / Model No. (Note 2)	SF4B-F111□<V2>	SF4B-F111G<V2>	SF4B-F127□<V2>	SF4B-F127G<V2>
Type	Min. sensing object ø14 mm ø0.551 in type (10 mm 0.394 in beam pitch)			
Number of beam channels	111		127	
Protective height	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 (GB4584)	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^{-9}		7.6×10^{-9}	
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.
2) The models with the "**-01**" or "**-03**" cannot be used with the handy-controller **SFB-HC**.

■ SPECIFICATIONS

SF4B-H□(G□)<V2>

Item	Model No. (Note 2)	Min. sensing object ø25 mm ø0.984 in type (20 mm 0.787 in beam pitch)									
	Type	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		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 (GB4584)		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 × 10⁻⁹		2.0 × 10⁻⁹		2.2 × 10⁻⁹		2.4 × 10⁻⁹		2.6 × 10⁻⁹	
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.

Item	Model No. (Note 2)	Min. sensing object ø25 mm ø0.984 in type (20 mm 0.787 in beam pitch)									
	Type	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		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 (GB4584)		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 × 10⁻⁹		3.0 × 10⁻⁹		3.2 × 10⁻⁹		3.6 × 10⁻⁹		4.0 × 10⁻⁹	
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.

Item	Model No. (Note 2)	Min. sensing object ø25 mm ø0.984 in type (20 mm 0.787 in beam pitch)									
	Type	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		1,270 mm 50.000 in	1,284 mm 50.551 in	1,430 mm 56.299 in	1,444 mm 56.850 in	1,590 mm 62.598 in	1,604 mm 63.150 in	1,750 mm 68.898 in	1,764 mm 69.449 in	1,910 mm 75.197 in	1,924 mm 75.748 in
China Press compliant (GB4584)		1,260 mm 49.606 in		1,420 mm 55.905 in		1,580 mm 62.205 in		1,740 mm 68.503 in		1,900 mm 74.803 in	
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 × 10⁻⁹		4.8 × 10⁻⁹		5.2 × 10⁻⁹		5.6 × 10⁻⁹		6.0 × 10⁻⁹	
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.
2) The models with the "-01" or "-03" cannot be used with the handy-controller SFB-HC.

SF4B-A□(G)<V2>

Item \ Model No. (Note 2)	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>
Type	Min. sensing object ø45 mm ø1.772 in type (40 mm 1.575 in beam pitch)									
Number of beam channels	6		8		10		12		14	
Protective height	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 (GB4584)	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^{-9}		1.6×10^{-9}		1.7×10^{-9}		1.8×10^{-9}		1.9×10^{-9}	
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.

Item \ Model No. (Note 2)	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>
Type	Min. sensing object ø45 mm ø1.772 in type (40 mm 1.575 in beam pitch)									
Number of beam channels	16		18		20		24		28	
Protective height	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 (GB4584)	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^{-9}		2.1×10^{-9}		2.2×10^{-9}		2.4×10^{-9}		2.6×10^{-9}	
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.

Item \ Model No. (Note 2)	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>
Type	Min. sensing object ø45 mm ø1.772 in type (40 mm 1.575 in beam pitch)									
Number of beam channels	32		36		40		44		48	
Protective height	1,270 mm 50.000 in	1,284 mm 50.551 in	1,430 mm 56.299 in	1,444 mm 56.850 in	1,590 mm 62.598 in	1,604 mm 63.150 in	1,750 mm 68.898 in	1,764 mm 69.449 in	1,910 mm 75.197 in	1,924 mm 75.748 in
China Press compliant (GB4584)	1,240 mm 48.819 in		1,400 mm 55.118 in		1,560 mm 61.417 in		1,720 mm 67.716 in		1,880 mm 74.016 in	
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^{-9}		3.0×10^{-9}		3.2×10^{-9}		3.4×10^{-9}		3.6×10^{-9}	
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.
2) The models with the "**-01**" or "**-03**" cannot be used with the handy-controller **SFB-HC**.

■ SPECIFICATIONS

Light curtain common specifications

	Type	Min. sensing object ø14 mm ø0.551 in type	Min. sensing object ø25 mm ø0.984 in type	Min. sensing object ø45 mm ø1.772 in type
	Model No.	**SF4B-F□(G)<V2>**	**SF4B-H□(G□)<V2>**	**SF4B-A□(G)<V2>**
	SFB-HC non-compatible	**SF4B-F□-01<V2>**	**SF4B-H□-01<V2>**	**SF4B-A□-01<V2>**
Item	Korean press compliant	**SF4B-F□-03<V2>**	**SF4B-H□-03<V2>**	
Applicable standards (Note 2)	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 (**SF4B-□<V2>** only)		
	China (GB)	GB 4584 (excluding **SF4B-□-03<V2>**)		
Operating range (Note 3)		0.3 to 7 m 0.984 to 22.966 ft	12 to 64 beam channels type: 0.3 to 9 m 0.984 to 29.528 ft 72 to 96 beam channels type: 0.3 to 7 m 0.984 to 22.966 ft	6 to 32 beam channels type: 0.3 to 9 m 0.984 to 29.528 ft 36 to 48 beam channels type: 0.3 to 7 m 0.984 to 22.966 ft
Min. sensing object (Note 4)		ø14 mm ø0.551 in opaque object	ø25 mm ø0.984 in opaque object	ø45 mm ø1.772 in opaque object
Effective aperture angle		±2.5° or less [for an operating range exceeding 3 m 9.843 ft (conforming to IEC 61496-2 / UL 61496-2)]		
Supply voltage		24 V DC ±10 % Ripple P-P 10 % or less		
Control outputs (OSSD 1, OSSD 2)		PNP open-collector transistor / NPN open-collector transistor (switching method) • When selecting PNP output: Max. source current 200 mA, When selecting NPN output: Max. sink current 200 mA • Applied voltage: same as supply voltage (When selecting PNP output: between the control output and +V, / When selecting NPN output: between the control output and 0 V) • Residual voltage: 2.5 V or less (When selecting PNP output: source current 200 mA, when selecting NPN output: sink current 200 mA) (when using 20 m 65.617 ft length cable)		
	Operation mode	ON when all beam channels are received, OFF when one or more beam channels are interrupted (OFF also in case of any malfunction in the light curtain or the synchronization signal)(Note 5,6)		
	Protection circuit	Incorporated		
Response time		OFF response: 14 ms or less, ON response: 80 to 90 ms		
Auxiliary output (Non-safety output)		PNP open-collector transistor / NPN open-collector transistor (switching method) • When selecting PNP output: Max. source current 60 mA, When selecting NPN output: Max. sink current 60 mA • Applied voltage: same as supply voltage (When selecting PNP output: between the auxiliary output and +V, / When selecting NPN output: between the auxiliary output and 0 V) • Residual voltage: 2.5 V or less (When selecting PNP output: source current 60 mA, when selecting NPN output: sink current 60 mA) (when using 20 m 65.617 ft length cable)		
	Operation mode	OFF when control outputs are ON, ON when control outputs are OFF [Factory setting, operating mode can be changed using the **SFB-HC** handy-controller (optional)].		
	Protection circuit	Incorporated		
	Responce time	OFF replay: 34 ms or less, ON replay 110 ms or less		
Interference prevention function		Incorporated (Note 7) (Available only when in series connection for **SF4B-□-03<V2>**)		
Emission halt function / Interlock function		Incorporated / Incorporated [Manual reset / Auto reset (Note 8)]		
External device monitoring function		Incorporated		
Override function / Muting function		Incorporated (Note 7) (excluding **SF4B-□-03<V2>**) / Incorporated (Note 7) (excluding **SF4B-□-03<V2>**)		
Optional functions (Note 9)		Fixed blanking, floating blanking, auxiliary output switching, interlock setting changing, external relay monitor setting changing, muting setting changing, protecting, light emitting amount control		
Environmental resistance	Degree of protection	IP67 / IP65 (IEC)		
	Ambient temperature	–10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), Storage: –25 to +70 °C –13 to +158 °F		
	Ambient humidity	30 to 85 % RH, Storage: 30 to 95 % RH		
	Ambient illuminance	Incandescent light: 3,500 ℓx or less at the light-receiving face		
	Dielectric strength voltage	1,000 V AC for one min. between all supply terminals connected together and enclosure		
	Insulation resistance	20 MΩ, or more, with 500 V DC megger between all supply terminals connected together and enclosure		
	Vibration resistance	10 to 55 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each		
	Shock resistance	300 m/s² acceleration (30 G approx.) in X, Y and Z directions for three times each		
Emitting element		Infrared LED (Peak emission wavelength: 870 nm 0.034 mil)		
Material		Enclosure: Aluminium, Upper and lower edges: Iron, Sensing surface: Polycarbonate and Polyester resin, Cap: PBT		
Connecting method / Cable length		Connector / Total length up to 50 m 164.042 ft is possible for both emitter and receiver, with optional mating cables (Note 10)		
Accessories		**MS-SFB-2** (Intermediate supporting bracket): (Note 11) **MS-SF4BG-2** (Intermediate supporting bracket): (Note 12) **SF4B-TR14** (Test rod): 1 No.	**MS-SFB-2** (Intermediate supporting bracket): (Note 11) **MS-SF4BG-2** (Intermediate supporting bracket): (Note 12) **SF4B-TR25** (Test rod): 1 No.	**MS-SFB-2** (Intermediate supporting bracket): (Note 11) **MS-SF4BG-2** (Intermediate supporting bracket): (Note 12)

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
    2) PLe SIL3 compliant from production in August 2009. Model Nos. having the suffix "G" are robust type.
    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.36~).
    5) The outputs are not "OFF" when muting function is active even if the beam channel is interruped.
    6) In case the blanking function is valid, the operation mode is changed. For details, refer to "**Safety distance**" (p.36~).
    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 light curtains are connected in series, within 20 m 65.617 ft when three 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: **SF4B-F□<V2>**.....Light curtain with 40 to 56 beam channels, **SF4B-H□<V2>**.....Light curtain with 79 to 111 beam channels,
           SF4B-A□<V2>.....Light curtain with 20 to 28 beam channels
        2 sets: **SF4B-F127<V2>**, **SF4B-H□<V2>**...Light curtain with 64 to 80 beam channels, **SF4B-A□<V2>**...Light curtain with 32 to 40 beam channels
        3 sets: **SF4B-H□<V2>**.....Light curtain with 88 to 96 beam channels, **SF4B-A□<V2>**.....Light curtain with 44 to 48 beam channels
    12) The intermediate supporting bracket (**MS-SF4BG-2**) is enclosed with the following models.
        1 set: **SF4B-F□G<V2>**.....Light curtain with 79 to 127 beam channels, **SF4B-H□G□<V2>**.....Light curtain with 40 to 64 beam channels
           SF4B-A□G<V2>.....Light curtain with 20 to 32 beam channels
        2 sets: **SF4B-H□G□<V2>**.....Light curtain with 72 to 96 beam channels, **SF4B-A□G<V2>**.....Light curtain with 36 to 48 beam channels
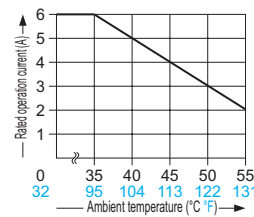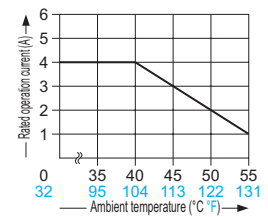
■ SPECIFICATIONS

Control units

Item \ Model No.	SF-C11 (Note 2)	SF-C12	SF-C13 (Note 2)
Connectable light curtains	SF4B / SF2B series	SF4B series	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		
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 ±10 % Ripple P-P 10 % or less / 100 mA or less (excluding light curtain)		
Fuse (rating)	Built-in electronic fuse, Triggering current: 0.5 A or more, Reset after power down		
Enabling path	NO contact × 3 (13-14, 23-24, 33-34)	NO contact × 2 (13-14, 23-24)	NO contact × 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) (Note3)
Contact resistance	100 mΩ or less (initial value)	50 mΩ or less (initial value)	100 mΩ 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) ×1 (41-42) (Related to enabling path)	Safety relay contact (NC contact) × 1 (31-32) (Related to enabling path)	Safety relay contact (NC contact) × 1 (41-42) (Related to enabling path)
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)> <Plus ground (Setting for NPN)> PNP open-collector transistor NPN open-collector transistor	——	PNP open-collector transistor
Output operation	Related to auxiliary output of light curtain	——	ON when the 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 light curtain Plus ground: Correspond to NPN output light curtain		Incorporated (Cable connection allows selection of plus / minus ground) Minus ground: Correspond to PNP output light curtain Plus ground: Correspond to NPN output light curtain
Pollution degree	2		
Protection	Enclosure: IP40, Terminal: IP20	IP65	Enclosure: IP40, Terminal: IP20
Ambient temperature	–10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), Storage: –25 to +70 °C –13 to +158 °F		
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 acqusred 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) For details of control unit **SF-C1□** (**SF-C10** series), refer to the website or general catalog.

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 light curtains	SF4B series
Applicable standards	IEC 61496-1, EN 61496-1, ANSI/UL 61496-1, CAN/CSA 61496-1, JIS B 9704-1
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 ±10 % Ripple P-P 10 % or less / 0.2 A or less (Excluding light curtain and other external connecting device)
Enabling path (Enabling path 1, 2, 3)	PNP open-collector transistor 2 outputs × 3 or NPN open-collector transistor 2 outputs × 3 (selectable using a slider switch)
Operation mode (Output operation)	Enabling path 1: ON when the light curtain is in light receiving condition, OFF when the light curtain is in light interrupted condition (Note 3) Enabling path 2: ON when the light curtain is in light receiving condition or the muting function is valid OFF when the light curtain is in light interrupted condition and the muting function is invalid (Note 3) Enabling path 3: ON when the emergency stop is invalid, OFF when the emergency stop is valid
Response time	OFF response: 14 ms or less (Enabling path 1 and 2: including the response time of the 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 × 3 or NPN open-collector transistor × 3 (selectable using a slider switch) <When PNP output is selected> <When NPN output is selected> • Maximum source current: 60 mA or less • Maximum sink current: 60 mA or less • Applied voltage: same as supply voltage (between the auxiliary output and +V) • Applied voltage: same as supply voltage (between the auxiliary output and 0 V) • Residual voltage: 2 V or less (at 60 mA source current) • Residual voltage: 2 V or less (at 60 mA sink current)
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 light curtain is in light interrupted condition, OFF when the 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 +14 to +131 °F (No dew condensation or icing allowed), Storage: –25 to +70 °C –13 to +158 °F
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 non-compatible type.
3) Both enabling path 1 and 2 are OFF when the emergency stop is valid regardless of whether the light curtain is in the light receiving or light interrupted condition.
4) The auto-reset cannot be used with enabling path 3.
5) The auxiliary output incorporated in the **SF4B** series is outputed.
6) For details of control unit **SF-C14EX(-01)**, refer to the website or general catalog.

SPECIFICATIONS

Handy-controller

Model No. / Item	SFB-HC
Supply voltage	24 V DC ±10 % Ripple P-P10 % or less (common to 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 × 2 (Selected beam channels, setting contents etc. are displayed.)
Function indicator	Green LED × 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 °C +14 to +131 °F (No dew condensation or icing allowed), Storage: −25 to +70 °C −13 to +158 °F
Ambient humidity	30 to 85 % RH, Storage: 30 to 85 % RH
Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure
Insulation resistance	20 MΩ , 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 °C +68 °F.

Laser alignment tool

Model No. / Item	SF-LAT-2N / SF-LAT-4BG (For SF4B-□G□)
Supply voltage	3 V (LR6 battery × 2 pcs.)
Battery	1.5 V (LR6 battery) × 2 pcs. (replaceable)
Battery lifetime	30 hours approx. of continuous operation (LR6 battery, at +25 °C +77 °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 2)
Spot diameter	10 mm 0.394 in approx. (at 5 m 16.404 ft distance)
Ambient temperature	0 to +40 °C +32 to +104 °F (No dew condensation), Storage: 0 to +55 °C +32 to +131 °F
Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH
Material	Enclosure: ABS, Mounting part: Aluminum
Weight	Net weight: 200 g approx. (including batteries)
Accessories	LR6 battery: 2 pcs.

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
2) 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. / Item		RF-SFBH-□
Attenuation rate of sensing range		With one mirror: Declined to 90 %, With two mirrors: Declined to 80 % (When used in combination with the SF4B series)
Environmental resistance	Ambient temperature	−10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), Storage: −25 to +70 °C −13 to +158 °F
	Ambient humidity	30 to 85 % RH, Storage: 30 to 95 % RH
	Vibration resistance	10 to 55 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each
	Shock resistance	300 m/s² acceleration (30 G approx.) in X, Y and Z directions for three times each
Material		Enclosure: Alminium, Mounting bracket: Stainless steel, Mirror (rear surface mirror): Glass, Side cover: EPDM
Accessories		Intermediate supporting bracket: 1 set (RF-SFBH-40/48/56/64), 2 sets (RF-SFBH-72/80/88/96)

Note: Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.

I/O circuit diagram

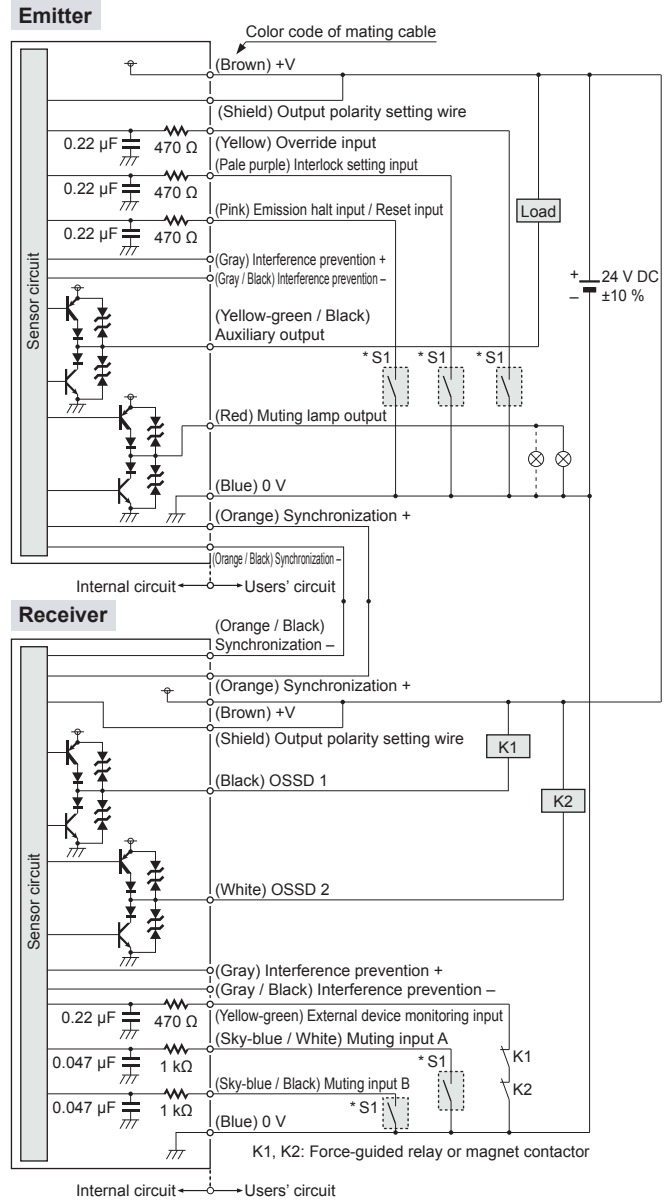### In case of using I/O circuit for PNP output
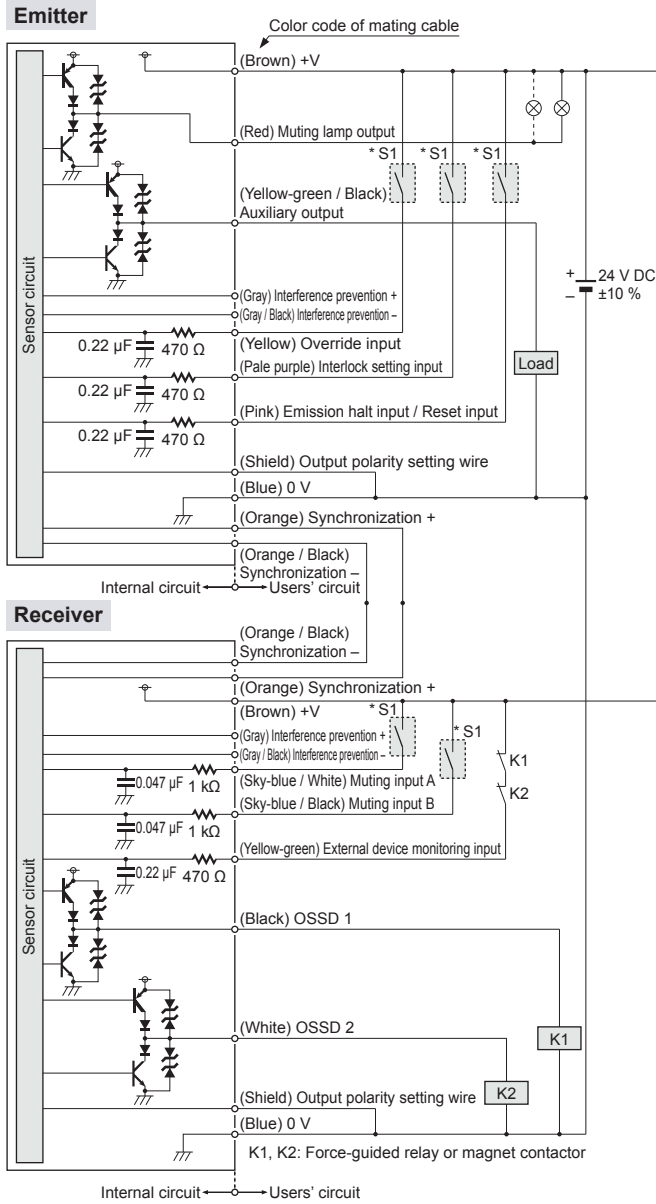
Emitter

Receiver

Note: The above diagram is when using a 12-core cable. If an 8-core cable is used, the red, yellow, gray, gray / black, sky-blue / white and sky-blue / black lead wires are absent.
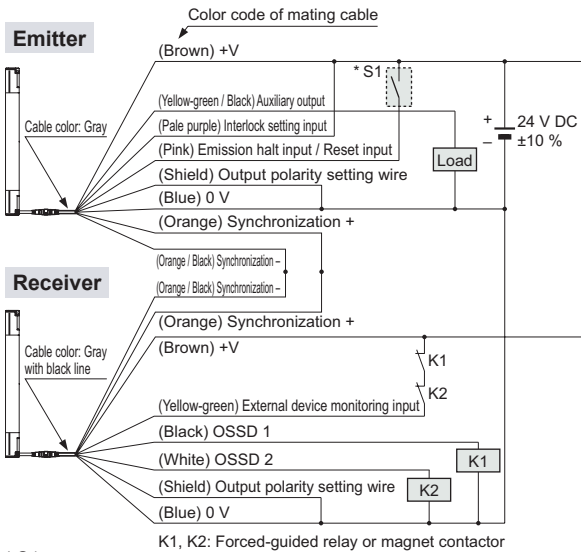
* S1
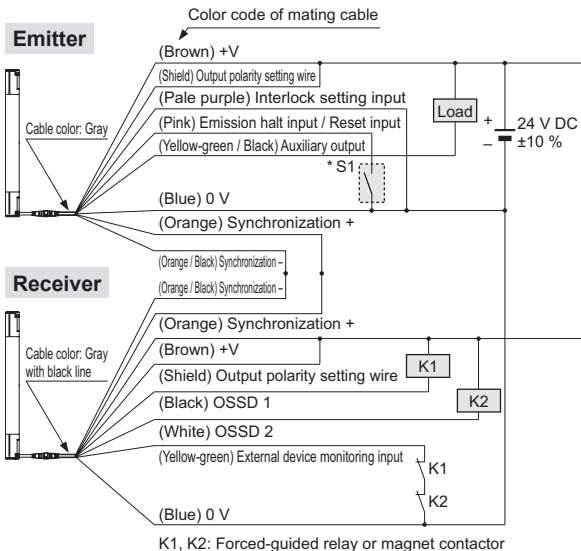
Switch S1
- Emission halt input / Reset input
  For manual reset
  Vs to Vs – 2.5 V (sink current 5 mA or less): Emission halt (Note 1)
  Open: Emission
  For automatic reset
  Vs to Vs – 2.5 V (sink current 5 mA or less): Emission (Note 1)
  Open: Emission halt
- Interlock setting input, Override input, Muting input A / B, External device monitor 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.

In case of using I/O circuit for NPN output

Emitter

Receiver

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

* S1

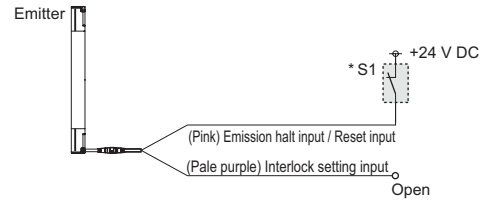Switch S1
- Emission halt input / Reset input
  For manual reset
  0 to +1.5 V (source current 5 mA or less): Emission halt
  Open: Emission
  For automatic reset
  0 to +1.5 V (source current 5 mA or less): Emission
  Open: Emission halt
- Interlock setting input, Override input, Muting input A / B, External device monitor input
  0 to +1.5 V (source current 5 mA or less): Enabled
  Open: Disabled

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

Emitter

Color code of mating cable
Cable color: Gray

(Brown) +V
(Yellow-green / Black) Auxiliary output
(Pale purple) Interlock setting input
(Pink) Emission halt input / Reset input
(Shield) Output polarity setting wire
(Blue) 0 V
(Orange) Synchronization +
(Orange / Black) Synchronization −

* S1
Load
+ 24 V DC − ±10 %

Receiver

Cable color: Gray with black line

(Orange / Black) Synchronization −
(Orange) Synchronization +
(Brown) +V
(Yellow-green) External device monitoring input
(Black) OSSD 1
(White) OSSD 2
(Shield) Output polarity setting wire
(Blue) 0 V

K1
K2

K1, K2: Forced-guided relay or magnet contactor

* 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
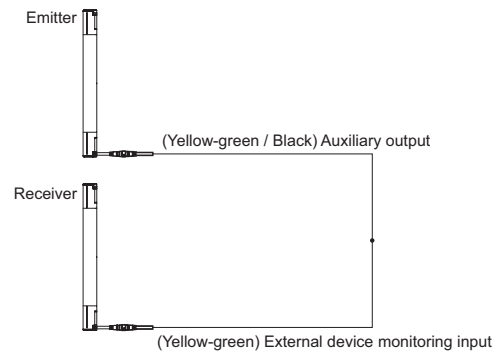
Note: Vs is the applying supply voltage.

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)"

Emitter
* S1
+24 V DC
(Pink) Emission halt input / Reset input
(Pale purple) Interlock setting input
Open

* Refer to the **SF4B<V2>** manual for details of the interlock function.

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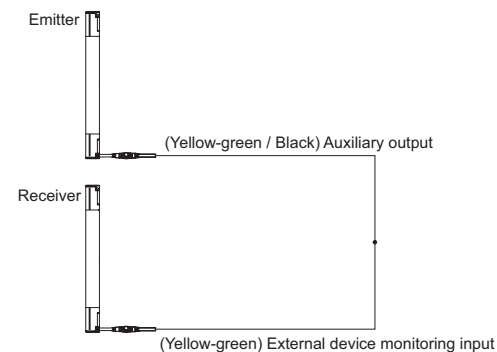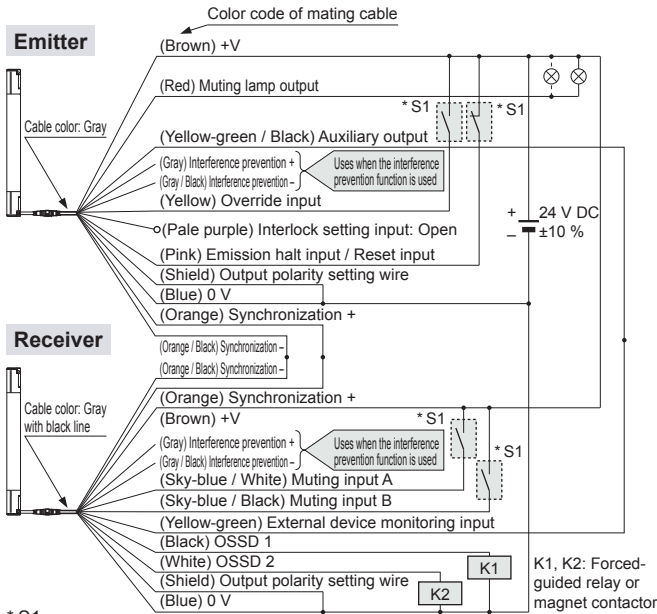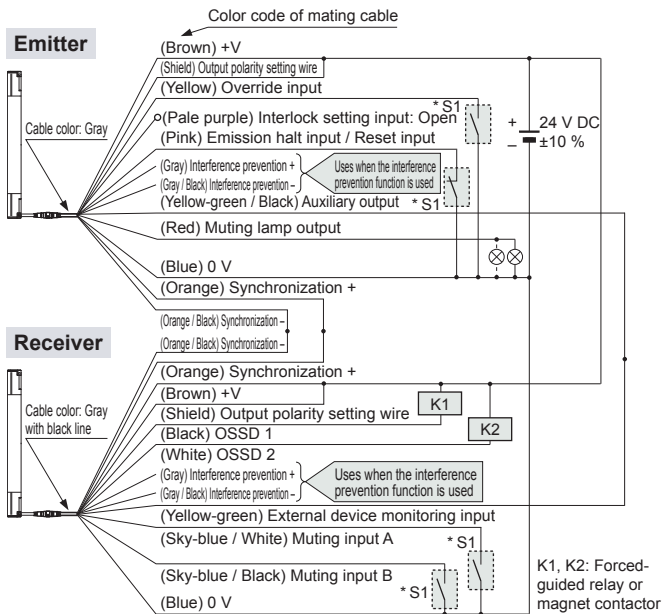

Emitter
(Yellow-green / Black) Auxiliary output
Receiver
(Yellow-green) External device monitoring input

* Refer to the **SF4B<V2>** manual for details of the external device monitoring function.

In case of using I/O circuit for NPN output

Emitter

Color code of mating cable
Cable color: Gray

(Brown) +V
(Shield) Output polarity setting wire
(Pale purple) Interlock setting input
(Pink) Emission halt input / Reset input
(Yellow-green / Black) Auxiliary output
(Blue) 0 V
(Orange) Synchronization +
(Orange / Black) Synchronization −

Load
+ 24 V DC − ±10 %
* S1

Receiver

Cable color: Gray with black line

(Orange / Black) Synchronization −
(Orange) Synchronization +
(Brown) +V
(Shield) Output polarity setting wire
(Black) OSSD 1
(White) OSSD 2
(Yellow-green) External device monitoring input
(Blue) 0 V

K1
K2
K1
K2

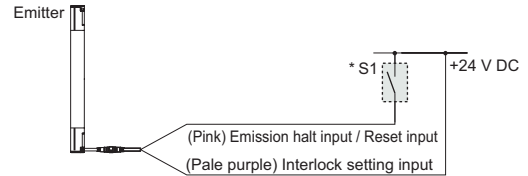K1, K2: Forced-guided relay or magnet contactor

* 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

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)"

Emitter
(Pale purple) Interlock setting input
Open
(Pink) Emission halt input / Reset input
* S1
0 V

* Refer to the **SF4B<V2>** manual for details of the interlock function.

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

Emitter
(Yellow-green / Black) Auxiliary output
Receiver
(Yellow-green) External device monitoring input

* Refer to the **SF4B<V2>** manual for details of the external device monitoring function.

I/O CIRCUIT AND WIRING DIAGRAMS

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

Color code of mating cable

Emitter

Cable color: Gray

(Brown) +V
(Red) Muting lamp output
(Yellow-green / Black) Auxiliary output
(Gray) Interference prevention +
(Gray / Black) Interference prevention –
Uses when the interference prevention function is used
(Yellow) Override input
(Pale purple) Interlock setting input: Open
(Pink) Emission halt input / Reset input
(Shield) Output polarity setting wire
(Blue) 0 V
(Orange) Synchronization +
(Orange / Black) Synchronization –
(Orange / Black) Synchronization –

* S1
* S1
+ 24 V DC – ±10 %

Receiver

Cable color: Gray with black line

(Orange) Synchronization +
(Brown) +V
(Gray) Interference prevention +
(Gray / Black) Interference prevention –
Uses when the interference prevention function is used
(Sky-blue / White) Muting input A
(Sky-blue / Black) Muting input B
(Yellow-green) External device monitoring input
(Black) OSSD 1
(White) OSSD 2
(Shield) Output polarity setting wire
(Blue) 0 V

* S1
* S1
K1
K2
K1, K2: Forced-guided relay or magnet contactor

* 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

Color code of mating cable

Emitter

Cable color: Gray

(Brown) +V
(Shield) Output polarity setting wire
(Yellow) Override input
(Pale purple) Interlock setting input: Open
(Pink) Emission halt input / Reset input
(Gray) Interference prevention +
(Gray / Black) Interference prevention –
Uses when the interference prevention function is used
(Yellow-green / Black) Auxiliary output
(Red) Muting lamp output
(Blue) 0 V
(Orange) Synchronization +
(Orange / Black) Synchronization –
(Orange / Black) Synchronization –

* S1
* S1
+ 24 V DC – ±10 %

Receiver

Cable color: Gray with black line

(Orange) Synchronization +
(Brown) +V
(Shield) Output polarity setting wire
(Black) OSSD 1
(White) OSSD 2
(Gray) Interference prevention +
(Gray / Black) Interference prevention –
Uses when the interference prevention function is used
(Yellow-green) External device monitoring input
(Sky-blue / White) Muting input A
(Sky-blue / Black) Muting input B
(Blue) 0 V

K1
K2
* S1
* S1
K1, K2: Forced-guided relay or magnet contactor

* 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

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The diagram at left shows the configuration when using PNP output, interlock function "disabled (automatic reset)" and external device monitoring function "disabled".
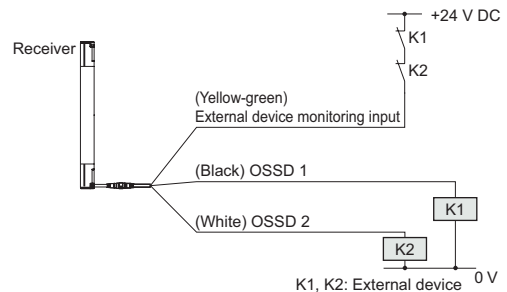
In case of setting the interlock function to "enabled (manual reset)"

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

Emitter
* S1
+24 V DC
(Pink) Emission halt input / Reset input
(Pale purple) Interlock setting input

* Refer to the **SF4B<V2>** manual for details of the interlock function.

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

+24 V DC
K1
K2
Receiver
(Yellow-green) External device monitoring input
(Black) OSSD 1
(White) OSSD 2
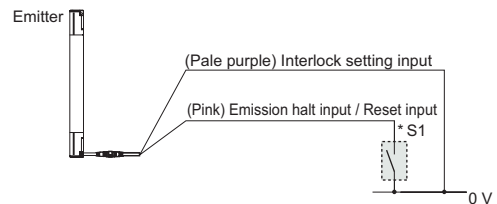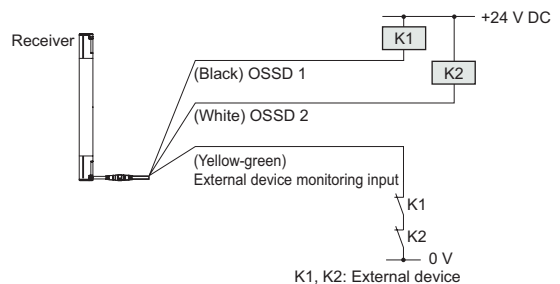K1
K2
K1, K2: External device
0 V

* Refer to the **SF4B<V2>** manual for details of the 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.

Emitter
(Pale purple) Interlock setting input
(Pink) Emission halt input / Reset input
* S1
0 V

* Refer to the **SF4B<V2>** manual for details of the interlock function.

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

+24 V DC
K1
K2
Receiver
(Black) OSSD 1
(White) OSSD 2
(Yellow-green) External device monitoring input
K1
K2
0 V
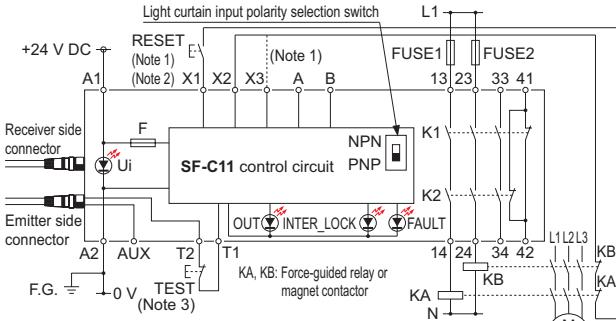K1, K2: External device

* Refer to the **SF4B<V2>** manual for details of the external device monitoring function.

SF-C11

SF4B series wiring diagram (Control Category 4)

For PNP output (minus ground)

- Set the 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 light curtain input polarity selection switch to the NPN side and ground the + side.
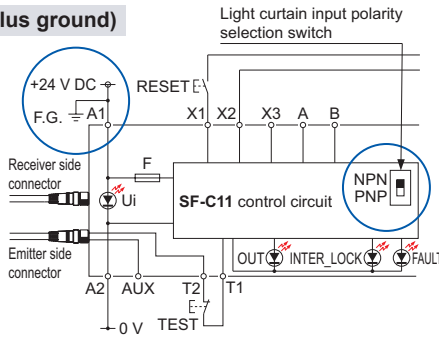
When **SF-C11** is connected to the light curtain, be sure to use the following mating cable.
SFB-CB□, **SFB-CCJ□**

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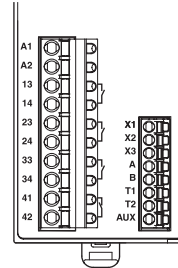
Terminal	Function
A1	+24 V DC
A2	0 V
13-14, 23-24, 33-34	Enabling path (NO contact × 3)
41-42	Auxiliary output (NC contact × 1)
X1	Reset output terminal
X2	Reset input terminal (Manual)
X3	Reset input terminal (Automatic)
A	Not used
B	
T1	Test output terminal
T2	Test input terminal
AUX	Semiconductor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

Pin layout for 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

SF-C12

SF4B series wiring diagram (Control Category 4)

For PNP output (minus ground)

- Set the two light curtain input polarity select switches to the PNP side and connect the FG terminal to the 0 V line.
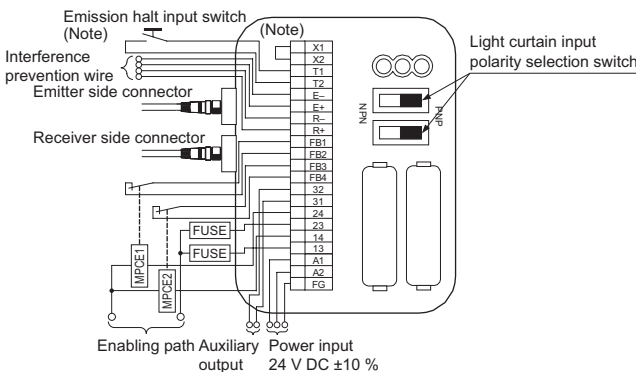
Note: The above diagram is when using manual reset. If automatic reset is used, connect a normally closed type pushbutton switch between T1 and T2 and leave between X1 and X2 open.

For NPN output (plus ground)

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

When **SF-C12** is connected to the light curtain, be sure to use the following maing cable.
SFB-CB05-MU, **SFB-CCJ□-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	Enabling path (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	
FB3			X2	Automatic reset / manual reset selection terminal
FB2	External relay monitor terminal 1		X1	Manual reset: X1 – X2 short-circuited
FB1				

Pin layout for light curtain connectors
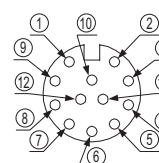
Note: Input and output for pin Nos. ⑪ and ⑫ are not used by this product.

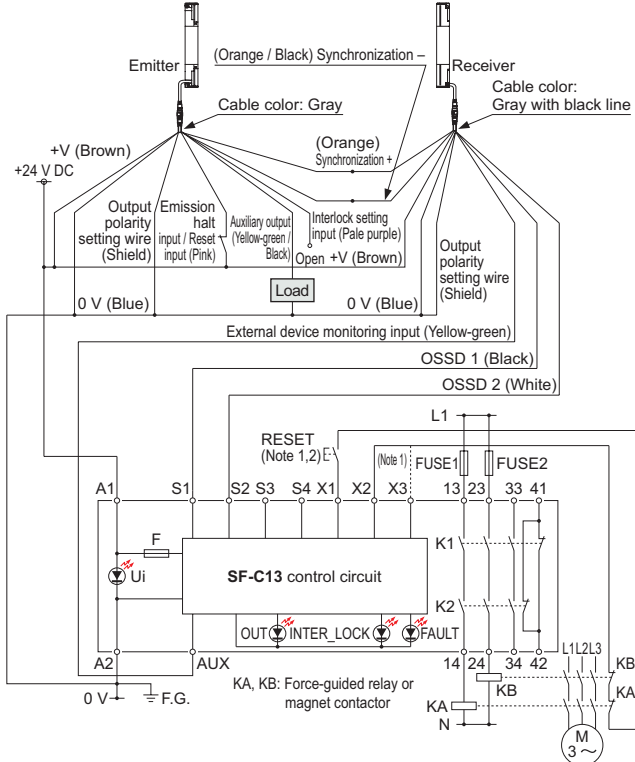| Connector pin No.	Emitter side connector	Receiver side connector
①	Interlock	OSSD 2
②	+24 V DC	+24 V DC
③	Emission halt	OSSD 1
④	Auxiliary output	EDM (External relay monitor)
⑤	Synchronization wire +	Synchronization wire +
⑥	Synchronization wire –	Synchronization wire –
⑦	0 V	0 V
⑧	Shield wire	Shield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

SF-C13

SF4B series wiring diagram (Control Category 4)
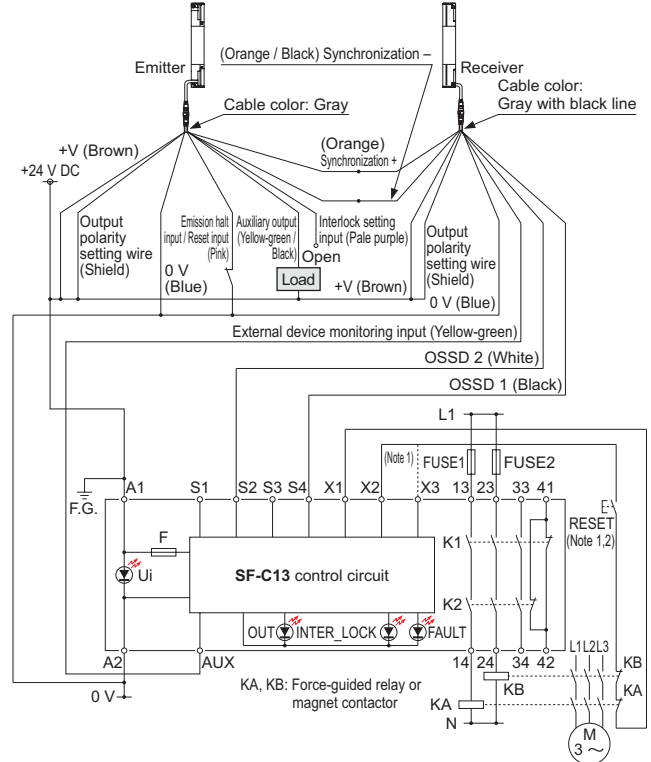
For PNP output (minus ground)

• Connect the 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 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 to S4	Light curtain control output (OSSD) input terminal
AUX	Semiconductor auxiliary output
X1	Reset output terminal
X2	Reset input terminal (Manual)
X3	Reset input terminal (Automatic)
13-14, 23-24, 33-34	Enabling path (NO contact × 3)
41-42	Auxiliary output (NC contact × 1)

A1
A2
S1
S2
S3
S4
AUX
X1
X2
X3
13
14
23
24
33
34
41
42

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

When **SF-C13** is connected to the light curtain, be sure to use the following descrete wire mating cable.
SFB-CCB□(-MU), **SFB-CC□(-MU)**

SF-C14EX(-01)

SF4B series wiring diagram (Control Category 4)

For PNP output (minus ground)

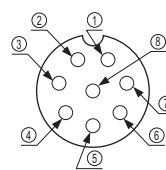• Set the output polarity selection switch to the PNP side and ground the 0 V line.
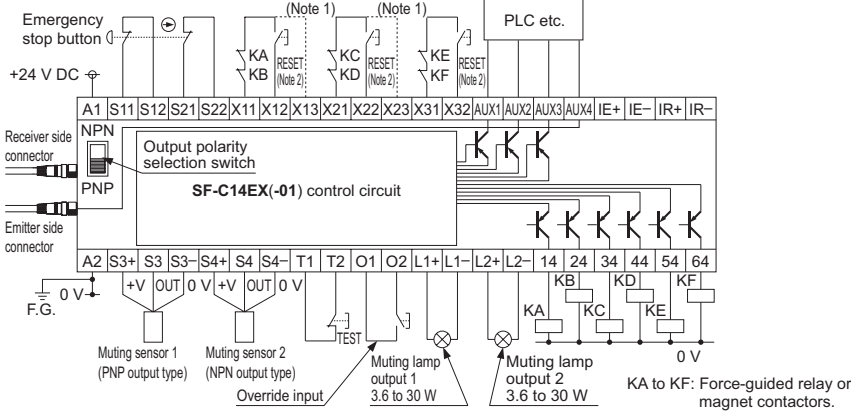
• When **SF-C14EX** is connected to the light curtain, be sure to use the following mating cable. **SFB-CB□-EX**, **SFB-CCJ□**

• If the NO (Normally Open) contact switch is used as a muting sensor, wire it as shown in the figure below.

S3+ | S3 | S3− | S4+ | S4 | S4−

• If the emergency stop button is not used, short-circuit between the terminals S11 to S12 and S21 to S22 directly.

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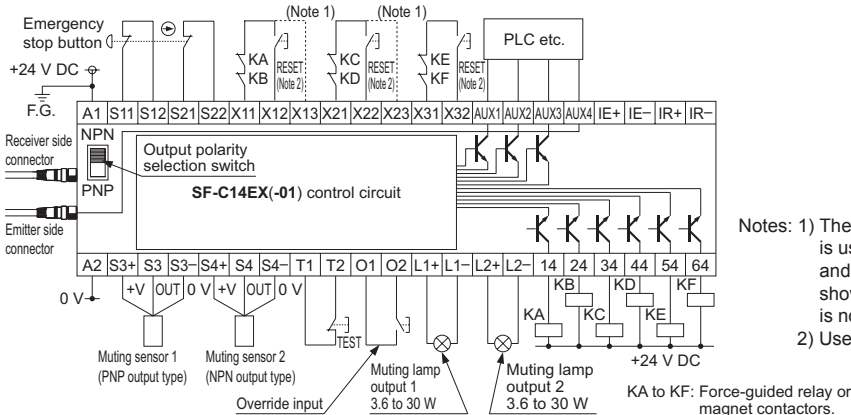
Notes: 1) The left diagram is when using manual reset. If automatic reset is used, disconnect the lead from X12 and connect it to X13, and disconnect the lead from X22 and connect it to X23, as shown by the dotted lines. In this case, a reset (RESET) button is not needed. Terminals X31 to X32 are for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

Terminal arrangement diagram

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

PRECAUTIONS FOR PROPER USE

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<V2>** 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<V2>** manual for details.)

Auxiliary output (Non-safety output)

- This 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<V2>** 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 light curtain into lockout one, and turn OFF the control outputs (OSSD 1, OSSD 2). (Refer to the **SF4B<V2>** manual for details.)

Muting function

- This function turns the safety function of this 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 light curtain without stopping the machinery. The muting function becomes valid when all the conditions listed below are satisfied. However, this function connot be used with the **SF4B-□-03<V2>**.
  ① The control outputs (OSSD 1, OSSD 2) shall be ON.
  ② The incandescent lamp with 3 to 10 W shall be connected to the muting lamp output (red).
  ③ 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<V2>** manual for details.)

Override function

- This function sets the safety function of this 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<V2>** manual for details.)

Series connection

Connectable up to 3 sets of light curtains (however, 192 beam channels max.)
(Refer to the **SF4B<V2>** manual for details.)

Parallel connection

Connectable up to 3 sets of light cartains
(Refer to the **SF4B<V2>** manual for details.)

Series and parallel mixed connection

Connectable up to 3 sets of light curtains (however, 192 beam channels max.)
(Refer to the **SF4B<V2>** 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.

Part description and function

- (Refer to the **SF4B<V2>** manual for details.)

Others

- 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 light curtain does not come in direct contact with water, oil, grease, or organic solvents, such as, thinner, etc.
- Take care that the 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.

⚠ • 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 product 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 attached to the product prior to its use.
• Both emitter and receiver are combined adjusted on factory setting, 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.
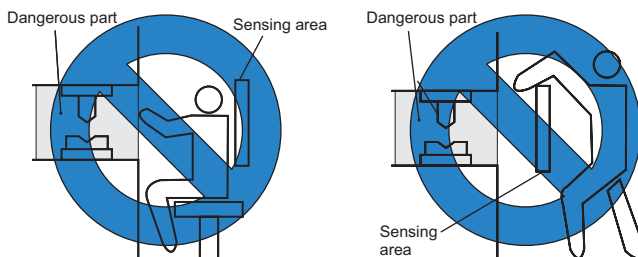
Sensing area

⚠ • Make sure to install this product such that any part of the human body must pass through its sensing area in order to reach the dangerous parts of the machinery. If the human body is not detected, there is a danger of serious injury or death.
• Do not use any reflective type or retroreflective type arrangement.
• Furthermore, facing several receivers towards one emitter, or vice versa, could produce a non-sensing area or cause mutual interference, which may result in serious injury or death.

Correct mounting method
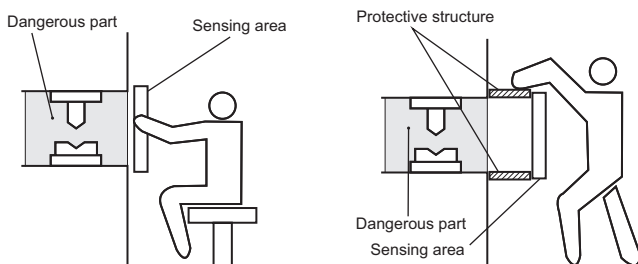
Wrong mounting method

Safety distance

⚠ • Calculate the safety distance correctly, and always maintain a distance which is equal to or greater than the safety distance, between the sensing area of this 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. Also, the below calculation is valid only when the intrusion direction is perpendicular to the sensing area. In case the intrusion direction is not perpendicular to the sensing area, be sure to refer to the relevant standard (regional standard, specification of the machine, etc.) for details of the calculation.
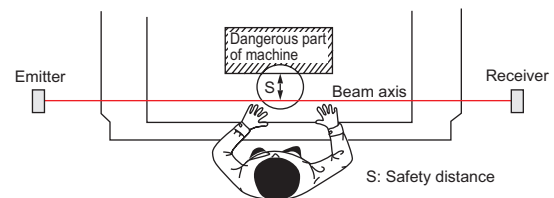
⚠ The sizes of the minimum sensing objects for this device vary depending on whether or not the floating blanking function is being used. Calculate the safety distance with the proper size of the minimum sensing object and appropriate equation.

Size of minimum sensing object when applying floating blanking function

| | Invalid | Min. sensing object when applying floating blanking function | | |
| | | Setting (Note) | | |
		1 beam channel	2 beam channels	3 beam channels
SF4B-F□(G) (Min. sensing object ø14 mm ø0.551 in)	ø14 mm ø0.551 in	ø24 mm ø0.945 in	ø34 mm ø1.339 in	ø44 mm ø1.732 in
SF4B-H□(G) (Min. sensing object ø25 mm ø0.984 in)	ø25 mm ø0.984 in	ø45 mm ø1.772 in	ø65 mm ø2.559 in	ø85 mm ø3.346 in
SF4B-A□(G) (Min. sensing object ø45 mm ø1.772 in)	ø45 mm ø1.772 in	ø85 mm ø3.346 in	ø125 mm ø4.921 in	ø165 mm ø6.496 in

Note: Refer to p.10 for details of the floating blanking function. However, the floating blanking function cannot be used with the **SF4B-□-01<V2>**, the **SF4B-□-03<V2>** and **SF-C14EX-01**.

For use in Europe (EU) (as EN ISO 13855)] (Also applicable to ISO 13855 / JIS B 9715)

For intrusion direction perpendicular to the sensing area
<In case that the minimum sensing object is ø40 mm ø1.575 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<V2>** series (sec.)
 C: Additional distance calculated from the size of the minimum sensing object of the light curtain (mm)
   However, the value of "C" cannot be less than 0.
   $C = 8 \times (d - 14)$
   d: Minimum sensing object diameter (mm)

• 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 ≤ S ≤ 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 ≤ 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 ⌀40 mm ⌀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.)
　$T = T_m + T_{SF4B}$
　T_m: Maximum halting time of machinery (sec.)
　T_{SF4B}: Response time of the **SF4B<V2>** series (sec.)
C: Additional distance calculated from the size of the minimum sensing object of the light curtain (mm)
　C = 850 (mm) (Constant)

For use in the United States of America (as per 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.) ≈ 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.
T_S: Halting time calculated from the operation time of the control element (air valve, etc.) (sec.)
T_C: Maximum response time of the control circuit required for functioning the brake (sec.)
T_{SF4B}: Response time of light curtain (sec.)
T_{bm}: Additional halting time tolerance for the brake monitor (sec.)
　The following equation holds when the machine is equipped with a brake monitor.
　$T_{bm} = T_a - (T_S + T_C)$
　T_a: 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.
D_{pf}: Additional distance calculated from the size of the minimum sensing of the
　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) ≈ 14 (mm) **SF4B-F□(G)<V2>**
　Minimum sensing object diameter 0.985 (inch) ≈ 25 (mm) **SF4B-H□(G□)<V2>**
　Minimum sensing object diameter 1.772 (inch) ≈ 45 (mm) **SF4B-A□(G)<V2>**

Output waveform [Control outputs (OSSD 1, OSSD 2) ON]

• Refer to the **SF4B<V2>** manual for details.

Influence of reflective surfaces

• Refer to the **SF4B<V2>** manual for details.

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 enclosed with the handy-controller for details of the function settings for using handy-controller **SFB-HC** (optional).

Troubleshooting

• Refer to the **SF4B<V2>** manual for details.

Corner mirror

• Be sure to carry out maintenance while referring to the instruction manual for the **SF4B** series of 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 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.
⚠ • Light curtain **SF4B** series cannot be used as a retroreflective type. Avoid installing the 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.

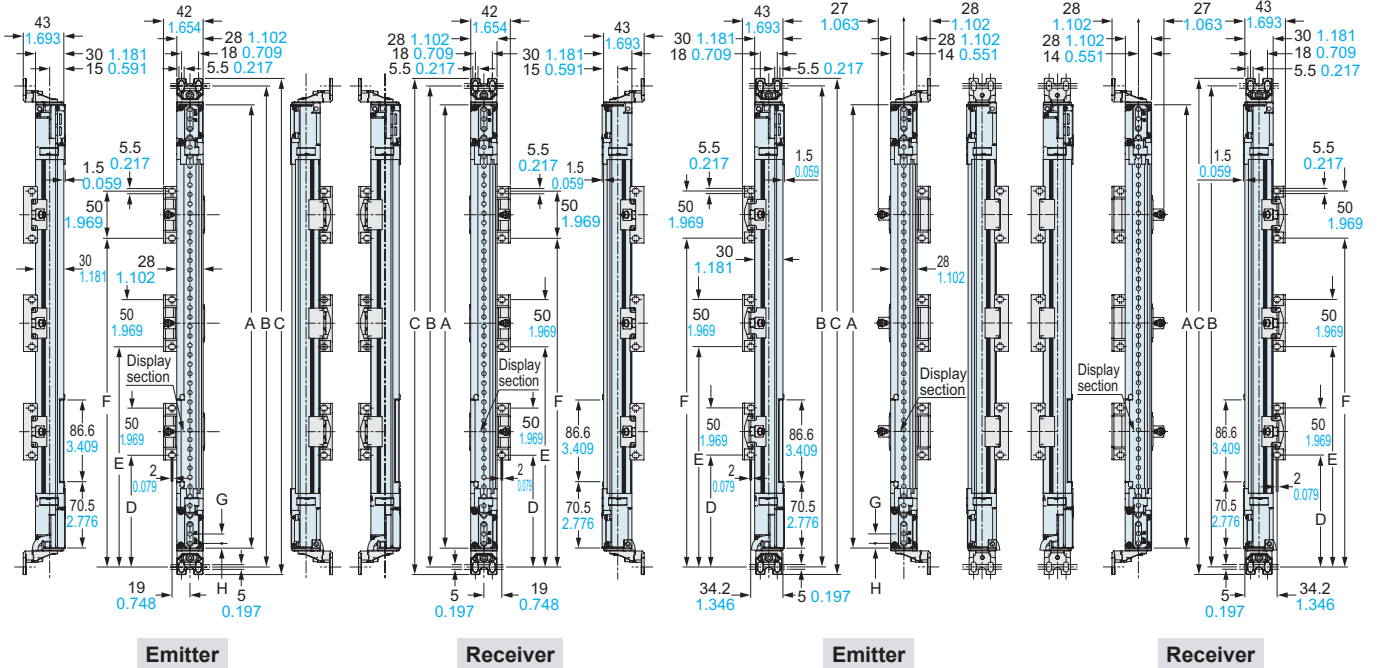**SF4B-□<V2>** — Not available for the robust type **SF4B-□G□<V2>** — Light curtain

Assembly dimensions

Mounting drawing for the light curtains using the standard mounting brackets **MS-SFB-1** (optional) and the intermediate supporting brackets.

<Rear mounting> **<Side mounting>**

Emitter   Receiver   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□01<V2> SF4B-H□01<V2>	SF4B-A□-01<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: When **SF4B-□-01<V2>** is used for China press machine as a safety device, the distance between the center of the 1st beam axis and the center of the last beam axis is regarded as protective height A'.
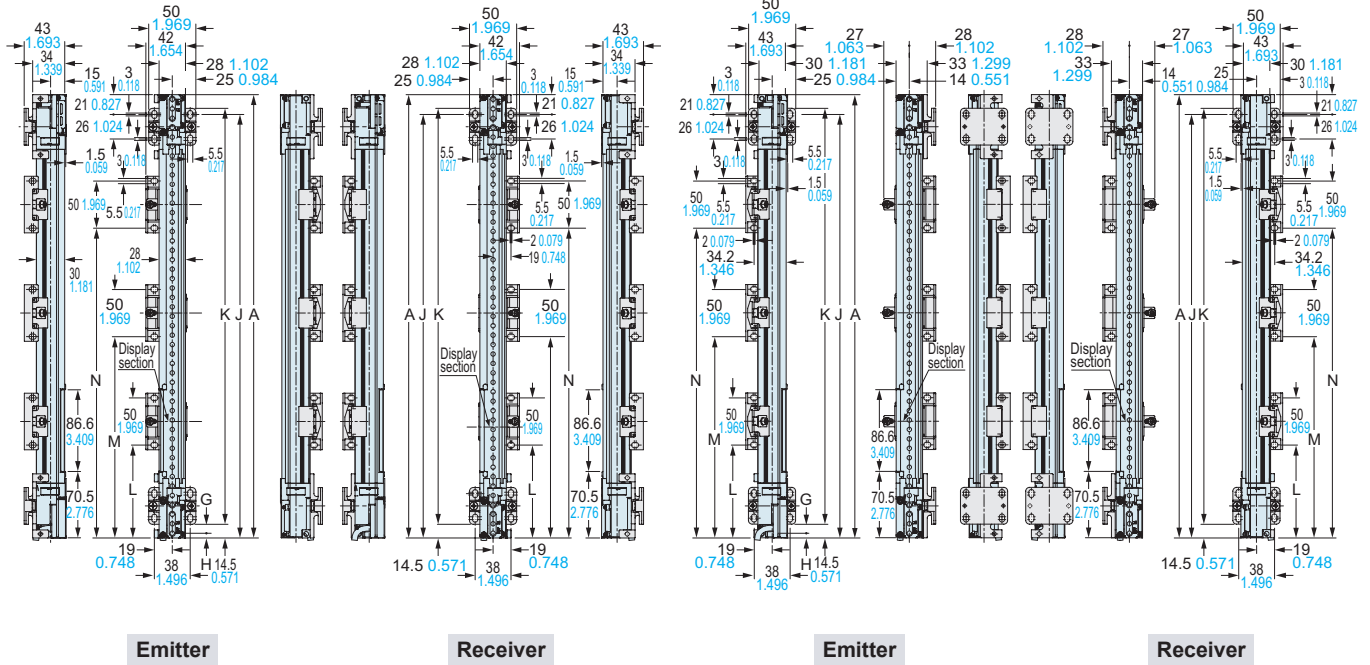
SF4B-□<V2> Not available for the robust type **SF4B-□G□<V2>** Light curtain

Assembly dimensions

Mounting drawing for the light curtains using the dead zoneless 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			Model No.	Beam pitch	First beam channel position
			A	A' (Note)		J	K	L	M	N		G	H
				SF4B-F□01<V2> SF4B-H□01<V2>	SF4B-A□-01<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-F□<V2>	10 0.394	5 0.197
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-H□<V2>	20 0.787	5 0.197
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-A□<V2>	40 1.575	15 0.591
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			

Note: When **SF4B-□-01<V2>** is used for China press machine as a safety device, the distance between the center of the 1st beam axis and the center of the last beam axis is regarded as protective height A'.

DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

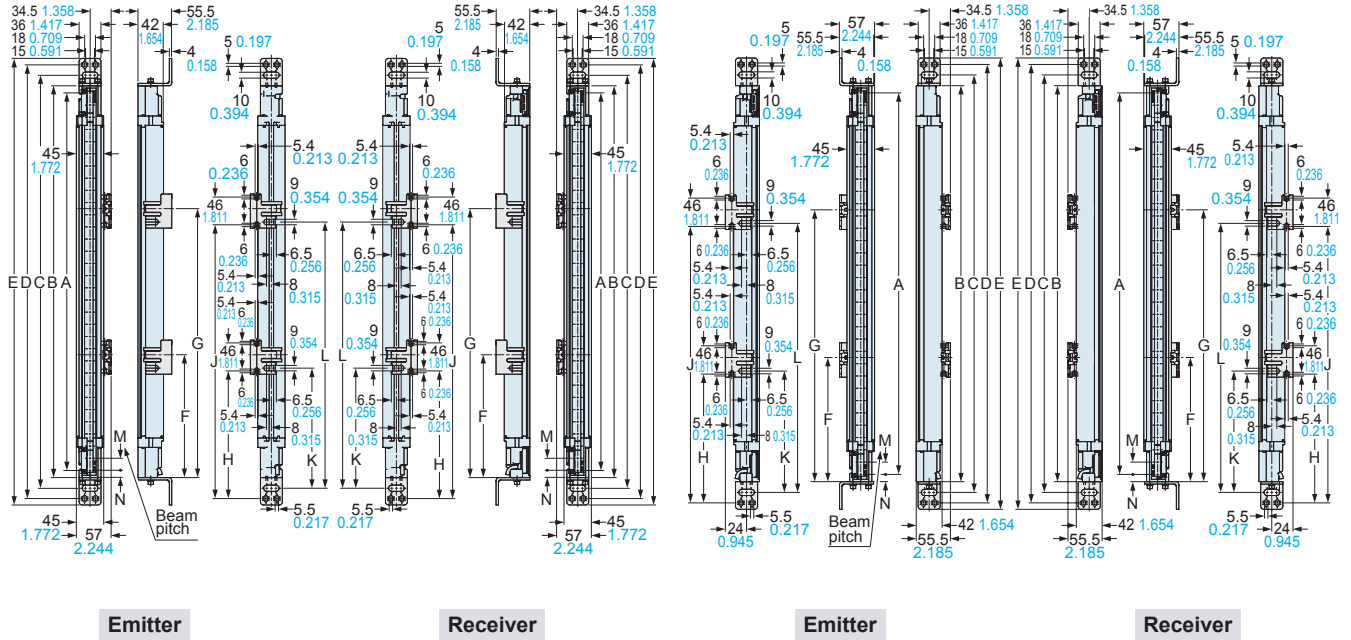
SF4B-□G□<V2>   It is only available for the robust **SF4B-□G□<V2>**   `Light curtain`

Assembly dimensions

Mounting drawing for light curtains using the standard mounting brackets **MS-SF4BG-1** (optional) and the intermediate supporting brackets.

<Rear mounting>   **<Side mounting>**

Emitter   Receiver   Emitter   Receiver

Model No.			Protective height			Mounting pitch		Total length	Intermediate supporting bracket mounting pitch					
			A (Note)		B	C	D	E	F	G	H	J	K	L
			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

Note: When **SF4B-□G□<V2>** is used for China press machine as a safety device, the distance between the center of the 1st beam axis and the center of the last beam axis is regarded as protective height described in column A.

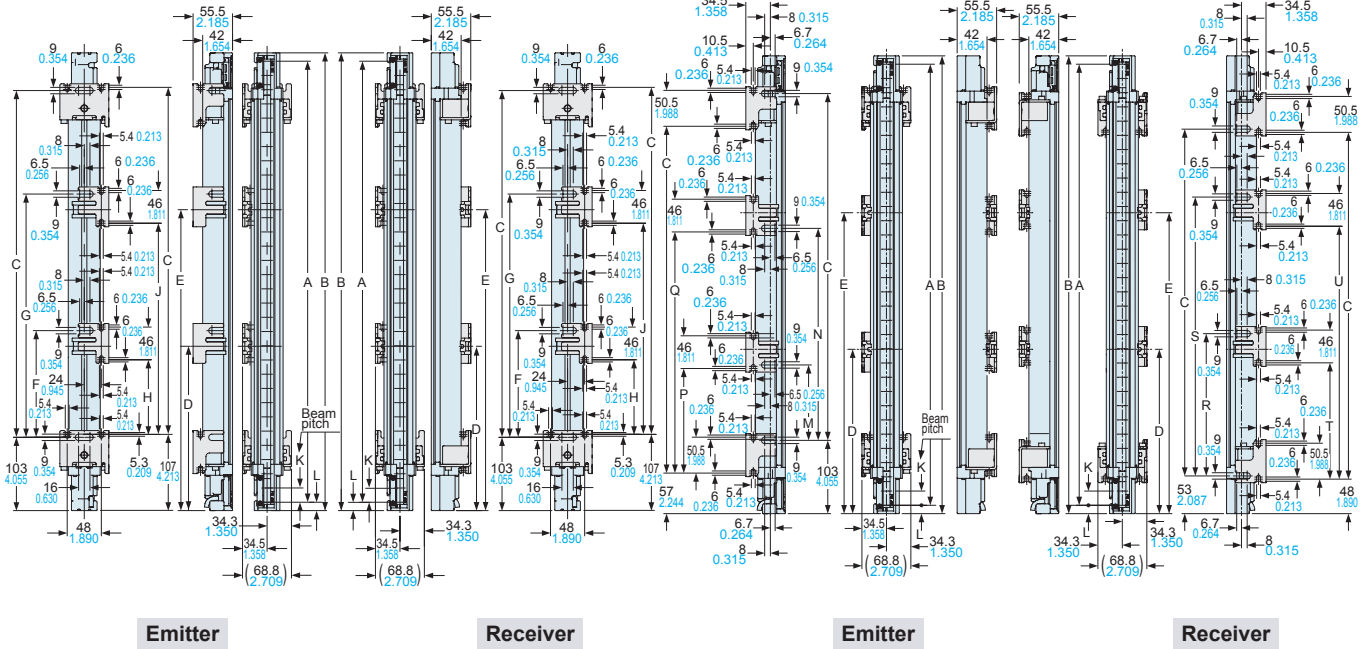| Model No.	Beam pitch	First beam channel position
	M	N
SF4B-F□G<V2>	10 0.394	11.8 0.465
SF4B-H□G□<V2>	20 0.787	11.8 0.465
SF4B-A□G<V2>	40 1.575	21.8 0.858

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

Assembly dimensions

Mounting drawing for 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	893 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	426 16.772	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	955 37.598	421 16.575	956 37.638	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

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

Note: When **SF4B-□G□<V2>** is used for China press machine as a safety device, the distance between the center of the 1st beam axis and the center of the last beam axis is regarded as protective height described in column A.
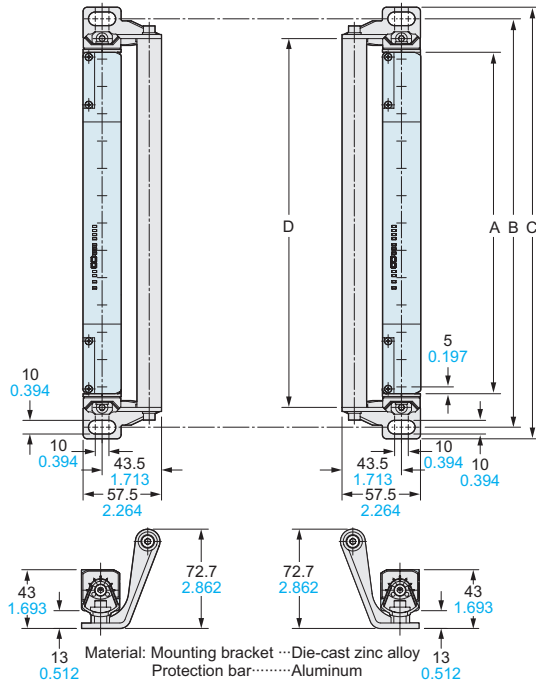
SF4B-□　　　　　　　　　　　　　　　　　　Not available for the robust type **SF4B-□G□<V2>**　Light curtain

Protection bar set MC-SFBH-□ assembly dimensions

Mounting drawing for the light curtain on which the front protection unit (**MC-SFBH-□**) is mounted.

MC-SFBH-□(L)　　　　**MC-SFBH-□(R)**

10 0.394
10 0.394
43.5 1.713
43.5 1.713
10 0.394
10 0.394
57.5 2.264
57.5 2.264
5 0.197
72.7 2.862
72.7 2.862
43 1.693
43 1.693
13 0.512
13 0.512

Material: Mounting bracket ···Die-cast zinc alloy
Protection bar·········Aluminum

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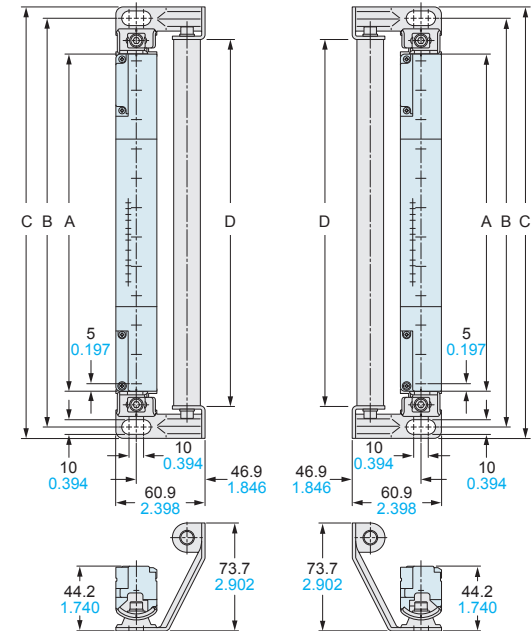hexagon-socket-head bolt are attached.

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

Mounting drawing for the light curtain on which the front protection unit (**MC-SFBH-□-T**) is mounted.
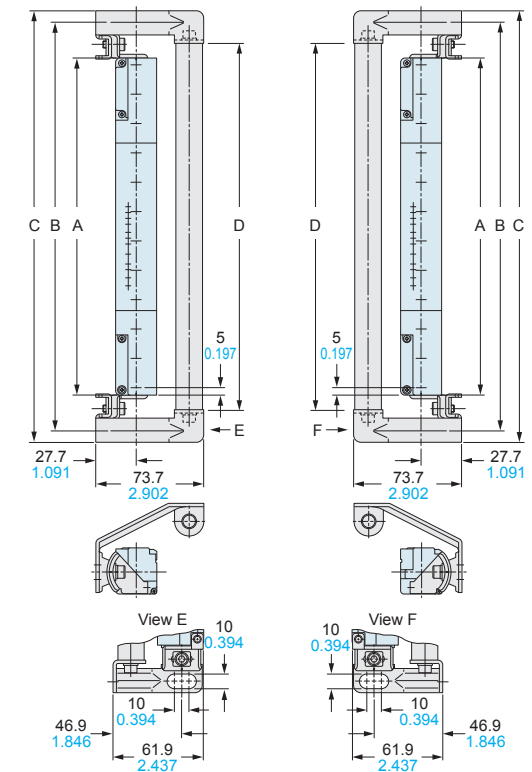
Rear mounting

MC-SFBH-□-T(L)　　　　**MC-SFBH-□-T(R)**

5 0.197
5 0.197
10 0.394
10 0.394
46.9 1.846
46.9 1.846
60.9 2.398
60.9 2.398
73.7 2.902
73.7 2.902
44.2 1.740
44.2 1.740

Side mounting

MC-SFBH-□-T(L)　　　　**MC-SFBH-□-T(R)**

27.7 1.091
27.7 1.091
73.7 2.902
73.7 2.902
5 0.197
5 0.197

View E　10 0.394
View F　10 0.394
46.9 1.846
46.9 1.846
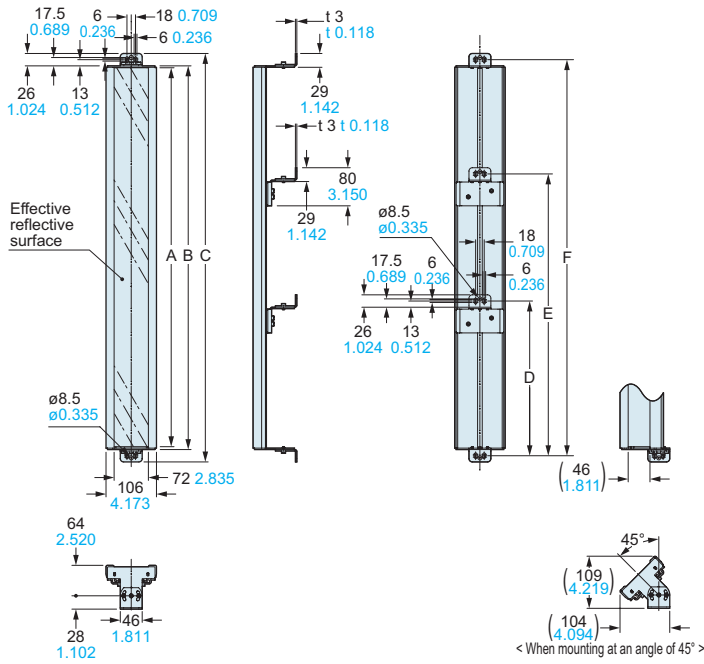10 0.394
10 0.394
61.9 2.437
61.9 2.437

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 bar
Two pcs. each of M5 (length 18 mm 0.709 in)
hexagon-socket-head bolts, M5 (length 20 mm 0.787 in)
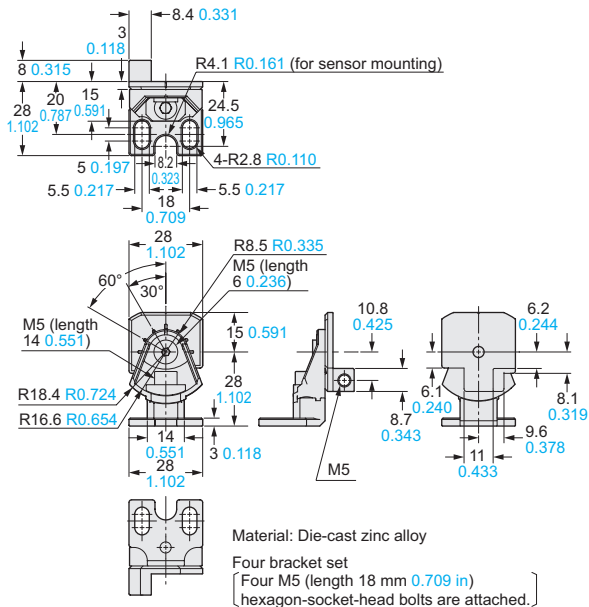hexagon-socket-head bolt are attached.

Model No.	Applicable 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

RF-**SFBH**-□ — Corner mirror (Optional)

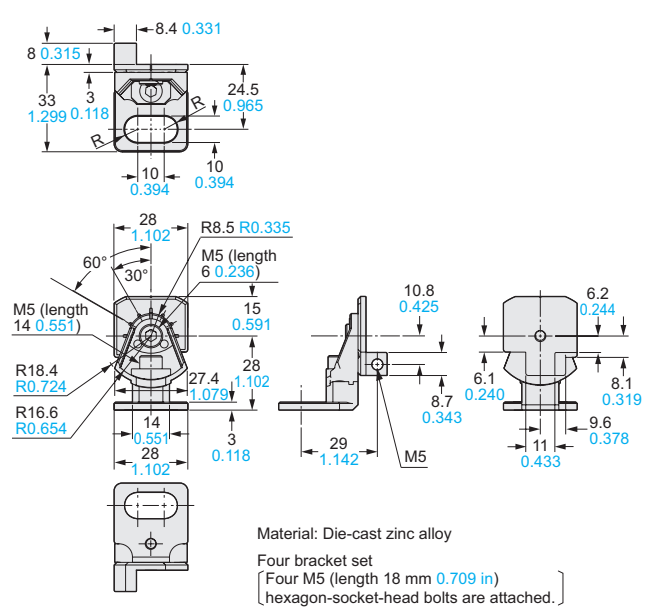| Model No.	A	B	C	D	E	F	Net weight
RF-SFBH-12	236 9.291	246 9.685	298 11.732	—	—	272 10.709	970 g approx.
RF-SFBH-16	316 12.441	326 12.835	378 14.882	—	—	352 13.858	1,170 g approx.
RF-SFBH-20	396 15.591	406 15.984	458 18.031	—	—	432 17.008	1,370 g approx.
RF-SFBH-24	476 18.740	486 19.134	538 21.181	—	—	512 20.157	1,570 g approx.
RF-SFBH-28	556 21.890	566 22.283	618 24.331	—	—	592 23.307	1,770 g approx.
RF-SFBH-32	636 25.039	646 25.433	698 27.480	—	—	672 26.457	1,970 g approx.
RF-SFBH-36	716 28.189	726 28.583	778 30.630	—	—	752 29.606	2,170 g approx.
RF-SFBH-40	796 31.339	806 31.732	858 33.779	458 ±50 18.031 ±1.969	—	832 32.756	2,660 g approx.
RF-SFBH-48	956 37.638	966 38.031	1,018 40.079	538 ±50 21.181 ±1.969	—	992 39.055	3,060 g approx.
RF-SFBH-56	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.
RF-SFBH-64	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.
RF-SFBH-72	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.
RF-SFBH-80	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.
RF-SFBH-88	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.
RF-SFBH-96	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 **SF4B-□G□<V2>**.

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

It is only available for the robust type **SF4B-□G□<V2>**.
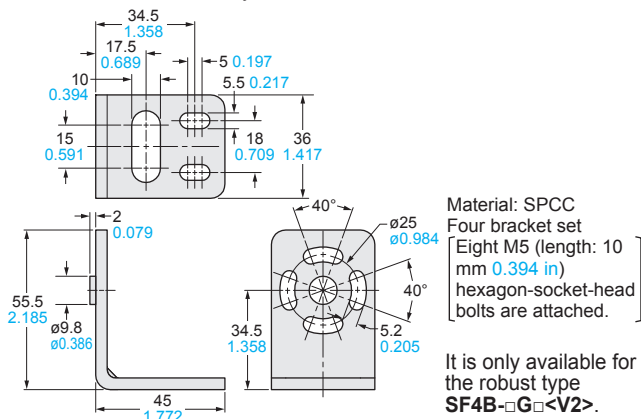
MS-SFB-2   Not available for the robust type SF4B-☐G☐<V2>   Intermediate supporting bracket (Accessory for light curtain)
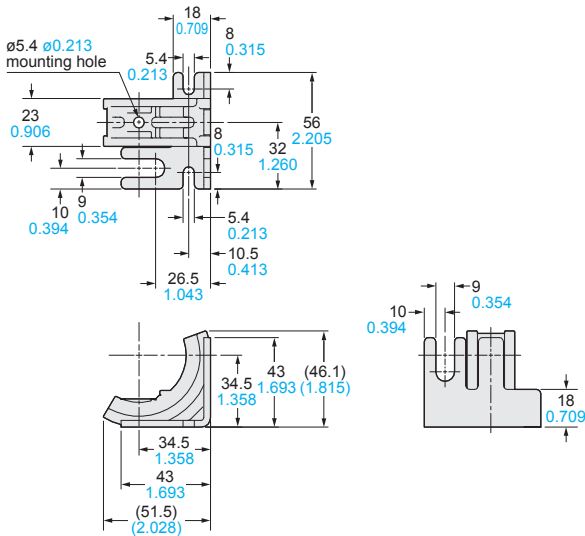

9.5 0.374
5.8 0.228
40 1.575
37 1.457
12 0.472
M4 (length 12 0.472)
4-R2.8 0.110
(55 2.165)
43 1.693
2 0.079
15 0.591
9 0.354
5.5 0.217
33 1.299
50 1.969
60 2.362
5.5 0.217

22.2 0.874
13 0.512
8.3 0.327
2 0.079
R21.4 R0.843
8.5 0.335
30°
31 1.220
28 1.102
12.5 0.492
52 2.047
41 1.614
2 0.079
13 0.512
10.5 0.413

32 1.260
4-R2.8 R0.110
24.8 0.976
14.8 0.583
2 0.079
8.8 0.346
5.5 0.217
5.5 0.217
50 1.969
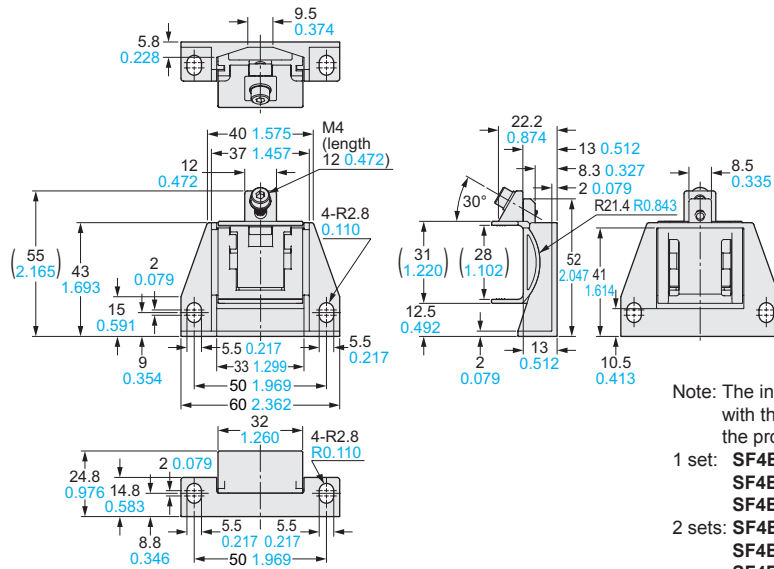
Material: Die-cast zinc alloy

Note: The intermediate supporting bracket (**MS-SFB-2**) is enclosed with the following products. The quantity differs depending on the product as shown below:
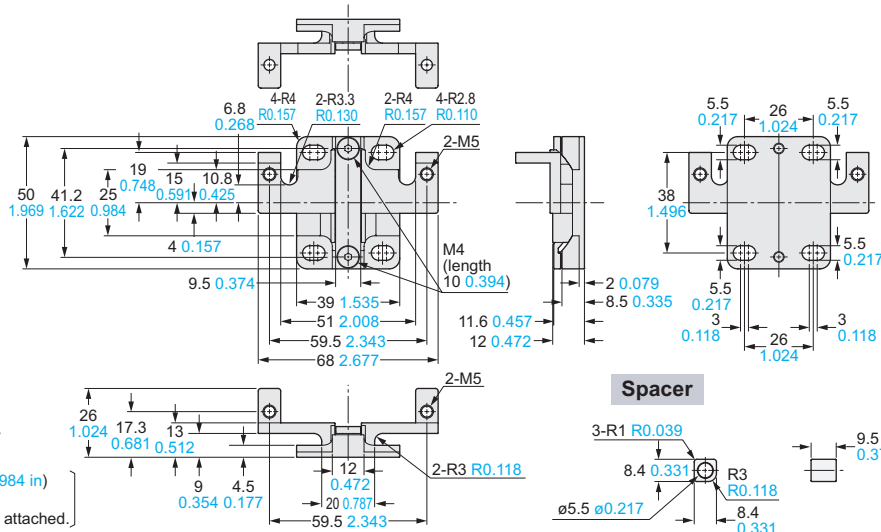1 set: SF4B-F☐<V2> … Light curtain with 79 to 111 beam channels
   SF4B-H☐<V2> … Light curtain with 40 to 56 beam channels
   SF4B-A☐<V2> … Light curtain with 20 to 28 beam channels
2 sets: SF4B-F127<V2>
   SF4B-H☐<V2> … Light curtain with 64 to 80 beam channels
   SF4B-A☐<V2> … Light curtain with 32 to 40 beam channels
3 sets: SF4B-H☐<V2> … Light curtain with 88 to 96 beam channels
   SF4B-A☐<V2> … Light curtain with 44 to 48 beam channels

MS-SF4BG-2   It is only available for the robust SF4B-☐G☐<V2>.   Intermediate supporting bracket (Accessory for light curtain)

Rear mounting

ø5.4 ø0.213 mounting hole
18 0.709
8 0.315
5.4 0.213
23 0.906
8 0.315
32 1.260
56 2.205
10 0.394
9 0.354
5.4 0.213
10.5 0.413
26.5 1.043

10 0.394
34.5 1.358
43 1.693
(46.1) (1.815)
34.5 1.358
43 1.693
(51.5) (2.028)

9 0.354
18 0.709

Side mounting

18 0.709
8 0.315
5.4 0.213
23 0.906
8 0.315
32 1.260
56 2.205
10 0.394
9 0.354
5.4 0.213
10.5 0.413
26.5 1.043

ø5.4 ø0.213 mounting hole
18 0.709
9 0.354
10 0.394
34.5 1.358
43 1.693
(51.5) (2.028)
34.5 1.358
43 1.693
(46.1) (1.815)
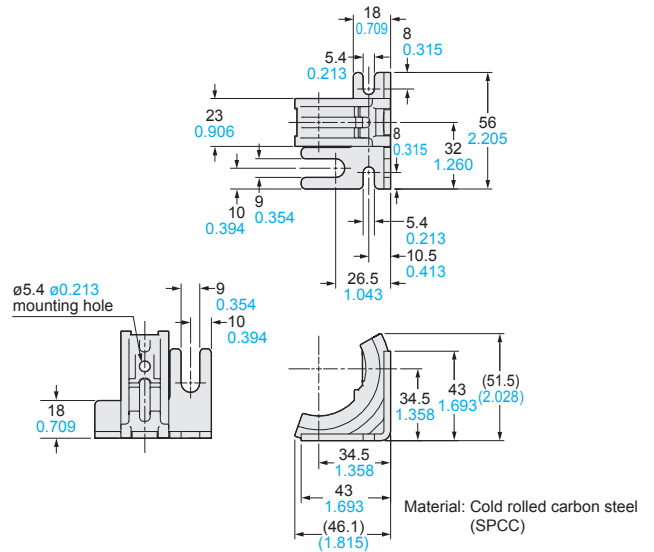
Material: Cold rolled carbon steel (SPCC)

Note: The intermediate supporting bracket **MS-SF4BG-2** is enclosed with the following products. The quantity differs depending on the product as shown below:
1 set: SF4B-F☐G<V2> … Light curtain with 79 to 127 beam channels
   SF4B-H☐G☐<V2> … Light curtain with 40 to 64 beam channels
   SF4B-A☐G<V2> … Light curtain with 20 to 32 beam channels
2 sets: SF4B-H☐G☐<V2> … Light curtain with 72 to 96 beam channels
   SF4B-A☐G<V2>   … Light curtain with 36 to 48 beam channels

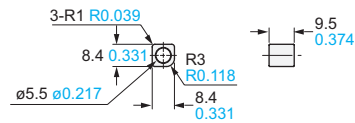## MS-SFB-3   Not available for the robust type **SF4B-□G□<V2>**   Dead zoneless mounting bracket (Optional)
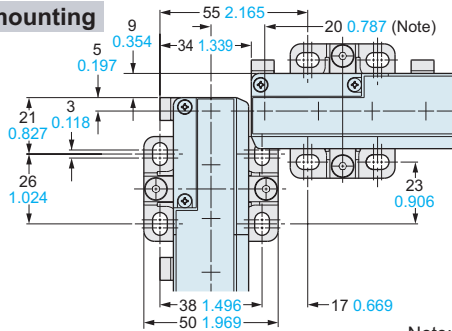
Main body

4-R4 R0.157   2-R3.3 R0.130   2-R4 R0.157   4-R2.8 R0.110

2-M5

6.8 0.268
50 1.969
41.2 1.622
25 0.984
19 0.748
15 0.591
10.8 0.425
4 0.157
9.5 0.374
39 1.535
51 2.008
59.5 2.343
68 2.677

M4 (length 10 0.394)

2 0.079
8.5 0.335
11.6 0.457
12 0.472

5.5 0.217   26 1.024   5.5 0.217
38 1.496
5.5 0.217
5.5 0.217
3 0.118   26 1.024   3 0.118

2-M5
26 1.024
17.3 0.681
13 0.512
9 0.354
4.5 0.177
12 0.472
20 0.787
59.5 2.343
2-R3 R0.118

Material: Die-cast zinc alloy

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

Spacer

3-R1 R0.039
8.4 0.331
ø5.5 ø0.217
R3 R0.118
8.4 0.331
9.5 0.374

L-shaped mounting

9 0.354
5 0.197
55 2.165
34 1.339
20 0.787 (Note)
21 0.827
3 0.118
26 1.024
23 0.906
38 1.496
50 1.969
17 0.669

Mounting adjustment range

The adjustment range of the light curtain angle is up to ±15 degrees.

15° 15°
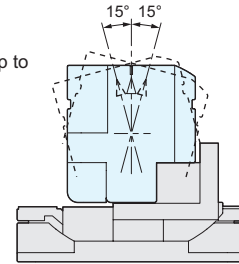
Note: The finger protection type has a beam pitch of 10 mm 0.394 in, which produces a dead zone. Additional measures will be required, such as using a protection cover.

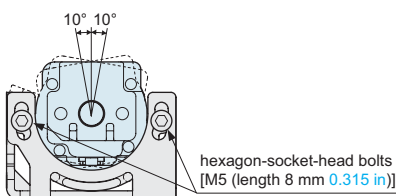## MS-SF4BG-3   Dead zoneless mounting bracket (Optional)

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

68.8 2.709
58.5 2.303
42.5 1.673
34.5 1.358
26.5 1.043
25 0.984
10.5 0.413
5.4 0.213
5.4 0.213
26 1.024
13 0.512
ø5.4 ø0.213
5.5 0.217
62.6 2.465
66.7 2.626

60.5 2.382
50.7 1.996
9 0.354
9.5 0.374
5.4 0.213
43.2 1.701
26.5 1.043
5.4 0.213
18.1 0.713
8 0.315
52.5 2.067
10.5 0.413
10.5 0.413

20°   20°
10°   10°
34.5 1.358
40°
60°
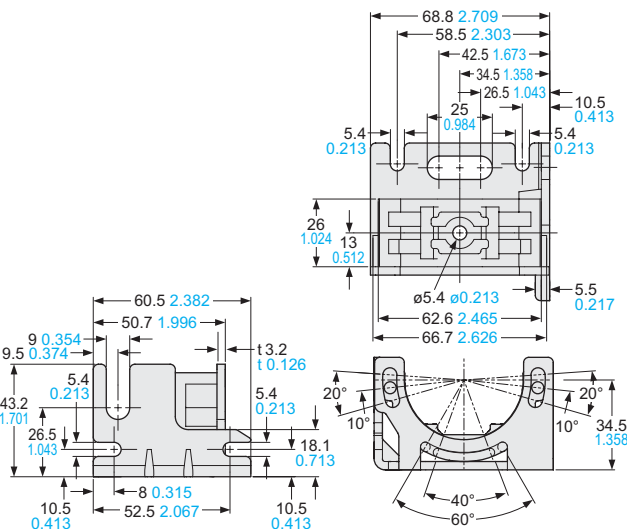
Material: Dead zoneless mounting bracket ⋯ Cold rolled carbon steel (SPCC) (Trivalent chrome plated)
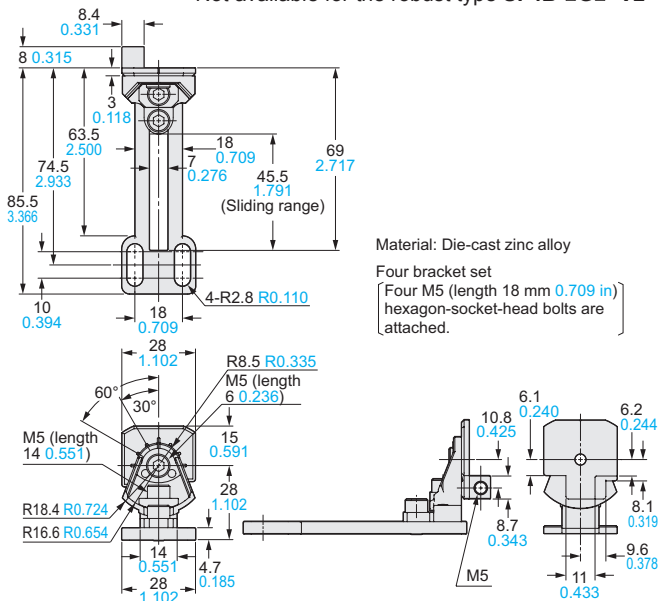   Dead zoneless supporting bracket ⋯ PPS

Mounting adjustment range

The adjustment range of the light curtain angle is up to ±10 degrees.

10° 10°

hexagon-socket-head bolts [M5 (length 8 mm 0.315 in)]

MS-SFB-4   Pitch adapter bracket (Optional)

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

8.4 0.331
8 0.315
3 0.118
63.5 2.500
74.5 2.933
85.5 3.366
7 0.276
18 0.709
45.5 1.791 (Sliding range)
69 2.717
10 0.394
18 0.709
4-R2.8 R0.110

Material: Die-cast zinc alloy

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

28 1.102
R8.5 R0.335
M5 (length 6 0.236)
60°
30°
M5 (length 14 0.551)
15 0.591
28 1.102
R18.4 R0.724
R16.6 R0.654
14 0.551
4.7 0.185
28 1.102

6.1 0.240
10.8 0.425
6.2 0.244
8.7 0.343
8.1 0.319
9.6 0.378
11 0.433
M5

MS-SFB-4-T

Not available for the robust type **SF4B-□G□<V2>**   M8 pitch adapter bracket (Optional)
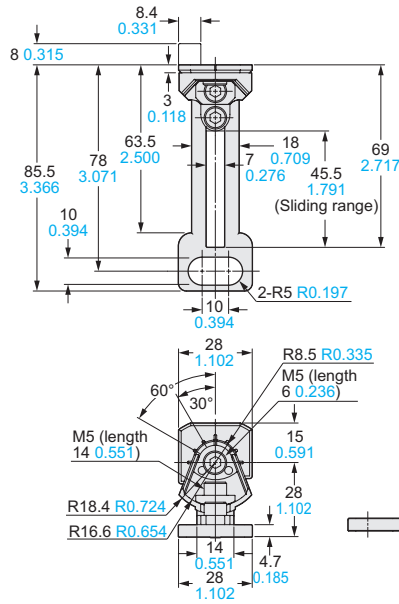
8.4
0.331
8 0.315
3
0.118
63.5
2.500
78
3.071
85.5
3.366
10
0.394
18
0.709
7
0.276
45.5
1.791
(Sliding range)
69
2.717
10
0.394
2-R5 R0.197

28
1.102
60°
30°
R8.5 R0.335
M5 (length 6 0.236)
M5 (length 14 0.551)
R18.4 R0.724
R16.6 R0.654
14
0.551
28
1.102
4.7
0.185
15
0.591
28
1.102

Material: Die-cast zinc alloy
Four bracket set
⌈Four M5 (length 18 mm 0.709 in)⌉
⌊hexagon-socket-head bolts are attached.⌋

10.8
0.425
8.7
0.343
M5

6.2
0.244
6.1
0.240
8.1
0.319
9.6
0.378
11
0.433

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>**
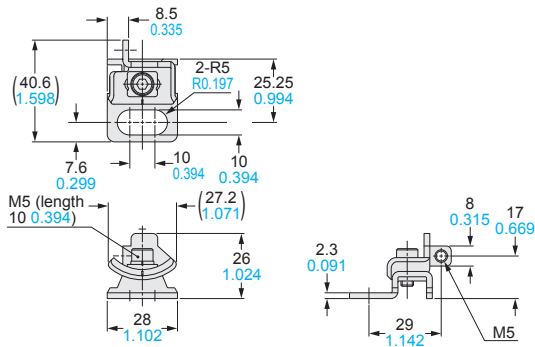
8.5
0.335
2-R5 R0.197
25.25
0.994
(40.6)
(1.598)
7.6
0.299
10
0.394
10
0.394
M5 (length 10 0.394)

(27.2)
(1.071)
26
1.024
28
1.102

2.3
0.091
8
0.315
17
0.669
29
1.142
M5

Mounting adjustment range

15° 15°

The adjustment range of the light curtain angle is up to ±15 degrees.

(28)
(1.811)
(R20.2)
(R0.795)

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.⌋
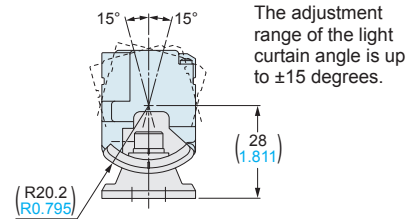
MS-SFB-8-T   MS-SFB-1-T2 (Side mounting)

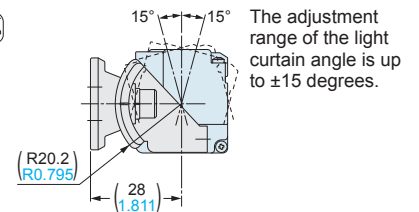M8 side mounting bracket (Optional)   M8 rear / side mounting brackets set (Optional)

MS-SFB-8-T(R)   #### MS-SFB-8-T(L)

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

M5
4 0.157
10.75
0.423
8
0.315
29
1.142
(40.6)
(1.598)
7.6
0.299
10
0.394
10
0.394
2-R5 R0.197

(28.35)
(1.116)
M5 (length 10 0.394)
(14.75)
(0.581)
33.5
1.319
28
1.811
2.3
0.091

10.75
0.423
8
0.315
M5
4 0.157
10
0.394
29
1.142
(40.6)
(1.598)
2-R5 R0.197
10
0.394
7.6
0.299

(28.35)
(1.116)
(14.75)
(0.581)
M5 (length 10 0.394)
33.5
1.319
2.3
0.091
28
1.811

Mounting adjustment range

15° 15°

The adjustment range of the light curtain angle is up to ±15 degrees.

R20.2
(R0.795)
28
(1.811)
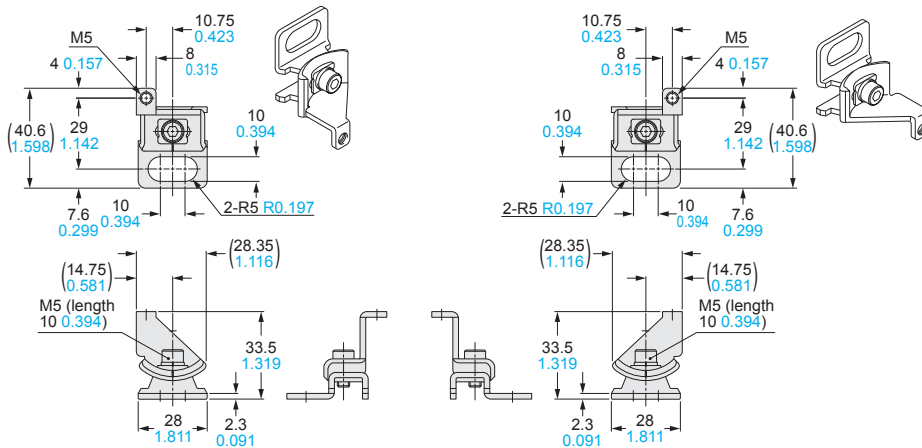
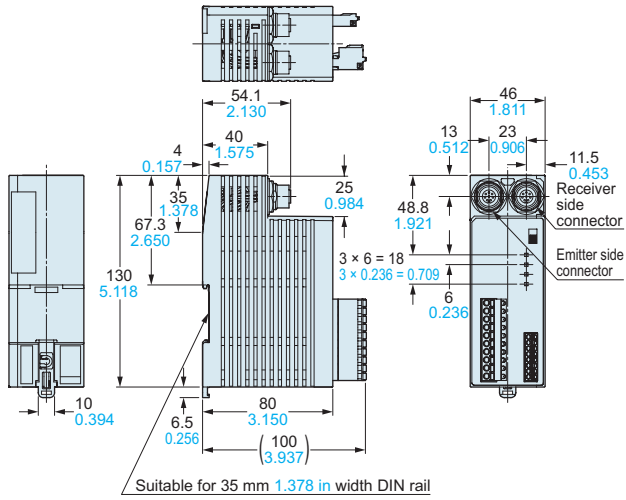Material: Cold rolled carbon steel (SPCC) (Trivalent chrome plated)
Four bracket (two pcs. each of R type and L type) set
⌈Four M5 (length 18 mm 0.709 in)⌉
⌊hexagon-socket-head bolts are attached.⌋

DIMENSIONS (Unit: mm in)

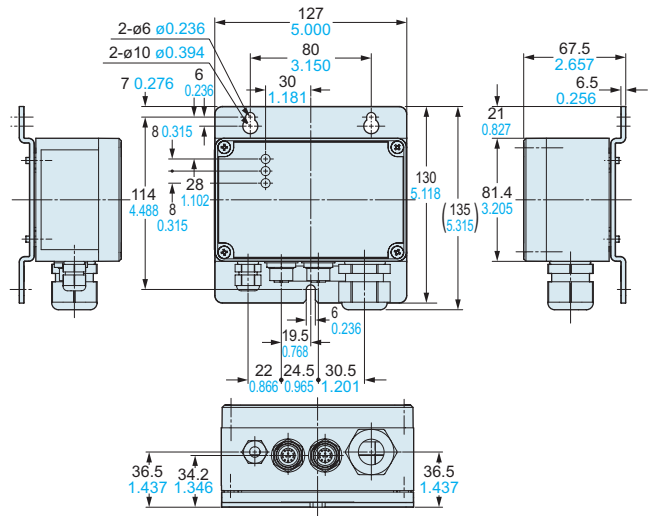The CAD data can be downloaded from our website.
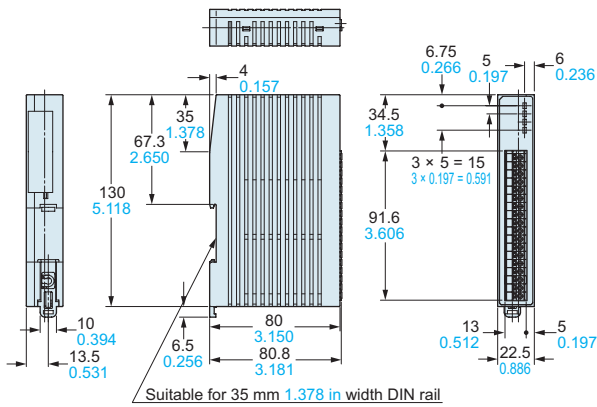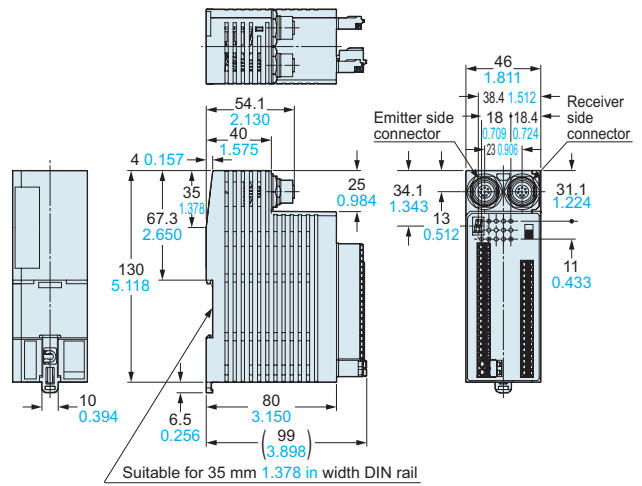
SF-C11 — Control unit (Optional)

Suitable for 35 mm 1.378 in width DIN rail

SF-C12 — Control unit (Optional)

SF-C13 — Control unit (Optional)

Suitable for 35 mm 1.378 in width DIN rail

SF-C14EX(-01) — Application expansion unit (Optional)

Suitable for 35 mm 1.378 in width DIN rail

SFB-HC — Handy-controller (Optional)
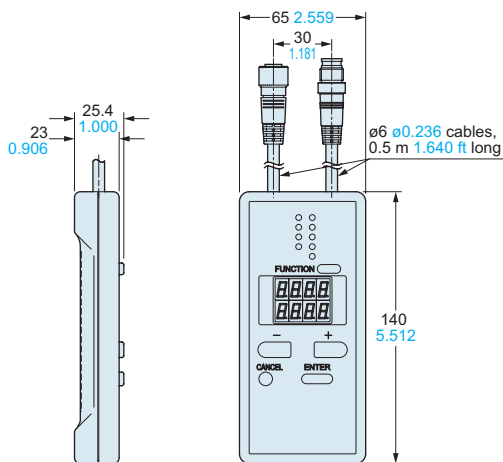
SFB-WY1 — Y-shaped connector (Optional)
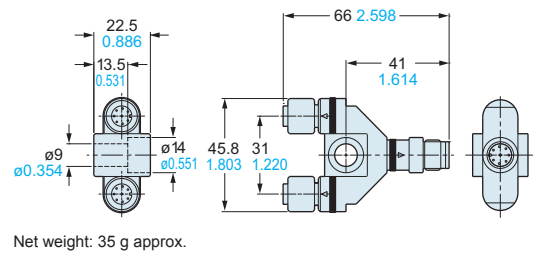
Net weight: 35 g approx.

SF-LAT-2N — Laser alignment tool (Optional)

ø12
ø0.472

21 (0.827) | 22.2 0.874

28 1.102

38 1.496

NO

Center of beam axis

66.5 2.618 | 18.75 0.738 | 5.3 0.209

28 1.102

20 0.787

92 3.622

48 1.890

【注意】 開けないで下さい。
[CAUTION] Do not open.
直視しないで下さい。
レーザ光が照射されます。
AVOID EXPOSURE
Laser Radiation is emitted
from this aperture.
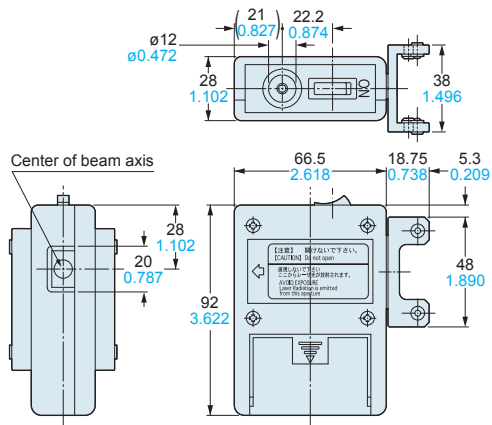
It is not available for the robust **SF4B-□G□<V2>**.

SF-LAT-4BG — Laser alignment tool (Optional)

Center of beam axis

(21) (0.827) | 22 0.866

28 1.102

48 1.890

ø12
ø0.472

31 1.220

66.5 2.618 | 1 0.039

15.8 0.622

20 0.787

92 3.622

62 2.441
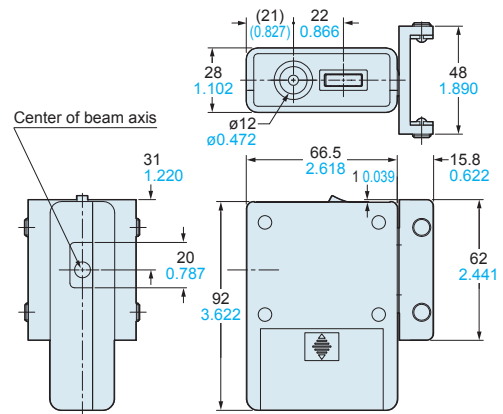
It is only available for the robust **SF4B-□G□<V2>**.

SF-IND-2 — Large display unit for light curtain (Optional)

40.1 1.579 | 35.5 1.398 | 25 0.984 | 23 0.906

4.6 0.181 | 18 0.709 | 28 1.102 | 5.5 0.217

ø3.6 ø0.142 cable,
3m 9.843 ft long

22.8 0.898
18.3 0.720

t 1.6 t 0.063
6.6 0.260
10.4 0.409
25.4 1.000
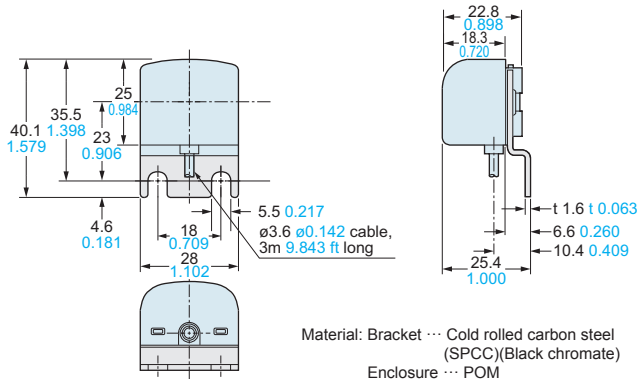
Material: Bracket ··· Cold rolled carbon steel
(SPCC)(Black chromate)
Enclosure ··· POM
Cover ··· Polycarbonate

43

Panasonic®