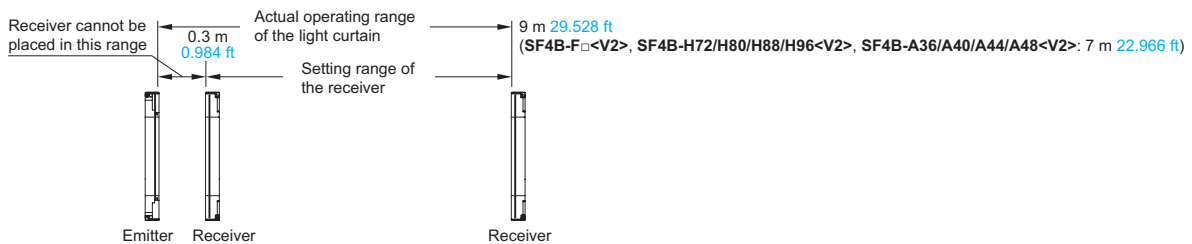


**ORDER GUIDE**

**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)			Number of beam channels	Protective height (mm in)			
			SFB-HC non-compatible	Korean Press compliant (SFB-HC non-compatible)						
Finger protection type Min. sensing object $\phi 14$ mm $\phi 0.551$ in (10 mm 0.394 in beam pitch)		0.3 to 7 m 0.984 to 22.966 ft	SF4B-F23<V2>	SF4B-F23-01<V2>	SF4B-F23-03<V2>	23	230 9.055			
			SF4B-F31<V2>	SF4B-F31-01<V2>	SF4B-F31-03<V2>	31	310 12.205			
			SF4B-F39<V2>	SF4B-F39-01<V2>	SF4B-F39-03<V2>	39	390 15.354			
			SF4B-F47<V2>	SF4B-F47-01<V2>	SF4B-F47-03<V2>	47	470 18.504			
			SF4B-F55<V2>	SF4B-F55-01<V2>	SF4B-F55-03<V2>	55	550 21.654			
			SF4B-F63<V2>	SF4B-F63-01<V2>	SF4B-F63-03<V2>	63	630 24.803			
			SF4B-F71<V2>	SF4B-F71-01<V2>	SF4B-F71-03<V2>	71	710 27.953			
			SF4B-F79<V2>	SF4B-F79-01<V2>	SF4B-F79-03<V2>	79	790 31.102			
			SF4B-F95<V2>	SF4B-F95-01<V2>	SF4B-F95-03<V2>	95	950 37.402			
			SF4B-F111<V2>	SF4B-F111-01<V2>	SF4B-F111-03<V2>	111	1,110 43.701			
			SF4B-F127<V2>	SF4B-F127-01<V2>	SF4B-F127-03<V2>	127	1,270 50.000			
			Hand protection type Min. sensing object $\phi 25$ mm $\phi 0.984$ in (20 mm 0.787 in beam pitch)		0.3 to 9 m 0.984 to 29.528 ft	SF4B-H12<V2>	SF4B-H12-01<V2>	SF4B-H12-03<V2>	12	230 9.055
						SF4B-H16<V2>	SF4B-H16-01<V2>	SF4B-H16-03<V2>	16	310 12.205
SF4B-H20<V2>	SF4B-H20-01<V2>	SF4B-H20-03<V2>				20	390 15.354			
SF4B-H24<V2>	SF4B-H24-01<V2>	SF4B-H24-03<V2>				24	470 18.504			
SF4B-H28<V2>	SF4B-H28-01<V2>	SF4B-H28-03<V2>				28	550 21.654			
SF4B-H32<V2>	SF4B-H32-01<V2>	SF4B-H32-03<V2>				32	630 24.803			
SF4B-H36<V2>	SF4B-H36-01<V2>	SF4B-H36-03<V2>				36	710 27.953			
SF4B-H40<V2>	SF4B-H40-01<V2>	SF4B-H40-03<V2>				40	790 31.102			
SF4B-H48<V2>	SF4B-H48-01<V2>	SF4B-H48-03<V2>				48	950 37.402			
SF4B-H56<V2>	SF4B-H56-01<V2>	SF4B-H56-03<V2>				56	1,110 43.701			
SF4B-H64<V2>	SF4B-H64-01<V2>	SF4B-H64-03<V2>				64	1,270 50.000			
SF4B-H72<V2>	SF4B-H72-01<V2>	SF4B-H72-03<V2>				72	1,430 56.299			
Arm / Foot protection type Min. sensing object $\phi 45$ mm $\phi 1.772$ in (40 mm 1.575 in beam pitch)		0.3 to 9 m 0.984 to 29.528 ft				SF4B-A6<V2>	SF4B-A6-01<V2>	-	6	230 9.055
			SF4B-A8<V2>	SF4B-A8-01<V2>	-	8	310 12.205			
			SF4B-A10<V2>	SF4B-A10-01<V2>	-	10	390 15.354			
			SF4B-A12<V2>	SF4B-A12-01<V2>	-	12	470 18.504			
			SF4B-A14<V2>	SF4B-A14-01<V2>	-	14	550 21.654			
			SF4B-A16<V2>	SF4B-A16-01<V2>	-	16	630 24.803			
		0.3 to 7 m 0.984 to 22.966 ft	SF4B-A18<V2>	SF4B-A18-01<V2>	-	18	710 27.953			
			SF4B-A20<V2>	SF4B-A20-01<V2>	-	20	790 31.102			
			SF4B-A24<V2>	SF4B-A24-01<V2>	-	24	950 37.402			
			SF4B-A28<V2>	SF4B-A28-01<V2>	-	28	1,110 43.701			
			SF4B-A32<V2>	SF4B-A32-01<V2>	-	32	1,270 50.000			
			SF4B-A36<V2>	SF4B-A36-01<V2>	-	36	1,430 56.299			
			SF4B-A40<V2>	SF4B-A40-01<V2>	-	40	1,590 62.598			
			SF4B-A44<V2>	SF4B-A44-01<V2>	-	44	1,750 68.898			
SF4B-A48<V2>	SF4B-A48-01<V2>	-	48	1,910 75.197						

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.



2) The model No. with "E" shown on the label affixed to the product is the emitter, "D" shown on the label is the receiver. (e.g.) Emitter of SF4B-F23<V2>: SF4B-F23E<V2>, Receiver of SF4B-F23<V2>: SF4B-F23D<V2>.

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

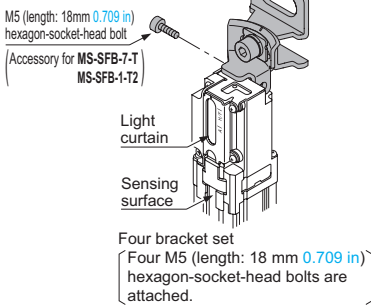
Designation		Model No.	Description
Rear / side mounting bracket (Material: Iron)	M8 rear mounting bracket	<b>MS-SFB-7-T</b>	For rear direction. Allows the light curtain to be mounted at the rear with one M8 hexagon-socket-head bolt. (4 pcs. per set for emitter and receiver)
	M8 side mounting bracket	<b>MS-SFB-8-T</b>	For side direction. 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	<b>MS-SFB-1-T2</b>	Can be used as either a rear mounting bracket <b>MS-SFB-7-T</b> or a side mounting bracket <b>MS-SFB-8-T</b> 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	<b>MS-SFB-1</b>	Used to mount the light curtain on the rear surface and side surface. (4 pcs. per set for emitter and receiver)
	M8 mounting bracket	<b>MS-SFB-1-T</b>	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	<b>MS-SFB-4</b>	Used as the mounting bracket when changing over a previous light curtain with a protective height of 200 mm <b>7.874 in</b> or more to the <b>SF4B</b> series. It is installed using two M5 hexagon-socket-head bolts. (4 pcs. per set for emitter and receiver)
	M8 pitch adapter bracket	<b>MS-SFB-4-T</b>	Used as the mounting bracket when changing over a previous light curtain with a protective height of 200 mm <b>7.874 in</b> or more to the <b>SF4B</b> 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)		<b>MS-SFB-3</b>	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)

**M8 rear mounting bracket**

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

M8 rear mounting bracket

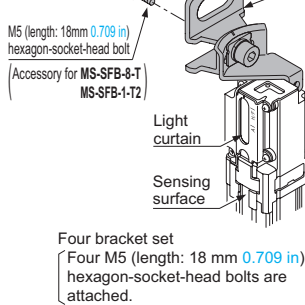
**MS-SFB-7-T**  
**MS-SFB-1-T2** (Rear mounting)



**M8 side mounting bracket**

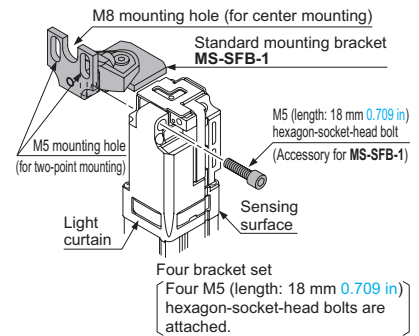
- **MS-SFB-8-T**
- **MS-SFB-1-T2** (Side mounting)

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



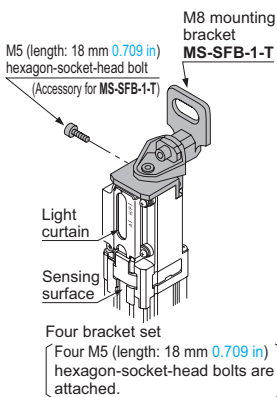
**Standard mounting bracket**

- **MS-SFB-1**



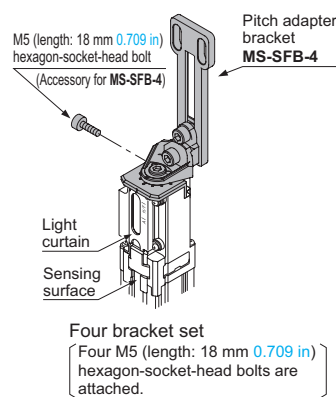
**M8 mounting bracket**

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



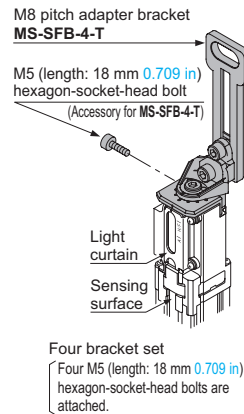
**Pitch adapter bracket**

- **MS-SFB-4**



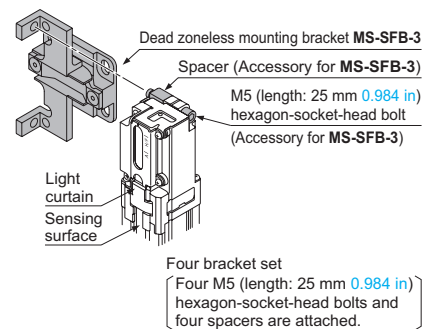
**M8 pitch adapter bracket**

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



**Dead zoneless mounting bracket**

- **MS-SFB-3**



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**SF2B**

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**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		
Standard components (8-core cable)	Discrete wire	SFB-CCB3	Length: 3 m <b>9.843 ft</b> Net weight: 370 g approx. (2 cables)		
		SFB-CCB7	Length: 7 m <b>22.966 ft</b> Net weight: 820 g approx. (2 cables)		
		SFB-CCB10	Length: 10 m <b>32.808 ft</b> Net weight: 1,160 g approx. (2 cables)		
		SFB-CCB15	Length: 15 m <b>49.213 ft</b> Net weight: 1,710 g approx. (2 cables)		
	Connector	SFB-CB05	Length: 0.5 m <b>1.640 ft</b> Net weight: 95 g approx. (2 cables)		
		SFB-CB5	Length: 5 m <b>16.404 ft</b> Net weight: 620 g approx. (2 cables)		
		SFB-CB10	Length: 10 m <b>32.808 ft</b> Net weight: 1,200 g approx. (2 cables)		
	Extension cable	With connector on one end	SFB-CC3	Length: 3 m <b>9.843 ft</b> Net weight: 380 g approx. (2 cables)	
			SFB-CC10	Length: 10 m <b>32.808 ft</b> Net weight: 1,200 g approx. (2 cables)	
		With connectors on both ends	For emitter	SFB-CCJ3E	Length: 3 m <b>9.843 ft</b> Net weight: 190 g approx. (1 cable)
			For receiver	SFB-CCJ10E	Length: 10 m <b>32.808 ft</b> Net weight: 580 g approx. (1 cable)
			For emitter	SFB-CCJ3D	Length: 3 m <b>9.843 ft</b> Net weight: 210 g approx. (1 cable)
For receiver			SFB-CCJ10D	Length: 10 m <b>32.808 ft</b> Net weight: 600 g approx. (1 cable)	
Mating control components (12-core cable, with interference prevention wire)	Discrete wire	SFB-CCB3-MU	Length: 3 m <b>9.843 ft</b> Net weight: 420 g approx. (2 cables)		
		SFB-CCB7-MU	Length: 7 m <b>22.966 ft</b> Net weight: 930 g approx. (2 cables)		
	Connector	SFB-CB05-MU	Length: 0.5 m <b>1.640 ft</b> Net weight: 110 g approx. (2 cables)		
		SFB-CC3-MU	Length: 3 m <b>9.843 ft</b> Net weight: 430 g approx. (2 cables)		
	Extension cable	With connector on one end	SFB-CC7-MU	Length: 7 m <b>22.966 ft</b> Net weight: 1,000 g approx. (2 cables)	
			SFB-CC10-MU	Length: 10 m <b>32.808 ft</b> Net weight: 1,300 g approx. (2 cables)	
SFB-CC3E-MU			Length: 3 m <b>9.843 ft</b> Net weight: 190 g approx. (1 cable)		
With connectors on both ends		For emitter	SFB-CCJ10E-MU	Length: 10 m <b>32.808 ft</b> Net weight: 660 g approx. (1 cable)	
		For receiver	SFB-CCJ3D-MU	Length: 3 m <b>9.843 ft</b> Net weight: 210 g approx. (1 cable)	
		For receiver	SFB-CCJ10D-MU	Length: 10 m <b>32.808 ft</b> Net weight: 680 g approx. (1 cable)	
Cable for series connection	Light Curtains	SFB-CSL01	Length: 0.1 m <b>0.328 ft</b> Net weight: 45 g approx. (2 cables)		
		SFB-CSL05	Length: 0.5 m <b>1.640 ft</b> Net weight: 95 g approx. (2 cables)		
		SFB-CSL1	Length: 1 m <b>3.281 ft</b> Net weight: 150 g approx. (2 cables)		
		SFB-CSL5	Length: 5 m <b>16.404 ft</b> Net weight: 630 g approx. (2 cables)		
Exclusive mating cable for SF-C14EX	Discrete wire	SFB-CB05-EX	Length: 0.5 m <b>1.640 ft</b> Net weight: 95 g approx. (2 cables)		
		SFB-CB5-EX	Length: 5 m <b>16.404 ft</b> Net weight: 620 g approx. (2 cables)		
		SFB-CB10-EX	Length: 10 m <b>32.808 ft</b> Net weight: 1,200 g approx. (2 cables)		
Adapter cable	Discrete wire	For SF4-AHα (PNP type)	SFB-CB05-A-P		
		For SF4-AHα-N (NPN type)	SFB-CB05-A-N		
		For SF2-EHα (PNP type)	SFB-CB05-B-P		
		For SF2-EHα-N (NPN type)	SFB-CB05-B-N		

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

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

**ORDER GUIDE**

**Spare parts (Accessories for light curtain)**

Designation	Model No.	Description
Intermediate supporting bracket (Note)	<b>MS-SFB-2</b>	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.
Test rod ø14	<b>SF4B-TR14</b>	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	<b>SF4B-TR25</b>	Min. sensing object for regular checking (ø25 mm ø0.984 in), with hand protection type (min. sensing object ø25 mm ø0.984 in)

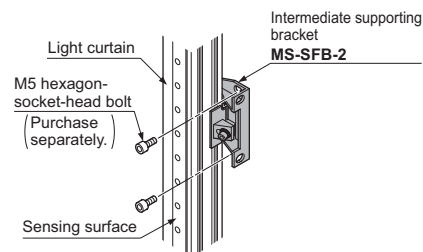
Note: The number of sets required varies depending on the product.

- 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

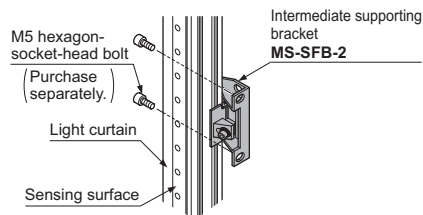
**Intermediate supporting bracket**

• **MS-SFB-2**

<In case of rear mounting>



<In case of side mounting>



**OPTIONS**

**Exclusive control units**

Designation	Appearance	Model No.	Application cable	Description
Connector connection type control unit		<b>SF-C11</b>	Bottom cap cable: <b>SFB-CB□</b> Extension cable: <b>SFB-CCJ10□</b>	Use 8-core cable with connector to connect to the light curtain. Compatible with up to Control Category 4. Interference prevention wires and muting function cannot be used.
Robust type control unit		<b>SF-C12</b>	Bottom cap cable: <b>SFB-CB05-MU</b> Extension cable: <b>SFB-CCJ10□-MU</b>	Use 12-core cable with connector to connect to the light curtain. Interference prevention wires can be used. Muting function cannot be used.
Slim type control unit		<b>SF-C13</b>	Bottom cap cable: <b>SFB-CCB□(-MU)</b> Extension cable: <b>SFB-CC□(-MU)</b>	Use a discrete wire cable to connect to the light curtain. Muting function and interference prevention wires can be used. Compatible with up to Control Category 4.
Application expansion unit for SF4B series		<b>SF-C14EX</b>	Bottom cap cable: <b>SFB-CB□-EX</b> Extension cable: <b>SFB-CCJ10□</b>	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 <b>SFB-HC</b> cannot be used with <b>SF-C14EX-01</b> .
Handy-controller non-compatible type		<b>SF-C14EX-01</b>		
CC-Link Safety system remote I/O unit for light curtain (Note)		<b>SF-CL1T264T</b>	Bottom cap cable: <b>SFB-CB□-CL</b> Extension cable: <b>SFB-CCJ10□-CL</b>	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 the remote I/O unit **SF-CL1T264T** pages for details.

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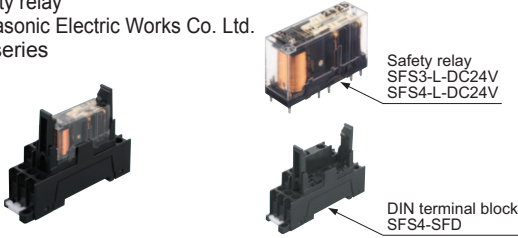
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**SF-C12 spare relay set**

A set of spare relays (2 safety relays and 1 removal tool) is available for the safety relay that is built into the **SF-C12**.  
Model No.: **SF-C12-RY**

**Recommended safety relay**

Safety relay  
Panasonic Electric Works Co. Ltd.  
SF series



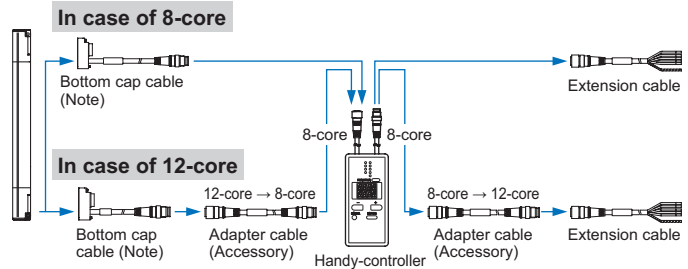
Note: Contact Panasonic Electric Works Co. Ltd. for details on the recommended products.

Item	Type Model No.	With LED indicator	
		SFS3-L-DC24V	SFS4-L-DC24V
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 PC
Rated power consumption		360 mW	500 mW
Operation time		20 ms or less	
Release time		20 ms or less	
Ambient temperature		-40 to +85 °C <b>-40 to +185 °F</b> (Humidity: 5 to 85 % RH)	
Applicable standards		UL, C-UL, TÜV	

**Handy-controller**

Designation	Appearance	Model No.
Handy-controller	 * Includes 2 adapter cables	<b>SFB-HC</b>

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



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.

**Light curtain diagnosis software**

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

\* Free download available from our website.

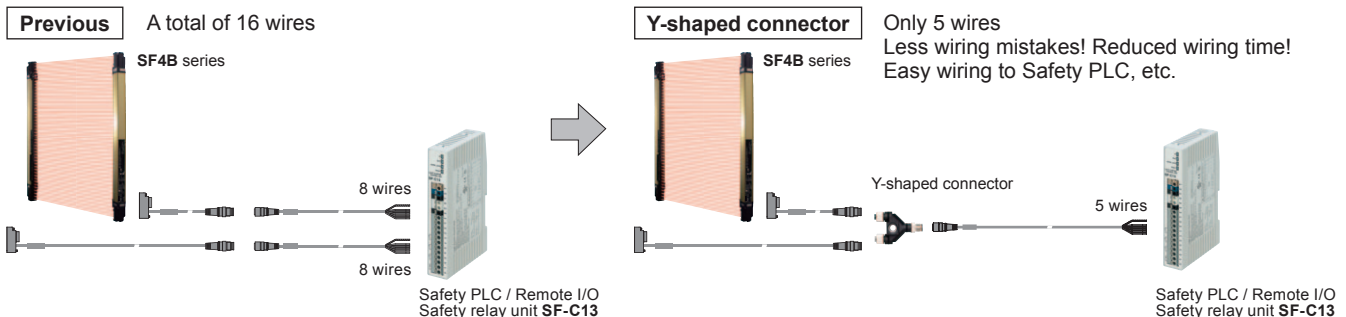


Light curtain diagnosis software

**Y-shaped connector**

Type	Appearance	Model No.	Description
Wire-saving Y-shaped connector		<b>SFB-WY1</b>	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		<b>WY1-CCN3</b>	Cable length: 3 m <b>9.843 ft</b> Net weight: 200 g approx. (1 cable)
		<b>WY1-CCN10</b>	Cable length: 10 m <b>32.808 ft</b> Net weight: 620 g approx. (1 cable)

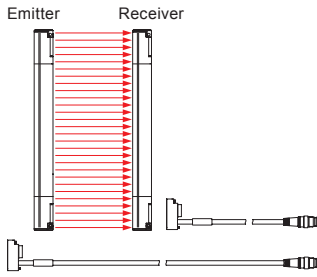
By using the Y-shaped connector, the least required wires such as power or safety output are consolidated into one cable. Man-hours taken for wiring is eliminated to the minimum. Construction times as well as wiring mistakes are greatly reduced.



- SF4C**
- SF4B**
- SF4B-G**
- SF2B**
- BSF4-AH80**

**OPTIONS**

**Product configuration**



**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**)

**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**)

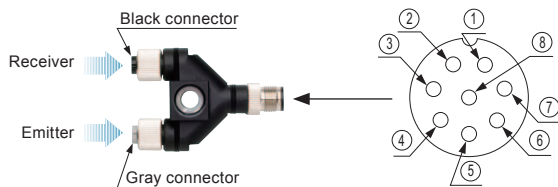
**Extension cable**  
**SFB-CCJ3D** (3 m **9.843 ft**)  
**SFB-CCJ10D** (10 m **32.808 ft**)



**Y-shaped connector  
SFB-WY1**

**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 layout**

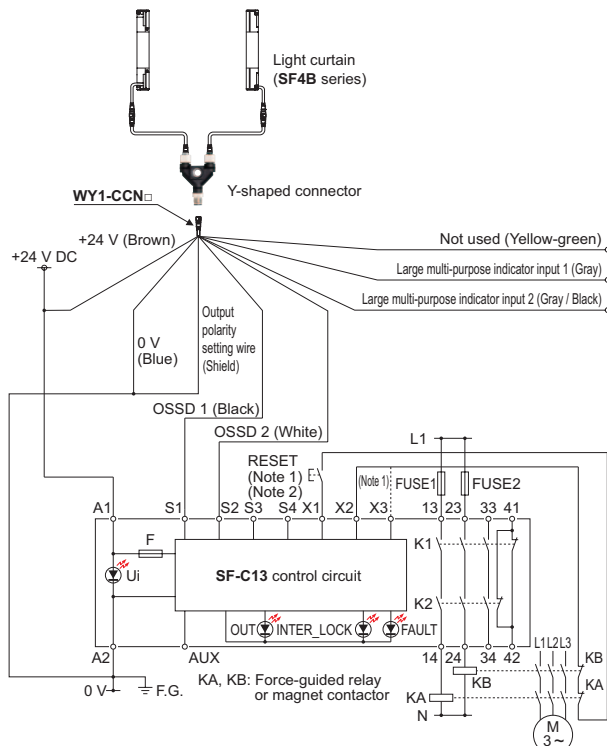


Connector pin No.	Description
①	OSSD 2
②	+24 V
③	OSSD 1
④	Not used
⑤	Not used
⑥	Not used
⑦	0 V
⑧	Output polarity setting wire (Shield)

**Wiring diagram of control unit SF-C13**

**<For PNP output (minus ground)>**

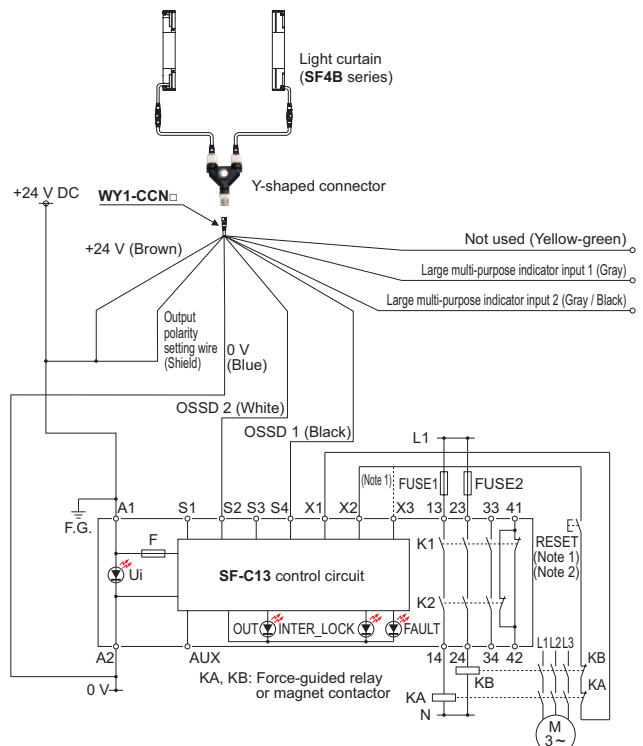
- Connect the light curtain control outputs OSSD 1 and OSSD 2 to S1 and S2 respectively.



- 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.



- 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.

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SF2B

BSF4-AH80

**OPTIONS**

**Front protection cover / Protection bar set / Corner mirror**

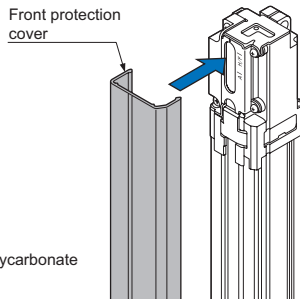
Applicable beam channels	Designation			Front protection cover	Protection bar set	Rear / side protection bar set	Corner mirror	
	Finger	Hand	Arm / Foot				Model No.	Effective reflective surface
	23	12	6	<b>FC-SFBH-12</b>	<b>MC-SFBH-12</b>	<b>MC-SFBH-12-T</b>	<b>RF-SFBH-12</b>	236 × 72 mm 9.291 × 2.835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

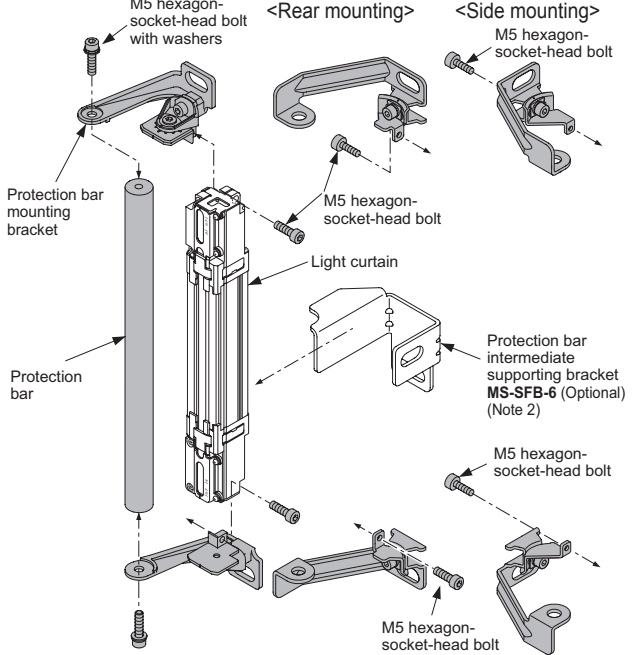
Protects sensing surface of the light curtain from flying objects such as welding spatter. The operating range reduces when the front protection cover is used.



Material: Polycarbonate

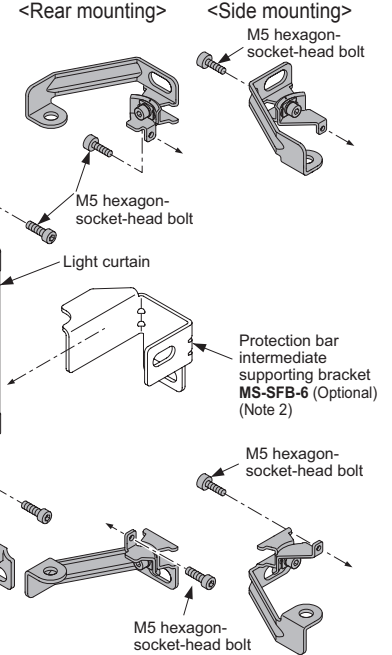
**Protection bar set**

• **MC-SFBH-□**



**Rear / side protection bar set**

• **MC-SFBH-□-T**



• **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: Iron (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: Iron (Trivalent chrome plated)	1 pc.	Material: Iron (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.

**Sensing range**

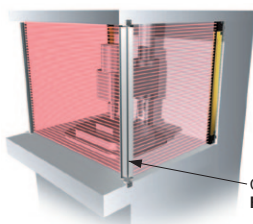
	SF4B-F□	SF4B-H□		SF4B-A□	
		12 to 64 beam channels type	72 to 96 beam channels type	6 to 32 beam channels type	36 to 48 beam channels type
Only emitter installed	0.3 to 6 m 0.984 to 19.685 ft	0.3 to 7.5 m 0.984 to 24.606 ft	0.3 to 6 m 0.984 to 19.685 ft	0.3 to 7.5 m 0.984 to 24.606 ft	0.3 to 6 m 0.984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

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

**Corner mirror**

• **RF-SFBH-□**

Normally for L-shaped or U-shaped installation, 2 or 3 sets of 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-□**

**Percent decline of the sensing range**

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

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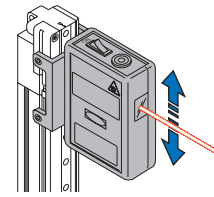
BSF4-AH80

**OPTIONS**

Designation	Model No.	Description
Test rod ø45	<b>SF4B-TR45</b>	Min. sensing object for regular checking (ø45 mm <b>ø1.772 in</b> ), with arm / foot protection type (min. sensing object ø45 mm <b>ø1.772 in</b> )
Laser alignment tool	<b>SF-LAT-2N</b>	Allows easy beam axis alignment using easy-to-see laser beam.
Large display unit for light curtain	<b>SF-IND-2</b>	<p>With the auxiliary output of the light curtain, the operation is easily observable from various directions.</p> <p><b>Specifications</b></p> <ul style="list-style-type: none"> <li>Supply voltage: 24 V DC ±15 %</li> <li>Current consumption: 12 mA or less</li> <li>Indicators: Orange LED (8 pcs. used) [Light up when external contact is ON]</li> <li>Ambient temperature: -10 to +55 °C <b>+14 to +131 °F</b> (No dew condensation or icing allowed)</li> <li>Material: POM (Enclosure) Polycarbonate (Cover) Cold rolled carbon steel (SPCC) (Bracket)</li> <li>Cable: 0.3 mm<sup>2</sup> 2-core cabtyre cable, 3 m <b>9.843 ft</b> long</li> <li>Weight: 70 g approx. (including bracket)</li> </ul> <p><b>I/O circuit diagrams</b></p> <p><b>&lt;With NPN output type&gt;</b></p> <p><b>&lt;With PNP output type&gt;</b></p>

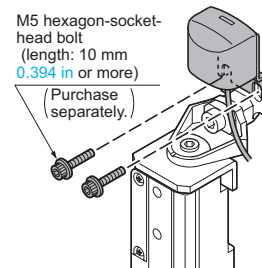
**Laser alignment tool**

• **SF-LAT-2N**



**Large display unit for light curtain**

• **SF-IND-2**



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

**SPECIFICATIONS**

**Light curtain individual specifications**

<b>SF4B-F□&lt;V2&gt;</b>						
Item	Type Model No. (Note 2)	Min. sensing object ø14 mm <b>ø0.551 in</b> type (10 mm <b>0.394 in</b> beam pitch)				
No. of beam channels		<b>SF4B-F23□&lt;V2&gt;</b>	<b>SF4B-F31□&lt;V2&gt;</b>	<b>SF4B-F39□&lt;V2&gt;</b>	<b>SF4B-F47□&lt;V2&gt;</b>	<b>SF4B-F63□&lt;V2&gt;</b>
Protective height		23 mm <b>9.055 in</b>	31 mm <b>12.205 in</b>	39 mm <b>15.354 in</b>	47 mm <b>18.504 in</b>	63 mm <b>24.803 in</b>
Current consumption		Emitter: 80 mA or less, Receiver: 120 mA or less			Emitter: 100 mA or less, Receiver: 160 mA or less	
PFHd		2.56×10 <sup>-9</sup>	2.96×10 <sup>-9</sup>	3.36×10 <sup>-9</sup>	3.75×10 <sup>-9</sup>	4.15×10 <sup>-9</sup>
MTTFd		100 years or more				
Net weight (Total of emitter and receiver)		510 g approx.	660 g approx.	810 g approx.	960 g approx.	1,100 g approx.
<b>SF4B-F□&lt;V2&gt;</b>						
Item	Type Model No. (Note 2)	Min. sensing object ø14 mm <b>ø0.551 in</b> type (10 mm <b>0.394 in</b> beam pitch)				
No. of beam channels		<b>SF4B-F71□&lt;V2&gt;</b>	<b>SF4B-F79□&lt;V2&gt;</b>	<b>SF4B-F95□&lt;V2&gt;</b>	<b>SF4B-F111□&lt;V2&gt;</b>	<b>SF4B-F127□&lt;V2&gt;</b>
Protective height		71 mm <b>27.953 in</b>	79 mm <b>31.102 in</b>	95 mm <b>37.402 in</b>	1,110 mm <b>43.701 in</b>	1,270 mm <b>50.000 in</b>
Current consumption		Emitter: 100 mA or less, Receiver: 160 mA or less		Emitter: 115 mA or less, Receiver: 190 mA or less		
PFHd		4.95×10 <sup>-9</sup>	5.35×10 <sup>-9</sup>	6.15×10 <sup>-9</sup>	6.94×10 <sup>-9</sup>	7.74×10 <sup>-9</sup>
MTTFd		100 years or more				
Net weight (Total of emitter and receiver)		1,420 g approx.	1,570 g approx.	1,870 g approx.	2,170 g approx.	2,470 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) The models with the "-01" or "-03" cannot be used with the handy-controller **SFB-HC**.

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- BSF4-AH00**



## SPECIFICATIONS

### Light curtain common specifications

#### SF4B-H□<V2>

Type		Min. sensing object ø25 mm <b>ø0.984 in</b> type (20 mm <b>0.787 in</b> beam pitch)					
Item	Model No. (Note 2)	SF4B-H12□<V2>	SF4B-H16□<V2>	SF4B-H20□<V2>	SF4B-H24□<V2>	SF4B-H28□<V2>	SF4B-H32□<V2>
No. of beam channels		12	16	20	24	28	32
Protective height		230 mm <b>9.055 in</b>	310 mm <b>12.205 in</b>	390 mm <b>15.354 in</b>	470 mm <b>18.504 in</b>	550 mm <b>21.654 in</b>	630 mm <b>24.803 in</b>
Current consumption		Emitter: 70 mA or less, Receiver: 95 mA or less			Emitter: 80 mA or less, Receiver: 115 mA or less		
PFHD		$2.01 \times 10^{-9}$	$2.21 \times 10^{-9}$	$2.41 \times 10^{-9}$	$2.61 \times 10^{-9}$	$2.81 \times 10^{-9}$	$3.01 \times 10^{-9}$
MTTFd		100 years or more					
Net weight (Total of emitter and receiver)		510 g approx.	660 g approx.	810 g approx.	960 g approx.	1,110 g approx.	1,260 g approx.

Type		Min. sensing object ø25 mm <b>ø0.984 in</b> type (20 mm <b>0.787 in</b> beam pitch)				
Item	Model No. (Note 2)	SF4B-H36□<V2>	SF4B-H40□<V2>	SF4B-H48□<V2>	SF4B-H56□<V2>	SF4B-H64□<V2>
No. of beam channels		36	40	48	56	64
Protective height		710 mm <b>27.953 in</b>	790 mm <b>31.102 in</b>	950 mm <b>37.402 in</b>	1,110 mm <b>43.701 in</b>	1,270 mm <b>50.000 in</b>
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		$3.21 \times 10^{-9}$	$3.41 \times 10^{-9}$	$3.80 \times 10^{-9}$	$4.20 \times 10^{-9}$	$4.60 \times 10^{-9}$
MTTFd		100 years or more				
Net weight (Total of emitter and receiver)		1,420 g approx.	1,570 g approx.	1,870 g approx.	2,170 g approx.	2,470 g approx.

Type		Min. sensing object ø25 mm <b>ø0.984 in</b> type (20 mm <b>0.787 in</b> beam pitch)			
Item	Model No. (Note 2)	SF4B-H72□<V2>	SF4B-H80□<V2>	SF4B-H88□<V2>	SF4B-H96□<V2>
No. of beam channels		72	80	88	96
Protective height		1,430 mm <b>56.299 in</b>	1,590 mm <b>62.598 in</b>	1,750 mm <b>68.898 in</b>	1,910 mm <b>75.197 in</b>
Current consumption		Emitter: 110 mA or less, Receiver: 180 mA or less		Emitter: 120 mA or less, Receiver: 200 mA or less	
PFHD		$5.00 \times 10^{-9}$	$5.40 \times 10^{-9}$	$5.80 \times 10^{-9}$	$6.20 \times 10^{-9}$
MTTFd		100 years or more			
Net weight (Total of emitter and receiver)		2,770 g approx.	3,070 g approx.	3,370 g approx.	3,670 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) The models with the "-01" or "-03" cannot be used with the handy-controller **SFB-HC**.

#### SF4B-A□<V2>

Type		Min. sensing object ø45 mm <b>ø1.772 in</b> type (40 mm <b>1.575 in</b> beam pitch)					
Item	Model No. (Note 2)	SF4B-A6□<V2>	SF4B-A8□<V2>	SF4B-A10□<V2>	SF4B-A12□<V2>	SF4B-A14□<V2>	SF4B-A16□<V2>
No. of beam channels		6	8	10	12	14	16
Protective height		230 mm <b>9.055 in</b>	310 mm <b>12.205 in</b>	390 mm <b>15.354 in</b>	470 mm <b>18.504 in</b>	550 mm <b>21.654 in</b>	630 mm <b>24.803 in</b>
Current consumption		Emitter: 65 mA or less, Receiver: 85 mA or less			Emitter: 70 mA or less, Receiver: 95 mA or less		
PFHD		$1.71 \times 10^{-9}$	$1.81 \times 10^{-9}$	$1.91 \times 10^{-9}$	$2.01 \times 10^{-9}$	$2.11 \times 10^{-9}$	$2.21 \times 10^{-9}$
MTTFd		100 years or more					
Net weight (Total of emitter and receiver)		510 g approx.	660 g approx.	810 g approx.	960 g approx.	1,110 g approx.	1,260 g approx.

Type		Min. sensing object ø45 mm <b>ø1.772 in</b> type (40 mm <b>1.575 in</b> beam pitch)				
Item	Model No. (Note 2)	SF4B-A18□<V2>	SF4B-A20□<V2>	SF4B-A24□<V2>	SF4B-A28□<V2>	SF4B-A32□<V2>
No. of beam channels		18	20	24	28	32
Protective height		710 mm <b>27.953 in</b>	790 mm <b>31.102 in</b>	950 mm <b>37.402 in</b>	1,110 mm <b>43.701 in</b>	1,270 mm <b>50.000 in</b>
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		$2.31 \times 10^{-9}$	$2.41 \times 10^{-9}$	$2.61 \times 10^{-9}$	$2.81 \times 10^{-9}$	$3.01 \times 10^{-9}$
MTTFd		100 years or more				
Net weight (Total of emitter and receiver)		1,420 g approx.	1,570 g approx.	1,870 g approx.	2,170 g approx.	2,470 g approx.

Type		Min. sensing object ø45 mm <b>ø1.772 in</b> type (40 mm <b>1.575 in</b> beam pitch)			
Item	Model No. (Note 2)	SF4B-A36□<V2>	SF4B-A40□<V2>	SF4B-A44□<V2>	SF4B-A48□<V2>
No. of beam channels		36	40	44	48
Protective height		1,430 mm <b>56.299 in</b>	1,590 mm <b>62.598 in</b>	1,750 mm <b>68.898 in</b>	1,910 mm <b>75.197 in</b>
Current consumption		Emitter: 85 mA or less, Receiver: 130 mA or less		Emitter: 95 mA or less, Receiver: 140 mA or less	
PFHD		$3.21 \times 10^{-9}$	$3.41 \times 10^{-9}$	$3.61 \times 10^{-9}$	$3.80 \times 10^{-9}$
MTTFd		100 years or more			
Net weight (Total of emitter and receiver)		2,770 g approx.	3,070 g approx.	3,370 g approx.	3,670 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) The models with the "-01" cannot be used with the handy-controller **SFB-HC**.

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SF4B-G

SF2B

BSF4-AH80

## SPECIFICATIONS

### Light curtain common specifications

Type	Min. sensing object $\phi$ 14 mm $\phi$ 0.551 in type	Min. sensing object $\phi$ 25 mm $\phi$ 0.984 in type	Min. sensing object $\phi$ 45 mm $\phi$ 1.772 in type
Model No. (Note 3)	<b>SF4B-F□(-01)&lt;V2&gt;</b>	<b>SF4B-H□(-01)&lt;V2&gt;</b>	<b>SF4B-A□(-01)&lt;V2&gt;</b>
Item	Korean press compliant (Note 3)	<b>SF4B-F□-03&lt;V2&gt;</b>	<b>SF4B-H□-03&lt;V2&gt;</b>
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 5058-1 to 7 (SIL3)	
	Europe (EU)	EN 61496-1 (Type 4), EN ISO 13849-1 (Category 4, PLe), EN 61508-1 to 7 (SIL3), EN 55011, EN 50178, EN 61000-6-2	
	North America	ANSI/UL 61496-1/2 (Type 4), ANSI/UL 508, UL 1998 (Class 2), CAN/CSA 61496-1/2 (Type 4), CAN/CSA C22.2 No.14, OSHA 1910.212, OSHA 1910.217(C), ANSI B11.1 to B11.19, ANSI/RIA 15.06	
	South Korea (S-Mark)	S1-G-35-2005, S2-W-11-2003 ( <b>SF4B-□&lt;V2&gt;</b> only)	
	China (GB)	GB 4584 ( <b>SF4B-□&lt;V2&gt;</b> , <b>SF4B-□-01&lt;V2&gt;</b> only)	
Operating range (Note 3)	0.3 to 7 m <b>0.984 to 22.966 ft</b>	12 to 64 beam channels type: 0.3 to 9 m <b>0.984 to 29.528 ft</b> 72 to 96 beam channels type: 0.3 to 7 m <b>0.984 to 22.966 ft</b>	6 to 32 beam channels type: 0.3 to 9 m <b>0.984 to 29.528 ft</b> 36 to 48 beam channels type: 0.3 to 7 m <b>0.984 to 22.966 ft</b>
Min. sensing object (Note 4)	$\phi$ 14 mm $\phi$ 0.551 in opaque object	$\phi$ 25 mm $\phi$ 0.984 in opaque object	$\phi$ 45 mm $\phi$ 1.772 in opaque object
Effective aperture angle	$\pm$ 2.5° or less [for an operating range exceeding 3 m <b>9.843 ft</b> (conforming to IEC 61496-2 / UL 61496-2)]		
Supply voltage	24 V DC $\pm$ 10 % Ripple P-P 10 % or less		
Control outputs (OSSD 1, OSSD 2)	PNP open-collector transistor / NPN open-collector transistor (switching method) <ul style="list-style-type: none"> <li>When selecting PNP output: Max. source current 200 mA, When selecting NPN output: Max. sink current 200 mA</li> <li>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 )</li> <li>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 <b>65.617 ft</b> length cable)</li> </ul>		
	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) <ul style="list-style-type: none"> <li>When selecting PNP output: Max. source current 60 mA, When selecting NPN output: Max. sink current 60 mA</li> <li>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 )</li> <li>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 <b>65.617 ft</b> length cable)</li> </ul>		
	Operation mode	OFF when control outputs are ON, ON when control outputs are OFF (Factory setting, operating mode can be changed using the <b>SFB-HC</b> handy-controller).	
	Protection circuit	Incorporated	
	Response 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 <b>SF4B-□-03&lt;V2&gt;</b> )		
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 <b>SF4B-□-03&lt;V2&gt;</b> ) / Incorporated (Note 7) (excluding <b>SF4B-□-03&lt;V2&gt;</b> )		
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 <b>+14 to +131 °F</b> (No dew condensation or icing allowed), Storage: -25 to +70 °C <b>-13 to +158 °F</b>	
	Ambient humidity	30 to 85 % RH, Storage: 30 to 95 % RH	
	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 M $\Omega$ , 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 <b>0.030 in</b> amplitude in X, Y and Z directions for two hours each	
	Shock resistance	300 m/s <sup>2</sup> acceleration (30 G approx.) in X, Y and Z directions for three times each	
Emitting element	Infrared LED (Peak emission wavelength: 870 nm <b>0.034 mil</b> )		
Material	Enclosure: Aluminum, Upper / lower case: Aluminum, Sensing surface: Polycarbonate • Polyester resin, Cap: PBT		
Connecting method / Cable length	Connector / Total length up to 50 m <b>164.042 ft</b> is possible for both emitter and receiver, with optional mating cables (Note 10)		
Accessories	<b>MS-SFB-2</b> (Intermediate supporting bracket): (Note 11) <b>SF4B-TR14</b> (Test rod): 1 No.	<b>MS-SFB-2</b> (Intermediate supporting bracket): (Note 11) <b>SF4B-TR25</b> (Test rod): 1 No.	<b>MS-SFB-2</b> (Intermediate supporting bracket): (Note 11)

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.

3) 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.

4) When the floating blanking function is used, the size of the min. sensing object is changed. For details, refer to "Safety distance".

5) The outputs are not "OFF" when muting function is active even if the beam channel is interrupted.

6) In case the blanking function is valid, the operation mode is changed. For details, refer to "Safety distance".

7) 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 quantity of the enclosed bracket differs depending on the model as follows:

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-F12□<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

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SF4B

SF4B-G

SF2B

BSF4-AH00

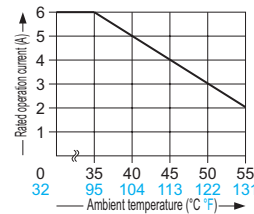
**SPECIFICATIONS**

**Control units**

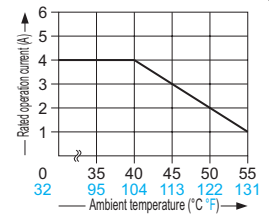
Item	Model No.	SF-C11 (Note 2)	SF-C12	SF-C13 (Note 2)
Connectable light curtains		<b>SF4B / SF2B series</b>	<b>SF4B series</b>	Light curtains manufactured by PEW SUNX
Control category		ISO 13849-1 (EN ISO 13849-1, JIS B 9705-1) compliance up to Category 4, PLe standards		
Supply voltage / Current consumption		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) (Note 3)
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		2
Protection		Enclosure: IP40, Terminal: IP20	IP65	Enclosure: IP40, Terminal: IP20
Ambient temperature		-10 to +55 °C <b>+14 to +131 °F</b> (No dew condensation or icing allowed), Storage: -25 to +70 °C <b>-13 to +158 °F</b>		
Enclosure material		ABS	Die-cast aluminum	ABS
Weight		Net weight: 320 g approx.	Net weight: 1 kg approx.	Net weight: 200 g approx.

- Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.  
 2) **SF-C11** and **SF-C13** have acquired the Korea S-mark.  
 3) If several **SF-C11** or **SF-C13** units are being used in a line together, leave a space of 5 mm **0.197 in** or more between each unit. If the units are touching each other, reduce the rated operating current for safety output in accordance with the ambient operating temperature as shown in the graphs at right.  
 4) Slide 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-C11**, refer to **SF-C10** series pages.

**(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		<b>SF4B series</b>
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		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>
Auxiliary output 1, 2, 3, 4 (Note 5)		<ul style="list-style-type: none"> <li>• Maximum source current: 60 mA or less</li> <li>• Applied voltage: same as supply voltage (between the auxiliary output and +V)</li> <li>• Residual voltage: 2 V or less (at 60 mA source current)</li> <li>• Maximum sink current: 60 mA or less</li> <li>• Applied voltage: same as supply voltage (between the auxiliary output and 0 V)</li> <li>• Residual voltage: 2 V or less (at 60 mA sink current)</li> </ul>
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 <b>+14 to +131 °F</b> (No dew condensation or icing allowed), Storage: -25 to +70 °C <b>-13 to +158 °F</b>
Material		Enclosure: ABS
Connection terminal		Detachable spring-cage terminal
Weight		Net weight: 250 g approx.

- Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.  
 2) **SF-C14EX-01** is Handy-controller 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 outputted.  
 6) For details of control unit **SF-C14EX(-01)**, refer to **SF-C10** series pages.

## SPECIFICATIONS

### Handy-controller

Model No.	SFB-HC
Item	
Supply voltage	24 V DC $\pm 10\%$ 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 $\times 2$ (Selected beam channels, setting contents etc. are displayed.)
Function indicator	Green LED $\times 9$ (set function is displayed.)
Functions	Fixed blanking (Factory setting: Disabled) / Floating blanking (Factory setting: Disabled) / Auxiliary output change (Factory setting: Negative Logic of OSSD) / Light emitting amount control (Factory setting: Disabled) / Muting setting change [Factory setting: All beam channels enabled, A = B, Setting of the muting lamp diagnosis function enabled (Ver. 2 or later), Muting sensor output operation setting N.O. / N.O. (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 <b>+14 to +131 °F</b> (No dew condensation or icing allowed), Storage: -25 to +70 °C <b>-13 to +158 °F</b>
Ambient humidity	30 to 85 % RH, Storage: 30 to 85 % RH
Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure
Insulation resistance	20 M $\Omega$ , or more, with 500 V DC megger between all supply terminals connected together and enclosure
Cable	8-core shielded cable, 0.5 m <b>1.640 ft</b> long, with a connector at the end (2 cables)
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.	SF-LAT-2N
Item	
Supply voltage	3 V (LR6 battery $\times 2$ pcs.)
Battery	1.5 V (LR6 battery) $\times 2$ pcs. (replaceable)
Battery lifetime	30 hours approx. of continuous operation (LR6 battery, at +25 °C <b>+77 °F</b> ambient temperature)
Light source	Red semiconductor laser: Class 2 (IEC / JIS / FDA) (Max. output: 1 mW, Peak emission wavelength: 650 nm <b>0.026 mil</b> ) (Note 2)
Spot diameter	10 mm <b>0.394 in</b> approx. (at 5 m <b>16.404 ft</b> distance)
Ambient temperature	0 to +40 °C <b>+32 to +104 °F</b> (No dew condensation), Storage: 0 to +55 °C <b>+32 to +131 °F</b>
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 based on Laser Notice No. 50, dated July 26, 2001, issued by CDRH under the FDA.

### Corner mirror

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

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

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MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT CURTAINS

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PARTICULAR USE SENSORS

SENSOR OPTIONS

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WIRE-SAVING SYSTEMS

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FA COMPONENTS

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Laser Scanner

Single Beam Sensor

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Definition of Sensing Heights

SF4C

SF4B

SF4B-G

SF2B

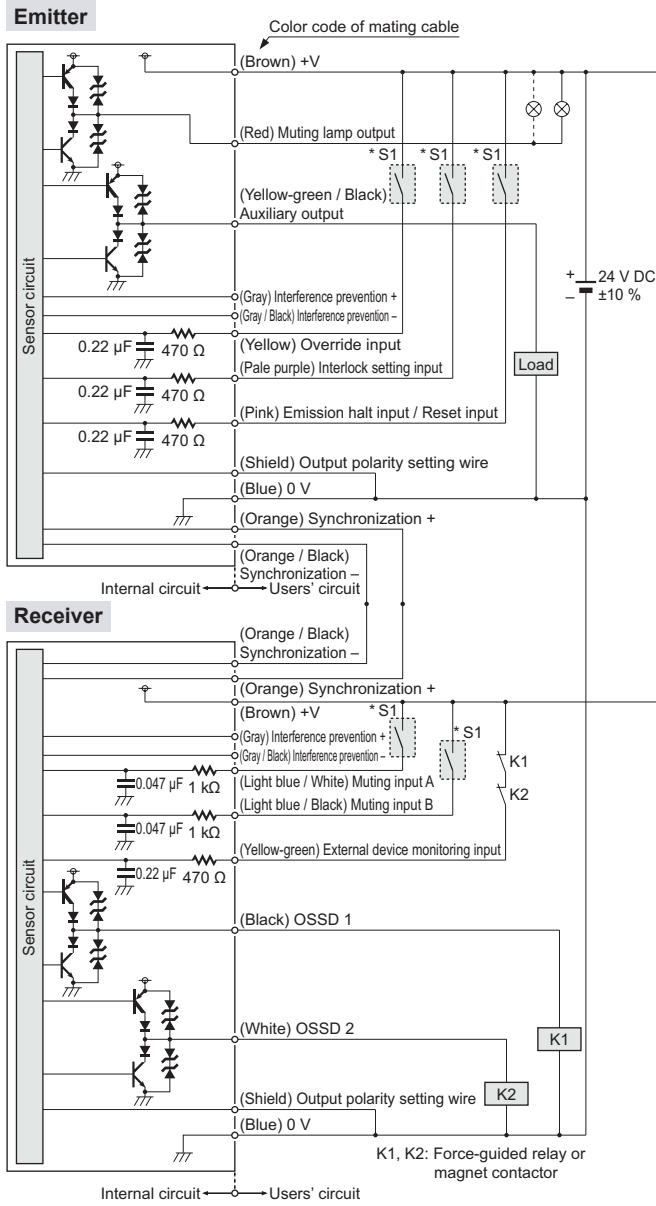
BSF4-AH80

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**I/O CIRCUIT AND WIRING DIAGRAMS**

**I/O circuit diagram**

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



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

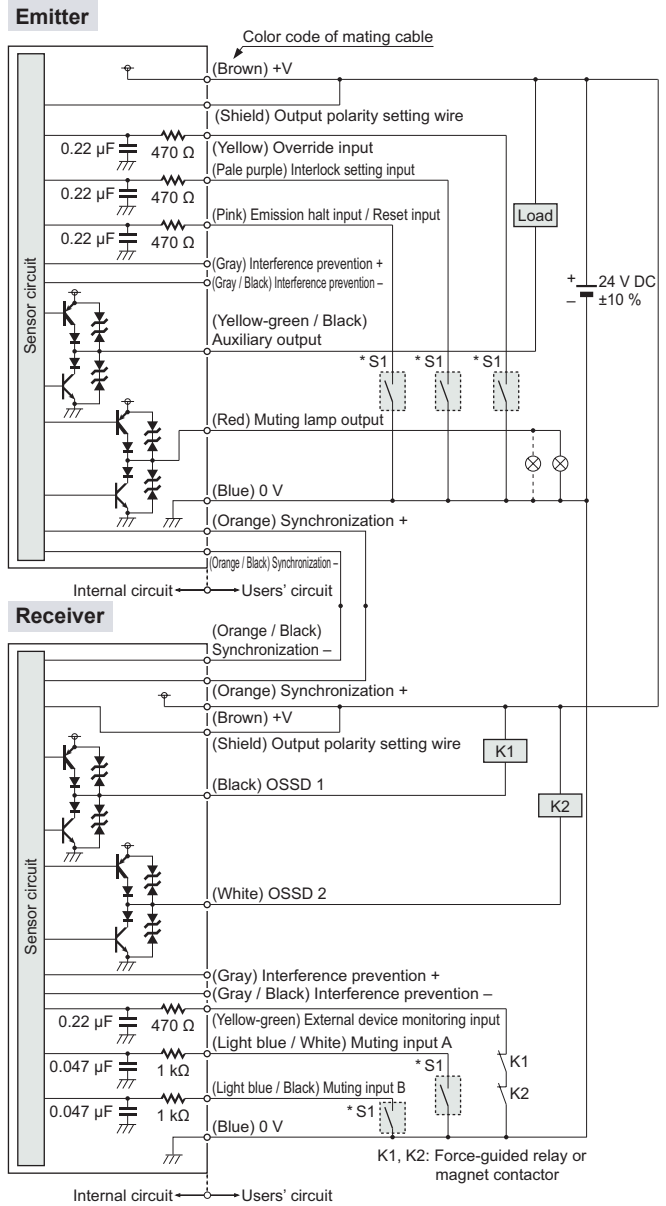
\* S1

Switch S1

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

Note: Vs is the applying supply voltage.

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



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

\* S1

Switch S1

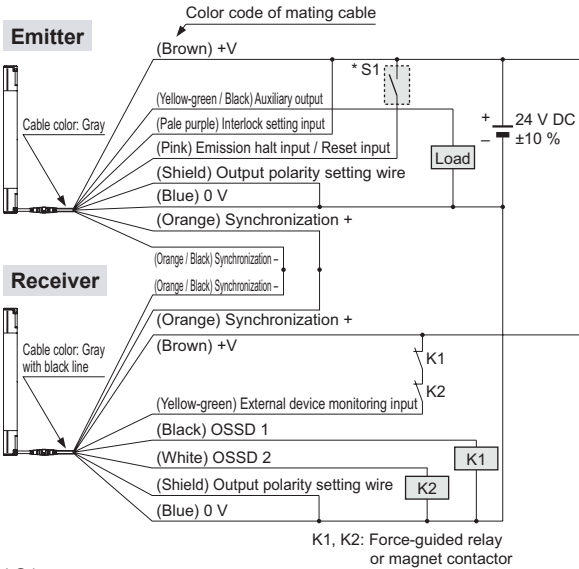
- Emission halt input / Reset input
- For manual reset
- 0 to +1.5 V (source current 5 mA or less): Emission halt
- Open: Emission
- For automatic reset
- 0 to +1.5 V (source current 5 mA or less): Emission
- Open: Emission halt
- Interlock setting input, Override input, Muting input A / B, External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

**I/O CIRCUIT AND WIRING DIAGRAMS**

**Connection example**

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

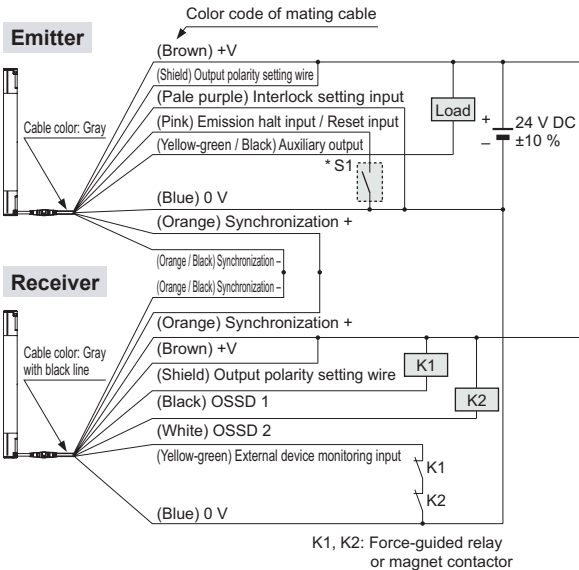
**<In case of using I/O circuit for PNP output>**



\* S1  
 Switch S1  
 • Emission halt input / Reset input  
 For manual reset  
 Vs to Vs - 2.5 V (sink current 5 mA or less): Emission halt (Note)  
 Open: Emission  
 For automatic reset  
 Vs to Vs - 2.5 V (sink current 5 mA or less): Emission (Note)  
 Open: Emission halt

Note: Vs is the applying supply voltage.

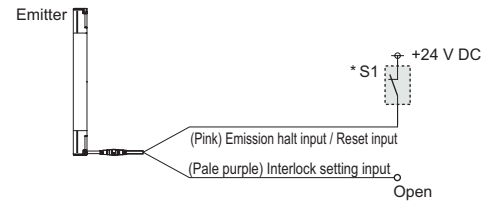
**<In case of using I/O circuit for NPN output>**



\* S1  
 Switch S1  
 • Emission halt input / Reset input  
 For manual reset  
 0 to +1.5 V (source current 5 mA or less): Emission halt  
 Open: Emission  
 For automatic reset  
 0 to +1.5 V (source current 5 mA or less): Emission  
 Open: Emission halt

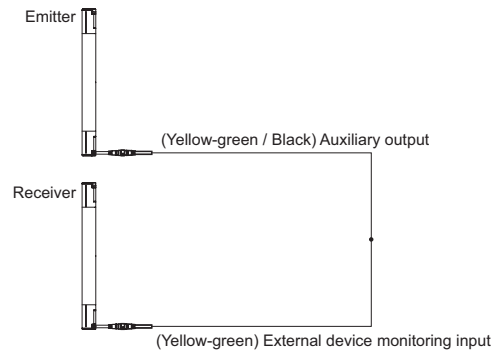
The diagram at left shows the configuration when using PNP output, interlock function “enabled (manual reset)” and external device monitoring function “enabled”.

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



\* Refer to “**PRECAUTIONS FOR PROPER USE**” for details of the interlock function.

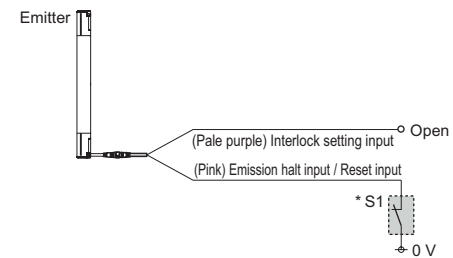
**In case of setting the external device monitoring function to “disabled”**



\* Refer to “**PRECAUTIONS FOR PROPER USE**” for details of the external device monitoring function.

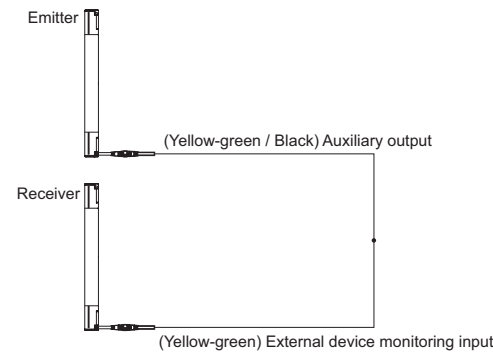
The diagram at left shows the configuration when using NPN output, interlock function “enabled (manual reset)” and external device monitoring function “enabled”.

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



\* Refer to “**PRECAUTIONS FOR PROPER USE**” for details of the interlock function.

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



\* Refer to “**PRECAUTIONS FOR PROPER USE**” for details of the external device monitoring function.

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**SF4B**

**SF4B-G**

**SF2B**

**BSF4-AH80**

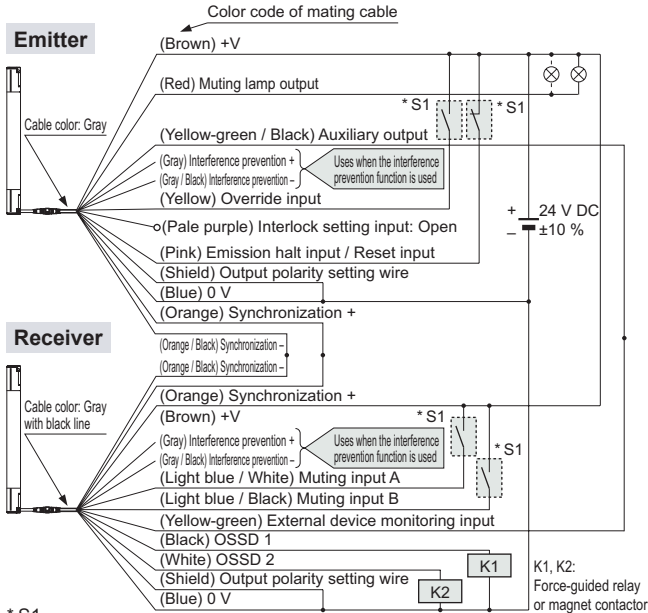
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## I/O CIRCUIT AND WIRING DIAGRAMS

### Connection example

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

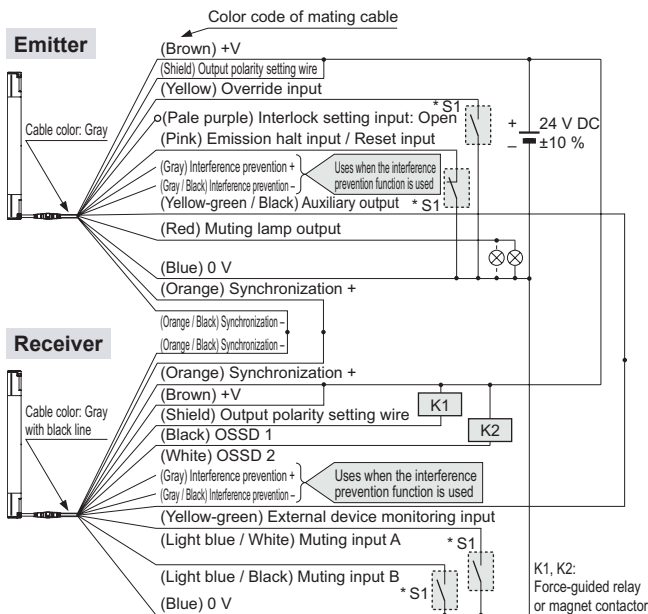
#### <In case of using I/O circuit for PNP output>



\* S1  
**Switch S1**  
 • Emission halt input / Reset input  
 For manual reset  
 Vs to Vs - 2.5 V (sink current 5 mA or less): Emission halt (Note), Open: Emission  
 For automatic reset  
 Vs to Vs - 2.5 V (sink current 5 mA or less): Emission (Note), Open: Emission halt  
 • Override input, Muting input A / B, External device monitoring input  
 Vs to Vs - 2.5 V (sink current 5 mA or less): Enabled (Note), Open: Disabled

Note: Vs is the applying supply voltage.

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

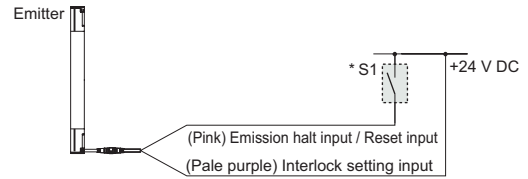


\* S1  
**Switch S1**  
 • Emission halt input / Reset input  
 For manual reset  
 0 to +1.5 V (source current 5 mA or less): Emission halt, Open: Emission  
 For automatic reset  
 0 to +1.5 V (source current 5 mA or less): Emission, Open: Emission halt  
 • Override input, Muting input A / B, External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

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

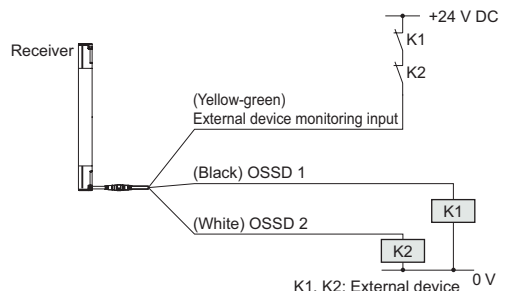
#### In case of setting the interlock function to "enabled (manual reset)"

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



\* Refer to "PRECAUTIONS FOR PROPER USE" for details of the interlock function.

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

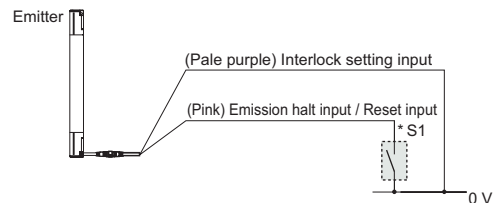


\* Refer to "PRECAUTIONS FOR PROPER USE" for details of the external device monitoring function.

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

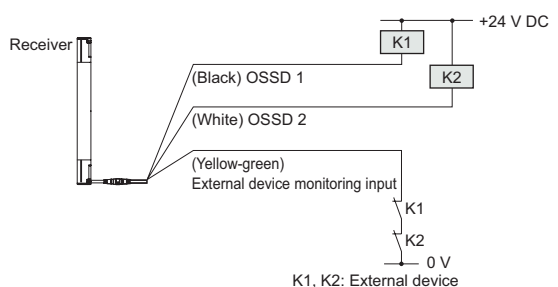
#### In case of setting the interlock function to "enabled (manual reset)"

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



\* Refer to "PRECAUTIONS FOR PROPER USE" for details of the interlock function.

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



\* Refer to "PRECAUTIONS FOR PROPER USE" for details of the external device monitoring function.

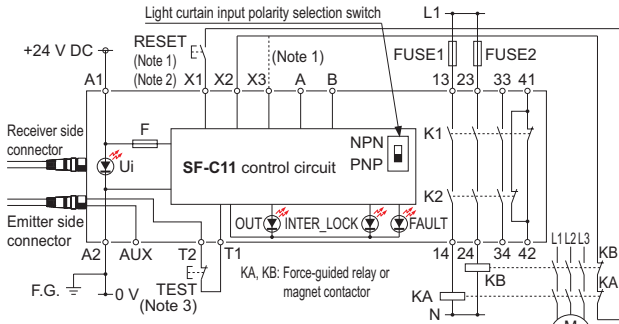
**I/O CIRCUIT AND WIRING DIAGRAMS**

**SF-C11**

**SF4B series wiring diagram (Control Category 4)**

**For PNP output (minus ground)**

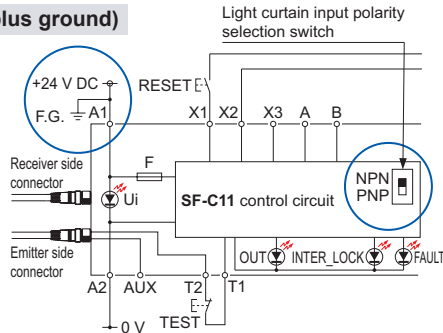
- Set the light curtain input polarity selection switch to the PNP side and ground the 0 V line.



- 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.

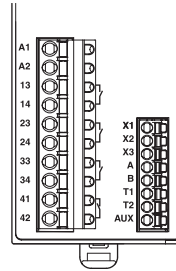
**For NPN output (plus ground)**

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



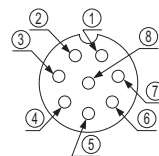
When SF-C11 is connected to the light curtain, be sure to use the following mating cable.  
**SFB-CB□, SFB-CCJ10□**

**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**



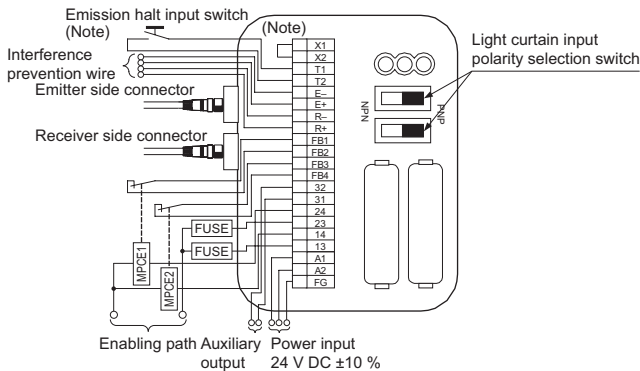
Connector pin No.	Emitter side connector	Receiver side connector
①	Interlock	OSSD 2
②	+24 V DC	+24 V DC
③	Emission halt	OSSD 1
④	Auxiliary output	EDM (External relay monitor)
⑤	Synchronization wire +	Synchronization wire +
⑥	Synchronization wire -	Synchronization wire -
⑦	0 V	0 V
⑧	Shield wire	Shield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

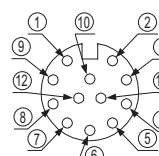
When SF-C12 is connected to the light curtain, be sure to use the following mating cable.  
**SFB-CB05-MU, SFB-CCJ10□-MU**

**Terminal arrangement diagram**



Terminal	Function	Terminal	Function
FG	Frame ground (F.G.) terminal	R+	Interference prevention wire - (Receiver side)
A2	0 V	R-	Interference prevention wire + (Receiver side)
A1	+24 V DC	E+	Interference prevention wire - (Emitter side)
13-14, 23-24	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	Automatic reset / manual reset selection terminal
FB3	External relay monitor terminal 1	X2	Manual reset: X1 - X2 short-circuited
FB2		X1	
FB1			

**Pin layout for 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)

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**SF4B**

**SF4B-G**

**SF2B**

**BSF4-AH00**



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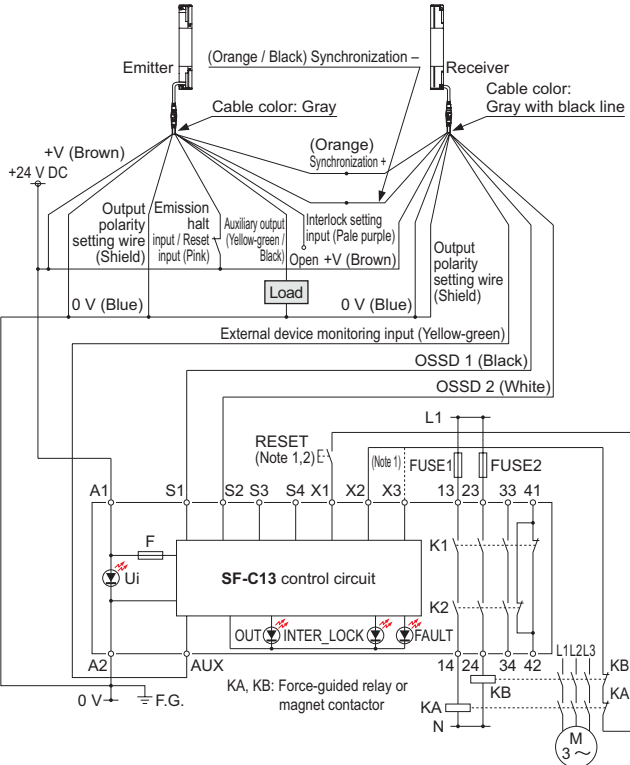
**I/O CIRCUIT AND WIRING DIAGRAMS**

**SF-C13**

**SF4B series wiring diagram (Control Category 4)**

**For PNP output (minus ground)**

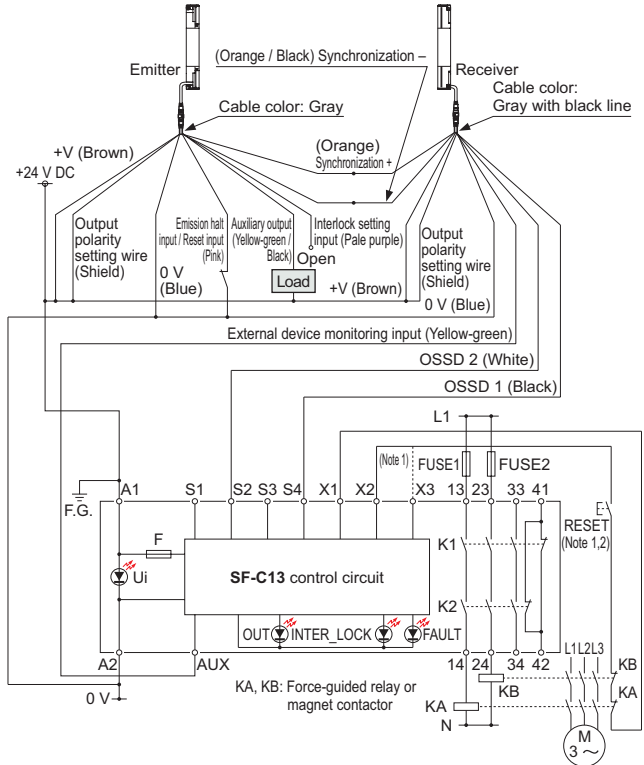
- Connect the light curtain control outputs OSSD 1 and OSSD 2 to S1 and S2 respectively.



- 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	Light curtain control output (OSSD) input terminal
S2	
S3	
S4	
AUX	Semiconductor auxiliary output
X1	Reset output terminal
X2	
X3	
13	Reset input terminal (Manual)
23	Reset input terminal (Automatic)
14	Enabling path (NO contact × 3)
24	
33	
34	Auxiliary output (NC contact × 1)
41	
42	

Use a separate terminal block to carry out wiring for light curtains that cannot be connected to the SF-C13.

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

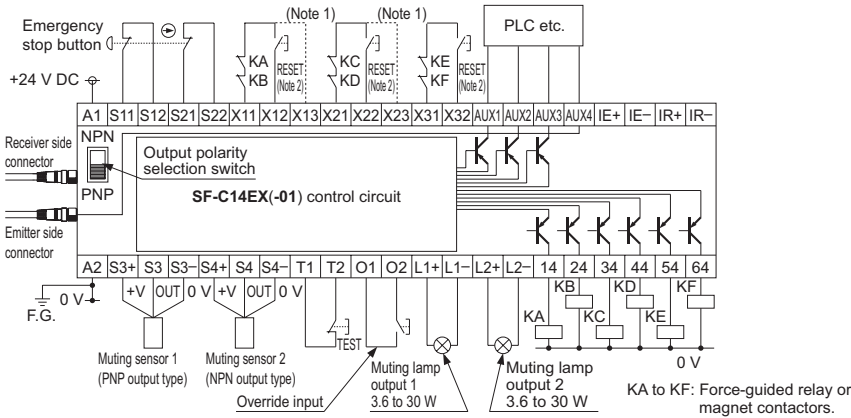
**I/O CIRCUIT AND WIRING DIAGRAMS**

**SF-C14EX(-01)**

**SF4B series wiring diagram (Control Category 4)**

**For PNP output (minus ground)**

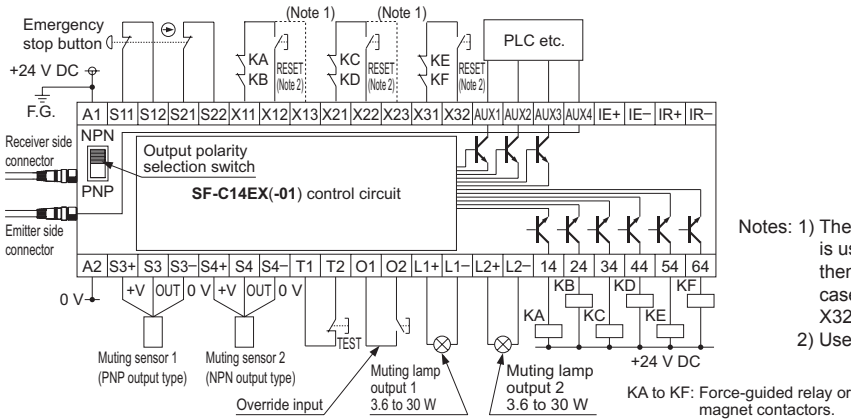
• Set the output polarity selection switch to the PNP side and ground the 0 V line.



Notes: 1) The above diagram is when using manual reset. If automatic reset is used, disconnect the lead from X12 and X22, and connect them to X13 and 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.

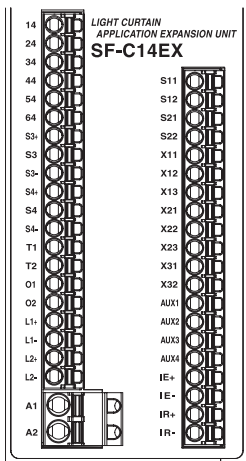
**For NPN output (plus ground)**

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



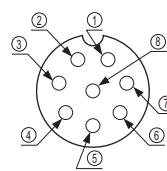
Notes: 1) The left diagram is when using manual reset. If automatic reset is used, disconnect the lead from X12 and X22, and connect them to X13 and X23, as shown by the dotted lines. In this case, a reset (RESET) button is not needed. Terminals X31 to X32 are for manual reset only.  
 2) Use a momentary-type 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)	X13	X11 - X13: Automatic reset
S3-	S3+, S3-: Power supply	X21	Enabling path 2 reset input
S3-	S3-: Sensor output	X22	X21 - X22: Manual reset
S4+	Muting sensor input 2 (NPN output type)	X23	X21 - X23: Automatic reset
S4-	S4+, S4-: Power supply	X31	Enabling path 3 reset input
S4-	S4-: Sensor output	X32	X31 - X32: Manual reset
T1	Test input terminal Open: Test mode Short-circuit: Normal operation	AUX1	Auxiliary output 1, Muting output
T2	Override input terminal Open: Invalid Short-circuit: Valid	AUX2	Auxiliary output 2, Override output
O1	Override input terminal Open: Invalid Short-circuit: Valid	AUX3	Auxiliary output 3, Blown lamp output
O2		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

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MICRO PHOTO-ELECTRIC SENSORS

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**SF2B**

**BSF4-AH80**

**PRECAUTIONS FOR PROPER USE**

Refer to General precautions.

**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.

Interlock setting input wire (pale purple)	Interlock function
When selecting PNP output: Connected to +V When selecting NPN output: Connected to 0 V	Manual reset
Open	Automatic reset

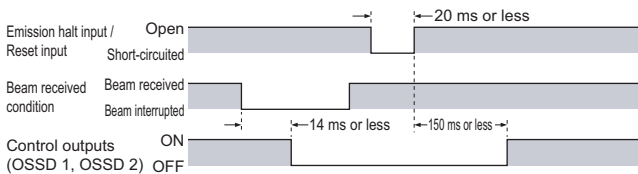


In case of using the interlock function, be sure there exists no operator inside of the dangerous area. It causes death or serious injury without the confirmation.

**Manual reset**

- The control output (OSSD 1, OSSD 2) is not turned ON automatically even though this device is received the light. When this device is reset in light received state [open the emission halt input / reset input → short-circuit the device to 0 V or +V → open], the control output (OSSD 1, OSSD 2) is turned ON.

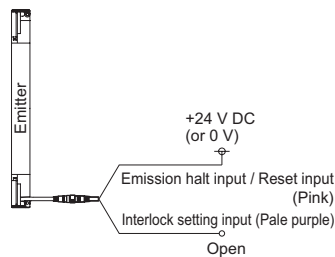
**<Time chart>**



The reset switch shall be placed in area where all over the dangerous zone shall be comprehend and out side of the dangerous zone.

**Automatic reset**

- The control output (OSSD 1, OSSD 2) is turned ON automatically when this device receives the light.



In case that this light curtain is used under automatic reset mode, set the system not to be auto reset by the safety relay unit, etc. (conforming to EN 60204-1)

- It is also possible to set the external device monitoring function into invalid by 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**.

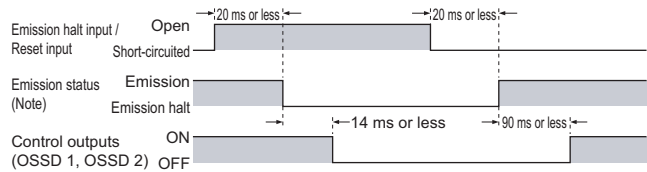
**Emission halt function**

- 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).

Interlock function	Emission halt input / reset input wire (pink)	Emission halt	Control output status (OSSD 1, OSSD 2)
Manual reset	Open	Invalid	ON
	When selecting PNP output: Connected to +V When selecting NPN output: Connected to 0 V	Valid	OFF
Automatic reset	Open	Valid	OFF
	When selecting PNP output: Connected to +V When selecting NPN output: Connected to 0 V	Invalid	ON

- 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.

**<Time chart (automatic reset)>**



Note: This time chart shows the operation in automatic reset. In manual reset, the light curtain performs emission under open status and performs emission halt under short-circuit status.



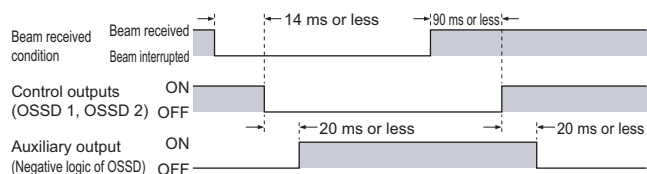
Do not use the emission halt function for the purpose of stopping the machine in which the **SF4B<V2>** series is installed. Failure to do so could result in death or serious injury.

**Auxiliary output (Non-safety output)**

- This light curtain incorporates the auxiliary output (yellow-green / black) for the non-safety output. The auxiliary output is incorporated with the emitter.

Auxiliary output setting	Normal mode		Lockout
	Emission halt	Control outputs (OSSD 1, OSSD 2) status	
Negative logic of OSSD (Factory setting)	ON	Beam received	OFF
		Beam interrupted	ON

**<Time chart>**



Do not use the auxiliary output for the purpose of stopping the device with **SF4B<V2>** installed. Failure to do so could result in serious injury or death.

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LASER SENSORS  
PHOTO-ELECTRIC SENSORS  
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SF2B

BSF4-AH80

**PRECAUTIONS FOR PROPER USE**

Refer to General precautions.

**External device monitoring function**

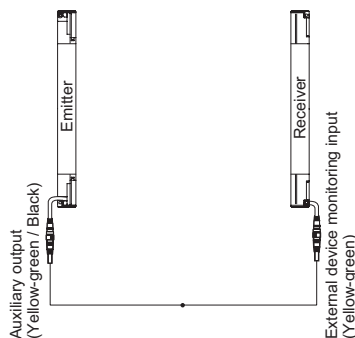
- This is the function for checking whether the external safety relay connected to the control outputs (OSSD 1, OSSD 2) perform normally in accordance with the control outputs (OSSD 1, OSSD 2) or not. Monitor the contacting point "b" of the external safety relay, and if any abnormality such as deposit 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).

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

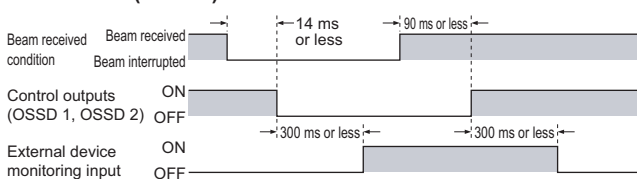
- Connect the external device monitoring input (yellow-green) to the external safety relay connected the control outputs (OSSD 1, OSSD 2).

**In case of not using the external device monitoring function**

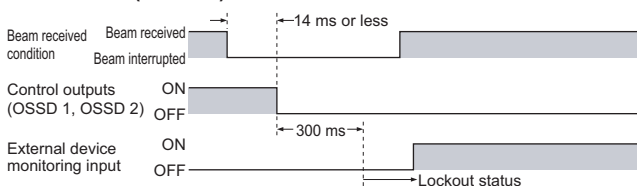
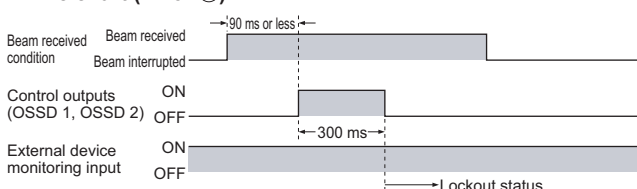
- Connect the external device monitoring input (yellow-green) to the auxiliary output (yellow-green / black). At this time, set the auxiliary output as [negative logic of control outputs (OSSD 1, OSSD 2)] (factory setting).
- The auxiliary output cannot be connected to external devices.



- It is also possible to set the external device monitoring function into invalid by 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**.

**<Time chart (normal)>**

- The time set for external device monitoring is 300 ms or less. Exceeding 300 ms turns the device into lockout status. It can be set within 100 to 600 ms (in units of 10 ms) by 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**.

**<Time chart (Error ①)>****<Time chart (Error ②)>****Muting function**

- Incorrect use of the muting control may cause accidents. Please understand the muting control fully, and use it. As for the muting control, the following international standards define the requirements.

ISO 13849-1 (EN ISO 13849-1 / JIS B 9705-1)  
IEC 61496-1 (ANSI / UL 61496 / JIS B 9704-1)  
IEC 60204-1 (JIS B 9960-1)  
EN 415-4  
ANSI B11.19-1990  
ANSI / RIA R15.06-1999

- Use the muting control while the machine cycle is not in danger mode. Maintain safety with the other measure while the muting control is activated.
- For the application that the muting control is activated when a workpiece passes through the sensor, place the muting sensor so that the conditions for the muting control cannot be satisfied by intrusion of personnel when the workpiece is passing through the sensor or the workpiece is not passing through it.
- The muting lamp should be installed in a position where it can always be seen by operators who set or adjust the machine.
- Be sure to check the operation of the muting function before its use. Furthermore, check the state of the muting lamp (cleanliness or brightness etc.).

- 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 cannot be used with the **SF4B-□-03<V2>**.

- The control outputs (OSSD 1, OSSD 2) shall be ON.
- The incandescent lamp with 3 to 10 W shall be connected to the muting lamp output (red) (Note 1).
- 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. (Note 2)

- 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.

- Notes: 1) Using handy-controller (**SFB-HC**) (optional) Ver.2 or later can configure muting lamp diagnosis function. If setting muting lamp diagnosis function to ineffective, muting function continues even when the lamp is out or not connected.
- 2) By using handy-controller (**SFB-HC**) (optional) Ver.2.1 or later, and connecting normally open (N.O.) type muting sensor to muting input A, and normally closed (N.C.) type muting sensor to muting input B, then muting function can be used for 0 to 3 sec.

**Output operation for muting sensor**

	Operation when sensor is ON	Operation when sensor is OFF
NO (Normal Open) type ON with "Dark-ON" condition (photoelectric sensor, etc.) ON with "Normally open" condition (inductive proximity sensor, etc.) ON with object contacted condition (position switch, etc.)	Output 0 V or +V	Open

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- LIGHT CURTAINS**
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- ENERGY CONSUMPTION VISUALIZATION COMPONENTS
- FA COMPONENTS
- MACHINE VISION SYSTEMS
- UV CURING SYSTEMS

Refer to General precautions.

**PRECAUTIONS FOR PROPER USE**

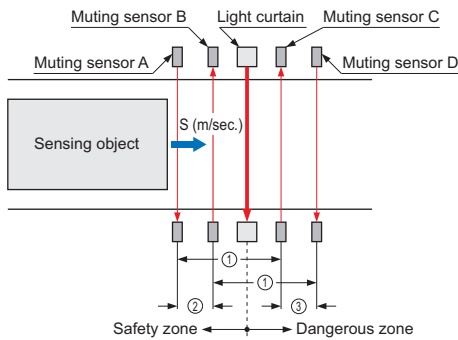


- Be sure to use the muting sensor that satisfies the previous table "Output operation for muting sensor". If the other muting sensor not satisfying the specification above, the muting function might become enabled with the timing that the machine designer cannot expect and could result in serious injury or death.
- The muting lamp shall be connected without fail. The muting function is invalid for activating with the muting lamp not connected.
- It is recommended that two muting lamps should be connected in parallel. However, take care not to exceed 10 W in total.

- It is possible to set the muting function into disabled per beam channel respectively and to specify the output order of the muting sensor to be set into enabled by 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**.

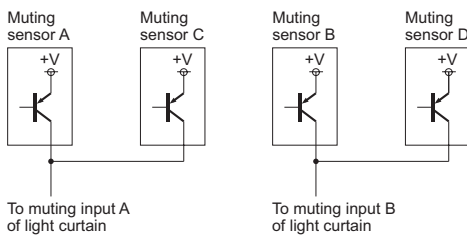
Notes: 1) By using handy-controller (**SFB-HC**) (optional) Ver.2.1 or later, and connecting normally open (N.O.) type muting sensor to muting input A, and normally closed (N.C.) type muting sensor to muting input B, then muting function can be used for 0 to 3 sec.  
 2) This is when the muting lamp diagnosis function is valid. If the muting lamp does not light up even if 1 sec. is passed, the muting function becomes invalid. When the muting lamp diagnosis function is invalid, the muting function becomes valid 0.05 sec. after the input conditions of the muting sensor A (C) and B (D) were satisfied.

**Installation condition of muting sensor**

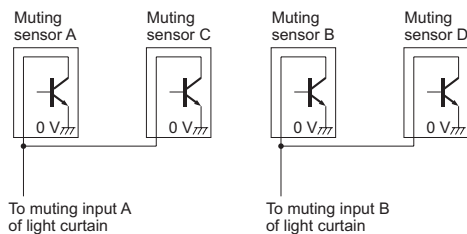


- ① Shorten the distances between muting sensors A to C and between B to D than the whole length of the sensing object.
- ② The transit time of the sensing object to be passed through the muting sensors A to B shall be 0.03 to less than 3 sec.  $S$  (m/sec.) is the moving speed of the sensing object, then distance (m) between A and B: less than  $S \times 3$  (sec.)
- ③ The transit time of the sensing object to be passed through the muting sensors C to D shall be under 3 sec.  $S$  (m/sec.) is the moving speed of the sensing object, then distance (m) between C and D: less than  $S \times 3$  (sec.)

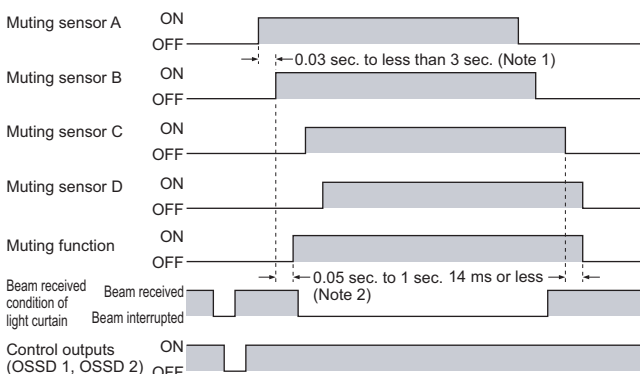
**<In case of PNP output>**



**<In case of NPN output>**



**<Time chart>**



**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>**.

- ① The incandescent lamp with 3 to 10 W shall be connected to the muting lamp output (red) (Note 1).
- ② The signal shall be input to either muting sensor A, B, or A and B.
- ③ The override input (yellow) shall be short-circuited to 0 V or +V, and the emission halt input / reset input (pink) shall be opened. (3 sec. continuously)

If one of the three conditions above becomes enabled or timing exceeds 60 sec. (Note 2), the override function becomes enabled.

- The override function only operates when the interlock function is disabled (automatic reset).
  - For using the override function, please order 12-core cable.
- Notes: 1) Using handy-controller (**SFB-HC**) (optional) Ver.2 or later can configure muting lamp diagnosis function. If setting muting lamp diagnosis function to ineffective, muting function continues even when the lamp is out or not connected.  
 2) By using handy-controller (**SFB-HC**) (optional) Ver.2.1 or later, a change between 60 and 600 sec. by 10 sec. per unit is possible.



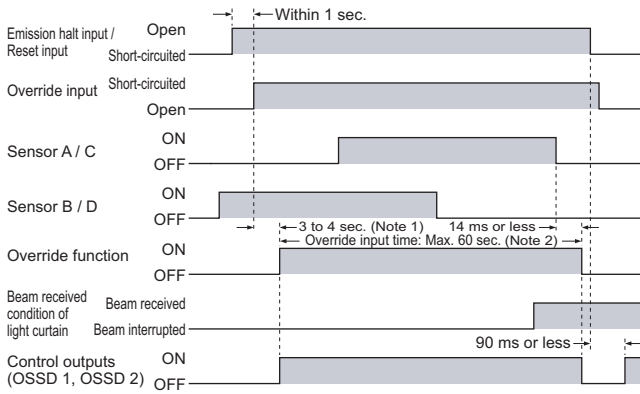
- Make sure manually to operate system for starting override function. Furthermore, the system shall be placed in area where all over the dangerous zone shall be comprehend and out side of the dangerous zone.
- Using override function, make sure that there exist no operator in the dangerous zone, which may result in death or serious injury.

- SF4C
- SF4B**
- SF4B-G
- SF2B
- BSF4-AH80

**PRECAUTIONS FOR PROPER USE**

Refer to General precautions.

**<Time chart>**



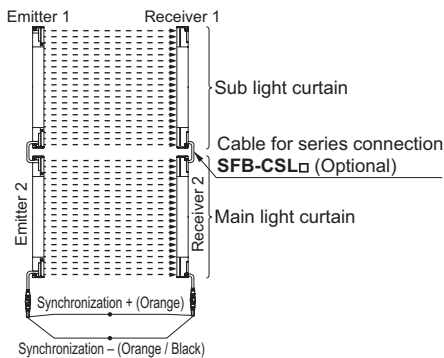
Notes: 1) This is when the muting lamp diagnosis function is valid. If the muting lamp does not light up even if 1 sec. is passed, the muting function becomes invalid. When the muting lamp diagnosis function is invalid, the muting function becomes valid 3 sec. after the input conditions of the muting sensor A (C) and B (D) were satisfied.  
 2) By using handy-controller (**SFB-HC**) (Optional) Ver.2.1 or later, a change between 60 and 600 sec. by 10 sec. per unit is possible.

**Series connection**

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

- This is the configuration for connecting multiple sets of emitters and receivers facing each other in series. It is used when the dangerous part can be entered from two or more directions. The control outputs (OSSD 1, OSSD 2) turn OFF if any of the light curtain is interrupted.

For series connection, connect the emitter and emitter, receiver and receiver respectively using the exclusive cable (**SFB-CSL□**) for series connection. Wrong connection could generate the non-sensing area, resulting in serious injury or death.

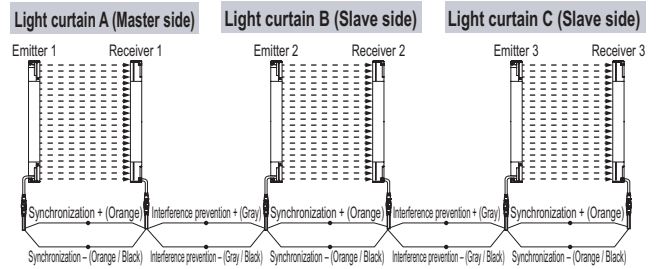


**Parallel connection**

Connectable up to 3 sets of light curtains

- This is the configuration for connecting multiple sets of emitter and receiver facing each other in parallel. It is used when there are two dangerous parts and each dangerous part can be entered from only one direction. By connecting the interference prevention wire, up to three sets of the light curtains can be connected. The control outputs (OSSD 1, OSSD 2) turn only its output to OFF if the light curtain is interrupted. However, **SF4B-□-03<V2>** does not apply.

For parallel connection, connect the one receiver to the other connection using the interference prevention wire as shown in the next figure. Wrong connection could generate the non-sensing area, resulting in serious injury or death.



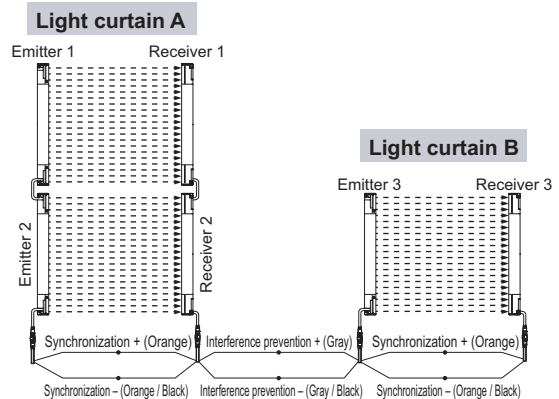
Notes: 1) Because of using the interference prevention wire, please order 12-core cable.  
 2) If the interference prevention wire is extended, use a 0.2 mm<sup>2</sup>, or more, shielded twist pair-cable.

**Series and parallel mixed connection**

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

- This is the configuration for connecting multiple sets of emitter and receiver facing each other in mixed series and parallel combination. It is used when there are two or more dangerous parts that can be entered from two or more directions. Up to three sets of light curtains in total of the series connection and parallel connection can be connected in combination. However, the total number of beam channels is a maximum of 192. The control outputs (OSSD 1, OSSD 2) turn only its output to OFF if the light curtain is interrupted. However, **SF4B-□-03<V2>** does not apply.

For parallel connection, connect the one receiver to the other connection using the interference prevention wire as shown in the figure below. Wrong connection could generate the non-sensing area, resulting in serious injury or death.



Notes: 1) Because of using the interference prevention wire, please order 12-core cable.  
 2) If the interference prevention wire is extended, use a 0.2 mm<sup>2</sup>, or more, shielded twist pair-cable.

**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.

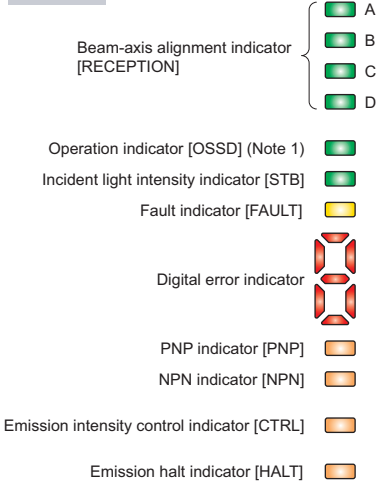
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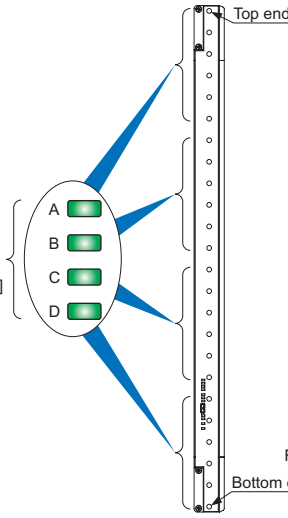
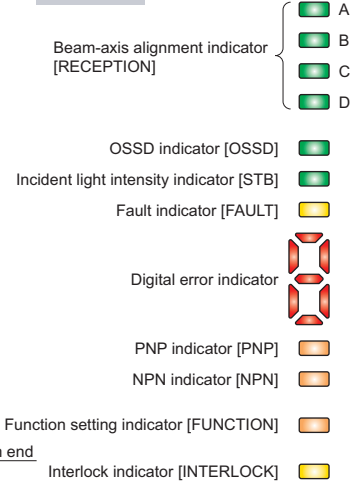
Refer to General precautions.

**Part description and function**

**Emitter**



**Receiver**



Description		Function
Beam-axis alignment indicator (Red / Green) [RECEPTION]	A	When light curtain top receives light: lights up in red When light curtain top end receives light: blinks in red When control output is ON: lights up in green
	B	When light curtain upper middle receives light: lights up in red When control output is ON: lights up in green
	C	When light curtain lower middle receives light: lights up in red When control output is ON: lights up in green
	D	When light curtain bottom receives light: lights up in red When light curtain bottom end receives light: blinks in red When control output is ON: lights up in green
Operation indicator (Red / Green) [OSSD] (Note 1)		Lights up while light curtain operation is as follows [sequential operation]: When control output is OFF: lights up in red When control output is ON: lights up in green
Incident light intensity indicator (Orange / Green) [STB]		When sufficient light is received (incident light: 130 % or more) (Note 2): lights up in green When stable light is received (incident light: 115 to 130 %) (Note 2): OFF When unstable light is received (incident light: 100 to 115 %) (Note 2): lights up in orange When light is interrupted: OFF (Note 3)
Fault indicator (Yellow) [FAULT] (Note 4)		When fault occurs in the light curtain: lights up or blinks
Digital error indicator (Red) (Note 4)		When device is lockout: lights up for incident error content
PNP indicator (Orange) [PNP]		When PNP output is set: lights up
NPN indicator (Orange) [NPN]		When NPN output is set: lights up
Emission intensity control indicator (Orange) [CTRL]		When light is emitted under short mode: lights up When light is emitted under normal mode: lights off
Emission halt indicator (Orange) [HALT]		When light emission is halt: lights up When light is emitted: OFF

Description		Function
Beam-axis alignment indicator (Red / Green) [RECEPTION]	A	When light curtain top receives light: lights up in red When light curtain top end receives light: blinks in red When control output is ON: lights up in green
	B	When light curtain upper middle receives light: lights up in red When control output is ON: lights up in green
	C	When light curtain lower middle receives light: lights up in red When control output is ON: lights up in green
	D	When light curtain bottom receives light: lights up in red When light curtain bottom end receives light: blinks in red When control output is ON: lights up in green
OSSD indicator (Red / Green) [OSSD]		When control output is OFF: lights up in red When control output is ON: lights up in green
Incident light intensity indicator (Orange / Green) [STB]		When sufficient light is received (incident light: 130 % or more) (Note 2): lights up in green When stable light is received (incident light: 115 to 130 %) (Note 2): OFF When unstable light is received (incident light: 100 to 115 %) (Note 2): lights up in orange When light is interrupted: OFF (Note 3)
Fault indicator (Yellow) [FAULT] (Note 4)		When fault occurs in the light curtain: lights up or blinks
Digital error indicator (Red) (Note 4)		When device is lockout: lights up for incident error content
PNP indicator (Orange) [PNP]		When PNP output is set: lights up
NPN indicator (Orange) [NPN]		When NPN output is set: lights up
Function setting indicator (Orange) [FUNCTION]		When blanking function is used: lights up (Note 5) When handy-controller is connected: blinks
Interlock indicator (Yellow) [INTERLOCK]		When device is interlocked: lights up Other cases: OFF

- Notes: 1) Since the color of the operation indicator changes according to the ON / OFF status of the control outputs (OSSD 1, OSSD 2), the operation indicator is marked as "OSSD" on the light curtain.
- 2) The threshold value where the control outputs (OSSD 1, OSSD 2) change from OFF to ON is applied as 100 % incident light intensity.
- 3) The status when light is interrupted refers to the status that the some obstacle is existed in the sensing area.
- 4) Refer to instruction manual enclosed with this product for details.
- 5) The blanking function is set by using the handy-controller **SFB-HC** (optional). Please order the handy-controller separately. However, a handy-controller cannot be used with the **SF4B-□-01<V2>**, the **SF4B-□-03<V2>** and the **SF-C14EX-01**.
- 6) The description given in [ ] is marked on the light curtain.

**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.

FIBER SENSORS  
LASER SENSORS  
PHOTO-ELECTRIC SENSORS  
MICRO PHOTO-ELECTRIC SENSORS  
AREA SENSORS  
LIGHT CURTAINS  
PRESSURE / FLOW SENSORS  
INDUCTIVE PROXIMITY SENSORS  
PARTICULAR USE SENSORS  
SENSOR OPTIONS  
SIMPLE WIRE-SAVING UNITS  
WIRE-SAVING SYSTEMS  
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UV CURING SYSTEMS  
Selection Guide  
Laser Scanner  
Single Beam Sensor  
Light Curtains  
Control Units  
Optical Touch Switch  
Definition of Sensing Heights

SF4C

SF4B

SF4B-G

SF2B

BSF4-AH80

**PRECAUTIONS FOR PROPER USE**

Refer to General precautions.

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

**LIGHT CURTAINS**

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SMILE WIRE-SAVING UNITS

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MEASUREMENT SENSORS

STATIC CONTROL DEVICES

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**Light Curtains**

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Definition of Sensing Heights


**SF4C**

**SF4B**

**SF4B-G**

**SF2B**

BSF4-AH00




- 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 999 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.)

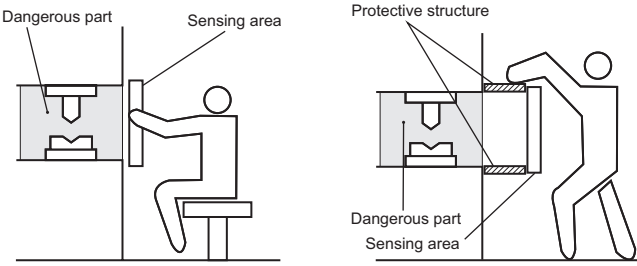
- Make sure to carry out the test run before regular operation.
- This safety system is for use only on machinery in which the dangerous parts can be stopped immediately, either by an emergency stop unit or by disconnecting the power supply. Do not use this system with machinery which cannot be stopped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

**Sensing area**

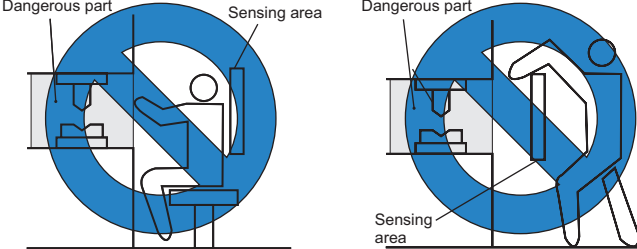


- Make sure to install this product such that any part of the human body must pass through its sensing area in order to reach the dangerous parts of the machinery. If the human body is not detected, there is a danger of serious injury or death.
- Do not use any reflective type or retroreflective type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



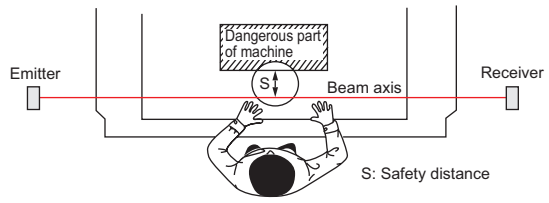

**Wrong mounting method**



**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

	Min. sensing object when applying floating blanking function			
	Invalid	Setting (Note)		
		1 beam channel	2 beam channels	3 beam channels
SF4B-F□ (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□ (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□ (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: 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 999) (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)



**PRECAUTIONS FOR PROPER USE**

Refer to General precautions.

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

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

- Equation  $S = K \times T + C$   
 S: Safety distance (mm)  
 K: Intrusion velocity of operator’s body or object (mm/sec.)  
 Taken as 1,600 (mm/sec.) for calculation  
 T: Response time of total equipment (sec.)  
 $T = T_m + T_{SF4B}$   
 Tm: Maximum halting time of machinery (sec.)  
 T<sub>SF4B</sub>: 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.)  $\approx 1,600$  (mm/sec.)}  
 ANSI B11.19 does not define the intrusion velocity “K”. When determining “K”, consider possible factors including physical ability of operators.  
 T<sub>s</sub>: Halting time calculated from the operation time of the control element (air valve, etc.) (sec.)  
 T<sub>c</sub>: Maximum response time of the control circuit required for functioning the brake (sec.)  
 T<sub>SF4B</sub>: Response time of light curtain (sec.)  
 T<sub>bm</sub>: 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<sub>a</sub>: 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<sub>s</sub> + T<sub>c</sub>) is taken as additional halting time.

D<sub>pf</sub>: Additional distance calculated from the size of the minimum sensing of the  
**SF4B-F□<V2>**: D<sub>pf</sub> = 23.8 mm **0.937 in**  
**SF4B-H□<V2>**: D<sub>pf</sub> = 61.2 mm **2.409 in**  
**SF4B-A□<V2>**: D<sub>pf</sub> = 129.2 mm **5.087 in**

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

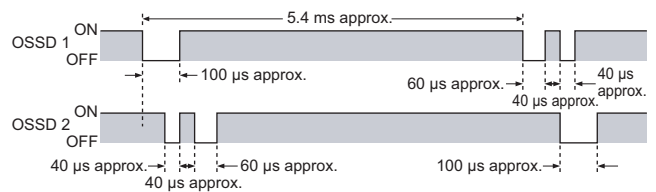
$$\approx 3.4 \times (d - 7) \text{ (mm)}$$

d: Minimum sensing object diameter 0.552 (inch)  $\approx 14$  (mm) **SF4B-F□<V2>**  
 Minimum sensing object diameter 0.985 (inch)  $\approx 25$  (mm) **SF4B-H□<V2>**  
 Minimum sensing object diameter 1.772 (inch)  $\approx 45$  (mm) **SF4B-A□<V2>**

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

- Since the receiver performs the self-diagnosis of the output circuit when the light curtain is in beam receiving status (ON status), the output transistor becomes OFF status periodically. (Refer to the figure below.)  
 When the OFF signal is fed back, the receiver judges the output circuit as normal. When the OFF signal is not fed back, the receiver judges either the output circuit or wiring as error, and the control outputs (OSSD 1, OSSD 2) maintain OFF status.

**!** Since the OFF signal of this device might cause malfunction, perform the connection paying attention to the input response time of the machine to be connected to this device.

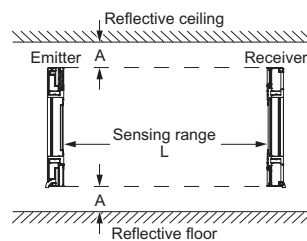


**Influence of reflective surfaces**

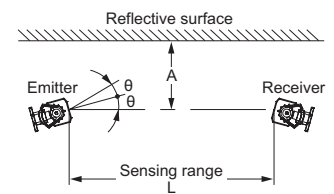
**!** Install the light curtain by considering the effect of nearby reflective surfaces, and take countermeasures such as painting, masking, or changing the material of the reflective surface, etc. Failure to do so may cause the light curtain not to detect, resulting in serious body injury or death.

- Install this device at a distance of at least A (m) (given below) away from reflective surfaces such as metal walls, floors, ceilings, workpiece, covers, panels or glass surfaces.

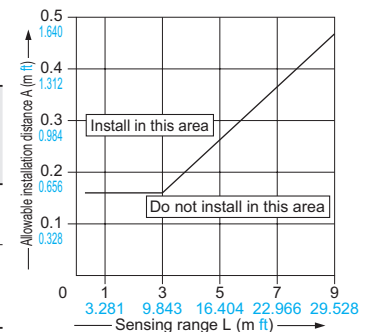
**Side view**



**Top view**



Distance between emitter and receiver (Setting distance L)	Allowable installation distance A
0.3 to 3 m 0.984 to 9.843 ft	0.16 m 0.525 ft
3 to 9 m 9.843 to 29.528 ft (Note 1)	$L/2 \times \tan 2\theta = 3^\circ$ $= L \times 0.053$ (m) 0.174 (ft)



Notes: 1) The setting distance “L” varies depending on the type of unit. Refer to “ORDER GUIDE” for details.  
 2) The effective aperture  $\theta$  angle for this device is  $\pm 2.5^\circ$  or less (when  $L > 3$  m **9.843 ft**) as required by IEC 61496-2, ANSI / UL 61496-2.  
 However, install this device away from reflective surfaces considering an effective aperture angle of  $\pm 3^\circ$  to take care of beam misalignment, etc. during installation.

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- SF4B**
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**PRECAUTIONS FOR PROPER USE**

Refer to General precautions.

**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 quick reference sheet**

Digital error indicator	Possible cause
	Affected by noise. Handy-controller setting error.
	Incorrect combination of emitter and receiver (e.g. number of beam channels) Output polarity setting wires (shield) connected incorrectly.
	Series connection cable connected incorrectly. Problem with upper light curtain connected in series.
	The number of light curtains connected in series and the total number of beam channels is outside the specification range.
	<Emitter side lights up> Interlock setting input or emission halt input / reset input connected incorrectly. <Receiver side lights up> Affected by extraneous light, or mutual interference occurring.
	<Emitter side lights up> Muting lamp output connected incorrectly. <Receiver side lights up> Control outputs (OSSD1, OSSD2) connected incorrectly.
	Output polarity setting wires (shield) connected incorrectly.
	External device monitoring input connected incorrectly. Malfunction with connection relay.
	Synchronizing wires connected incorrectly. <Emitter side lights up> Problem at receiver side. <Receiver side lights up> Problem at emitter side.
	Affected by noise. Power supply-related problem. Light curtain malfunction. * Please contact our office.
	Drop in incident light intensity due to dirty sensing surface or beam axis misalignment. (Beam axis input is erratic.)
	Light emission halted.
	Interlock active.
	Control output is set to PNP output.
	Control output is set to NPN output.

\* Refer to the instruction 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.

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**DIMENSIONS (Unit: mm in)**

The CAD data in the dimensions can be downloaded from our website.

**SF4B-□<V2>**

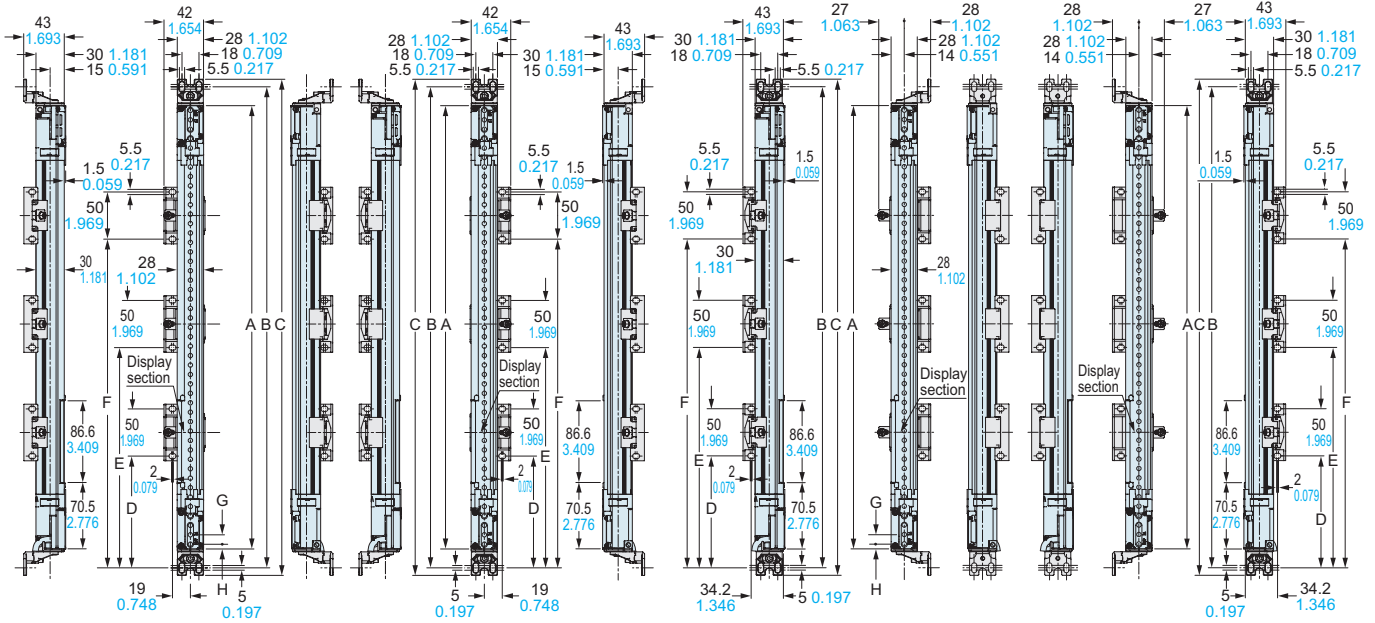
Light curtain

**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 (Main body) length	Mounting pitch	Total length	Intermediate supporting bracket mounting pitch		
						A	B	C
SF4B-F23□<V2>	SF4B-H12□<V2>	SF4B-A6□<V2>	230 9.055	270 10.630	286 11.260	—	—	—
SF4B-F31□<V2>	SF4B-H16□<V2>	SF4B-A8□<V2>	310 12.205	350 13.780	366 14.406	—	—	—
SF4B-F39□<V2>	SF4B-H20□<V2>	SF4B-A10□<V2>	390 15.354	430 16.929	446 17.559	—	—	—
SF4B-F47□<V2>	SF4B-H24□<V2>	SF4B-A12□<V2>	470 18.504	510 20.079	526 20.709	—	—	—
SF4B-F55□<V2>	SF4B-H28□<V2>	SF4B-A14□<V2>	550 21.654	590 23.228	606 23.858	—	—	—
SF4B-F63□<V2>	SF4B-H32□<V2>	SF4B-A16□<V2>	630 24.803	670 26.378	686 27.008	—	—	—
SF4B-F71□<V2>	SF4B-H36□<V2>	SF4B-A18□<V2>	710 27.953	750 29.528	766 30.157	—	—	—
SF4B-F79□<V2>	SF4B-H40□<V2>	SF4B-A20□<V2>	790 31.102	830 32.677	846 33.307	390 15.354	—	—
SF4B-F95□<V2>	SF4B-H48□<V2>	SF4B-A24□<V2>	950 37.402	990 38.976	1,006 39.606	470 18.504	—	—
SF4B-F111□<V2>	SF4B-H56□<V2>	SF4B-A28□<V2>	1,110 43.701	1,150 45.276	1,166 45.905	550 21.654	—	—
SF4B-F127□<V2>	SF4B-H64□<V2>	SF4B-A32□<V2>	1,270 50.000	1,310 51.575	1,326 52.505	418 16.457	842 33.150	—
—	SF4B-H72□<V2>	SF4B-A36□<V2>	1,430 56.299	1,470 57.874	1,486 58.504	472 18.583	948 37.323	—
—	SF4B-H80□<V2>	SF4B-A40□<V2>	1,590 62.598	1,630 64.173	1,646 64.803	525 20.669	1,055 41.535	—
—	SF4B-H88□<V2>	SF4B-A44□<V2>	1,750 68.898	1,790 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	1,950 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

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**DIMENSIONS (Unit: mm in)**

The CAD data in the dimensions can be downloaded from our website.

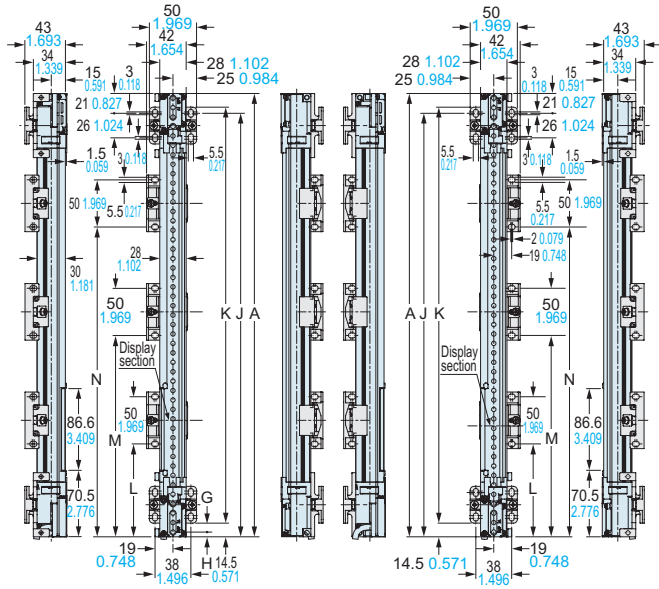
**SF4B-□<V2>**

Light curtain

**Assembly dimensions**

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

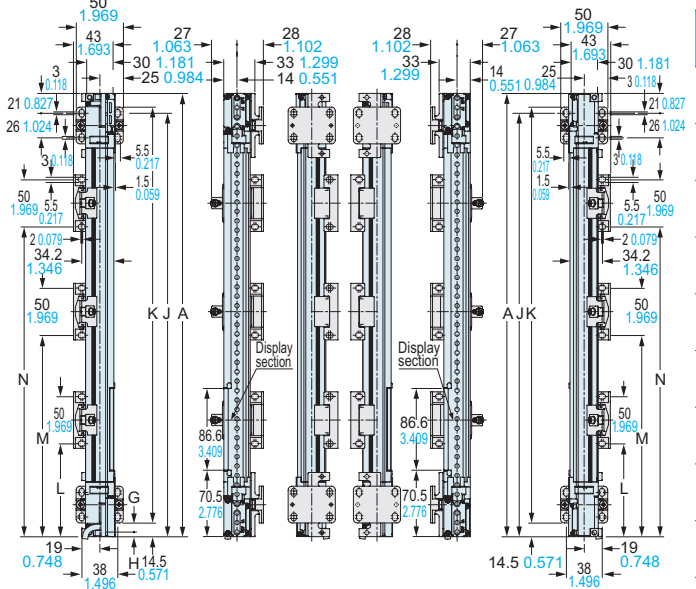
**<Rear mounting>**



**Emitter**

**Receiver**

**<Side mounting>**



**Emitter**

**Receiver**

Model No.			Protective height (Main body length)	MS-SFB-3 Mounting pitch			Intermediate supporting bracket mounting pitch		
				A	J	K	L	M	N
SF4B-F23□<V2>	SF4B-H12□<V2>	SF4B-A6□<V2>	230 9.055	209 8.228	201 7.913	—	—	—	
SF4B-F31□<V2>	SF4B-H16□<V2>	SF4B-A8□<V2>	310 12.205	289 11.378	281 11.063	—	—	—	
SF4B-F39□<V2>	SF4B-H20□<V2>	SF4B-A10□<V2>	390 15.354	369 14.528	361 14.213	—	—	—	
SF4B-F47□<V2>	SF4B-H24□<V2>	SF4B-A12□<V2>	470 18.504	449 17.677	441 17.362	—	—	—	
SF4B-F55□<V2>	SF4B-H28□<V2>	SF4B-A14□<V2>	550 21.654	529 20.827	521 20.512	—	—	—	
SF4B-F63□<V2>	SF4B-H32□<V2>	SF4B-A16□<V2>	630 24.803	609 23.976	601 23.661	—	—	—	
SF4B-F71□<V2>	SF4B-H36□<V2>	SF4B-A18□<V2>	710 27.953	689 27.126	681 26.811	—	—	—	
SF4B-F79□<V2>	SF4B-H40□<V2>	SF4B-A20□<V2>	790 31.102	769 30.276	761 29.961	370 14.567	—	—	
SF4B-F95□<V2>	SF4B-H48□<V2>	SF4B-A24□<V2>	950 37.402	929 36.575	921 36.260	450 17.717	—	—	
SF4B-F111□<V2>	SF4B-H56□<V2>	SF4B-A28□<V2>	1,110 43.701	1,089 42.874	1,081 42.559	530 20.866	—	—	
SF4B-F127□<V2>	SF4B-H64□<V2>	SF4B-A32□<V2>	1,270 50.000	1,249 49.173	1,241 48.858	398 15.669	822 32.362	—	
—	SF4B-H72□<V2>	SF4B-A36□<V2>	1,430 56.299	1,409 55.472	1,401 55.157	452 17.795	928 36.535	—	
—	SF4B-H80□<V2>	SF4B-A40□<V2>	1,590 62.598	1,569 61.772	1,561 61.457	505 19.882	1,035 40.748	—	
—	SF4B-H88□<V2>	SF4B-A44□<V2>	1,750 68.898	1,729 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	1,889 74.370	1,881 74.055	453 17.835	930 36.614	1,408 55.433	

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

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**SF2B**

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**DIMENSIONS (Unit: mm in)**

The CAD data in the dimensions can be downloaded from our website.

**SF4B-□**

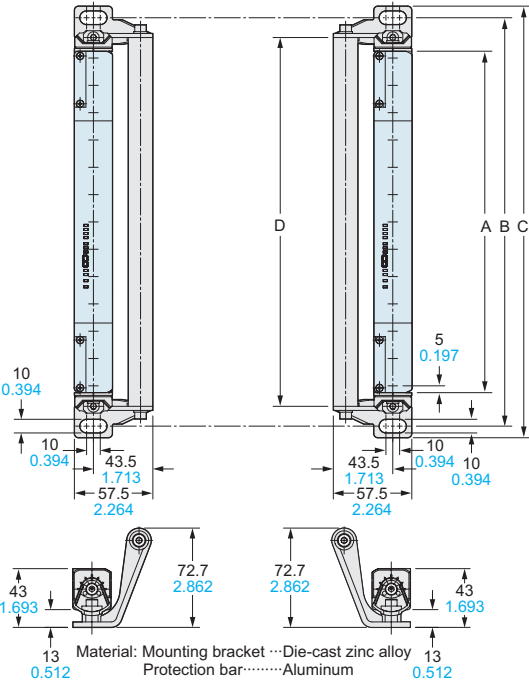
Light curtain

**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)>



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.

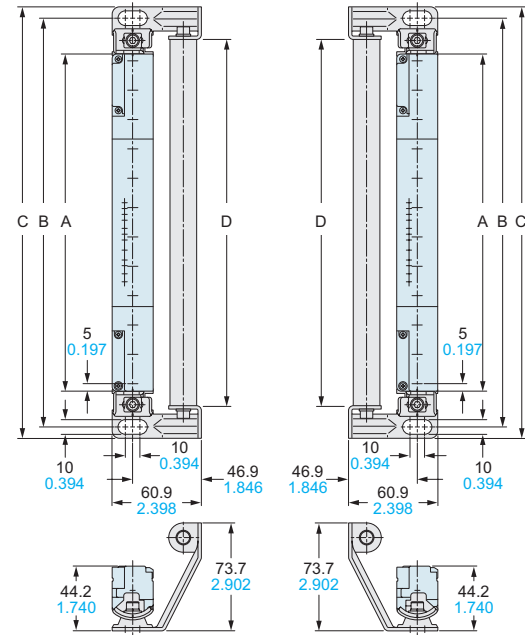
**Protection bar set for rear / side mounting MC-SFBH-□-T assembly dimensions**

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

**Rear mounting**

<MC-SFBH-□-T(L)>

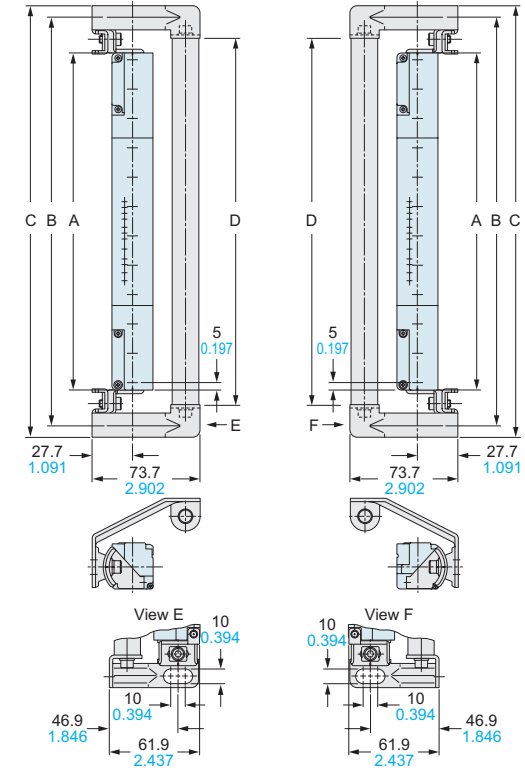
<MC-SFBH-□-T(R)>



**Side mounting**

<MC-SFBH-□-T(L)>

<MC-SFBH-□-T(R)>



Material: Mounting bracket ...Iron (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

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**DIMENSIONS (Unit: mm in)**

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**SF4B**

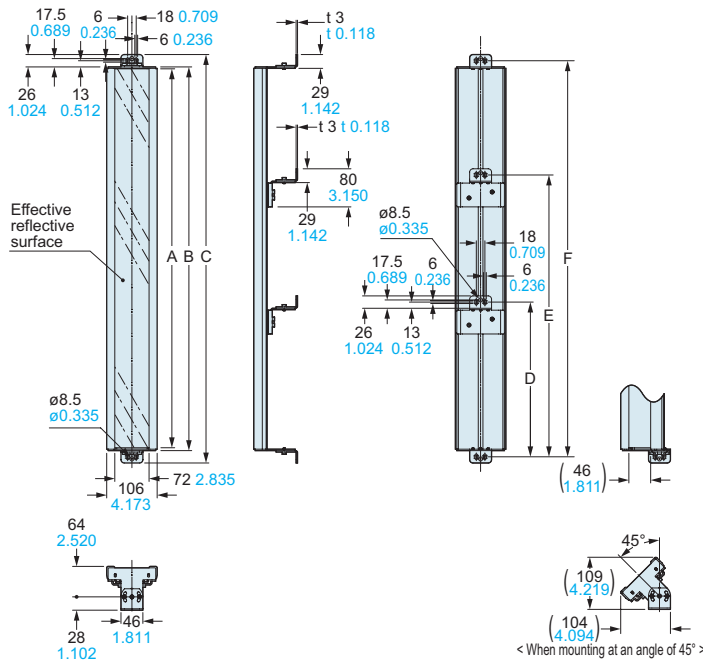
SF4B-G

SF2B

BSF4-AH80

**RF-SFBH-□**

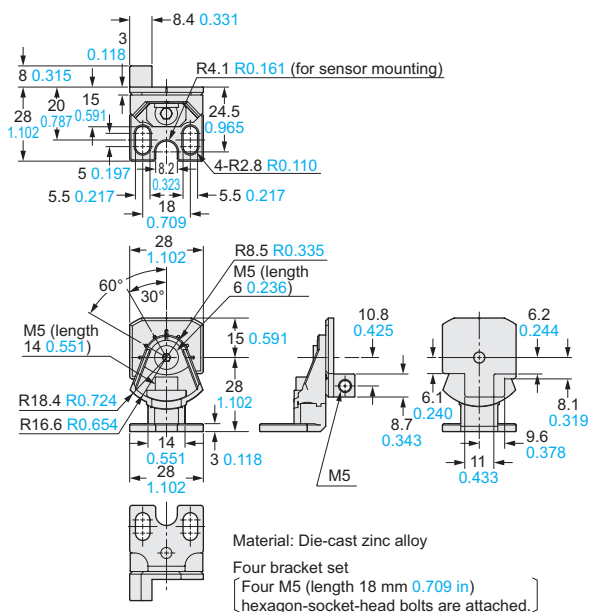
Corner mirror (Optional)



Model No.	A	B	C	D	E	F	Net weight
<b>RF-SFBH-12</b>	236 9.291	246 9.685	298 11.732	—	—	272 10.709	970 g approx.
<b>RF-SFBH-16</b>	316 12.441	326 12.835	378 14.882	—	—	352 13.858	1,170 g approx.
<b>RF-SFBH-20</b>	396 15.591	406 15.984	458 18.031	—	—	432 17.008	1,370 g approx.
<b>RF-SFBH-24</b>	476 18.740	486 19.134	538 21.181	—	—	512 20.157	1,570 g approx.
<b>RF-SFBH-28</b>	556 21.890	566 22.283	618 24.331	—	—	592 23.307	1,770 g approx.
<b>RF-SFBH-32</b>	636 25.039	646 25.433	698 27.480	—	—	672 26.457	1,970 g approx.
<b>RF-SFBH-36</b>	716 28.189	726 28.583	778 30.630	—	—	752 29.606	2,170 g approx.
<b>RF-SFBH-40</b>	796 31.339	806 31.732	858 33.779	458 ±50 18.031 ±1.969	—	832 32.756	2,660 g approx.
<b>RF-SFBH-48</b>	956 37.638	966 38.031	1,018 40.079	538 ±50 21.181 ±1.969	—	992 39.055	3,060 g approx.
<b>RF-SFBH-56</b>	1,116 43.937	1,126 44.331	1,178 46.378	618 ±50 24.331 ±1.969	—	1,152 45.354	3,460 g approx.
<b>RF-SFBH-64</b>	1,276 50.236	1,286 50.630	1,338 52.677	698 ±50 27.480 ±1.969	—	1,312 51.653	3,890 g approx.
<b>RF-SFBH-72</b>	1,436 56.535	1,446 56.929	1,498 58.976	778 ±50 30.630 ±1.969	1,018 ±50 40.079 ±1.969	1,472 57.953	4,550 g approx.
<b>RF-SFBH-80</b>	1,596 62.835	1,606 63.228	1,658 65.275	858 ±50 33.779 ±1.969	1,125 ±50 44.291 ±1.969	1,632 64.252	4,950 g approx.
<b>RF-SFBH-88</b>	1,756 69.134	1,766 69.527	1,818 71.575	938 ±50 36.929 ±1.969	1,231 ±50 48.464 ±1.969	1,792 70.551	5,350 g approx.
<b>RF-SFBH-96</b>	1,916 75.433	1,926 75.827	1,978 77.874	1,018 ±50 39.981 ±1.969	1,338 ±50 52.677 ±1.969	1,952 76.850	5,750 g approx.

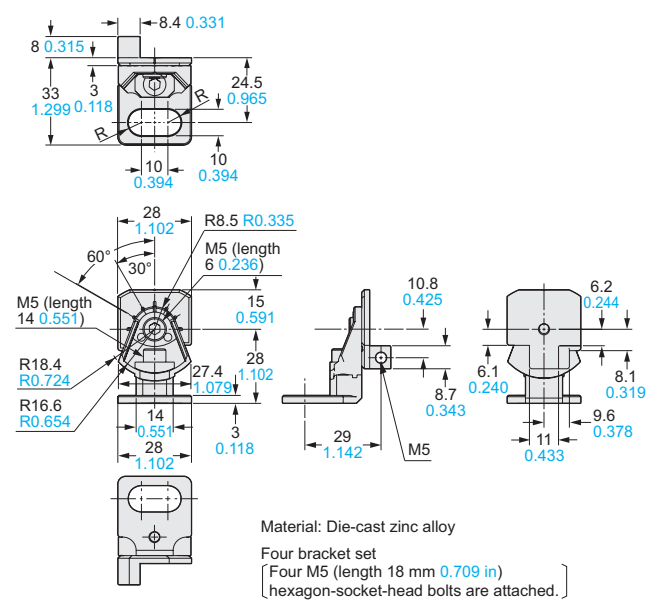
**MS-SFB-1**

Standard mounting bracket (Optional)



**MS-SFB-1-T**

M8 mounting bracket (Optional)

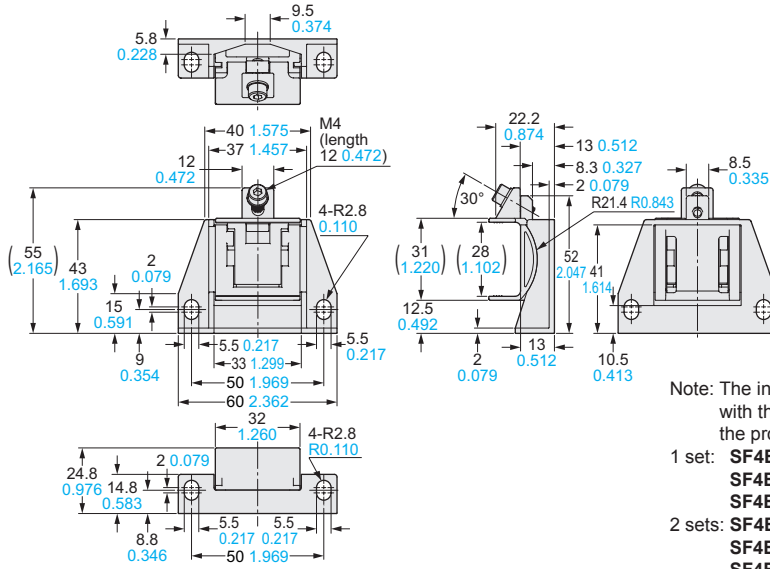


**DIMENSIONS (Unit: mm in)**

The CAD data in the dimensions can be downloaded from our website.

**MS-SFB-2**

Intermediate supporting bracket (Accessory for light curtain)



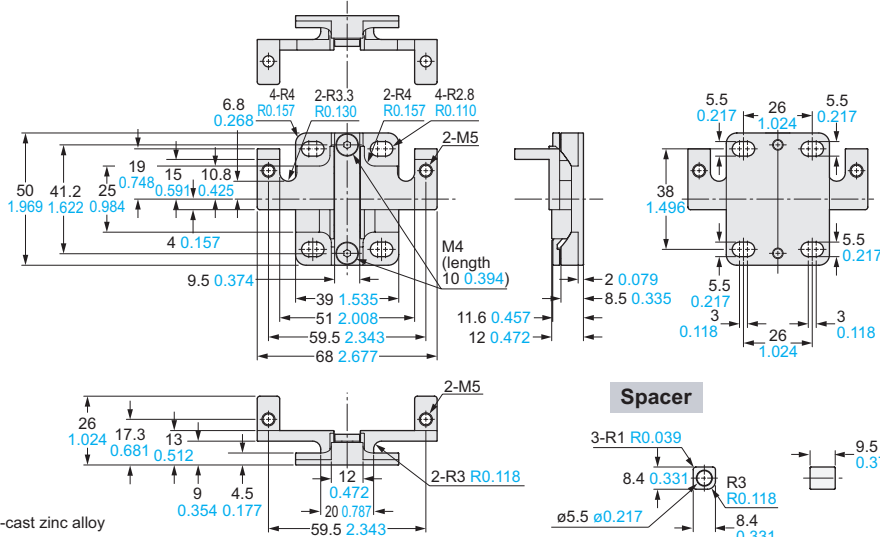
Note: The intermediate supporting bracket (**MS-SFB-2**) is enclosed with the following products. The quantity differs depending on the product as shown below:

- 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-SFB-3**

Dead zoneless mounting bracket (Optional)

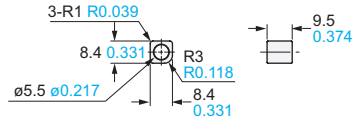
**Main body**



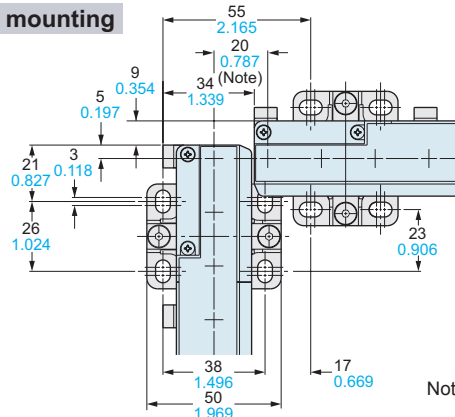
Material: Die-cast zinc alloy

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

**Spacer**

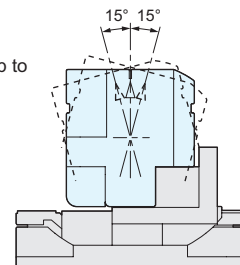


**L-shaped mounting**



**Mounting adjustment range**

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



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.

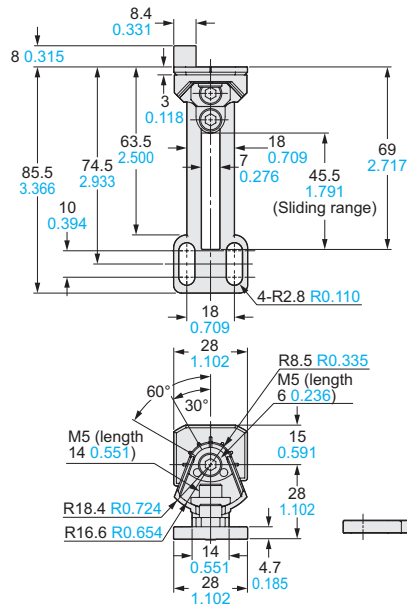
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**DIMENSIONS (Unit: mm in)**

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**MS-SFB-4**

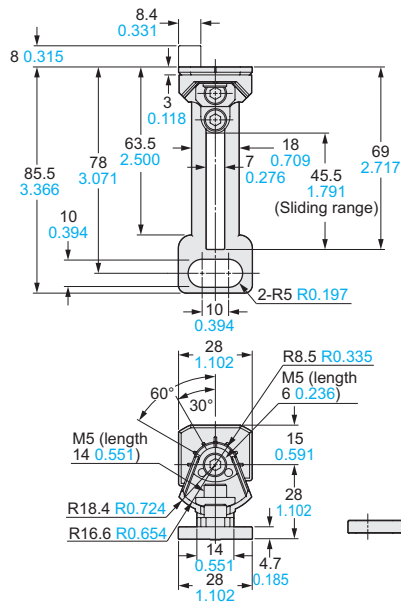
Pitch adapter bracket (Optional)



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

**MS-SFB-4-T**

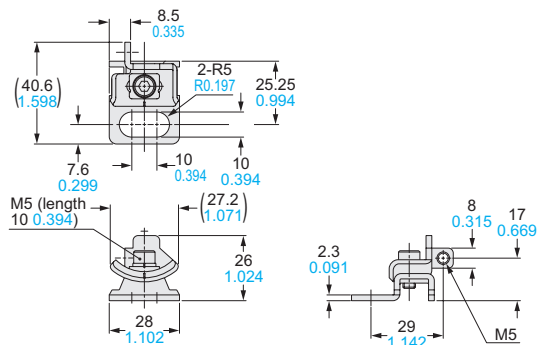
M8 pitch adapter bracket (Optional)



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

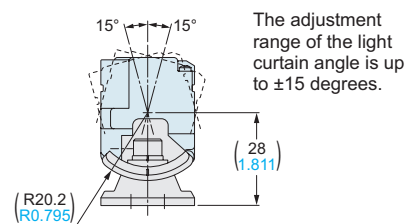
**MS-SFB-7-T MS-SFB-1-T2 (Rear mounting)**

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



Material: Iron (Trivalent chrome plated)  
 Four bracket set  
 [Four M5 (length 18 mm 0.709 in)  
 hexagon-socket-head bolts are attached.]

**Mounting adjustment range**



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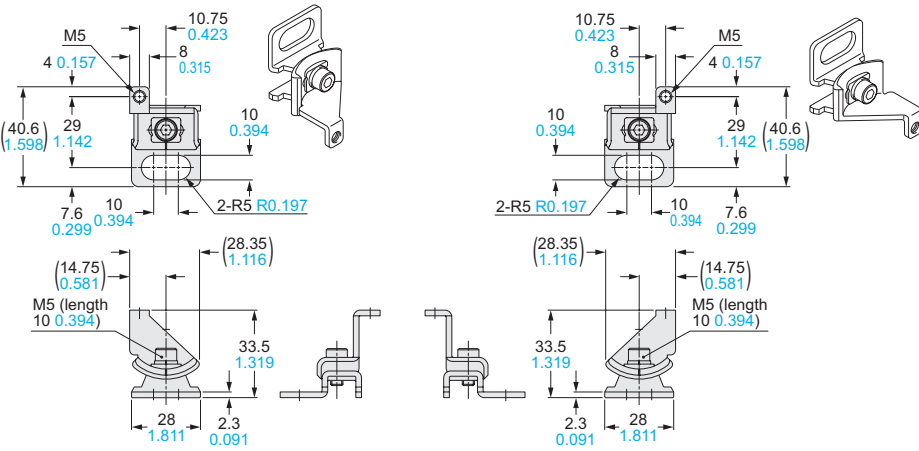
**DIMENSIONS (Unit: mm in)**

The CAD data in the dimensions can be downloaded from our website.

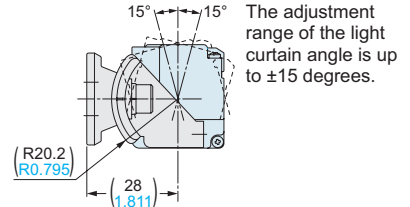
**MS-SFB-8-T MS-SFB-1-T2 (Side mounting)** M8 side mounting bracket (Optional) M8 rear / side mounting brackets set (Optional)

**<MS-SFB-8-T(R)>**

**<MS-SFB-8-T(L)>**



**Mounting adjustment range**

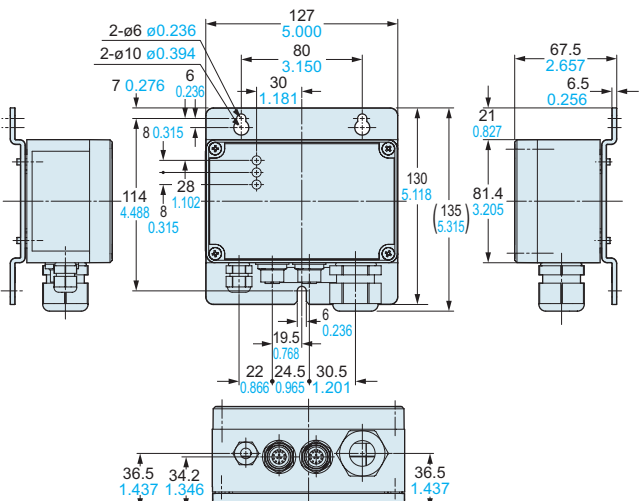
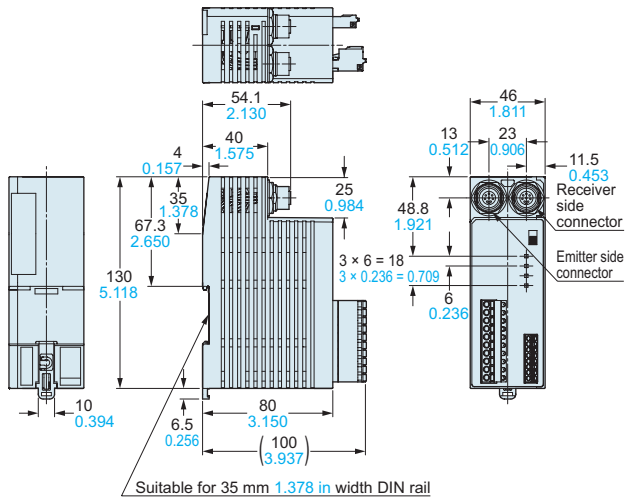


The adjustment range of the light curtain angle is up to ±15 degrees.

Material: Iron (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.]

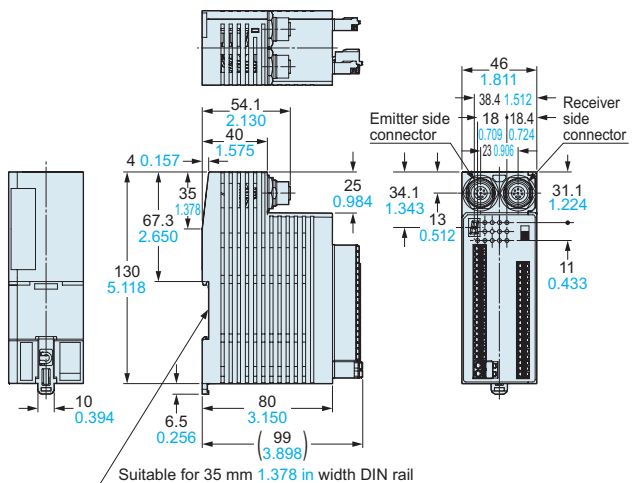
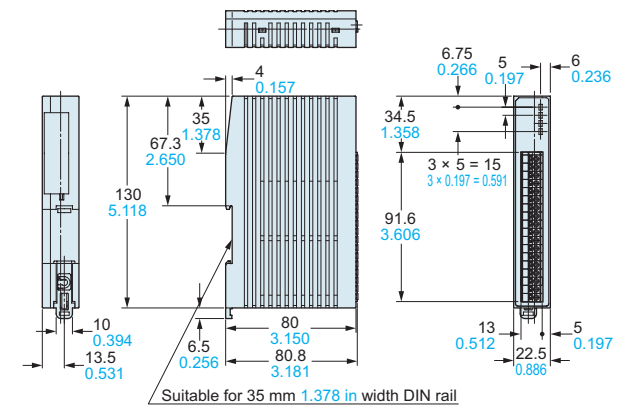
**SF-C11 Control unit (Optional)**

**SF-C12 Control unit (Optional)**



**SF-C13 Control unit (Optional)**

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

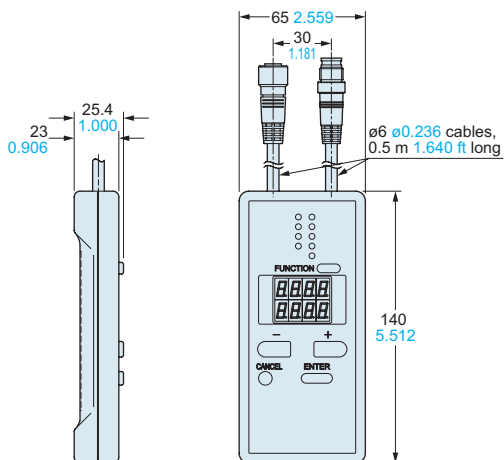


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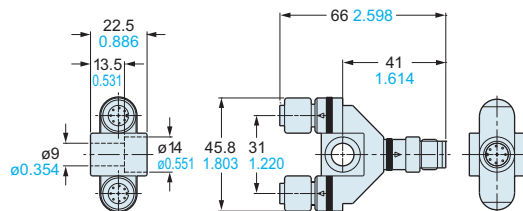
**DIMENSIONS (Unit: mm in)**

The CAD data in the dimensions can be downloaded from our website.

**SFB-HC** Handy-controller (Optional)

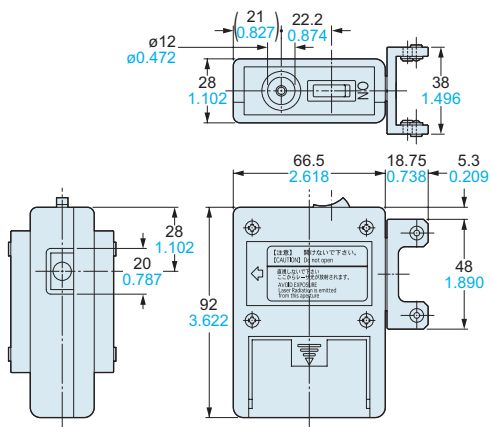


**SFB-WY1** Y-shaped connector

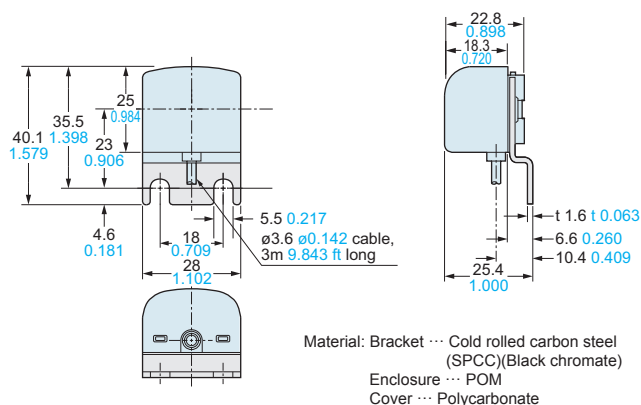


Net weight: 35 g approx.

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



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



FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

**LIGHT CURTAINS**

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC CONTROL DEVICES

ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

HUMAN MACHINE INTERFACES

ENERGY CONSUMPTION VISUALIZATION COMPONENTS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide

Laser Scanner

Single Beam Sensor

**Light Curtains**

Control Units

Optical Touch Switch

Definition of Sensing Heights

**SF4C**

**SF4B**

**SF4B-G**

**SF2B**

**BSF4-AH00**