Type 4

Ultra-slim Safety Light Curtain
SF4C SERIES

The control category differs depending on the configuration and wiring of the external circuit.
Ultra-slim Safety Light Curtain Type 4

SF4C SERIES

Machine safeguarding without sacrificing productivity

Slim size for efficient applications

Available work space is expanded from the previous model, and productivity is improved.

<table>
<thead>
<tr>
<th>Previous</th>
<th>SF4C series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usable work space</td>
<td>Usable work space</td>
</tr>
<tr>
<td>83 % (414 mm 16.299 in)</td>
<td>95 % (474 mm 18.661 in approx.)</td>
</tr>
</tbody>
</table>

Thinness

- Previous: 13 mm 0.512 in
- SF4C series: 13 mm 0.512 in

Usable work space approx.

- Previous: 414 mm 16.299 in
- SF4C series: 474 mm 18.661 in

Safety distance

- Previous: 18 mm 0.709 in
- SF4C series: 102 mm 4.016 in

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

Shorter safety distance to downsize equipment

The safety distance of SF4C series finger protection type is 84 mm 3.307 in shorter than that of SF4C series hard protection type (SF4C-H□). As a result, the depth and guard of the equipment can be downsized.

<table>
<thead>
<tr>
<th>SF4C series</th>
<th>Safety distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finger protection type</td>
<td>102 mm 4.016 in</td>
</tr>
<tr>
<td>Hand protection type</td>
<td>18 mm 0.709 in</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Finger protection type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety distance which is dependent on the safety light curtain</td>
</tr>
<tr>
<td>Shortened by 18 mm 0.709 in</td>
</tr>
</tbody>
</table>

* Calculation based on ISO 13855 with 41 ms or longer being the machinery’s maximum stopping time.

* The safety light curtain cannot be installed within a distance of 100 mm 3.937 in. (ISO 13855)
Can be used in a variety of applications for simplified equipment [Large multi-purpose indicator]

The bright LED indicators located in the center of both sides of each safety light curtain can be illuminated by using external inputs. There is no need for setting up a separate indicator, so that equipment is consolidated.

* The lighting conditions of SF4C series can be changed by using a handy-controller SFC-HC (optional). It is possible to actuate the lighting together with internal operation, regardless of connection of the large multi-purpose indicator input wires.

<table>
<thead>
<tr>
<th>Use as an operation indicator</th>
<th>Use as an error indicator</th>
<th>Use as a muting lamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Solid green</td>
<td>● Blinking red Error present</td>
<td>* If a failure diagnosis of muting lamp is needed as by the result of risk assessment, use the handy-controller SFC-HC (optional) to change the setting, and connect the muting lamp output wire (red) of this safety light curtain to an incandescent lamp separately.</td>
</tr>
<tr>
<td>Equipment is operating</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>● Solid red</td>
<td>Error blinking</td>
<td></td>
</tr>
<tr>
<td>Emergency stop</td>
<td>Confirm detail of error quickly on the digital display.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* The photo is SF4C-H;. SF4C-F differs in the position of digital display.</td>
<td></td>
</tr>
</tbody>
</table>

Use the handy-controller SFC-HC (optional) to change lighting conditions.

Beam-axis alignment indicators help to reduce startup time

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

A single model supports both PNP and NPN polarities reducing model numbers

PNP transistor output and NPN transistor output are combined in a single model. Overseas equipment that uses PNP, replacement with NPN sensors, factories that are positively grounded, and transfer of equipment overseas are all situations where the control circuits for a single model are suitable for use worldwide.

Lightweight!

The SF4C series is made of resin that is approx. 45% lighter than the conventional aluminum case type. Its lightweight body eases the burden on the mounting surface of the equipment and contributes to overall reduced weight during equipment transportation or overseas shipment.

* Except the cable part

IP67 protection structure

An IP67 (IEC) rating is achieved even in an ultra-slim resin body by using a laser welding method.

A fast response time for all models

SF4C-H: 7 ms*, SF4C-F: 9 ms*

The SF4C series reduces the safety distance as well as the calculation work required for the safety distance among models with different beam channels.

* When connecting safety sensors (safety light curtains, etc) to the safety input, the response time will be the total time of connected units

Mutual interference is reduced without needing for interference prevention lines

The ELCA (Extraneous Light Check & Avoid) function automatically shifts the scan timing in order to avoid interference.

Material suitable for manufacturing a secondary battery

SF4C body is made of resin and the mounting bracket is made of Stainless Steel (SUS), so materials used are limited. Suitable for manufacturing secondary batteries or for food production equipment.

Reducing the number of malfunctions caused by extraneous light

Double scanning method and retry processing are effective in eliminating the effects of extraneous light.
Handy-controller SFC-HC (Optional) enables the user to select a variety of settings.

**Operation of the large multi-purpose indicators can be configured**

<table>
<thead>
<tr>
<th>Mode No.</th>
<th>Large multi-purpose indicator 1</th>
<th>Large multi-purpose indicator 2</th>
<th>Control outputs (OSSD 1 / OSSD 2)</th>
<th>Muting function</th>
<th>Override function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>High or Low</td>
<td>High or Low</td>
<td>ON / OFF</td>
<td>Valid</td>
<td>Valid</td>
</tr>
<tr>
<td>1</td>
<td>Blink in red</td>
<td>Blink in green</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>Blink in red</td>
<td>Blink in green</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3</td>
<td>Blink in red</td>
<td>Blink in green</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>4 (Note 1)</td>
<td>Blink in red</td>
<td>Blink in green</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>5 (Note 1)</td>
<td>Blink in green</td>
<td>Blink in green</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>6 (Note 1)</td>
<td>Blink in red</td>
<td>Blink in green</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>7 (Note 1)</td>
<td>Blink in red</td>
<td>Blink in green</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Notes:
1) Blinking takes precedence in case of same color blinks or light up.
2) During lockout, it is possible to blink in red.

**Lockout blinking function**

<table>
<thead>
<tr>
<th>When lockout occurs</th>
<th>Valid</th>
<th>Blinks in red</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Auxiliary output has selectable output configuration**

<table>
<thead>
<tr>
<th>Mode No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Negative logic of the control outputs (OSSD 1, OSSD 2) (factory setting)</td>
</tr>
<tr>
<td>1</td>
<td>Positive logic of the control outputs (OSSD 1, OSSD 2)</td>
</tr>
<tr>
<td>2</td>
<td>For test input enabled: output OFF, For Disabled: output ON</td>
</tr>
<tr>
<td>3</td>
<td>For test input enabled: output ON, For Disabled: output OFF</td>
</tr>
<tr>
<td>4</td>
<td>For unstable incident beam: OFF (Note 1)</td>
</tr>
<tr>
<td>5</td>
<td>For unstable incident beam: ON (Note 1)</td>
</tr>
<tr>
<td>6</td>
<td>For muting: ON</td>
</tr>
<tr>
<td>7</td>
<td>For muting: OFF</td>
</tr>
<tr>
<td>8</td>
<td>For beam received: ON, For beam interrupted: OFF (Note 2)</td>
</tr>
<tr>
<td>9</td>
<td>For beam received: OFF, For beam interrupted: ON (Note 2)</td>
</tr>
<tr>
<td>A</td>
<td>For safety input enabled: ON, Disabled: OFF</td>
</tr>
<tr>
<td>B</td>
<td>For safety input enabled: OFF, Disabled: ON</td>
</tr>
<tr>
<td>C</td>
<td>For lockout: OFF</td>
</tr>
<tr>
<td>D</td>
<td>For lockout: ON</td>
</tr>
</tbody>
</table>

Notes:
1) The output cannot be used while the fix blanking function, floating blanking function or the muting function is activated.
2) This device outputs the beam received/interrupted state under activating the auxiliary output switching function using the handy-controller irrespective of activating other functions, fixed blanking function, floating blanking function, and muting function.

**Fixed blanking function which allows selective beam channels to be activated improves productivity**

The SF4C series is equipped with a fixed blanking function which allows specific beam channels to be selectively interrupted without causing the control output (OSSD) to output the OFF signal. This function is convenient for use with applications in which certain fixed obstacles tend to interrupt specific beam channels.

**Floating blanking function which allows non-specified beam channels to be deactivated improves productivity**

1, 2 or 3 non-specified beam channels can be deactivated. This function is useful in the event when an object passes through the safety light curtain’s sensing area.

**Safety, productivity, and cost reduction [Muting control function]**

The safety light curtain has a built-in muting control function that causes the line to stop only when a person passes through the safety light curtain, and does not stop the line when an object passes through. The muting sensors and muting lamps can be connected directly to the safety light curtain. Furthermore, the large multi-purpose indicators can be used as muting lamps, which contribute to less wiring troubles, improvement of safety and productivity, and cost reduction.

*If a failure diagnosis of muting lamp is needed as by the result of risk assessment, use the handy-controller SFC-HC (optional) to change the setting, and connect the muting lamp output wire (red) of this safety light curtain to an incandescent lamp separately.*
Selective muting area [Separate muting control function for each beam channel]

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

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

Safety measures when objects exit [Exit muting control function]

Muting at the exit of a machine is now possible using the handy-controller SFC-HC (optional). Just set a Max. four sec. delay timer on the muting sensors located at the exit. This is efficient for places with no installation space for muting sensors and also reduces cost and wiring.

By installing muting sensors only within the dangerous zone and setting up a delay timer on the sensor, muting control is made possible even on the exit side where muting sensors cannot be installed.

Safety circuit is constructed without the need for a safety relay unit [External device monitoring function]

The safety light curtain has a built-in external device monitoring function (such as deposited relay monitoring) and an interlock function. This allows a safety circuit to be constructed so that a separate safety relay unit is not needed, and the control box has become smaller to help to achieve to lower costs.

The safety light curtain can directly connect to external devices (safety relay, etc) without an exclusive control unit. This allows for simplified equipment, cost reduction, and error prevention.
Industry first*1 Wire-saving when connecting to safety devices [Safety input function]

Contact outputs such as an emergency stop switches or a safety door switches can be connected to the safety light curtain. Also, by using the handy-controller SFC-HC (optional) up to three sets of safety light curtains can be cascade connected for a consolidated safety output.

* As of March 2009, in-company survey

Direct connection of safety devices

Previous

SF4C series

A safety relay unit is needed for connecting safety devices other than safety light curtain.

By using the handy-controller SFC-HC (optional) up to three sets of safety light curtains can be cascade connected for a consolidated safety output. (Note)

Three sets of safety light curtains require three sets of safety relays.

Individual monitoring on safety light curtains is possible while the outputs of three sets of safety light curtains and other safety devices are consolidated in one unit.

Note: This setting is possible with the use of handy-controller SFC-HC (optional) for SF4C series Ver.2.1 or later.
## PRODUCT CONFIGURATION

### Maintenance is prioritized

Pigtailed type (with mounting bracket, connector attached cable)

- Standard mounting bracket MS-SFC-1 (Accessory)
- Connector attached cable 0.5 m 1.640 ft

<table>
<thead>
<tr>
<th>Type</th>
<th>Appearance</th>
<th>Operating range (Note 1)</th>
<th>Model No. (Note 2)</th>
<th>Number of beam channels</th>
<th>Protective height (mm in)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pigtailed type</strong></td>
<td></td>
<td></td>
<td>SF4C-F15-J05</td>
<td>15</td>
<td>160 mm 6.299 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SF4C-F23-J05</td>
<td>23</td>
<td>240 mm 9.449 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SF4C-F31-J05</td>
<td>31</td>
<td>320 mm 12.598 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SF4C-F39-J05</td>
<td>39</td>
<td>400 mm 15.748 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SF4C-F47-J05</td>
<td>47</td>
<td>480 mm 18.898 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SF4C-F55-J05</td>
<td>55</td>
<td>560 mm 22.047 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SF4C-F63-J05</td>
<td>63</td>
<td>640 mm 25.197 in</td>
</tr>
</tbody>
</table>

### Basic set in one model No.

Cable type [Mounting bracket, with 5 m (16.404 ft) cable]

- Standard mounting bracket MS-SFC-1 (Accessory)
- Cable 5 m 16.404 ft (discrete wire)

### ORDER GUIDE

#### 1 Safety light curtains

<table>
<thead>
<tr>
<th>Type</th>
<th>Appearance</th>
<th>Operating range (Note 1)</th>
<th>Model No. (Note 2)</th>
<th>Number of beam channels</th>
<th>Protective height (mm in)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Finger protection type</strong></td>
<td></td>
<td></td>
<td>SF4C-F15-J05</td>
<td>15</td>
<td>160 mm 6.299 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SF4C-F23-J05</td>
<td>23</td>
<td>240 mm 9.449 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SF4C-F31-J05</td>
<td>31</td>
<td>320 mm 12.598 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SF4C-F39-J05</td>
<td>39</td>
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<td>SF4C-F55-J05</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SF4C-F63-J05</td>
<td>63</td>
<td>640 mm 25.197 in</td>
</tr>
</tbody>
</table>

Notes: 1) The operating range is the possible setting distance between the emitter and the receiver.
2) The model No. with suffix “E” shown on the label affixed to the product is the emitter, “D” shown on the label is the receiver.

#### 2 Receiver cannot be placed in this range

**Actual operating range of the safety light curtain**

**Setting range of the receiver**

**3 Mating cables**

<table>
<thead>
<tr>
<th>Type</th>
<th>Appearance</th>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mating cables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With connector on one end</td>
<td>SFB-CC3-MU</td>
<td>Length: 3 m 9.843 ft</td>
<td>Cable with connector on one end for pigtailed type</td>
</tr>
<tr>
<td></td>
<td>SFB-CC7-MU</td>
<td>Length: 7 m 22.966 ft</td>
<td>Two cables per set for emitter and receiver</td>
</tr>
<tr>
<td></td>
<td>SFB-CC10-MU</td>
<td>Length: 10 m 32.808 ft</td>
<td>Cable color: Gray (for emitter), Gray with black line (for receiver)</td>
</tr>
<tr>
<td></td>
<td>SFB-CCJ3E-MU</td>
<td>Length: 3 m 9.843 ft</td>
<td>Connector color: Gray (for emitter), Black (for receiver)</td>
</tr>
<tr>
<td></td>
<td>SFB-CCJ10E-MU</td>
<td>Length: 10 m 32.808 ft</td>
<td>The min. bending radius: R6 mm R0.236 in</td>
</tr>
</tbody>
</table>

| Mating cables            |            |           |             |
| With connectors on both ends | SFB-CCJ3D-MU | Length: 3 m 9.843 ft | Cable with connectors on both ends for pigtailed type |
|                          | SFB-CCJ10D-MU | Length: 10 m 32.808 ft | Connector color: Gray (for emitter), Black (for receiver) |

Notes: 1) The operating range is the possible setting distance between the emitter and the receiver.
2) The model No. with suffix “E” shown on the label affixed to the product is the emitter, “D” shown on the label is the receiver.

**Actual operating range of the safety light curtain**

**Setting range of the receiver**

**Cable color: Gray (for emitter), Gray with black line (for receiver) **

**Connector color: Gray (for emitter), Black (for receiver) **

**The min. bending radius: R6 mm R0.236 in**
Spare parts (Accessories for safety light curtain)

<table>
<thead>
<tr>
<th>Designation</th>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard mounting bracket</td>
<td>MS-SFC-1</td>
<td>Allows the safety light curtain to be mounted at the rear with one M5 hexagon-socket-head bolt. Mounting direction of the bracket can be selected between vertical or horizontal (no dead zone). (4 pcs. per set for emitter and receiver)(Note)</td>
</tr>
<tr>
<td>Test rod ø14</td>
<td>SF4C-TR14</td>
<td>Min. sensing object for regular checking (ø14 mm ø0.551 in)</td>
</tr>
<tr>
<td>Test rod ø25</td>
<td>SF4C-TR25</td>
<td>Min. sensing object for regular checking (ø25 mm ø0.984 in)</td>
</tr>
</tbody>
</table>

Note: The body of the safety light curtain is made of resin, so please take into account the expansion and contraction of the longitudinal dimension. When machining mounting holes, please check the actual product.

Mounting brackets

<table>
<thead>
<tr>
<th>Designation</th>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA2-N compatible mounting bracket</td>
<td>MS-SFC-2</td>
<td>Used when changing over area sensor NA2-N series to the SF4C series. The mounting holes of NA2-N series can continue to be used. Center mounting by a M6 hexagon-socket-head bolt is also possible. (4 pcs. per set for emitter and receiver)(Note)</td>
</tr>
<tr>
<td>Versatile bracket</td>
<td>MS-SFC-3</td>
<td>Two ways of mounting are possible. 1 Rear mounting which enables beam adjustment 2 Dead zoneless center mounting on aluminum frame (4 pcs. per set for emitter and receiver)(Note)</td>
</tr>
<tr>
<td>Intermediate supporting bracket</td>
<td>MS-SFC-4</td>
<td>Used to support the safety light curtain in the middle. Be sure to purchase it when using the versatile bracket MS-SFC-3(optional) on SF4C-F55(-J05), SF4C-F63(-J05), SF4C-H28(-J05), or SF4C-H32(-J05), (2 pcs. per set for emitter and receiver)(Note)</td>
</tr>
</tbody>
</table>

Note: The body of the safety light curtain is made of resin, so please take into account the expansion and contraction of the longitudinal dimension. When machining mounting holes, please check the actual product.

OPTIONS

NA2-N compatible mounting bracket

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-SFC-2</td>
<td>Mounting holes for M4 screw Mounting hole for M6 hexagon-socket-head bolt (Purchase separately.)</td>
</tr>
</tbody>
</table>

Versatile bracket

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-SFC-3</td>
<td>Mounting holes for M4 screw Mounting hole for M6 hexagon-socket-head bolt</td>
</tr>
</tbody>
</table>

Intermediate supporting bracket for versatile bracket

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-SFC-4</td>
<td>Mounting hole for M6 hexagon-socket-head bolt (Mount on either one)</td>
</tr>
</tbody>
</table>
**OPTIONS**

### Control unit

<table>
<thead>
<tr>
<th>Designation</th>
<th>Appearance</th>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slim type control unit</td>
<td>SF-C13</td>
<td></td>
<td>Use a discrete wire cable to connect to the safety light curtain. Relay output. Compatible up to Control Category 4.</td>
</tr>
</tbody>
</table>

### Recommended safety relay

**SF relay, slim type**

- **Type**: SF relay, slim type
- **Model No.**: SFS3-L-DC24V (AG1S132), SFS4-L-DC24V (AG1S142)

#### SF relay, slim type

- **Model No.**: SFS3-L-DC24V (AG1S132), SFS4-L-DC24V (AG1S142)
- **Contact arrangement**: 3a1b, 4a2b
- **Rated nominal switching capacity**: 6 A / 250 V AC, 6 A / 30 V DC
- **Min. switching capacity**: 1 mA / 5 V DC
- **Rated power consumption**: 360 mW, 500 mW
- **Operation time**: 20 ms or less
- **Release time**: 20 ms or less
- **Ambient temperature**: –40 to +85 °C, –40 to +185 °F (Humidity: 5 to 85 % RH)
- **Applicable standards**: UL/c-UL, TÜV, Korea’s S-mark

#### DIN terminal block

- **Type**: SFS4-SFD (AG1S847) [4-poles type], SFS6-SFD (AG1S867) [6-poles type]

#### Wire-saving Y-shaped connector

- **Model No.**: SFC-WY1
- **Description**: Wire-saving connector for SF4C-F□-J05 and SF4C-H□-J05. 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), large multi-purpose indicator input 1, and large multi-purpose indicator input 2 only. Net weight: 40 g approx. [Power wire and synchronization wire are connected inside the connector. Interlock is disabled (automatic reset).]

#### Cable with connector on one side

- **Model No.**: WY1-CCN3, WY1-CCN10
- **Description**: Mating cable for Y-shaped connector. Connection color: Gray (with black line). Connector color: Black. The min. bending radius: R6 mm R0.236 in. Connector outer diameter: ø14 mm ø0.551 in max.

### Y-shaped connectors

- **Type**: Wire-saving Y-shaped connector
- **Model No.**: SFC-WY1
- **Description**: Wire-saving connector for SF4C-F□-J05 and SF4C-H□-J05. 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), large multi-purpose indicator input 1, and large multi-purpose indicator input 2 only. Net weight: 40 g approx. [Power wire and synchronization wire are connected inside the connector. Interlock is disabled (automatic reset).]

- **Type**: Cable with connector on one side
- **Model No.**: WY1-CCN3, WY1-CCN10
- **Description**: Mating cable for Y-shaped connector. Connection color: Gray (with black line). Connector color: Black. The min. bending radius: R6 mm R0.236 in. Connector outer diameter: ø14 mm ø0.551 in max.

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

**Previous**

A total of 24 wires

**Y-shaped connector**

Only 7 wires

Less wiring mistakes! Reduced wiring time! Easy wiring to Safety PLC, etc.
Ultra-slim Safety Light Curtain Type 4 SF4C SERIES

Product configuration

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

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

Pigtailed type
0.5 m 1.640 ft

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

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

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

**For PNP output (minus ground)**

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

**For NPN output (plus ground)**

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

**Connector pin layout**

<table>
<thead>
<tr>
<th>Connector pin No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OSSD 2</td>
</tr>
<tr>
<td>2</td>
<td>+24 V</td>
</tr>
<tr>
<td>3</td>
<td>OSSD 1</td>
</tr>
<tr>
<td>4</td>
<td>Not used</td>
</tr>
<tr>
<td>5</td>
<td>Large multi-purpose indicator input 1</td>
</tr>
<tr>
<td>6</td>
<td>Large multi-purpose indicator input 2</td>
</tr>
<tr>
<td>7</td>
<td>0 V</td>
</tr>
<tr>
<td>8</td>
<td>Output polarity setting wire (Shield)</td>
</tr>
</tbody>
</table>

**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.
2) Use a momentary-type switch as the reset (RESET) button.
3) Unused wires must be insulated.
## Ultra-slim Safety Light Curtain Type 4 SF4C SERIES

### OPTIONS

#### Handy-controller

<table>
<thead>
<tr>
<th>Designation</th>
<th>Appearance</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handy-controller</td>
<td></td>
<td>SFC-HC</td>
</tr>
</tbody>
</table>

- **Metal protection case**

<table>
<thead>
<tr>
<th>Applicable beam channels</th>
<th>Designation</th>
<th>Metal protection case (2 pcs. per set for emitter and receiver)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF4C-F</td>
<td>SF4C-H</td>
<td>Model No.</td>
</tr>
<tr>
<td>15</td>
<td>8</td>
<td>MS-SFCH-8</td>
</tr>
<tr>
<td>23</td>
<td>12</td>
<td>MS-SFCH-12</td>
</tr>
<tr>
<td>31</td>
<td>16</td>
<td>MS-SFCH-16</td>
</tr>
<tr>
<td>39</td>
<td>20</td>
<td>MS-SFCH-20</td>
</tr>
<tr>
<td>47</td>
<td>24</td>
<td>MS-SFCH-24</td>
</tr>
<tr>
<td>55</td>
<td>28</td>
<td>MS-SFCH-28</td>
</tr>
<tr>
<td>63</td>
<td>32</td>
<td>MS-SFCH-32</td>
</tr>
</tbody>
</table>

- **Pigtailed type**

- **Cable type**

- **Cable type**

- **Options**

- **MS-SFCH-8**
- **MS-SFCH-12/16/20/24/28/32**
# SPECIFICATIONS

## Safety light curtain individual specifications

### SF4C-F

<table>
<thead>
<tr>
<th>Type</th>
<th>Min. sensing object ø14 mm ø0.551 in type (10 mm 0.394 in beam pitch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF4C-F□</td>
<td></td>
</tr>
<tr>
<td>Pigtailed type</td>
<td></td>
</tr>
<tr>
<td>Cable type</td>
<td></td>
</tr>
<tr>
<td>SF4C-F□</td>
<td></td>
</tr>
<tr>
<td>No. of beam channels</td>
<td>15</td>
</tr>
<tr>
<td>Protective height</td>
<td>160 mm 6.299 in</td>
</tr>
<tr>
<td>Current consumption</td>
<td>Emitter: 70 mA or less</td>
</tr>
<tr>
<td>PFH₀</td>
<td>2.29 × 10⁻⁶</td>
</tr>
<tr>
<td>MTTF₀</td>
<td>100 years or more</td>
</tr>
<tr>
<td>Net weight (Total of emitter and receiver)</td>
<td>Pigtailed type</td>
</tr>
<tr>
<td>Cable type</td>
<td>600 g approx.</td>
</tr>
</tbody>
</table>

### SF4C-H

<table>
<thead>
<tr>
<th>Type</th>
<th>Min. sensing object ø25 mm ø0.984 in type (20 mm 0.787 in beam pitch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF4C-H□</td>
<td></td>
</tr>
<tr>
<td>Pigtailed type</td>
<td></td>
</tr>
<tr>
<td>Cable type</td>
<td></td>
</tr>
<tr>
<td>SF4C-H□</td>
<td></td>
</tr>
<tr>
<td>No. of beam channels</td>
<td>6</td>
</tr>
<tr>
<td>Protective height</td>
<td>160 mm 6.299 in</td>
</tr>
<tr>
<td>Current consumption</td>
<td>Emitter: 70 mA or less</td>
</tr>
<tr>
<td>PFH₀</td>
<td>1.66 × 10⁻⁶</td>
</tr>
<tr>
<td>MTTF₀</td>
<td>100 years or more</td>
</tr>
<tr>
<td>Net weight (Total of emitter and receiver)</td>
<td>Pigtailed type</td>
</tr>
<tr>
<td>Cable type</td>
<td>630 g approx.</td>
</tr>
</tbody>
</table>

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

PFH₀: Probability of dangerous failure per hour, MTTF₀: Mean time to dangerous failure (in years)
### SPECIFICATIONS

#### Safety light curtain common specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
<th>Pigtailed type</th>
<th>Cable type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model No.</td>
<td>SF4C-F-□:□05</td>
<td>SF4C-H-□:□05</td>
<td>SF4C-F□</td>
</tr>
<tr>
<td><strong>International standard</strong></td>
<td>IEC 61496-1/2 (Type 4), ISO 13849-1 (Category 4, PLe), IEC 61508-1 to 7 (SIL 3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Japan</strong></td>
<td>JIS B 9704-1/2 (Type 4), JIS B 9705 (Category 4), JIS C 0508 (SIL 3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Europe (EU) (Note 2)</strong></td>
<td>EN 61496-1/2 (Type 4), EN ISO 13849-1 (Type 4), PLe, EN 61508-1 to 7 (SIL 3), EN 55011, EN 50178, EN 61000-6-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>North America (Note 3)</strong></td>
<td>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Regulatory compliance</strong></td>
<td>CE Marking (Machinery Directive, EMC Directive, RoHS Directive), TÜV SÜD certification, TÜV SÜD NRTL certification, S-mark certification(SF4C-H□:□05) only</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating range (Note 4)</strong></td>
<td>0.1 to 3 m 0.328 to 9.843 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Beam pitch</strong></td>
<td>10 mm 0.394 in 20 mm 0.787 in</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min. sensing object (Note 5)</strong></td>
<td>ø14 mm ø0.551 in opaque object</td>
<td>ø25 mm ø0.984 in opaque object</td>
<td>ø14 mm ø0.551 in opaque object</td>
</tr>
<tr>
<td><strong>Effective aperture angle</strong></td>
<td>±2.5° or less [for an operating range exceeding 3 m 9.843 ft (conforming to IEC 61496-2, ANSI/UL 61496-2)]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Supply voltage</strong></td>
<td>24 V DC ±10 % Ripple P 10 % or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Control outputs (OSSD 1, OSSD 2)</strong></td>
<td>PNP open-collector transistor / NPN open-collector transistor (switching method)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response time</strong></td>
<td>OFF response: 9 ms or less, ON response: 90 ms or less</td>
<td>OFF response: 7 ms or less, ON response: 90 ms or less</td>
<td>OFF response: 9 ms or less, ON response: 90 ms or less</td>
</tr>
<tr>
<td><strong>Auxiliary output (Non-safety output)</strong></td>
<td>PNP open-collector transistor / NPN open-collector transistor (switching method)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protection circuit</strong></td>
<td>Incorporated</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operation mode</strong></td>
<td>ON when all beam channels are received, OFF when one or more beam channels are interrupted</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protection circuit</strong></td>
<td>Incorporated</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ELCA function</strong></td>
<td>Incorporated (reducing mutual interference automatically)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Test / reset input function</strong></td>
<td>Incorporated</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interlock function</strong></td>
<td>Incorporated (Manual reset / Automatic reset (Note 8))</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>External device monitoring function</strong></td>
<td>Incorporated</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Safety input function</strong></td>
<td>Incorporated (safety contact)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mutting function / Override function</strong></td>
<td>Incorporated</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optional functions (Note 9)</strong></td>
<td>In case of using optional function, the handy-controller SFC-H□ (optional).</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pollution degree / Operating altitude</strong></td>
<td>3 / 2,000 m 6.561 68 ft or less (Note 10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Degree of protection</strong></td>
<td>IP67 / IP65 (IEC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>–10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), Storage: –25 to +60 °C –13 to +140 °F</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient humidity</strong></td>
<td>30 to 85 % RH, Storage: 30 to 85 % RH</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient illumination</strong></td>
<td>Incandescent light: 5,000 lx or less at the light-receiving face</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dielectric strength voltage</strong></td>
<td>1,000 V AC for one min. between all supply terminals connected together and enclosure</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Insulation resistance</strong></td>
<td>20 MΩ, or more, with 500 V DC megger between all supply terminals connected together and enclosure</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vibration resistance</strong></td>
<td>10 to 55 Hz frequency, 0.75 mm 0.030 in double amplitude in X, Y and Z directions for two hours each</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shock resistance</strong></td>
<td>300 m/s² acceleration (30 G approx.) in X, Y and Z directions three times each</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Emitting element</strong></td>
<td>Infrared LED (Peak emission wavelength: 855 nm 0.034 mJ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Enclosure: Polycarbonate alloy, Sensing surface: Polycarbonate alloy, MS-SFC-1 (Standard mounting bracket): SUS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cable</strong></td>
<td>0.15 mm² power line 0.2 mm² control wire, 0.15 mm² power line 0.2 mm² control wire, 0.15 mm² power line 0.2 mm² control wire, 12 core heat-resistant PVC cable, 5 m 16.404 ft long</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cable extension</strong></td>
<td>Extension up to 40.5 m 132.874 ft is possible for both emitter and receiver optional mating cables</td>
<td>Extension up to 40.5 m 132.874 ft is possible for both emitter and receiver, with 0.2 mm² or more cable (Note 11) (Note 12)</td>
<td></td>
</tr>
<tr>
<td><strong>Accessories</strong></td>
<td>MS-SFC-1 (Standard mounting bracket): 1 set, SF4C-Tr (Test rod): 1 No.</td>
<td>MS-SFC-1 (Standard mounting bracket): 1 set, SF4C-Tr (Test rod): 1 No.</td>
<td>MS-SFC-1 (Standard mounting bracket): 1 set, SF4C-Tr (Test rod): 1 No.</td>
</tr>
</tbody>
</table>

**Notes:**
1. Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
2. Regarding EU Machinery Directive, a Notified Body, TÜV SÜD, has certified with the type examination certificate.
3. With regards to the standards in the US, under the safety regulations based on CEC (Canadian Electric Code), TÜV SÜD America, a Certification Body accredited by SCC, has certified with the safety certificate based on CSA standards.
4. In case of using optional function, the handy-controller SFC-H□ (optional).
5. When the floating blanking function is used, the size of the min. sensing object is changed.
6. The outputs are not “OFF” when muting function is active even if the beam channel is interrupted.
7. In case the blanking function is valid, the operation mode is changed.
8. The manual reset and automatic reset are possible to be switched depending on the wiring status.
9. In case of using optional function, the handy-controller SFC-H□ (optional) is required.
10. Do not use or store in an environment pressurized to atmospheric pressure or higher at an altitude of 0 m.
11. When the muting lamp is used, the cable can be extended within 30.5 m 100.066 ft (for emitter / receiver).
12. When the synchronization + wire (orange) and synchronization - wire (orange / black) is extended with a cable other than exclusive cable, use a 0.2 mm² or more shielded twisted pair cable.
# SPECIFICATIONS

## Control unit

<table>
<thead>
<tr>
<th>Model No.</th>
<th>SF-C13</th>
</tr>
</thead>
</table>

### Connectable safety light curtains
Safety light curtain manufactured by Panasonic Industry

### Applicable standards
- EN 61496-1 (Type 4), EN 55011, EN ISO 13849-1 (Category 4, PLe), IEC 61496-1 (Type 4), ISO 13849-1 (Category 4, PLe), JIS B 9704-1 (Type 4), JIS B 9705-1 (Category 4), ANSI/UL 61496-1 (Type 4), UL 1998 (Class 2)

### Regulatory compliance

### 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 (without safety light curtain)

### Fuse (power supply)
Built-in electronic fuse, Triggering current: 0.5 A or more, Reset after power down

### Safety output
- NO contact × 3 (13-14, 23-24, 33-34)
- AC-15, DC-13 (IEC 60947-5-1)
- Rated operation voltage (Ue) / Rated operation current (Ie)
  - 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 2)
- Contact resistance
  - 100 mΩ or less (initial value)
- Contact protection fuse rated
  - 4 A (slow blow)
- Pick-up delay (Auto reset / Manual reset)
  - 80 ms or less / 90 ms or less
- Response time (Recovery time)
  - 10 ms or less

### Auxiliary output
- Safety relay contact (NC contact) × 1 (41-42) (Related to safety output)
- Rated operation voltage / current
  - 24 V DC / 2 A, Min. applicable load: 10 mA (at 24 V DC)
- Contact protection fuse rated
  - 2 A (slow blow)

### Semiconductor auxiliary output (AUX)
- PNP open-collector transistor
- Max. source current: 60 mA

### Output operation
On when the safety light curtain is interrupted

### Excess voltage category
II

### Polarity selection function
- Incorporated (Cable connection allows selection of plus/minus ground)
- Minus ground: Correspond to PNP output safety light curtain
- Plus ground: Correspond to NPN output safety light curtain

### Pollution degree
2

### Environmental protection
- Enclosure: IP40, Terminal IP20
- Ambient temperature: –10 to +55 °C (-14 to +131 °F) (No dew condensation or icing allowed), Storage: –25 to +70 °C (-13 to +158 °F)
- Ambient humidity: 30 to 85 % RH, Storage: 30 to 95 % RH
- Vibration resistance: Resistance to malfunction 10 to 55 Hz frequency, 0.35 mm 0.014 in double amplitude in X, Y, and Z directions twenty times each

### Enclosure material
ABS

### Weight
- 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) If several SF-C13 units are being used in 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.

## Handy-controller

<table>
<thead>
<tr>
<th>Model No.</th>
<th>SFC-HC</th>
</tr>
</thead>
</table>

### Supply voltage
24 V DC ± 10 % Ripple P-P 10 % or less (common to safety light curtain power supply)

### Current consumption
65 mA or less

### Communication method
RS-485 two-way communications (Specific procedure)

### Digital display
4-digit red LED display × 2 (Selected beam channels, setting contents etc. are displayed.)

### Function indicators
Green LED × 9 (Sel function is displayed.)

### Functions
- Fixed blanking / Floating blanking / Auxiliary output change / Safety input setting change / Large multi-purpose indicator setting change / Muting setting change / Interlock setting change / External device monitoring setting change / Override setting changing function 60 sec. / Protecting

### Environmental
- Ambient temperature
  - –10 to +55 °C / +14 to +131 °F (No dew condensation or icing allowed), Storage: –25 to +70 °C / –13 to +158 °F
- Ambient humidity
  - 30 to 85 % RH, Storage: 30 to 85 % RH
- Voltage withstandability
  - 1,000 V AC for one min. between all supply terminals connected together and enclosure
- Insulation resistance
  - 20 MΩ, or more, with 500 V DC megger between all supply terminals connected together and enclosure
- Cable
  - 12-core shielded cable, 0.5 m 1.640 ft long, with a connector at the end (2 cables)

### Weight
- Net weight: 200 g approx.

Note: Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C / +68 °F.
I/O CIRCUIT AND WIRING DIAGRAMS

In case of using I/O circuit for PNP output:

Emitter

Terminal No. of pigtailed type

Color code

Terminal

(Pink) Test input / Reset input

(Yellow) Override input

(Gray) Safety input 1

(Gray) Safety input 2

(Pale purple) Interlock setting input

(Brown) +V

(Orange) Synchronization +

(Orange / Black) Synchronization –

(Blue) 0 V

Load

Internal circuit

Users’ circuit

External device monitoring input

Black) Control output 1 (OSSD 1)

White) Control output 2 (OSSD 2)

Yellow-green / Black) Auxiliary output

Sky-blue / Black) Muting input 2

Sky-blue / White) Muting input 1

Gray / Black) Large multi-purpose indicator input 2

Gray) Large multi-purpose indicator input 1

Gray / Black) Output polarity setting wire

Shield) Output polarity setting wire

Blue) 0 V

K1

K2

K1, K2: External device monitoring input

(Force-guided relay or magnet contactor)

Note: Vs is the applying supply voltage.

Switch S1

• Test input / Reset input
  For manual reset
  Vs to Vs – 3.5 V (sink current 5 mA or less): OFF (Note)
  Open: ON
  For automatic reset
  Vs to Vs – 3.5 V (sink current 5 mA or less): ON (Note)
  Open: OFF

Switch S2

• Interlock setting input, Override input, Muting input 1/2, Large multi-purpose indicator input 1/2,
  Vs to Vs – 3.5 V (sink current 5 mA or less): Valid (Note)
  Open: Invalid

Note: Vs is the applying supply voltage.

In case of using I/O circuit for NPN output:

Emitter

Terminal No. of pigtailed type

Color code

Terminal

(Pink) Test input / Reset input

(Yellow) Override input

(Gray) Safety input 1

(Gray) Safety input 2

(Pale purple) Interlock setting input

(Brown) +V

(Orange) Synchronization +

(Orange / Black) Synchronization –

(Blue) 0 V

Load

Internal circuit

Users’ circuit

External device monitoring input

Black) Control output 1 (OSSD 1)

White) Control output 2 (OSSD 2)

Yellow-green / Black) Auxiliary output

Sky-blue / Black) Muting input 2

Sky-blue / White) Muting input 1

Gray / Black) Large multi-purpose indicator input 2

Gray) Large multi-purpose indicator input 1

Gray / Black) Output polarity setting wire

Shield) Output polarity setting wire

Blue) 0 V

K1

K2

K1, K2: External device monitoring input

(Force-guided relay or magnet contactor)

Note: Vs is the applying supply voltage.

Switch S1

• Test input / Reset input
  For manual reset
  0 to +2.5 V (source current 5 mA or less): OFF
  Open: ON
  For automatic reset
  0 to +2.5 V (source current 5 mA or less): OFF
  Open: ON

Switch S2

• Interlock setting input, Override input, Muting input 1/2, Large multi-purpose indicator input 1/2,
  0 to +2.5 V (source current 5 mA or less): Valid
  Open: Invalid

Note: Vs is the applying supply voltage.
**I/O CIRCUIT AND WIRING DIAGRAMS**

**Connection example**

**Basic wiring: Min. operation only**

This is the general configuration using one set of the emitter and receiver facing each other. The control outputs (OSSD 1 / OSSD 2) turn OFF if the light is interrupted, while they automatically turn ON if receive the light.

The auxiliary output is used to invalidate the external device monitoring function. The auxiliary output cannot be connected to external devices.

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**PRECAUTIONS FOR PROPER USE**

- **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.

- **This catalog is a guide to select a suitable product.** Be sure to read instruction manual prior to its use.

- **Both emitter and receiver are adjusted before shipment, please apply both emitter and receiver with the same serial No.** The serial No. is indicated on the plates of both emitter and receiver. (Indicated under model No.)

- **Make sure to carry out the test run before regular operation.**

- **Do not install this safety light curtain with a machine whose operation cannot be stopped immediately in the middle of an operation cycle by an emergency stop equipment.**

- **This device has been developed / produced for industrial use only.**

- **Do not use during the initial transient time (2 sec.) after the power supply is switched on.**

- **Avoid dust, dirt and steam.**

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

- **Take care that the sensor is not directly exposed to fluorescent lamp from a rapid-starter lamp or a high frequency lighting device, as it may affect the sensing performance.**

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**Handy-controller**

This safety light curtain enables to set each function using the handy-controller SFC-HC (optional). 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.

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**Others**

- **This device has been developed / produced for industrial use only.**

- **Do not use during the initial transient time (2 sec.) after the power supply is switched on.**

- **Avoid dust, dirt and steam.**

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

- **Take care that the sensor is not directly exposed to fluorescent lamp from a rapid-starter lamp or a high frequency lighting device, as it may affect the sensing performance.**
DIMENSIONS (Unit: mm in)

Mounting bracket assembly dimensions

Mounting drawing for the safety light curtains using the standard mounting brackets MS-SFC-1 (accessory).

<Center mounting>  <Dead zoneless mounting>

Connector of the pigtailed type SF4C-F□-J05 / SF4C-H□-J05

Notes: 1) Measurement of drawing above is display section of SF4C-H□. In case of SF4C-F□, the position of digital error indicator (red) is different as lower figure. Also, digital error indicator (red) is not incorporated in SF4C-F15□-J05.

2) The body of the safety light curtain is made of resin, so please take into account the expansion and contraction of the longitudinal dimension. When machining mounting holes, please check the actual product.

The CAD data can be downloaded from our website.
### DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

#### Mounting bracket assembly dimensions

Mounting drawing for the safety light curtains using the versatile brackets MS-SFC-C3 (optional) and intermediate supporting bracket for versatile brackets MS-SFC-F4 (optional).

#### Table of Mounting Bracket Assembly Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Intermediate Supporting Bracket</th>
<th>Emitter</th>
<th>Receiver</th>
<th>Emitter</th>
<th>Receiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF4C-F15(-J05)</td>
<td>SF4C-H8(-J05)</td>
<td>175</td>
<td>6.890</td>
<td>116</td>
<td>4.567</td>
</tr>
<tr>
<td>SF4C-F23(-J05)</td>
<td>SF4C-H12(-J05)</td>
<td>255</td>
<td>10.039</td>
<td>196</td>
<td>7.717</td>
</tr>
<tr>
<td>SF4C-F31(-J05)</td>
<td>SF4C-H16(-J05)</td>
<td>335</td>
<td>13.189</td>
<td>276</td>
<td>10.866</td>
</tr>
<tr>
<td>SF4C-F39(-J05)</td>
<td>SF4C-H20(-J05)</td>
<td>415</td>
<td>16.339</td>
<td>356</td>
<td>14.016</td>
</tr>
<tr>
<td>SF4C-F47(-J05)</td>
<td>SF4C-H24(-J05)</td>
<td>495</td>
<td>19.488</td>
<td>436</td>
<td>17.165</td>
</tr>
<tr>
<td>SF4C-F55(-J05)</td>
<td>SF4C-H28(-J05)</td>
<td>575</td>
<td>22.638</td>
<td>516</td>
<td>20.315</td>
</tr>
<tr>
<td>SF4C-F63(-J05)</td>
<td>SF4C-H32(-J05)</td>
<td>655</td>
<td>25.787</td>
<td>596</td>
<td>23.465</td>
</tr>
</tbody>
</table>

#### Notes:

1. Be sure to mount MS-SFC-4 when using SF4C-F55(-J05), SF4C-F63(-J05), SF4C-F63(-J05), SF4C-H28(-J05), SF4C-H32(-J05), and SF4C-H32(-J05).
2. The body of the safety light curtain is made of resin, so please take into account the expansion and contraction of the longitudinal dimension. When machining mounting holes, please check the actual product.
### DIMENSIONS (Unit: mm in)

#### MS-SFC-1 Standard mounting bracket (Accessory)

- **Material:** Stainless steel (SUS304)
- **Net weight:** 32 g approx. (4 pcs.)
- **Package weight:** 35 g approx.
- **Four bracket set**
  - Four M3 (length 4 mm 0.157 in) countersunk screws are attached.

#### MS-SFC-2 NA2-N compatible mounting bracket (Optional)

- **Material:** Stainless steel (SUS304)
- **Net weight:** 40 g approx. (2 pcs.)
- **Package weight:** 40 g approx.
- **Four bracket set**
  - Four M3 (length 4 mm 0.157 in) countersunk screws are attached.

#### MS-SFC-3 Versatile bracket (Optional)

**<Rear mounting>**

- **Material:** Stainless steel (SUS304)
- **Net weight:** 75 g approx. (4 pcs.)
- **Package weight:** 90 g approx.
- **Four bracket set**
  - Four M3 (length 4 mm 0.157 in) countersunk screws are attached.

**<Dead zoneless mounting>**

- **Material:** Stainless steel (SUS304)
- **Net weight:** 75 g approx. (4 pcs.)
- **Package weight:** 90 g approx.
- **Four bracket set**
  - Four M3 (length 4 mm 0.157 in) countersunk screws are attached.

#### MS-SFC-4 Intermediate supporting bracket for versatile bracket (Optional)

- **Material:** Stainless steel (SUS304)
- **Net weight:** 40 g approx. (2 pcs.)
- **Package weight:** 60 g approx.
  - Two bracket set

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The CAD data can be downloaded from our website.
Assembly dimensions

Mounting drawing for the safety light curtains using the metal protection case (MS-SFCH-□).
Ultra-slim Safety Light Curtain Type 4 SF4C SERIES

### Dimensions (Unit: mm in)

**SFB-CC□-MU**  
Mating cable with connector on one end (Optional)

![Diagram of SFB-CC□-MU](image1)

- **Length L**
  - Model No. | Length L
  - SFB-CC3-MU | 3,000 118.110
  - SFB-CC7-MU | 7,000 275.590
  - SFB-CC10-MU | 10,000 393.700

**SFB-CC□J-MU**  
Mating cable with connectors on both ends (Optional)

![Diagram of SFB-CC□J-MU](image2)

- **Length L**
  - Model No. | Length L
  - SFB-CCJ3D-MU | 3,000 118.110
  - SFB-CCJ3E-MU | 3,000 118.110
  - SFB-CCJ10D-MU | 10,000 393.700
  - SFB-CCJ10E-MU | 10,000 393.700

**SFC-WY1**  
Y-shaped connector (Optional)

![Diagram of SFC-WY1](image3)

**WY1-CCN□**  
Mating cable (Optional)

- **Model No.** | **Length L**
- WY1-CCN3 | 3,000 118.110
- WY1-CCN10 | 10,000 393.700

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

![Diagram of SFC-HC](image4)

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

- Suitable for 35 mm 1.378 in width DIN rail