

- Use this device as per its specifications. Do not modify this device since its functions and capabilities may not be maintained and it may malfunction.
- This device has been developed / produced for industrial use only.
- This device is suitable for indoor use only.
- Use of this device under the following conditions or environments is not presupposed. Please consult us if there is no other choice but to use this device in such an environment.
  - 1) Operating this device under conditions or environments not described in this manual.
  - 2) Using this device in the following fields: nuclear power plant, railroad, aircraft, automobiles, combustion facilities, medical systems, aerospace development, etc.
- When this device is to be used for enforcing protection of a person from any danger occurring around an operating machine, the user should satisfy the regulations established by national or regional security committees (Occupational Safety and Health Administration: OSHA, the European Standardization Committee, etc.). Contact the relative organization(s) for details.
- In case of installing this device to a particular machine, follow the safety regulations in regard to appropriate usage, mounting (installation), operation and maintenance. The users including the installation operator are responsible for the introduction of this device.
- Note that this device may be damaged if it is subject to a strong shock (if it is dropped onto the floor, for example).
- Use this device by installing suitable protection equipment as a countermeasure against fire, failure, damage, or malfunction of this device.
- Before using this device, check whether the device performs properly with the functions and capabilities as per the design specifications.
- In case of disposal, dispose this device as an industrial waste.

- This is the configuration when two or more sets of emitter and receiver facing each other are placed. It is used for the case that there is a problem in wiring or for system evaluation in case of addition of equipment.  
It is used for system evaluation in case of addition of equipment.

Diagram illustrating the assembly of the main body with a hexagon-socket head bolt. The bolt is shown being inserted into the top of the main body.

Labels:

- Hexagon-socket head bolt [M5 (purchase separately)]
- Main body

Note: **SF4B-H-Cco**: 48 beam channels or more, **SF4B-A-Cco**: 24 beam channels or more require intermediate support bracket **MS-SF4BC-5** (optional).  
Refer "our web site (<http://panasonic.net/id/pidx/global>)" \* for mounting position.  
40 to 56 beam channels for **SF4B-H-Cco**, 20 to 28 beam channels for **SF4B-A-Cco**: 1 set  
64 to 96 beam channels for **SF4B-H-Cco**, 32 to 48 beam channels for **SF4B-A-Cco**: 2 sets

- Earth the machine or the support where the device is mounted on to frame ground (F.G.). Failure to do so could cause the malfunction of the device by noise, resulting in death or serious injury. Furthermore, the wiring should be done in a metal box connected to the frame ground (F.G.).
- Take countermeasure against the system to be applied for this device so as not to carry out the dangerous performance caused by the earth failure. Failure to do so could cause invalid for the system stop, resulting in death or serious injury.
- When the synchronization + wire (orange) and synchronization - wire (orange / black) is extended with a cable other than exclusive cable, use a 0.2mm<sup>2</sup> or more shielded twisted pair cable.
- 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.
- The reset switch shall be placed in area where all over the dangerous zone shall be comprehend and out side of the dangerous zone.
- Do not use the emission halt function and auxiliary output for the purpose of stopping the machine in which this device is installed. Failure to do so could result in death or serious injury.
- 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 outside 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.

A specialist who has the required electrical knowledge should perform the wiring. The power supply unit must satisfy the conditions given below.

- 1) Power supply unit authorized in the region where this device is to be used.
- 2) Power supply unit SELV (safety extra low voltage) / PELV (protected extra low voltage) conforming to EMC Directive and Low-voltage Directive.  
(only for requiring CE marking conformation)
- 3) Power supply unit SELV (safety extra low voltage) / PELV (protected extra low voltage) conforming to EMC Regulations and Low-voltage Directive.  
(only for requiring UKCA marking conformation)
- 4) The frame ground (F.G.) terminal must be connected to ground when using a commercially available switching regulator.
- 5) Power supply unit with an output holding time of 20ms or more.
- 6) In case a surge is generated, take countermeasures such as connecting a surge absorber to the origin of the surge.
- 7) Power supply unit corresponding to CLASS 2 (only for requiring cTUVus Mark conformation).

Switch S1

- Emission halt input / Reset input  
For manual reset ... Vs to Vs - 2.5V (sink current 5mA or less) : Emission halt (Note 2), Open: Emission For auto-reset ... Vs to Vs - 2.5V (sink current 5mA or less) : Emission halt (Note 2), Open: Emission halt
- Input setting input. Overwrite input, Muting input A / B, External device monitor input  
Vs to Vs - 2.5V (sink current 5mA or less): Valid (Note 2), Open: Invalid
- Large multi-purpose indicator input  
0 to + 1.5V (source current: 5mA or less): Lights up, Open: Turn OFF

Notes: 1) The circuit diagram shown above is for **SF4B-□CA-J05**. For **SF4B-□C**, yellow, red, gray, gray / black, sky-blue / white, sky-blue / black, there is no lead wire.  
2)  $V_s$  is the applying supply voltage.

K1, K2: External device (Forced guided relay or magnetic contactor)

(Gray) NC (Note)

(Gray / Black) Large multi-purpose indicator input (Emitter side) (Note)

(Red) Muting auxiliary output (Note)

(Yellow) Override input (Note)

(Pale purple) Interlock setting input

(Brown) +V

(Pink) Emission halt input / Reset input

(Shield) Output polarity setting wire

(Blue) 0V

(Yellow-green / Black) Auxiliary output

(Orange) Synchronization +

(Orange / Black) Synchronization -

(Orange / Black) Synchronization -

(Orange) Synchronization +

(Yellow-green) External device monitor input

(Brown) +V

(Black) Control output 1 (OSSD 1)

(White) Control output 2 (OSSD 2)

(Shield) Output polarity setting wire

(Blue) 0V

(Sky-blue / White) Muting input A (Note)

(Sky-blue / Black) Muting input B (Note)

(Gray / Black) Large multi-purpose indicator input (Receiver side) (Note)

(Gray) NC (Note)

24V DC  $\pm 10\%$

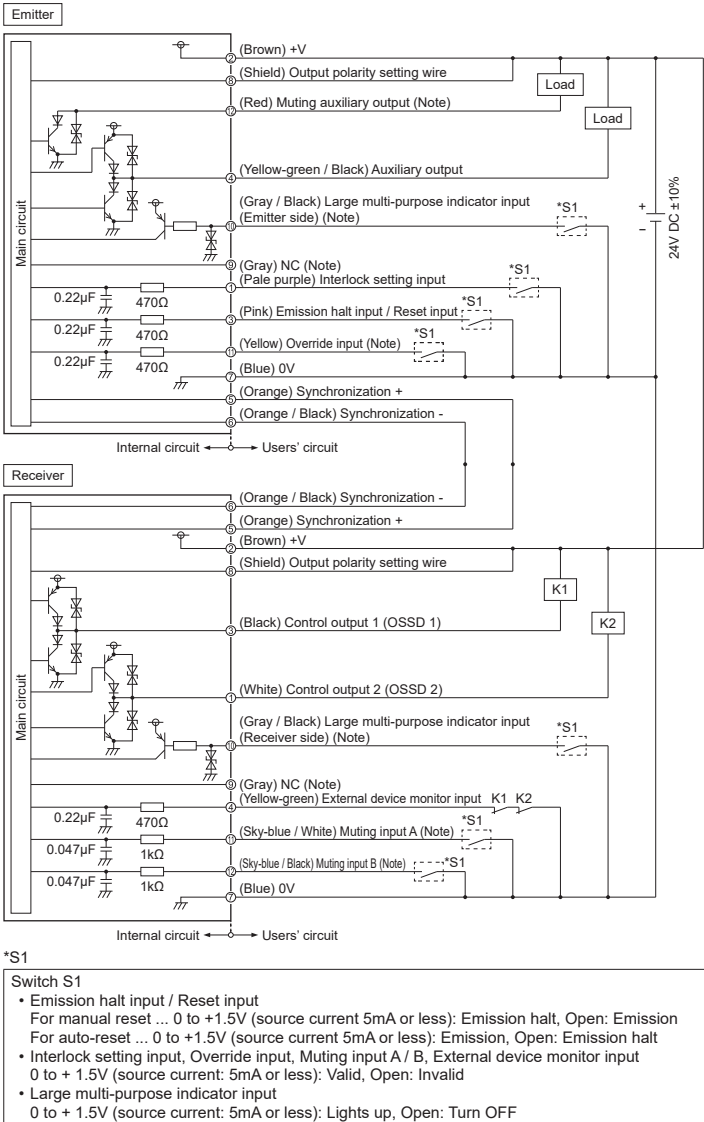
Interlock function	Invalid (Auto-reset)
External device monitor function	Invalid
Auxiliary output	Cannot be used

Note: The circuit diagram shown above is for **SF4B-CA-J05**. For **SF4B-C**, yellow, red, gray, gray / black, sky-blue / white, sky-blue / black, there is no lead wire.



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

● I/O Circuit Diagrams

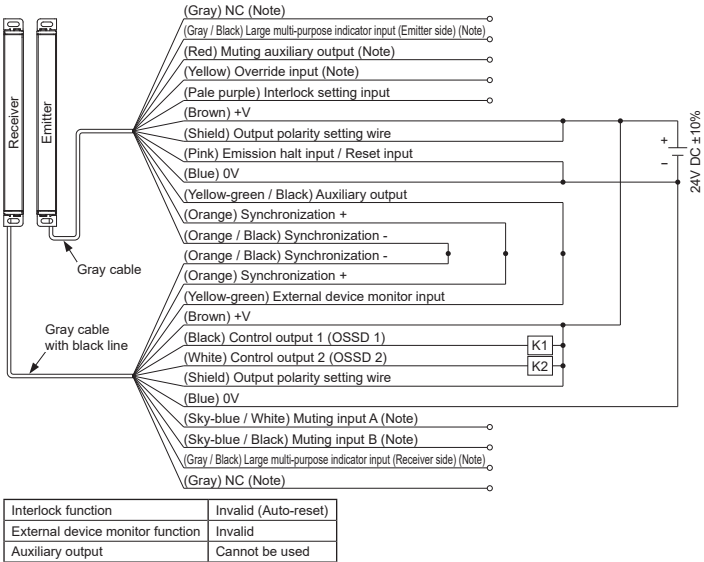


Note: The circuit diagram shown above is for **SF4B--CA-J05**. For **SF4B--C**, yellow, red, gray, gray / black, sky-blue / white, sky-blue / black, there is no lead wire.

<Reference>

K1, K2: External device (Forced guided relay or magnetic contactor)

































































● Basic Wiring



Note: The circuit diagram shown above is for **SF4B--CA-J05**. For **SF4B--C**, yellow, red, gray, gray / black, sky-blue / white, sky-blue / black, there is no lead wire.

















## 7 OPERATION OF INDICATORS

● Normal Operation

Device status	Indicators (Note)		Control output	
	Emitter	Receiver	OSSD 1	OSSD 2
Light received status (all beams received)	RECEPTION 	RECEPTION 		
	OSSD 	OSSD 		
	STB 	STB 		
	FAULT 	FAULT 		
	PNP 	PNP 		
	NPN 	NPN 		
	CTRL 	FUNCTION 		
	HALT 	INTERLOCK 		
One or more lights blocked	RECEPTION 	RECEPTION 		
	OSSD 	OSSD 		
	STB 	STB 		
	FAULT 	FAULT 		
	PNP 	PNP 		
	NPN 	NPN 		
	CTRL 	FUNCTION 		
	HALT 	INTERLOCK 		
Lights other than the top end blocked	RECEPTION 	RECEPTION 		
	OSSD 	OSSD 		
	STB 	STB 		
	FAULT 	FAULT 		
	PNP 	PNP 		
	NPN 	NPN 		
	CTRL 	FUNCTION 		
	HALT 	INTERLOCK 		
Lights other than the bottom end blocked	RECEPTION 	RECEPTION 		
	OSSD 	OSSD 		
	STB 	STB 		
	FAULT 	FAULT 		
	PNP 	PNP 		
	NPN 	NPN 		
	CTRL 	FUNCTION 		
	HALT 	INTERLOCK 		

Note: The status of the emitter / receiver indicators during operation above shows the case in PNP output setting mode. In case of NPN output setting mode, the NPN indicator (orange) lights up.

● When an error occurs

Device status	Indicators (Note)		Control output	
	Emitter	Receiver	OSSD 1	OSSD 2
Error state	RECEPTION 	RECEPTION 		
	OSSD 	OSSD 		
	STB 	STB 		
	FAULT 	FAULT 		
	PNP 	PNP 		
	NPN 	NPN 		
	CTRL 	FUNCTION 		
	HALT 	INTERLOCK 		

Note: The status of the emitter / receiver indicators during operation above shows the case in PNP output setting mode. In case of NPN output setting mode, the NPN indicator (orange) lights up.

## 8 FUNCTION

- Refer "our web site (<https://panasonic.net/id/pidsx/global>) " for details of functions of this product.

## 9 MAINTENANCE

<Reference>

When any errors are found, refer to "our web site (<https://panasonic.net/id/pidsx/global>) " and report the symptoms to the maintenance in charge. If the rectification method is not clear, please contact our office. Please make a copy of this checklist, check each inspection item in the respective square, and file the list for record.

● Daily Inspection

 <b>WARNING</b>
Be sure to inspect the following items prior to operation and confirm that there is no error. Operating this device without inspection or in an error condition can result in death or serious injury.

Check column	Inspection item
<input type="checkbox"/>	Dangerous parts of the machine cannot be reached without passing through the sensing area of this device.
<input type="checkbox"/>	Some part of operator's body remains in the sensing area when operation is done with dangerous parts of the machine.
<input type="checkbox"/>	The calculated safety distance has been maintained or exceeded during installation.
<input type="checkbox"/>	There is no damage to the safety guard or protective structure.
<input type="checkbox"/>	There is no defect, fold, or damage in the wiring.
<input type="checkbox"/>	The corresponding connectors have been connected securely.
<input type="checkbox"/>	No dirt or scratches exist on the light emitting surface.
<input type="checkbox"/>	The test rod is not deformed or defective.
<input type="checkbox"/>	The operation indicator (green) of the emitter and the OSSD indicator (green) of the receiver light up when no object is present in the sensing area. The control output (OSSD 1 / 2) is in ON status. At this time, the effect of external noise can be inspected. In case external noise affects the operation, remove its cause and reinspect.
<input type="checkbox"/>	It should be possible to detect the test rod (ø25mm for <b>SF4B-H-C</b> , or ø45mm for <b>SF4B-A-C</b> ) at three positions, directly in front of the emitter, midway between the emitter and the receiver, and directly in front of the receiver when the test rod is moved at a speed of 1,600mm/sec. The OSSD indicator (red) of the receiver and the operation indicator (red) of the emitter continue to light up as long as the test rod is present in the sensing area.
<input type="checkbox"/>	With the machine in the operating condition, the dangerous parts operate normally when no object is present in the sensing area.
<input type="checkbox"/>	With the machine in the operating condition, the dangerous parts stop immediately when the testrod is inserted into the sensing area at any of the three positions, directly in front of the emitter, midway between the emitter and the receiver, and directly in front of the receiver.
<input type="checkbox"/>	The dangerous parts remain stopped as long as the test rod is present in the sensing area.
<input type="checkbox"/>	The dangerous parts stop immediately when the power supply of this device is turned OFF.
<input type="checkbox"/>	The control output (OSSD 1 / 2) must turn OFF when the emission halt input wire (pink) is open (for manual reset: connected to 0V, +V). At this time, the effect of external noise can be inspected. In case external noise affects the operation, remove its cause and reinspect.
<input type="checkbox"/>	Be sure to check the operation of the muting function before its use. Furthermore, check the state of the muting indicator (cleanliness or brightness, etc.)

● Periodic Inspection (Every Six Months)

 <b>WARNING</b>
Be sure to inspect the following items every six months and confirm that there is no error. Operating this device without inspection or in an error condition can result in death or serious injury.

Check column	Inspection item
<input type="checkbox"/>	The structure of the machine does not obstruct any safety mechanism for stopping operation.
<input type="checkbox"/>	No modification has been made in the machine controls which obstructs the safety mechanisms.
<input type="checkbox"/>	The output of this device is correctly detected.
<input type="checkbox"/>	The wiring from this device is correct.
<input type="checkbox"/>	The overall response time of the complete machine is equal or less than the calculated value.
<input type="checkbox"/>	The actual number of operation cycle (time) of the limited lifetime parts (relay, etc.) is less than their rated operation cycles (time).
<input type="checkbox"/>	No screws or connectors of this device are loose.
<input type="checkbox"/>	No extraneous light source or reflective object has been added near this device.

● Inspection after Maintenance

- When any parts of this device are replaced.
- When some abnormality is felt during operation.
- When beam-axis alignment of the emitter and receiver is done.
- When the device installation place or environment is changed.
- When the wiring method or wiring layout is changed.
- When FSD (Final Switching Device) parts are replaced.
- When FSD (Final Switching Device) setting is changed.

## 10 SPECIFICATIONS

Type	20mm pitch type	40mm pitch type
Model No.	<b>SF4B-H-C</b>	<b>SF4B-A-C</b>
Number of beam channels	12 / 16 / 20 / 24 / 28 / 32 / 36 / 40 / 48 / 56 / 64 / 72 / 80 / 88 / 96	8 / 12 / 16 / 20 / 24 / 28 / 32 / 36 / 40 / 44 / 48
Protective hight	263.4 (12 channels) to 1,943.4 (96 channels) mm	343.4 (8 channels) to 1,943.4 (48 channels) mm
Sensing range	0.3 to 7m	
Minimum sensing object	ø25mm opaque object	ø45mm opaque object
Supply voltage	24V DC ±10%	
Control output (OSSD 1 / 2)	Maximum source (PNP) / sink (NPN) current: 200mA, Residual voltage: 2.5V or less Leakage current: 0.1mA or less, Maximum load capacity: 0.22μF, Load wiring resistance: 30Ω or less	
Response time	When OFF: 14ms or less, When ON: 80 to 90ms	
Auxiliary output setting (AUX)	Maximum source (PNP) / sink (NPN) current: 60mA, Residual voltage: 2.5V or less	
Muting auxiliary output	Maximum sink current: 100mA, Residual voltage: 2.5V or less	
Ambient temperature	-10 to +55°C, Storage: -25 to +60°C	
Ambient humidity	30 to 85%RH, Storage: 30 to 85%RH	

<Reference>

The enclosure of the **SF4B-□C** is made of a clear resin (polycarbonate). Therefore, machining marks or electrolytic corrosion may be found on the internal shield frame. However, they do not affect the performance of the device.

## 11 CE MARKING DECLARATION OF CONFORMITY

**Itemized Essentials of EU Declaration of Conformity**

**Manufacturer's Name:** Panasonic Industrial Devices SUNX Co., Ltd.  
**Manufacturer's Address:** 2431-1, Ushiyama-cho, Kasugai, Aichi 486-0901, Japan  
**EU Representative's Name:** Panasonic Marketing Europe GmbH Panasonic Testing Centre  
**EU Representative's Address:** Winsbergring 15, 22525 Hamburg, Germany

**Product:** Active Opto-electronic Protective Device (Light Curtain)

**Model Name:** SF4B Series

**Trade Name:** Panasonic

**Application of Council Directive:**

- 2006/42/EC Machinery Directive
- 2014/30/EU EMC Directive
- 2011/65/EU RoHS Directive

**Applicable Standard(s):**

- EN ISO 13849-1:2015
- EN IEC 63000
- IEC 61508-1
- IEC 61508-4
- EN 55011
- EN 61496-1
- IEC 61508-2
- EN 61000-6-2
- EN 61496-2
- IEC 61508-3

**Type Examination:** TÜV SÜD Product Service GmbH, No.0123

EC-Type Examination Certificate M6A 019003 0129 Rev.00

## 12 UKCA MARKING DECLARATION OF CONFORMITY

**Itemized Essentials of UK Declaration of Conformity**

**Manufacturer's Name:** Panasonic Industrial Devices SUNX Co., Ltd.  
**Manufacturer's Address:**2431-1, Ushiyama-cho, Kasugai, Aichi 486-0901, Japan  
**Authorized Representative:** Panasonic Testing Centre on behalf of Panasonic UK  
Panasonic UK, a branch of Panasonic Marketing Europe GmbH  
Maxis 2, Western Road, Bracknell, Berkshire, RG12 1RT  
**Product Name:** Active Opto-electronic Protective Device (Light Curtain)  
**Trade Name:** Panasonic  
**Model Number:** SF4B Series  
**Statutory Instruments:**

- 2008 No.1597 Supply of Machinery (Safety) Regulations 2008
- 2016 No.1091 Electromagnetic Compatibility Regulations 2016
- 2012 No.3032 RoHS Regulations 2012

**Designated Standards:**

- EN ISO 13849-1:2015
- EN IEC 63000
- IEC 61508-1
- IEC 61508-4
- EN 55011
- EN 61496-1
- IEC 61508-2
- EN 61000-6-2
- EN 61496-2
- IEC 61508-3

**Approved Body:** Certified by TÜV SÜD Product Service GmbH, No.0123

EC-Type Examination Certificate M6A 019003 0129 Rev.00

Panasonic Industry Co., Ltd.  
Panasonic Industrial Devices SUNX Co., Ltd.

<https://panasonic.net/id/pidsx/global>

Please visit our website for inquiries and about our sales network.

Panasonic Industrial Devices SUNX Co., Ltd. 2023

June, 2023

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