

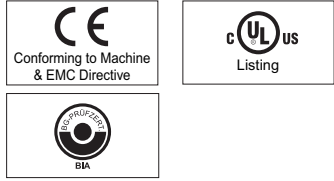
# Safety Relay Unit SF-AC

- FIBER SENSORS
- LASER SENSORS
- PHOTOELECTRIC SENSORS
- MICRO PHOTOELECTRIC SENSORS
- AREA SENSORS
- LIGHT CURTAINS / SAFETY COMPONENTS
- PRESSURE / FLOW SENSORS
- INDUCTIVE PROXIMITY SENSORS
- PARTICULAR USE SENSORS
- SENSOR OPTIONS
- SIMPLE WIRE-SAVING UNITS
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- MEASUREMENT SENSORS
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- FA COMPONENTS
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- Related Information
- General terms and conditions..... F-7
  - Light Curtains / SF-C10 ..... P.495~ / P.703~
  - SG-B1 / SG-A1 / SG-B2 ..... P.643~
  - General precautions ..... P.1501



[panasonic.net/id/pidsx/global](http://panasonic.net/id/pidsx/global)



## Possible to create the highest level safety system

### Compatible up to control category 4

Control category 4 compatible with an **SF4B** series / **SF4B-C** series / **SF4C** series combination and control category 2 compatible with an **SF2B** series / **SF2C** series combination.

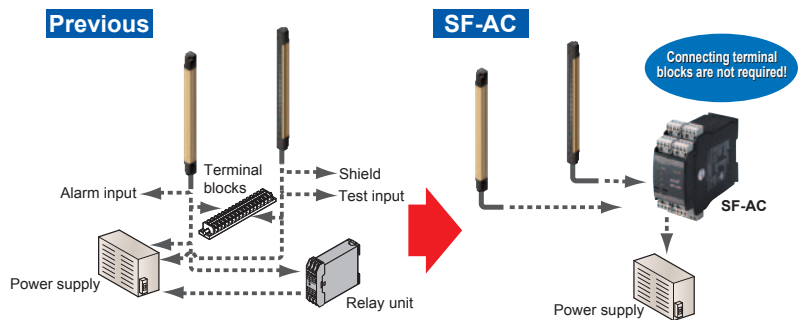
### Installation time and labor can be saved due to the usage of detachable terminal blocks

As wiring can be performed with the terminal blocks removed, it is not necessary to detach the controller from the control panel when performing maintenance, thus reducing the number of installation procedures required. Also, when replacing the relay units, you simply insert new terminals without having to manipulate the wiring.



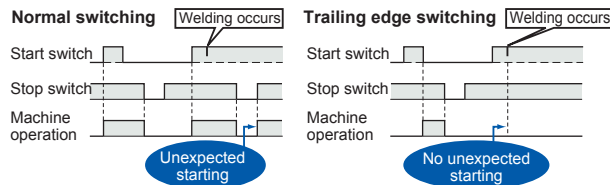
### A connecting terminal blocks are not needed

As **SF-AC** incorporates a power supply terminals and synchronization lines terminals for the light curtain, so terminal blocks are not required.



### Unexpected start due to start-switch welding prevented

The unit is equipped with a trailing edge switching function, which causes an ON signal to be sent when the start switch signal is falling. This prevents unexpected starting which can occur if the start switch gets welded.

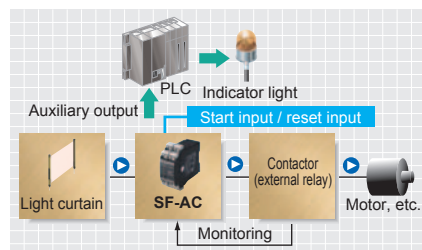


### 10 ms high-speed response

We have realized the highest-class response time, 10 ms, for the relay output making for even more enhanced safety.

### Incorporates a 2-channel auxiliary output


**SF-AC** incorporates both an auxiliary output that operates together with the light curtain's control output (OSSD), and an alarm output that functions together with the light curtain's auxiliary output (non-safety output). These features allow for monitoring of light curtain activity.



- Selection Guide
- Light Curtains
- Safety Components
- Optical Touch Switch
- Control Units
- Definition of Sensing Heights

- SF-C10
- SF-CL1T264T
- SF-AC

**ORDER GUIDE**

Type	Appearance	Model No.	Enabling path
Control category 4		<b>SF-AC</b>	NO contact × 3

**SPECIFICATIONS**

Item	Model No.	SF-AC
Connectable light curtains		PNP output type light curtains and Safety devices ( <b>SG-B1/A1/B2</b> series) manufactured by Panasonic Industrial SUNX
Applicable standards		EN 60947-5-1, EN ISO 13849-1(Category 4,PLe), EN ISO 13849-2, IEC 60947-5-1, ISO 13849-1(Category 4, PLe), ISO 13849-2, JIS B 9705-1 (Category 4), ANSI/UL 508, CAN/CSA C22.2 No.14, OSHA1910.212, OSHA 1910.217(C), ANSI B11.1 to B11.19, ANSI/RIA 15.06
Control category		ISO 13849-1 compliance up to Category 4
Supply voltage		24 V DC ± 10 % Ripple P-P 10 % or less
Power consumption		1.7 W approx. (at 24 V DC) (without any connected devices)
Power supply for light curtain		24 V DC ± 10 %
Fuse (power supply)		Hybrid fuse, triggering current: 1.1 A or more, Reset after power down
OSSD input		PNP transistor 2 inputs (S1, S2)
Enabling path		NO contact × 3 (13-14, 23-24, 33-34)
Utilization category		AC-15, DC-13 (EN 60947-5-1)
Rated operational current (Ie)(Note 2) / Rated operational voltage		6 A / 30 V DC, 6 A / 230 V AC, resistive load
Contact material / contacts		AgSnO, Self cleaning, positively driven
Contact resistance		100 mΩ or less (initial value)
Fuse		6 A (slow blow)
Mechanical lifetime		10 million times (switching frequency 180 times/min.)
Electrical lifetime		100,000 times (switching frequency 20 times/min, rated load)
B10d		At min.load:20,000,000 / At max.load :400,000 (ISO 13849-1)
Pick-up delay		40 ms or less (Automatic reset), 50 ms or less (Manual reset)
Drop-out delay		10 ms or less
Auxiliary output		NC contact × 1 (41-42)
Switching current		1 A / 24 V DC
Fuse		1 A (slow blow)
Alarm output (Note 3)		NC contact × 1 (51-52) (Non-safety contact, related to input "Alarm in")
Switching current		Max. 1 A / 24 V DC, Min. 5 mA / 24 V DC
Fuse		1 A (slow blow)
Power		Green LED (lights up when the power is supplied)
Internal circuit operation (Ui)		Green LED (lights up when both conditions are present: unit is powered up and hybrid fuse is at normal state)
Relay operation (K1 / K2)		Green LED × 2 (lights up when enabling contacts are closed)
Test input (Test)		Yellow LED (lights up when X11-X12 is opened)
External relay monitor function		Incorporated
Trailing edge function		Incorporated
Test input polarity selection function		Incorporated (Selectable PNP or NPN test input polarity by internal switch)
Excess voltage category		III
Rated impulse-withstand voltage (Uimp)		4 kV
Pollution degree		2
Environmental resistance	Degree of protection	Enclosure : IP40, Terminal : IP20
Ambient temperature		-10 to +55 °C +14 to +131 °F, Storage: -10 to +55 °C +14 to +131 °F
Ambient humidity		35 to 85 % RH, Storage: 35 to 85 % RH
Vibration resistance		10 to 55 Hz frequency, 0.35 mm 0.014 in amplitude in X, Y, Z directions for three times each (in power OFF state)
Shock resistance		15 G (150 m/s <sup>2</sup> approx.) Effective impulse time 11ms
Material		Enclosure: Polycarbonate
Connection terminal		Removable European terminal
Tightening torque		0.6 N·m
Wiring cable		0.2 to 2.5 mm <sup>2</sup> [including single wire or ferrule (sleeve)]
Mounting		Complies with 35 mm width DIN rail (EN 50022)
Weight		Net weight: 400 g approx.

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.

2) The rated operational current (Ie) varies depending on the ambient temperature. For details, refer to "Derating (p.726)" in "PRECAUTIONS FOR PROPER USE".

3) The alarm output is "open" when the alarm input from the light curtain is ON.

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**SF-C10**

SF-CL17&amp;4T

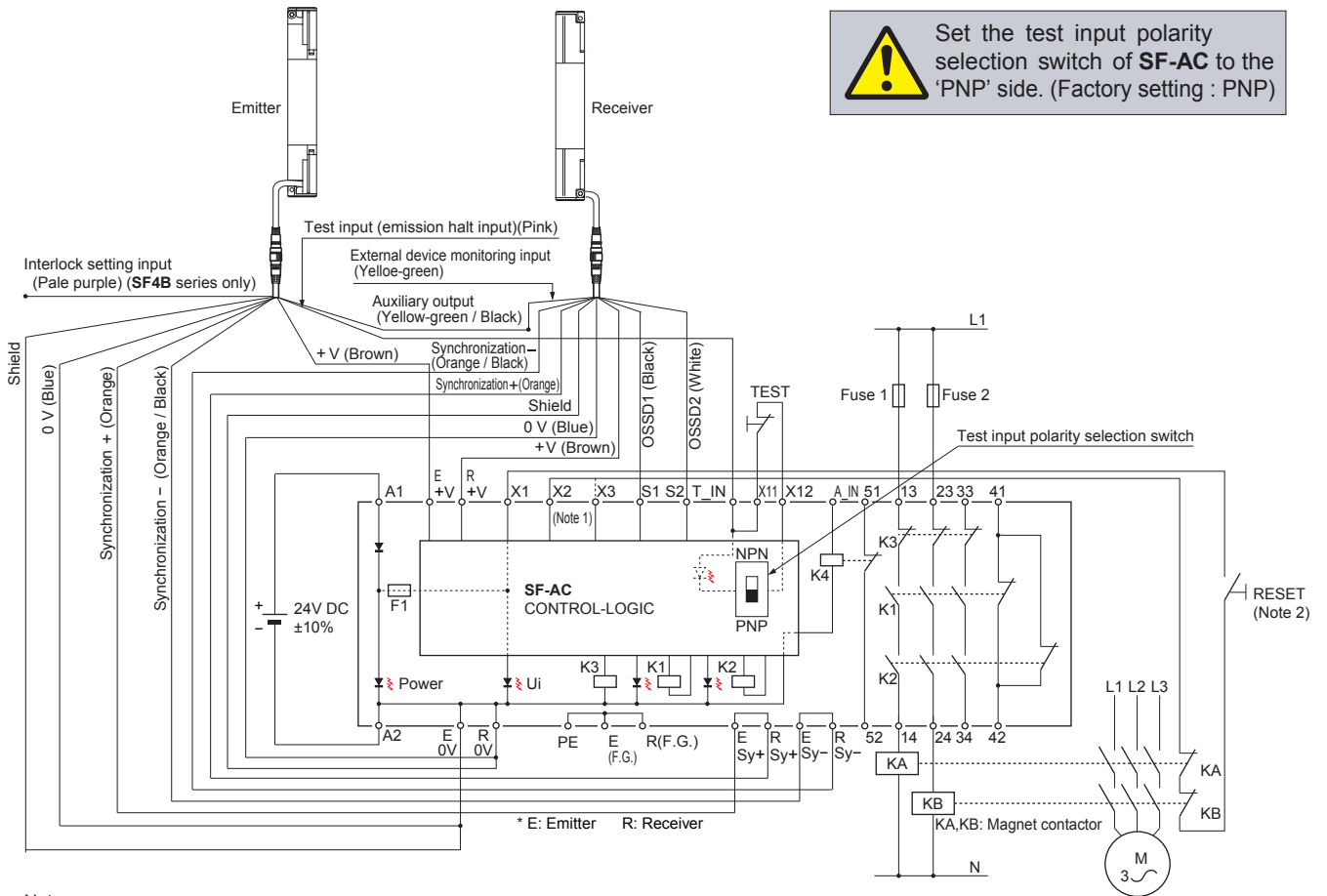
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**I/O CIRCUIT AND WIRING DIAGRAMS**

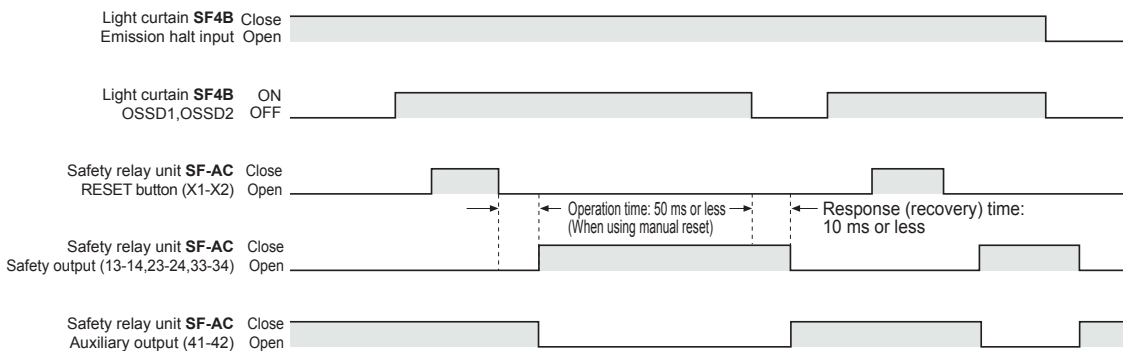
Light curtain SF4B series wiring diagram (Supports to Control category 4)  
 Light curtain SF2B series wiring diagram (Supports to Control category 2)

**!** Set the test input polarity selection switch of **SF-AC** to the 'PNP' side. (Factory setting : PNP)



- Notes: 1) If using the equipment with the manual reset, wire X1 to X2 as per the illustration above. If using with the automatic reset, disconnect X2 wire and connect it to X3. In this case, reset button is not required.  
 2) Use a momentary-type switch for the reset button.

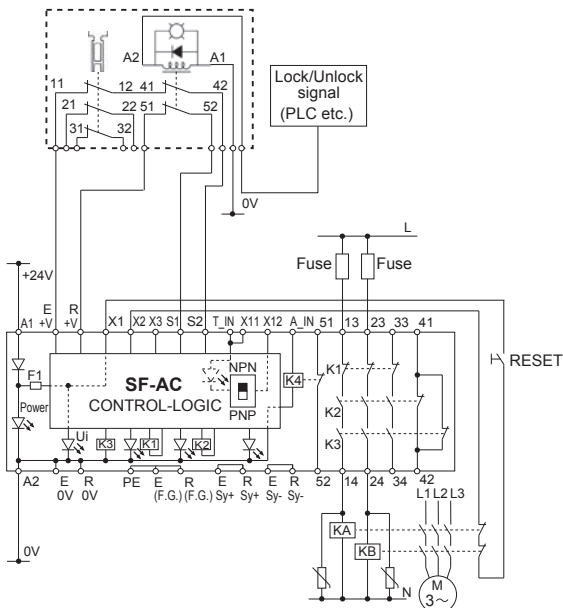
**Time chart**



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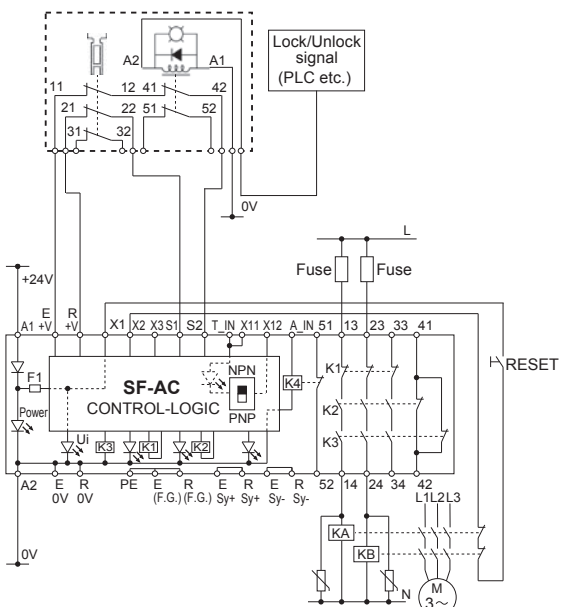
**I/O CIRCUIT AND WIRING DIAGRAMS**

**Safety door switch SG-B1-SA-G□ / SG-B1-MA-G□ wiring diagram (Supports to Control Category 3)**



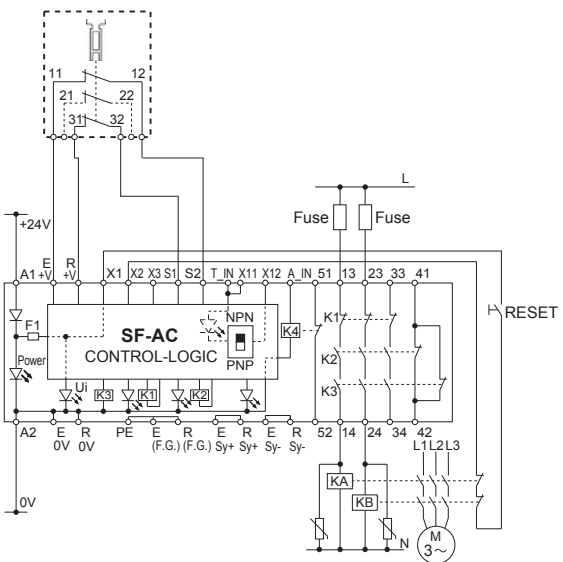
• Relay unit can be operated by reset after setting “UNLOCK → LOCK”.

**Safety door switch SG-B1-SA-G□ / SG-B1-MA-G□ wiring diagram (Supports to Control Category 3)**



• Relay unit can be operated by reset after setting “UNLOCK → Door opening/closing → LOCK”.

**Safety door switch SG-A1-02-□ / SG-A1-03-□ wiring diagram (Supports to Control Category 3)**



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SF-CL1724T

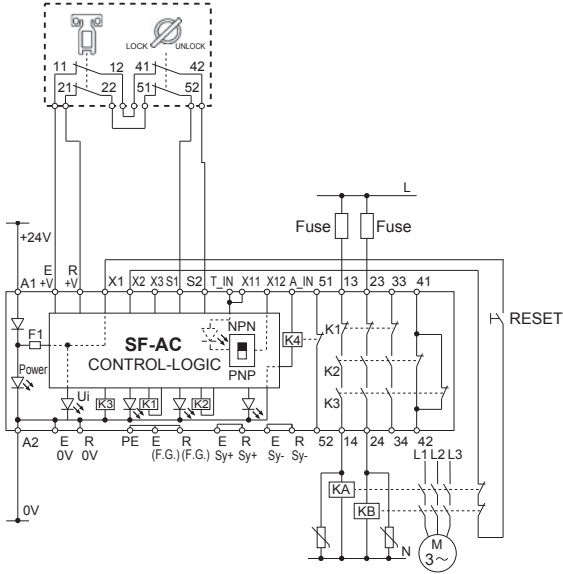
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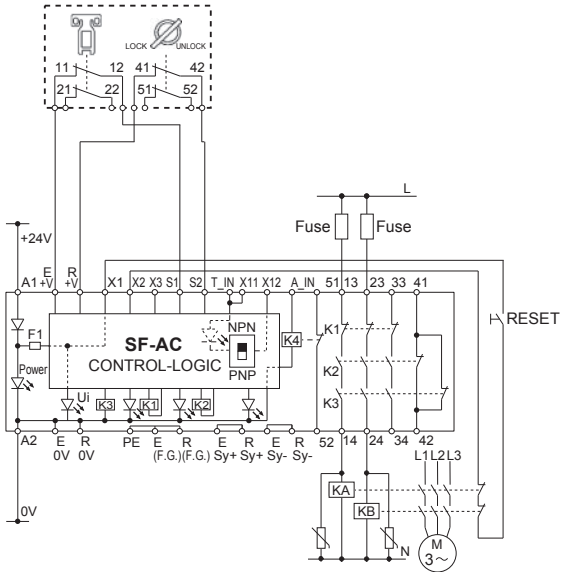
### Safety door switch SG-B2-K2AD-□ / SG-B2-K2BD-□ / SG-B2-K2CD-□ wiring diagram (Supports to Control Category 3)

- Relay unit can be operated by reset after setting "UNLOCK → LOCK".



### Safety door switch SG-B2-K2AD-□ / SG-B2-K2BD-□ / SG-B2-K2CD-□ wiring diagram (Supports to Control Category 3)

- Relay unit can be operated by reset after setting "UNLOCK → Door opening/closing → LOCK".




SF-C10

SF-CL17264T

SF-AC

## PRECAUTIONS FOR PROPER USE

 Note that **SF-AC** cannot be connected to the NPN output (equivalent) type light curtain.

### Wiring

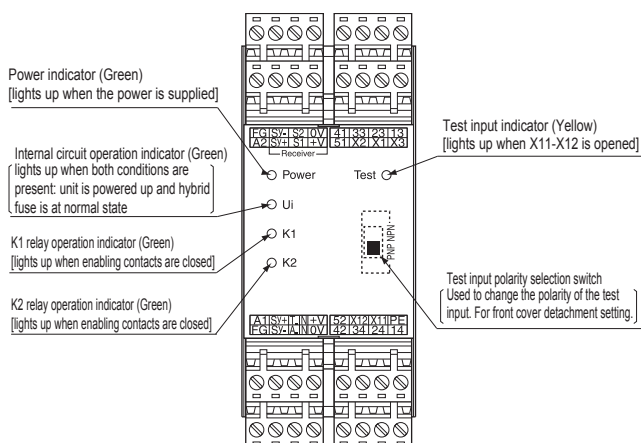
Please install and connect ferrule (stick) terminal when the lead wire of the connected equipment is a twisted wire. Please do not connect the twisted wire directly with the terminal. Tighten the wiring to the wiring terminal block at tightening torque of 0.6 N m.

### Others

The seal as shown in the drawing on the right is stuck to the engagement point of unit. When the seal is peeled off or broken, this equipment will not be certified as 'Safety equipment'.

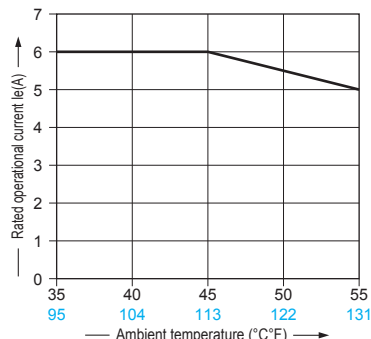


### Functional description



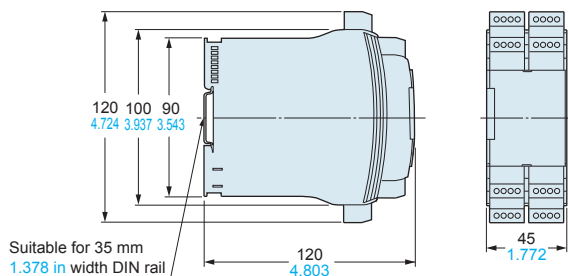
### Derating

Rated operation current ( $I_e$ ) of enabling path changes depending on ambient temperature.



## DIMENSIONS (Unit: mm in)

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



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