

# Safety Light Curtains: SF4C Specifications

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Specifications for this product appear below.

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## Specifications

### Light curtain individual specifications

#### SF4C-F?

Type		Min. sensing object ø14 mm ø0.551 in type (10 mm 0.394 in beam pitch)			
Model No.	Pigtalled type	SF4C-F15-J05	SF4C-F23-J05	SF4C-F31-J05	
	Cable type	SF4C-F15	SF4C-F23	SF4C-F31	
No. of beam channels		15	23	31	
Protective height		160 mm 6.299 in	240 mm 9.449 in	320 mm 12.598 in	
Current consumption	Large multipurpose indicator lights off	Emitter: 70 mA or less Receiver: 80 mA or less	Emitter: 75 mA or less Receiver: 85 mA or less		
	Large multipurpose indicator lights up	Emitter: 105 mA or less Receiver: 110 mA or less	Emitter: 110 mA or less Receiver: 115 mA or less		
PFHd		2.29 x 10 <sup>-9</sup>	2.73 x 10 <sup>-9</sup>	3.18 x 10 <sup>-9</sup>	
MTTFd		100 years or more			
Net weight (Total of emitter and receiver)	Pigtalled type	210 g approx.	270 g approx.	340 g approx.	
	Cable type	600 g approx.	670 g approx.	730 g approx.	

Type		Min. sensing object ø14 mm ø0.551 in type (10 mm 0.394 in beam pitch)			
Model No.	Pigtalled type	SF4C-F39-J05	SF4C-F47-J05	SF4C-F55-J05	SF4C-F63-J05
	Cable type	SF4C-F39	SF4C-F47	SF4C-F55	SF4C-F63
No. of beam channels		39	47	55	63
Protective height		400 mm 15.748 in	480 mm 18.898 in	560 mm 22.047 in	640 mm 25.197 in
Current consumption	Large multipurpose indicator lights off	Emitter: 80 mA or less Receiver: 90 mA or less	Emitter: 85 mA or less Receiver: 95 mA or less		
	Large multipurpose indicator lights up	Emitter: 115 mA or less Receiver: 120 mA or less	Emitter: 120 mA or less Receiver: 125 mA or less		
PFHd		3.62 x 10 <sup>-9</sup>	4.06 x 10 <sup>-9</sup>	4.50 x 10 <sup>-9</sup>	4.95 x 10 <sup>-9</sup>
MTTFd		100 years or more			
Net weight (Total of emitter and receiver)	Pigtalled type	400 g approx.	470 g approx.	540 g approx.	600 g approx.
	Cable type	800 g approx.	860 g approx.	930 g approx.	1,000 g approx.

#### SF4C-H?

Type		Min. sensing object ø25 mm ø0.984 in type (20 mm 0.787 in beam pitch)			
Model No.	Pigtalled type	SF4C-H8-J05	SF4C-H12-J05	SF4C-H16-J05	
	Cable type	SF4C-H8	SF4C-H12	SF4C-H16	
No. of beam channels		8	12	16	
Protective height		160 mm 6.299 in	240 mm 9.449 in	320 mm 12.598 in	
Current consumption	Large multipurpose indicator lights off	Emitter: 70 mA or less Receiver: 85 mA or less	Emitter: 70 mA or less Receiver: 90 mA or less		
	Large multipurpose indicator lights up	Emitter: 120 mA or less Receiver: 135 mA or less	Emitter: 120 mA or less Receiver: 140 mA or less		
PFHd		1.66 x 10 <sup>-9</sup>	1.90 x 10 <sup>-9</sup>	2.10 x 10 <sup>-9</sup>	
MTTFd		100 years or more			
Net weight (Total of emitter and receiver)	Pigtalled type	240 g approx.	300 g approx.	360 g approx.	
	Cable type	630 g approx.	700 g approx.	760 g approx.	

Type		Min. sensing object ø25 mm ø0.984 in type (20 mm 0.787 in beam pitch)			
Model No.	Pigtalled type	SF4C-H20-J05	SF4C-H24-J05	SF4C-H28-J05	SF4C-H32-J05
	Cable type	SF4C-H20	SF4C-H24	SF4C-H28	SF4C-H32
No. of beam channels		20	24	28	32
Protective height		400 mm 15.748 in	480 mm 18.898 in	560 mm 22.047 in	640 mm 25.197 in
Current consumption	Large multipurpose indicator lights off	Emitter: 75 mA or less Receiver: 95 mA or less	Emitter: 80 mA or less Receiver: 100 mA or less		
	Large multipurpose indicator lights up	Emitter: 120 mA or less Receiver: 145 mA or less	Emitter: 120 mA or less Receiver: 150 mA or less		
PFHd		2.33 x 10 <sup>-9</sup>	2.54 x 10 <sup>-9</sup>	2.77 x 10 <sup>-9</sup>	2.98 x 10 <sup>-9</sup>
MTTFd		100 years or more			
Net weight (Total of emitter and receiver)	Pigtalled type	420 g approx.	490 g approx.	550 g approx.	610 g approx.
	Cable type	820 g approx.	880 g approx.	950 g approx.	1,000 g approx.

### Light curtain common specifications

Type		Min. sensing object ø14 mm ø0.551 in type (10 mm 0.394 in beam pitch)	Min. sensing object ø25 mm ø0.984 in type (20 mm 0.787 in beam pitch)
Model No.	Pigtalled type	SF4C-F? -J05	SF4C-H? -J05
	Cable type	SF4C-F?	SF4C-H?
Applicable standards	International standard	IEC 61496-1/2 (Type 4), ISO 13849-1 (Category 4, PLe), IEC 61508-1 to 7 (SIL 3)	
	Japan	JIS B 9704-1/2 (Type 4), JIS B 9705-1 (Category 4), JIS C 0508-1 to 7 (SIL 3)	
	Europe (EU) (Note 2)	EN 61496-1 (Type 4), EN ISO 13849-1 (Category 4, PLe), EN 61508-1 to 7 (SIL 3), EN 55011, EN 50178, EN 61000-6-2	
	North America (Note 3)	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	
Operating range (Note 4)		0.1 to 3 m 0.328 to 9.843 ft	
Beam pitch		10 mm 0.394 in	20 mm 0.787 in
Min. sensing object (Note 5)		ø14 mm ø0.551 in opaque object	ø25 mm ø0.984 in opaque object
Effective aperture angle		±2.5° or less [for an operating range exceeding 3 m 9.843 ft (conforming to IEC 61496-2 / UL 61496-2)]	
Supply voltage		24 V DC <sup>+10</sup> / <sub>-15</sub> % Ripple P-P 10 % or less	
Control outputs (OSSD 1, OSSD 2)		PNP open-collector transistor / NPN open-collector transistor (switching method) <When selecting PNP output> •Max. source current: 200 mA •Applied voltage: same as supply voltage (between the control output and +V) •Residual voltage: 2.5 V or less (source current 200 mA, when using 10 m 32.808 ft length cable) •Leakage current: 200 ?A or less (including power supply OFF condition) •Max. load capacity: 1 ?F (No load to Max. output current) •Load wiring resistance: 3 ? or less <When selecting NPN output> •Max. sink current: 200 mA •Applied voltage: same as supply voltage (between the control output and 0 V) •Residual voltage: 2.5 V or less (sink current 200 mA, when using 10 m 32.808 ft length cable) •Leakage current: 200 ?A or less (including power supply OFF condition) •Max. load capacity: 1 ?F (No load to Max. output current) •Load wiring resistance: 3 ? or less	
	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 6,7)	
	Protection circuit	Incorporated	
Response time		OFF response: 9 ms or less, ON response: 90 ms or less	OFF response: 7 ms or less, ON response: 90 ms or less
Auxiliary output (Non-safety output)		PNP open-collector transistor / NPN open-collector transistor (switching method) <When selecting PNP output> •Max. source current: 100 mA •Applied voltage: same as supply voltage (between the auxiliary output and +V) •Residual voltage: 2.5 V or less (source current 100 mA, when using 10 m 32.808 ft length cable) <When selecting NPN output> •Max. sink current: 100 mA •Applied voltage: same as supply voltage (between the auxiliary output and 0 V) •Residual voltage: 2.5 V or less (sink current 100 mA, when using 10 m 32.808 ft length cable)	
	Operation mode	OFF when control outputs are ON, ON when control outputs are OFF (Factory setting, operating mode can be changed using the SFC-HC handy-controller).	
	Protection circuit	Incorporated	
ELCA function		Incorporated (reducing mutual interference automatically)	
Test / reset input function		Incorporated	
Interlock function		Incorporated [Manual reset / Automatic reset (Note 8)]	
External device monitoring function		Incorporated	
Safety input function		Incorporated (safety contact)	
Muting function		Incorporated	
Override function		Incorporated	
Optional functions (Note 9)		Fixed blanking, floating blanking, auxiliary output change, safety input (safety sensor), large multi-purpose indicator setting change, interlock setting change, external relay monitoring setting change, muting setting change, override setting change, protecting	
Degree of protection		IP67 / IP65 (IEC)	
Ambient temperature		-10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), Storage: -25 to +60 °C -13 to +140 °F	
Ambient humidity		30 to 85 % RH, Storage: 30 to 85 % RH	
Ambient illuminance		Incandescent light: 5,000 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?, or more, with 500 VDC megger between all supply terminals connected together and enclosure	
Vibration resistance		10 to 55 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each	
Shock resistance		300 m/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: 855 nm 0.034 mil)	
Material		Enclosure: Polycarbonate alloy, Sensing surface: Polycarbonate alloy	
Cable	Pigtalled type	0.15 mm <sup>2</sup> 12-core heat-resistant PVC cable, 0.5 m 1.640 ft long with connector	
	Cable type	0.15 mm <sup>2</sup> 12-core heat-resistant PVC cable, 5 m 16.404 ft long	
Cable extension		Extension up to 40.5 m 132.874 ft is possible for both emitter and receiver, with 0.2 mm <sup>2</sup> or more cable. (Note 10)	
Accessories		MS-SFC-1 (Standard mounting bracket): 1 set, SF4C-TR14 (Test rod): 1 No.	MS-SFC-1 (Standard mounting bracket): 1 set, SF4C-TR25 (Test rod): 1 No.

- Notes:
- Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
  - Regarding EU Machinery Directive, a Notified Body, TÜV SÜD, has certified with the type examination certificate.
  - With regards to the standards in the US, under the US regulation 29 CFR 1910.7, TÜV SÜD, a Nationally Recognized Testing Laboratory (NRTL) certified by OSHA, has certified with the safety certificate based on UL / ANSI standards.
  - With regards to the standards in Canada, under the safety regulations based on CEC (Canadian Electric Code), TÜV SÜD, a Certification Body accredited by SCC, has certified with the safety certificate based on CSA standards.
  - The operating range is the possible setting distance between the emitter and the receiver.
  - When the floating blanking function is used, the size of the min. sensing object is changed.
  - The outputs are not "OFF" when muting function is active even if the beam channel is interrupted.
  - In case the blanking function is valid, the operation mode is changed.
  - The manual reset and automatic reset are possible to be switched depending on the wiring status.
  - In case of using optional function, the handy-controller SFC-HC is required.
  - When the muting lamp is used, the cable can be extended within 30.5 m 100.066 ft (for emitter / receiver).

### Handy controller

Model No.	SFC-HC
Supply voltage	24 V DC <sup>+10</sup> / <sub>-15</sub> % Ripple P-P 10 % 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 x2 (Selected beam channels, setting contents etc. are displayed.)
Function indicators	Green LED x9 (Set function is displayed.)
Functions	Fixed blanking / Floating blanking / Auxiliary output change / Safety input setting change / Large multi-purpose indicator setting change / Muting / Muting setting change / Interlock setting change / External device monitoring setting change / Override setting changing function 60 sec. / Protecting
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 M?, or more, with 500 VDC 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.