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English (Asia Pacific)

▼

NEW

SF4D-H88 | Compact & Robust Safety Light Curtain [Type 4 PLe SIL3] SF4D

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Product Number

SF4D-H88

Part Number

SF4D-H88

Product

Safety Light Curtain [Type 4 PLe SIL3]

Details

Min. sensing object ø25 mm **ø0.984 in** (20 mm **0.787 in** beam pitch)

Product name

Compact & Robust Safety Light Curtain [Type 4 PLe SIL3] SF4D

\*Photo may vary from actual product.

RoHS  
compliant

→ Dimensions

↓ Accessories (Option)

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→ Distributors in Asia-Pacific, Middle East

FAQ

As of July 31, 2018

Specifications and design of the products are subject to change without notice for the product improvement.

| Item                                                                         | Specifications                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Number                                                               | SF4D-H88                                                                                                                                                                                                                        |
| Part Number                                                                  | SF4D-H88                                                                                                                                                                                                                        |
| No. of beam channels                                                         | 88                                                                                                                                                                                                                              |
| Protective height                                                            | 1,750 mm<br><b>68.898 in</b><br>(Note): When using as a safety device for a press machine in China, the length from the center of the first beam channel to the center of the last beam channel become to be protective height. |
| Protective height : When using as safety equipment for Chinese press machine | 1,740 mm<br><b>68.504 in</b><br>(Note): When using as a safety device for a press machine in China, the length from the center of the first beam channel to the center of the last beam channel become to be protective height. |
| Current consumption                                                          | Emitter : 120 mA or less<br>Receiver : 160 mA or less                                                                                                                                                                           |
| PFH <sub>D</sub>                                                             | 4.00×10 <sup>-9</sup>                                                                                                                                                                                                           |
| MTTF <sub>D</sub>                                                            | 293 years or more                                                                                                                                                                                                               |
| Weight(Total of emitter and receiver)                                        | 4,400g approx.                                                                                                                                                                                                                  |
|                                                                              |                                                                                                                                                                                                                                 |

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|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicable standards:International standard                | IEC 61496-1/2 (Type 4), ISO 13849-1 (Category 4, PLe), IEC 61508-1 to 7 (SIL3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Applicable standards:Japan                                 | JIS B 9704-1/2 (Type 4), JIS B 9705-1 (Category 4), JIS C 0508-1 to 7 (SIL3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Applicable standards:Europe (EU)                           | EN 61496-1/2 (Type 4), EN ISO 13849-1 (Category 4, PLe), EN 55011, EN 61000-6-2, EN 50178                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Applicable standards:North America                         | ANSI/UL 61496-1/2 (Type 4),CAN/CSA C22.2 No.14, CAN/CSA E61496-1/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Applicable standards:South Korea (S-Mark)                  | S1-G-1-2009, S2-W-5-2009                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Applicable standards:China (GB)                            | GB/T 4584                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| CE marking directive compliance                            | Machinery Directive, EMC Directive, RoHS Directive                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Operating range                                            | Short mode : 0.2 to 9 m <a href="#">0.656 to 29.528 ft</a><br>Long mode : 0.8 to 15 m <a href="#">2.625 to 49.213 ft</a><br>(selectable by DIP switch)<br>(Note): The operating range is the possible setting distance between the emitter and the receiver.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Min. sensing object                                        | ø25 mm <a href="#">ø0.984 in</a> opaque object<br>(Note): When the floating blanking function is used, the size of the minimum sensing object varies. For the detail, refer to the section on Safety distance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Effective aperture angle                                   | ±2.5° or less at a sensing range of 3 m <a href="#">9.843 ft</a> or longer (based on IEC 61496-2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Power voltage                                              | 24 V DC <sup>+20</sup> <sub>-30</sub> % Ripple P-P 10 % or less (excluding voltage drop due to cable)<br>(Note): In consideration of the voltage drop caused by the cable, use Control output (OSSD 1, OSSD 2) source / sink current and cable length as a guideline.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Control outputs (OSSD 1, OSSD 2)                           | PNP open-collector transistor / NPN open collector transistor (selectable)<br><br><ul style="list-style-type: none"> <li>•Maximum source current : 350 mA</li> <li>•Applied voltage : Same as supply voltage (between control output and +V)</li> <li>•Residual voltage : 2 V or less (source current 350 mA) (excluding voltage drop due to cable)</li> <li>•Leakage current : 0.2 mA or less (including power OFF state)</li> <li>•Maximum load capacity : 2.2 µF</li> <li>•Load wiring resistance : 3 Ω or less</li> </ul><br><ul style="list-style-type: none"> <li>•Maximum sink current : 350 mA</li> <li>•Applied voltage : Same as supply voltage (between control output and 0 V)</li> <li>•Residual voltage : 2 V or less (sink current 350 mA) (excluding voltage drop due to cable)</li> <li>•Leakage current : 0.2 mA or less (including power OFF state)</li> <li>•Maximum load capacity : 2.2 µF</li> <li>•Load wiring resistance : 3 Ω or less</li> </ul> |
| Control outputs (OSSD 1, OSSD 2):Operation mode            | ON when all beams are received, OFF when one or more beams are blocked (Also OFF when internal sensor error or synchronization signal error occurs)<br>(Note): The setting can be changed when the SF4D-TM1 (optional) and Configurator Light Curtain setting software are used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Control outputs(OSSD1, OSSD2):Protection circuit           | Incorporated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Control output(OSSD 1, OSSD 2):Response time               | OFF response : 10 ms or less (Not connected in series / parallel), 18 ms or less (Connected in series / parallel)(Note 1)<br>ON response : 50 ms or less (Note 2)(Note 3)<br>(Note 1): For response times by number of beams, refer to the Control output (OSSD 1, OSSD 2) OFF response times.<br>(Note 2): Because the control output (OSSD 1, OSSD 2) must be OFF for at least 80 ms, the ON response will be delayed more than 50 ms when the light blocked time is less than 30 ms.<br>(Note 3): When optical synchronization is selected, if the beam axes of both the top end and bottom end are blocked, the ON response speed decreases by as much as 1 sec.                                                                                                                                                                                                                                                                                                      |
| Auxiliary output (AUX)(Non-safety output)                  | PNP open-collector transistor / NPN open collector transistor (selectable)<br><br><ul style="list-style-type: none"> <li>•Maximum source current : 60 mA</li> <li>•Applied voltage : Same as supply voltage (between auxiliary output and +V)</li> <li>•Residual voltage : 2 V or less (source current 60 mA) (excluding voltage drop due to cable)</li> <li>•Leakage current : 0.2 mA or less (including power OFF state)</li> </ul><br><ul style="list-style-type: none"> <li>•Maximum sink current : 60 mA</li> <li>•Applied voltage : Same as supply voltage (between auxiliary output and 0 V)</li> <li>•Residual voltage : 2 V or less (sink current 60 mA) (excluding voltage drop due to cable)</li> <li>•Leakage current : 0.2 mA or less (including power OFF state)</li> </ul>                                                                                                                                                                                 |
| Auxiliary output (AUX)(Non-safety output) : Operation mode | Control output ON : OFF, Control output OFF : ON<br>(Note): The setting can be changed when the SF4D-TM1 (optional) and Configurator Light Curtain setting software are used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Auxiliary output (AUX)(Non-safety output) :<br>Protection circuit | Incorporated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Auxiliary output (AUX)(Non-safety output) :<br>Response time      | OFF response : 60 ms or less, ON response : 60 ms or less                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Synchronization method                                            | Line synchronization / optical synchronization (selectable by DIP switch)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Interference prevention function                                  | <ul style="list-style-type: none"> <li>•Line synchronization : 2 units or less (auto)</li> <li>•Optical synchronization : 2 units or less (selectable by DIP switch)</li> </ul> <ul style="list-style-type: none"> <li>•Series connection : 5 units or less (total number of beam channels 256 or less)</li> <li>•Parallel connection : 3 units or less (total number of beam channels 192 or less)(Note)</li> <li>•Series / parallel connection mixed : 5 units or less (total number of beam channels 144 or less)(Note)</li> </ul> (Note): The setting can be changed when the SF4D-TM1 (optional) and Configurator Light Curtain setting software are used. |
| Test input function                                               | Incorporated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Interlock function                                                | Incorporated [Manual reset / auto reset (selectable by wiring)] (8-core cable or 12-core cable)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Lockout release function                                          | Incorporated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| External device monitoring function                               | Incorporated (8-core cable or 12-core cable)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Application indicator function                                    | Incorporated (only the receiver lights up when optical synchronization is used)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Muting function                                                   | Incorporated (12-core cable)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Override function                                                 | Incorporated (12-core cable)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Power save function                                               | Incorporated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Optional functions                                                | Fixed blanking function, floating blanking function, interlock setting function, external device monitoring setting function, auxiliary output setting function, application indicator setting function, muting setting function, override setting function, protect function, cable switching function<br>(Note): To use optional functions, the SF4D-TM1 (optional) and Configurator Light Curtain setting software are required.                                                                                                                                                                                                                             |
| Pollution degree                                                  | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Operating altitude                                                | 2,000 m <b>6,561.68 ft</b> or less<br>(Note): Do not use or store in an environment pressurized to atmospheric pressure or higher at an altitude of 0 m.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Environmental resistance:Degree of protection                     | IP67, IP65 (IEC), NEMA Type 13 (NEMA 250)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Ambient temperature                                               | -10 to +55 °C <b>+14 to +131 °F</b> (No dew condensation or icing allowed), Storage : -25 to +60 °C <b>-13 to +140 °F</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Ambient humidity                                                  | 30 to 85 % RH, Storage : 30 to 95 % RH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Ambient illuminance                                               | Incandescent light : 5,000 lx or less at the light-receiving surface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Environmental resistance:Dielectric strength voltage              | 1,000 V AC for one minute, 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Vibration resistance                                              | 10 to 55 Hz, 0.75 mm <b>0.030 in</b> double amplitude in X, Y, and Z directions for two hours each<br>Malfunction resistance 10 to 55 Hz, 0.75 mm <b>0.030 in</b> double amplitude in X, Y, and Z directions twenty times each                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Shock resistance                                                  | 300 m/s <sup>2</sup> acceleration (30 G approx.) in X, Y, and Z directions three times each<br>Malfunction resistance 100 m/s <sup>2</sup> acceleration (10 G approx.) in X, Y, and Z directions 1,000 times each                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| SFF (Safe Failure Fraction)                                       | 99%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| HFT (Hardware Fault Tolerance)                                    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Subsystem type                                                    | Type B (IEC 61508-2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| T1 (proof test interval)                                          | 20 years                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Failure response time                                             | Within response time (OFF response)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Safety state                                                      | Control output (OSSD 1 / 2) OFF state                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Emitting element                                                  | Infrared LED (peak emission wavelength : 850 nm <b>0.0335 mil</b> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Material                                                          | Enclosure : Aluminum, Detection surface : Polycarbonate resin and stainless steel (SUS304), Upper cap / lower cap : Nylon                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|                   |                                                                                                                                                                                                                                                                                                                                          |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connecting method | By connector                                                                                                                                                                                                                                                                                                                             |
| Cable extension   | Total length of emitter / receiver can be extended up to 70 m <a href="#">229.659 ft</a> each using optional mating cable (including the length of series mating cables)<br>(Note): In consideration of the voltage drop caused by the cable, use Control output (OSSD 1, OSSD 2) source / sink current and cable length as a guideline. |
| Accessories       | SF4B-TR25 (test rod) : 1 pc.                                                                                                                                                                                                                                                                                                             |
| Remark            | Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C <a href="#">+68 °F</a> .<br>PFH <sub>D</sub> : Probability of Dangerous Failure per Hour, MTTF <sub>D</sub> : Mean Time to Dangerous Failure (in years).                                                       |

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## Accessories (Option)

|                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |  |
| Product Number <b>NEW FC-SFDH-88</b>                                              | Product Number <b>NEW FC-SFDH-88-S</b>                                            | Product Number <b>MS-SFB-2</b>                                                    |
| Part Number <b>FC-SFDH-88</b>                                                     | Part Number <b>FC-SFDH-88-S</b>                                                   | Part Number <b>MS-SFB-2</b>                                                       |
| Product name <b>Front protection cover</b>                                        | Product name <b>Front protection cover</b>                                        | Product name <b>Intermediate supporting bracket</b>                               |

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