

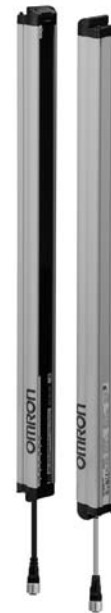
Safety Light Curtain Easy type

F3SG-RE



Easy-to-use Safety Sensor Ideal for Simple On/Off Detection Applications

- Provides simple safety functions - saving TCO by reducing errors
- Simple wiring with only 4 wires
- Fast response time of 5 ms

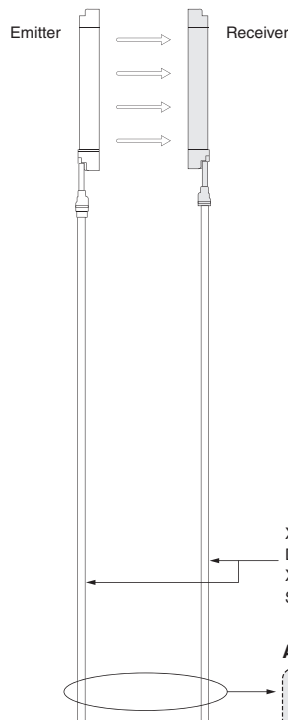


System Configuration

Mounting bracket

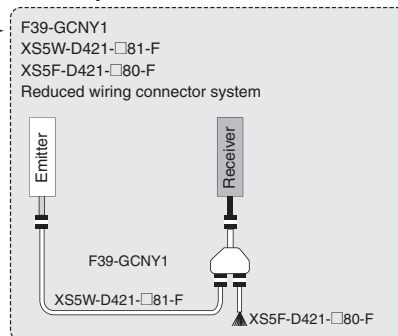


Accessory



XS5W-D421-□81-F
Double-Ended Cable
XS5F-D421-□80-F
Single-Ended Cable
or

Accessory



Recommended safety controller *

NX/NE1A-series
Safety Network Controller

G9SP-series
Safety Controller

G9SE/G9SA-series
Safety Relay Unit

G9SX-series
Flexible Safety Unit

G7SA/G7S-E
Relays with Forcibly
Guided Contacts

* The recommended safety controller is required to build a safety circuit using emergency stop switches and door switches.

Ordering Information

Main Units

Safety Light Curtain

Finger protection

| Number of beams | Protective height (mm) | Model | |
|-----------------|------------------------|-----------------|-----------------|
| | | PNP output | NPN output |
| 15 | 160 | F3SG-4RE0160P14 | F3SG-4RE0160N14 |
| 23 | 240 | F3SG-4RE0240P14 | F3SG-4RE0240N14 |
| 31 | 320 | F3SG-4RE0320P14 | F3SG-4RE0320N14 |
| 39 | 400 | F3SG-4RE0400P14 | F3SG-4RE0400N14 |
| 47 | 480 | F3SG-4RE0480P14 | F3SG-4RE0480N14 |
| 55 | 560 | F3SG-4RE0560P14 | F3SG-4RE0560N14 |
| 63 | 640 | F3SG-4RE0640P14 | F3SG-4RE0640N14 |
| 71 | 720 | F3SG-4RE0720P14 | F3SG-4RE0720N14 |
| 79 | 800 | F3SG-4RE0800P14 | F3SG-4RE0800N14 |
| 87 | 880 | F3SG-4RE0880P14 | F3SG-4RE0880N14 |
| 95 | 960 | F3SG-4RE0960P14 | F3SG-4RE0960N14 |
| 103 | 1,040 | F3SG-4RE1040P14 | F3SG-4RE1040N14 |
| 111 | 1,120 | F3SG-4RE1120P14 | F3SG-4RE1120N14 |
| 119 | 1,200 | F3SG-4RE1200P14 | F3SG-4RE1200N14 |
| 127 | 1,280 | F3SG-4RE1280P14 | F3SG-4RE1280N14 |
| 135 | 1,360 | F3SG-4RE1360P14 | F3SG-4RE1360N14 |
| 143 | 1,440 | F3SG-4RE1440P14 | F3SG-4RE1440N14 |
| 151 | 1,520 | F3SG-4RE1520P14 | F3SG-4RE1520N14 |
| 159 | 1,600 | F3SG-4RE1600P14 | F3SG-4RE1600N14 |
| 167 | 1,680 | F3SG-4RE1680P14 | F3SG-4RE1680N14 |
| 175 | 1,760 | F3SG-4RE1760P14 | F3SG-4RE1760N14 |
| 183 | 1,840 | F3SG-4RE1840P14 | F3SG-4RE1840N14 |
| 191 | 1,920 | F3SG-4RE1920P14 | F3SG-4RE1920N14 |
| 199 | 2,000 | F3SG-4RE2000P14 | F3SG-4RE2000N14 |
| 207 | 2,080 | F3SG-4RE2080P14 | F3SG-4RE2080N14 |



Hand and arm protection

| Number of beams | Protective height (mm) | Model | |
|-----------------|------------------------|-----------------|-----------------|
| | | PNP | NPN |
| 8 | 190 | F3SG-4RE0190P30 | F3SG-4RE0190N30 |
| 12 | 270 | F3SG-4RE0270P30 | F3SG-4RE0270N30 |
| 16 | 350 | F3SG-4RE0350P30 | F3SG-4RE0350N30 |
| 20 | 430 | F3SG-4RE0430P30 | F3SG-4RE0430N30 |
| 24 | 510 | F3SG-4RE0510P30 | F3SG-4RE0510N30 |
| 28 | 590 | F3SG-4RE0590P30 | F3SG-4RE0590N30 |
| 32 | 670 | F3SG-4RE0670P30 | F3SG-4RE0670N30 |
| 36 | 750 | F3SG-4RE0750P30 | F3SG-4RE0750N30 |
| 40 | 830 | F3SG-4RE0830P30 | F3SG-4RE0830N30 |
| 44 | 910 | F3SG-4RE0910P30 | F3SG-4RE0910N30 |
| 48 | 990 | F3SG-4RE0990P30 | F3SG-4RE0990N30 |
| 52 | 1,070 | F3SG-4RE1070P30 | F3SG-4RE1070N30 |
| 56 | 1,150 | F3SG-4RE1150P30 | F3SG-4RE1150N30 |
| 60 | 1,230 | F3SG-4RE1230P30 | F3SG-4RE1230N30 |
| 64 | 1,310 | F3SG-4RE1310P30 | F3SG-4RE1310N30 |
| 68 | 1,390 | F3SG-4RE1390P30 | F3SG-4RE1390N30 |
| 72 | 1,470 | F3SG-4RE1470P30 | F3SG-4RE1470N30 |
| 76 | 1,550 | F3SG-4RE1550P30 | F3SG-4RE1550N30 |
| 80 | 1,630 | F3SG-4RE1630P30 | F3SG-4RE1630N30 |
| 84 | 1,710 | F3SG-4RE1710P30 | F3SG-4RE1710N30 |
| 88 | 1,790 | F3SG-4RE1790P30 | F3SG-4RE1790N30 |
| 92 | 1,870 | F3SG-4RE1870P30 | F3SG-4RE1870N30 |
| 96 | 1,950 | F3SG-4RE1950P30 | F3SG-4RE1950N30 |
| 100 | 2,030 | F3SG-4RE2030P30 | F3SG-4RE2030N30 |
| 104 | 2,110 | F3SG-4RE2110P30 | F3SG-4RE2110N30 |
| 108 | 2,190 | F3SG-4RE2190P30 | F3SG-4RE2190N30 |
| 112 | 2,270 | F3SG-4RE2270P30 | F3SG-4RE2270N30 |
| 116 | 2,350 | F3SG-4RE2350P30 | F3SG-4RE2350N30 |
| 120 | 2,430 | F3SG-4RE2430P30 | F3SG-4RE2430N30 |
| 124 | 2,510 | F3SG-4RE2510P30 | F3SG-4RE2510N30 |

Accessories (Sold separately)


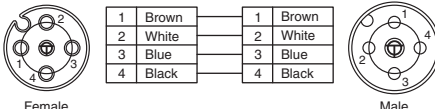
Safety light curtain connecting cable

Single-Ended Cable (Round Water-resistant Connector: Connector Connected to Cable, Socket on One Cable End)

| Appearance | Type | Cable length | Specifications | Model | | | | | | | | | | | | | | | | | | | | |
|---|--------------------------------|--------------|--|---------------|----------|----------|-------|---|---------|---------|-------|---|---------------|--------|-------|---|-------|-------|------|---|----------|--------|-------|-----------------|
|  | M12 connector (4-pin), 4 wires | 1 m |  <table border="1" data-bbox="842 360 1166 456"> <thead> <tr> <th>PIN</th> <th>Emitter</th> <th>Receiver</th> <th>Color</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+24 VDC</td> <td>+24 VDC</td> <td>Brown</td> </tr> <tr> <td>2</td> <td>Range setting</td> <td>OSSD 2</td> <td>White</td> </tr> <tr> <td>3</td> <td>0 VDC</td> <td>0 VDC</td> <td>Blue</td> </tr> <tr> <td>4</td> <td>Not used</td> <td>OSSD 1</td> <td>Black</td> </tr> </tbody> </table> | PIN | Emitter | Receiver | Color | 1 | +24 VDC | +24 VDC | Brown | 2 | Range setting | OSSD 2 | White | 3 | 0 VDC | 0 VDC | Blue | 4 | Not used | OSSD 1 | Black | XS5F-D421-C80-F |
| | | PIN | | Emitter | Receiver | Color | | | | | | | | | | | | | | | | | | |
| | | 1 | | +24 VDC | +24 VDC | Brown | | | | | | | | | | | | | | | | | | |
| | | 2 | | Range setting | OSSD 2 | White | | | | | | | | | | | | | | | | | | |
| | | 3 | | 0 VDC | 0 VDC | Blue | | | | | | | | | | | | | | | | | | |
| | | 4 | | Not used | OSSD 1 | Black | | | | | | | | | | | | | | | | | | |
| 2 m | XS5F-D421-D80-F | | | | | | | | | | | | | | | | | | | | | | | |
| 3 m | XS5F-D421-E80-F | | | | | | | | | | | | | | | | | | | | | | | |
| 5 m | XS5F-D421-G80-F | | | | | | | | | | | | | | | | | | | | | | | |
| 10 m | XS5F-D421-J80-F | | | | | | | | | | | | | | | | | | | | | | | |
| 20 m | XS5F-D421-L80-F | | | | | | | | | | | | | | | | | | | | | | | |

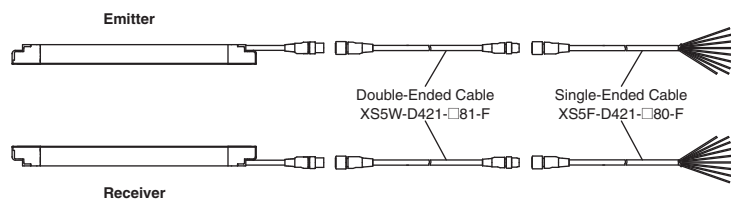
- Note:** 1. One cable that can be used for both emitter and receiver is provided. Order two cables for one set of safety light curtains.
 2. To extend the cable length to 20 m or more, add the XS5W-D421-□81-F Double-Ended Cable.

Double-Ended Cable (Round Water-resistant Connector: Connectors Connected to Cable, Socket and Plug on Cable Ends) For cable extension and simple wiring


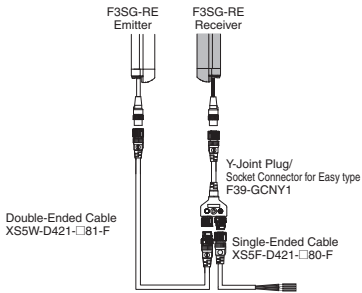
| Appearance | Type | Cable length | Specifications | Model |
|---|------------------------------------|--------------|--|-----------------|
|  | M12 connector (4-pin) on both ends | 1 m |  | XS5W-D421-C81-F |
| | | 2 m | | XS5W-D421-D81-F |
| | | 3 m | | XS5W-D421-E81-F |
| | | 5 m | | XS5W-D421-G81-F |
| | | 10 m | | XS5W-D421-J81-F |
| | | 20 m | | XS5W-D421-L81-F |

- Note:** 1. One cable that can be used for both emitter and receiver is provided. Order two cables for one set of safety light curtains.
 2. To extend the cable length to more than 20 m, add the XS5W-D421-□81-F Double-Ended Cable to the XS5F-D421-□80-F Single-Ended Cable.
 To extend the cable length to more than 40 m, add several Double-Ended Cables to the Single-Ended Cable.
 Example: To extend the cable length to 50 m, connect two XS5W-D421-L81-F (20 m) cables and one XS5F-D421-J80-F (10 m) cable.

<Connection example>







Y-Joint Plug/Socket Connector for Easy type F3SG-RE

| Appearance | Type | Cable length | Specifications | Model |
|---|--|--------------|--|-----------|
|  | M12 connectors. Used for reduced wiring. | 0.5 m |  <p>When using the reduced wiring connector system F39-GCNY1, the Operating Range Selection is fixed to Long Mode.</p> | F39-GCNY1 |

F3SG-RE

Sensor Mounting Brackets

| Appearance | Specification | Application | Model |
|---|--|--|-------------------|
|  | Standard Fixed Bracket | Bracket to mount the F3SG-R. Side mounting and backside mounting possible. (This is included as a standard accessory with the product. It comes as a set of two Brackets. Refer to note *1 for the number of sets provided with each model.) | F39-LGF |
|  | Standard Adjustable Bracket | Bracket to mount the F3SG-R. Beam alignment after mounting possible. The angle adjustment range is $\pm 15^\circ$. Side mounting and backside mounting possible. (Sold separately as a set of two Brackets. Refer to note *1 for the number of sets required for each model.) | F39-LGA |
|  | Top/Bottom Adjustable Bracket *2 | Bracket to mount the F3SG-R. Use this bracket at the top and bottom positions of the F3SG-R. Beam alignment after mounting possible. The angle adjustment range is $\pm 22.5^\circ$. Side mounting and backside mounting possible. (Sold separately. 4 brackets per set.) | F39-LGTB |
|  | Top/Bottom Adjustable Bracket *2 (For user-made mounting part) | Top/Bottom Adjustable Bracket without a bracket to mount to the wall. Use the user's own wall mounting part to suit the machine. (Sold separately. 4 brackets per set.) | F39-LGTB-1 |

*1. [for F3SG-4RE□□□□□14] Protective height of 0160 to 1200: 2 sets, Protective height of 1280 to 2080: 3 sets [for F3SG-4RE□□□□□30] Protective height of 0190 to 1230: 2 sets, Protective height of 1310 to 2270: 3 sets, Protective height of 2350 to 2510: 4 sets

*2. Top/Bottom Adjustable Bracket cannot be used with the Standard Fixed Bracket. Use with the Standard Adjustable Bracket.

Using Top/Bottom Adjustable Brackets with Standard Adjustable Brackets

F3SG-4RE□□□□□14: Protective height of 1040 or less: The Standard Adjustable Bracket is not required. Please purchase 1 set of Top/Bottom Adjustable Brackets (F39-LGTB(-1)).

Protective height of 1120 to 1920: Please purchase 1 set of Top/Bottom Adjustable Brackets (F39-LGTB(-1)) and 1 set of Standard Adjustable Brackets (F39-LGA).


Protective height of 2000 to 2080: Please purchase 1 set of Top/Bottom Adjustable Brackets (F39-LGTB(-1)) and 2 sets of Standard Adjustable Brackets (F39-LGA).

F3SG-4RE□□□□□30: Protective height of 1070 or less: The Standard Adjustable Bracket is not required. Please purchase 1 set of Top/Bottom Adjustable Brackets (F39-LGTB(-1)).

Protective height of 1150 to 1950: Please purchase 1 set of Top/Bottom Adjustable Brackets (F39-LGTB(-1)) and 1 set of Standard Adjustable Brackets (F39-LGA).

Protective height of 2030 to 2510: Please purchase 1 set of Top/Bottom Adjustable Brackets (F39-LGTB(-1)) and 2 sets of Standard Adjustable Brackets (F39-LGA).

Laser Pointer for F3SG-R

| Appearance | Specifications | Model |
|---|--|----------------|
|  | The laser pointer is attached on the optical surface of the F3SG-R to help coarse adjustment of beams. | F39-PTG |

Spatter Protection Cover (2 covers per set, one for emitter and one for receiver)

Spatter Protection Covers include the mounting brackets.

For Safety Light Curtain models of the protective height of 2,000 mm or longer, use two Spatter Protection Covers of different lengths.



| Appearance | Safety Light Curtain Model | | Model |
|------------|----------------------------|-------------------------|-------------|
| | Finger protection | Hand and arm protection | |
| | F3SG-4RE0160□14 | F3SG-4RE0190□30 | F39-HGB0180 |
| | F3SG-4RE0240□14 | F3SG-4RE0270□30 | F39-HGB0260 |
| | F3SG-4RE0320□14 | F3SG-4RE0350□30 | F39-HGB0340 |
| | F3SG-4RE0400□14 | F3SG-4RE0430□30 | F39-HGB0420 |
| | F3SG-4RE0480□14 | F3SG-4RE0510□30 | F39-HGB0500 |
| | F3SG-4RE0560□14 | F3SG-4RE0590□30 | F39-HGB0580 |
| | F3SG-4RE0640□14 | F3SG-4RE0670□30 | F39-HGB0660 |
| | F3SG-4RE0720□14 | F3SG-4RE0750□30 | F39-HGB0740 |
| | F3SG-4RE0800□14 | F3SG-4RE0830□30 | F39-HGB0820 |
| | F3SG-4RE0880□14 | F3SG-4RE0910□30 | F39-HGB0900 |
| | F3SG-4RE0960□14 | F3SG-4RE0990□30 | F39-HGB0980 |
| | F3SG-4RE1040□14 | F3SG-4RE1070□30 | F39-HGB1060 |
| | F3SG-4RE1120□14 | F3SG-4RE1150□30 | F39-HGB1140 |
| | F3SG-4RE1200□14 | F3SG-4RE1230□30 | F39-HGB1220 |
| | F3SG-4RE1280□14 | F3SG-4RE1310□30 | F39-HGB1300 |
| | F3SG-4RE1360□14 | F3SG-4RE1390□30 | F39-HGB1380 |
| | F3SG-4RE1440□14 | F3SG-4RE1470□30 | F39-HGB1460 |
| | F3SG-4RE1520□14 | F3SG-4RE1550□30 | F39-HGB1540 |
| | F3SG-4RE1600□14 | F3SG-4RE1630□30 | F39-HGB1620 |
| | F3SG-4RE1680□14 | F3SG-4RE1710□30 | F39-HGB1700 |
| | F3SG-4RE1760□14 | F3SG-4RE1790□30 | F39-HGB1780 |
| | F3SG-4RE1840□14 | F3SG-4RE1870□30 | F39-HGB1860 |
| | F3SG-4RE1920□14 | F3SG-4RE1950□30 | F39-HGB1940 |
| | | | F39-HGB1460 |
| | F3SG-4RE2000□14 | F3SG-4RE2030□30 | F39-HGA0550 |
| | | | F39-HGB1540 |
| | F3SG-4RE2080□14 | F3SG-4RE2110□30 | F39-HGA0550 |
| | | | F39-HGB1620 |
| | - | F3SG-4RE2190□30 | F39-HGA0550 |
| | | | F39-HGB1700 |
| | | | F39-HGA0550 |
| | | F3SG-4RE2270□30 | F39-HGB1780 |
| | | | F39-HGA0550 |
| | | F3SG-4RE2350□30 | F39-HGB1860 |
| | | | F39-HGA0550 |
| | | F3SG-4RE2430□30 | F39-HGB1940 |
| | | | F39-HGA0550 |
| | | F3SG-4RE2510□30 | F39-HGB1940 |
| | | | F39-HGA0550 |

Note: The operating range of the Safety Light Curtain attached with the product is 10% shorter than the rating.

Test Rod

| Diameter | Model |
|------------|-----------|
| 14 mm dia. | F39-TRD14 |
| 30 mm dia. | F39-TRD30 |

Ratings/Specifications

Main unit

The □□□□ in the model names indicate the protective heights in millimeters.

| | | F3SG-4RE□□□□-14, F3SG-2RE□□□□-14 | F3SG-4RE□□□□-30, F3SG-2RE□□□□-30 | |
|-------------|--|---|---|-----------------------------------|
| Performance | Type of ESPE (IEC 61496-1) | Type 4 F3SG-4RE□□□□14/30 | Type 2 F3SG-2RE□□□□14/30 | |
| | Object Resolution (Detection Capability) | Opaque objects 14-mm dia. | | |
| | Beam Gap | 10mm | 30-mm dia. | |
| | Number of Beams | 15 to 207 | 20mm | |
| | Lens Size | 5.2 × 3.4 (W×H) mm | 8 to 124 | |
| | Protective Height | 160 to 2080 mm (6.3 to 81.9 inch) | 7-mm dia. | |
| | Operating Range | Long | 0.3 to 10.0 m (1 to 32 ft.) | 190 to 2510 mm (7.3 to 98.7 inch) |
| | | Short | 0.3 to 3.0 m (1 to 10 ft.) | 0.3 to 20.0 m (1 to 65 ft.) |
| | Response Time | ON to OFF | 5 to 15ms *1 | 0.3 to 7.0 m (1 to 23 ft.) |
| | | OFF to ON | 25 to 75ms *1 | |
| | *1. Response time when used in one segment system Refer to page 79. | | | |
| | Effective Aperture Angle (EAA) (IEC61496-2) | Type 4 | ±2.5° max., emitter and receiver at operating range of 3 m or greater | |
| Type 2 | | ±5.0° max., emitter and receiver at operating range of 3 m or greater | | |

F3SG-RE

| | | F3SG-4RE□□□□-14, F3SG-2RE□□□□-14 | F3SG-4RE□□□□-30, F3SG-2RE□□□□-30 | |
|---|---|---|---|--|
| Performance | Light Source | Infrared LEDs, Wavelength: 870 nm | | |
| | Startup Waiting Time | 2 s max. | | |
| Electrical | Power Supply Voltage (Vs) | SELV/PELV 24 VDC±20% (ripple p-p 10% max.) | | |
| | Current Consumption | Refer to page 79 | | |
| | Safety Outputs (OSSD) | F3SG-□RE□□□□P□□: Two PNP transistor outputs F3SG-□RE□□□□N□□: Two NPN transistor outputs | | |
| | | Load current of 300 mA max., Residual voltage of 2 V max. (except for voltage drop due to cable extension), Capacitive load of 1 μF max., Inductive load of 2.2 H max. *1 Leakage current of 1 mA max. (PNP), 2 mA max. (NPN) *2 | | |
| | | *1.The load inductance is the maximum value when the safety output frequently repeats ON and OFF. When you use the safety output at 4 Hz or less, the usable load inductance becomes larger. *2.These values must be taken into consideration when connecting elements including a capacitive load such as a capacitor. | | |
| | Output Operation Mode | Safety Output | Light-ON (Safety output is enabled when the receiver receives an emitting signal.) | |
| | Input Voltage | ON Voltage | Operating Range Select Input: Long: 9 V to Vs (sink current 3 mA max.) * Short: 0 to 3 V (source current 3 mA max.) | |
| | | OFF Voltage | | |
| | | * The Vs indicates a supply voltage value in your environment. | | |
| | Overvoltage Category (IEC60664-1) | II | | |
| Indicators | Refer to page 80 | | | |
| Protective Circuit | Output short protection, Power supply reverse polarity protection | | | |
| Insulation Resistance | 20 MΩ or higher (500 VDC megger) | | | |
| Dielectric Strength | 1,000 VAC, 50/60 Hz (1 min) | | | |
| Functional | Test Function | Self-test (at power-on, and during operation) | | |
| Environmental | Ambient Temperature | Operating | -10 to 55°C (14 to 131°F) (non-icing) | |
| | | Storage | -25 to 70°C (-13 to 158°F) | |
| | Ambient Humidity | Operating | 35% to 85% (non-condensing) | |
| | | Storage | 35% to 95% | |
| | Ambient Illuminance | Incandescent lamp: 3,000 lx max. on receiver surface Sunlight: 10,000 lx max. on receiver surface | | |
| | Degree of Protection (IEC 60529) | IP65 and IP67 | | |
| | Vibration Resistance (IEC 61496-1) | 10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes | | |
| | Shock Resistance (IEC 61496-1) | 100 m/s ² , 1000 shocks for all 3 axes | | |
| | Pollution Degree (IEC 60664-1) | Pollution Degree 3 | | |
| | Connections | Power cable | Type of Connection | M12 connectors: 4-pin, IP67 rated when mated, Cables prewired to the sensors |
| Number of Wires | | | Emitter: 4, Receiver: 4 | |
| Cable Length | | | 0.3 m | |
| Cable Diameter | | | 6 mm | |
| Minimum Bending Radius | | | R5 mm | |
| Extension cable - Single-Ended Cable - Double-Ended Cable | | Type of Connection | Use the XS5□-D42□ series cables. | |
| | | Number of Wires | | |
| | | Cable Length | | |
| | | Cable Diameter | | |
| | | Minimum Bending Radius | | |
| Extension of Power Cable | 100 m max. | | | |
| Material | Material | Housing: Aluminum alloy Cap: PBT resin Front window: Acrylic resin Cable: Oil-resistant PVC resin Standard Fixed Bracket (F39-LGF): Zinc alloy FE plate: Stainless steel | | |
| | Weight | Refer to page 79. | | |
| | Included Accessories | Safety Precautions, Quick Installation Manual, Standard Fixed Bracket*1, Troubleshooting Guide Sticker *1.The quantity of Standard Fixed Brackets included varies depending on the protective height. [F3SG-□RE□□□□14] - Protective height of 0160 to 1200: 2 sets - Protective height of 1280 to 2080: 3 sets [F3SG-□RE□□□□30] - Protective height of 0190 to 1230: 2 sets - Protective height of 1310 to 2270: 3 sets - Protective height of 2350 to 2510: 4 sets | | |
| Conformity | Conforming standards | Refer to page 26 | | |
| | Performance Level (PL)/Safety category | Type 4 | PL e/Category 4 (EN ISO 13849-1:2015) | |
| | | Type 2 | PL c/Category 2 (EN ISO 13849-1:2015) | |
| | PFH _D | 9.1 × 10 ⁻⁹ (IEC 61508) | | |
| | Proof test interval T _M | Every 20 years (IEC 61508) | | |
| | SFF | 99% (IEC 61508) | | |
| | HFT | 1 (IEC 61508) | | |
| Classification | Type B (IEC 61508-2) | | | |

List of Models/Response Time/Current Consumption/Weight

F3SG-□RE□□□□□-14

| Model | Number of Beams | Protective Height [mm] | Response Time [ms] *1 | | | Current Consumption [mA] | | Weight [kg] | |
|-----------------|-----------------|------------------------|-----------------------|------------------------|----------------------------|--------------------------|----------|-------------|----------|
| | | | ON→OFF | OFF (Synchronized) →ON | OFF (Not synchronized) →ON | Emitter | Receiver | Net *2 | Gross *3 |
| F3SG-□RE0160□14 | 15 | 160 | 5 | 25 | 125 | 45 | 50 | 0.6 | 1.9 |
| F3SG-□RE0240□14 | 23 | 240 | 5 | 25 | 125 | 55 | 55 | 0.8 | 2.2 |
| F3SG-□RE0320□14 | 31 | 320 | 7 | 35 | 135 | 55 | 55 | 1.0 | 2.5 |
| F3SG-□RE0400□14 | 39 | 400 | 7 | 35 | 135 | 65 | 60 | 1.2 | 2.9 |
| F3SG-□RE0480□14 | 47 | 480 | 7 | 35 | 135 | 70 | 60 | 1.4 | 3.2 |
| F3SG-□RE0560□14 | 55 | 560 | 7 | 35 | 135 | 80 | 60 | 1.6 | 3.5 |
| F3SG-□RE0640□14 | 63 | 640 | 7 | 35 | 135 | 85 | 65 | 1.9 | 3.8 |
| F3SG-□RE0720□14 | 71 | 720 | 9 | 45 | 145 | 80 | 65 | 2.1 | 4.1 |
| F3SG-□RE0800□14 | 79 | 800 | 9 | 45 | 145 | 85 | 70 | 2.3 | 4.4 |
| F3SG-□RE0880□14 | 87 | 880 | 9 | 45 | 145 | 90 | 70 | 2.5 | 4.7 |
| F3SG-□RE0960□14 | 95 | 960 | 9 | 45 | 145 | 95 | 75 | 2.7 | 5.0 |
| F3SG-□RE1040□14 | 103 | 1040 | 9 | 45 | 145 | 100 | 75 | 2.9 | 5.4 |
| F3SG-□RE1120□14 | 111 | 1120 | 11 | 55 | 155 | 90 | 75 | 3.1 | 5.7 |
| F3SG-□RE1200□14 | 119 | 1200 | 11 | 55 | 155 | 95 | 80 | 3.3 | 6.0 |
| F3SG-□RE1280□14 | 127 | 1280 | 11 | 55 | 155 | 100 | 80 | 3.5 | 6.3 |
| F3SG-□RE1360□14 | 135 | 1360 | 11 | 55 | 155 | 105 | 85 | 3.7 | 6.6 |
| F3SG-□RE1440□14 | 143 | 1440 | 11 | 55 | 155 | 110 | 85 | 3.9 | 6.9 |
| F3SG-□RE1520□14 | 151 | 1520 | 13 | 65 | 165 | 100 | 90 | 4.1 | 7.2 |
| F3SG-□RE1600□14 | 159 | 1600 | 13 | 65 | 165 | 105 | 90 | 4.4 | 7.5 |
| F3SG-□RE1680□14 | 167 | 1680 | 13 | 65 | 165 | 110 | 95 | 4.6 | 7.9 |
| F3SG-□RE1760□14 | 175 | 1760 | 13 | 65 | 165 | 115 | 95 | 4.8 | 8.2 |
| F3SG-□RE1840□14 | 183 | 1840 | 13 | 65 | 165 | 115 | 95 | 5.0 | 8.5 |
| F3SG-□RE1920□14 | 191 | 1920 | 15 | 75 | 175 | 110 | 100 | 5.2 | 8.8 |
| F3SG-□RE2000□14 | 199 | 2000 | 15 | 75 | 175 | 115 | 100 | 5.4 | 9.1 |
| F3SG-□RE2080□14 | 207 | 2080 | 15 | 75 | 175 | 115 | 105 | 5.6 | 9.4 |

*1. The maximum speed of movement of a test rod up to which the detection capability is maintained is 2.0 m/s.

*2. The net weight is the weight of an emitter and a receiver.

*3. The gross weight is the weight of an emitter, a receiver, included accessories and a package.

F3SG-□RE□□□□□30

| Model | Number of Beams | Protective Height [mm] | Response Time [ms] *1 | | | Current Consumption [mA] | | Weight [kg] | |
|-----------------|-----------------|------------------------|-----------------------|------------------------|----------------------------|--------------------------|----------|-------------|----------|
| | | | ON→OFF | OFF (Synchronized) →ON | OFF (Not synchronized) →ON | Emitter | Receiver | Net *2 | Gross *3 |
| F3SG-□RE0190□30 | 8 | 190 | 5 | 25 | 125 | 40 | 50 | 0.6 | 2.0 |
| F3SG-□RE0270□30 | 12 | 270 | 5 | 25 | 125 | 45 | 50 | 0.8 | 2.3 |
| F3SG-□RE0350□30 | 16 | 350 | 5 | 25 | 125 | 50 | 50 | 1.0 | 2.6 |
| F3SG-□RE0430□30 | 20 | 430 | 5 | 25 | 125 | 55 | 55 | 1.2 | 2.9 |
| F3SG-□RE0510□30 | 24 | 510 | 5 | 25 | 125 | 60 | 55 | 1.4 | 3.2 |
| F3SG-□RE0590□30 | 28 | 590 | 7 | 35 | 135 | 50 | 55 | 1.6 | 3.5 |
| F3SG-□RE0670□30 | 32 | 670 | 7 | 35 | 135 | 55 | 55 | 1.8 | 3.8 |
| F3SG-□RE0750□30 | 36 | 750 | 7 | 35 | 135 | 60 | 60 | 2.0 | 4.1 |
| F3SG-□RE0830□30 | 40 | 830 | 7 | 35 | 135 | 65 | 60 | 2.2 | 4.4 |
| F3SG-□RE0910□30 | 44 | 910 | 7 | 35 | 135 | 65 | 60 | 2.4 | 4.7 |
| F3SG-□RE0990□30 | 48 | 990 | 7 | 35 | 135 | 70 | 60 | 2.6 | 5.0 |
| F3SG-□RE1070□30 | 52 | 1070 | 7 | 35 | 135 | 75 | 60 | 2.8 | 5.3 |
| F3SG-□RE1150□30 | 56 | 1150 | 7 | 35 | 135 | 80 | 65 | 3.0 | 5.6 |
| F3SG-□RE1230□30 | 60 | 1230 | 7 | 35 | 135 | 85 | 65 | 3.3 | 5.9 |
| F3SG-□RE1310□30 | 64 | 1310 | 7 | 35 | 135 | 85 | 65 | 3.5 | 6.2 |
| F3SG-□RE1390□30 | 68 | 1390 | 9 | 45 | 145 | 75 | 65 | 3.7 | 6.5 |
| F3SG-□RE1470□30 | 72 | 1470 | 9 | 45 | 145 | 80 | 65 | 3.9 | 6.8 |
| F3SG-□RE1550□30 | 76 | 1550 | 9 | 45 | 145 | 80 | 70 | 4.1 | 7.1 |
| F3SG-□RE1630□30 | 80 | 1630 | 9 | 45 | 145 | 85 | 70 | 4.3 | 7.4 |
| F3SG-□RE1710□30 | 84 | 1710 | 9 | 45 | 145 | 85 | 70 | 4.5 | 7.7 |
| F3SG-□RE1790□30 | 88 | 1790 | 9 | 45 | 145 | 90 | 70 | 4.7 | 8.0 |
| F3SG-□RE1870□30 | 92 | 1870 | 9 | 45 | 145 | 95 | 75 | 4.9 | 8.3 |
| F3SG-□RE1950□30 | 96 | 1950 | 9 | 45 | 145 | 95 | 75 | 5.1 | 8.6 |
| F3SG-□RE2030□30 | 100 | 2030 | 9 | 45 | 145 | 100 | 75 | 5.3 | 8.9 |
| F3SG-□RE2110□30 | 104 | 2110 | 9 | 45 | 145 | 100 | 75 | 5.5 | 9.2 |
| F3SG-□RE2190□30 | 108 | 2190 | 11 | 55 | 155 | 90 | 75 | 5.7 | 9.5 |
| F3SG-□RE2270□30 | 112 | 2270 | 11 | 55 | 155 | 95 | 80 | 5.9 | 9.8 |
| F3SG-□RE2350□30 | 116 | 2350 | 11 | 55 | 155 | 95 | 80 | 6.1 | 10.1 |
| F3SG-□RE2430□30 | 120 | 2430 | 11 | 55 | 155 | 95 | 80 | 6.3 | 10.4 |
| F3SG-□RE2510□30 | 124 | 2510 | 11 | 55 | 155 | 100 | 80 | 6.5 | 10.7 |

*1. The maximum speed of movement of a test rod up to which the detection capability is maintained is 2.0 m/s.

*2. The net weight is the weight of an emitter and a receiver.

*3. The gross weight is the weight of an emitter, a receiver, included accessories and a package.

F3SG-RE

LED Indicator Status

Emitter

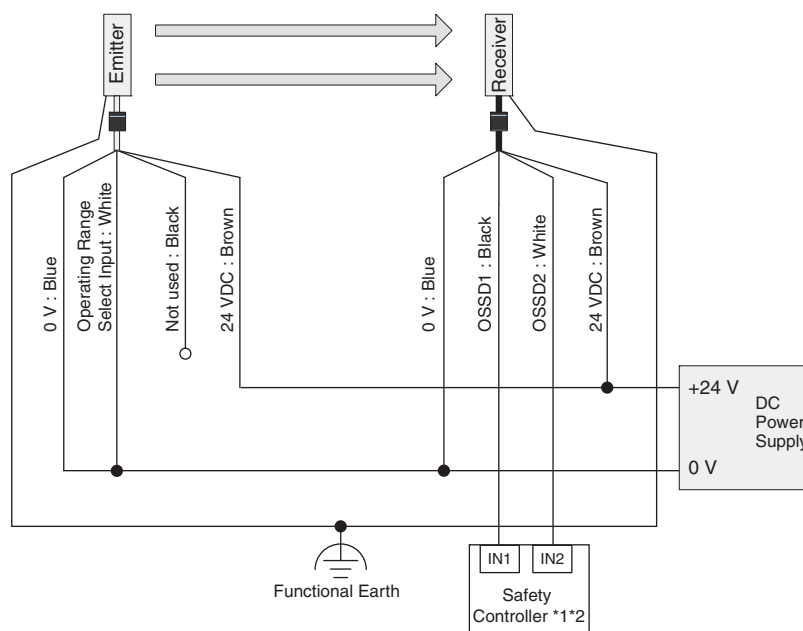
| Name of Indicator | | Color | Illuminated | Blinking |
|-------------------|---------|-------|-----------------------------|--|
| Operating range | LONG | Green | Long range mode is selected | Lockout state due to Operating range selection setting error |
| Power | POWER | Green | Power is ON. | Error due to noise |
| Lockout | LOCKOUT | Red | – | Lockout state due to error in emitter |

Receiver

| Name of Indicator | | Color | Illuminated | Blinking |
|-------------------|----------|-------|--|--|
| Top-beam-state | TOP | Blue | The top beam is unblocked | – |
| Internal error | INTERNAL | Red | – | Lockout state due to Internal error, or error due to abnormal power supply or noise |
| Lockout | LOCKOUT | Red | – | Lockout state due to error in receiver |
| Stable-state | STB | Green | Incident light level is 170% or higher of ON threshold | Safety output is instantaneously turned OFF due to ambient light or vibration |
| ON/OFF | ON/OFF | Green | Safety output is in ON state | – |
| | | Red | Safety output is in OFF state | Lockout state due to Safety Output error, or error due to abnormal power supply or noise |
| Communication | COM | Green | Synchronization between emitter and receiver is maintained | Lockout state due to Communication error, or error due to abnormal power supply or noise |
| Bottom-beam-state | BTM | Blue | The bottom beam is unblocked | – |

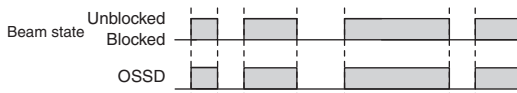
Connections (Basic Wiring Diagram)

Short Mode



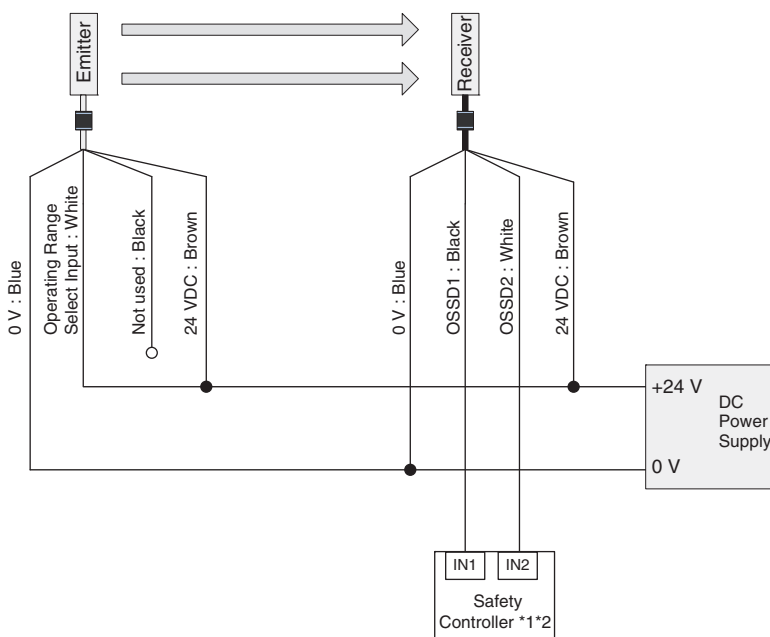
*1.Refer to page 82 for more information.

*2.The safety controller and the F3SG-RE must share the power supply or be connected to the common terminal of the power supply.



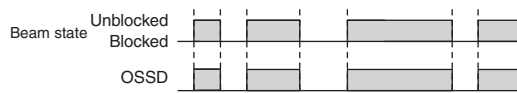
Note: Functional earth connection is unnecessary when you use the F3SG-RE in a general industrial environment where noise control or stable power supply is considered. However, when you use the F3SG-RE in an environment where there may be excessive noise from surroundings or stable power supply may be interfered, it is recommended the F3SG-RE be connected to functional earth. The wiring examples in later examples do not indicate functional earth. To use functional earth, wire an earth cable according to the example above. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information.

Long Mode



*1.Refer to page 82 for more information.

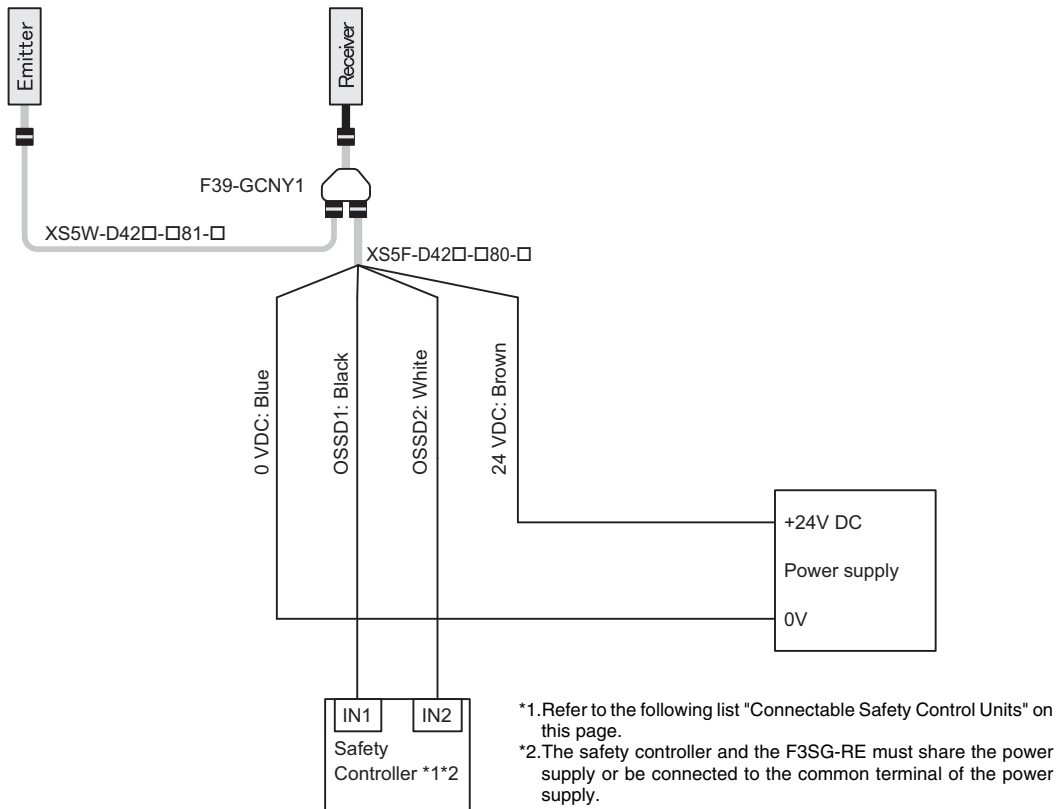
*2.The safety controller and the F3SG-RE must share the power supply or be connected to the common terminal of the power supply.



Note: For the functional earth connection, refer to the Short Mode example.

F3SG-RE

Standalone F3SG-RE with Y-Joint Plug/Socket Connector



- Note:** 1. When using the reduced wiring connector system F39-GCNY1, the Operating Range Selection is fixed to Long Mode.
 2. For the functional earth connection, refer to the Short Mode example.

Connectable Safety Control Units

The F3SG-RE with PNP output can be connected to the safety control units listed in the table below.

| Connectable Safety Control Units (PNP output) | | |
|--|---|--|
| Safety Relay Units | Flexible Safety Units | Safety Controllers |
| G9SA-301 G9SA-321-T□ G9SA-501 G9SB-200-B G9SB-200-D G9SB-301-B G9SB-301-D G9SE-201 G9SE-401 G9SE-221-T□ | G9SX-AD322-T G9SX-ADA222-T G9SX-BC202 G9SX-GS226-T15 | G9SP-N10S G9SP-N10D G9SP-N20S NE0A-SCPU01 NE1A-SCPU01 NE1A-SCPU02 DST1-ID12SL-1 DST1-MD16SL-1 DST1-MRD08SL-1 NX-SIH400 NX-SID800 F3SP-T01 |

The F3SG-R with NPN output can be connected to the safety control units listed in the table below.

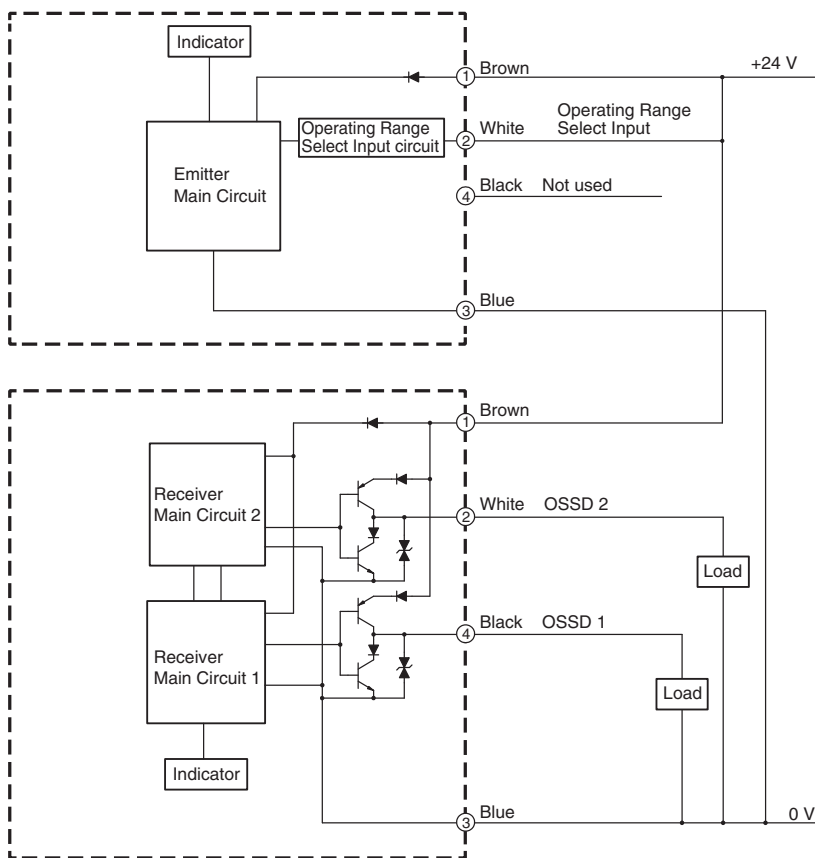
| Connectable Safety Control Units (NPN output) |
|---|
| Safety Relay Units |
| G9SA-301-P |

Input/Output Circuit

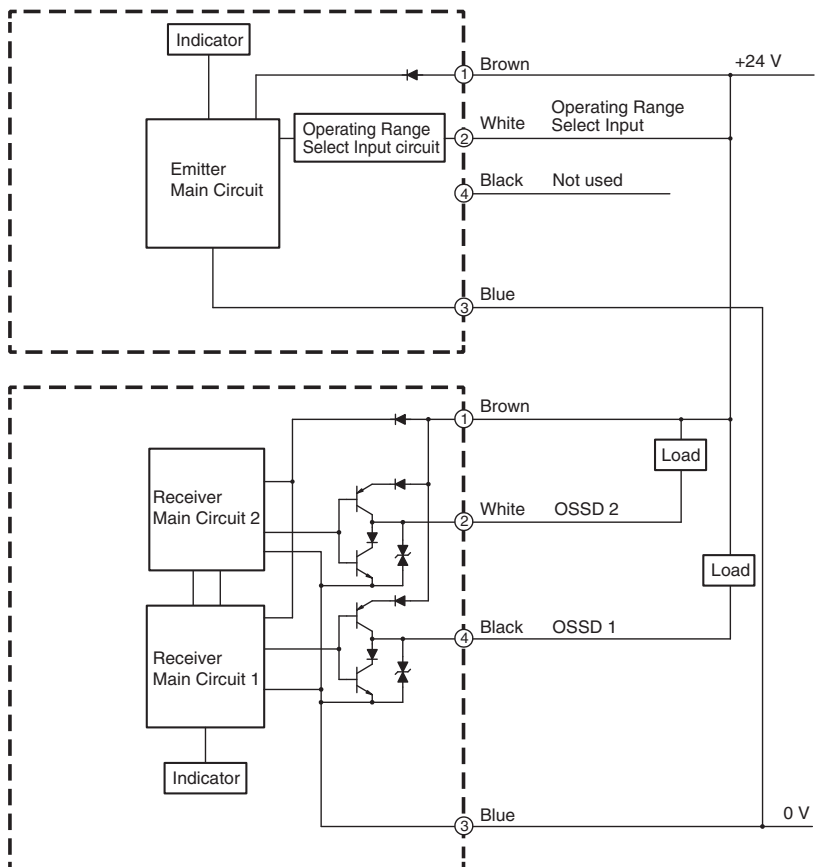
Entire Circuit Diagram

The entire circuit diagram of the F3SG-RE is shown below. The numbers in the circles indicate the connector's pin numbers.

PNP Output



NPN Output



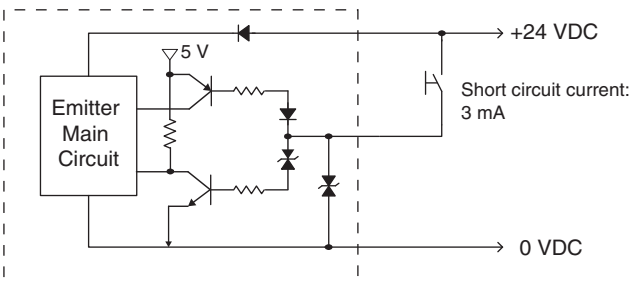
F3SG-RE

Input Circuit Diagram by Function

The input circuit diagrams of by function are shown below.

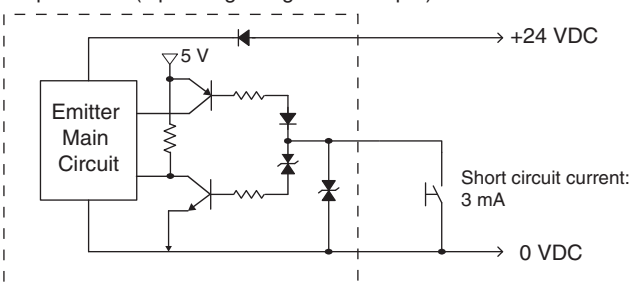
PNP Output

<Input circuit (Operating Range Select Input)>



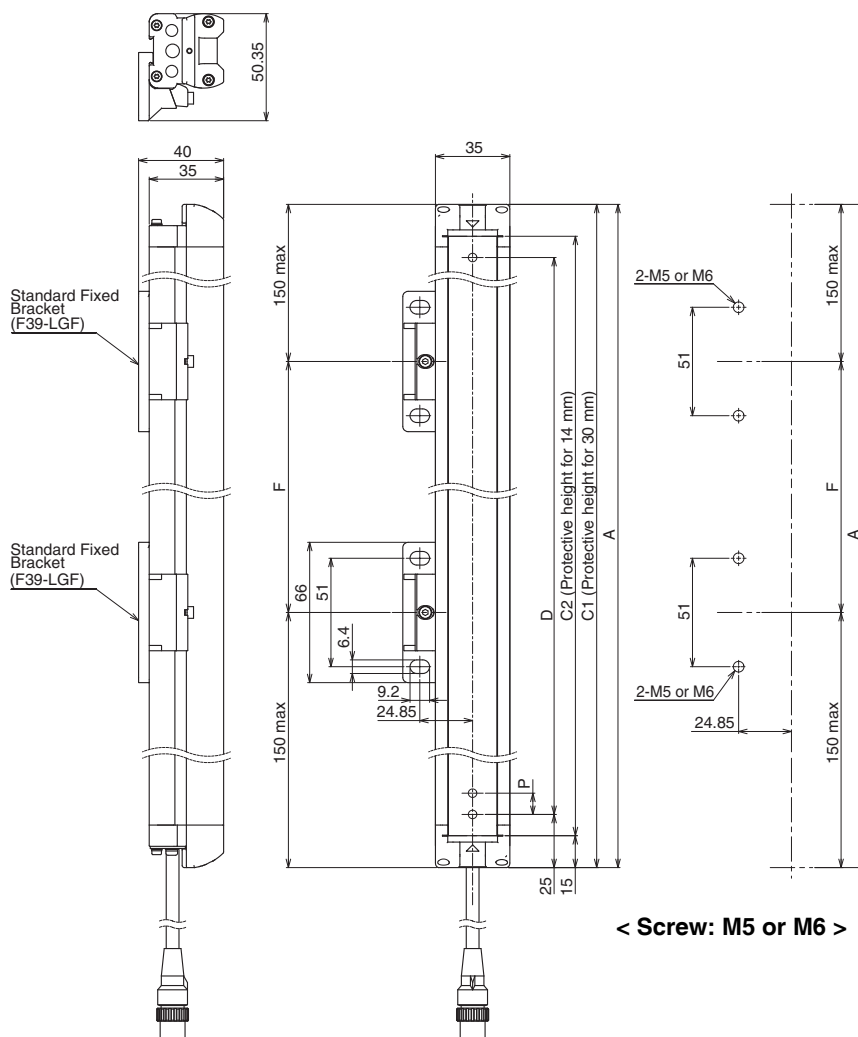
NPN Output

<Input circuit (Operating Range Select Input)>



Dimensions

Mounted with Standard Fixed Brackets (F39-LGF) Backside Mounting



F3SG-4RE□□□□30 Series

| | |
|--------------|--|
| Dimension A | C1 |
| Dimension C1 | 4-digit number of the type name(Protective height) |
| Dimension D | C1-50 |
| Dimension P | 20 |

| Protective height (C1) | Number of Standard Fixed Brackets *1 | Dimension F |
|------------------------|--------------------------------------|--------------|
| 0190 to 1230 | 2 *2 | 1000 mm max. |
| 1310 to 2270 | 3 | 1000 mm max. |
| 2350 to 2510 | 4 | 1000 mm max. |

F3SG-4RE□□□□14 Series

| | |
|--------------|--|
| Dimension A | C2+30 |
| Dimension C2 | 4-digit number of the type name(Protective height) |
| Dimension D | C2-20 |
| Dimension P | 10 |

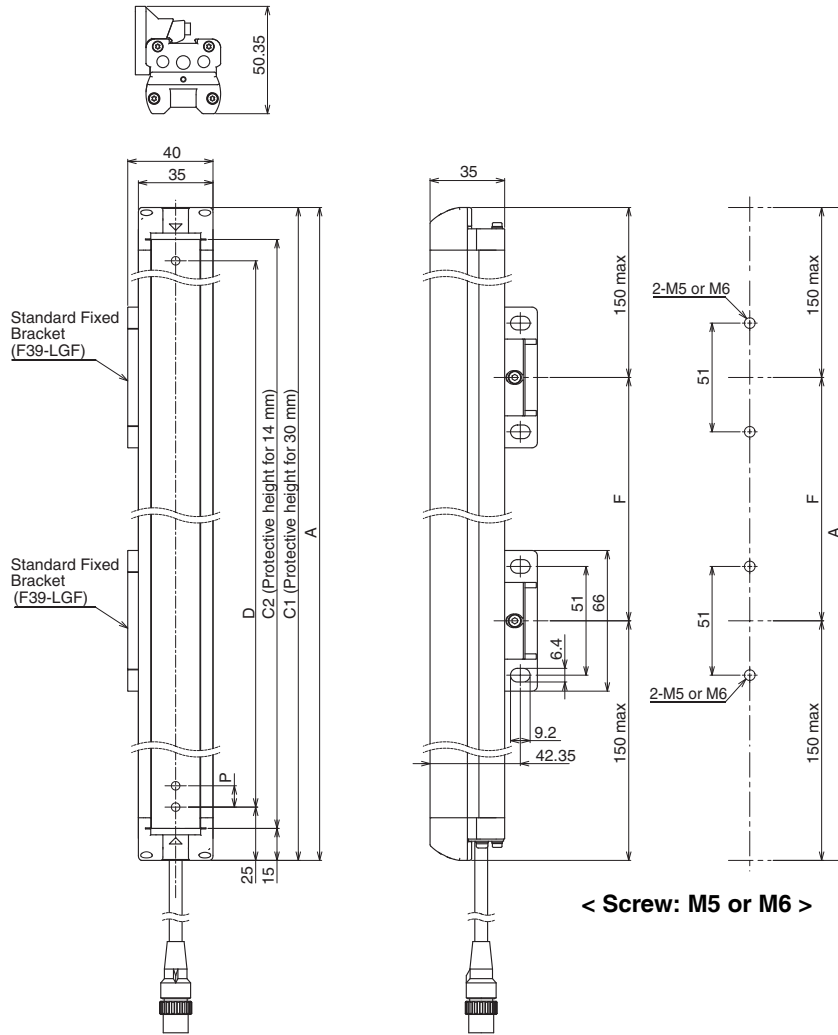
| Protective height (C2) | Number of Standard Fixed Brackets *1 | Dimension F |
|------------------------|--------------------------------------|--------------|
| 0160 to 1200 | 2 *2 | 1000 mm max. |
| 1280 to 2080 | 3 | 1000 mm max. |

*1.The number of brackets required to mount either one of emitter and receiver.

*2.Mounting an emitter or receiver with one bracket is possible for the models of protective height of 0160 to 0270. In this case, locate this bracket at half the Dimension A (or at the center of the sensor length).

F3SG-RE

Side Mounting



F3SG-4RE□□□□30 Series

| | |
|--------------|---|
| Dimension A | C1 |
| Dimension C1 | 4-digit number of the type name (Protective height) |
| Dimension D | C1-50 |
| Dimension P | 20 |

| Protective height (C1) | Number of Standard Fixed Brackets *1 | Dimension F |
|------------------------|--------------------------------------|--------------|
| 0190 to 1230 | 2 *2 | 1000 mm max. |
| 1310 to 2270 | 3 | 1000 mm max. |
| 2350 to 2510 | 4 | 1000 mm max. |

F3SG-4RE□□□□14 Series

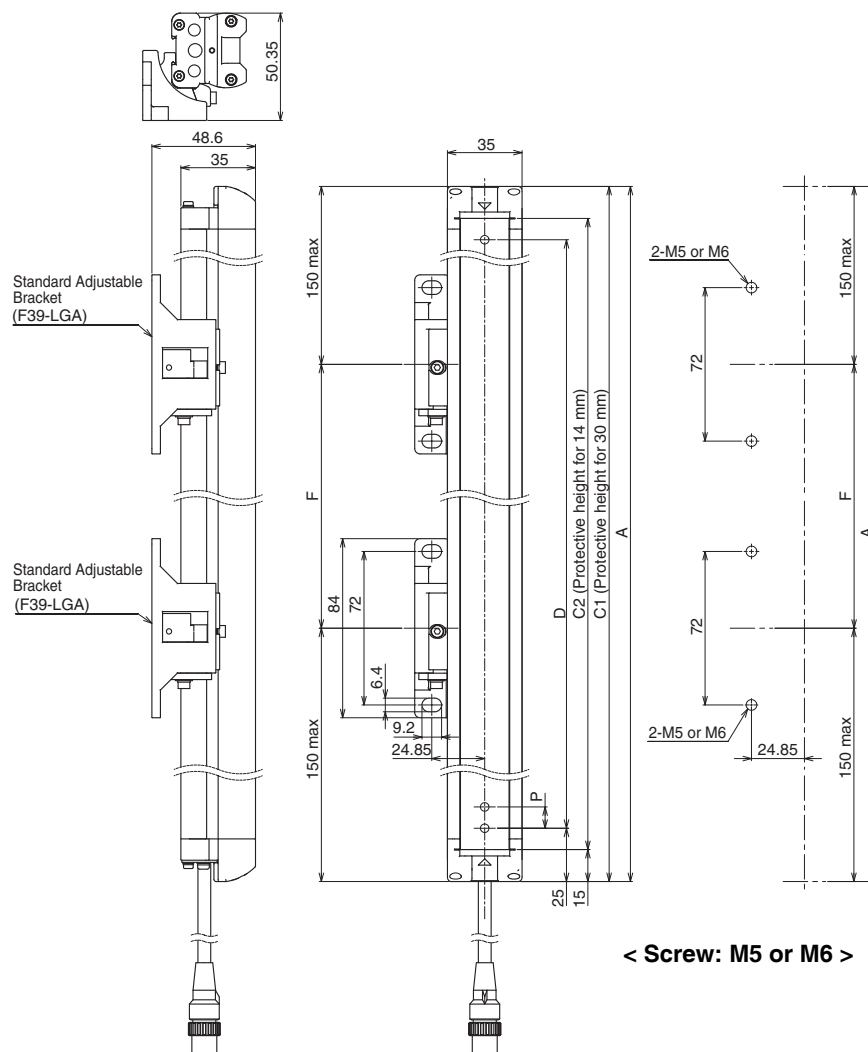
| | |
|--------------|---|
| Dimension A | C2+30 |
| Dimension C2 | 4-digit number of the type name (Protective height) |
| Dimension D | C2-20 |
| Dimension P | 10 |

| Protective height (C2) | Number of Standard Fixed Brackets *1 | Dimension F |
|------------------------|--------------------------------------|--------------|
| 0160 to 1200 | 2 *2 | 1000 mm max. |
| 1280 to 2080 | 3 | 1000 mm max. |

*1. The number of brackets required to mount either one of emitter and receiver.

*2. Mounting an emitter or receiver with one bracket is possible for the models of protective height of 0160 to 0270. In this case, locate this bracket at half the Dimension A (or at the center of the sensor length).

**Mounted with Standard Fixed Brackets (F39-LGA)
Backside Mounting**



F3SG-4RE□□□□□30 Series

| | |
|---------------------|---|
| Dimension A | C1 |
| Dimension C1 | 4-digit number of the type name (Protective height) |
| Dimension D | C1-50 |
| Dimension P | 20 |

| Protective height (C1) | Number of Standard Adjustable Brackets *1 | Dimension F |
|------------------------|---|--------------|
| 0190 to 1230 | 2 *2 | 1000 mm max. |
| 1310 to 2270 | 3 | 1000 mm max. |
| 2350 to 2510 | 4 | 1000 mm max. |

F3SG-4RE□□□□□14 Series

| | |
|---------------------|---|
| Dimension A | C2+30 |
| Dimension C2 | 4-digit number of the type name (Protective height) |
| Dimension D | C2-20 |
| Dimension P | 10 |

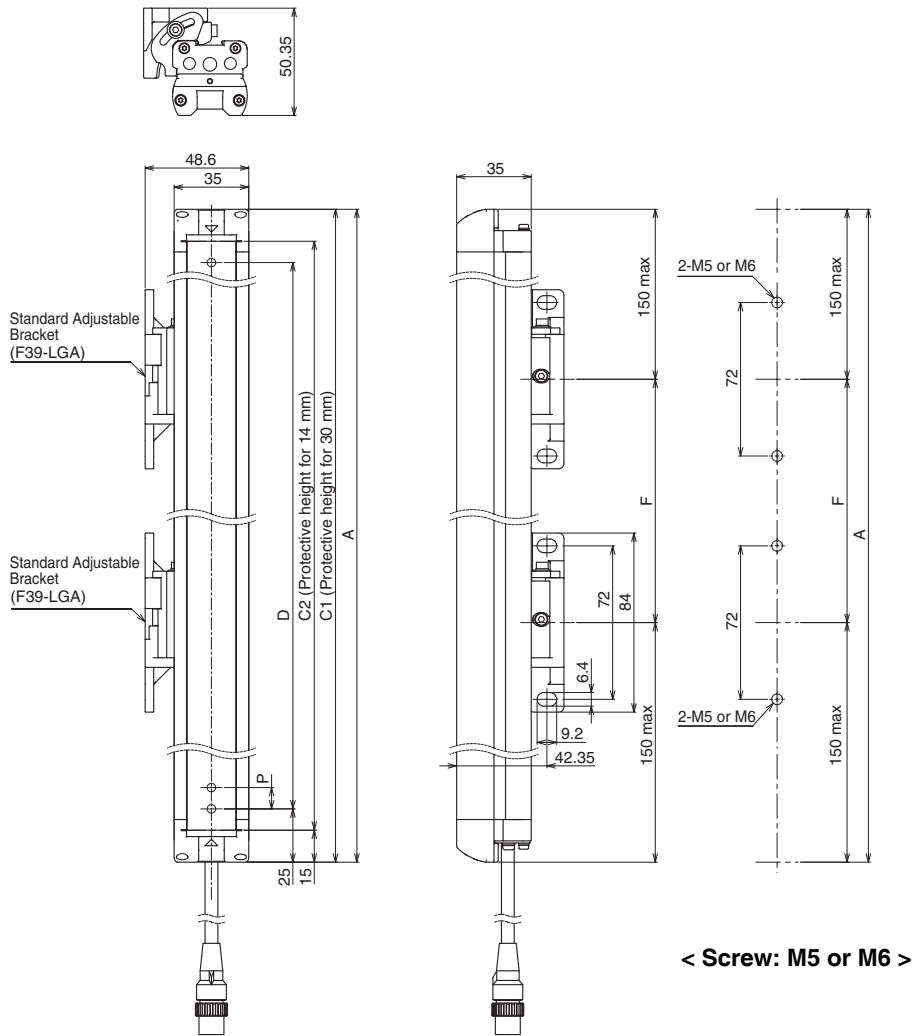
| Protective height (C2) | Number of Standard Adjustable Brackets *1 | Dimension F |
|------------------------|---|--------------|
| 0160 to 1200 | 2 *2 | 1000 mm max. |
| 1280 to 2080 | 3 | 1000 mm max. |

*1. The number of brackets required to mount either one of emitter and receiver.

*2. Mounting an emitter or receiver with one bracket is possible for the models of protective height of 0160 to 0270. In this case, locate this bracket at half the Dimension A (or at the center of the sensor length).

F3SG-RE

Side Mounting



F3SG-4RE□□□□30 Series

| | |
|---------------------|---|
| Dimension A | C1 |
| Dimension C1 | 4-digit number of the type name (Protective height) |
| Dimension D | C1-50 |
| Dimension P | 20 |

| Protective height (C1) | Number of Standard Adjustable Brackets *1 | Dimension F |
|------------------------|---|--------------|
| 0190 to 1230 | 2 *2 | 1000 mm max. |
| 1310 to 2270 | 3 | 1000 mm max. |
| 2350 to 2510 | 4 | 1000 mm max. |

F3SG-4RE□□□□14 Series

| | |
|---------------------|---|
| Dimension A | C2+30 |
| Dimension C2 | 4-digit number of the type name (Protective height) |
| Dimension D | C2-20 |
| Dimension P | 10 |

| Protective height (C2) | Number of Standard Adjustable Brackets *1 | Dimension F |
|------------------------|---|--------------|
| 0160 to 1200 | 2 *2 | 1000 mm max. |
| 1280 to 2080 | 3 | 1000 mm max. |

*1. The number of brackets required to mount either one of emitter and receiver.

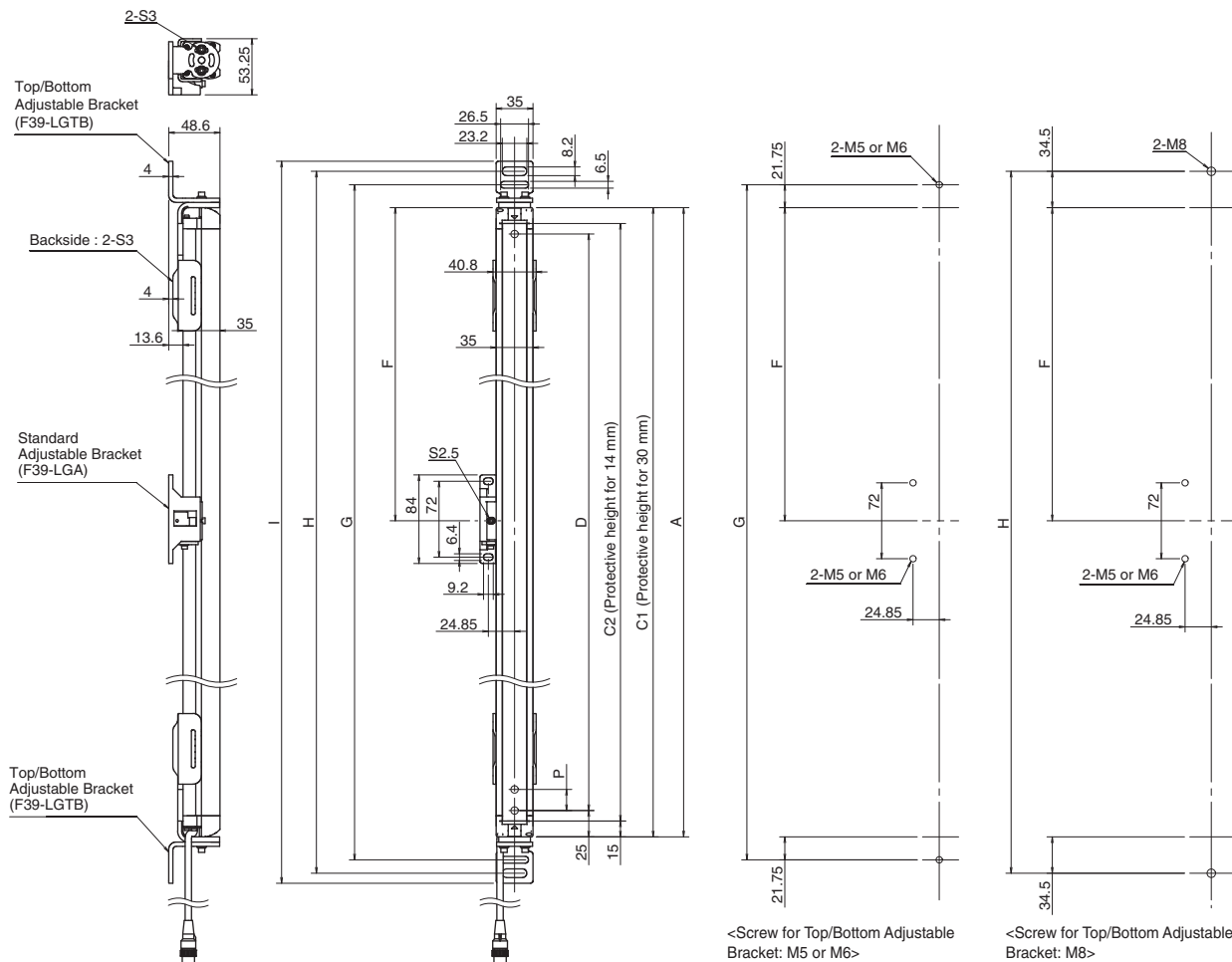
*2. Mounting an emitter or receiver with one bracket is possible for the models of protective height of 0160 to 0270. In this case, locate this bracket at half the Dimension A (or at the center of the sensor length).

Mounted with Top/Bottom Adjustable Brackets (F39-LGTB) and Standard Adjustable Brackets (F39-LGA)

Dimensions when using the F3SG-RE Series except the F3SG-4RE0190□30 and F3SG-4RE0160□14

Refer to *Safety Light Curtain F3SG-R Series User's Manual* for the dimensions when using the F3SG-4RE0190□30 and F3SG-4RE0160□14.

Backside Mounting



F3SG-4RE□□□□□30 Series

| | |
|--------------|---|
| Dimension A | C1 |
| Dimension C1 | 4-digit number of the type name (Protective height) |
| Dimension D | C1-50 |
| Dimension G | C1+43.5 |
| Dimension H | C1+69 |
| Dimension I | C1+88 |
| Dimension P | 20 |

| Protective height (C1) | Number of Top/Bottom Adjustable Brackets | Number of Standard Adjustable Brackets | Dimension F |
|------------------------|--|--|--------------|
| 0270 to 1070 | 2 | 0 | - |
| 1150 to 1950 | 2 | 1 | 1000 mm max. |
| 2030 to 2510 | 2 | 2 | 1000 mm max. |

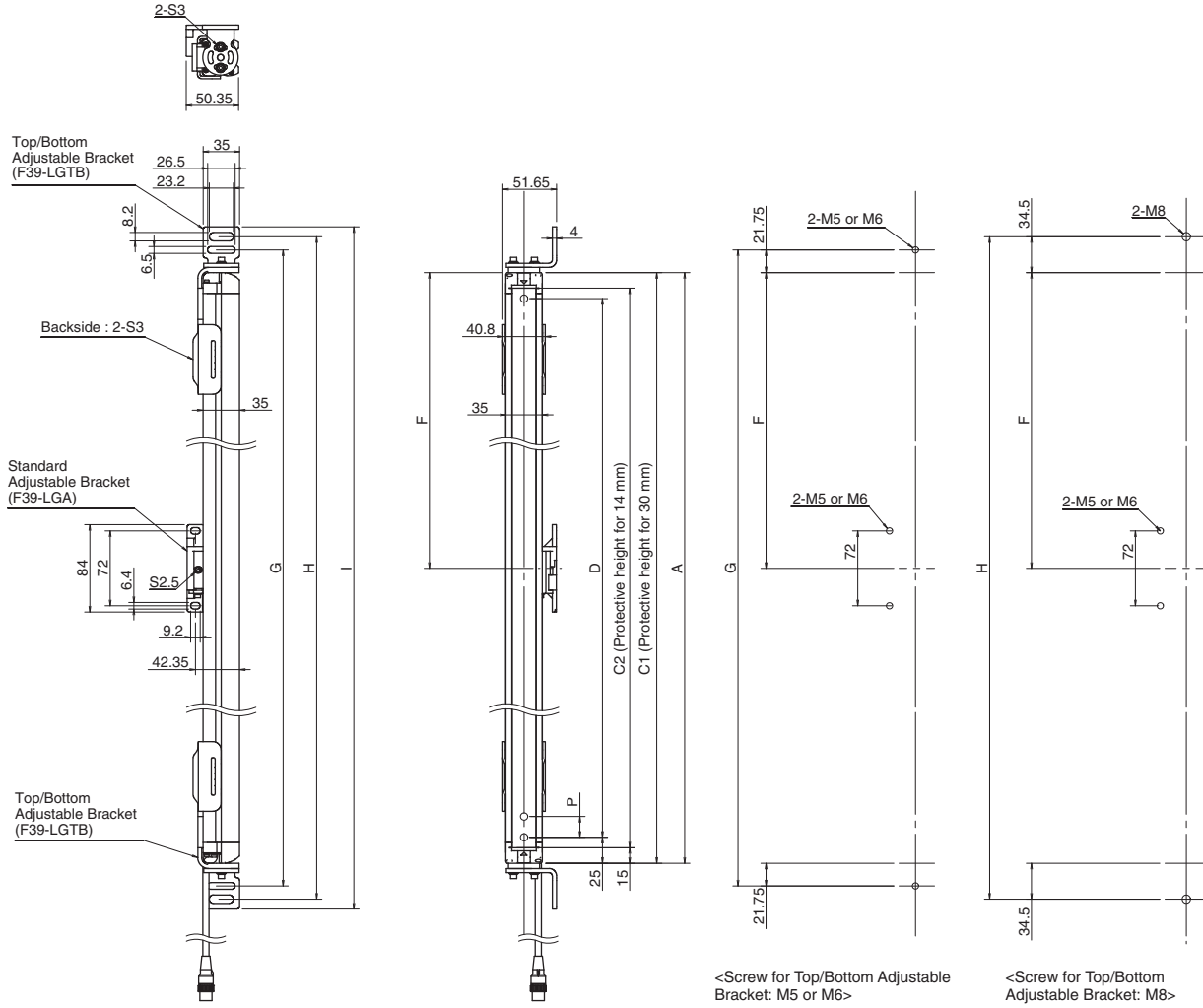
F3SG-4RE□□□□□14 Series

| | |
|--------------|---|
| Dimension A | C2+30 |
| Dimension C2 | 4-digit number of the type name (Protective height) |
| Dimension D | C2-20 |
| Dimension G | C2+73.5 |
| Dimension H | C2+99 |
| Dimension I | C2+118 |
| Dimension P | 10 |

| Protective height (C2) | Number of Top/Bottom Adjustable Brackets | Number of Standard Adjustable Brackets | Dimension F |
|------------------------|--|--|--------------|
| 0240 to 1040 | 2 | 0 | - |
| 1120 to 1920 | 2 | 1 | 1000 mm max. |
| 2000 to 2080 | 2 | 2 | 1000 mm max. |

F3SG-RE

Side Mounting



F3SG-4RE□□□□30 Series

| | |
|---------------------|---|
| Dimension A | C1 |
| Dimension C1 | 4-digit number of the type name (Protective height) |
| Dimension D | C1-50 |
| Dimension G | C1+43.5 |
| Dimension H | C1+69 |
| Dimension I | C1+88 |
| Dimension P | 20 |

| Protective height (C1) | Number of Top/Bottom Adjustable Brackets | Number of Standard Adjustable Brackets | Dimension F |
|------------------------|--|--|--------------|
| 0270 to 1070 | 2 | 0 | - |
| 1150 to 1950 | 2 | 1 | 1000 mm max. |
| 2030 to 2510 | 2 | 2 | 1000 mm max. |

F3SG-4RE□□□□14 Series

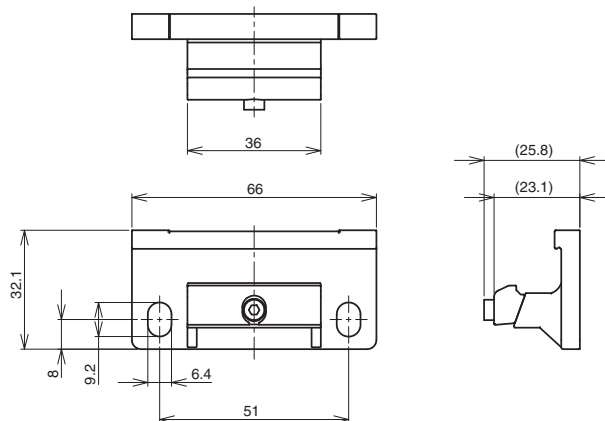
| | |
|---------------------|---|
| Dimension A | C2+30 |
| Dimension C2 | 4-digit number of the type name (Protective height) |
| Dimension D | C2-20 |
| Dimension G | C2+73.5 |
| Dimension H | C2+99 |
| Dimension I | C2+118 |
| Dimension P | 10 |

| Protective height (C2) | Number of Top/Bottom Adjustable Brackets | Number of Standard Adjustable Brackets | Dimension F |
|------------------------|--|--|--------------|
| 0240 to 1040 | 2 | 0 | - |
| 1120 to 1920 | 2 | 1 | 1000 mm max. |
| 2000 to 2080 | 2 | 2 | 1000 mm max. |

Accessories

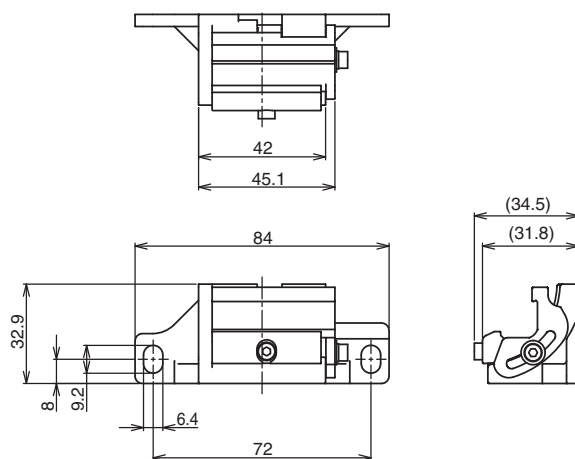
Sensor Mounting Brackets

Standard Fixed Bracket (F39-LGF)



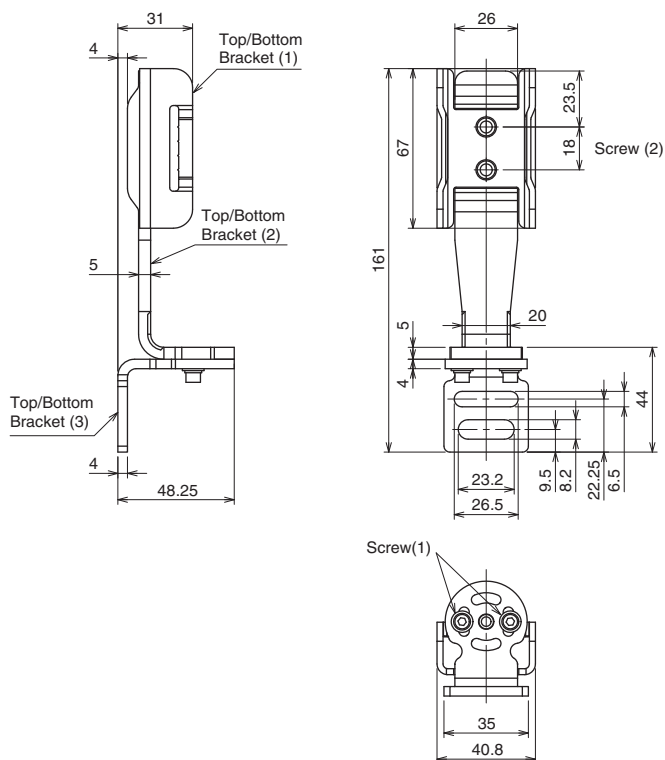
Material: Zinc alloy

Standard Fixed Bracket (F39-LGA, sold separately)



Material: Zinc alloy, Fluorochemical lubricant oil

Top/Bottom Adjustable Bracket (F39-LGTB, sold separately)



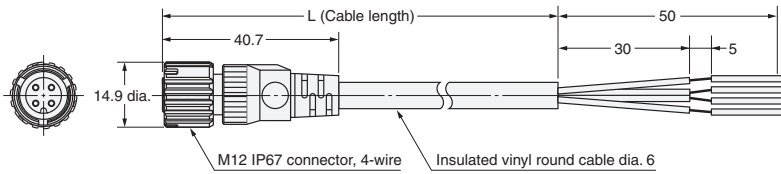
Material: Stainless steel

F3SG-RE

F3SG-RE

Safety light curtain connecting cable

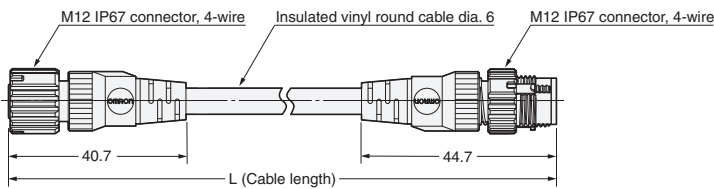
Round Water-resistant Connector: Connector Connected to Cable, Socket on One Cable End (XS5F-D421-□80-F, sold separately)



Material: Insulated vinyl round cable

| Specification | Model | L (m) |
|-----------------------------|-----------------|-------|
| Fire-retardant, Robot cable | XS5F-D421-C80-F | 1 |
| | XS5F-D421-D80-F | 2 |
| | XS5F-D421-E80-F | 3 |
| | XS5F-D421-G80-F | 5 |
| | XS5F-D421-J80-F | 10 |
| | XS5F-D421-L80-F | 20 |

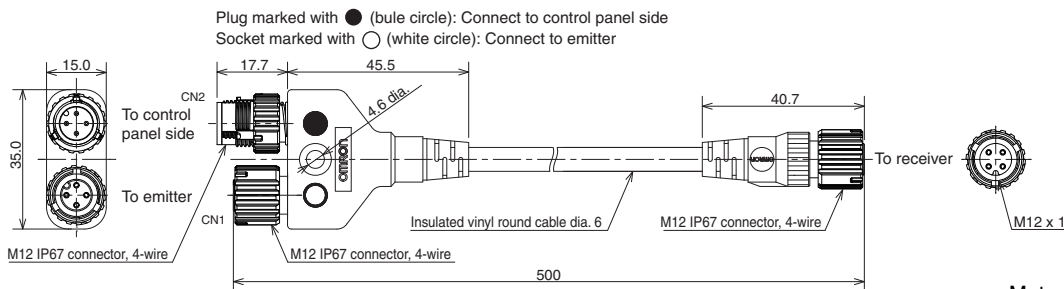
Round Water-resistant Connector: Connectors Connected to Cable, Socket and Plug on Cable Ends (XS5W-D421-□81-F, sold separately)



Material: Insulated vinyl round cable

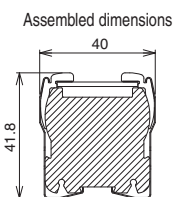
| Specification | Model | L (m) |
|-----------------------------|-----------------|-------|
| Fire-retardant, Robot cable | XS5W-D421-C81-F | 1 |
| | XS5W-D421-D81-F | 2 |
| | XS5W-D421-E81-F | 3 |
| | XS5W-D421-G81-F | 5 |
| | XS5W-D421-J81-F | 10 |
| | XS5W-D421-L81-F | 20 |

Y-Joint Plug/Socket Connector (F39-GCNY1, sold separately)



Material: PBT (Main body)

Spatter Protection Cover(F39-HGA/-HGB, sold separately)



| Model | Total length |
|-------------|--------------|
| F39-HGB□□□□ | □□□□+6 |
| F39-HGA0550 | 558 |

Material: PC (Transparent cover)
 ABS (Side wall)
 Stainless steel (Bracket)
 Aluminum adhesive tape
 (Fixing sticker)

Related Manuals

| ManNo. | Model | Manual name |
|--------|-----------------|--|
| Z352 | F3SG-□R□□□□□□□□ | Safety Light Curtain F3SG-□R Series User's Manual |