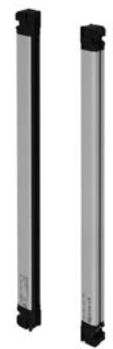


Safety Light Curtain/Safety Multi-Light Beam F3SG-SR/PG

Easy to monitor and ready for IoT

- Conforms to major international standards
- Environmental resistance and rugged structure for use in various environments (IP67, IP67G*1, IP69K*2)
- A broad line-up, from finger protection to body protection
- Flexible height model for easy integration into machines and lines
- IoT ready via IO-Link

*1. IEC 60529/JIS C 0920 Annex 1
*2. Available with the F3SG-SR-K IP69K Model.



For the most recent information on models that have been certified for safety standards, refer to your local OMRON website.

Key Features

| Feature | Availability | | | | | | Setting/monitoring by | | | | Factory default setting |
|---|--------------|----------|-----------|-----------|-----------|------------|-----------------------|---------|-----------------|--|---|
| | F3SG-SRA | F3SG-SRB | F3SG-PG-A | F3SG-PG-L | F3SG-PG-C | F3SG-SRB-K | Sensor | | Intelligent Tap | PC/Smartphone | |
| | | | | | | | Wiring | End Cap | DIP Switch #1 | SD Manager 3/SD Manger 3 Mobile APP #2 | |
| Mutual interference prevention | X | X | X | X | X | X*6 | X*4 | X*4 | --- | --- | Code A *4 |
| PNP/NPN selection | X | X | X | X | X | X | X | --- | --- | --- | --- |
| External test | X | X | X | X | X | X | X | --- | --- | --- | --- |
| Interlock | X | X | X | X | X | X | --- | --- | X | X | Start/Restart Interlock Disabled (Auto Reset) |
| Pre-reset | X | X | X | X | X | X | --- | --- | X | X | Disabled |
| PSDI | X | X | --- | --- | --- | X | --- | --- | --- | X | Disabled |
| External Device Monitoring (EDM) | X | X | X | X | X | X | --- | --- | X | X | Disabled |
| Auxiliary output | X | X | X | X | X | X | --- | --- | --- | X | Safety output information (Inverted signal output: Enabled) |
| Muting | X | X | X | X | X | X | --- | --- | --- | X | Enabled (Standard Muting) |
| Override | X | X | X | X | X | X | --- | --- | --- | X | Enabled |
| Fixed blanking | X | X | --- | --- | --- | X | --- | --- | X | X | Disabled |
| Floating blanking | X | X | --- | --- | --- | X | --- | --- | X | X | Disabled |
| Reduced resolution | X | X | --- | --- | --- | X | --- | --- | --- | X | Disabled |
| Warning zone | X | X | --- | --- | --- | --- | --- | --- | --- | X | Disabled |
| Operating range selection | X | X | --- | X | --- | X | X | --- | X | X | Long *5 |
| Response time adjustment | X | X | X | X | X | X | --- | --- | --- | X | Normal |
| Area Beam Indicator (ABI) | X | --- | X | X | X | --- | --- | --- | --- | X | Block/Unblock information |
| Designated beam output | X | X | X | X | X | X | --- | --- | --- | X | Disabled |
| Stable light threshold adjustment | X | X | X | X | X | X | --- | --- | --- | X | 170% |
| Light Level Monitoring/Interference Light Display | X | X | X | X | X | X | --- | --- | --- | X | --- |
| Maintenance information | X | X | X | X | X | X | --- | --- | --- | X | --- |
| Operation status monitoring | X | X | X | X | X | X | --- | --- | --- | X | --- |
| Instantaneous block detection information | X | X*7 | X | X | X | --- | --- | --- | --- | X | Enabled |

*1. DIP Switch is on the F39-SGIT-IL3 Intelligent Tap.
 *2. The F39-SGIT-IL3 Intelligent Tap is necessary to use the SD Manager 3 or SD Manager 3 Mobile APP.
 *3. Mutual interference can be prevented by Optical Synchronization or Wired Synchronization.
 *4. Mutual interference can be prevented by Scan Code Selection.
 *5. In the case of setting by DIP Switch or SD Manager 3. For the setting by wiring, it is selectable from the Long and Short modes.
 *6. Mutual interference cannot be prevented using the End Cap. The scan code is fixed to Code A.
 *7. The F3SG-SRB does not record vibration.

F3SG-SR/PG

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Safety Light Curtain/Safety Multi-Light Beam

F3SG-SR/PG

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Safety Light Curtain F3SG-SR Series IP69K Model

F3SG-SR-K

| | |
|---|---------|
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Common to Safety Light Curtain and Safety Multi-Light Beam

Common to F3SG-SR and F3SG-PG

| | |
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Model Number Legend

Safety Light Curtain F3SG-SR

F3SG-4SR □ □ □ □ □ - □ □ - □
 (1) (2) (3) (4) (5)

* For details on the IP69K model, refer to page 72.

| No. | Classification | Code | Meaning | Remarks |
|-----|----------------------|-------------|---|---|
| (1) | ESPE | 4 | Type 4 | |
| (2) | Function | A | Advanced | |
| | | B | Standard | |
| (3) | Protective height | 0160 - 2000 | Protective height for finger protection (mm) | |
| | | 0160 - 2480 | Protective height for hand protection (mm) | |
| | | 0240 - 1520 | Protective height for arm/leg protection (mm) | |
| | | 0280 - 0920 | Protective height for body protection (mm) | |
| (4) | Detection capability | 14 | Finger protection (Detection capability: 14-mm dia.) | |
| | | 25 | Hand protection (Detection capability: 25-mm dia.) | |
| | | 45 | Arm/leg protection (Detection capability: 45-mm dia.) | |
| | | 85 | Body protection (Detection capability: 85-mm dia.) | |
| (5) | Option | Blank | | |
| | | F | Flexible height model | Finger protection and hand protection: Protective heights are available in increments of 40 mm up to 1 m |

Note: 1. The purpose of this model number legend is to provide understanding of the meaning of specifications from the model number. Models are not available for all combinations of code numbers. See *Ordering Information* on page 5 for details.

2. The bracket is not included. Order brackets sold separately.
3. Connection cables are not included with the safety light curtain. Order cables sold separately.

Safety Multi-Light Beam F3SG-PG

F3SG-4PG A □□□□ - □□
 (1) (2) (3) (4) (5)

| No. | Classification | Code | Meaning | Remarks |
|-----|------------------------------|------|-----------------------------------|--|
| (1) | ESPE | 4 | Type 4 | |
| (2) | Function | A | Advanced | |
| (3) | Product length | 0670 | Product length (mm) | |
| | | 0970 | | |
| | | 1070 | | |
| | | 1370 | | |
| (4) | Number of beams/ beam gap | 2 | 2 beams/500 mm | Product length: 670 mm |
| | | 3 * | 3 beams/400 mm | Product length: 970 mm * Not available for Perimeter guarding passive mirror |
| | | 4 | 4 beams/300 or 400 mm | Product length: 1,070 or 1,370 mm |
| (5) | Application | A | Perimeter access guarding | |
| | | L | Perimeter guarding long range | |
| | | C | Perimeter guarding passive mirror | |

- Note: 1.** The purpose of this model number legend is to provide understanding of the meaning of specifications from the model number. Models are not available for all combinations of code numbers. See *Ordering Information* on page 7 for details.
- 2.** The bracket is not included. Order brackets sold separately.
- 3.** Connection cables are not included with the safety multi-light beam. Order cables sold separately.

Ordering Information

Main Units

Safety Light Curtain F3SG-SR

Finger protection (Detection capability: 14-mm dia.)

| Number of beams | Protective height (mm) | Advanced | Standard |
|-----------------|------------------------|--------------------|--------------------|
| | | Model | Model |
| 15 | 160 | F3SG-4SRA0160-14 | F3SG-4SRB0160-14 |
| 19 | 200 | F3SG-4SRA0200-14-F | F3SG-4SRB0200-14-F |
| 23 | 240 | F3SG-4SRA0240-14 | F3SG-4SRB0240-14 |
| 27 | 280 | F3SG-4SRA0280-14-F | F3SG-4SRB0280-14-F |
| 31 | 320 | F3SG-4SRA0320-14 | F3SG-4SRB0320-14 |
| 35 | 360 | F3SG-4SRA0360-14-F | F3SG-4SRB0360-14-F |
| 39 | 400 | F3SG-4SRA0400-14 | F3SG-4SRB0400-14 |
| 43 | 440 | F3SG-4SRA0440-14-F | F3SG-4SRB0440-14-F |
| 47 | 480 | F3SG-4SRA0480-14 | F3SG-4SRB0480-14 |
| 51 | 520 | F3SG-4SRA0520-14-F | F3SG-4SRB0520-14-F |
| 55 | 560 | F3SG-4SRA0560-14 | F3SG-4SRB0560-14 |
| 59 | 600 | F3SG-4SRA0600-14-F | F3SG-4SRB0600-14-F |
| 63 | 640 | F3SG-4SRA0640-14 | F3SG-4SRB0640-14 |
| 67 | 680 | F3SG-4SRA0680-14-F | F3SG-4SRB0680-14-F |
| 71 | 720 | F3SG-4SRA0720-14-F | F3SG-4SRB0720-14-F |
| 75 | 760 | F3SG-4SRA0760-14-F | F3SG-4SRB0760-14-F |
| 79 | 800 | F3SG-4SRA0800-14 | F3SG-4SRB0800-14 |
| 83 | 840 | F3SG-4SRA0840-14-F | F3SG-4SRB0840-14-F |
| 87 | 880 | F3SG-4SRA0880-14-F | F3SG-4SRB0880-14-F |
| 91 | 920 | F3SG-4SRA0920-14-F | F3SG-4SRB0920-14-F |
| 95 | 960 | F3SG-4SRA0960-14-F | F3SG-4SRB0960-14-F |
| 99 | 1,000 | F3SG-4SRA1000-14 | F3SG-4SRB1000-14 |
| 119 | 1,200 | F3SG-4SRA1200-14 | F3SG-4SRB1200-14 |
| 139 | 1,400 | F3SG-4SRA1400-14 | F3SG-4SRB1400-14 |
| 159 | 1,600 | F3SG-4SRA1600-14 | F3SG-4SRB1600-14 |
| 179 | 1,800 | F3SG-4SRA1800-14 | F3SG-4SRB1800-14 |
| 199 | 2,000 | F3SG-4SRA2000-14 | F3SG-4SRB2000-14 |

F3SG-SR/PG

F3SG-SR-K

Common to
F3SG-SR and F3SG-PG

F3SG-SR/PG

Hand protection (Detection capability: 25-mm dia.)

| Number of beams | Protective height (mm) | Advanced | Standard |
|-----------------|------------------------|--------------------|--------------------|
| | | Model | Model |
| 8 | 160 | F3SG-4SRA0160-25 | F3SG-4SRB0160-25 |
| 10 | 200 | F3SG-4SRA0200-25-F | F3SG-4SRB0200-25-F |
| 12 | 240 | F3SG-4SRA0240-25 | F3SG-4SRB0240-25 |
| 14 | 280 | F3SG-4SRA0280-25-F | F3SG-4SRB0280-25-F |
| 16 | 320 | F3SG-4SRA0320-25 | F3SG-4SRB0320-25 |
| 18 | 360 | F3SG-4SRA0360-25-F | F3SG-4SRB0360-25-F |
| 20 | 400 | F3SG-4SRA0400-25 | F3SG-4SRB0400-25 |
| 22 | 440 | F3SG-4SRA0440-25-F | F3SG-4SRB0440-25-F |
| 24 | 480 | F3SG-4SRA0480-25 | F3SG-4SRB0480-25 |
| 26 | 520 | F3SG-4SRA0520-25-F | F3SG-4SRB0520-25-F |
| 28 | 560 | F3SG-4SRA0560-25 | F3SG-4SRB0560-25 |
| 30 | 600 | F3SG-4SRA0600-25-F | F3SG-4SRB0600-25-F |
| 32 | 640 | F3SG-4SRA0640-25 | F3SG-4SRB0640-25 |
| 34 | 680 | F3SG-4SRA0680-25-F | F3SG-4SRB0680-25-F |
| 36 | 720 | F3SG-4SRA0720-25 | F3SG-4SRB0720-25 |
| 38 | 760 | F3SG-4SRA0760-25-F | F3SG-4SRB0760-25-F |
| 40 | 800 | F3SG-4SRA0800-25 | F3SG-4SRB0800-25 |
| 42 | 840 | F3SG-4SRA0840-25-F | F3SG-4SRB0840-25-F |
| 44 | 880 | F3SG-4SRA0880-25 | F3SG-4SRB0880-25 |
| 46 | 920 | F3SG-4SRA0920-25-F | F3SG-4SRB0920-25-F |
| 48 | 960 | F3SG-4SRA0960-25 | F3SG-4SRB0960-25 |
| 50 | 1,000 | F3SG-4SRA1000-25-F | F3SG-4SRB1000-25-F |
| 52 | 1,040 | F3SG-4SRA1040-25 | F3SG-4SRB1040-25 |
| 56 | 1,120 | F3SG-4SRA1120-25 | F3SG-4SRB1120-25 |
| 60 | 1,200 | F3SG-4SRA1200-25 | F3SG-4SRB1200-25 |
| 64 | 1,280 | F3SG-4SRA1280-25 | F3SG-4SRB1280-25 |
| 68 | 1,360 | F3SG-4SRA1360-25 | F3SG-4SRB1360-25 |
| 72 | 1,440 | F3SG-4SRA1440-25 | F3SG-4SRB1440-25 |
| 76 | 1,520 | F3SG-4SRA1520-25 | F3SG-4SRB1520-25 |
| 80 | 1,600 | F3SG-4SRA1600-25 | F3SG-4SRB1600-25 |
| 84 | 1,680 | F3SG-4SRA1680-25 | F3SG-4SRB1680-25 |
| 88 | 1,760 | F3SG-4SRA1760-25 | F3SG-4SRB1760-25 |
| 92 | 1,840 | F3SG-4SRA1840-25 | F3SG-4SRB1840-25 |
| 96 | 1,920 | F3SG-4SRA1920-25 | F3SG-4SRB1920-25 |
| 104 | 2,080 | F3SG-4SRA2080-25 | F3SG-4SRB2080-25 |
| 114 | 2,280 | F3SG-4SRA2280-25 | F3SG-4SRB2280-25 |
| 124 | 2,480 | F3SG-4SRA2480-25 | F3SG-4SRB2480-25 |

Arm/Leg protection (Detection capability: 45-mm dia.)

| Number of beams | Protective height (mm) | Advanced | Standard |
|-----------------|------------------------|------------------|------------------|
| | | Model | Model |
| 6 | 240 | F3SG-4SRA0240-45 | F3SG-4SRB0240-45 |
| 10 | 400 | F3SG-4SRA0400-45 | F3SG-4SRB0400-45 |
| 14 | 560 | F3SG-4SRA0560-45 | F3SG-4SRB0560-45 |
| 18 | 720 | F3SG-4SRA0720-45 | F3SG-4SRB0720-45 |
| 22 | 880 | F3SG-4SRA0880-45 | F3SG-4SRB0880-45 |
| 30 | 1,200 | F3SG-4SRA1200-45 | F3SG-4SRB1200-45 |
| 38 | 1,520 | F3SG-4SRA1520-45 | F3SG-4SRB1520-45 |

Body protection (Detection capability: 85-mm dia.)

| Number of beams | Protective height (mm) | Advanced | Standard |
|-----------------|------------------------|------------------|------------------|
| | | Model | Model |
| 4 | 280 | F3SG-4SRA0280-85 | F3SG-4SRB0280-85 |
| 6 | 440 | F3SG-4SRA0440-85 | F3SG-4SRB0440-85 |
| 8 | 600 | F3SG-4SRA0600-85 | F3SG-4SRB0600-85 |
| 10 | 760 | F3SG-4SRA0760-85 | F3SG-4SRB0760-85 |
| 12 | 920 | F3SG-4SRA0920-85 | F3SG-4SRB0920-85 |

Safety Multi-Light Beam F3SG-PG

Perimeter access guarding (Beam gap: 300 to 500 mm)

| Number of beams | Beam gap (mm) | Product length (mm) | Advanced |
|-----------------|---------------|---------------------|------------------|
| | | | Model |
| 2 | 500 | 670 | F3SG-4PGA0670-2A |
| 3 | 400 | 970 | F3SG-4PGA0970-3A |
| 4 | 300 | 1,070 | F3SG-4PGA1070-4A |
| 4 | 400 | 1,370 | F3SG-4PGA1370-4A |

Perimeter guarding long range (Beam gap: 300 to 500 mm)

| Number of beams | Beam gap (mm) | Product length (mm) | Advanced |
|-----------------|---------------|---------------------|------------------|
| | | | Model |
| 2 | 500 | 670 | F3SG-4PGA0670-2L |
| 3 | 400 | 970 | F3SG-4PGA0970-3L |
| 4 | 300 | 1,070 | F3SG-4PGA1070-4L |
| 4 | 400 | 1,370 | F3SG-4PGA1370-4L |

Perimeter guarding passive mirror (Beam gap: 300 to 500 mm)

| Number of beams | Beam gap (mm) | Product length (mm) | Advanced |
|-----------------|---------------|---------------------|------------------|
| | | | Model |
| 2 | 500 | 670 | F3SG-4PGA0670-2C |
| 4 | 300 | 1,070 | F3SG-4PGA1070-4C |
| 4 | 400 | 1,370 | F3SG-4PGA1370-4C |

F3SG-SR/PG

Accessories (Sold separately)

Bracket Common to F3SG-SR and F3SG-PG

Side mounting and backside mounting are possible.

For fixed mounting

| Appearance | Type | Application/Specifications | Model |
|------------|--|--|-----------------|
| | Standard Bracket (Intermediate Bracket) | Bracket to mount the F3SG-SR/PG. Side mounting and backside mounting possible. Beam alignment after mounting of F3SG-SR/PG not possible. Two brackets per set (See * below for the number of sets required for each model.) | F39-LSGF |

* Protective height of 0160 to 1440: 2 set (4 brackets), protective height of 1520 to 2480: 3 sets (6 brackets)

The bracket allows beam adjustment after the F3SG-SR/PG is mounted on it.

For angle adjustment mounting

| Appearance | Type | Application/Specifications | Model |
|------------|---|--|---------------------|
| | Adjustable Side-Mount Bracket (Intermediate Bracket) | The angle adjustment range is $\pm 15^\circ$. Two brackets per set (See *1 below for the number of sets required for each model.) | F39-LSGA |
| | Adjustable Top/Bottom Bracket F3SJ, F3SN Adapter | Use this bracket at the top and bottom positions of the F3SG-SR/PG. The angle adjustment range is $\pm 22.5^\circ$. Use this bracket when replacing an existing F3SJ or F3SN Safety Light Curtain. Two brackets per set (See *2 below for the number of sets required for each model.) | F39-LSGTB-SJ |
| | Adjustable Top/Bottom Bracket F3SG-RA/RE Adapter | Use this bracket at the top and bottom positions of the F3SG-SR/PG. The angle adjustment range is $\pm 22.5^\circ$. Use this bracket when replacing an existing F3SG-RA/RE Safety Light Curtain. Two brackets per set (See *2 below for the number of sets required for each model.) | F39-LSGTB-RE |
| | Adjustable Top/Bottom Bracket MS4800, F3SR Adapter | Use this bracket at the top and bottom positions of the F3SG-SR/PG. The angle adjustment range is $\pm 22.5^\circ$. Use this bracket when replacing an existing MS4800 or F3SR Safety Light Curtain. Two brackets per set (See *2 below for the number of sets required for each model.) | F39-LSGTB-MS |


*1. Protective height of 0160 to 0280: 1 set (2 brackets), protective height of 0320 to 1440: 2 sets (4 brackets), protective height of 1520 to 2480: 3 sets (6 brackets)

*2. Using Adjustable Top/Bottom Brackets with Side-Mount Brackets (Intermediate Brackets) or Adjustable Side-Mount Brackets (Intermediate Brackets)
Protective height of 0840 or less:
The Side-Mount Bracket (Intermediate Bracket) or Adjustable Side-Mount Bracket (Intermediate Bracket) is not required. Use 2 sets of Adjustable Top/Bottom Brackets.
Protective height of 0880 to 1680:
Use 2 sets of Adjustable Top/Bottom Brackets and 1 set of Side-Mount Brackets (Intermediate Brackets) or Adjustable Side-Mount Brackets (Intermediate Brackets).
Protective height of 1760 to 2480:
Use 2 sets of Adjustable Top/Bottom Brackets and 2 sets of Side-Mount Brackets (Intermediate Brackets) or Adjustable Side-Mount Brackets (Intermediate Brackets).
Refer to *Dimensions* on page 37 and following.

Connecting Cable Common to F3SG-SR and F3SG-PG




[Root Cable]

Root-Straight Cable

| Appearance | Type | Specifications | Cable length | Model | |
|---|--|--|---|-------------|--|
|  | For emitter To sensors: dedicated connector, To external: open-ended type 5 wires Color: Gray | Brown 24V/0V | 3 m | F39-JG3C-L | |
| | | Black TEST | 7 m | F39-JG7C-L | |
| | | Blue 0V/24V | 10 m | F39-JG10C-L | |
| | For receiver or emitter/receiver of F3SG-PG Perimeter Guarding Passive Mirror To sensors: dedicated connector, To external: open-ended type 8 wires Color: Black | White COM(+) | IP67 and IP67G (JIS C 0920 Annex 1) rated when mated. | | |
| | | Yellow OPERATING RANGE SELECT INPUT/COM(-) | | | |
| | | Yellow RESET/EDM | | | |
| Gray MUTE A/PRE-RESET/PSDI/COM(+) | | | | | |
| Pink MUTE B/COM(-) | | | | | |
| Black OSSD 1 | 3 m | F39-JG3C-D | | | |
| White OSSD 2 | 7 m | F39-JG7C-D | | | |
| Blue 0V/24V | 10 m | F39-JG10C-D | | | |
| Red AUX | | | | | |

Note: Cables are not included with the safety light curtain/safety multi-light beam.
Order the F39-JG□C-□ Root-Straight Cable or F39-JGR3K-L-D Root-Plug Cable for Extended.

Root-Plug Cable for Extended

| Appearance | Type | Specifications | Cable length | Model | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|--------------|-----------|--------|-------|--------|------|------|------------------------------|--------|------|---------------|--------|-------|--------|-------------------------------------|-------|-------------|---|------|--------|---|-----|-----|-------|-------------|
|  | For emitter To sensors: dedicated connector, To external: M12 connector type (5-pin) Color: Gray | <table border="1"> <tr><td>1</td><td>Brown</td><td>24V/0V</td></tr> <tr><td>2</td><td>Black</td><td>TEST</td></tr> <tr><td>3</td><td>Blue</td><td>0V/24V</td></tr> <tr><td>4</td><td>White</td><td>COM(+)</td></tr> <tr><td>5</td><td>Yellow</td><td>OPERATING RANGE SELECT INPUT/COM(-)</td></tr> </table> <p>IP67 and IP67G (JIS C 0920 Annex 1) rated when mated.</p>  Male | 1 | Brown | 24V/0V | 2 | Black | TEST | 3 | Blue | 0V/24V | 4 | White | COM(+) | 5 | Yellow | OPERATING RANGE SELECT INPUT/COM(-) | 0.3 m | F39-JGR3K-L | | | | | | | | |
| | 1 | Brown | 24V/0V | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Black | TEST | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Blue | 0V/24V | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | White | COM(+) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Yellow | OPERATING RANGE SELECT INPUT/COM(-) | | | | | | | | | | | | | | | | | | | | | | | | | |
| For receiver or emitter/receiver of F3SG-PG Perimeter Guarding Passive Mirror To sensors: dedicated connector, To external: M12 connector type (8-pin) Color: Black | <table border="1"> <tr><td>1</td><td>Yellow</td><td>RESET/EDM</td></tr> <tr><td>2</td><td>Brown</td><td>24V/0V</td></tr> <tr><td>3</td><td>Gray</td><td>MUTE A/PRE-RESET/PSDI/COM(+)</td></tr> <tr><td>4</td><td>Pink</td><td>MUTE B/COM(-)</td></tr> <tr><td>5</td><td>Black</td><td>OSSD 1</td></tr> <tr><td>6</td><td>White</td><td>OSSD 2</td></tr> <tr><td>7</td><td>Blue</td><td>0V/24V</td></tr> <tr><td>8</td><td>Red</td><td>AUX</td></tr> </table> <p>IP67 and IP67G (JIS C 0920 Annex 1) rated when mated.</p>  Male | 1 | Yellow | RESET/EDM | 2 | Brown | 24V/0V | 3 | Gray | MUTE A/PRE-RESET/PSDI/COM(+) | 4 | Pink | MUTE B/COM(-) | 5 | Black | OSSD 1 | 6 | White | OSSD 2 | 7 | Blue | 0V/24V | 8 | Red | AUX | 0.3 m | F39-JGR3K-D |
| 1 | Yellow | RESET/EDM | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Brown | 24V/0V | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Gray | MUTE A/PRE-RESET/PSDI/COM(+) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Pink | MUTE B/COM(-) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Black | OSSD 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | White | OSSD 2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Blue | 0V/24V | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Red | AUX | | | | | | | | | | | | | | | | | | | | | | | | | |

Note: 1. Cables are not included with the safety light curtain/safety multi-light beam.
Order the F39-JG□C-□ Root-Straight Cable or F39-JGR3K-L-D Root-Plug Cable for Extended.
2. Use with the F39-JG□A-□ Extended Socket-Straight Cable or F39-JG□B-□ Extended Plug-Socket Cable.





F3SG-SR/PG

F3SG-SR-K

F3SG-SR and F3SG-PG
Common to

F3SG-SR/PG

[Extension Cable] Extended Socket-Straight Cable


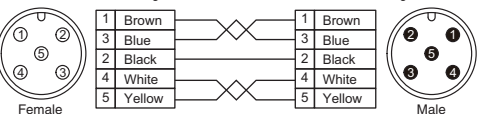

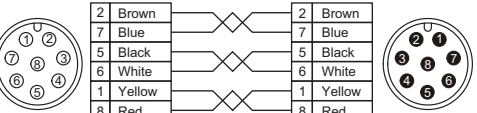
| Appearance | Type | Specifications | Cable length | Model | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|--------------|--------|------------------------------|---|-------|--------|---|------|------------------------------|---|-------|---------------|---|--------|-------------------------------------|-----|-------------------|--------|---|------|--------|---|-----|-----|-----|-------------------|
|  | For emitter M12 connector (5-pin), 5 wires Color: Gray | Connected to root cable or Extended Plug-Socket Cable  <table border="1"> <tr><td>1</td><td>Brown</td><td>24V/0V</td></tr> <tr><td>2</td><td>Black</td><td>TEST</td></tr> <tr><td>3</td><td>Blue</td><td>0V/24V</td></tr> <tr><td>4</td><td>White</td><td>COM(+)</td></tr> <tr><td>5</td><td>Yellow</td><td>OPERATING RANGE SELECT INPUT/COM(-)</td></tr> </table> Female IP67* rated when mated. | 1 | Brown | 24V/0V | 2 | Black | TEST | 3 | Blue | 0V/24V | 4 | White | COM(+) | 5 | Yellow | OPERATING RANGE SELECT INPUT/COM(-) | 3 m | F39-JG3A-L | | | | | | | | | |
| | | | 1 | Brown | 24V/0V | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 2 | Black | TEST | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 3 | Blue | 0V/24V | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 4 | White | COM(+) | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Yellow | OPERATING RANGE SELECT INPUT/COM(-) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 m | F39-JG7A-L | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 m | F39-JG10A-L | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 m | F39-JG15A-L | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 m | F39-JG20A-L | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | For receiver or emitter/receiver of F3SG-PG Perimeter Guarding Passive Mirror M12 connector (8-pin), 8 wires Color: Black | Connected to root cable or Extended Plug-Socket Cable  <table border="1"> <tr><td>1</td><td>Yellow</td><td>RESET/EDM</td></tr> <tr><td>2</td><td>Brown</td><td>24V/0V</td></tr> <tr><td>3</td><td>Gray</td><td>MUTE A/PRE-RESET/PSDI/COM(+)</td></tr> <tr><td>4</td><td>Pink</td><td>MUTE B/COM(-)</td></tr> <tr><td>5</td><td>Black</td><td>OSSD 1</td></tr> <tr><td>6</td><td>White</td><td>OSSD 2</td></tr> <tr><td>7</td><td>Blue</td><td>0V/24V</td></tr> <tr><td>8</td><td>Red</td><td>AUX</td></tr> </table> Female IP67* rated when mated. | 1 | Yellow | RESET/EDM | 2 | Brown | 24V/0V | 3 | Gray | MUTE A/PRE-RESET/PSDI/COM(+) | 4 | Pink | MUTE B/COM(-) | 5 | Black | OSSD 1 | 6 | White | OSSD 2 | 7 | Blue | 0V/24V | 8 | Red | AUX | 3 m | F39-JG3A-D |
| | | | 1 | Yellow | RESET/EDM | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 2 | Brown | 24V/0V | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 3 | Gray | MUTE A/PRE-RESET/PSDI/COM(+) | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 4 | Pink | MUTE B/COM(-) | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Black | OSSD 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | White | OSSD 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Blue | 0V/24V | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Red | AUX | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 m | F39-JG7A-D | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 m | F39-JG10A-D | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 m | F39-JG15A-D | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 m | F39-JG20A-D | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* When the accessory is used, protect it from cutting oil.

Note: 1. Use with the F39-JGR3K-L/-D Root-Plug Cable for Extended.

2. To extend the cable length to more than 20 m, connect the F39-JG□B-□ Extended Plug-Socket Cable to the F39-JG□A-□ Extended Socket-Straight Cable.

Extended Plug-Socket Cable

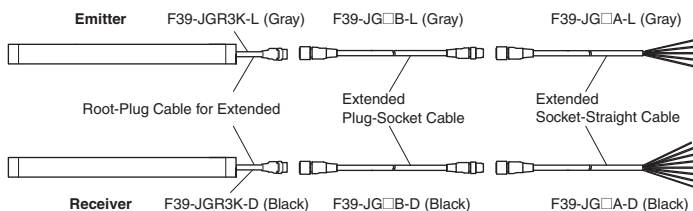
| Appearance | Type | Specifications | Cable length | Model |
|---|---|---|--------------|--------------------|
|  | For emitter M12 connector (5-pin) on both ends Color: Gray | Connected to Root-Plug Cable for Extended or Extended Plug-Socket Cable Connected to Extended Socket-Straight Cable or Extended Plug-Socket Cable  Female Male Twisted pair wires are brown and blue, and white and yellow. IP67* rated when mated. | 0.5 m | F39-JGR5B-L |
| | | | 1 m | F39-JG1B-L |
| | | | 3 m | F39-JG3B-L |
| | | | 5 m | F39-JG5B-L |
| | | | 7 m | F39-JG7B-L |
| | | | 10 m | F39-JG10B-L |
| | | | 15 m | F39-JG15B-L |
| 20 m | F39-JG20B-L | | | |
|  | For receiver or emitter/receiver of F3SG-PG Perimeter Guarding Passive Mirror M12 connector (8-pin) on both ends Color: Black | Connected to Root-Plug Cable for Extended or Extended Plug-Socket Cable Connected to Extended Socket-Straight Cable or Extended Plug-Socket Cable  Female Male Twisted pair wires are brown and blue, black and white, yellow and red, and gray and pink. IP67* rated when mated. | 0.5 m | F39-JGR5B-D |
| | | | 1 m | F39-JG1B-D |
| | | | 3 m | F39-JG3B-D |
| | | | 5 m | F39-JG5B-D |
| | | | 7 m | F39-JG7B-D |
| | | | 10 m | F39-JG10B-D |
| | | | 15 m | F39-JG15B-D |
| 20 m | F39-JG20B-D | | | |

* When the accessory is used, protect it from cutting oil.

Note: 1. Use with the F39-JGR3K-L/-D Root-Plug Cable for Extended.


2. To extend the cable length to more than 40 m, connect two or more F39-JG□B-□ Extended Plug-Socket Cable to the F39-JG□A-□ Extended Socket-Straight Cable.

Example: To extend the cable length to 50 m, connect two F39-JG20B-□ (20 m) Extended Plug-Socket Cables and one F39-JG10A-□ (10 m) Extended Socket-Straight Cable.




[Cascading Cable]

Side-by-side Cascading Cable (Two cables per set, one for emitter and one for receiver)

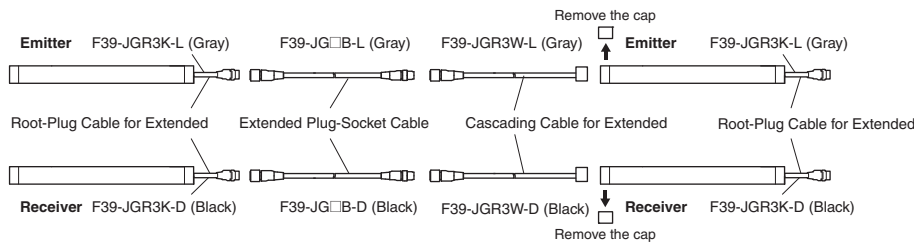
| Appearance | Type | Application/Specifications | Cable length | Model |
|---|--|--|--------------|------------|
|  | For emitter To sensors: dedicated connector 1, To cascading sensors: dedicated connector 2 Color: Gray For receiver To sensors: dedicated connector 1, To cascading sensors: dedicated connector 2 Color: Black | Used to series-connect sensors with the minimum cable length of 12 cm. IP67 and IP67G (JIS C 0920 Annex 1) rated when mated. | 12 cm | F39-JGR12L |

Note: To extend the cable length between the series-connected sensors to more than 12 cm, add the F39-JGR3W Cascading Cable for Extended.

Cascading Cable for Extended (Two cables per set, one for emitter and one for receiver)

| Appearance | Type | Application/Specifications | Cable length | Model |
|---|--|---|--------------|-----------|
|  | For emitter To sensors: dedicated connector, To cascading sensors: M12 connector type (5 pin) Color: Gray For receiver To sensors: dedicated connector, To cascading sensors: M12 connector type (8 pin) Color: Black | Used together with the F39-JGR3K Root-Plug Cable for Extended to extend the cable length between the series-connected sensors to more than 12 cm. IP67 and IP67G (JIS C 0920 Annex 1) rated when mated. | 0.3 m | F39-JGR3W |


Note: To extend the cable length between the series-connected sensors to more than 60 cm, connect the F39-JG□B-□ Extended Plug-Socket Cable (up to 10 m: F39-JG10B-□) to the F39-JGR3W Cascading Cable for Extended. Extension cable between sensors: 10 m max. (not including Cascading Cable for Extended (F39-JGR3W) and Root Cable (F39-JGR3K-L/-D).)



F3SG-SR/PG
 F3SG-SR-K
 F3SG-SR and F3SG-PG
 Common to

F3SG-SR/PG

[Conversion Cable: Converting Wiring for Existing Light Curtain] Conversion Cable

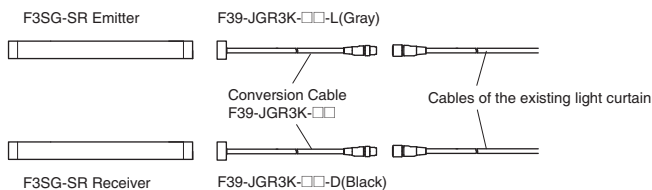
| Appearance | Type | Application | Cable length | Model |
|--|--|--|----------------|----------------|
|  | F3SJ-A/-B Conversion Cable For emitter To sensor: dedicated connector 1, To wires for F3SJ-A/B, F3SR-B or F3SN: M12 connector type (8 pin) Color: Gray | Used to convert the wiring for F3SJ-A/B, F3SR-B or F3SN Safety Light Curtain to that for the F3SG-SR. | 0.3 m | F39-JGR3K-SJ-L |
| | F3SJ-A/B Conversion Cable For receiver To sensor: dedicated connector 1, To wires for F3SJ-A/B, F3SR-B or F3SN: M12 connector type (8 pin) Color: Black | | | F39-JGR3K-SJ-D |
| | F3SG-RE Conversion Cable For emitter To sensor: dedicated connector 1, To wires for F3SG-RE: M12 connector type (4 pin) Color: Gray | Used to convert the wiring for F3SG-RE Safety Light Curtain to that for the F3SG-SR. | 0.3 m | F39-JGR3K-RE-L |
| | F3SG-RE Conversion Cable For receiver To sensor: dedicated connector 1, To wires for F3SG-RE: M12 connector type (4 pin) Color: Black | | | F39-JGR3K-RE-D |
| | MS48 Conversion Cable For emitter To sensor: dedicated connector 1, To wires for MS4800: M12 connector type (5 pin) Color: Gray | Used to convert the wiring for MS4800 Safety Light Curtain to that for the F3SG-SR. | 0.3 m | F39-JGR3K-MS-L |
| | MS48 Conversion Cable For receiver To sensor: dedicated connector 1, To wires for MS4800: M12 connector type (8 pin) Color: Black | | | F39-JGR3K-MS-D |
| F3SJ-A-TS/-T or F3SJ-B-TS/-T or F3SR-RA-TS Conversion Cable For emitter To sensor: dedicated connector 1, To wires for F3SJ-A-TS/-T or F3SJ-B-TS/-T or F3SR-RA-TS: M12 connector type (8 pin) Color: Gray | Used to convert the wiring for F3SJ-A-TS/-T or F3SJ-B-TS/-T or F3SR-RA-TS Safety Light Curtain to that for the F3SG-SR. | 0.3 m | F39-JGR3K-SW-L | |
| F3SJ-A-TS/-T or F3SJ-B-TS/-T or F3SR-RA-TS Conversion Cable For receiver To sensor: dedicated connector 1, To wires for F3SJ-A-TS/-T or F3SJ-B-TS/-T or F3SR-RA-TS: M12 connector type (8 pin) Color: Black | | | F39-JGR3K-SJ-D | |

* The wiring for the F3SG-RA can be used without the need for a conversion cable.

Note: 1. Cables are not included with the safety light curtain/safety multi-light beam.

When connecting to the cables of the existing light curtain, order the conversion cables.

Conversion cables are only for PNP connection. To use for NPN, connect the 24 VDC line and the 0 VDC line in reverse. For details, refer to *User's Manual* (Man. No. Z405).






2. Do not connect the Conversion Cable for the following purposes. Failure to do so may result in failure.

1. Connecting with the F39-SGIT-IL3, F39-GCNY2, F39-GCNY3 or F39-GCN5
2. Connecting between the F3SG-SR's

Configuration Tool SD Manager 3 and Intelligent Tap
Configuration tool SD Manager 3


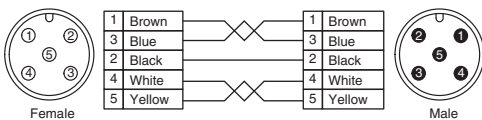
| Type | Specifications |
|-------------------------|--|
| SD Manager 3 | Configuration tool running on a PC. Use with the Intelligent Tap. (The Bluetooth® communication unit is required to connect using Bluetooth®.) For details, refer to your local Omron website. |
| SD Manager 3 Mobile APP | Monitoring tool running on a smartphone. Use with the Intelligent Tap and Bluetooth® communication unit. For details, refer to your local Omron website. |

Intelligent Tap, Optional Accessories for Intelligent Tap

| Appearance | Type | Application/Specifications | Model |
|--|--|---|---------------------|
|  | Intelligent Tap | Used to configure the F3SG-SR/PG and connect external devices via IO-Link. The F3SG-SR/PG can be configured on a PC or with the DIP switch on the Intelligent Tap. IP67 and IP67G (JIS C 0920 Annex 1) rated when mated. | F39-SGIT-IL3 |
|  | Bluetooth® Communication Unit | Mounted to the Intelligent Tap to connect with the SD Manager 3 via Bluetooth®. IP67 and IP67G (JIS C 0920 Annex 1) rated when mated. * For the regions where the Bluetooth® Communication Unit can be used, refer to <i>Legislation and Standards</i> on page 111. | F39-SGBT |
|  | Intelligent Tap Bracket For DIN in Panel | Bracket to mount the Intelligent Tap on a DIN track. | F39-LITF1 |

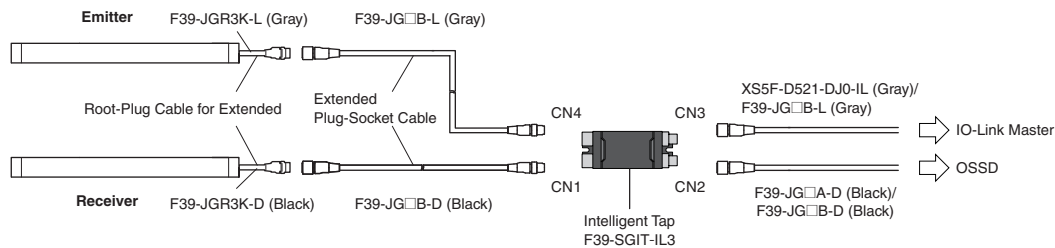
Note: Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

Intelligent Tap-to-IO-Link Master Cable

| Omron IO-Link master unit | Type | Specifications | Cable length | Model |
|---------------------------|---|---|--------------|-------------------------|
| NX-ILM400 | Single-ended cable M12 connector (5-pin), 5 wires Color: Gray |  Female IP67* rated when mated. | 2 m | XS5F-D521-DJ0-IL |
| GX-ILM08C | Double-ended cable M12 connector (5-pin), 5 wires Color: Gray |  Female IP67* rated when mated. | 3 m | F39-JG3B-L |
| | | | 10 m | F39-JG10B-L |
| | | | 20 m | F39-JG20B-L |

* When the accessory is used, protect it from cutting oil.

Note: Use the F39-JG□A-D Extended Socket-Straight Cable or F39-JG□B-D Extended Plug-Socket Cable for safety output (OSSD).




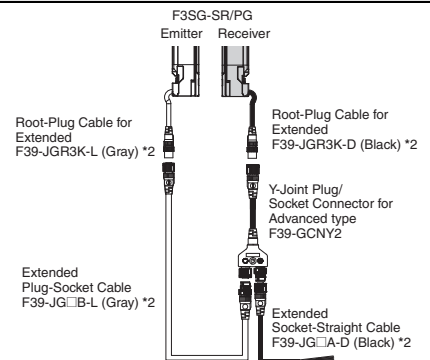
F3SG-SR/PG

F3SG-SR-K

Common to
F3SG-SR and F3SG-PG

F3SG-SR/PG


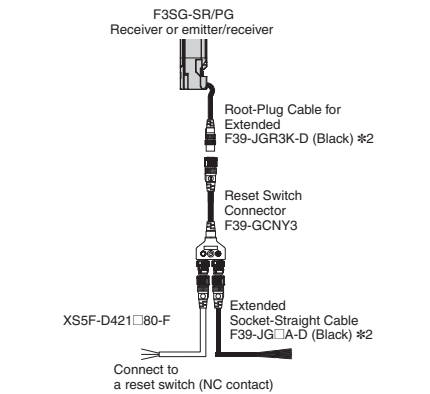
Reduced Wiring System Y-Joint Plug/Socket Connector

| Appearance | Type | Specifications | Cable length | Model |
|--|---|--|--------------|------------------|
|  | M12 connectors. Used for reduced wiring. IP67*1 rated when mated. |  | 0.5 m | F39-GCNY2 |

*1. When the accessory is used, protect it from cutting oil.

*2. Order the cable (root-plug cable for extended and extended cable) for emitter (end of model: -L) and the cable for receiver (end of model: -D).

Reset Switch Connector

| Appearance | Type | Specifications | Cable length | Model |
|---|---|---|--------------|------------------|
|  | M12 connectors. Used for reduced wiring. IP67*1 rated when mated. |  | 0.5 m | F39-GCNY3 |

Note: Purchase a reset switch (NC contact) separately.


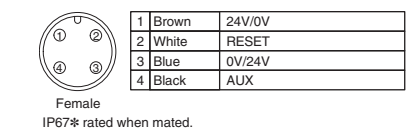
*1. When the accessory is used, protect it from cutting oil.

*2. Order the extended socket-straight cable for receiver (end of model: -D).

*3. The External Device Monitoring (EDM) function cannot be used with this accessory.

Reset Switch Connector-to-Reset Switch Cable

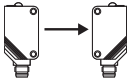
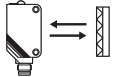
Connector Connected to Cable, Socket on One Cable End

| Appearance | Type | Specifications | Cable length | Model | | | | | | | | | | | | |
|--|--------------------------------|--|--------------|-------|--------|---|-------|-------|---|------|--------|---|-------|-----|--|--|
|  | M12 connector (4-pin), 4 wires |  <table border="1" data-bbox="734 1500 1013 1590"> <tr> <td>1</td> <td>Brown</td> <td>24V/0V</td> </tr> <tr> <td>2</td> <td>White</td> <td>RESET</td> </tr> <tr> <td>3</td> <td>Blue</td> <td>0V/24V</td> </tr> <tr> <td>4</td> <td>Black</td> <td>AUX</td> </tr> </table> <p>Female IP67* rated when mated.</p> | 1 | Brown | 24V/0V | 2 | White | RESET | 3 | Blue | 0V/24V | 4 | Black | AUX | 1 m 2 m 3 m 5 m 10 m 20 m | XS5F-D421-C80-F XS5F-D421-D80-F XS5F-D421-E80-F XS5F-D421-G80-F XS5F-D421-J80-F XS5F-D421-L80-F |
| 1 | Brown | 24V/0V | | | | | | | | | | | | | | |
| 2 | White | RESET | | | | | | | | | | | | | | |
| 3 | Blue | 0V/24V | | | | | | | | | | | | | | |
| 4 | Black | AUX | | | | | | | | | | | | | | |

* When the accessory is used, protect it from cutting oil.

Muting System

Muting Sensor E3Z (M8 Connector)

| Sensing method | Sensing distance | Mounter | Output | Model |
|--|-----------------------|-------------|------------|-----------------|
| Through-beam  | 10 m (Red light) | F39-FMA□□□T | NPN output | E3Z-T66A |
| | | | PNP output | E3Z-T86A |
| Retro-reflective *1  | 4 m *2 (Red light) | F39-FMA□□□R | NPN output | E3Z-R66 |
| | | | PNP output | E3Z-R86 |
| | | | Reflectors | E39-R1S |


Note: The muting sensor arm mounter is not included with the muting sensor. Order the muting sensor arm mounter.

*1. The reflector is not included with the muting sensor. Order the E39-R1S Reflector when using the E3Z-R□6 Retroreflective Muting Sensor.

*2. The minimum required distance between the E3Z Muting Sensor and reflector is 100 mm.

For details, refer to your local Omron website.


Muting Sensor Arm Mounter (Two mounters per set, for emitter and receiver)

| Appearance | Application | Length | Model |
|---|--|--------|--------------------|
|  | The through-beam muting sensor can be mounted easily. | 150 mm | F39-FMA150T |
| | | 400 mm | F39-FMA400T |
| | The retroreflective muting sensor can be mounted easily. | 150 mm | F39-FMA150R |
| | | 400 mm | F39-FMA400R |

Note: 1. The muting sensor is not included with the muting sensor arm mounter. Order the Muting Sensor.

2. When mounting the muting sensor arm mounter to the safety light curtain, order the F39-LMAF1 Muting Sensor Arm Mounter Bracket for SLC. When the muting sensor arm mounter is mounted to the floor mount column, no brackets are required.


Muting Sensor Arm Mounter Bracket for SLC (Two brackets per set, for emitter and receiver) *

| Appearance | Application | Model |
|---|----------------|------------------|
|  | For F3SG-SR/PG | F39-LMAF1 |

Note: The F39-LMAF1 Muting Sensor Arm Mounter Bracket for SLC cannot be used for the F3SG-SR/PG with a product length smaller than 280 mm.

* Order when mounting the muting sensor arm mounter to the safety light curtain. When the muting sensor arm mounter is mounted to the floor mount column, no brackets are required.

Muting Sensor Connection Box

| Appearance | Application | Specifications | Cable Length | Model |
|---|----------------------------------|---|--------------|-----------------|
|  | Speeds up wiring muting sensors. | PNP/NPN selection Main Unit: M12 socket (5 pin) ×7, M12 socket (8 pin) ×1 Cable: M12 plug (8 pin) ×1 IP67*1 rated when mated. | 0.5 m | F39-GCN5 |

*1. When the accessory is used, protect it from cutting oil.

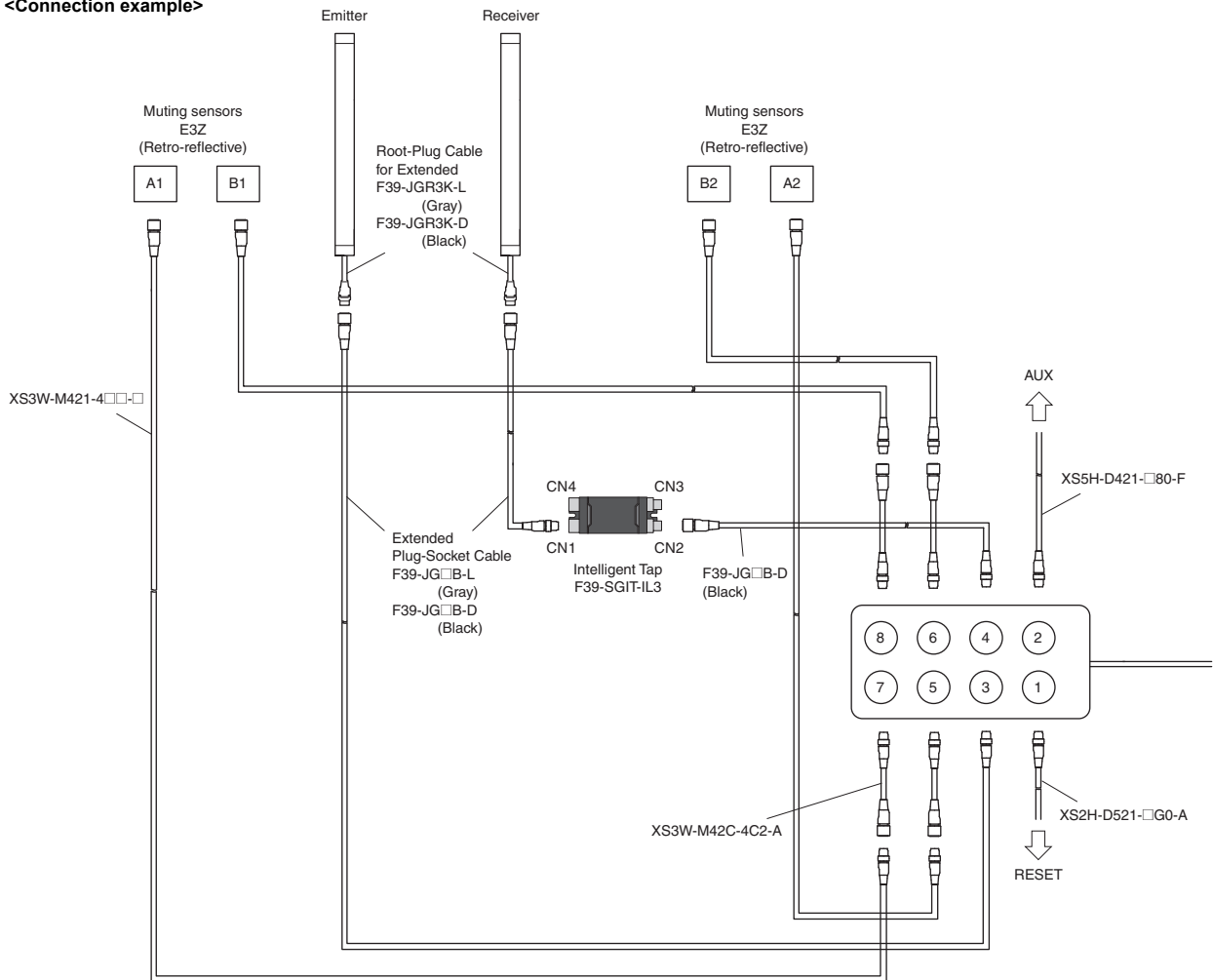
*2. When using four muting sensors, order the E3Z-R□□ Muting Sensor (Retro-reflective) that can be connected to the F39-GCN5 Muting Sensor Connection Box.

Connection Cable for Muting Sensor Connection Box


| Appearance | Type | Application | Cable Length | Model |
|------------|--|---|--------------|------------------------|
| | Connectors connected to cable, M8 socket and M12 plug on cable ends (4 pin) | Cable to connect the Muting Sensor and F39-GCN5 Muting Sensor Connection Box. | 0.2 m | XS3W-M42C-4C2-A |
| | Connectors connected to cable, M8 socket and M8 plug on cable ends (4 pin) Straight (socket, plug) | Sensor I/O Connectors Connectors with Cables, Connectors on Both Cable Ends (Socket/Plug) | 1 m | XS3W-M421-401-R |
| | | | 2 m | XS3W-M421-402-R |
| | | | 5 m | XS3W-M421-405-R |
| | | | 10 m | XS3W-M421-410-R |
| | Connectors connected to cable, M8 socket and M8 plug on cable ends (4 pin) Right-angle (socket)/straight (plug) | Sensor I/O Connectors Connectors with Cables, Connectors on Both Cable Ends (Socket/Plug) Used together with the XS3W-M42C-4C2-A when the space to connect to the connector of the E3Z Muting Sensor is between 40 and 80 mm. | 2 m | XS3W-M424-402-R |
| | | | 5 m | XS3W-M424-405-R |
| | Connector connected to cable, M12 plug on one cable end (4 pin) | Cable to connect the device for auxiliary output and F39-GCN5 Muting Sensor Connection Box | 0.3 m | XS5H-D421-A80-F |
| | | | 1 m | XS5H-D421-C80-F |
| | | | 2 m | XS5H-D421-D80-F |
| | | | 5 m | XS5H-D421-G80-F |
| | Connector connected to cable, M12 plug on one cable end (5 pin) | Cable to connect the device for reset input and F39-GCN5 Muting Sensor Connection Box | 0.3 m | XS2H-D521-AG0-A |
| | | | 1 m | XS2H-D521-CG0-A |

- Note:** 1. Select the same output type for both the safety light curtain/safety multi-light beam (PNP/NPN selection by wiring) and muting sensor (PNP or NPN model).
 2. For details of the **XS3W, XS5H and XS2H cables with connector(s)**, refer to your local OMRON website.
 3. Use the F39-JG□B-D Extended Plug-Socket Cable to connect the muting sensor connection box with the Intelligent Tap. The connection example for optical synchronization is shown below.

<Connection example>





Floor Mount System
Floor Mount Column

| Appearance | Applicable sensor | | Column height | Model |
|---|---------------------------------|---|---------------|------------|
| | F3SG-SR Safety Light Curtain | F3SG-PG Safety Multi-Light Beam | | |
|  | Protective height up to 0880 | F3SG-4PGA0670-2□ | 990 mm | F39-ST0990 |
| | Protective height up to 1280 | F3SG-4PGA0970-3A/3L F3SG-4PGA1070-4□ | 1,310 mm | F39-ST1310 |
| | Protective height up to 1520 | F3SG-4PGA1370-4□ | 1,630 mm | F39-ST1630 |
| | Protective height up to 1840 | --- | 1,950 mm | F39-ST1950 |
| | Protective height up to 2080 | --- | 2,270 mm | F39-ST2270 |


*1. Floor Mount Column, Mirror Column, Mount-Column Adjustable Base: Each model includes one product.
When using for both the emitter and receiver, order two sets.
*2. The mount-column adjustable base is sold separately.

Mirror Column

| Appearance | Applicable sensor | | Column height | Model |
|--|---------------------------------|--|---------------|---------------|
| | F3SG-SR Safety Light Curtain | F3SG-PG Safety Multi-Light Beam | | |
|  (Operating range becomes 15% shorter than the rating) | Protective height up to 0880 | F3SG-4PGA0670-2A/2L | 990 mm | F39-SML0990 |
| | Protective height up to 1200 | F3SG-4PGA0970-3A/3L F3SG-4PGA1070-4A/4L | 1,310 mm | F39-SML1310 |
| | Protective height up to 1520 | F3SG-4PGA1370-4A/4L | 1,630 mm | F39-SML1630 |
| | Protective height up to 1840 | --- | 1,950 mm | F39-SML1950 |
|  (Operating range becomes 10% shorter than the rating) | --- | F3SG-4PGA0670-2A/2L | 990 mm | F39-PML0990-2 |
| | --- | F3SG-4PGA0970-3A/3L | 1,310 mm | F39-PML1310-3 |
| | --- | F3SG-4PGA1070-4A/4L | | F39-PML1310-4 |
| | --- | F3SG-4PGA1370-4A/4L | 1,630 mm | F39-PML1630-4 |

Note: The F3SG-SR Safety Light Curtain with the protective height of 1920 or more cannot be used.
*1. Floor Mount Column, Mirror Column, Mount-Column Adjustable Base: Each model includes one product.
When using for both the emitter and receiver, order two sets.
*2. The mount-column adjustable base is sold separately.

Mount-Column Adjustable Base

| Appearance | Application | Model |
|---|--|---------|
|  | Mounted to the floor mount column or mirror column. The angle and height of the column can be adjusted. | F39-STB |

*1. Floor Mount Column, Mirror Column, Mount-Column Adjustable Base: Each model includes one product.
When using for both the emitter and receiver, order two sets.
*2. The floor mount column and mirror column are sold separately.

F3SG-SR/PG



F3SG-SR-K

F3SG-SR and F3SG-PG
Common to


Other Optional Accessories Common to F3SG-SR and F3SG-PG

Laser Alignment Pointer

- The laser alignment pointer is attached on the optical surface of the F3SG-SR/PG to help coarse adjustment of beams.

| Appearance | Application/Specifications | Model |
|---|---|----------------|
|  | Mountable from the front. This can be easily mounted and removed to/from the main unit, even as a set with the F39-ST. (Red semiconductor laser (wavelength 650 nm, 1 mW max, JIS Class 2, IEC Class 2, FDA Class II)) | F39-PTS |
|  | This can be mounted even from above the Spatter Protection Cover. (Red semiconductor laser (wavelength 650 nm, 1 mW max, JIS Class 2, IEC Class 2, FDA Class II)) | F39-PTG |


Lamp

| Appearance | Application/Specifications | Model |
|---|--|-----------------|
|  | The lamp can be connected to emitter, receiver, or emitter/receiver and turned ON based on the operation of F3SG-SR/PG. The lamp can indicate red, orange, and green colors, to which three different states can be assigned. IP67 * rated when mated. | F39-SGLP |

* When the accessory is used, protect it from cutting oil.

Note: The Lamp does not support Bluetooth® communication.

Optional Accessories for F3SG-SR
Spatter Protection Cover
 (2 covers per set, one for emitter and one for receiver)

| Appearance | Safety light curtain | | | Model |
|---|---|--------------------|--|-------------|
| | Finger protection | Hand protection | Arm/leg protection and Body protection | |
|  | F3SG-4SR□0160-14 | F3SG-4SR□0160-25 | --- | F39-HSG0160 |
| | F3SG-4SR□0200-14-F | F3SG-4SR□0200-25-F | --- | F39-HSG0200 |
| | F3SG-4SR□0240-14 | F3SG-4SR□0240-25 | F3SG-4SR□0240-45 | F39-HSG0240 |
| | F3SG-4SR□0280-14-F | F3SG-4SR□0280-25-F | F3SG-4SR□0280-85 | F39-HSG0280 |
| | F3SG-4SR□0320-14 | F3SG-4SR□0320-25 | --- | F39-HSG0320 |
| | F3SG-4SR□0360-14-F | F3SG-4SR□0360-25-F | --- | F39-HSG0360 |
| | F3SG-4SR□0400-14 | F3SG-4SR□0400-25 | F3SG-4SR□0400-45 | F39-HSG0400 |
| | F3SG-4SR□0440-14-F | F3SG-4SR□0440-25-F | F3SG-4SR□0440-85 | F39-HSG0440 |
| | F3SG-4SR□0480-14 | F3SG-4SR□0480-25 | --- | F39-HSG0480 |
| | F3SG-4SR□0560-14 | F3SG-4SR□0560-25 | F3SG-4SR□0560-45 | F39-HSG0560 |
| | F3SG-4SR□0640-14 | F3SG-4SR□0640-25 | --- | F39-HSG0640 |
| | --- | F3SG-4SR□0720-25 | F3SG-4SR□0720-45 | F39-HSG0720 |
| | F3SG-4SR□0800-14 | F3SG-4SR□0800-25 | --- | F39-HSG0800 |
| | --- | F3SG-4SR□0880-25 | F3SG-4SR□0880-45 | F39-HSG0880 |
| | F3SG-4SR□0960-14-F | F3SG-4SR□0960-25 | --- | F39-HSG0960 |
| | --- | F3SG-4SR□1040-25 | --- | F39-HSG1040 |
| | --- | F3SG-4SR□1120-25 | --- | F39-HSG1120 |
| | F3SG-4SR□1200-14 | F3SG-4SR□1200-25 | F3SG-4SR□1200-45 | F39-HSG1200 |
| | --- | F3SG-4SR□1280-25 | --- | F39-HSG1280 |
| | --- | F3SG-4SR□1360-25 | --- | F39-HSG1360 |
| | --- | F3SG-4SR□1440-25 | --- | F39-HSG1440 |
| | --- | F3SG-4SR□1520-25 | F3SG-4SR□1520-45 | F39-HSG1520 |
| | (Operating range becomes 10% shorter than the rating) | F3SG-4SR□1600-14 | F3SG-4SR□1600-25 | --- |
| --- | F3SG-4SR□1680-25 | --- | F39-HSG1680 | |
| --- | F3SG-4SR□1760-25 | --- | F39-HSG1760 | |
| --- | F3SG-4SR□1840-25 | --- | F39-HSG1840 | |
| --- | F3SG-4SR□1920-25 | --- | F39-HSG1920 | |

Note: Two or more spatter protection covers can be attached to the safety light curtain with a protective height not listed above.

Test Rod *

| Appearance | Diameter | Model |
|------------|----------|-----------|
| --- | 14 mm | F39-TRD14 |
| | 25 mm | F39-TRD25 |
| | 30 mm | F39-TRD30 |

* When you need a test rod larger than 30 mm in diameter, prepare it by yourself.

F3SG-SR/PG

F3SG-SR-K

F3SG-SR and F3SG-PG
Common to

Ratings and Specifications

Safety Light Curtain/Safety Multi-Light Beam

F3SG-SR/PG Main Unit

□□□□ in the model number indicates the protective height or product length in millimeters.

| Model | | Safety Light Curtain | | | | |
|--|--|---|--|--|---|---|
| | | F3SG-□SRA□□□□-14 F3SG-□SRB□□□□-14 | F3SG-□SRA□□□□-25 F3SG-□SRB□□□□-25 | F3SG-□SRA□□□□-45 F3SG-□SRB□□□□-45 | F3SG-□SRA□□□□-85 F3SG-□SRB□□□□-85 | |
| Performance | Object resolution (Detection capability) | Opaque objects | | | | |
| | | 14-mm dia. | 25-mm dia. | 45-mm dia. | 85-mm dia. | |
| | Beam gap | 10 mm | 20 mm | 40 mm | 80 mm | |
| | Number of beams | 15 to 199 | 8 to 124 | 6 to 38 | 4 to 12 | |
| | Lens size | 4.4 × 3.4 mm (W × H) | | 6.7 × 4.5 mm (W × H) | | |
| | Protective height | 160 to 2,000 mm | 160 to 2,480 mm | 240 to 1,520 mm | 280 to 920 mm | |
| | Product length | --- | | | | |
| | Operating range | Long | 0.3 to 10.0 m (Typ. 15.0 m) * | 0.3 to 20.0 m (Typ. 30.0 m) | | |
| | | Short | 0.3 to 3.0 m (Typ. 4.5 m) * | 0.3 to 7.0 m (Typ. 10.5 m) | | |
| | * When operating at an ambient temperature of -10 to -30 °C, use the F3SG-SR with the operating range of 0.3 to 5.0 m in Long Mode and 0.3 to 1.5 m in Short Mode. | | | | | |
| | Response time *1 | Normal mode | ON to OFF | Optical synchronization: 8 to 18 ms Wired synchronization: 10 to 21 ms | Optical synchronization: 8 to 13 ms Wired synchronization: 10 to 17 ms | Optical synchronization: 8 ms Wired synchronization: 10 ms |
| | | | OFF to ON | Optical synchronization: 40 to 90 ms Wired synchronization: 50 to 105 ms | Optical synchronization: 40 to 65 ms Wired synchronization: 50 to 85 ms | Optical synchronization: 40 ms Wired synchronization: 50 ms |
| | | ×2 Slow mode *2 | ON to OFF | Optical synchronization: 16 to 36 ms Wired synchronization: 20 to 42 ms | Optical synchronization: 16 to 26 ms Wired synchronization: 20 to 34 ms | Optical synchronization: 16 ms Wired synchronization: 20 ms |
| | | | OFF to ON | Optical synchronization: 80 to 180 ms Wired synchronization: 100 to 210 ms | Optical synchronization: 80 to 130 ms Wired synchronization: 100 to 170 ms | Optical synchronization: 80 ms Wired synchronization: 100 ms |
| ×4 Slow mode *2 | | ON to OFF | Optical synchronization: 32 to 72 ms Wired synchronization: 40 to 84 ms | Optical synchronization: 32 to 52 ms Wired synchronization: 40 to 68 ms | Optical synchronization: 32 ms Wired synchronization: 40 ms | |
| | | OFF to ON | Optical synchronization: 160 to 360 ms Wired synchronization: 200 to 420 ms | Optical synchronization: 160 to 260 ms Wired synchronization: 200 to 340 ms | Optical synchronization: 160 ms Wired synchronization: 200 ms | |
| ×8 Slow mode *2 | | ON to OFF | Optical synchronization: 64 to 144 ms Wired synchronization: 80 to 168 ms | Optical synchronization: 64 to 104 ms Wired synchronization: 80 to 136 ms | Optical synchronization: 64 ms Wired synchronization: 80 ms | |
| | | OFF to ON | Optical synchronization: 320 to 720 ms Wired synchronization: 400 to 840 ms | Optical synchronization: 320 to 520 ms Wired synchronization: 400 to 680 ms | Optical synchronization: 320 ms Wired synchronization: 400 ms | |
| *1. Response time when used in one segment system. Refer to page 29. Refer to <i>the User's Manual</i> (Man. No. Z405) for cascaded connection. | | | | | | |
| *2. Selectable by SD Manager 3. | | | | | | |
| Effective aperture angle (EAA) (IEC 61496-2) | | ±2.5° max. * Emitter and receiver at operating range of 3 m or greater. | | | | |
| Light source | | Infrared LEDs, Wavelength: 870 nm | | | | |
| Startup waiting time | | 3 s max. | | | | |

| Safety Multi-Light Beam | | | Model | |
|--|-------------------------------|--|---|----------------------------|
| F3SG-4PGA□□□□-□A | F3SG-4PGA□□□□-□L | F3SG-4PGA□□□□-□C | | |
| Opaque objects | | | Object resolution (Detection capability) | |
| 30-mm dia. * It is the minimum diameter of an object that can be detected on the any optical axes, and the definition of the term is different from that for the F3SG-SR. The minimum diameter that can be detected in any position of the product length is "detection capability (30 mm) + beam gap". | | | | |
| F3SG-4PGA0670-2□: 500 mm F3SG-4PGA0970-3□: 400 mm F3SG-4PGA1070-4□: 300 mm F3SG-4PGA1370-4□: 400 mm | | F3SG-4PGA0670-2C: 500 mm F3SG-4PGA1070-4C: 300 mm F3SG-4PGA1370-4C: 400 mm | Beam gap | |
| F3SG-4PGA0670-2□: 2 F3SG-4PGA0970-3□: 3 F3SG-4PGA1070-4□: 4 F3SG-4PGA1370-4□: 4 | | F3SG-4PGA0670-2C: 2 F3SG-4PGA1070-4C: 4 F3SG-4PGA1370-4C: 4 | Number of beams | |
| 8.1 × 12.8 mm (W × H) | | | Lens size | |
| --- | | | Protective height | |
| 670 mm/970 mm/1070 mm/1370 mm | | | Product length | |
| 0.5 to 20.0 m (Typ. 30.0 m) | 20.0 to 70.0 m (Typ. 110.0 m) | 0.5 to 5.0 m (Typ. 8.0 m) | Long | Operating range |
| --- | 0.5 to 20.0 m (Typ. 30.0 m) | --- | Short | |
| Optical synchronization: 8 ms Wired synchronization: 10 ms | | | ON to OFF | Normal mode |
| Optical synchronization: 40 ms Wired synchronization: 50 ms | | | OFF to ON | |
| Optical synchronization: 16 ms Wired synchronization: 20 ms | | | ON to OFF | ×2 Slow mode *2 |
| Optical synchronization: 80 ms Wired synchronization: 100 ms | | | OFF to ON | |
| Optical synchronization: 32 ms Wired synchronization: 40 ms | | | ON to OFF | ×4 Slow mode *2 |
| Optical synchronization: 160 ms Wired synchronization: 200 ms | | | OFF to ON | |
| Optical synchronization: 64 ms Wired synchronization: 80 ms | | | ON to OFF | ×8 Slow mode *2 |
| Optical synchronization: 320 ms Wired synchronization: 400 ms | | | OFF to ON | |
| * Selectable by SD Manager 3. | | | | |
| ±2.5° max. * Emitter, receiver, and Emitter/receiver at operating range of 3 m or greater. Passive mirror not applicable | | | Effective aperture angle (EAA) (IEC 61496-2) | |
| Infrared LEDs, Wavelength: 870 nm | | | Light source | |
| 3 s max. | | | Startup waiting time | |

Performance

| Model | | Safety Light Curtain | | | | |
|---------------------|------------------------------------|---|--|--------------------------------------|--------------------------------------|--|
| | | F3SG-□SRA□□□□-14 F3SG-□SRB□□□□-14 | F3SG-□SRA□□□□-25 F3SG-□SRB□□□□-25 | F3SG-□SRA□□□□-45 F3SG-□SRB□□□□-45 | F3SG-□SRA□□□□-85 F3SG-□SRB□□□□-85 | |
| Electrical | Power supply voltage (Vs) | SELV/PELV 24 VDC ±20% (ripple p-p 10% max.) | | | | |
| | Current consumption | Refer to page 29. | | | | |
| | Safety outputs (OSSD) | <p>Two PNP or NPN transistor outputs (PNP or NPN is selectable by wiring of power supply.) Load current: 300 mA max., Residual voltage: 2 V max. (except for voltage drop due to cable extension), Capacitive load: 1 µF max., Inductive load: 2.2 H max. *1*2*3 Leakage current: 1 mA max.(PNP), 2 mA max. (NPN) *4</p> <p>*1. For the F3SG-4SRA, the load current is 150 mA max. in 2-segment cascade and 80 mA max. in 3-segment cascade. *2. The residual voltage is 3 V max. when the Intelligent Tap is connected to the sensor. *3. 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. *4. These values must be taken into consideration when connecting elements including a capacitive load such as a capacitor.</p> | | | | |
| | Auxiliary output | <p>Two PNP or NPN transistor 1 outputs (PNP or NPN is selectable by wiring of power supply.) Load current: 100 mA max., Residual voltage: 2 V max. *5 *5. The residual voltage is 3 V max. when the Intelligent Tap is connected to the sensor.</p> | | | | |
| | Output operation mode | Safety output | Light-ON (Safety outputs are turned to the ON state when the receiver receives an emitting signal.) | | | |
| | | Auxiliary output | Safety output (Inverted signal output: Enable) (default) (Configurable by SD Manager 3) | | | |
| | Input voltage | TEST | <p>Light emission stops when connected to 24 VDC ON voltage: Vs-3 V to Vs (short circuit current: approx. 5.0 mA) *7 OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 6.0 mA) *7 Light emission stops when connected to 0 V ON voltage: 0 to 3 V (short circuit current: approx. 6.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 5.0 mA) *7</p> | | | |
| | | OPERATING RANGE SELECT INPUT | <p>Long: 12 V to Vs (short circuit current: approx. 4.2 mA) *7 or open Short: 0 to 3 V (short circuit current: approx. 4.2 mA)</p> | | | |
| | | RESET/EDM | <p>PNP ON voltage: Vs-3 V to Vs (short circuit current: approx. 9.5 mA) *7 OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 13.0 mA) *7 NPN ON voltage: 0 to 3 V (short circuit current: approx. 13.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 9.5 mA) *7</p> | | | |
| | | MUTE A/B, RE-RESET, PSDI *6 | <p>PNP ON voltage: Vs-3 V to Vs (short circuit current: approx. 4.5 mA) *7 OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 7.0mA) *7 NPN ON voltage: 0 to 3 V (short circuit current: approx. 7.0mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 4.5mA) *7</p> | | | |
| | | | *6. PSDI is only available for F3SG-SR. *7. The Vs indicates a supply voltage value in your environment. | | | |
| | Overvoltage category (IEC 60664-1) | II | | | | |
| | Indicators | Refer to page 97. | | | | |
| | Protective circuit | Output short-circuit protection | | | | |
| | Insulation resistance | 20 M or higher (500 VDC megger) | | | | |
| Dielectric strength | 1,000 VAC, 50/60 Hz (1 min) | | | | | |
| Functional | Mutual interference prevention | Optical synchronization by Scan Code: in up to 2 sets Wired synchronization: in up to 3 sets | | | | |
| | Cascade connection | Number of cascaded segments: 3 max. Total number of beams: 255 max. | | | | |
| | Test function | Self-test (at power-on, and during operation) External test (light emission stop function by test input) | | | | |
| | Safety-related functions | Interlock External Device Monitoring (EDM) Pre-Reset PSDI Fixed Blanking/Floating Blanking Reduced Resolution Muting/Override Mutual Interference Prevention PNP/NPN Selection Response Time Adjustment | | | | |

| Safety Multi-Light Beam | | | Model | |
|--|--|---|------------------------------------|-----------------------|
| F3SG-4PGA□□□□-□A | F3SG-4PGA□□□□-□L | F3SG-4PGA□□□□-□C | | |
| SELV/PELV 24 VDC ±20% (ripple p-p 10% max.) | | | Power supply voltage (Vs) | |
| Refer to page 29. | | | Current consumption | |
| <p>Two PNP or NPN transistor outputs (PNP or NPN is selectable by wiring of power supply.) Load current: 300 mA max., Residual voltage: 2 V max. (except for voltage drop due to cable extension), Capacitive load: 1 μF max., Inductive load: 2.2 H max. Leakage current: 1 mA max. (PNP), 2 mA max. (NPN)</p> <p>*1. The load current is 150 mA max. when the operating ambient temperature is between 45°C and 55°C. *2. The residual voltage is 3 V max. when the Intelligent Tap is connected to the sensor. *3. 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. *4. These values must be taken into consideration when connecting elements including a capacitive load such as a capacitor.</p> | | | Safety outputs (OSSD) | |
| <p>Two PNP or NPN transistor 1 outputs (PNP or NPN is selectable by wiring of power supply.) Load current: 100 mA max., Residual voltage: 2 V max. *5 *5. The residual voltage is 3 V max. when the Intelligent Tap is connected to the sensor.</p> | | | Auxiliary output | |
| Light-ON (Safety outputs are turned to the ON state when the receiver receives an emitting signal.) | | | Safety output | Output operation mode |
| Safety output (Inverted signal output: Enable) (default) (Configurable by SD Manager 3) | | | Auxiliary output | |
| Light emission stops when connected to 24 VDC ON voltage: Vs-3 V to Vs (short circuit current: approx. 5.0 mA) *7 OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 6.0mA) Light emission stops when connected to 0 V ON voltage: 0 to 3 V (short circuit current: approx. 6.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 5.0mA) *7 | | --- | TEST | Input voltage |
| --- | Long: 12V to Vs (short circuit current: approx. 4.2 mA) * or open Short: 0 to 3V (short circuit current: approx. 4.2 mA) | --- | OPERATING RANGE SELECT INPUT | |
| PNP | ON voltage: Vs-3 V to Vs (short circuit current: approx. 9.5 mA) *7 OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 13.0 mA) *7 | | RESET/EDM | |
| NPN | ON voltage: 0 to 3 V (short circuit current: approx. 13.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 9.5 mA) *7 | | | |
| PNP | ON voltage: Vs-3 V to Vs (short circuit current: approx. 4.5 mA) *7 OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 7.0mA) *7 | | MUTE A/B, RE-RESET, PSDI *6 | |
| NPN | ON voltage: 0 to 3 V (short circuit current: approx. 7.0mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 4.5mA) *7 | | | |
| *6. PSDI is only available for F3SG-SR. | | | | |
| *7. The Vs indicates a supply voltage value in your environment. | | | | |
| II | | | Overvoltage category (IEC 60664-1) | |
| Refer to page 97. | | | Indicators | |
| Output short-circuit protection | | | Protective circuit | |
| 20 M or higher (500 VDC megger) | | | Insulation resistance | |
| 1,000 VAC, 50/60 Hz (1 min) | | | Dielectric strength | |
| Optical synchronization by Scan Code: in up to 2 sets Wired synchronization: in up to 3 sets | | | Mutual interference prevention | |
| --- | | | Cascade connection | |
| Self-test (at power-on, and during operation) External test (light emission stop function by test input) | | Self-test (at power-on, and during operation) | Test function | |
| Interlock External Device Monitoring (EDM) Pre-Reset Muting/Override Mutual Interference Prevention PNP/NPN Selection Response Time Adjustment | | | Safety-related functions | |

Electrical

Functional

F3SG-SR/PG

| Model | | | Safety Light Curtain | | | |
|--------------------------------|---|---|---|--------------------------------------|--------------------------------------|--------------------------------------|
| | | | F3SG-□SRA□□□□-14 F3SG-□SRB□□□□-14 | F3SG-□SRA□□□□-25 F3SG-□SRB□□□□-25 | F3SG-□SRA□□□□-45 F3SG-□SRB□□□□-45 | F3SG-□SRA□□□□-85 F3SG-□SRB□□□□-85 |
| Environmental | Ambient temperature | Operating | -30 to 55 °C (non-icing) | | | |
| | | Storage | -30 to 70 °C | | | |
| | 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) | | IEC 60529: IP65 and IP67, JIS C 0920 Annex 1: IP67G | | | |
| | Vibration resistance (IEC 61496-1) | | Class 3M4 (IEC TR 60721-4-3) Operation limit: 5 to 150 Hz, Multiple amplitude of 7 mm, Acceleration of 1 G, 10 sweeps each in X, Y, and Z directions (no delay at resonant frequencies) | | | |
| | Shock resistance (IEC 61496-1) | | Class 3M4 (IEC TR 60721-4-3) Operation limit: Acceleration of 15 G, Pulse duration of 6 ms, 100 shocks for each in X, Y, and Z directions (600 shocks in total) | | | |
| Pollution degree (IEC 60664-1) | | 3 | | | | |
| Connections | Root cable | Type of connection | To sensors: dedicated connector, To external: M12 connector type (5-pin emitter and 8-pin receiver) or open-ended type IP67 and IP67G (JIS C 0920 Annex 1) * rated when mated. * The F3SG-SR meets the degree of protection when the root cable is correctly connected with the F3SG-SR. The degree of protection is not satisfied with the part where cable wires are uncovered. | | | |
| | | Number of wires | Emitter: 5, Receiver: 8 | | | |
| | | Cable length | Refer to page 9. | | | |
| | | Cable diameter | 6 mm | | | |
| | | Minimum bending radius | R5 mm | | | |
| | Cascading cable | Type of connection | To sensors: dedicated connector, To cascading sensors: M12 connector type (5-pin emitter and 8-pin receiver) or dedicated connector IP67 and IP67G (JIS C 0920 Annex 1) * rated when mated. * The F3SG-SR meets the degree of protection when the cascading cable is correctly connected with the F3SG-SR and the root cable. The degree of protection is not satisfied with the part where cable wires are uncovered. | | | |
| | | Number of wires | Emitter: 5, Receiver: 8 | | | |
| | | Cable length | Refer to page 11. | | | |
| | | Cable diameter | 6 mm | | | |
| | | Minimum bending radius | R5 mm | | | |
| | Extension cable - Extended Socket-Straight Cable - Extended Plug-Socket Cable | Type of connection | M12 connector type (5-pin emitter and 8-pin receiver), IP67 * rated when mated * The extension cable meets the degree of protection when the root cable is correctly connected with the extension cable. The degree of protection is not satisfied with the part where cable wires are uncovered. | | | |
| | | Number of wires | Emitter: 5, Receiver: 8 | | | |
| | | Cable length | Refer to page 10. | | | |
| | | Cable diameter | 6.6 mm | | | |
| | | Minimum bending radius | R36 mm | | | |
| | Cable extension | Refer to page 26 for restrictions on cable extension. | | | | |
| | | Root cable | In optical synchronization: 100 m max. * between power supply and emitter and between power supply and receiver In wired synchronization: 100 m max. * between power supply and emitter, between power supply and receiver, and between emitter and receiver * When the Intelligent Tap (F39-SGIT-IL3) is connected to the sensor, this applies in the case of the rated power supply of 24 VDC to 24 VDC +20%. | | | |
| | | Cascade connection | Extension cable between sensors: 10 m max. (not including Cascading Cable for Extended *1 and Root Cable *2.) *1. F39-JGR3W *2. F39-JGR3K | | | |
| | Material | | Housing: Aluminum alloy Cap: PBT resin Front window: Acrylic resin FE plate: Stainless steel | | | |
| | Weight | | Refer to page 26. | | | |
| Included accessories | | Instruction Sheet, Quick Installation Manual, Troubleshooting Guide Sticker, Warning Zone Label End Cap (for switching Scan Code Selection function) | | | | |
| Conformity | Conforming standards | | Refer to page 111. | | | |
| | Type of ESPE (IEC 61496-1) | | Type 4 | | | |
| | Performance Level (PL)/ Safety category | | PL e/Category 4 (EN ISO 13849-1:2015) | | | |
| | PFH _D | | 1.1×10 ⁻⁸ max. (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) | | | | |

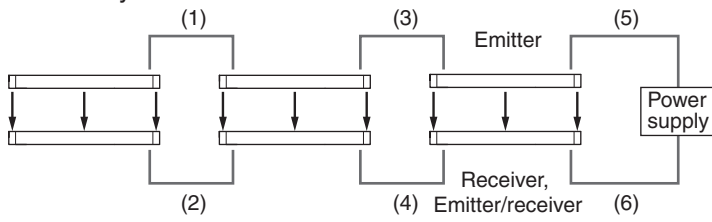
| Safety Multi-Light Beam | | | Model | |
|---|------------------|------------------|---|---|
| F3SG-4PGA□□□□-□A | F3SG-4PGA□□□□-□L | F3SG-4PGA□□□□-□C | | |
| -30 to 55 °C (non-icing) | | | Operating | Ambient temperature |
| -30 to 70 °C | | | Storage | |
| 35% to 85% (non-condensing) | | | Operating | Ambient humidity |
| 35% to 95% | | | Storage | |
| Incandescent lamp: 3,000 lx max. on receiver surface Sunlight: 10,000 lx max. on receiver surface | | | Ambient illuminance | |
| IEC 60529: IP65 and IP67 | | | Degree of protection (IEC 60529) | |
| Class 3M4 (IEC TR 60721-4-3) Operation limit: 5 to 150 Hz, Multiple amplitude of 7 mm, Acceleration of 1 G, 10 sweeps each in X, Y, and Z directions (no delay at resonant frequencies) | | | Vibration resistance (IEC 61496-1) | |
| Class 3M4 (IEC TR 60721-4-3) Operation limit: Acceleration of 15 G, Pulse duration of 6 ms, 100 shocks for each in X, Y, and Z directions (600 shocks in total) | | | Shock resistance (IEC 61496-1) | |
| 3 | | | Pollution degree (IEC 60664-1) | |
| To sensors: dedicated connector, To external: M12 connector type (5-pin emitter and 8-pin receiver) or open-ended type IP67 and IP67G (JIS C 0920 Annex 1) * rated when mated. * The F3SG-SR meets the degree of protection when the root cable is correctly connected with the F3SG-SR. The degree of protection is not satisfied with the part where cable wires are uncovered. | | | Type of connection | Root cable |
| Emitter: 5, Receiver: 8, Emitter/receiver: 8 | | | Number of wires | |
| Refer to page 9. | | | Cable length | |
| 6 mm | | | Cable diameter | |
| R5 mm | | | Minimum bending radius | |
| --- | | | Type of connection | Cascading cable |
| --- | | | Number of wires | |
| --- | | | Cable length | |
| --- | | | Cable diameter | |
| --- | | | Minimum bending radius | |
| M12 connector type (5-pin emitter and 8-pin receiver), IP67 * rated when mated * The extension cable meets the degree of protection when the root cable is correctly connected with the extension cable. The degree of protection is not satisfied with the part where cable wires are uncovered. | | | Type of connection | Extension cable - Extended Socket-Straight Cable - Extended Plug-Socket Cable |
| Emitter: 5, Receiver: 8, Emitter/receiver: 8 | | | Number of wires | |
| Refer to page 10. | | | Cable length | |
| 6.6 mm | | | Cable diameter | |
| R36 mm | | | Minimum bending radius | |
| Refer to page 26 for restrictions on cable extension. | | | | |
| In optical synchronization: 100 m max. * between power supply and emitter and between power supply and receiver In wired synchronization: 100 m max. * between power supply and emitter, between power supply and receiver, and between emitter and receiver * When the Intelligent Tap (F39-SGIT-IL3) is connected to the sensor, this applies in the case of the rated power supply of 24 VDC to 24 VDC +20%. | | | Root cable | Cable extension |
| --- | | | Cascade connection | |
| Housing: Aluminum alloy Cap: PBT resin Front window: Acrylic resin FE plate: Stainless steel | | | Material | |
| Refer to page 26. | | | Weight | |
| Instruction Sheet, Quick Installation Manual, Troubleshooting Guide Sticker, End Cap (for switching Scan Code Selection function) | | | Included accessories | |
| Refer to page 111. | | | Conforming standards | |
| Type 4 | | | Type of ESPE (IEC 61496-1) | |
| PL e/Category 4 (EN ISO 13849-1:2015) | | | Performance Level (PL)/ Safety category | |
| 1.1×10 ⁻⁸ max. (IEC 61508) | | | PFH ₀ | |
| Every 20 years (IEC 61508) | | | Proof test interval T _M | |
| 99% (IEC 61508) | | | SFF | |
| 1 (IEC 61508) | | | HFT | |
| Type B (IEC 61508-2) | | | Classification | |

F3SG-SR/PG
 F3SG-SR-K
 Common to F3SG-SR and F3SG-PG

Restrictions on cable extension

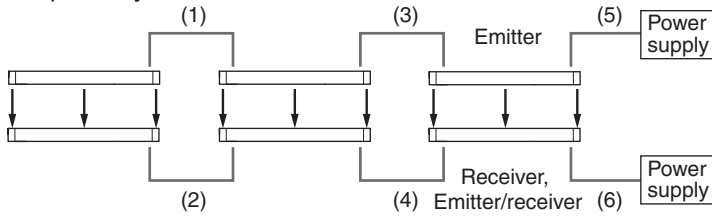
For the cable extension of the F3SG-SR/PG, refer to the following diagrams. For the cable extension of the F3SG-SR/PG with the Intelligent Tap, refer to *User's Manual* (Man. No. Z405).

- Wired synchronization



| |
|--------------------------|
| Maximum extension length |
| (1) to (4): 10 m each * |
| (5) to (6): 100 m |

- Optical synchronization



| |
|--------------------------|
| Maximum extension length |
| (1) to (4): 10 m each * |
| (5) to (6): 100 m each |

* Not including the F39-JGR3W Cascading Cable for Extended and F39-JGR3K Root-Plug Cable for Extended.
Cascade connection is not available for the F3SG-PG and F3SG-SR-K Series.

Intelligent Tap F39-SGIT-IL3

| Model | | F39-SGIT-IL3 | |
|--------------------------------|--|--|--|
| Applicable sensor | | F3SG-SR/PG | |
| Performance | Response time | Output ON to OFF and OFF to ON: 44 ms max. each * * The response time is the time interval between the changes of the states of the sensor OSSD's and the DO (pin 2). | |
| | Startup waiting time | 3 s max. | |
| Electrical | Power supply voltage (Vs) | Supplied from external power source: SELV/PELV 24 VDC±20% (ripple p-p 10% max.) USB bus powered: 5 VDC | |
| | Current consumption | 85 mA max. (When connecting 24 VDC power supply and IO-Link Master) | |
| | Safety outputs (OSSD) /Auxiliary output | Refer to the ratings and specifications of the F3SG-SR/PG. The safety outputs and auxiliary output of the Intelligent Tap are directly connected to those of the F3SG-SR/PG. | |
| | Digital output for pin 2 (IO-Link) * | One PNP transistor output Load current: 100 mA max., Residual voltage: 2 V max., Leakage current: 1 mA max. The DO is in the OFF state when the safety outputs are in the ON state. The DO is in the ON state when the safety outputs are in the OFF state. (Regardless of the PNP/NPN setting of the F3SG-SR) | |
| | * For the DO (pin 2) of CN3 | | |
| | Input voltage | RESET, EDM | PNP ON voltage: Vs-3 V to Vs (short circuit current: approx. 9.5 mA) *2 OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 13.0 mA) *2 NPN ON voltage: 0 to 3 V (short circuit current: approx. 13.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 9.5 mA) *2 |
| | | MUTE A/B, PRE-RESET, PSDI *1 | PNP ON voltage: Vs-3 V to Vs (short circuit current: approx. 4.5 mA) *2 OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 7.0 mA) *2 NPN ON voltage: 0 to 3 V (short circuit current: approx. 7.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 4.5 mA) *2 |
| | *1. PSDI is only available for F3SG-SR. *2. The Vs indicates a supply voltage value in your environment. | | |
| | Overvoltage category (IEC 60664-1) | II | |
| | Protective circuit | Output short-circuit protection, Output reverse polarity protection | |
| Insulation resistance | 20 MΩ or higher (500 VDC megger) | | |
| Dielectric strength | 1,000 VAC, 50/60 Hz (1 min) | | |
| Functional | Maintenance Information | Error Log Power-ON Time | |
| Environmental | Ambient temperature | Operating | -30 to 55 °C (non-icing) |
| | | Storage | -30 to 70 °C |
| | Ambient humidity | Operating | 35% to 85% (non-condensing) |
| | | Storage | 35% to 85% |
| | Degree of protection (IEC 60529) | IP65, IP67 and IP67G (Covers and cables connected with the Intelligent Tap.) | |
| | Vibration resistance (IEC 61496-1) | Class 3M4 (IEC TR 60721-4-3) Operation limit: 5 to 150 Hz, Multiple amplitude of 7 mm, Acceleration of 1 G, 10 sweeps each in X, Y, and Z directions (no delay at resonant frequencies) | |
| Shock resistance (IEC 61496-1) | Class 3M4 (IEC TR 60721-4-3) Operation limit: Acceleration of 15 G, Pulse duration of 6 ms, 100 shocks for each in X, Y, and Z directions (600 shocks in total) | | |
| Pollution degree (IEC 60664-1) | 3 | | |
| Connections | To sensors, control box and IO-Link | M12 connectors: 8-pin (CN1: receiver and CN2: control box) and 5-pin (CN3: IO-Link and CN4: emitter), IP67 and IP67G (JIS C 0920 Annex 1) * rated when mated. * The F3SG-SR meets the degree of protection when the root cable of the F3SG-SR is correctly connected with the F3SG-SR. | |
| | Connection | USB Type-C | |
| | Cable extension | 20 m max. between IO-Link Master and Intelligent Tap, 4 m max.* between PC and Intelligent Tap via USB cable * It is not guaranteed that the Intelligent Tap is connectable to any PC or USB cable. Verify the connection with the USB cable you use. | |
| IO-Link communications | IO-Link version | Version 1.1 | |
| | Baud rate | COM3: 230.4 kbps | |
| | Data length | PD: 4 bytes, OD: 32 bytes (M-sequence type: TYPE_2_V) | |
| | Minimum cycle time | 22 ms | |
| Material | PBT resin | | |
| Weight | F39-SGIT-IL3: 180 g (when packaged), F39-LITF1: 50 g (when packaged) | | |
| Included accessories | Instruction Sheet and M12 Connector Cover (2 pcs) | | |

Bluetooth® Communication Unit F39-SGBT

| Model | F39-SGBT |
|----------------------------------|--|
| Applicable sensor | F3SG-SR/PG |
| Power supply voltage (Vs) | 24 VDC±20%, ripple p-p 10% max. (shares power supply of Intelligent Tap) |
| Current consumption | 30 mA max. (shares power supply of Intelligent Tap) |
| Ambient temperature | Operating: -30 to 55 °C (non-icing) Storage: -30 to 70 °C |
| Ambient humidity | Operating: 35% to 85% (non-condensing) Storage: 35% to 85% |
| Degree of protection | IP65, IP67 and IP67G (rated when connected to Intelligent Tap) |
| Vibration resistance | Class 3M4 (IEC TR 60721-4-3) Operation limit: 5 to 150 Hz, Multiple amplitude of 7 mm, Acceleration of 1 G, 10 sweeps each in X, Y, and Z directions (no delay at resonant frequencies) |
| Shock resistance | Class 3M4 (IEC TR 60721-4-3) Operation limit: Acceleration of 15 G, Pulse duration of 6 ms, 100 shocks for each in X, Y, and Z directions (600 shocks in total) |
| Type of connection | To be connected to Intelligent Tap |
| Communication system | Bluetooth® Version 3.0 |
| Communication profile | SPP (Serial Port Profile) |
| Transmission distance | Approx. 10 m max. (Output power: Class 2) * |
| Material | PBT resin |
| Weight | 70 g (when packaged) |

* It depends on use environment conditions.

Models/Response Time/Current Consumption/Weight

F3SG-SR

Finger protection (Detection capability: 14-mm dia.)

Models and Response Times

| Model | | Number of beams | Protective height [mm] | Response time (Optical synchronization) [ms] | | | Response time (Wired synchronization) [ms] | |
|--------------------|------------------|-----------------|------------------------|--|--------------------------|------------------------------|--|-----------|
| | | | | ON to OFF | OFF (synchronized) to ON | OFF (not synchronized) to ON | ON to OFF | OFF to ON |
| F3SG-4SR□0160-14 | F3SG-2SRB0160-14 | 15 | 160 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0200-14-F | --- | 19 | 200 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0240-14 | F3SG-2SRB0240-14 | 23 | 240 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0280-14-F | --- | 27 | 280 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0320-14 | F3SG-2SRB0320-14 | 31 | 320 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0360-14-F | --- | 35 | 360 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0400-14 | F3SG-2SRB0400-14 | 39 | 400 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0440-14-F | --- | 43 | 440 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0480-14 | F3SG-2SRB0480-14 | 47 | 480 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0520-14-F | --- | 51 | 520 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0560-14 | F3SG-2SRB0560-14 | 55 | 560 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0600-14-F | --- | 59 | 600 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0640-14 | F3SG-2SRB0640-14 | 63 | 640 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0680-14-F | --- | 67 | 680 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0720-14-F | --- | 71 | 720 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0760-14-F | --- | 75 | 760 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0800-14 | F3SG-2SRB0800-14 | 79 | 800 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0840-14-F | --- | 83 | 840 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0880-14-F | --- | 87 | 880 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0920-14-F | --- | 91 | 920 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0960-14-F | --- | 95 | 960 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1000-14 | F3SG-2SRB1000-14 | 99 | 1000 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1200-14 | F3SG-2SRB1200-14 | 119 | 1200 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1400-14 | F3SG-2SRB1400-14 | 139 | 1400 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1600-14 | F3SG-2SRB1600-14 | 159 | 1600 | 18 | 90 | 190 | 21 | 105 |
| F3SG-4SR□1800-14 | F3SG-2SRB1800-14 | 179 | 1800 | 18 | 90 | 190 | 21 | 105 |
| F3SG-4SR□2000-14 | F3SG-2SRB2000-14 | 199 | 2000 | 18 | 90 | 190 | 21 | 105 |

Note: 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 response times of "Optical synchronization" are values when Scan Code is set at Code B. The response times for Code A are 1 ms shorter than these values.

F3SG-SR/PG

Models, Current Consumption and Weight

| Model | Number of beams | Protective height [mm] | Current consumption [mA] | | Weight [kg] | |
|--------------------|-----------------|------------------------|--------------------------|----------|-------------|-------|
| | | | Emitter | Receiver | Net | Gross |
| F3SG-4SRA0160-14 | 15 | 160 | 68 | 106 | 0.4 | 0.8 |
| F3SG-□SRB0160-14 | 15 | 160 | 69 | 97 | 0.4 | 0.8 |
| F3SG-4SRA0200-14-F | 19 | 200 | 71 | 108 | 0.5 | 0.9 |
| F3SG-4SRB0200-14-F | 19 | 200 | 70 | 97 | 0.5 | 0.9 |
| F3SG-4SRA0240-14 | 23 | 240 | 74 | 111 | 0.6 | 1 |
| F3SG-□SRB0240-14 | 23 | 240 | 71 | 98 | 0.6 | 1 |
| F3SG-4SRA0280-14-F | 27 | 280 | 77 | 114 | 0.7 | 1.1 |
| F3SG-4SRB0280-14-F | 27 | 280 | 73 | 99 | 0.7 | 1.1 |
| F3SG-4SRA0320-14 | 31 | 320 | 81 | 117 | 0.8 | 1.2 |
| F3SG-□SRB0320-14 | 31 | 320 | 74 | 100 | 0.8 | 1.2 |
| F3SG-4SRA0360-14-F | 35 | 360 | 84 | 119 | 0.9 | 1.4 |
| F3SG-4SRB0360-14-F | 35 | 360 | 75 | 100 | 0.9 | 1.4 |
| F3SG-4SRA0400-14 | 39 | 400 | 87 | 122 | 1 | 1.5 |
| F3SG-□SRB0400-14 | 39 | 400 | 77 | 101 | 1 | 1.5 |
| F3SG-4SRA0440-14-F | 43 | 440 | 90 | 125 | 1.1 | 1.6 |
| F3SG-4SRB0440-14-F | 43 | 440 | 78 | 102 | 1.1 | 1.6 |
| F3SG-4SRA0480-14 | 47 | 480 | 93 | 128 | 1.2 | 1.7 |
| F3SG-□SRB0480-14 | 47 | 480 | 79 | 103 | 1.2 | 1.7 |
| F3SG-4SRA0520-14-F | 51 | 520 | 96 | 131 | 1.3 | 1.8 |
| F3SG-4SRB0520-14-F | 51 | 520 | 81 | 103 | 1.3 | 1.8 |
| F3SG-4SRA0560-14 | 55 | 560 | 99 | 133 | 1.4 | 1.9 |
| F3SG-□SRB0560-14 | 55 | 560 | 82 | 104 | 1.4 | 1.9 |
| F3SG-4SRA0600-14-F | 59 | 600 | 103 | 136 | 1.5 | 2.1 |
| F3SG-4SRB0600-14-F | 59 | 600 | 83 | 105 | 1.5 | 2.1 |
| F3SG-4SRA0640-14 | 63 | 640 | 106 | 139 | 1.6 | 2.2 |
| F3SG-□SRB0640-14 | 63 | 640 | 85 | 106 | 1.6 | 2.2 |
| F3SG-4SRA0680-14-F | 67 | 680 | 109 | 142 | 1.7 | 2.3 |
| F3SG-4SRB0680-14-F | 67 | 680 | 86 | 106 | 1.7 | 2.3 |
| F3SG-4SRA0720-14-F | 71 | 720 | 112 | 144 | 1.8 | 2.4 |
| F3SG-4SRB0720-14-F | 71 | 720 | 87 | 107 | 1.8 | 2.4 |
| F3SG-4SRA0760-14-F | 75 | 760 | 115 | 147 | 1.9 | 2.5 |
| F3SG-4SRB0760-14-F | 75 | 760 | 89 | 108 | 1.9 | 2.5 |
| F3SG-4SRA0800-14 | 79 | 800 | 118 | 150 | 2 | 2.6 |
| F3SG-□SRB0800-14 | 79 | 800 | 90 | 109 | 2 | 2.6 |
| F3SG-4SRA0840-14-F | 83 | 840 | 121 | 153 | 2.1 | 2.7 |
| F3SG-4SRB0840-14-F | 83 | 840 | 91 | 109 | 2.1 | 2.7 |
| F3SG-4SRA0880-14-F | 87 | 880 | 124 | 155 | 2.2 | 2.8 |
| F3SG-4SRB0880-14-F | 87 | 880 | 93 | 110 | 2.2 | 2.8 |
| F3SG-4SRA0920-14-F | 91 | 920 | 128 | 158 | 2.3 | 3 |
| F3SG-4SRB0920-14-F | 91 | 920 | 94 | 111 | 2.3 | 3 |
| F3SG-4SRA0960-14-F | 95 | 960 | 131 | 161 | 2.4 | 3.1 |
| F3SG-4SRB0960-14-F | 95 | 960 | 95 | 112 | 2.4 | 3.1 |
| F3SG-4SRA1000-14 | 99 | 1000 | 134 | 164 | 2.5 | 3.2 |
| F3SG-□SRB1000-14 | 99 | 1000 | 97 | 112 | 2.5 | 3.2 |
| F3SG-4SRA1200-14 | 119 | 1200 | 150 | 178 | 3.1 | 3.8 |
| F3SG-□SRB1200-14 | 119 | 1200 | 103 | 116 | 3.1 | 3.8 |
| F3SG-4SRA1400-14 | 139 | 1400 | 165 | 191 | 3.6 | 4.3 |
| F3SG-□SRB1400-14 | 139 | 1400 | 110 | 120 | 3.6 | 4.3 |
| F3SG-4SRA1600-14 | 159 | 1600 | 181 | 205 | 4.1 | 4.9 |
| F3SG-□SRB1600-14 | 159 | 1600 | 117 | 124 | 4.1 | 4.9 |
| F3SG-4SRA1800-14 | 179 | 1800 | 197 | 219 | 4.6 | 5.5 |
| F3SG-□SRB1800-14 | 179 | 1800 | 124 | 128 | 4.6 | 5.5 |
| F3SG-4SRA2000-14 | 199 | 2000 | 212 | 233 | 5.1 | 6.1 |
| F3SG-□SRB2000-14 | 199 | 2000 | 130 | 131 | 5.1 | 6.1 |

Note: 1. The net weight is the weight of an emitter and a receiver per set.
 2. The gross weight is the weight of an emitter, a receiver, included accessories and a package.

Hand protection (Detection capability: 25-mm dia.)

Models and Response Times

| Model | | Number of beams | Protective height [mm] | Response time (Optical synchronization) [ms] | | | Response time (Wired synchronization) [ms] | |
|--------------------|------------------|-----------------|------------------------|--|--------------------------|------------------------------|--|-----------|
| | | | | ON to OFF | OFF (synchronized) to ON | OFF (not synchronized) to ON | ON to OFF | OFF to ON |
| F3SG-4SR□0160-25 | F3SG-2SRB0160-25 | 8 | 160 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0200-25-F | --- | 10 | 200 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0240-25 | F3SG-2SRB0240-25 | 12 | 240 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0280-25-F | --- | 14 | 280 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0320-25 | F3SG-2SRB0320-25 | 16 | 320 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0360-25-F | --- | 18 | 360 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0400-25 | F3SG-2SRB0400-25 | 20 | 400 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0440-25-F | --- | 22 | 440 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0480-25 | F3SG-2SRB0480-25 | 24 | 480 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0520-25-F | --- | 26 | 520 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0560-25 | F3SG-2SRB0560-25 | 28 | 560 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0600-25-F | --- | 30 | 600 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0640-25 | F3SG-2SRB0640-25 | 32 | 640 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0680-25-F | --- | 34 | 680 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0720-25 | F3SG-2SRB0720-25 | 36 | 720 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0760-25-F | --- | 38 | 760 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0800-25 | F3SG-2SRB0800-25 | 40 | 800 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0840-25-F | --- | 42 | 840 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0880-25 | F3SG-2SRB0880-25 | 44 | 880 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0920-25-F | --- | 46 | 920 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□0960-25 | F3SG-2SRB0960-25 | 48 | 960 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1000-25-F | --- | 50 | 1000 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1040-25 | F3SG-2SRB1040-25 | 52 | 1040 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1120-25 | F3SG-2SRB1120-25 | 56 | 1120 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1200-25 | F3SG-2SRB1200-25 | 60 | 1200 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1280-25 | F3SG-2SRB1280-25 | 64 | 1280 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1360-25 | F3SG-2SRB1360-25 | 68 | 1360 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1440-25 | F3SG-2SRB1440-25 | 72 | 1440 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1520-25 | F3SG-2SRB1520-25 | 76 | 1520 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1600-25 | F3SG-2SRB1600-25 | 80 | 1600 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1680-25 | F3SG-2SRB1680-25 | 84 | 1680 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1760-25 | F3SG-2SRB1760-25 | 88 | 1760 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1840-25 | F3SG-2SRB1840-25 | 92 | 1840 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□1920-25 | F3SG-2SRB1920-25 | 96 | 1920 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□2080-25 | F3SG-2SRB2080-25 | 104 | 2080 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□2280-25 | F3SG-2SRB2280-25 | 114 | 2280 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SR□2480-25 | F3SG-2SRB2480-25 | 124 | 2480 | 13 | 65 | 165 | 17 | 85 |

Note: 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 response times of "Optical synchronization" are values when Scan Code is set at Code B. The response times for Code A are 1 ms shorter than these values.

F3SG-SR/PG

F3SG-SR-K

F3SG-SR and F3SG-PG
Common to

F3SG-SR/PG

Models, Current Consumption and Weight

| Model | Number of beams | Protective height [mm] | Current consumption [mA] | | Weight [kg] | |
|--------------------|-----------------|------------------------|--------------------------|----------|-------------|-------|
| | | | Emitter | Receiver | Net | Gross |
| F3SG-4SRA0160-25 | 8 | 160 | 63 | 105 | 0.4 | 0.8 |
| F3SG-□SRB0160-25 | 8 | 160 | 61 | 96 | 0.4 | 0.8 |
| F3SG-4SRA0200-25-F | 10 | 200 | 65 | 108 | 0.5 | 0.9 |
| F3SG-4SRB0200-25-F | 10 | 200 | 62 | 96 | 0.5 | 0.9 |
| F3SG-4SRA0240-25 | 12 | 240 | 68 | 110 | 0.6 | 1 |
| F3SG-□SRB0240-25 | 12 | 240 | 63 | 97 | 0.6 | 1 |
| F3SG-4SRA0280-25-F | 14 | 280 | 71 | 112 | 0.7 | 1.1 |
| F3SG-4SRB0280-25-F | 14 | 280 | 64 | 97 | 0.7 | 1.1 |
| F3SG-4SRA0320-25 | 16 | 320 | 74 | 115 | 0.8 | 1.2 |
| F3SG-□SRB0320-25 | 16 | 320 | 65 | 97 | 0.8 | 1.2 |
| F3SG-4SRA0360-25-F | 18 | 360 | 76 | 117 | 0.9 | 1.4 |
| F3SG-4SRB0360-25-F | 18 | 360 | 65 | 98 | 0.9 | 1.4 |
| F3SG-4SRA0400-25 | 20 | 400 | 79 | 119 | 1 | 1.5 |
| F3SG-□SRB0400-25 | 20 | 400 | 66 | 98 | 1 | 1.5 |
| F3SG-4SRA0440-25-F | 22 | 440 | 82 | 121 | 1.1 | 1.6 |
| F3SG-4SRB0440-25-F | 22 | 440 | 67 | 98 | 1.1 | 1.6 |
| F3SG-4SRA0480-25 | 24 | 480 | 84 | 124 | 1.2 | 1.7 |
| F3SG-□SRB0480-25 | 24 | 480 | 68 | 99 | 1.2 | 1.7 |
| F3SG-4SRA0520-25-F | 26 | 520 | 87 | 126 | 1.3 | 1.8 |
| F3SG-4SRB0520-25-F | 26 | 520 | 69 | 99 | 1.3 | 1.8 |
| F3SG-4SRA0560-25 | 28 | 560 | 90 | 128 | 1.4 | 1.9 |
| F3SG-□SRB0560-25 | 28 | 560 | 70 | 99 | 1.4 | 1.9 |
| F3SG-4SRA0600-25-F | 30 | 600 | 92 | 131 | 1.5 | 2.1 |
| F3SG-4SRB0600-25-F | 30 | 600 | 71 | 100 | 1.5 | 2.1 |
| F3SG-4SRA0640-25 | 32 | 640 | 95 | 133 | 1.6 | 2.2 |
| F3SG-□SRB0640-25 | 32 | 640 | 72 | 100 | 1.6 | 2.2 |
| F3SG-4SRA0680-25-F | 34 | 680 | 98 | 135 | 1.7 | 2.3 |
| F3SG-4SRB0680-25-F | 34 | 680 | 73 | 100 | 1.7 | 2.3 |
| F3SG-4SRA0720-25 | 36 | 720 | 100 | 137 | 1.8 | 2.4 |
| F3SG-□SRB0720-25 | 36 | 720 | 74 | 101 | 1.8 | 2.4 |
| F3SG-4SRA0760-25-F | 38 | 760 | 103 | 140 | 1.9 | 2.5 |
| F3SG-4SRB0760-25-F | 38 | 760 | 75 | 101 | 1.9 | 2.5 |
| F3SG-4SRA0800-25 | 40 | 800 | 106 | 142 | 2 | 2.6 |
| F3SG-□SRB0800-25 | 40 | 800 | 76 | 101 | 2 | 2.6 |
| F3SG-4SRA0840-25-F | 42 | 840 | 109 | 144 | 2.1 | 2.7 |
| F3SG-4SRB0840-25-F | 42 | 840 | 77 | 101 | 2.1 | 2.7 |
| F3SG-4SRA0880-25 | 44 | 880 | 111 | 147 | 2.2 | 2.8 |
| F3SG-□SRB0880-25 | 44 | 880 | 78 | 102 | 2.2 | 2.8 |
| F3SG-4SRA0920-25-F | 46 | 920 | 114 | 149 | 2.3 | 3 |
| F3SG-4SRB0920-25-F | 46 | 920 | 79 | 102 | 2.3 | 3 |
| F3SG-4SRA0960-25 | 48 | 960 | 117 | 151 | 2.4 | 3.1 |
| F3SG-□SRB0960-25 | 48 | 960 | 80 | 102 | 2.4 | 3.1 |
| F3SG-4SRA1000-25-F | 50 | 1000 | 119 | 154 | 2.5 | 3.2 |
| F3SG-4SRB1000-25-F | 50 | 1000 | 81 | 103 | 2.5 | 3.2 |
| F3SG-4SRA1040-25 | 52 | 1040 | 122 | 156 | 2.6 | 3.3 |
| F3SG-□SRB1040-25 | 52 | 1040 | 82 | 103 | 2.6 | 3.3 |
| F3SG-4SRA1120-25 | 56 | 1120 | 127 | 160 | 2.9 | 3.5 |
| F3SG-□SRB1120-25 | 56 | 1120 | 84 | 104 | 2.9 | 3.5 |
| F3SG-4SRA1200-25 | 60 | 1200 | 133 | 165 | 3.1 | 3.8 |
| F3SG-□SRB1200-25 | 60 | 1200 | 86 | 104 | 3.1 | 3.8 |
| F3SG-4SRA1280-25 | 64 | 1280 | 138 | 170 | 3.3 | 4 |
| F3SG-□SRB1280-25 | 64 | 1280 | 88 | 105 | 3.3 | 4 |
| F3SG-4SRA1360-25 | 68 | 1360 | 144 | 174 | 3.5 | 4.2 |
| F3SG-□SRB1360-25 | 68 | 1360 | 90 | 106 | 3.5 | 4.2 |

| Model | Number of beams | Protective height [mm] | Current consumption [mA] | | Weight [kg] | |
|------------------|-----------------|------------------------|--------------------------|----------|-------------|-------|
| | | | Emitter | Receiver | Net | Gross |
| F3SG-4SRA1440-25 | 72 | 1440 | 149 | 179 | 3.7 | 4.4 |
| F3SG-□SRB1440-25 | 72 | 1440 | 92 | 106 | 3.7 | 4.4 |
| F3SG-4SRA1520-25 | 76 | 1520 | 154 | 183 | 3.9 | 4.7 |
| F3SG-□SRB1520-25 | 76 | 1520 | 93 | 107 | 3.9 | 4.7 |
| F3SG-4SRA1600-25 | 80 | 1600 | 160 | 188 | 4.1 | 4.9 |
| F3SG-□SRB1600-25 | 80 | 1600 | 95 | 107 | 4.1 | 4.9 |
| F3SG-4SRA1680-25 | 84 | 1680 | 165 | 192 | 4.3 | 5.2 |
| F3SG-□SRB1680-25 | 84 | 1680 | 97 | 108 | 4.3 | 5.2 |
| F3SG-4SRA1760-25 | 88 | 1760 | 170 | 197 | 4.5 | 5.4 |
| F3SG-□SRB1760-25 | 88 | 1760 | 99 | 109 | 4.5 | 5.4 |
| F3SG-4SRA1840-25 | 92 | 1840 | 176 | 202 | 4.7 | 5.6 |
| F3SG-□SRB1840-25 | 92 | 1840 | 101 | 109 | 4.7 | 5.6 |
| F3SG-4SRA1920-25 | 96 | 1920 | 181 | 206 | 4.9 | 5.8 |
| F3SG-□SRB1920-25 | 96 | 1920 | 103 | 110 | 4.9 | 5.8 |
| F3SG-4SRA2080-25 | 104 | 2080 | 192 | 215 | 5.3 | 6.3 |
| F3SG-□SRB2080-25 | 104 | 2080 | 107 | 111 | 5.3 | 6.3 |
| F3SG-4SRA2280-25 | 114 | 2280 | 205 | 227 | 5.8 | 6.9 |
| F3SG-□SRB2280-25 | 114 | 2280 | 112 | 113 | 5.8 | 6.9 |
| F3SG-4SRA2480-25 | 124 | 2480 | 219 | 238 | 6.3 | 7.4 |
| F3SG-□SRB2480-25 | 124 | 2480 | 117 | 114 | 6.3 | 7.4 |

Note: 1. The net weight is the weight of an emitter and a receiver per set.

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

Arm/leg protection (Detection capability: 45-mm dia.)

Models and Response Times

| Model | | Number of beams | Protective height [mm] | Response time (Optical synchronization) [ms] | | | Response time (Wired synchronization) [ms] | |
|------------------|------------------|-----------------|------------------------|--|--------------------------|------------------------------|--|-----------|
| | | | | ON to OFF | OFF (synchronized) to ON | OFF (not synchronized) to ON | ON to OFF | OFF to ON |
| F3SG-4SR□0240-45 | F3SG-2SRB0240-45 | 6 | 240 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0400-45 | F3SG-2SRB0400-45 | 10 | 400 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0560-45 | F3SG-2SRB0560-45 | 14 | 560 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0720-45 | F3SG-2SRB0720-45 | 18 | 720 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0880-45 | F3SG-2SRB0880-45 | 22 | 880 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□1200-45 | F3SG-2SRB1200-45 | 30 | 1200 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□1520-45 | F3SG-2SRB1520-45 | 38 | 1520 | 8 | 40 | 140 | 10 | 50 |

Note: 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 response times of "Optical synchronization" are values when Scan Code is set at Code B. The response times for Code A are 1 ms shorter than these values.

Models, Current Consumption and Weight

| Model | Number of beams | Protective height [mm] | Current consumption [mA] | | Weight [kg] | |
|------------------|-----------------|------------------------|--------------------------|----------|-------------|-------|
| | | | Emitter | Receiver | Net | Gross |
| F3SG-4SRA0240-45 | 6 | 240 | 60 | 107 | 0.6 | 1.0 |
| F3SG-□SRB0240-45 | 6 | 240 | 52 | 95 | 0.6 | 1.0 |
| F3SG-4SRA0400-45 | 10 | 400 | 71 | 116 | 1 | 1.5 |
| F3SG-□SRB0400-45 | 10 | 400 | 56 | 95 | 1 | 1.5 |
| F3SG-4SRA0560-45 | 14 | 560 | 82 | 124 | 1.4 | 1.9 |
| F3SG-□SRB0560-45 | 14 | 560 | 60 | 96 | 1.4 | 1.9 |
| F3SG-4SRA0720-45 | 18 | 720 | 93 | 133 | 1.8 | 2.4 |
| F3SG-□SRB0720-45 | 18 | 720 | 64 | 96 | 1.8 | 2.4 |
| F3SG-4SRA0880-45 | 22 | 880 | 104 | 141 | 2.2 | 2.8 |
| F3SG-□SRB0880-45 | 22 | 880 | 68 | 97 | 2.2 | 2.8 |
| F3SG-4SRA1200-45 | 30 | 1200 | 125 | 158 | 3.1 | 3.8 |
| F3SG-□SRB1200-45 | 30 | 1200 | 75 | 98 | 3.1 | 3.8 |
| F3SG-4SRA1520-45 | 38 | 1520 | 147 | 175 | 3.9 | 4.7 |
| F3SG-□SRB1520-45 | 38 | 1520 | 83 | 99 | 3.9 | 4.7 |

Note: 1. The net weight is the weight of an emitter and a receiver per set.

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

Body protection (Detection capability: 85-mm dia.)

Models and Response Times

| Model | | Number of beams | Protective height [mm] | Response time (Optical synchronization) [ms] | | | Response time (Wired synchronization) [ms] | |
|------------------|------------------|-----------------|------------------------|--|--------------------------|------------------------------|--|-----------|
| | | | | ON to OFF | OFF (synchronized) to ON | OFF (not synchronized) to ON | ON to OFF | OFF to ON |
| F3SG-4SR□0280-85 | F3SG-2SRB0280-85 | 4 | 280 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0440-85 | F3SG-2SRB0440-85 | 6 | 440 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0600-85 | F3SG-2SRB0600-85 | 8 | 600 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0760-85 | F3SG-2SRB0760-85 | 10 | 760 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SR□0920-85 | F3SG-2SRB0920-85 | 12 | 920 | 8 | 40 | 140 | 10 | 50 |

Note: 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 response times of "Optical synchronization" are values when Scan Code is set at Code B. The response times for Code A are 1 ms shorter than these values.

Models, Current Consumption and Weight

| Model | Number of beams | Protective height [mm] | Current consumption [mA] | | Weight [kg] | |
|------------------|-----------------|------------------------|--------------------------|----------|-------------|-------|
| | | | Emitter | Receiver | Net | Gross |
| F3SG-4SRA0280-85 | 4 | 280 | 63 | 111 | 0.7 | 1.1 |
| F3SG-□SRB0280-85 | 4 | 280 | 50 | 95 | 0.7 | 1.1 |
| F3SG-4SRA0440-85 | 6 | 440 | 72 | 120 | 1.1 | 1.6 |
| F3SG-□SRB0440-85 | 6 | 440 | 52 | 95 | 1.1 | 1.6 |
| F3SG-4SRA0600-85 | 8 | 600 | 81 | 128 | 1.5 | 2.1 |
| F3SG-□SRB0600-85 | 8 | 600 | 54 | 96 | 1.5 | 2.1 |
| F3SG-4SRA0760-85 | 10 | 760 | 91 | 136 | 1.9 | 2.5 |
| F3SG-□SRB0760-85 | 10 | 760 | 56 | 96 | 1.9 | 2.5 |
| F3SG-4SRA0920-85 | 12 | 920 | 100 | 145 | 2.3 | 3.0 |
| F3SG-□SRB0920-85 | 12 | 920 | 58 | 96 | 2.3 | 3.0 |

Note: 1. The net weight is the weight of an emitter and a receiver per set.

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

F3SG-PG

Perimeter access guarding (Operating range: 20 m)

Models and Response Times

| Model | Number of beams | Beam gap [mm] | Response time (Optical synchronization) [ms] | | | Response time (Wired synchronization) [ms] | |
|------------------|-----------------|---------------|--|--------------------------|------------------------------|--|-----------|
| | | | ON to OFF | OFF (synchronized) to ON | OFF (not synchronized) to ON | ON to OFF | OFF to ON |
| F3SG-4PGA0670-2A | 2 | 500 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4PGA0970-3A | 3 | 400 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4PGA1070-4A | 4 | 300 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4PGA1370-4A | 4 | 400 | 8 | 40 | 140 | 10 | 50 |

Models, Current Consumption and Weight

| Model | Number of beams | Beam gap [mm] | Current consumption [mA] | | Weight [kg] | |
|------------------|-----------------|---------------|--------------------------|----------|-------------|-------|
| | | | Emitter | Receiver | Net | Gross |
| F3SG-4PGA0670-2A | 2 | 500 | 45 | 120 | 1.7 | 2.2 |
| F3SG-4PGA0970-3A | 3 | 400 | 55 | 130 | 2.5 | 3.1 |
| F3SG-4PGA1070-4A | 4 | 300 | 65 | 140 | 2.7 | 3.3 |
| F3SG-4PGA1370-4A | 4 | 400 | 65 | 140 | 3.5 | 4.2 |

Perimeter guarding long range (operating range: 70 m)

Models and Response Times

| Model | Number of beams | Beam gap [mm] | Response time (Optical synchronization) [ms] | | | Response time (Wired synchronization) [ms] | |
|------------------|-----------------|---------------|--|--------------------------|------------------------------|--|-----------|
| | | | ON to OFF | OFF (synchronized) to ON | OFF (not synchronized) to ON | ON to OFF | OFF to ON |
| F3SG-4PGA0670-2L | 2 | 500 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4PGA0970-3L | 3 | 400 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4PGA1070-4L | 4 | 300 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4PGA1370-4L | 4 | 400 | 8 | 40 | 140 | 10 | 50 |

Models, Current Consumption and Weight

| Model | Number of beams | Beam gap [mm] | Current consumption [mA] | | Weight [kg] | |
|------------------|-----------------|---------------|--------------------------|----------|-------------|-------|
| | | | Emitter | Receiver | Net | Gross |
| F3SG-4PGA0670-2L | 2 | 500 | 45 | 120 | 1.7 | 2.2 |
| F3SG-4PGA0970-3L | 3 | 400 | 55 | 130 | 2.5 | 3.1 |
| F3SG-4PGA1070-4L | 4 | 300 | 65 | 140 | 2.7 | 3.3 |
| F3SG-4PGA1370-4L | 4 | 400 | 65 | 140 | 3.5 | 4.2 |

Perimeter guarding passive mirror (operating range: 5 m)

Models and Response Times

| Model | Number of beams | Beam gap [mm] | Response time (Optical synchronization) [ms] | | | Response time (Wired synchronization) [ms] | |
|------------------|-----------------|---------------|--|--------------------------|------------------------------|--|-----------|
| | | | ON to OFF | OFF (synchronized) to ON | OFF (not synchronized) to ON | ON to OFF | OFF to ON |
| F3SG-4PGA0670-2C | 2 | 500 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4PGA1070-4C | 4 | 300 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4PGA1370-4C | 4 | 400 | 8 | 40 | 140 | 10 | 50 |

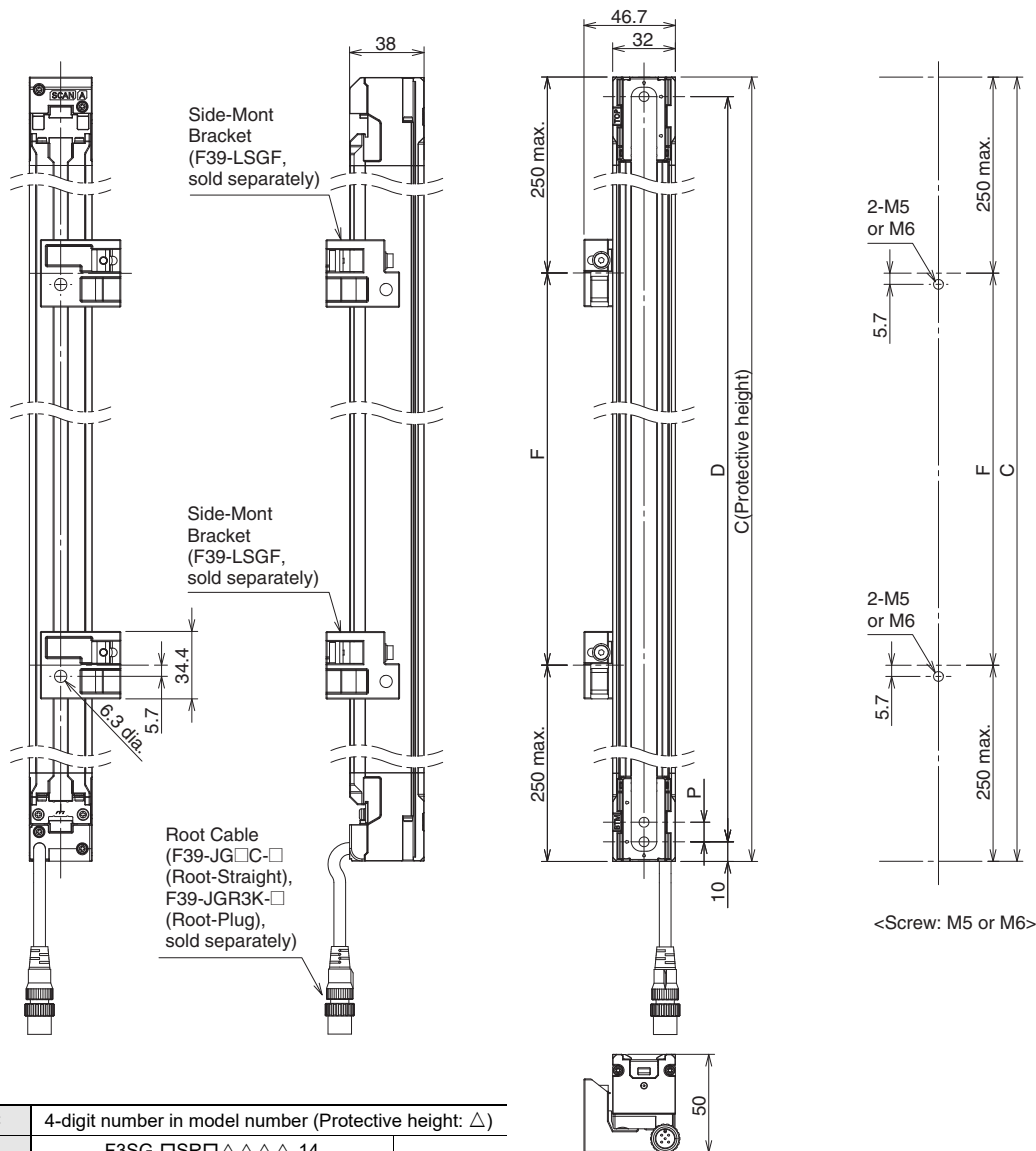
Models, Current Consumption and Weight

| Model | Number of beams | Beam gap [mm] | Current consumption [mA] | | Weight [kg] | |
|------------------|-----------------|---------------|--------------------------|--|-------------|-------|
| | | | Emitter/Receiver | | Net | Gross |
| F3SG-4PGA0670-2C | 2 | 500 | 140 | | 1.6 | 2.1 |
| F3SG-4PGA1070-4C | 4 | 300 | 150 | | 2.6 | 3.2 |
| F3SG-4PGA1370-4C | 4 | 400 | 150 | | 3.3 | 4.0 |

Dimensions

F3SG-SR Main Unit

Mounted with Side-Mount Brackets (Intermediate Brackets) (F39-LSGF)
Backside Mounting



| | | |
|--------------------|---|------|
| Dimension C | 4-digit number in model number (Protective height: Δ) | |
| Dimension D | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -14 | C-20 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -25 | |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -45 | C-40 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -85 | |
| Dimension P | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -14 | 10 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -25 | 20 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -45 | 40 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -85 | 80 |

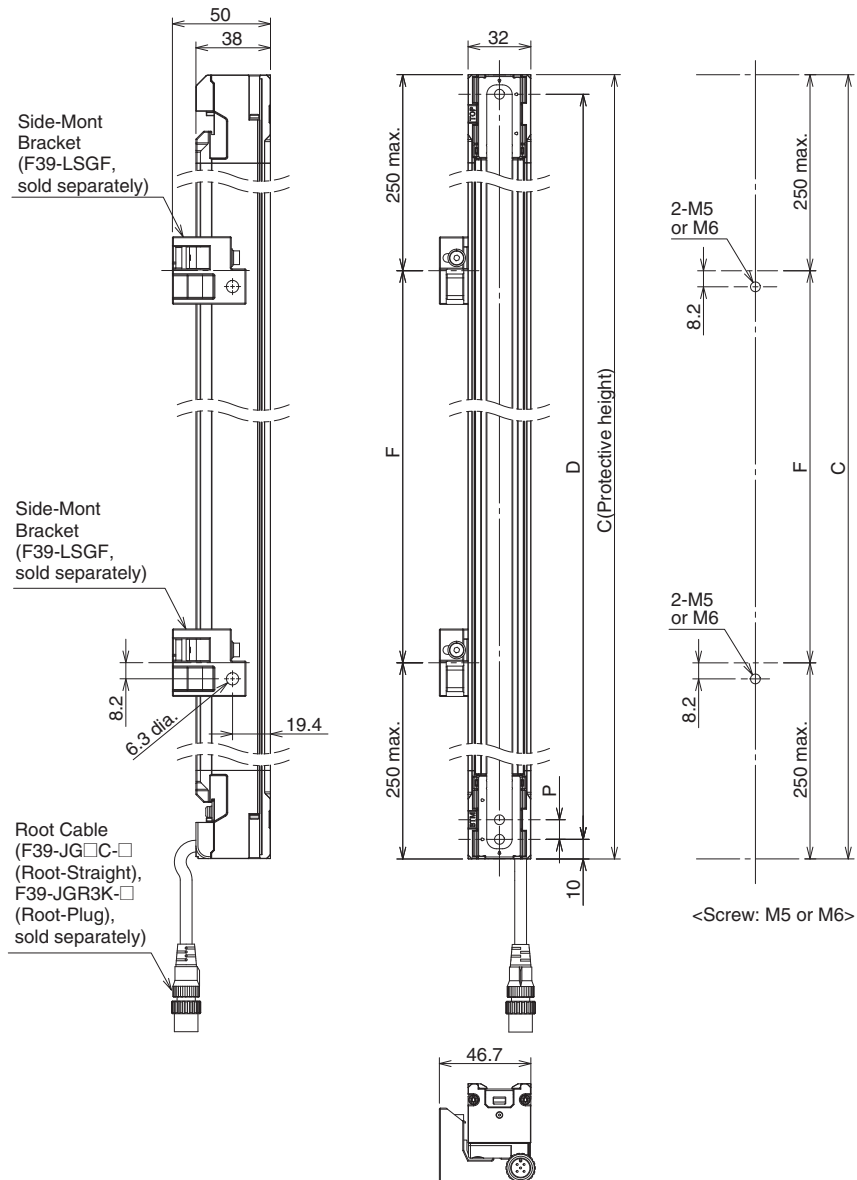
| Protective height (Dimension C) | Number of Side-Mount Brackets * | Dimension F |
|---------------------------------|---------------------------------|--------------|
| 0160 to 1440 | 2 | 1000 mm max. |
| 1520 to 2480 | 3 | 1000 mm max. |

* The number of brackets required to mount each unit (emitter, receiver).

F3SG-SR/PG
F3SG-SR-K
Common to F3SG-SR and F3SG-PG

F3SG-SR/PG

Mounted with Side-Mount Brackets (Intermediate Brackets) (F39-LSGF) Side Mounting

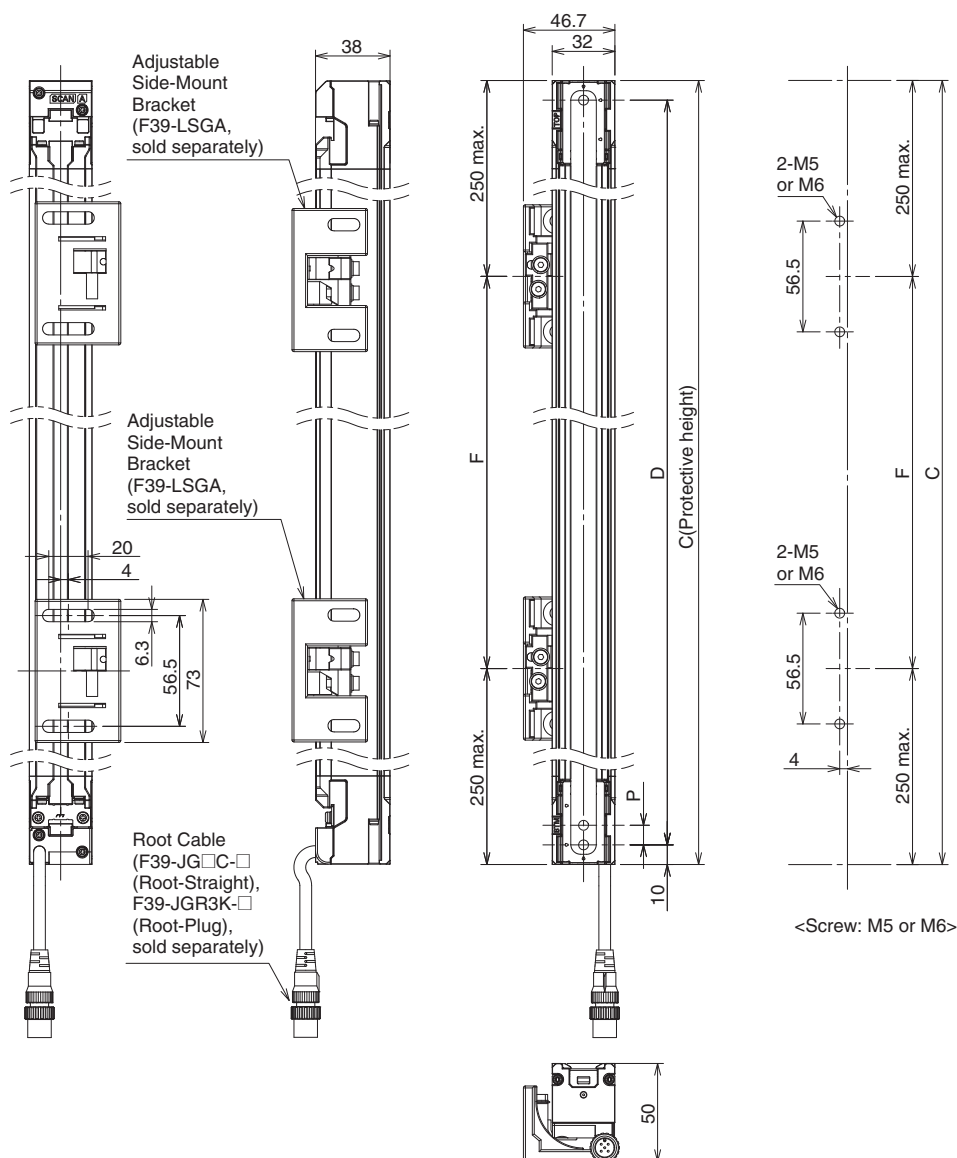


| Dimension C | 4-digit number in model number (Protective height: △) | |
|-------------|---|------|
| Dimension D | F3SG-□SR□△△△△-14 | C-20 |
| | F3SG-□SR□△△△△-25 | |
| | F3SG-□SR□△△△△-45 | C-40 |
| | F3SG-□SR□△△△△-85 | |
| Dimension P | F3SG-□SR□△△△△-14 | 10 |
| | F3SG-□SR□△△△△-25 | 20 |
| | F3SG-□SR□△△△△-45 | 40 |
| | F3SG-□SR□△△△△-85 | 80 |

| Protective height (Dimension C) | Number of Side-Mount Brackets * | Dimension F |
|---------------------------------|---------------------------------|--------------|
| 0160 to 1440 | 2 | 1000 mm max. |
| 1520 to 2480 | 3 | 1000 mm max. |

* The number of brackets required to mount each unit (emitter, receiver).

Mounted with Adjustable Side-Mount Brackets (Intermediate Brackets) (F39-LSGA)
Backside Mounting



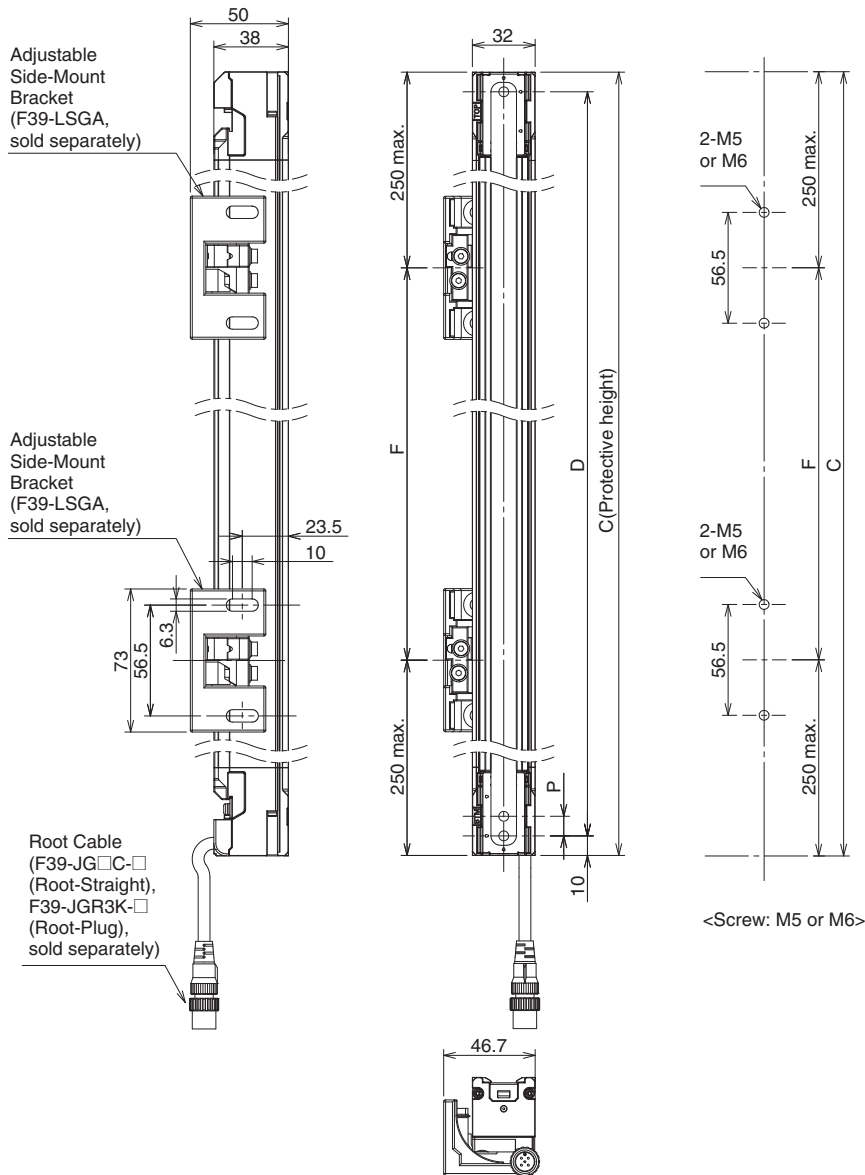
| | | |
|--------------------|---|------|
| Dimension C | 4-digit number in model number (Protective height: △) | |
| Dimension D | F3SG-□SR□△△△△-14 | C-20 |
| | F3SG-□SR□△△△△-25 | C-40 |
| | F3SG-□SR□△△△△-45 | |
| Dimension P | F3SG-□SR□△△△△-14 | 10 |
| | F3SG-□SR□△△△△-25 | 20 |
| | F3SG-□SR□△△△△-45 | 40 |
| | F3SG-□SR□△△△△-85 | 80 |

| Protective height (Dimension C) | Number of Adjustable Side-Mount Brackets * | Dimension F |
|---------------------------------|--|--------------|
| 0160 to 0280 | 1 | 1000 mm max. |
| 0320 to 1440 | 2 | 1000 mm max. |
| 1520 to 2480 | 3 | 1000 mm max. |

* The number of brackets required to mount each unit (emitter, receiver).

F3SG-SR/PG
F3SG-SR-K
Common to F3SG-SR and F3SG-PG

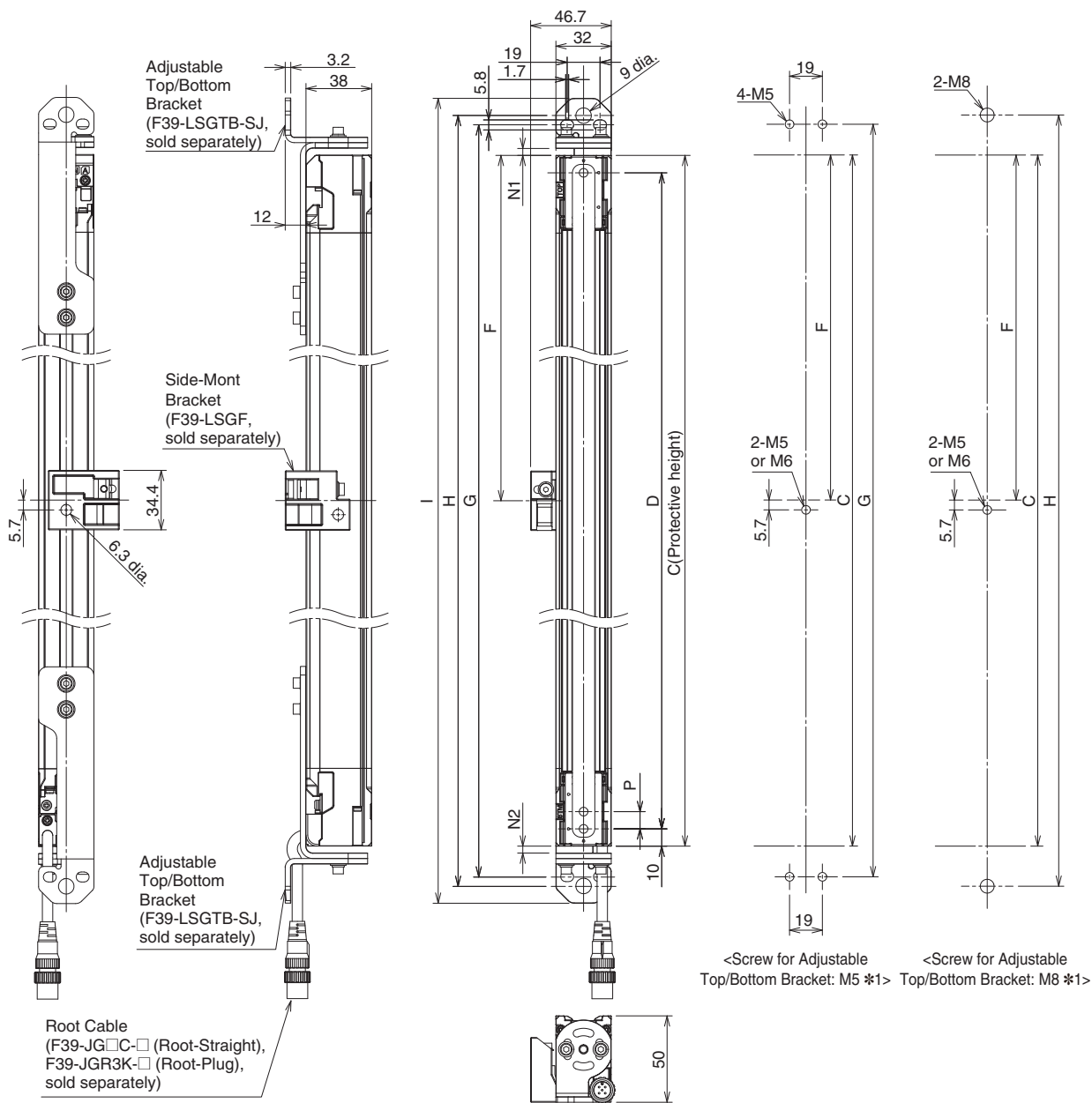
Mounted with Adjustable Side-Mount Brackets (Intermediate Brackets) (F39-LSGA) Side Mounting



| Dimension C | 4-digit number in model number (Protective height: △) | | Protective height (Dimension C) | Number of Adjustable Side-Mount Brackets * | Dimension F |
|-------------|---|------|---------------------------------|--|--------------|
| Dimension D | F3SG-□SR□△△△△-14 | C-20 | 0160 to 0280 | 1 | 1000 mm max. |
| | F3SG-□SR□△△△△-25 | | | | |
| | F3SG-□SR□△△△△-45 | C-40 | | | |
| | F3SG-□SR□△△△△-85 | | | | |
| Dimension P | F3SG-□SR□△△△△-14 | 10 | 0320 to 1440 | 2 | 1000 mm max. |
| | F3SG-□SR□△△△△-25 | 20 | | | |
| | F3SG-□SR□△△△△-45 | 40 | | | |
| | F3SG-□SR□△△△△-85 | 80 | 1520 to 2480 | 3 | 1000 mm max. |

* The number of brackets required to mount each unit (emitter, receiver).

Mounted with Adjustable Top/Bottom Brackets (F3SJ, F3SN Adapter) (F39-LSGTB-SJ) and Side-Mount Brackets (Intermediate Brackets) (F39-LSGF) Backside Mounting



F3SG-SR/PG

F3SG-SR-K

F3SG-SR and F3SG-PG
Common to

| | | |
|---------------------|---|------|
| Dimension C | 4-digit number in model number (Protective height: Δ) | |
| Dimension D | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -14 | C-20 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -25 | C-40 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -45 | |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -85 | |
| Dimension G | $C+27.2+N1+N2$ | |
| Dimension H | $C+38+N1+N2$ | |
| Dimension I | $C+58+N1+N2$ | |
| Dimension N1 | 0 to 30 *2 | |
| Dimension N2 | 0 to 30 *2 | |
| Dimension P | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -14 | 10 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -25 | 20 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -45 | 40 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -85 | 80 |

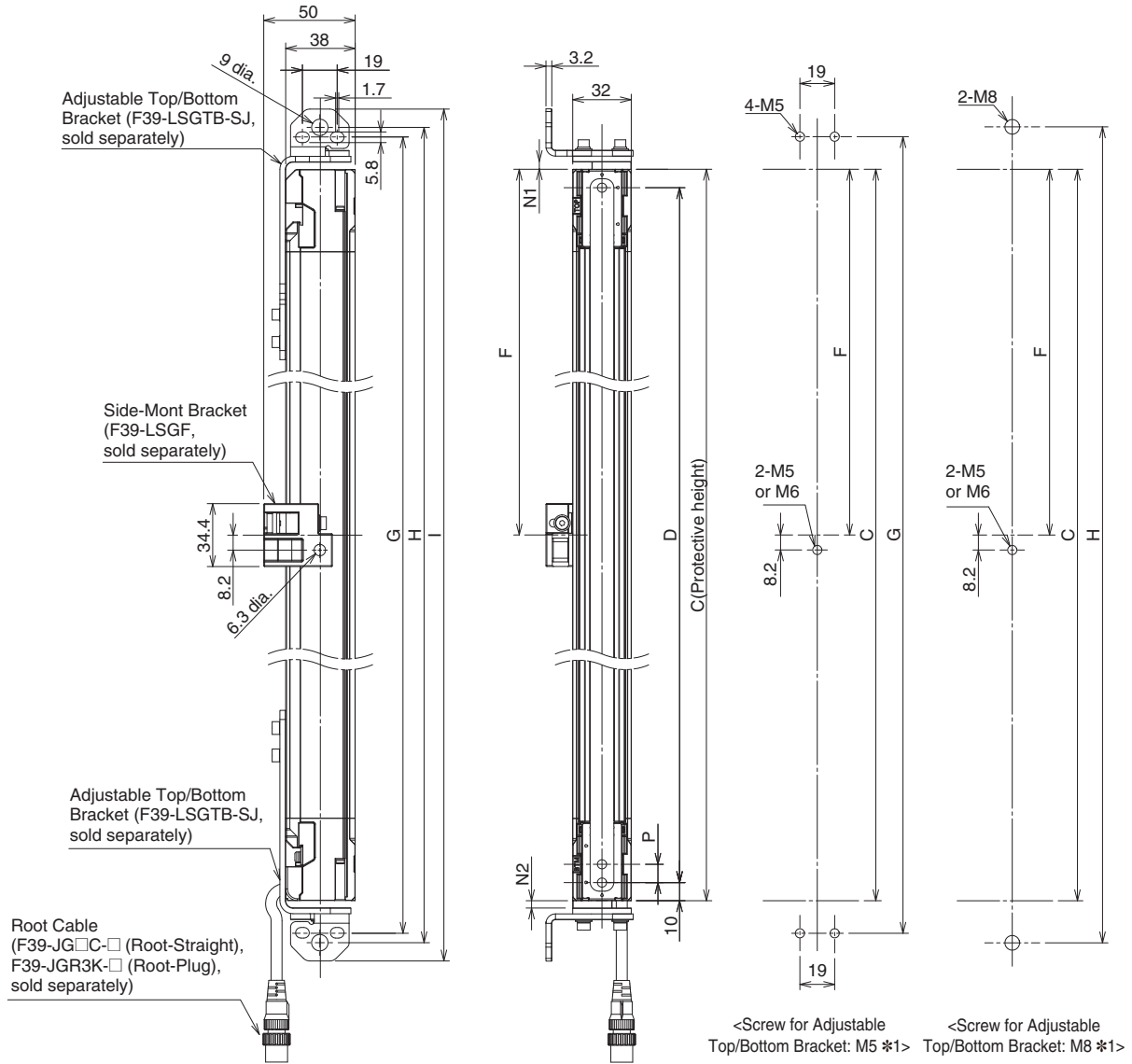
| Protective height (Dimension C) | Number of Adjustable Top/Bottom Brackets *3 | Number of Intermediate Brackets *3 | Dimension F |
|---------------------------------|---|------------------------------------|--------------|
| 0160 to 0840 | 2 | 0 | --- |
| 0880 to 1680 | 2 | 1 | 1000 mm max. |
| 1760 to 2480 | 2 | 2 | 1000 mm max. |

*1. Side-Mount Bracket: M5 or M6
 *2. For the model with a protective height of 0160, the dimensions N1 and N2 are 20 to 30 mm.
 *3. The number of brackets required to mount each unit (emitter, receiver).

F3SG-SR/PG

Mounted with Adjustable Top/Bottom Brackets (F3SJ, F3SN Adapter) (F39-LSGTB-SJ) and Side-Mount Brackets (Intermediate Brackets) (F39-LSGF)

Side Mounting



| | | |
|---------------------|---|------|
| Dimension C | 4-digit number in model number (Protective height: △) | |
| Dimension D | F3SG-□SR□△△△△-14 | C-20 |
| | F3SG-□SR□△△△△-25 | |
| | F3SG-□SR□△△△△-45 | C-40 |
| | F3SG-□SR□△△△△-85 | |
| Dimension G | C+27.2+N1+N2 | |
| Dimension H | C+38+N1+N2 | |
| Dimension I | C+58+N1+N2 | |
| Dimension N1 | 0 to 30 *2 | |
| Dimension N2 | 0 to 30 *2 | |
| Dimension P | F3SG-□SR□△△△△-14 | 10 |
| | F3SG-□SR□△△△△-25 | 20 |
| | F3SG-□SR□△△△△-45 | 40 |
| | F3SG-□SR□△△△△-85 | 80 |

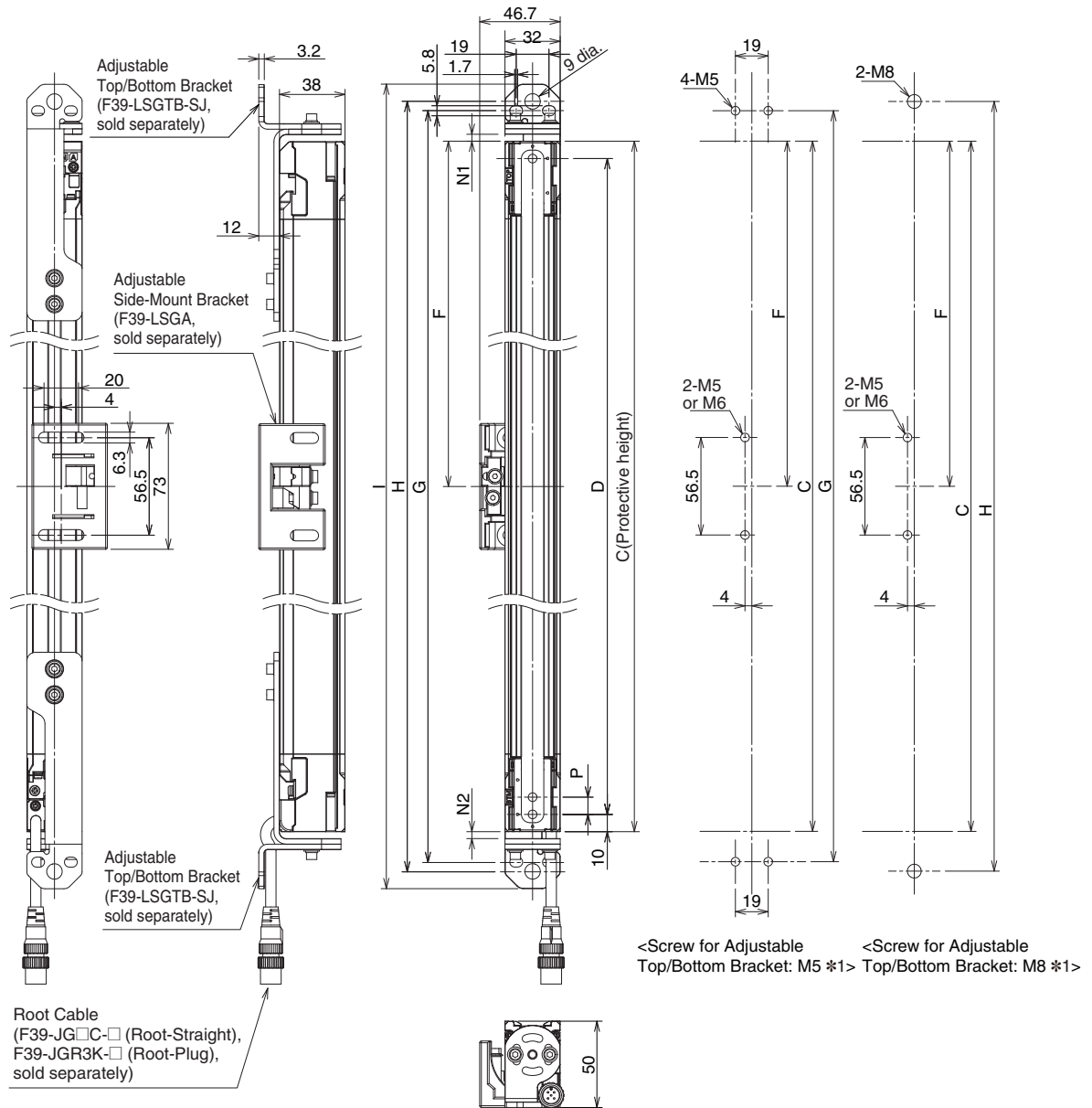
| Protective height (Dimension C) | Number of Adjustable Top/Bottom Brackets *3 | Number of Intermediate Brackets *3 | Dimension F |
|---------------------------------|---|------------------------------------|--------------|
| 0160 to 0840 | 2 | 0 | --- |
| 0880 to 1680 | 2 | 1 | 1000 mm max. |
| 1760 to 2480 | 2 | 2 | 1000 mm max. |

*1. Side-Mount Bracket: M5 or M6

*2. For the model with a protective height of 0160, the dimensions N1 and N2 are 20 to 30 mm.

*3. The number of brackets required to mount each unit (emitter, receiver).

Mounted with Adjustable Top/Bottom Brackets (F3SJ, F3SN Adapter) (F39-LSGTB-SJ) and Adjustable Side-Mount Brackets (Intermediate Brackets) (F39-LSGA) Backside Mounting



F3SG-SR/PG

F3SG-SR-K

Common to F3SG-SR and F3SG-PG

| | | |
|---------------------|---|------|
| Dimension C | 4-digit number in model number (Protective height: Δ) | |
| Dimension D | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -14 | C-20 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -25 | C-40 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -45 | |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -85 | |
| Dimension G | $C+27.2+N1+N2$ | |
| Dimension H | $C+38+N1+N2$ | |
| Dimension I | $C+58+N1+N2$ | |
| Dimension N1 | 0 to 30 *2 | |
| Dimension N2 | 0 to 30 *2 | |
| Dimension P | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -14 | 10 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -25 | 20 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -45 | 40 |
| | F3SG-□SR□ $\Delta\Delta\Delta\Delta$ -85 | 80 |

| Protective height (Dimension C) | Number of Adjustable Top/Bottom Brackets *3 | Number of Intermediate Brackets *3 | Dimension F |
|---------------------------------|---|------------------------------------|--------------|
| 0160 to 0840 | 2 | 0 | --- |
| 0880 to 1680 | 2 | 1 | 1000 mm max. |
| 1760 to 2480 | 2 | 2 | 1000 mm max. |

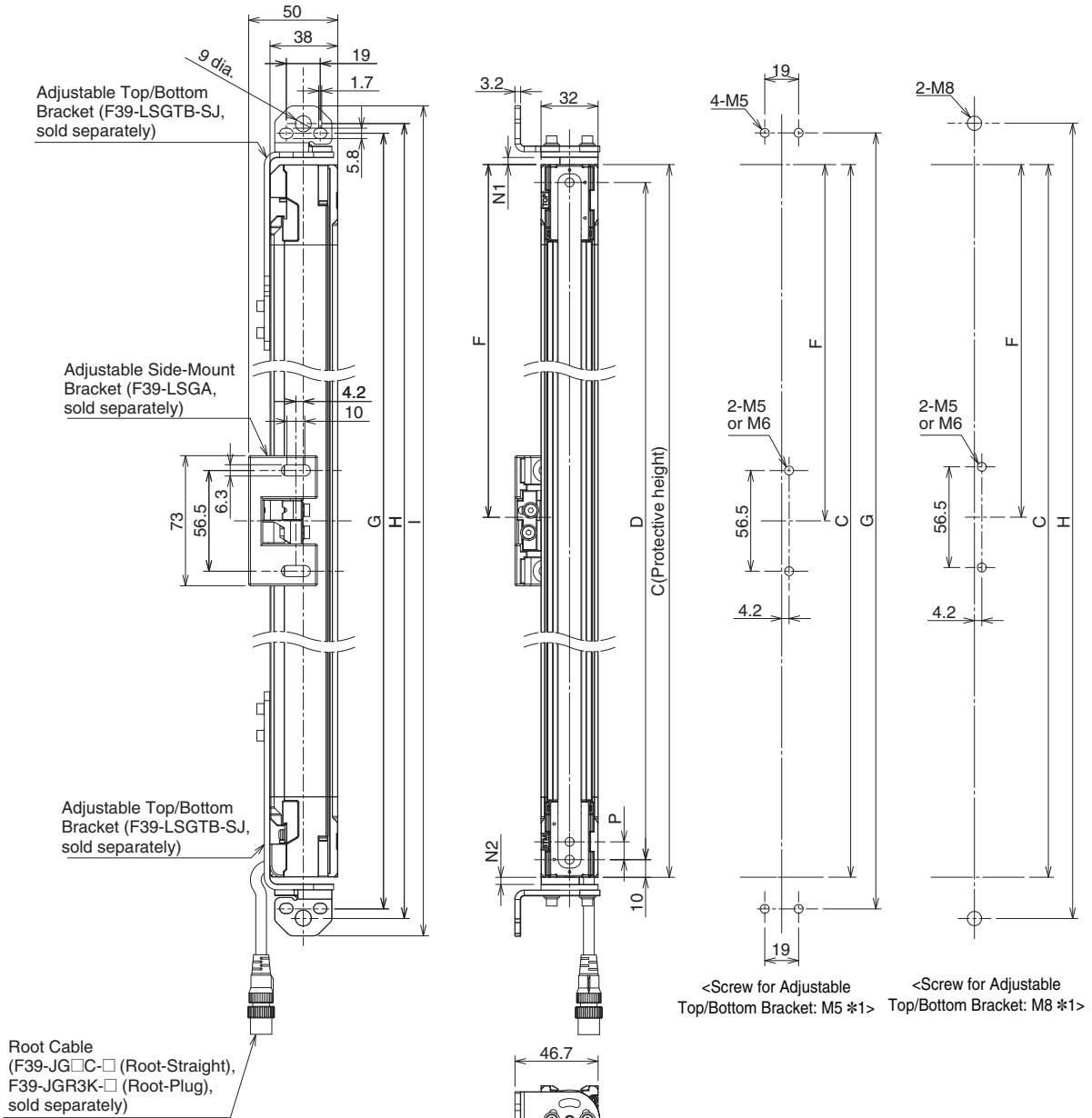
*1. Adjustable Side-Mount Bracket: M5 or M6

*2. For the model with a protective height of 0160, the dimensions N1 and N2 are 20 to 30 mm.

*3. The number of brackets required to mount each unit (emitter, receiver).

F3SG-SR/PG

Mounted with Adjustable Top/Bottom Brackets (F3SJ, F3SN Adapter) (F39-LSGTB-SJ) and Adjustable Side-Mount Brackets (Intermediate Brackets) (F39-LSGA) Side Mounting



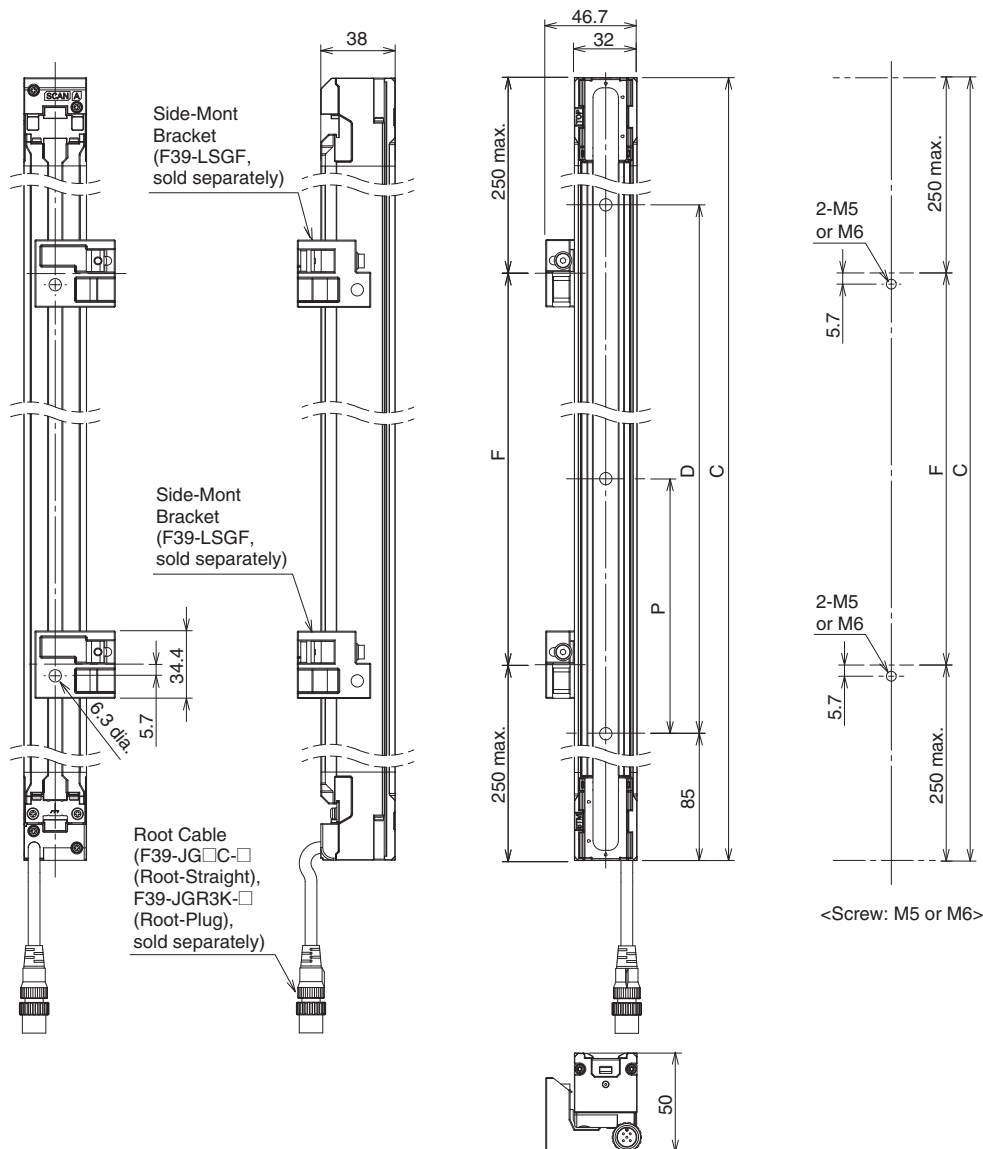
| | | |
|---------------------|---|------|
| Dimension C | 4-digit number in model number (Protective height: △) | |
| Dimension D | F3SG-□SR□△△△△-14 | C-20 |
| | F3SG-□SR□△△△△-25 | C-20 |
| | F3SG-□SR□△△△△-45 | C-40 |
| | F3SG-□SR□△△△△-85 | C-40 |
| Dimension G | C+27.2+N1+N2 | |
| Dimension H | C+38+N1+N2 | |
| Dimension I | C+58+N1+N2 | |
| Dimension N1 | 0 to 30 *2 | |
| Dimension N2 | 0 to 30 *2 | |
| Dimension P | F3SG-□SR□△△△△-14 | 10 |
| | F3SG-□SR□△△△△-25 | 20 |
| | F3SG-□SR□△△△△-45 | 40 |
| | F3SG-□SR□△△△△-85 | 80 |

| Protective height (Dimension C) | Number of Adjustable Top/Bottom Brackets *3 | Number of Intermediate Brackets *3 | Dimension F |
|---------------------------------|---|------------------------------------|--------------|
| 0160 to 0840 | 2 | 0 | --- |
| 0880 to 1680 | 2 | 1 | 1000 mm max. |
| 1760 to 2480 | 2 | 2 | 1000 mm max. |

- *1. Adjustable Side-Mount Bracket: M5 or M6
- *2. For the model with a protective height of 0160, the dimensions N1 and N2 are 20 to 30 mm.
- *3. The number of brackets required to mount each unit (emitter, receiver).

F3SG-PG Main Unit

Mounted with Side-Mount Brackets (Intermediate Brackets) (F39-LSGF) Backside Mounting



| | | |
|--------------------|--------------------------------|-----|
| Dimension C | 4-digit number in model number | |
| Dimension D | C-170 | |
| Dimension P | F3SG-4PGA0670-2□ | 500 |
| | F3SG-4PGA0970-3□ | 400 |
| | F3SG-4PGA1070-4□ | 300 |
| | F3SG-4PGA1370-4□ | 400 |

| Product length (Dimension C) | Number of Side-Mount Brackets * | Dimension F |
|------------------------------|---------------------------------|--------------|
| 0670 to 1370 | 2 | 1000 mm max. |

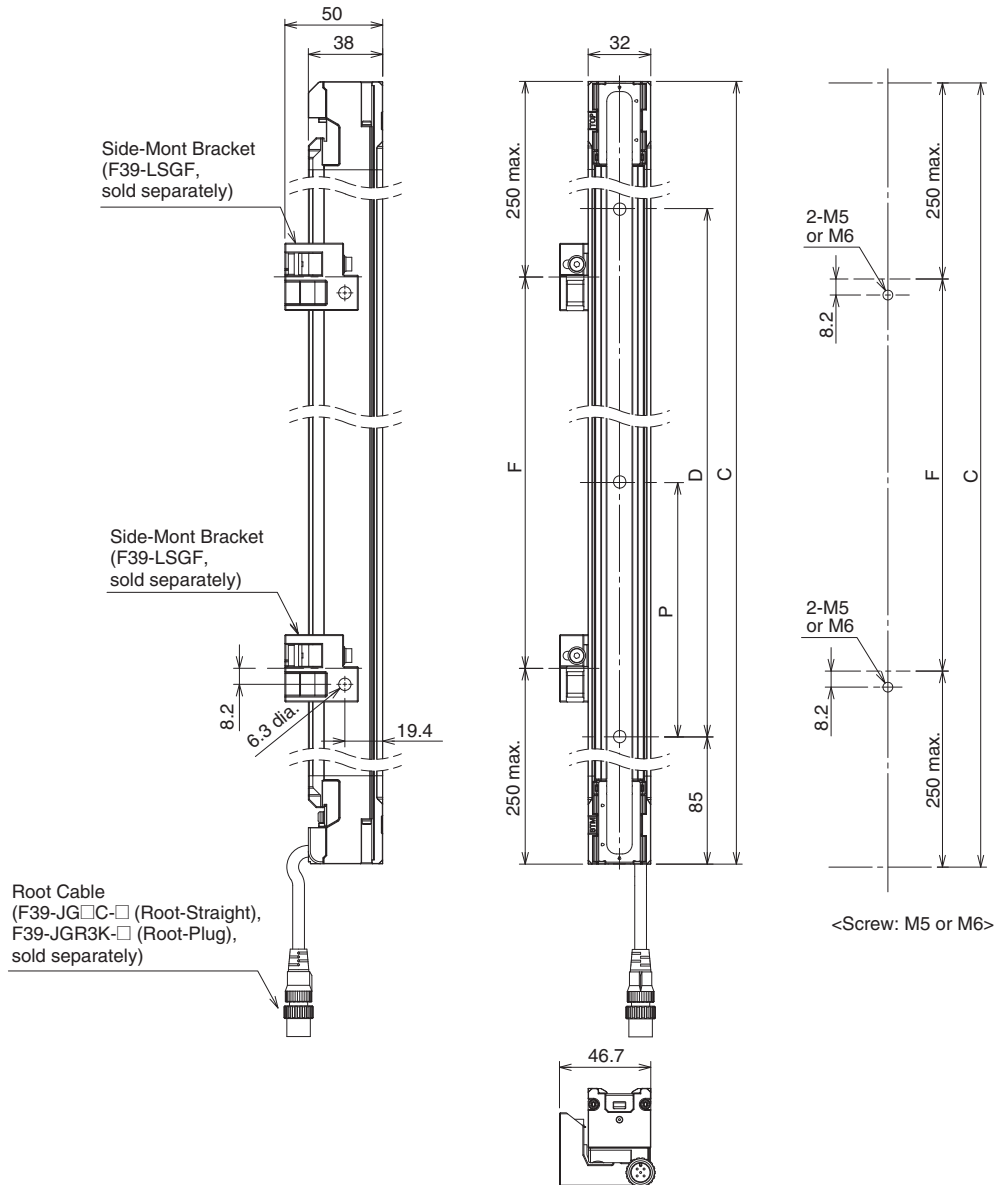
* The number of brackets required to mount each unit (emitter, receiver, emitter/receiver, passive mirror).

F3SG-SR/PG
F3SG-SR-K
Common to F3SG-SR and F3SG-PG

F3SG-SR/PG

Mounted with Side-Mount Brackets (Intermediate Brackets) (F39-LSGF)

Side Mounting

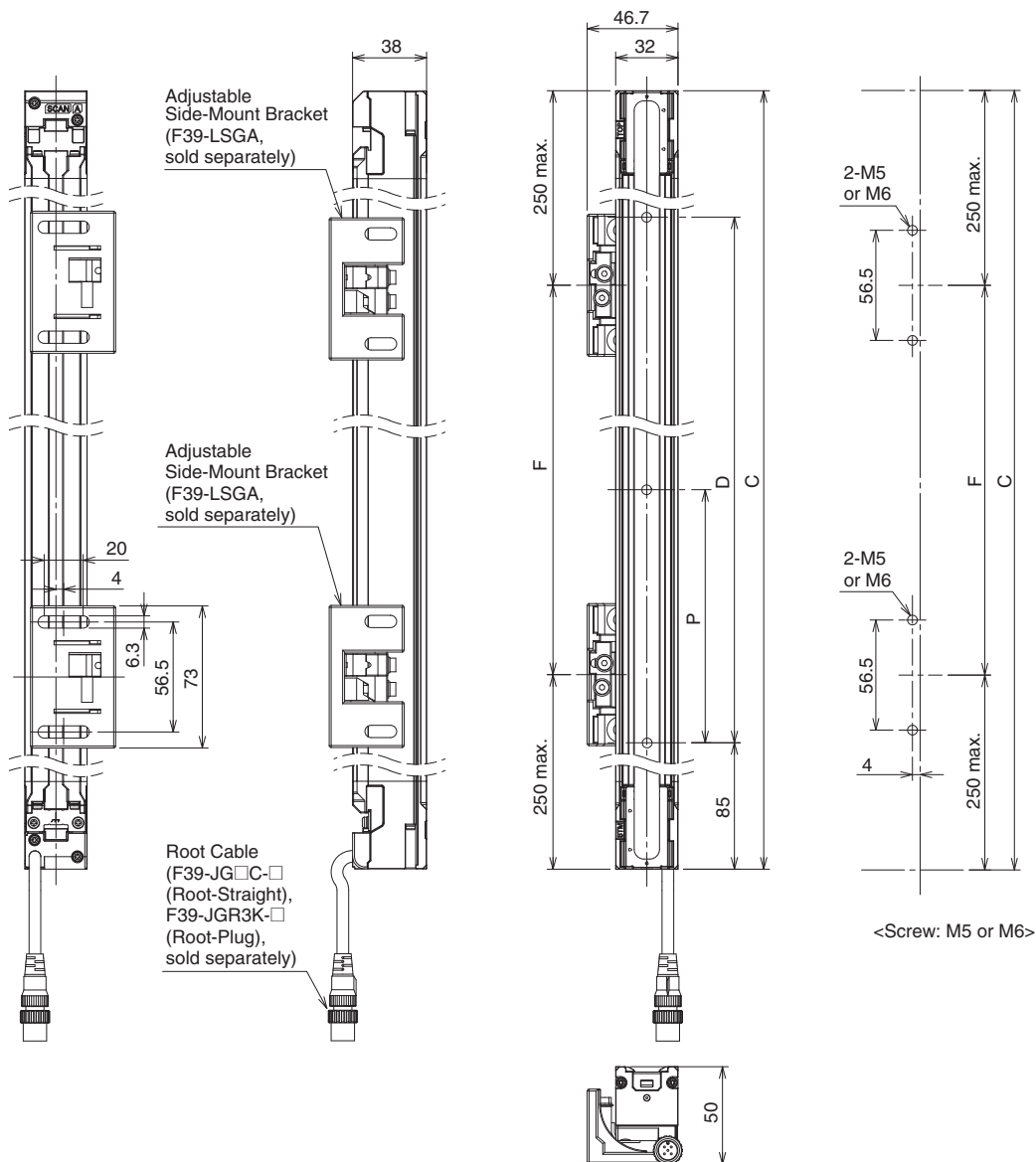


| | | |
|--------------------|--------------------------------|-----|
| Dimension C | 4-digit number in model number | |
| Dimension D | C-170 | |
| Dimension P | F3SG-4PGA0670-2□ | 500 |
| | F3SG-4PGA0970-3□ | 400 |
| | F3SG-4PGA1070-4□ | 300 |
| | F3SG-4PGA1370-4□ | 400 |

| Product length (Dimension C) | Number of Side-Mount Brackets * | Dimension F |
|------------------------------|---------------------------------|--------------|
| 0670 to 1370 | 2 | 1000 mm max. |

* The number of brackets required to mount each unit (emitter, receiver, emitter/receiver, passive mirror).

Mounted with Adjustable Side-Mount Brackets (Intermediate Brackets) (F39-LSGA)
Backside Mounting



F3SG-SR/PG

F3SG-SR-K

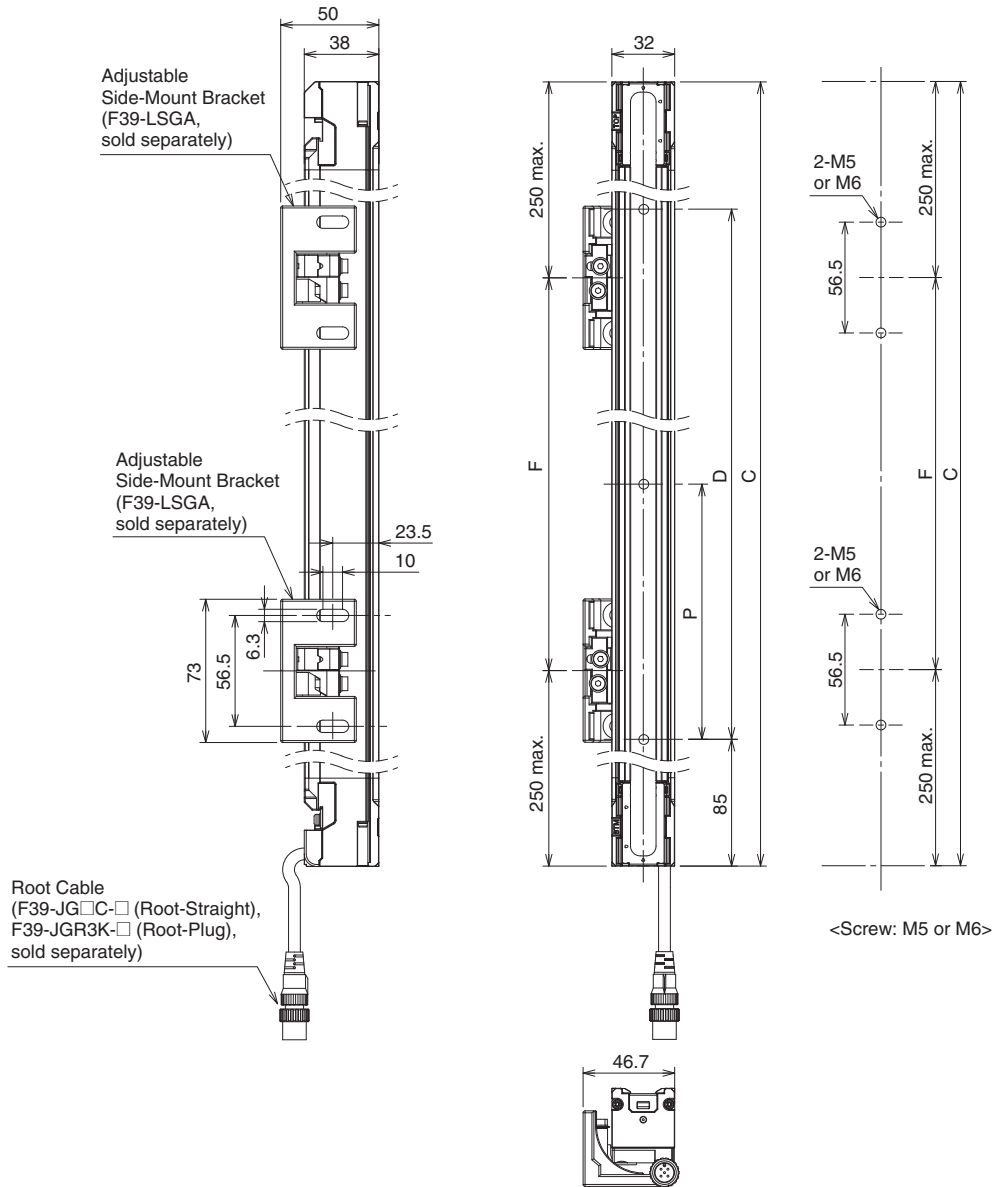
Common to
F3SG-SR and F3SG-PG

| | | |
|--------------------|--------------------------------|-----|
| Dimension C | 4-digit number in model number | |
| Dimension D | C-170 | |
| Dimension P | F3SG-4PGA0670-2□ | 500 |
| | F3SG-4PGA0970-3□ | 400 |
| | F3SG-4PGA1070-4□ | 300 |
| | F3SG-4PGA1370-4□ | 400 |

| Product length (Dimension C) | Number of Adjustable Side-Mount Brackets * | Dimension F |
|------------------------------|--|--------------|
| 0670 to 1370 | 2 | 1000 mm max. |

* The number of brackets required to mount each unit (emitter, receiver, emitter/receiver, passive mirror).

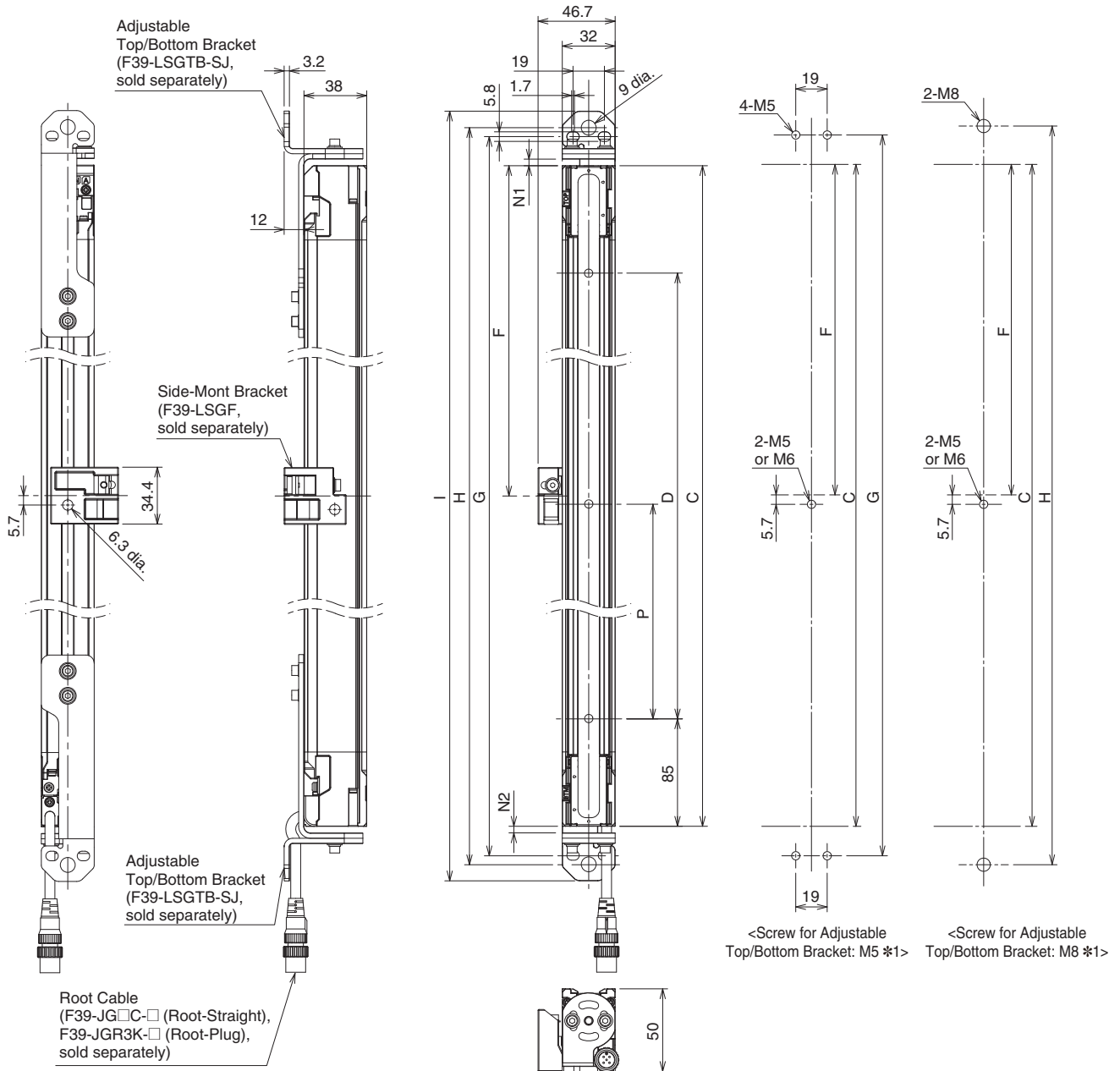
Mounted with Adjustable Side-Mount Brackets (Intermediate Brackets) (F39-LSGA) Side Mounting



| | | | | | |
|--------------------|--------------------------------|-----|-------------------------------------|--------------|---|
| Dimension C | 4-digit number in model number | | | | |
| Dimension D | C-170 | | | | |
| Dimension P | F3SG-4PGA0670-2□ | 500 | Product length (Dimension C) | 0670 to 1370 | Number of Adjustable Side-Mount Brackets * |
| | F3SG-4PGA0970-3□ | 400 | | | |
| | F3SG-4PGA1070-4□ | 300 | | | |
| | F3SG-4PGA1370-4□ | 400 | | | Dimension F |
| | | | | | 1000 mm max. |

* The number of brackets required to mount each unit (emitter, receiver, emitter/receiver, passive mirror).

Mounted with Adjustable Top/Bottom Brackets (F3SJ, F3SN Adapter) (F39-LSGTB-SJ) and Side-Mount Brackets (Intermediate Brackets) (F39-LSGF) Backside Mounting



F3SG-SR/PG

F3SG-SR-K

F3SG-SR and F3SG-PG
Common to

| | | |
|---------------------|--------------------------------|-----|
| Dimension C | 4-digit number in model number | |
| Dimension D | C-170 | |
| Dimension G | C+27.2+N1+N2 | |
| Dimension H | C+38+N1+N2 | |
| Dimension I | C+58+N1+N2 | |
| Dimension N1 | 0 to 30 | |
| Dimension N2 | 0 to 30 | |
| Dimension P | F3SG-4PGA0670-2□ | 500 |
| | F3SG-4PGA0970-3□ | 400 |
| | F3SG-4PGA1070-4□ | 300 |
| | F3SG-4PGA1370-4□ | 400 |

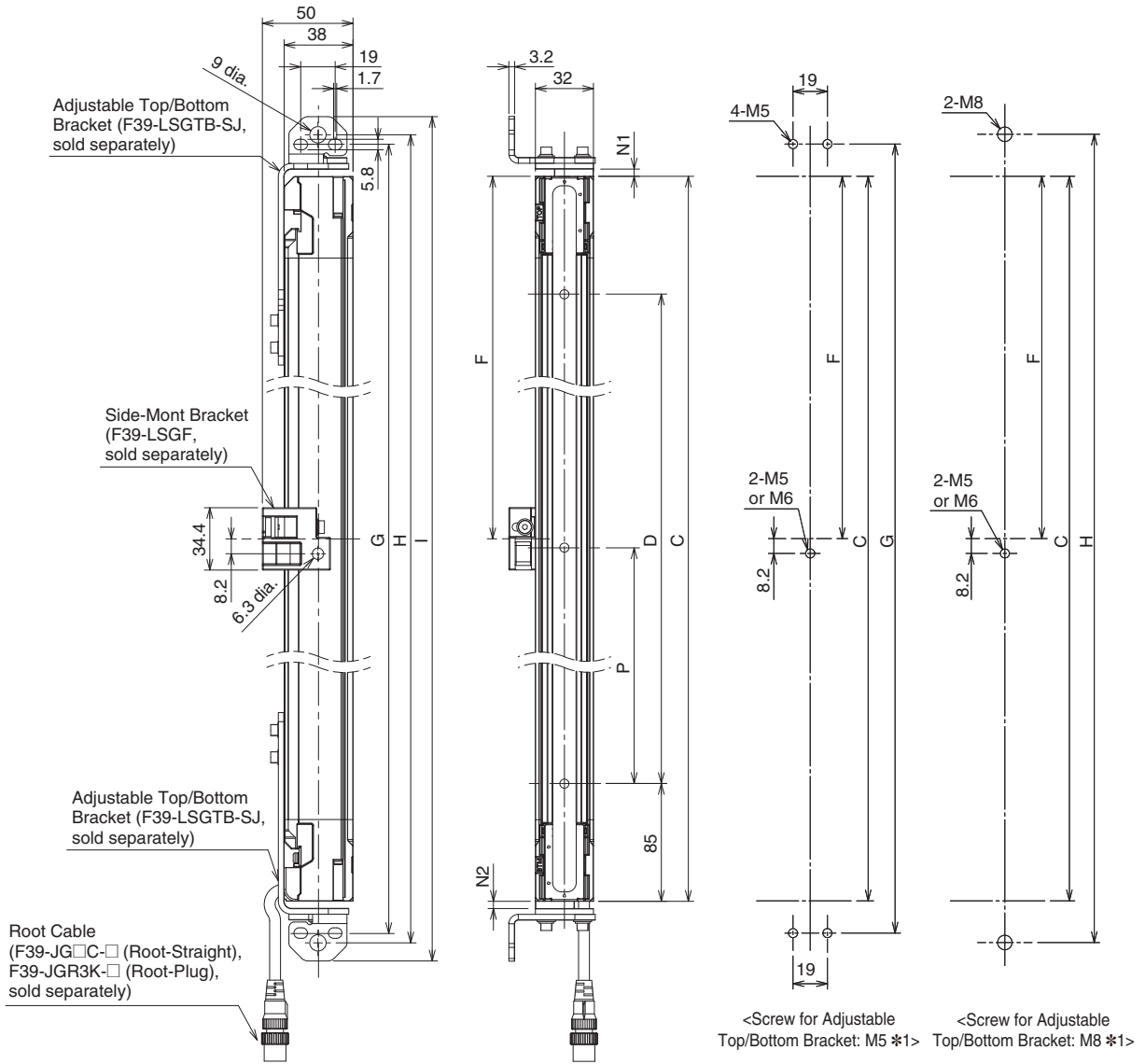
| Product length (Dimension C) | Number of Adjustable Top/Bottom Brackets *2 | Number of Intermediate Brackets *2 | Dimension F |
|------------------------------|---|------------------------------------|--------------|
| 0670 | 2 | 0 | --- |
| 0970 to 1370 | 2 | 1 | 1000 mm max. |

*1. Side-Mount Bracket: M5 or M6

*2. The number of brackets required to mount each unit (emitter, receiver, emitter/receiver, passive mirror).

F3SG-SR/PG

Mounted with Adjustable Top/Bottom Brackets (F3SJ, F3SN Adapter) (F39-LSGTB-SJ) and Side-Mount Brackets (Intermediate Brackets) (F39-LSGF) Side Mounting



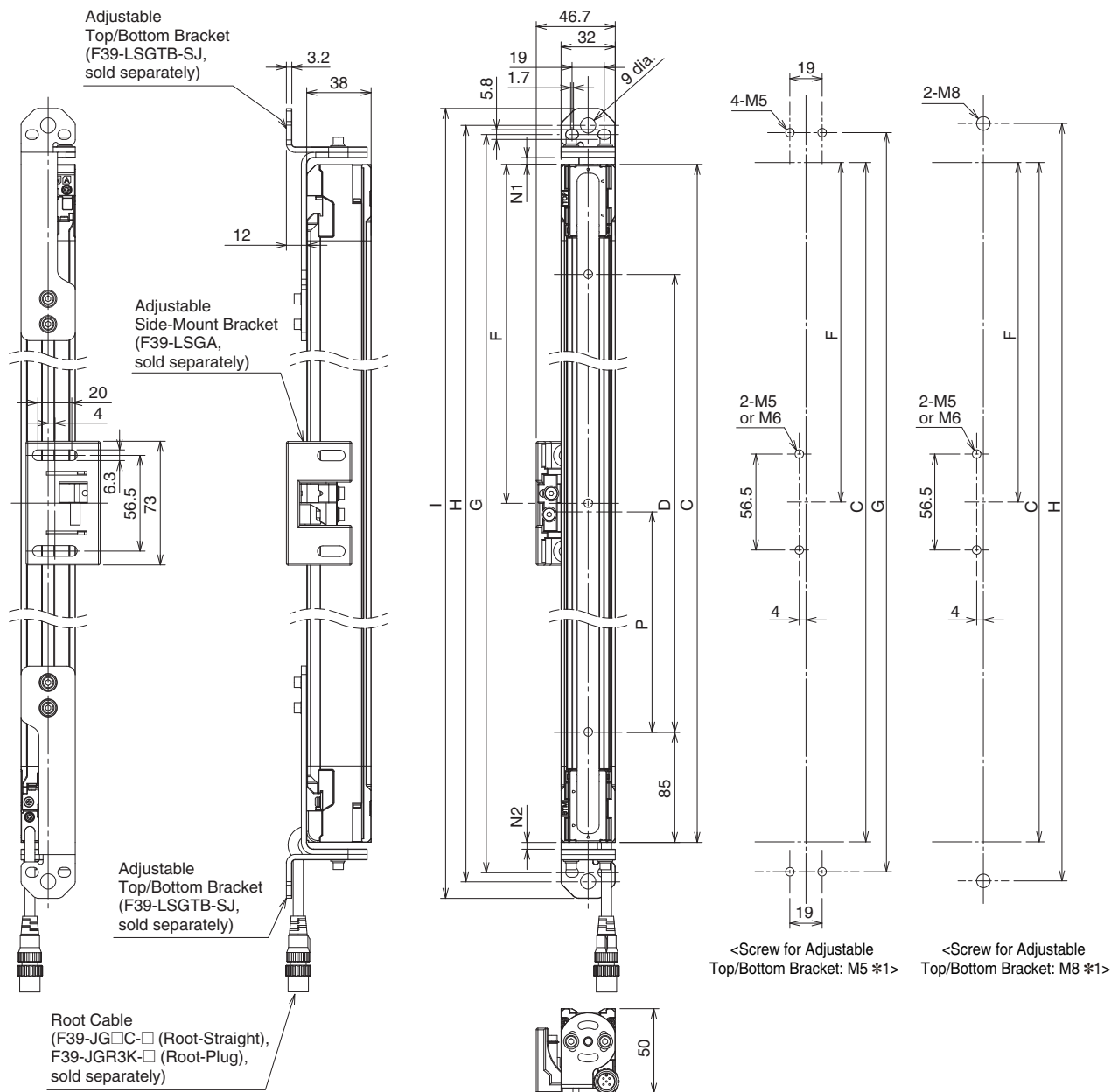
| | | |
|--------------|--------------------------------|-----|
| Dimension C | 4-digit number in model number | |
| Dimension D | C-170 | |
| Dimension G | C+27.2+N1+N2 | |
| Dimension H | C+38+N1+N2 | |
| Dimension I | C+58+N1+N2 | |
| Dimension N1 | 0 to 30 | |
| Dimension N2 | 0 to 30 | |
| Dimension P | F3SG-4PGA0670-2□ | 500 |
| | F3SG-4PGA0970-3□ | 400 |
| | F3SG-4PGA1070-4□ | 300 |
| | F3SG-4PGA1370-4□ | 400 |

| Product length (Dimension C) | Number of Adjustable Top/Bottom Brackets *2 | Number of Intermediate Brackets *2 | Dimension F |
|------------------------------|---|------------------------------------|--------------|
| 0670 | 2 | 0 | --- |
| 0970 to 1370 | 2 | 1 | 1000 mm max. |

*1. Side-Mount Bracket: M5 or M6

*2. The number of brackets required to mount each unit (emitter, receiver, emitter/receiver, passive mirror).

Mounted with Adjustable Top/Bottom Brackets (F3SJ, F3SN Adapter) (F39-LSGTB-SJ) and Adjustable Side-Mount Brackets (Intermediate Brackets) (F39-LSGA) Backside Mounting



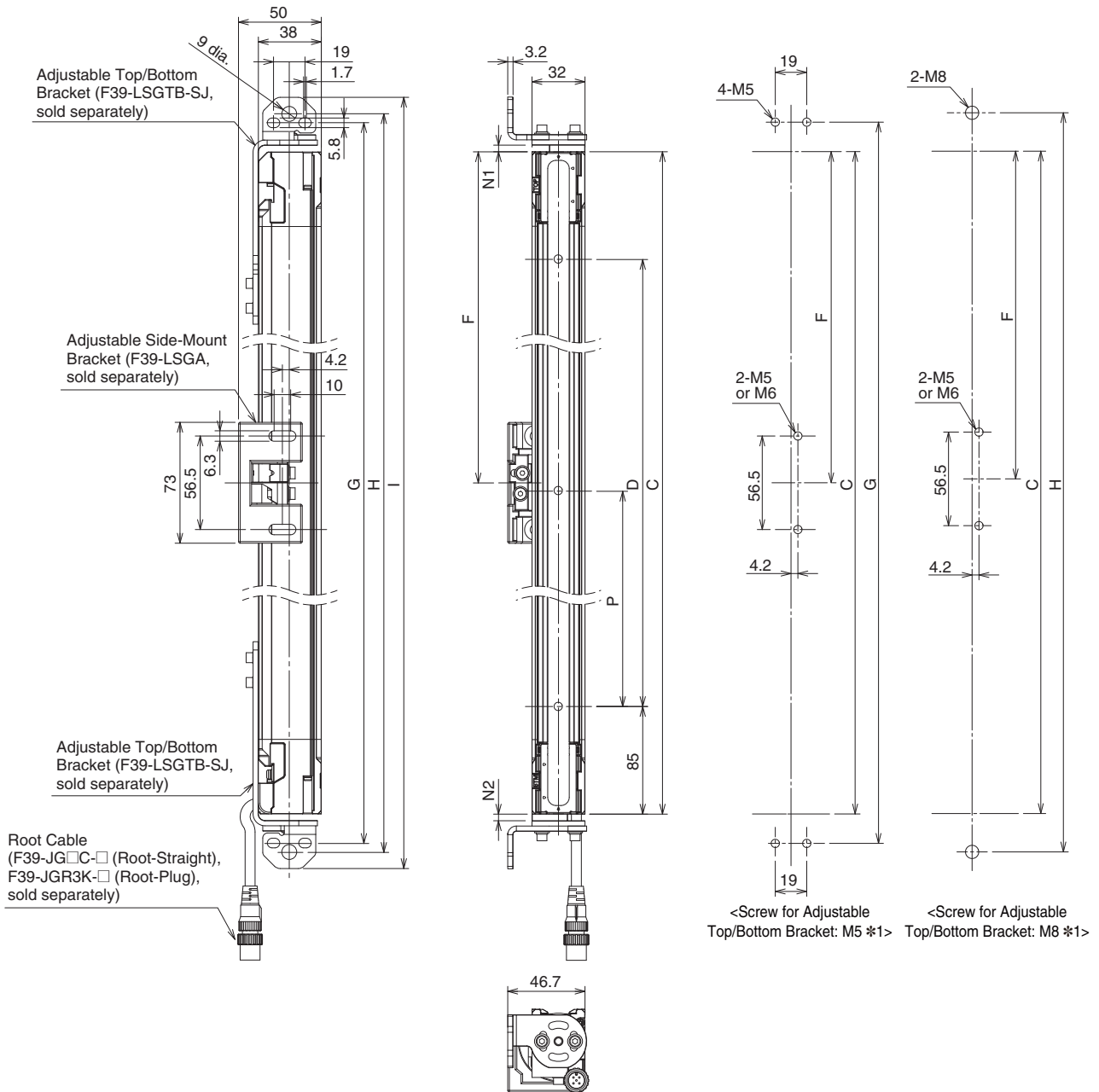
| | | |
|---------------------|--------------------------------|-----|
| Dimension C | 4-digit number in model number | |
| Dimension D | C-170 | |
| Dimension G | C+27.2+N1+N2 | |
| Dimension H | C+38+N1+N2 | |
| Dimension I | C+58+N1+N2 | |
| Dimension N1 | 0 to 30 | |
| Dimension N2 | 0 to 30 | |
| Dimension P | F3SG-4PGA0670-2□ | 500 |
| | F3SG-4PGA0970-3□ | 400 |
| | F3SG-4PGA1070-4□ | 300 |
| | F3SG-4PGA1370-4□ | 400 |

| Product length (Dimension C) | Number of Adjustable Top/Bottom Brackets *2 | Number of Intermediate Brackets *2 | Dimension F |
|------------------------------|---|------------------------------------|--------------|
| 0670 | 2 | 0 | --- |
| 0970 to 1370 | 2 | 1 | 1000 mm max. |

*1. Adjustable Side-Mount Bracket: M5 or M6
 *2. The number of brackets required to mount each unit (emitter, receiver, emitter/receiver, passive mirror).

F3SG-SR/PG
F3SG-SR-K
Common to F3SG-SR and F3SG-PG

Mounted with Adjustable Top/Bottom Brackets (F3SJ, F3SN Adapter) (F39-LSGTB-SJ) and Adjustable Side-Mount Brackets (Intermediate Brackets) (F39-LSGA) Side Mounting



| | | |
|---------------------|--------------------------------|-----|
| Dimension C | 4-digit number in model number | |
| Dimension D | C-170 | |
| Dimension G | C+27.2+N1+N2 | |
| Dimension H | C+38+N1+N2 | |
| Dimension I | C+58+N1+N2 | |
| Dimension N1 | 0 to 30 | |
| Dimension N2 | 0 to 30 | |
| Dimension P | F3SG-4PGA0670-2□ | 500 |
| | F3SG-4PGA0970-3□ | 400 |
| | F3SG-4PGA1070-4□ | 300 |
| | F3SG-4PGA1370-4□ | 400 |

| Product length (Dimension C) | Number of Adjustable Top/Bottom Brackets *2 | Number of Intermediate Brackets *2 | Dimension F |
|------------------------------|---|------------------------------------|--------------|
| 0670 | 2 | 0 | --- |
| 0970 to 1370 | 2 | 1 | 1000 mm max. |

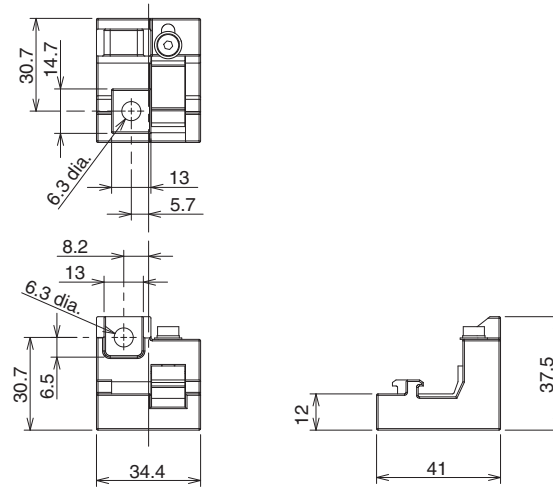
*1. Adjustable Side-Mount Bracket: M5 or M6

*2. The number of brackets required to mount each unit (emitter, receiver, emitter/receiver, passive mirror).

Accessories (Sold separately)

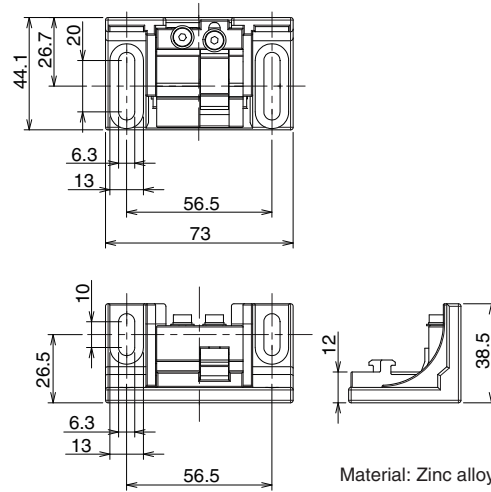
Bracket

Side-Mount Bracket
(Intermediate Bracket)
(F39-LSGF, sold separately)



Material: Zinc alloy

Adjustable Side-Mount Bracket
(Intermediate Bracket)
(F39-LSGA, sold separately)



Material: Zinc alloy

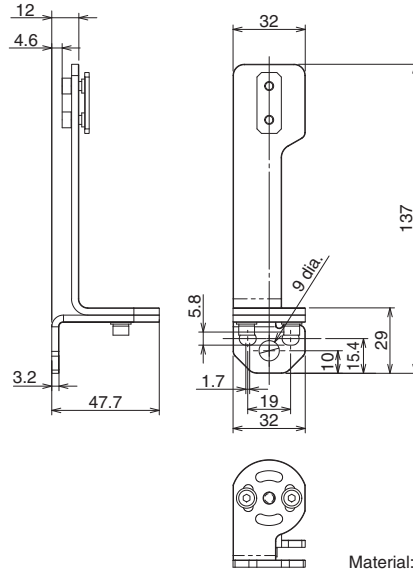
F3SG-SR/PG

F3SG-SR-K

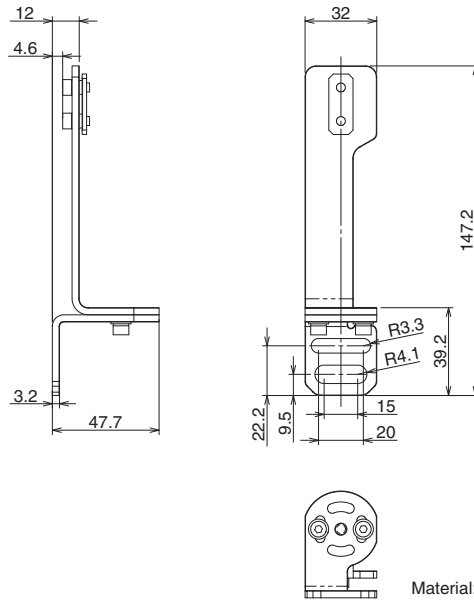
Common to
F3SG-SR and F3SG-PG

F3SG-SR/PG

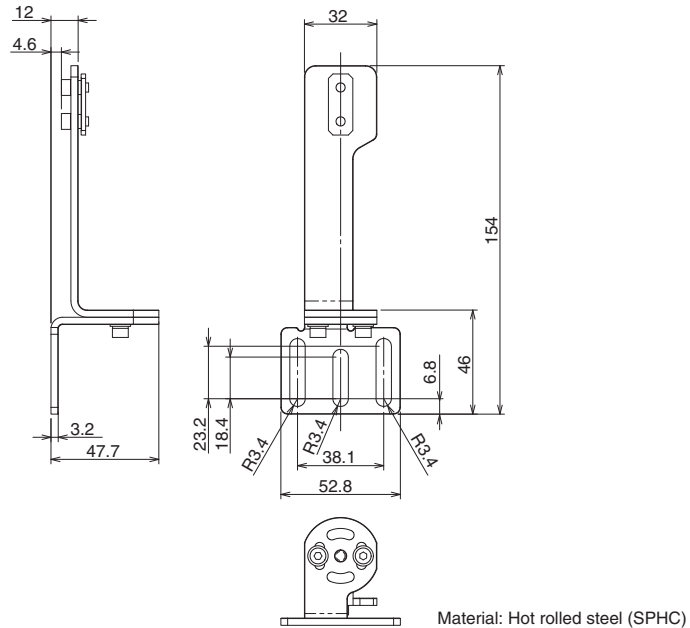
Adjustable Top/Bottom Bracket (F3SJ, F3SN Adapter) (F39-LSGTB-SJ, sold separately)



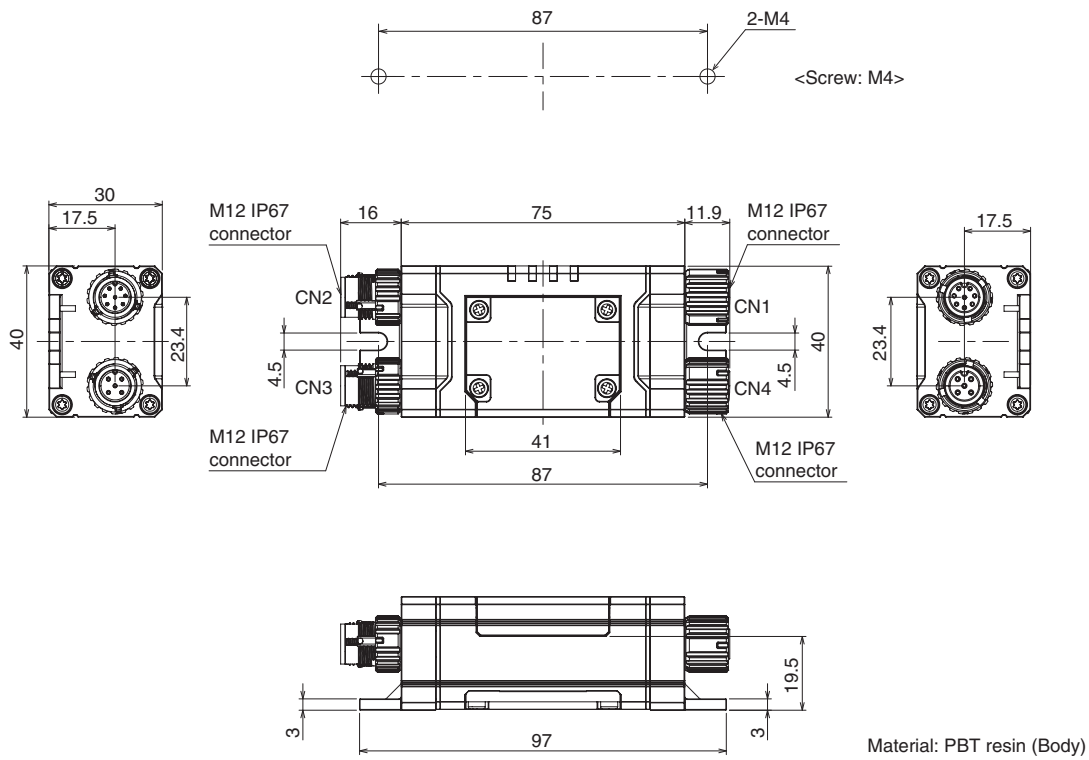
Adjustable Top/Bottom Bracket (F3SG-RA/RE Adapter) (F39-LSGTB-RE, sold separately)



Adjustable Top/Bottom Bracket (MS4800, F3SR Adapter) (F39-LSGTB-MS, sold separately)



Intelligent Tap
Intelligent Tap (F39-SGIT-IL3, sold separately)

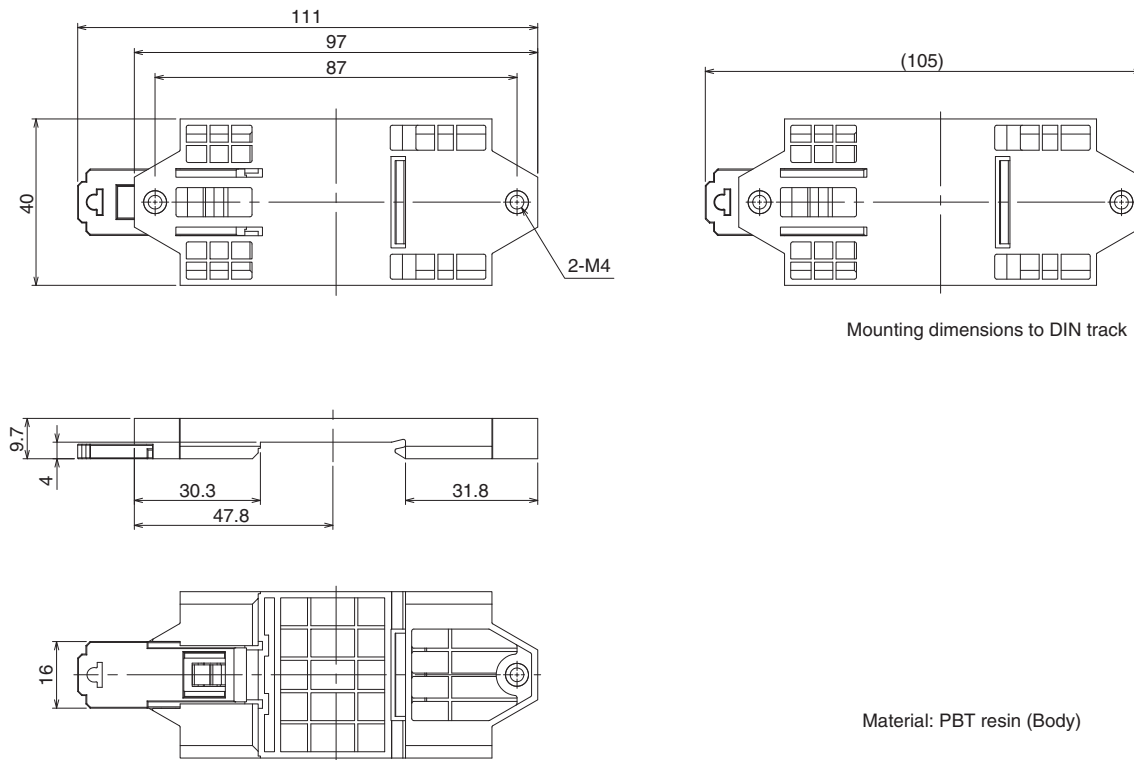


F3SG-SR/PG

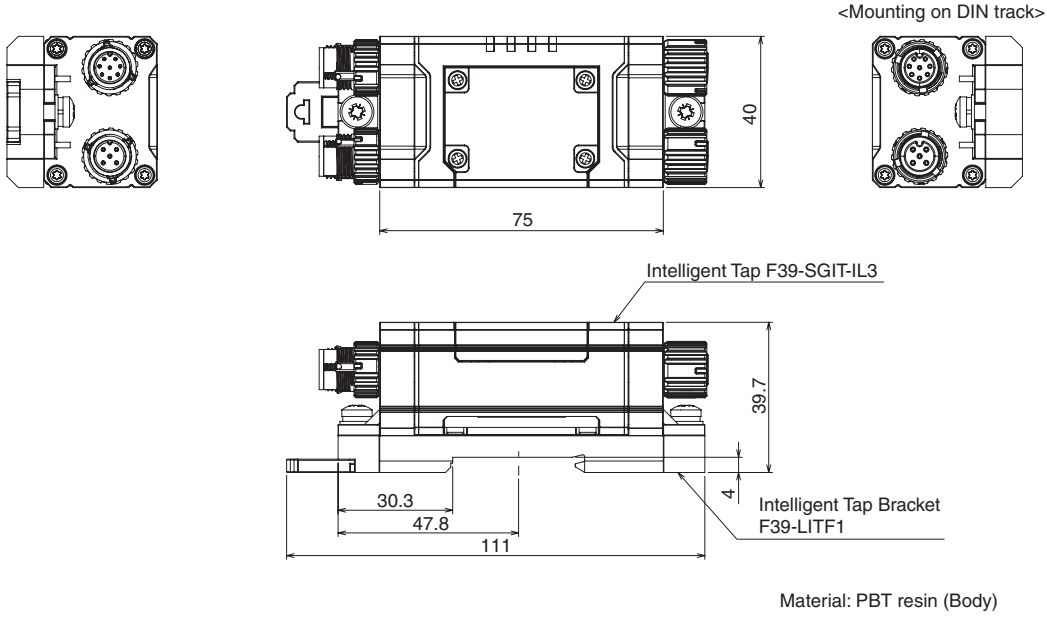
F3SG-SR-K

Common to
 F3SG-SR and F3SG-PG

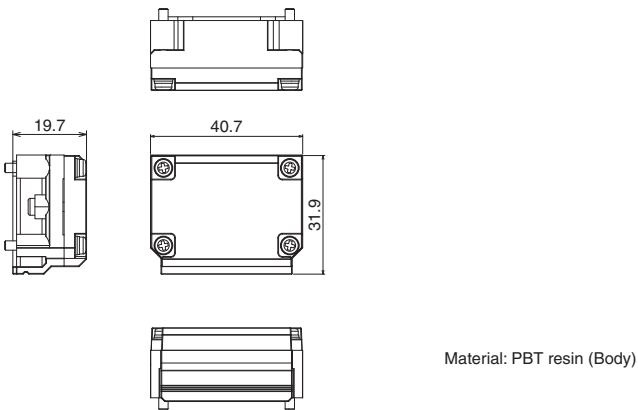
Intelligent Tap Bracket (F39- LITF1, sold separately)



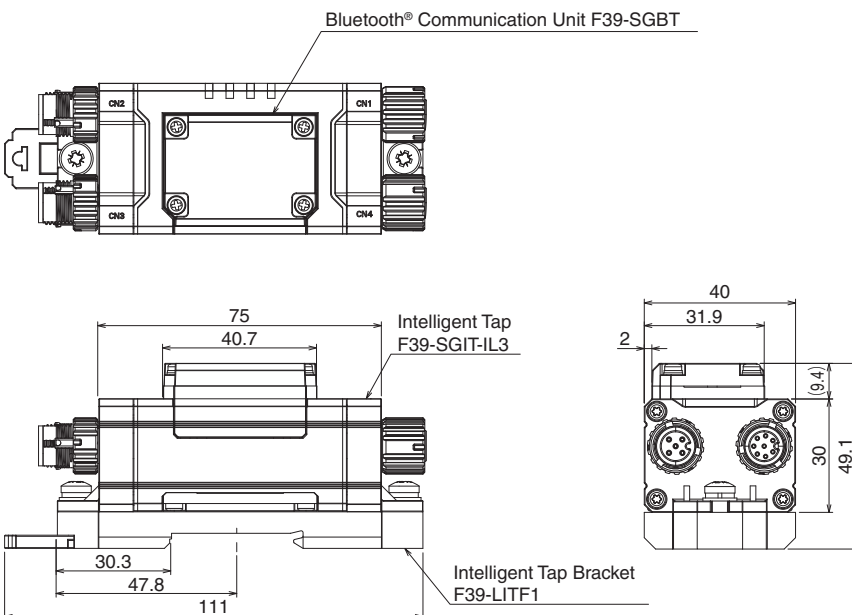
Assembly Dimensions (Intelligent Tap/ Intelligent Tap Bracket)



Bluetooth® Communication Unit (F39-SGBT, sold separately)

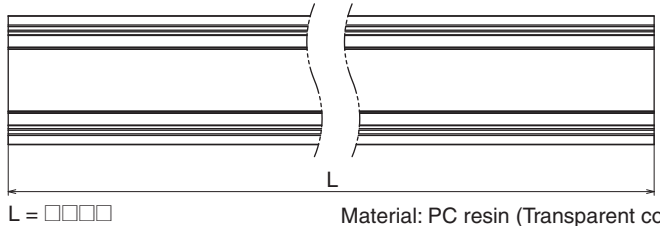
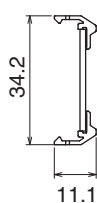


Assembly Dimensions (Intelligent Tap/Bluetooth® Communication Unit/Intelligent Tap Bracket)

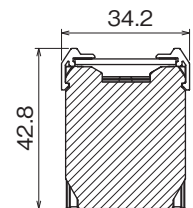


Spatter Protection Cover

Spatter Protection Cover (F39-HSG□□□□, sold separately)



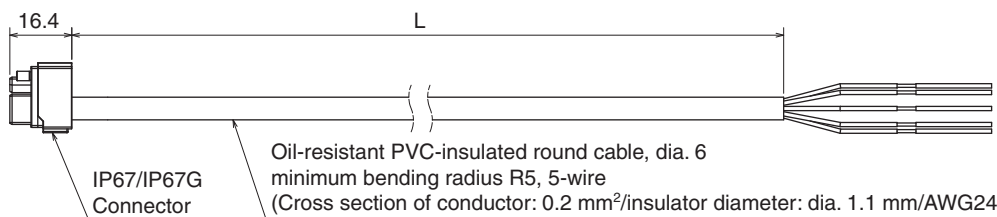
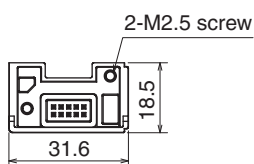
Assembly Dimensions



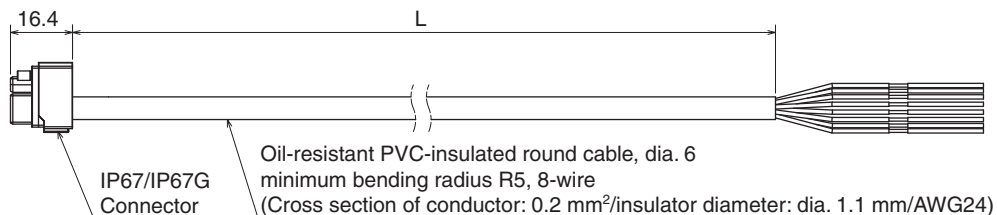
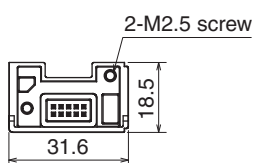
Connecting Cables

Root-Straight Cable

Root-Straight Cable for Emitter (F39-JG□C-L, sold separately)



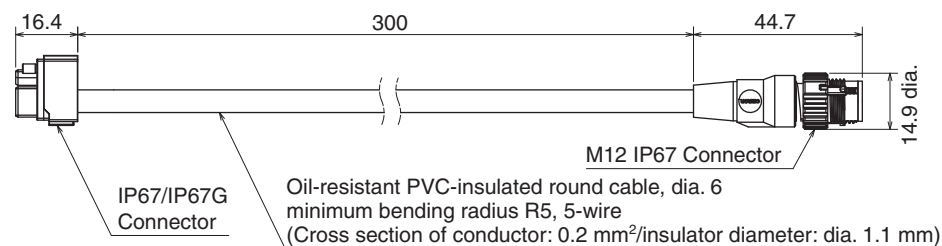
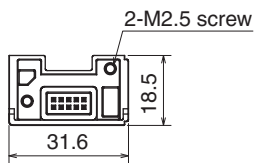
Root-Straight Cable for receiver or emitter/receiver of F3SG-PG Perimeter Guarding Passive Mirror (F39-JG□C-D, sold separately)



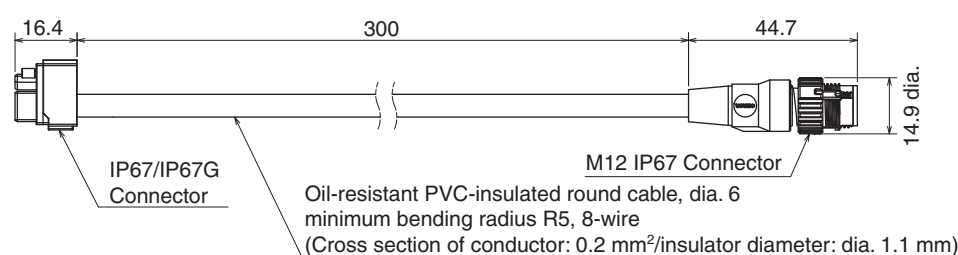
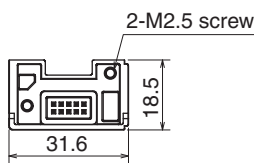
| Emitter cable (Gray) | Receiver cable (Black) | Length (L) |
|----------------------|------------------------|------------|
| F39-JG3C-L | F39-JG3C-D | 3 m |
| F39-JG7C-L | F39-JG7C-D | 7 m |
| F39-JG10C-L | F39-JG10C-D | 10 m |

Root-Plug Cable for Extended

Root-Plug Cable for Extended for Emitter (F39-JGR□K-L, sold separately)



Root-Plug Cable for Extended for receiver or emitter/receiver of F3SG-PG Perimeter Guarding Passive Mirror (F39-JGR□K-D, sold separately)



| Emitter cable (Gray) | Receiver cable (Black) | Length |
|----------------------|------------------------|--------|
| F39-JGR3K-L | F39-JGR3K-D | 0.3 m |

F3SG-SR/PG

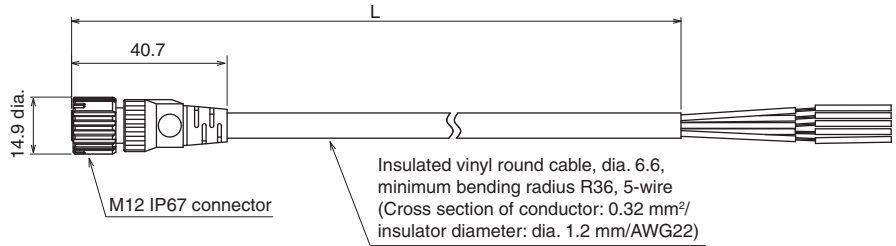
F3SG-SR-K

F3SG-SR and F3SG-PG
Common to

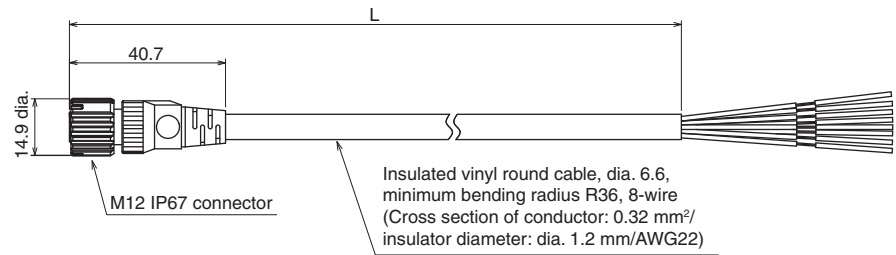
Extended Socket-Straight Cable

| Emitter cable (Gray) | Receiver cable (Black) | Length (L) |
|----------------------|------------------------|------------|
| F39-JG3A-L | F39-JG3A-D | 3 m |
| F39-JG7A-L | F39-JG7A-D | 7 m |
| F39-JG10A-L | F39-JG10A-D | 10 m |
| F39-JG15A-L | F39-JG15A-D | 15 m |
| F39-JG20A-L | F39-JG20A-D | 20 m |

Extended Socket-Straight Cable for Emitter (F39-JG□A-L, sold separately)



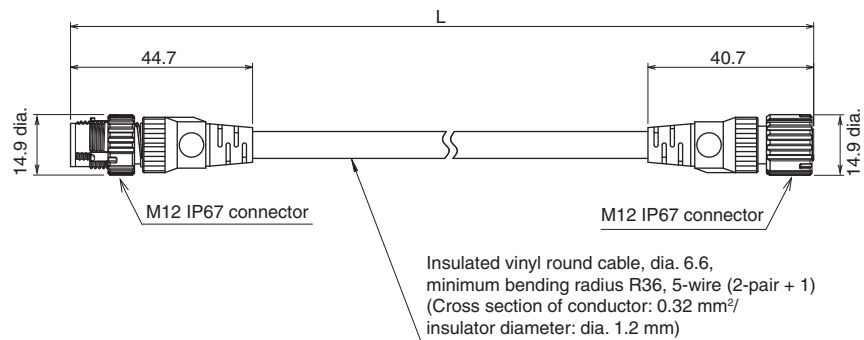
Extended Socket-Straight Cable for receiver or emitter/receiver of F3SG-PG Perimeter Guarding Passive Mirror (F39-JG□A-D, sold separately)



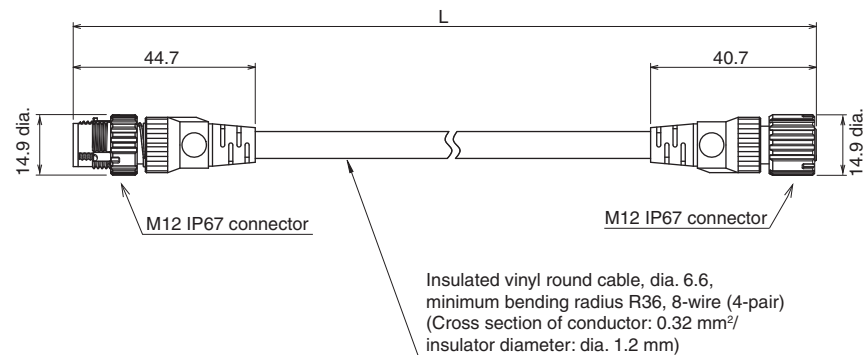
Extended Plug-Socket Cable

| Emitter cable (Gray) | Receiver cable (Black) | Length (L) |
|----------------------|------------------------|------------|
| F39-JGR5B-L | F39-JGR5B-D | 0.5 m |
| F39-JG1B-L | F39-JG1B-D | 1 m |
| F39-JG3B-L | F39-JG3B-D | 3 m |
| F39-JG5B-L | F39-JG5B-D | 5 m |
| F39-JG7B-L | F39-JG7B-D | 7 m |
| F39-JG10B-L | F39-JG10B-D | 10 m |
| F39-JG15B-L | F39-JG15B-D | 15 m |
| F39-JG20B-L | F39-JG20B-D | 20 m |

Extended Plug-Socket Cable for Emitter: Cable for extension (F39-JG□B-L, sold separately)

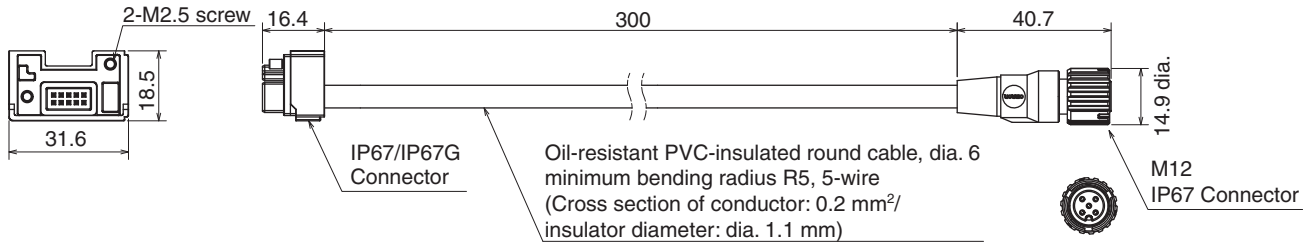


Extended Plug-Socket Cable for receiver or emitter/receiver of F3SG-PG Perimeter Guarding Passive Mirror: Cable for extension (F39-JG□B-D, sold separately)

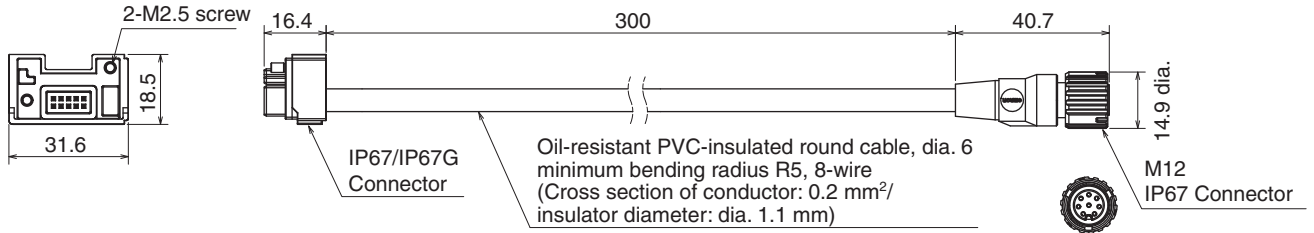


Cascading Cable for Extended (F39-JGR3W, sold separately)
(two cables per set, one for emitter and one for receiver)

Emitter Cascading Cable for Extended



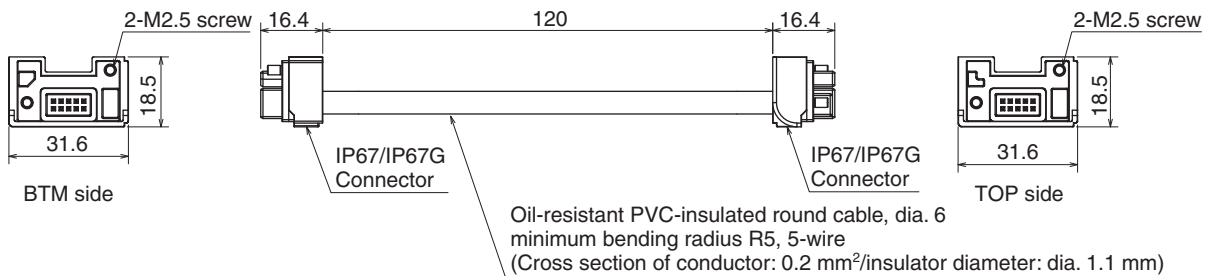
Receiver Cascading Cable for Extended



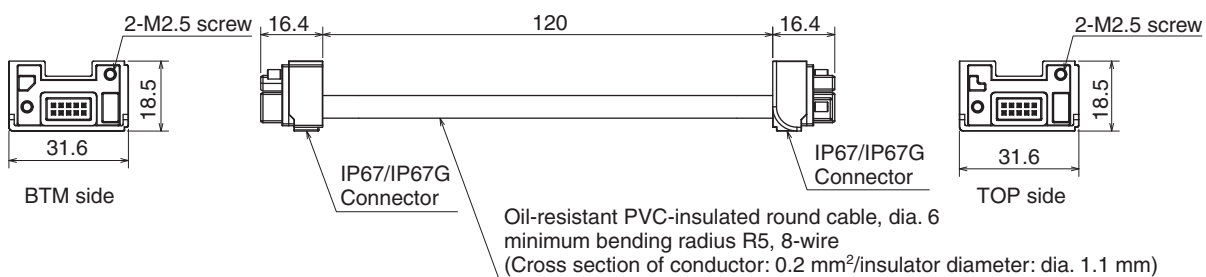
| Set model name | Emitter cable (Gray) | Receiver cable (Black) | Length |
|----------------|----------------------|------------------------|--------|
| F39-JGR3W | F39-JGR3W-L | F39-JGR3W-D | 0.3 m |

Side-by-side Cascading Cable (F39-JGR12L, sold separately)
(two cables per set, one for emitter and one for receiver)

Side-by-side Cascading Cable for Emitter



Side-by-side Cascading Cable for Receiver



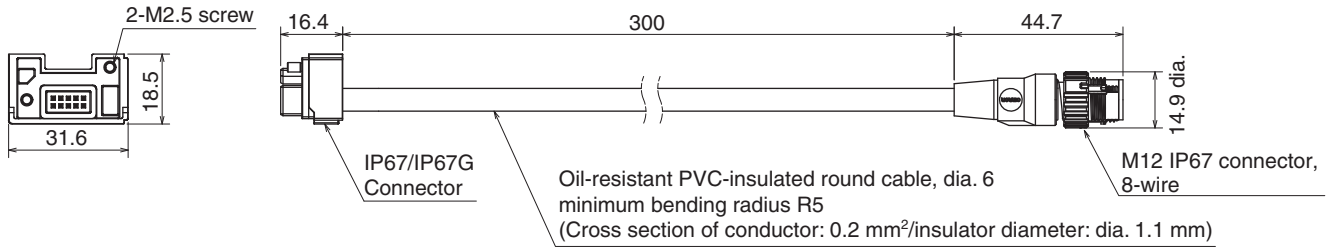
| Set model name | Emitter cable (Gray) | Receiver cable (Black) | Length |
|----------------|----------------------|------------------------|--------|
| F39-JGR12L | F39-JGR12L-L | F39-JGR12L-D | 12 cm |

F3SG-SR/PG
F3SG-SR-K
Common to F3SG-SR and F3SG-PG

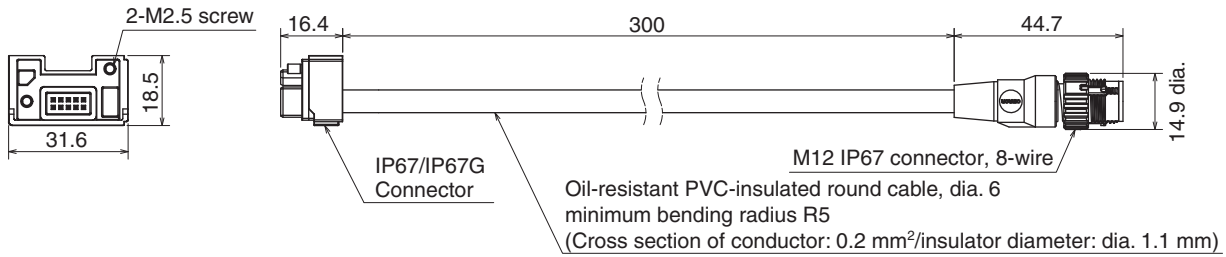
F3SG-SR/PG

Conversion Cable

F3SJ-A/B Conversion Cable for Emitter (F39-JGR3K-SJ-L, sold separately)

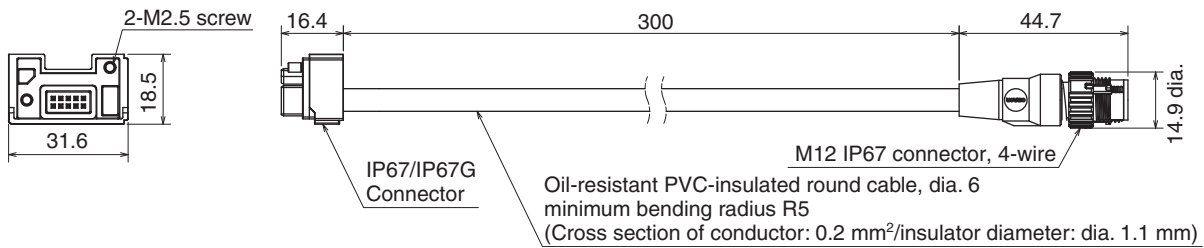


F3SJ-A/B Conversion Cable for Receiver (F39-JGR3K-SJ-D, sold separately)

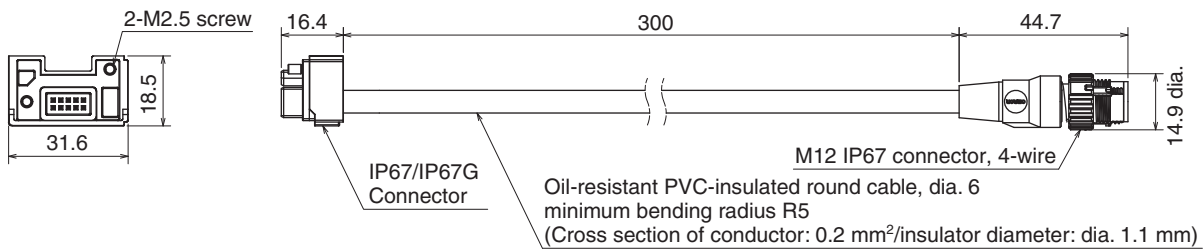


| Emitter cable (Gray) | Receiver cable (Black) | Length |
|----------------------|------------------------|--------|
| F39-JGR3K-SJ-L | F39-JGR3K-SJ-D | 0.3 m |

F3SG-RE Conversion Cable for Emitter (F39-JGR3K-RE-L, sold separately)

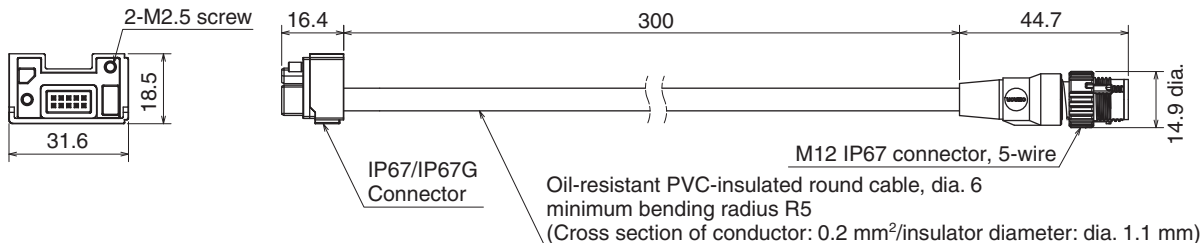


F3SG-RE Conversion Cable for Receiver (F39-JGR3K-RE-D, sold separately)

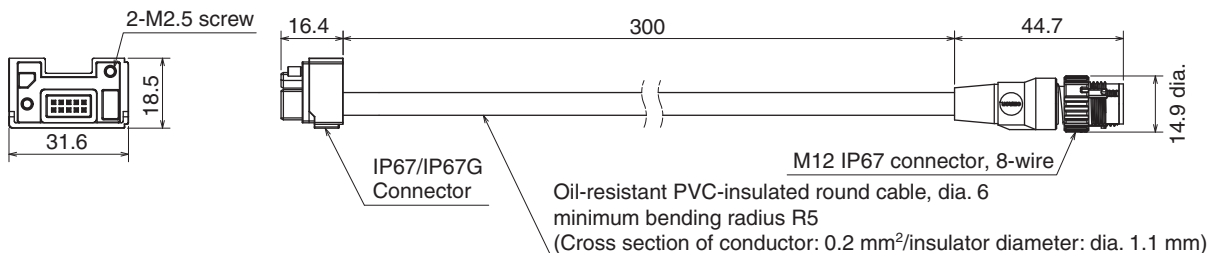


| Emitter cable (Gray) | Receiver cable (Black) | Length |
|----------------------|------------------------|--------|
| F39-JGR3K-RE-L | F39-JGR3K-RE-D | 0.3 m |

MS48 Conversion Cable for Emitter (F39-JGR3K-MS-L, sold separately)

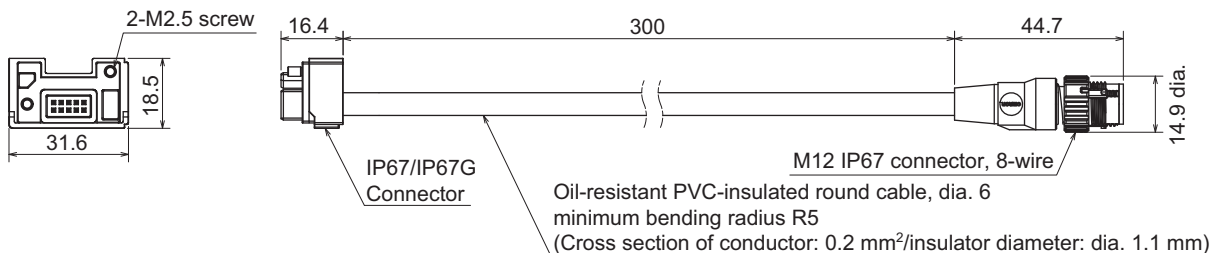


MS48 Conversion Cable for Receiver (F39-JGR3K-MS-D, sold separately)

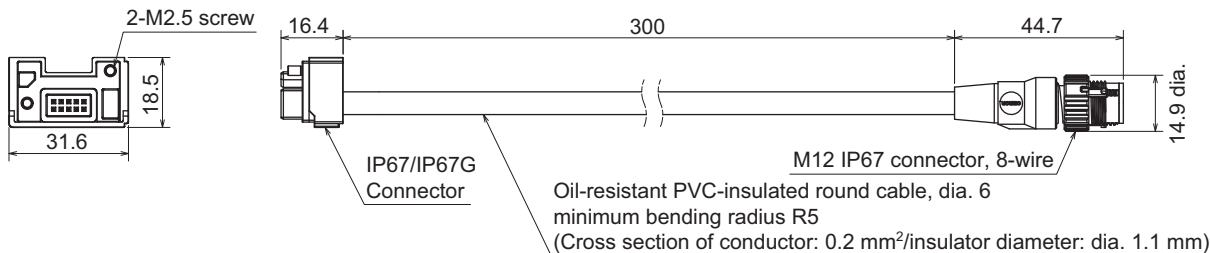


| Emitter cable (Gray) | Receiver cable (Black) | Length |
|----------------------|------------------------|--------|
| F39-JGR3K-MS-L | F39-JGR3K-MS-D | 0.3 m |

F3SJ-A-TS/-T, F3SJ-B-TS/-T, F3SG-RA-TS Conversion Cable for Emitter (F39-JGR3K-SW-L, sold separately)



F3SJ-A-TS/-T, F3SJ-B-TS/-T, F3SG-RA-TS Conversion Cable for Receiver (F39-JGR3K-SJ-D, sold separately)



| Emitter cable (Gray) | Receiver cable (Black) | Length |
|----------------------|------------------------|--------|
| F39-JGR3K-SW-L | F39-JGR3K-SJ-D | 0.3 m |

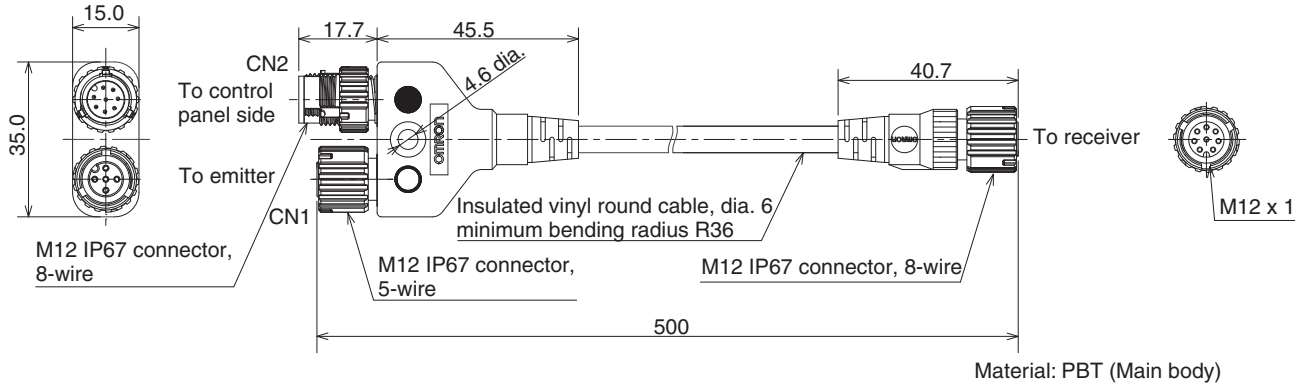
F3SG-SR/PG

F3SG-SR-K

F3SG-SR and F3SG-PG
Common to

Y-Joint Plug/Socket Connector (F39-GCNY2, sold separately)

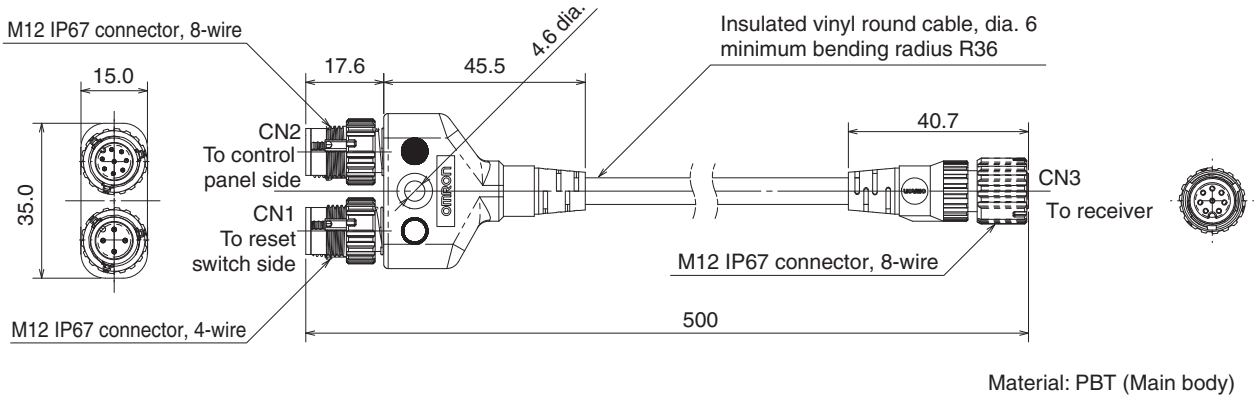
Plug marked with ● (blue circle): Connect to control panel side
 Socket marked with ○ (open circle): Connect to emitter



| Model | Length |
|-----------|--------|
| F39-GCNY2 | 0.5 m |

Reset Switch Connector (F39-GCNY3, sold separately)

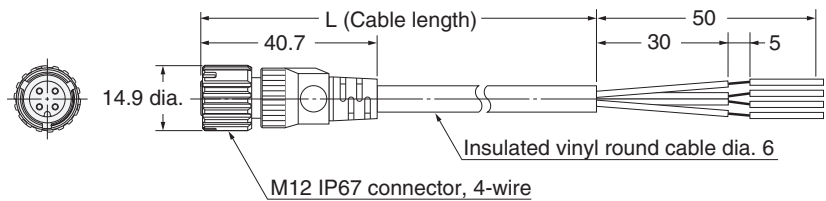
Plug marked with ● (blue circle): Connect to control panel side
 Plug marked with ○ (open circle): Connect to reset switch side



| Model | Length |
|-----------|--------|
| F39-GCNY3 | 0.5 m |

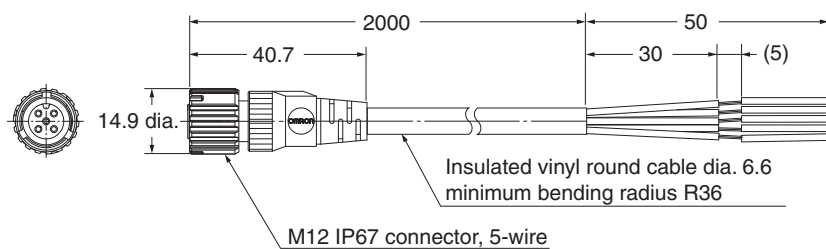
Connector Connected to Cable, Socket on One Cable End (XS5F-D421-□80-F, sold separately)

| Model | Length (L) |
|-----------------|------------|
| XS5F-D421-C80-F | 1 m |
| XS5F-D421-D80-F | 2 m |
| XS5F-D421-E80-F | 3 m |
| XS5F-D421-G80-F | 5 m |
| XS5F-D421-J80-F | 10 m |
| XS5F-D421-L80-F | 20 m |

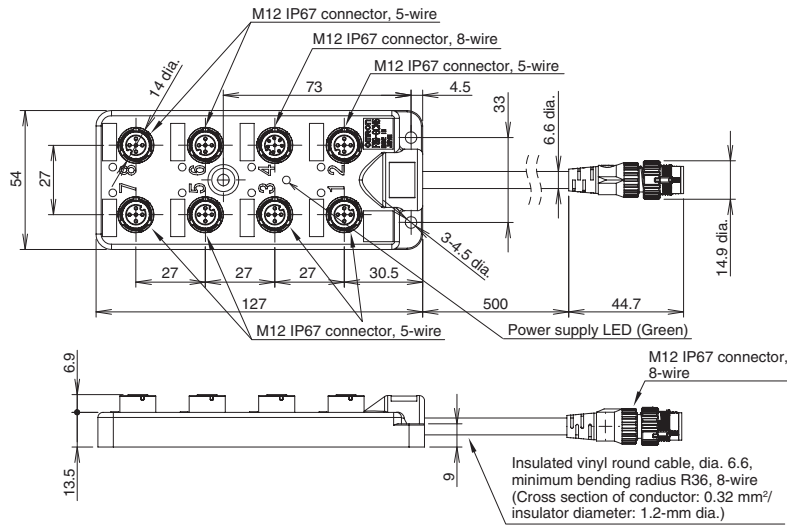


Intelligent Tap-to-IO-Link Master Cable (Single ended cable) (XS5F-D521-DJ0-IL, sold separately)

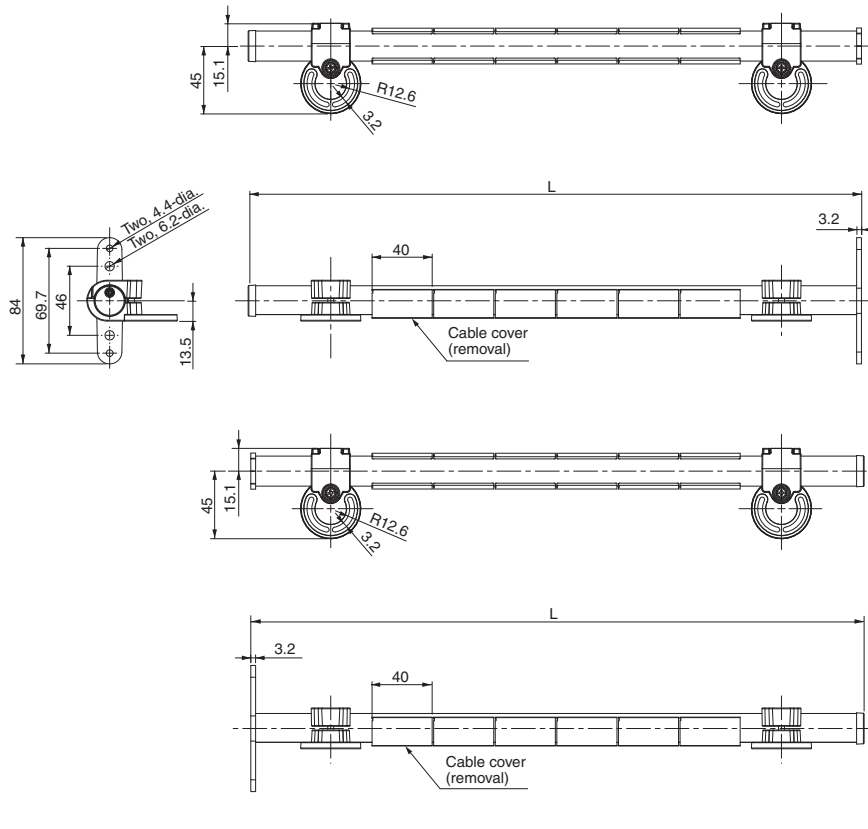
| Model | Length (L) |
|------------------|------------|
| XS5F-D521-DJ0-IL | 2 m |



Muting Sensor Connection Box
F39-GCN5



Muting Sensor Arm Mounter
Muting Sensor Arm Mounter
(F39-FMA□□□□, sold separately)



Material: PBT resin (Sensor Mounting)
PC resin (Cable cover)
Hot rolled steel (Base)
Aluminum alloy (Arm)

| Model | Dimension L |
|-------------|-------------|
| F39-FMA150□ | 158.2 |
| F39-FMA400□ | 408.2 |

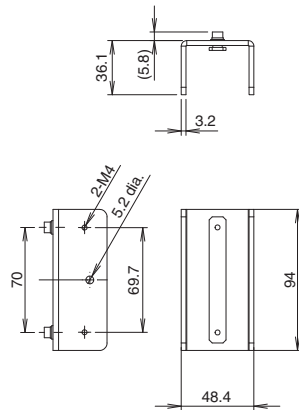
F3SG-SR/PG

F3SG-SR-K

Common to
F3SG-SR and F3SG-PG

F3SG-SR/PG

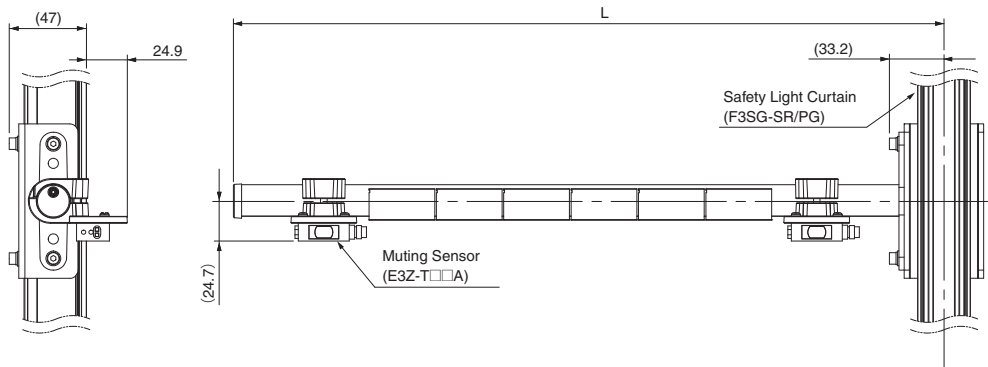
Muting Sensor Arm Mounter Bracket for SLC (F39-LMAF1, sold separately)



Material: Hot rolled steel

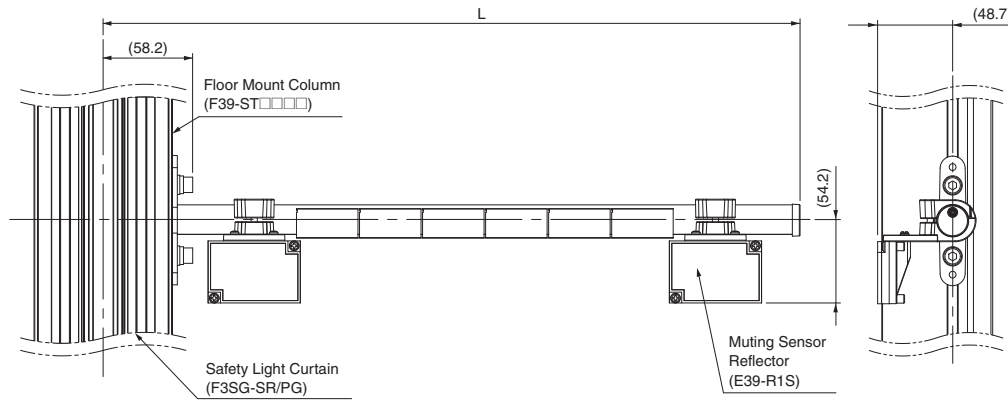
• Assembly Dimensions

Mounting F39-FMA□□□□-T on the Muting Sensor Arm Mounter Bracket for SLC (F39-LMAF1)



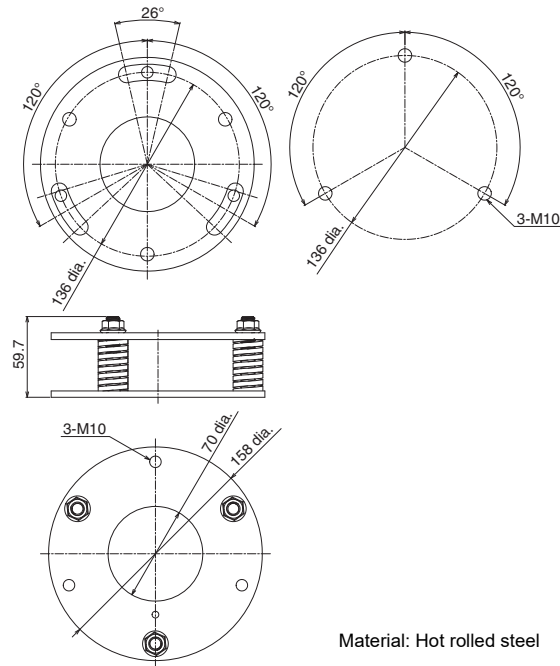
| Model | Dimension L |
|-------------|-------------|
| F39-FMA150□ | 182.4 |
| F39-FMA400□ | 432.4 |

Mounting F39-FMA□□□□-R on the Floor Mount Column (F39-ST□□□□)



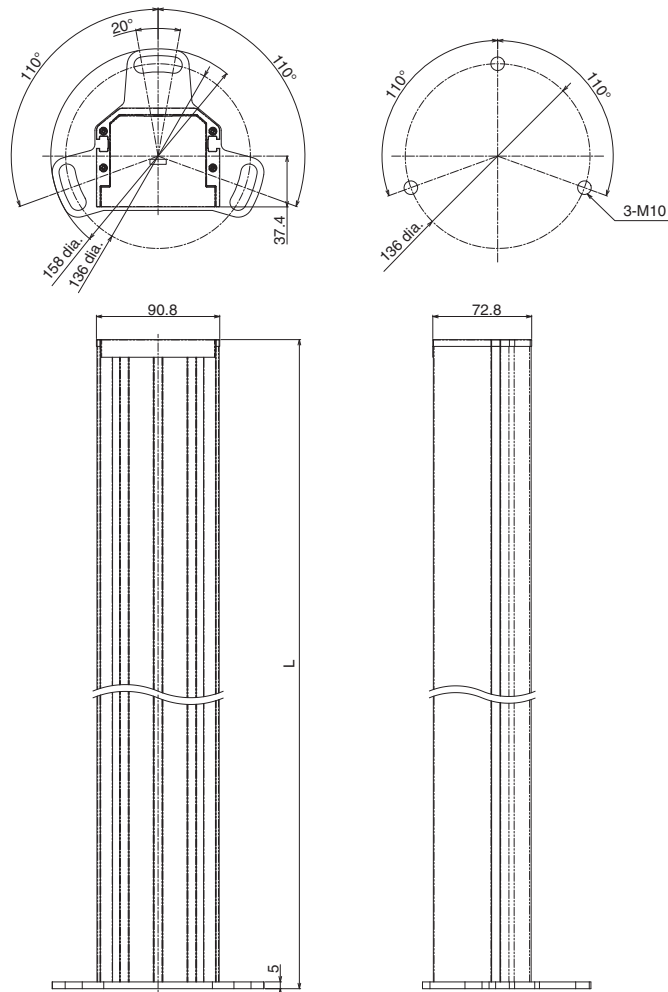
| Model | Dimension L |
|-------------|-------------|
| F39-FMA150□ | 203.2 |
| F39-FMA400□ | 453.2 |

Mount-Column Adjustable Base
F39-STB



F3SG-SR/PG
F3SG-SR-K
Common to F3SG-SR and F3SG-PG

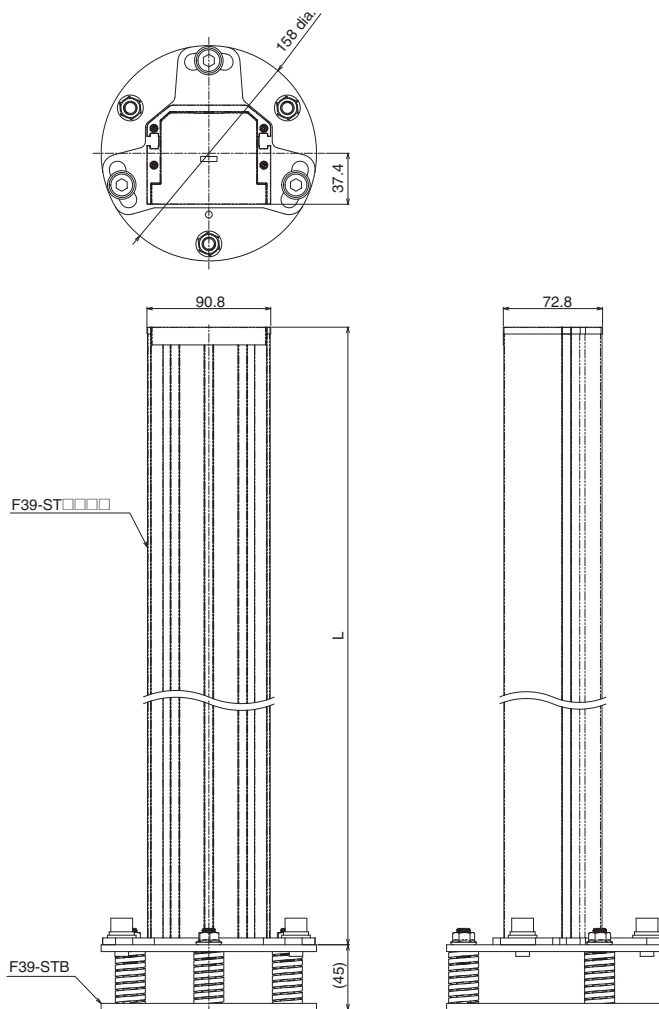
Floor Mount Column
F39-ST□□□□



| Model | Dimension L |
|------------|-------------|
| F39-ST0990 | 990 |
| F39-ST1310 | 1310 |
| F39-ST1630 | 1630 |
| F39-ST1950 | 1950 |
| F39-ST2270 | 2270 |

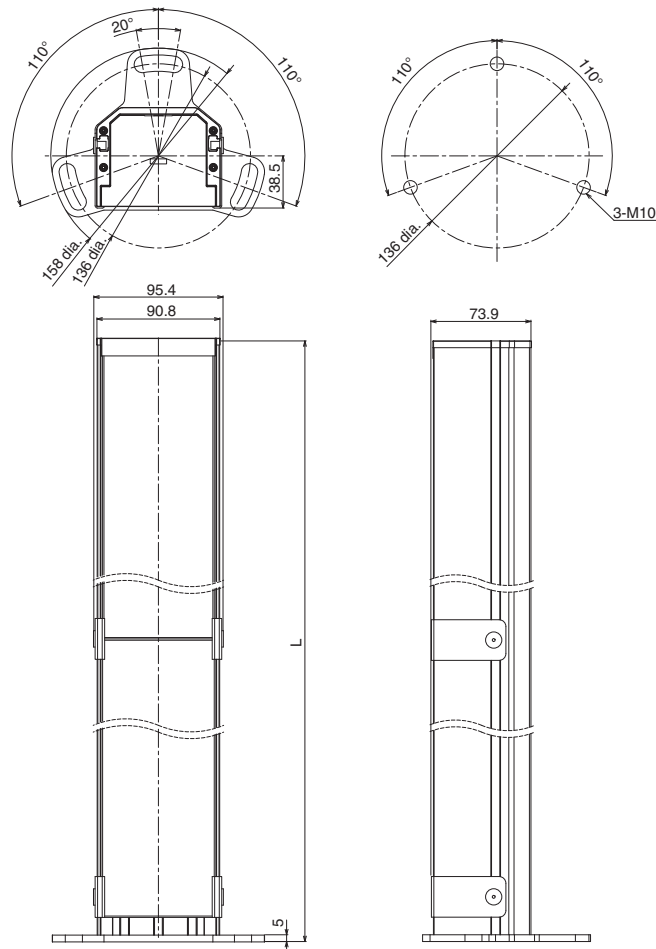
F3SG-SR/PG

• Assembly Dimensions (Mount-Column Adjustable Base /Floor Mount Column)
F39-STB/F39-ST□□□□



| Model | Dimension L |
|------------|-------------|
| F39-ST0990 | 990 |
| F39-ST1310 | 1310 |
| F39-ST1630 | 1630 |
| F39-ST1950 | 1950 |
| F39-ST2270 | 2270 |

Mirror Column
F39-SML□□□□



Material: Aluminum alloy (Housing)
Hot rolled steel (Base)
PBT resin (Cap)
Glass mirror (Mirror)

| Model | Dimension L |
|-------------|-------------|
| F39-SML0990 | 990 |
| F39-SML1310 | 1310 |
| F39-SML1630 | 1630 |
| F39-SML1950 | 1950 |

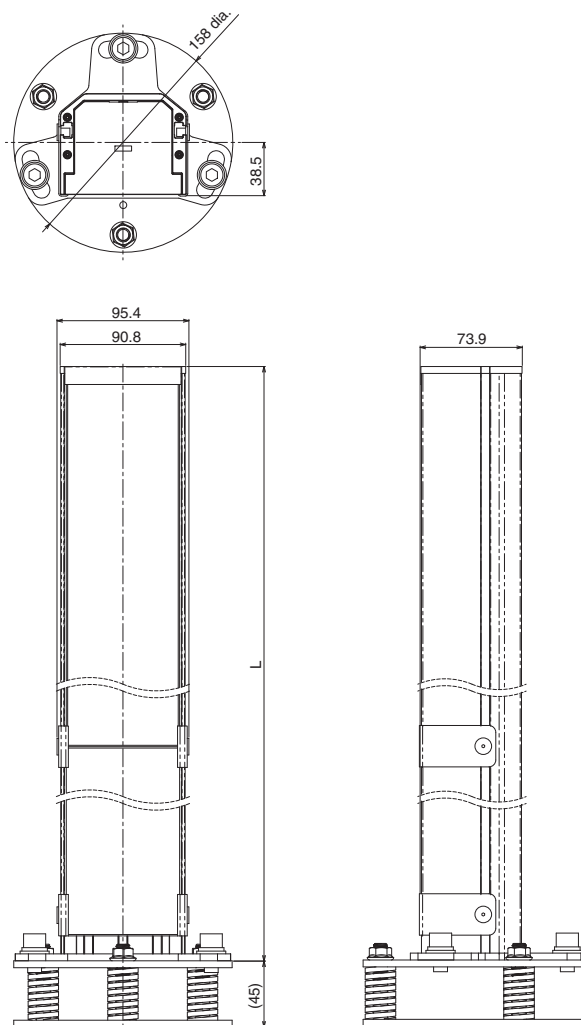
F3SG-SR/PG

F3SG-SR-K

F3SG-SR and F3SG-PG
Common to

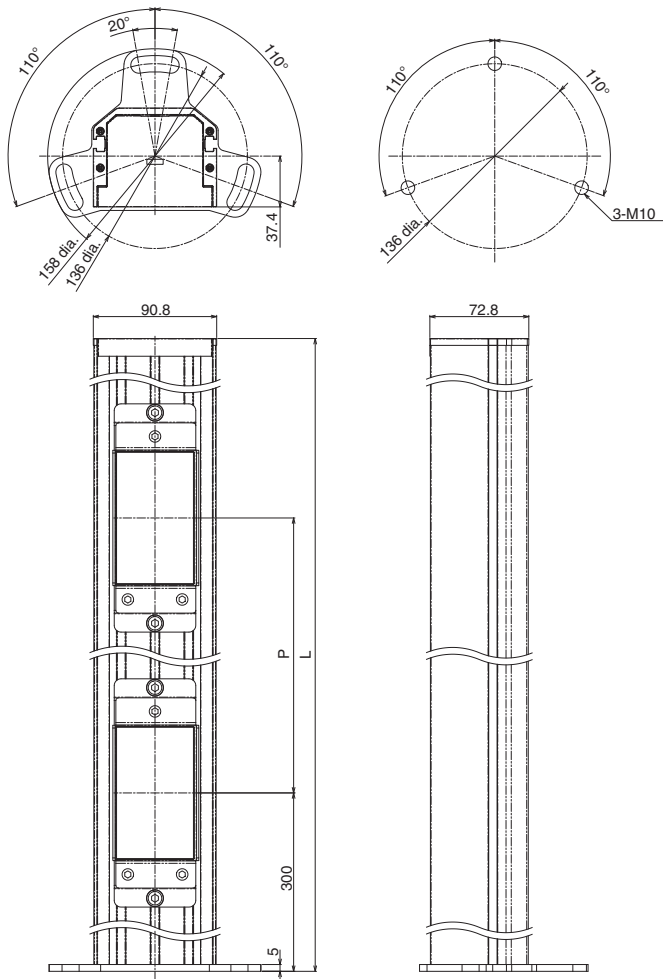
F3SG-SR/PG

• Assembly Dimensions (Mount-Column Adjustable Base /Mirror Column)
 F39-STB/F39-SML□□□□



| Model | Dimension L |
|-------------|-------------|
| F39-SML0990 | 990 |
| F39-SML1310 | 1310 |
| F39-SML1630 | 1630 |
| F39-SML1950 | 1950 |

F39-PML□□□□



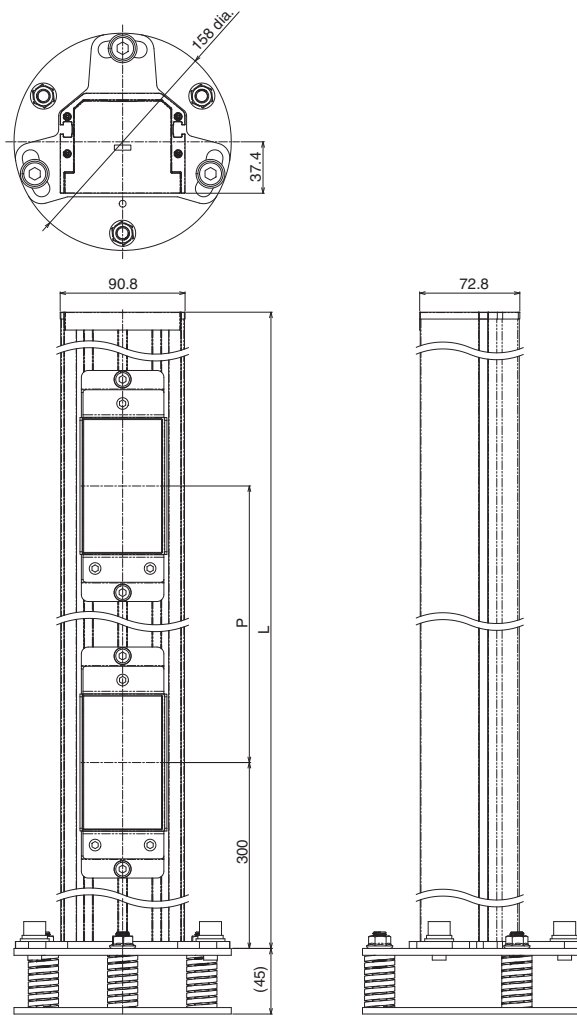
Material: Aluminum alloy (Housing)
 Hot rolled steel (Base, Mirror base)
 PBT resin (Cap)
 Glass mirror (Mirror)

| Model | Dimension L | Dimension P | Mirror Q'ty |
|---------------|-------------|-------------|-------------|
| F39-PML0990-2 | 990 | 500 | 2 |
| F39-PML1310-3 | 1310 | 400 | 3 |
| F39-PML1310-4 | | 300 | 4 |
| F39-PML1630-4 | 1630 | 400 | 4 |

F3SG-SR/PG
 F3SG-SR-K
 Common to F3SG-SR and F3SG-PG

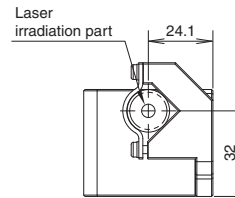
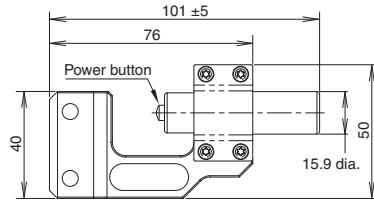
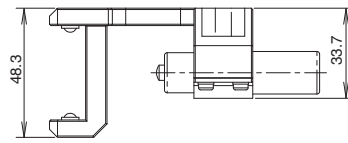
F3SG-SR/PG

• Assembly Dimensions (Mount-Column Adjustable Base /Mirror Column)
F39-STB/F39-PML□□□□



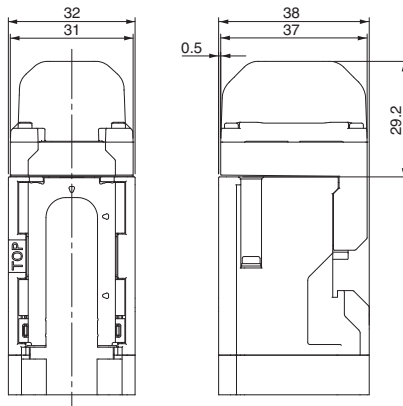
| Model | Dimension L | Dimension P | Mirror Q'ty |
|---------------|-------------|-------------|-------------|
| F39-PML0990-2 | 990 | 500 | 2 |
| F39-PML1310-3 | 1310 | 400 | 3 |
| F39-PML1310-4 | | 300 | 4 |
| F39-PML1630-4 | 1630 | 400 | 4 |

Laser Alignment Pointer
F39-PTS



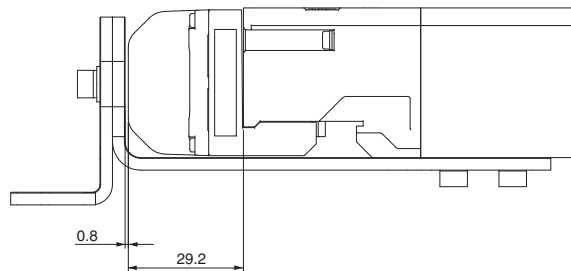
Material: Laser module case: Aluminum
Attaching part: Aluminum, stainless

Lamp
Lamp
(F39-SGLP, sold separately)



Material: PC resin (Transparent cover)
PBT resin (Base)

• **Assembly Dimensions**



F3SG-SR/PG
F3SG-SR-K

Common to
F3SG-SR and F3SG-PG

Safety Light Curtain F3SG-SR Series IP69K Model

F3SG-SR-K

IP69K protection for high-pressure wash-down applications

- Offers the same specifications and functionality as F3SG-4SRB□□ standard model.
Detection capability of 14- and 25-mm dia.
- Conforms to major international standards



For the most recent information on models that have been certified for safety standards, refer to your local OMRON website.

F3SG-SR-K

Model Number Legend

IP69K Model F3SG-SR-K

F3SG-4SRB □□□□ - □□ - K
 (1) (2) (3) (4) (5)

| No. | Classification | Code | Meaning | Remarks |
|-----|----------------------|-------------|--|---------|
| (1) | ESPE | 4 | Type 4 | |
| (2) | Function | B | Standard | |
| (3) | Protective height | 0320 - 1800 | Protective height for finger protection (mm) | |
| | | 0320 - 1840 | Protective height for hand protection (mm) | |
| (4) | Detection capability | 14 | Finger protection (Detection capability: 14-mm dia.) | |
| | | 25 | Hand protection (Detection capability: 25-mm dia.) | |
| (5) | Option | K | Water/oil resistance IP69K | |

Note: 1. The purpose of this model number legend is to provide understanding of the meaning of specifications from the model number. Models are not available for all combinations of code numbers.

See *Ordering Information* on page 73 for details.

2. The bracket is not included. Order brackets sold separately.
3. Connection cables are integrated with the safety light curtain.

Ordering Information

Safety Light Curtain IP69K Model Main Unit F3SG-SR-K

Finger protection (Detection capability: 14-mm dia.)

| Number of beams | Protective height (mm) | Standard |
|-----------------|------------------------|--------------------|
| | | Model |
| 31 | 320 | F3SG-4SRB0320-14-K |
| 39 | 400 | F3SG-4SRB0400-14-K |
| 47 | 480 | F3SG-4SRB0480-14-K |
| 55 | 560 | F3SG-4SRB0560-14-K |
| 63 | 640 | F3SG-4SRB0640-14-K |
| 71 | 720 | F3SG-4SRB0720-14-K |
| 79 | 800 | F3SG-4SRB0800-14-K |
| 87 | 880 | F3SG-4SRB0880-14-K |
| 95 | 960 | F3SG-4SRB0960-14-K |
| 99 | 1,000 | F3SG-4SRB1000-14-K |
| 119 | 1,200 | F3SG-4SRB1200-14-K |
| 139 | 1,400 | F3SG-4SRB1400-14-K |
| 159 | 1,600 | F3SG-4SRB1600-14-K |
| 179 | 1,800 | F3SG-4SRB1800-14-K |

Note: Connection cables are integrated with the safety light curtain.

Hand protection (Detection capability: 25-mm dia.)


| Number of beams | Protective height (mm) | Standard |
|-----------------|------------------------|--------------------|
| | | Model |
| 16 | 320 | F3SG-4SRB0320-25-K |
| 20 | 400 | F3SG-4SRB0400-25-K |
| 24 | 480 | F3SG-4SRB0480-25-K |
| 28 | 560 | F3SG-4SRB0560-25-K |
| 32 | 640 | F3SG-4SRB0640-25-K |
| 36 | 720 | F3SG-4SRB0720-25-K |
| 40 | 800 | F3SG-4SRB0800-25-K |
| 44 | 880 | F3SG-4SRB0880-25-K |
| 48 | 960 | F3SG-4SRB0960-25-K |
| 50 | 1,000 | F3SG-4SRB1000-25-K |
| 52 | 1,040 | F3SG-4SRB1040-25-K |
| 56 | 1,120 | F3SG-4SRB1120-25-K |
| 60 | 1,200 | F3SG-4SRB1200-25-K |
| 64 | 1,280 | F3SG-4SRB1280-25-K |
| 68 | 1,360 | F3SG-4SRB1360-25-K |
| 72 | 1,440 | F3SG-4SRB1440-25-K |
| 76 | 1,520 | F3SG-4SRB1520-25-K |
| 80 | 1,600 | F3SG-4SRB1600-25-K |
| 84 | 1,680 | F3SG-4SRB1680-25-K |
| 88 | 1,760 | F3SG-4SRB1760-25-K |
| 92 | 1,840 | F3SG-4SRB1840-25-K |

Note: Connection cables are integrated with the safety light curtain.

Accessories (Sold separately)

Optional Accessories for F3SG-SR-K

Bracket

| Appearance | Type | Application | Model |
|---|---|--|-------------|
| Bracket to mount the F3SG-SR-K. 360° mounting including side mounting and backside mounting possible. Beam alignment after mounting of F3SG-SR/PG not possible. Two brackets per set |  | IP69K Model Mounting Bracket (Top/Bottom Bracket) | F39-LSGTB-K |

F3SG-SR/PG

F3SG-SR-K

Common to
F3SG-SR and F3SG-PG

F3SG-SR-K

Ratings and Specifications

Safety Light Curtain IP69K Model Main Unit F3SG-SR-K

□□□□ in the model number indicates the protective height in millimeters.

| Model | | F3SG-4SRB□□□□-14-K | | F3SG-4SRB□□□□-25-K | | |
|--|--|---|--|--|--|--|
| Performance | Object resolution (Detection capability) | | Opaque objects | | | |
| | | | 14-mm dia. | | 25-mm dia. | |
| | Beam gap | | 10 mm | | 20 mm | |
| | Number of beams | | 31 to 179 | | 16 to 92 | |
| | Lens size | | 4.4 × 3.4 mm (W × H) | | 6.7 × 4.5 mm (W × H) | |
| | Protective height | | 320 to 1,800 mm | | 320 to 1,840 mm | |
| | Operating range | Long | 0.3 to 8.0 m (Typ. 12.0 m) | | 0.3 to 16.0 m (Typ. 24.0 m) | |
| | | Short | 0.3 to 2.4 m (Typ. 3.6 m) | | 0.3 to 5.6 m (Typ. 8.4 m) | |
| | | | * When operating at an ambient temperature of -10 to -30 °C, use the F3SG-SR with the operating range of 0.3 to 4.0 m in Long Mode and 0.3 to 1.2 m in Short Mode. | | | |
| | Response time | Normal mode | ON to OFF | Optical synchronization: 8 to 18 ms Wired synchronization: 10 to 21 ms | | Optical synchronization: 8 to 13 ms Wired synchronization: 10 to 17 ms |
| | | | OFF to ON | Optical synchronization: 40 to 90 ms Wired synchronization: 50 to 105 ms | | Optical synchronization: 40 to 90 ms Wired synchronization: 50 to 85 ms |
| | | ×2 Slow mode * | ON to OFF | Optical synchronization: 16 to 36 ms Wired synchronization: 20 to 42 ms | | Optical synchronization: 16 to 26 ms Wired synchronization: 20 to 34 ms |
| | | | OFF to ON | Optical synchronization: 80 to 180 ms Wired synchronization: 100 to 210 ms | | Optical synchronization: 80 to 130 ms Wired synchronization: 100 to 170 ms |
| | | ×4 Slow mode * | ON to OFF | Optical synchronization: 32 to 72 ms Wired synchronization: 40 to 84 ms | | Optical synchronization: 32 to 52 ms Wired synchronization: 40 to 68 ms |
| | | | OFF to ON | Optical synchronization: 160 to 360 ms Wired synchronization: 200 to 420 ms | | Optical synchronization: 160 to 260 ms Wired synchronization: 200 to 340 ms |
| ×8 Slow mode * | | ON to OFF | Optical synchronization: 64 to 144 ms Wired synchronization: 80 to 168 ms | | Optical synchronization: 64 to 104 ms Wired synchronization: 80 to 136 ms | |
| | | OFF to ON | Optical synchronization: 320 to 720 ms Wired synchronization: 400 to 840 ms | | Optical synchronization: 320 to 520 ms Wired synchronization: 400 to 680 ms | |
| | | * Selectable by SD Manager 3. | | | | |
| Effective aperture angle (EAA) (IEC 61496-2) | | ±2.5° max. * Emitter and receiver at operating range of 3 m or greater. | | | | |
| Light source | | Infrared LEDs, Wavelength: 870 nm | | | | |
| Startup waiting time | | 3 s max. | | | | |

| Model | | F3SG-4SRB□□□□-14-K | F3SG-4SRB□□□□-25-K | |
|------------------------------------|---------------------------------|---|--|--|
| Electric al | Power supply voltage (Vs) | SELV/PELV 24 VDC ±20% (ripple p-p 10% max.) | | |
| | Current consumption | Refer to page 77. | | |
| | Safety outputs (OSSD) | Two PNP or NPN transistor outputs (PNP or NPN is selectable by wiring of power supply.) Load current: 300 mA max., Residual voltage: 2 V max. (except for voltage drop due to cable extension), Capacitive load: 1 µF max., Inductive load: 2.2 H max. *1*2 Leakage current: 1 mA max. (PNP), 2 mA max. (NPN) *3 *1. The residual voltage is 3 V max. when the Intelligent Tap is connected to the sensor. *2. 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. *3. These values must be taken into consideration when connecting elements including a capacitive load such as a capacitor. | | |
| | Auxiliary output | Two PNP or NPN transistor 1 outputs (PNP or NPN is selectable by wiring of power supply.) Load current: 100 mA max., Residual voltage: 2 V max. * * The residual voltage is 3 V max. when the Intelligent Tap is connected to the sensor. | | |
| | Output operation mode | Safety output | Light-ON (Safety outputs are turned to the ON state when the receiver receives an emitting signal.) | |
| | | Auxiliary output | Safety output (Inverted signal output: Enable) (default) (Configurable by SD Manager 3) | |
| | Input voltage | TEST | Light emission stops when connected to 24 VDC ON voltage: Vs-3 V to Vs (short circuit current: approx. 5.0 mA) * OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 6.0 mA) * Light emission stops when connected to 0 VDC ON voltage: 0 to 3 V (short circuit current: approx. 6.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 5.0 mA) * | |
| | | OPERATING RANGE SELECT INPUT | Long: 12 V to Vs (short circuit current: approx. 4.2 mA) * or open Short: 0 to 3 V (short circuit current: approx. 4.2 mA) | |
| | | RESET/EDM | PNP | ON voltage: Vs-3 V to Vs (short circuit current: approx. 9.5 mA) * OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 13.0 mA) * |
| | | | NPN | ON voltage: 0 to 3 V (short circuit current: approx. 13.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 9.5 mA) * |
| | | MUTE A/B, RE-RESET, PSDI | PNP | ON voltage: Vs-3V to Vs (short circuit current: approx. 4.5 mA) * OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 7.0 mA) * |
| | | | NPN | ON voltage: 0 to 3 V (short circuit current: approx. 7.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 4.5 mA) * |
| | | * The Vs indicates a supply voltage value in your environment. | | |
| Overvoltage category (IEC 60664-1) | II | | | |
| Indicators | Refer to page 97. | | | |
| Protective circuit | Output short-circuit protection | | | |
| Insulation resistance | 20 M or higher (500 VDC megger) | | | |
| Dielectric strength | 1,000 VAC, 50/60 Hz (1 min) | | | |

F3SG-SR-K

| Model | | F3SG-4SRB□□□□-14-K | F3SG-4SRB□□□□-25-K |
|--------------------------------|--|--|---|
| Functional | Mutual interference prevention | Optical synchronization: The scan code is fixed to Code A. Wired synchronization: in up to 3 sets | |
| | Cascade connection | --- | |
| | Test function | Self-test (at power-on, and during operation) External test (light emission stop function by test input) | |
| | Safety-related functions | Interlock External Device Monitoring (EDM) Pre-Reset PSDI Fixed Blanking/Floating Blanking Reduced Resolution Muting/Override Mutual Interference Prevention PNP/NPN Selection Response Time Adjustment | |
| Environmental | Ambient temperature | Operating | -30 to 55 °C (non-icing) |
| | | Storage | -30 to 70 °C |
| | 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) | IEC 60529: IP65 and IP67, ISO 20653: IP69K | |
| | Vibration resistance (IEC 61496-1) | Class 3M4 (IEC TR 60721-4-3) Operation limit: 5 to 150 Hz, Multiple amplitude of 7 mm, Acceleration of 1 G, 10 sweeps each in X, Y, and Z directions (no delay at resonant frequencies) | |
| Shock resistance (IEC 61496-1) | Class 3M4 (IEC TR 60721-4-3) Operation limit: Acceleration of 15 G, Pulse duration of 6 ms, 100 shocks for each in X, Y, and Z directions (600 shocks in total) | | |
| Pollution degree (IEC 60664-1) | 3 | | |
| Connections | Root cable | Type of connection | Open-ended type |
| | | Number of wires | Emitter: 5, Receiver: 8 |
| | | Cable length | 15 m |
| | | Cable diameter | 6 mm |
| | | Minimum bending radius | R5 mm |
| | Cable extension | Refer to page 26 for restrictions on cable extension. | In optical synchronization: 100 m max. * between power supply and emitter and between power supply and receiver In wired synchronization: 100 m max. * between power supply and emitter, between power supply and receiver, and between emitter and receiver * When the Intelligent Tap (F39-SGIT-IL3) is connected to the sensor, this applies in the case of the rated power supply of 24 VDC to 24 VDC +20%. |
| Material | Pipe: Acrylic resin Cap: SUS316L | | |
| Weight | Refer to page 77. | | |
| Included accessories | Instruction Sheet, Quick Installation Manual, Troubleshooting Guide Sticker | | |
| Conformity | Conforming standards | Refer to page 111. | |
| | Type of ESPE (IEC 61496-1) | Type 4 | |
| | Performance Level (PL)/ Safety category | PL e/Category 4 (EN ISO 13849-1:2015) | |
| | PFH _b | 1.1×10 ⁻⁸ max. (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) | | |

Models/Response Time/Current Consumption/Weight

Finger protection (Detection capability: 14-mm dia.)

Models and Response Times

| Model | Number of beams | Protective height [mm] | Response time (Optical synchronization) [ms] | | | Response time (Wired synchronization) [ms] | |
|--------------------|-----------------|------------------------|--|--------------------------|------------------------------|--|-----------|
| | | | ON to OFF | OFF (synchronized) to ON | OFF (not synchronized) to ON | ON to OFF | OFF to ON |
| F3SG-4SRB0320-14-K | 31 | 320 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SRB0400-14-K | 39 | 400 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SRB0480-14-K | 47 | 480 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB0560-14-K | 55 | 560 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB0640-14-K | 63 | 640 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB0720-14-K | 71 | 720 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB0800-14-K | 79 | 800 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB0880-14-K | 87 | 880 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB0960-14-K | 95 | 960 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1000-14-K | 99 | 1000 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1200-14-K | 119 | 1200 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1400-14-K | 139 | 1400 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1600-14-K | 159 | 1600 | 18 | 90 | 190 | 21 | 105 |
| F3SG-4SRB1800-14-K | 179 | 1800 | 18 | 90 | 190 | 21 | 105 |

Models, Current Consumption and Weight

| Model | Number of beams | Protective height [mm] | Current consumption [mA] | | Weight [kg] | |
|--------------------|-----------------|------------------------|--------------------------|----------|-------------|-------|
| | | | Emitter | Receiver | Net | Gross |
| F3SG-4SRB0320-14-K | 31 | 320 | 74 | 100 | 5.2 | 6.7 |
| F3SG-4SRB0400-14-K | 39 | 400 | 77 | 101 | 5.5 | 7.0 |
| F3SG-4SRB0480-14-K | 47 | 480 | 79 | 103 | 5.8 | 7.4 |
| F3SG-4SRB0560-14-K | 55 | 560 | 82 | 104 | 6.1 | 7.7 |
| F3SG-4SRB0640-14-K | 63 | 640 | 85 | 106 | 6.4 | 8.1 |
| F3SG-4SRB0720-14-K | 71 | 720 | 87 | 107 | 6.7 | 8.5 |
| F3SG-4SRB0800-14-K | 79 | 800 | 90 | 109 | 7.0 | 8.8 |
| F3SG-4SRB0880-14-K | 87 | 880 | 93 | 110 | 7.3 | 9.2 |
| F3SG-4SRB0960-14-K | 95 | 960 | 95 | 112 | 7.6 | 9.6 |
| F3SG-4SRB1000-14-K | 99 | 1000 | 97 | 112 | 7.7 | 9.8 |
| F3SG-4SRB1200-14-K | 119 | 1200 | 103 | 116 | 8.5 | 10.6 |
| F3SG-4SRB1400-14-K | 139 | 1400 | 110 | 120 | 9.2 | 11.5 |
| F3SG-4SRB1600-14-K | 159 | 1600 | 117 | 124 | 10.0 | 12.5 |
| F3SG-4SRB1800-14-K | 179 | 1800 | 124 | 128 | 10.7 | 13.4 |

F3SG-SR/PG

F3SG-SR-K

Common to
F3SG-SR and F3SG-PG

Hand protection (Detection capability: 25-mm dia.)

Models and Response Times

| Model | Number of beams | Protective height [mm] | Response time (Optical synchronization) [ms] | | | Response time (Wired synchronization) [ms] | |
|--------------------|-----------------|------------------------|--|--------------------------|------------------------------|--|-----------|
| | | | ON to OFF | OFF (synchronized) to ON | OFF (not synchronized) to ON | ON to OFF | OFF to ON |
| F3SG-4SRB0320-25-K | 16 | 320 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SRB0400-25-K | 20 | 400 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SRB0480-25-K | 24 | 480 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SRB0560-25-K | 28 | 560 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SRB0640-25-K | 32 | 640 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SRB0720-25-K | 36 | 720 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SRB0800-25-K | 40 | 800 | 8 | 40 | 140 | 10 | 50 |
| F3SG-4SRB0880-25-K | 44 | 880 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB0960-25-K | 48 | 960 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1000-25-K | 50 | 1000 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1040-25-K | 52 | 1040 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1120-25-K | 56 | 1120 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1200-25-K | 60 | 1200 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1280-25-K | 64 | 1280 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1360-25-K | 68 | 1360 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1440-25-K | 72 | 1440 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1520-25-K | 76 | 1520 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1600-25-K | 80 | 1600 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1680-25-K | 84 | 1680 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1760-25-K | 88 | 1760 | 13 | 65 | 165 | 17 | 85 |
| F3SG-4SRB1840-25-K | 92 | 1840 | 13 | 65 | 165 | 17 | 85 |

Models, Current Consumption and Weight

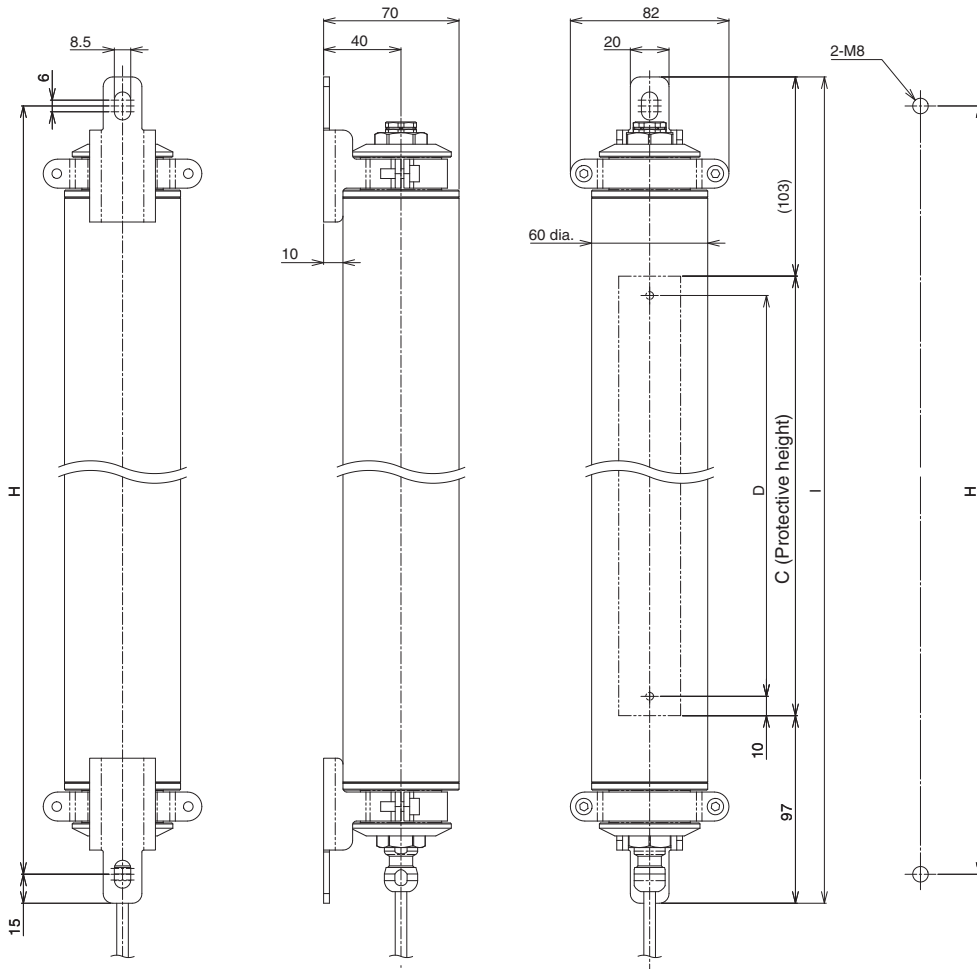
| Model | Number of beams | Protective height [mm] | Current consumption [mA] | | Weight [kg] | |
|--------------------|-----------------|------------------------|--------------------------|----------|-------------|-------|
| | | | Emitter | Receiver | Net | Gross |
| F3SG-4SRB0320-25-K | 16 | 320 | 65 | 97 | 5.2 | 6.7 |
| F3SG-4SRB0400-25-K | 20 | 400 | 66 | 98 | 5.5 | 7.0 |
| F3SG-4SRB0480-25-K | 24 | 480 | 68 | 99 | 5.8 | 7.4 |
| F3SG-4SRB0560-25-K | 28 | 560 | 70 | 99 | 6.1 | 7.7 |
| F3SG-4SRB0640-25-K | 32 | 640 | 72 | 100 | 6.4 | 8.1 |
| F3SG-4SRB0720-25-K | 36 | 720 | 74 | 101 | 6.7 | 8.5 |
| F3SG-4SRB0800-25-K | 40 | 800 | 76 | 101 | 7.0 | 8.8 |
| F3SG-4SRB0880-25-K | 44 | 880 | 78 | 102 | 7.3 | 9.2 |
| F3SG-4SRB0960-25-K | 48 | 960 | 80 | 102 | 7.6 | 9.6 |
| F3SG-4SRB1000-25-K | 50 | 1000 | 81 | 103 | 7.7 | 9.8 |
| F3SG-4SRB1040-25-K | 52 | 1040 | 82 | 103 | 7.9 | 9.9 |
| F3SG-4SRB1120-25-K | 56 | 1120 | 84 | 104 | 8.2 | 10.3 |
| F3SG-4SRB1200-25-K | 60 | 1200 | 86 | 104 | 8.5 | 10.6 |
| F3SG-4SRB1280-25-K | 64 | 1280 | 88 | 105 | 8.8 | 11.0 |
| F3SG-4SRB1360-25-K | 68 | 1360 | 90 | 106 | 9.1 | 11.4 |
| F3SG-4SRB1440-25-K | 72 | 1440 | 92 | 106 | 9.4 | 11.7 |
| F3SG-4SRB1520-25-K | 76 | 1520 | 93 | 107 | 9.7 | 12.1 |
| F3SG-4SRB1600-25-K | 80 | 1600 | 95 | 107 | 10.0 | 12.5 |
| F3SG-4SRB1680-25-K | 84 | 1680 | 97 | 108 | 10.3 | 12.8 |
| F3SG-4SRB1760-25-K | 88 | 1760 | 99 | 109 | 10.6 | 13.2 |
| F3SG-4SRB1840-25-K | 92 | 1840 | 101 | 109 | 10.9 | 13.5 |

Dimensions

F3SG-SR-K Main Unit

Mounted with IP69K Model Mounting Brackets (F39-LSGTB-K)

Side mounting and backside mounting

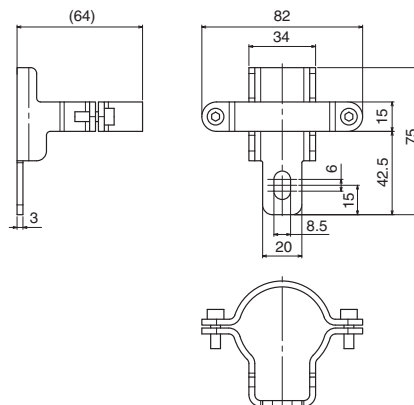


| | | |
|-------------|---|------|
| Dimension C | 4-digit number in model number (Protective height: Δ) | |
| Dimension D | F3SG-□SR□△△△△-14 | C-20 |
| | F3SG-□SR□△△△△-25 | |
| Dimension H | C+170 | |
| Dimension I | C+200 | |

Accessories

Bracket

IP69K Model Mounting Bracket (F39-LSGTB-K, sold separately)



Material: SUS316L

F3SG-SR/PG

F3SG-SR-K

Common to F3SG-SR and F3SG-PG

Common to F3SG-SR and F3SG-PG

Common to F3SG-SR and F3SG-PG

Connectable Safety Controllers

The F3SG-SR/PG in the PNP system can be connected to the safety controllers listed in the table below.

| Connectable safety controllers (PNP output) | | |
|---|----------------|----------------|
| G9SA-301 | G9SX-AD322-T | G9SP-N10S |
| G9SA-321-T□ | G9SX-ADA222-T | G9SP-N10D |
| G9SA-501 | G9SX-BC202 | G9SP-N20S |
| G9SB-200-B | G9SX-GS226-T15 | NE0A-SCPU01 |
| G9SB-200-D | | NE1A-SCPU01 |
| G9SB-301-B | | NE1A-SCPU02 |
| G9SB-301-D | | DST1-ID12SL-1 |
| G9SE-201 | | DST1-MD16SL-1 |
| G9SE-401 | | DST1-MRD08SL-1 |
| G9SE-221-T□ | | NX-SIH400 |
| F3SP-T01 * | | NX-SID800 |
| | | GI-SMD1624 |
| | | GI-SID1224 |

* F3SP-T01 was discontinued at the end of March 2020.

The F3SG-SR/PG in the NPN system can be connected to the safety controller listed in the table below.

| Connectable safety Controllers (NPN output) |
|---|
| G9SA-301-P |

For the connection to IO-Link with the Intelligent Tap, the F3SG-SR/PG can be connected to the IO-Link master unit listed in the table below.

| Connectable IO-Link master units * |
|------------------------------------|
| NX-ILM400 |
| GX-ILM08C |

* Connectable to units supporting IO-Link Version 1.1.

System Configuration

Example 1. Basic system: ON-OFF control

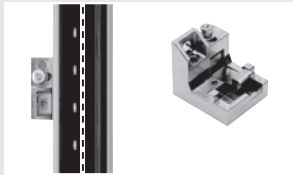
Feature: Easy connection, ON-OFF control
Factory default setting
Without monitoring on PC or smartphone via network
Optical synchronization

[1] F3SG-SR/PG

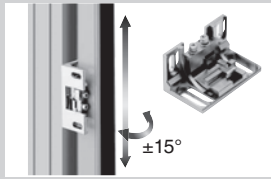
Receiver, Emitter

[2] Bracket (Sold separately)

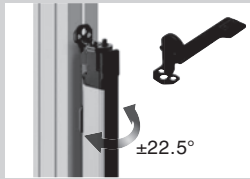
Standard Fixed Bracket (Intermediate Bracket)
 F39-LSGF



Adjustable Side-Mount Bracket (Intermediate Bracket)
 F39-LSGA



Adjustable Top/Bottom Bracket (Intermediate Bracket)
 F39-LSGTB-SJ
 F39-LSGTB-RE
 F39-LSGTB-MS



[3] Connecting Cable (Sold separately)

- (1) Root-Straight Cable (For emitter)
 F39-JG□C-L Color: Gray, 5 wires
- (2) Root-Straight Cable (For receiver)
 F39-JG□C-D Color: Black, 8 wires

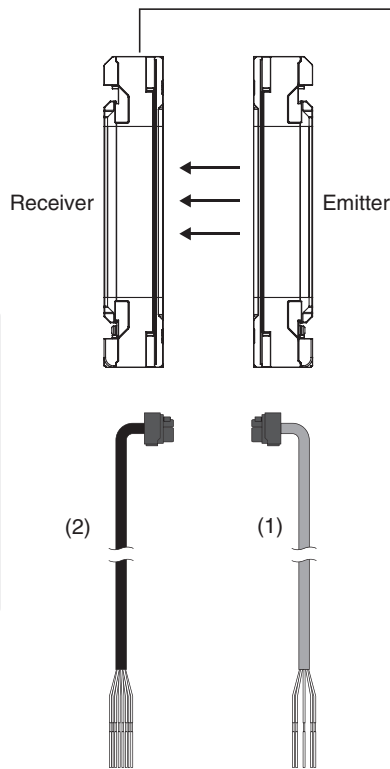
[4] Accessories (Sold separately)

Lamp
 F39-SGLP
 Attachable to receiver only

Other Optional Accessories

Laser Pointer
 F39-PTS
 F39-PTG

Spatter Protection Cover (For F3SG-SR)
 F39-HSG



F3SG-SR/PG

F3SG-SR-K

Common to F3SG-SR and F3SG-PG

Common to F3SG-SR and F3SG-PG

Example 2. Cascading using Intelligent Tap

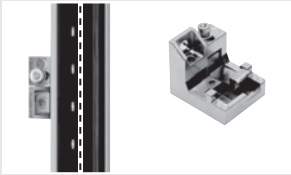
Feature:
Flexible functional setting and monitoring of multiple light curtains using SD Manager 3
Wired synchronization

[1] F3SG-SR/PG

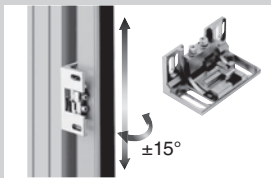
Receiver, Emitter

[2] Bracket (Sold separately)

Standard Fixed Bracket (Intermediate Bracket)
 F39-LSGF



Adjustable Side-Mount Bracket (Intermediate Bracket)
 F39-LSGA



Adjustable Top/Bottom Bracket (Intermediate Bracket)
 F39-LSGTB-SJ
 F39-LSGTB-RE
 F39-LSGTB-MS



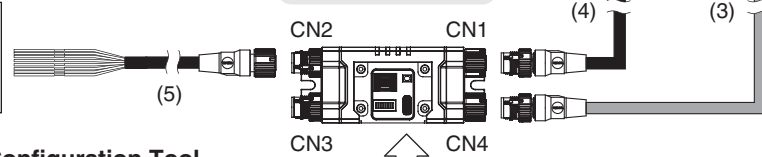
[3] Connecting Cable (Sold separately)

- (1) Root-Plug Cable for Extended (For emitter)
 F39-JGR3K-L Color: Gray, 5 wires, 0.3 m
- (2) Root-Plug Cable for Extended (For receiver)
 F39-JGR3K-D Color: Black, 8 wires, 0.3 m
- (3) Extended Plug-Socket Cable (For emitter)
 F39-JG□B-L Color: Gray, 5 wires
- (4) Extended Plug-Socket Cable (For receiver)
 F39-JG□B-D Color: Black, 8 wires
- (5) Extended Socket-Straight Cable
 F39-JG□A-D Color: Black, 8 wires
- (6) Cascading Cable for Extended
 (For emitter and receiver, two cables per set, 0.3 m)
 F39-JGR3W

[5] Intelligent Tap (Sold separately)

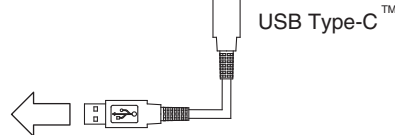
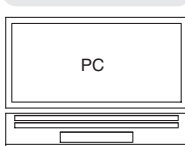
F39-SGIT-IL3

Safety outputs (OSSD) · Power Supply (Control panel)



[6] Configuration Tool

SD Manager3



[4] Accessories (Sold separately)

Lamp
 F39-SGLP
 Emitter and Receiver Mountable

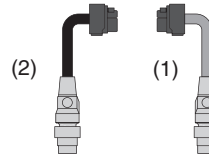
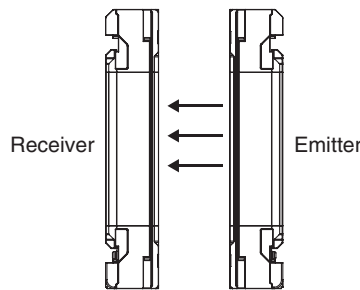
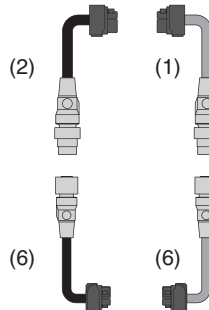
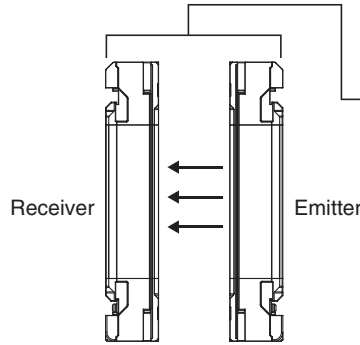


Other Optional Accessories

Laser Pointer
 F39-PTS
 F39-PTG



Spatter Protection Cover (For F3SG-SR)
 F39-HSG



Example 3. IO-Link Monitoring system

Feature:

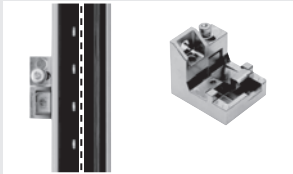
Data collection and status monitoring using open network are available
Wired synchronization

[1] F3SG-SR/PG

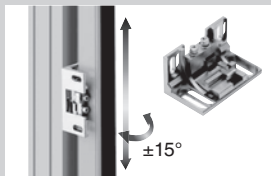
Receiver, Emitter

[2] Bracket (Sold separately)

Standard Fixed Bracket (Intermediate Bracket)
F39-LSGF



Adjustable Side-Mount Bracket (Intermediate Bracket)
F39-LSGA



Adjustable Top/Bottom Bracket
F39-LSGTB-SJ
F39-LSGTB-RE
F39-LSGTB-MS



[3] Connecting Cable (Sold separately)

- (1) Root-Plug Cable for Extended (For emitter)
F39-JGR3K-L Color: Gray, 5 wires, 0.3 m
- (2) Root-Plug Cable for Extended (For receiver)
F39-JGR3K-D Color: Black, 8 wires, 0.3 m
- (3) Extended Plug-Socket Cable (For emitter)
F39-JG□B-L Color: Gray, 5 wires
- (4) Extended Plug-Socket Cable (For receiver)
F39-JG□B-D Color: Black, 8 wires
- (5) Extended Socket-Straight Cable
F39-JG□A-D Color: Black, 8 wires
- (6) IO-Link Cable
Plug-Socket F39-JG□B-L
Root-Straight XS5F-D521-DJ0-IL

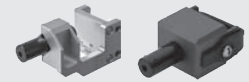
[4] Accessories (Sold separately)

Lamp
F39-SGLP
Emitter and Receiver Mountable

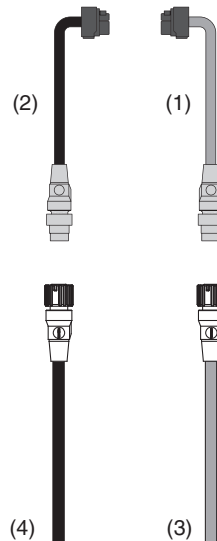
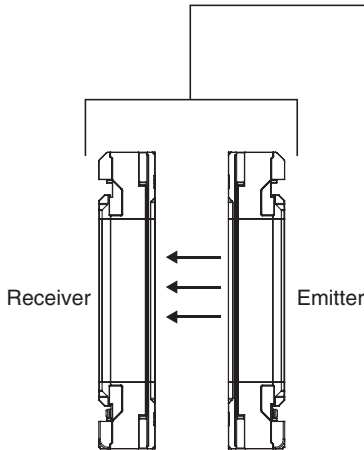


Other Optional Accessories

Laser Pointer
F39-PTS
F39-PTG

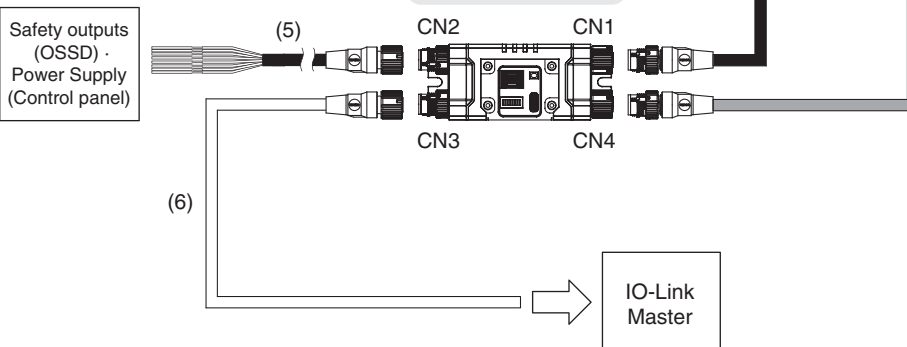


Spatter Protection Cover (For F3SG-SR)
F39-HSG



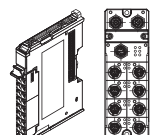
[5] Intelligent Tap (Sold separately)

F39-SGIT-IL3



[6] IO-Link Master unit (Sold separately)

NX-series
NX-ILM400
GX-series
GX-ILM08C



F3SG-SR/PG

F3SG-SR-K

Common to F3SG-SR and F3SG-PG

Common to F3SG-SR and F3SG-PG

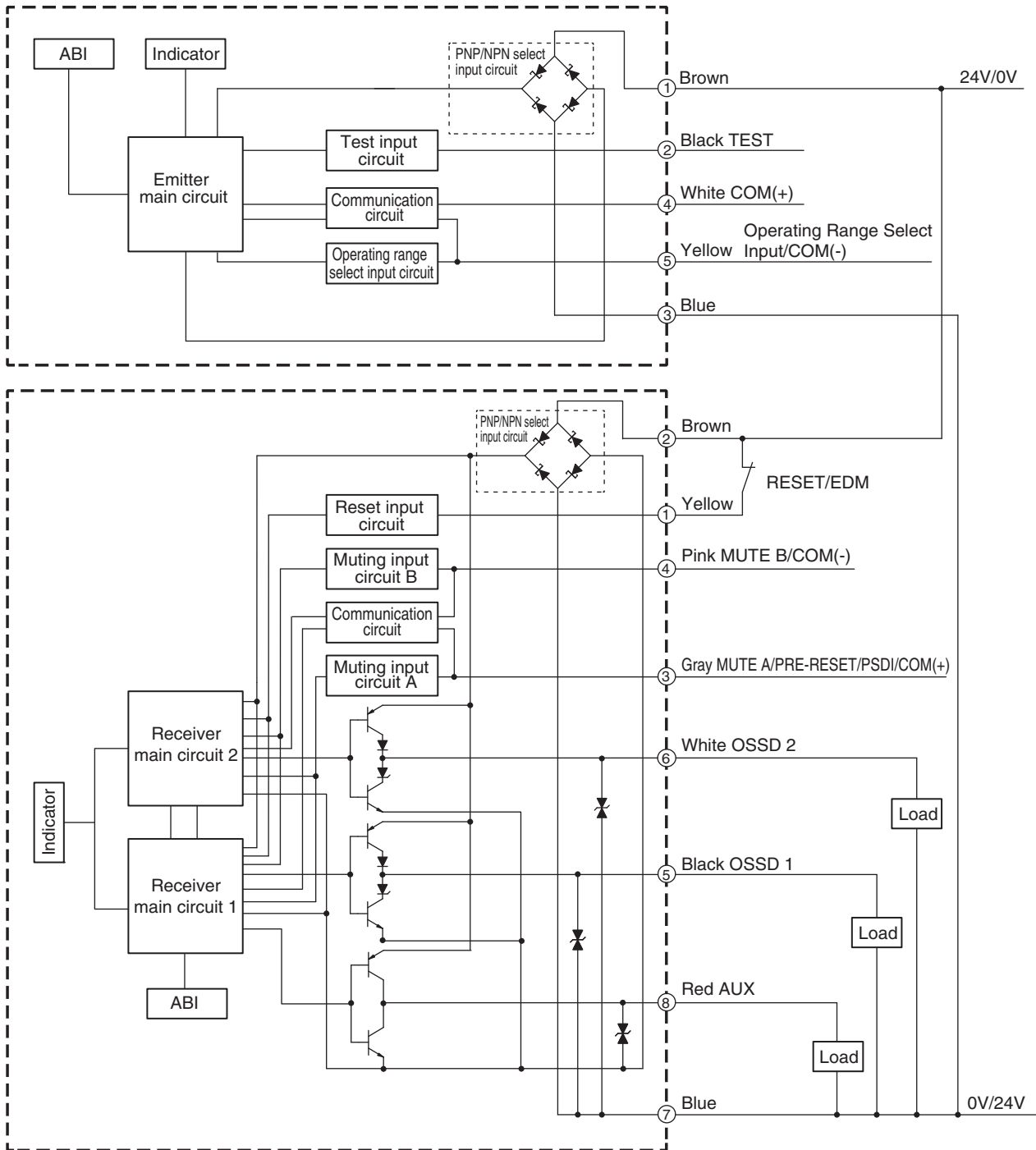
Input/Output Circuit

Entire Circuit Diagram

F3SG-SR and F3SG-PGA-A/-L

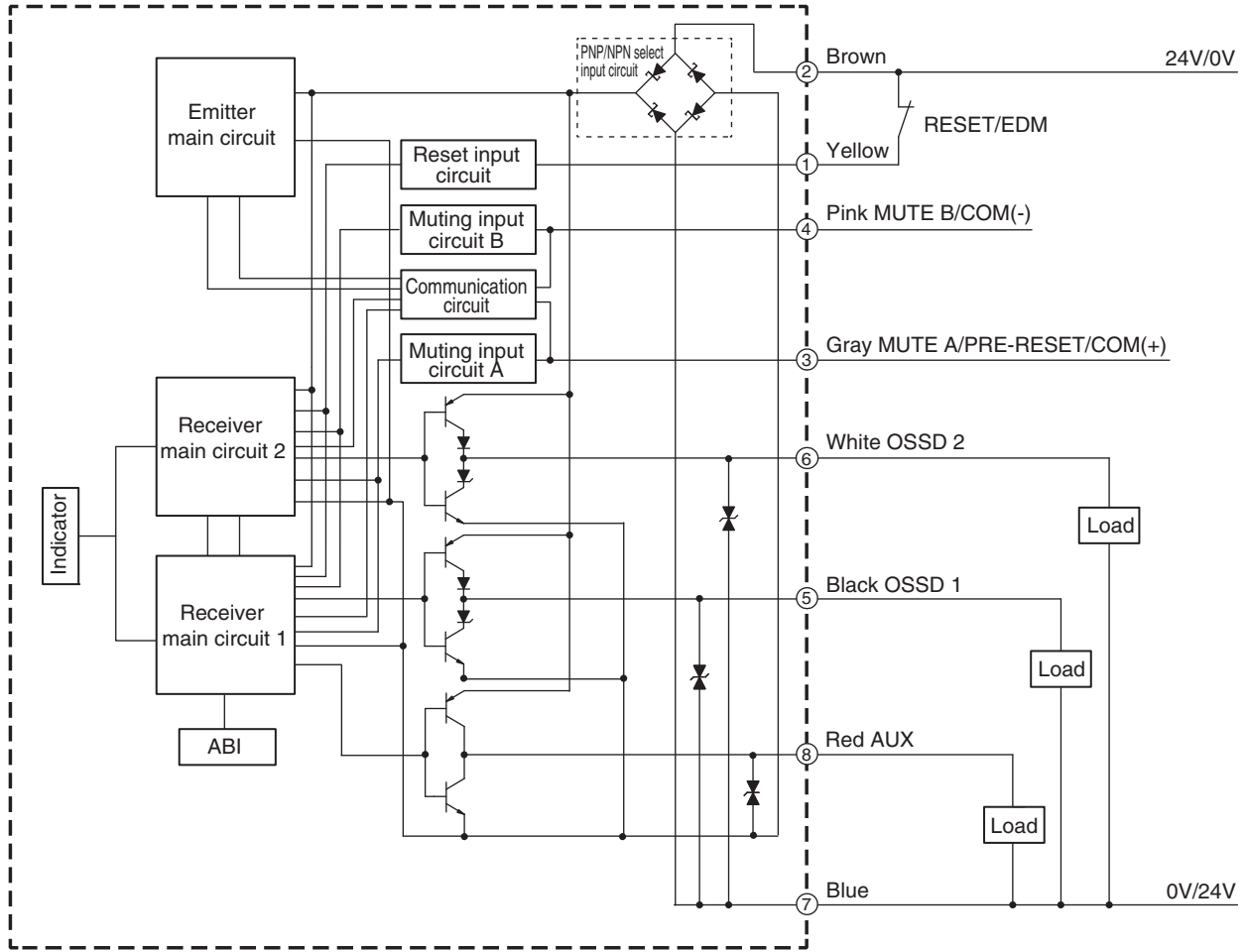
The entire circuit diagram of the F3SG-SR/PG is shown below.

The numbers in the circles indicate the connector's pin numbers.



F3SG-PGA-C

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



F3SG-SR/PG

F3SG-SR-K

Common to F3SG-SR and F3SG-PG

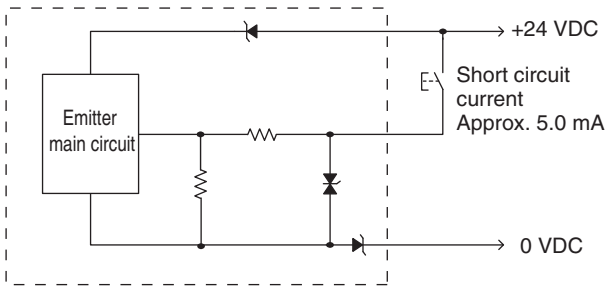
Common to F3SG-SR and F3SG-PG

Input Circuit Diagram by Function

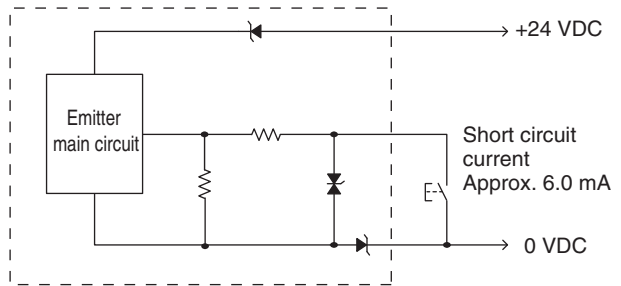
The input circuit diagrams of by function are shown below.

Test Input #1

<Light emission stops when connected to 24 VDC>



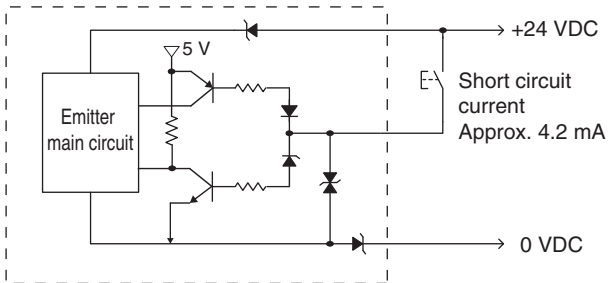
<Light emission stops when connected to 0 V>



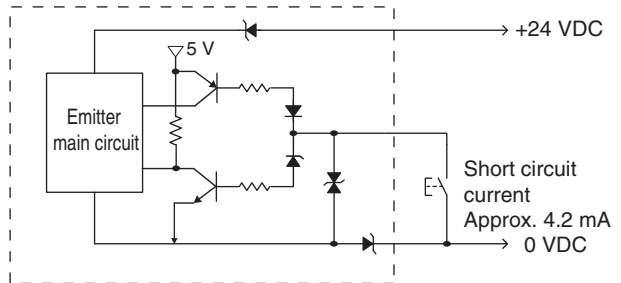
*1. The F3SG-PGA-C does not have a test input function.

Operating Range Select Input #2

<Long>



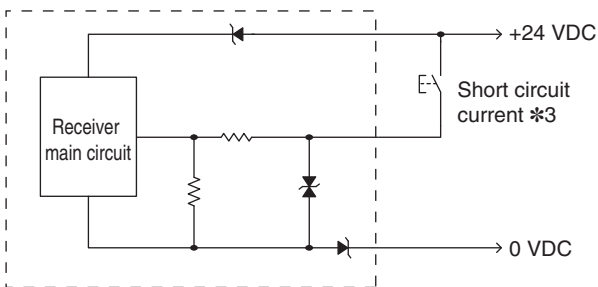
<Short>



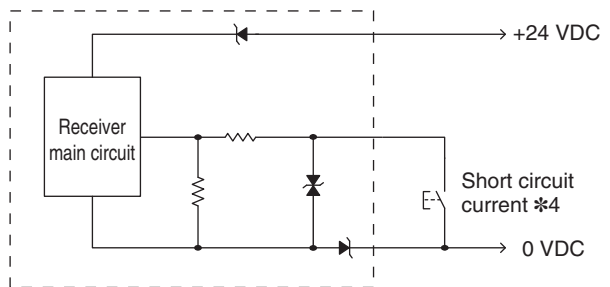
*2. The F3SG-PGA-A-C do not have an operation range select input function.

RESET/EDM, MUTE A/B

<PNP>



<NPN>



*3. Short circuit current: approx. 9.5 mA (RESET/EDM), approx. 4.5 mA (MUTE A/B)

*4. Short circuit current: approx. 13.0 mA (RESET/EDM), approx. 7.0 mA (MUTE A/B)

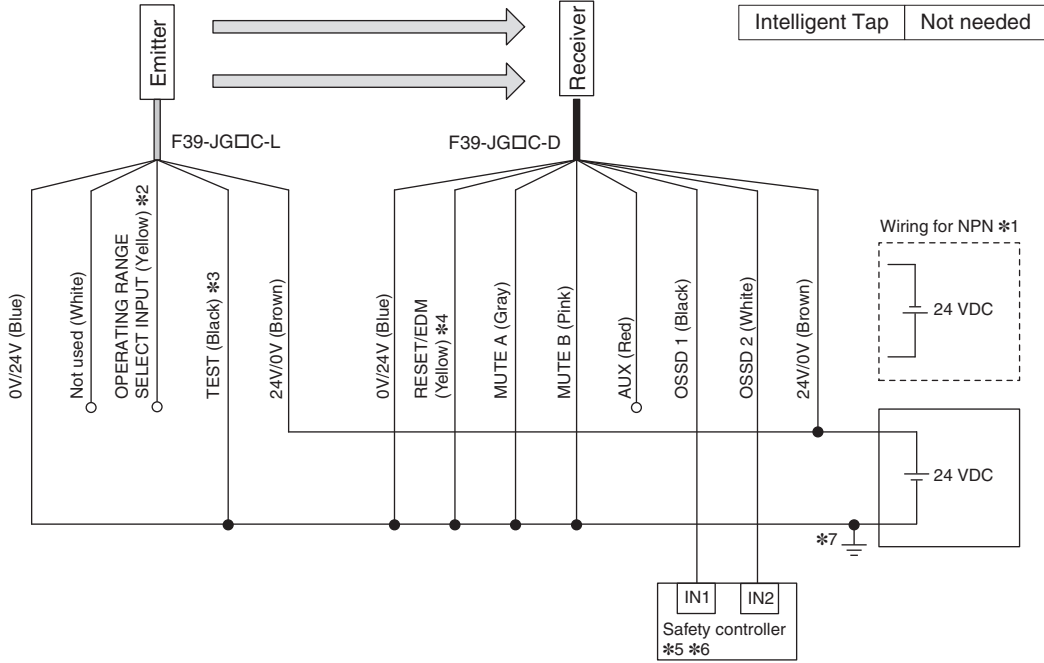
Connections (Basic Wiring Diagram)

F3SG-SR/PG

Examples of a motor control system using the F3SG-SR/PG are shown below. The examples are equivalent to up to PLe, Category 4 (ISO 13849-1).

Non-Muting System Wiring Examples Auto Reset Mode with Optical Synchronization and EDM Unused [Wiring Example 1 (F3SG-SR and F3SG-PGA-A/-L)]

| | | | |
|----------|-----------|---------------|-----------|
| F3SG-SRA | Available | F3SG-PGA-A/-L | Available |
| F3SG-SRB | Available | F3SG-PGA-C | Available |



| Function | Setting |
|---------------------------|---|
| EDM | EDM Disabled (factory default setting) |
| Interlock | Auto Reset (factory default setting) |
| Operating Range Selection | Long : Open the OPERATING RANGE SELECT INPUT line of the emitter or connect the line to 24 VDC. |
| Non-Muting system | Perform wiring according to the wiring diagram. |
| External Test not used | Connect the TEST line of the emitter to 0V/24V of the emitter. |
| Optical Synchronization | Do not connect the COM(+) and COM(-) lines of the of emitter and receiver with each other. |

Timing chart



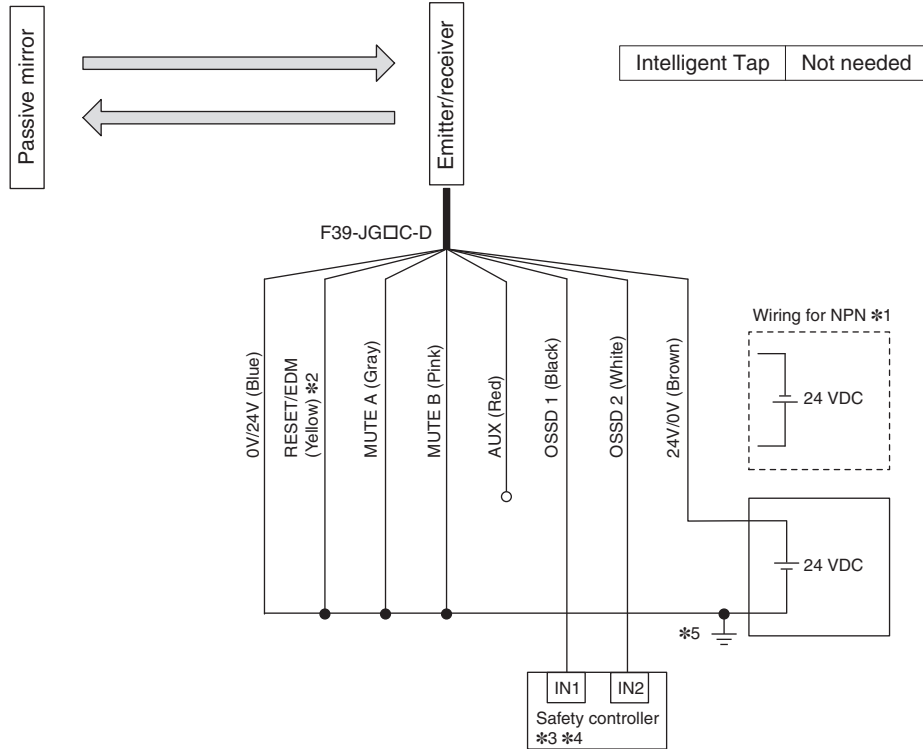
- *1. Reverse the polarity of the power supply when using in the NPN system. Select a safety controller of PNP or NPN type according to the system of your application.
- *2. Connect the line to 0 V if F3SG-SR or F3SG-PGA-L is used in Short Mode.
- *3. If External Test is used, refer to the *User's Manual* (Man.No.Z405).
- *4. Connect the line to 24V/0V (brown) of the receiver via a lockout reset switch (NC contact) if Lockout Reset is used.
- *5. Refer to page 80 for more information.
- *6. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
- *7. This is the case for a PELV circuit.

Note: Functional earth connection to the F3SG-SR/PG housing is unnecessary when you use the F3SG-SR/PG in a general industrial environment where noise control or stable power supply is considered. However, when you use the F3SG-SR/PG in an environment where there may be excessive noise from surroundings or stable power supply may be interfered, it is recommended the F3SG-SR/PG be connected to functional earth.

The wiring examples in later pages do not indicate functional earth. To use functional earth, wire an earth cable according to the example above. Refer to the *User's Manual* (Man.No.Z405) for more information.

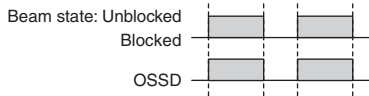
Common to F3SG-SR and F3SG-PG

[Wiring Example 2 (F3SG-PGA-C)]



| Function | Setting |
|-------------------------|---|
| EDM | EDM Disabled (factory default setting) |
| Interlock | Auto Reset (factory default setting) |
| Non-Muting system | Perform wiring according to the wiring diagram. |
| Optical Synchronization | --- |

Timing chart



- *1. Reverse the polarity of the power supply when using in the NPN system. Select a safety controller of PNP or NPN type according to the system of your application.
- *2. Connect the line to 24V/0V (brown) of the receiver via a lockout reset switch (NC contact) if Lockout Reset is used.
- *3. Refer to page 80 for more information.
- *4. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
- *5. This is the case for a PELV circuit.

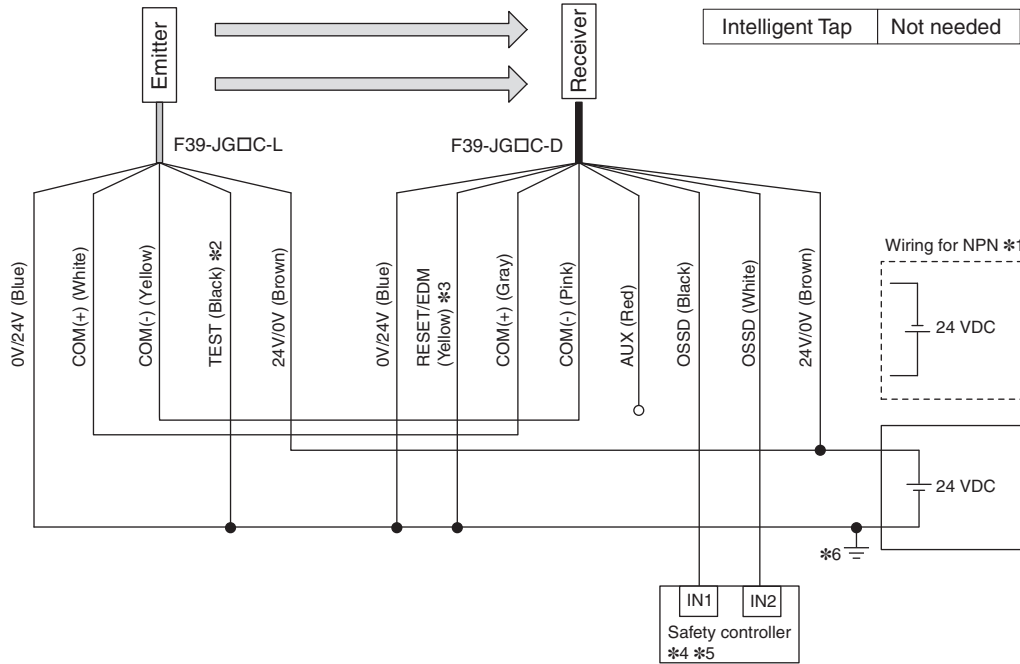
Note: Functional earth connection to the F3SG-SR/PG housing is unnecessary when you use the F3SG-SR/PG in a general industrial environment where noise control or stable power supply is considered. However, when you use the F3SG-SR/PG in an environment where there may be excessive noise from surroundings or stable power supply may be interfered, it is recommended the F3SG-SR/PG be connected to functional earth.

The wiring examples in later pages do not indicate functional earth. To use functional earth, wire an earth cable according to the example above. Refer to the *User's Manual* (Man.No.Z405) for more information.

Auto Reset Mode with Wired Synchronization and EDM Unused

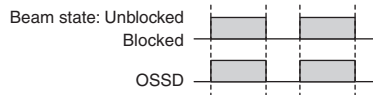
| | | | |
|----------|-----------|---------------|---------------|
| F3SG-SRA | Available | F3SG-PGA-AI-L | Available |
| F3SG-SRB | Available | F3SG-PGA-C | Not available |

[Wiring Example]



| Function | Setting |
|---------------------------|---|
| EDM | EDM Disabled (factory default setting) |
| Interlock | Auto Reset (factory default setting) |
| Operating Range Selection | Long (factory default setting) |
| Non-Muting system | Perform wiring according to the wiring diagram. |
| External Test not used | Connect the TEST line of the emitter to 0V/24V of the emitter. |
| Optical Synchronization | Connect the COM(+) and COM(-) line of the emitter and receiver with each other. |

Timing chart



- *1. Reverse the polarity of the power supply when using in the NPN system. Select a safety controller of PNP or NPN type according to the system of your application.
- *2. If External Test is used, refer to the *User's Manual* (Man.No.Z405).
- *3. Connect the line to 24V/0V (brown) of the receiver via a lockout reset switch (NC contact) if Lockout Reset is used.
- *4. Refer to page 80 for more information.
- *5. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
- *6. This is the case for a PELV circuit.

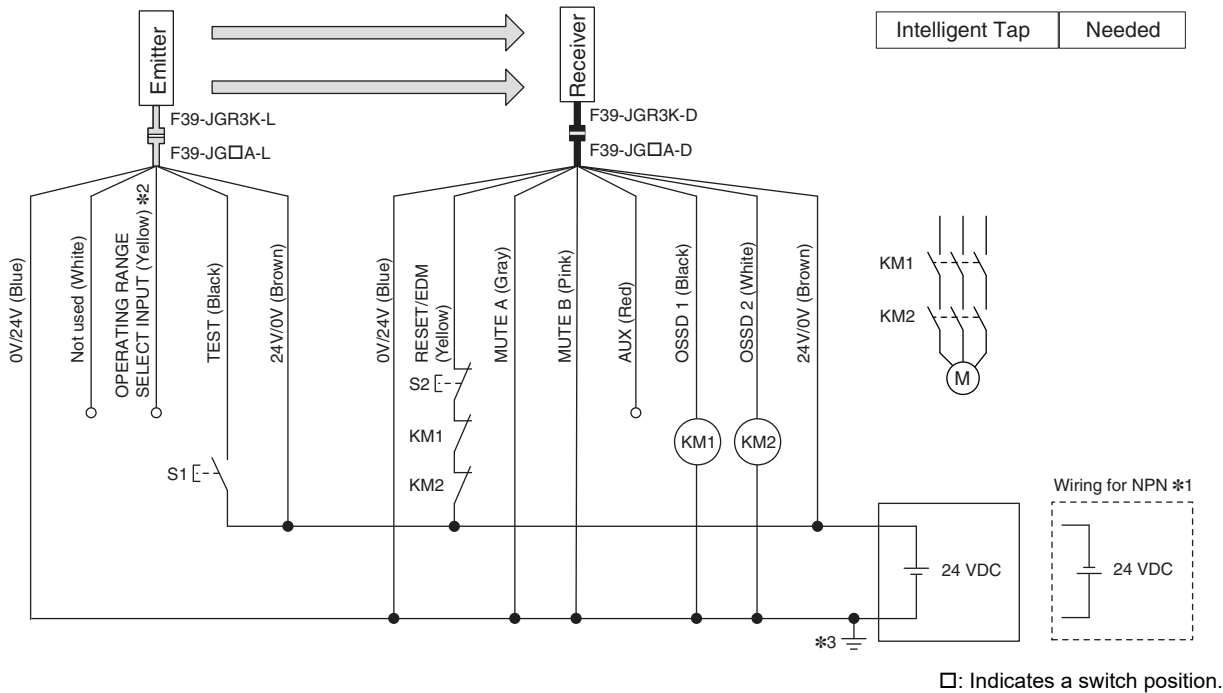
Note: For the functional earth connection, refer to page 87.

Common to F3SG-SR and F3SG-PG

Manual Reset Mode with EDM

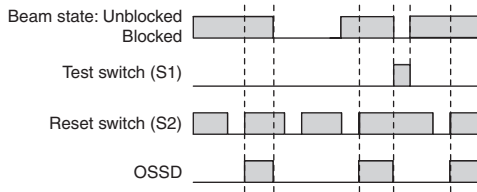
| | | | |
|----------|-----------|---------------|--------------|
| F3SG-SRA | Available | F3SG-PGA-A/-L | Available |
| F3SG-SRB | Available | F3SG-PGA-C | Available *6 |

[Wiring Example]



| Function | Setting | |
|---------------------------|---|--|
| | DIP switch | SD Manager 3 |
| EDM *4 | EDM Enabled 3 <input type="checkbox"/> ON | [External device monitoring] : Enable |
| Interlock *4 | Manual Reset (Start/Restart Interlock) 4 <input type="checkbox"/> ON | [Start interlock] : Enable |
| | 5 <input type="checkbox"/> ON | [Restart interlock] : Enable |
| Operating Range Selection | Long : Open the OPERATING RANGE SELECT INPUT line of the emitter or connect the line to 24 VDC. | |
| Non-Muting system | Perform wiring according to the wiring diagram. | |
| | N/A | [Muting] : Disable *4 |
| External Test used *7 | Connect the TEST line of the emitter to 24V/0V of the emitter via a test switch (NO contact).*5 | |
| | N/A | [External test signal inversion] : Disable |
| Optical Synchronization | Do not connect the COM(+) and COM(-) lines of the of emitter and receiver with each other. | |

Timing chart



S1: Test switch
 S2: Lockout/interlock reset switch
 KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor
 M: Motor

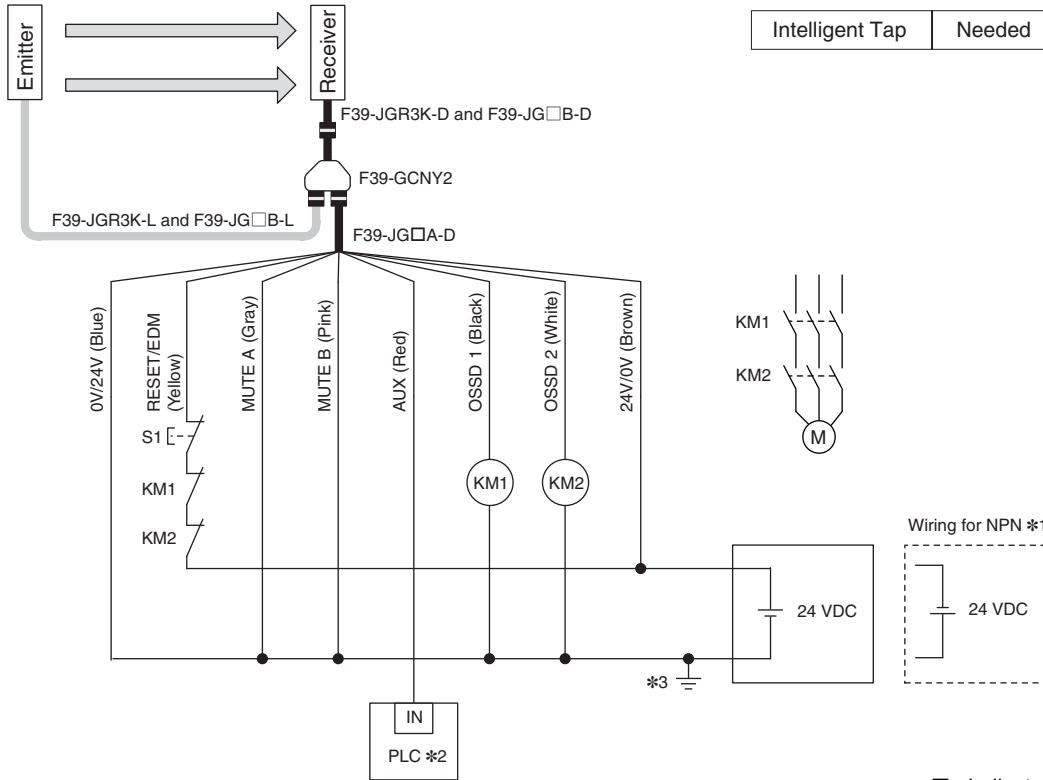
- *1. Reverse the polarity of the power supply when using in the NPN system.
- *2. Connect the line to 0 VDC if Operating Range Selection is used in Short Mode.
- *3. This is the case for a PELV circuit.
- *4. Set the function with the DIP Switches on the Intelligent Tap or the SD Manager 3, restore the settings to the F3SG-SR/PG, and perform wiring according to the wiring diagram.
- *5. This wiring example shows light emission stop when connected to 24 VDC with PNP setting, and light emission stop when connected to 0 VDC with NPN setting. If TEST switch is not needed, refer to the *User's Manual* (Man. No. Z405).
- *6. When wiring the emitter/receiver of the F3SG-PGA-C, follow the same wiring as for the receiver in the figure above. Wiring of the emitter side is not required.
- *7. The F3SG-PGA-C does not support the external test function.

Note: For the functional earth connection, refer to page 87.

Manual Reset Mode with EDM and Y-Joint Plug/Socket Connector

| | | | |
|----------|-----------|--------------|---------------|
| F3SG-SRA | Available | F3SG-PGA-A-L | Available |
| F3SG-SRB | Available | F3SG-PGA-C | Not available |

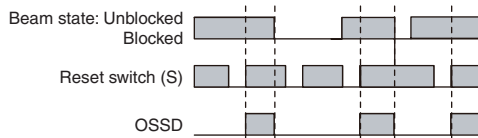
[Wiring Example]



□ : Indicates a switch position.

| Function | Setting | |
|---------------------------|---|--|
| | DIP switch | SD Manager 3 |
| EDM *4 | EDM Enabled 3 <input type="checkbox"/> ON | [External device monitoring] : Enable |
| Interlock *4 | Manual Reset (Start/Restart Interlock) 4 <input type="checkbox"/> ON 5 <input type="checkbox"/> ON | [Start interlock] : Enable [Restart interlock] : Enable |
| Operating Range Selection | Long | |
| Non-Muting system | Perform wiring according to the wiring diagram. | |
| External Test not used | N/A | [Muting] : Disable *4 |
| Optical Synchronization | Connect the wires according to the diagram above. | |

Timing chart



S1: Lockout/interlock reset switch
 KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor
 M: Motor
 PLC: Programmable logic controller (Used for monitoring only. NOT related to safety system.)

- *1. Reverse the polarity of the power supply when using in the NPN system. Select a PLC of PNP or NPN type according to the system of your application.
- *2. When connecting to the PLC, the output mode must be changed with the SD Manager 3 according to your application. For the setting this function, refer to the *User's Manual* (Man.No.Z405).
- *3. This is the case for a PELV circuit.
- *4. Set the function with the DIP Switches on the Intelligent Tap or the SD Manager 3, restore the settings to the F3SG-SR/PG, and perform wiring according to the wiring diagram.

Note: 1. When using the Y-Joint Plug/Socket Connector (F39-GCNY2), the following functions are not available.

- External Test
- Operating Range Selection by wiring
- Wired Synchronization

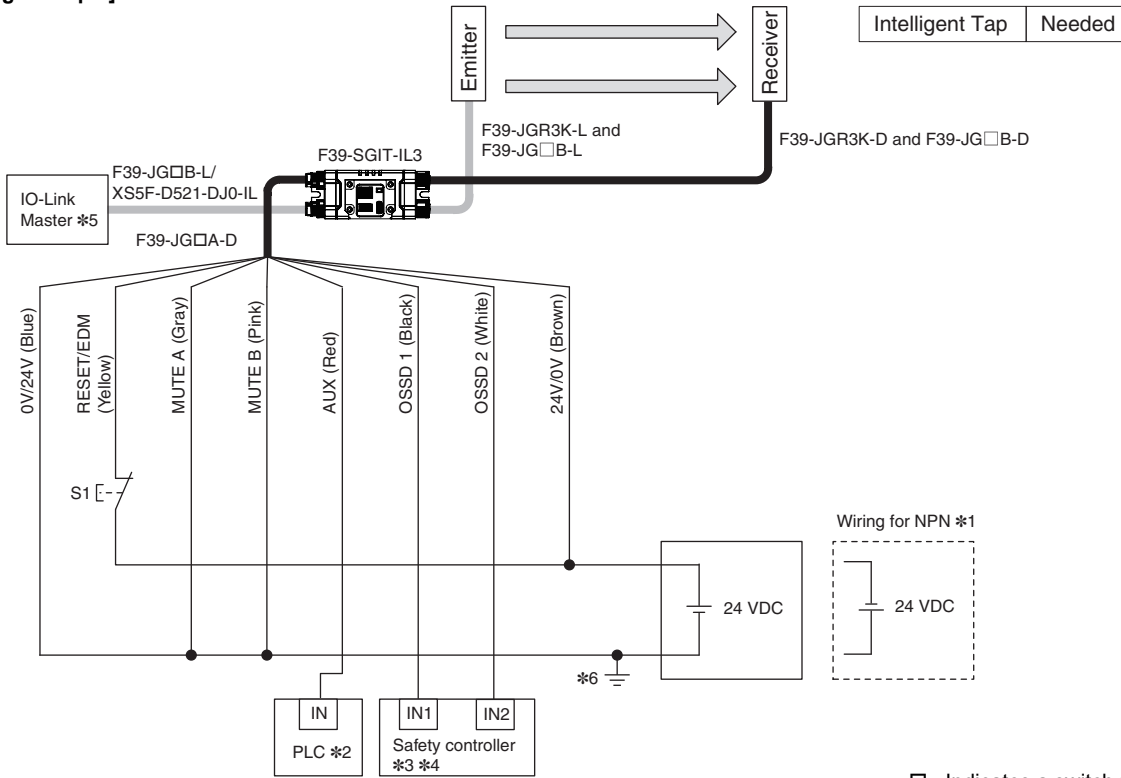
2. For the functional earth connection, refer to page 87.

Common to F3SG-SR and F3SG-PG

Manual Reset Mode with Intelligent Tap

| | | | |
|----------|-----------|---------------|--------------|
| F3SG-SRA | Available | F3SG-PGA-A/-L | Available |
| F3SG-SRB | Available | F3SG-PGA-C | Available *9 |

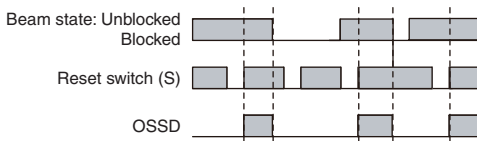
[Wiring Example]



□ : Indicates a switch position.

| Function | Setting | |
|------------------------------|---|--|
| | DIP switch | SD Manager 3 |
| EDM | EDM Disabled 3 <input type="checkbox"/> ON | [External device monitoring] : Disable |
| Interlock #7 | Manual Reset (Start/Restart Interlock) 4 <input type="checkbox"/> ON 5 <input type="checkbox"/> ON | [Start interlock] : Enable [Restart interlock] : Enable |
| Operating Range Selection #8 | Long 8 <input type="checkbox"/> ON | [Operating Range Selection] : Long mode |
| Non-Muting system | Perform wiring according to the wiring diagram. N/A | [Muting] : Disable *7 |
| Test Input | N/A | |
| Wired Synchronization | Connect the emitter and receiver with the Intelligent Tap. | |

Timing chart



S1: Lockout/interlock reset switch
PLC: Programmable logic controller (Used for monitoring only.
NOT related to safety system.)

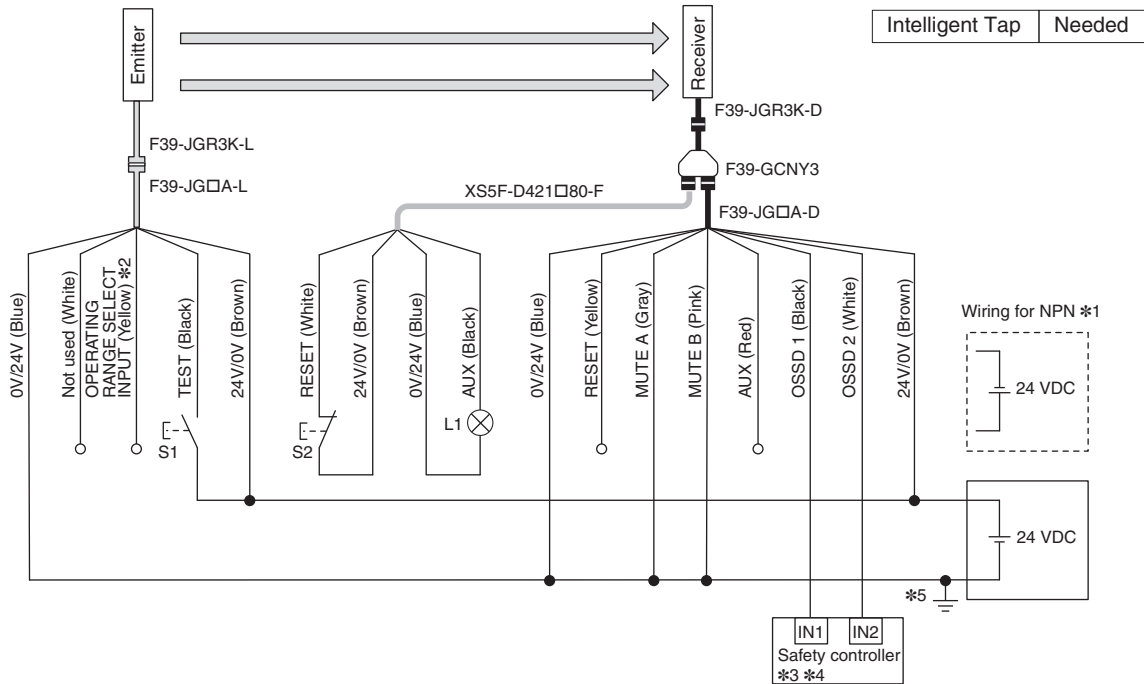
- *1. Reverse the polarity of the power supply when using in the NPN system. Select a PLC and a safety controller of PNP or NPN type according to the system of your application.
- *2. When connecting to the PLC, the output mode must be changed with the SD Manager 3 according to your application. For the setting this function, refer to the *User's Manual* (Man.No.Z405).
- *3. Refer to page 80 for more information.
- *4. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
- *5. For connecting with the IO-Link Master unit, refer to an instruction manual of the IO-Link Master unit you use.
- *6. This is the case for a PELV circuit.
- *7. Set the function with the DIP Switches on the Intelligent Tap or the SD Manager 3, restore the settings to the F3SG-SR/PG, and perform wiring according to the wiring diagram.
- *8. To set the Short mode, set the function with the DIP Switches on the Intelligent Tap or the SD Manager 3, restore the settings to the F3SG-SR/PG, and perform wiring according to the wiring diagram.
- *9. When wiring the emitter/receiver of the F3SG-PGA-C, follow the same wiring as for the receiver in the figure above. Wiring of the emitter side is not required

- Note:**
1. When using the Intelligent Tap (F39-SGIT-IL3) with the emitter and receiver connected, the following functions are not available.
 - External Test
 - Operating Range Selection by wiring
 - Optical Synchronization
 2. For the functional earth connection, refer to page 87.

Manual Reset Mode with Reset Switch Connector

| | | | |
|----------|-----------|---------------|--------------|
| F3SG-SRA | Available | F3SG-PGA-AI-L | Available |
| F3SG-SRB | Available | F3SG-PGA-C | Available *9 |

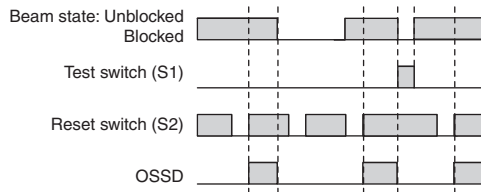
[Wiring Example]



□ : Indicates a switch position.

| Function | Setting | |
|---------------------------|--|--|
| | DIP switch | SD Manager 3 |
| EDM | EDM Disabled (factory default setting) | [External device monitoring] : Disable |
| Interlock *6 | Manual Reset (Start/Restart Interlock) 4 <input type="checkbox"/> ON 5 <input type="checkbox"/> ON | [Start interlock] : Enable [Restart interlock] : Enable |
| Operating Range Selection | Long : Open the OPERATING RANGE SELECT INPUT line of the emitter or connect the line to 24 VDC. | |
| Non-Muting system | Perform wiring according to the wiring diagram. N/A | [Muting] : Disable *6 |
| External Test used *8 | Connect the TEST line of the emitter to 24V/0V of the emitter via a test switch (NO contact). *7 N/A | |
| Optical Synchronization | Open the COM(+) and COM(-) lines of the emitter. | |

Timing chart



S1: Test switch
S2: Lockout/interlock reset switch
L1: Lamp

- *1. Reverse the polarity of the power supply when using in the NPN system. Select a PLC and a safety controller of PNP or NPN type according to the system of your application.
- *2. Connect the line to 0 VDC if Operating Range Selection is used in Short Mode.
- *3. Refer to page 80 for more information.
- *4. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
- *5. This is the case for a PELV circuit.
- *6. Set the function with the DIP Switches on the Intelligent Tap or the SD Manager 3, restore the settings to the F3SG-SR/PG, and perform wiring according to the wiring diagram.
- *7. This wiring example shows light emission stop when connected to 24 VDC with PNP setting, and light emission stop when connected to 0 VDC with NPN setting. If TEST switch is not needed, refer to the *User's Manual* (Man. No. Z405).
- *8. The F3SG-PGA-C does not support the external test function.
- *9. When wiring the emitter/receiver of the F3SG-PGA-C, follow the same wiring as for the receiver in the figure above. Wiring of the emitter side is not required.

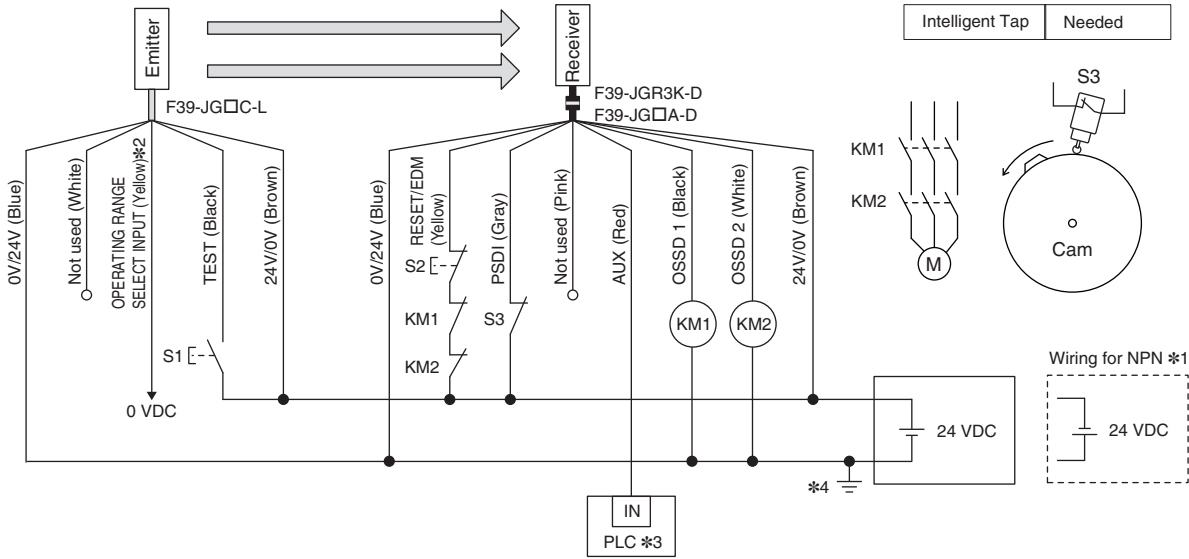
Note: 1. When using the Reset Switch Connector (F39-GCNY3), the following functions are not available.
• External Device Monitoring (EDM)
2. For the functional earth connection, refer to page 87.

Common to F3SG-SR and F3SG-PG

Double Break with EDM

| | | | |
|----------|-----------|---------------|---------------|
| F3SG-SRA | Available | F3SG-PGA-A/-L | Not available |
| F3SG-SRB | Available | F3SG-PGA-C | Not available |

[Wiring Example]

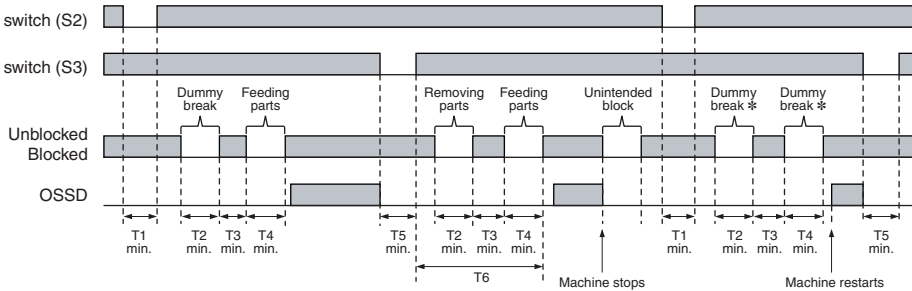


| Function | Setting | |
|---------------------------|--|--|
| | DIP switch | SD Manager 3 |
| EDM | - | [External device monitoring] : Enable *5 |
| Operating Range Selection | Short : Connect the OPERATING RANGE SELECT INPUT line of the emitter to 0 VDC. | |
| PSDI | N/A | [PSDI] : Double break *5 |
| Non-Muting system | Perform wiring according to the wiring diagram. | |
| | N/A | [Muting] : Disable *5 |
| External Test used | Connect the TEST line of the emitter to 24V/0V of the emitter via a test switch (NO contact). *6 | |
| | N/A | [External test signal inversion] : Disable |
| Optical Synchronization | Do not connect the COM(+) and COM(-) lines of the of emitter and receiver with each other. | |

S1: Test switch
 S2: Reset switch
 S3: Press position switch
 KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor
 PLC: Programmable logic controller (Used for monitoring only. NOT related to safety system.)
 M: Motor

- *1. Reverse the polarity of the power supply when using in the NPN system. Select a PLC of PNP or NPN type according to the system of your application.
- *2. Open or connect the line to 24 VDC if Operating Range Selection is used in Long Mode.
- *3. When connecting to the PLC, the output mode must be changed with the SD Manager 3 according to your application. For the setting this function, refer to the *User's Manual* (Man.No.Z405).
- *4. This is the case for a PELV circuit.
- *5. Set the function with the SD Manager 3, restore the settings to the F3SG-SR/PG, and perform wiring according to the wiring diagram.
- *6. This wiring example shows light emission stop when connected to 24 VDC with PNP setting, and light emission stop when connected to 0 VDC with NPN setting. If TEST switch is not needed, refer to the *User's Manual* (Man. No. Z405).

Timing chart



T1: Minimum pressing time of reset switch. Configurable from 100 to 500 ms in 100-ms increments by SD Manager 3.
 T2: Minimum break time (300 ms)
 T3: Minimum unblocked time during the time from removing to feeding parts. T3 = T1
 T4: Minimum break time (300 ms)
 T5: Minimum pressing time of press position switch. T5 = T1
 T6: Wait time until double break is complete (30 s or less)

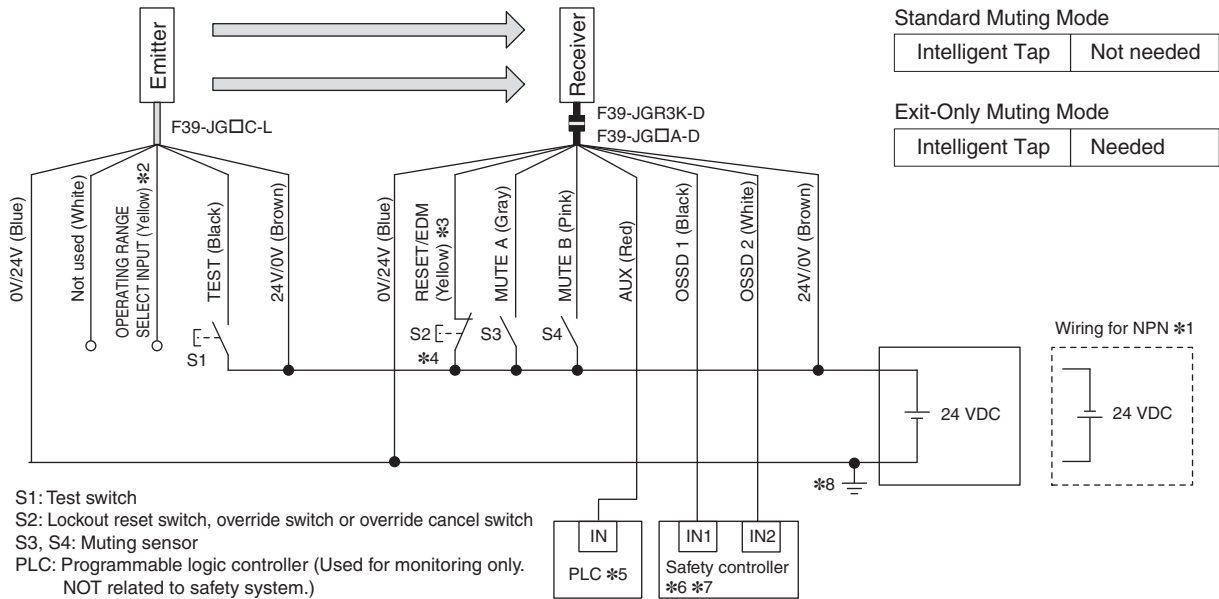
* When the machine is stopped by unintended block in the middle of pressing of parts, operation of the reset switch (S1) and then double dummy break are needed for reinitiation of the machine cycle.

Note: For the functional earth connection, refer to page 87.

Muting System Wiring Examples
Standard Muting Mode/Exit-Only Muting Mode

| | | | |
|----------|-----------|---------------|---------------|
| F3SG-SRA | Available | F3SG-PGA-AI-L | Available |
| F3SG-SRB | Available | F3SG-PGA-C | Available *12 |

[Wiring Example]

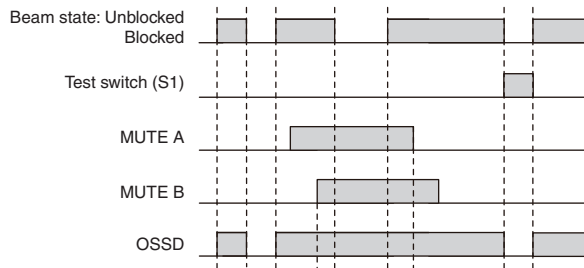


| | |
|-----------------------|------------|
| Standard Muting Mode | |
| Intelligent Tap | Not needed |
| Exit-Only Muting Mode | |
| Intelligent Tap | Needed |

S1: Test switch
S2: Lockout reset switch, override switch or override cancel switch
S3, S4: Muting sensor
PLC: Programmable logic controller (Used for monitoring only. NOT related to safety system.)

| Function | Setting | |
|---------------------------|---|---|
| | DIP switch | SD Manager 3 |
| EDM | EDM Disabled (factory default setting) | [External device monitoring] : Disable |
| Interlock | Auto Reset (factory default setting) | [Start interlock] : Disable [Restart interlock] : Disable |
| | | |
| Operating Range Selection | Long : Open the OPERATING RANGE SELECT INPUT line of the emitter or connect the line to 24 VDC. | |
| Standard Muting Mode | When not using the Intelligent Tap or the SD Manager 3, perform wiring according to the wiring diagram. (factory default setting) | |
| | N/A | [Muting] : Enable [Muting mode] : Standard Muting (Installation Example1/2) *9 |
| Exit-Only Muting Mode | N/A | [Muting] : Enable [Muting mode] : Exit-Only Muting *9 |
| External Test used *11 | Connect the TEST line of the emitter to 24V/0V of the emitter via a test switch (NO contact). *10 | |
| | N/A | [External test signal inversion] : Disable |
| Optical Synchronization | Open the COM(+) and COM(-) lines of the emitter. | |

Timing chart



- *1. Reverse the polarity of the power supply when using in the NPN system.
- *2. Connect the line to 0 VDC if Operating Range Selection is used in Short Mode.
- *3. Also used as OVERRIDE INPUT line.
- *4. Make sure to connect an override cancel switch to the RESET line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.
- *5. When connecting to the PLC, the output mode must be changed with the SD Manager 3 according to your application. For the setting this function, refer to the *User's Manual* (Man.No.Z405).
- *6. Refer to page 80 for more information.
- *7. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
- *8. This is the case for a PELV circuit.
- *9. Set the function with the SD Manager 3, restore the settings to the F3SG-SR/PG, and perform wiring according to the wiring diagram.
- *10. This wiring example shows light emission stop when connected to 24 VDC with PNP setting, and light emission stop when connected to 0 VDC with NPN setting. If TEST switch is not needed, refer to the *User's Manual* (Man. No. Z405).
- *11. The F3SG-PGA-C does not support the external test function.
- *12. When wiring the emitter/receiver of the F3SG-PGA-C, follow the same wiring as for the receiver in the figure above. Wiring of the emitter side is not required.

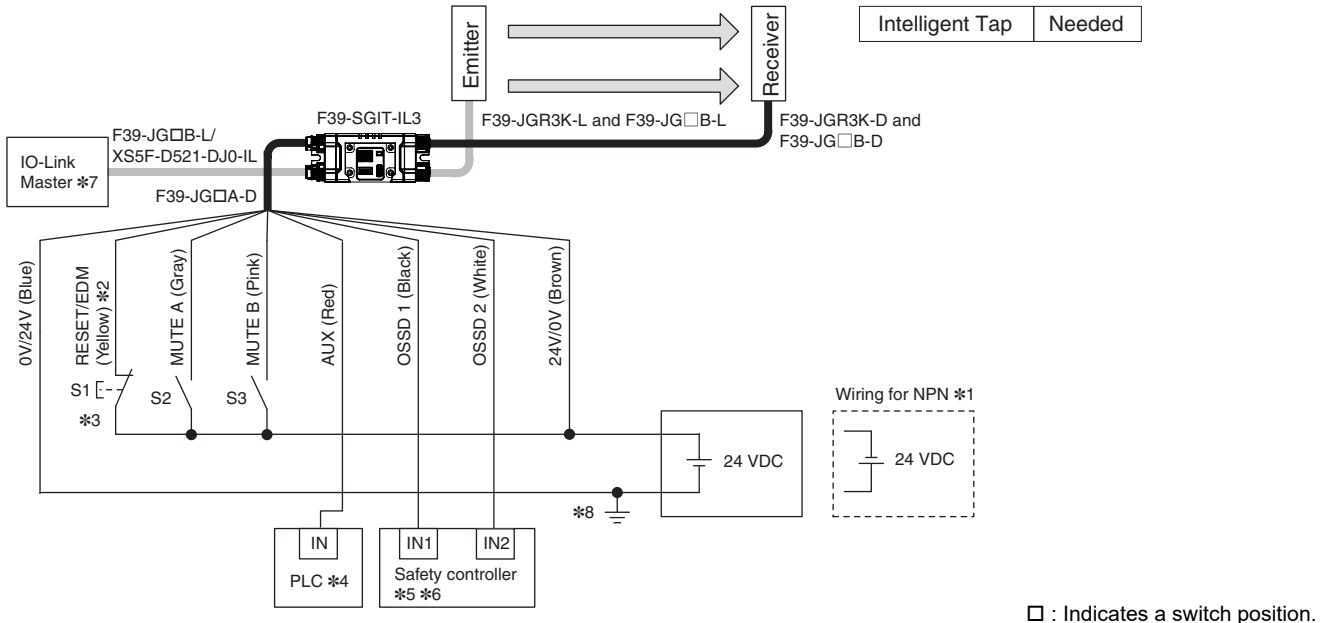
Note: For the functional earth connection, refer to page 87.

Common to F3SG-SR and F3SG-PG

Standard Muting Mode/Exit-Only Muting Mode with Intelligent Tap

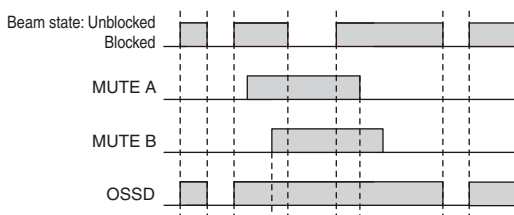
| | | | |
|----------|-----------|---------------|---------------|
| F3SG-SRA | Available | F3SG-PGA-A/-L | Available |
| F3SG-SRB | Available | F3SG-PGA-C | Available *11 |

[Wiring Example]



| Function | Setting | |
|-------------------------------|--|--|
| | DIP switch | SD Manager 3 |
| EDM #9 | EDM Disabled 3 <input type="checkbox"/> ON | [External device monitoring] : Disable |
| Interlock #9 | Auto Reset 4 <input type="checkbox"/> ON 5 <input type="checkbox"/> ON | [Start interlock] : Disable [Restart interlock] : Disable |
| Operating Range Selection #10 | Long 8 <input type="checkbox"/> ON | [Operating Range Selection] : Long mode |
| Standard Muting Mode | N/A | [Muting] : Enable [Muting mode] : Standard Muting (Installation Example1/2) |
| Exit-Only Muting Mode | N/A | [Muting] : Enable [Muting mode] : Exit-Only Muting |
| Test Input | N/A | |
| Wired Synchronization | Connect the emitter and receiver with the Intelligent Tap. | |

Timing chart



S1: Lockout reset switch, override switch or override cancel switch

S2, S3: Muting sensor

PLC: Programmable logic controller (Used for monitoring only. NOT related to safety system.)

Note: 1. When using the Intelligent Tap (F39-SGIT-IL3), the following functions are not available.

- External Test
- Operating Range Selection by wiring
- Optical Synchronization

2. For the functional earth connection, refer to page 87.

***1.** Reverse the polarity of the power supply when using in the NPN system. Select a PLC and a safety controller of PNP or NPN type according to the system of your application.

***2.** Also used as OVERRIDE INPUT line.

***3.** Make sure to connect an override cancel switch to the RESET line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.

***4.** When connecting to the PLC, the output mode must be changed with the SD Manager 3 according to your application. For the setting this function, refer to the *User's Manual* (Man.No.Z405).

***5.** Refer to page 80 for more information.

***6.** The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.

***7.** For connecting with the IO-Link Master unit, refer to an instruction manual of the IO-Link Master unit you use.

***8.** This is the case for a PELV circuit.

***9.** Set the function with the DIP Switches on the Intelligent Tap or SD Manager 3.

***10.** Set the function with the DIP Switches on the Intelligent Tap or SD Manager 3 and wire according to the wiring diagram after restoring the settings to the F3SG-SR/PG when the F3SG-SR/PG or F3SG-PGA-L is used in Short Mode. The F3SG-PGA-A/-C do not support the operating range selection function.

***11.** When wiring the emitter/receiver of the F3SG-PGA-C, follow the same wiring as for the receiver in the figure above. Wiring of the emitter side is not required.

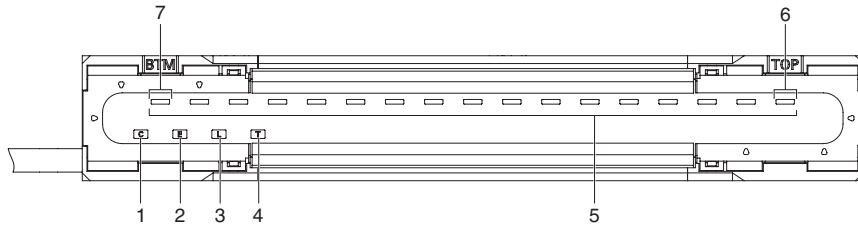
Indicator

LED Indicators on F3SG-SR/PG

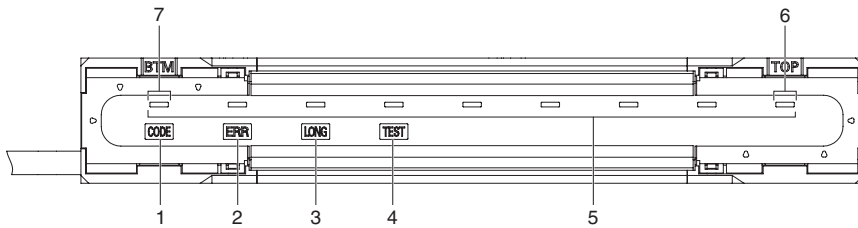
F3SG-SR

<Emitter>

F3SG-□SR□□□□□-14

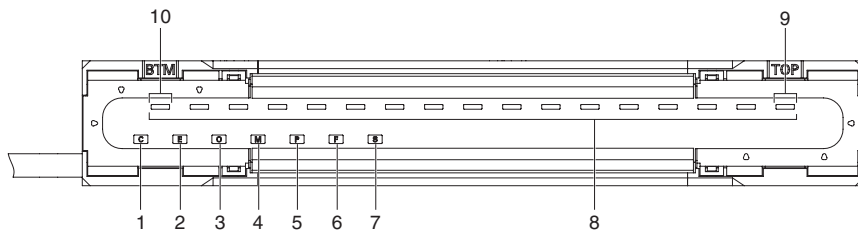


F3SG-□SR□□□□□-25/-45/-85

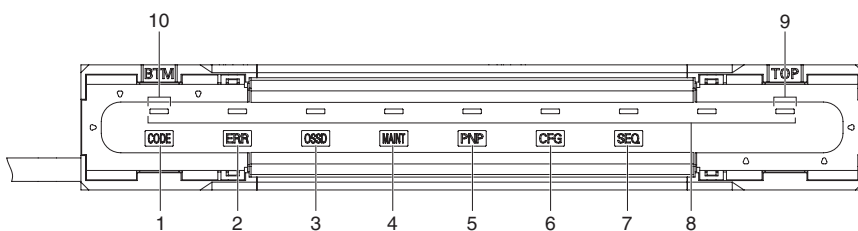


<Receiver>

F3SG-□SR□□□□□-14



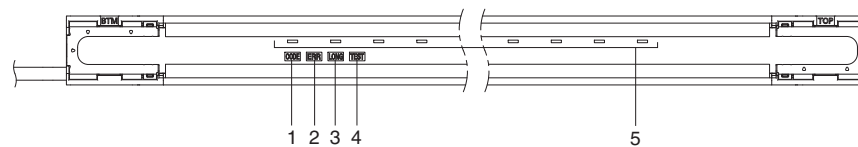
F3SG-□SR□□□□□-25/-45/-85



F3SG-PG

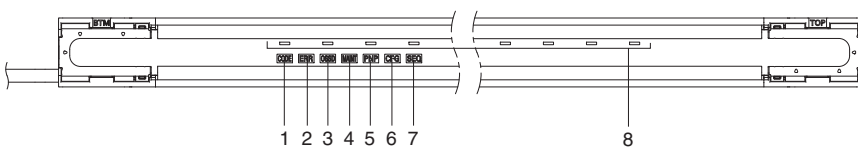
<Emitter>

F3SG-4PGA□□□□-□A/□L



<Receiver, Emitter/receiver>

F3SG-4PGA□□□□-□A/□L/□C



F3SG-SR/PG
F3SG-SR-K
Common to F3SG-SR and F3SG-PG

Common to F3SG-SR and F3SG-PG

Shown below are indication statuses of the LED indicators on the F3SG-SR/PG when you purchased.

Emitter (F3SG-SR/PG)

| Location | Indicator | Name | Color | Illuminated | Blinking | F3SG-SRA | F3SG-SRB | F3SGPG-A | F3SGPG-L |
|----------|---|--------------------------------|--------|---|---|----------|----------|----------|----------|
| 1 | <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 20px; text-align: center; line-height: 20px;">C</div> or <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 40px; height: 20px; text-align: center; line-height: 20px;">CODE</div> | Scan code | Green | Code A is selected | --- | X | X | X | X |
| | | | Orange | Code B is selected | | | | | |
| | | | OFF | Automatic interference prevention by wired synchronization being performed | | | | | |
| 2 | <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 20px; text-align: center; line-height: 20px;">E</div> or <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 40px; height: 20px; text-align: center; line-height: 20px;">ERR</div> | Lockout | Red | LOCKOUT state. The indicator is illuminated in the emitter of another sensor segment than that having a lockout error (when in cascade connection or between the emitter and receiver in the Wired Synchronization) | LOCKOUT state. The indicator is illuminated in the emitter of a sensor segment having a lockout error | X | X | X | X |
| 3 | <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 20px; text-align: center; line-height: 20px;">L</div> or <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 40px; height: 20px; text-align: center; line-height: 20px;">LONG</div> | Operating range | Green | Long Mode is selected | LOCKOUT state due to Operating range selection setting error | X | X | --- | X |
| | | | OFF | Short Mode is selected | --- | | | | |
| 4 | <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 20px; text-align: center; line-height: 20px;">T</div> or <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 40px; height: 20px; text-align: center; line-height: 20px;">TEST</div> | Test | Yellow | --- | External Test is being performed | X | X | X | X |
| 5 | --- | Area Beam Indicator (ABI) (*1) | Green | The target beams of the ABI are unblocked and the safety outputs are turned ON | MUTING or OVERRIDE state. In the MUTING state, only the ABI indicators in the muting zone are blinking. Or the target beams of the ABI are blocked instantaneously | X | --- | X | X |
| | | | Orange | Incident light level of the target beams of the ABI is 170% (factory default setting (*2)) or less of ON-threshold | Incident light level of the target beams of the ABI is 170% (factory default setting (*2)) or less of ON threshold and 5 to 10 s elapsed. Or one muting input becomes the ON state and the MUTING state has not been started yet, or one muting input becomes the OFF state and the other is not in the OFF state yet. (*3) | | | | |
| | | | Red | The target beams of the ABI are blocked | LOCKOUT state due to Cap error or Other sensor error (*4), or Lockout state due to DIP Switch setting error (*5 *6) | | | | |
| | | | OFF | The target beams of the ABI are unblocked (The ABI then will be illuminated in green when the safety outputs are turned ON.) | --- | | | | |
| 6 | TOP | Top-beam-state (*1) | Blue | The top beam is unblocked | MUTING/OVERRIDE state, or LOCKOUT state due to Cap error or Other sensor error | --- | X | --- | --- |
| 7 | BTM | Bottom-beam-state (*1) | Blue | The bottom beam is unblocked | MUTING/OVERRIDE, or LOCKOUT state due to DIP Switch setting error (*6) | --- | X | --- | --- |

*1. The indicator of the emitter is illuminated only in the case the Wired Synchronization is enabled and is off in the case the Optical Synchronization is enabled.

*2. Configurable by SD Manager 3.

*3. This is the case for the Standard Muting mode. For other muting modes, refer to *User's Manual* (Man.No.Z405).

*4. The Area Beam Indicator closer to the "TOP" mark on the F3SG-SR/PG blinks.

*5. The Area Beam Indicator closer to the "BTM" mark on the F3SG-SR/PG blinks.

*6. DIP switches is on the Intelligent Tap.

Receiver (F3SG-SR/PG)

| Location | Indicator | Name | Color | Illuminated | Blinking | F3SG-SRA | F3SG-SRB | F3SG-PG |
|----------|------------------|---------------------------|--------|--|---|----------|----------|---------|
| 1 | C or CODE | Scan code | Green | Code A is selected | --- | X | X | X |
| | | | Orange | Code B is selected | | | | |
| | | | OFF | Automatic interference prevention by wired synchronization being performed | | | | |
| 2 | E or ERR | Lockout | Red | LOCKOUT state. The indicator is illuminated in the receiver of another sensor segment than that having a lockout error (when in cascade connection or between the emitter and receiver in the Wired Synchronization) | LOCKOUT state. The indicator is illuminated in the receiver of a sensor segment having a lockout error | X | X | X |
| | | | Green | Safety outputs are in ON state | --- | X | X | X |
| 3 | O or OSSD | ON/OFF | Red | Safety outputs are in OFF state | LOCKOUT state due to Safety output error, or error due to abnormal power supply or noise | X | X | X |
| | | | Green | Safety outputs are in ON state | --- | X | X | X |
| 4 | M or MAINT | Maintenance | Red | LOCKOUT state due to a recoverable error (When in cascade connection, the indicator of only the sensor segment having the error is illuminated) | LOCKOUT state due to a replacement-recommended error (When in cascade connection, the indicator of only the sensor segment having the error blinks) | X | X | X |
| | | | Orange | Safety outputs are instantaneously turned OFF due to ambient light, vibration or noise. Or sequence error in Muting, Pre-Reset or PSDI | Intelligent Tap is in the LOCKOUT state | X | X | X |
| 5 | P or PNP | PNP/NPN mode | Green | PNP is configured | Polarity of PNP is changed to NPN, or vice versa, during operation, and internal circuit is defective | X | X | X |
| | | | OFF | NPN is configured | --- | | | |
| 6 | F or CFG | Configuration | Green | Fixed or Floating Blanking, Reduced Resolution, Warning Zone or Slow mode of Response Time Adjustment is enabled. Or after the Muting zone is determined by the Dynamic Muting function. | TEACH-IN mode, zone measurement being performed by Dynamic Muting, or LOCKOUT state due to Blanking monitoring error, Configuration error or Parameter error | X | X | X |
| 7 | S or SEQ | Sequence | Yellow | INTERLOCK state | Sequence or sequence error in Muting, Pre-Reset or PSDI (*1) or Teach-in error | X | X | X |
| 8 | --- | Area Beam Indicator (ABI) | Green | The target beams of the ABI are unblocked and the safety outputs are turned ON | MUTING or OVERRIDE state. In the MUTING state, only the ABI indicators in the muting zone are blinking. Or the target beams of the ABI are blocked instantaneously | X | --- | X |
| | | | Orange | Incident light level of the target beams of the ABI is 170% (factory default setting (*2)) or less of ON-threshold | Incident light level of the target beams of the ABI is 170% (factory default setting (*2)) or less of ON threshold and 5 to 10 s elapsed. Or one muting input becomes the ON state and the MUTING state has not been started yet, or one muting input becomes the OFF state and the other is not in the OFF state yet. (*3) | | | |
| | | | Red | The target beams of the ABI are blocked | LOCKOUT state due to Cap error or Other sensor error (*4), or LOCKOUT state due to DIP Switch setting error (*5*6) | | | |
| | | | OFF | The target beams of the ABI are unblocked (The ABI then will be illuminated in green when the safety outputs are turned ON.) | --- | | | |
| 9 | TOP | Top-beam-state | Blue | The top beam is unblocked | MUTING/OVERRIDE state, or LOCKOUT state due to Cap error or Other sensor error | --- | X | --- |
| 10 | BTM | Bottom-beam-state | Blue | The bottom beam is unblocked | MUTING/OVERRIDE state, or LOCKOUT state due to DIP Switch setting error (*6) | --- | X | --- |

*1. Refer to *Troubleshooting* on page 101 for more information on blinking patterns.

*2. Configurable by SD Manager 3.

*3. This is the case for the Standard Muting mode. For other muting modes, refer to *User's Manual* (Man.No.Z405).

*4. The Area Beam Indicator closer to the "TOP" mark on the F3SG-SR/PG blinks.

*5. The Area Beam Indicator closer to the "BTM" mark on the F3SG-SR/PG blinks.

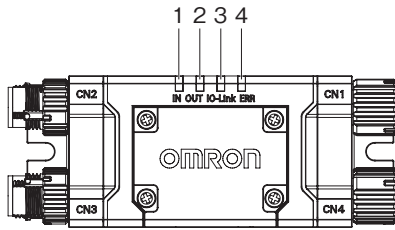
*6. DIP switches is on the Intelligent Tap.

Note: In the SETTING state to make settings with the SD Manager 3, the TEST, LONG and CODE indicators on the emitter and the CFG, PNP and CODE indicators on the receiver blink. (TEST: Yellow, LONG/CODE: Green, CFG/PNP/CODE: Green)

For more information on the statuses of the LED indicators in the SETTING state, refer to *User's Manual* (Man.No.Z405).

Common to F3SG-SR and F3SG-PG

LED Indicators on Intelligent Tap



Shown below are indication statuses of LED indicators on the Intelligent Tap when you purchased.

| Location | Indicator | Name | Color | Illuminated | Blinking |
|----------|-----------|---------------|--------|--|--|
| 1 | IN | Sensor status | Yellow | Safety outputs of the F3SG-SR/PG are in the ON state | The F3SG-SR/PG is in the LOCKOUT state. Or the Intelligent Tap is waiting for Push Switch operation (in the Backup) or the Intelligent Tap and F3SG-SR/PG are waiting for restart (in the Backup). Or communication error in the Backup or between the F3SG-SR/PG and the Intelligent Tap. Or the Restoration failed |
| 2 | OUT | Output status | Green | Outputs of the Intelligent Tap are in the ON state(*1) | The Restoration failed. Or in the Restoration, the Intelligent Tap has communication error, is waiting for Push Switch operation or transferring data, or the Intelligent Tap and F3SG-SR/PG are waiting for restart. |
| | | | Red | Outputs of the Intelligent Tap are in the OFF state (*2) | Communication error between the F3SG-SR/PG and the Intelligent Tap |
| 3 | IO-Link | IO-Link | Green | --- | Intelligent Tap communicates with IO-Link Master. Or IO-Link circuit error |
| 4 | ERR | Lockout | Red | The Intelligent Tap is in the LOCKOUT state, or has communication error, DIP Switch circuit error at startup, communication error in the Backup or Restoration, restoration failure, IO-Link circuit error, power supply voltage error or other errors | --- |

*1. When the safety outputs of the F3SG-SR/PG are in the ON state, the outputs of the Intelligent Tap are in the ON state.

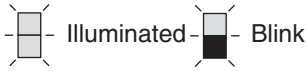
*2. When the safety outputs of the F3SG-SR/PG are in the OFF state, the outputs of the Intelligent Tap are in the OFF state.

Note: In the SETTING state to make settings with the SD Manager 3, the IN, OUT indicators blink. (IN: Yellow, OUT: Green)
For more information on the statuses of the LED indicators in the SETTING state, refer to User's Manual (Man.No.Z405).

Troubleshooting

F3SG-SR/PG LOCKOUT State

Identify an error according to the combination of the indicators when the error occurs. See the following troubleshooting tables to take measures. For detail, Refer to *User's Manual* (Man. No. Z405).



<Indicator status at lockout: Receiver>

Combination of indicators and error description

| ERR indicator | MAINT indicator | Other indicators | Error description |
|--------------------|--|------------------|---|
| Blinking once | [Error description] Recoverable error Red blinking : Replacement-recommended error | or | Safety Output error |
| | | or | Error due to change of PNP/NPN polarity during operation |
| | | or | Blanking monitoring error Configuration error Parameter error |
| | | TOP *1 | Cap error Other sensor error |
| Blinking twice | | BTM *2 | DIP Switch setting error |
| | | or | Safety output error due to power supply voltage or noise |
| Blinking once | | --- | Communication error External device monitoring error Error other than those above |
| --- | Orange blinking | --- | Intelligent Tap error |

*1. For the F3SG-SRA and F3SG-PG, the Area Beam Indicator closer to the "TOP" mark on the housing blinks.

*2. For the F3SG-SRA and F3SG-PG, the Area Beam Indicator closer to the "BTM" mark on the housing blinks.

<Indicator status at lockout: Emitter>

Combination of indicators and error description

| ERR indicator | Other indicators | Error description |
|-------------------|------------------|---|
| Blinking once | or | Operating range selection setting error |
| | TOP *1 *3 | Cap error Other sensor error |
| | BTM *2 *3 | DIP Switch setting error |
| | --- | --- |

*1. For the F3SG-SRA and F3SG-PG, the Area Beam Indicator closer to the "TOP" mark on the housing blinks.

*2. For the F3SG-SRA and F3SG-PG, the Area Beam Indicator closer to the "BTM" mark on the housing blinks.

*3. The indicator blinks only in the case the Wired Synchronization is enabled and is off in the case the Optical Synchronization is enabled.

F3SG-SR/PG
F3SG-SR-K
Common to F3SG-SR and F3SG-PG

Common to F3SG-SR and F3SG-PG

| Description | Checking by | | Error code (hex) *1 | Cause and measures | |
|--|-------------|---|------------------------|--|---|
| | Indicator | SD Manager 3/ SD Manager 3 Mobile APP | | | |
| Safety output error | X | X | 60, 6B, 6C | The OSSD lines may be short-circuited to each other or another signal line may be short-circuited to the OSSD line. Wire the OSSD lines properly. | |
| | | | 56 | The polarity does not match between the power supply and the OSSD lines. Check if a correct polarity is selected for the PNP/NPN setting according to your application. Also check: <ul style="list-style-type: none"> if the power supply (0 VDC or 24 VDC) of the Intelligent Tap and F3SG-SR/PG is wired as intended. if the OSSD lines are properly wired. | |
| Recoverable error | X | --- | --- | The error may occur due to a temporary cause. Identify the cause by the status of the other LED indicator and take measures. | |
| Replacement-recommended error | | | | The error may occur due to a product failure. If the measure according to the status of the other LED indicator does not work, it is recommended to replace the F3SG-SR/PG. | |
| Intelligent Tap error | X | --- | --- | An error due to noise may have occurred in the internal circuit of the Intelligent Tap. Check the noise level in the environment. | |
| | | | | The internal circuit of the Intelligent Tap may be defective. Replace the Intelligent Tap. | |
| Error due to change of PNP/NPN polarity during operation | X | X | E7 | An error due to noise may have occurred in the internal circuit. Check the noise level in the environment. | |
| | | | | The internal circuit may be defective. Replace the F3SG-SR/PG. | |
| Blanking monitoring error | X | X | EC | An error is detected by the Fixed Blanking Monitoring function or the Floating Blanking Monitoring function. | |
| Configuration error | X | X | 39, 3A, 3B | The cascading cable may be short-circuited, broken, or disconnected. Check that the cascading cable should be tightly connected. If the cascading cable is broken, replace it. | |
| | | | | The number of connected sensors or beams may have exceeded the maximum value due to cascading. Check the configuration. | |
| | | | 34 | 3C, 3E, 3F | A model name does not match between emitter and receiver. Check that the emitter and receiver are the same model. |
| | | | | An error may have occurred to the internal information of the model name of the F3SG-SR/PG due to effect of noise. If other devices using the same power supply generate noise, do not share the same power supply with other devices, and use a separate power supply exclusively for the safety components. The inductive noise tends to be induced especially if the power supply line of the machine guarded and the power supply line of the Intelligent Tap are arranged in parallel. Arrange the exclusive power supply near the Intelligent Tap or lay the power supply line of the Intelligent Tap away from the power supply line of the machine guarded. If the power supply for the Intelligent Tap is located near the power supply of the machine guarded and it shares the same grounding wire, it is subject to the influence of common mode noise. Separate the grounding point or use it as the exclusive ground. | |
| Parameter error | X | X | F1 | The settings do not match between the Intelligent Tap and F3SG-SR/PG. Perform the Backup. | |
| | | | 40 | The settings of the F3SG-SR/PG may be faulty. Check if the settings are correct. | |

Common to F3SG-SR and F3SG-PG

| Description | Checking by | | Error code (hex) *1 | Cause and measures |
|--|-------------|---|---------------------|--|
| | Indicator | SD Manager 3/ SD Manager 3 Mobile APP | | |
| Cap error | X | X | 4F | A cap may be detached. Attach the cap properly. |
| Other sensor error | X | X | 38 | Other sensor being cascaded caused an error. Check the indicator of the sensor. |
| DIP Switch setting error | X | X | E7, E8 | A DIP Switch on the Intelligent Tap setting may have been changed during operation. Check if a DIP Switch setting was changed or not. |
| Communication error | --- | X | 30, 32 | The communication lines or other lines may be short-circuited or broken. Check if the cascading or extension cables. If the cascading cable or extension cables is broken, replace it. |
| | | | 31 | An error may have occurred to the communication due to effect of noise. If other devices using the same power supply generate noise, do not share the same power supply with other devices, and use a separate power supply exclusively for the safety components. The inductive noise tends to be induced especially if the power supply line of the machine guarded and the power supply line of the Intelligent Tap are arranged in parallel. Arrange the exclusive power supply near the Intelligent Tap or lay the power supply line of the Intelligent Tap away from the power supply line of the machine guarded. If the power supply for the Intelligent Tap is located near the power supply of the machine guarded and it shares the same grounding wire, it is subject to the influence of common mode noise. Separate the grounding point or use it as the exclusive ground. |
| | | | | An error may have occurred in the internal circuit. Replace the F3SG-SR/PG. |
| Safety output error due to power supply voltage or noise | X | X | 19 | The power supply voltage may have dropped temporarily when the F3SG-SR/PG is in operation. Check for temporary power supply voltage drop (by about 12 VDC) by the influence of the inductive load, etc. If the exclusive power supply is not used, check the power consumption of other connected devices for enough capacity. Power supply voltage may be outside the rated range. Connect the F3SG-SR/PG to a 24 VDC±20% power supply voltage. Voltage fluctuation may have occurred due to insufficient power supply capacity. Replace the power supply with one that has a larger capacity. |
| | | | | Instantaneous break or instantaneous stop may have occurred due to power sharing with other devices. Do not share the power supply with other devices. Connect the F3SG-SR/PG to a power supply that is dedicated to electro-sensitive protective devices for electro-sensitive protective equipment such as the F3SG-SR/PG, safety controller, etc. |
| | | | 1A | Effect of noise may be excessive. If other devices using the same power supply generate noise, do not share the same power supply with other devices, and use a separate power supply exclusively for the safety components. The inductive noise tends to be induced especially if the power supply line of the machine guarded and the power supply line of the F3SG-SR/PG are arranged in parallel. Arrange the exclusive power supply near the F3SG-SR/PG or lay the power supply line of the F3SG-SR/PG away from the power supply line of the machine guarded. If the power supply for the F3SG-SR/PG is located near the power supply of the machine guarded and it shares the same grounding wire, it is subject to the influence of common mode noise. Separate the grounding point or use it as the exclusive ground. |

F3SG-SR/PG

F3SG-SR-K

Common to
F3SG-SR and F3SG-PG

Common to F3SG-SR and F3SG-PG

| Description | Checking by | | Error code (hex) *1 | Cause and measures |
|---|-------------|---|-----------------------------------|--|
| | Indicator | SD Manager 3/ SD Manager 3 Mobile APP | | |
| Operating range selection setting error | X | X | EB | The setting of the operating range selection may be incorrect. <ul style="list-style-type: none"> When the Intelligent Tap is connected, check if the Operating Range Selection of the DIP Switch is properly set. When the Intelligent Tap is not connected, check if the Operating Range Select Input line is properly wired. |
| External device monitoring error | --- *2 | X | 52 | Relay may be welded. Replace the relay. The relay and the RESET line may not be properly wired. Check the wiring with the relay. The relay response time may be exceeding the allowable delay time. Change the allowable delay time or replace the relay with one that has an appropriate response time. |
| Error other than those above | --- *2 | X | Error code other than those above | An error may have occurred in the internal circuit. Replace the F3SG-SR/PG. |

*1. You can check the error codes by SD Manager 3 or SD Manager 3 Mobile APP.

*2. Other indicators than the ERR and MAINT indicators are not illuminated. For details of the error, refer to [Code] and [Error description] displayed in [Error Log] in the SD Manager 3.

Warning

Identify an error according to the combination of the indicators when the error occurs. See the following troubleshooting tables to take measures. For detail, Refer to *User's Manual* (Man. No. Z405).



<Indicator status at warning: Receiver *1>

Combination of indicators and error description

| ERR indicator | MAINT indicator | Other indicators | Error description |
|---------------|---|---------------------------|--|
| | | | Teach-in error |
| | | | |
| | Orange | *2 | Muting sequence error, Interlock sequence error or PSDI sequence error |
| | | Area Beam Indicator Green | Malfunction due to ambient light or vibration |
| | Area Beam Indicator Orange → After 5 to 10 s → | Low incident light level | |

*1. In the warning state, no indicators on the emitter are illuminated or blink.

*2. There are several illumination patterns to identify a faulty sequence.

| Description | Checking by | | Warning code (hex) *1 | Cause and measures |
|---|-------------|---|-----------------------|---|
| | Indicator | SD Manager 3/ SD Manager 3 Mobile APP | | |
| Teach-in error | X | X | ED | Teach-in failed. Perform the Teach-in again. |
| Muting sequence error | X | X | 2C, 2D, 2F | Muting input may have been applied in the incorrect order. Check the pattern of illumination of the LED indicator to identify the cause. |
| Interlock sequence error | X | --- | --- | When using the Pre-Reset function, the reset signals for interlock may be input in the wrong order. Check the pattern of illumination of the LED indicator to identify the cause. |
| PSDI sequence error | X | X | 2A, 2B | PSDI input may have been applied in the correct order. Check if the pattern of illumination of the LED indicator to identify the cause. |
| Malfunction due to ambient light or vibration | X | X (SD Manager 3 Mobile APP is not applicable) *2 | --- | Malfunction may have occurred due to ambient light or instantaneous beam misalignment from vibration. Check the installation condition. |
| Low incident light level | X | X | 12 | The incident light level may be low due to dirty front window or misaligned beams caused by vibration. Clean the front window and check the alignment of the beams. |
| Low communications quality | --- *3 | X | F0 | Retries of communications may have been generated due to noise. Check the noise level in the proximity of the communication lines. |
| | | | | Retries of communications may have been generated due to short-circuit of the communication lines. Check the cables connected. |

*1. You can check the warning codes by SD Manager 3 or SD Manager 3 Mobile APP.







*2. You can check by instantaneous block detection logs in [Instantaneous Block Detection Information].

*3. The indicators are not illuminated. For details of the warning, refer to [Code] and [Warning description] displayed in [Warning Log] in the SD Manager 3.

Common to F3SG-SR and F3SG-PG

Muting Sequence Error Indication




The following table is applied only when the muting function is being enabled.

| SEQ indicator | Cause and measures |
|---|--|
|  Blinking: Once | Power supply may have been turned ON with muting input A or B being ON. Check the condition of the muting sensors and the F3SG-SR/PG. |
| | Muting input B may have been turned ON before muting input A was turned ON. Check the condition of the muting sensors. |
| | Muting input A and B may have been turned ON at the same time. <ul style="list-style-type: none"> • Check the arrangement of the muting sensors. • Check if the wiring of muting input A and B is short-circuited. |
| | Either muting input A or B may have been turned ON with the F3SG-SR/PG being blocked or INTERLOCK State. Check the condition of the F3SG-SR/PG. |
|  Blinking: Twice | Muting input B may have been turned ON within T1min (= 0.1 s*) after muting input A was turned ON. <ul style="list-style-type: none"> • Check that if the muting sensors are installed too close each other. • Check that if the speed of the workpiece is too fast. |
| | It may have taken T1max (= 4 s*) or longer for muting input B to be turned ON after muting input A was turned ON. <ul style="list-style-type: none"> • Check that if the muting sensors are installed too far each other. • Check that if the speed of the workpiece is too slow. |
| | The F3SG-SR/PG may have been blocked after muting input A was turned ON but before muting input B was turned ON. Check the condition of the F3SG-SR/PG. |
|  Blinking: Four times | The F3SG-SR/PG may have been blocked within 0.08 s after muting input A and B were normally turned ON. <ul style="list-style-type: none"> • Check that if the muting sensor and the F3SG-SR/PG are installed too close each other. • Check that if the speed of the workpiece is too fast. |
| | Muting may have been released after the F3SG-SR/PG entered the MUTING state but before a workpiece blocked the F3SG-SR/PG. <ul style="list-style-type: none"> • Check that the workpiece still remains. • Check that the speed of the workpiece is too slow. |
|  Blinking: Five times | The F3SG-SR/PG entered the MUTING state, but muting may have then been released while a workpiece passes through the F3SG-SR/PG. <ul style="list-style-type: none"> • Check that the workpiece still remains. • Check that if the speed of the workpiece is too slow. • Check that the muting sensors have been installed upstream and downstream of the F3SG-SR/PG with the size of workpieces taken into account. (Using four muting sensors) |
|  Blinking: Six times | Muting may have been released with muting input A and B remained ON after a workpiece passed through the F3SG-SR/PG. <ul style="list-style-type: none"> • Check that the workpiece still remains. • Check that the speed of the workpiece is too slow. |
|  Blinking: Seven times | The next muting sequence may have started after muting was released but before the initial muting condition was established. <ul style="list-style-type: none"> • Check that if a next workpiece has not entered before the current workpiece passes through the F3SG-SR/PG. • Check that if the interval between workpieces are too narrow. |

* Factory default setting





Interlock Sequence Error Indication

The following table is applied only when the pre-reset function is being enabled.

| SEQ indicator | Cause and measures |
|---|--|
|  Blinking: Once | The reset or pre-reset switch may have been pressed before the F3SG-SR/PG receives light. Check the wiring of the reset and pre-reset signals. |
| | The F3SG-SR/PG may have been blocked or the pre-reset switch may have been pressed before the pre-reset switch is pressed. Check the status of the F3SG-SR/PG and the wiring of the pre-reset signal. |
|  Blinking: Twice | After the pre-reset switch was pressed, the pre-reset or reset switch may have been pressed before the F3SG-SR/PG is blocked. Check the installation environment of the F3SG-SR/PG. |
|  Blinking: Three times | After the pre-reset switch was pressed and the F3SG-SR/PG was blocked, the pre-reset switch may have been pressed before the reset switch is pressed. Check the wiring of the pre-reset signal. |
| | After the pre-reset switch was pressed, a time period from the block of the F3SG-SR/PG to the press of the reset switch may have exceeded the allowable time. Check the installation environment of the F3SG-SR/PG as well as pre-reset and reset switches. |
| | The number of blocks of the F3SG-SR/PG may have exceeded the allowable value after the pre-reset switch was pressed and before the reset switch is pressed. Check the installation environment of the F3SG-SR/PG. |

PSDI Sequence Error Indication

The following table is applied only when the PSDI function is being enabled.

| SEQ indicator | Error condition | Cause and measures |
|--|-----------------|--|
|  Blinking: Once | ● | Power supply may have been turned ON with PSDI input being OFF. Check the condition of the light curtains and PSDI input wiring. |
| | ● | Power supply may have been turned ON with the light curtain blocked. Check the condition of the light curtains and PSDI input wiring. |
| | ● | Power supply may have been turned ON with RESET input being OFF. Check the condition of the light curtains and RESET input wiring. |
| | ● | PSDI input may have been turned OFF before RESET input was turned OFF. Check the PSDI input wiring. |
| | ● | The light curtain may have been blocked before RESET input was turned ON. Check the condition of the light curtains and RESET input wiring. |
| | ● | The PSDI input may have turned OFF while the RESET input is OFF. Check the condition of the light curtains and PSDI input wiring. |
|  Blinking: Twice | ● | After RESET input, the light curtain may not be blocked longer than T2 and the PSDI input may have turned OFF. Check the condition of the light curtains and RESET input wiring. |
| | ● | The PSDI input may have turned OFF with the light curtain blocked. Check the condition of the light curtains and PSDI input wiring. |
| | ⊙ | PSDI input may have turned OFF before the light curtain blocked twice. Check the condition of the light curtains and PSDI input wiring. |
|  Blinking: Three times | ● | The light curtain was blocked before the PSDI input turned OFF. Check the condition of the light curtains and PSDI input wiring. |
| | ● | The light curtain was blocked while the PSDI input turned OFF. Check the condition of the light curtains and PSDI input wiring. |
|  Blinking: Four times | ● | PSDI input may have turned OFF during the period from when the PSDI state is canceled until the light curtain blocked. Check the condition of the light curtains and PSDI input wiring. |
| | ● | The PSDI input may have turned OFF with the light curtain blocked. Check the condition of the light curtains and PSDI input wiring. |
| | ○ | It may have taken T4 (= 30 s) or longer for PSDI input to be turned OFF after the light curtain blocked. Check the condition of the light curtains and PSDI input wiring. |
| | ⊙ | It may have taken T6 (= 30 s) or longer for PSDI input to be turned OFF after the light curtain blocked. Check the condition of the light curtains and PSDI input wiring. |
| | ⊙ | The PSDI input may have turned OFF again before the light curtain blocked. Check the condition of the light curtains and PSDI input wiring. |
| | ⊙ | It may have taken T6 (= 30 s) or longer for PSDI input to be turned OFF after the light curtain blocked twice. Check the condition of the light curtains and PSDI input wiring. |
| | ⊙ | PSDI input may have turned OFF before the light curtain blocked again. Check the light curtain status and PSDI input wiring. |

Notations

- ...Single Break
- ⊙...Double Break
- ...Common

Common to F3SG-SR and F3SG-PG

Intelligent Tap

If the Intelligent Tap detects any failure, it transitions to the LOCKOUT state. Under the LOCKOUT state, the ERR indicator is turned ON. Identify an error according to the combination of the indicators when the error occurs. See the following troubleshooting tables to take measures. For detail, Refer to *User's Manual* (Man. No. Z405).



Combination of indicators and error description

| ERR (Red) | IN (Yellow) | OUT (Green/Red) | IO-Link (Green) | Error description |
|-----------|-------------|-----------------|-----------------|--|
| | --- | --- | --- | Communication error DIP Switch circuit error at startup |
| | | | --- | Communication error in Backup |
| | | Green | --- | Communication error in Restoration |
| | | Red | --- | Communication error between the F3SG-SR/PG and the Intelligent Tap |
| | | Green | --- | Restoration failed |
| | | Red | --- | LOCKOUT state of the F3SG-SR/PG |
| | --- | --- | | IO-Link circuit error |
| | --- | --- | --- | Power supply voltage error, or other errors |

- Note:**
- The signals output to IO-Link or IN and OUT indicators show the statuses of the F3SG-SR/PG or Intelligent Tap except their LOCKOUT state.
 - The muting inputs A and B are kept in the OFF state when the LOCKOUT state occurs due to the power supply voltage error.

| Description | Checking by | | Error code (hex) * | Cause and measures |
|-------------------------------|-------------|---|--------------------|---|
| | Indicator | SD Manager 3/ SD Manager 3 Mobile APP | | |
| Communication error | X | X | 1D | The communication lines or other lines may be short-circuited or broken. Check the cables for cascading or extension cables. If the wiring is extended with cables other than specified, the cables used for extension may not have performance equivalent or greater than the specified cables. Use cables with the same performance or more than the specified cables. |
| Communication error in Backup | X | X | 1E | The communication lines or other lines may be short-circuited or broken. Check the cables for cascading or extension cables. If the wiring is extended with cables other than specified, the cables used for extension may not have performance equivalent or greater than the specified cables. Use cables with the same performance or more than the specified cables. Effect of noise may be excessive. If other devices using the same power supply generate noise, do not share the same power supply with other devices, and use a separate power supply exclusively for the safety components. The inductive noise tends to be induced especially if the power supply line of the machine guarded and the power supply line of the Intelligent Tap are arranged in parallel. Arrange the exclusive power supply near the Intelligent Tap or lay the power supply line of the Intelligent Tap away from the power supply line of the machine guarded. If the power supply for the Intelligent Tap is located near the power supply of the machine guarded and it shares the same grounding wire, it is subject to the influence of common mode noise. Separate the grounding point or use it as the exclusive ground. |
| | | | | The internal circuit of the Intelligent Tap may be defective. Replace the Intelligent Tap. |

| Description | Checking by | | Error code (hex) * | Cause and measures |
|--|-------------|---|--------------------|---|
| | Indicator | SD Manager 3/ SD Manager 3 Mobile APP | | |
| Communication error in Restoration | X | X | 1F | <p>The communication lines or other lines may be short-circuited or broken. Check the cables for cascading or extension cables. If the wiring is extended with cables other than specified, the cables used for extension may not have performance equivalent or greater than the specified cables. Use cables with the same performance or more than the specified cables.</p> <p>Effect of noise may be excessive. If other devices using the same power supply generate noise, do not share the same power supply with other devices, and use a separate power supply exclusively for the safety components. The inductive noise tends to be induced especially if the power supply line of the machine guarded and the power supply line of the Intelligent Tap are arranged in parallel. Arrange the exclusive power supply near the Intelligent Tap or lay the power supply line of the Intelligent Tap away from the power supply line of the machine guarded. If the power supply for the Intelligent Tap is located near the power supply of the machine guarded and it shares the same grounding wire, it is subject to the influence of common mode noise. Separate the grounding point or use it as the exclusive ground.</p> <p>The internal circuit of the Intelligent Tap may be defective. Replace the Intelligent Tap.</p> |
| Communication error between the F3SG-SR/PG and the Intelligent Tap | X | --- | --- | <p>The F3SG-SR/PG may be disconnected from the Intelligent Tap, the communication line of the F3SG-SR/PG may be broken, or the internal circuit of the Intelligent Tap may be defective. Check the connection and cable wiring between the Intelligent Tap and the F3SG-SR/PG. In the case of defective internal circuit, replace the Intelligent Tap.</p> |
| F3SG-SR/PG LOCKOUT state | X | --- | --- | <p>The F3SG-SR/PG is in the LOCKOUT state. For details of the error of the F3SG-SR/PG, check the indicator status or error code of the F3SG-SR/PG.</p> |
| Restoration failed | X | --- | --- | <p>The sensor configuration (sensor model, connection configuration, etc.) stored in the Intelligent Tap by the Backup process does not match the sensor configuration of the connected F3SG-SR/PG. Connect the F3SG-SR/PG with the same sensor configuration as the backed-up sensor configuration, or perform the Backup process of the connected F3SG-SR / PG. Error codes are not recorded.</p> |
| Power supply voltage error, or other errors | X | X | A3 | <p>The muting inputs A and B are kept in the OFF state when the LOCKOUT state occurs due to the power supply voltage error. The power supply voltage may have dropped temporarily when the F3SG-SR/PG is in operation. Check for temporary power supply voltage drop (by about 12 VDC) by the influence of the inductive load, etc. If the exclusive power supply is not used, check the power consumption of other connected devices for enough capacity.</p> <p>Power supply voltage may be outside the rated range. Connect the F3SG-SR/PG to a 24 VDC±20% power supply voltage.</p> <p>Voltage fluctuation may have occurred due to insufficient power supply capacity. Replace the power supply with one that has a larger capacity.</p> <p>Instantaneous break or instantaneous stop may have occurred due to power sharing with other devices. Do not share the power supply with other devices. Connect the F3SG-SR/PG to a power supply that is dedicated to electro-sensitive protective devices for electro-sensitive protective equipment such as the F3SG-SR/PG, safety controller, etc.</p> |
| DIP Switch circuit error at startup | X | X | BC | <p>The internal circuit may be defective. Replace the Intelligent Tap.</p> |
| IO-Link circuit error | X | X | BD | <p>The internal circuit may be defective. Replace the Intelligent Tap.</p> |
| Internal error | X | X | Others | <p>The internal circuit may be defective. Replace the Intelligent Tap.</p> |

* You can check the error codes by SD Manager 3 or SD Manager 3 Mobile APP.

Common to F3SG-SR and F3SG-PG

Bluetooth® Communication Unit

See the following troubleshooting table to take measures if any of the phenomena in the table occurs when in the connection with the Bluetooth® Communication Unit.

| Status | Measures |
|--|--|
| Communications cannot be established | Check if Bluetooth® Communication Unit is properly mounted. |
| | Check if Bluetooth® function is enabled on the device you use for SD Manager 3. |
| | Check if Bluetooth® Communication Unit is not being paired with another device. |
| | Check if Bluetooth® Communication Unit and the device you use for SD Manager 3 are properly paired (or the connection is verified). * |
| | Check if Bluetooth® function of the device you use for SD Manager 3 supports SPP (Serial Port Profile). |
| | Check if a COM port is properly configured. |
| | Check the noise level in the environment. |
| | Check if there is any device that uses 2.4 GHz band. |
| | Check if there is any obstruction between Bluetooth® Communication Unit and the device you use for SD Manager 3. The maximum permissible line-of-sight distance is approximately 10 m. |
| | The F3SG-SR/PG is under the SETTING state. Turn OFF and ON the power of the F3SG-SR/PG. |
| Files cannot be read from the outside while the sensor is connected | The sensor model in the saved file does not match the sensor model in the file that you are about to read in. Check the sensor model. |
| | If a file is saved by SD Manager 3 of a newer version than your SD Manager 3, the file is not usable on your SD Manager 3. Check the SD Manager 3 version. |
| F3SG-SR/PG does not go back to normal state after terminating SD Manager 3 | Restart F3SG-SR/PG. If SD Manager 3 does not operate normally even after restarted, use the setup recovery function to restore to the factory default settings again. |

* The procedure depends on the device you use for SD Manager 3. Refer to instruction manuals of the device.

Legislation and Standards

1. The F3SG-SR/PG does not receive type approval provided by Article 44-2 of the Industrial Safety and Health Act of Japan. When using the F3SG-SR/PG in Japan as a "safety system for pressing or shearing machines" prescribed in Article 42 of that law, the machine control system must receive type approval.
2. The F3SG-SR/PG is electro-sensitive protective equipment (ESPE) in accordance with European Union (EU) Machinery Directive Index Annex V, Item 2.
3. EU Declaration of Conformity
OMRON declares that the F3SG-SR/PG is in conformity with the requirements of the following EU Directives:
Machinery Directive 2006/42/EC
EMC Directive 2014/30/EU
4. Conforming Standards
 - (1) European standards
EN61496-1 (Type 4 and Type 2 ESPE), EN 61496-2 (Type 4 and Type 2 AOPD), EN61508-1 through -4 (SIL 3 for Type 4 and SIL 1 for Type 2), EN ISO 13849-1:2015 (PL e, Category 4 for Type 4 and PL c, Category 2 for Type 2)
 - (2) International standards
IEC61496-1 (Type 4 and Type 2 ESPE), IEC61496-2 (Type 4 and Type 2 AOPD), IEC61508-1 through -4 (SIL 3 for Type 4 and SIL 1 for Type 2), ISO 13849-1:2015 (PL e, Category 4 for Type 4 and PL c, Category 2 for Type 2)
 - (3) JIS standards
JIS B 9704-1 (Type 4 and Type 2 ESPE), JIS B 9704-2 (Type 4 and Type 2 AOPD)
 - (4) North American standards
UL61496-1 (Type 4 and Type 2 ESPE), UL61496-2 (Type 4 and Type 2 AOPD), UL508, UL1998, CAN/CSA C22.2 No.14, CAN/CSA C22.2 No.0.8
 - (5) Chinese standards
GB/T 4584 (Specification of active opto-electronic protective devices for presses)
(Models: F3SG-4SR□□□□□-14/-25 in the case of the ON to OFF response time not exceeding 20 ms max.)

The following configurations of the F3SG-SR are compliant with GB/T 4584.

Configurations using the F3SG-SR with detection capability of 14-mm or 25-mm dia. and 20 ms max. of the ON to OFF response time

| Detection capability | Protective height | Number of beams | Configuration | Synchronization method | Response Time Adjustment | ON to OFF response time |
|---|-------------------|-----------------|---------------|------------------------|--------------------------|-------------------------|
| 14-mm dia. | 160 to 2000 mm | - | Single | Optical | Normal | 18 ms max. |
| 14-mm dia. | 160 to 1400 mm | - | Single | Wired | Normal | 17 ms max. |
| 25-mm dia. | 160 to 2480 mm | - | Single | Optical/Wired | Normal | 17 ms max. |
| Combination of 14-mm 25-mm dia. In cascade connection | - | 255 max. | Cascaded | Optical | Normal | 18 ms max. * |
| Combination of 14-mm 25-mm dia. In cascade connection | - | 140 max. | Cascaded | Wired | Normal | 15 ms max. * |

* Refer to *User's Manual* (Man.No.Z405) for more information on the response time for the F3SG-SR in cascade connection.

Note: The F3SG-SR's with detection capability of 45-mm and 85-mm dia. are not compliant with GB/T 4584. Refer to *Ratings and Specifications* on page 20 for more information on the ratings and specifications by model.

5. Third-Party Certifications
 - (1) TÜV SÜD
 - EC Type-Examination certificate:
EU Machinery Directive, Type 4 and Type 2 ESPE (EN61496-1), Type 4 and Type 2 AOPD (EN 61496-2)
 - Certificate:
Type 4 and Type 2 ESPE (EN61496-1), Type 4 and Type 2 AOPD (EN61496-2), EN 61508-1 through -4 (SIL 3 for Type 4 and SIL 1 for Type 2), EN ISO 13849-1:2015 (PL e, Category 4 for Type 4, and PL c, Category 2 for Type 2)
 - (2) UL
 - UL Listing:
Type 4 and Type 2 ESPE (UL61496-1), Type 4 and Type 2 AOPD (UL61496-2), UL508, UL1998, CAN/CSA C22.2 No.14, CAN/CSA C22.2 No.0.8
 - (3) China National Casting and Forging Machines Quality Supervision and Inspection Center
 - Certificate:
GB/T 4584 (Specification of active opto-electronic protective devices for presses)
(Models: F3SG-4SR□□□□□-14/-25 in the case of the ON to OFF response time not exceeding 20 ms max.)
6. Other Standards
The F3SG-SR/PG is designed according to the standards listed below. To make sure that the final system complies with the following standards and regulations, you are asked to design and use it in accordance with all other related standards, laws, and regulations. If you have any questions, consult with specialized organizations such as the body responsible for prescribing and/or enforcing machinery safety regulations in the location where the equipment is to be used.
 - European Standards: EN415-4, EN691-1, EN692, EN693, IEC 62046
 - U.S. Occupational Safety and Health Standards: OSHA 29 CFR 1910.212
 - U.S. Occupational Safety and Health Standards: OSHA 29 CFR 1910.217
 - American National Standards: ANSI B11.1 to B11.19
 - American National Standards: ANSI/RIA R15.06
 - Canadian Standards Association CSA Z142, Z432, Z434
 - SEMI Standards SEMI S2
 - Japan Ministry of Health, Labour and Welfare "Guidelines for Comprehensive Safety Standards of Machinery", Standard Bureau's Notification No. 0731001 dated July 31, 2007.rms and Conditions Agreement
 - Chinese National Standards: GB17120, GB27607
7. Meaning of mark according to EU WEEE Directive



Dispose in accordance with applicable regulations.

Common to F3SG-SR and F3SG-PG

8. Regions where F39-SGBT can be used

The product can be used in Japan, the United States, Canada, EU member state, and China. The use in other countries may conflict with radio laws of the countries. For the regions where the F39-SGBT can be used, refer to the following instruction manuals of the F39-SGBT.

| Document Title | No. |
|------------------------------------|-----------|
| F39-SGBT Instruction Sheet | 4615743-0 |
| F39-SGBT Regulations and Standards | 4615744-8 |

Related Manuals

| Man.No. | Model | Manual Name |
|---------|--|---|
| Z405 | F3SG-□SR□□□□□□-□□-□□ F3SG-□PG□□□□□□-□□-□□ | Safety Light Curtain F3SG-□SR□ Series Safety Multi-Light Beam F3SG-□PG□ Series User's Manuals |

Safety Precautions

Be sure to read the *Common Precautions for Safety Warning* at the following URL: <http://www.ia.omron.com/>.

Be sure to read the following user's manual for other details required for correct use of the Safety Light Curtain.

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Brochure
**Safety Light Curtain/
Safety Multi-Light Beam**



F3SG-SR/PG

Cat No.F118

Note: Do not use this document to operate the Unit.

OMRON Corporation Industrial Automation Company

Kyoto, JAPAN

Contact : www.ia.omron.com

Regional Headquarters

OMRON EUROPE B.V.

Wegalaan 67-69, 2132 JD Hoofddorp
The Netherlands
Tel: (31) 2356-81-300 Fax: (31) 2356-81-388

OMRON ELECTRONICS LLC

2895 Greenspoint Parkway, Suite 200
Hoffman Estates, IL 60169 U.S.A.
Tel: (1) 847-843-7900 Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.

438B Alexandra Road, #08-01/02 Alexandra
Technopark, Singapore 119968
Tel: (65) 6835-3011 Fax: (65) 6835-3011

OMRON (CHINA) CO., LTD.

Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-6023-0333 Fax: (86) 21-5037-2388

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