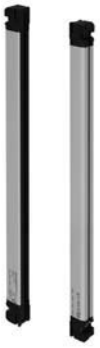
Safety Light Curtain/Safety Multi-Light Beam

F3SG-SR/PG

Easy to monitor and ready for IoT

- Conforms to major international standards
- Environmental resistance and rugged structure for use in any environment (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
- For diverse applications, from simple protection to data utilization

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



IO-Link

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
							Sensor		Intelligent Tap	PC/Smartphone	
	F3SG-SRA	F3SG-SRB	F3SG-PG-A	F3SG-PG-L	F3SG-PG-C	F3SG-SRB-K	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	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.

System Configuration

Example 1. Basic system: ON-OFF control

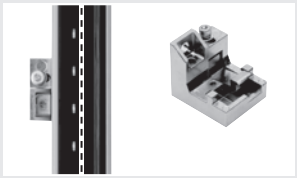
Feature: Easy connection, ON-OFF control
Use in default setting (settings cannot be changed)
Monitoring is unavailable
Optical synchronization

[1] F3SG-SR/PG

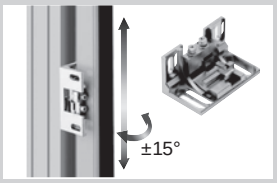
Receiver, Emitter

[2] Bracket (Sold separately)

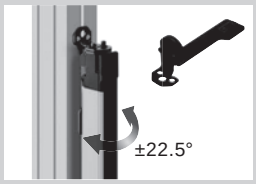
Standard Fixed Bracket (Intermediate Bracket)
F39-LSGF



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



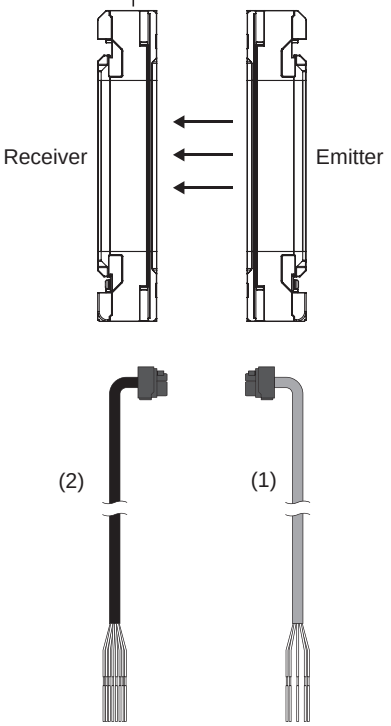
Adjustable Top/Bottom Bracket
F39-LSGTB-SJ
F39-LSGTB-RE
F39-LSGTB-MS



[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
Receiver Mountable

Other Optional Accessories Common

Laser Pointer
F39-PTS
F39-PTG

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

Recommended Safety Controllers (Sold separately) ✻

Safety Control Unit
NX-Series, NX-SL/SI/SO

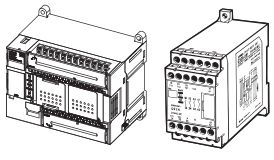
Safety Controller
G9SP-series

Safety Network Controller
NE1A-series

Safety Relay Unit
G9SE, G9SA

Flexible Safety Unit
G9SX-series

Relays with Forcibly Guided Contacts
G7SA, G7S-E



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

Example 2. Cascading using Intelligent Tap

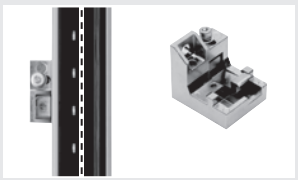
Feature:
Flexible functional setting and monitoring with SD Manager 3
Wired synchronization

[1] F3SG-SR/PG

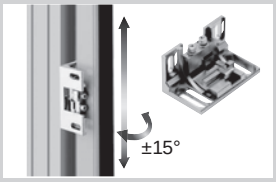
Receiver, Emitter

[2] Bracket (Sold separately)

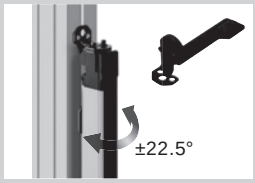
Standard Fixed Bracket (Intermediate Bracket)
F39-LSGF



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



Adjustable Top/Bottom Bracket
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

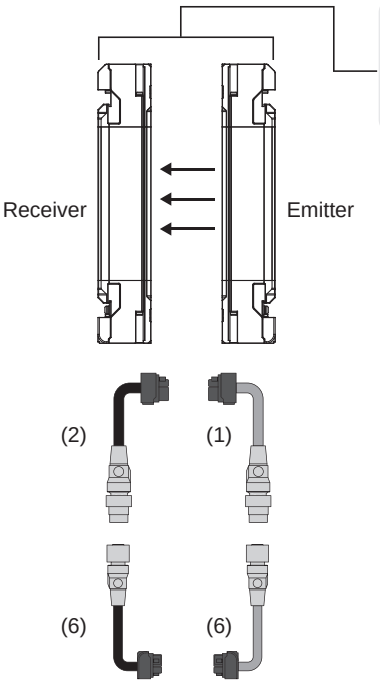
[4] Accessories (Sold separately)

Lamp
F39-SGLP
Emitter and Receiver Mountable

Other Optional Accessories Common

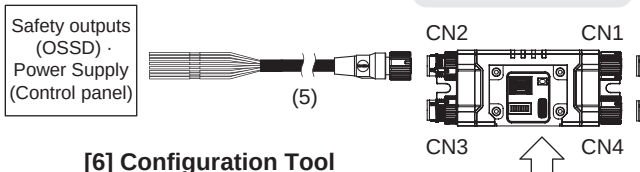
Laser Pointer
F39-PTS
F39-PTG

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



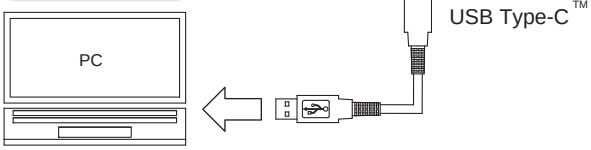
[5] Intelligent Tap (Sold separately)

F39-SGIT-IL3



[6] Configuration Tool

SD Manager3



Recommended Safety Controllers (Sold separately) ✻

Safety Control Unit
NX-Series, NX-SL/SI/SO

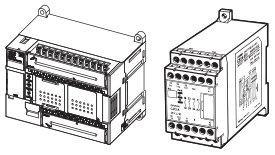
Safety Controller
G9SP-series

Safety Network Controller
NE1A-series

Safety Relay Unit
G9SE, G9SA

Flexible Safety Unit
G9SX-series

Relays with Forcibly Guided Contacts
G7SA, G7S-E



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

Example 3. IO-Link system

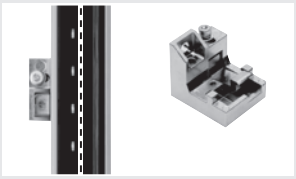
Feature:
Data collection and status monitoring using open network are available
Wired synchronization

[1] F3SG-SR/PG

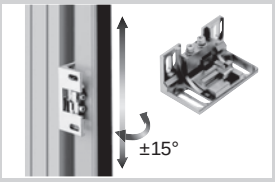
Receiver, Emitter

[2] Bracket (Sold separately)

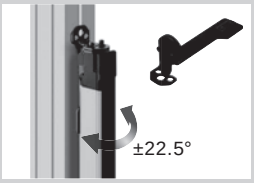
Standard Fixed Bracket (Intermediate Bracket)
F39-LSGF



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

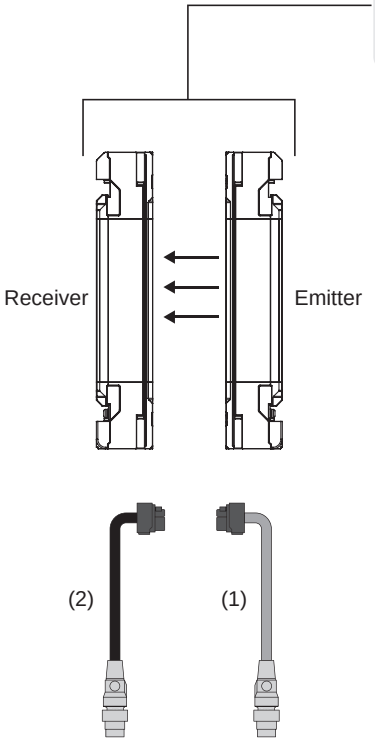
[4] Accessories (Sold separately)

Lamp
F39-SGLP
Emitter and Receiver Mountable

Other Optional Accessories Common

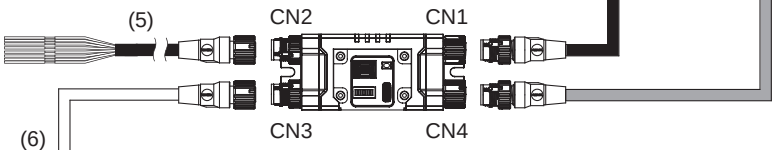
Laser Pointer
F39-PTS
F39-PTG

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



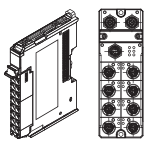
[5] Intelligent Tap (Sold separately)

F39-SGIT-IL3



IO-Link Master unit (Sold separately)

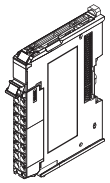
NX-series
NX-ILM400
GX-series
GX-ILM08C



IO-Link Master

Recommended Safety Controllers (Sold separately) ✻

Safety Control Unit
NX-Series
NX-SL/SI/SO



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

Table of Contents

Safety Light Curtain/Safety Multi-Light Beam

F3SG-SR/PG

Safety Light Curtain F3SG-SR Series IP69K Model

F3SG-SR-K

Common to Safety Light Curtain and Safety Multi-Light Beam

Common to F3SG-SR and F3SG-PG

Model Number Legend

Safety Light Curtain F3SG-SR

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

✻For details on the IP69K model, refer to page 74.

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 8 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 10 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**

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**

Accessories (Sold separately)

Bracket Common to F3SG-SR and F3SG-PG

Side mounting and backside mounting are possible.

For fixed mounting

Application	Appearance	Type	Model
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.)		Standard Bracket (Intermediate Bracket)	**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.

Application	Appearance	Type	Model
The angle adjustment range is ±15°. Two brackets per set (See ✻1 below for the number of sets required for each model.)		Adjustable Side-Mount Bracket (Intermediate Bracket)	**F39-LSGA**
Use this bracket at the top and bottom positions of the F3SG-SR/PG. The angle adjustment range is ±22.5°. 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.)		Adjustable Top/Bottom Bracket F3SJ, F3SN Adapter	**F39-LSGTB-SJ**
Use this bracket at the top and bottom positions of the F3SG-SR/PG. The angle adjustment range is ±22.5°. 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.)		Adjustable Top/Bottom Bracket F3SG-RA/RE Adapter	**F39-LSGTB-RE**
Use this bracket at the top and bottom positions of the F3SG-SR/PG. The angle adjustment range is ±22.5°. 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.)		Adjustable Top/Bottom Bracket MS4800, F3SR Adapter	**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 41 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 Black TEST Blue 0V/24V White COM(+) Yellow OPERATING RANGE SELECT INPUT/COM(-) IP67 and IP67G (JIS C 0920 Annex 1) rated when mated.	3 m	**F39-JG3C-L**
			7 m	**F39-JG7C-L**
			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	Yellow RESET/EDM Brown 24V/0V Gray MUTE A/PRE-RESET/PSDI/COM(+) Pink MUTE B/COM(-) Black OSSD 1 White OSSD 2 Blue 0V/24V Red AUX IP67 and IP67G (JIS C 0920 Annex 1) rated when mated.	3 m	**F39-JG3C-D**
			7 m	**F39-JG7C-D**
			10 m	**F39-JG10C-D**

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	1 Brown 24V/0V 2 Black TEST 3 Blue 0V/24V 4 White COM(+) 5 Yellow OPERATING RANGE SELECT INPUT/COM(-) IP67 and IP67G (JIS C 0920 Annex 1) rated when mated.  Male	0.3 m	**F39-JGR3K-L**
	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	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 IP67 and IP67G (JIS C 0920 Annex 1) rated when mated.  Male	0.3 m	**F39-JGR3K-D**

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.

[Extension Cable]
Extended Socket-Straight Cable

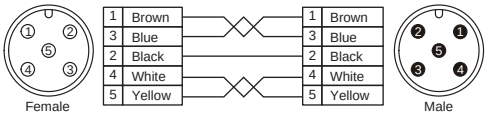
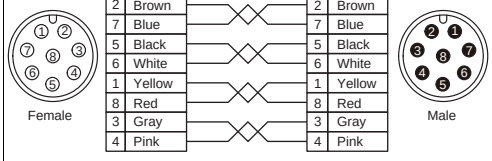
Appearance	Type	Specifications	Cable length	Model
	For emitter M12 connector (5-pin), 5 wires Color: Gray	Connected to root cable or Extended Plug-Socket Cable  Female 1 Brown 24V/0V 2 Black TEST 3 Blue 0V/24V 4 White COM(+) 5 Yellow OPERATING RANGE SELECT INPUT/COM(-) IP67* rated when mated.	3 m	**F39-JG3A-L**
			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  Female 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 IP67* rated when mated.	3 m	**F39-JG3A-D**
			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.

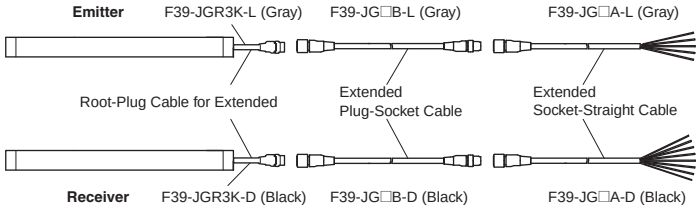
Extended Plug-Socket Cable

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: 1 Brown, 3 Blue, 2 Black, 4 White, 5 Yellow — Male: 1 Brown, 3 Blue, 2 Black, 4 White, 5 Yellow 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: 2 Brown, 7 Blue, 5 Black, 6 White, 1 Yellow, 8 Red, 3 Gray, 4 Pink — Male: 2 Brown, 7 Blue, 5 Black, 6 White, 1 Yellow, 8 Red, 3 Gray, 4 Pink 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)

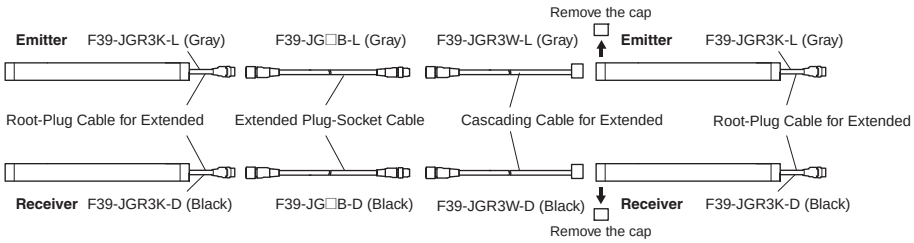
Appearance	Type	Specifications	Cable length	Model
	For emitter To sensors: dedicated connector 1, To cascading sensors: dedicated connector 2 Color: Gray For receiver To sensors: dedicated connector 1, To cascading sensors: dedicated connector 2 Color: Black	Used to series-connect sensors with the minimum 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	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**

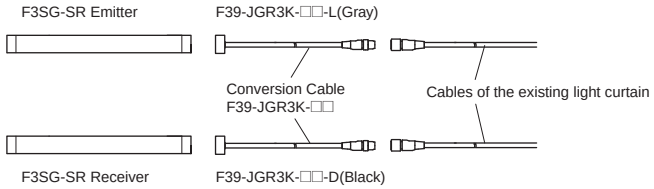
Note: To extend the cable length between the series-connected sensors to more than 60 cm, connect the F39-JG□B-□ Extended Plug-Socket Cable (up to 10 m: F39-JG10B-□) to the F39-JGR3W Cascading Cable for Extended.
Extension cable between sensors: 10 m max. (not including Cascading Cable for Extended (F39-JGR3W)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



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

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

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

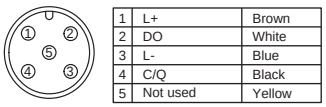
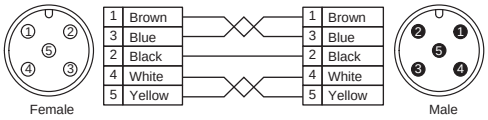
Type	Specifications
SD Manager 3	Configuration tool running on a PC. Use with the Intelligent Tap. (The Bluetooth® communication unit is required to connect using Bluetooth®.) For details, refer to your local Omron website.
SD Manager 3 Mobile APP	Monitoring tool running on a smartphone. Use with the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

Intelligent Tap ✻

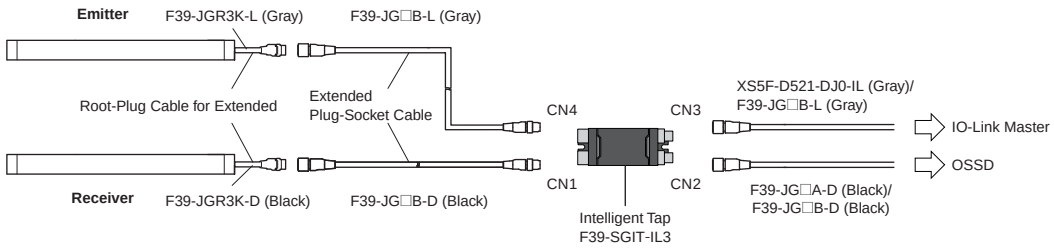
Appearance	Specifications	Type	Model
	Used to configure the F3SG-SR/PG and connect external devices via IO-Link. The F3SG-SR/PG can be configured on a PC or with the DIP switch on the Intelligent Tap. IP67 and IP67G (JIS C 0920 Annex 1) rated when mated.	Intelligent Tap	**F39-SGIT-IL3**
	Mounted to the 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 *Legislation and Standards* on page 110.	Bluetooth® Communication Unit	**F39-SGBT**
	Bracket to mount the Intelligent Tap on a DIN track.	Intelligent Tap Bracket For DIN in Panel	**F39-LITF1**

Note: Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).
✻ Use the F39-SGBT Bluetooth® Communication Unit or a commercially available USB Type-C™ cable to connect to a PC.

Intelligent Tap-to-IO-Link Master Cable

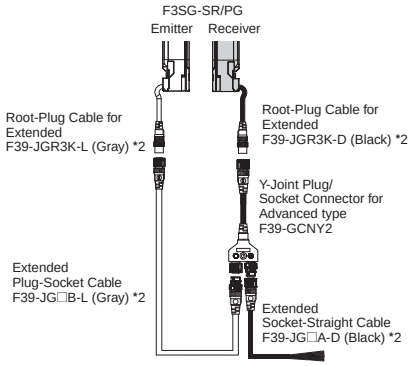
Omron IO-Link master unit	Type	Specifications	Cable length	Model
NX-ILM400	Single-ended cable M12 connector (5-pin), 5 wires Color: Gray	 Female IP67✻ rated when mated.	2 m	**XS5F-D521-DJ0-IL**
GX-ILM08C	Double-ended cable M12 connector (5-pin), 5 wires Color: Gray	 Female Male IP67✻ rated when mated.	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).



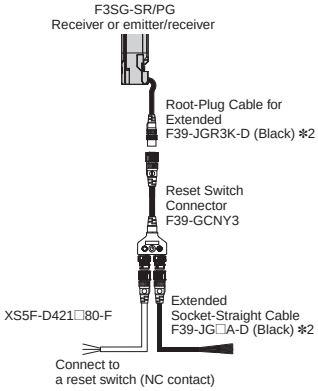
Reduced Wiring System

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

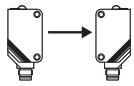
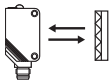
Connector Connected to Cable, Socket on One Cable End

Appearance	Type	Specifications	Cable length	Model
	M12 connector (4-pin), 4 wires		1 m	**XS5F-D421-C80-F**
			2 m	**XS5F-D421-D80-F**
			3 m	**XS5F-D421-E80-F**
			5 m	**XS5F-D421-G80-F**
			10 m	**XS5F-D421-J80-F**
			20 m	**XS5F-D421-L80-F**

✻ 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

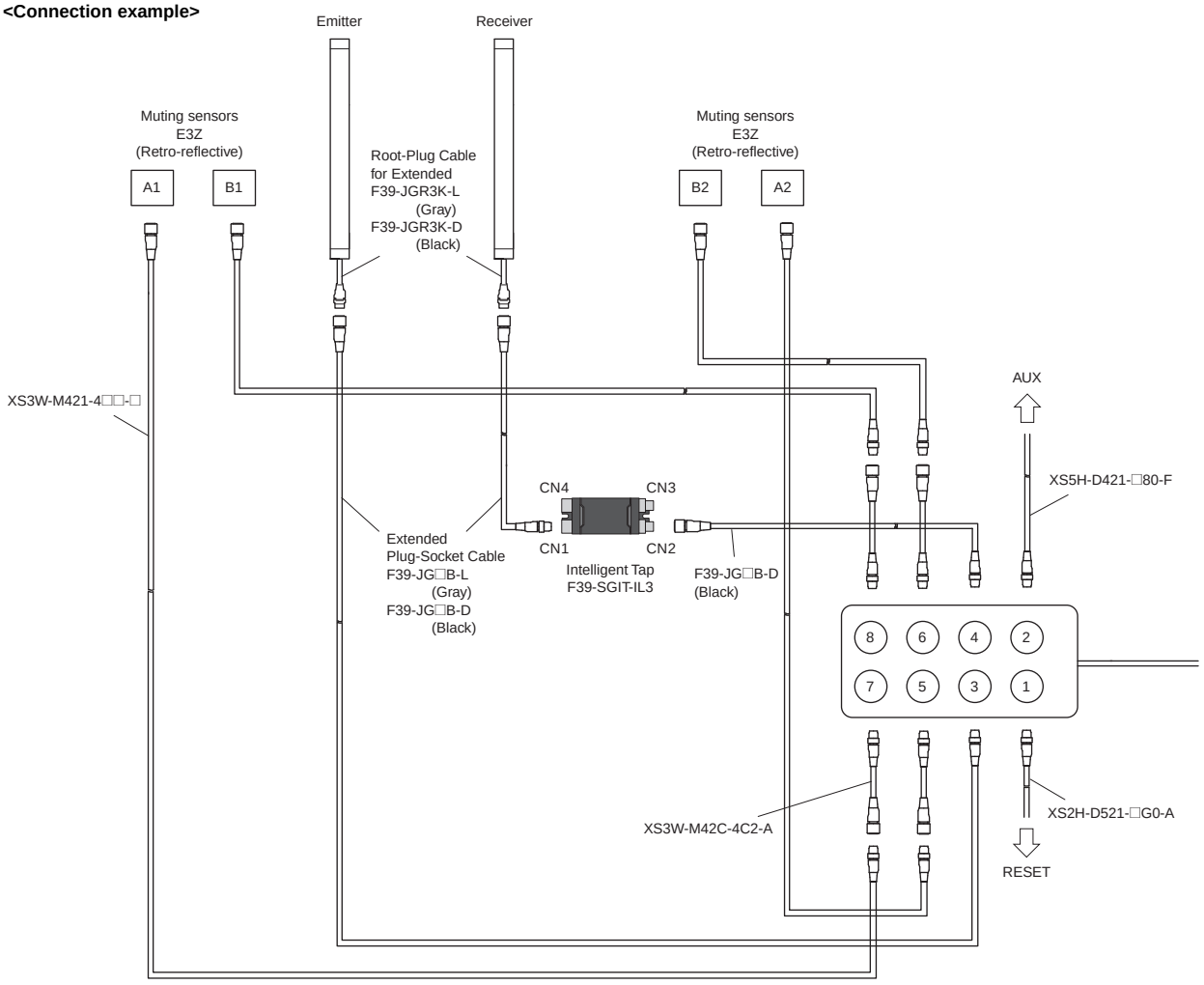
Appearance	Application	Specifications	Cable Length	Model
	Cable to connect the Muting Sensor and F39-GCN5 Muting Sensor Connection Box.	Connectors connected to cable, M8 socket and M12 plug on cable ends (4 pin)	0.2 m	**XS3W-M42C-4C2-A**
	Sensor I/O Connectors Connectors with Cables, Connectors on Both Cable Ends (Socket/Plug)	Connectors connected to cable, M8 socket and M8 plug on cable ends (4 pin) Straight (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**
	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.	Connectors connected to cable, M8 socket and M8 plug on cable ends (4 pin) Right-angle (socket)/straight (plug)	2 m	**XS3W-M424-402-R**
			5 m	**XS3W-M424-405-R**
	Cable to connect the device for auxiliary output and F39-GCN5 Muting Sensor Connection Box	Connector connected to cable, M12 plug on one cable end (4 pin)	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**
	Cable to connect the device for reset input and F39-GCN5 Muting Sensor Connection Box	Connector connected to cable, M12 plug on one cable end (5 pin)	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 light curtain		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 light curtain		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**
	---	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**
(Operating range becomes 10% shorter than the rating)	---	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.

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	Specifications	Model
	The laser alignment pointer can be attached to the front side of the F3SG-SR/PG. It can be used together with F39-ST.	**F39-PTS**
	The laser alignment pointer can be attached to the F3SG-SR/PG with the spatter protection cover.	**F39-PTG**

Lamp

Appearance	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	
 (Operating range becomes 10% shorter than the rating)	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**
	F3SG-4SR□1600-14	F3SG-4SR□1600-25	---	**F39-HSG1600**
	---	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.

MEMO

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 33. Refer to *the User's Manual* (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)			Performance
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	Response time ✻	
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			

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 33.			
	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✻3 Leakage current: 1 mA max.(PNP), 2 mA max. (NPN) ✻4 **✻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.			
	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 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) ✻			
		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-3 V to Vs (short circuit current: approx. 4.5 mA) ✻ OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 7.0mA) ✻ 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) ✻			
		✻ The Vs indicates a supply voltage value in your environment.				
	Overvoltage category (IEC 60664-1)		II			
	Indicators		Refer to page 96.			
	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)		Electrical
Refer to page 33.			Current consumption		
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) ✻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.			Safety outputs (OSSD)		
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.			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) ✻ 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) ✻		---	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) ✻ 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) ✻			RESET/EDM		
PNP ON voltage: Vs-3 V to Vs (short circuit current: approx. 4.5 mA) ✻ OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 7.0mA) ✻ 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) ✻			MUTE A/B, RE-RESET, PSDI		
✻ The Vs indicates a supply voltage value in your environment.					
II			Overvoltage category (IEC 60664-1)		
Refer to page 96.			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		Functional
---			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		

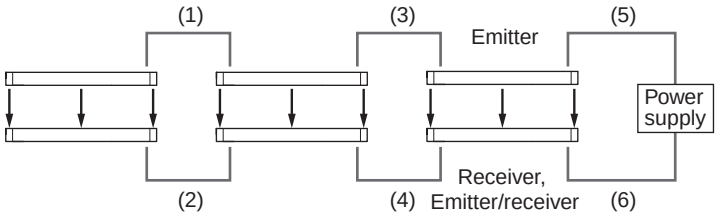
Model			Safety Light Curtain			
			F3SG-□SRA□□□□-14 F3SG-□SRB□□□□-14	F3SG-□SRA□□□□-25 F3SG-□SRB□□□□-25	F3SG-□SRA□□□□-45 F3SG-□SRB□□□□-45	F3SG-□SRA□□□□-85 F3SG-□SRB□□□□-85
Environmental	Ambient temperature	Operating	-30 to 55 °C (non-icing)			
		Storage	-30 to 70 °C			
	Ambient humidity	Operating	35% 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)		10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes			
	Shock resistance (IEC 61496-1)		100 m/s^2, 1000 shocks for all 3 axes			
	Pollution degree (IEC 60664-1)		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 12.			
		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 14.			
		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 13.			
		Cable diameter	6.6 mm			
		Minimum bending radius	R36 mm			
	Cable extension		Refer to page 30 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 30.			
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 110.			
	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	Environmental
-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)		
10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes			Vibration resistance (IEC 61496-1)		
100 m/s^2, 1000 shocks for all 3 axes			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	Connections
Emitter: 5, Receiver: 8, Emitter/receiver: 8			Number of wires		
Refer to page 12.			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 13.			Cable length		
6.6 mm			Cable diameter		
R36 mm			Minimum bending radius		
Refer to page 30 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 30.			Weight		
Instruction Sheet, Quick Installation Manual, Troubleshooting Guide Sticker, End Cap (for switching Scan Code Selection function)			Included accessories		
Refer to page 110.			Conforming standards		Conformity
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_D		
Every 20 years (IEC 61508)			Proof test interval T_M		
99% (IEC 61508)			SFF		
1 (IEC 61508)			HFT		
Type B (IEC 61508-2)			Classification		

Restrictions on cable extension

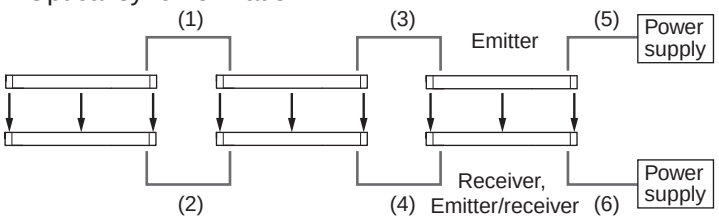
For the cable extension of the F3SG-SR/PG, refer to the following diagrams. For the cable extension of the F3SG-SR/PG with the Intelligent Tap, refer to *User's Manual* (Man. No. Z405).

- 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)		10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes
	Shock resistance (IEC 61496-1)		100 m/s^2, 1000 shocks for all 3 axes
	Pollution degree (IEC 60664-1)		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	10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes
Shock resistance	100m/s^2, 1000 shocks for all 3 axes
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.

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.

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

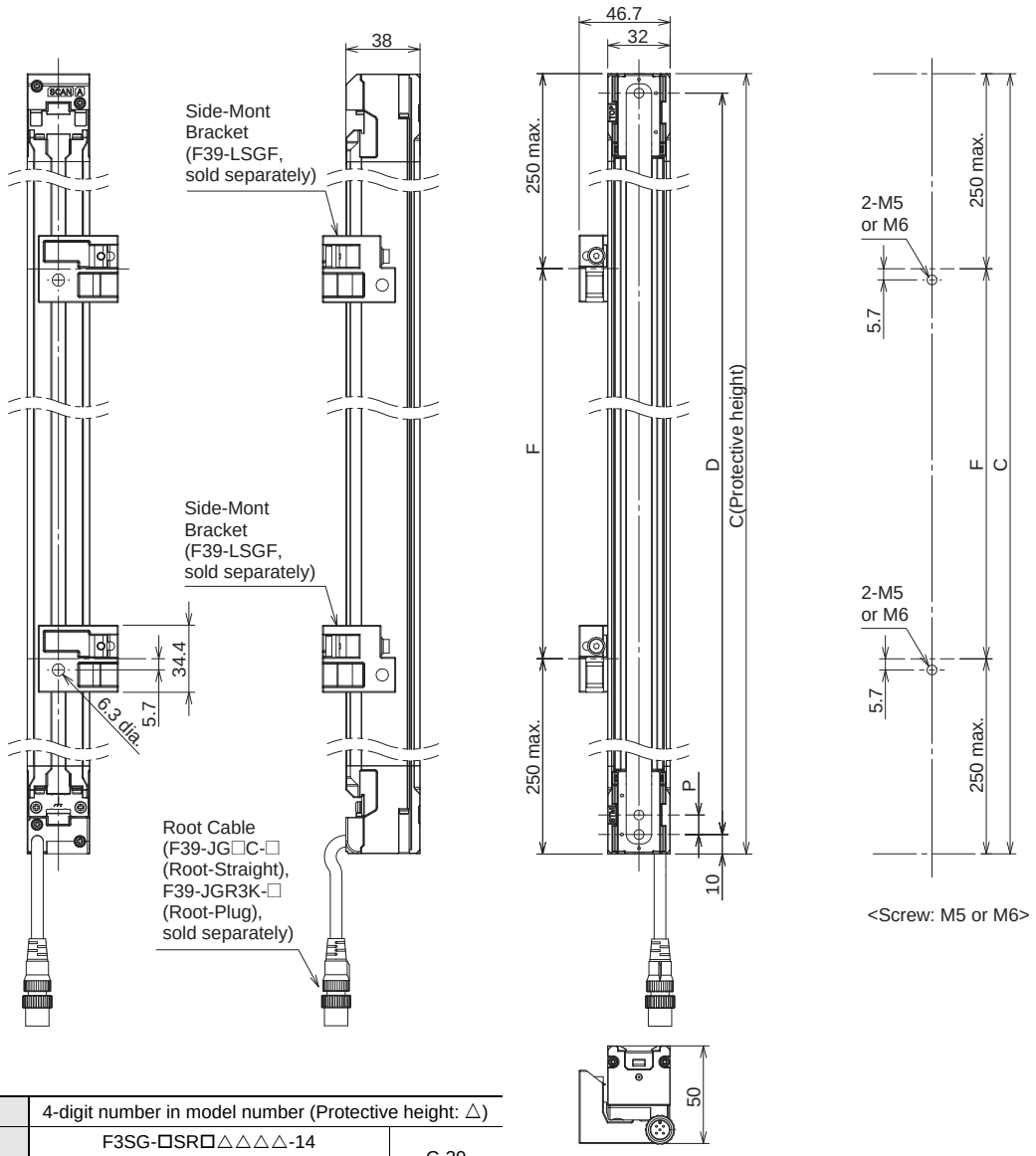
Dimensions

(Unit: mm)

F3SG-SR Main Unit

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

Backside Mounting



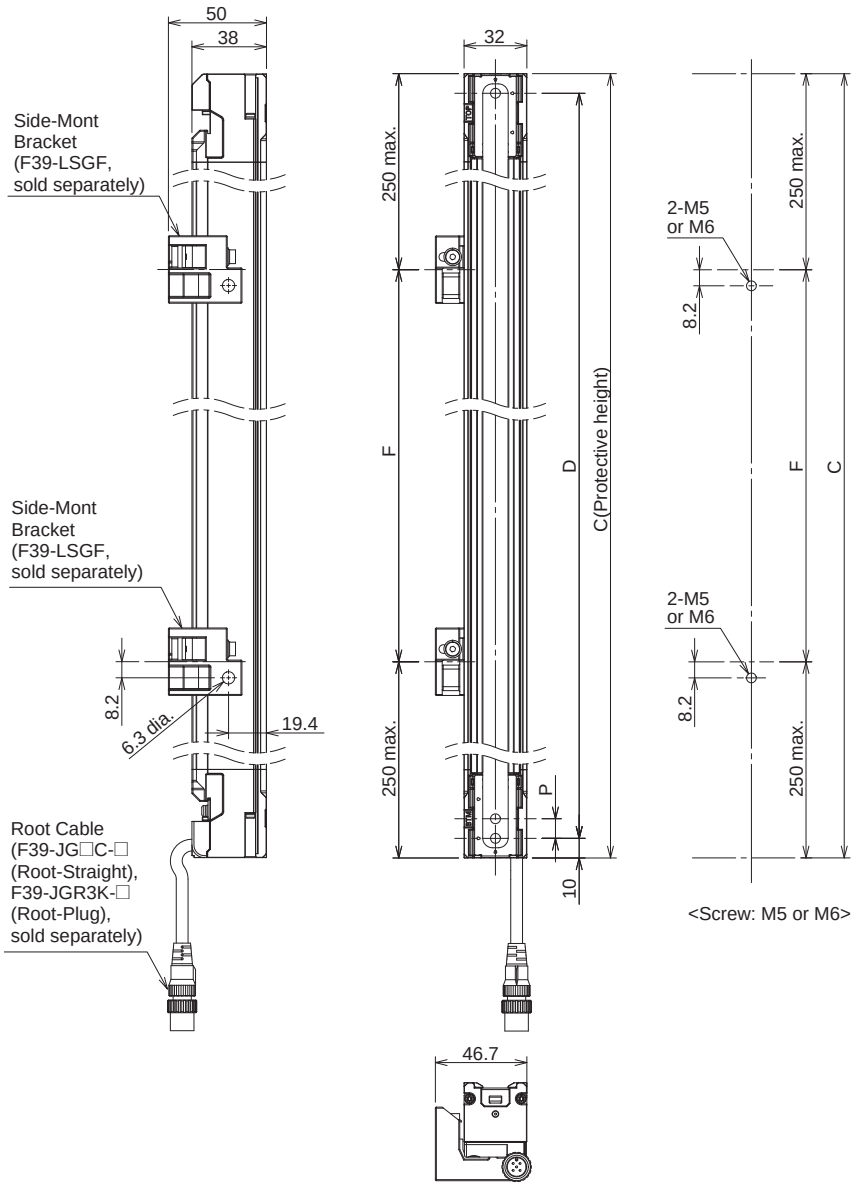
Dimension C	4-digit number in model number (Protective height: △)	
Dimension D	F3SG-□SR□△△△△-14	C-20
	F3SG-□SR□△△△△-25	
	F3SG-□SR□△△△△-45	C-40
	F3SG-□SR□△△△△-85	
Dimension P	F3SG-□SR□△△△△-14	10
	F3SG-□SR□△△△△-25	20
	F3SG-□SR□△△△△-45	40
	F3SG-□SR□△△△△-85	80

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

Side Mounting



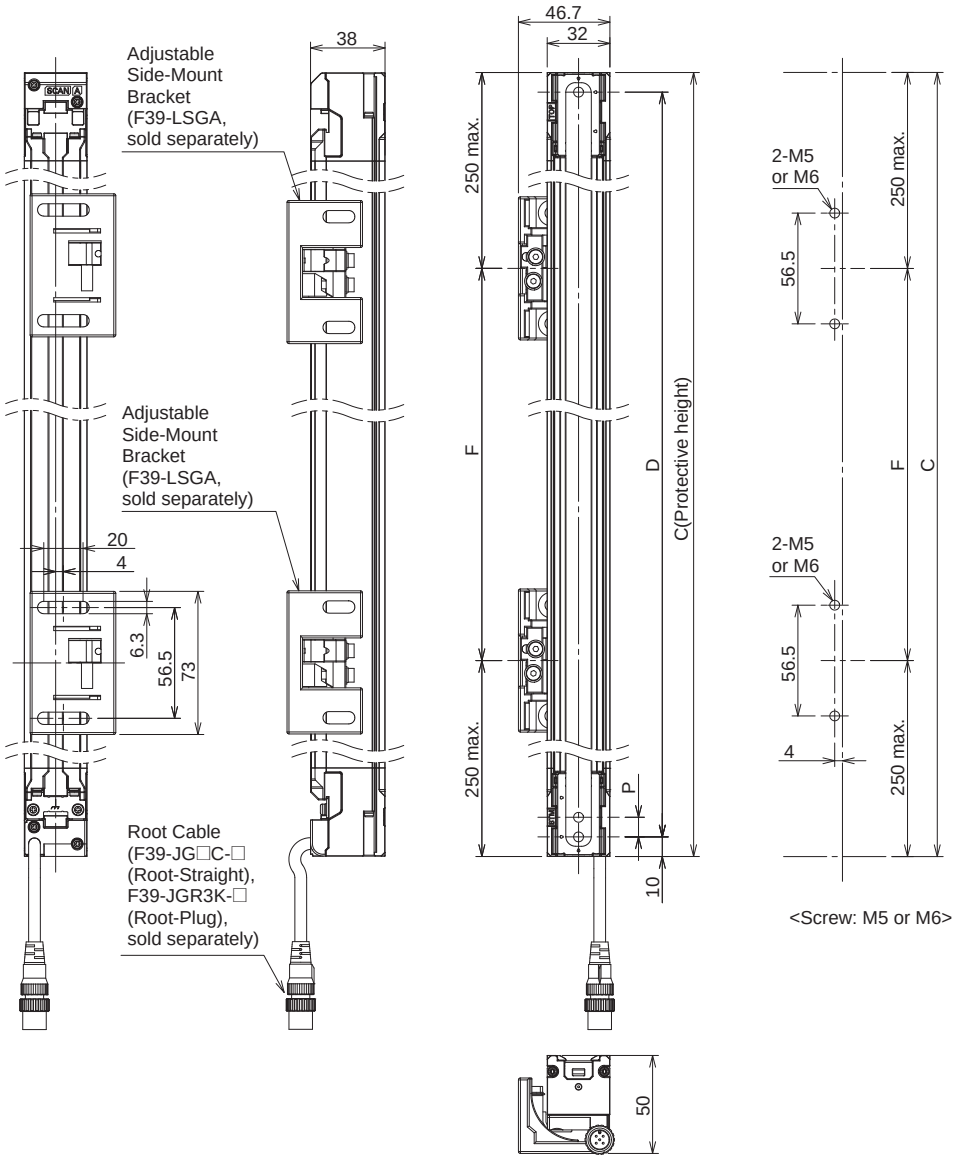
Dimension C	4-digit number in model number (Protective height: △)	
Dimension D	F3SG-□SR□△△△△-14	C-20
	F3SG-□SR□△△△△-25	
	F3SG-□SR□△△△△-45	C-40
	F3SG-□SR□△△△△-85	
Dimension P	F3SG-□SR□△△△△-14	10
	F3SG-□SR□△△△△-25	20
	F3SG-□SR□△△△△-45	40
	F3SG-□SR□△△△△-85	80

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



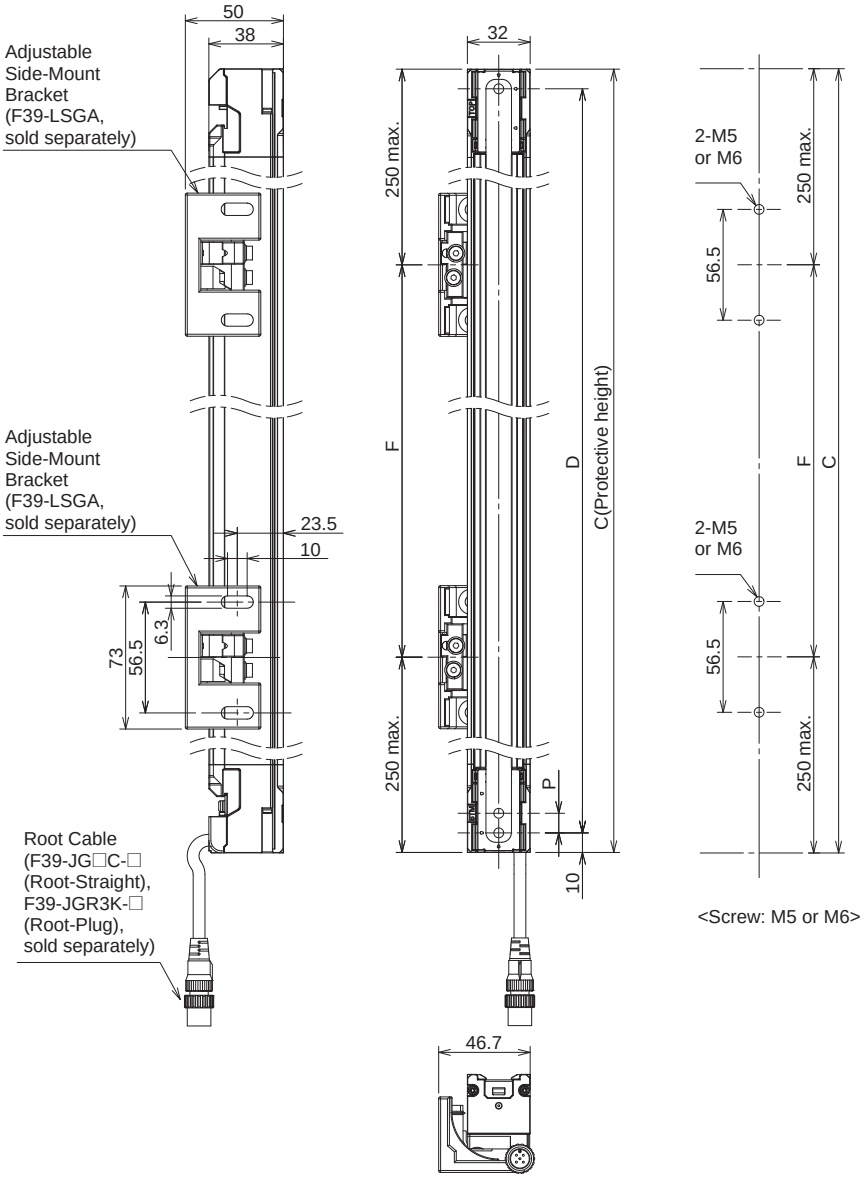
Dimension C	4-digit number in model number (Protective height: △)	
Dimension D	F3SG-□SR□△△△△-14	C-20
	F3SG-□SR□△△△△-25	
	F3SG-□SR□△△△△-45	C-40
	F3SG-□SR□△△△△-85	
Dimension P	F3SG-□SR□△△△△-14	10
	F3SG-□SR□△△△△-25	20
	F3SG-□SR□△△△△-45	40
	F3SG-□SR□△△△△-85	80

Protective height (Dimension C)	Number of 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).

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

Side Mounting



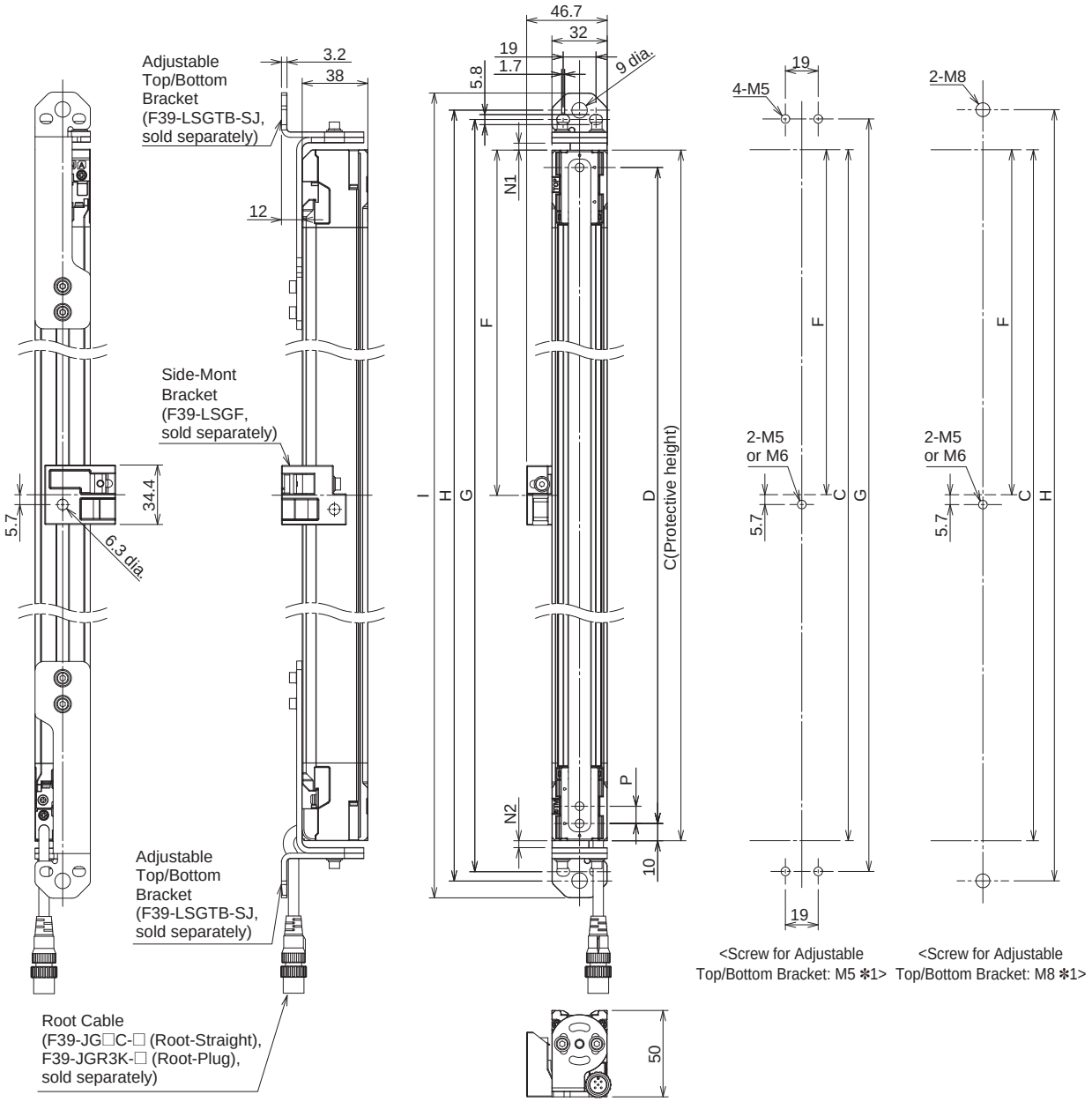
Dimension C	4-digit number in model number (Protective height: △)	
Dimension D	F3SG-□SR□△△△△-14	C-20
	F3SG-□SR□△△△△-25	
	F3SG-□SR□△△△△-45	C-40
	F3SG-□SR□△△△△-85	
Dimension P	F3SG-□SR□△△△△-14	10
	F3SG-□SR□△△△△-25	20
	F3SG-□SR□△△△△-45	40
	F3SG-□SR□△△△△-85	80

Protective height (Dimension C)	Number of 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).

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

Backside Mounting



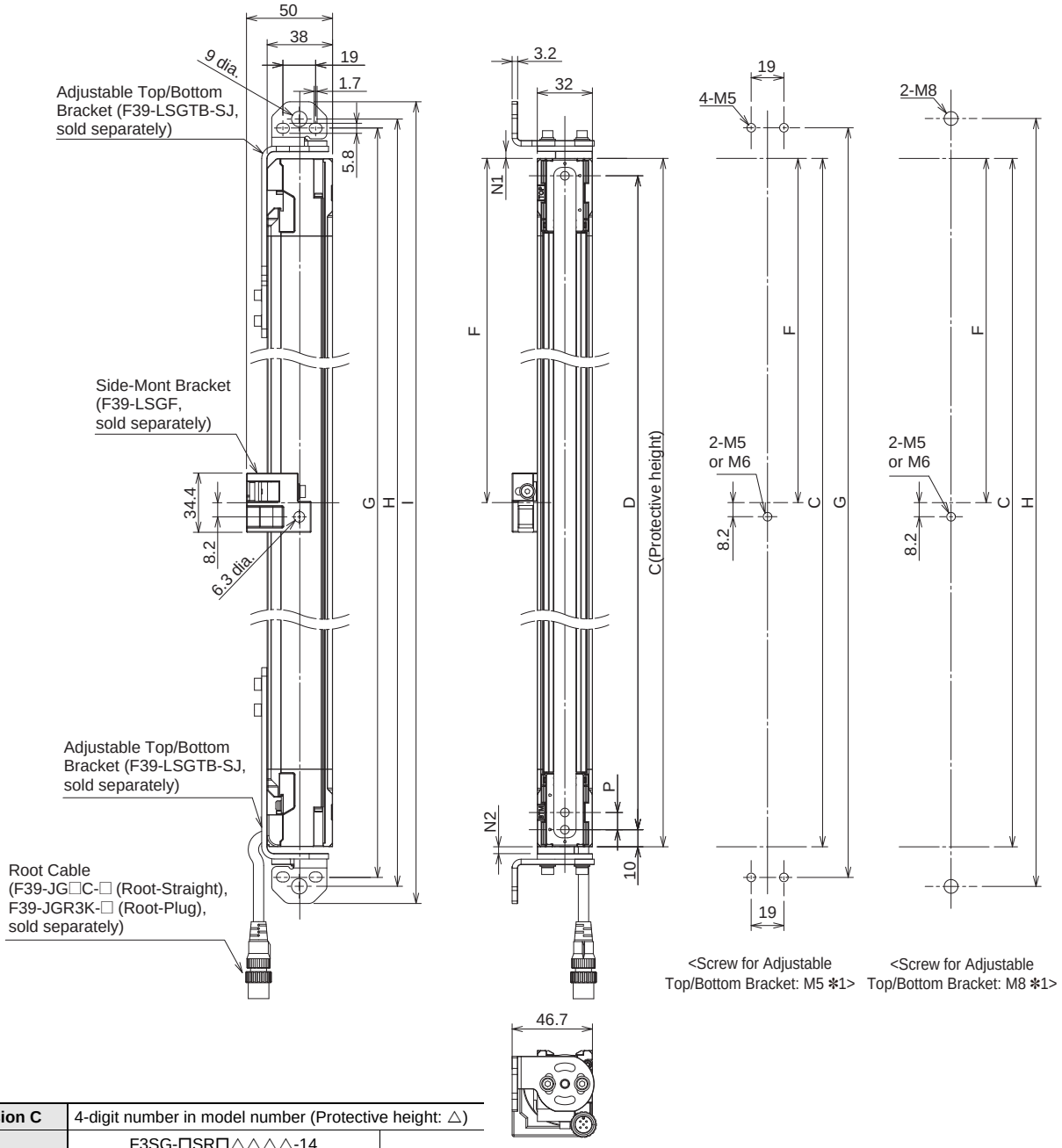
Dimension C	4-digit number in model number (Protective height: △)	
Dimension D	F3SG-□SR□△△△△-14	C-20
	F3SG-□SR□△△△△25	
	F3SG-□SR□△△△△-45	C-40
	F3SG-□SR□△△△△-85	
Dimension G	C+27.2+N1+N2	
Dimension H	C+38+N1+N2	
Dimension I	C+58+N1+N2	
Dimension N1	0 to 30 ✻2	
Dimension N2	0 to 30 ✻2	
Dimension P	F3SG-□SR□△△△△-14	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 to1680	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 Side-Mount Brackets (Intermediate Brackets) (F39-LSGF)

Side Mounting



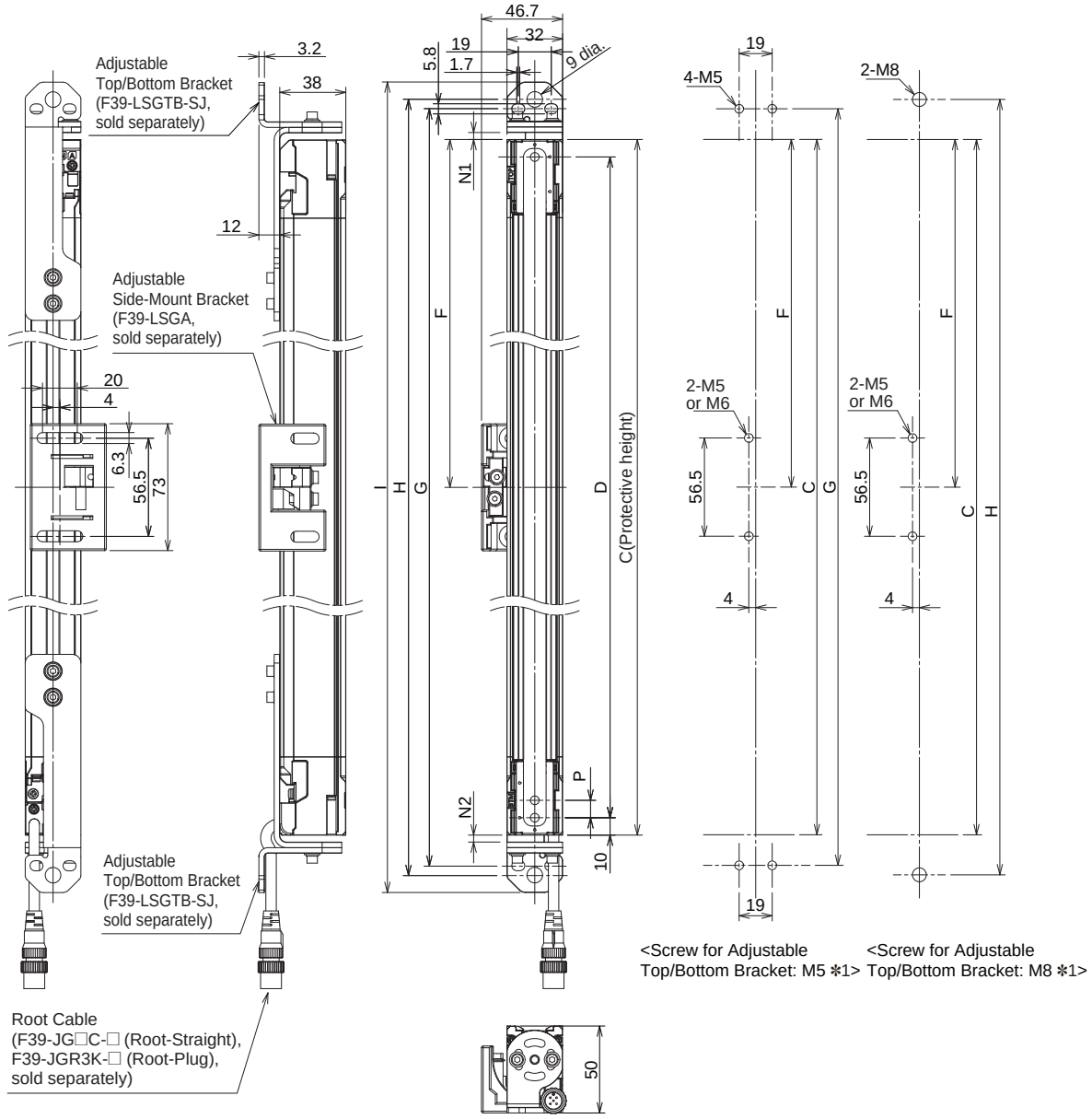
Dimension C	4-digit number in model number (Protective height: △)	
Dimension D	F3SG-□SR□△△△△-14	C-20
	F3SG-□SR□△△△△25	
	F3SG-□SR□△△△△-45	C-40
	F3SG-□SR□△△△△-85	
Dimension G	C+27.2+N1+N2	
Dimension H	C+38+N1+N2	
Dimension I	C+58+N1+N2	
Dimension N1	0 to 30 ✻2	
Dimension N2	0 to 30 ✻2	
Dimension P	F3SG-□SR□△△△△-14	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 to1680	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



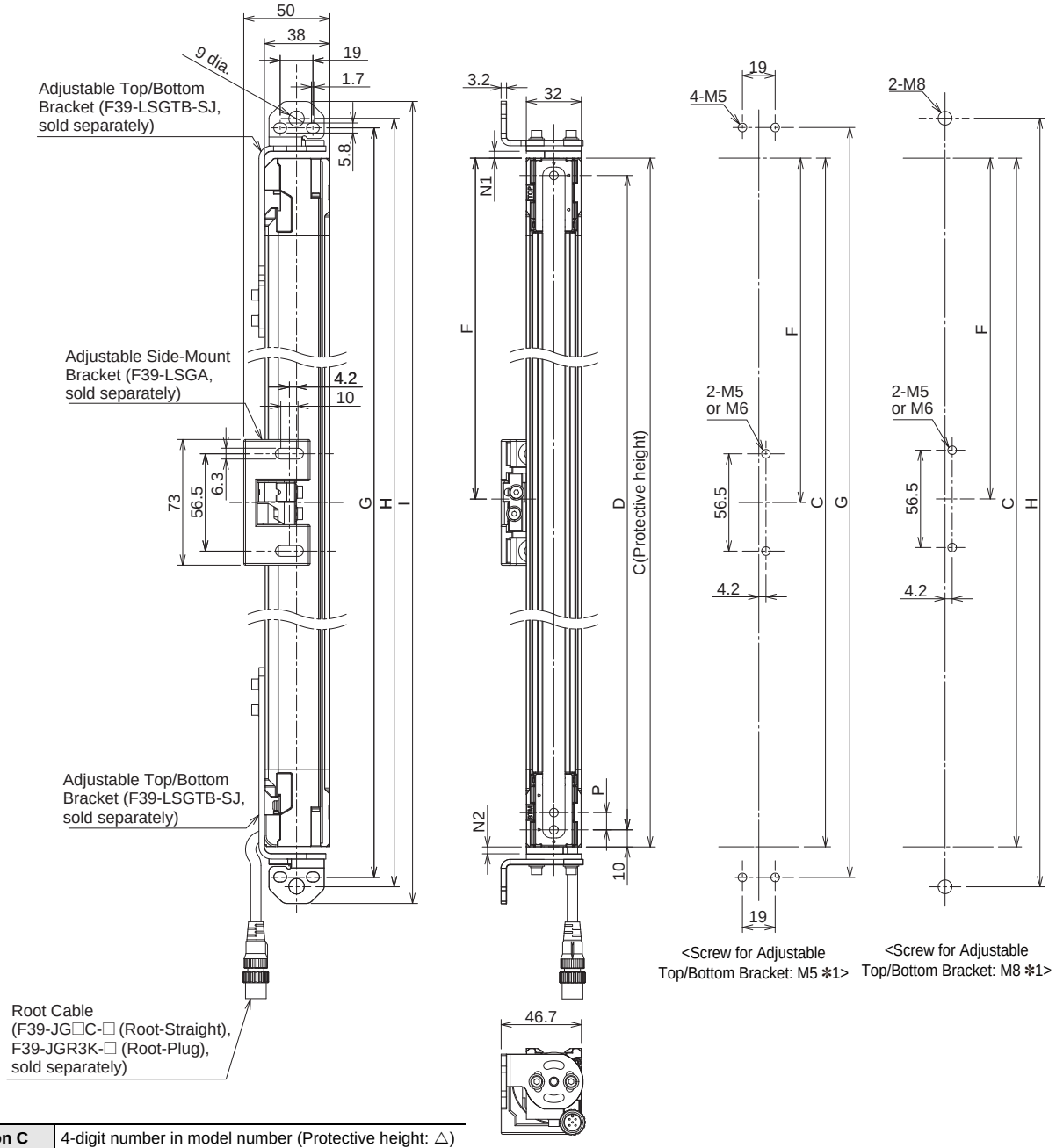
Dimension C	4-digit number in model number (Protective height: △)	
Dimension D	F3SG-□SR□△△△△-14	C-20
	F3SG-□SR□△△△△25	
	F3SG-□SR□△△△△-45	C-40
	F3SG-□SR□△△△△-85	
Dimension G	C+27.2+N1+N2	
Dimension H	C+38+N1+N2	
Dimension I	C+58+N1+N2	
Dimension N1	0 to 30 ✻2	
Dimension N2	0 to 30 ✻2	
Dimension P	F3SG-□SR□△△△△-14	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 to1680	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).

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	
	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

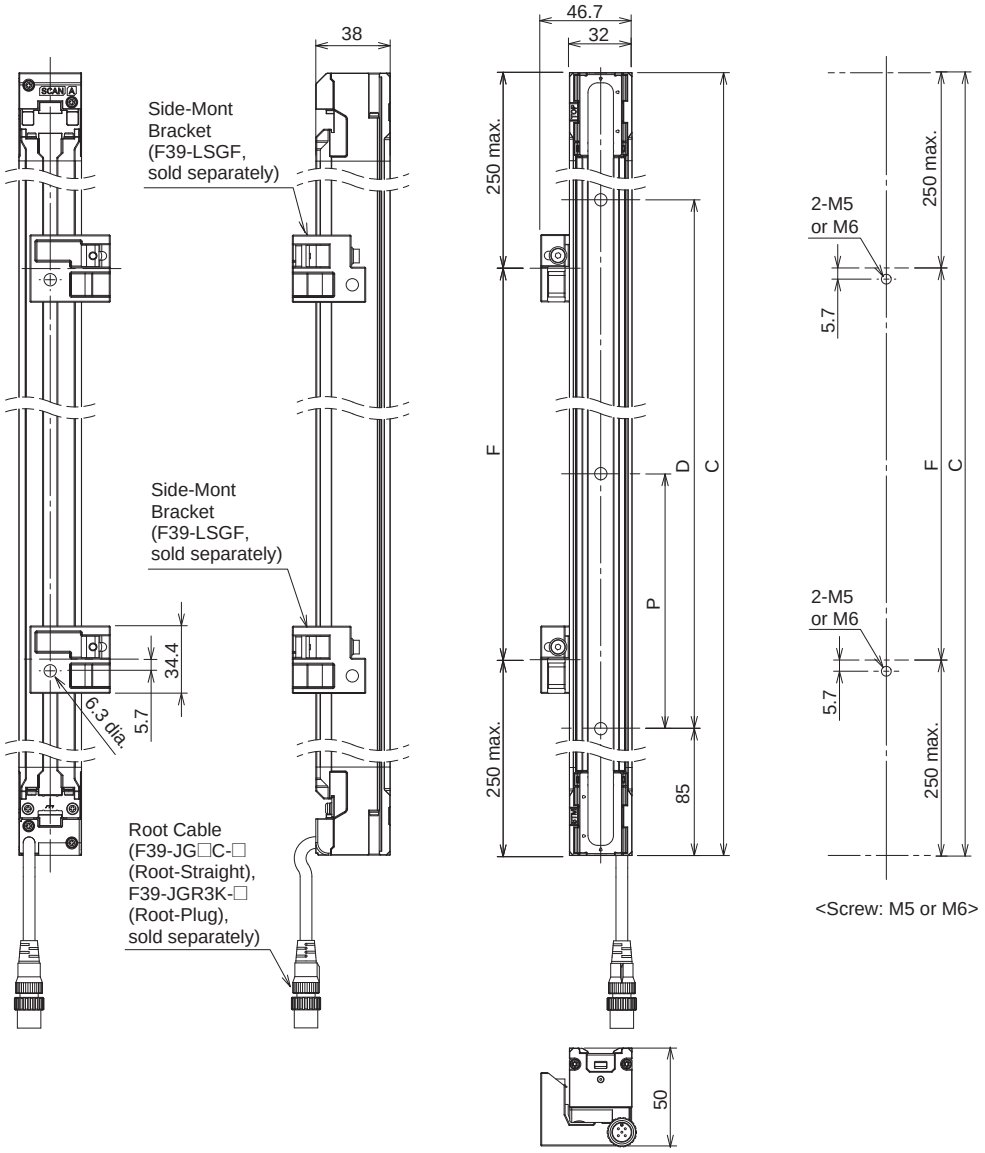
Protective height (Dimension C)	Number of Adjustable Top/Bottom Brackets ✻3	Number of Intermediate Brackets ✻3	Dimension F
0160 to 0840	2	0	---
0880 to1680	2	1	1000 mm max.
1760 to 2480	2	2	1000 mm max.

✻**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



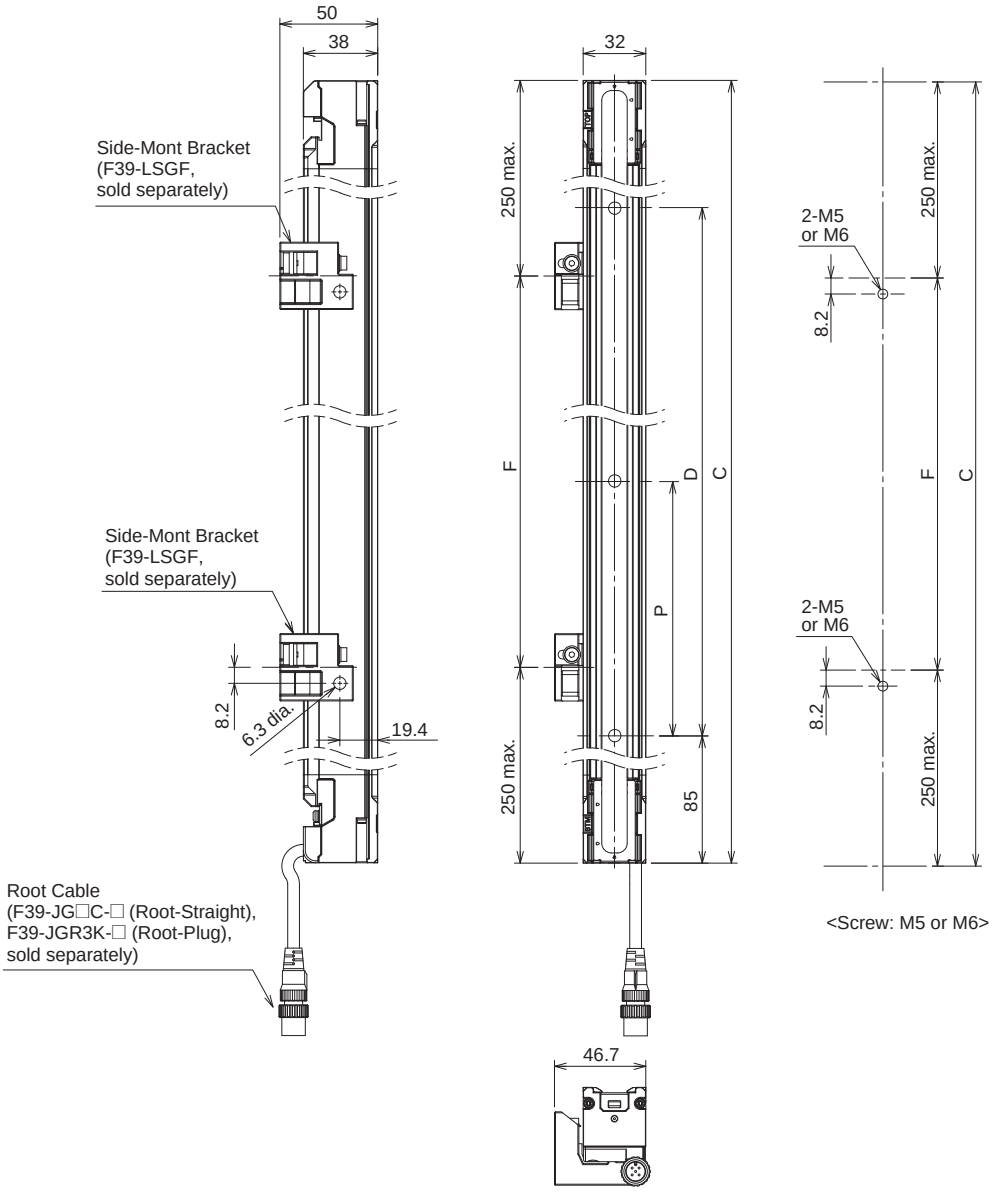
Dimension C	4-digit number in model number	
Dimension D	C-170	
Dimension P	F3SG-4PGA0670-2□	500
	F3SG-4PGA0970-3□	400
	F3SG-4PGA1070-4□	300
	F3SG-4PGA1370-4□	400

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).

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

Side Mounting



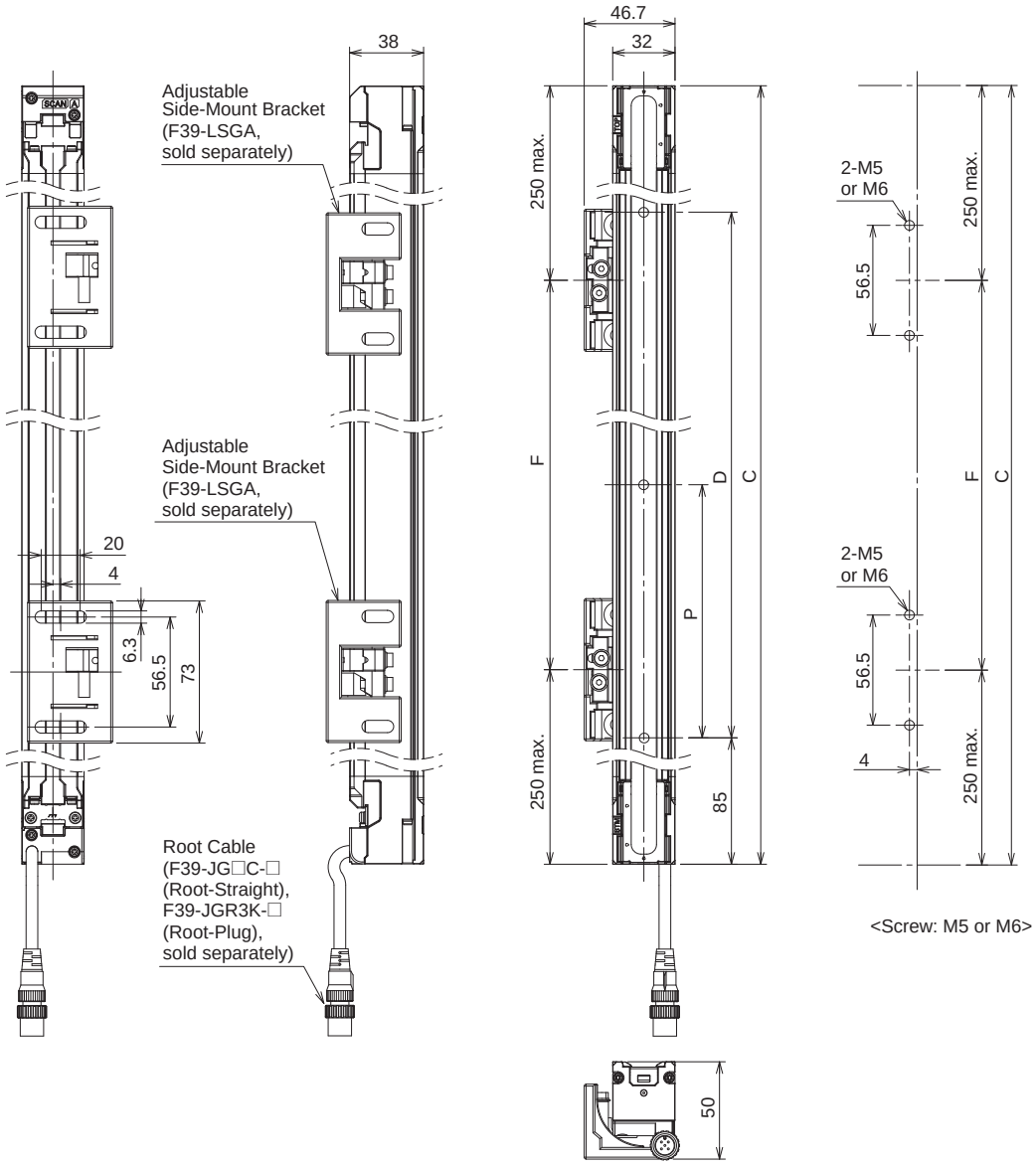
Dimension C	4-digit number in model number	
Dimension D	C-170	
Dimension P	F3SG-4PGA0670-2□	500
	F3SG-4PGA0970-3□	400
	F3SG-4PGA1070-4□	300
	F3SG-4PGA1370-4□	400

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



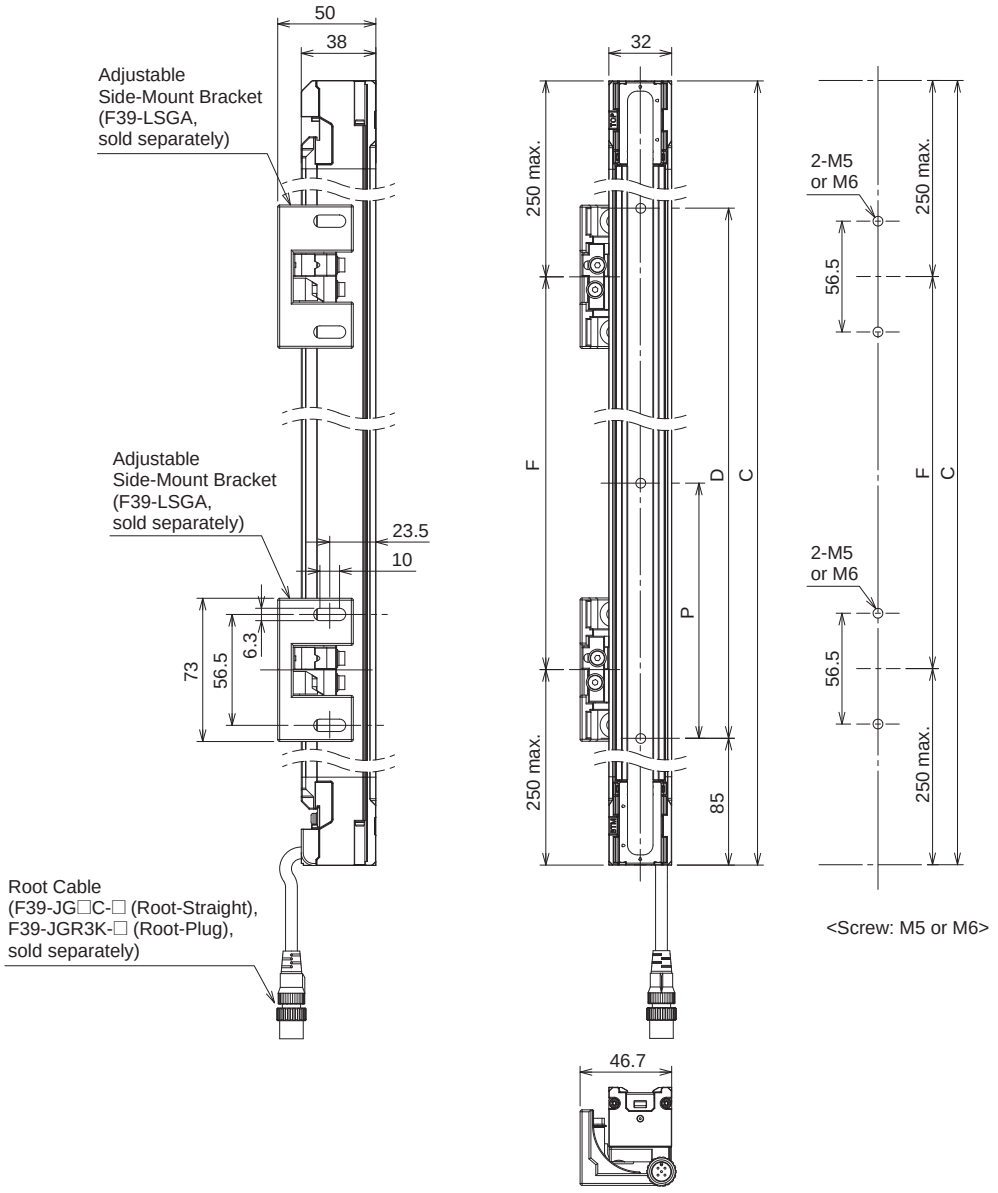
Dimension C	4-digit number in model number	
Dimension D	C-170	
Dimension P	F3SG-4PGA0670-2☐	500
	F3SG-4PGA0970-3☐	400
	F3SG-4PGA1070-4☐	300
	F3SG-4PGA1370-4☐	400

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



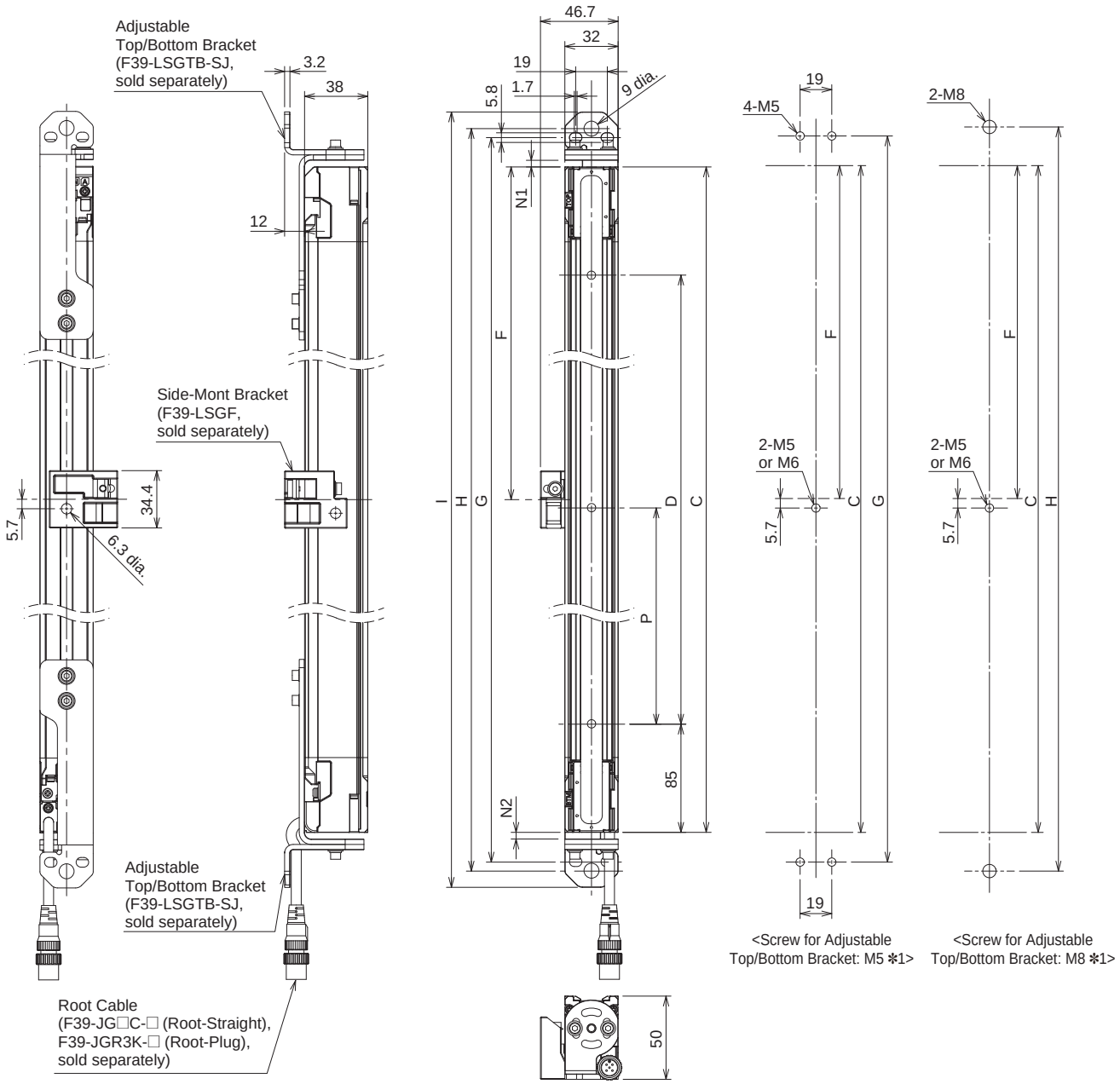
Dimension C	4-digit number in model number	
Dimension D	C-170	
Dimension P	F3SG-4PGA0670-2□	500
	F3SG-4PGA0970-3□	400
	F3SG-4PGA1070-4□	300
	F3SG-4PGA1370-4□	400

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

Backside Mounting



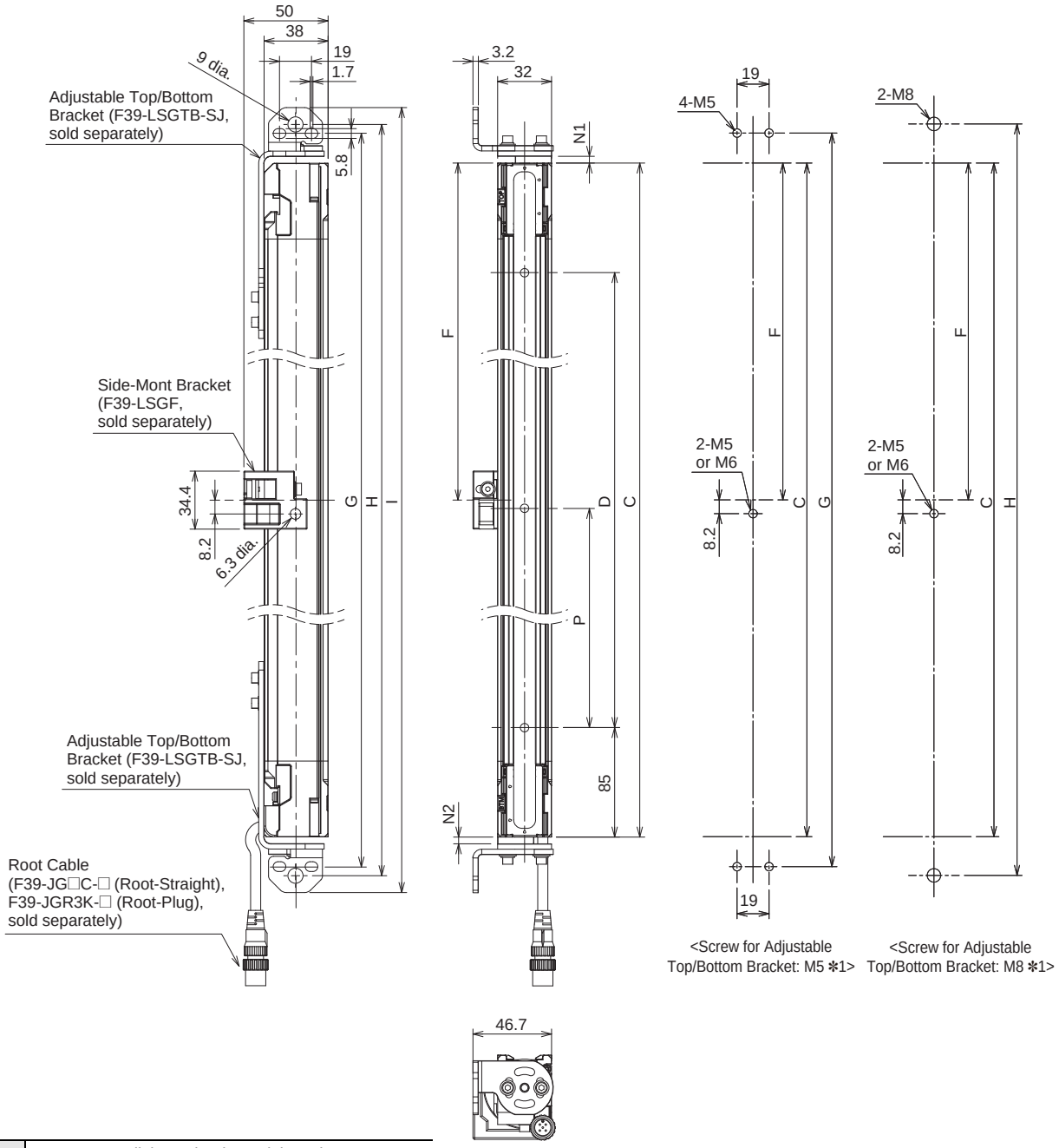
Dimension C	4-digit number in model number	
Dimension D	C-170	
Dimension G	C+27.2+N1+N2	
Dimension H	C+38+N1+N2	
Dimension I	C+58+N1+N2	
Dimension N1	0 to 30	
Dimension N2	0 to 30	
Dimension P	F3SG-4PGA0670-2□	500
	F3SG-4PGA0970-3□	400
	F3SG-4PGA1070-4□	300
	F3SG-4PGA1370-4□	400

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.** 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 Side-Mount Brackets (Intermediate Brackets) (F39-LSGF)

Side Mounting



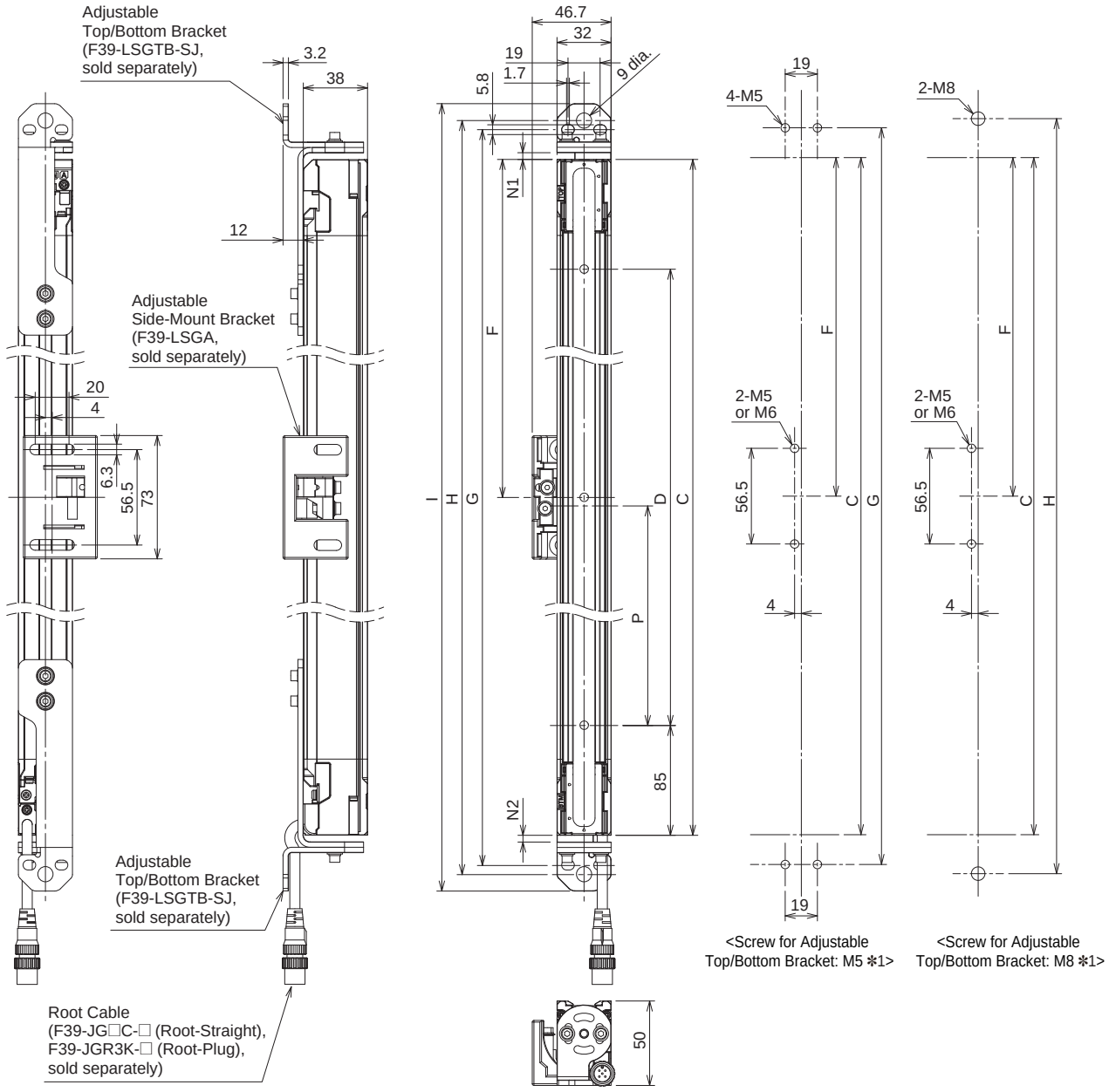
Dimension C	4-digit number in model number	
Dimension D	C-170	
Dimension G	C+27.2+N1+N2	
Dimension H	C+38+N1+N2	
Dimension I	C+58+N1+N2	
Dimension N1	0 to 30	
Dimension N2	0 to 30	
Dimension P	F3SG-4PGA0670-2□	500
	F3SG-4PGA0970-3□	400
	F3SG-4PGA1070-4□	300
	F3SG-4PGA1370-4□	400

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



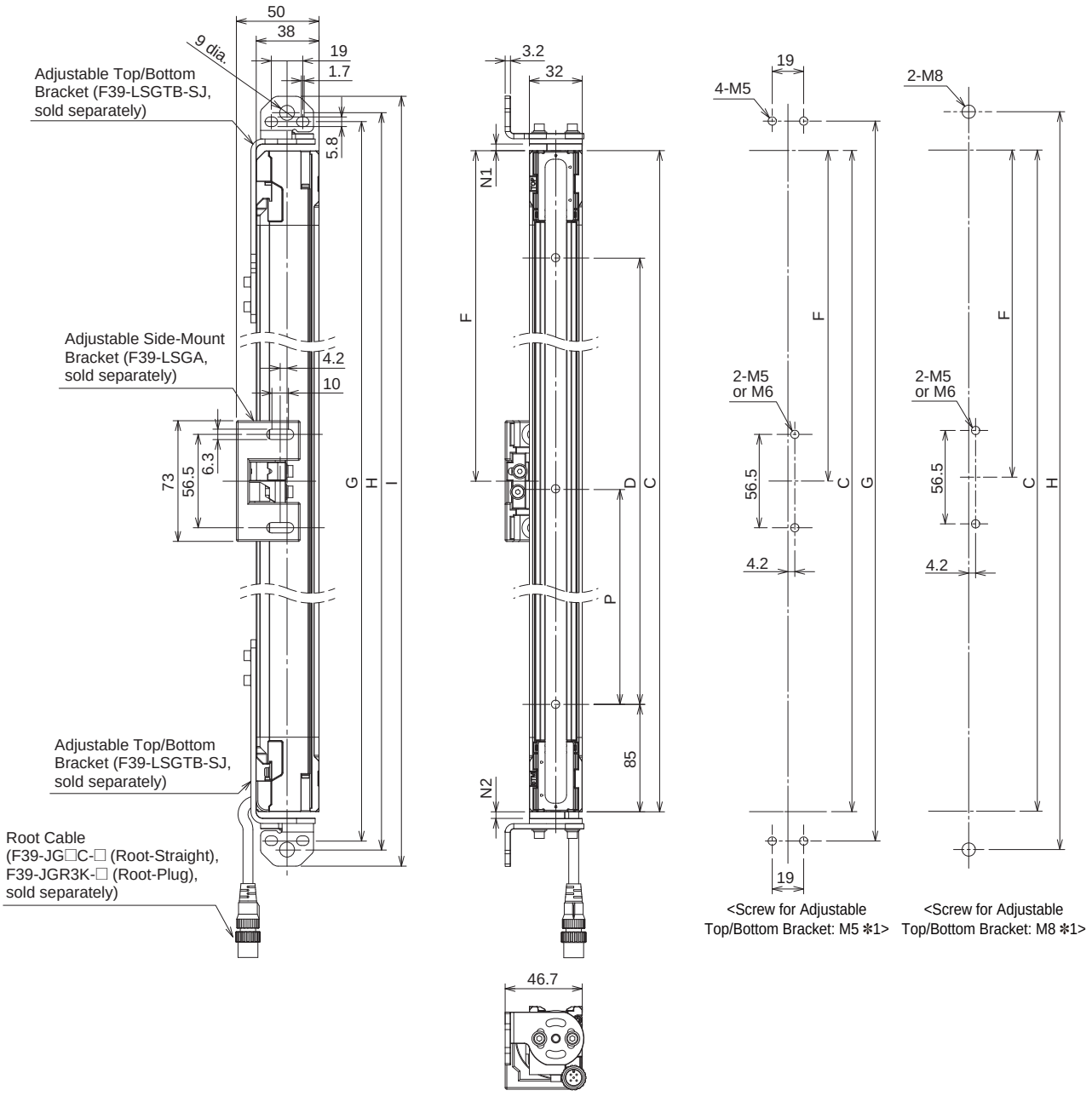
Dimension C	4-digit number in model number	
Dimension D	C-170	
Dimension G	C+27.2+N1+N2	
Dimension H	C+38+N1+N2	
Dimension I	C+58+N1+N2	
Dimension N1	0 to 30	
Dimension N2	0 to 30	
Dimension P	F3SG-4PGA0670-2☐	500
	F3SG-4PGA0970-3☐	400
	F3SG-4PGA1070-4☐	300
	F3SG-4PGA1370-4☐	400

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).

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

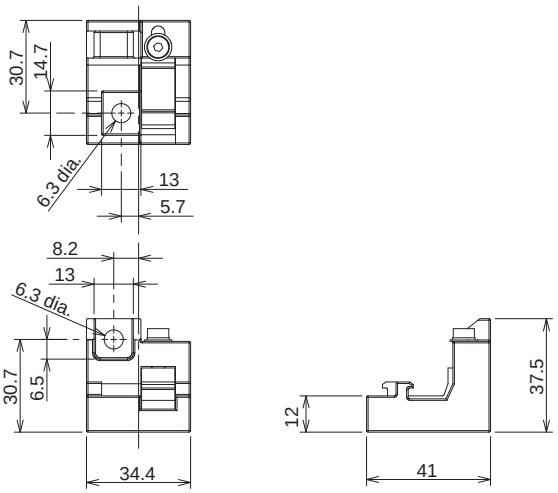
Product length (Dimension C)	Number of Adjustable Top/Bottom Brackets ✻2	Number of Intermediate Brackets ✻2	Dimension F
0670	2	0	---
0970 to 1370	2	1	1000 mm max.

✻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)

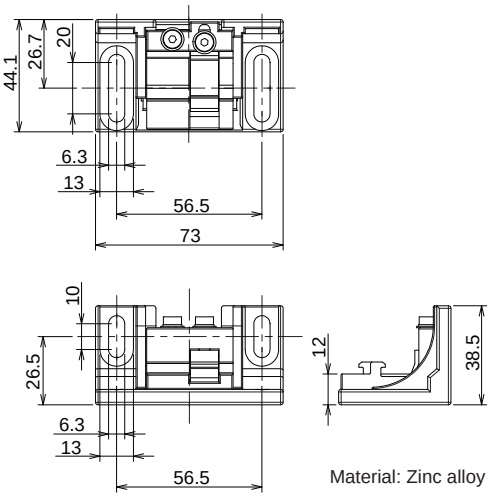
Bracket

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



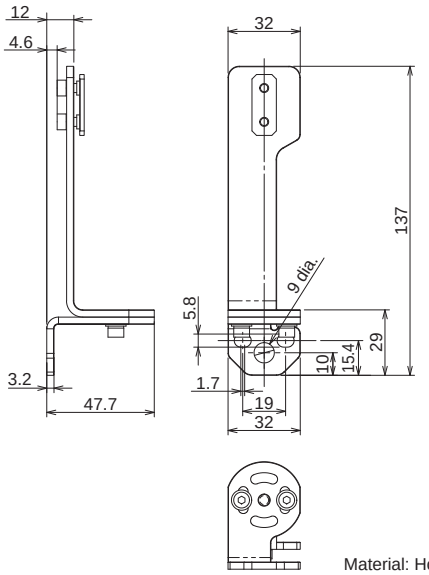
Material: Zinc alloy

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



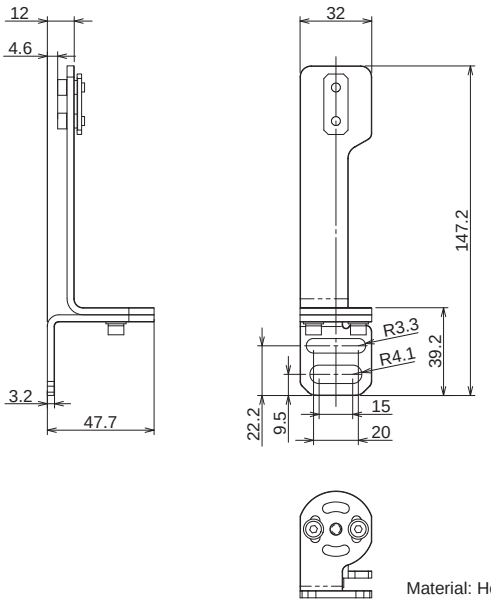
Material: Zinc alloy

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



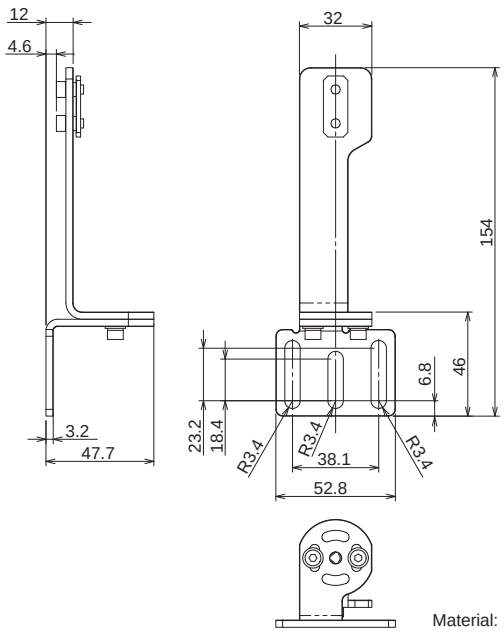
Material: Hot rolled steel (SPHC)

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



Material: Hot rolled steel (SPHC)

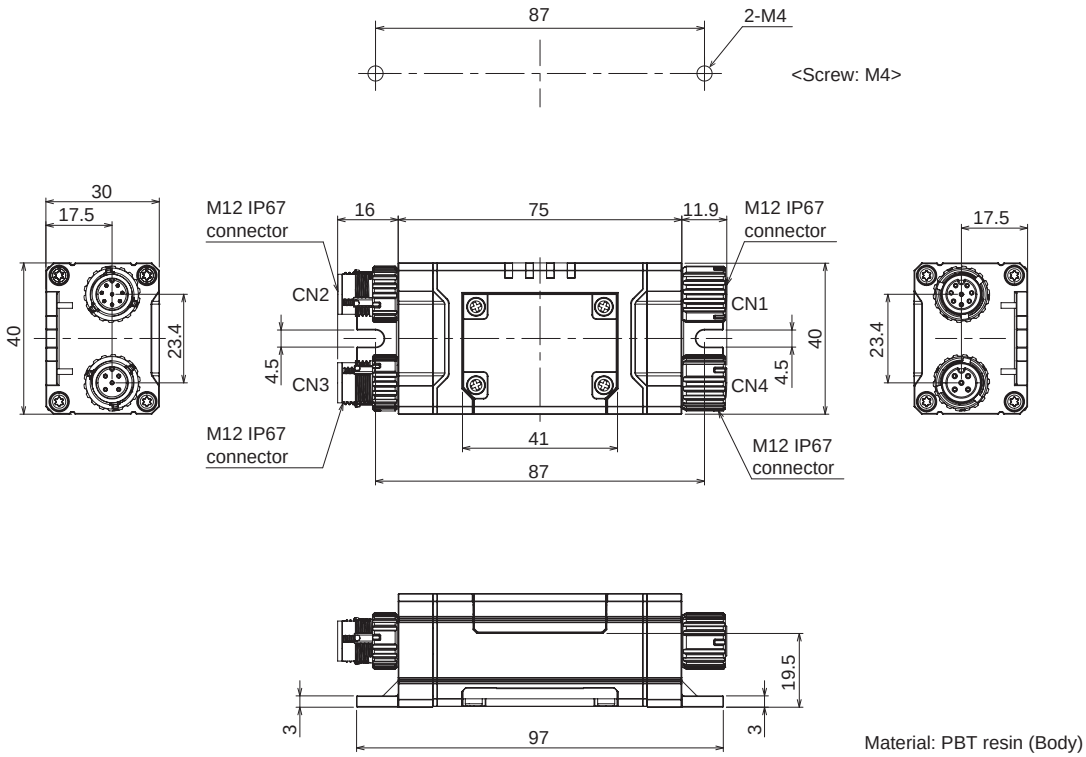
Adjustable Top/Bottom Bracket (MS4800, F3SR Adapter) (F39-LSGTB-MS, sold separately)



Material: Hot rolled steel (SPHC)

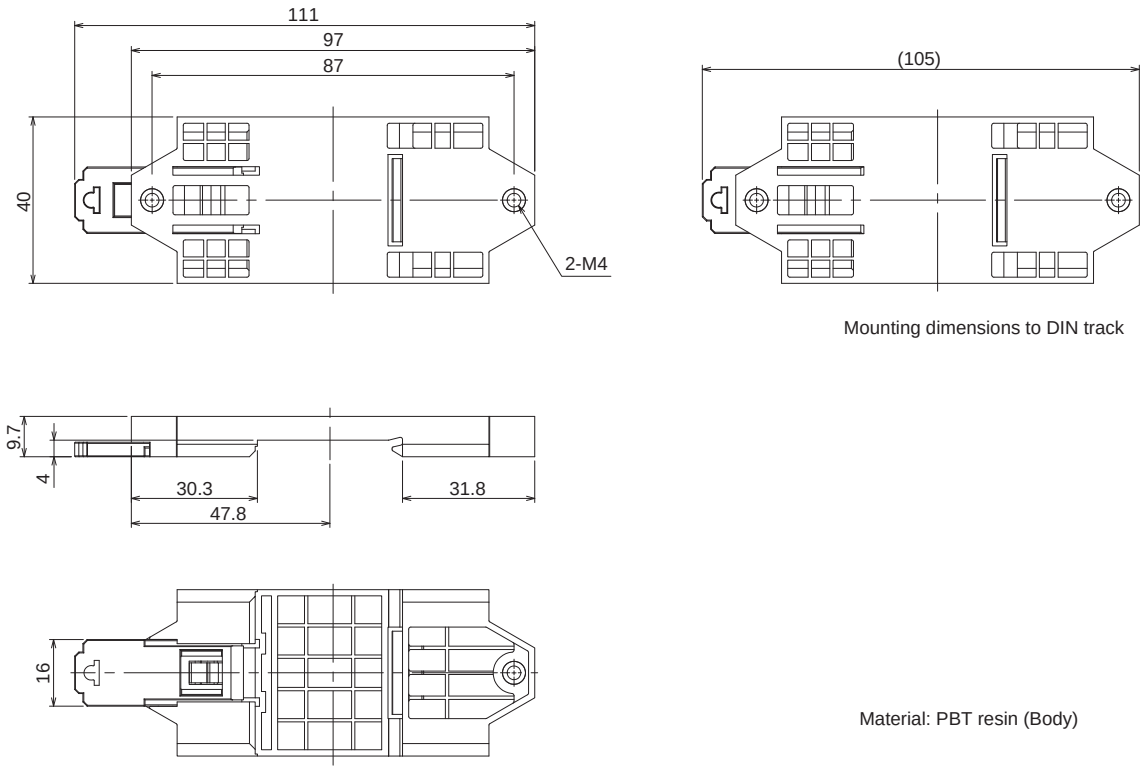
Intelligent Tap

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



Material: PBT resin (Body)

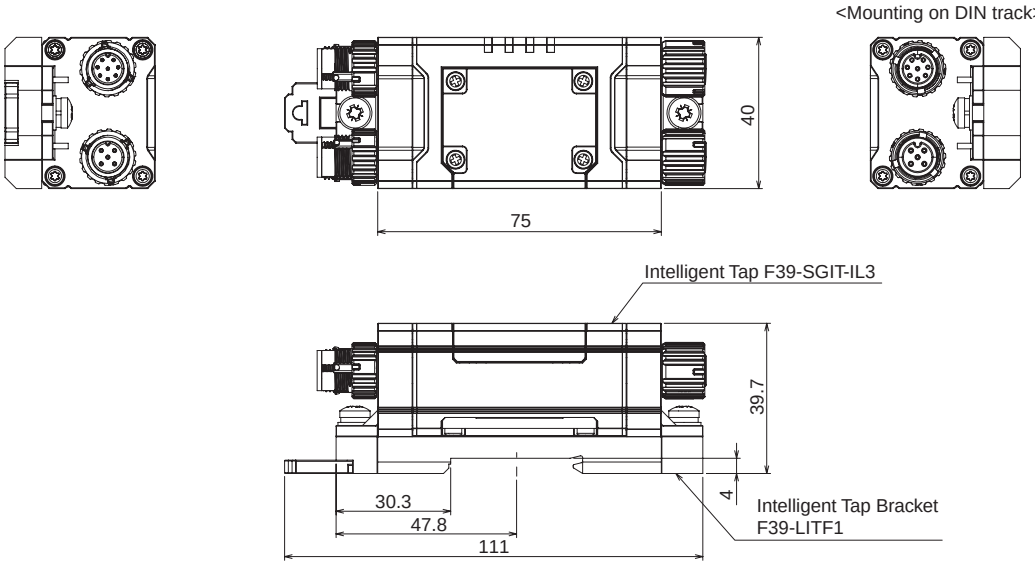
Intelligent Tap Bracket (F39- LITF1, sold separately)



Mounting dimensions to DIN track

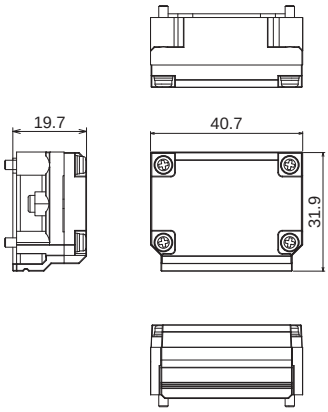
Material: PBT resin (Body)

Assembly Dimensions (Intelligent Tap/ Intelligent Tap Bracket)



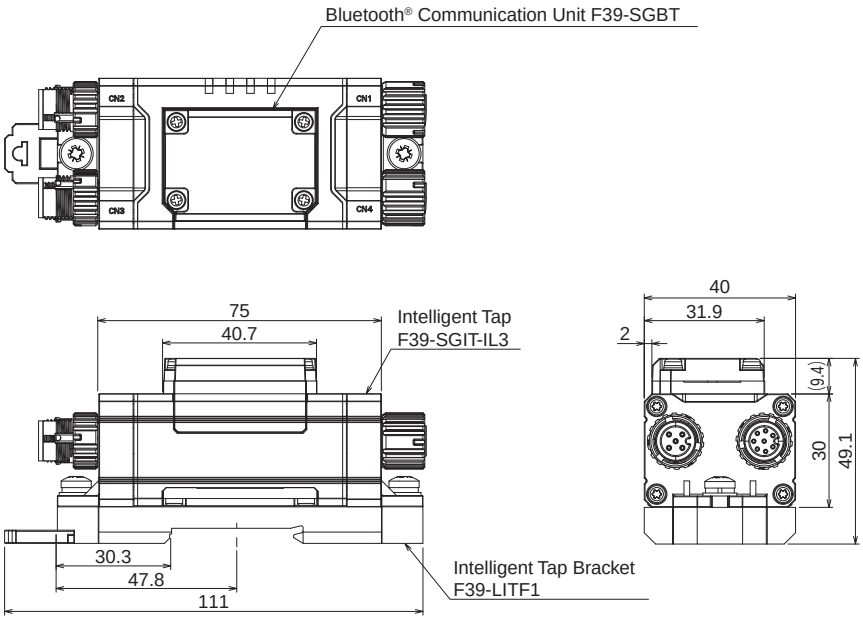
Material: PBT resin (Body)

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



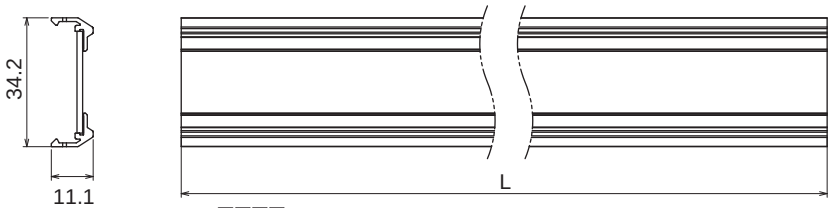
Material: PBT resin (Body)

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



Spatter Protection Cover

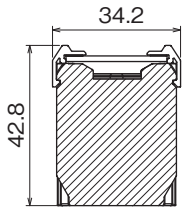
Spatter Protection Cover (F39-HSG□□□□, sold separately)



L = □□□□

Material: PC resin (Transparent cover)
ABS resin (Side)

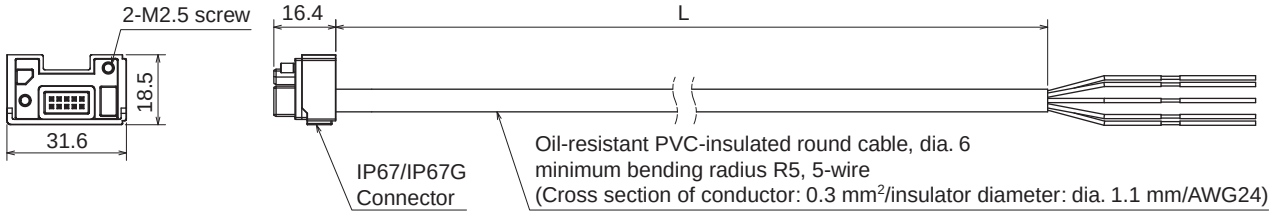
Assembly Dimensions



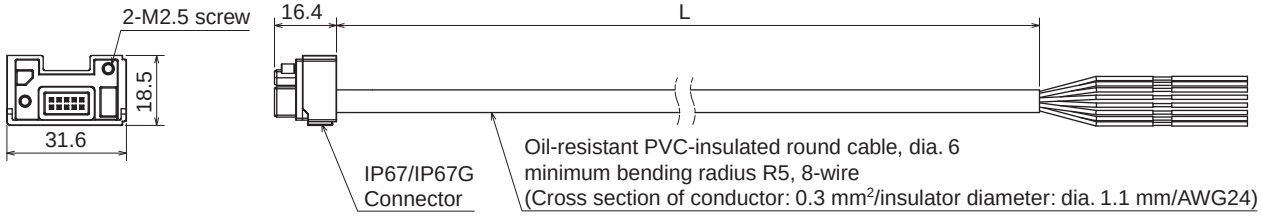
Connecting Cables

Root-Straight Cable

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



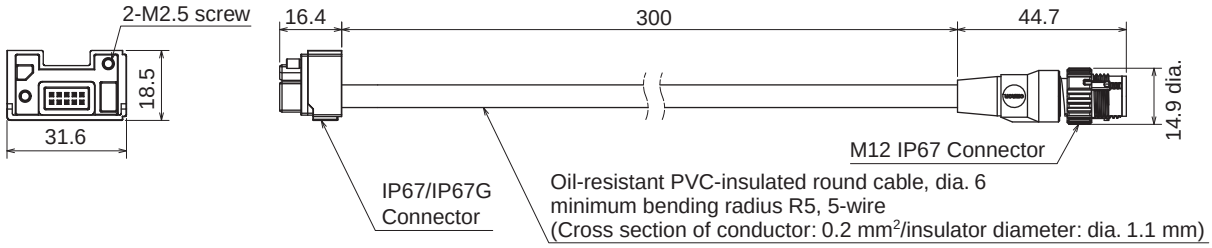
Root-Straight Cable for receiver or emitter/receiver of F3SG-PG Perimeter Guarding Passive Mirror (F39-JG□C-D, sold separately)



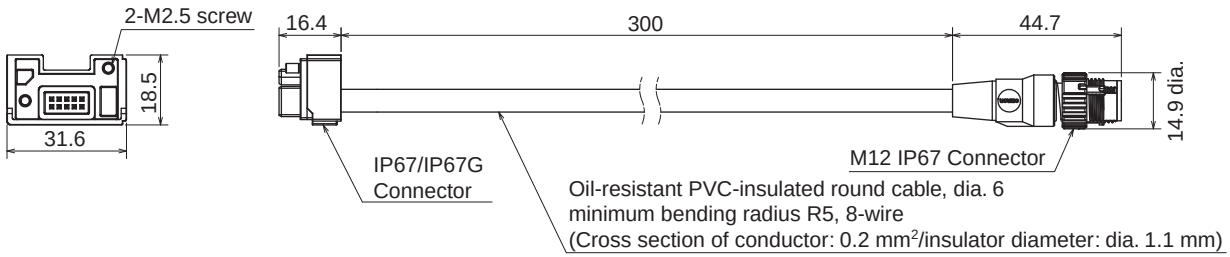
Emitter cable (Gray)	Receiver cable (Black)	Length (L)
F39-JG3C-L	**F39-JG3C-D**	3 m
F39-JG7C-L	**F39-JG7C-D**	7 m
F39-JG10C-L	**F39-JG10C-D**	10 m

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)

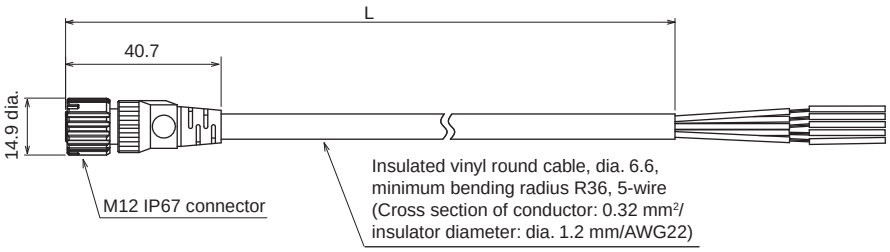


Emitter cable (Gray)	Receiver cable (Black)	Length
F39-JGR3K-L	**F39-JGR3K-D**	0.3 m

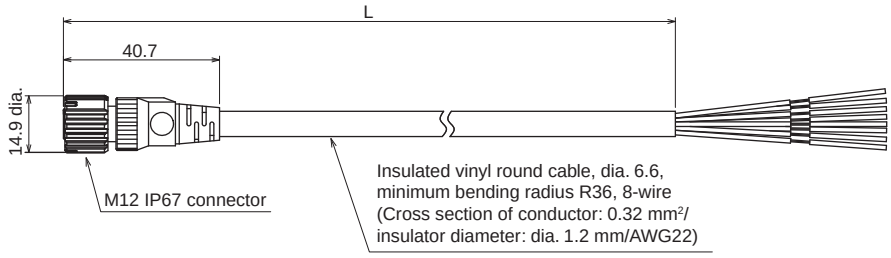
Extended Socket-Straight Cable

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)



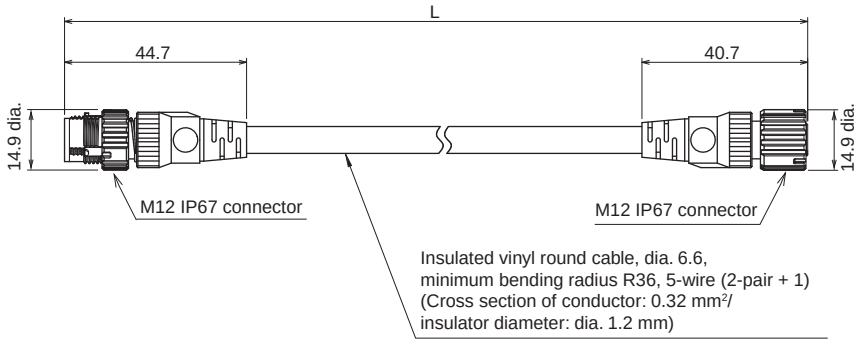
Extended Socket-Straight Cable for receiver or emitter/receiver of F3SG-PG Perimeter Guarding Passive Mirror (F39-JG□A-D, sold separately)



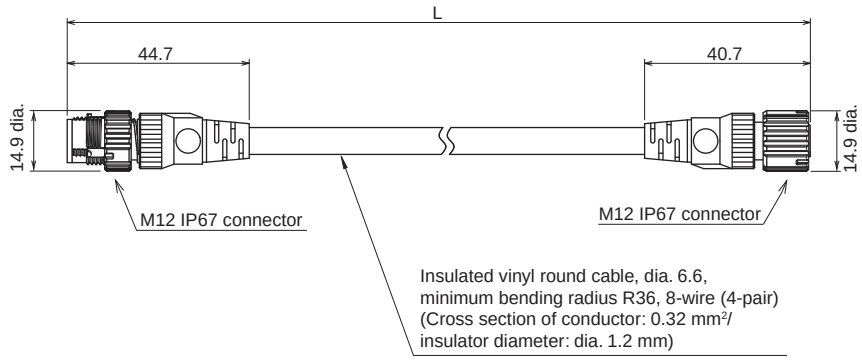
Extended Plug-Socket Cable

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)

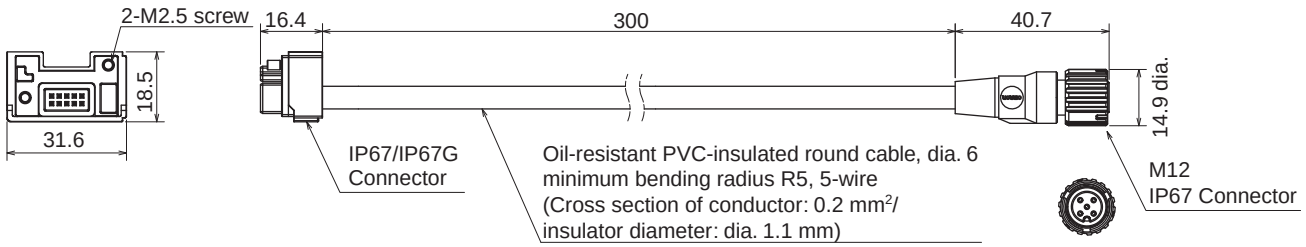


Extended Plug-Socket Cable for receiver or emitter/receiver of F3SG-PG Perimeter Guarding Passive Mirror:
Cable for extension (F39-JG□B-D, sold separately)

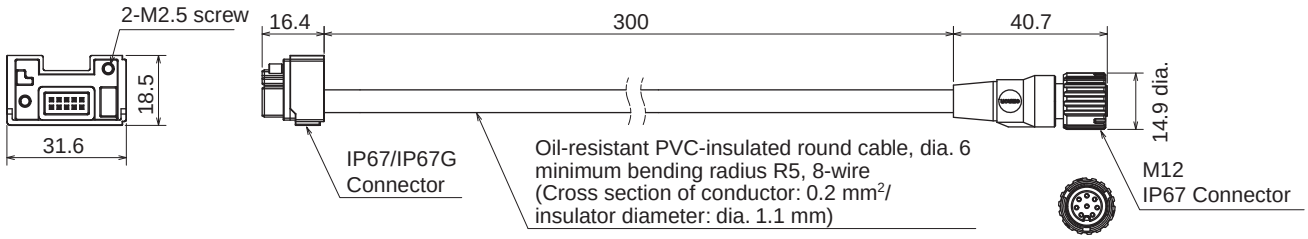


Cascading Cable for Extended (F39-JGR3W, sold separately) (two cables per set, one for emitter and one for receiver)

Emitter Cascading Cable for Extended



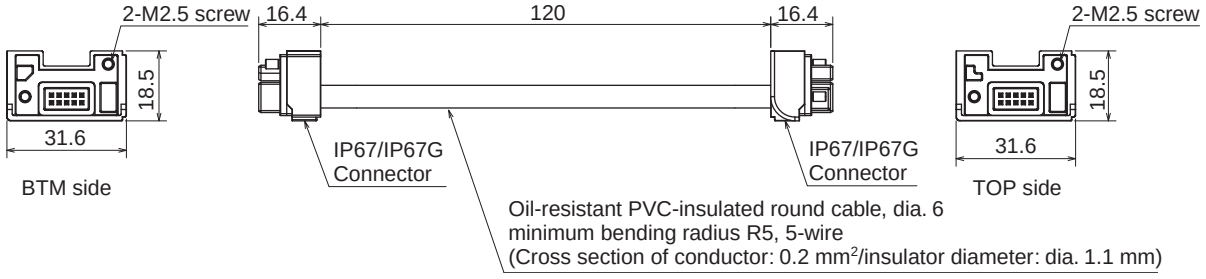
Receiver Cascading Cable for Extended



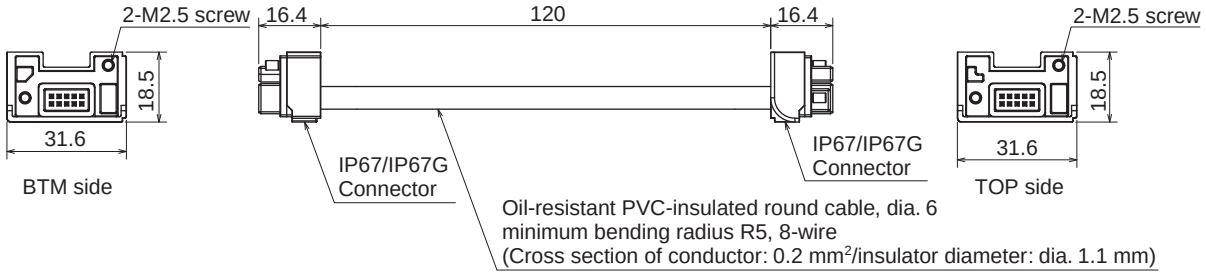
Set model name	Emitter cable (Gray)	Receiver cable (Black)	Length
F39-JGR3W	**F39-JGR3W-L**	**F39-JGR3W-D**	0.3 m

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



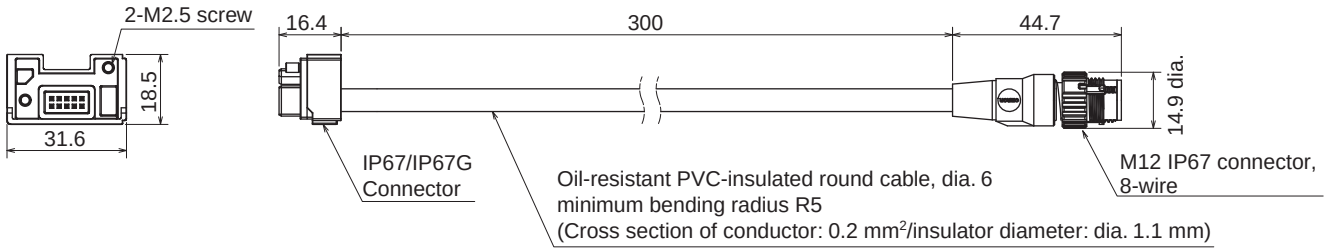
Side-by-side Cascading Cable for Receiver



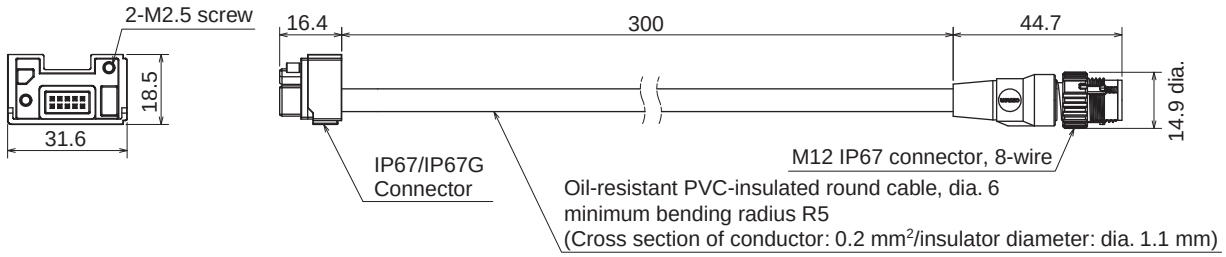
Set model name	Emitter cable (Gray)	Receiver cable (Black)	Length
F39-JGR12L	**F39-JGR12L-L**	**F39-JGR12L-D**	12 cm

Conversion Cable

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

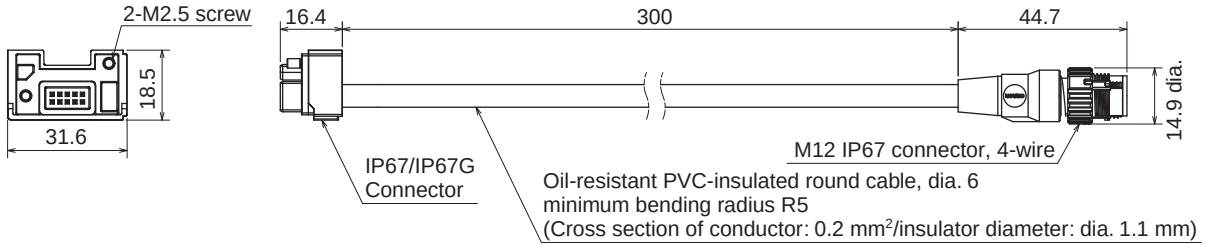


F3SJ-B/A Conversion Cable for Receiver (F39-JGR3K-SJ-D, sold separately)

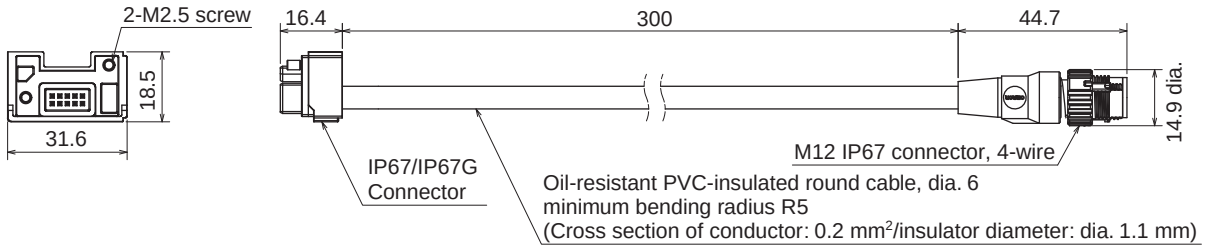


Emitter cable (Gray)	Receiver cable (Black)	Length
F39-JGR3K-SJ-L	**F39-JGR3K-SJ-D**	0.3 m

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

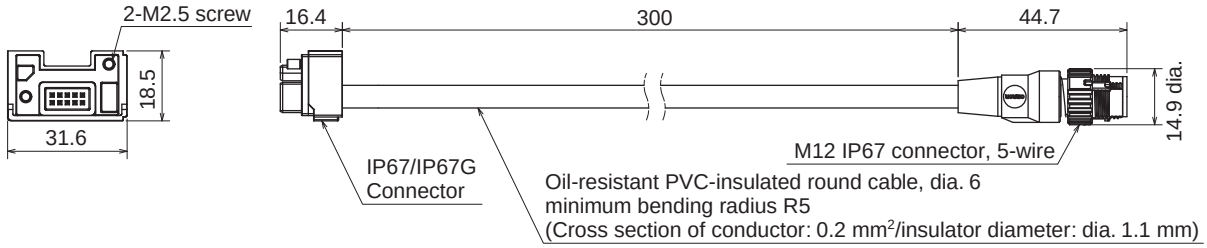


F3SG-RE Conversion Cable for Receiver (F39-JGR3K-RE-D, sold separately)

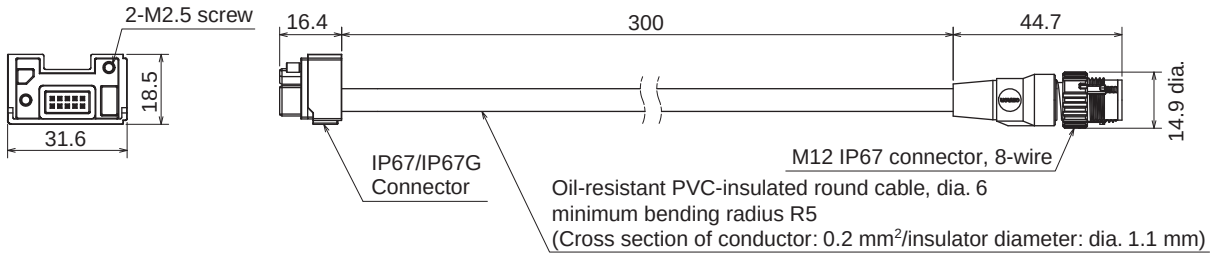


Emitter cable (Gray)	Receiver cable (Black)	Length
F39-JGR3K-RE-L	**F39-JGR3K-RE-D**	0.3 m

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



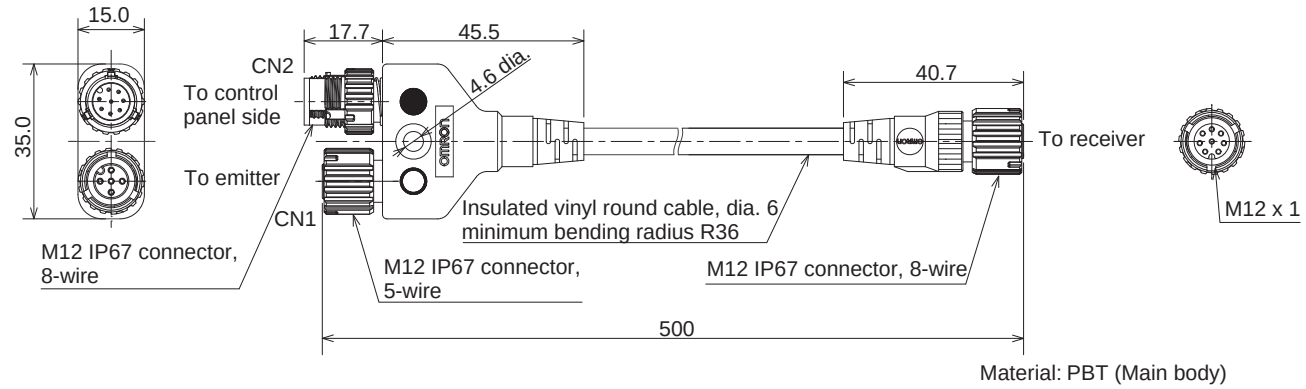
MS48 Conversion Cable for Receiver (F39-JGR3K-MS-D, sold separately)



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

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

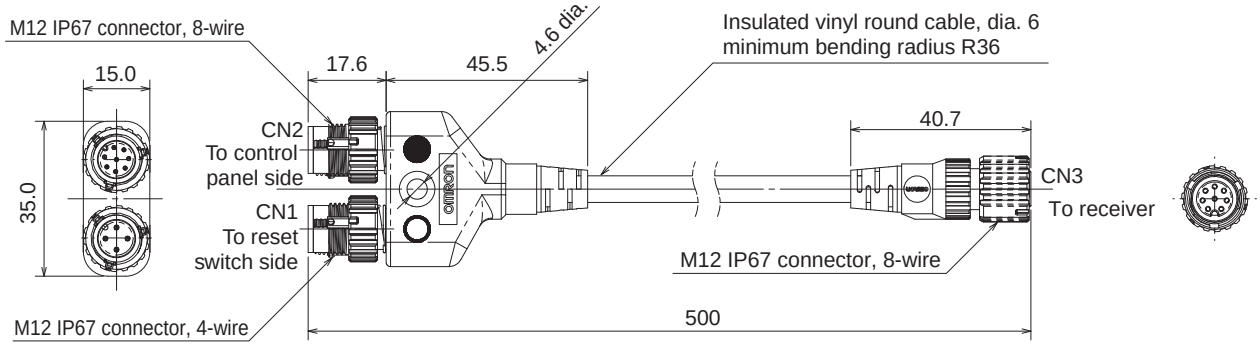


Material: PBT (Main body)

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

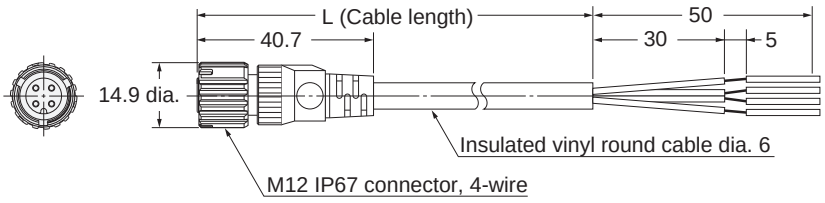


Material: PBT (Main body)

Model	Length
F39-GCNY3	0.5 m

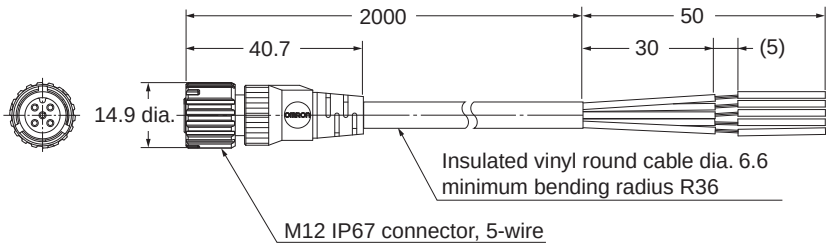
Connector Connected to Cable, Socket on One Cable End (XS5F-D421-□80-F, sold separately)

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



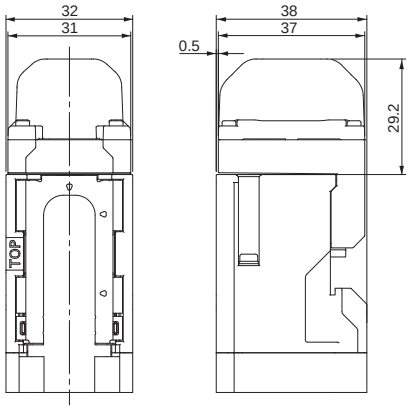
Intelligent Tap-to-IO-Link Master Cable (Single ended cable) (XS5F-D521-DJ0-IL, sold separately)

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



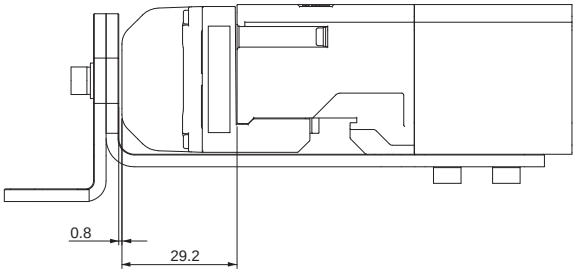
Lamp

Lamp
(F39-SGLP, sold separately)



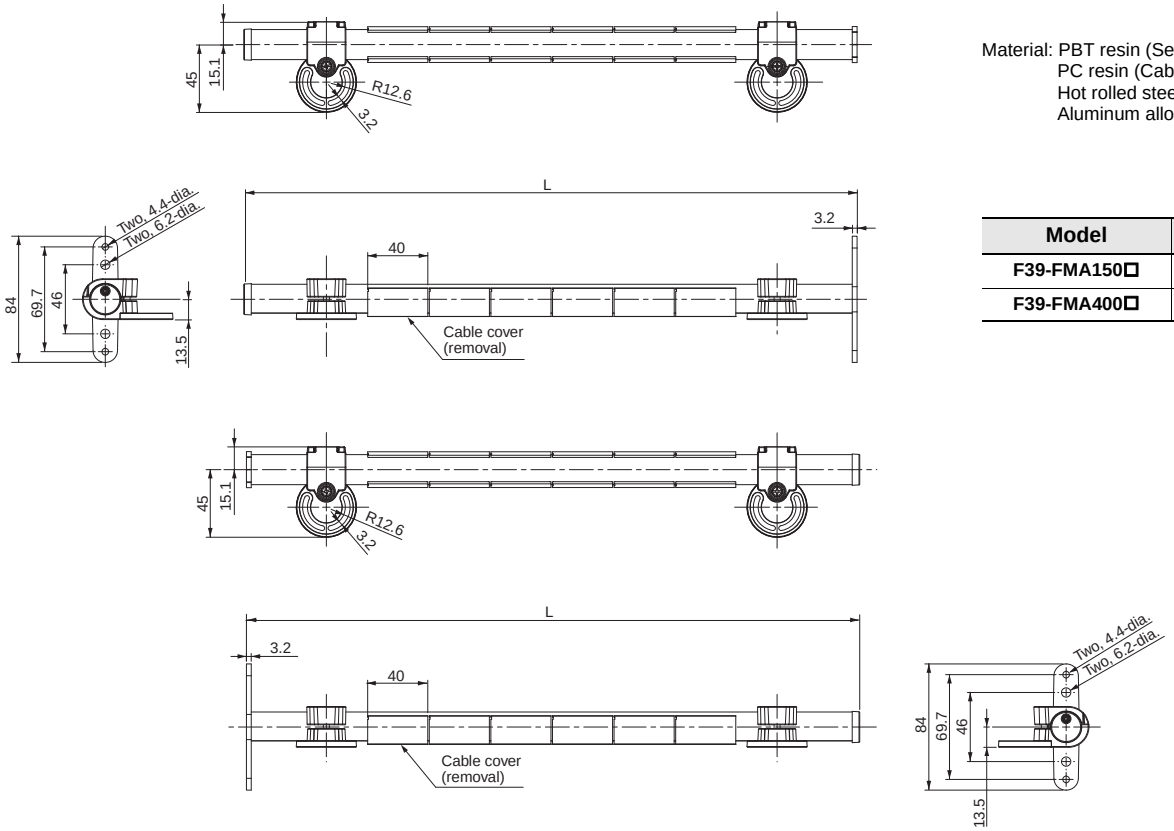
Material: PC resin (Transparent cover)
PBT resin (Base)

• Assembly Dimensions



Muting Sensor Arm Mounter

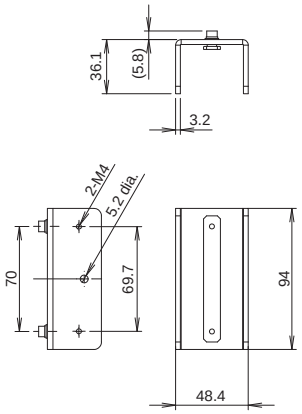
Muting Sensor Arm Mounter
(F39-FMA□□□□, sold separately)



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

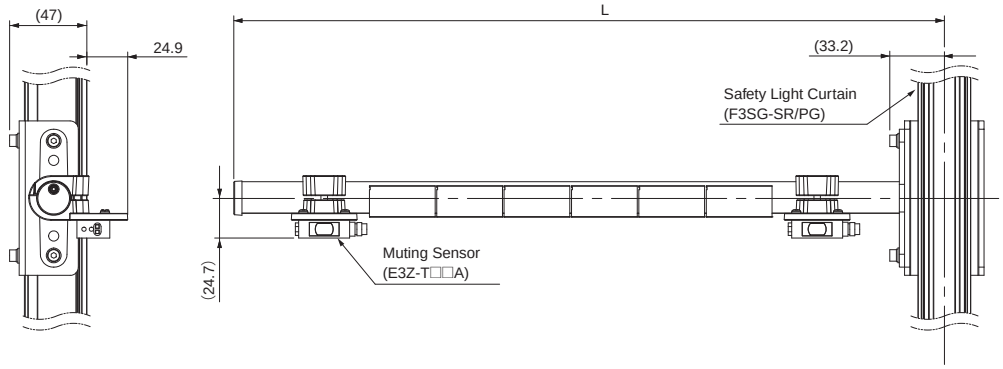
Muting Sensor Arm Mounter Bracket for SLC (F39-LMAF1, sold separately)



Material: Hot rolled steel

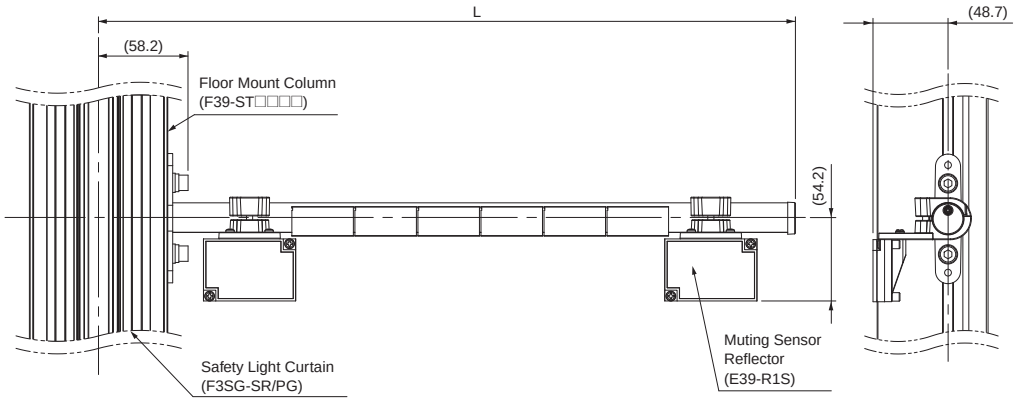
• Assembly Dimensions

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

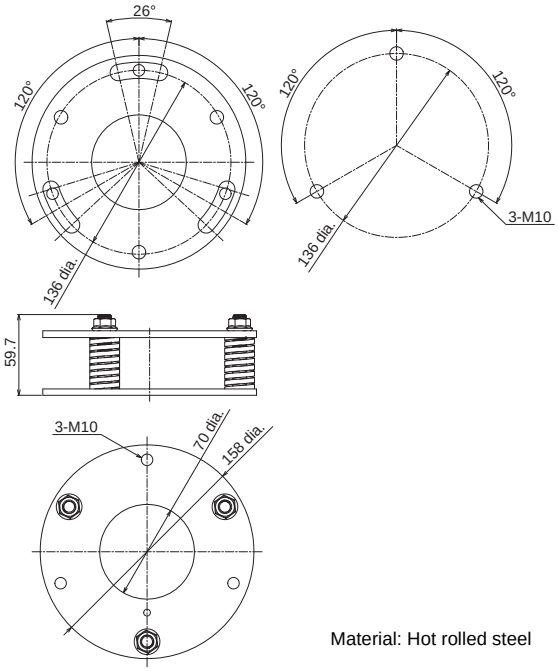
Mounting F39-FMA□□□□-R on the Floor Mount Column (F39-ST□□□□)



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

Mount-Column Adjustable Base

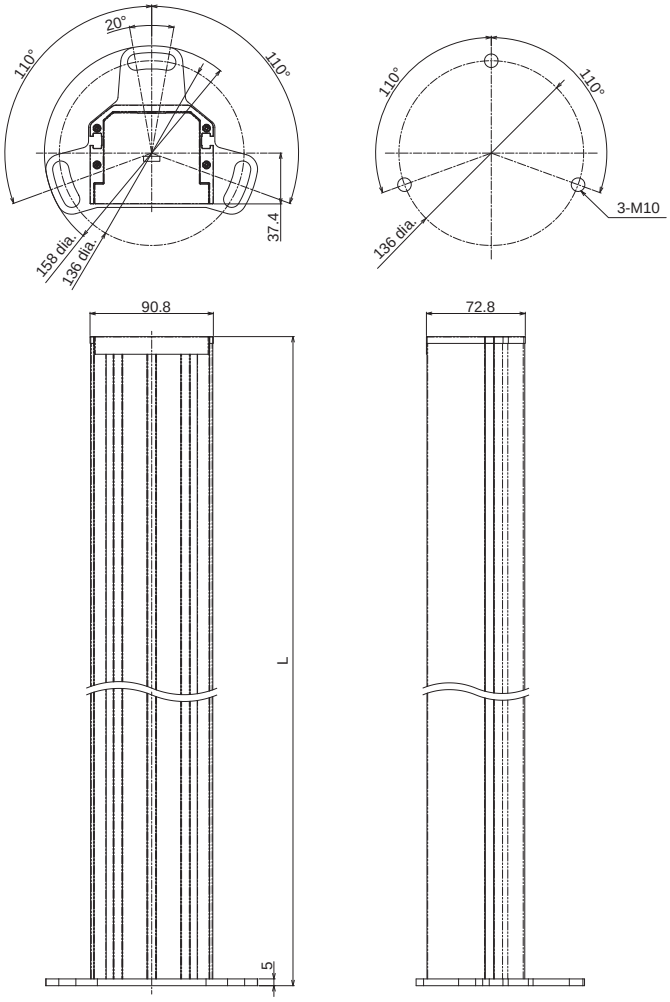
F39-STB



Material: Hot rolled steel

Floor Mount Column

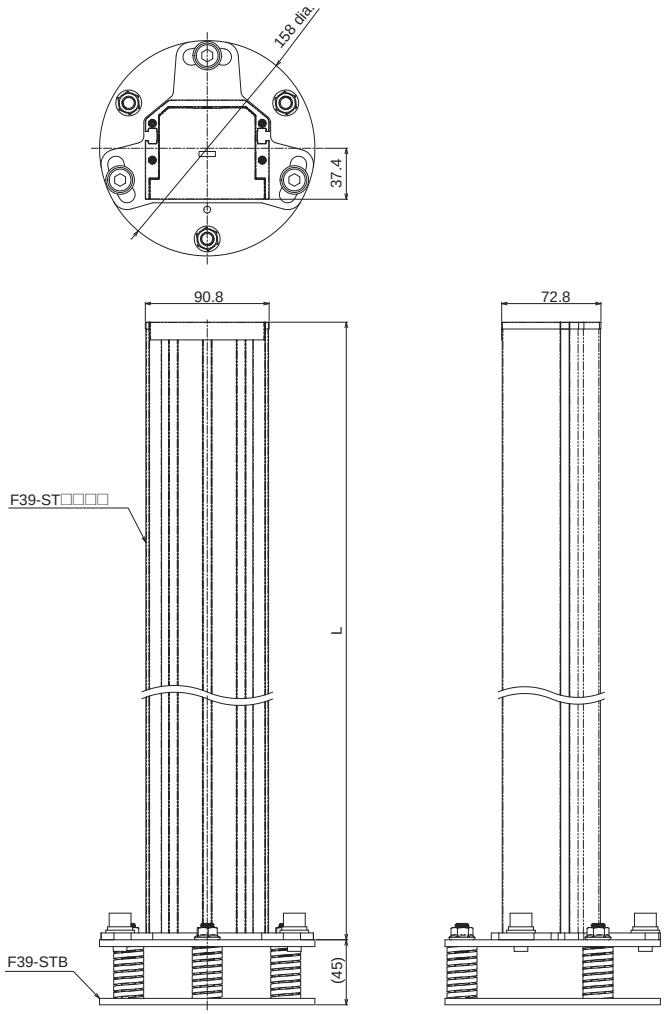
F39-ST□□□□



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

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

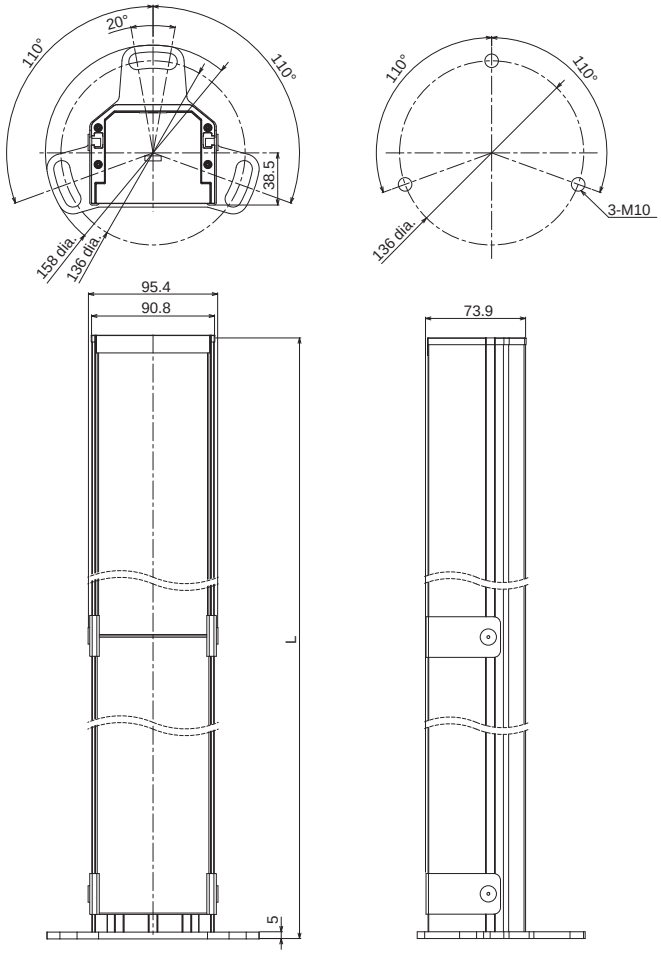
• Assembly Dimensions (Mount-Column Adjustable Base /Floor Mount Column)
F39-STB/F39-ST□□□□



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

Mirror Column

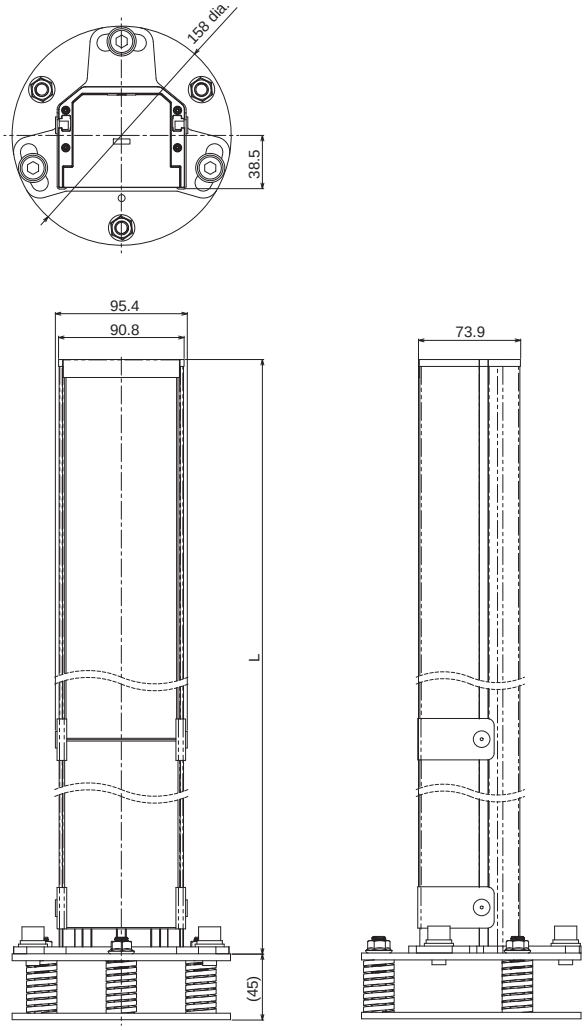
F39-SML□□□□



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

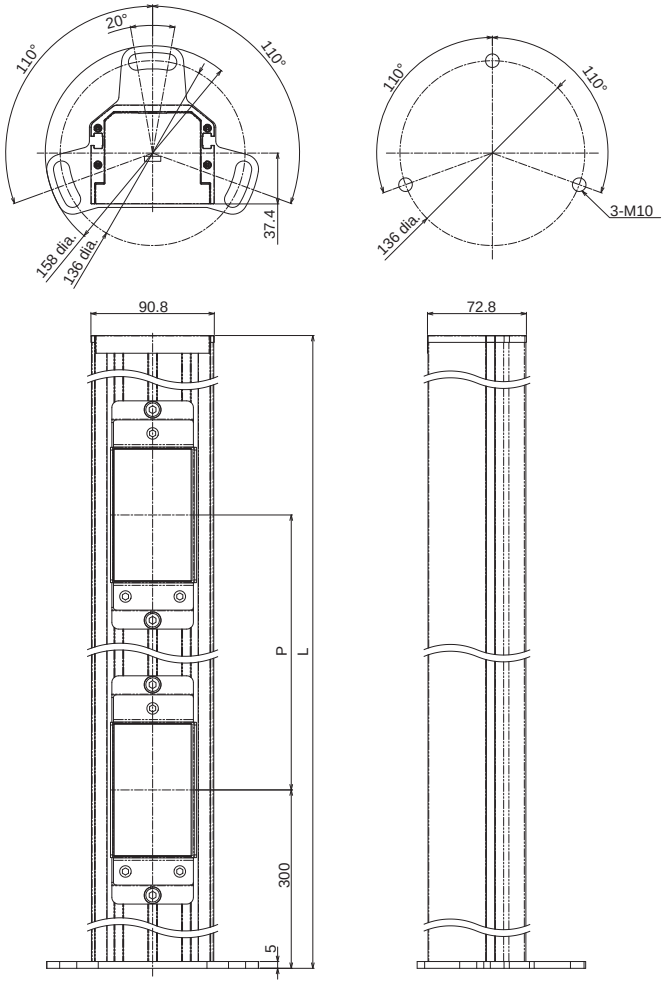
Model	Dimension L
F39-SML0990	990
F39-SML1310	1310
F39-SML1630	1630
F39-SML1950	1950

• 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□□□□

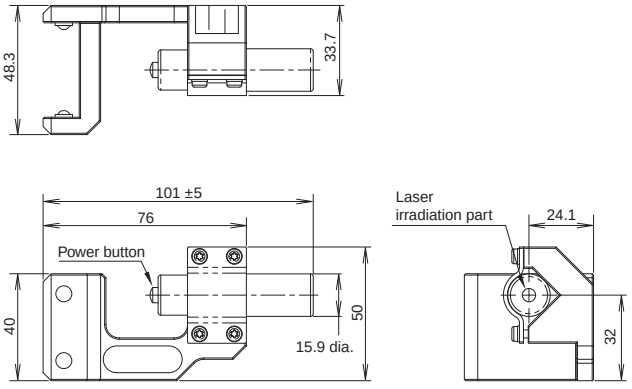


Material: Aluminum alloy (Housing)
Hot rolled steel (Base, Mirror base)
PBT resin (Cap)
Glass mirror (Mirror)

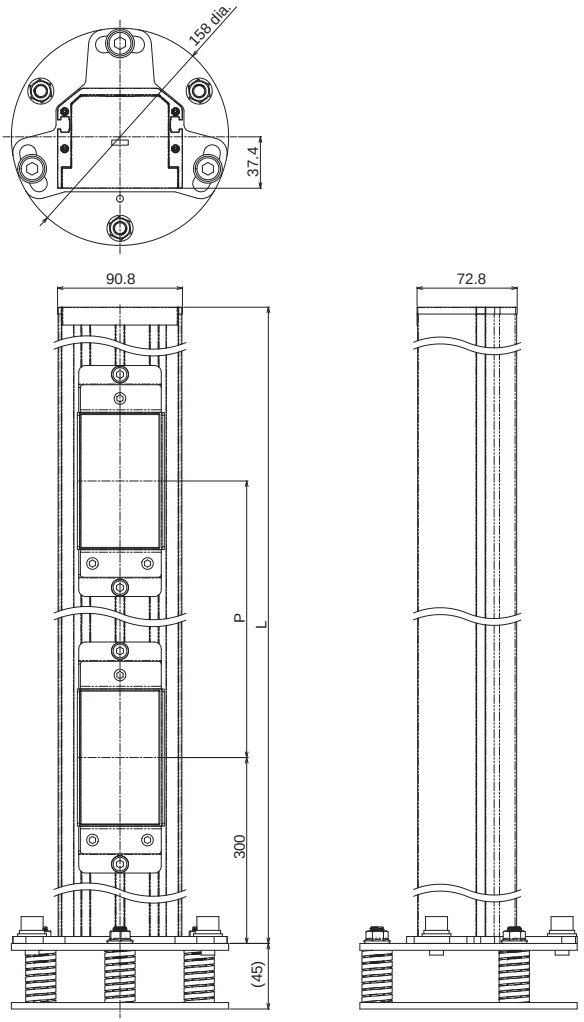
Model	Dimension L	Dimension P	Mirror Q'ty
F39-PML0990-2	990	500	2
F39-PML1310-3	1310	400	3
F39-PML1310-4		300	4
F39-PML1630-4	1630	400	4

Laser Alignment Pointer

F39-PTS



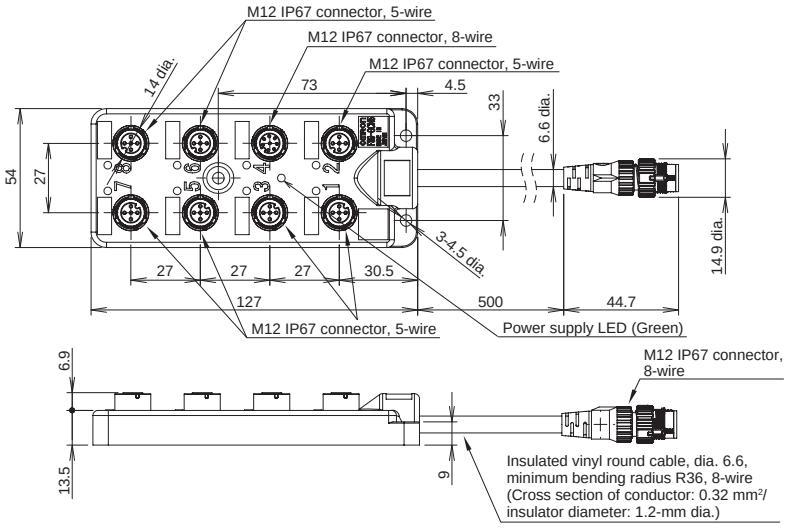
• Assembly Dimensions (Mount-Column Adjustable Base /Mirror Column)
F39-STB/F39-PML□□□□



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

Muting Sensor Connection Box

F39-GCN5



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 75 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**

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
Electrical	Power supply voltage (Vs)		SELV/PELV 24 VDC ±20% (ripple p-p 10% max.)	
	Current consumption		Refer to page 79.	
	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 96.	
	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)	

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	
	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)		10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes	
	Shock resistance (IEC 61496-1)		100 m/s^2, 1000 shocks for all 3 axes	
	Pollution degree (IEC 60664-1)		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 30 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%.	
Material			Pipe: Acrylic resin Cap: SUS316L	
Weight			Refer to page 79.	
Included accessories			Instruction Sheet, Quick Installation Manual, Troubleshooting Guide Sticker	
Conformity	Conforming standards		Refer to page 110.	
	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)	

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

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

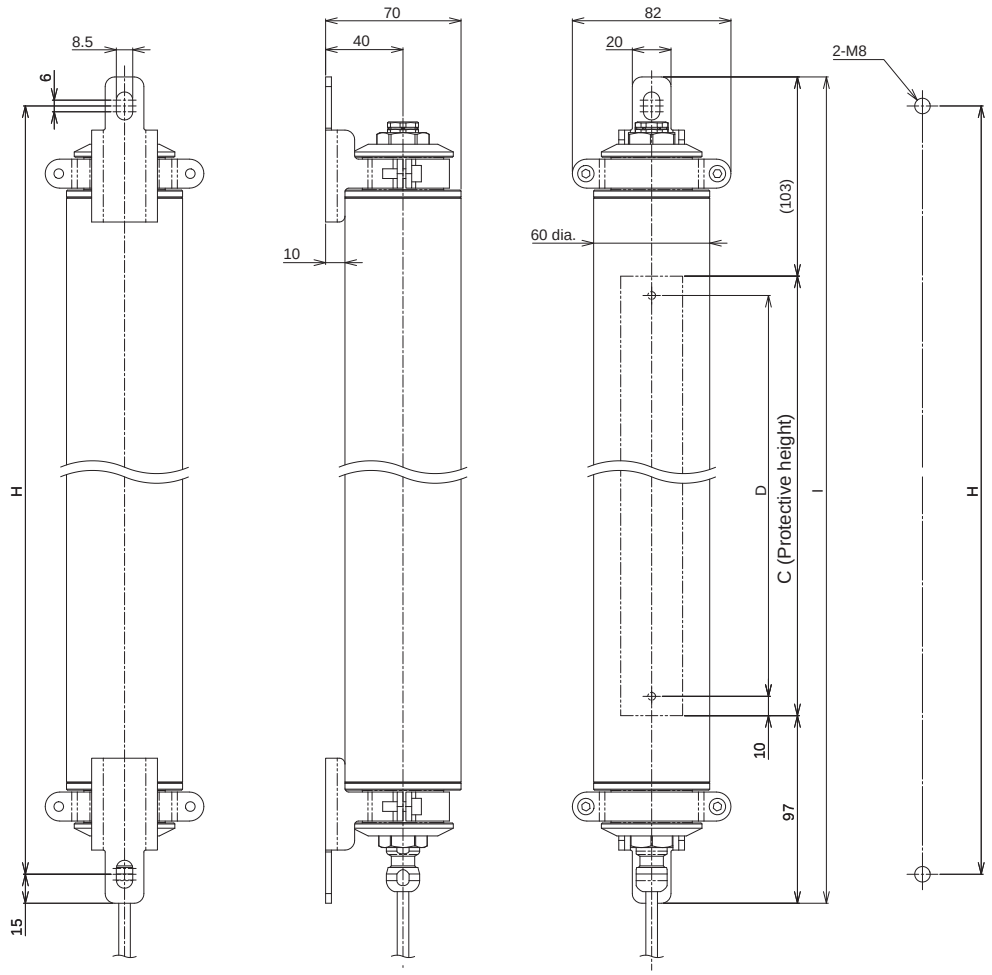
Dimensions

(Unit: mm)

F3SG-SR-K Main Unit

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

Side mounting and backside mounting

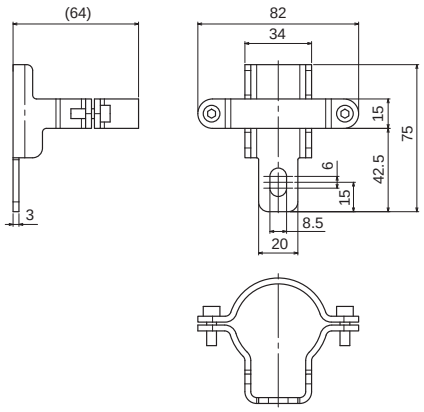


Dimension C	4-digit number in model number (Protective height: △)	
Dimension D	F3SG-□SR□△△△△-14	C-20
	F3SG-□SR□△△△△-25	
Dimension H	C+170	
Dimension I	C+200	

Accessories

Bracket

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



Material: SUS316L

Common to F3SG-SR and F3SG-PG

Connectable Safety Control Units

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

Connectable safety control units (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 control unit listed in the table below.

Connectable safety control units (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

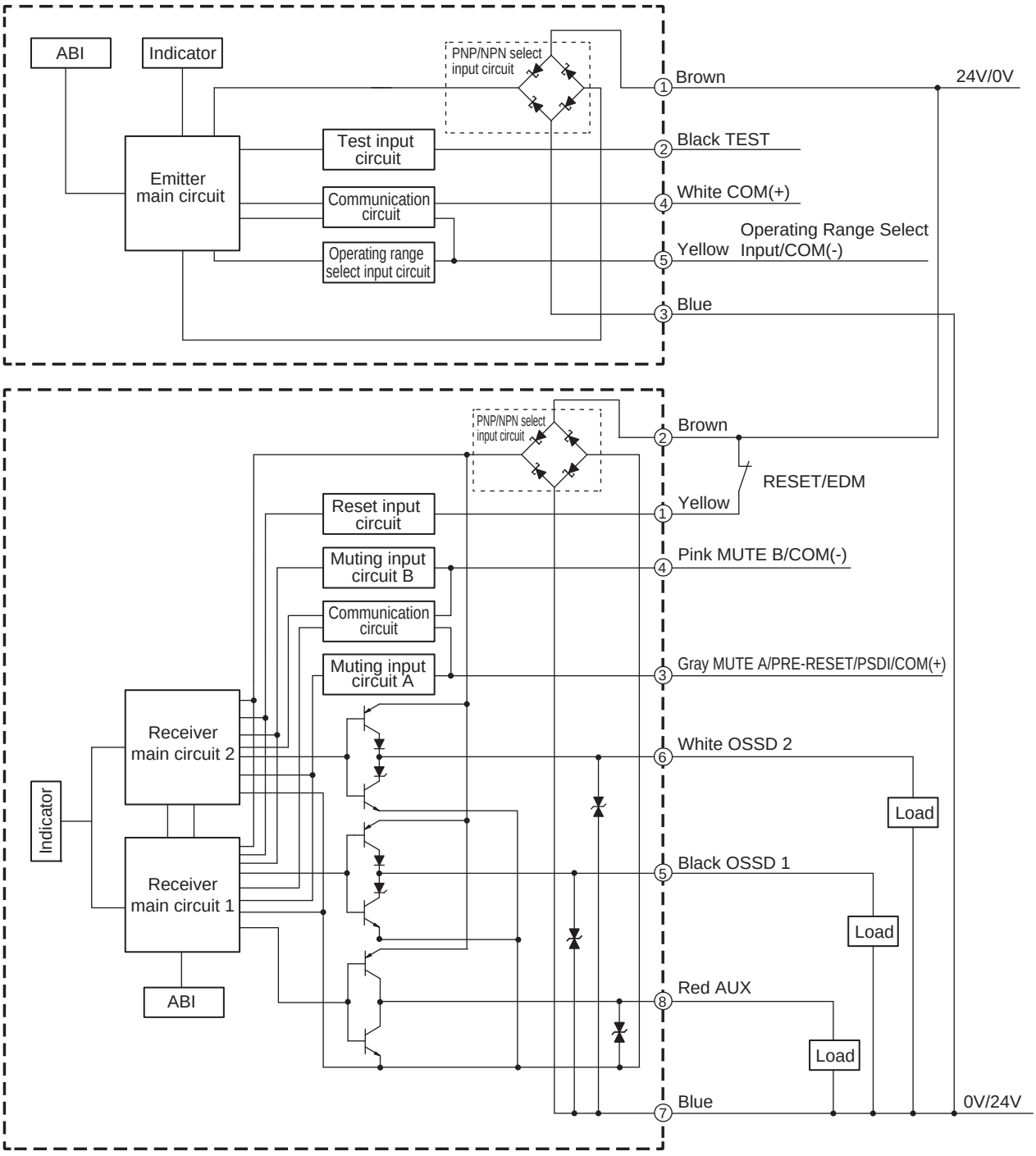
✻ Connectable to units supporting IO-Link Version 1.1.

Input/Output Circuit

Entire Circuit Diagram

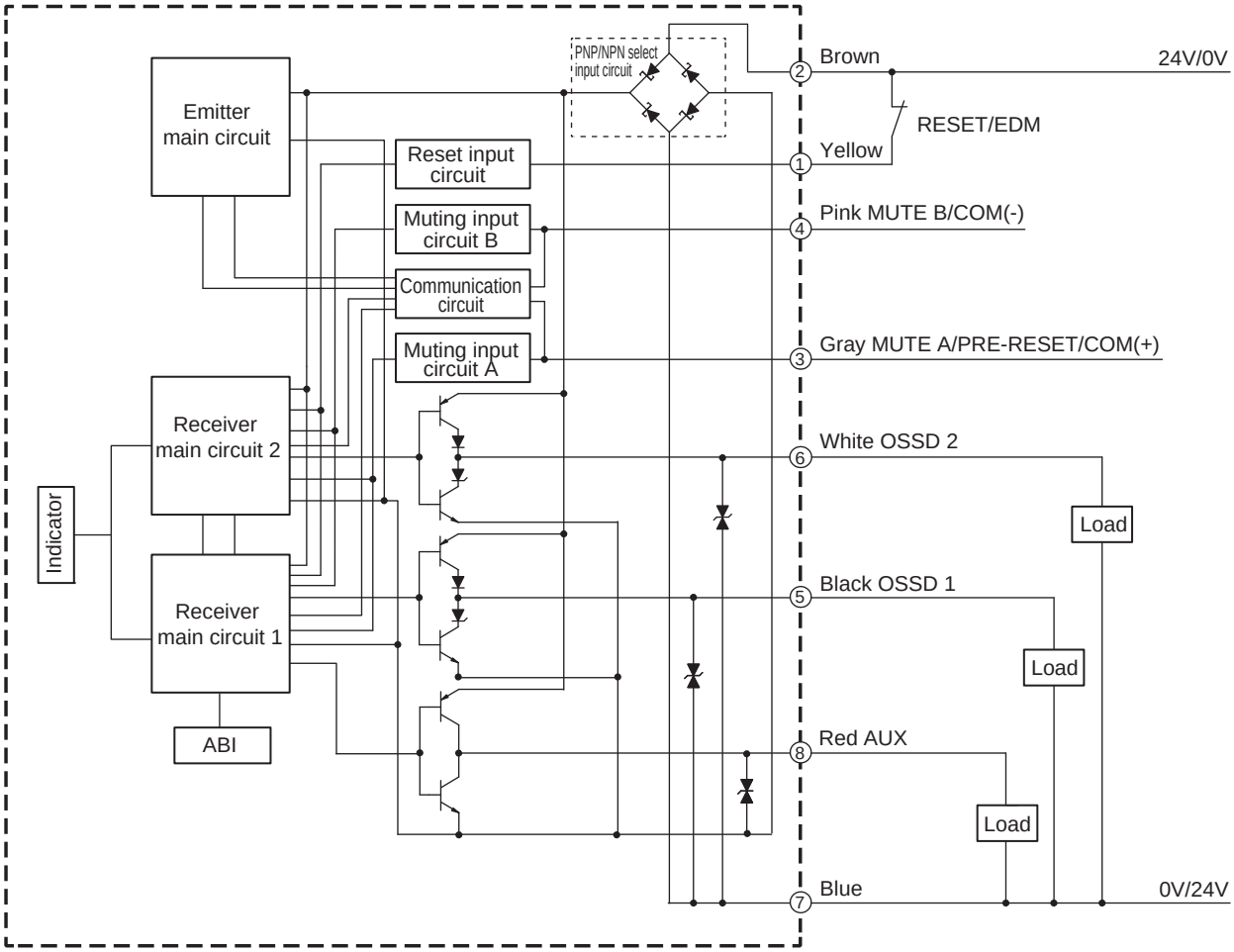
F3SG-SR and F3SG-PGA-A/-L

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.

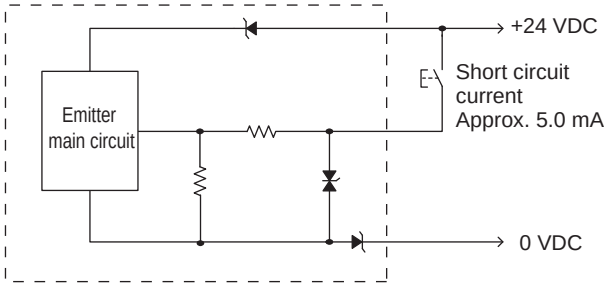


Input Circuit Diagram by Function

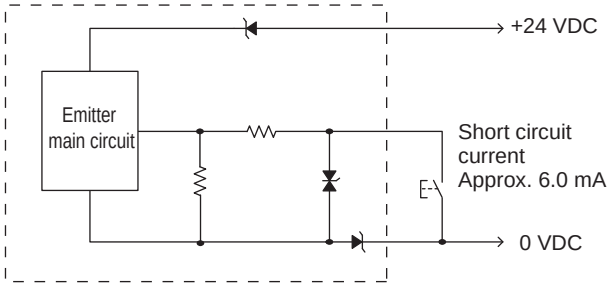
The input circuit diagrams of by function are shown below.

Test Input ✻1

<Light emission stops when connected to 24 VDC>



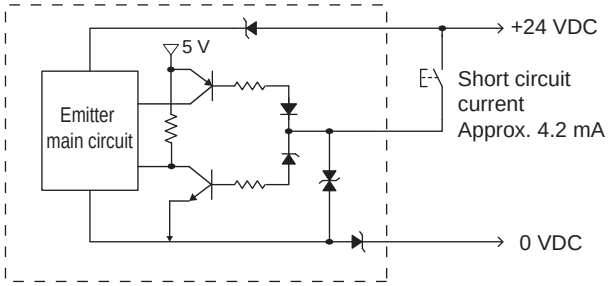
<Light emission stops when connected to 0 V>



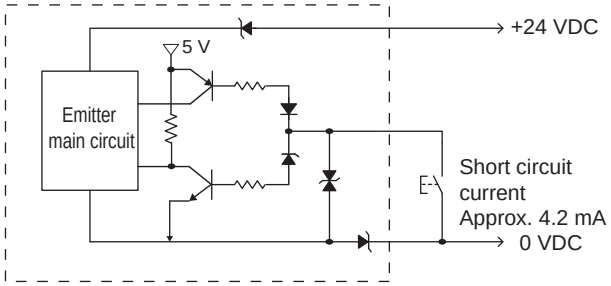
✻1. The F3SG-PGA-C does not have a test input function.

Operating Range Select Input ✻2

<Long>



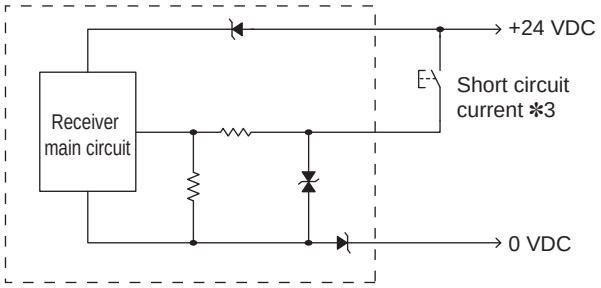
<Short>



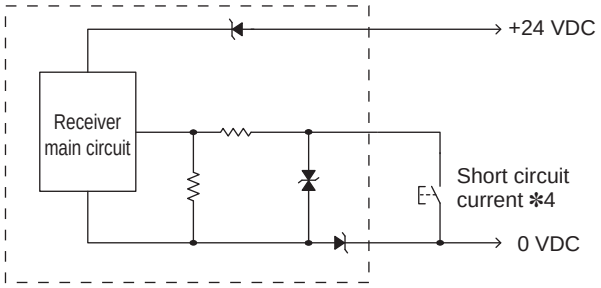
✻2. The F3SG-PGA-A/-C do not have an operation range select input function.

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)

Common to F3SG-SR and F3SG-PG

Connections (Basic Wiring Diagram)

F3SG-SR/PG

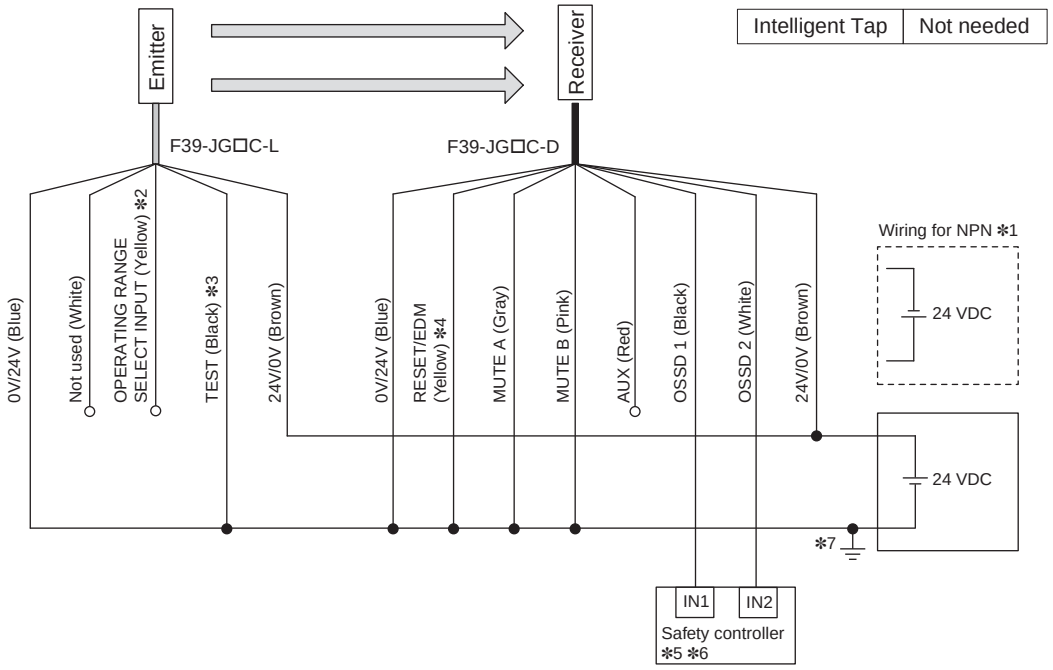
Examples of a motor control system using the F3SG-SR/PG are shown below. The examples are equivalent to up to PLe, Category 4 (ISO 13849-1).

Non-Muting System Wiring Examples

Auto Reset Mode with Optical Synchronization and EDM Unused

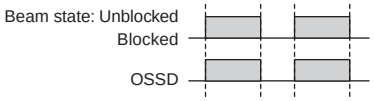
[Wiring Example 1 (F3SG-SR and F3SG-PGA-A/-L)]

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.

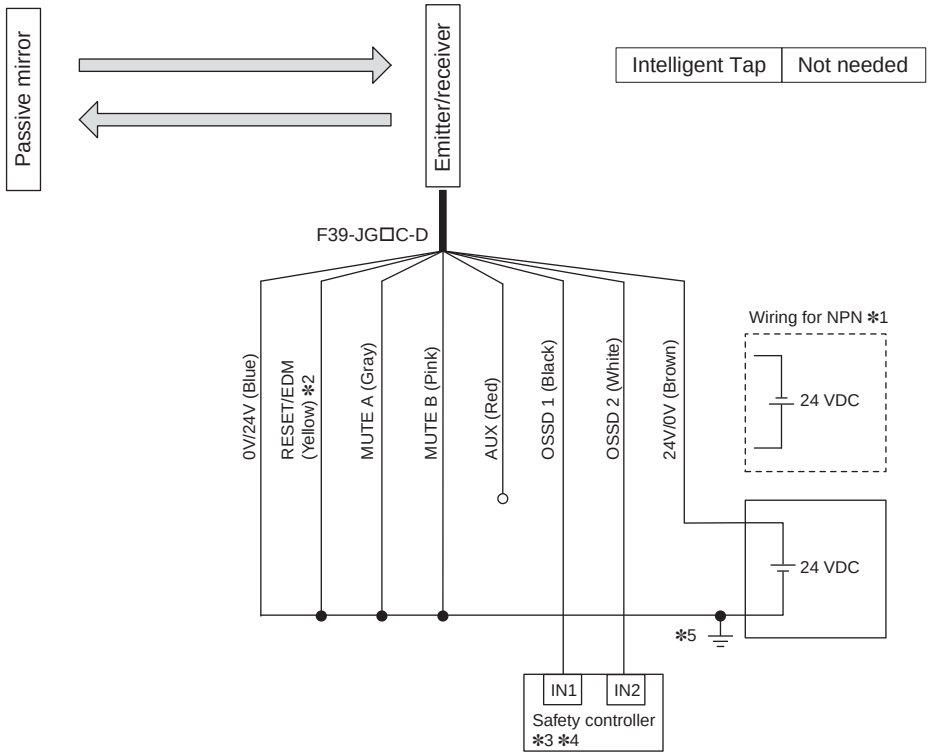
Timing chart



✻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 82 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.

[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

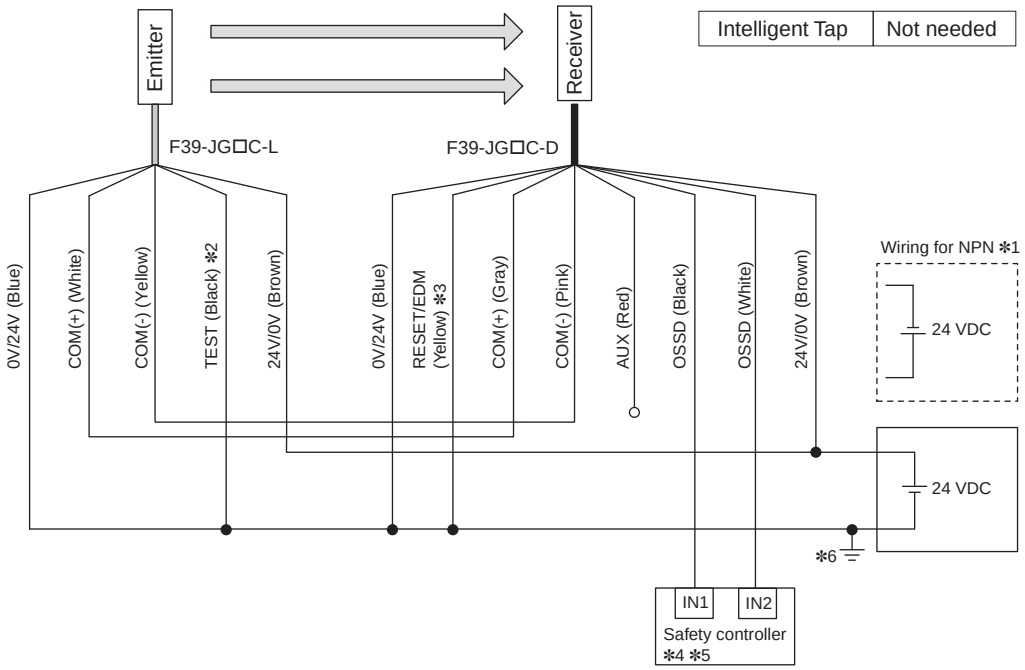
✻1. Reverse the polarity of the power supply when using in the NPN system. Select a safety controller of PNP or NPN type according to the system of your application.
✻2. Connect the line to 24V/0V (brown) of the receiver via a lockout reset switch (NC contact) if Lockout Reset is used.
✻3. Refer to page 82 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

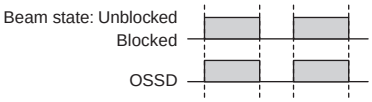
F3SG-SRA	Available	F3SG-PGA-A/-L	Available
F3SG-SRB	Available	F3SG-PGA-C	Not available

[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



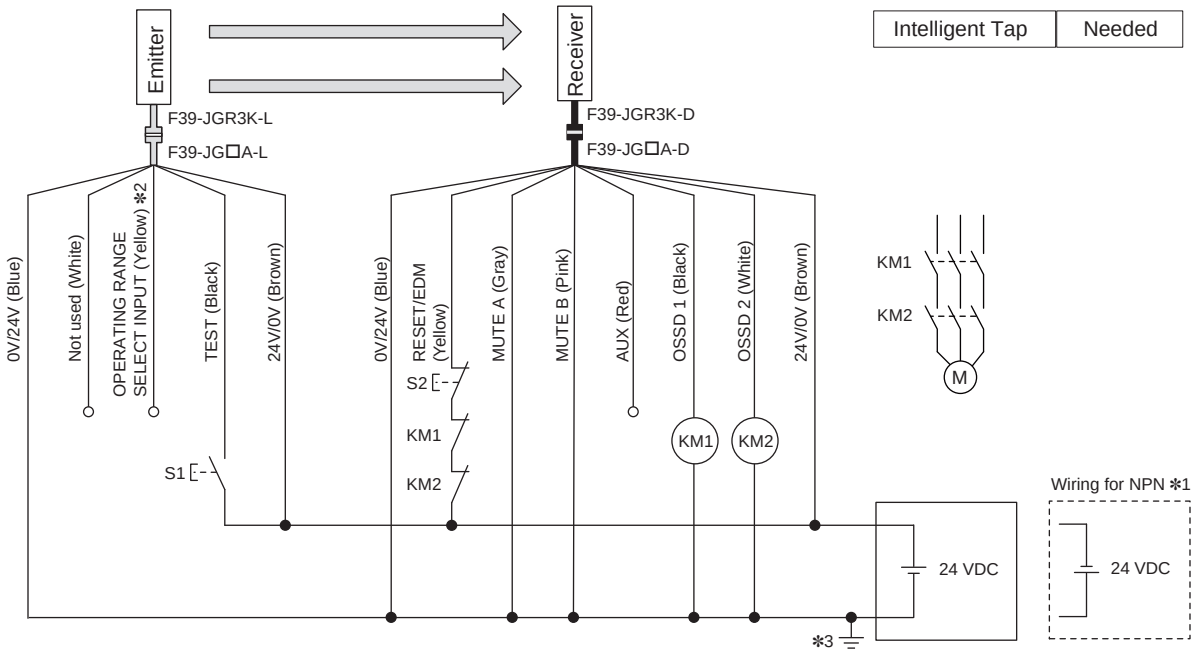
✻1. Reverse the polarity of the power supply when using in the NPN system. Select a safety controller of PNP or NPN type according to the system of your application.
✻2. If External Test is used, refer to the *User's Manual* (Man.No.Z405).
✻3. Connect the line to 24V/0V (brown) of the receiver via a lockout reset switch (NC contact) if Lockout Reset is used.
✻4. Refer to page 82 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 86.

Manual Reset Mode with EDM

F3SG-SRA	Available	F3SG-PGA-A/-L	Available
F3SG-SRB	Available	F3SG-PGA-C	Available ✻6

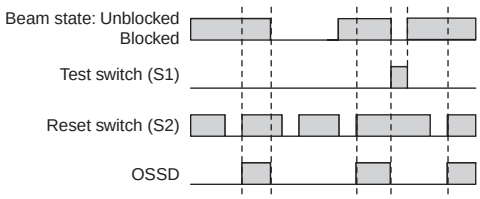
[Wiring Example]



☐: Indicates a switch position.

Function	Setting	
	DIP switch	SD Manager 3
EDM ✻4	EDM Enabled 3 ON	[External device monitoring] : Enable
Interlock ✻4	Manual Reset (Start/ Restart Interlock) 4 ON 5 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 ✻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

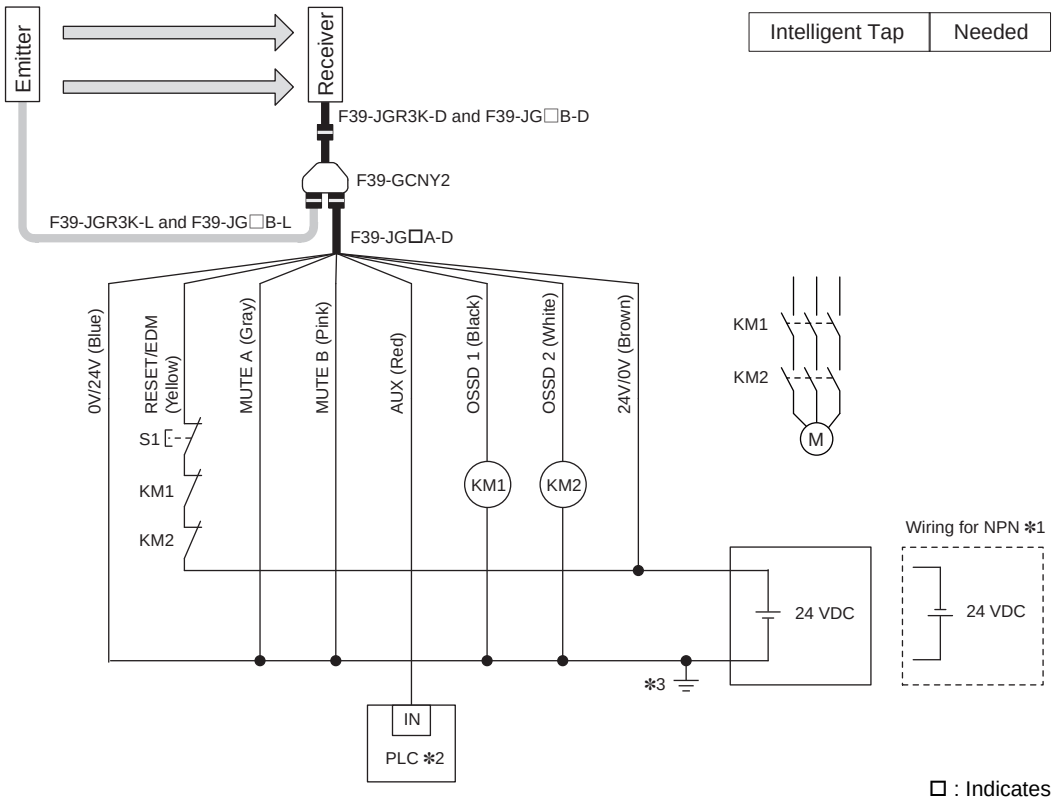
✻1. Reverse the polarity of the power supply when using in the NPN system.
✻2. Connect the line to 0 VDC if Operating Range Selection is used in Short Mode.
✻3. This is the case for a PELV circuit.
✻4. Set the function with the DIP Switches on the Intelligent Tap or the SD Manager 3, restore the settings 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 86.

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

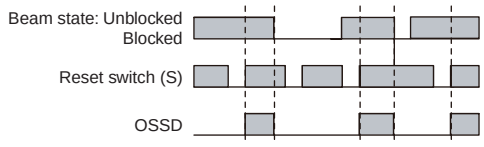
[Wiring Example]



□ : Indicates a switch position.

Function	Setting	
	DIP switch	SD Manager 3
EDM ✻4	EDM Enabled 3 ON	[External device monitoring] : Enable
Interlock ✻4	Manual Reset (Start/ Restart Interlock) 4 ON 5 ON	[Start interlock] : Enable [Restart interlock] : Enable
Operating Range Selection	Long	
Non-Muting system	Perform wiring according to the wiring diagram.	
	N/A	[Muting] : Disable ✻4
External Test not used	N/A	
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.

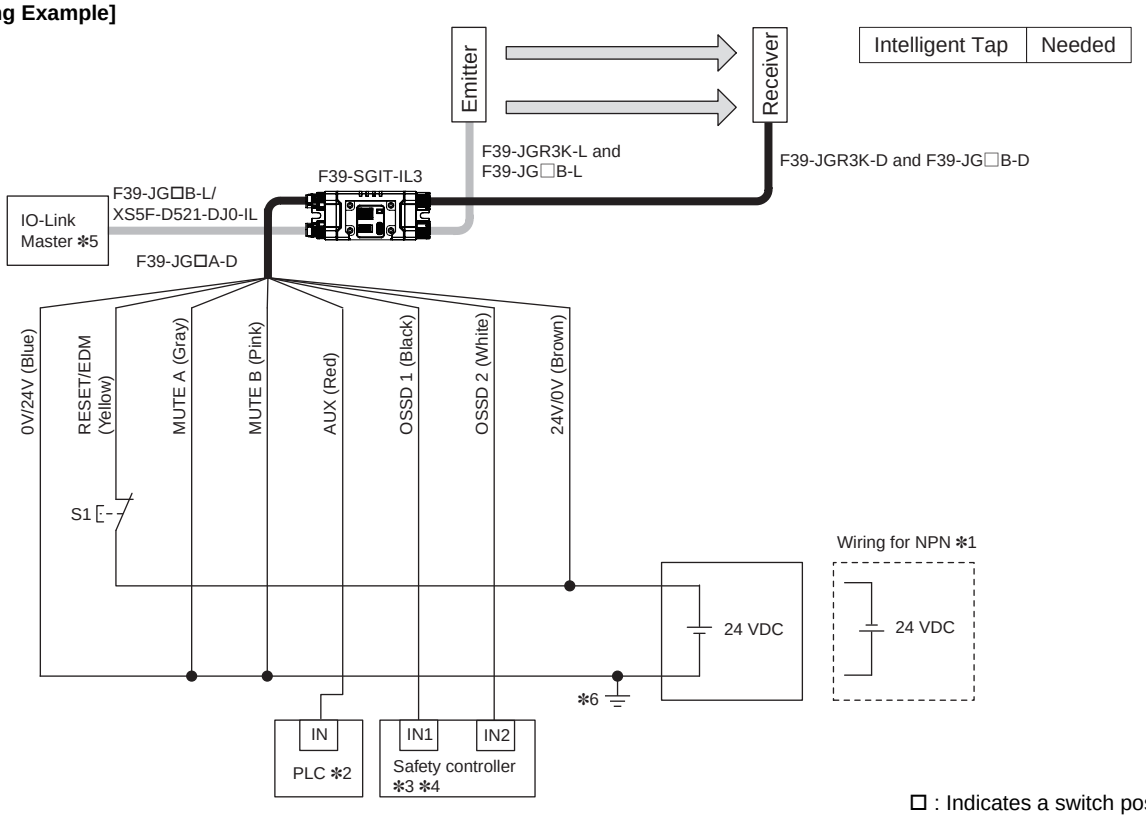
Note: 1. When using the Y-Joint Plug/Socket Connector (F39-GCNY2), the following functions are not available.
- External Test
- Operating Range Selection by wiring
- Wired Synchronization

2. For the functional earth connection, refer to page 86.

Manual Reset Mode with Intelligent Tap

F3SG-SRA	Available	F3SG-PGA-A/-L	Available
F3SG-SRB	Available	F3SG-PGA-C	Available ✻9

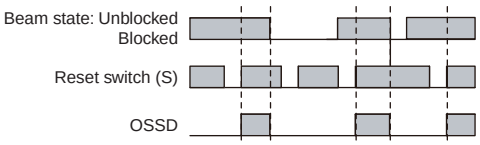
[Wiring Example]



□ : Indicates a switch position.

Function	Setting	
	DIP switch	SD Manager 3
EDM	EDM Disabled — 3 ON	[External device monitoring] : Disable
Interlock ✻7	Manual Reset (Start/ Restart Interlock) — 4 ON, 5 ON	[Start interlock] : Enable [Restart interlock] : Enable
Operating Range Selection ✻8	Long — 8 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 82 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

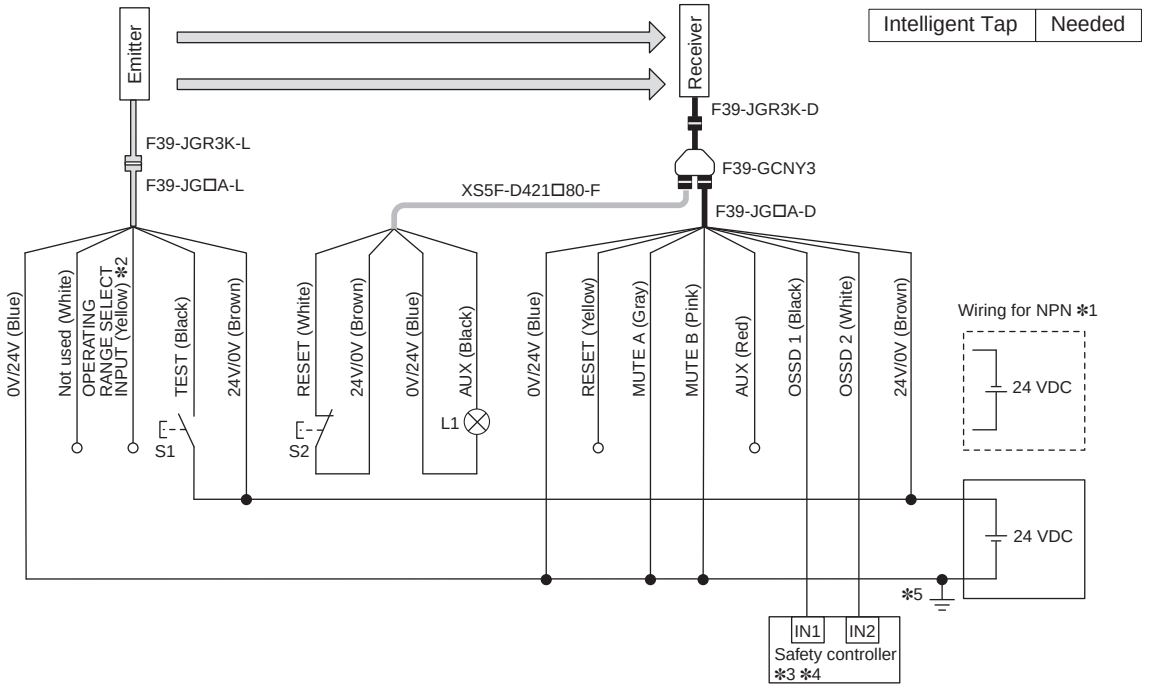
Note: 1. When using the Intelligent Tap (F39-SGIT-IL3) with the emitter and receiver connected, the following functions are not available.
- External Test
- Operating Range Selection by wiring
- Optical Synchronization

2. For the functional earth connection, refer to page 86.

Manual Reset Mode with Reset Switch Connector

F3SG-SRA	Available	F3SG-PGA-A/-L	Available
F3SG-SRB	Available	F3SG-PGA-C	Available ✻9

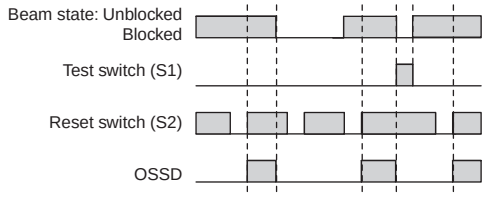
[Wiring Example]



□ : Indicates a switch position.

Function	Setting	
	DIP switch	SD Manager 3
EDM	EDM Disabled (factory default setting)	[External device monitoring] : Disable
Interlock ✻6	Manual Reset (Start/ Restart Interlock) 4 ON 5 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	[External test signal inversion] : Disable
Optical Synchronization	Open the COM(+) and COM(-) lines of the emitter.	

Timing chart



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

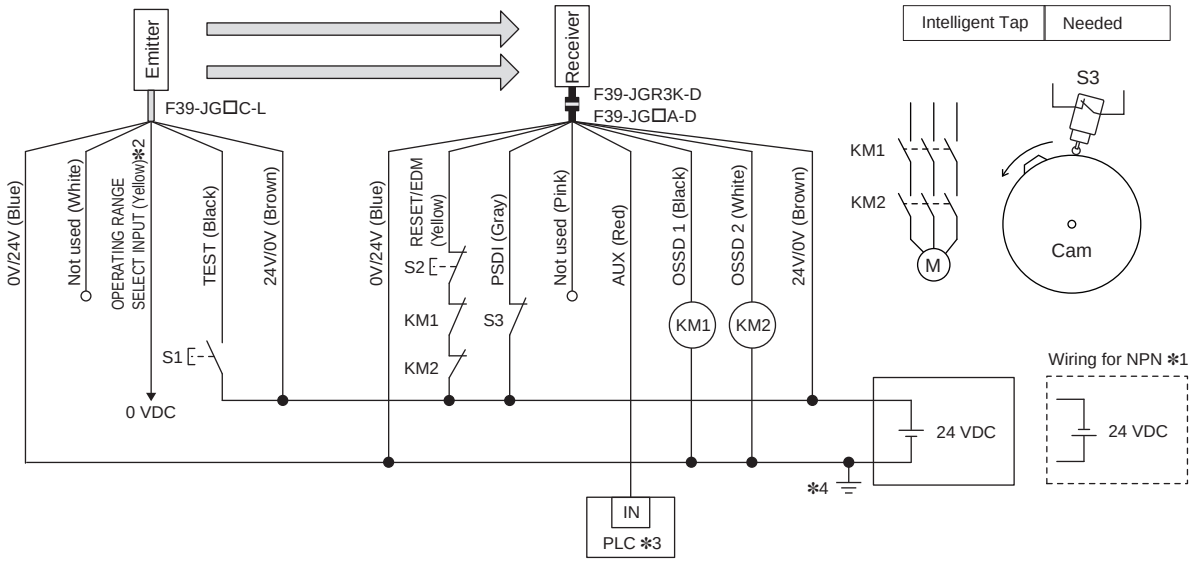
✻1. Reverse the polarity of the power supply when using in the NPN system. Select a PLC and a safety controller of PNP or NPN type according to the system of your application.
✻2. Connect the line to 0 VDC if Operating Range Selection is used in Short Mode.
✻3. Refer to page 82 for more information.
✻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 86.

Double Break with EDM

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

[Wiring Example]

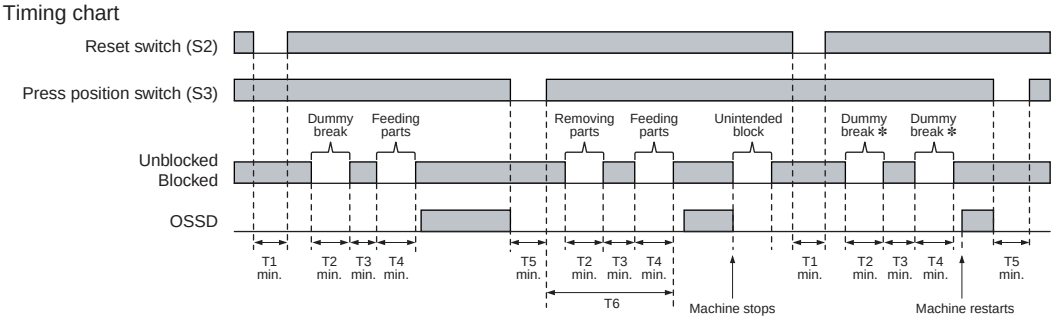


Function	Setting	
	DIP switch	SD Manager 3
EDM	-	[External device monitoring] : Enable *5
Operating Range Selection	Short : Connect the OPERATING RANGE SELECT INPUT line of the emitter to 0 VDC.	
PSDI	N/A	[PSDI] : Double break *5
Non-Muting system	Perform wiring according to the wiring diagram.	
	N/A	[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.

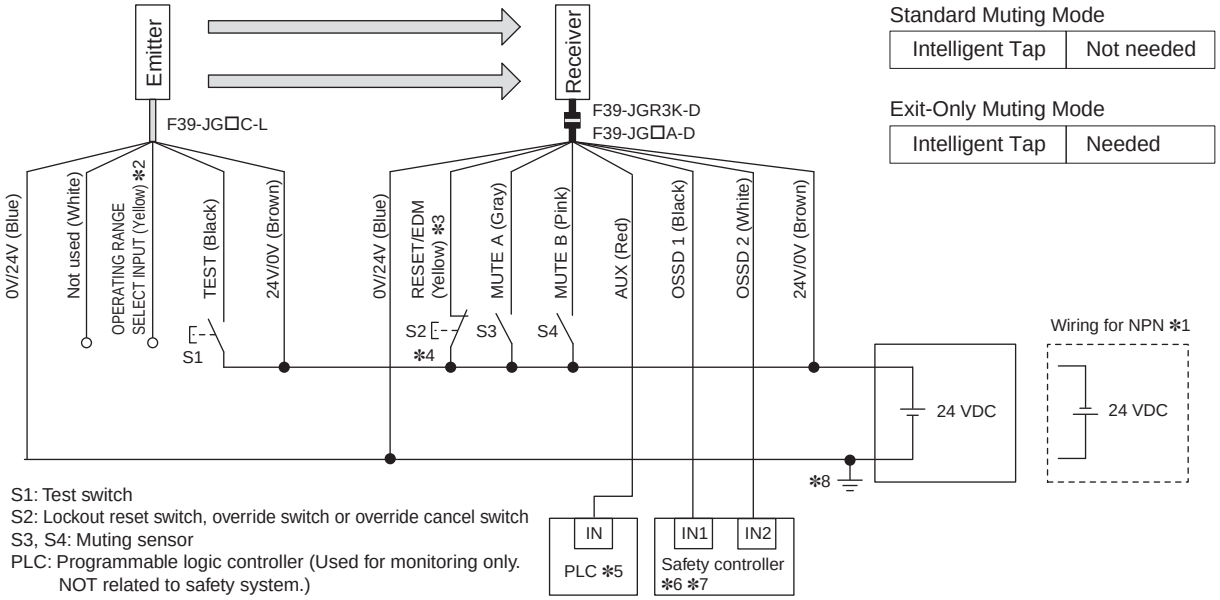
Note: For the functional earth connection, refer to page 86.

Muting System Wiring Examples

Standard Muting Mode/Exit-Only Muting Mode

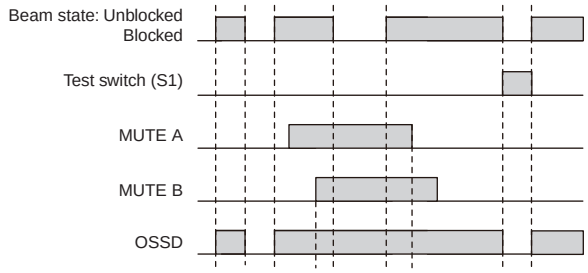
F3SG-SRA	Available	F3SG-PGA-A/-L	Available
F3SG-SRB	Available	F3SG-PGA-C	Available ✻12

[Wiring Example]



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



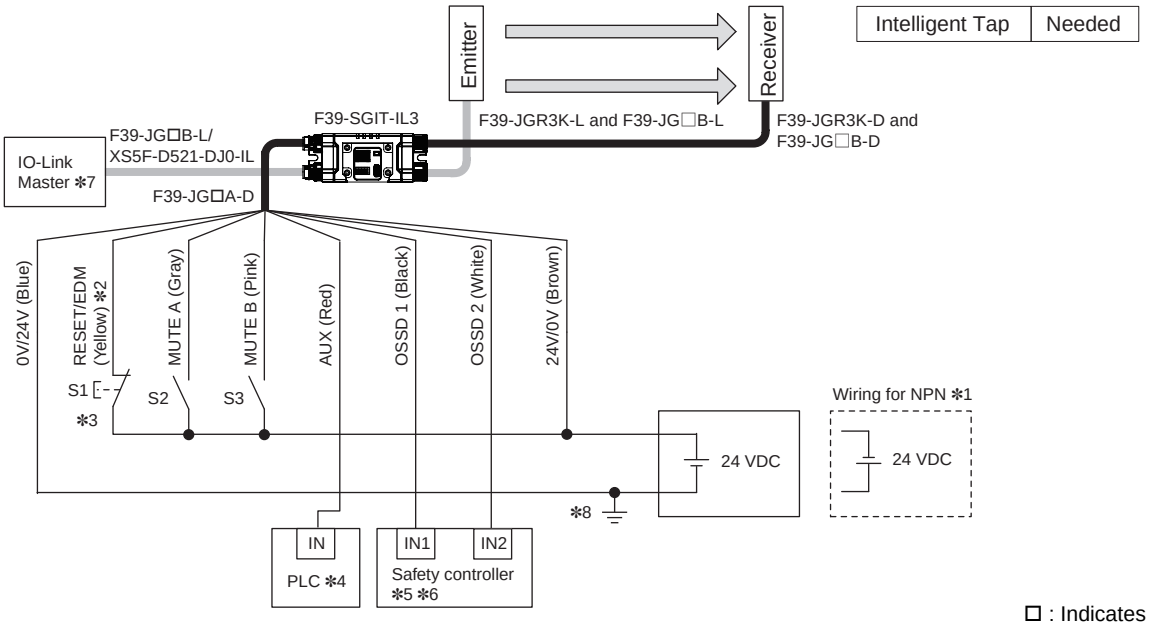
✻1. Reverse the polarity of the power supply when using in the NPN system.
✻2. Connect the line to 0 VDC if Operating Range Selection is used in Short Mode.
✻3. Also used as OVERRIDE INPUT line.
✻4. Make sure to connect an override cancel switch to the RESET line when using the override function. Otherwise 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 82 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 86.

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

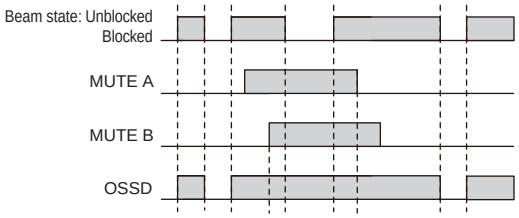
[Wiring Example]



□ : Indicates a switch position.

Function	Setting	
	DIP switch	SD Manager 3
EDM ✻9	EDM Disabled 3 □■ ON	[External device monitoring] : Disable
Interlock ✻9	Auto Reset 4 □■ ON 5 □■ ON	[Start interlock] : Disable [Restart interlock] : Disable
Operating Range Selection ✻10	Long 8 □■ 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.)

✻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 82 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 FE3SG-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.

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 86.

Common to F3SG-SR and F3SG-PG

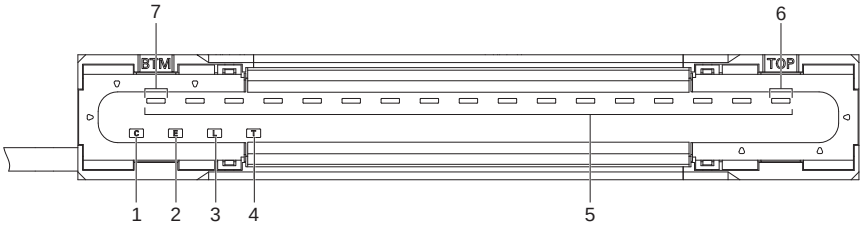
Indicator

LED Indicators on F3SG-SR/PG

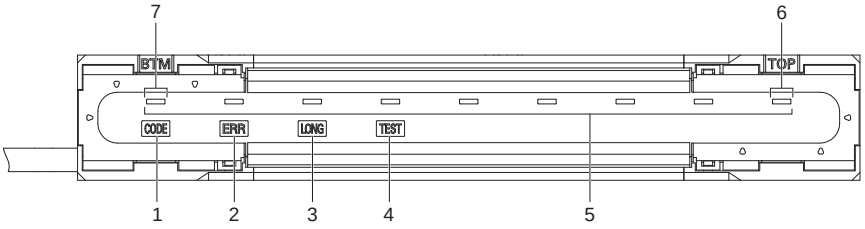
F3SG-SR

<Emitter>

F3SG-□SR□□□□□-14

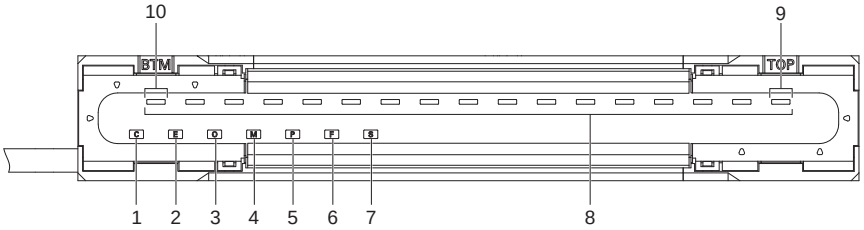


F3SG-□SR□□□□□-25/-45/-85

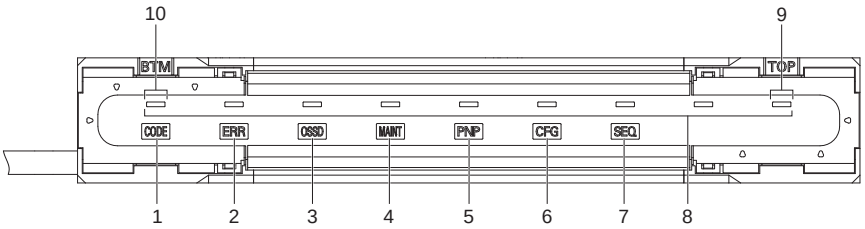


<Receiver>

F3SG-□SR□□□□□-14



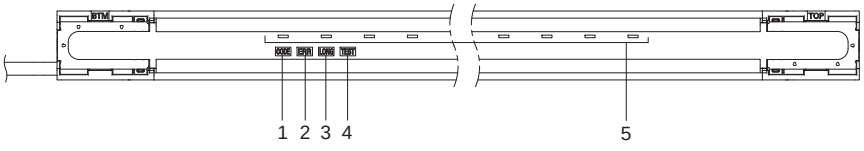
F3SG-□SR□□□□□-25/-45/-85



F3SG-PG

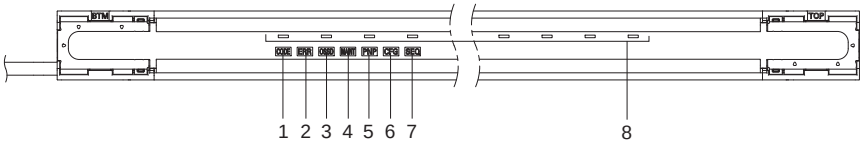
<Emitter>

F3SG-4PGA□□□□-□A/□L



<Receiver, Emitter/receiver>

F3SG-4PGA□□□□-□A/□L/□C



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	C or CODE	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	E or ERR	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	L or LONG	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	T or TEST	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 (for 5 to 10 s)	Incident light level of the target beams of the ABI is 170% (factory default setting (✻2)) or less of ON threshold 5 to 10 s after illuminated when incident light level of the target beams of the ABI is 170% (factory default setting (✻2)) or less of ON threshold. 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	---	---

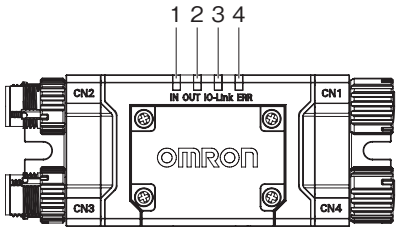
✻1. The indicator of the emitter is illuminated only in the case the Wired Synchronization is enabled and is off in the case the Optical Synchronization is enabled.
✻2. Configurable by SD Manager 3.
✻3. This is the case for the Standard Muting mode. For other muting modes, refer to *User's Manual* (Man.No.Z405).
✻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
3	O or OSSD	ON/OFF	Green	Safety outputs are in ON state	---	X	X	X
			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
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 (for 5 to 10 s)	Incident light level of the target beams of the ABI is 170% (factory default setting (✻2)) or less of ON threshold 5 to 10 s after illuminated when incident light level of the target beams of the ABI is 170% (factory default setting (✻2)) or less of ON threshold. 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 100 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).

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	---

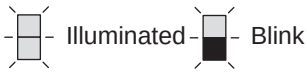
✻1. When the safety outputs of the F3SG-SR/PG are in the ON state, the outputs of the Intelligent Tap are in the ON state.
✻2. When the safety outputs of the F3SG-SR/PG are in the OFF state, the outputs of the Intelligent Tap are in the OFF state.
Note: In the SETTING state to make settings with the 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
E or ERR Blinking once	M or MAINT [Error description] Recoverable error Red blinking : Replacement-recommended error	O or OSSD	Safety Output error
		P or PNP	Error due to change of PNP/NPN polarity during operation
		F or CFG	Blanking monitoring error Configuration error Parameter error
		TOP ✻1	Cap error Other sensor error
E or ERR Blinking twice		BTM ✻2	DIP Switch setting error
		O or OSSD	Safety output error due to power supply voltage or noise
E or ERR Blinking once		---	Communication error External device monitoring error Error other than those above
---	M or MAINT 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
E or ERR Blinking once	L or LONG	Operating range selection setting error
	TOP ✻1 ✻3	Cap error Other sensor error
	BTM ✻2 ✻3	DIP Switch setting error
	---	Communication error Error other than those above

✻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.

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: • 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.
			3C, 3E, 3F	A model name does not match between emitter and receiver. Check that the emitter and receiver are the same model.
			34	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.
				An error may have occurred in the internal circuit. Replace the F3SG-SR/PG.
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.

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.

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. • 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
	M or MAINT ■	F or CFG S or SEQ	Teach-in error
E or ERR ■		S or SEQ ✻2	Muting sequence error, Interlock sequence error or PSDI sequence error
	M or MAINT Orange	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.

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. • 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. • 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. • 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. • 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. • 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. • 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. • 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. • 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.
	●	The light curtain may have been blocked before RESET input was turned ON. Check the condition of the light curtains and RESET 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

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: 1. 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.
2. 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	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.
Communication error between the F3SG-SR/ PG and the Intelligent Tap	X	---	---	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.
F3SG-SR/PG LOCKOUT state	X	---	---	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.
Restoration failed	X	---	---	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.
Power supply voltage error, or other errors	X	X	A3	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.
				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.
DIP Switch circuit error at startup	X	X	BC	The internal circuit may be defective. Replace the Intelligent Tap.
IO-Link circuit error	X	X	BD	The internal circuit may be defective. Replace the Intelligent Tap.
Internal error	X	X	Others	The internal circuit may be defective. Replace the Intelligent Tap.

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

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.