

# Safety Light Curtain Easy type

# F3SG-RE



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

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

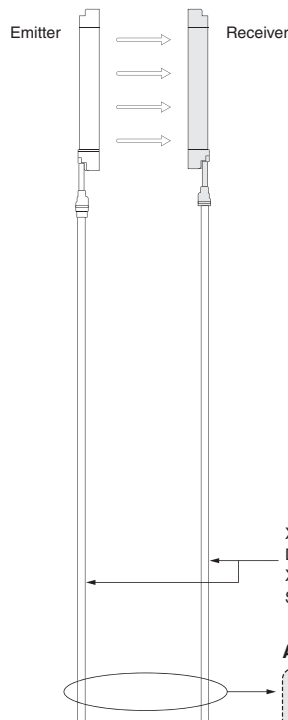


## System Configuration

### Mounting bracket

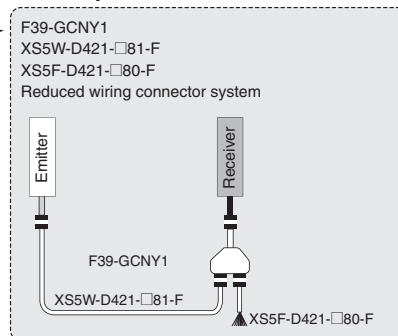


### Accessory



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

### Accessory



### Recommended safety controller \*

NX/NE1A-series  
Safety Network Controller

G9SP-series  
Safety Controller

G9SE/G9SA-series  
Safety Relay Unit

G9SX-series  
Flexible Safety Unit

G7SA/G7S-E  
Relays with Forcibly  
Guided Contacts

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

Ordering Information

Main Units

Safety Light Curtain  
Finger protection

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



Hand and arm protection

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

### Accessories (Sold separately)


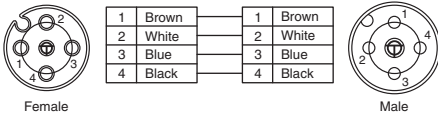
#### Safety light curtain connecting cable

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

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

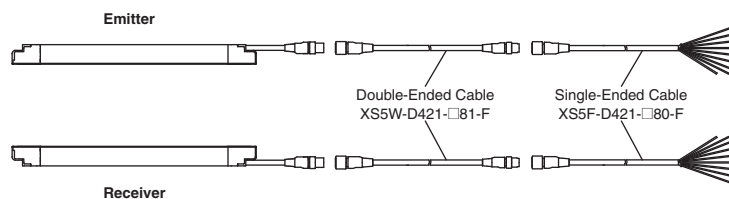
- Note:** 1. One cable that can be used for both emitter and receiver is provided. Order two cables for one set of safety light curtains.  
 2. To extend the cable length to 20 m or more, add the XS5W-D421-□81-F Double-Ended Cable.

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


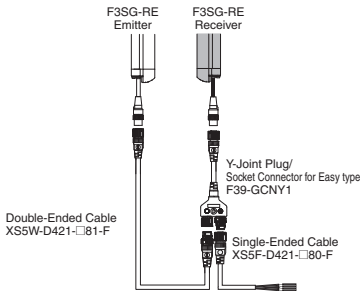
Appearance	Type	Cable length	Specifications	Model																
	M12 connector (4-pin) on both ends	1 m	 <table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th>1</th> <th>Brown</th> <th>1</th> <th>Brown</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>White</td> <td>2</td> <td>White</td> </tr> <tr> <td>3</td> <td>Blue</td> <td>3</td> <td>Blue</td> </tr> <tr> <td>4</td> <td>Black</td> <td>4</td> <td>Black</td> </tr> </tbody> </table>	1	Brown	1	Brown	2	White	2	White	3	Blue	3	Blue	4	Black	4	Black	XS5W-D421-C81-F
		1		Brown	1	Brown														
		2		White	2	White														
		3		Blue	3	Blue														
		4		Black	4	Black														
		2 m		XS5W-D421-D81-F																
3 m	XS5W-D421-E81-F																			
5 m	XS5W-D421-G81-F																			
10 m	XS5W-D421-J81-F																			
20 m	XS5W-D421-L81-F																			

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

**<Connection example>**







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

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

F3SG-RE

# F3SG-RE

## Sensor Mounting Brackets

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

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

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

Using Top/Bottom Adjustable Brackets with Standard Adjustable Brackets

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

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


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

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

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

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


## Laser Pointer for F3SG-R

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

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

Spatter Protection Covers include the mounting brackets.

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

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

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

### Test Rod

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

## Ratings/Specifications

### Main unit

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

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

# F3SG-RE

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

## List of Models/Response Time/Current Consumption/Weight

## F3SG-□RE□□□□□-14

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

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

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

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

## F3SG-□RE□□□□□30

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

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

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

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

# F3SG-RE

## LED Indicator Status

### Emitter

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

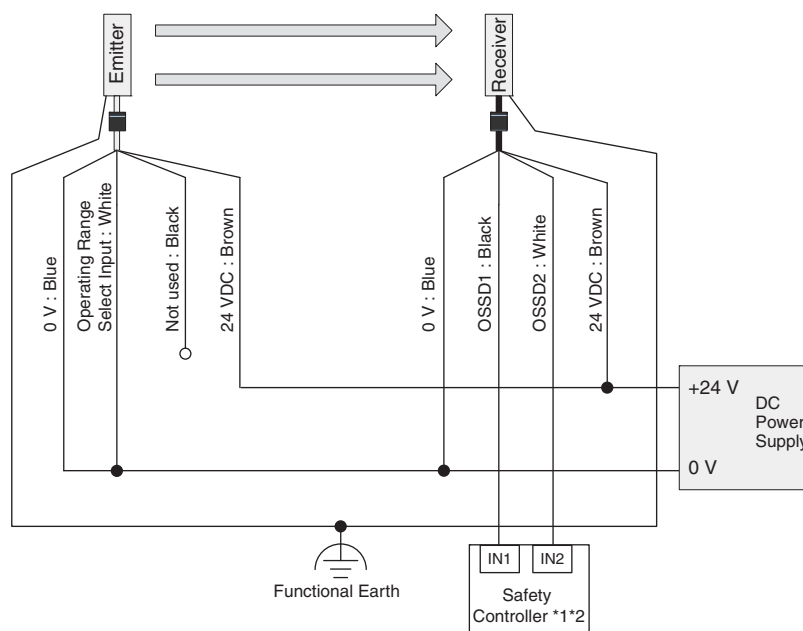
### Receiver

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



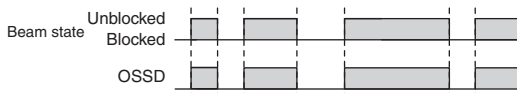
# Connections (Basic Wiring Diagram)

## Short Mode



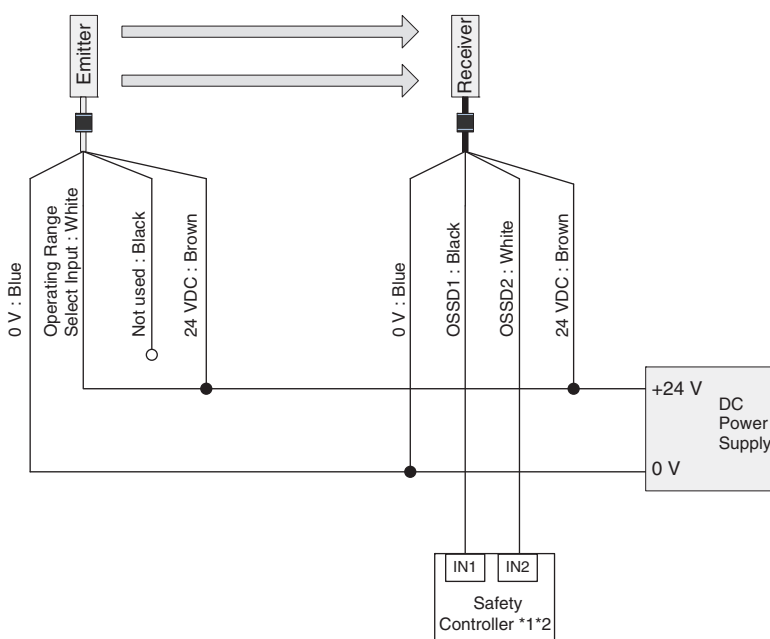
\*1.Refer to page 82 for more information.

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



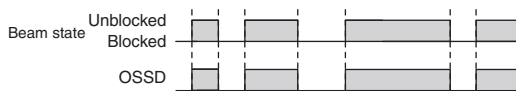
**Note:** Functional earth connection is unnecessary when you use the F3SG-RE in a general industrial environment where noise control or stable power supply is considered. However, when you use the F3SG-RE in an environment where there may be excessive noise from surroundings or stable power supply may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

## Long Mode



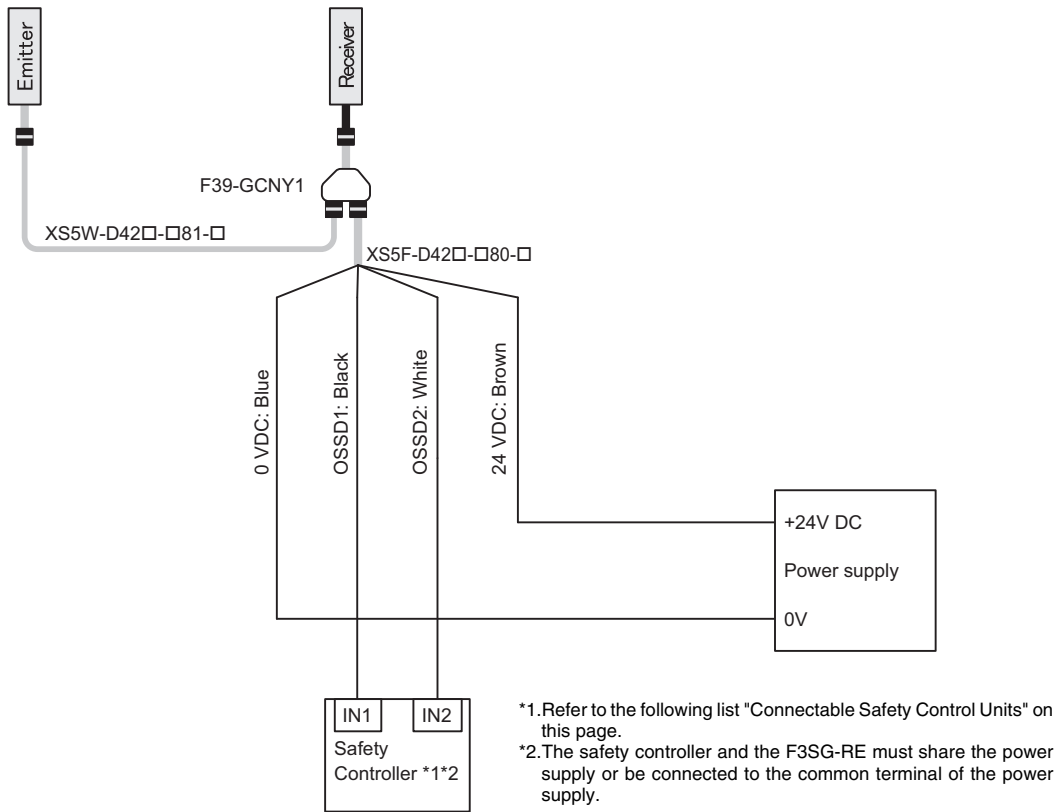
\*1.Refer to page 82 for more information.

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



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

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



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

## Connectable Safety Control Units

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

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

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

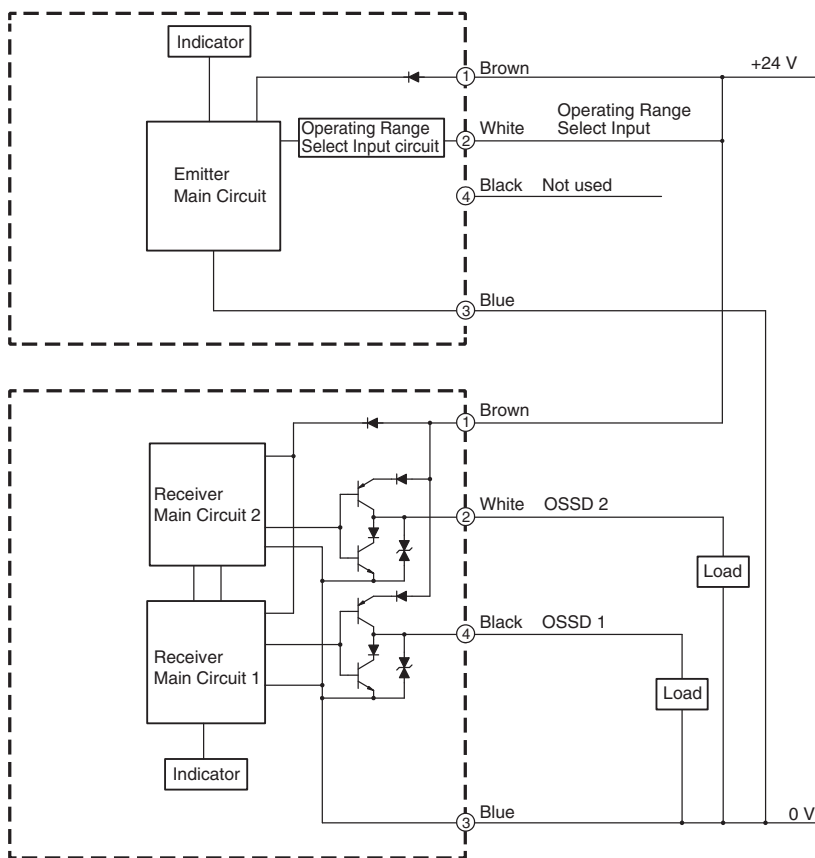
Connectable Safety Control Units (NPN output)
Safety Relay Units
G9SA-301-P

# Input/Output Circuit

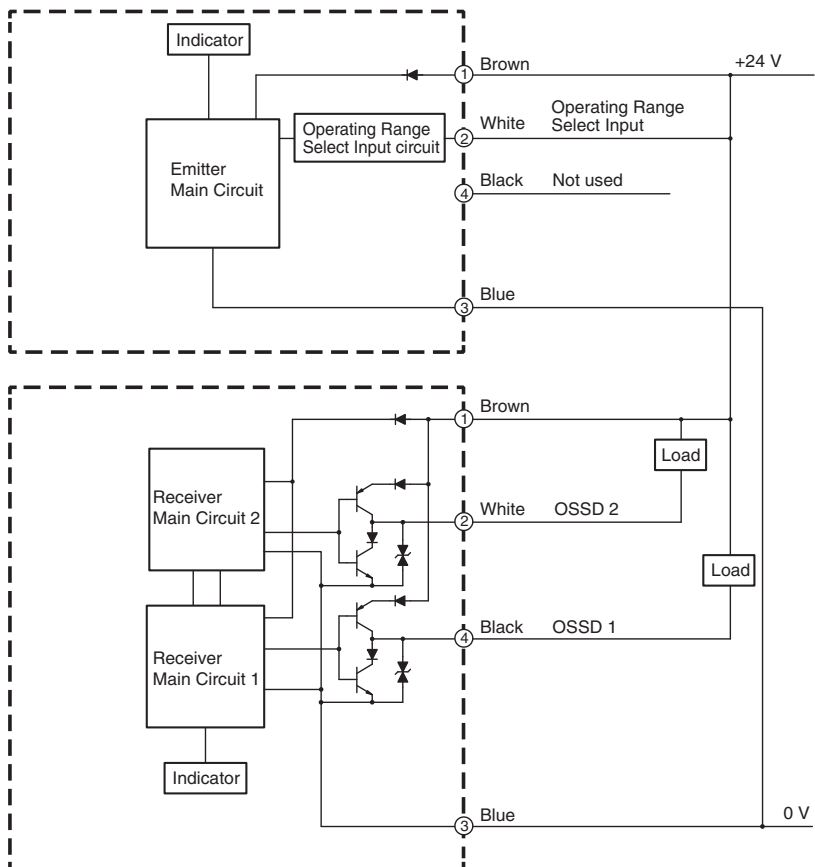
## Entire Circuit Diagram

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

### PNP Output



### NPN Output



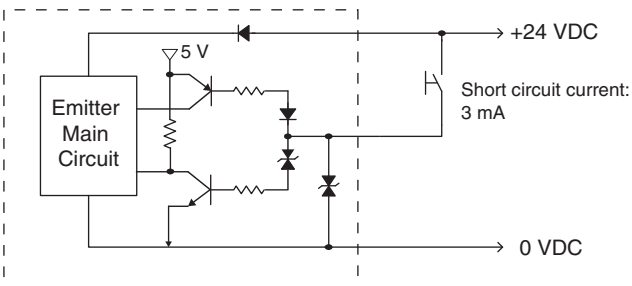
F3SG-RE

## Input Circuit Diagram by Function

The input circuit diagrams of by function are shown below.

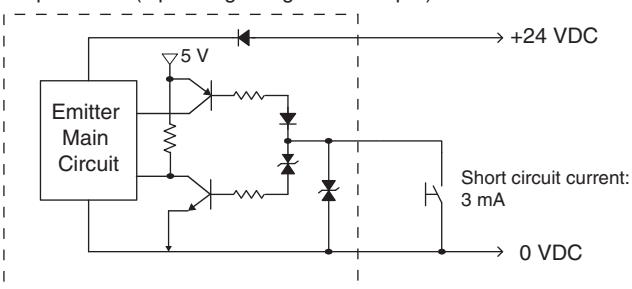
### PNP Output

<Input circuit (Operating Range Select Input)>



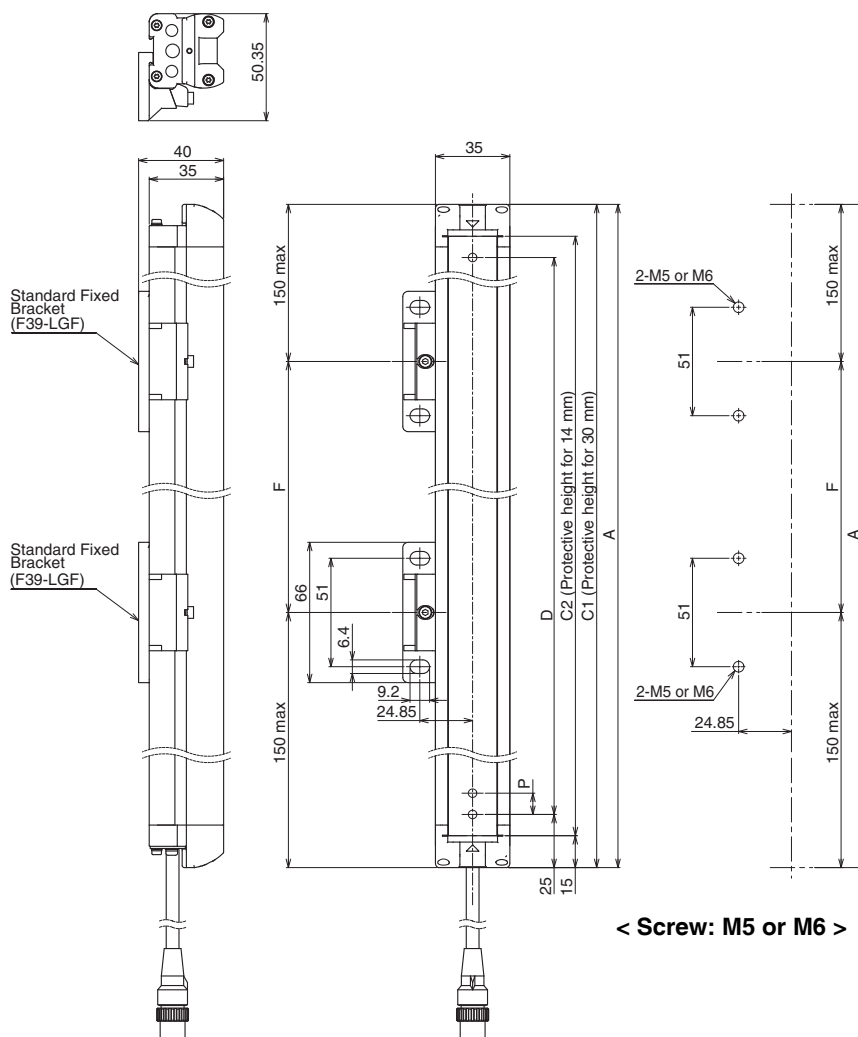
### NPN Output

<Input circuit (Operating Range Select Input)>



# Dimensions

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



### F3SG-4RE□□□□30 Series

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

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

### F3SG-4RE□□□□14 Series

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

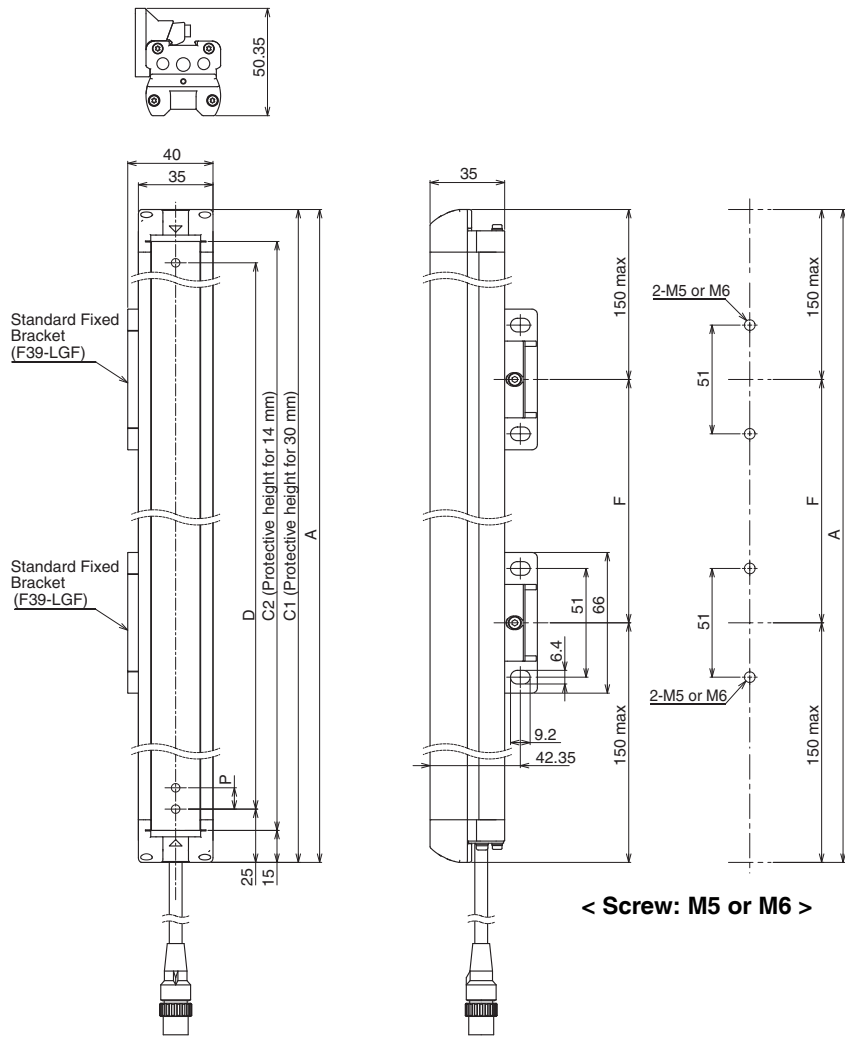
Protective height (C2)	Number of Standard Fixed Brackets *1	Dimension F
0160 to 1200	2 *2	1000 mm max.
1280 to 2080	3	1000 mm max.

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

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

F3SG-RE

## Side Mounting



### F3SG-4RE□□□□30 Series

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

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

### F3SG-4RE□□□□14 Series

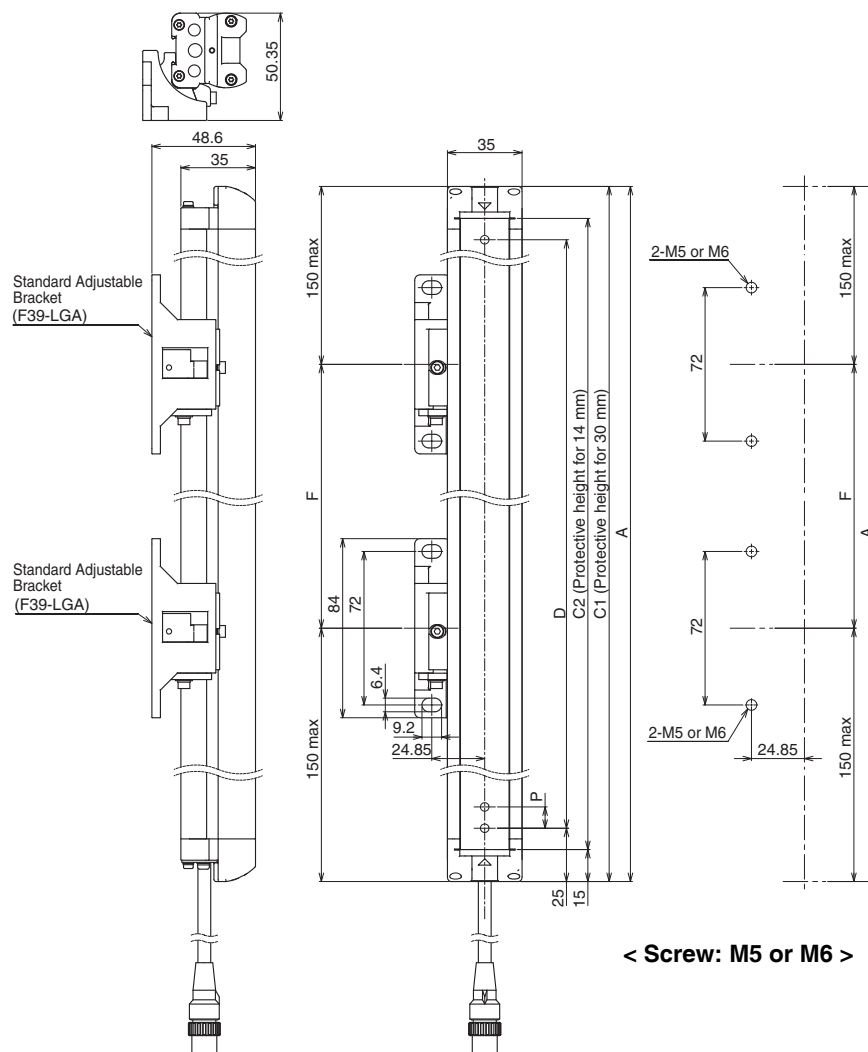
Dimension A	C2+30
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

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

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

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

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



**F3SG-4RE□□□□□30 Series**

<b>Dimension A</b>	C1
<b>Dimension C1</b>	4-digit number of the type name (Protective height)
<b>Dimension D</b>	C1-50
<b>Dimension P</b>	20

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

**F3SG-4RE□□□□□14 Series**

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

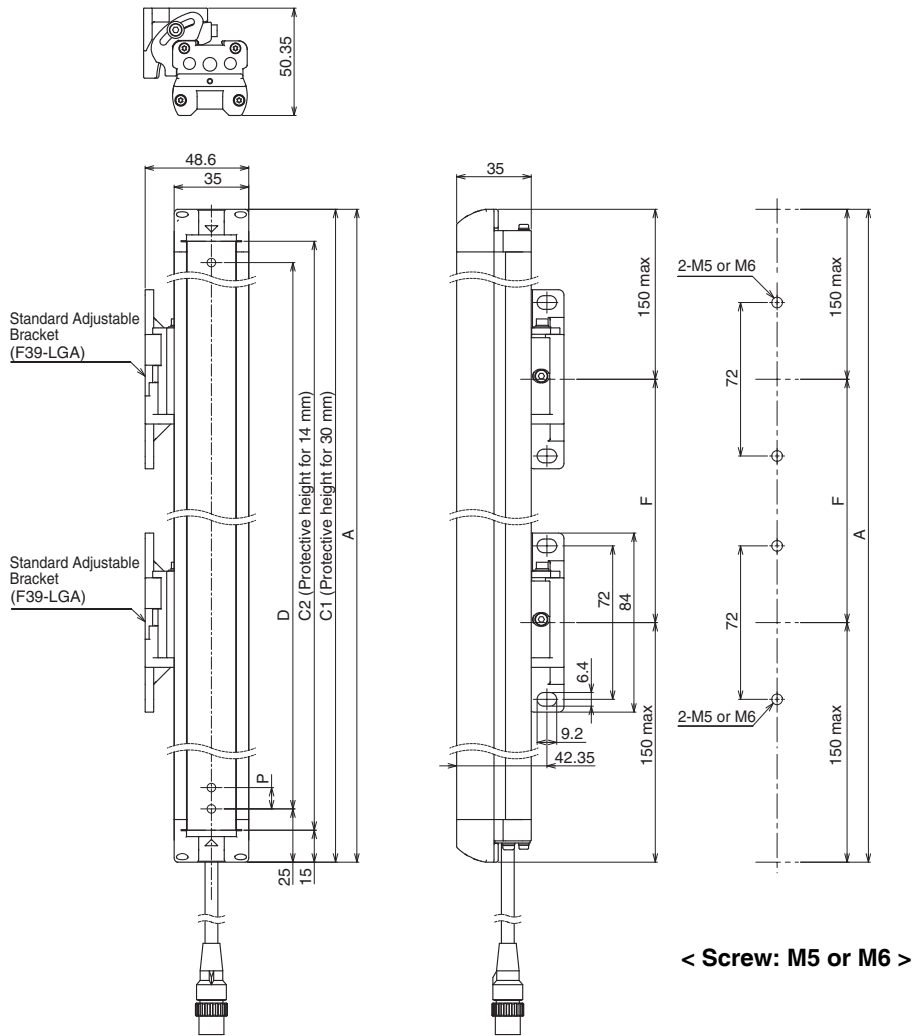
Protective height (C2)	Number of Standard Adjustable Brackets *1	Dimension F
0160 to 1200	2 *2	1000 mm max.
1280 to 2080	3	1000 mm max.

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

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

F3SG-RE

## Side Mounting



### F3SG-4RE□□□□30 Series

<b>Dimension A</b>	C1
<b>Dimension C1</b>	4-digit number of the type name (Protective height)
<b>Dimension D</b>	C1-50
<b>Dimension P</b>	20

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

### F3SG-4RE□□□□14 Series

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

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

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

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

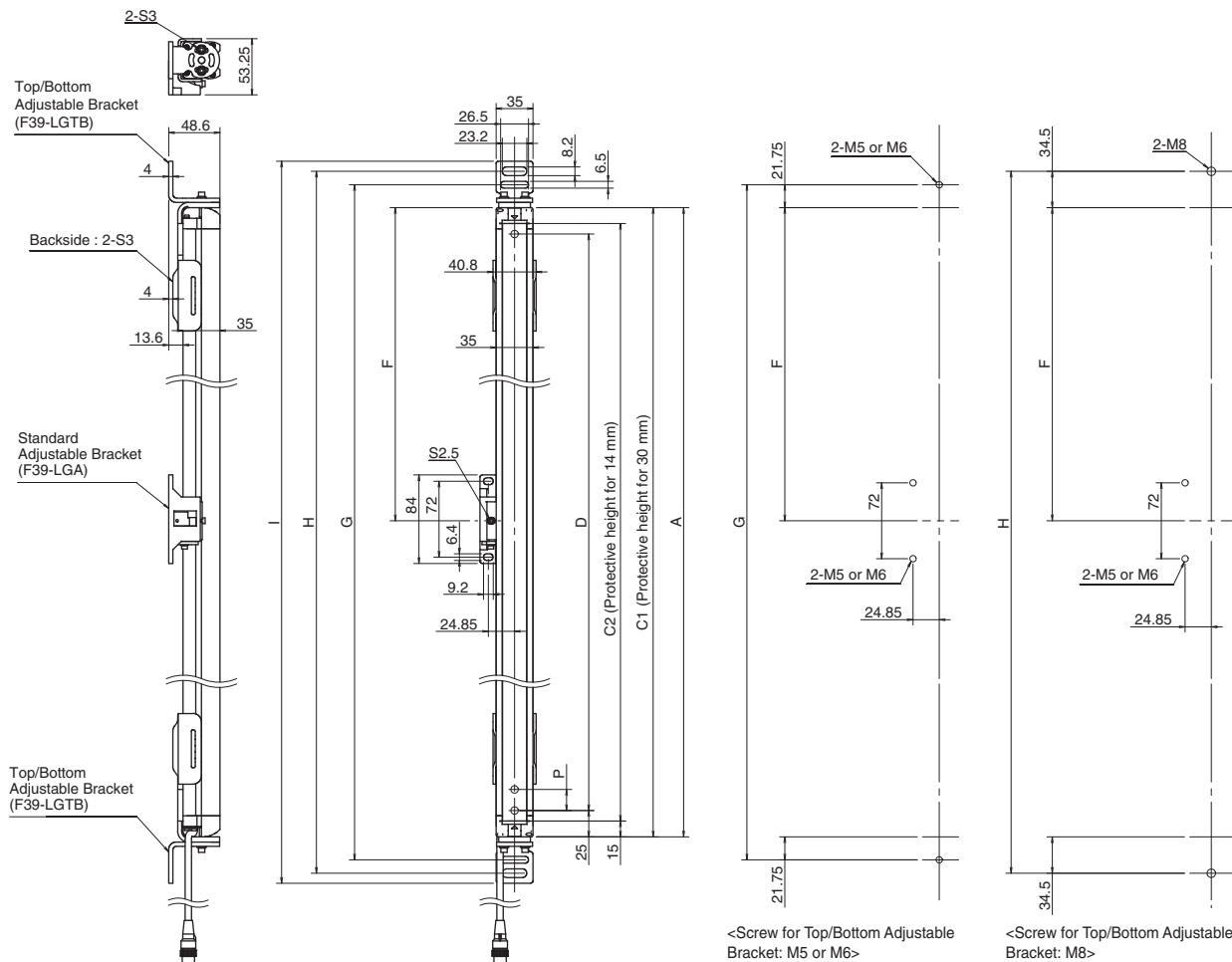


## Mounted with Top/Bottom Adjustable Brackets (F39-LGTB) and Standard Adjustable Brackets (F39-LGA)

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

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

### Backside Mounting



#### F3SG-4RE□□□□□30 Series

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

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

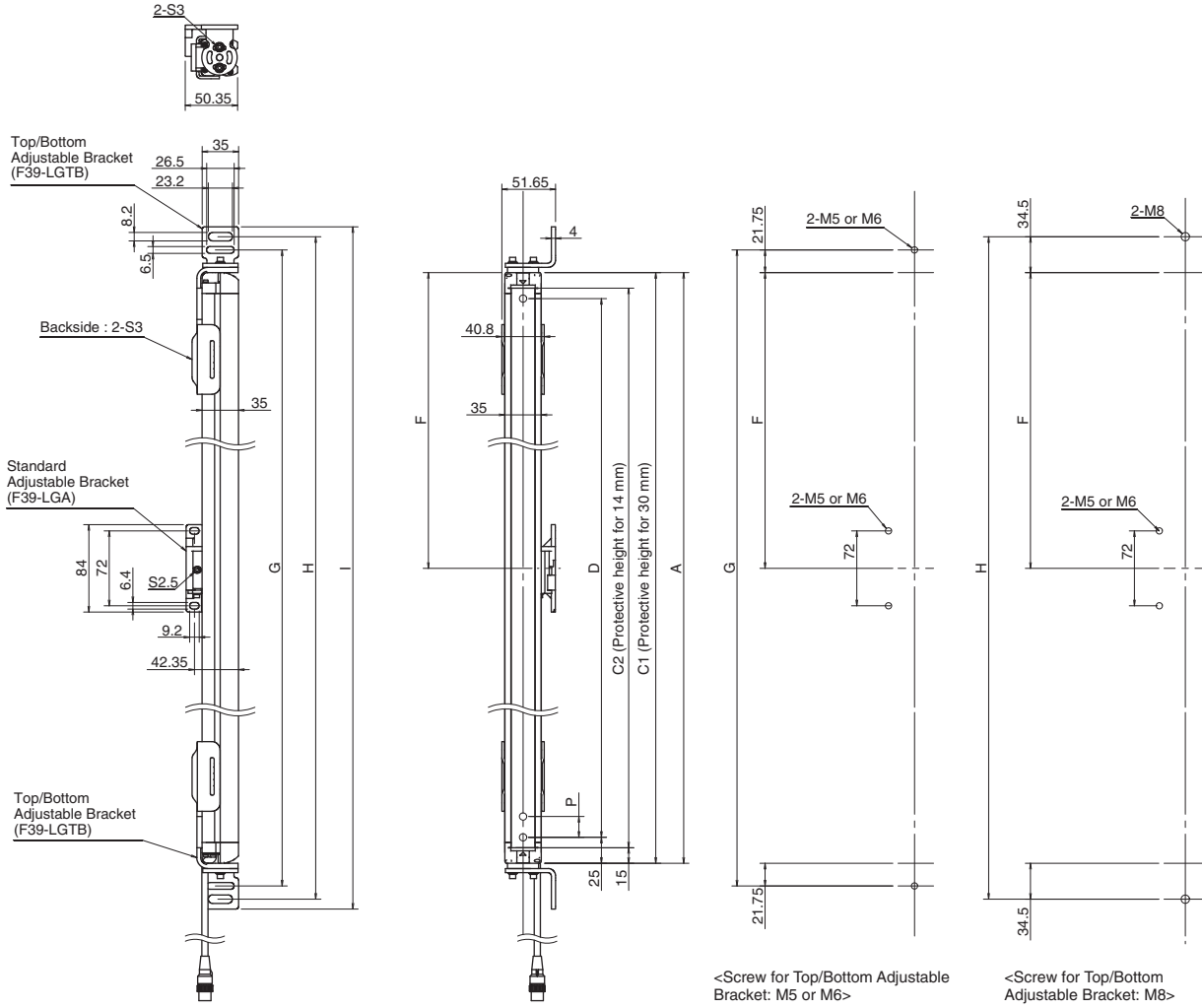
#### F3SG-4RE□□□□□14 Series

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

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

F3SG-RE

## Side Mounting



### F3SG-4RE□□□□30 Series

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

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

### F3SG-4RE□□□□14 Series

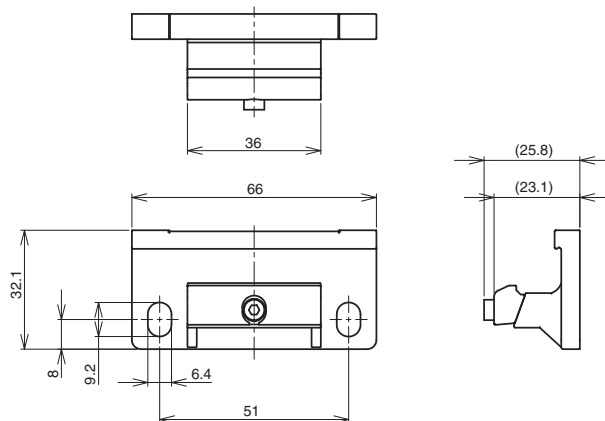
Dimension A	C2+30
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension G	C2+73.5
Dimension H	C2+99
Dimension I	C2+118
Dimension P	10

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

**Accessories**

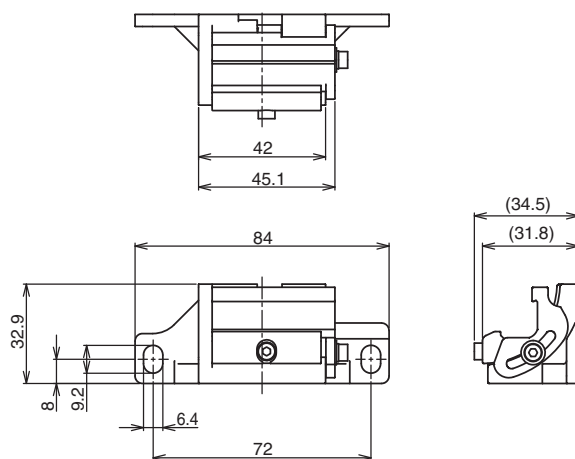
**Sensor Mounting Brackets**

**Standard Fixed Bracket (F39-LGF)**



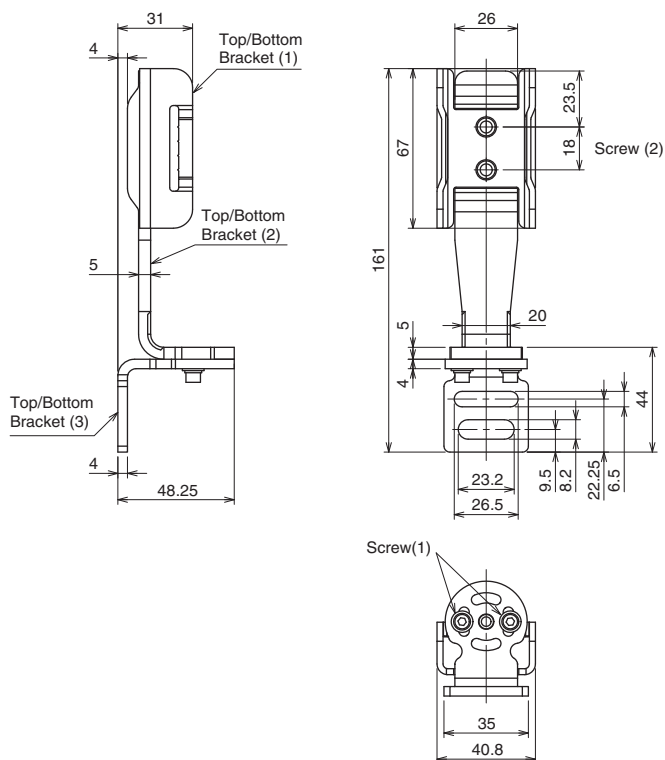
Material: Zinc alloy

**Standard Fixed Bracket (F39-LGA, sold separately)**



Material: Zinc alloy, Fluorochemical lubricant oil

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



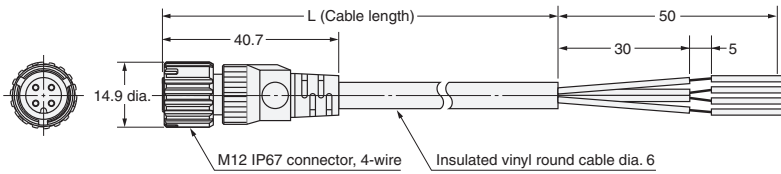
Material: Stainless steel

F3SG-RE

# F3SG-RE

## Safety light curtain connecting cable

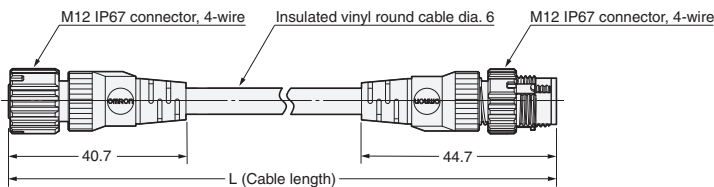
### Round Water-resistant Connector: Connector Connected to Cable, Socket on One Cable End (XS5F-D421-□80-F, sold separately)



Material: Insulated vinyl round cable

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

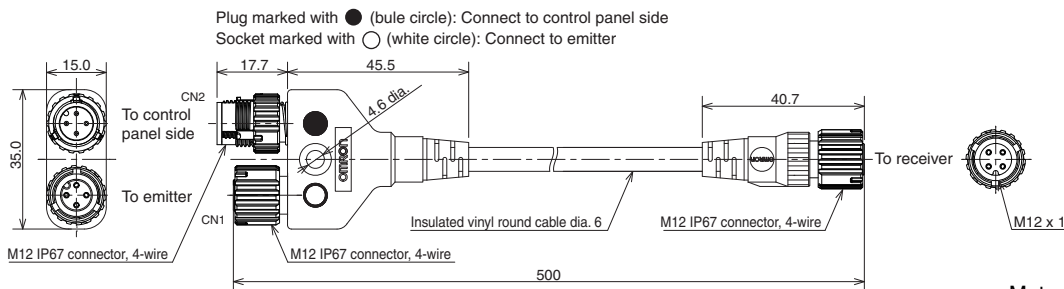
### Round Water-resistant Connector: Connectors Connected to Cable, Socket and Plug on Cable Ends (XS5W-D421-□81-F, sold separately)



Material: Insulated vinyl round cable

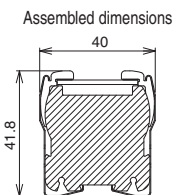
Specification	Model	L (m)
Fire-retardant, Robot cable	XS5W-D421-C81-F	1
	XS5W-D421-D81-F	2
	XS5W-D421-E81-F	3
	XS5W-D421-G81-F	5
	XS5W-D421-J81-F	10
	XS5W-D421-L81-F	20

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



Material: PBT (Main body)

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



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

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

### Related Manuals

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