

Safety Light Curtain

F3SG-R Series

New standard, offering both robustness and reliability

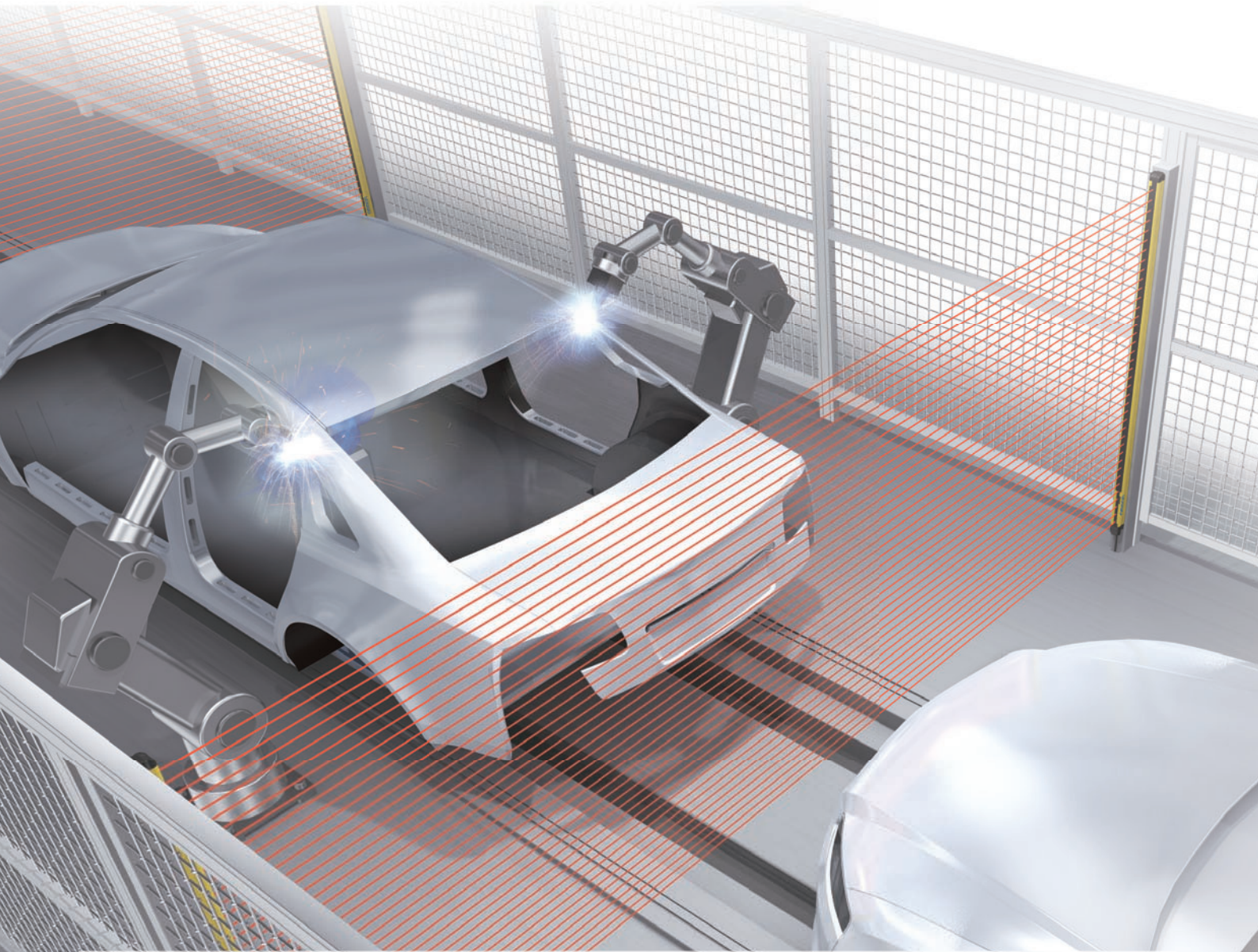


» Compact: Easy installation

» Robust: Even in severe environments

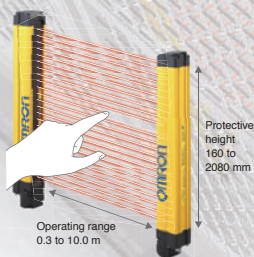
» Global: Reliable safety solutions

Next generation safety

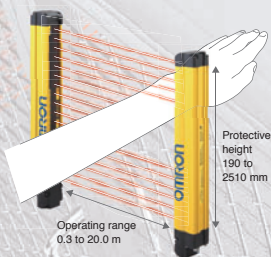


Advance Advance type suitable for flexible production line applications

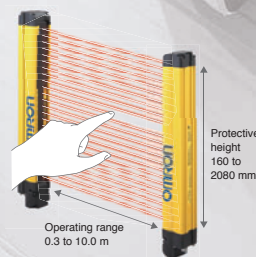
Easy Easy type ideal for simple On/Off detection applications
NEW



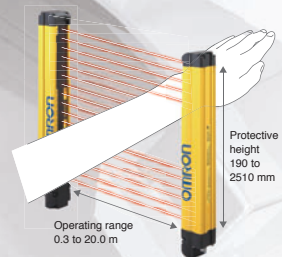
F3SG-4RA □□□□-14
Detection capability: Dia. 14 mm



F3SG-4RA □□□□-30
Detection capability: Dia. 30 mm



F3SG-4RE □□□□-14
Detection capability: Dia. 14 mm



F3SG-4RE □□□□-30
Detection capability: Dia. 30 mm

light curtain packed with powerful features, offering both robustness and reliability

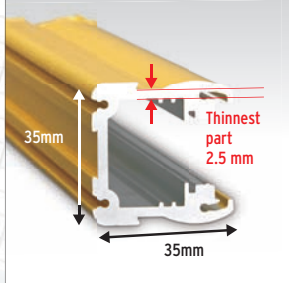
F3SG-R

Benefit

Previously it took time to select the right safety light curtains for the conditions: physical conditions such as size and operating range, ambient environments, and countries.

If just one single safety light curtain can be used in a variety of environments, the time required for selection, installation, and maintenance can be reduced.

Selection & Design



>> p4

Easy Selection & Design

• In almost any environment

Waterproof and shock-resistant yet compact body. Conforms to major international standards including Chinese standard GB 4585 to be used worldwide.

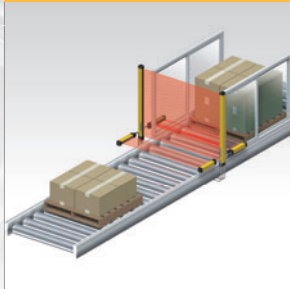
• Ensuring safety in various production lines

The Muting function to automatically set a minimum muting zone according to workpiece height. Can be used for a variety of production lines.

• Complete safety measures by detecting presence

Distinguishes between small object passing and human entry by changing resolution and response time. This maintains a high level of safety while minimizing unexpected machine downtime.

Set-up



>> p8

Easy Set-up

• Drastically reduced set-up time and wiring

The Smartclick connectors and optical synchronization enable smooth set-up of machines.

• Simple, two-step optical adjustment

Quick adjustment by checking beam alignment with the LED indicators and Configuration Tool SD Manager2.

• Flexible installation

More flexible layout by eliminating the need of synchronization wiring and using extension cables.

Operation



>> p10

Stable Operation

• Quick troubleshooting and predictive maintenance

The sticker and error logs stored in the F3SG-R helps speed troubleshooting. Accumulated log data facilitates systematic maintenance.

• Mutual interference prevention

The DIP switches is used to change emission light intensity to prevent mutual interference with other sensors.

• Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation.

• The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. Any use of such marks by Omron is under license.

• Other company names and product names in this document are the trademarks or registered trademarks of their respective companies.

Easy Selection & Design

Robustness

Allows use in a variety of environments

Protects itself and production sites



In almost any environment | For global use |

The F3SG-R is designed to be used in a variety of environments around the world, conforming to international standards

For global use

Advance



PNP or NPN can be selected with the DIP switch. The same cables are used.



The F3SG-R conforms to major international standards including Chinese GB standards



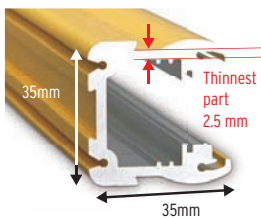
Robust and Compact | Robust housing |

Advance

Easy

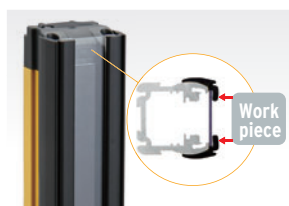
All models are equipped with a robust housing that can be used in harsh conditions and withstand shocks caused by sudden human contact or a dropped tool. The scratch-resistant material is used for the optical surface to prevent unexpected machine stops.

Slim housing



The housing structure is significantly improved to enhance resistance against shock and vibration and to reduce the thickness of the thinnest part of the housing material from 3 mm to 2.5mm.

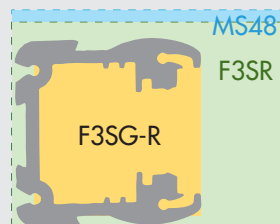
Protected with protection cover



The optical surface can be protected from contact with workpieces by using the optional protection cover together.

Downsized

The robust housing can be used in harsh conditions and withstand shocks caused by sudden human contact or a dropped tool. The scratch-resistant material is used for the optical surface to prevent unexpected machine stops.



Cross-section is
Approx. **60%**
of previous model

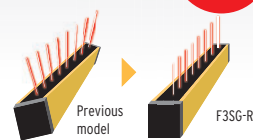
For harsh environments

Advance

Easy

Secured against torsion

5 times more torsion resistant



The risk of optical axis misalignment due to vibration or aging can be reduced.

* Compared to OMRON previous model in December 2014.

IP67



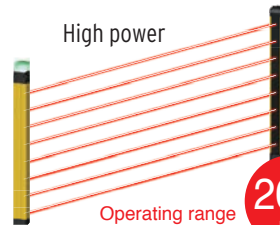
IP67 protection allows use in environments that are subject to water.

Reliable even in harsh environments

Advance

Easy

High power

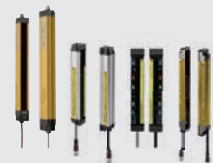


The newly designed high-power optical system provides the best-in-class* light transmission and operating range. This allows stable operation even in dusty or other environments where light transmission is reduced.

* Based on OMRON investigation in December 2014.

Previously... Mixing several models

Several types of safety light curtains with different environmental resistance and functionality were required to suit the installation environment. It took time to select the right models.



New Muting Functionality

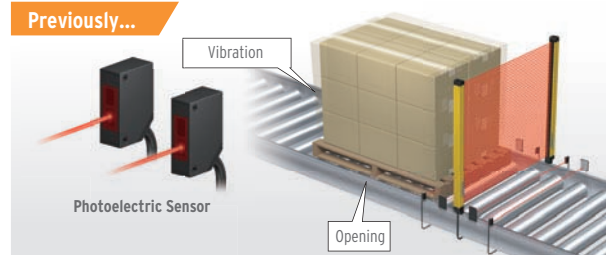
Increases both productivity and safety

Easily distinguishes between workers and objects

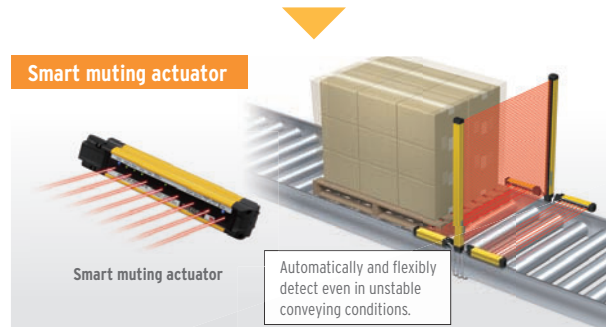
Increasing both productivity and safety

| Muting function | **Advance**

The F3SG-R provides advanced Muting function that detects the zone where workpieces pass or the position of a machine or robot and disable beams of the detected part. This increases both safety and productivity. By adding the smart muting actuator, the F3SG-R provides stable operation even for the production lines where errors occur due to vibration caused by the passing workpiece.



The point detection muting sensor mistakenly disabled muting while a workpiece was passing, which led to unexpected machine stops.



The muting actuator detects the surface of a passing workpiece. Even if a workpiece moves due to vibration, muting is kept enabled until the workpiece has passed. This prevents unexpected machine stops.

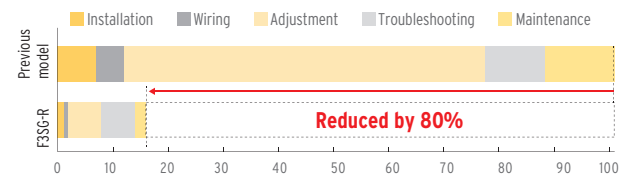
Adjustment time reduced by 80%*

Advance

| Smart muting actuator |

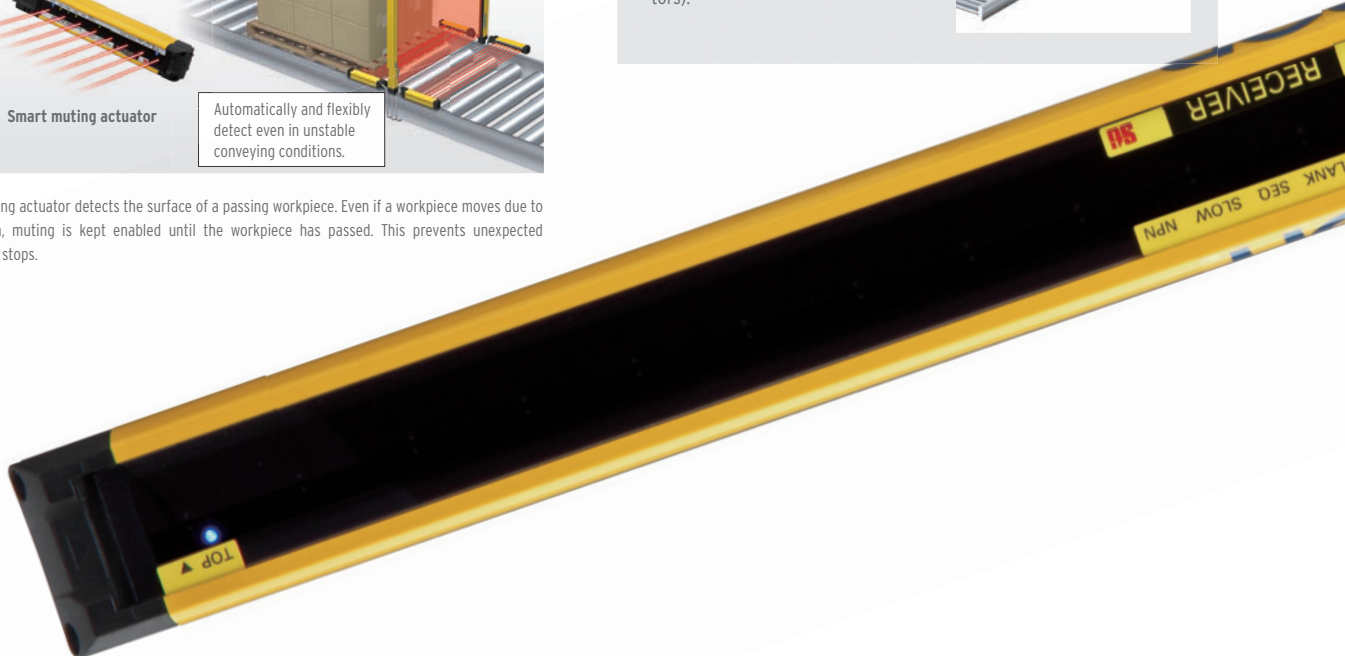
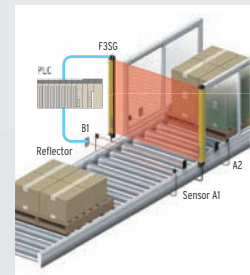
The use of the dedicated actuator can significantly reduce the time required to adjust the sensor to detect workpieces even in unstable conveying conditions

*Compared to the previous model
(Based on OMRON investigation in September 2014)



Previously... Many processes including programming and adjustment were required

Since bypass processing to disable the safety light curtain was performed via the PLC, programming before installation required time and work. It also took a lot of time and work to install and adjust many muting sensors (sensors and reflectors).



Powerful Features

Prevent unexpected machine stops

Ensure stable operation

Auto-configuration of muting zone

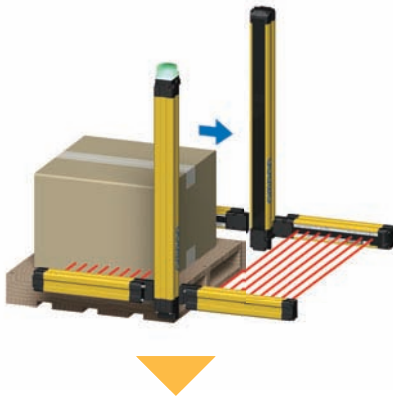
| Dynamic Muting | **Advance**

When workpieces with various heights are conveyed on the same line, partial muting is automatically performed based on the height of the workpiece. This advanced muting function can automatically perform normal detection at the zone where a workpiece does not pass.

Automatically minimizes muting zone according to workpiece size

1

When the muting sensor detects that a workpiece passes, all beams are muted.

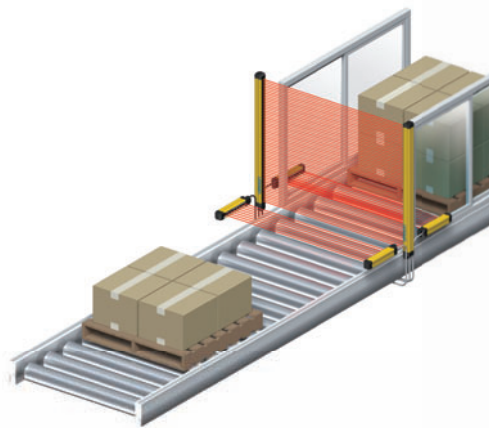
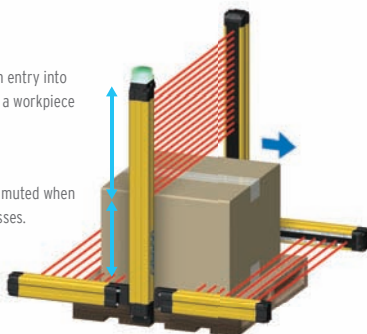


2

The only beams interrupted by the workpiece are kept muted and other beams are released from the muting state three seconds after the workpiece pass through the safety light curtain. Muting is disabled after the workpiece has passed.

Monitors human entry into the zone where a workpiece does not pass.

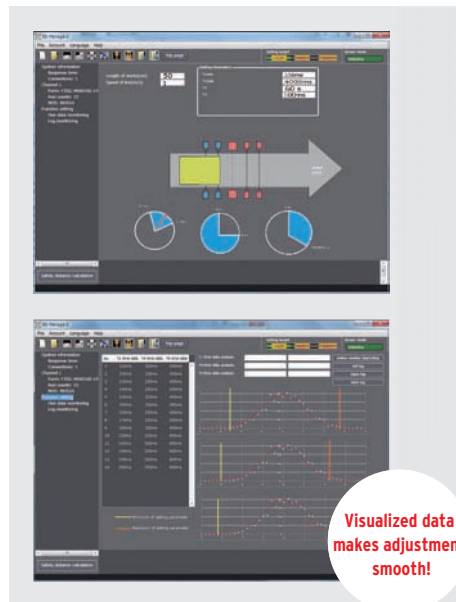
Keeps the zone muted when a workpiece passes.



Minimizing setting and detection errors

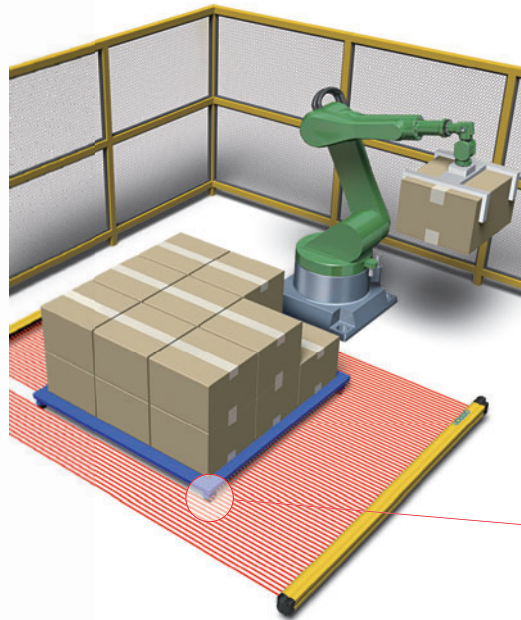
| Configuration Tool SD Manager2 | **Advance**

The function to log the muting sensor operating conditions of the F3SG-R visualizes the installation position and setting conditions of the sensor to achieve reliable configuration. The stop due to the muting error can be analyzed using the data stored in the F3SG-R. Quick identification of the cause can reduce unexpected machine downtime.



Visualized data makes adjustment smooth!

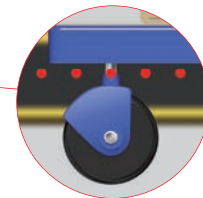




Detecting both objects and workers

| Reduced Resolution | **Advance**

With the Reduced Resolution function that is used to change the number of interrupted beams (1 to 3 beams), the F3SG-R can detect human entry while workability is maintained. This makes easier to distinguish between objects and workers.



· Keep the safety outputs ON even when an object like a transport vehicle (with the size of 1 to 3 beams) is present discontinuously.

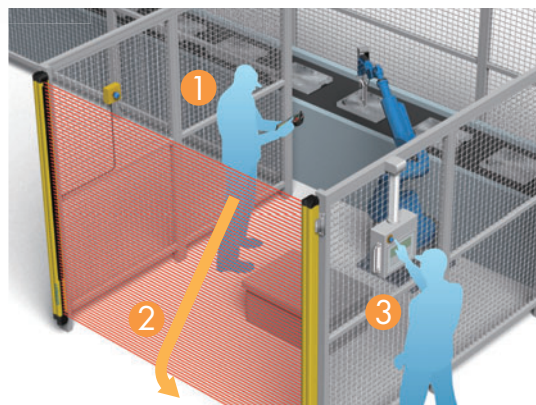
· Turn safety outputs OFF when an object with the size over 3 beams, like an ankle,

Ensuring safe restart

| Pre-reset | **Advance**

The Pre-reset function prevents possible accidents and supports safe restart of machines. Even if a worker presses the reset switch of the safety light curtain without noticing another worker near the robot, restart will not be executed unless certain conditions are met.

Helps prevent workers from being trapped



1 Press the pre-reset switch in the hazardous zone (safety fence)



2 Get out of the hazardous zone (safety fence)



3 Press the reset switch in the control panel to restart the F3SG-R. The machine is ready for restart.

The machine cannot be restarted until the pre-reset switch is pressed to restart the F3SG-R.

Preventing accidental stops due to insects

| Response Time Adjustment | **Advance**

This function is used to distinguish between an instant passing of a small object such as an insect and a human passing by changing the time to respond to the block of the beam. Accidental machine stops can be avoided.

Smart Wiring, Beam Adjustment, and Operation Check

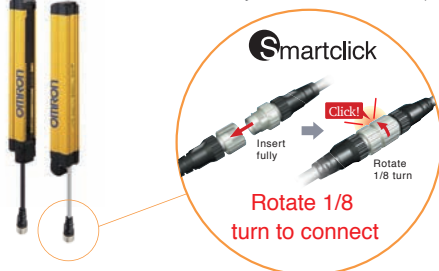
Facilitate installation

No torque control required | Smartclick | **Advance** **Easy**

Smartclick connectors are used to quickly connect cables. Just turn the round waterproof M12 connector 1/8 of a turn. This stress-free connection reduces time required for wiring and replacement when many devices are connected together.

Smartclick

Smartclick is a registered trademark of OMRON Corporation.



This popular connector is used for a variety of OMRON products to reduce time required for wiring and replacement when many devices are connected together.

Previously... **Faulty connection and need of torque control**

When many safety light curtains were connected, torque control of connectors was required and delay in set-up occurred due to failure of connection. The Smartclick connector can be connected with the existing screw-type M12 connector.

Long-distance wiring

| Maximum 100 m cable length | **Advance** **Easy**

The total extension cable length is up to 100 m. Flexible wiring maximizes long-distance detection and optical synchronization functionality.

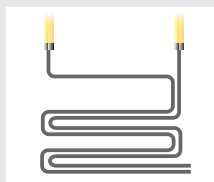
Simple wiring

| Simple wiring connector | **Advance** **Easy**

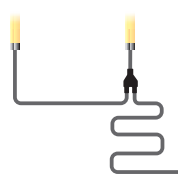
Simple wiring connector can reduce wiring time. Fewer cables mean that the risk of disconnection and noise troubles can also be reduced.

Previously...

Cables of the emitter and receiver



Only one cable



No limitation in wiring

| Optical synchronization | **Advance** **Easy**

Optical synchronization eliminates the need of synchronization wiring between the emitter and receiver. Flexible wiring enables reducing disconnection risk and avoiding noise sources.

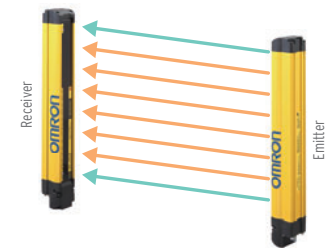
Flexible, new method

Fine tuning all beams, the F3SG-R provides high ambient light immunity and flexible detection functions.

High ambient light immunity

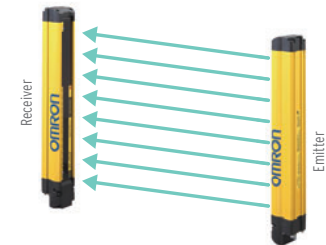
Start-up

The Top or Bottom beam of the emitter starts synchronizing with the corresponding beam of the receiver.



After sync

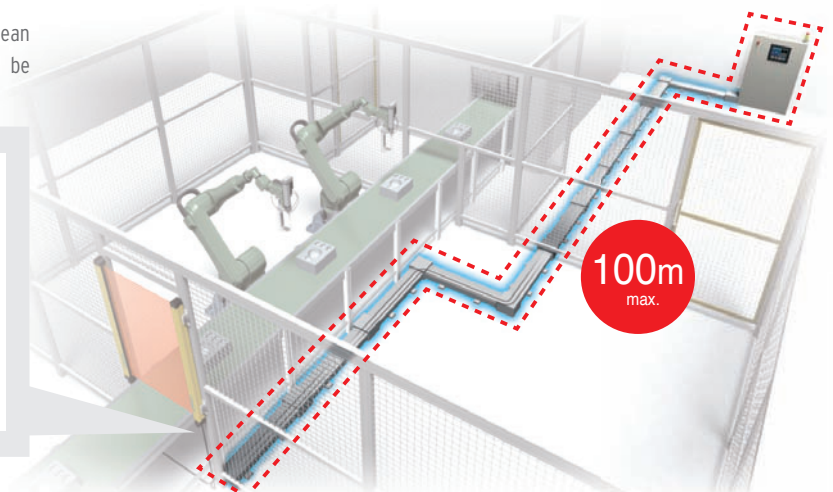
Once synchronization is done, the emitter is kept synchronized with the receiver while at least one beam is unblocked.



Previously... **Limitations imposed by synchronization wiring**

Wiring and connection works between the emitter and receiver were required.

- With the previous synchronization function, if the Top or Bottom beam was blocked, synchronization was not maintained.



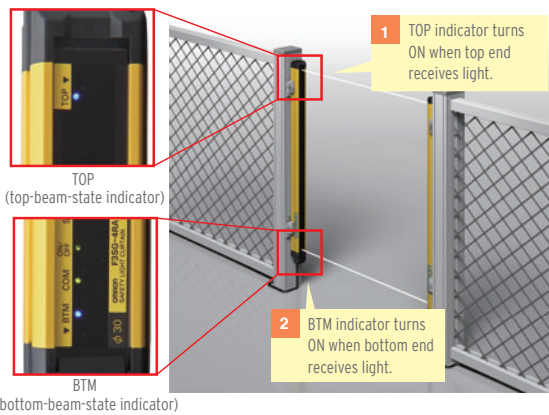


Simple two steps | Beam adjustment | Advance

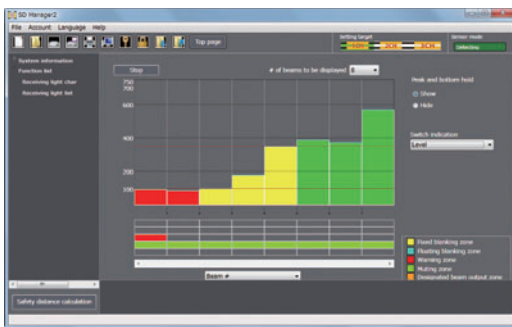
The benefit of robust, torsion-resistant housing contributes to reduce the time required to install the safety light curtain.

Simple adjustment: Coarse adjustment → positional alignment

Beam adjustment can be done easily by checking the TOP and BTM LED indicators. The SD Manager 2 helps install the safety light curtain by showing the incident light levels of each beam.



1 Adjustment is completed when the TOP, BTM, and STB LED indicators turn ON.



2 Finer adjustments can be made using the Configuration Tool SB Manager2.



Easy adjustment after mounting

| Mounting bracket | Advance Easy

Two types of mounting brackets are available.

Standard fixed bracket



Standard adjustable bracket

(sold separately)



After mounted on a safety fence, the F3SG-R can be slid vertically to adjust. This means this mounting bracket allows for a wider adjustment range than the existing top/bottom mounting bracket.

In addition to vertical adjustment, the angle can be adjusted up to $\pm 15^\circ$.



Standard fixed bracket

The bracket is included in the F3SG-R.

Protective height	No. of brackets included
Less than 1,280 mm	2 sets
1,280 to 2,270 mm	3 sets
2,350 mm or more	4 sets

Quick

Troubleshooting and Predictive Maintenance

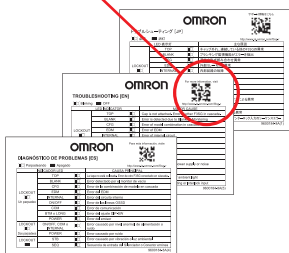
Eliminate machine downtime to ensure stable operation

For global operators

| Multilingual troubleshooting | **Advance** **Easy**

Troubleshooting in eight languages is published on the website to find causes and solutions of errors that occur during operation. Operators across the world can check the error details in their local languages, which will help them minimize time to troubleshoot.

Troubleshooting Web



Troubleshooting guide sticker

* English, Chinese, Italian, Korean, French, German, Spanish, and Japanese



* The Interface Unit F39-GIF is required to connect with a personal computer.

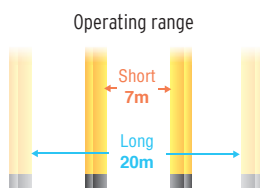
Quick troubleshooting | Data logging 1 | **Advance**

The error logs stored in the F3SG-R can be obtained by connecting with a personal computer via the interface unit. The Configuration Tool SD Manager2 analyzes error logs to identify causes of errors and suggest solutions. This helps simplify troubleshooting.

Reducing stops due to mutual interference

| Operating Range Selection | **Advance** **Easy**

When other sensors are installed near the F3SG-R, Operating Range Selection helps reduce mutual interference.



Mutual interference with the other sensor near the F3SG-R can be reduced by changing the mode from Long * to Short (7 m).

*. Maximum operating range of 20 m for hand/arm protection or 10 m for finger protection



The mode of Operating Range Selection can be selected with the DIP Switches* on the emitter.

*. For the F3SG-RE, the mode can be selected by wiring.

Systematic maintenance based on trend management

| Data logging 2 | **Advance**

By using the Configuration Tool SD Manager2, the data of light intensity, power-ON time, and switching frequency of the F3SG-R can be collected regularly to predict when systematic and preventive maintenance is required.

NEW

Easy type

Easy-to-use safety sensor Ideal for Simple On/Off Detection Applications

Robust but slim housing and basic safety functions are inherited from the F3SG-R Advance type. Providing only simple safety functions, the Easy type helps save TCO (Total Cost of Ownership) by reducing errors that required a lot of time to identify the causes.



Simple wiring

Only four wires are required for the minimum configuration, which is as simple as wiring a photoelectric sensor. Simple connection with a safety controller makes it easy to build a safety circuit. Commercially available M12 connector cables can be used for extension cables.

Fast response time of 5 ms

The Easy type that allows the distance between the light curtain and hazard source to be reduced is best suited to use in a small machine.

Feature	Advance type	Easy type	Factory default setting (Advance type)
	F3SG-RA	F3SG-RE	
PNP/NPN Selection	<input checked="" type="checkbox"/>		PNP output
External Test	<input checked="" type="checkbox"/>		24 V Active
Interlock	<input checked="" type="checkbox"/> <input type="checkbox"/>		Auto Reset Mode
Pre-Reset	<input checked="" type="checkbox"/> <input type="checkbox"/>		Disabled
External Device Monitoring(EDM)	<input checked="" type="checkbox"/> <input type="checkbox"/>		Disabled
Auxiliary Output		<input type="checkbox"/>	Muting /Override information
Muting		<input type="checkbox"/>	Standard Muting mode
Override		<input type="checkbox"/>	Enabled
Fixed Blanking	<input checked="" type="checkbox"/> <input type="checkbox"/>		Disabled
Floating Blanking	<input checked="" type="checkbox"/> <input type="checkbox"/>		Disabled
Reduced Resolution		<input type="checkbox"/>	Disabled
Warning Zone		<input type="checkbox"/>	Disabled
Scan Code Selection	<input checked="" type="checkbox"/>		CodeA
Operating Range Selection	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Short mode
Response Time Adjustment		<input type="checkbox"/>	Standard mode
Lamp		<input type="checkbox"/>	Red:Disabled Orange:Disabled Green:Muting/Override information
Designated Beam Output		<input type="checkbox"/>	Disabled
Cascade Connection		<input checked="" type="checkbox"/>	

Setting by DIP Switch Setting by Configuration Tool Setting by Wiring

Safety Sensor Line-up

More slim models

Safety Light
Curtain F3SJ
Cat. No. F074



For flexible zone detection

Safety Laser
Scanner
Cat. No. Z298



Safety Light Curtain Advance type

F3SG-RA

New Standard of Safety Light Curtain, Offering Both Robustness and Reliability

- Robust and compact
- New muting function to increase both productivity and safety
- All models designed for global use. PNP/NPN selection by DIP switch
- Conforming to major international standards including Chinese standard GB 4584



Ordering Information

Main Units

Safety Light Curtain

Finger protection


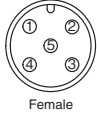

Number of beams	Protective height (mm)	Model
15	160	F3SG-4RA0160-14
23	240	F3SG-4RA0240-14
31	320	F3SG-4RA0320-14
39	400	F3SG-4RA0400-14
47	480	F3SG-4RA0480-14
55	560	F3SG-4RA0560-14
63	640	F3SG-4RA0640-14
71	720	F3SG-4RA0720-14
79	800	F3SG-4RA0800-14
87	880	F3SG-4RA0880-14
95	960	F3SG-4RA0960-14
103	1,040	F3SG-4RA1040-14
111	1,120	F3SG-4RA1120-14
119	1,200	F3SG-4RA1200-14
127	1,280	F3SG-4RA1280-14
135	1,360	F3SG-4RA1360-14
143	1,440	F3SG-4RA1440-14
151	1,520	F3SG-4RA1520-14
159	1,600	F3SG-4RA1600-14
167	1,680	F3SG-4RA1680-14
175	1,760	F3SG-4RA1760-14
183	1,840	F3SG-4RA1840-14
191	1,920	F3SG-4RA1920-14
199	2,000	F3SG-4RA2000-14
207	2,080	F3SG-4RA2080-14

Hand and arm protection

Number of beams	Protective height (mm)	Model
8	190	F3SG-4RA0190-30
12	270	F3SG-4RA0270-30
16	350	F3SG-4RA0350-30
20	430	F3SG-4RA0430-30
24	510	F3SG-4RA0510-30
28	590	F3SG-4RA0590-30
32	670	F3SG-4RA0670-30
36	750	F3SG-4RA0750-30
40	830	F3SG-4RA0830-30
44	910	F3SG-4RA0910-30
48	990	F3SG-4RA0990-30
52	1,070	F3SG-4RA1070-30
56	1,150	F3SG-4RA1150-30
60	1,230	F3SG-4RA1230-30
64	1,310	F3SG-4RA1310-30
68	1,390	F3SG-4RA1390-30
72	1,470	F3SG-4RA1470-30
76	1,550	F3SG-4RA1550-30
80	1,630	F3SG-4RA1630-30
84	1,710	F3SG-4RA1710-30
88	1,790	F3SG-4RA1790-30
92	1,870	F3SG-4RA1870-30
96	1,950	F3SG-4RA1950-30
100	2,030	F3SG-4RA2030-30
104	2,110	F3SG-4RA2110-30
108	2,190	F3SG-4RA2190-30
112	2,270	F3SG-4RA2270-30
116	2,350	F3SG-4RA2350-30
120	2,430	F3SG-4RA2430-30
124	2,510	F3SG-4RA2510-30


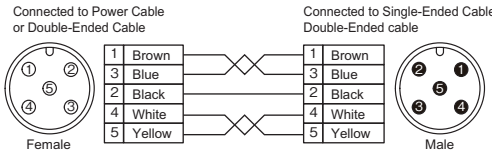
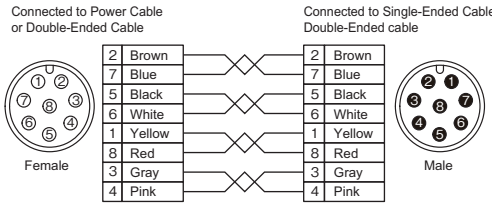
Accessories (Sold separately)

Single-ended Connector Cable


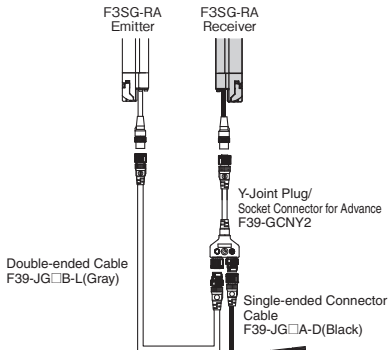
Appearance	Type	Cable length	Specifications	Model																							
	For emitter M12 connector (5-pin), 5 wires Color: Gray	3 m	 <table border="1"> <tr><td>1</td><td>+24 VDC</td><td>Brown</td></tr> <tr><td>2</td><td>TEST</td><td>Black</td></tr> <tr><td>3</td><td>0 VDC</td><td>Blue</td></tr> <tr><td>4</td><td>Not used</td><td>White</td></tr> <tr><td>5</td><td>Not used</td><td>Yellow</td></tr> </table>	1	+24 VDC	Brown	2	TEST	Black	3	0 VDC	Blue	4	Not used	White	5	Not used	Yellow	F39-JG3A-L								
		1		+24 VDC	Brown																						
		2		TEST	Black																						
		3		0 VDC	Blue																						
		4		Not used	White																						
	5	Not used	Yellow																								
	7 m	F39-JG7A-L																									
	10 m	F39-JG10A-L																									
	15 m	F39-JG15A-L																									
	20 m	F39-JG20A-L																									
For receiver M12 connector (8-pin), 8 wires Color: Black	3 m	 <table border="1"> <tr><td>1</td><td>RESET</td><td>Yellow</td></tr> <tr><td>2</td><td>+24 VDC</td><td>Brown</td></tr> <tr><td>3</td><td>MUTE A</td><td>Gray</td></tr> <tr><td>4</td><td>MUTE B</td><td>Pink</td></tr> <tr><td>5</td><td>OSSD 1</td><td>Black</td></tr> <tr><td>6</td><td>OSSD 2</td><td>White</td></tr> <tr><td>7</td><td>0 VDC</td><td>Blue</td></tr> <tr><td>8</td><td>AUX</td><td>Red</td></tr> </table>	1	RESET	Yellow	2	+24 VDC	Brown	3	MUTE A	Gray	4	MUTE B	Pink	5	OSSD 1	Black	6	OSSD 2	White	7	0 VDC	Blue	8	AUX	Red	F39-JG3A-D
	1		RESET	Yellow																							
	2		+24 VDC	Brown																							
	3		MUTE A	Gray																							
	4		MUTE B	Pink																							
5	OSSD 1	Black																									
6	OSSD 2	White																									
7	0 VDC	Blue																									
8	AUX	Red																									
7 m	F39-JG7A-D																										
10 m	F39-JG10A-D																										
15 m	F39-JG15A-D																										
20 m	F39-JG20A-D																										

Double-ended Cable


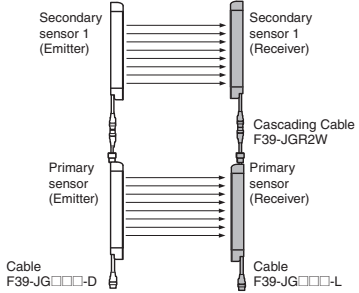
For cable extension and simple wiring

Appearance	Type	Cable length	Specifications	Model
	For emitter M12 connector (5-pin) on both ends Color: Gray	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 M12 connector (8-pin) on both ends Color: Black	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			

Y-Joint Plug/Socket Connector for Advance type F3SG-RA





Appearance	Type	Cable length	Specifications	Model
	M12 connectors. Used for reduced wiring.	0.5 m		F39-GCNY2

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

Appearance	Type	Cable length	Specifications	Model
	Emitter cable: Cap (5-pin), M12 connector (5-pin) Receiver cable: Cap (8-pin), M12 connector (8-pin)	0.2 m		F39-JGR2W

F3SG-RA

Sensor Mounting Brackets

Appearance	Specification	Application	Model
	Standard Fixed Bracket	Bracket to mount the F3SG-R. Side mounting and backside mounting possible. (Included in the F3SG-R product package. See *1 below for the number of included brackets.)	F39-LGF
	Standard Adjustable Bracket	Bracket to mount the F3SG-R. Beam alignment after mounting possible. The angle adjustment range is $\pm 15^\circ$. Side mounting and backside mounting possible. (Sold separately. See *1 below for the number of required brackets.)	F39-LGA
	Top/Bottom Adjustable Bracket *2	Bracket to mount the F3SG-R. Use this bracket at the top and bottom positions of the F3SG-R. Beam alignment after mounting possible. The angle adjustment range is $\pm 22.5^\circ$. Side mounting and backside mounting possible. (Sold separately. 4 brackets per set.)	F39-LGTB
	Top/Bottom Adjustable Bracket *2 (For user-made mounting part)	Top/Bottom Adjustable Bracket without a bracket to mount to the wall. Use the user's own wall mounting part to suit the machine. (Sold separately. 4 brackets per set.)	F39-LGTB-1

*1 Two brackets per set

[for F3SG-□RA□□□□-14]

- Protective height of 0160 to 1200: 2 sets, Protective height of 1280 to 2080: 3 sets




[for F3SG-□RA□□□□-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.

(See *1 for the number of required brackets.)


Interface units and configuration tool SD Manager 2

Appearance	Type	Specifications	Model
	SD Manager2	The Configuration Tool SD Manager 2 is available to download from our website at http://www.ia.omron.com/f3sg-r_tool . To change the settings of the F3SG-RA using SD Manager 2, it is necessary to set the receiver's two DIP switches No. 8 to ON.	-
	Interface Unit	F39-GIF interface unit to connect the F3SG-RA receiver to a USB port of the PC	F39-GIF
	Bluetooth unit	F39-BT bluetooth unit to enable bluetooth on the F3SG-RA	F39-BT


Lamp

Appearance	Type	Specifications	Model
	Lamp unit	The lamp unit can be connected to a receiver and turned ON based on the operation of F3SG-RA.	F39-LP
	Bluetooth + Lamp unit	The lamp can indicate red, orange, and green colors, to which three different states can be assigned.	F39-BTLP

End Cap

Appearance	Specifications	Model
	Housing color: Black For both emitter and receiver (Attached to the F3SG-R. The End Cap can be purchased if lost.)	F39-CNM


Laser Pointer for F3SG-R

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

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

Spatter Protection Covers include 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-□RA0160-14	F3SG-□RA0190-30	F39-HGA0200
	F3SG-□RA0240-14	F3SG-□RA0270-30	F39-HGA0280
	F3SG-□RA0320-14	F3SG-□RA0350-30	F39-HGA0360
	F3SG-□RA0400-14	F3SG-□RA0430-30	F39-HGA0440
	F3SG-□RA0480-14	F3SG-□RA0510-30	F39-HGA0520
	F3SG-□RA0560-14	F3SG-□RA0590-30	F39-HGA0600
	F3SG-□RA0640-14	F3SG-□RA0670-30	F39-HGA0680
	F3SG-□RA0720-14	F3SG-□RA0750-30	F39-HGA0760
	F3SG-□RA0800-14	F3SG-□RA0830-30	F39-HGA0840
	F3SG-□RA0880-14	F3SG-□RA0910-30	F39-HGA0920
	F3SG-□RA0960-14	F3SG-□RA0990-30	F39-HGA1000
	F3SG-□RA1040-14	F3SG-□RA1070-30	F39-HGA1080
	F3SG-□RA1120-14	F3SG-□RA1150-30	F39-HGA1160
	F3SG-□RA1200-14	F3SG-□RA1230-30	F39-HGA1240
	F3SG-□RA1280-14	F3SG-□RA1310-30	F39-HGA1320
	F3SG-□RA1360-14	F3SG-□RA1390-30	F39-HGA1400
	F3SG-□RA1440-14	F3SG-□RA1470-30	F39-HGA1480
	F3SG-□RA1520-14	F3SG-□RA1550-30	F39-HGA1560
	F3SG-□RA1600-14	F3SG-□RA1630-30	F39-HGA1640
	F3SG-□RA1680-14	F3SG-□RA1710-30	F39-HGA1720
	F3SG-□RA1760-14	F3SG-□RA1790-30	F39-HGA1800
	F3SG-□RA1840-14	F3SG-□RA1870-30	F39-HGA1880
	F3SG-□RA1920-14	F3SG-□RA1950-30	F39-HGA1960
	F3SG-□RA2000-14	F3SG-□RA2030-30	F39-HGA1480
			F39-HGA0550
	F3SG-□RA2080-14	F3SG-□RA2110-30	F39-HGA1560
			F39-HGA0550
	-	F3SG-□RA2190-30	F39-HGA1640
		F39-HGA0550	
-	F3SG-□RA2270-30	F39-HGA1720	
		F39-HGA0550	
-	F3SG-□RA2350-30	F39-HGA1800	
		F39-HGA0550	
-	F3SG-□RA2430-30	F39-HGA1880	
		F39-HGA0550	
-	F3SG-□RA2510-30	F39-HGA1960	
		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 and Specifications

Main unit

		F3SG-4RA□□□□-14 F3SG-2RA□□□□-14	F3SG-4RA□□□□-30 F3SG-2RA□□□□-30	
Type of ESPE (IEC 61496-1)	Type 4	F3SG-4RA□□□□-14/-30		
	Type 2	F3SG-2RA□□□□-14/-30		
Performance	Object Resolution (Detection Capability)	Opaque objects		
	Beam Gap	14-mm dia.	30-mm dia.	
	Number of Beams	10 mm	20 mm	
	Lens Size	15 to 207	8 to 124	
	Protective Height	5.2 × 3.4 (W × H) mm		
	Operating Range	160 to 2080 mm (6.3 to 81.9 inch)		
	Response Time	Long	0.3 to 10.0 m (1 to 32 ft.)	
		Short	0.3 to 3.0 m (1 to 10 ft.)	
		ON to OFF	Normal mode: 8 to 18 ms max. *1 Slow mode: 16 to 36 ms max. *1 *2	
	Effective Aperture Angle (EAA) (IEC 61496-2)	Type 4	40 to 90 ms max. *1	
		Type 2	*1 Response time when used in one segment system or in cascaded connection. *2 Selectable by Configuration Tool.	
	Light Source	±2.5° max., emitter and receiver at operating range of 3 m or greater		
	Startup Waiting Time	±5.0° max., emitter and receiver at operating range of 3 m or greater		
Power Supply Voltage (Vs)	Infrared LEDs, Wavelength: 870 nm			
Current Consumption	2 s max.			
Safety Outputs (OSSD)	SELV/PELV 24 VDC±20% (ripple p-p 10% max.)			
Auxiliary Output	Refer to page 18.			
Output Operation Mode	Two PNP or NPN transistor outputs (PNP or NPN is selectable by DIP Switch.) 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			
Electrical	Input Voltage	ON Voltage	*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.	
		OFF Voltage	One PNP or NPN transistor output (PNP or NPN is selectable by DIP Switch.) Load current of 100 mA max., Residual voltage of 2 V max.	
	Safety Output	Auxiliary Output	Light-ON (Safety output is enabled when the receiver receives an emitting signal.)	
		Muting or Override output (default) (Configurable by Configuration Tool)		
Overvoltage Category (IEC 60664-1)	TEST: 24 V Active: 9 V to Vs (sink current 3 mA max.) * 0 V Active: 0 to 3 V (source current 3 mA max.) MUTE A/B: PNP: Vs to Vs-3 V (sink current 3 mA max.) * NPN: 0 to 3 V (source current 3 mA max.) RESET: PNP: Vs to Vs-3 V (sink current 5 mA max.) * NPN: 0 to 3 V (source current 5 mA max.)			
Indicators	TEST: 24 V Active : 0 to 1.5 V or open 0 V Active : 9 V to Vs or open MUTE A/B, RESET: PNP: 0 to 1/2 Vs, or open * NPN: 1/2 Vs to Vs, or open *			
Protective Circuit	* The Vs indicates a supply voltage value in your environment.			
Insulation Resistance	II			
Dielectric Strength	Refer to page 20.			
Functional	Mutual Interference Prevention (Scan Code)	Output short protection, Power supply reverse polarity protection		
	Cascade Connection	20 MΩ or higher (500 VDC megger)		
	Test Function	1,000 VAC, 50/60 Hz (1 min)		
	Safety-Related Functions	This function prevents mutual interference in up to two F3SG-RA systems.		
Safety-Related Functions	Cascade Connection	Number of cascaded segments: 3 max. Total number of beams: 255 max. Cable lengths between sensors: 10 m 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 Fixed blanking/Floating blanking Reduced resolution Muting/Override Scan code selection PNP/NPN selection Response time adjustment		

		F3SG-4RA□□□□-14 F3SG-2RA□□□□-14	F3SG-4RA□□□□-30 F3SG-2RA□□□□-30	
Environmental	Ambient Temperature	Operating	-10 to 55°C (14 to 131°F) (non-icing)	
		Storage	-25 to 70°C (-13 to 158°F)	
	Ambient Humidity	Operating	35% to 85% (non-condensing)	
		Storage	35% to 95%	
	Ambient Illuminance		Incandescent lamp: 3,000 lx max. on receiver surface Sunlight: 10,000 lx max. on receiver surface	
	Degree of Protection (IEC 60529)		IP65 and IP67	
	Vibration Resistance (IEC 61496-1)		10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes	
Shock Resistance (IEC 61496-1)		100 m/s ² , 1000 shocks for all 3 axes		
Pollution Degree (IEC 60664-1)		Pollution Degree 3		
Connections	Power cable	Type of Connection	M12 connectors: 5-pin emitter and 8-pin receiver, IP67 rated when mated, Cables prewired to the sensors	
		Number of Wires	Emitter: 5, Receiver: 8	
		Cable Length	0.3 m	
		Cable Diameter	6 mm	
		Minimum Bending Radius	R5 mm	
	Cascading cable	Type of Connection	M12 connectors: 5-pin emitter and 8-pin receiver, IP67 rated when mated	
		Number of Wires	Emitter: 5, Receiver: 8	
		Cable Length	0.2 m	
		Cable Diameter	6 mm	
	Extension cable - Single-ended cable - Double-ended cable	Type of Connection	M12 connectors: 5-pin emitter and 8-pin receiver, IP67 rated when mated	
		Number of Wires	Emitter: 5, Receiver: 8	
		Cable Length	Refer to page 13.	
		Cable Diameter	6.6 mm	
Minimum Bending Radius		R36 mm		
Extension of Power Cable		100 m max.		
Material	Material		Housing: Aluminum Cap: PBT Front window: PMMA Cable: Oil resistant PVC Mounting Bracket: ZDC2 FE plate: SUS	
	Weight (packaged)		Refer to page 18.	
	Included Accessories		Safety Precautions, Quick Installation Manual, Standard Fixed Bracket*, Troubleshooting Guide Sticker, Warning Zone Label * The quantity of Standard Fixed Brackets included varies depending on the protective height. [F3SG-□RA□□□□-14] - Protective height of 0160 to 1200: 2 sets - Protective height of 1280 to 2080: 3 sets [F3SG-□RA□□□□-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 19.	
	Type of ESPE (IEC 61496-1)		Type 4	
	Performance Level (PL)/Safety category	Type 4	PL e/Category 4 (EN ISO 13849-1:2008)	
		Type 2	PL c/Category 2 (EN ISO 13849-1:2008)	
	PFHd		1.1 × 10 ⁻⁸ (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)		

Bluetooth Communication Unit

Communication System	Bluetooth Version 3.0
Communication Profile	SPP (Serial Port Profile)
Transmission Distance	Approx. 10 m max. (Output power: Class 2) *

* It depends on use environment conditions.

F3SG-RA

List of Models/Response Time/Current Consumption/Weight

F3SG-4RA□□□□-14/F3SG-2RA□□□□-14

Model	Number of Beams	Protective Height [mm]	Response Time [ms]			Current Consumption [mA]		Weight [kg] ²	
			ON → OFF ¹	OFF (Synchronized) → ON	OFF (Not synchronized) → ON	Emitter	Receiver		
F3SG-4RA0160-14	F3SG-2RA0160-14	15	160	8	40	140	40	75	1.8
F3SG-4RA0240-14	F3SG-2RA0240-14	23	240	8	40	140	45	75	2.0
F3SG-4RA0320-14	F3SG-2RA0320-14	31	320	8	40	140	55	75	2.2
F3SG-4RA0400-14	F3SG-2RA0400-14	39	400	8	40	140	60	80	2.7
F3SG-4RA0480-14	F3SG-2RA0480-14	47	480	13	65	165	50	80	2.9
F3SG-4RA0560-14	F3SG-2RA0560-14	55	560	13	65	165	55	80	3.1
F3SG-4RA0640-14	F3SG-2RA0640-14	63	640	13	65	165	60	85	3.3
F3SG-4RA0720-14	F3SG-2RA0720-14	71	720	13	65	165	65	85	3.9
F3SG-4RA0800-14	F3SG-2RA0800-14	79	800	13	65	165	65	90	4.1
F3SG-4RA0880-14	F3SG-2RA0880-14	87	880	13	65	165	70	90	4.3
F3SG-4RA0960-14	F3SG-2RA0960-14	95	960	13	65	165	75	90	4.5
F3SG-4RA1040-14	F3SG-2RA1040-14	103	1040	13	65	165	80	95	4.7
F3SG-4RA1120-14	F3SG-2RA1120-14	111	1120	13	65	165	85	95	4.8
F3SG-4RA1200-14	F3SG-2RA1200-14	119	1200	13	65	165	90	100	5.0
F3SG-4RA1280-14	F3SG-2RA1280-14	127	1280	13	65	165	95	100	5.2
F3SG-4RA1360-14	F3SG-2RA1360-14	135	1360	13	65	165	95	105	5.6
F3SG-4RA1440-14	F3SG-2RA1440-14	143	1440	18	90	190	85	105	5.8
F3SG-4RA1520-14	F3SG-2RA1520-14	151	1520	18	90	190	90	105	6.0
F3SG-4RA1600-14	F3SG-2RA1600-14	159	1600	18	90	190	90	110	6.6
F3SG-4RA1680-14	F3SG-2RA1680-14	167	1680	18	90	190	95	110	6.8
F3SG-4RA1760-14	F3SG-2RA1760-14	175	1760	18	90	190	100	115	7.0
F3SG-4RA1840-14	F3SG-2RA1840-14	183	1840	18	90	190	100	115	7.2
F3SG-4RA1920-14	F3SG-2RA1920-14	191	1920	18	90	190	105	120	7.3
F3SG-4RA2000-14	F3SG-2RA2000-14	199	2000	18	90	190	105	120	7.5
F3SG-4RA2080-14	F3SG-2RA2080-14	207	2080	18	90	190	110	125	8.1

*1 The response times are values when Scan Code is set at Code B. The response times for Code A are 1 ms shorter than these values.

*2 The weight includes an emitter, a receiver and included brackets in a product package.

F3SG-4RA□□□□-30/F3SG-2RA□□□□-30

Model	Number of Beams	Protective Height [mm]	Response Time [ms]			Current Consumption [mA]		Weight [kg] ²	
			ON → OFF ¹	OFF (Synchronized) → ON	OFF (Not synchronized) → ON	Emitter	Receiver		
F3SG-4RA0190-30	F3SG-2RA0190-30	8	190	8	40	140	35	75	1.8
F3SG-4RA0270-30	F3SG-2RA0270-30	12	270	8	40	140	35	75	2.0
F3SG-4RA0350-30	F3SG-2RA0350-30	16	350	8	40	140	40	75	2.2
F3SG-4RA0430-30	F3SG-2RA0430-30	20	430	8	40	140	45	75	2.7
F3SG-4RA0510-30	F3SG-2RA0510-30	24	510	8	40	140	50	75	2.9
F3SG-4RA0590-30	F3SG-2RA0590-30	28	590	8	40	140	50	75	3.1
F3SG-4RA0670-30	F3SG-2RA0670-30	32	670	8	40	140	55	75	3.3
F3SG-4RA0750-30	F3SG-2RA0750-30	36	750	8	40	140	60	80	3.9
F3SG-4RA0830-30	F3SG-2RA0830-30	40	830	8	40	140	65	80	4.0
F3SG-4RA0910-30	F3SG-2RA0910-30	44	910	13	65	165	50	80	4.2
F3SG-4RA0990-30	F3SG-2RA0990-30	48	990	13	65	165	50	80	4.4
F3SG-4RA1070-30	F3SG-2RA1070-30	52	1070	13	65	165	55	80	4.6
F3SG-4RA1150-30	F3SG-2RA1150-30	56	1150	13	65	165	55	85	4.8
F3SG-4RA1230-30	F3SG-2RA1230-30	60	1230	13	65	165	55	85	4.9
F3SG-4RA1310-30	F3SG-2RA1310-30	64	1310	13	65	165	60	85	5.1
F3SG-4RA1390-30	F3SG-2RA1390-30	68	1390	13	65	165	60	85	5.6
F3SG-4RA1470-30	F3SG-2RA1470-30	72	1470	13	65	165	65	85	5.8
F3SG-4RA1550-30	F3SG-2RA1550-30	76	1550	13	65	165	65	90	6.0
F3SG-4RA1630-30	F3SG-2RA1630-30	80	1630	13	65	165	70	90	6.5
F3SG-4RA1710-30	F3SG-2RA1710-30	84	1710	13	65	165	70	90	6.7
F3SG-4RA1790-30	F3SG-2RA1790-30	88	1790	13	65	165	70	90	6.9
F3SG-4RA1870-30	F3SG-2RA1870-30	92	1870	13	65	165	75	90	7.1
F3SG-4RA1950-30	F3SG-2RA1950-30	96	1950	13	65	165	75	95	7.3
F3SG-4RA2030-30	F3SG-2RA2030-30	100	2030	13	65	165	80	95	7.4
F3SG-4RA2110-30	F3SG-2RA2110-30	104	2110	13	65	165	80	95	8.0
F3SG-4RA2190-30	F3SG-2RA2190-30	108	2190	13	65	165	85	95	8.2
F3SG-4RA2270-30	F3SG-2RA2270-30	112	2270	13	65	165	85	100	8.4
F3SG-4RA2350-30	F3SG-2RA2350-30	116	2350	13	65	165	85	100	8.8
F3SG-4RA2430-30	F3SG-2RA2430-30	120	2430	13	65	165	90	100	8.9
F3SG-4RA2510-30	F3SG-2RA2510-30	124	2510	13	65	165	90	100	9.1

*1 The response times are values when Scan Code is set at Code B. The response times for Code A are 1 ms shorter than these values.

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

*2 The weight includes an emitter, a receiver and included brackets in a product package.

Legislation and Standards

1. The F3SG-R does not receive type approval provided by Article 44-2 of the Industrial Safety and Health Act of Japan. When using the F3SG-R in Japan as a "safety system for pressing or shearing machines" prescribed in Article 42 of that law, the machine control system must receive type approval.
2. The F3SG-R is electro-sensitive protective equipment (ESPE) in accordance with European Union (EU) Machinery Directive Index Annex V, Item 2.
3. EC Declaration of Conformity
OMRON declares that the F3SG-R is in conformity with the requirements of the following EC Directives:
Machinery Directive 2006/42/EC
EMC Directive 2004/108/EC
4. Conforming Standards
 - (1) European standards
EN61496-1 (Type 4 and Type 2 ESPE), EN 61496-2 (Type 4 and Type 2 AOPD), EN61508-1 through -4 (SIL 3 for Type 4 and SIL 1 for Type 2), EN ISO 13849-1:2008 (PL e, Category 4 for Type 4 and PL c, Category 2 for Type 2)
 - (2) International standards
IEC61496-1 (Type 4 and Type 2 ESPE), IEC61496-2 (Type 4 and Type 2 AOPD), IEC61508-1 through -4 (SIL 3 for Type 4 and SIL 1 for Type 2), ISO 13849-1:2006 (PL e, Category 4 for Type 4 and PL c, Category 2 for Type 2)
 - (3) JIS standards
JIS B 9704-1 (Type 4 and Type 2 ESPE), JIS B 9704-2 (Type 4 and Type 2 AOPD)
 - (4) North American standards
UL61496-1(Type 4 and Type 2 ESPE), UL61496-2(Type 4 and Type 2 AOPD), UL508, UL1998, CAN/CSA C22.2 No.14, CAN/CSA C22.2 No.0.8
 - (5) Chinese standards
GB4584(Specification of active opto-electronic protective devices for presses)
5. Third-Party Certifications
 - (1) TÜV SÜD
 - EC Type-Examination certificate:
EU Machinery Directive, Type 4 and Type 2 ESPE (EN61496-1), Type 4 and Type 2 AOPD (EN 61496-2)
 - Certificate:
Type 4 and Type 2 ESPE (EN61496-1), Type 4 and Type 2 AOPD (EN61496-2), EN 61508-1 through -4 (SIL 3 for Type 4 and SIL 1 for Type 2), EN ISO 13849-1:2008 (PL e, Category 4 for Type 4, and PL c, Category 2 for Type 2)
 - (2) UL
 - UL Listing:
Type 4 and Type 2 ESPE (UL61496-1), Type 4 and Type 2 AOPD (UL61496-2), UL508, UL1998, CAN/CSA C22.2 No.14, CAN/CSA C22.2 No.0.8
 - (3) China National Casting and Forging Machines Quality Supervision and Inspection Center
 - Certificate:
GB4584 (Specification of active opto-electronic protective devices for presses)
6. Other Standards
The F3SG-R is designed according to the standards listed below. To make sure that the final system complies with the following standards and regulations, you are asked to design and use it in accordance with all other related standards, laws, and regulations. If you have any questions, consult with specialized organizations such as the body responsible for prescribing and/or enforcing machinery safety regulations in the location where the equipment is to be used.
 - European Standards: EN415-4, EN691-1, EN692, EN693, IEC/TS 62046
 - U.S. Occupational Safety and Health Standards: OSHA 29 CFR 1910.212
 - U.S. Occupational Safety and Health Standards: OSHA 29 CFR 1910.217
 - American National Standards: ANSI B11.1 to B11.19
 - American National Standards: ANSI/RIA R15.06
 - Canadian Standards Association CSA Z142, Z432, Z434
 - SEMI Standards SEMI S2
 - Japan Ministry of Health, Labour and Welfare "Guidelines for Comprehensive Safety Standards of Machinery", Standard Bureau's Notification No. 0731001 dated July 31, 2007.rms and Conditions Agreement
 - Chinese National Standards: GB17120, GB27607

F3SG-RA

Indicator

Emitter

Name of Indicator		Color	Illuminated	Blinking
Test	TEST	Green	–	External Test is being performed
Operating range	LONG	Green	Long range mode is selected	Lockout state due to DIP Switch setting error or 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	Muting/Override state, or Lockout state due to Cap error or Other sensor error
PNP/NPN mode	NPN	Green	NPN mode is selected by DIP Switch	–
Response time	SLOW	Green	Response Time Adjustment is enabled	–
Sequence error	SEQ	Yellow	–	Sequence error in Muting or Pre-reset mode
Blanking	BLANK	Green	Blanking, Warning Zone or Reduced Resolution is enabled	Teach-in mode, or Blanking Monitoring error
Configuration	CFG	Green	–	Teach-in mode, zone measurement being performed by Dynamic Muting, or Lockout state due to Parameter error or Cascading Configuration error
Interlock	INT-LK	Yellow	Interlock state	Pre-reset mode
External device monitoring	EDM	Green	RESET input is in ON state	Lockout state due to EDM error
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, or the sensor is in Setting 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	Muting/Override state, or Lockout state due to DIP Switch setting error

Interface Unit

Main unit	PC/AT compatible machine (computer that runs Microsoft Windows)
Operating system (OS)	Windows 7 (32-bit/64-bit), Windows 8 (32-bit/64-bit)
Communication port	USB port ×1
Ambient temperature	Operating: -10 to 55°C, Storage: -30 to 70°C(non-icing and non-condensing)
Ambient humidity	Operating: 35% to 85%, Storage: 35% to 95%(non-condensing)

Lamp

Item	F39-LP
Applicable Sensor	F3SG-□RA Series Safety Light Curtain (Receiver)
LED Light Color	Red/Green/Orange
Power Supply Voltage	24 VDC±20%, ripple p-p 10% max.(shares sensor's power supply)
Current Consumption	25 mA max. (shares sensor's power supply.)
Ambient Temperature	Operating: -10 to 55°C, Storage: -25 to 70°C
Ambient Humidity	Operating: 35% to 85%, Storage: 35% to 95%
Vibration Resistance	10 to 55 Hz, Multiple amplitude of 0.7 mm,20 sweeps for all 3 axes
Shock Resistance	100 m/s ² , 1000 shocks for all 3 axes
Degree of Protection	IP65 and IP67(When attached to F3SG)
Type of Connection	Connectable to F3SG-RA's terminal connector
Material	Lighting element: PC, Other body parts: PBT
Weight	45 g (when packaged)

Connections (Basic Wiring Diagram)

Standalone F3SG-RA using PNP Outputs

The following is the example of External Device Monitoring enabled, Manual Reset mode, PNP output and External Test in 24 V Active.

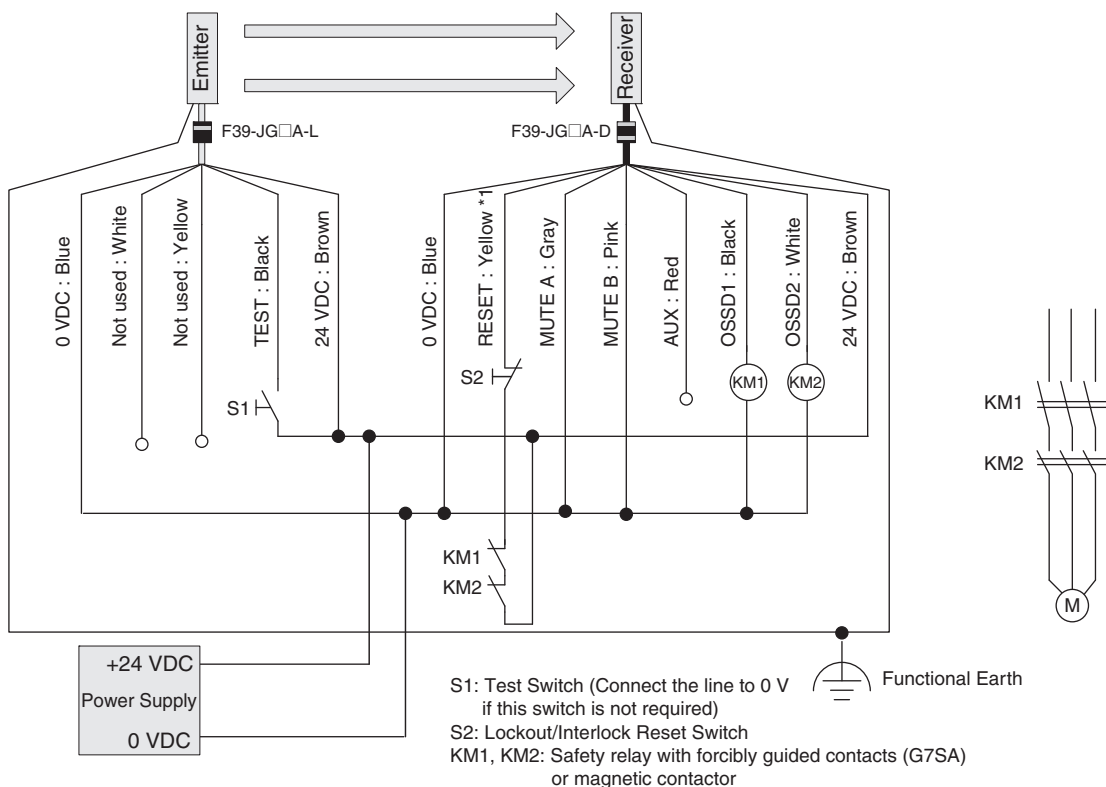
DIP Switch settings *2

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 <input type="checkbox"/> ON	2 <input type="checkbox"/> ON
	Manual Reset	3 <input type="checkbox"/> ON	3 <input type="checkbox"/> ON
		4 <input type="checkbox"/> ON	4 <input type="checkbox"/> ON
	PNP (factory default setting)	7 <input type="checkbox"/> ON	7 <input type="checkbox"/> ON
Emitter	External Test: 24 V Active (factory default setting)	4 <input type="checkbox"/> ON	

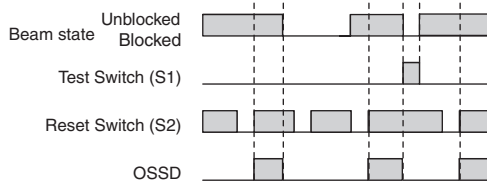
: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example



S1: Test Switch (Connect the line to 0 V if this switch is not required)
 S2: Lockout/Interlock Reset Switch
 KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor
 M: 3-phase motor
 *1.Also used as EDM input line.
 *2.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Note: 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 *Safety Light Curtain F3SG-R Series User's Manual* for more information.

Standalone F3SG-RA with Y-Joint Plug/Socket Connector using PNP outputs

The following is the example of External Device Monitoring enabled, Manual Reset mode, PNP output and External Test in 24 V Active.

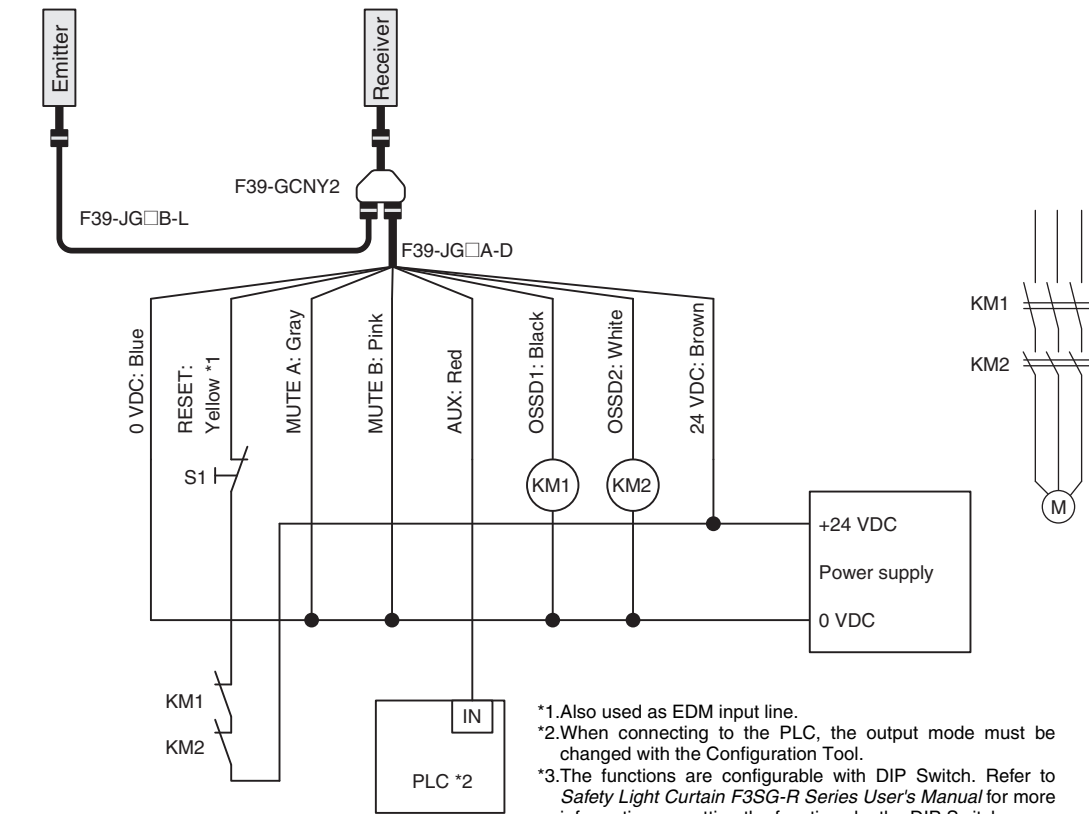
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 <input type="checkbox"/> ON	2 <input type="checkbox"/> ON
	Manual Reset	3 <input type="checkbox"/> ON	3 <input type="checkbox"/> ON
		4 <input type="checkbox"/> ON	4 <input type="checkbox"/> ON
	PNP (factory default setting)	7 <input type="checkbox"/> ON	7 <input type="checkbox"/> ON
Emitter	External Test: 24 V Active (factory default setting)	4 <input type="checkbox"/> ON	

: Indicates a switch position.

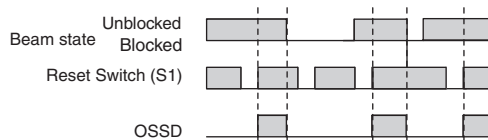
Configure functions with the DIP Switches before wiring.

Wiring Example



S1: Lockout/Interlock Reset Switch
 KM1, KM2: External device feedback
 M: 3-phase motor
 PLC: Programmable controller
 (Used for monitoring only. NOT related to safety system.)

- *1. Also used as EDM input line.
- *2. When connecting to the PLC, the output mode must be changed with the Configuration Tool.
- *3. The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



F3SG-RA with Y-Joint Plug/Socket Connector in Standard Muting Mode/Exit-Only Muting Mode using PNP outputs

The following is the example of External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active.

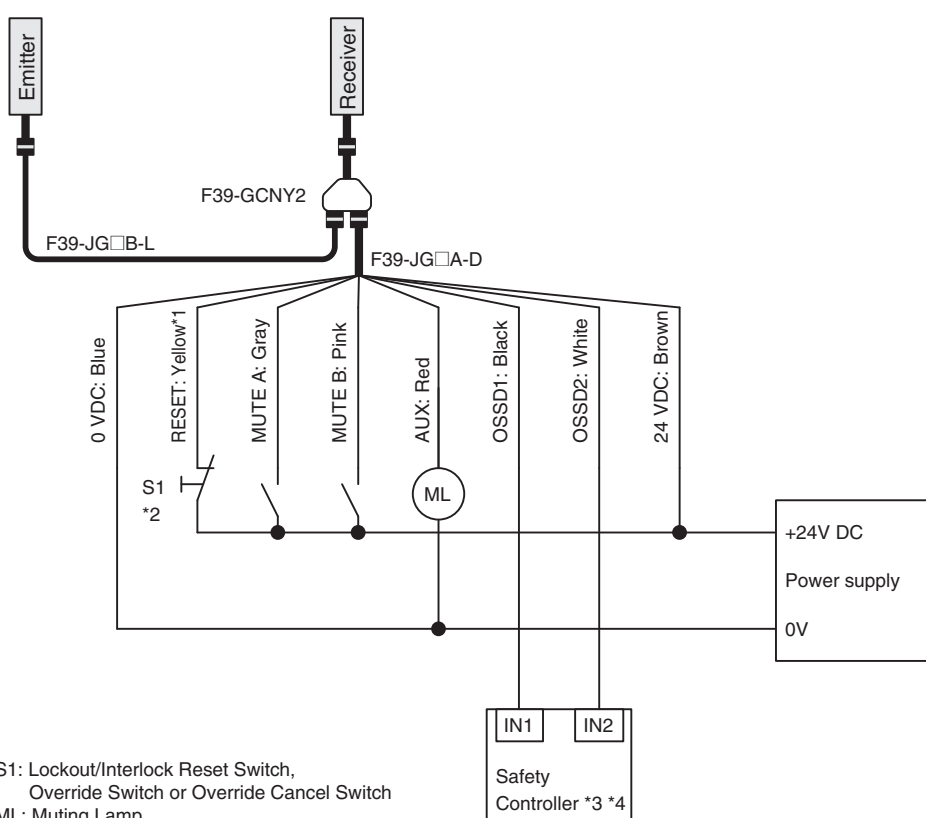
DIP Switch settings *5

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 <input checked="" type="checkbox"/> ON	2 <input checked="" type="checkbox"/> ON
	Auto Reset (factory default setting)	3 <input checked="" type="checkbox"/> ON	3 <input checked="" type="checkbox"/> ON
		4 <input checked="" type="checkbox"/> ON	4 <input checked="" type="checkbox"/> ON
	PNP (factory default setting)	7 <input checked="" type="checkbox"/> ON	7 <input checked="" type="checkbox"/> ON
Emitter	External Test: 24 V Active (factory default setting)	4 <input checked="" type="checkbox"/> ON	

: Indicates a switch position.

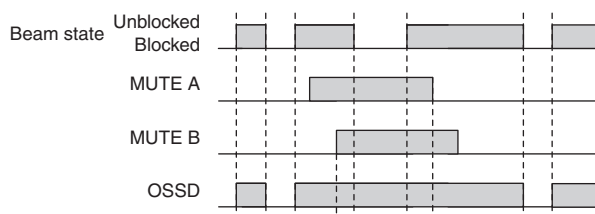
Configure functions with the DIP Switches before wiring.

Wiring Example



S1: Lockout/Interlock Reset Switch, Override Switch or Override Cancel Switch
ML: Muting Lamp

- *1. Also used as EDM input line.
- *2. 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.
- *3. Refer to page 27 for more information.
- *4. The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.
- *5. The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Standard Muting Mode/Exit-Only Muting Mode using PNP Outputs

The following is the example of External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active.

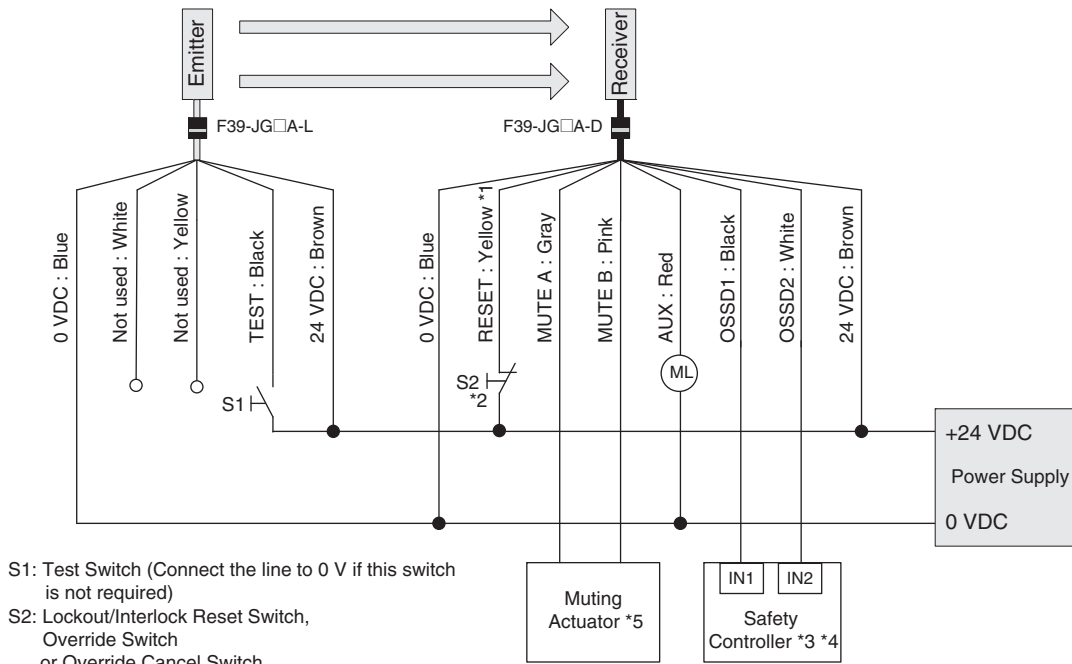
DIP Switch settings *6

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 <input checked="" type="checkbox"/> ON	2 <input checked="" type="checkbox"/> ON
	Auto Reset (factory default setting)	3 <input checked="" type="checkbox"/> ON	3 <input checked="" type="checkbox"/> ON
		4 <input checked="" type="checkbox"/> ON	4 <input checked="" type="checkbox"/> ON
	PNP (factory default setting)	7 <input checked="" type="checkbox"/> ON	7 <input checked="" type="checkbox"/> ON
Emitter	External Test: 24 V Active (factory default setting)	4 <input checked="" type="checkbox"/> ON	

: Indicates a switch position.

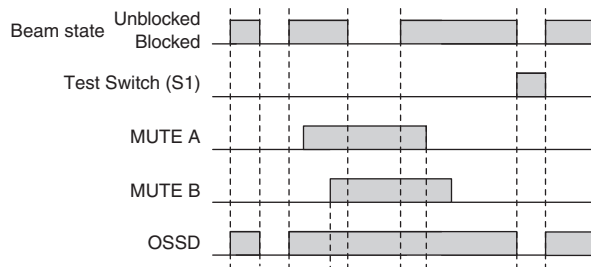
Configure functions with the DIP Switches before wiring.

Wiring Example



- S1: Test Switch (Connect the line to 0 V if this switch is not required)
- S2: Lockout/Interlock Reset Switch, Override Switch or Override Cancel Switch
- ML: Muting lamp

- *1. Also used as Override input line.
- *2. 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.
- *3. Refer to page 27 for more information.
- *4. The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.
- *5. Refer to *Smart Muting Actuator F3W-MA Series User's Manual* for more information.
- *6. The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Standard Muting Mode/Exit-Only Muting Mode with two Muting Sensors using PNP Outputs

The following is the example of External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active.

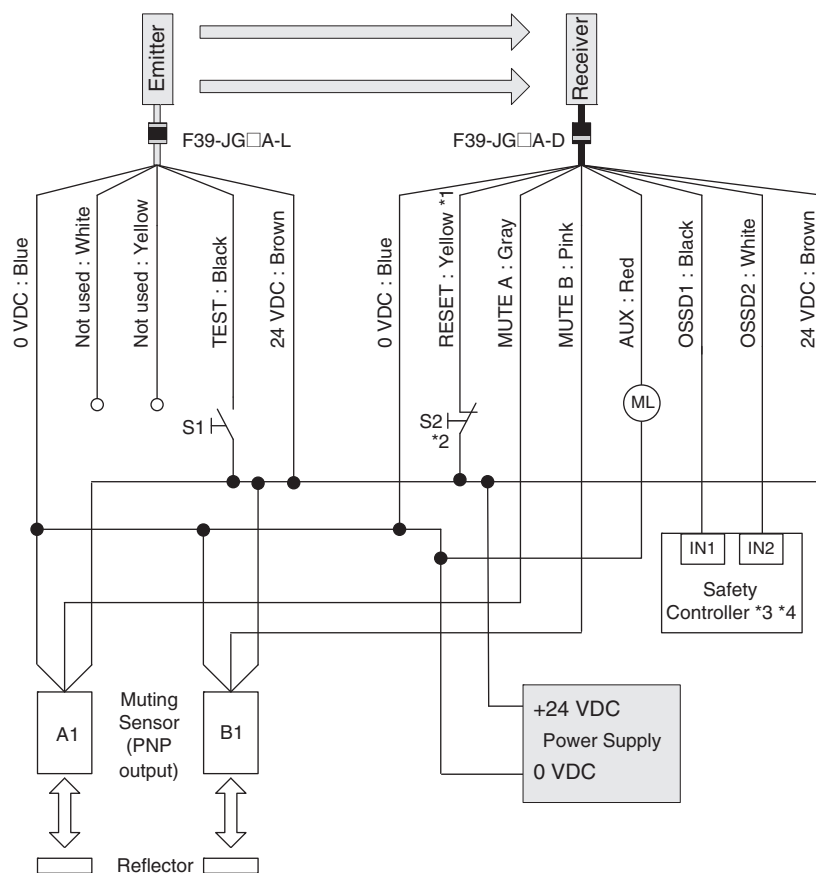
DIP Switch settings *5

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 <input type="checkbox"/> ON	2 <input type="checkbox"/> ON
	Auto Reset (factory default setting)	3 <input type="checkbox"/> ON	3 <input type="checkbox"/> ON
		4 <input type="checkbox"/> ON	4 <input type="checkbox"/> ON
	PNP (factory default setting)	7 <input type="checkbox"/> ON	7 <input type="checkbox"/> ON
Emitter	External Test: 24 V Active (factory default setting)	4 <input type="checkbox"/> ON	

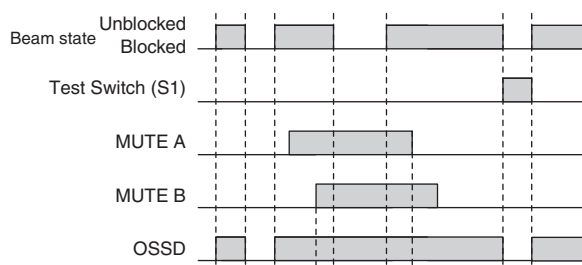
: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example



S1: Test Switch (Connect the line to 0 V if this switch is not required)
 S2: Lockout/Interlock Reset Switch, Override Switch or Override Cancel Switch
 ML: Muting lamp
 A1, B1: Muting sensor



- *1. Also used as Override input line.
- *2. 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.
- *3. Refer to page 27 for more information.
- *4. The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.
- *5. The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.

Standard Muting Mode with four Muting Sensors using PNP Outputs

The following is the example of External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active.

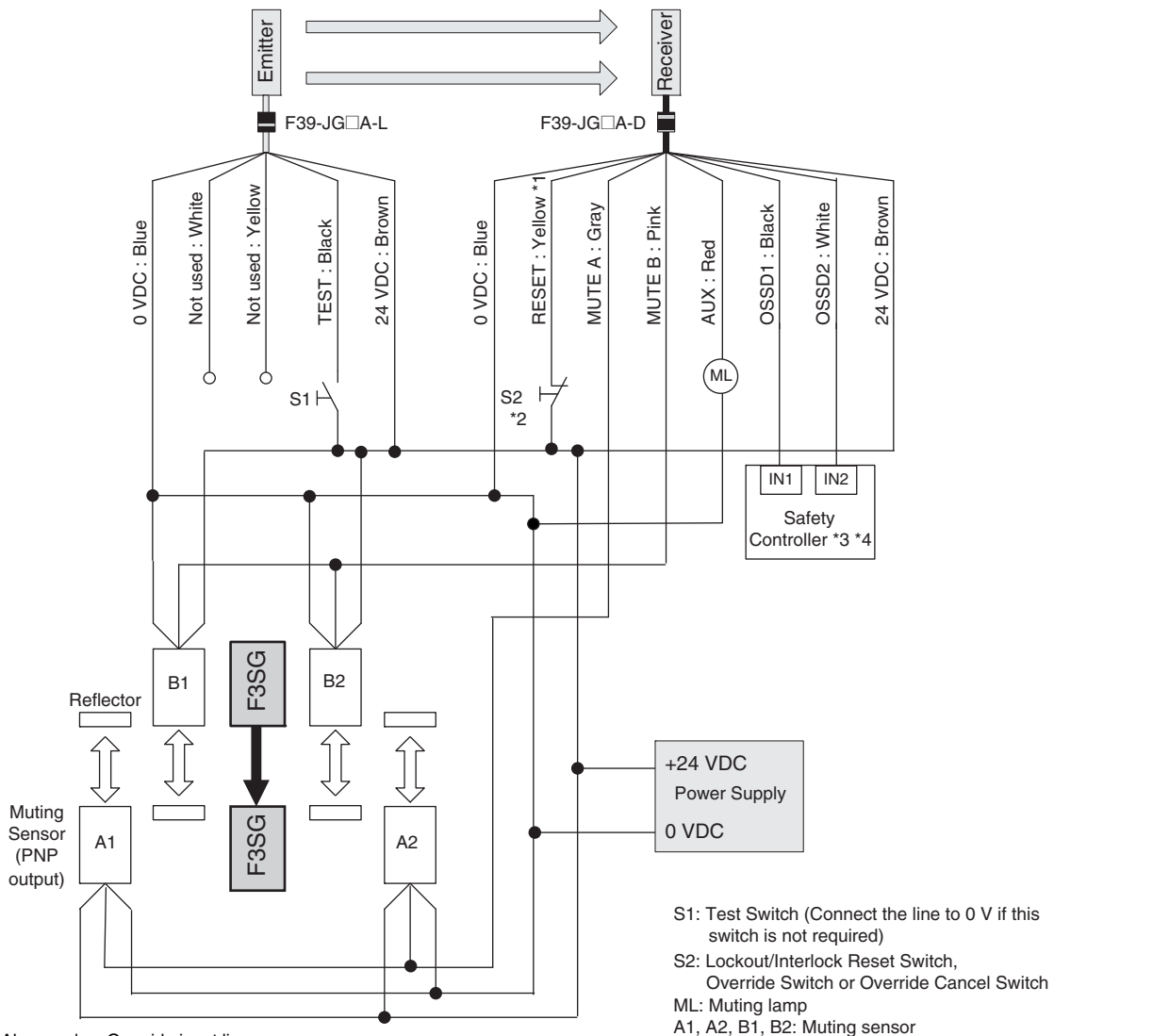
DIP Switch settings *5

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 <input checked="" type="checkbox"/> ON	2 <input checked="" type="checkbox"/> ON
	Auto Reset (factory default setting)	3 <input checked="" type="checkbox"/> ON	3 <input checked="" type="checkbox"/> ON
		4 <input checked="" type="checkbox"/> ON	4 <input checked="" type="checkbox"/> ON
	PNP (factory default setting)	7 <input checked="" type="checkbox"/> ON	7 <input checked="" type="checkbox"/> ON
Emitter	External Test: 24 V Active (factory default setting)	4 <input checked="" type="checkbox"/> ON	

: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example



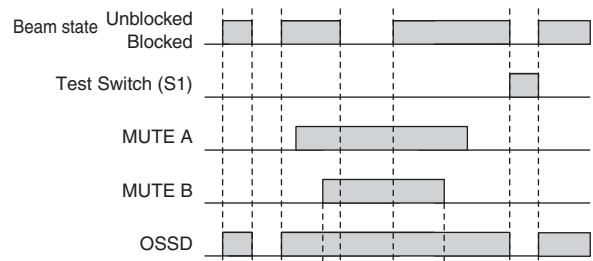
*1. Also used as Override input line.

*2. 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.

*3. Refer to page 27 for more information.

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

*5. The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Pre-Reset Mode using PNP Output

The following is the example of External Device Monitoring disabled, Pre-Reset mode, PNP output and External Test in 24 V Active.

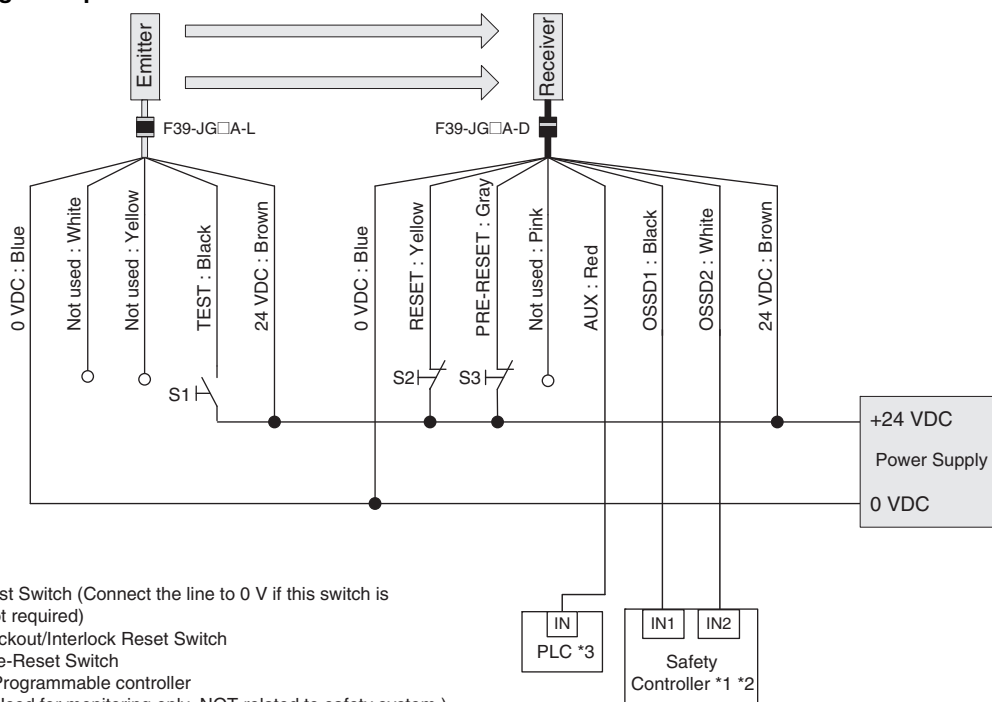
DIP Switch settings *4

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 <input type="checkbox"/> ON	2 <input type="checkbox"/> ON
	Pre-Reset	3 <input type="checkbox"/> ON	3 <input type="checkbox"/> ON
		4 <input type="checkbox"/> ON	4 <input type="checkbox"/> ON
	PNP (factory default setting)	7 <input type="checkbox"/> ON	7 <input type="checkbox"/> ON
Emitter	External Test: 24 V Active (factory default setting)	4 <input type="checkbox"/> ON	

Indicates a switch position.

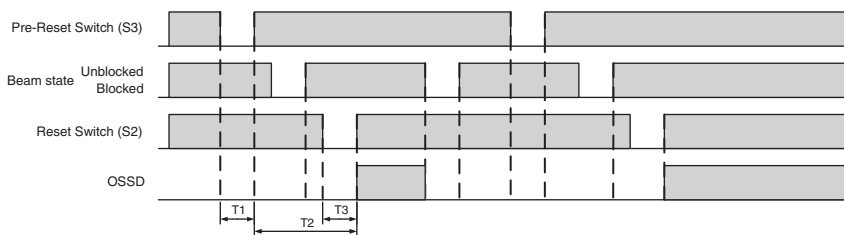
Configure functions with the DIP Switches before wiring.

Wiring Example



- S1: Test Switch (Connect the line to 0 V if this switch is not required)
- S2: Lockout/Interlock Reset Switch
- S3: Pre-Reset Switch
- PLC: Programmable controller
(Used for monitoring only. NOT related to safety system.)

- *1. Refer to the following list "Connectable Safety Control Units" on this page.
- *2. The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.
- *3. When connecting to the PLC, the output mode must be changed with the Configuration Tool.
- *4. The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



- T1: Push time: must be $T1 \geq 300\text{ms}$
- T2: Pre-reset limit time between Pre-reset and Reset: must be $T2 \leq 60\text{s}$
- T3: Push time: must be $T3 \geq 300\text{ms}$

Connectable Safety Control Units

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

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

Standalone F3SG-RA using NPN Outputs

The following is the example of External Device Monitoring enabled, Manual Reset mode, NPN output and External Test in 0 V Active.

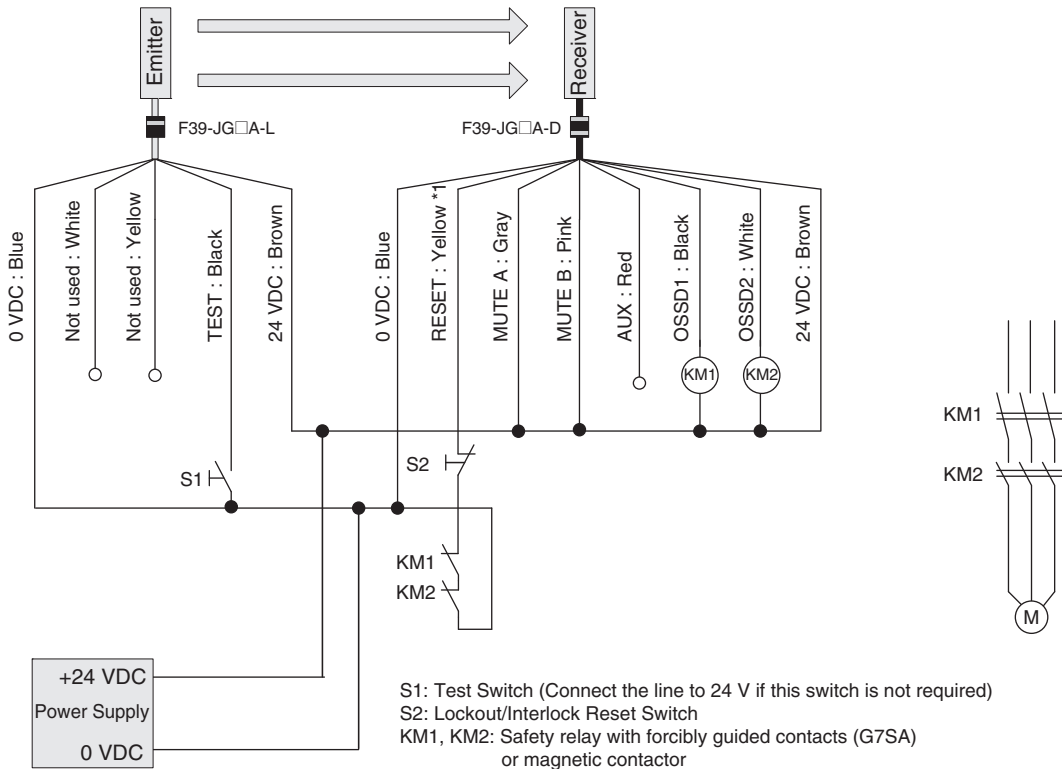
DIP Switch settings *2

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 <input checked="" type="checkbox"/> ON	2 <input checked="" type="checkbox"/> ON
	Manual Reset	3 <input checked="" type="checkbox"/> ON	3 <input checked="" type="checkbox"/> ON
		4 <input type="checkbox"/> OFF	4 <input type="checkbox"/> OFF
	NPN	7 <input checked="" type="checkbox"/> ON	7 <input checked="" type="checkbox"/> ON
Emitter	External Test: 0 V Active	4 <input type="checkbox"/> OFF	

: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example



S1: Test Switch (Connect the line to 24 V if this switch is not required)

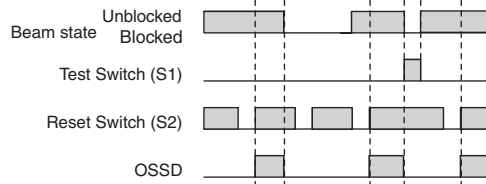
S2: Lockout/Interlock Reset Switch

KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor

M: 3-phase motor

*1.Also used as EDM input line.

*2.The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Standard Muting Mode/Exit-Only Muting Mode using NPN Outputs

The following is the example of External Device Monitoring enabled, Auto Reset mode, NPN output and External Test in 0 V Active.

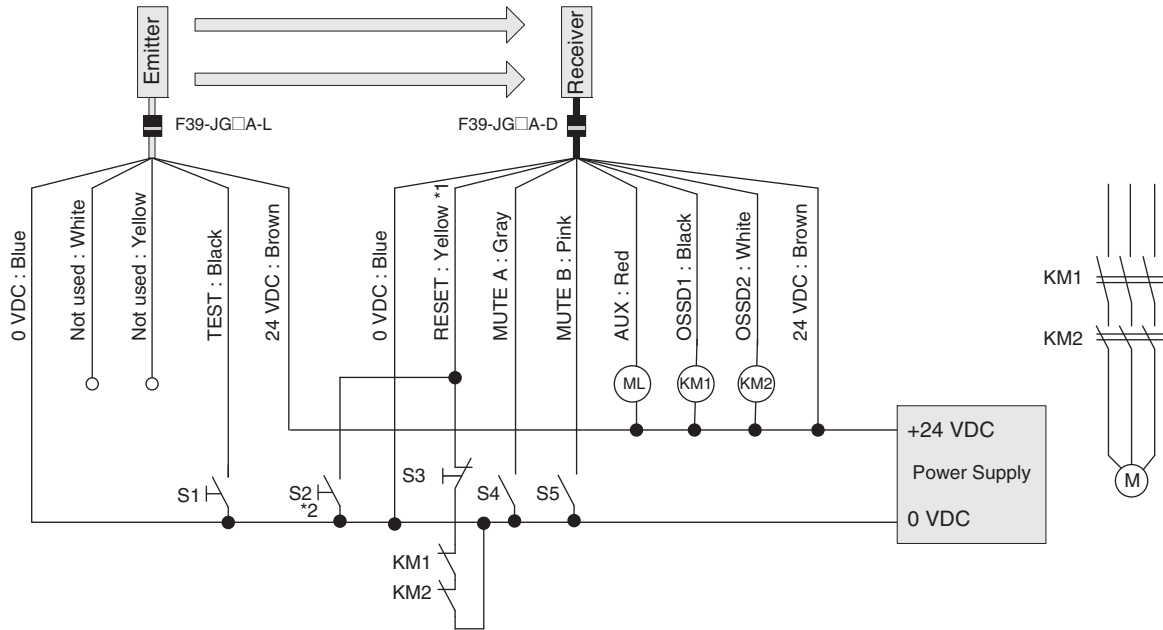
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 <input type="checkbox"/> ON	2 <input type="checkbox"/> ON
	Auto Reset (factory default setting)	3 <input type="checkbox"/> ON	3 <input type="checkbox"/> ON
		4 <input type="checkbox"/> ON	4 <input type="checkbox"/> ON
	NPN	7 <input type="checkbox"/> ON	7 <input type="checkbox"/> ON
Emitter	External Test: 0 V Active	4 <input type="checkbox"/> ON	

: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example

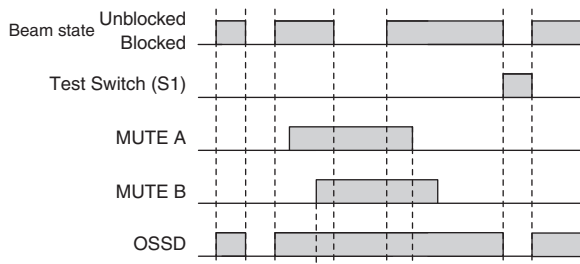


- S1: Test Switch (Connect the line to 24 V if this switch is not required)
- S2: Override Cancel Switch
- S3: Lockout/Interlock Reset Switch or Override Switch
- S4, S5: Muting sensor
- KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor
- M: 3-phase motor
- ML: Muting lamp

*1. Also used as Override input line.

*2. 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.

*3. The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Standard Muting Mode/Exit-Only Muting Mode with two Muting Sensors using NPN Outputs

The following is the example of External Device Monitoring enabled, Auto Reset mode, NPN output and External Test in 0 V Active.

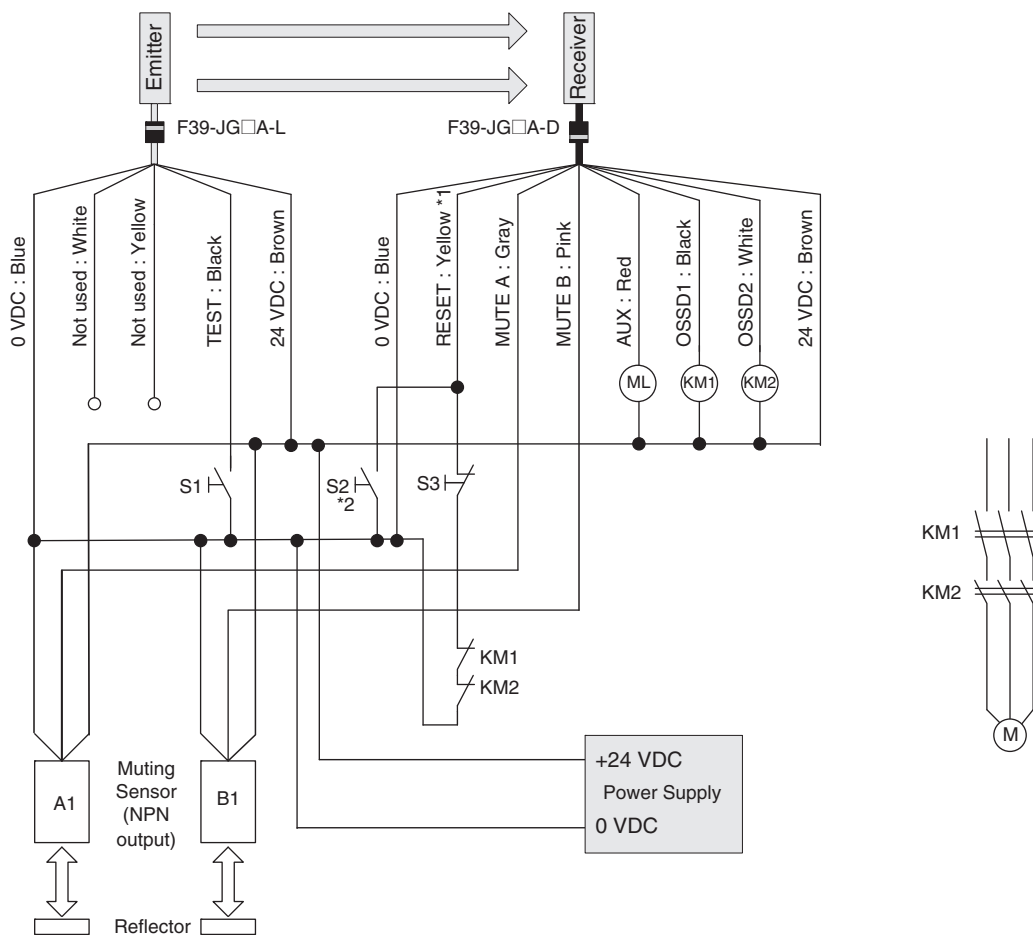
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 <input type="checkbox"/> ON	2 <input type="checkbox"/> ON
	Auto Reset (factory default setting)	3 <input type="checkbox"/> ON	3 <input type="checkbox"/> ON
		4 <input type="checkbox"/> ON	4 <input type="checkbox"/> ON
	NPN	7 <input type="checkbox"/> ON	7 <input type="checkbox"/> ON
Emitter	External Test: 0 V Active	4 <input type="checkbox"/> ON	

: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example



S1: Test Switch (Connect the line to 24 V if this switch is not required)

S2: Override Cancel Switch

S3: Lockout/Interlock Reset Switch or Override Switch

KM1, KM2: Safety relay with forcibly guided contacts (G7SA) or magnetic contactor

M: 3-phase motor

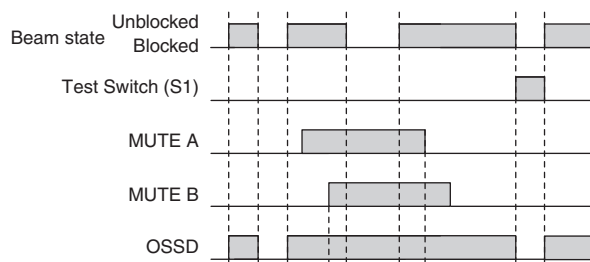
ML: Muting lamp

A1, B1: Muting sensor

*1. Also used as Override input line.

*2. 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.

*3. The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Standard Muting Mode with four Muting Sensors using NPN Outputs

The following is the example of External Device Monitoring enabled, Auto Reset mode, NPN output and External Test in 0 V Active.

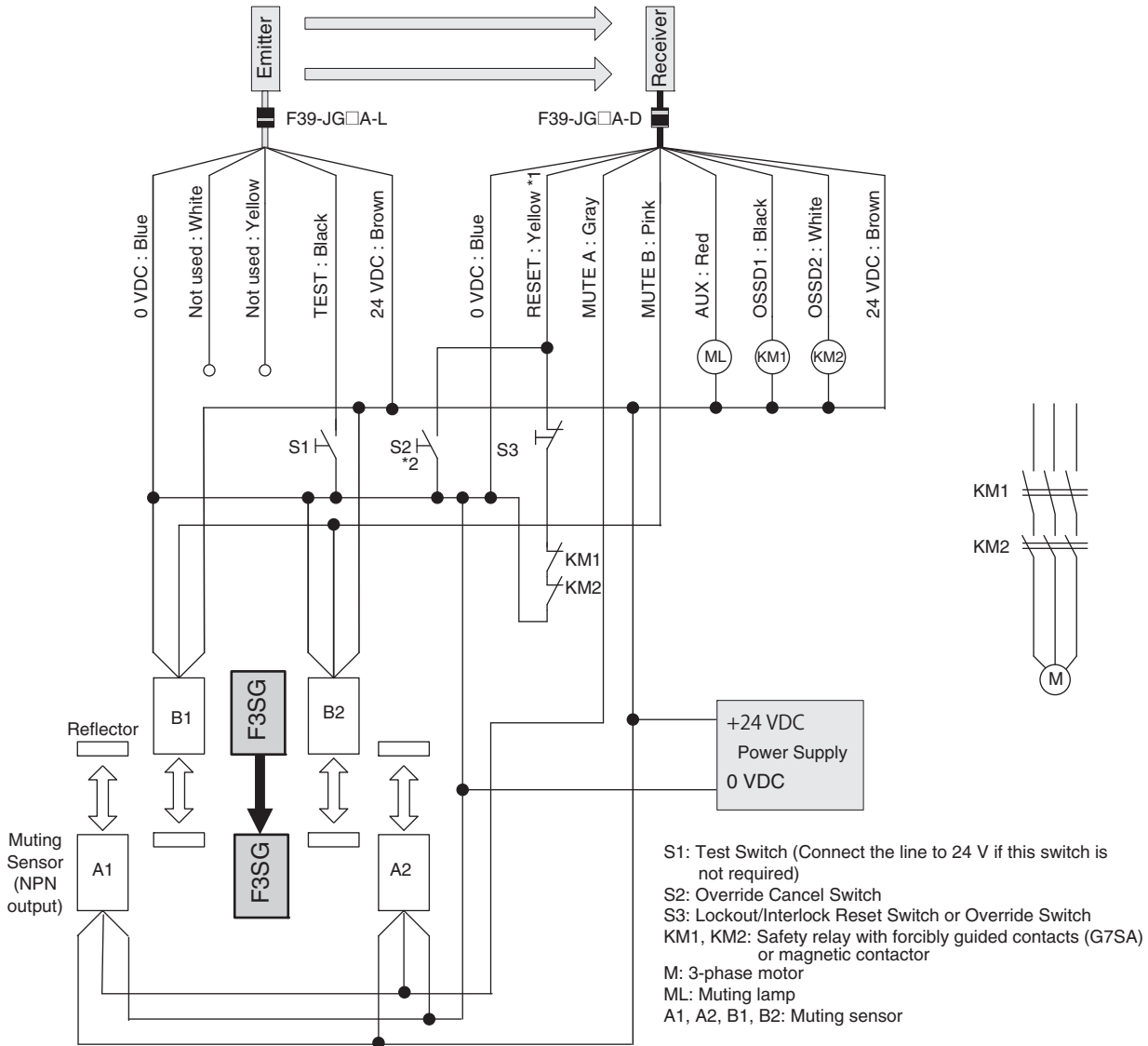
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 <input type="checkbox"/> ON	2 <input type="checkbox"/> ON
	Auto Reset (factory default setting)	3 <input type="checkbox"/> ON	3 <input type="checkbox"/> ON
		4 <input type="checkbox"/> ON	4 <input type="checkbox"/> ON
	NPN	7 <input type="checkbox"/> ON	7 <input type="checkbox"/> ON
Emitter	External Test: 0 V Active	4 <input type="checkbox"/> ON	

: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

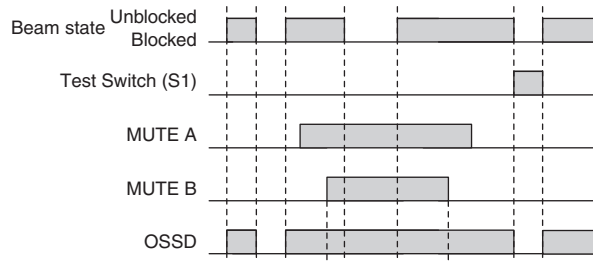
Wiring Example



*1. Also used as Override input line.

*2. 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.

*3. The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



Pre-Reset Mode using NPN Output

The following is the example of External Device Monitoring enabled, Pre-Reset mode, NPN output and External Test in 0 V Active.

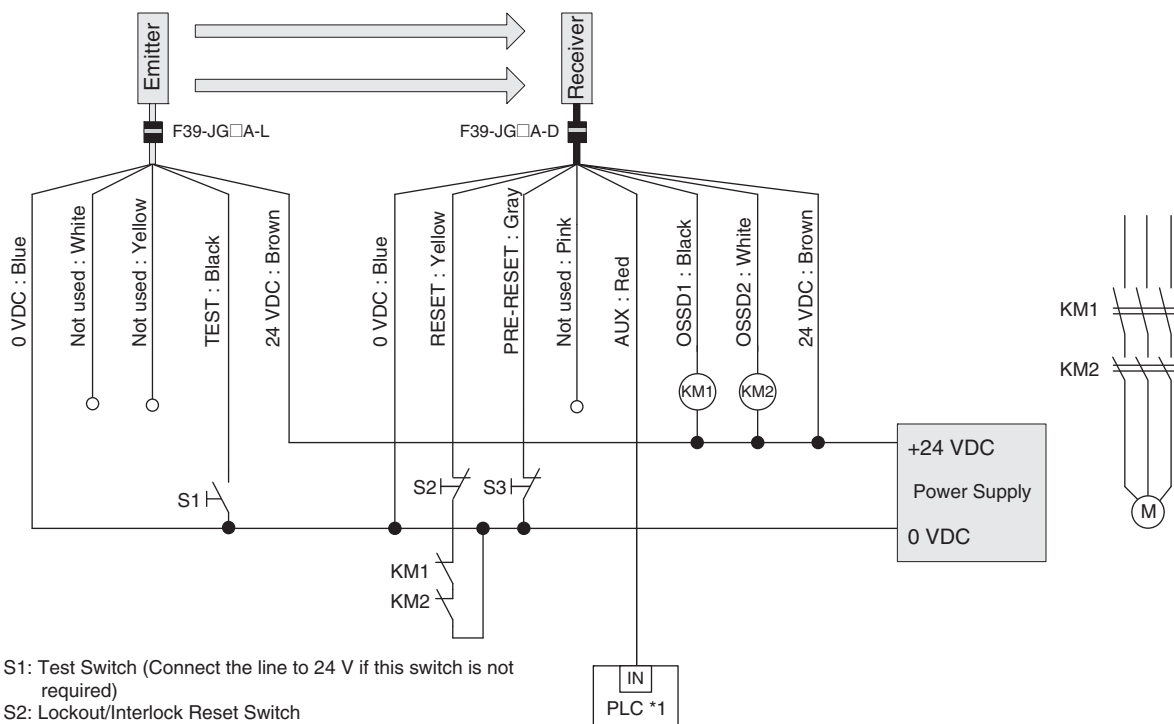
DIP Switch settings *2

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 <input checked="" type="checkbox"/> ON	2 <input checked="" type="checkbox"/> ON
	Pre-Reset	3 <input checked="" type="checkbox"/> ON	3 <input checked="" type="checkbox"/> ON
		4 <input checked="" type="checkbox"/> ON	4 <input checked="" type="checkbox"/> ON
	NPN	7 <input checked="" type="checkbox"/> ON	7 <input checked="" type="checkbox"/> ON
Emitter	External Test: 0 V Active	4 <input checked="" type="checkbox"/> ON	

: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example



S1: Test Switch (Connect the line to 24 V if this switch is not required)

S2: Lockout/Interlock Reset Switch

S3: Pre-Reset Switch

KM1, KM2: External device feedback

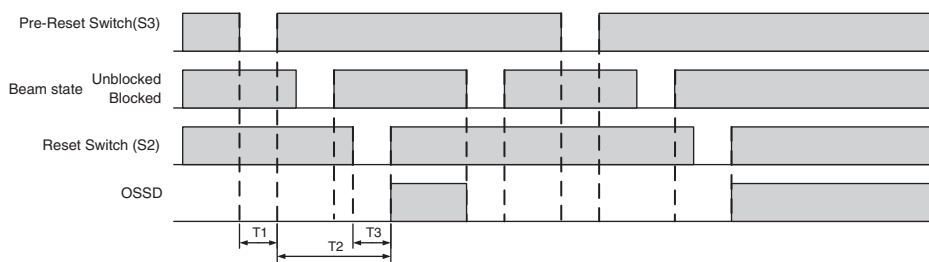
M: 3-phase motor

PLC: Programmable controller

(Used for monitoring only. NOT related to safety system.)

*1. When connecting to the PLC, the output mode must be changed with the Configuration Tool.

*2. The functions are configurable with DIP Switch. Refer to *Safety Light Curtain F3SG-R Series User's Manual* for more information on setting the functions by the DIP Switch.



T1: Push time: must be $T1 \geq 300\text{ms}$
 T2: Pre-reset limit time between Pre-reset and Reset: must be $T2 \leq 60\text{s}$
 T3: Push time: must be $T3 \geq 300\text{ms}$

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

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

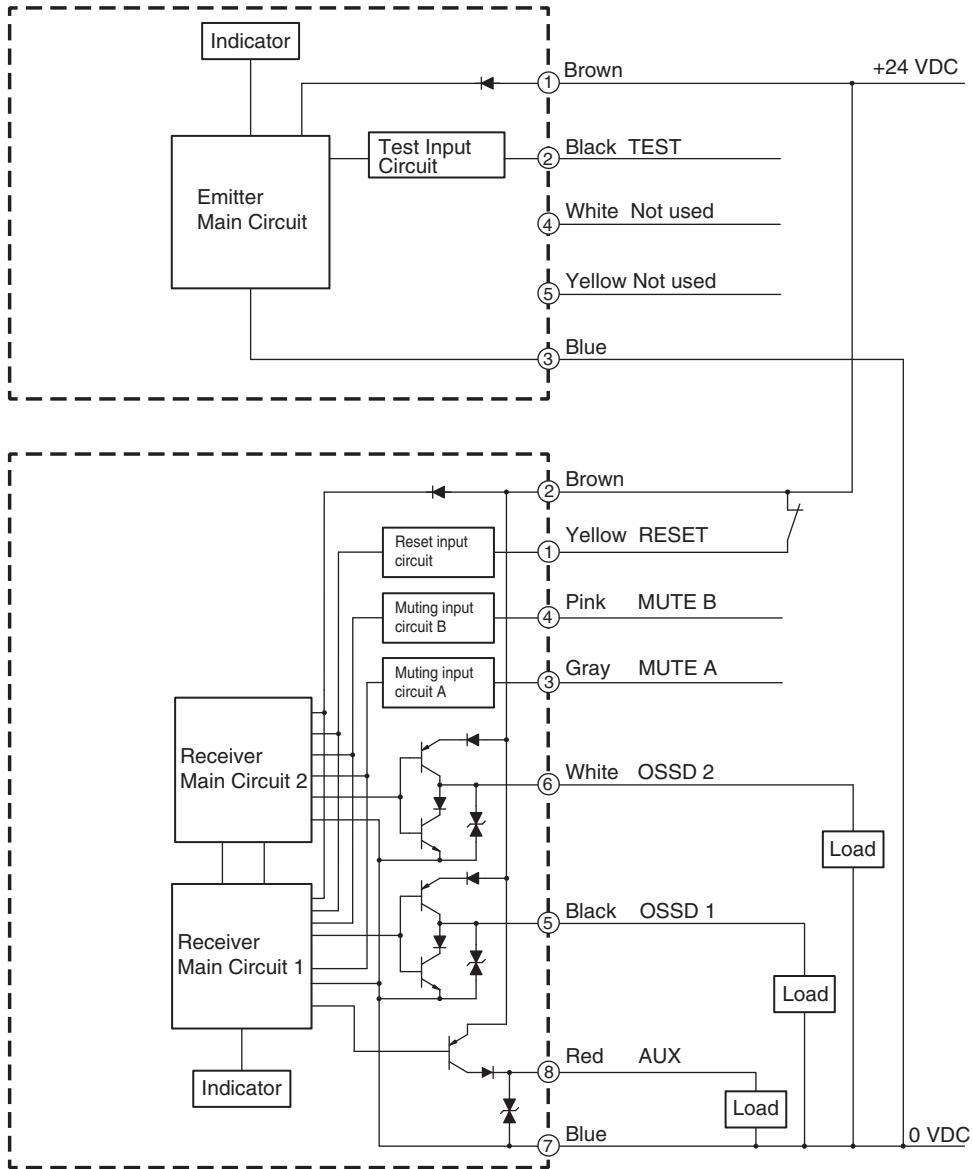
F3SG-RA

Input/Output Circuit

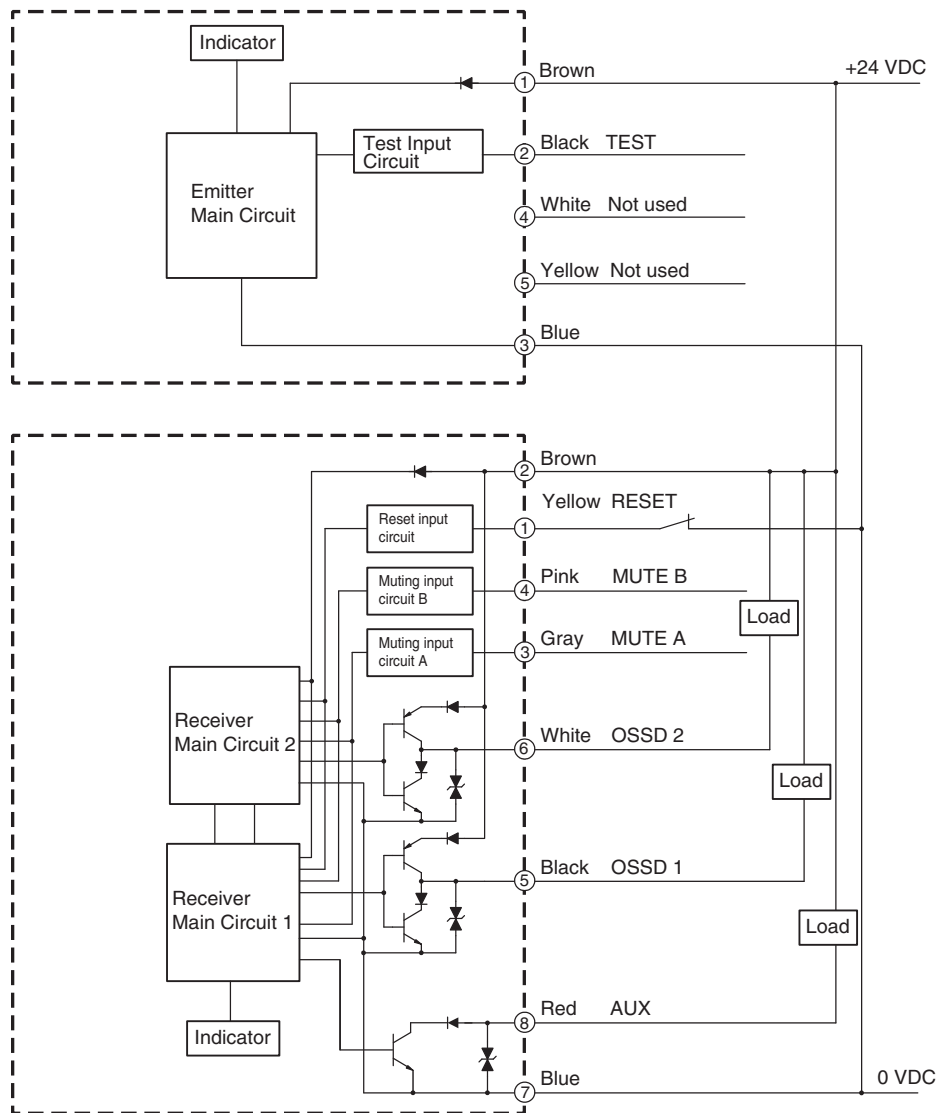
Entire Circuit Diagram

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

PNP Output



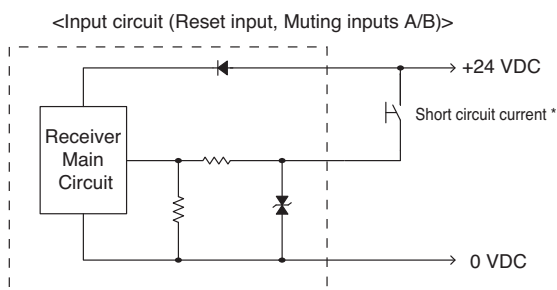
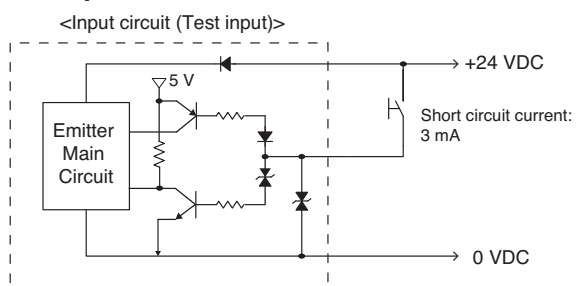
NPN Output



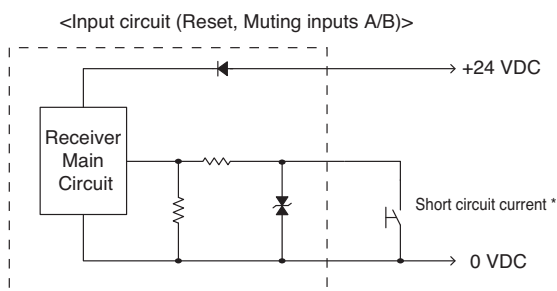
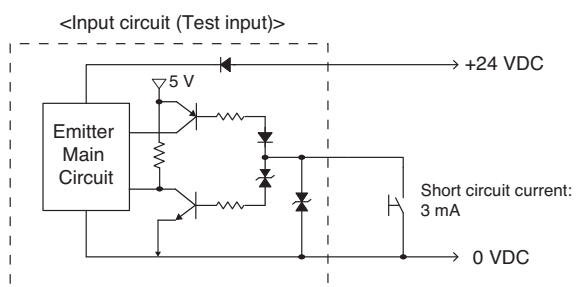
Input Circuit Diagram by Function

The input circuit diagrams of by function are shown below.

PNP Output



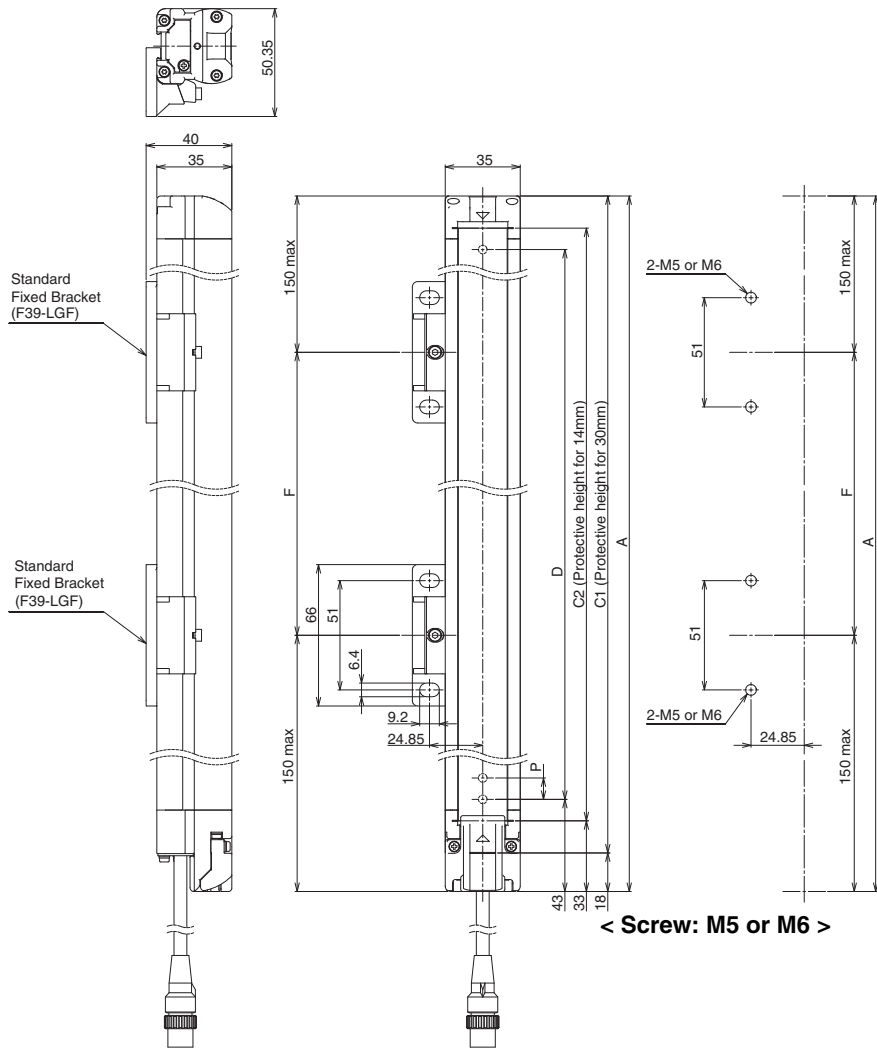
NPN Output



*Short circuit current: 5mA (Reset input), 3mA (Muting inputs A/B)

Mounted with Standard Fixed Brackets (F39-LGF)

Backside Mounting



F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension P	20

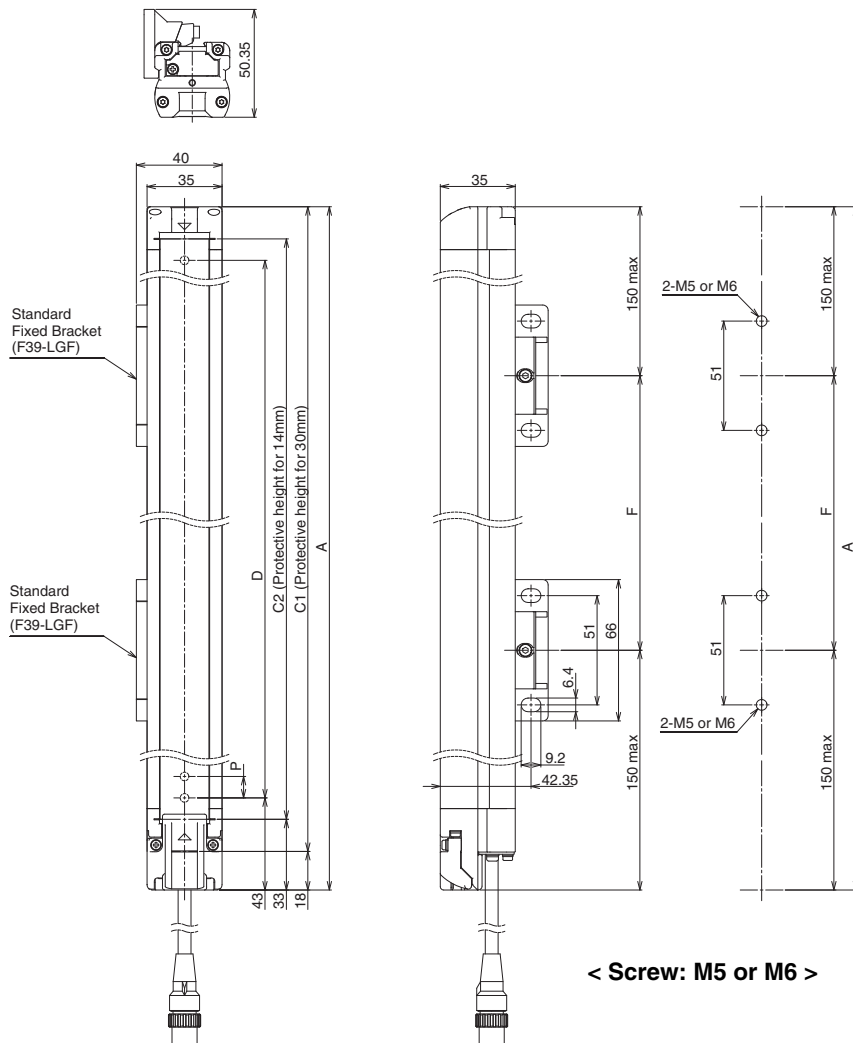
F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

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

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

Side Mounting



F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension P	20

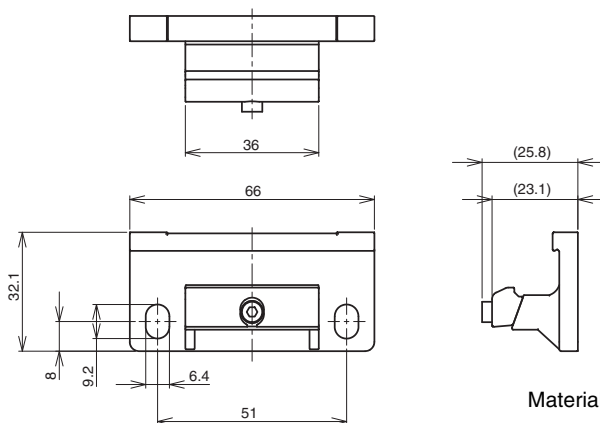
F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

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

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

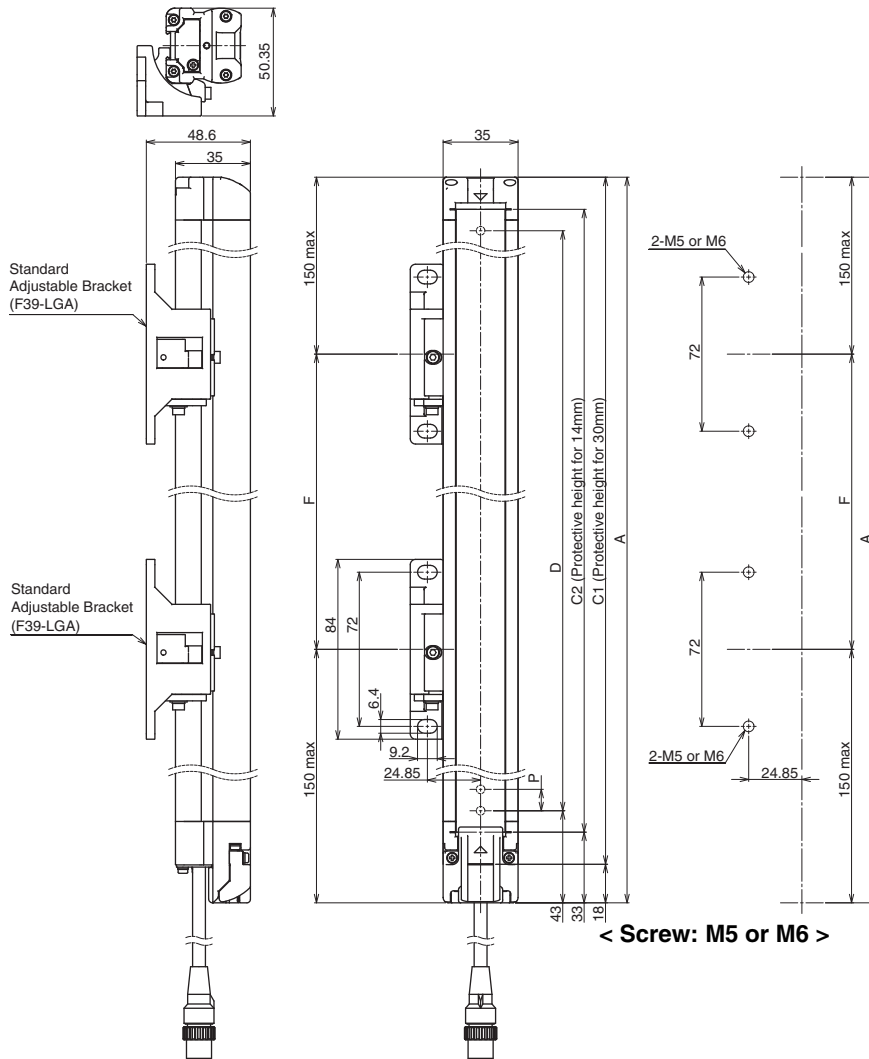
Standard Fixed Bracket (F39-LGF)



Material: ZDC2

F3SG-RA

Mounted with Standard Adjustable Brackets (F39-LGA) Backside Mounting



F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension P	20

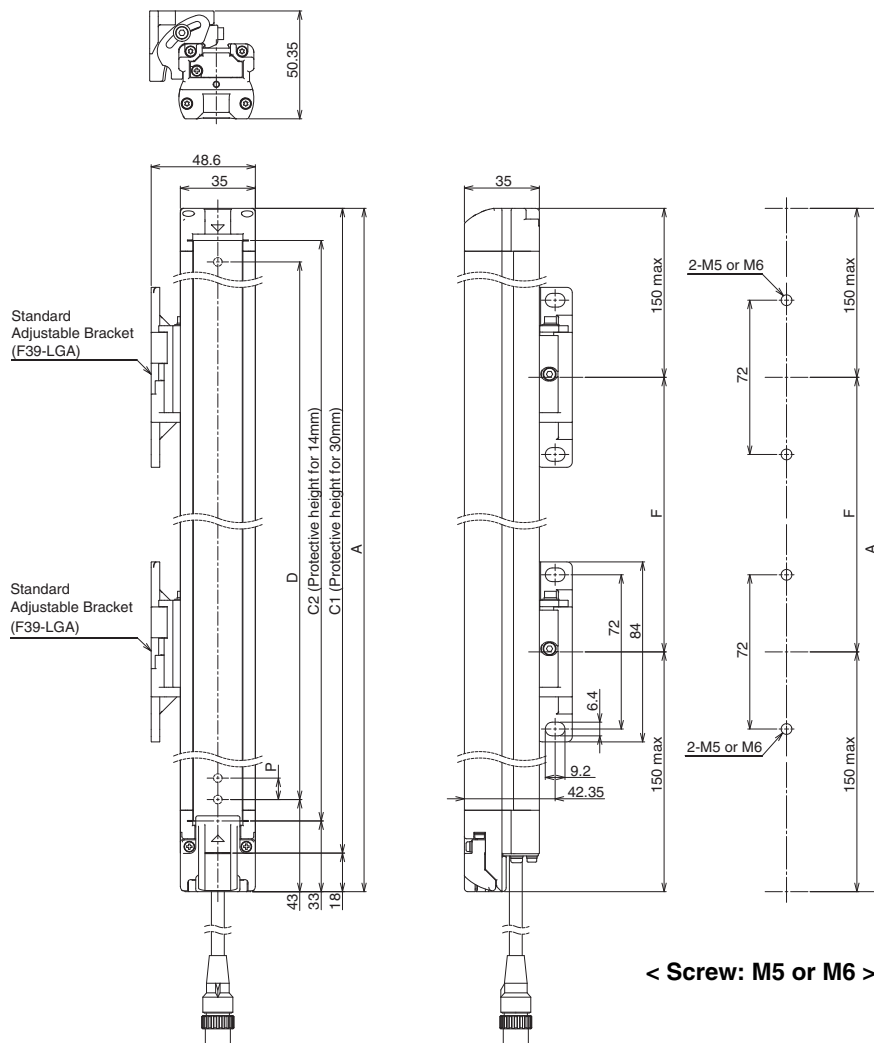
Protective height (C1)	Number of Standard Adjustable Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

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

Side Mounting



< Screw: M5 or M6 >

F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension P	20

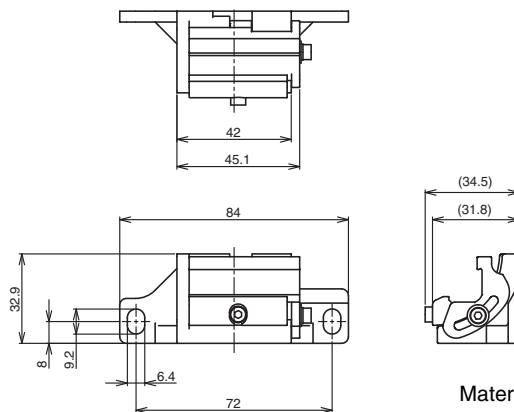
F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension P	10

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

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

Standard Adjustable Bracket (F39-LGA)



Material: ZDC2 ,Fluorochemical lubricant oil

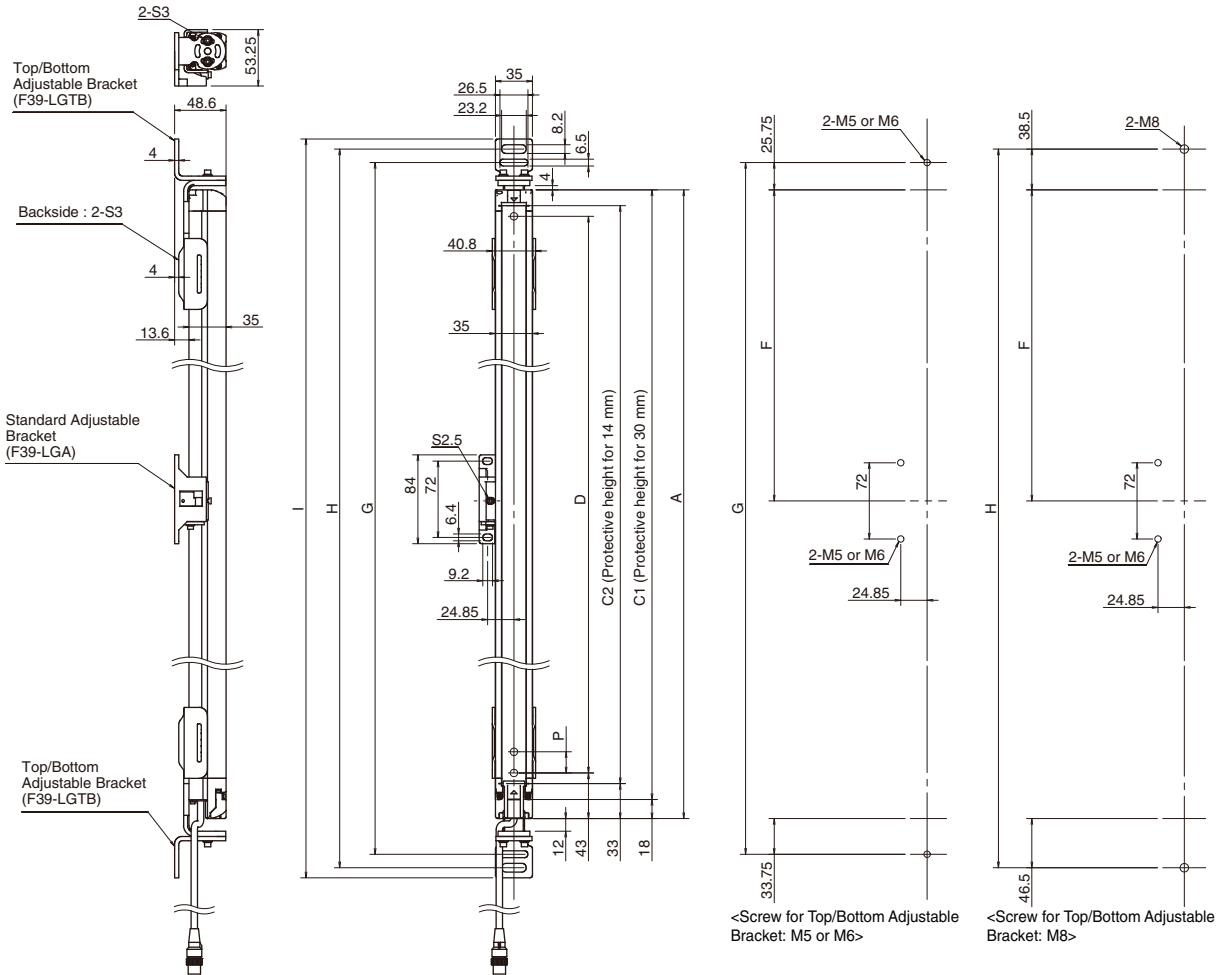
F3SG-RA

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

Dimensions when using the F3SG-RA Series except the F3SG-4RA0190-30 and F3SG-4RA0160-14

Refer to *Safety Light Curtain F3SG-R Series User's Manual* for the dimensions when using the F3SG-4RA0190-30 and F3SG-4RA0160-14.

Backside Mounting



F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension G	C1+77.5
Dimension H	C1+103
Dimension I	C1+122
Dimension P	20

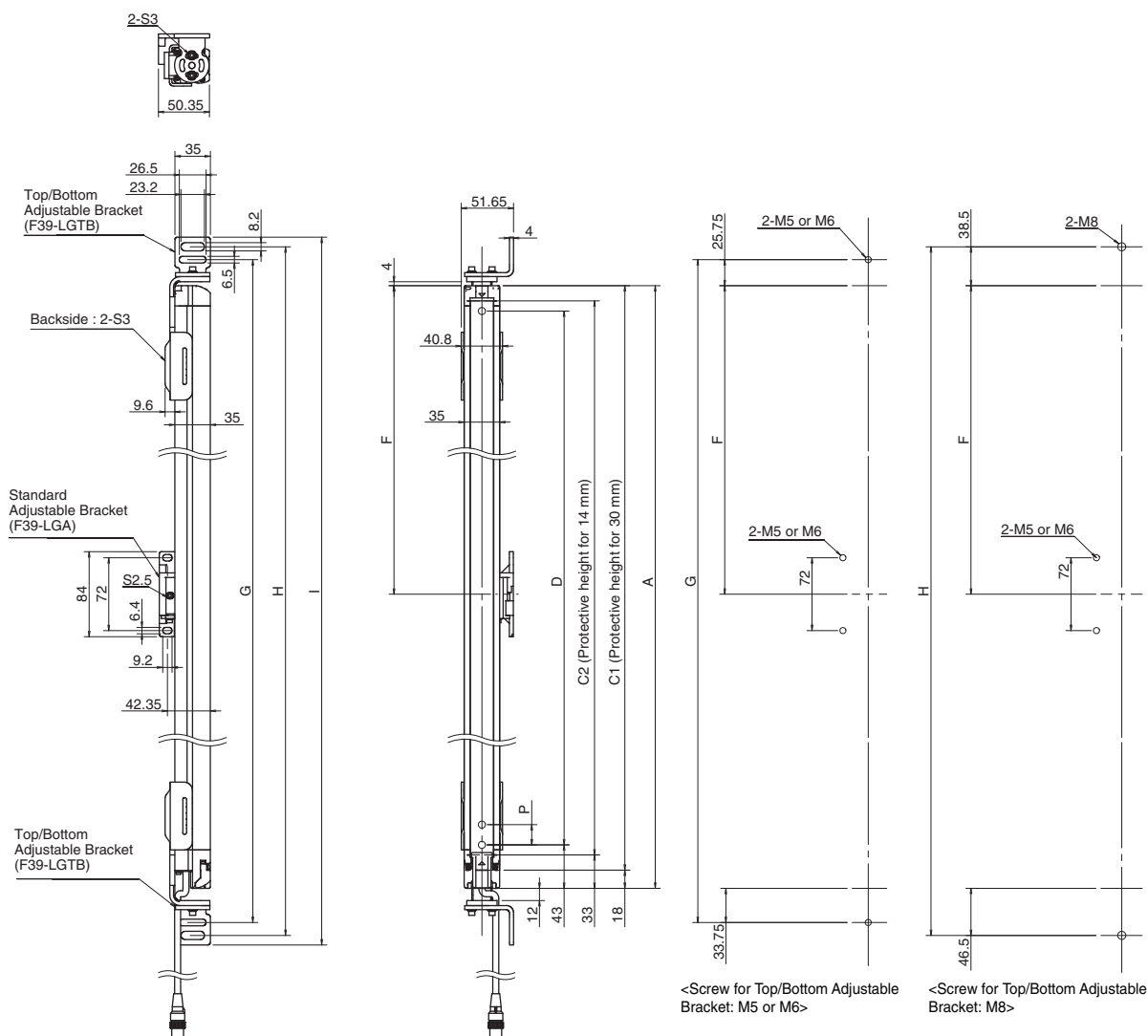
F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension G	C2+107.5
Dimension H	C2+133
Dimension I	C2+152
Dimension P	10

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.

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.

Side Mounting



F3SG-□RA□□□□-30 Series

Dimension A	C1+18
Dimension C1	4-digit number of the type name (Protective height)
Dimension D	C1-50
Dimension G	C1+77.5
Dimension H	C1+103
Dimension I	C1+122
Dimension P	20

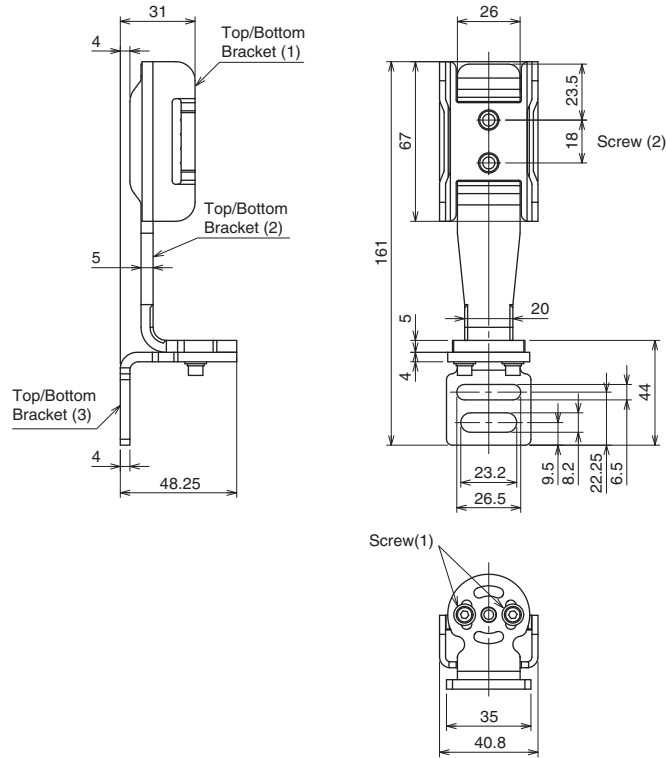
F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension G	C2+107.5
Dimension H	C2+133
Dimension I	C2+152
Dimension P	10

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.

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.

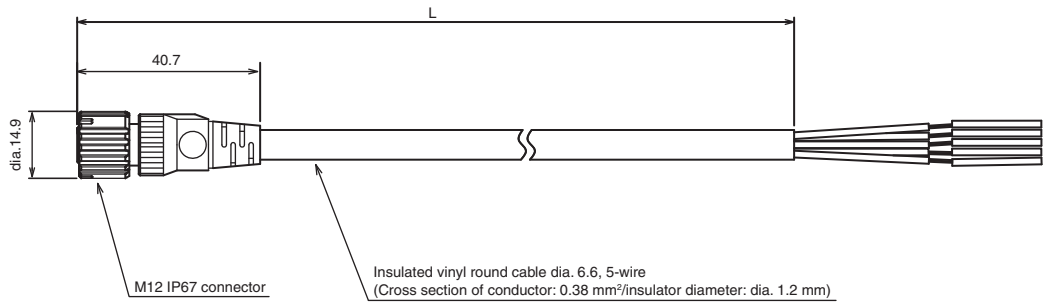
Top/Bottom Adjustable Bracket (F39-LGTB)



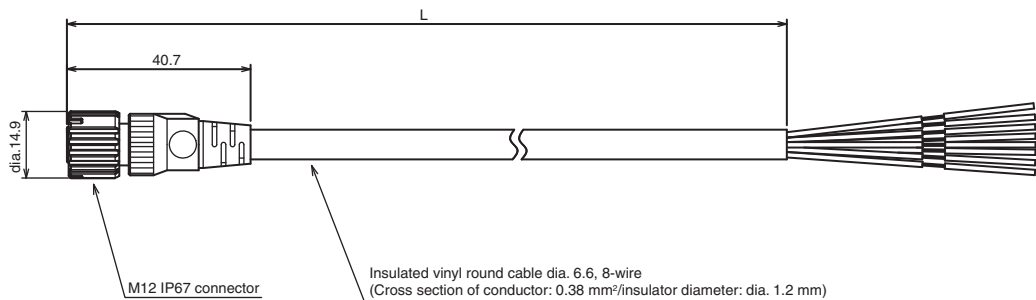
Material: SUS304

Accessories

Single-Ended Cable for Emitter (F39-JG□A-L, sold separately)

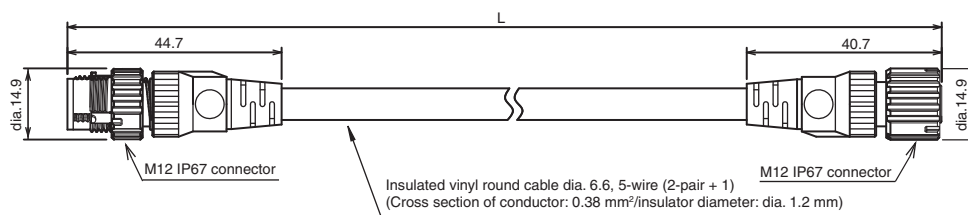


Single-Ended Cable for Receiver (F39-JG□A-D, sold separately)

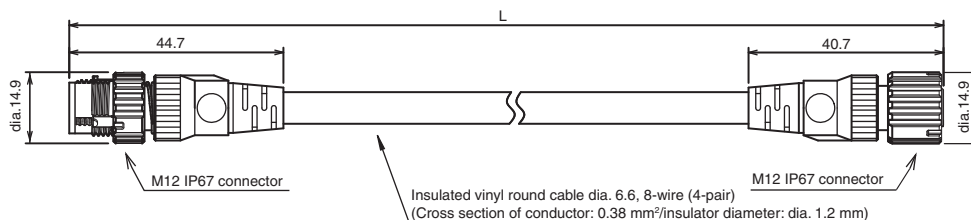


Emitter cable (Gray)	Receiver cable (Black)	L (m)
F39-JG3A-L	F39-JG3A-D	3
F39-JG7A-L	F39-JG7A-D	7
F39-JG10A-L	F39-JG10A-D	10
F39-JG15A-L	F39-JG15A-D	15
F39-JG20A-L	F39-JG20A-D	20

Double-ended Cable for Emitter: Cable for extension (F39-JG□B-L, sold separately)

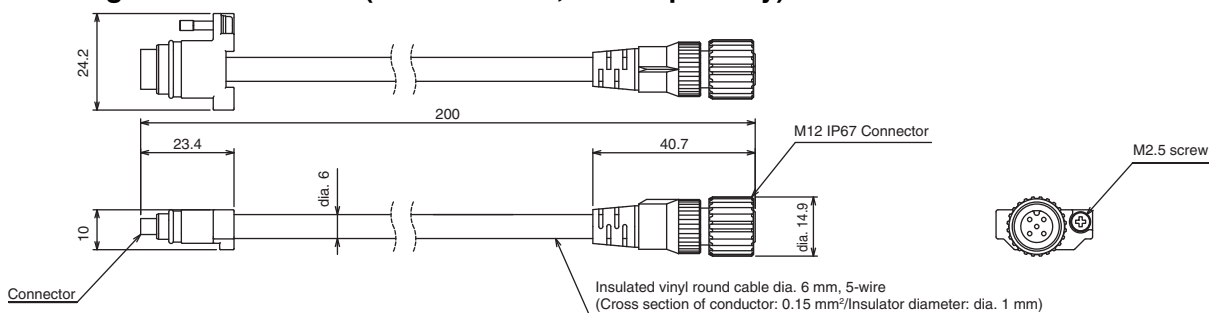


Double-Ended Cable for Receiver: Cable for extension (F39-JG□B-D, sold separately)

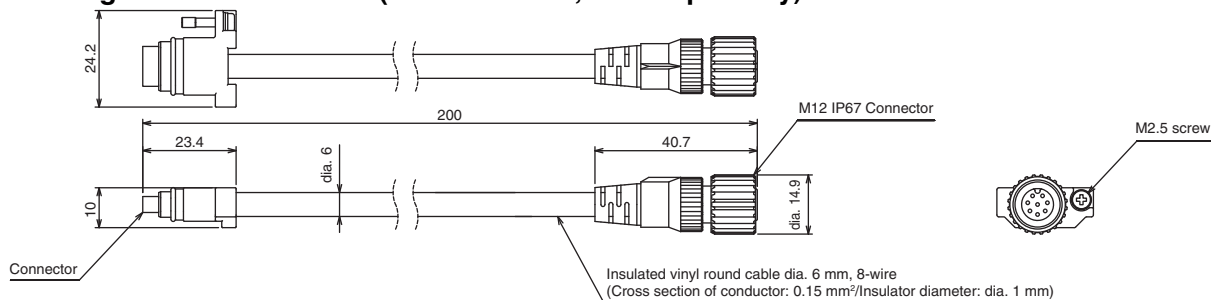


Emitter cable (Gray)	Receiver cable (Black)	L (m)
F39-JGR5B-L	F39-JGR15B-D	0.5
F39-JG1B-L	F39-JG1B-D	1
F39-JG3B-L	F39-JG3B-D	3
F39-JG5B-L	F39-JG5B-D	5
F39-JG7B-L	F39-JG7B-D	7
F39-JG10B-L	F39-JG10B-D	10
F39-JG15B-L	F39-JG15B-D	15
F39-JG20B-L	F39-JG20B-D	20

Cascading Cable for Emitter (F39-JGR2W-L, sold separately)

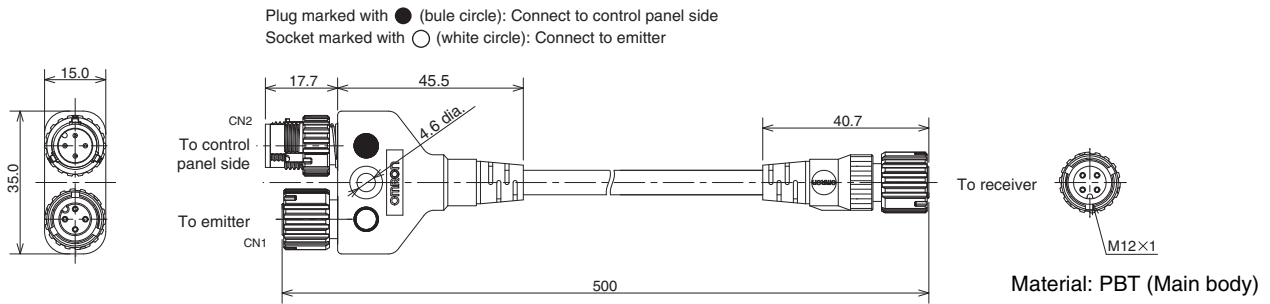


Cascading Cable for Receiver (F39-JGR2W-D, sold separately)

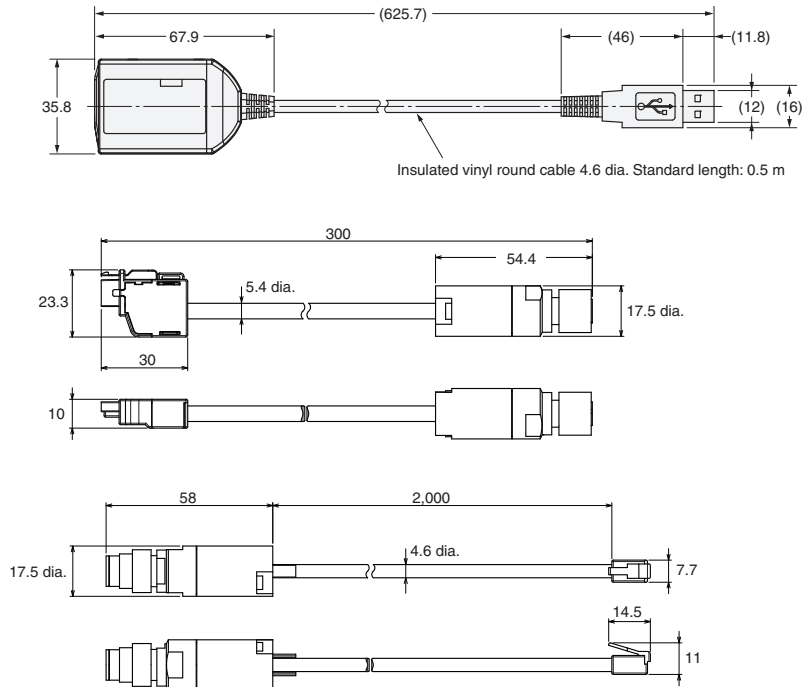


F3SG-RA

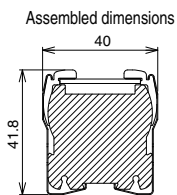
Y-Joint Plug/Socket Connector (F39-GCNY2, sold separately)



Interface Unit (F39-GIF)



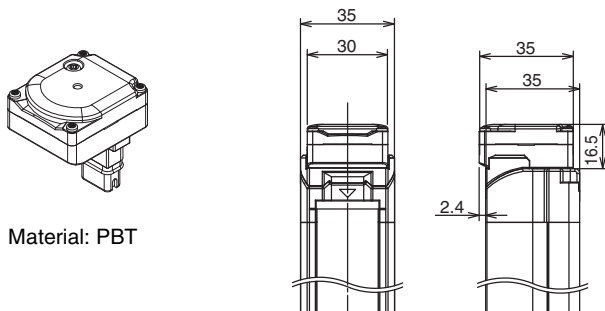
Spatter Protection Cover (F39-HGA)



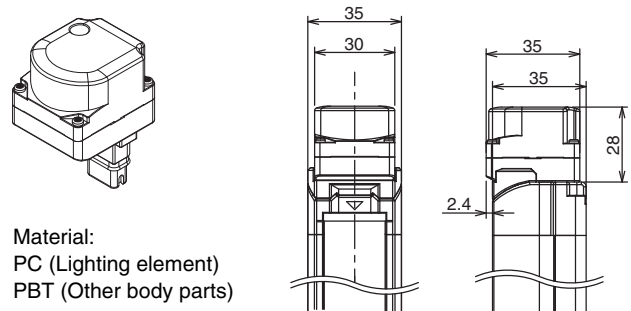
Model	Total length
F39-HGA□□□□	□□□□+4
F39-HGA0550	558

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

Bluetooth unit (F39-BT)



Bluetooth + Lamp unit (F39-BTLP) Lamp (F39-LP)



Related Manuals

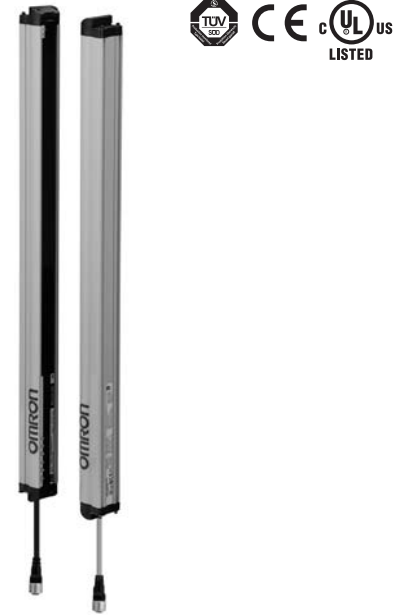
ManNo.	Model	Manual name
Z352	F3SG-□R□□□□□□□□	Safety Light Curtain F3SG-□R Series User's Manual

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



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)


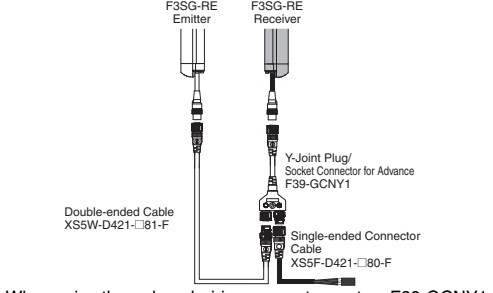
Single-ended Connector Cable (Round Water-resistant Connector: Connector Connected to Cable, Socket on One Cable End)

Appearance	Type	Cable length	Specifications	Model																				
	M12 connector (4-pin), 4 wires	1 m	 <table border="1" data-bbox="842 331 1168 425"> <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																							





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" data-bbox="842 622 1061 705"> <thead> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Brown</td> <td>White</td> <td>Blue</td> <td>Black</td> <td>Brown</td> <td>White</td> <td>Blue</td> <td>Black</td> </tr> </tbody> </table> 	1	2	3	4	1	2	3	4	Brown	White	Blue	Black	Brown	White	Blue	Black	XS5W-D421-C81-F
		1		2	3	4	1	2	3	4										
		Brown		White	Blue	Black	Brown	White	Blue	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																			

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

Sensor Mounting Brackets

Appearance	Specification	Application	Model
	Standard Fixed Bracket	Bracket to mount the F3SG-R. Side mounting and backside mounting possible. (Included in the F3SG-R product package. See *1 below for the number of included brackets.)	F39-LGF
	Standard Adjustable Bracket	Bracket to mount the F3SG-R. Beam alignment after mounting possible. The angle adjustment range is $\pm 15^\circ$. Side mounting and backside mounting possible. (Sold separately. See *1 below for the number of required brackets.)	F39-LGA
	Top/Bottom Adjustable Bracket *2	Bracket to mount the F3SG-R. Use this bracket at the top and bottom positions of the F3SG-R. Beam alignment after mounting possible. The angle adjustment range is $\pm 22.5^\circ$. Side mounting and backside mounting possible. (Sold separately. 4 brackets per set.)	F39-LGTB
	Top/Bottom Adjustable Bracket *2 (For user-made mounting part)	Top/Bottom Adjustable Bracket without a bracket to mount to the wall. Use the user's own wall mounting part to suit the machine. (Sold separately. 4 brackets per set.)	F39-LGTB-1


*1 Two brackets per set

[for F3SG-□RE□□□□□14] Protective height of 0160 to 1200: 2 sets, Protective height of 1280 to 2080: 3 sets

[for 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

*2 Top/Bottom Adjustable Bracket cannot be used with the Standard Fixed Bracket. Use with the Standard Adjustable Bracket. (See *1 for the number of required brackets.)


Laser Pointer for F3SG-R

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

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

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

		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 or in cascaded connection Refer to page 50 .			
	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		
Light Source	Infrared LEDs, Wavelength: 870 nm			
Startup Waiting Time	2 s max.			

		F3SG-4RE□□□□-14, F3SG-2RE□□□□-14	F3SG-4RE□□□□-30, F3SG-2RE□□□□-30	
Electrical	Power Supply Voltage (Vs)	SELV/PELV 24 VDC±20% (ripple p-p 10% max.)		
	Current Consumption	Refer to page 50		
	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 51	
	Protective Circuit		Output short protection, Power supply reverse polarity protection	
Insulation Resistance		20 MΩ or higher (500 VDC megger)		
Dielectric Strength		1,000 VAC, 50/60 Hz (1 min)		
Functional	Test Function	Self-test (at power-on, and during operation)		
Environmental	Ambient Temperature	Operating	-10 to 55°C (14 to 131°F) (non-icing)	
		Storage	-25 to 70°C (-13 to 158°F)	
	Ambient Humidity	Operating	35% to 85% (non-condensing)	
		Storage	35% to 95%	
	Ambient Illuminance		Incandescent lamp: 3,000 lx max. on receiver surface Sunlight: 10,000 lx max. on receiver surface	
	Degree of Protection (IEC 60529)		IP65 and IP67	
	Vibration Resistance (IEC 61496-1)		10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes	
Shock Resistance (IEC 61496-1)		100 m/s ² , 1000 shocks for all 3 axes		
Pollution Degree (IEC 60664-1)		Pollution Degree 3		
Connections	Power cable	Type of Connection	M12 connectors: 4-pin, IP67 rated when mated, Cables prewired to the sensors	
		Number of Wires	Emitter: 4, Receiver: 4	
		Cable Length	0.3 m	
		Cable Diameter	6 mm	
		Minimum Bending Radius	R5 mm	
	Extension cable - Single-ended cable - Double-ended cable	Type of Connection	Use the XS5□-D42□ series cables.	
		Number of Wires		
Cable Length				
Cable Diameter				
Minimum Bending Radius				
Extension of Power Cable		100 m max.		
Material	Material	Housing: Aluminum Cap: PBT Front window: PMMA Cable: Oil resistant PVC Mounting Bracket: ZDC2 FE plate: SUS		
	Weight (packaged)	Refer to page 50.		
	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 19	
	Performance Level (PL)/Safety category	Type 4	PL e/Category 4 (EN ISO 13849-1:2008)	
		Type 2	PL c/Category 2 (EN ISO 13849-1:2008)	
	PFHd	9.1 × 10 ⁻⁹ (IEC 61508)		
	Proof test interval T _M	Every 20 years (IEC 61508)		
	SFF	99% (IEC 61508)		
HFT	1 (IEC 61508)			
Classification		Type B (IEC 61508-2)		

F3SG-RE

List of Models/Response Time/Current Consumption/Weight

F3SG-□RE□□□□□-14

Model	Number of Beams	Protective Height [mm]	Response Time[ms]			Current Consumption[mA]		Weight [kg] *
			ON→OFF	OFF (Synchronized) →ON	OFF (Not synchronized) →ON	Emitter	Receiver	
F3SG-□RE0160□14	15	160	5	25	125	45	50	1.7
F3SG-□RE0240□14	23	240	5	25	125	55	55	1.9
F3SG-□RE0320□14	31	320	7	35	135	55	55	2.1
F3SG-□RE0400□14	39	400	7	35	135	65	60	2.6
F3SG-□RE0480□14	47	480	7	35	135	70	60	2.8
F3SG-□RE0560□14	55	560	7	35	135	80	60	3.1
F3SG-□RE0640□14	63	640	7	35	135	85	65	3.3
F3SG-□RE0720□14	71	720	9	45	145	80	65	3.8
F3SG-□RE0800□14	79	800	9	45	145	85	70	4.0
F3SG-□RE0880□14	87	880	9	45	145	90	70	4.2
F3SG-□RE0960□14	95	960	9	45	145	95	75	4.4
F3SG-□RE1040□14	103	1040	9	45	145	100	75	4.6
F3SG-□RE1120□14	111	1120	11	55	155	90	75	4.7
F3SG-□RE1200□14	119	1200	11	55	155	95	80	4.9
F3SG-□RE1280□14	127	1280	11	55	155	100	80	5.1
F3SG-□RE1360□14	135	1360	11	55	155	105	85	5.6
F3SG-□RE1440□14	143	1440	11	55	155	110	85	5.7
F3SG-□RE1520□14	151	1520	13	65	165	100	90	5.9
F3SG-□RE1600□14	159	1600	13	65	165	105	90	6.5
F3SG-□RE1680□14	167	1680	13	65	165	110	95	6.7
F3SG-□RE1760□14	175	1760	13	65	165	115	95	6.9
F3SG-□RE1840□14	183	1840	13	65	165	115	95	7.1
F3SG-□RE1920□14	191	1920	15	75	175	110	100	7.3
F3SG-□RE2000□14	199	2000	15	75	175	115	100	7.4
F3SG-□RE2080□14	207	2080	15	75	175	115	105	8.0

* The weight includes an emitter, a receiver and included brackets in a product package.

F3SG-□RE□□□□□30

Model	Number of Beams	Protective Height [mm]	Response Time[ms]			Current Consumption[mA]		Weight [kg] *
			ON→OFF	OFF (Synchronized) →ON	OFF (Not synchronized) →ON	Emitter	Receiver	
F3SG-□RE0190□30	8	190	5	25	125	40	50	1.7
F3SG-□RE0270□30	12	270	5	25	125	45	50	1.9
F3SG-□RE0350□30	16	350	5	25	125	50	50	2.1
F3SG-□RE0430□30	20	430	5	25	125	55	55	2.6
F3SG-□RE0510□30	24	510	5	25	125	60	55	2.8
F3SG-□RE0590□30	28	590	7	35	135	50	55	3.0
F3SG-□RE0670□30	32	670	7	35	135	55	55	3.2
F3SG-□RE0750□30	36	750	7	35	135	60	60	3.8
F3SG-□RE0830□30	40	830	7	35	135	65	60	4.0
F3SG-□RE0910□30	44	910	7	35	135	65	60	4.2
F3SG-□RE0990□30	48	990	7	35	135	70	60	4.4
F3SG-□RE1070□30	52	1070	7	35	135	75	60	4.5
F3SG-□RE1150□30	56	1150	7	35	135	80	65	4.7
F3SG-□RE1230□30	60	1230	7	35	135	85	65	4.9
F3SG-□RE1310□30	64	1310	7	35	135	85	65	5.1
F3SG-□RE1390□30	68	1390	9	45	145	75	65	5.5
F3SG-□RE1470□30	72	1470	9	45	145	80	65	5.7
F3SG-□RE1550□30	76	1550	9	45	145	80	70	5.9
F3SG-□RE1630□30	80	1630	9	45	145	85	70	6.4
F3SG-□RE1710□30	84	1710	9	45	145	85	70	6.6
F3SG-□RE1790□30	88	1790	9	45	145	90	70	6.8
F3SG-□RE1870□30	92	1870	9	45	145	95	75	7.0
F3SG-□RE1950□30	96	1950	9	45	145	95	75	7.2
F3SG-□RE2030□30	100	2030	9	45	145	100	75	7.3
F3SG-□RE2110□30	104	2110	9	45	145	100	75	7.9
F3SG-□RE2190□30	108	2190	11	55	155	90	75	8.1
F3SG-□RE2270□30	112	2270	11	55	155	95	80	8.2
F3SG-□RE2350□30	116	2350	11	55	155	95	80	8.7
F3SG-□RE2430□30	120	2430	11	55	155	95	80	8.8
F3SG-□RE2510□30	124	2510	11	55	155	100	80	9.0

* The weight includes an emitter, a receiver and included brackets in a product package.

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

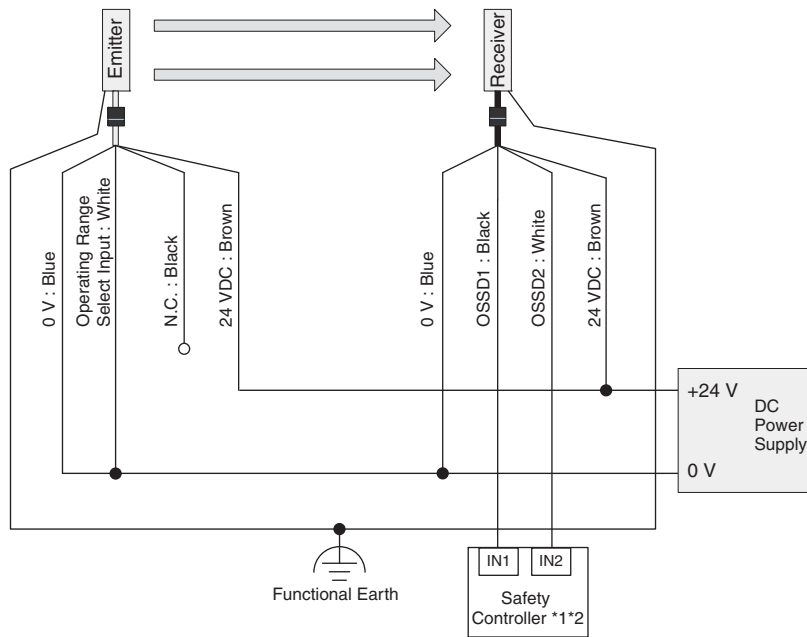
Receiver

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	–

F3SG-RE

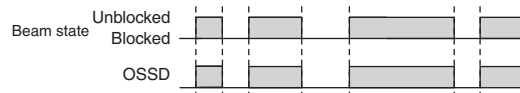
Connections (Basic Wiring Diagram)

Short Mode

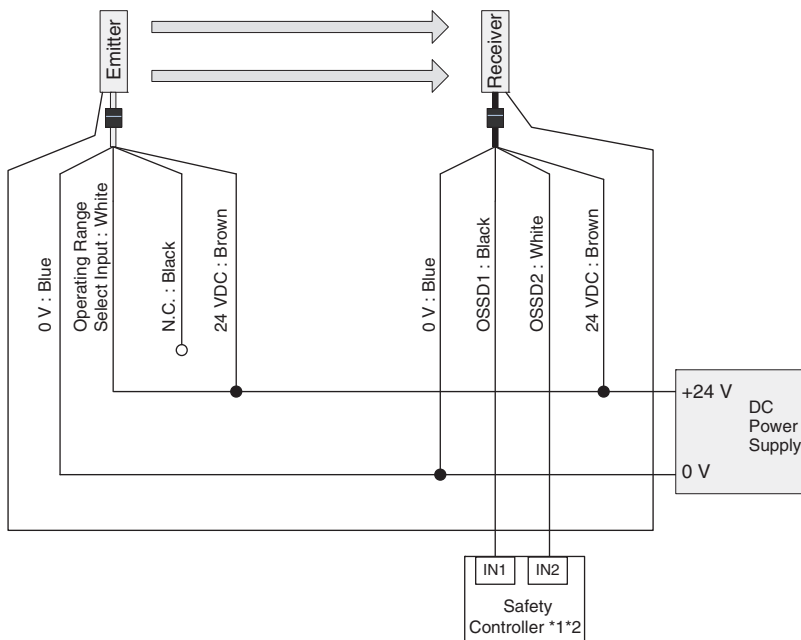


*1. Refer to page 49 for more information.

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

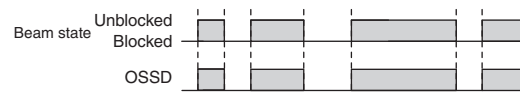


Long Mode

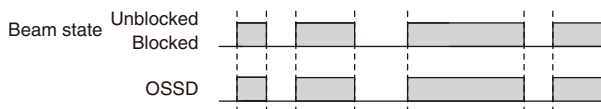
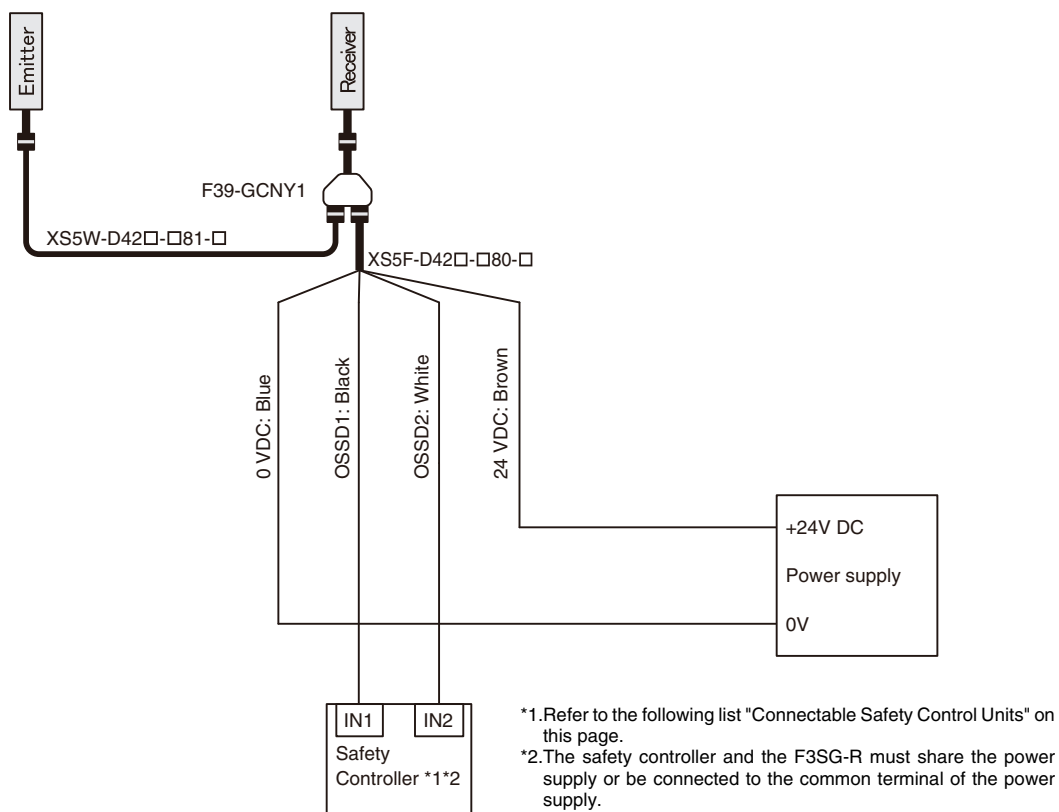


*1. Refer to page 49 for more information.

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



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



Note: When using the reduced wiring connector system F39-GCNY1, the Operating Range Selection is fixed to Long Mode.

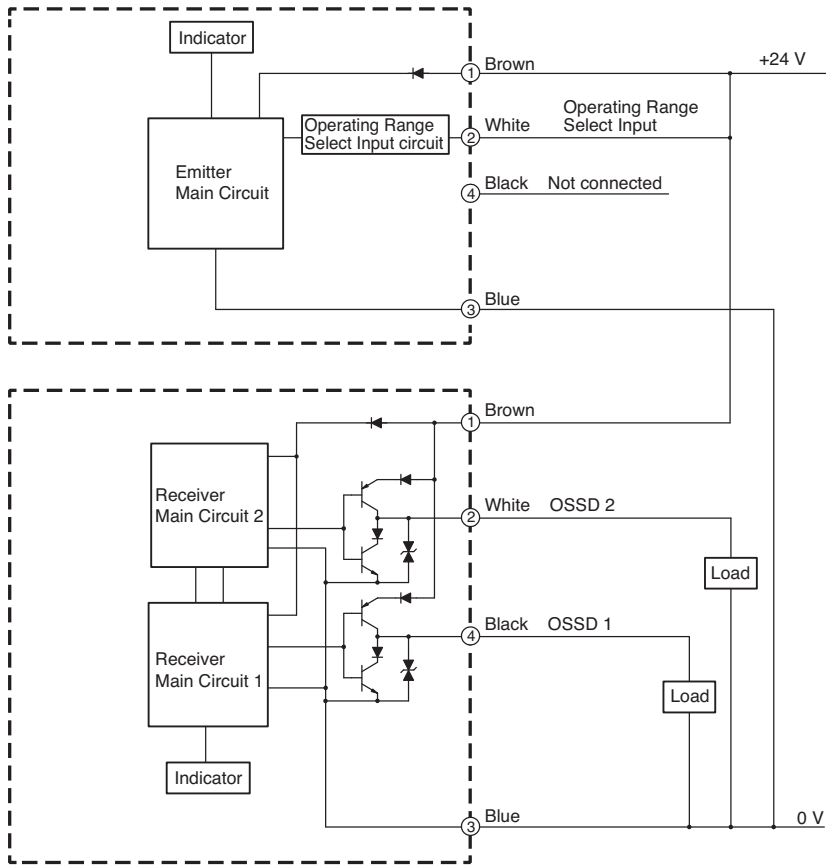
Connectable Safety Control Units

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

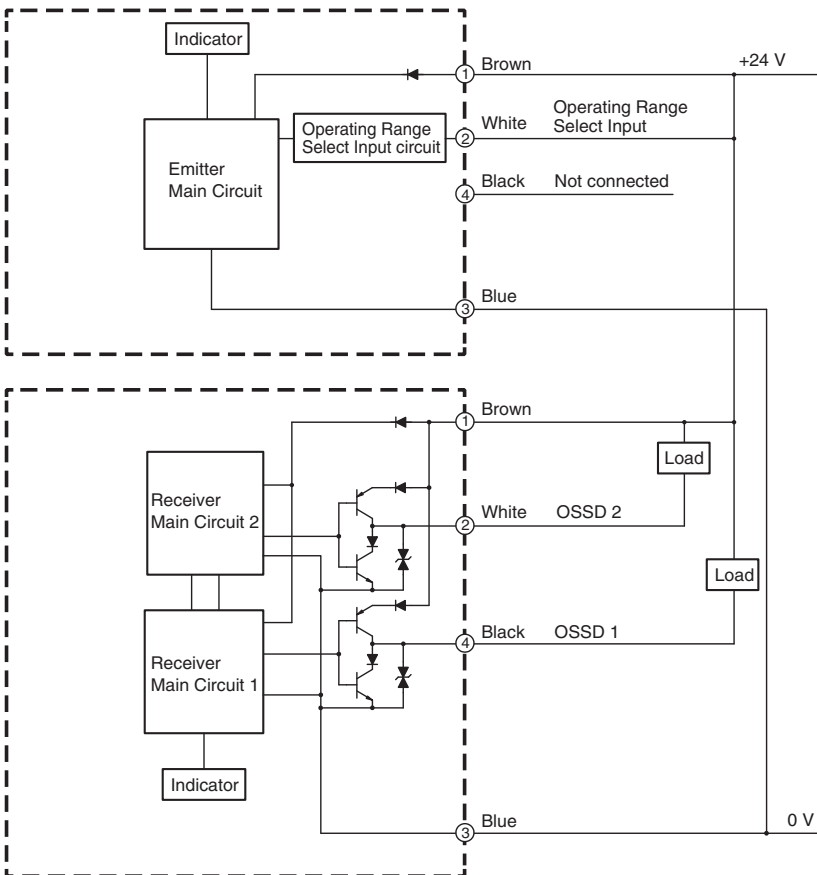
Connectable Safety Control Units (PNP output)		
<p>G9SA-301 G9SA-321 G9SA-501 G9SB-200-B G9SB-200-D G9SB-301-B G9SB-301-D G9SE-201 G9SE-401 G9SE-221-T□</p>	<p>G9SX-AD322-T G9SX-ADA222-T G9SX-BC202 G9SX-GS226-T15</p>	<p>G9SP-N10S G9SP-N10D G9SP-N20S NE0A-SCPU01 NE1A-SCPU01 NE1A-SCPU02 DST1-ID12SL-1 DST1-MD16SL-1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

Input/Output Circuit

PNP Output



NPN Output

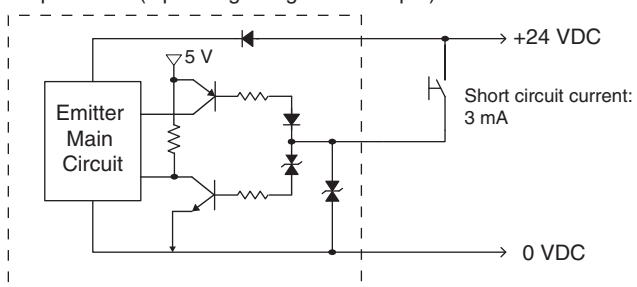


Input Circuit Diagram by Function

The input circuit diagrams of by function are shown below.

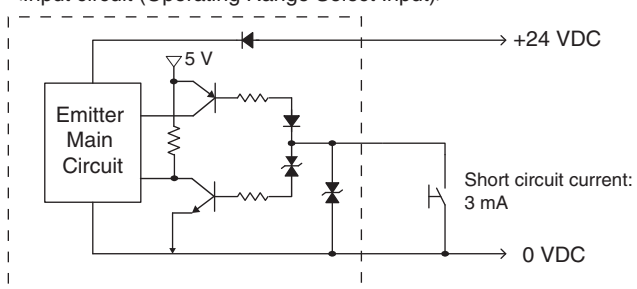
PNP Output

<Input circuit (Operating Range Select Input)>



NPN Output

<Input circuit (Operating Range Select Input)>



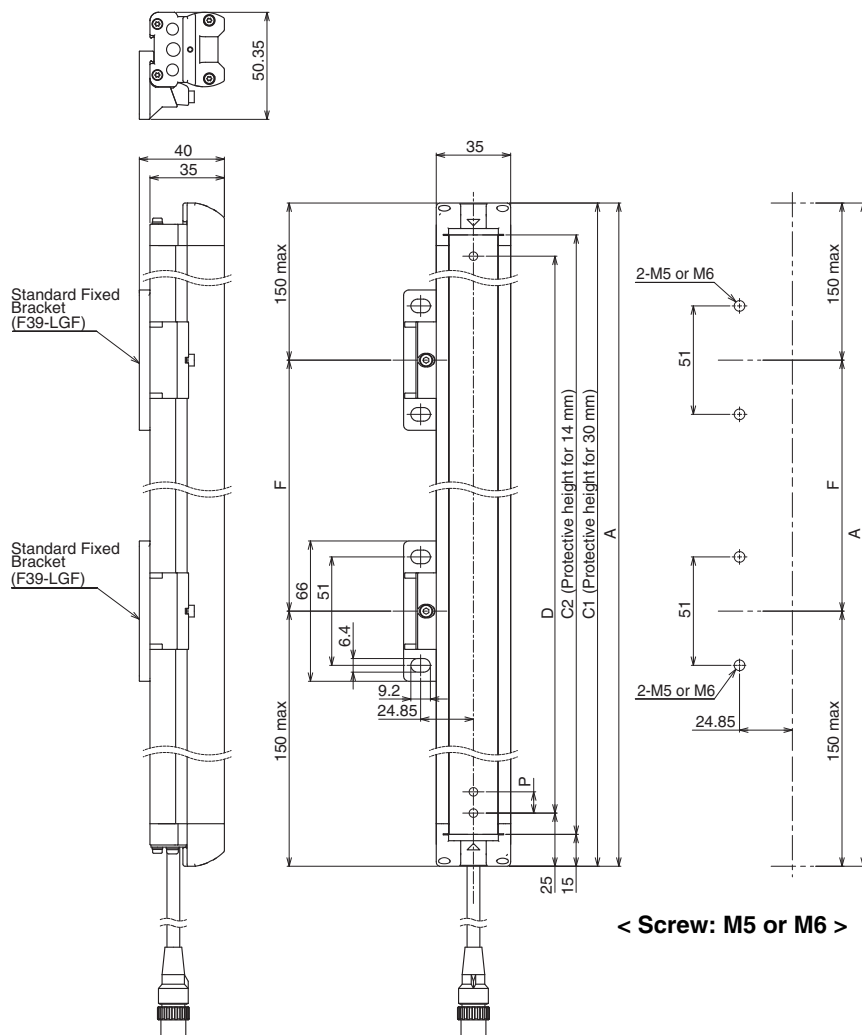
F3SG-RE

Dimensions

(Unit: mm)

Mounted with Standard Fixed Brackets (F39-LGF)

Backside Mounting



< Screw: M5 or M6 >

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

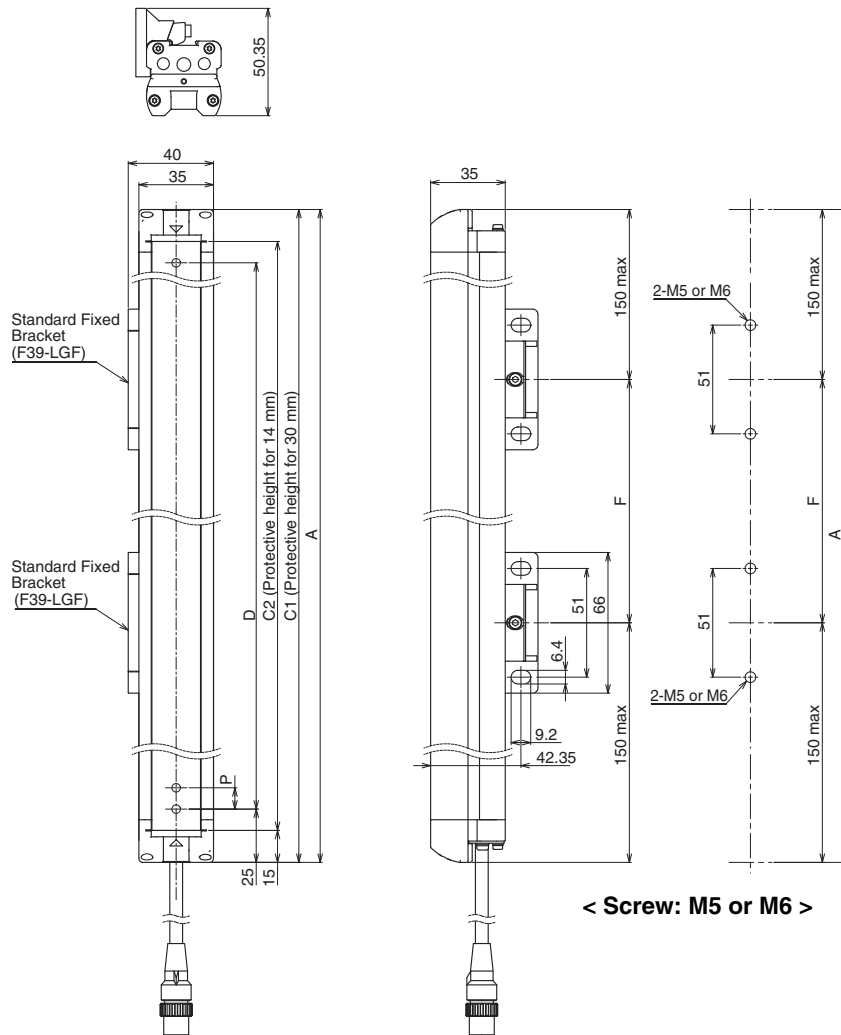
Protective height (C1)	Number of Standard Fixed Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

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	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

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

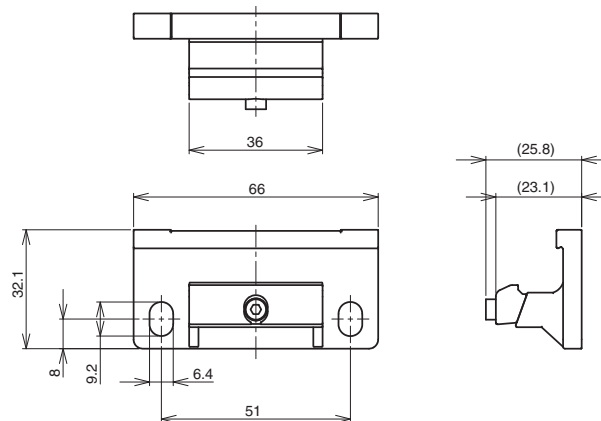
Protective height (C1)	Number of Standard Fixed Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

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

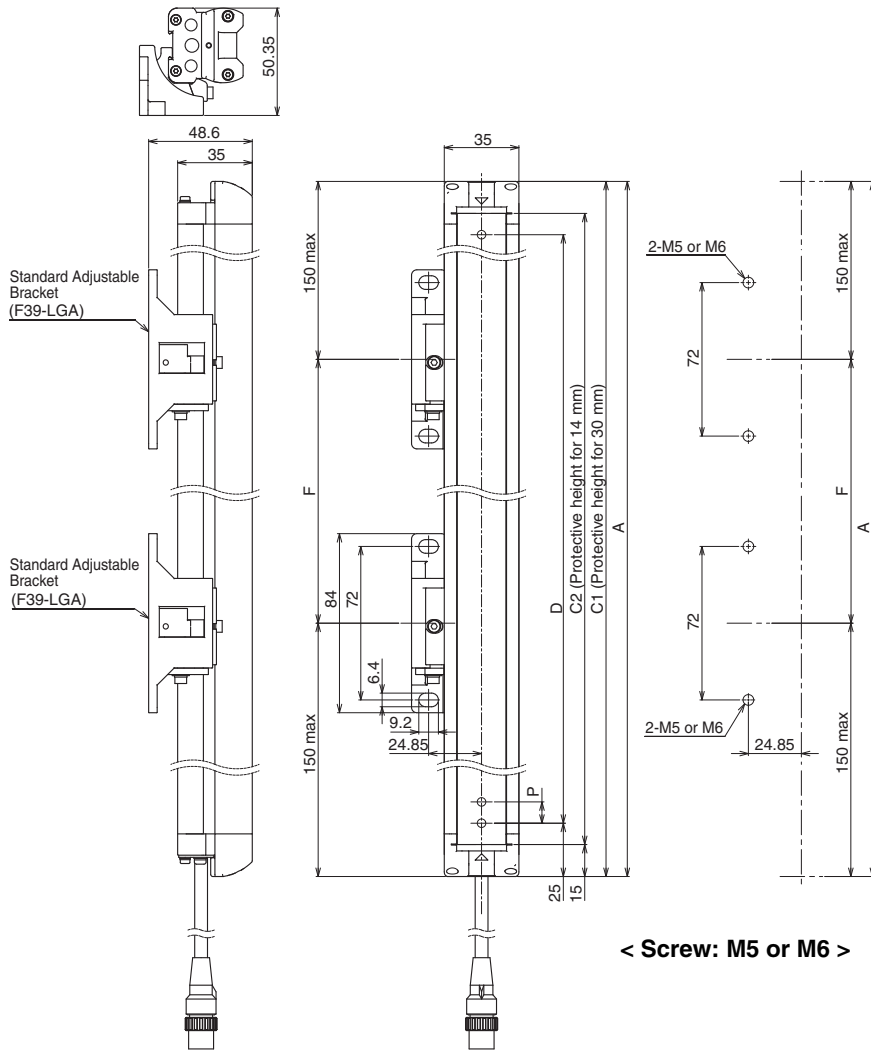
Protective height (C2)	Number of Standard Fixed Brackets	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

Standard Fixed Bracket(F39-LGF)



Material: ZDC2

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



F3SG-4RE□□□□30 Series

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

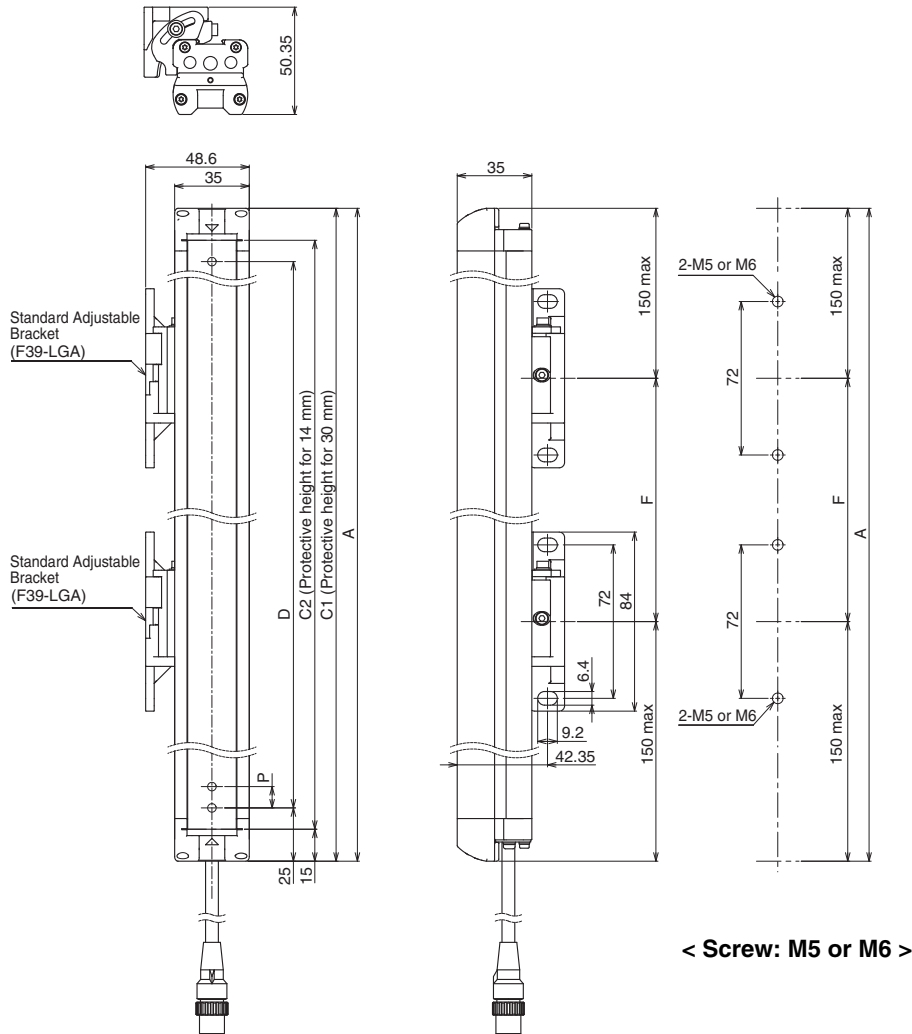
Protective height (C1)	Number of Standard Adjustable Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

F3SG-4RE□□□□14 Series

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

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

Side Mounting



F3SG-4RE□□□□30 Series

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

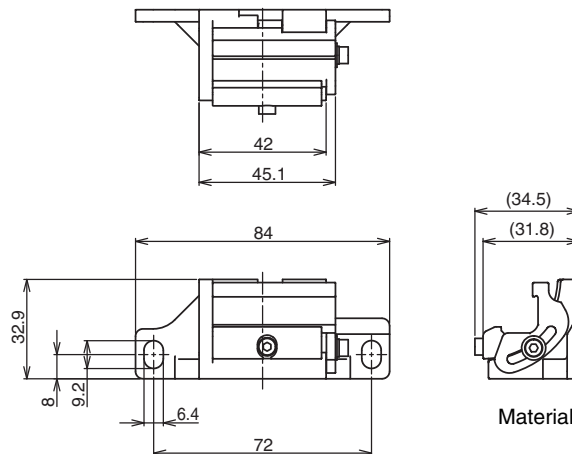
Protective height (C1)	Number of Standard Adjustable Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

F3SG-4RE□□□□14 Series

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

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

Standard Fixed Bracket (F39-LGA)



Material: ZDC2, Fluorochemical lubricant oil

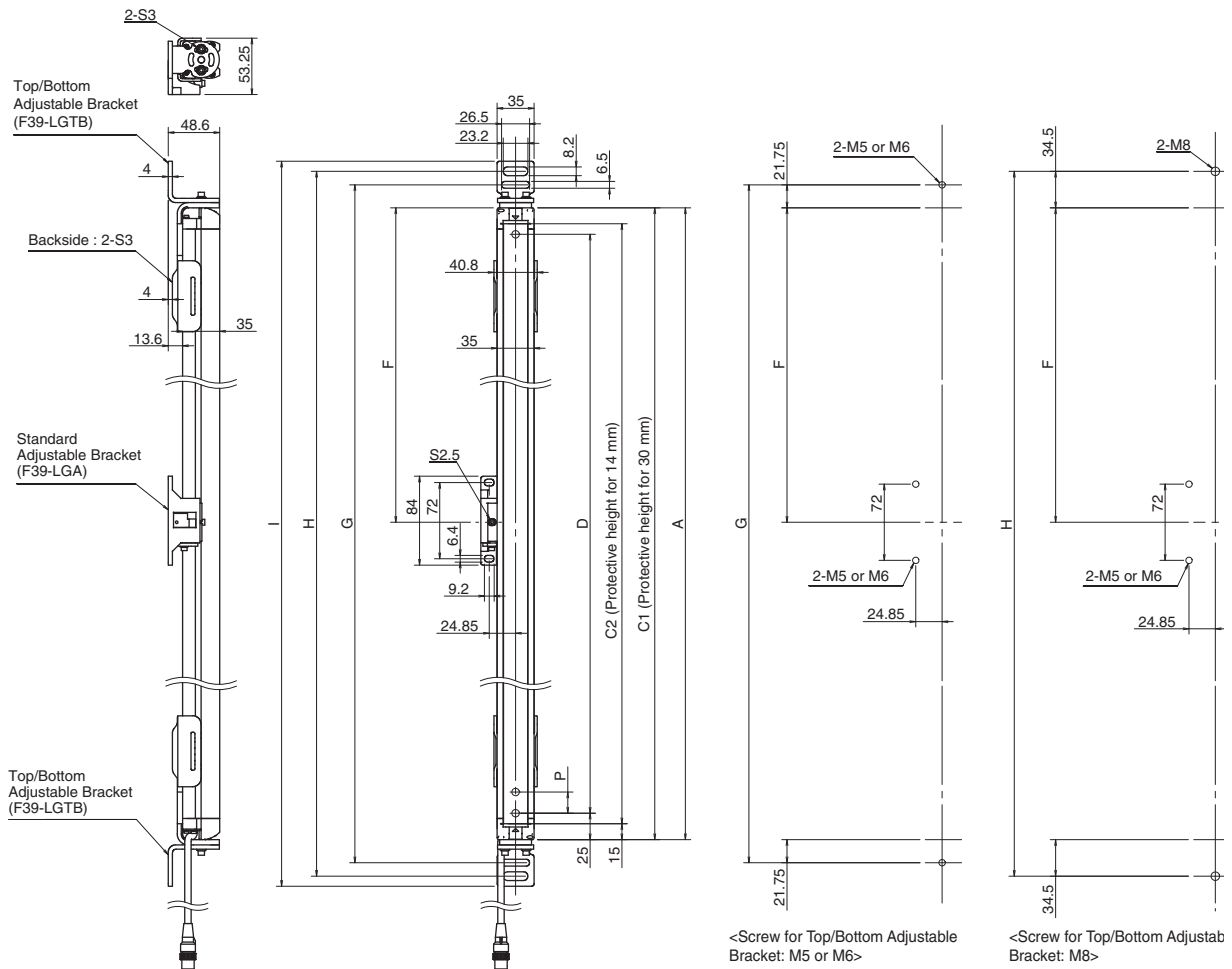
F3SG-RE

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

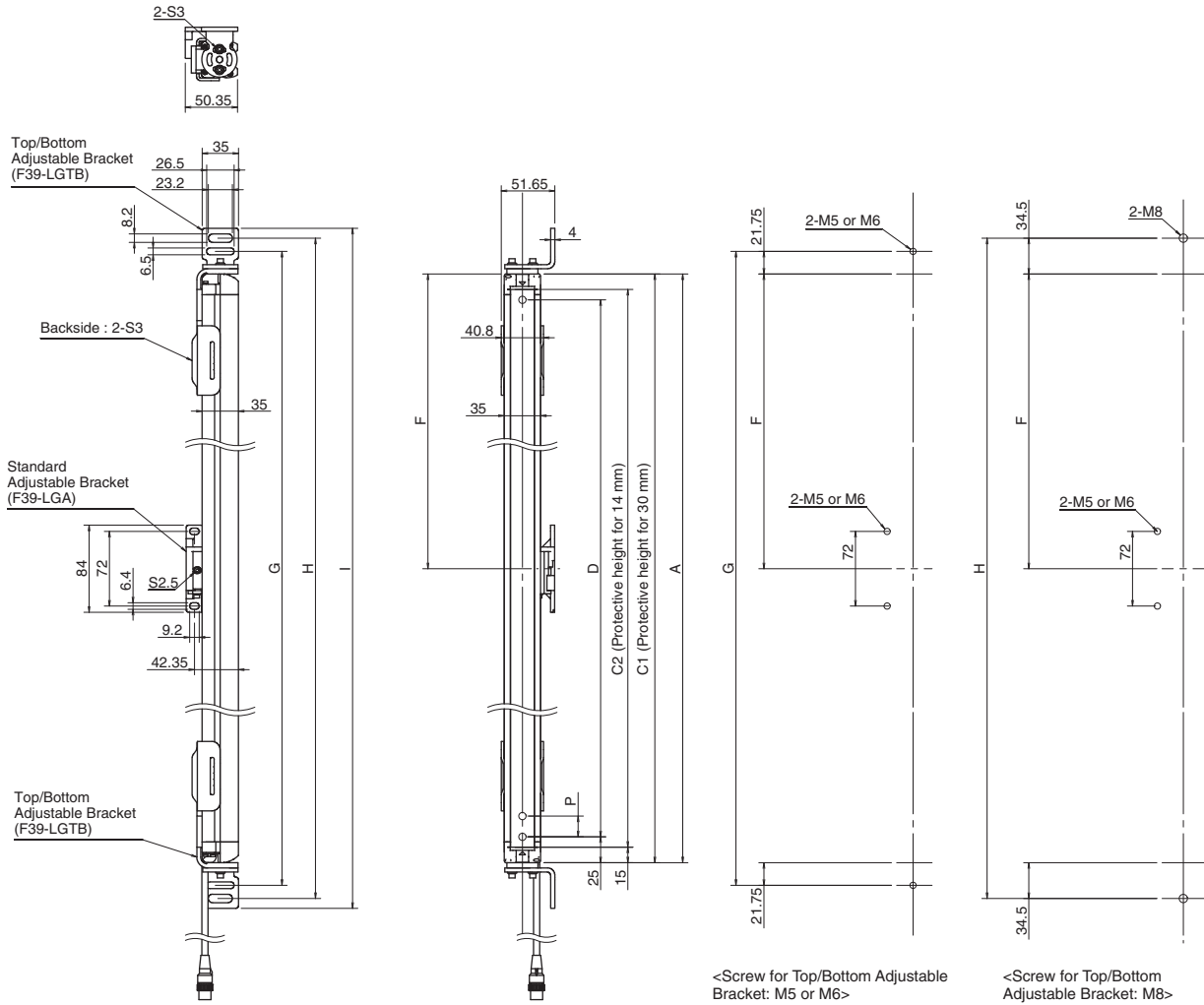
Protective height (C1)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0270 to 1070	2	0	-
1150 to 1950	2	1	1000 mm max.
2030 to 2510	2	2	1000 mm max.

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.

Side Mounting



<Screw for Top/Bottom Adjustable Bracket: M5 or M6>

<Screw for Top/Bottom Adjustable Bracket: M8>

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

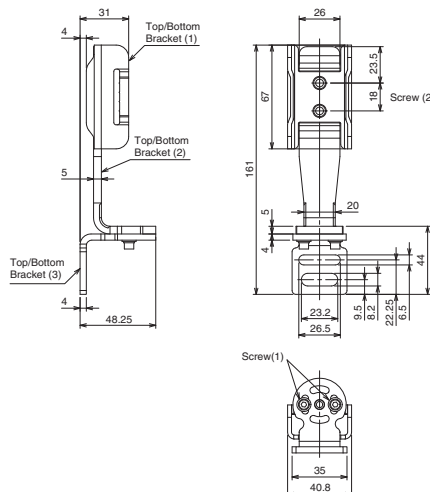
Protective height (C1)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0270 to 1070	2	0	-
1150 to 1950	2	1	1000 mm max.
2030 to 2510	2	2	1000 mm max.

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.

Top/Bottom Adjustable Bracket (F39-LGTB)

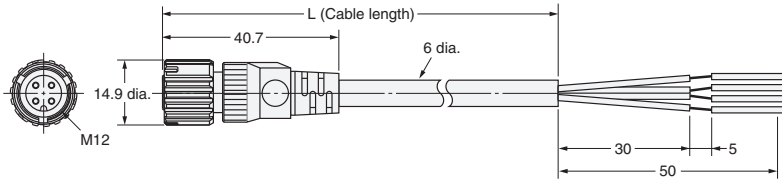


Material: SUS304

F3SG-RE

Accessories

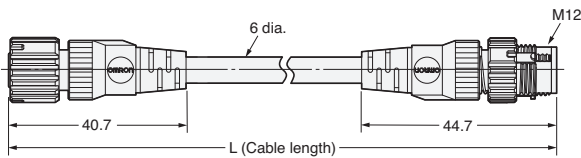
Round Water-resistant Connector: Connector Connected to Cable, Socket on One Cable End (XS5F-D421-□80-F, sold separately)



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)

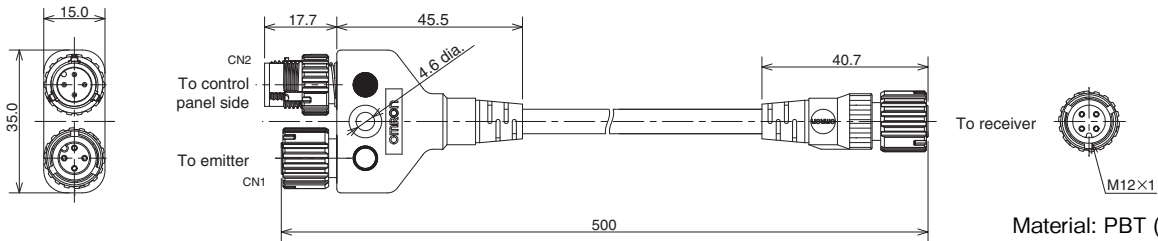


Material: Insulated vinyl round cable

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

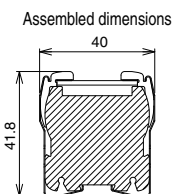
Y-Joint Plug/Socket Connector (F39-GCNY1, sold separately)

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



Material: PBT (Main body)

Spatter Protection Cover(F39-HGA/-HGB)



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

Smart Muting Actuator

F3W-MA



Integrated muting sensor based on multi-beam photoelectric sensor

- A muting system can be configured easily in combination with the safety light curtain.
- Muting functions can be stably performed even when workpieces with holes pass.



Ordering Information

Smart Muting Actuator

Appearance	Beam Gap between Muting Trigger Beams	output	Number of Beams	Model
	100 mm	PNP output	8	F3W-MA0100P
	300 mm		20	F3W-MA0300P

Note: Use with the PNP output model safety light curtain.

Accessories (Sold separately)

Single-ended Connector Cable

Appearance	Type	Cable length	Specifications	Model																							
	M12 connector (5-pin), 5 wires Color: Gray	3 m	<table border="1"> <tr><td>1</td><td>+24 VDC</td><td>Brown</td></tr> <tr><td>2</td><td>CFG In</td><td>Black</td></tr> <tr><td>3</td><td>0 VDC</td><td>Blue</td></tr> <tr><td>4</td><td>COM+</td><td>White</td></tr> <tr><td>5</td><td>COM-</td><td>Yellow</td></tr> </table>	1	+24 VDC	Brown	2	CFG In	Black	3	0 VDC	Blue	4	COM+	White	5	COM-	Yellow	F39-JG3A-L								
		1		+24 VDC	Brown																						
		2		CFG In	Black																						
		3		0 VDC	Blue																						
		4		COM+	White																						
	5	COM-	Yellow																								
	7 m	F39-JG7A-L																									
	10 m	F39-JG10A-L																									
	15 m	F39-JG15A-L																									
	20 m	F39-JG20A-L																									
For receiver M12 connector (8-pin), 8 wires Color: Black	3 m	<table border="1"> <tr><td>1</td><td>Mute Enable / CFG In / Reset</td><td>Yellow</td></tr> <tr><td>2</td><td>+24 VDC</td><td>Brown</td></tr> <tr><td>3</td><td>COM+</td><td>Gray</td></tr> <tr><td>4</td><td>COM-</td><td>Pink</td></tr> <tr><td>5</td><td>Muting Output A</td><td>Black</td></tr> <tr><td>6</td><td>Muting Output B</td><td>White</td></tr> <tr><td>7</td><td>0 VDC</td><td>Blue</td></tr> <tr><td>8</td><td>CFG Out</td><td>Red</td></tr> </table>	1	Mute Enable / CFG In / Reset	Yellow	2	+24 VDC	Brown	3	COM+	Gray	4	COM-	Pink	5	Muting Output A	Black	6	Muting Output B	White	7	0 VDC	Blue	8	CFG Out	Red	F39-JG3A-D
	1		Mute Enable / CFG In / Reset	Yellow																							
	2		+24 VDC	Brown																							
	3		COM+	Gray																							
	4		COM-	Pink																							
5	Muting Output A	Black																									
6	Muting Output B	White																									
7	0 VDC	Blue																									
8	CFG Out	Red																									
7 m	F39-JG7A-D																										
10 m	F39-JG10A-D																										
15 m	F39-JG15A-D																										
20 m	F39-JG20A-D																										


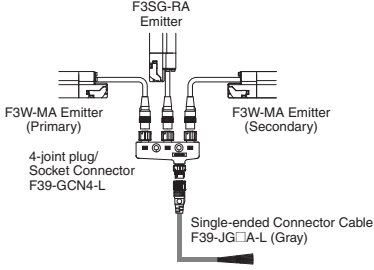

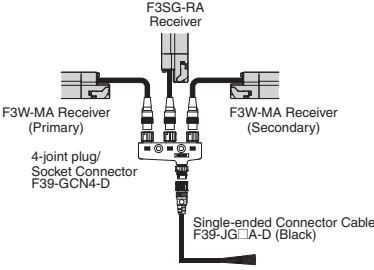

Double-ended Cable

Appearance	Type	Cable length	Specifications	Model
	M12 connector (5-pin) on both ends Color: Gray	0.5 m	<p>Connected to Power Cable or Double-Ended Cable</p> <p>Connected to Single-Ended Cable, Double-Ended cable</p>	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
	M12 connector (8-pin) on both ends Color: Black	0.5 m	<p>Connected to Power Cable or Double-Ended Cable</p> <p>Connected to Single-Ended Cable, Double-Ended cable</p>	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			



F3W-MA

4-Joint Plug/Socket Connector

Used for reduced wiring for connecting F3W-MA with F3SG-RA.

Appearance	Type	Specifications	Model
	For emitter M12 connectors. Used for reduced wiring.		F39-GCN4-L
	For receiver(PNP output) M12 connectors. Used for reduced wiring.		F39-GCN4-D
	Includes one each of F39-GCN4-L and F39-GCN4-D	—	F39-GCN4

Sensor Mounting Brackets

Appearance	Specification	Application	Remarks	Model
	Standard Fixed Bracket	Bracket to mount the F3W-MA. Side mounting and backside mounting possible.	Two brackets per set	F39-LGF
	Standard Adjustable Bracket	Bracket to mount the F3W-MA. Beam alignment after mounting possible. The angle adjustment range is $\pm 15^\circ$. Side mounting and backside mounting possible.	Two brackets per set	F39-LGA

Ratings/Specifications

		F3W-MA0100P	F3W-MA0300P	
Performance	Beam Gap between Muting Trigger Beams	100mm	300mm	
	Number of Beams	8	20	
	Standard Detection Object	30mm		
	Operating Range	Long	0.3 to 20.0 m (1 to 65 ft.)	
		Short	0.3 to 7.0 m (1 to 23 ft.)	
	Response Time	Operation	13 ms max.	
		Reset	26 ms max. (Synchronized) 78 ms max. (Not synchronized)	
	Effective Aperture Angle	±2.5° max., emitter and receiver at operating range of 3 m or greater		
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	Emitter	35mA	45mA
		Receiver	75mA	75mA
	Muting Outputs	Two PNP transistor outputs. * Load current of 300 mA max., Residual voltage of 2 V max. (except for voltage drop due to cable extension)]		
		* This product is a PNP output model. Use with the PNP output model safety light curtain.		
	Output Operation Mode	Muting Output A	Dark-ON (Muting Output A is enabled when MuteA trigger beam is blocked.)	
		Muting Output B	Dark-ON (Muting Output B is enabled when MuteB trigger beam is blocked.)	
	Input Voltage	ON Voltage	[MuteEnable] Vs to Vs-3 V (sink current 5 mA max.) *	
		OFF Voltage	[Mute Enable] 0 to 1/2 Vs, or open *	
		* The Vs indicates a supply voltage value in your environment.		
	Indicators	Refer to page 66. LED Indicator Status		
Protective Circuit	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	Functions	<ul style="list-style-type: none"> - Scan Code Selection - Operation Mode Selection (Point to Point Detection/ Chattering and Void Space Prevention) - Off-Delay - Muting Enable - Muting Trigger Beam Allocation - Operating Range Selection 		
Environmental	Ambient Temperature	Operating	-10 to 55°C (13 to 131°F) (non-icing)	
		Storage	-25 to 70°C (-13 to 158°F)	
	Ambient Humidity	Operating	35% to 85% (non-condensing)	
		Storage	35% to 95%	
	Ambient Illuminance	Incandescent lamp: 3,000 lx max. on receiver surface Sunlight: 10,000 lx max. on receiver surface		
	Degree of Protection (IEC 60529)	IP65 and IP67		
	Vibration Resistance (IEC 61496-1)	10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes		
Shock Resistance (IEC 61496-1)	100 m/s ² , 1000 shocks for all 3 axes			
Pollution Degree (IEC 60664-1)	Pollution Degree 3			
Connections	Extension of Power Cable	100 m max. Note: For T-Shaped configuration with COM lines, the length of cable extension is 30m max.		
Material	Housing: Aluminum, Cap: PBT, Front Window: PMMA, Cable: Oil resistant PVC, FE plate: SUS			
Weight (packaged)	1.8 kg max.	2.8 kg max.		
Included Accessories	Instruction Sheet			

F3W-MA

LED Indicator Status

Shown below are indication statuses of F3W-MA LED indicators when you purchased.

Emitter

Name of Indicator		Color	Illuminated	Blinking
Operating range	LONG	Green	Long Range mode is selected by DIP Switch.	-
Running	RUN	Green	Power is ON.	-
Error	ERR	Red	-	Error in emitter. Generic error happens.

Receiver

Name of Indicator		Color	Illuminated	Blinking
Top-beam-state	TOP	Blue	The top beam is unblocked.	-
Muting output A	MUTE A	Green	Muting Output A is activated.	-
Muting output B	MUTE B	Green	Muting Output B is activated.	-
Off-Delay	DELAY	Yellow	Off-Delay function is enabled by DIP Switch.	-
Chattering/ Void space	CHAT	Green	Chattering and Void Space Prevention mode is selected by DIP Switch.	-
Muting Enable	MUTE DISABLE	Red	The Muting Enable function is enabled and Muting Enable input is turned OFF by DIP Switch.	-
Error	ERR	Red	-	Error in receiver. Generic error happens.
Stable-state	STB	Green	Incident light level is 170% or higher of ON-threshold	-
Running	RUN	Green	Power is ON.	-
Communication	COM	Green	Synchronization between emitter and receiver is maintained.	[Primary sensor] - Start-up (for approx. 3 s) - Synchronization between emitter and receiver is lost
Bottom-beamstate	BTM	Blue	The bottom beam is unblocked.	-

Wiring Examples

Standard Muting Mode with F3SG-R (T-Shaped Configuration with COM lines)

The following is the example of F3W-MA with Scan Code B, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable Disabled (factory default setting).

DIP Switch settings *1

		Function	DIP-SW1	DIP-SW2 *2
F3W-MA Primary	Receiver	Scan Code B (factory default setting)	1 <input checked="" type="checkbox"/> ON	1 <input checked="" type="checkbox"/> ON
		Chattering and Void Space Prevention 1	2 <input checked="" type="checkbox"/> ON 3 <input checked="" type="checkbox"/> ON	2 <input checked="" type="checkbox"/> ON 3 <input checked="" type="checkbox"/> ON
		Off-Delay 100 ms	4 <input checked="" type="checkbox"/> ON 5 <input checked="" type="checkbox"/> ON	4 <input checked="" type="checkbox"/> ON 5 <input checked="" type="checkbox"/> ON
		Muting Enable Disabled (factory default setting)	6 <input checked="" type="checkbox"/> ON	6 <input checked="" type="checkbox"/> ON
	Emitter	Scan Code B (factory default setting)	1 <input checked="" type="checkbox"/> ON	-
F3W-MA Secondary	Receiver Emitter	-	No setting required	No setting required

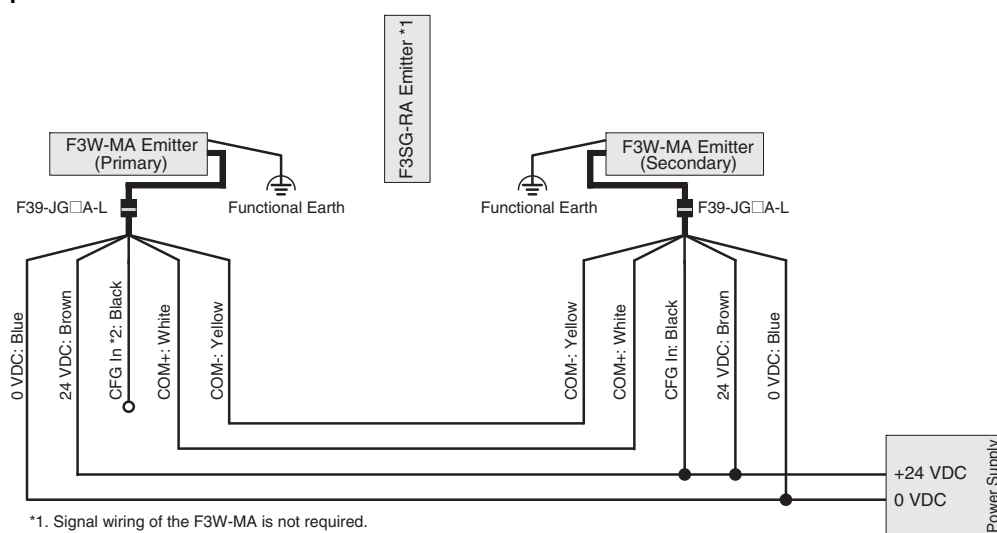
: Indicates a switch position.

*1. Configure functions with the DIP Switches before wiring. Refer to *Smart Muting Actuator F3W-MA Series User's Manual* for more information.

*2. DIP Switch Bank 2 is not used.

Wiring example

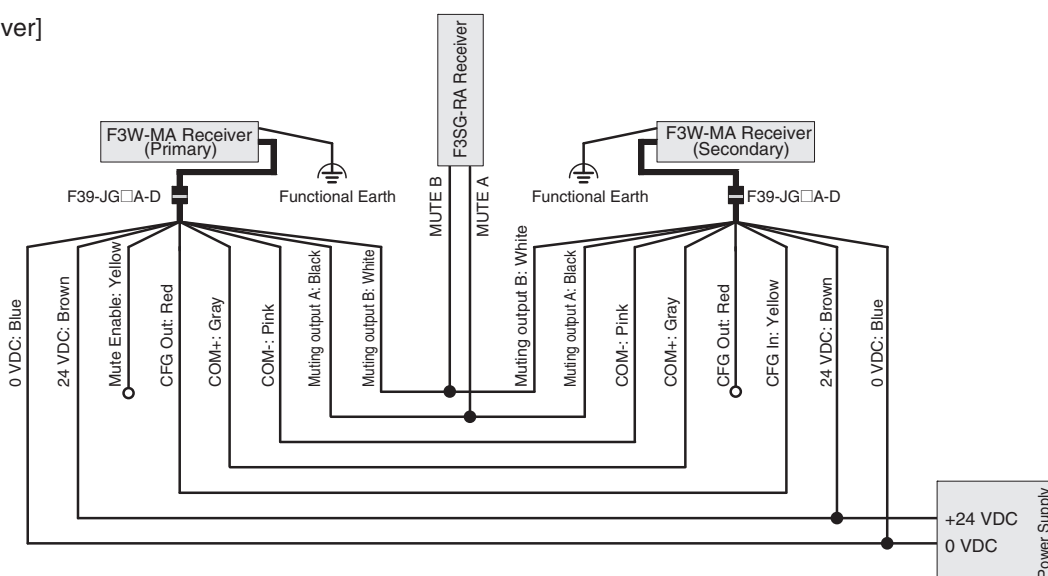
[Emitter]



*1. Signal wiring of the F3W-MA is not required.

*2. Do not connect CFG In line to +24 VDC line. Otherwise, F3W-MA enters the error state.

[Receiver]



Note: 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 *Smart Muting Actuator F3W-MA Series User's Manual* for more information.

Standard Muting Mode with F3SG-R (T-Shaped Configuration with 4-Joint Connector)

The following is the example of F3SG-RA with Scan Code B, External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active, and F3W-MA with Scan Code A, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable disabled.

DIP Switch settings*1

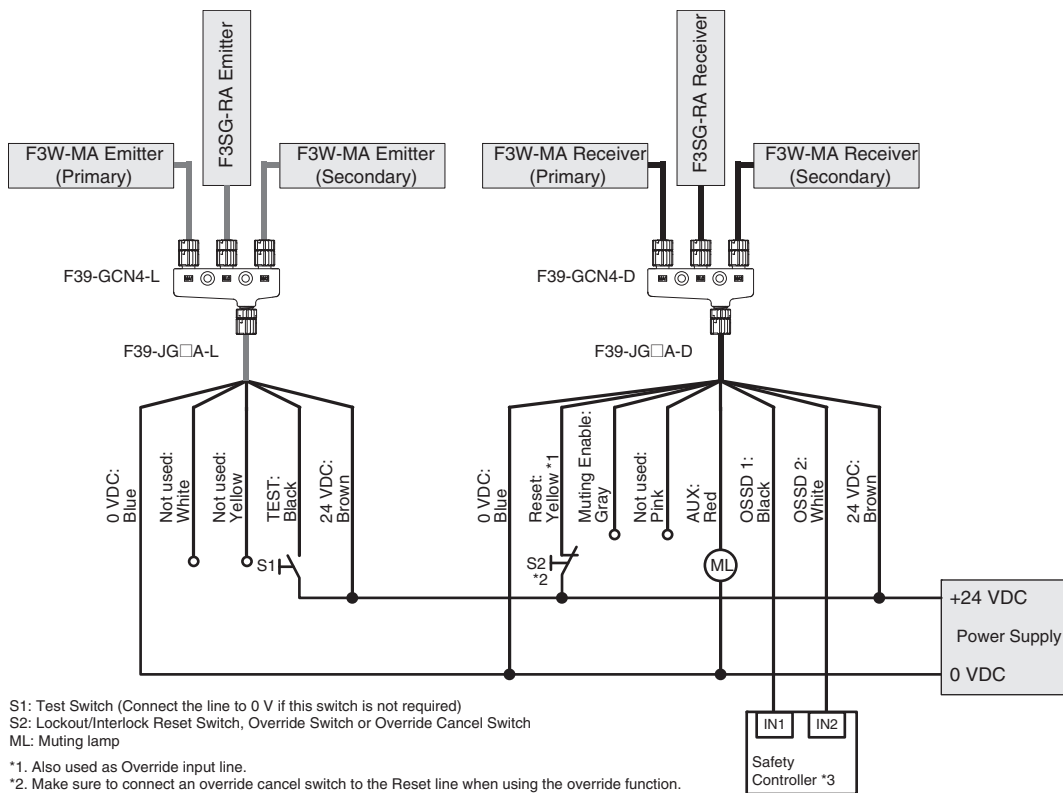
		Function	DIP-SW1	DIP-SW2
F3SG-RA	Receiver	Scan Code B	1 <input type="checkbox"/> ON	1 <input type="checkbox"/> ON
		EDM Disabled (factory default setting)	2 <input type="checkbox"/> ON	2 <input type="checkbox"/> ON
		Auto Reset (factory default setting)	3 <input type="checkbox"/> ON	3 <input type="checkbox"/> ON
			4 <input type="checkbox"/> ON	4 <input type="checkbox"/> ON
	PNP (factory default setting)	7 <input type="checkbox"/> ON	7 <input type="checkbox"/> ON	
Emitter	Scan Code B	1 <input type="checkbox"/> ON	-	
	External Test: 24 V Active (factory default setting)	4 <input type="checkbox"/> ON	-	
F3W-MA Primary	Receiver	Scan Code A	1 <input type="checkbox"/> ON	1 <input type="checkbox"/> ON*2
		Chattering and Void Space Prevention 1	2 <input type="checkbox"/> ON	2 <input type="checkbox"/> ON*2
			3 <input type="checkbox"/> ON	3 <input type="checkbox"/> ON*2
		Off-Delay 100 ms	4 <input type="checkbox"/> ON	4 <input type="checkbox"/> ON*2
	5 <input type="checkbox"/> ON	5 <input type="checkbox"/> ON*2		
Muting Enable Disabled (factory default setting)	6 <input type="checkbox"/> ON	6 <input type="checkbox"/> ON*2		
Emitter	Scan Code A	1 <input type="checkbox"/> ON	-	
F3W-MA Secondary	Receiver Emitter	-	No setting required	No setting required

: Indicates a switch position.

*1. Configure functions with the DIP Switches before wiring. For the DIP Switch of the F3W-MA, refer to *Smart Muting Actuator F3W-MA Series User's Manual*. For the DIP Switch of the F3SG-RA, refer to the *Safety Light Curtain F3SG-R Series User's Manual*.

*2. DIP Switch Bank 2 of F3W-MA receiver is not used.

Wiring example



Exit-Only Muting Mode with F3SG-R (L-Shaped Configuration)

The following is the example of F3W-MA with Scan Code A, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable enabled.

DIP Switch settings*1

		Function	DIP-SW1	DIP-SW2 *2
F3W-MA	Receiver	Scan Code A	1 <input checked="" type="checkbox"/> ON	1 <input checked="" type="checkbox"/> ON
		Chattering and Void Space Prevention 1	2 <input checked="" type="checkbox"/> ON 3 <input checked="" type="checkbox"/> ON	2 <input checked="" type="checkbox"/> ON 3 <input checked="" type="checkbox"/> ON
		Off-Delay 100 ms	4 <input checked="" type="checkbox"/> ON 5 <input checked="" type="checkbox"/> ON	4 <input checked="" type="checkbox"/> ON 5 <input checked="" type="checkbox"/> ON
		Muting Enable Enabled	6 <input checked="" type="checkbox"/> ON	6 <input checked="" type="checkbox"/> ON
	Emitter	Scan Code A	1 <input checked="" type="checkbox"/> ON	-

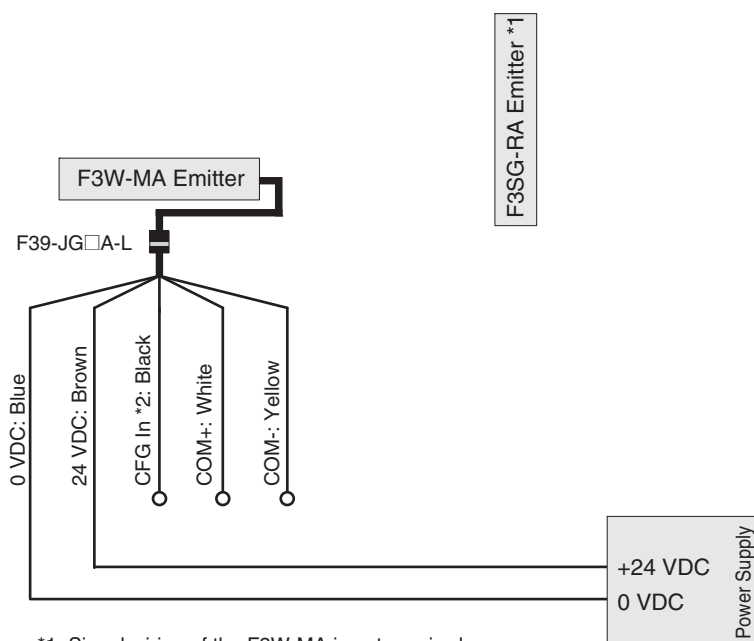
: Indicates a switch position.

*1. Configure functions with the DIP Switches before wiring. Refer to *Smart Muting Actuator F3W-MA Series User's Manual* for more information.

*2. DIP Switch Bank 2 is not used.

Wiring example

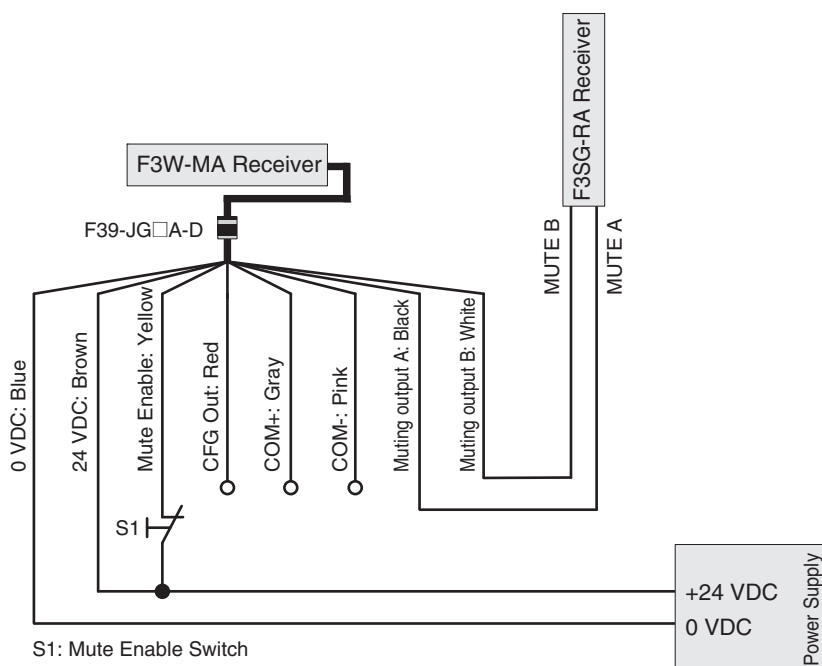
[Emitter]



*1. Signal wiring of the F3W-MA is not required.

*2. Do not connect CFG In line to +24 VDC line. Otherwise, F3W-MA enters the error state.

[Receiver]



S1: Mute Enable Switch

Exit-Only Muting Mode with F3SG-R (L-Shaped Configuration with 4-Joint Connector)

The following is the example of F3SG-RA with Scan Code A, External Device Monitoring disabled, Auto Reset mode, PNP output and External Test in 24 V Active, and F3W-MA with Scan Code B, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable enabled.

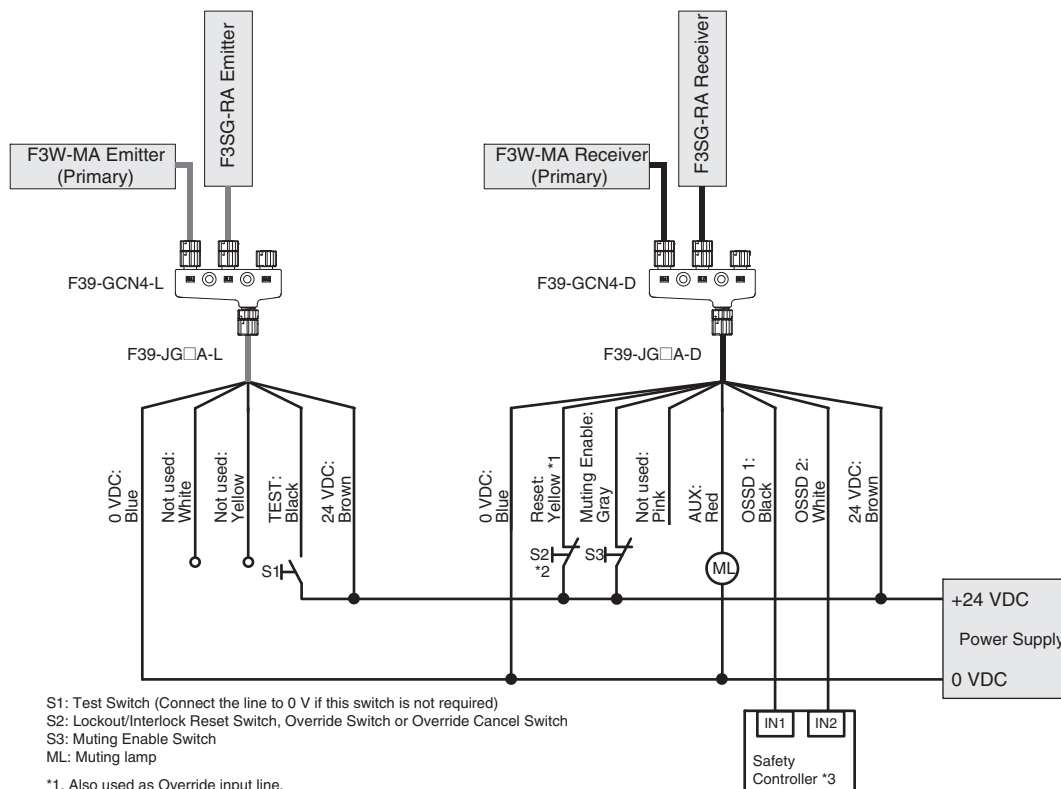
DIP Switch settings*1

		Function	DIP-SW1	DIP-SW2
F3SG-RA	Receiver	Scan Code A (factory default setting)	1 <input type="checkbox"/> ON	1 <input type="checkbox"/> ON
		EDM Disabled (factory default setting)	2 <input type="checkbox"/> ON	2 <input type="checkbox"/> ON
		Auto Reset (factory default setting)	3 <input type="checkbox"/> ON	3 <input type="checkbox"/> ON
			4 <input type="checkbox"/> ON	4 <input type="checkbox"/> ON
	Emitter	PNP (factory default setting)	7 <input type="checkbox"/> ON	7 <input type="checkbox"/> ON
		Scan Code A (factory default setting)	1 <input type="checkbox"/> ON	–
F3W-MA	Receiver	Scan Code B (factory default setting)	1 <input type="checkbox"/> ON	1 <input type="checkbox"/> ON*2
		Chattering and Void Space Prevention 1	2 <input type="checkbox"/> ON	2 <input type="checkbox"/> ON*2
			3 <input type="checkbox"/> ON	3 <input type="checkbox"/> ON*2
		Off-Delay 100 ms	4 <input type="checkbox"/> ON	4 <input type="checkbox"/> ON*2
			5 <input type="checkbox"/> ON	5 <input type="checkbox"/> ON*2
	Muting Enable Enabled	6 <input type="checkbox"/> ON	6 <input type="checkbox"/> ON*2	
	Emitter	Scan Code B (factory default setting)	1 <input type="checkbox"/> ON	–

: Indicates a switch position.

*1. Configure functions with the DIP Switches before wiring. For the DIP Switch of the F3W-MA, refer to *Smart Muting Actuator F3W-MA Series User's Manual*. For the DIP Switch of the F3SG-RA, refer to the *Safety Light Curtain F3SG-R Series User's Manual*.
 *2. DIP Switch Bank 2 of F3W-MA receiver is not used.

Wiring example



Standard Muting Mode with Other Safety Component (T-Shaped Configuration)

The following is the example of F3W-MA-1 with Scan Code A, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable enabled, and F3W-MA-2 with Scan Code B, Chattering and Void Space Prevention 1, Off-Delay 100 ms and Muting Enable enabled.

DIP Switch settings*1

		Function	DIP-SW1	DIP-SW2 *2
F3W-MA-1	Receiver	Scan Code A	1 <input checked="" type="checkbox"/> ON	1 <input checked="" type="checkbox"/> ON
		Chattering and Void Space Prevention 1	2 <input checked="" type="checkbox"/> ON 3 <input checked="" type="checkbox"/> ON	2 <input checked="" type="checkbox"/> ON 3 <input checked="" type="checkbox"/> ON
		Off-Delay 100 ms	4 <input checked="" type="checkbox"/> ON 5 <input checked="" type="checkbox"/> ON	4 <input checked="" type="checkbox"/> ON 5 <input checked="" type="checkbox"/> ON
		Muting Enable Enabled	6 <input checked="" type="checkbox"/> ON	6 <input checked="" type="checkbox"/> ON
	Emitter	Scan Code A	1 <input checked="" type="checkbox"/> ON	-
F3W-MA-2	Receiver	Scan Code B (factory default setting)	1 <input type="checkbox"/> OFF	1 <input type="checkbox"/> OFF
		Chattering and Void Space Prevention 1	2 <input checked="" type="checkbox"/> ON 3 <input checked="" type="checkbox"/> ON	2 <input checked="" type="checkbox"/> ON 3 <input checked="" type="checkbox"/> ON
		Off-Delay 100 ms	4 <input checked="" type="checkbox"/> ON 5 <input checked="" type="checkbox"/> ON	4 <input checked="" type="checkbox"/> ON 5 <input checked="" type="checkbox"/> ON
		Muting Enable Enabled	6 <input checked="" type="checkbox"/> ON	6 <input checked="" type="checkbox"/> ON
	Emitter	Scan Code B (factory default setting)	1 <input type="checkbox"/> OFF	-

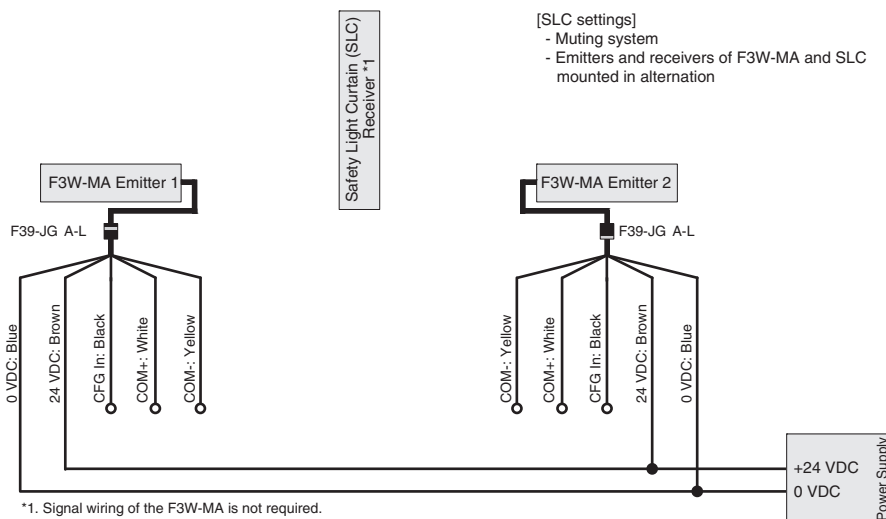
: Indicates a switch position.

*1. Configure functions with the DIP Switches before wiring. For the DIP Switch of the F3W-MA, refer to *Smart Muting Actuator F3W-MA Series User's Manual*. For the DIP Switch of the F3SG-RA, refer to the *Safety Light Curtain F3SG-R Series User's Manual*.

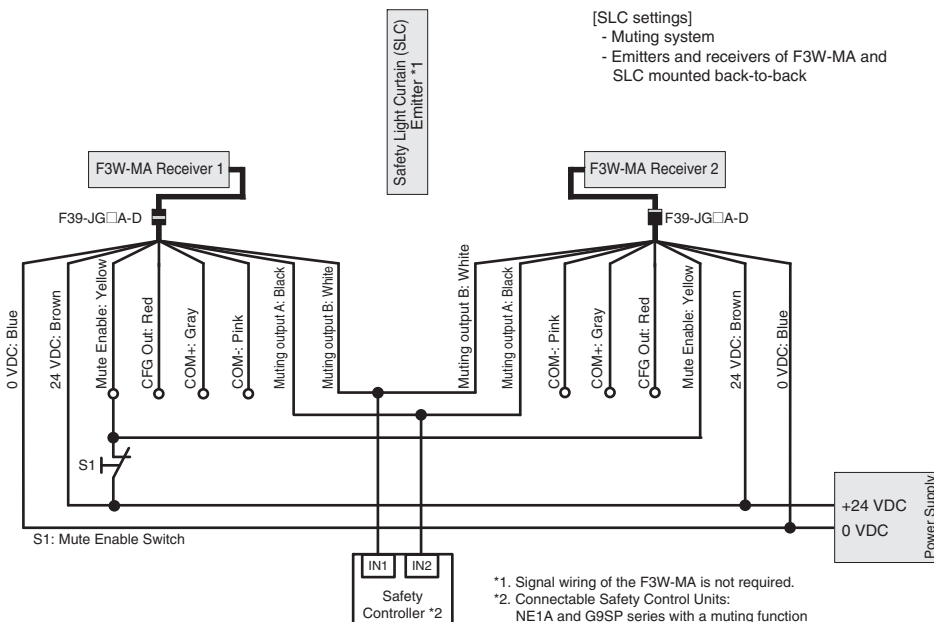
*2. DIP Switch Bank 2 is not used.

Wiring example

[Emitter]



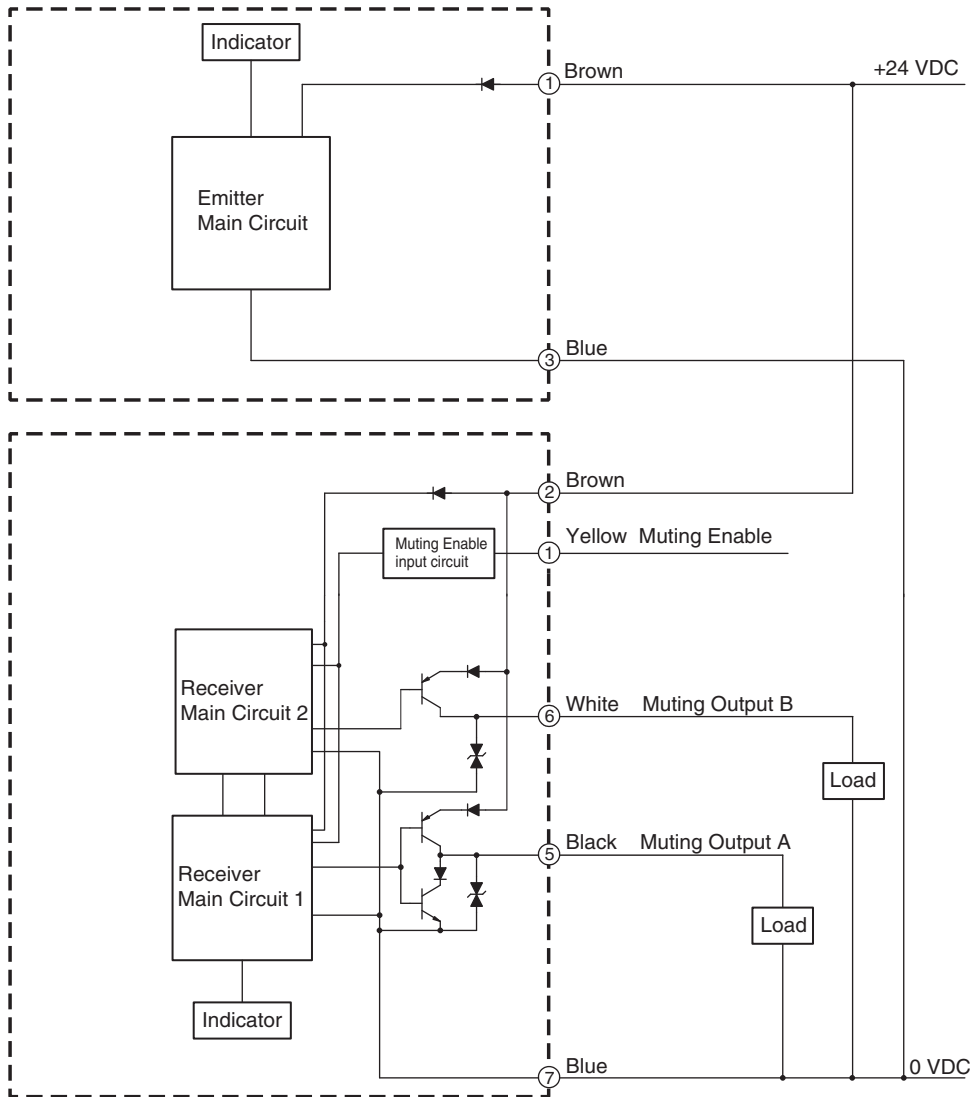
[Receiver]



F3W-MA

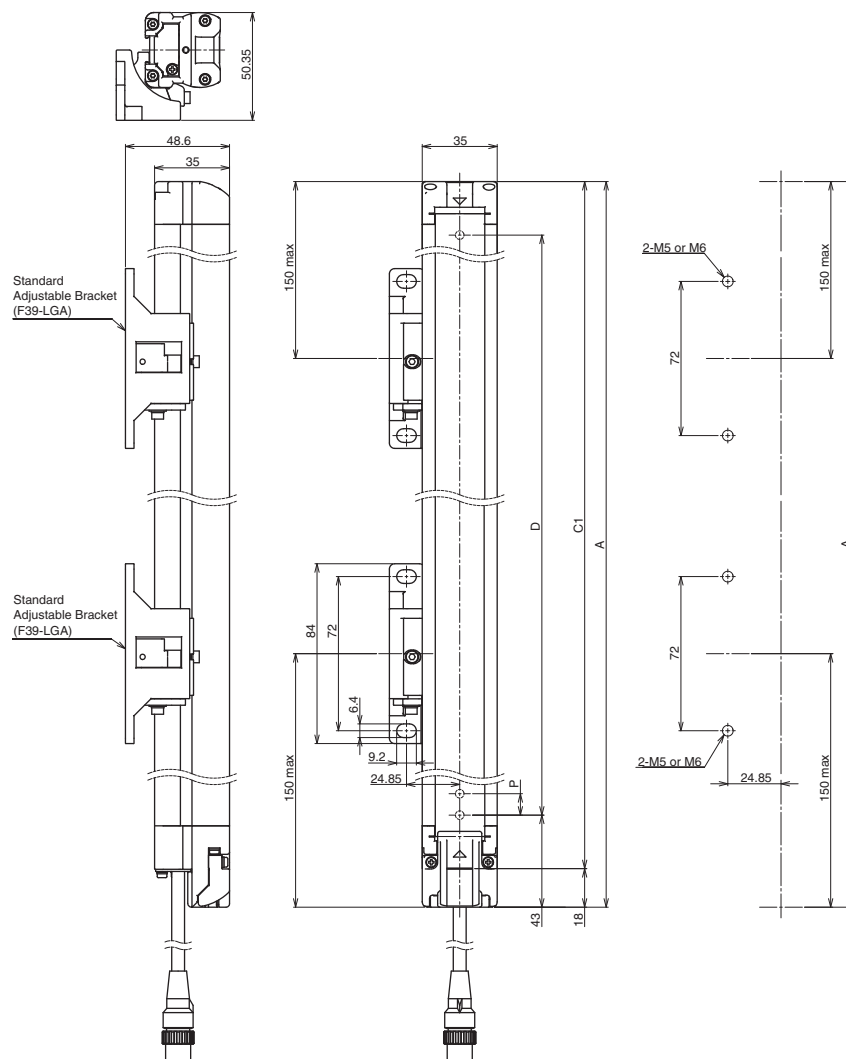
Input/Output Circuit

The entire circuit diagram of the F3W-MA is shown below.
The numbers in the circles indicate the connector's pin numbers.



Mounted with Standard Adjustable Brackets (F39-LGA)

Mounted with Standard Adjustable Brackets (F39-LGA) Backside Mounting

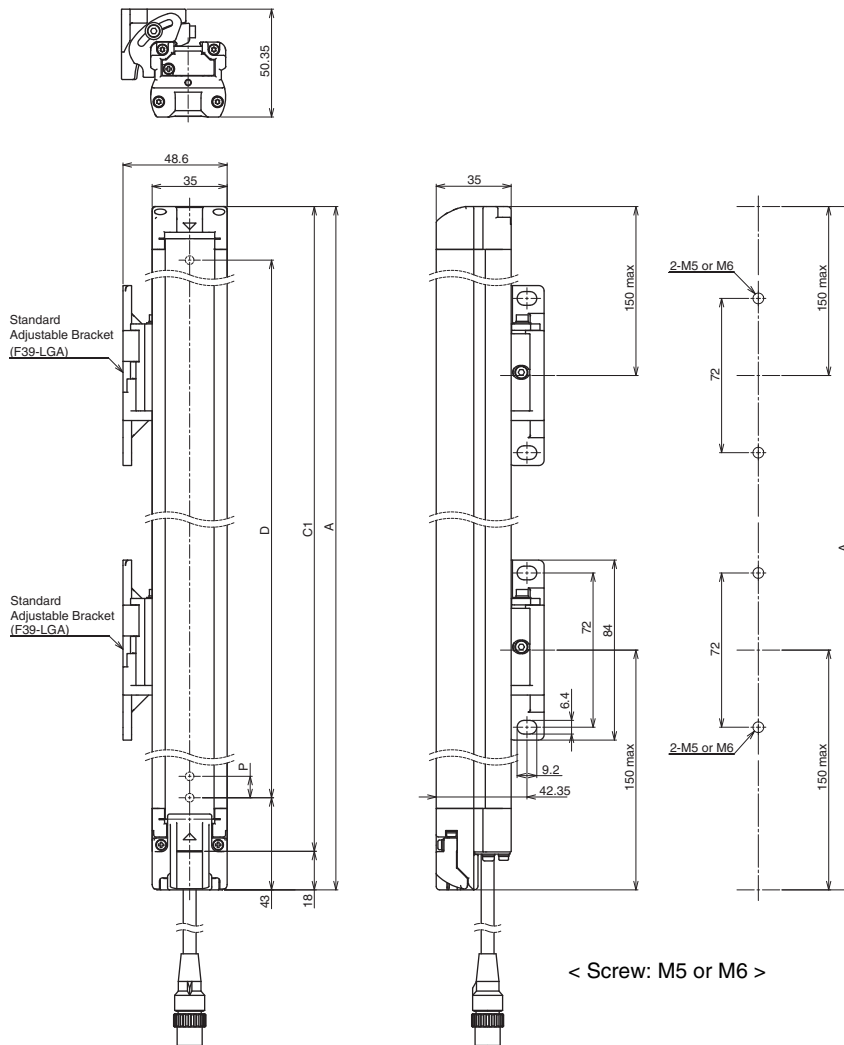


< Screw: M5 or M6 >

Model	F3W-MA0100P	F3W-MA0300P
Dimension A	208	448
Dimension C1	190	430
Dimension D	140	380
Dimension P	20	20
Number of Standard Adjustable Brackets *	2	2

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

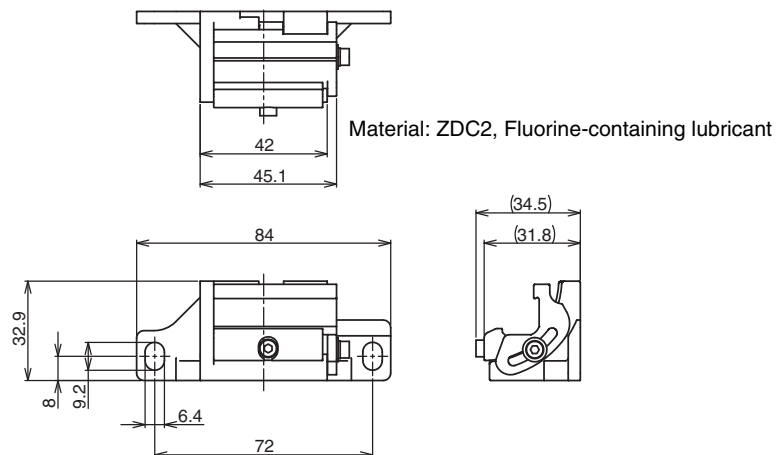
Side Mounting



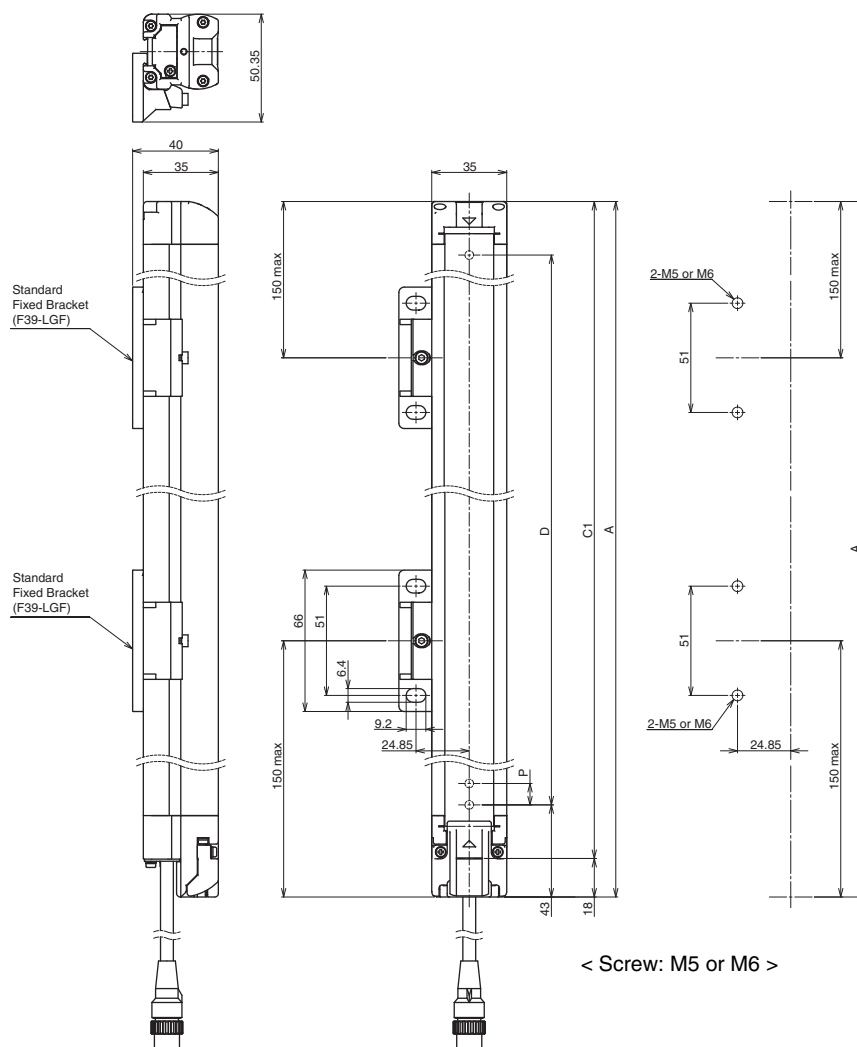
Model	F3W-MA0100P	F3W-MA0300P
Dimension A	208	448
Dimension C1	190	430
Dimension D	140	380
Dimension P	20	20
Number of Standard Adjustable Brackets *	2	2

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

Standard Adjustable Bracket (F39-LGA)



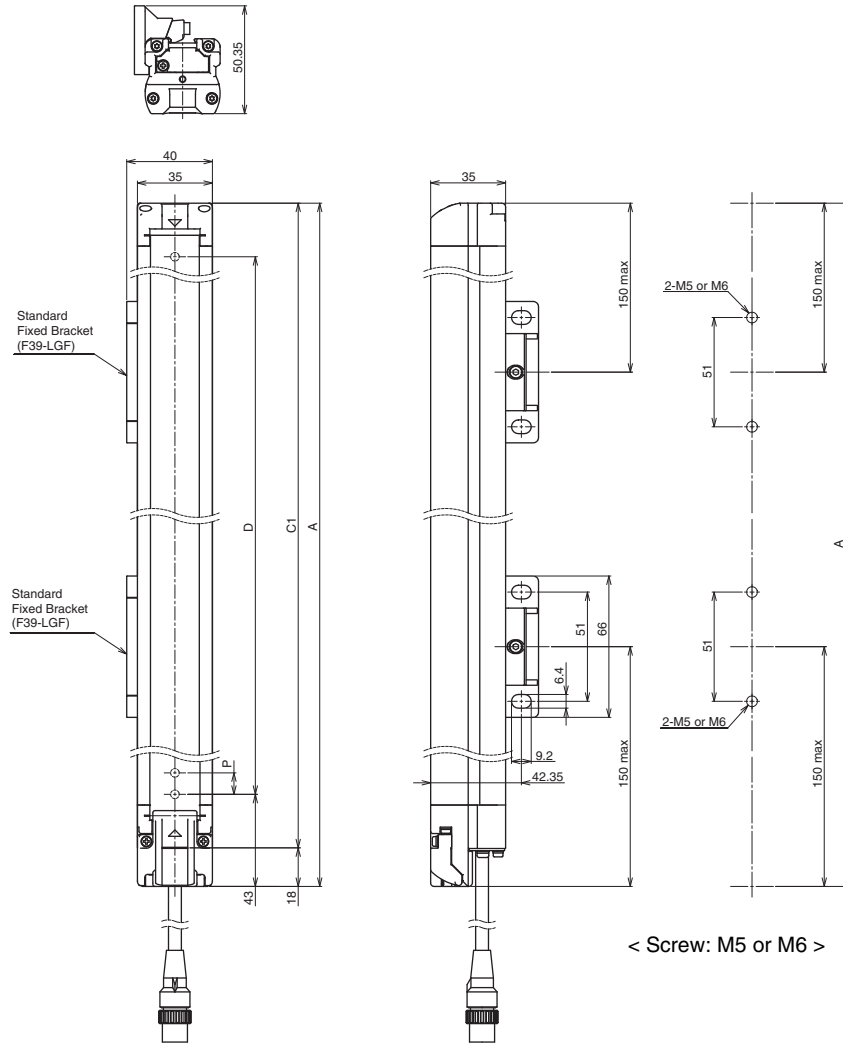
**Mounted with Standard Fixed Brackets (F39-LGF)
Backside Mounting**



Model	F3W-MA0100P	F3W-MA0300P
Dimension A	208	448
Dimension C1	190	430
Dimension D	140	380
Dimension P	20	20
Number of Standard Fixed Brackets *	2	2

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

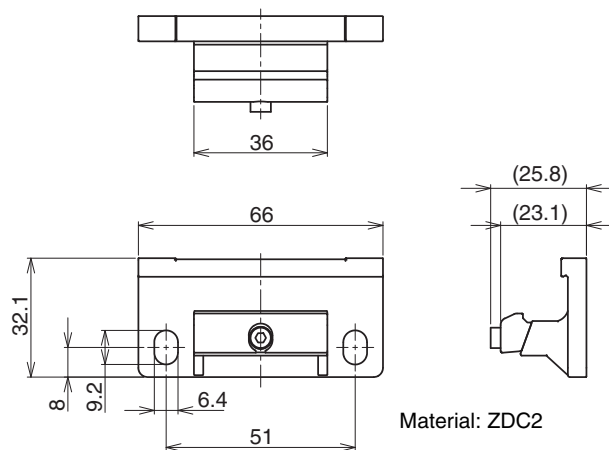
Side Mounting



Model	F3W-MA0100P	F3W-MA0300P
Dimension A	208	448
Dimension C1	190	430
Dimension D	140	380
Dimension P	20	20
Number of Standard Fixed Brackets *	2	2

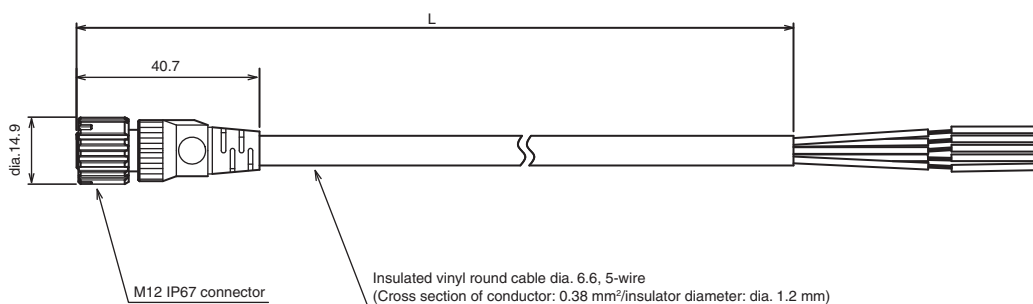
* The number of brackets required to mount either one of emitter and receiver.

Standard Fixed Bracket (F39-LGF)

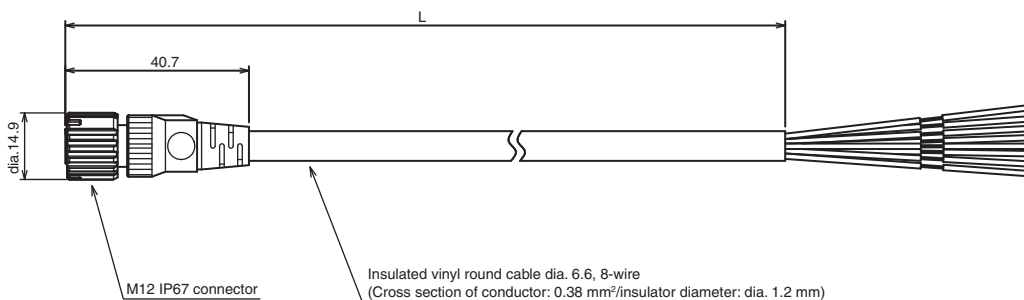


Accessories

Single-Ended Cable for Emitter (F39-JG□A-L, sold separately)



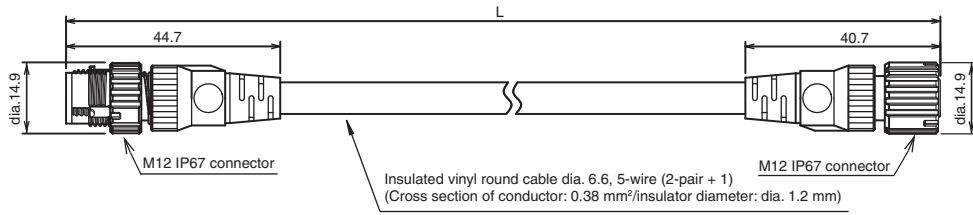
Single-Ended Cable for Receiver (F39-JG□A-D, sold separately)



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

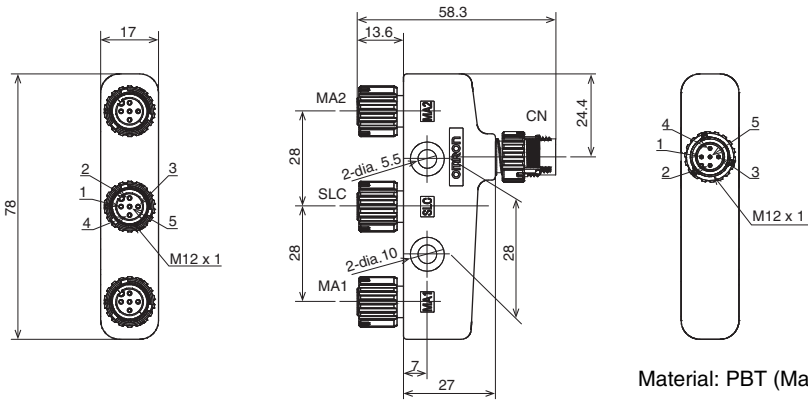
F3W-MA

Double-ended Cable for Emitter: Cable for extension (F39-JG□B-L, sold separately)

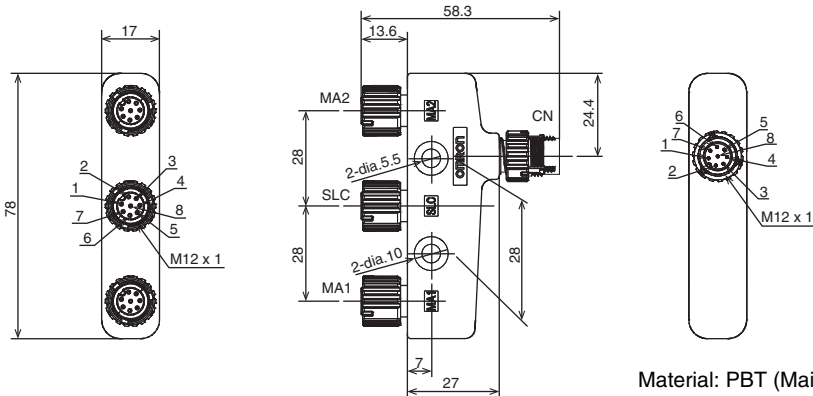


Emitter cable (Gray)	Receiver cable (Black)	L (m)
F39-JGR5B-L	F39-JGR15B-D	0.5
F39-JG1B-L	F39-JG1B-D	1
F39-JG3B-L	F39-JG3B-D	3
F39-JG5B-L	F39-JG5B-D	5
F39-JG7B-L	F39-JG7B-D	7
F39-JG10B-L	F39-JG10B-D	10
F39-JG15B-L	F39-JG15B-D	15
F39-JG20B-L	F39-JG20B-D	20

4-Joint Plug/Socket Connector for Emitter (F39-GCN4-L, sold separately)



4-Joint Plug/Socket Connector for Receiver (F39-GCN4-D, sold separately)



Related Manuals

ManNo.	Model	Manual name
Z355	F3W-MA	Smart Muting Actuator F3W-MA Series User's Manual

Terms and Conditions Agreement

Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.

- (a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.
- (b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

Limitation on Liability; Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

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

OMRON Corporation Industrial Automation Company
Tokyo, JAPAN

Contact: www.ia.omron.com

Regional Headquarters

OMRON EUROPE B.V.

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

OMRON ELECTRONICS LLC

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

OMRON ASIA PACIFIC PTE. LTD.

No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.

Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

Authorized Distributor:

© OMRON Corporation 2014-2015 All Rights Reserved.
In the interest of product improvement,
specifications are subject to change without notice.

CSM_6_1_0915
Cat. No. F094-E1-04

Printed in Japan
0915(1214)