Safety Light Curtain

F3SG-RA

Advanced Safety Light Curtain in Rugged, IP67 Rated Housing

- Rugged, IP67 rated housing resists washdown
- Space-saving slim profile of 35x35 mm (1.37 in.)
- Scan QR code with smart phone for local language support and troubleshooting guide
- Built-in muting; requires no external muting controller
- All models designed for global use. PNP/NPN output selection by DIP switch
- Resolution: 14 mm (finger protection) and 30 mm (hand and arm protection) models
- Cascaded designs possible: 3 segments, up to 255 beams
- “Smart click” 1/8 turn quick connect M12 cables: for fast installation and proper torque to ensure IP67 connection
- 14mm resolution up to 10.0 m (32 ft.) range in 160 to 2080 mm (6.3 to 81.9 inch) protective heights
- 30mm resolution up to 20.0 m (65 ft.) range in 190 to 2510 mm (7.3 to 98.7 inch) protective heights

Online Multilanguage Support

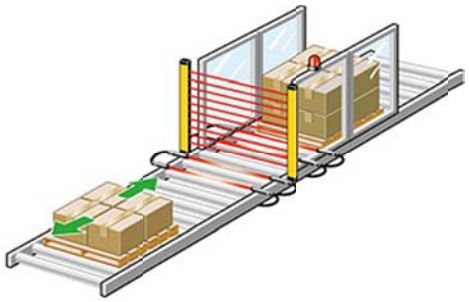
To access troubleshooting support for safety light curtain errors in your local language use your tablet or smartphone to scan a QR code sticker that can be applied to the machine.

Also accessible by computer, operators can check the error details in 8 languages and download manuals from a dedicated website.

The interactive diagnostics ask about error indicator color, indicator flashing frequency and DIP switch settings to thoroughly analyze the cause of an error.

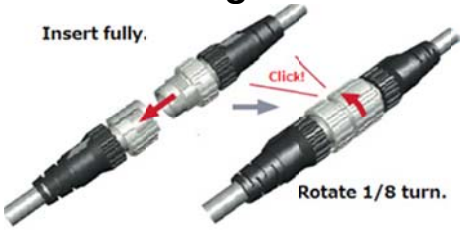
Languages include English, Spanish, French, Chinese, Korean, Japanese, German, and Italian.

Built-in Muting and Blanking



Built-in muting to pass through materials into the hazard zone requires no external muting controller. The blanking function disables specific beams of the safety light curtain. A warning zone can be set to alert people before they enter a danger zone using single or series-connected units when horizontally mounted.

Reduced Wiring Work



“Smart click” 1/8 turn quick-connect M12 cables allow fast installation and proper torque to ensure IP67 connection.

Ordering Information

Main Units

Safety Light Curtain

Finger protection

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

Hand and arm protection

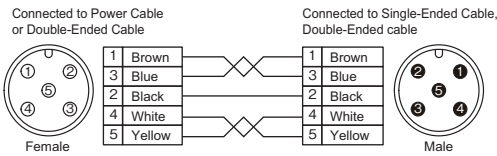
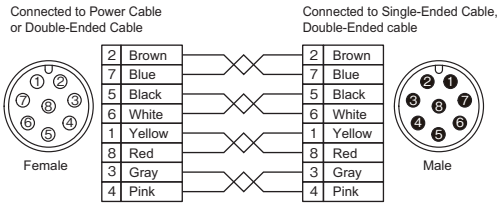
Model	Number of beams	Protective height (mm)
F3SG-4RA0190-30	8	190
F3SG-4RA0270-30	12	270
F3SG-4RA0350-30	16	350
F3SG-4RA0430-30	20	430
F3SG-4RA0510-30	24	510
F3SG-4RA0590-30	28	590
F3SG-4RA0670-30	32	670
F3SG-4RA0750-30	36	750
F3SG-4RA0830-30	40	830
F3SG-4RA0910-30	44	910
F3SG-4RA0990-30	48	990
F3SG-4RA1070-30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

Accessories (Sold separately)

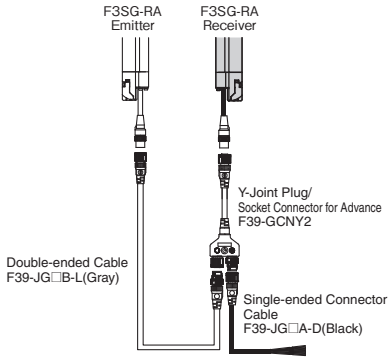
Single-ended Connector Cable

Appearance	Type	Cable length	Specifications	Model
	For emitter M12 connector (5-pin), 5 wires Color: Gray	3 m	 1 +24 VDC Brown 2 TEST Black 3 0 VDC Blue 4 Not used White 5 Not used Yellow	F39-JG3A-L
		7 m		F39-JG7A-L
		10 m		F39-JG10A-L
		15 m		F39-JG15A-L
		20 m		F39-JG20A-L
	For receiver M12 connector (8-pin), 8 wires Color: Black	3 m	 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
		7 m		F39-JG7A-D
		10 m		F39-JG10A-D
		15 m		F39-JG15A-D
		20 m		F39-JG20A-D

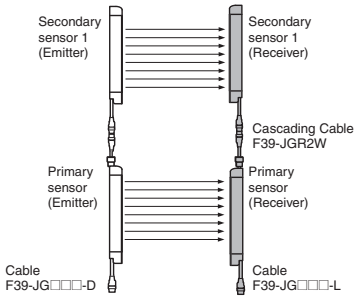
Double-ended Cable
For cable extension and simple wiring

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

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 ±15°. 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 ±22.5°. 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.omron247.com/ safety_light_curtain/ f3sg_ra/Software tools/SD Manager 2 Configurator. 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**

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.	**STI-TO14**
30 mm dia.	**STI-TO30**

F3SG-RA

Ratings and Specifications

Main unit

			F3SG-4RA□□□□-14	F3SG-4RA□□□□-30
Type of ESPE (IEC 61496-1)		Type 4	F3SG-4RA□□□□-14/-30	
Performance	Object Resolution (Detection Capability)		Opaque objects	
			14-mm dia.	30-mm dia.
	Beam Gap		10 mm	20 mm
	Number of Beams		15 to 207	8 to 124
	Lens Size		5.2 × 3.4 (W × H) mm	7-mm dia.
	Protective Height		160 to 2080 mm (6.3 to 81.9 inch)	190 to 2510 mm (7.3 to 98.7 inch)
	Operating Range	Long	0.3 to 10.0 m (1 to 32 ft.)	0.3 to 20.0 m (1 to 65 ft.)
		Short	0.3 to 3.0 m (1 to 10 ft.)	0.3 to 7.0 m (1 to 23 ft.)
	Response Time	ON to OFF	Normal mode: 8 to 18 ms max. *1 Slow mode: 16 to 36 ms max. *1 *2	
		OFF to ON	40 to 90 ms max. *1	
			*1 Response time when used in one segment system or in cascaded connection. Refer to page 8. *2 Selectable by Configuration Tool.	
	Effective Aperture Angle (EAA) (IEC 61496-2)	Type 4	±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		Refer to page 8 .	
	Safety Outputs (OSSD)		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 *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.	
	Auxiliary Output		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 .	
	Output Operation Mode	Safety Output	Light-ON (Safety output is enabled when the receiver receives an emitting signal.)	
		Auxiliary Output	Muting or Override output (default) (Configurable by Configuration Tool)	
	Input Voltage	ON Voltage	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.)	
		OFF Voltage	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 *	
			* The Vs indicates a supply voltage value in your environment.	
	Overvoltage Category (IEC 60664-1)		II	
	Indicators		Refer to page 10.	
	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	Mutual Interference Prevention (Scan Code)		This function prevents mutual interference in up to two F3SG-RA systems.	
	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-4RA□□□□-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	
		Minimum Bending Radius	R5 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 3.	
		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 8.	
	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)	
	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)	

F3SG-RA

List of Models/Response Time/Current Consumption/Weight

F3SG-4RA□□□□-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	15	160	8	40	140	40	75	1.8
F3SG-4RA0240-14	23	240	8	40	140	45	75	2.0
F3SG-4RA0320-14	31	320	8	40	140	55	75	2.2
F3SG-4RA0400-14	39	400	8	40	140	60	80	2.7
F3SG-4RA0480-14	47	480	13	65	165	50	80	2.9
F3SG-4RA0560-14	55	560	13	65	165	55	80	3.1
F3SG-4RA0640-14	63	640	13	65	165	60	85	3.3
F3SG-4RA0720-14	71	720	13	65	165	65	85	3.9
F3SG-4RA0800-14	79	800	13	65	165	65	90	4.1
F3SG-4RA0880-14	87	880	13	65	165	70	90	4.3
F3SG-4RA0960-14	95	960	13	65	165	75	90	4.5
F3SG-4RA1040-14	103	1040	13	65	165	80	95	4.7
F3SG-4RA1120-14	111	1120	13	65	165	85	95	4.8
F3SG-4RA1200-14	119	1200	13	65	165	90	100	5.0
F3SG-4RA1280-14	127	1280	13	65	165	95	100	5.2
F3SG-4RA1360-14	135	1360	13	65	165	95	105	5.6
F3SG-4RA1440-14	143	1440	18	90	190	85	105	5.8
F3SG-4RA1520-14	151	1520	18	90	190	90	105	6.0
F3SG-4RA1600-14	159	1600	18	90	190	90	110	6.6
F3SG-4RA1680-14	167	1680	18	90	190	95	110	6.8
F3SG-4RA1760-14	175	1760	18	90	190	100	115	7.0
F3SG-4RA1840-14	183	1840	18	90	190	100	115	7.2
F3SG-4RA1920-14	191	1920	18	90	190	105	120	7.3
F3SG-4RA2000-14	199	2000	18	90	190	105	120	7.5
F3SG-4RA2080-14	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

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	8	190	8	40	140	35	75	1.8
F3SG-4RA0270-30	12	270	8	40	140	35	75	2.0
F3SG-4RA0350-30	16	350	8	40	140	40	75	2.2
F3SG-4RA0430-30	20	430	8	40	140	45	75	2.7
F3SG-4RA0510-30	24	510	8	40	140	50	75	2.9
F3SG-4RA0590-30	28	590	8	40	140	50	75	3.1
F3SG-4RA0670-30	32	670	8	40	140	55	75	3.3
F3SG-4RA0750-30	36	750	8	40	140	60	80	3.9
F3SG-4RA0830-30	40	830	8	40	140	65	80	4.0
F3SG-4RA0910-30	44	910	13	65	165	50	80	4.2
F3SG-4RA0990-30	48	990	13	65	165	50	80	4.4
F3SG-4RA1070-30	52	1070	13	65	165	55	80	4.6
F3SG-4RA1150-30	56	1150	13	65	165	55	85	4.8
F3SG-4RA1230-30	60	1230	13	65	165	55	85	4.9
F3SG-4RA1310-30	64	1310	13	65	165	60	85	5.1
F3SG-4RA1390-30	68	1390	13	65	165	60	85	5.6
F3SG-4RA1470-30	72	1470	13	65	165	65	85	5.8
F3SG-4RA1550-30	76	1550	13	65	165	65	90	6.0
F3SG-4RA1630-30	80	1630	13	65	165	70	90	6.5
F3SG-4RA1710-30	84	1710	13	65	165	70	90	6.7
F3SG-4RA1790-30	88	1790	13	65	165	70	90	6.9
F3SG-4RA1870-30	92	1870	13	65	165	75	90	7.1
F3SG-4RA1950-30	96	1950	13	65	165	75	95	7.3
F3SG-4RA2030-30	100	2030	13	65	165	80	95	7.4
F3SG-4RA2110-30	104	2110	13	65	165	80	95	8.0
F3SG-4RA2190-30	108	2190	13	65	165	85	95	8.2
F3SG-4RA2270-30	112	2270	13	65	165	85	100	8.4
F3SG-4RA2350-30	116	2350	13	65	165	85	100	8.8
F3SG-4RA2430-30	120	2430	13	65	165	90	100	8.9
F3SG-4RA2510-30	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 ESPE), EN 61496-2 (Type 4 AOPD), EN61508-1 through -4 (SIL 3 for Type 4), EN ISO 13849-1:2008 (PL e, Category 4 for Type 4 and PL c)
   (2) International standards
   IEC61496-1 (Type 4 ESPE), IEC61496-2 (Type 4 AOPD), IEC61508-1 through -4 (SIL 3 for Type 4), ISO 13849-1:2006 (PL e, Category 4 for Type 4
5.
   (1) JIS standards
   JIS B 9704-1 (Type 4 ESPE), JIS B 9704-2 (Type 4 AOPD)
   (2) North American standards
   UL61496-1(Type 4 ESPE), UL61496-2(Type 4 AOPD), UL508, UL1998,
   CAN/CSA C22.2 No.14, CAN/CSA C22.2 No.0.8
   (3) Chinese standards
   GB4584(Specification of active opto-electronic protective devices for presses)
6. Third-Party Certifications
   (1) TÜV SÜD
   - EC Type-Examination certificate:
     EU Machinery Directive, Type 4 ESPE (EN61496-1), Type 4 AOPD (EN 61496-2)
   - Certificate:
     Type 4 ESPE (EN61496-1), Type 4 AOPD (EN61496-2), EN 61508-1 through -4 (SIL 3 for Type 4), EN ISO 13849-1:2008 (PL e, Category 4 for Type 4,)

   (2) UL
   - UL Listing:
     Type 4 ESPE (UL61496-1), Type 4 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)
7. 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

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 beng 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.

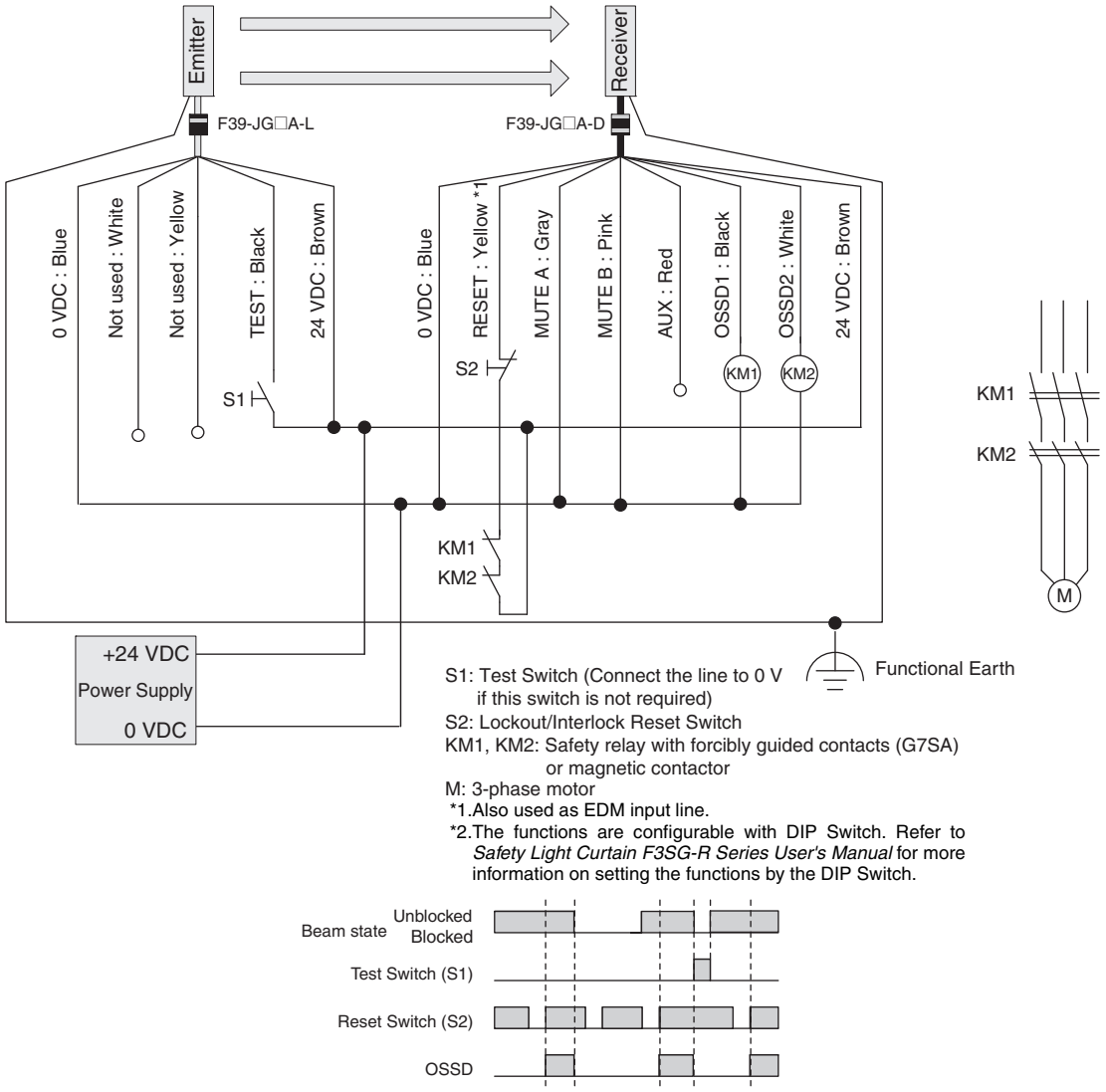
DIP Switch settings *2

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ON	2 ON
	Manual Reset	3 ON	3 ON
		4 ON	4 ON
	PNP (factory default setting)	7 ON	7 ON
Emitter	External Test: 24 V Active (factory default setting)	4 ON	

□: Indicates a switch position.

Configure functions with the DIP Switches before wiring.

Wiring Example



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 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.

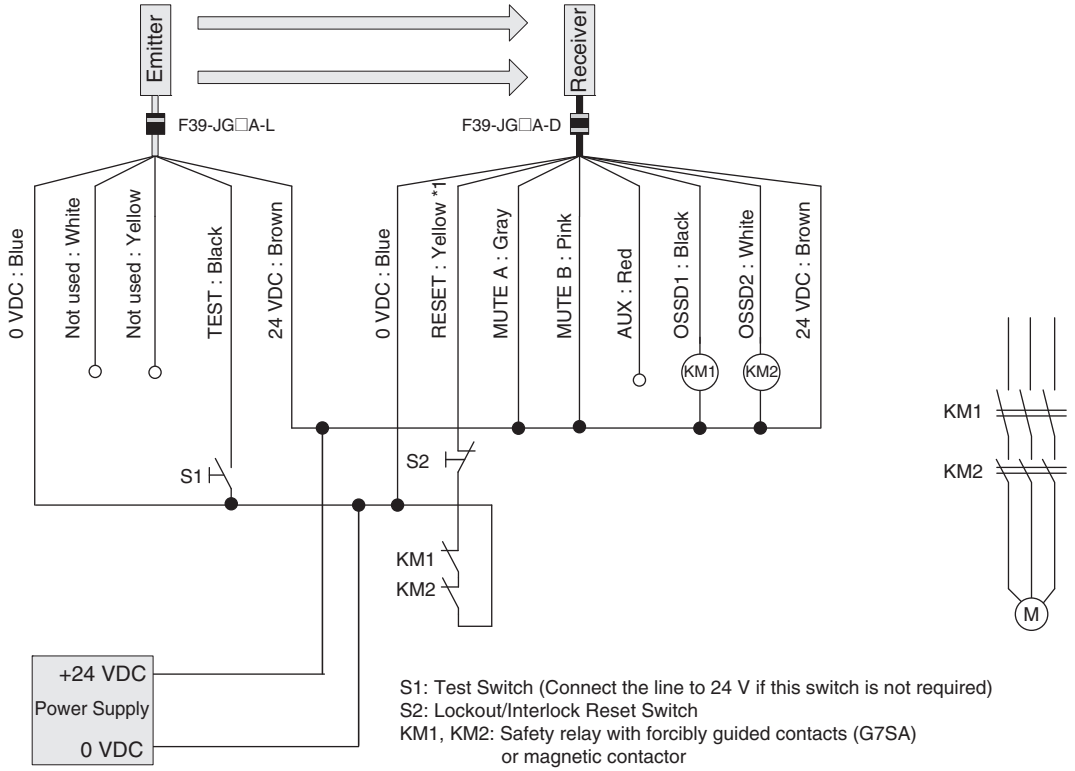
DIP Switch settings *2

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ON	2 ON
	Manual Reset	3 ON	3 ON
		4 ON	4 ON
	NPN	7 ON	7 ON
Emitter	External Test: 0 V Active	4 ON	

□: Indicates a switch position.

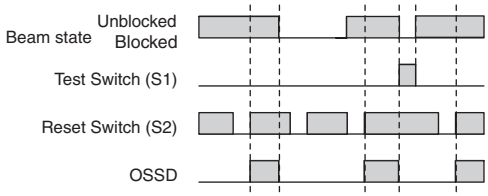
Configure functions with the DIP Switches before wiring.

Wiring Example



S1: Test Switch (Connect the line to 24 V if this switch is not required)
S2: Lockout/Interlock Reset Switch
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 PNP Outputs

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

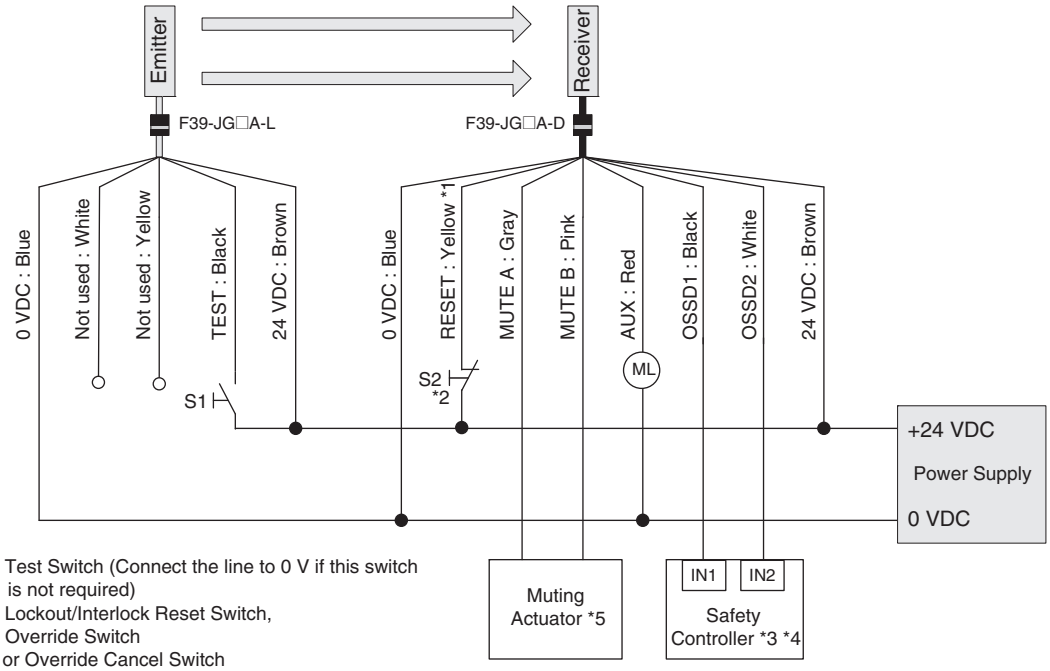
DIP Switch settings *6

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 ON	2 ON
	Auto Reset (factory default setting)	3 ON	3 ON
		4 ON	4 ON
	PNP (factory default setting)	7 ON	7 ON
Emitter	External Test: 24 V Active (factory default setting)	4 ON	

□: Indicates a switch position.

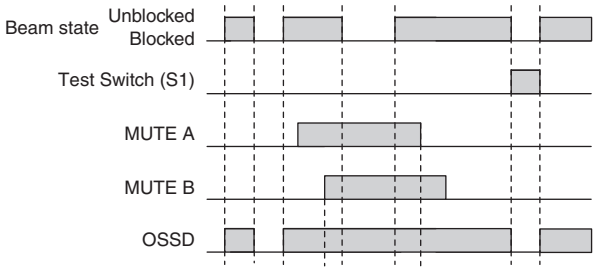
Configure functions with the DIP Switches before wiring.

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 29 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 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.

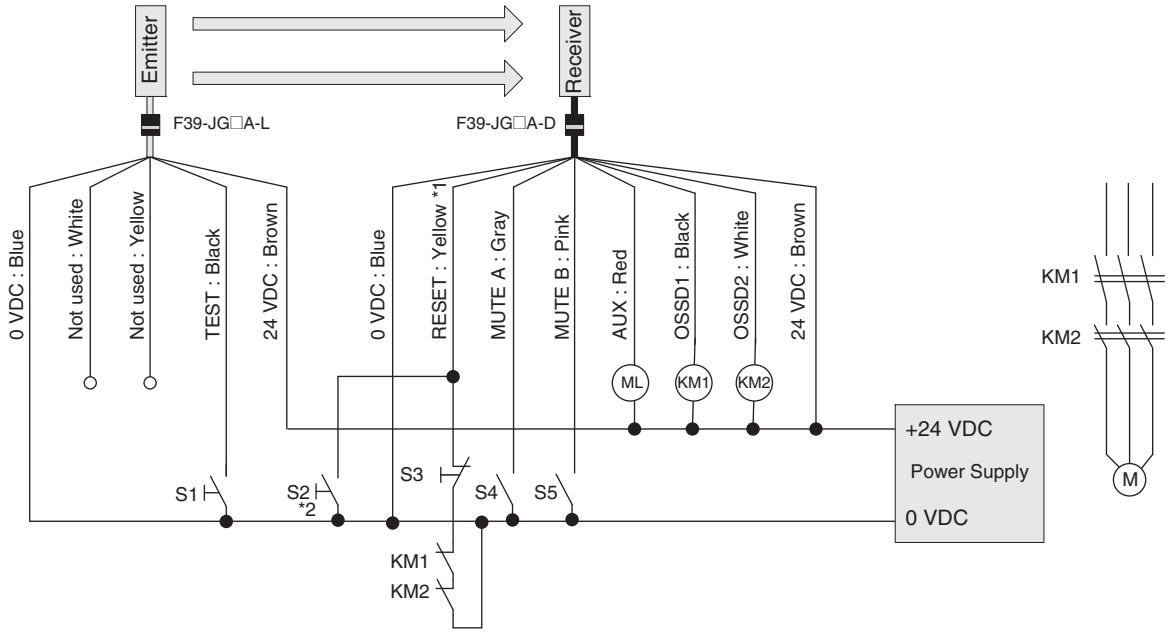
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ON	2 ON
	Auto Reset (factory default setting)	3 ON	3 ON
		4 ON	4 ON
	NPN	7 ON	7 ON
Emitter	External Test: 0 V Active	4 ON	

□: Indicates a switch position.

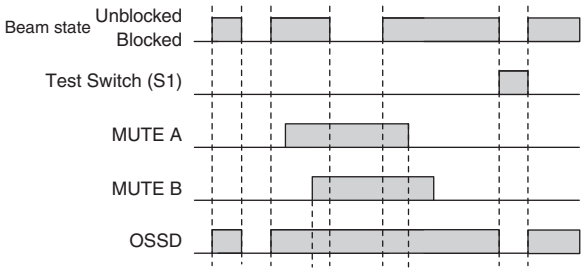
Configure functions with the DIP Switches before wiring.

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 PNP Outputs

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

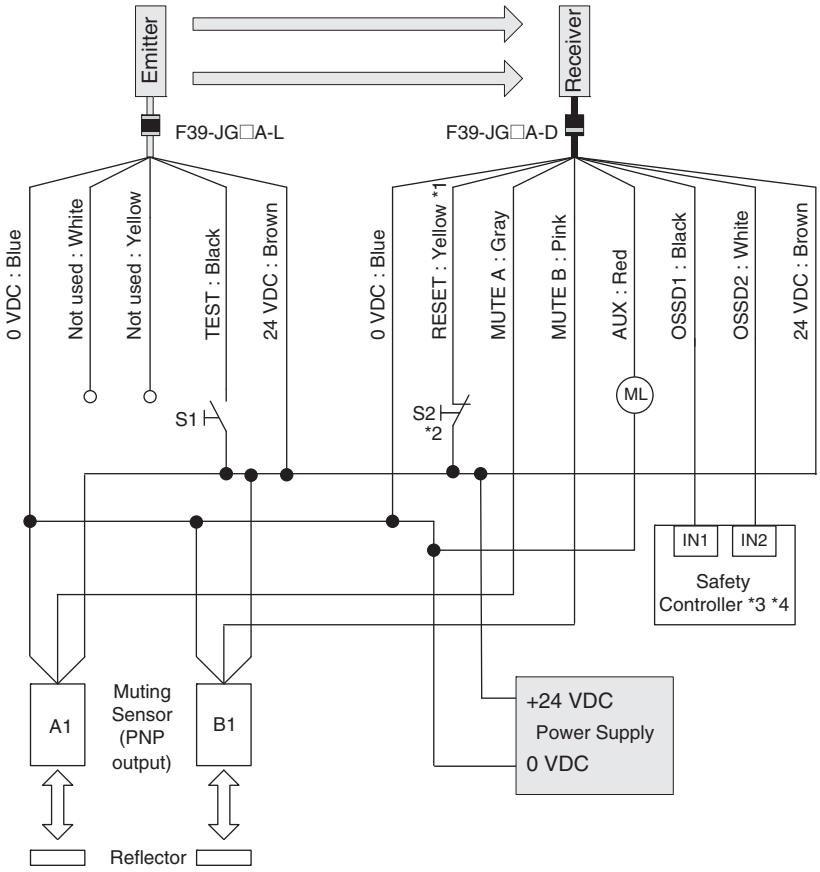
DIP Switch settings *5

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 ON	2 ON
	Auto Reset (factory default setting)	3 ON	3 ON
		4 ON	4 ON
	PNP (factory default setting)	7 ON	7 ON
Emitter	External Test: 24 V Active (factory default setting)	4 ON	

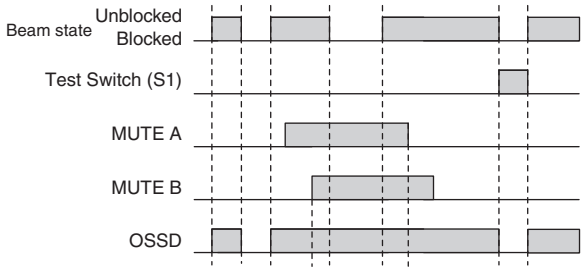
□: Indicates a switch position.

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 29 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 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.

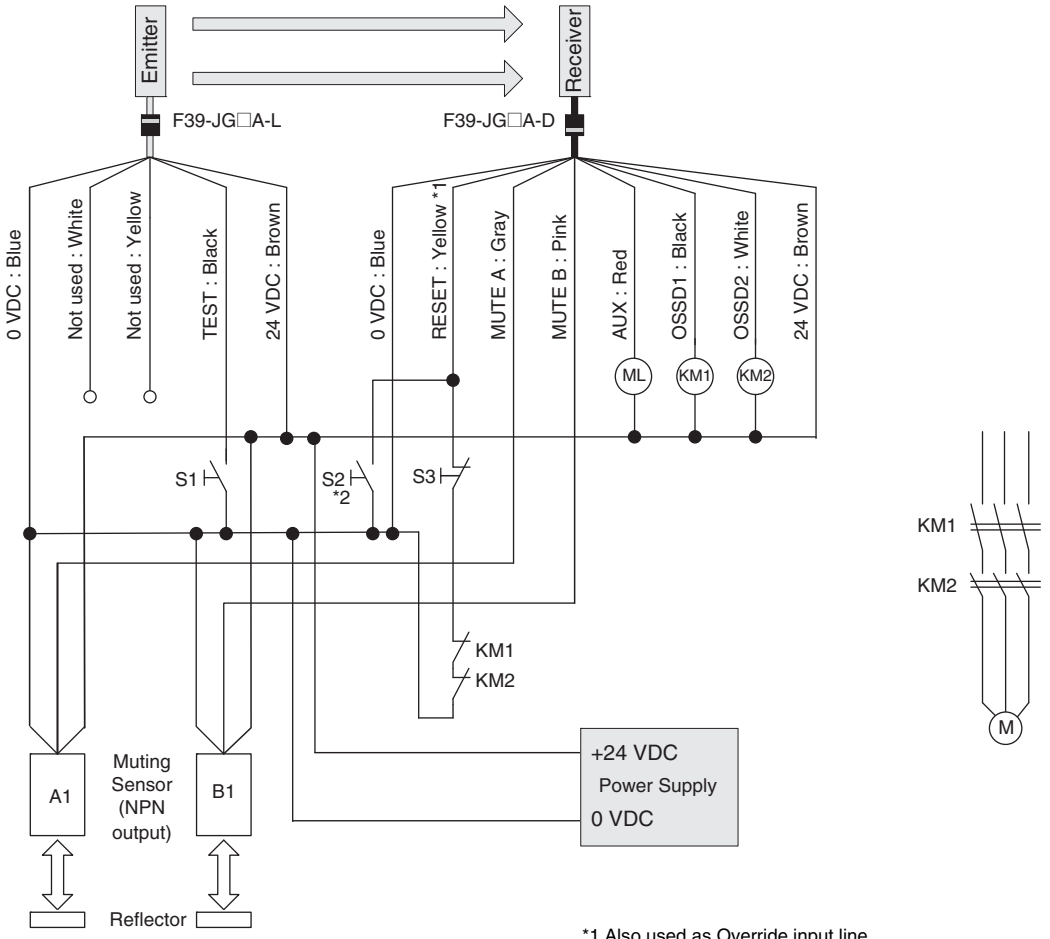
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ON	2 ON
	Auto Reset (factory default setting)	3 ON	3 ON
		4 ON	4 ON
	NPN	7 ON	7 ON
Emitter	External Test: 0 V Active	4 ON	

□: Indicates a switch position.

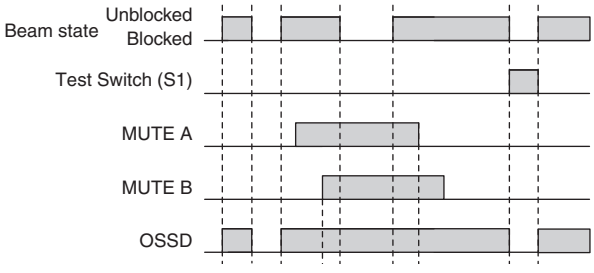
Configure functions with the DIP Switches before wiring.

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 PNP Outputs

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

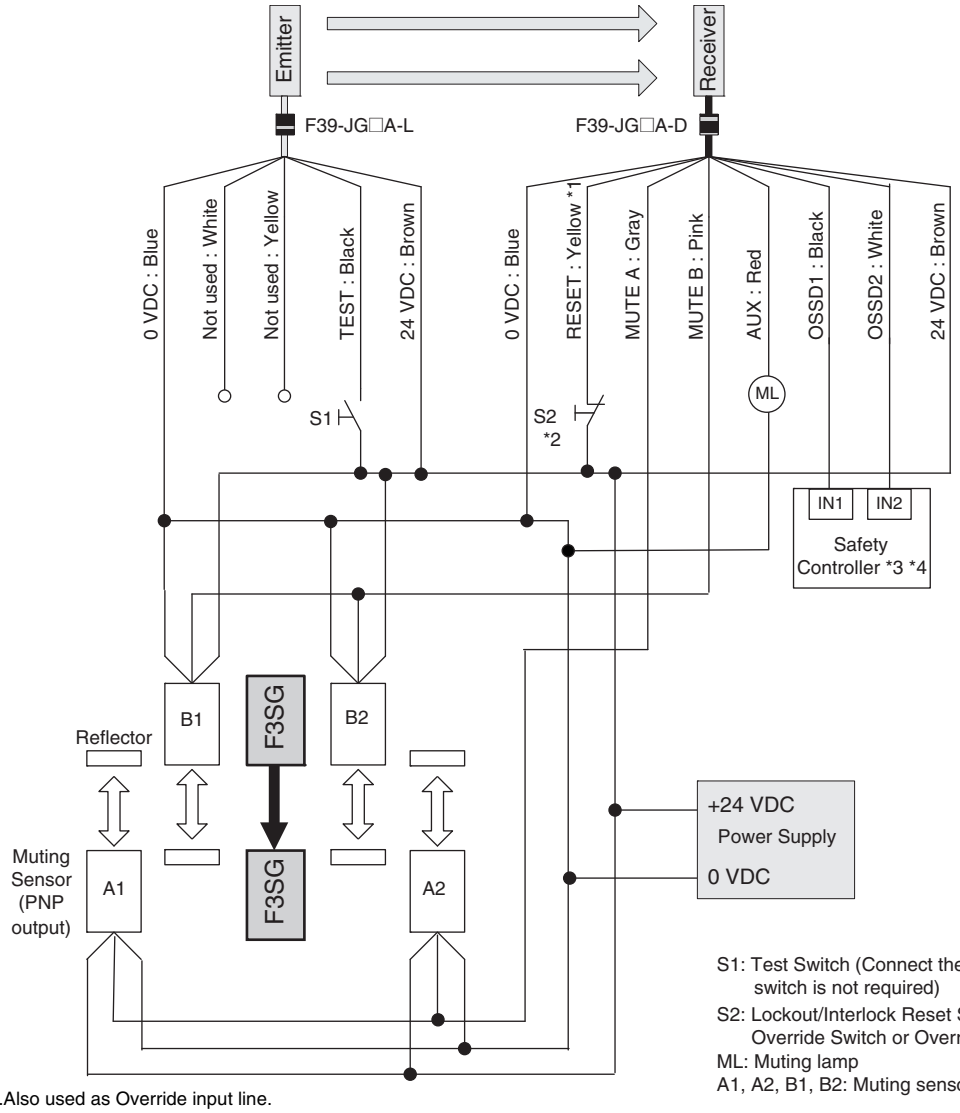
DIP Switch settings *5

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 ON	2 ON
	Auto Reset (factory default setting)	3 ON	3 ON
		4 ON	4 ON
	PNP (factory default setting)	7 ON	7 ON
Emitter	External Test: 24 V Active (factory default setting)	4 ON	

□: Indicates a switch position.

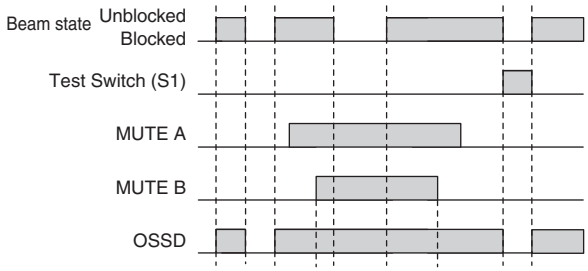
Configure functions with the DIP Switches before wiring.

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, A2, B1, B2: 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 19 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 NPN Outputs

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

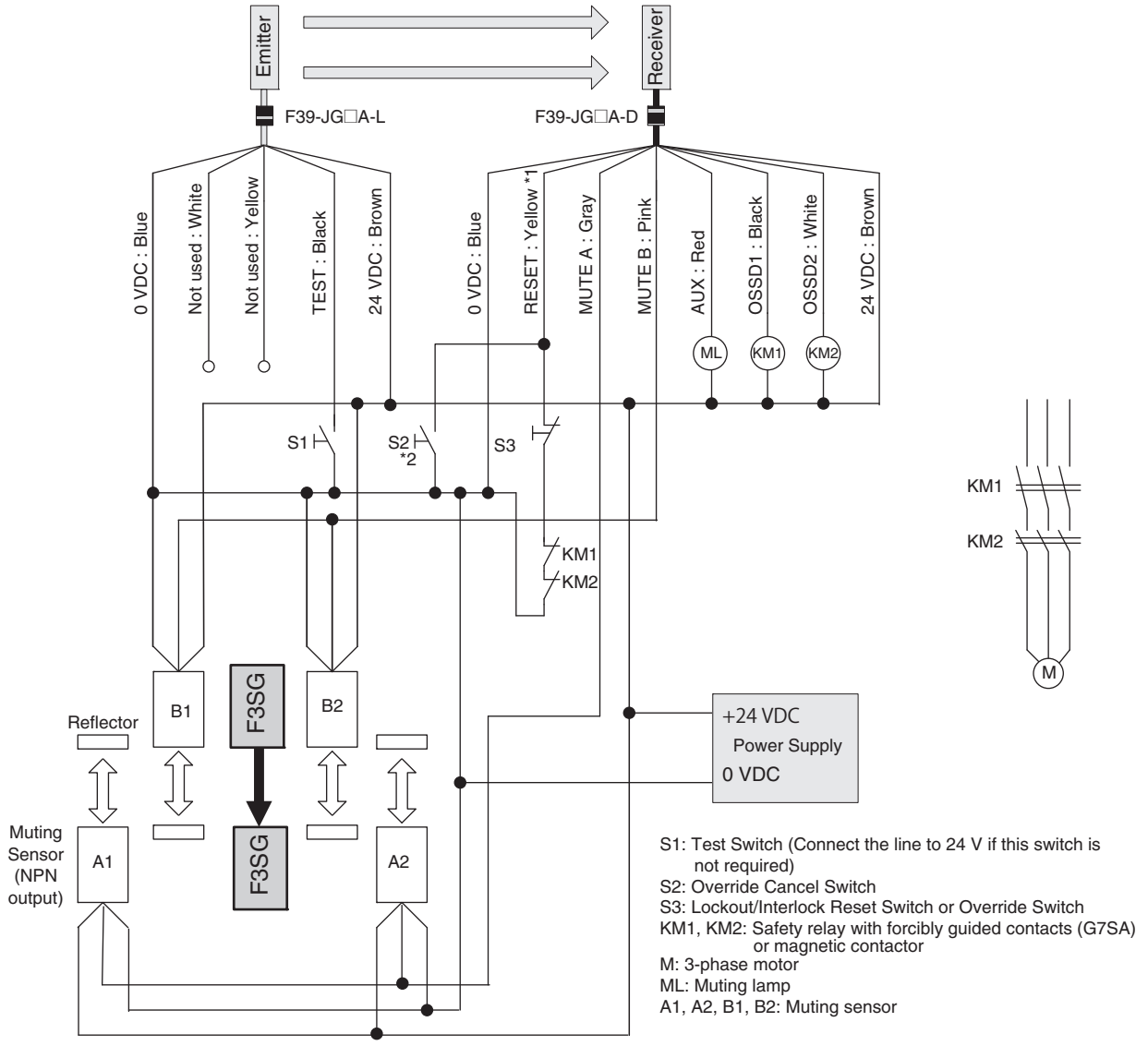
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ON	2 ON
	Auto Reset (factory default setting)	3 ON	3 ON
		4 ON	4 ON
	NPN	7 ON	7 ON
Emitter	External Test: 0 V Active	4 ON	

□: Indicates a switch position.

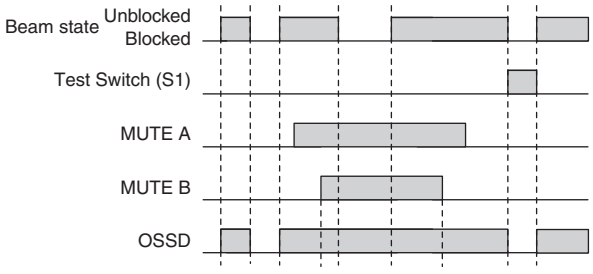
Configure functions with the DIP Switches before wiring.

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, A2, B1, B2: 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 maynot 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-Resest 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.

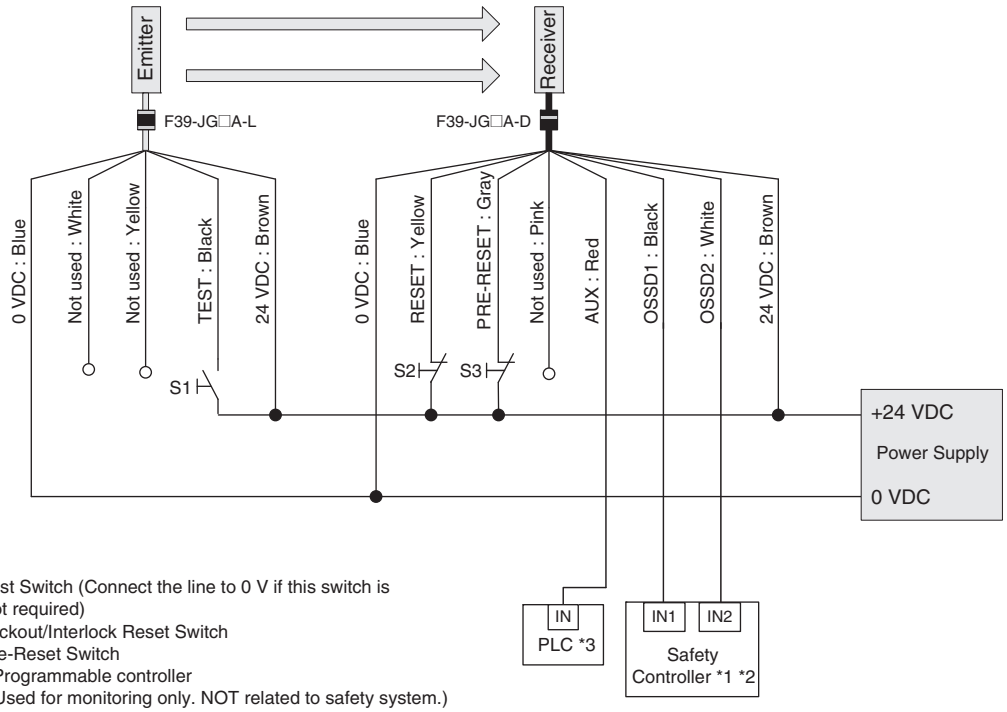
DIP Switch settings *4

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 ON	2 ON
	Pre-Reset	3 ON	3 ON
		4 ON	4 ON
	PNP (factory default setting)	7 ON	7 ON
Emitter	External Test: 24 V Active (factory default setting)	4 ON	

□: Indicates a switch position.

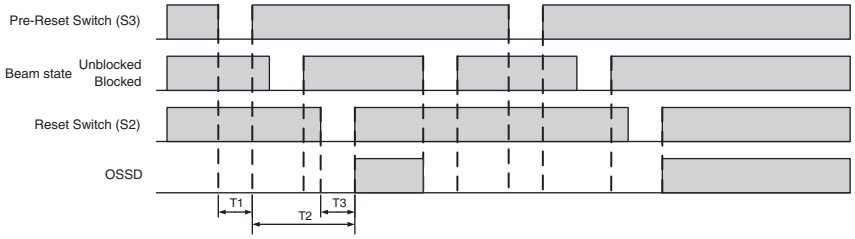
Configure functions with the DIP Switches before wiring.

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 >= 300ms
T2: Pre-reset limit time between Pre-reset and Reset: must be T2 <= 60s
T3: Push time: must be T3 >= 300ms

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)		
G9SA-301		**G9SP-N10S**
G9SA-321		**G9SP-N10D**
G9SA-501		**G9SP-N20S**
G9SB-200-B	**G9SX-AD322-T**	**NE0A-SCPU01**
G9SB-200-D	**G9SX-ADA222-T**	**NE1A-SCPU01**
G9SB-301-B	**G9SX-BC202**	**NE1A-SCPU02**
G9SB-301-D	**G9SX-GS226-T15**	**DST1-ID12SL**
G9SE-201		**DST1-MD16SL**
G9SE-401		**DST1-MRD08SL**
G9SE-221-T□		**NX-SIH400**
		NX-SID800
		F3SP-T01

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.

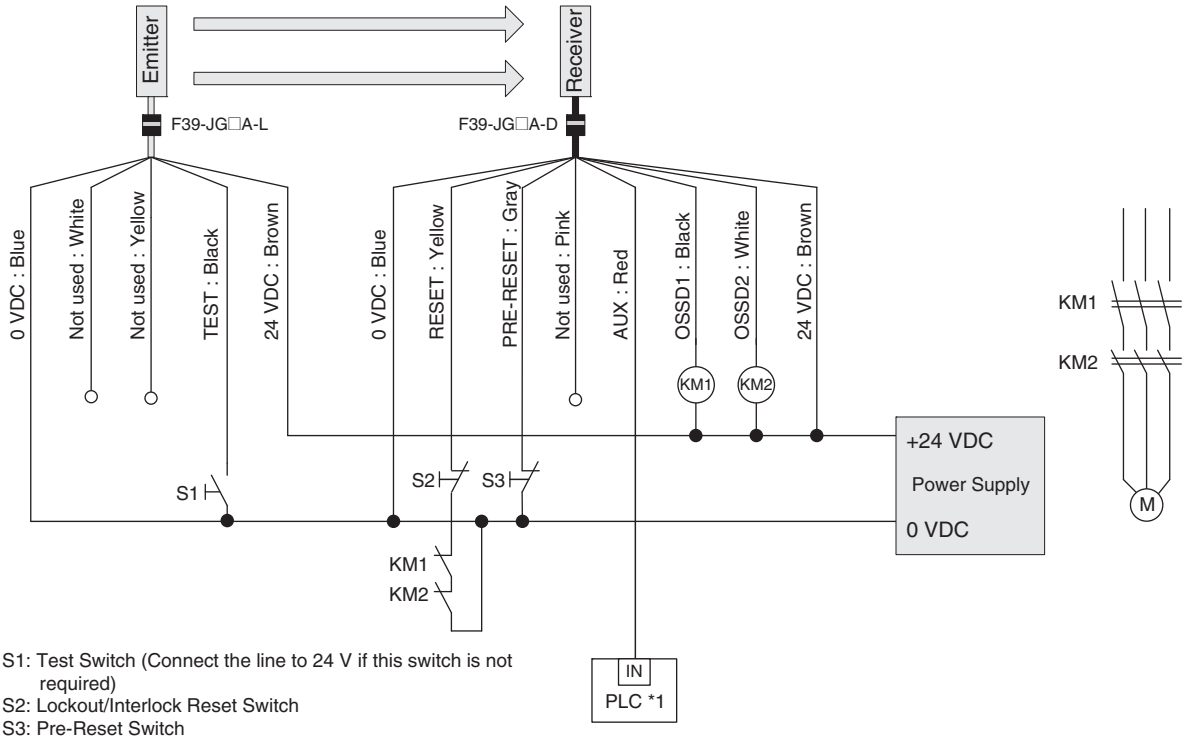
DIP Switch settings *2

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ON	2 ON
	Pre-Reset	3 ON	3 ON
		4 ON	4 ON
	NPN	7 ON	7 ON
Emitter	External Test: 0 V Active	4 ON	

□: Indicates a switch position.

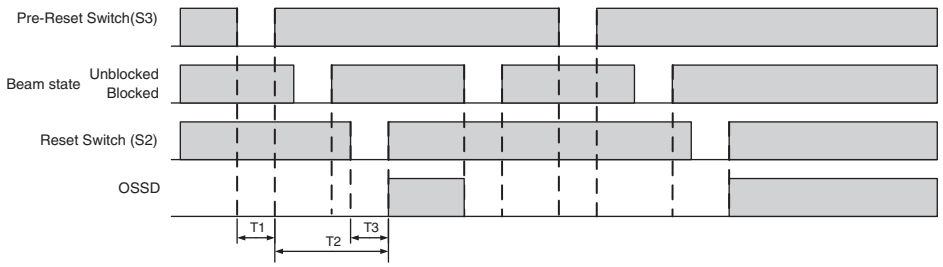
Configure functions with the DIP Switches before wiring.

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 >= 300ms
T2: Pre-reset limit time between Pre-reset and Reset: must be T2 <= 60s
T3: Push time: must be T3 >= 300ms

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.

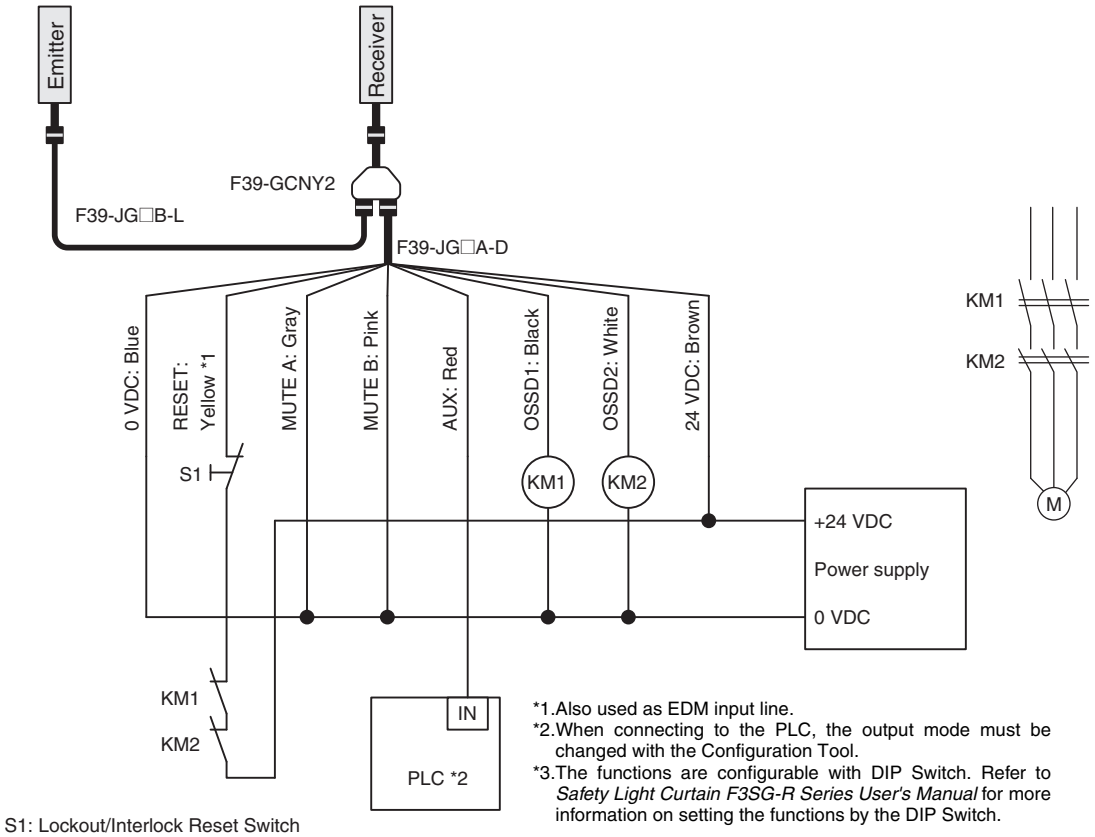
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ON	2 ON
	Manual Reset	3 ON	3 ON
		4 ON	4 ON
	PNP (factory default setting)	7 ON	7 ON
Emitter	External Test: 24 V Active (factory default setting)	4 ON	

□: Indicates a switch position.

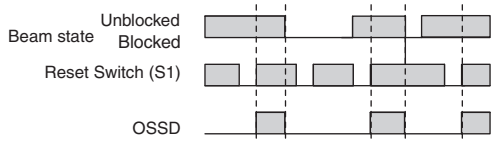
Configure functions with the DIP Switches before wiring.

Wiring Example



*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.

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.)



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

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

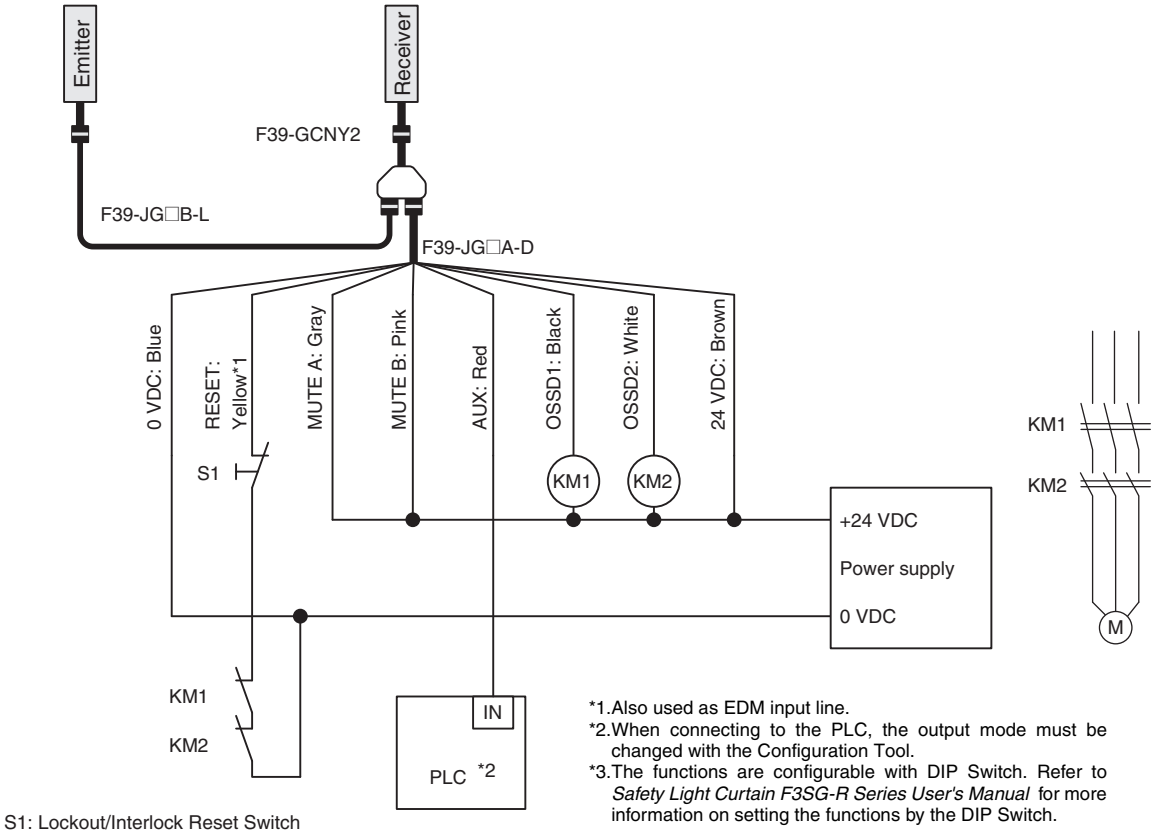
DIP Switch settings *3

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Enabled	2 ON	2 ON
	Manual Reset	3 ON	3 ON
		4 ON	4 ON
	NPN	7 ON	7 ON
Emitter	External Test: 24 V Active (factory default setting)	4 ON	

□: Indicates a switch position.

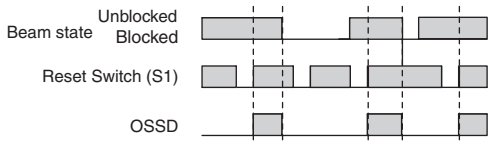
Configure functions with the DIP Switches before wiring.

Wiring Example



*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.

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.)



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.

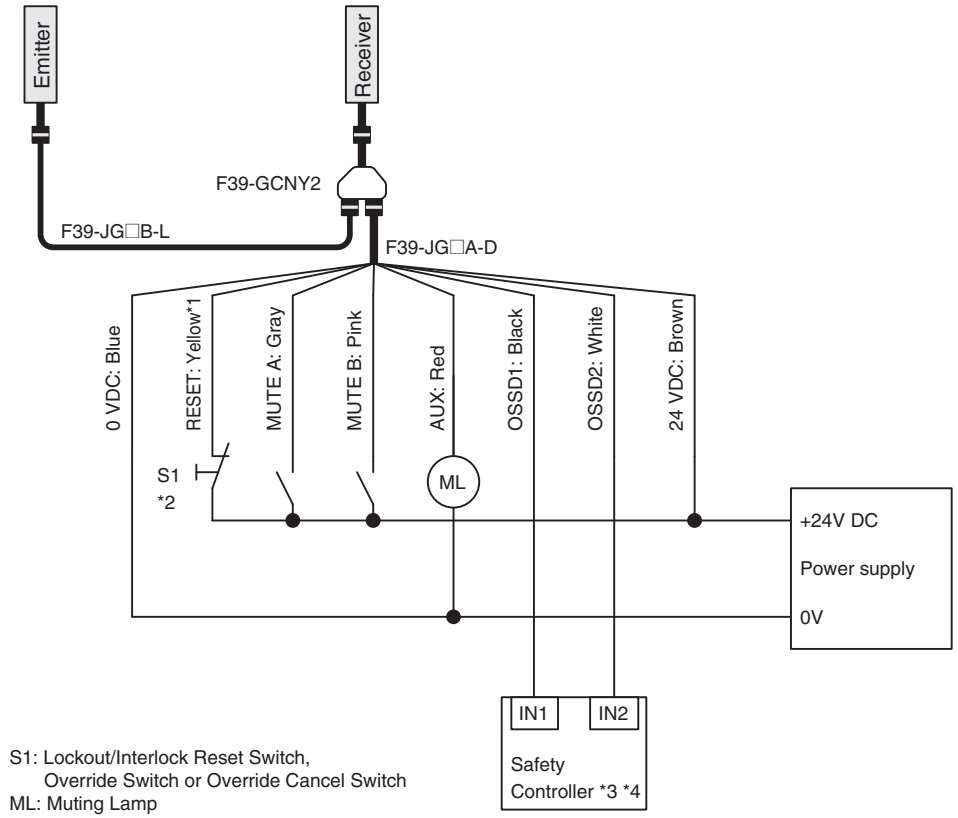
DIP Switch settings *5

	Function	DIP-SW1	DIP-SW2
Receiver	EDM Disabled (factory default setting)	2 ON	2 ON
	Auto Reset (factory default setting)	3 ON	3 ON
		4 ON	4 ON
	PNP (factory default setting)	7 ON	7 ON
Emitter	External Test: 24 V Active (factory default setting)	4 ON	

□: Indicates a switch position.

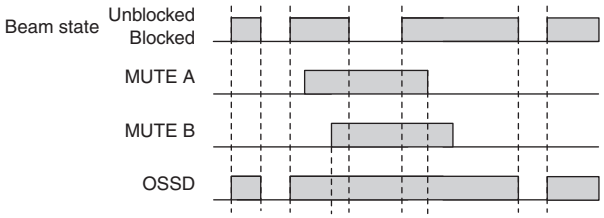
Configure functions with the DIP Switches before wiring.

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 29 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.

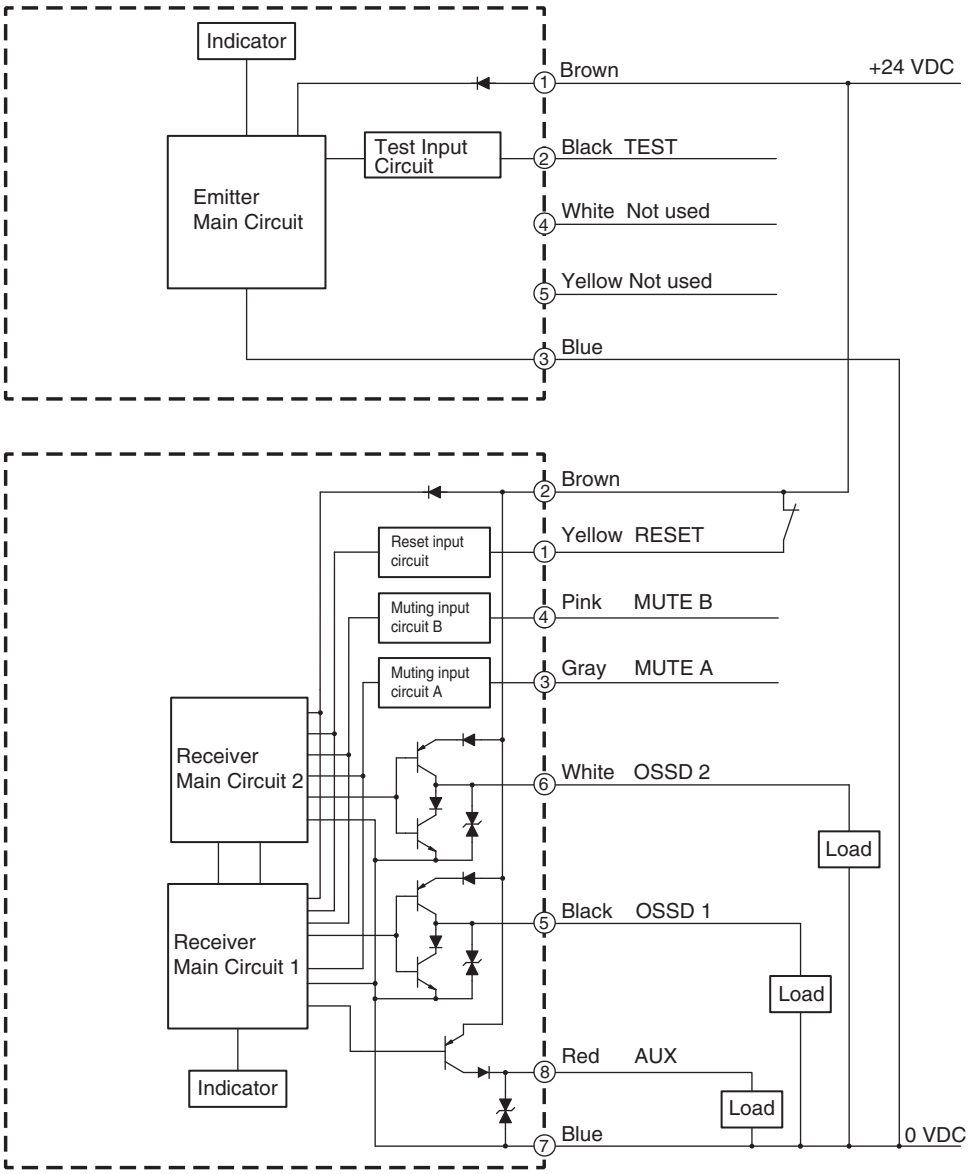


Input/Output Circuit

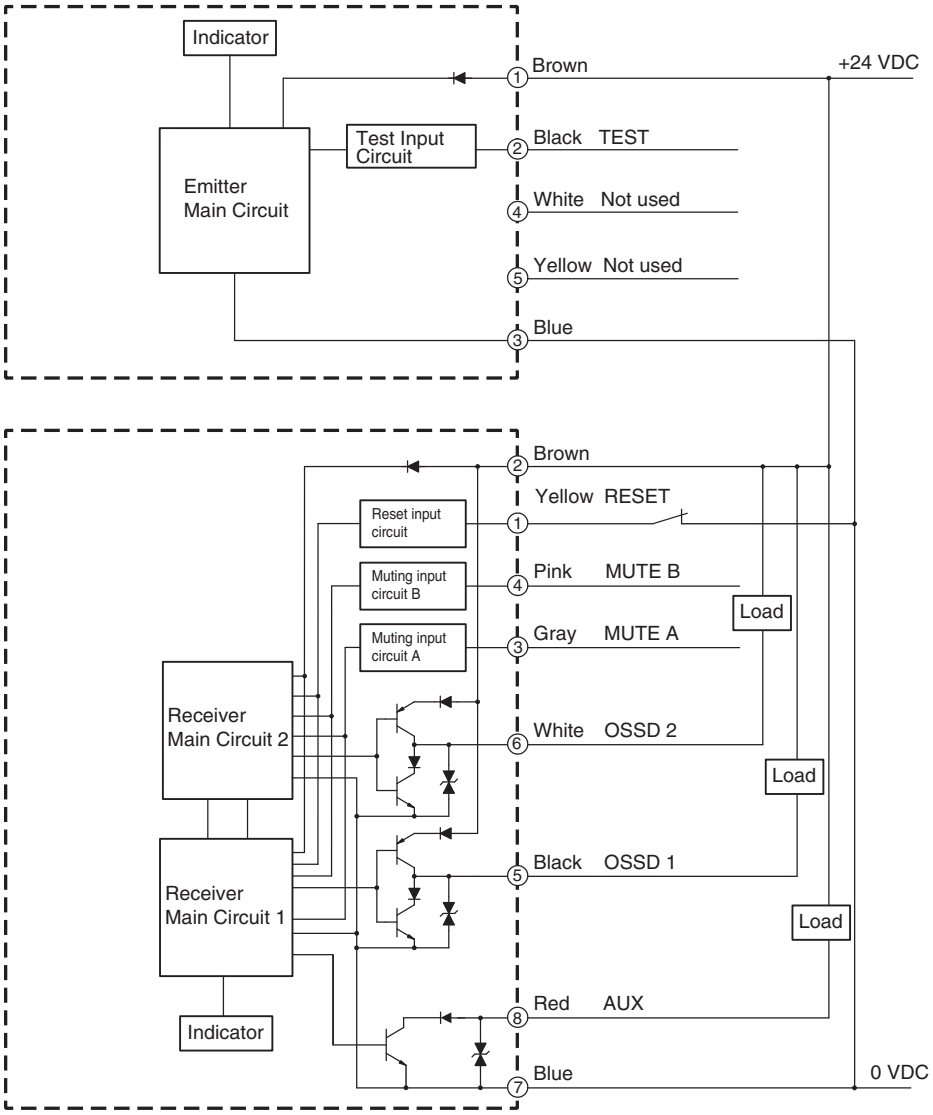
Entire Circuit Diagram

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

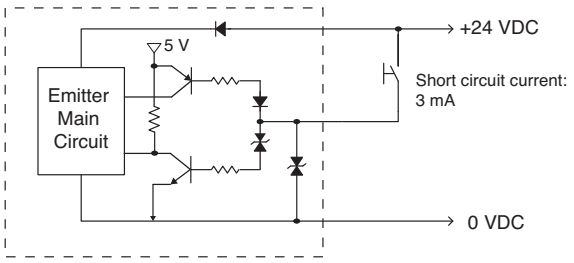


Input Circuit Diagram by Function

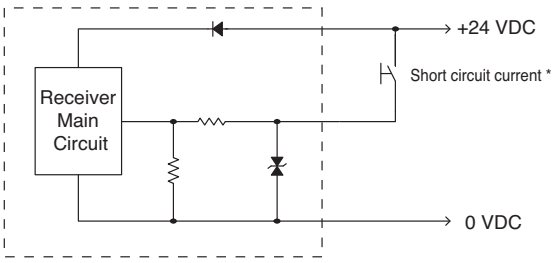
The input circuit diagrams of by function are shown below.

PNP Output

<Input circuit (Test input)>

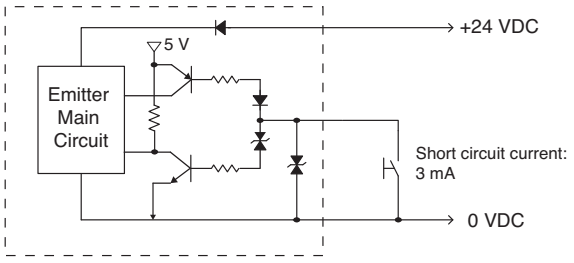


<Input circuit (Reset input, Muting inputs A/B)>

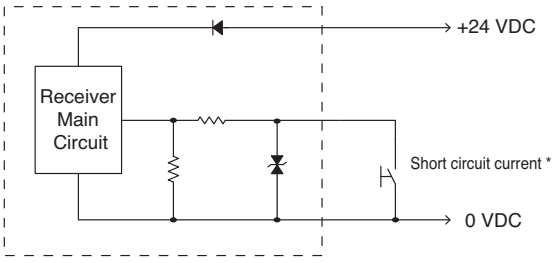


NPN Output

<Input circuit (Test input)>



<Input circuit (Reset, Muting inputs A/B)>



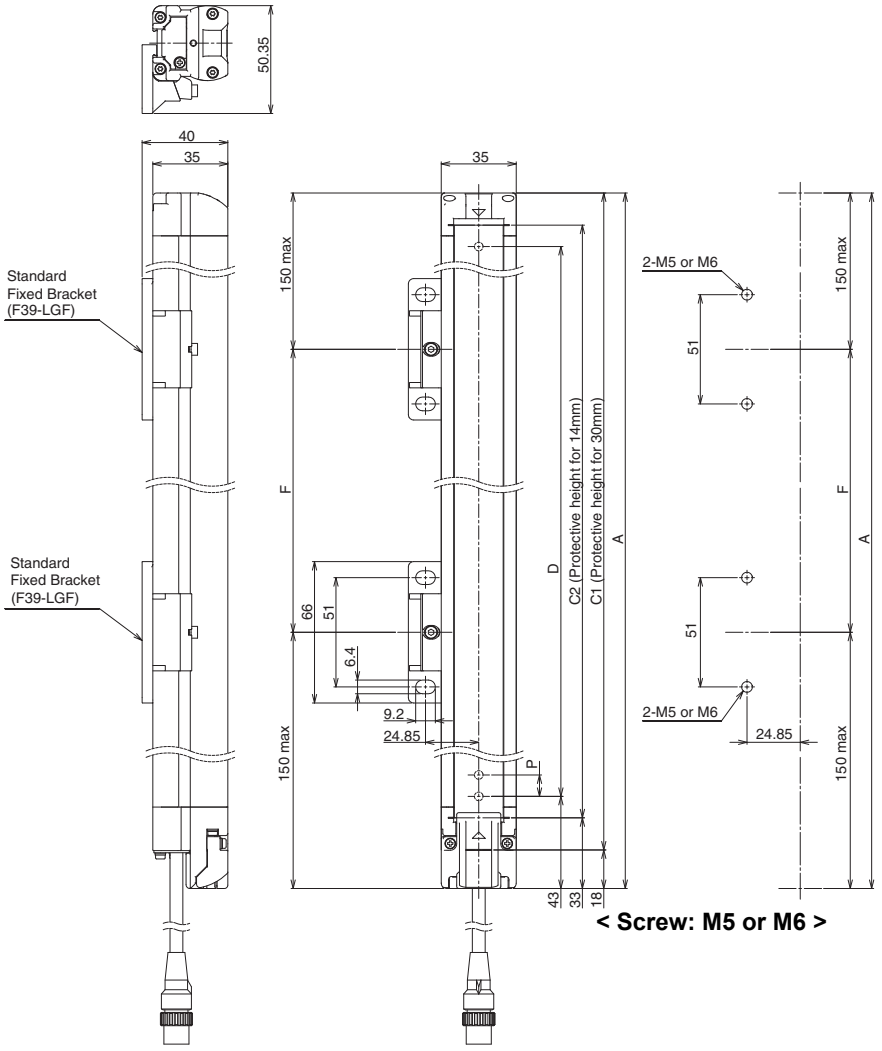
*Short circuit current: 5mA (Reset input), 3mA (Muting inputs A/B)

Dimensions

(Unit: mm)

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

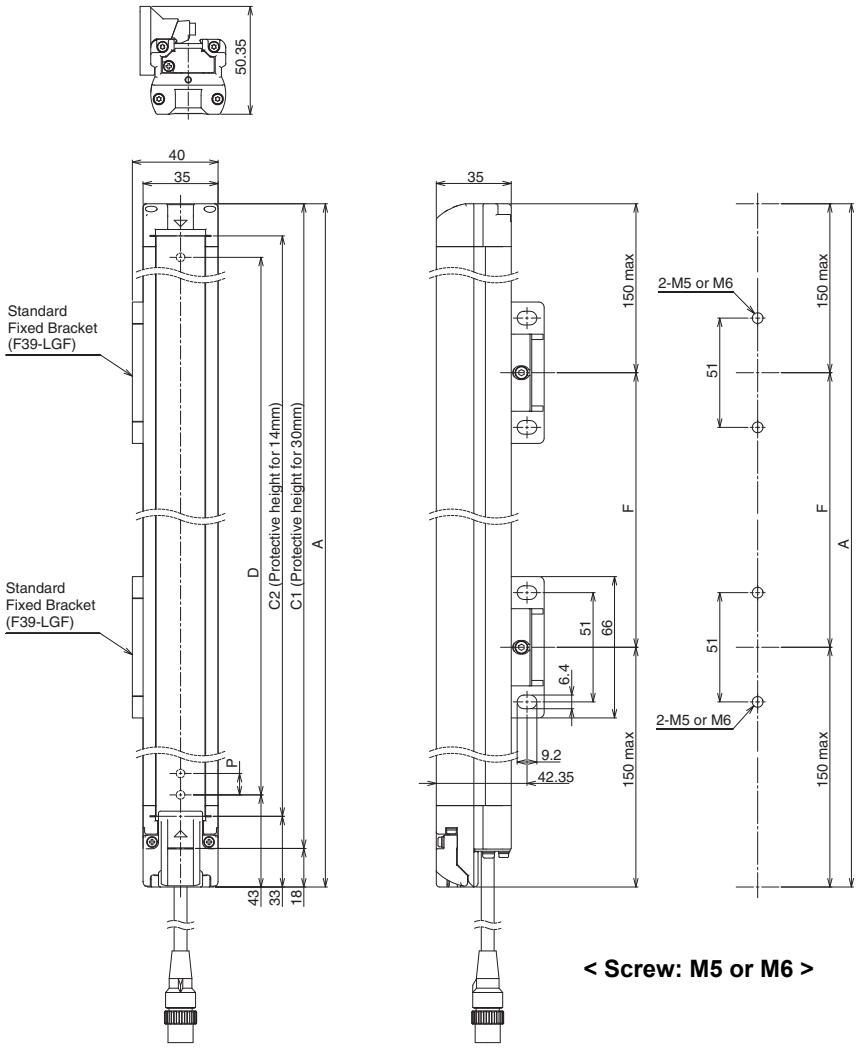
Protective height (C1)	Number of Standard Fixed Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

F3SG-□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 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

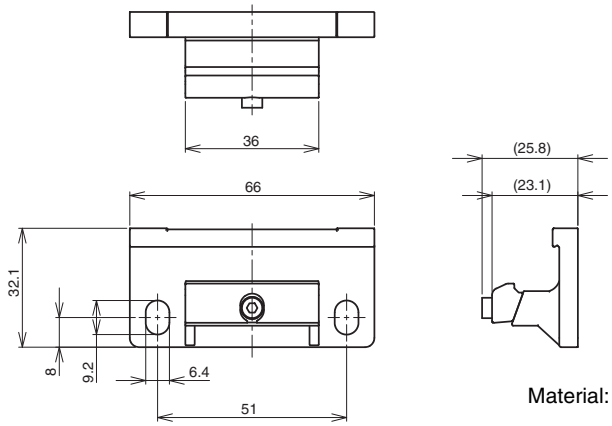
Protective height (C1)	Number of Standard Fixed Brackets	Dimension F
0190 to 1230	**2**	**1000 mm max.**
1310 to 2270	**3**	**1000 mm max.**
2350 to 2510	**4**	**1000 mm max.**

F3SG-□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 Fixed Brackets	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

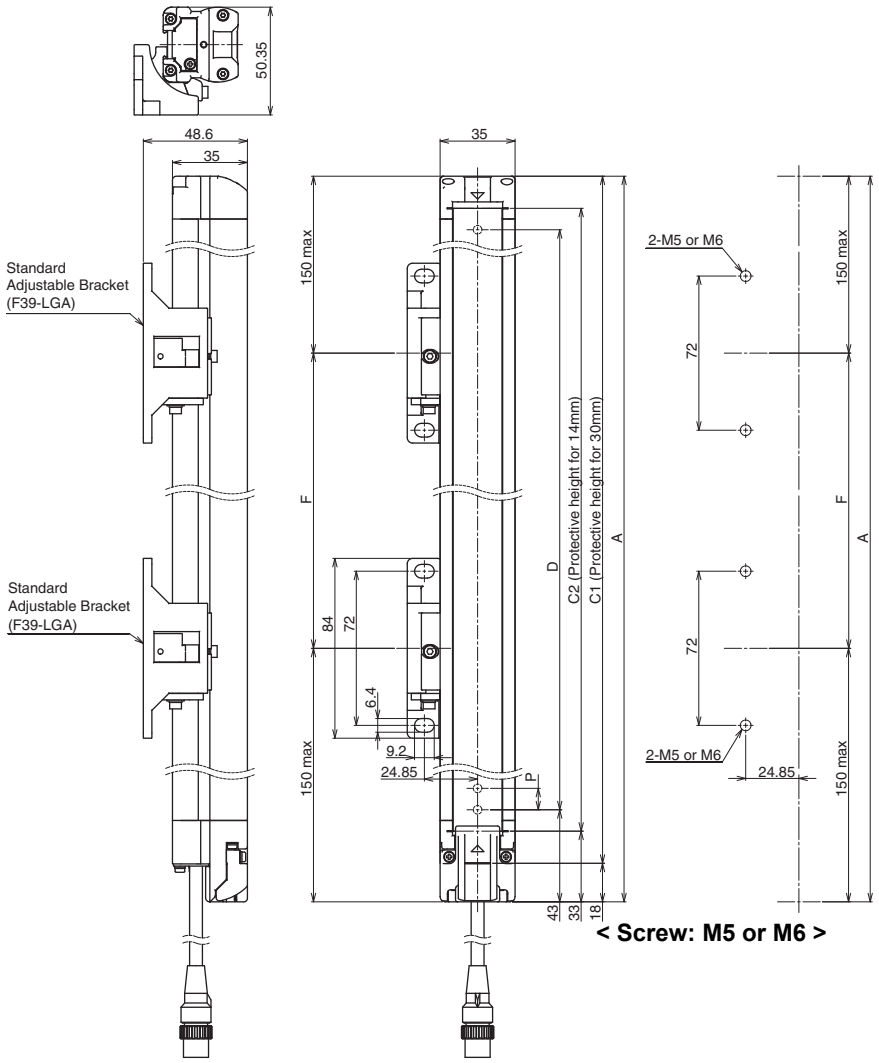
Standard Fixed Bracket (F39-LGF)



Material: ZDC2

Mounted with Standard 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

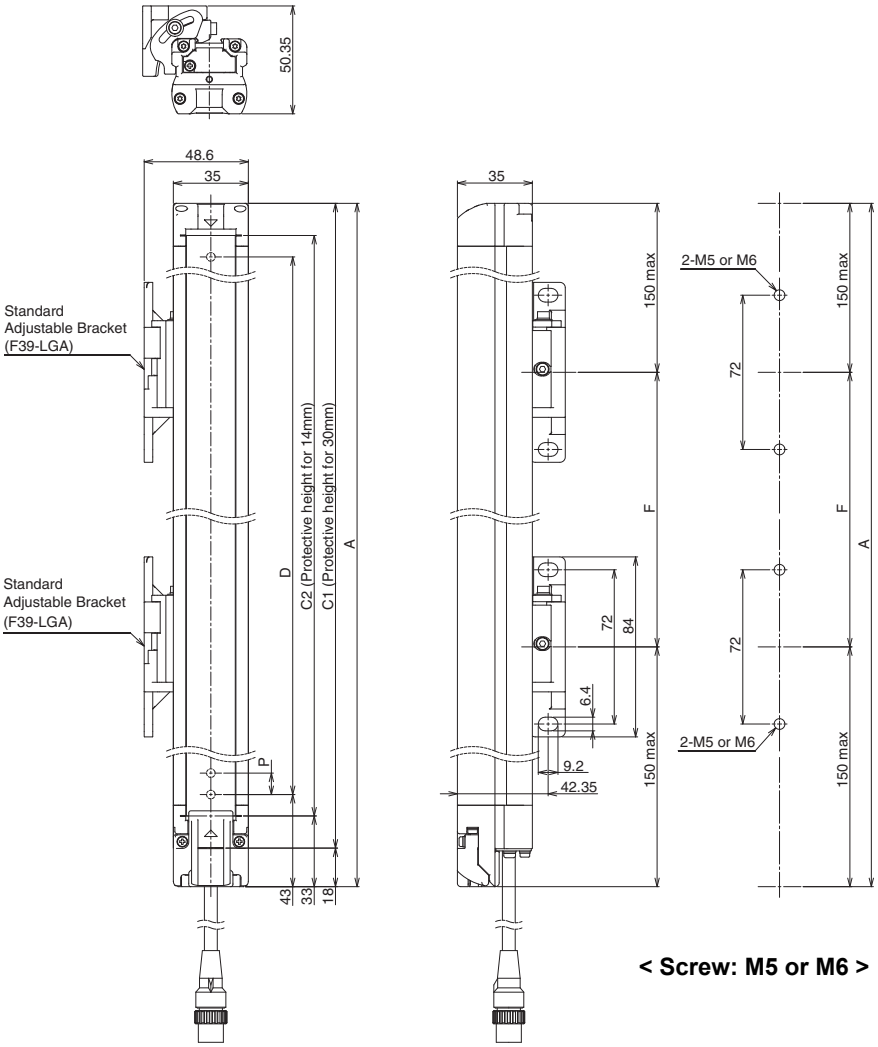
Protective height (C1)	Number of Standard Adjustable Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

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

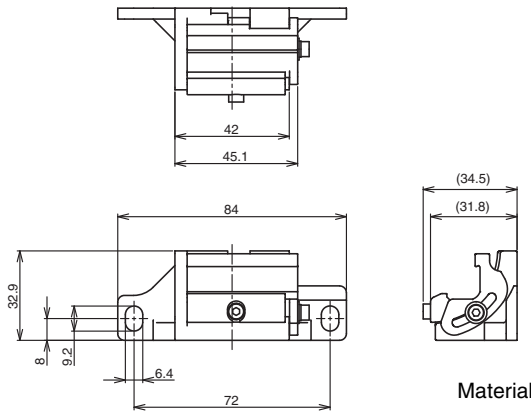
Protective height (C1)	Number of Standard Adjustable Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

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.

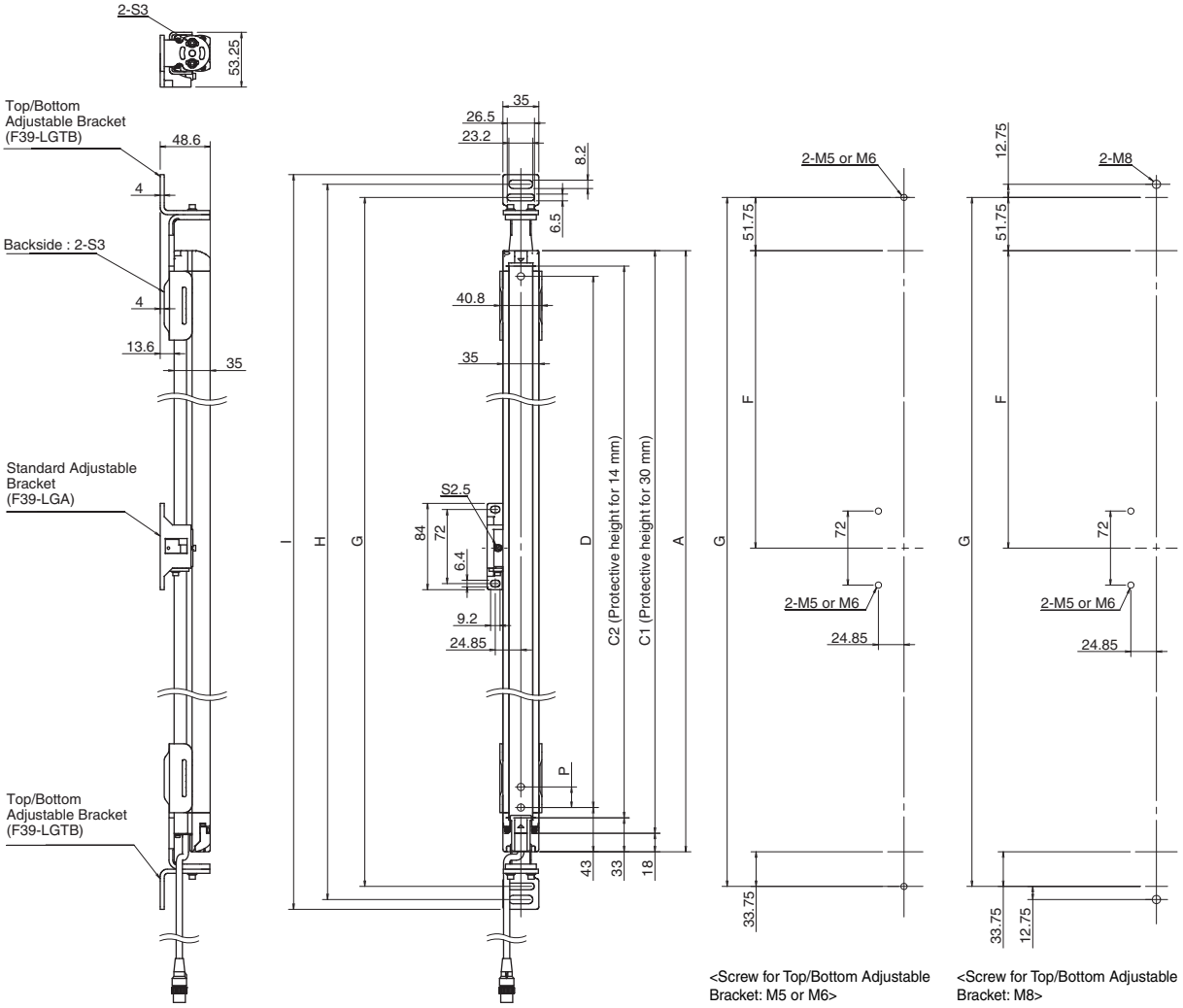
Standard Adjustable Bracket (F39-LGA)



Material: ZDC2 ,Fluorochemical lubricant oil

Mounted with Top/Bottom Adjustable Brackets (F39-LGTB) and 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 G	C1+103.5
Dimension H	C1+129
Dimension I	C1+148
Dimension P	20

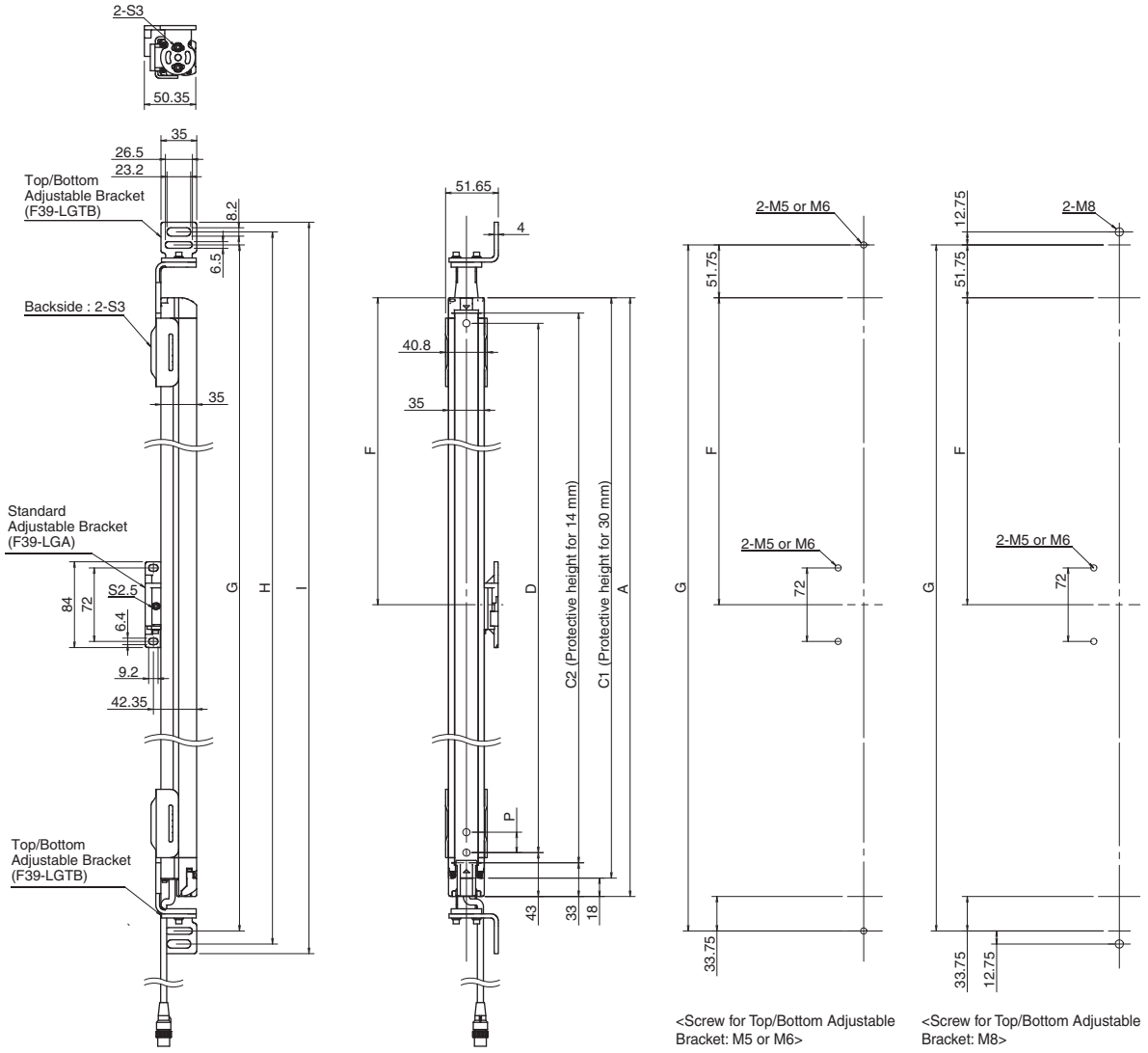
Protective height (C1)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0190 to 1070	2	0	–
1150 to 1950	2	1	1000 mm max.
2030 to 2510	2	2	1000 mm max.

F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension G	C2+133.5
Dimension H	C2+159
Dimension I	C2+178
Dimension P	10

Protective height (C2)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0160 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+103.5
Dimension H	C1+129
Dimension I	C1+148
Dimension P	20

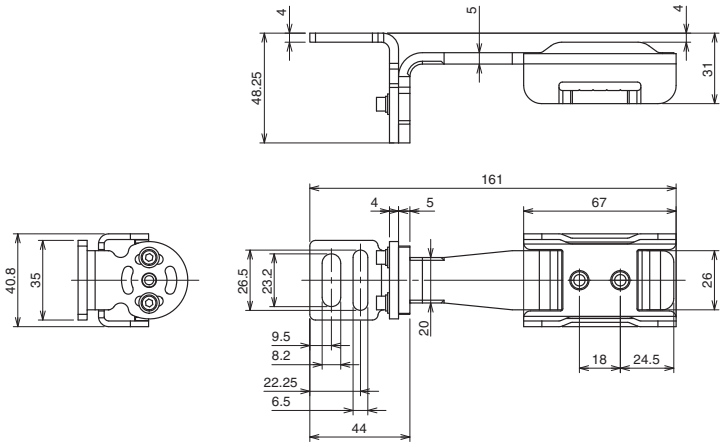
F3SG-□RA□□□□-14 Series

Dimension A	C2+48
Dimension C2	4-digit number of the type name (Protective height)
Dimension D	C2-20
Dimension G	C2+133.5
Dimension H	C2+159
Dimension I	C2+178
Dimension P	10

Protective height (C1)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0190 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
0160 to 1040	2	0	–
1120 to 1920	2	1	1000 mm max.
2000 to 2080	2	2	1000 mm max.

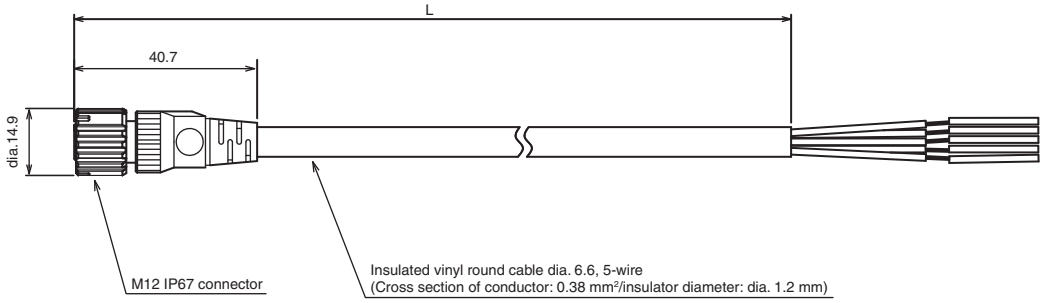
Top/Bottom Adjustable Bracket (F39-LGTB)



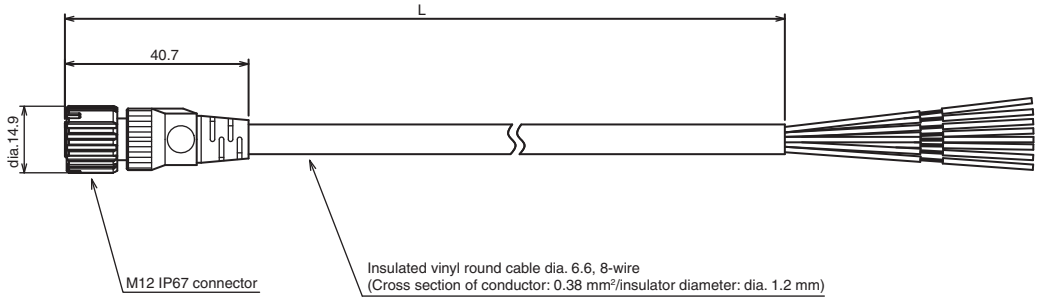
Material: SUS304

Accessories

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

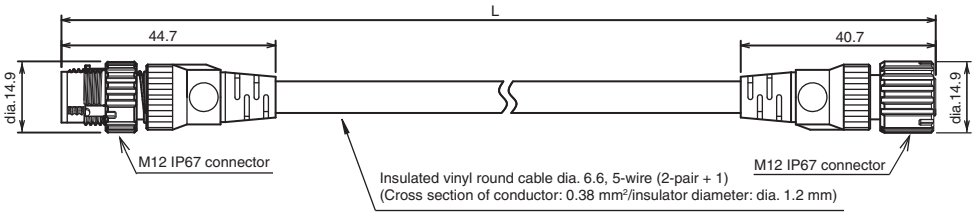


Single-Ended Cable for Receiver (F39-JG□A-D, sold separately)

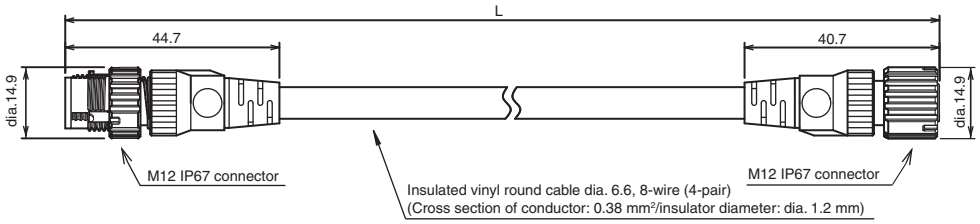


Emitter cable (Gray)	Receiver cable (Black)	L (m)
F39-JG3A-L	**F39-JG3A-D**	3
F39-JG7A-L	**F39-JG7A-D**	7
F39-JG10A-L	**F39-JG10A-D**	10
F39-JG15A-L	**F39-JG15A-D**	15
F39-JG20A-L	**F39-JG20A-D**	20

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

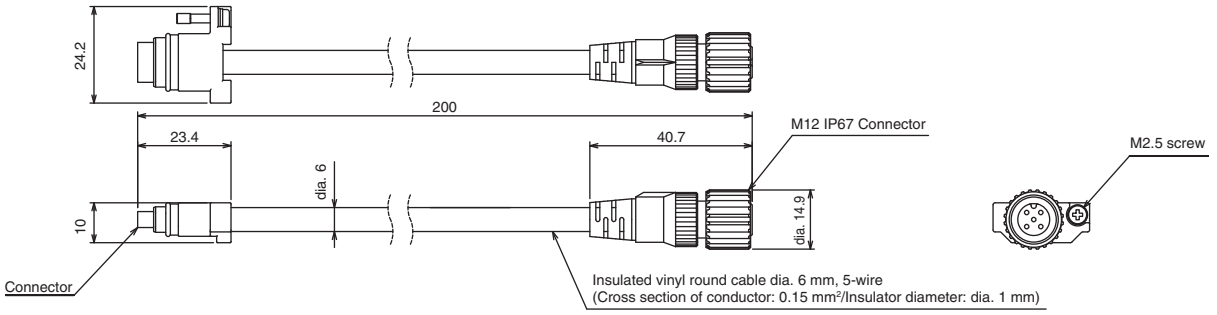


Double-Ended Cable for Receiver: Cable for extension (F39-JG□B-D, sold separately)

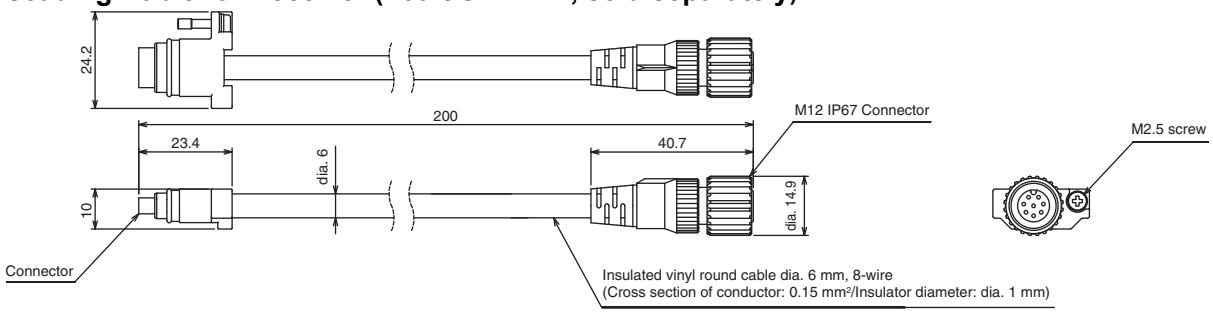


Emitter cable (Gray)	Receiver cable (Black)	L (m)
F39-JGR5B-L	**F39-JGR15B-D**	0.5
F39-JG1B-L	**F39-JG1B-D**	1
F39-JG3B-L	**F39-JG3B-D**	3
F39-JG5B-L	**F39-JG5B-D**	5
F39-JG7B-L	**F39-JG7B-D**	7
F39-JG10B-L	**F39-JG10B-D**	10
F39-JG15B-L	**F39-JG15B-D**	15
F39-JG20B-L	**F39-JG20B-D**	20

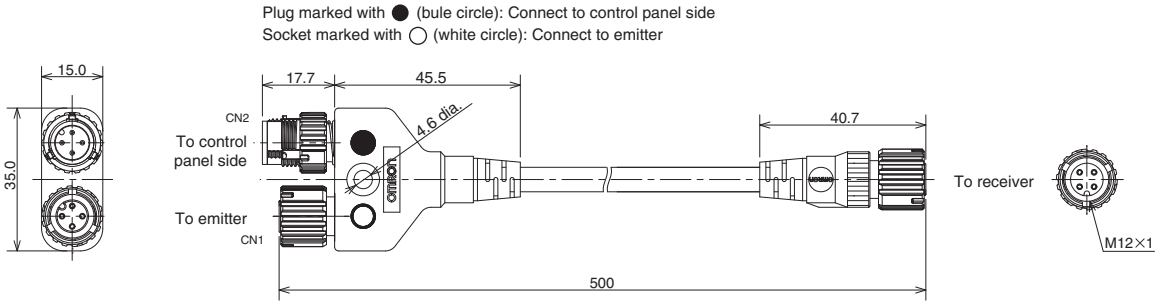
Cascading Cable for Emitter (F39-JGR2W-L, sold separately)



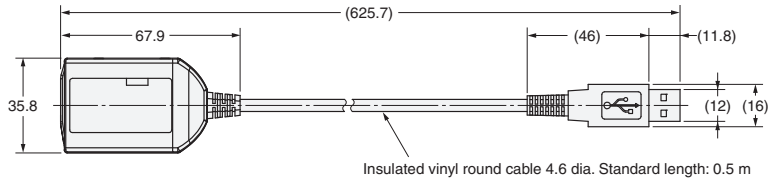
Cascading Cable for Receiver (F39-JGR2W-D, sold separately)

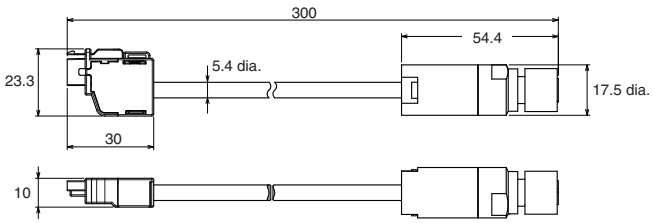


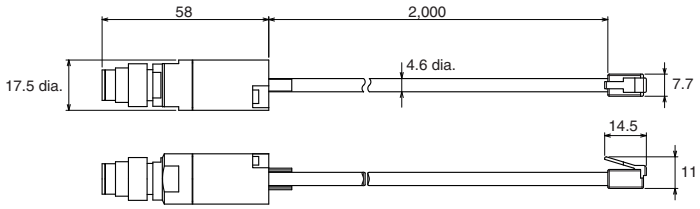
Y-Joint Plug/Socket Connector (F39-GCNY1, sold separately)



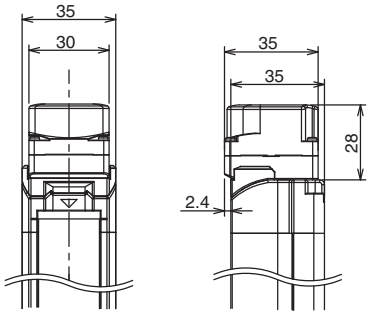
Interface Unit (F39-GIF)



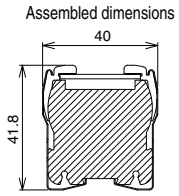




Lamp (F39-LP)



Spatter Protection Cover (F39-HGA)



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

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)

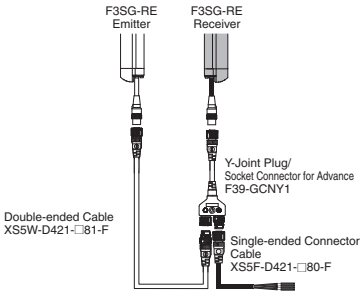
Single-ended Connector Cable (Round Water-resistant Connector Connected to Cable, Socket on One Cable End)

Appearance	Sheath material	Cable length	Model	Specifications
	PVC	2 m	**XS2F-M12PVC4S2M**	M12 connector (4-pin), 4 wires
	PVC	5 m	**XS2F-M12PVC4S5M**	
	PVC	10 m	**XS2F-M12PVC4S10M**	
	PUR	2 m	**XS2F-M12PUR4S2M**	
	PUR	5 m	**XS2F-M12PUR4S5M**	
	PUR	10 m	**XS2F-M12PUR4S10M**	

Double-ended Cable (Round Water-resistant Connectors Connected to Cable, Socket and Plug on Cable Ends)

Appearance	Sheath material	Cable length	Model	Specifications
	PVC	2 m	**XS2W-M12PVC4SS2M**	M12 connector (4-pin), on both ends
	PVC	5 m	**XS2W-M12PVC4SS5M**	
	PVC	10 m	**XS2W-M12PVC4SS10M**	
	PUR	2 m	**XS2W-M12PUR4SS2M**	
	PUR	5 m	**XS2W-M12PUR4SS5M**	
	PUR	10 m	**XS2W-M12PUR4SS10M**	

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	 When using the reduced wiring connector system F39-GCNY1, the Operating Range Selection is fixed to Long Mode.	**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 ±15°. 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 ±22.5°. 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.)

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
			F39-HGA0550
	F3SG-□RE2080□14	F3SG-□RE2110□30	F39-HGB1540
			F39-HGA0550
	–	F3SG-□RE2190□30	F39-HGB1620
			F39-HGA0550
	–	F3SG-□RE2270□30	F39-HGB1700
			F39-HGA0550
	–	F3SG-□RE2350□30	F39-HGB1780
			F39-HGA0550
	–	F3SG-□RE2430□30	F39-HGB1860
			F39-HGA0550
	–	F3SG-□RE2510□30	F39-HGB1940
			F39-HGA0550

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

Test Rod

Diameter	Model
14 mm dia.	**STI-TO14**
30 mm dia.	**STI-TO30**

Ratings/Specifications

Main unit

			F3SG-4RE□□□□-14	F3SG-4RE□□□□-30
Performance	Type of ESPE (IEC 61496-1)	Type 4	F3SG-4RE□□□□□14/30	
	Object Resolution (Detection Capability)		Opaque objects	
			14-mm dia.	30-mm dia.
	Beam Gap		10mm	20mm
	Number of Beams		15 to 207	8 to 124
	Lens Size		5.2 ×3.4 (W×H) mm	7-mm dia.
	Protective Height		160 to 2080 mm (6.3 to81.9 inch)	190 to 2510 mm (7.3 to98.7 inch)
	Operating Range	Long	0.3 to 10.0 m (1 to 32 ft.)	0.3 to 20.0 m (1 to 65 ft.)
		Short	0.3 to 3.0 m (1 to 10 ft.)	0.3 to 7.0 m (1 to 23 ft.)
	Response Time	ON to OFF	5 to 15ms *1	
		OFF to ON	25 to 75ms *1	
			*1.Response time when used in one segment system or in cascaded connection Refer to page 41.	
	Effective Aperture Angle (EAA) (IEC	Type 4	±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.	
Electricall	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 42.	
	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	
	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.	

			F3SG-4RE□□□□-14	F3SG-4RE□□□□-30
Material	Material		Housing: Aluminum Cap: PBT Front window: PMMA Cable: Oil resistant PVC Mounting Bracket: ZDC2 FE plate: SUS	
	Weight (packaged)		Refer to page 41.	
	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 9.	
	Performance Level (PL)/Safety category	Type 4	PL e/Category 4 (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)	

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

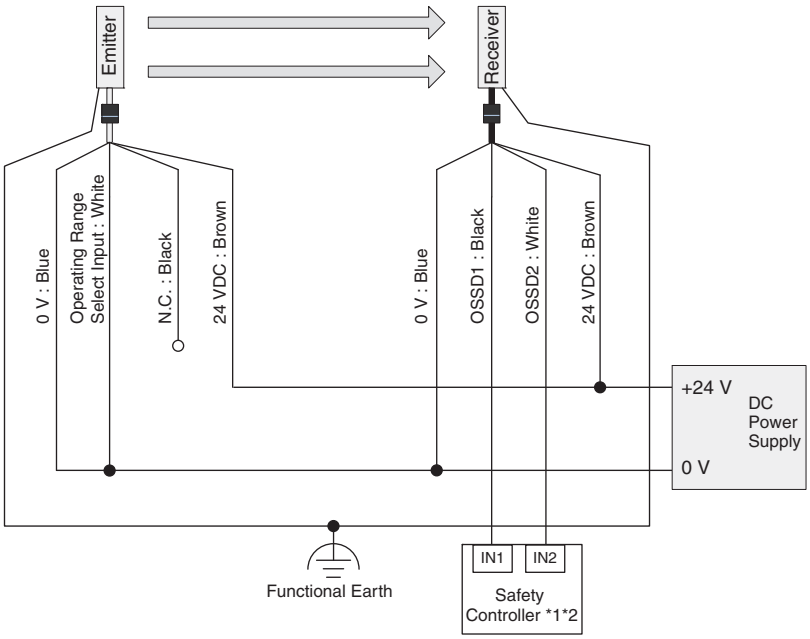
Name of Indicator		Color	Illuminated	Blinking
Operating range	LONG	Green	Long range mode is selected	Lockout state due to Operating range selection setting error
Power	POWER	Green	Power is ON.	Error due to noise
Lockout	LOCKOUT	Red	–	Lockout state due to error in emitter

Receiver

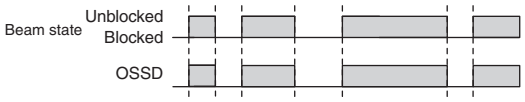
Name of Indicator		Color	Illuminated	Blinking
Top-beam-state	TOP	Blue	The top beam is unblocked	–
Internal error	INTERNAL	Red	–	Lockout state due to Internal error, or error due to abnormal power supply or noise
Lockout	LOCKOUT	Red	–	Lockout state due to error in receiver
Stable-state	STB	Green	Incident 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	–

Connections (Basic Wiring Diagram)

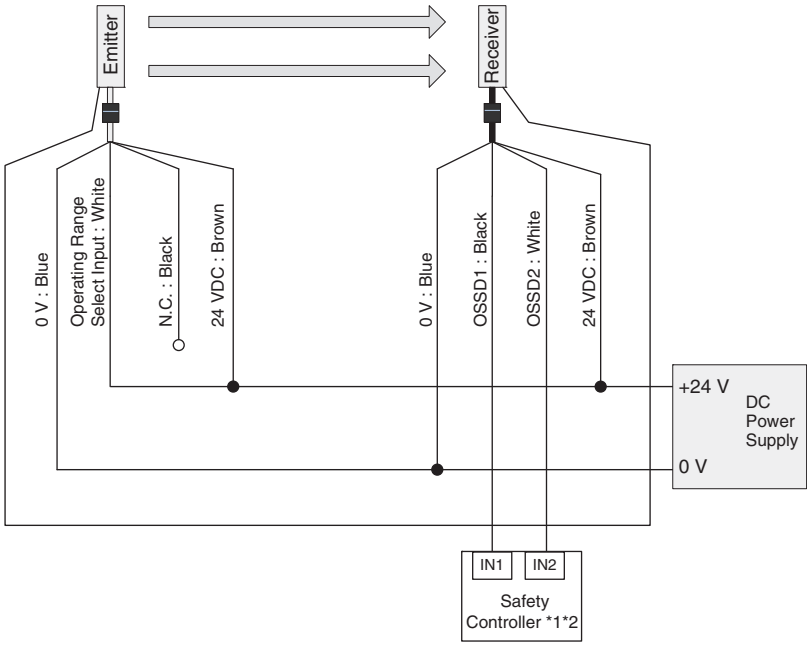
Short Mode



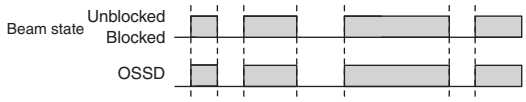
*1.Refer to page 49 for more information.
*2.The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.



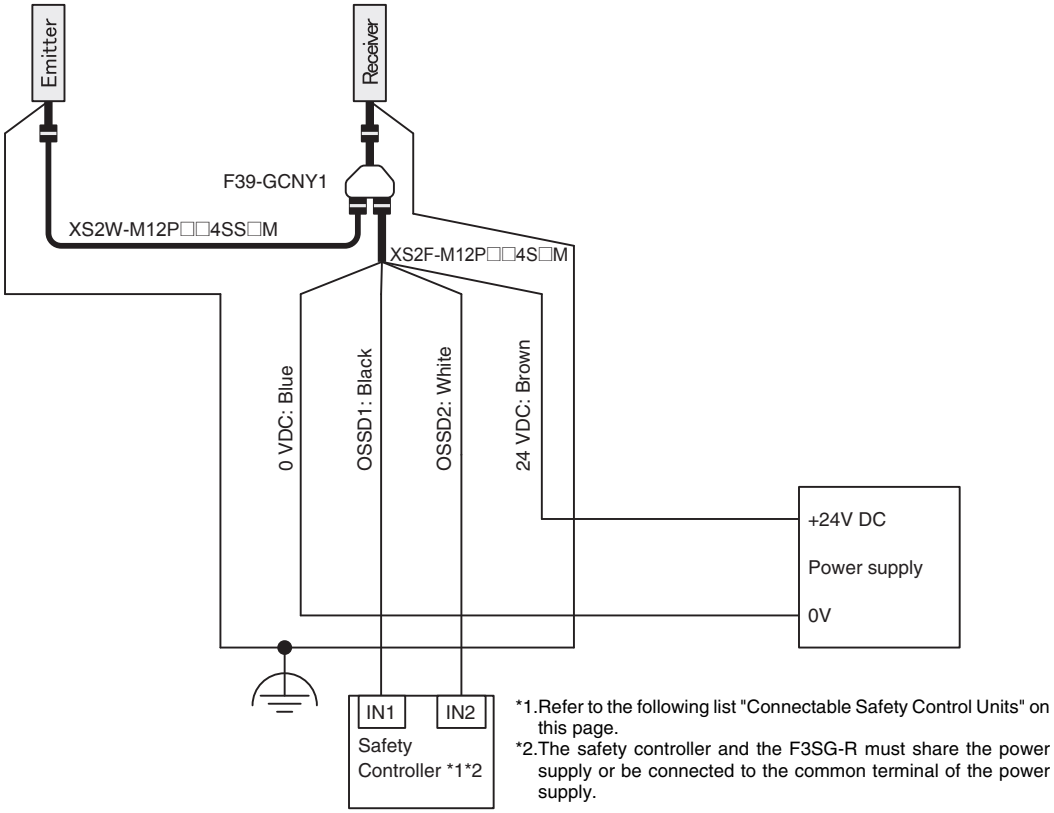
Long Mode

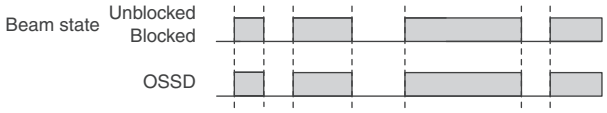


*1.Refer to page 49 for more information.
*2.The safety controller and the F3SG-R must share the power supply or be connected to the common terminal of the power supply.



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.

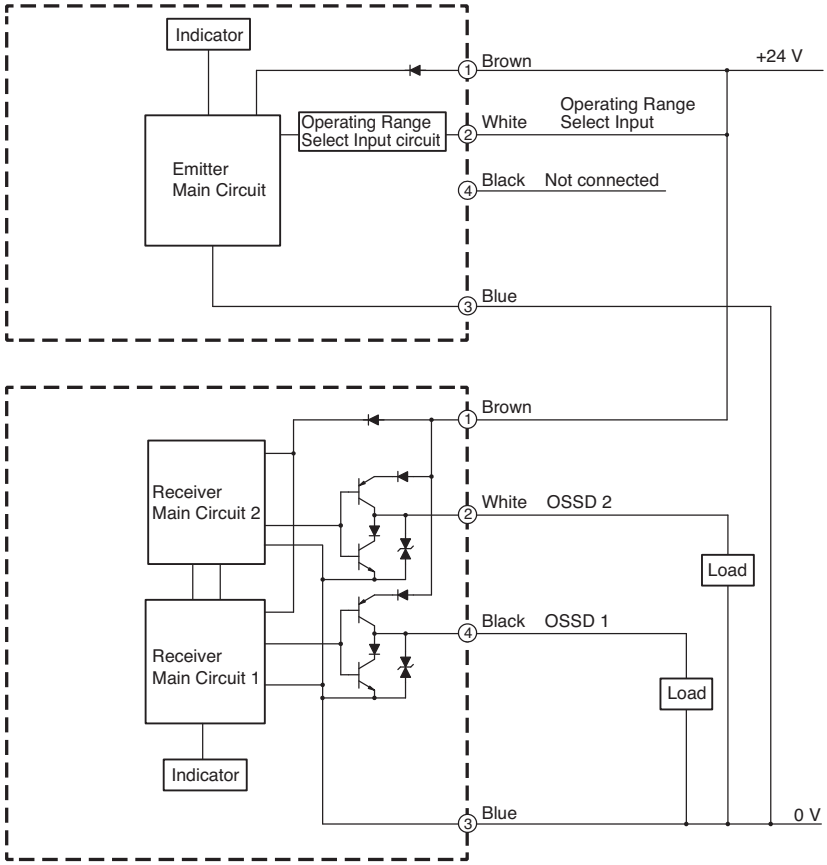
Connectable Safety Control Units (PNP output)		
G9SA-301 **G9SA-321** **G9SA-501** **G9SB-200-B** **G9SB-200-D** **G9SB-301-B** **G9SB-301-D** **G9SE-201** **G9SE-401** **G9SE-221-T□**	**G9SX-AD322-T** **G9SX-ADA222-T** **G9SX-BC202** **G9SX-GS226-T15**	**G9SP-N10S** **G9SP-N10D** **G9SP-N20S** **NE0A-SCPU01**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

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

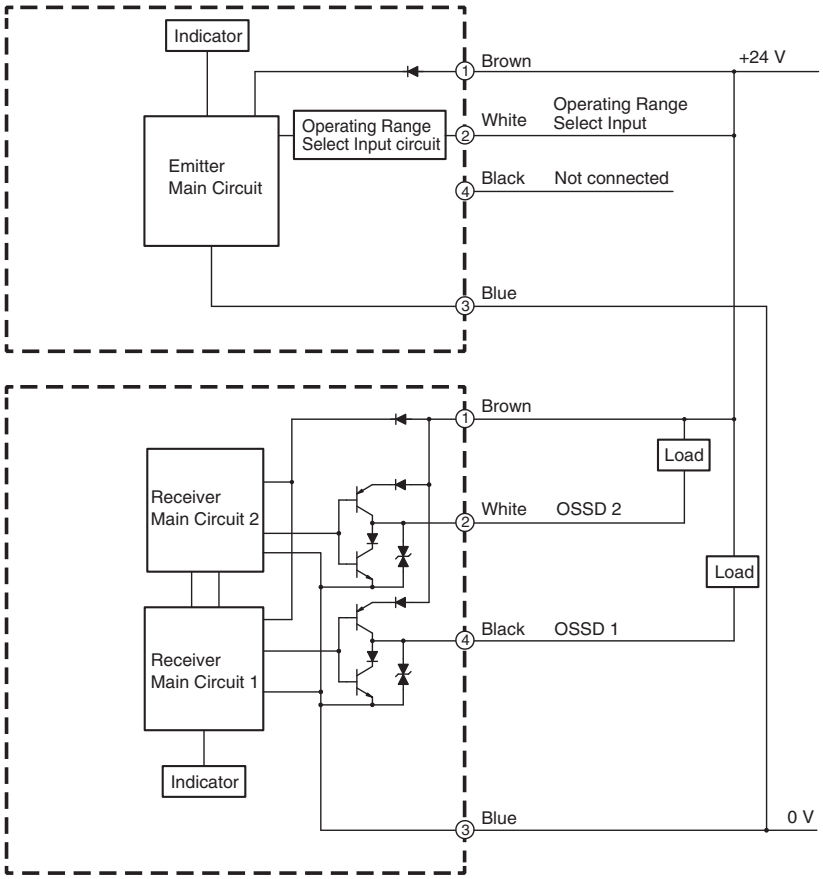
Connectable Safety Control Units (NPN output)
G9SA-301-P

Input/Output Circuit

PNP Output



NPN Output

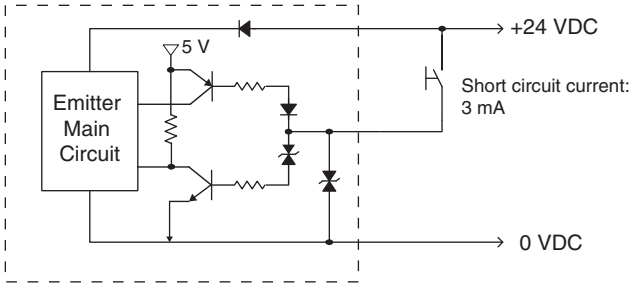


Input Circuit Diagram by Function

The input circuit diagrams of by function are shown below.

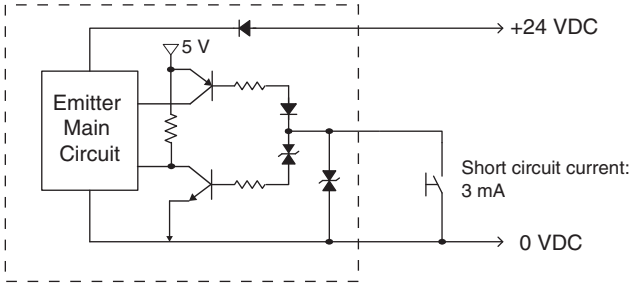
PNP Output

<Input circuit (Operating Range Select Input)>



NPN Output

<Input circuit (Operating Range Select Input)>

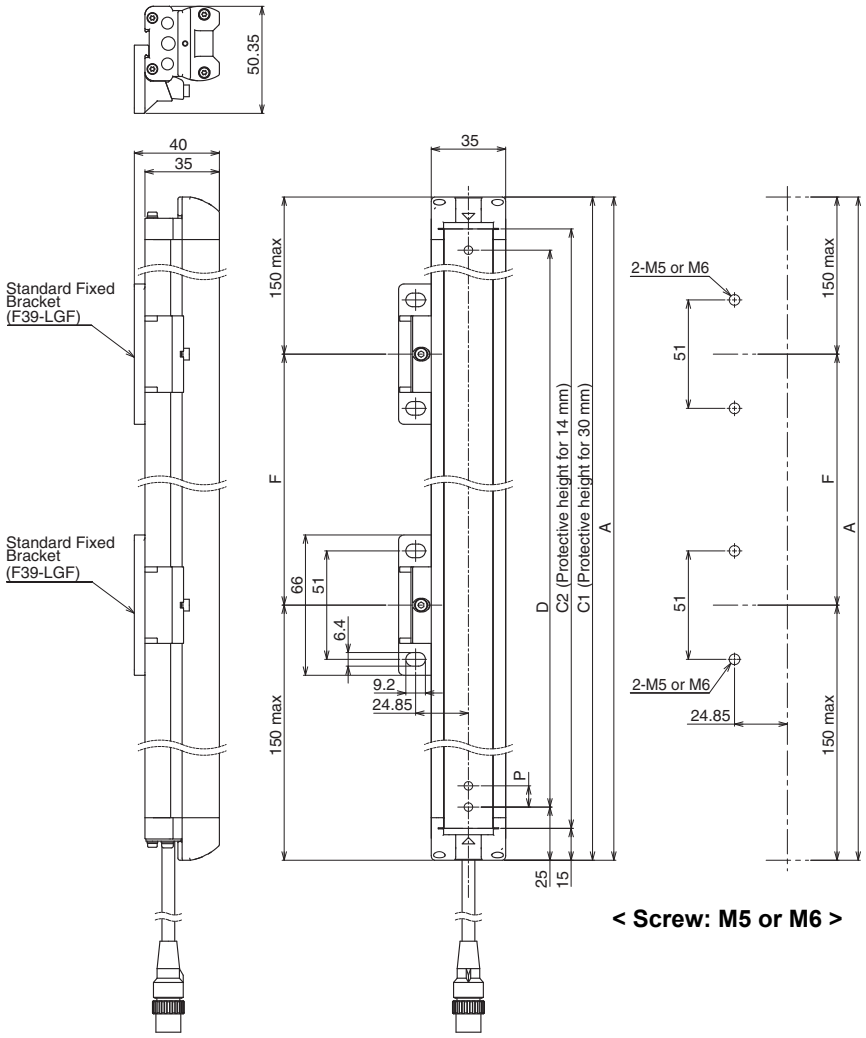


Dimensions

(Unit: mm)

Mounted with Standard Fixed Brackets (F39-LGF)

Backside Mounting



F3SG-4RE□□□□□30 Series

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

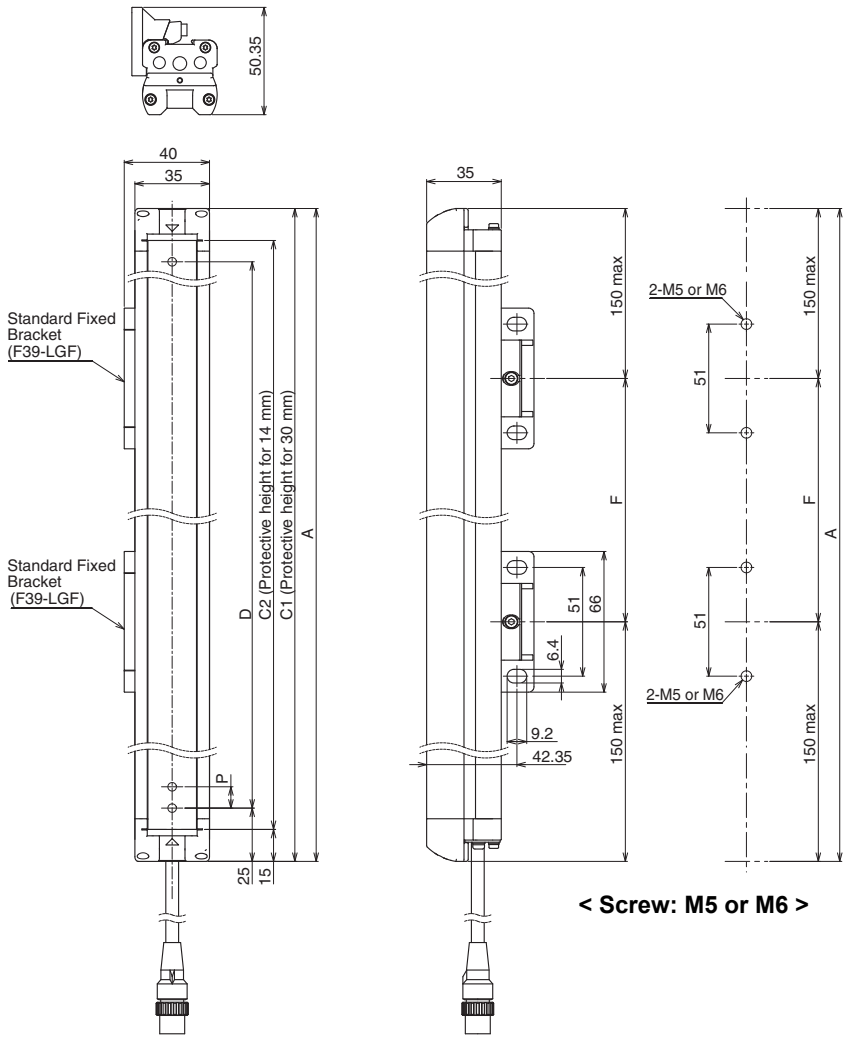
Protective height (C1)	Number of Standard Fixed Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

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

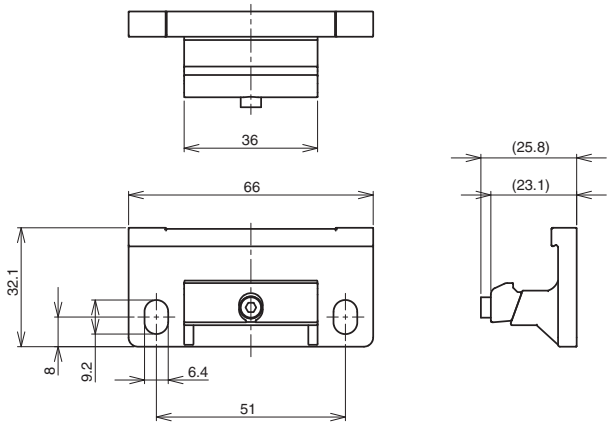
Protective height (C1)	Number of Standard Fixed Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

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

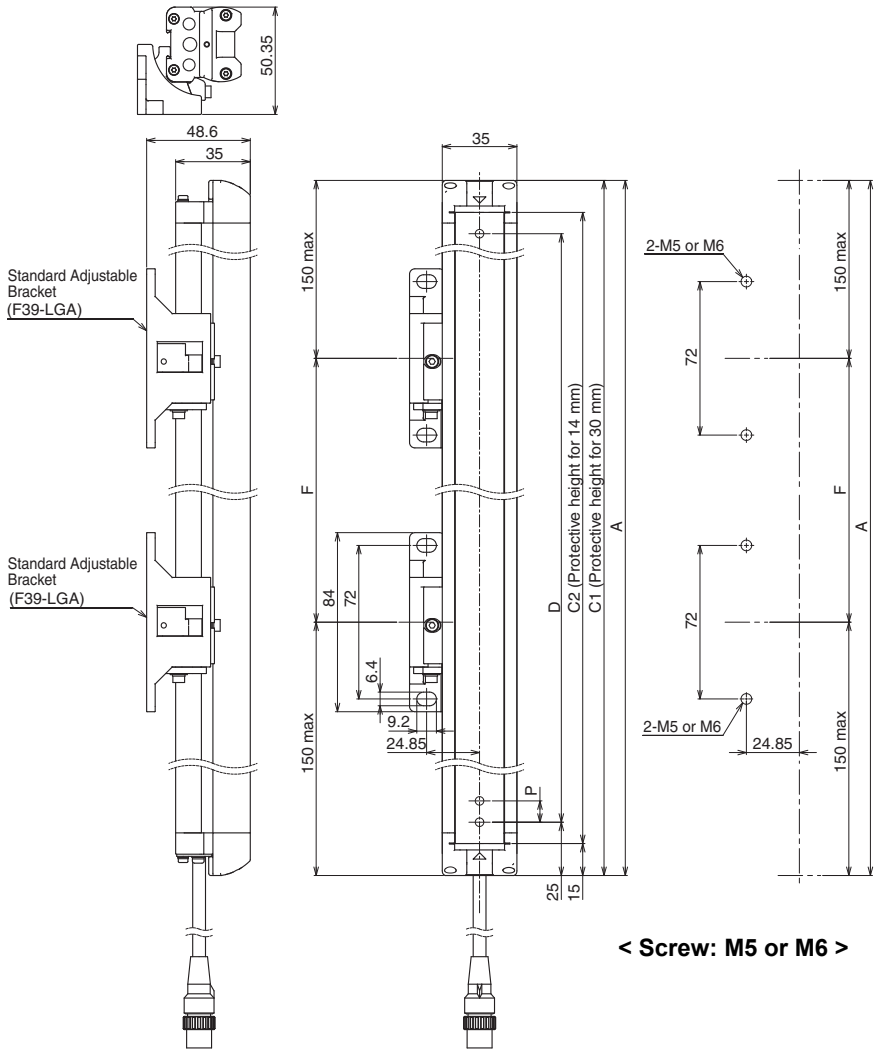
Protective height (C2)	Number of Standard Fixed Brackets	Dimension F
0160 to 1200	2	1000 mm max.
1280 to 2080	3	1000 mm max.

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

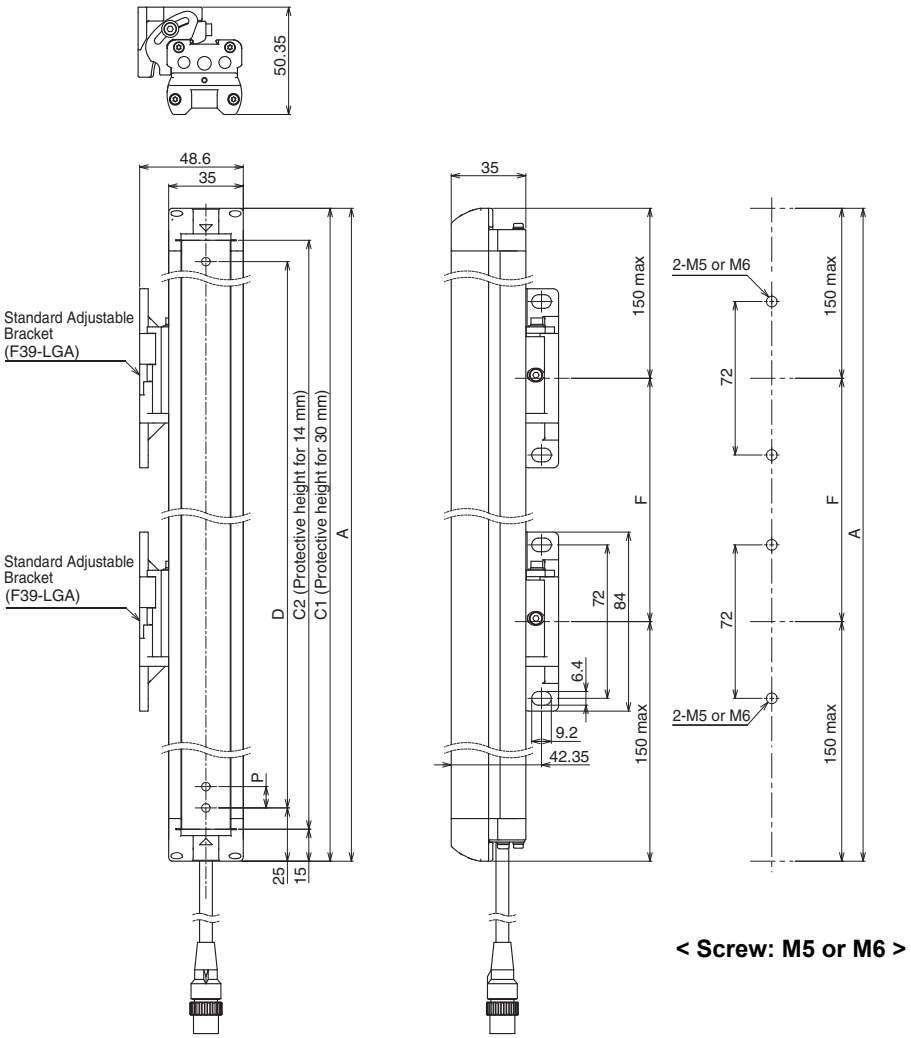
Protective height (C1)	Number of Standard Adjustable Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

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

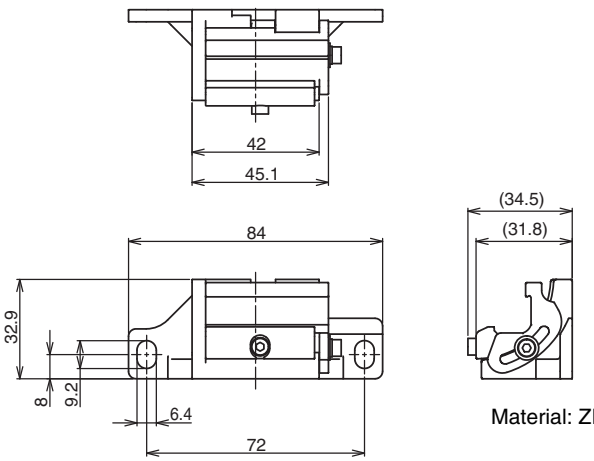
Protective height (C1)	Number of Standard Adjustable Brackets	Dimension F
0190 to 1230	2	1000 mm max.
1310 to 2270	3	1000 mm max.
2350 to 2510	4	1000 mm max.

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.

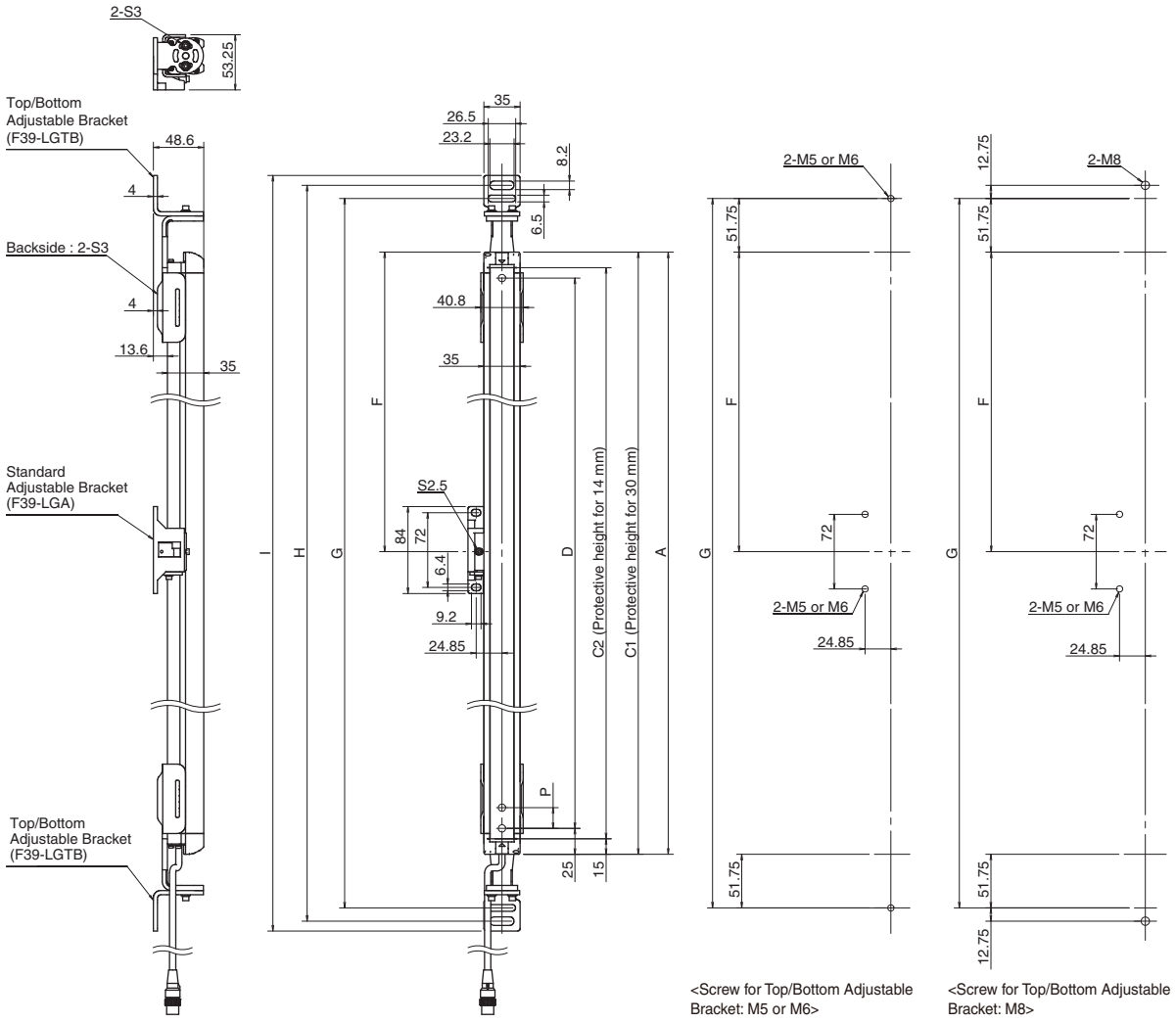
Standard Fixed Bracket (F39-LGA)



Material: ZDC2, Fluorochemical lubricant oil

Mounted with Top/Bottom Adjustable Brackets (F39-LGTB) and Standard Adjustable 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 G	C1+103.5
Dimension H	C1+129
Dimension I	C1+148
Dimension P	20

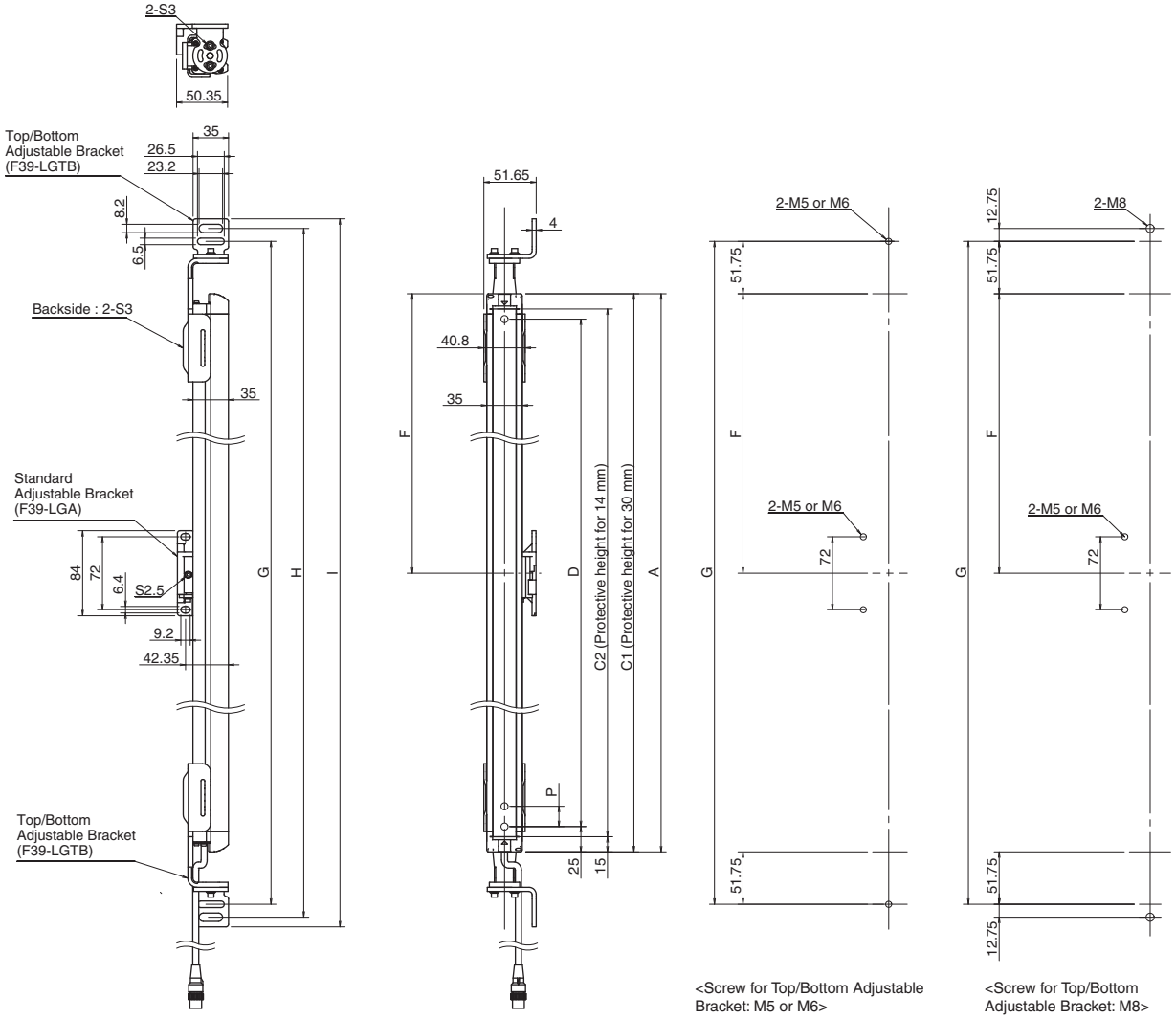
Protective height (C1)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0190 to 1070	2	0	–
1150 to 1950	2	1	1000 mm max.
2030 to 2510	2	2	1000 mm max.

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+133.5
Dimension H	C2+159
Dimension I	C2+178
Dimension P	10

Protective height (C2)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0160 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+103.5
Dimension H	C1+129
Dimension I	C1+148
Dimension P	20

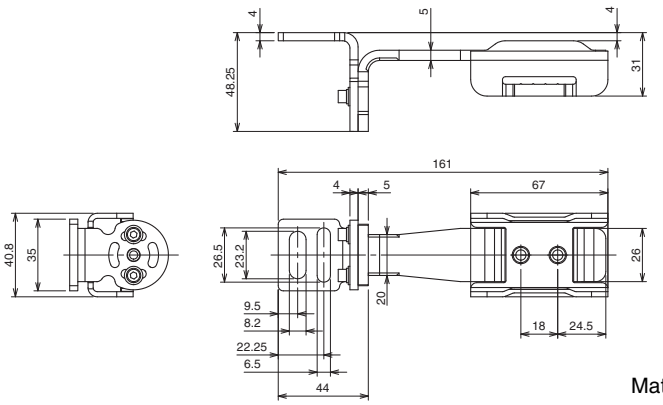
Protective height (C1)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0190 to 1070	2	0	–
1150 to 1950	2	1	1000 mm max.
2030 to 2510	2	2	1000 mm max.

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+133.5
Dimension H	C2+159
Dimension I	C2+178
Dimension P	10

Protective height (C2)	Number of Top/Bottom Adjustable Brackets	Number of Standard Adjustable Brackets	Dimension F
0160 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-JGTB)

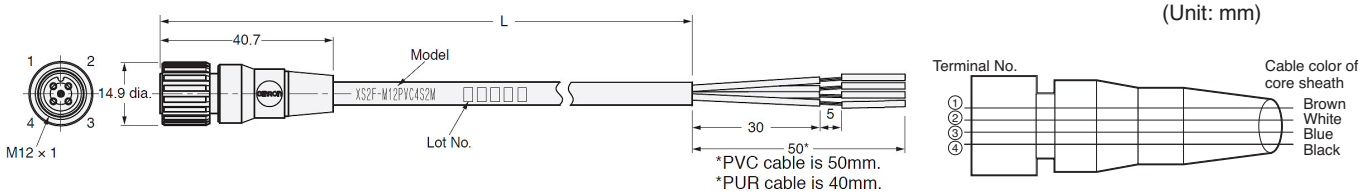


Material: SUS304

Accessories

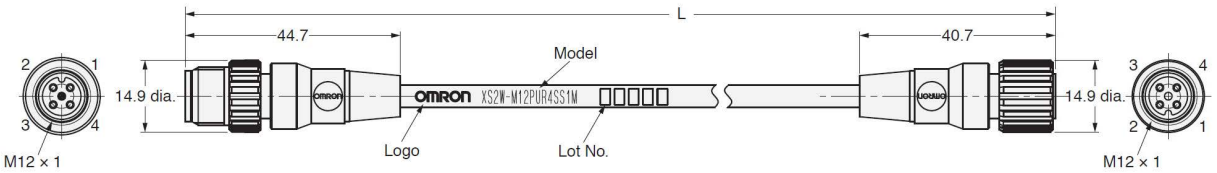
Round Water-resistant Connector: Connected to Cable, Socket on One Cable End (XS2F-M12 _ _ _ 4S _ M, sold separately)

(Unit: mm)



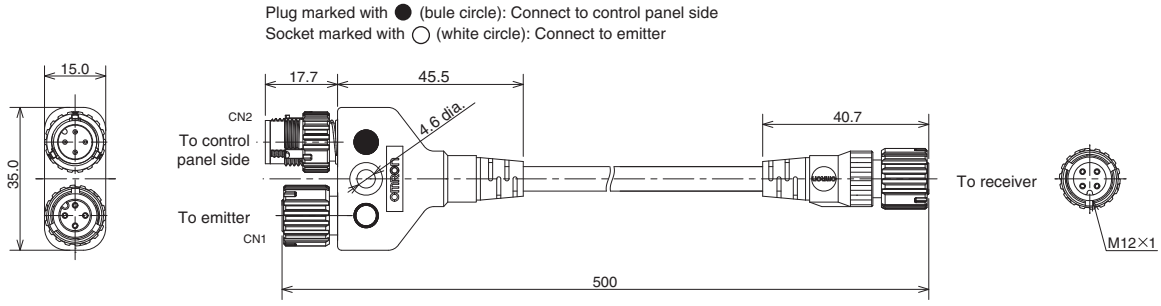
Appearance	Sheath material	Cable length	Model	Specifications
	PVC	2 m	**XS2F-M12PVC4S2M**	M12 connector (4-pin), 4 wires
	PVC	5 m	**XS2F-M12PVC4S5M**	
	PVC	10 m	**XS2F-M12PVC4S10M**	
	PUR	2 m	**XS2F-M12PUR4S2M**	
	PUR	5 m	**XS2F-M12PUR4S5M**	
	PUR	10 m	**XS2F-M12PUR4S10M**	

Round Water-resistant Connectors Connected to Cable, Socket and Plug on Cable Ends (XS2W-M12 _ _ _ 4SS _ M, sold separately)

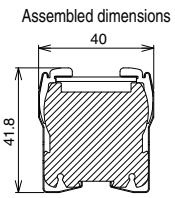


Appearance	Sheath material	Cable length	Model	Specifications
	PVC	2 m	**XS2W-M12PVC4SS2M**	M12 connector (4-pin), on both ends
	PVC	5 m	**XS2W-M12PVC4SS5M**	
	PVC	10 m	**XS2W-M12PVC4SS10M**	
	PUR	2 m	**XS2W-M12PUR4SS2M**	
	PUR	5 m	**XS2W-M12PUR4SS5M**	
	PUR	10 m	**XS2W-M12PUR4SS10M**	

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



Spatter Protection Cover(F39-HGA/-HGB)



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

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 F3SG-RA safety light curtains.
- 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**

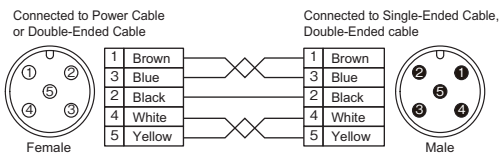
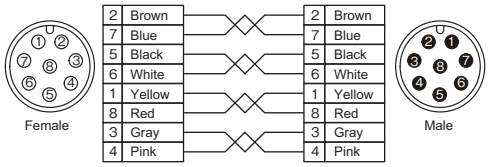
Note: Use with the PNP output model safety light curtain.

Accessories (Sold separately)

Single-ended Connector Cable

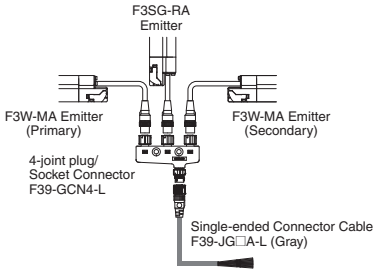
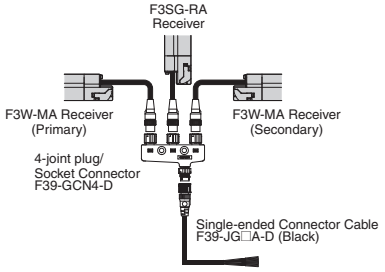
Appearance	Type	Cable length	Specifications	Model
	M12 connector (5-pin), 5 wires Color: Gray	3 m	 Female 1 +24 VDC Brown 2 CFG In Black 3 0 VDC Blue 4 COM+ White 5 COM- Yellow	**F39-JG3A-L**
		7 m		**F39-JG7A-L**
		10 m		**F39-JG10A-L**
		15 m		**F39-JG15A-L**
		20 m		**F39-JG20A-L**
	For receiver M12 connector (8-pin), 8 wires Color: Black	3 m	 Female 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**
		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	 Connected to Power Cable or Double-Ended Cable / Connected to Single-Ended Cable, Double-Ended cable Female: 1 Brown, 3 Blue, 2 Black, 4 White, 5 Yellow Male: 1 Brown, 3 Blue, 2 Black, 4 White, 5 Yellow	**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	 Connected to Power Cable or Double-Ended Cable / Connected to Single-Ended Cable, Double-Ended cable Female: 2 Brown, 7 Blue, 5 Black, 6 White, 1 Yellow, 8 Red, 3 Gray, 4 Pink Male: 2 Brown, 7 Blue, 5 Black, 6 White, 1 Yellow, 8 Red, 3 Gray, 4 Pink	**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**

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 ±15°. 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)j	
		* 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 67. 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		- 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	

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.

DIP Switch settings *1

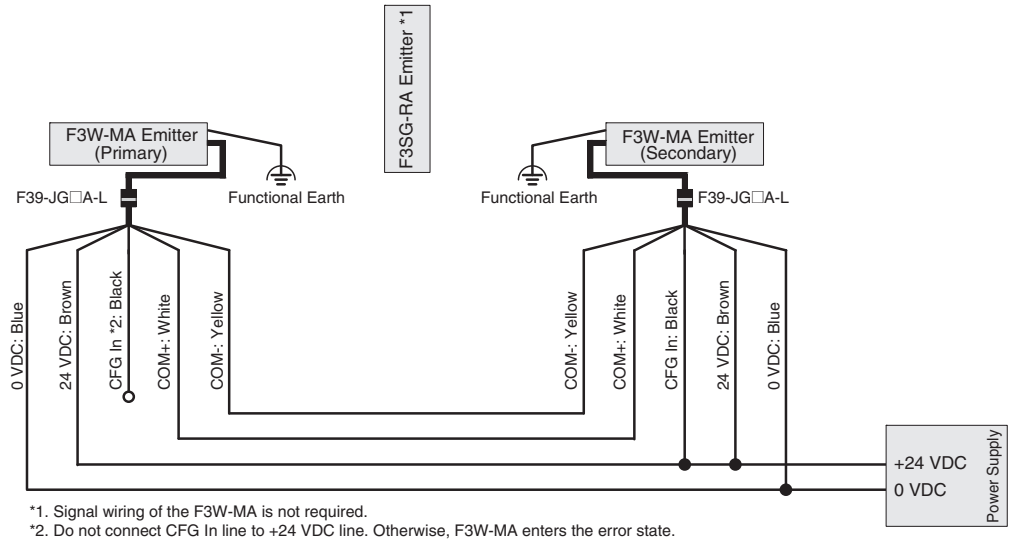
		Function	DIP-SW1	DIP-SW2 *2
F3W-MA Primary	Receiver	Scan Code B (factory default setting)	1 ON	1 ON
		Chattering and Void Space Prevention 1	2 ON 3 ON	2 ON 3 ON
		Off-Delay 100 ms	4 ON 5 ON	4 ON 5 ON
		Muting Enable Disabled (factory default setting)	6 ON	6 ON
	Emitter	Scan Code B (factory default setting)	1 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.

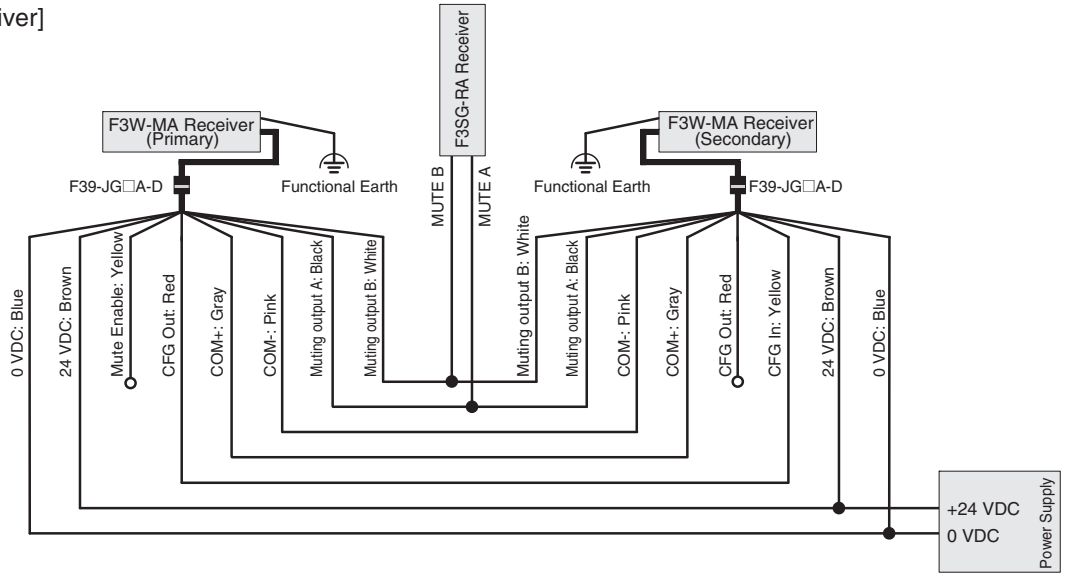
Wiring example

[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.

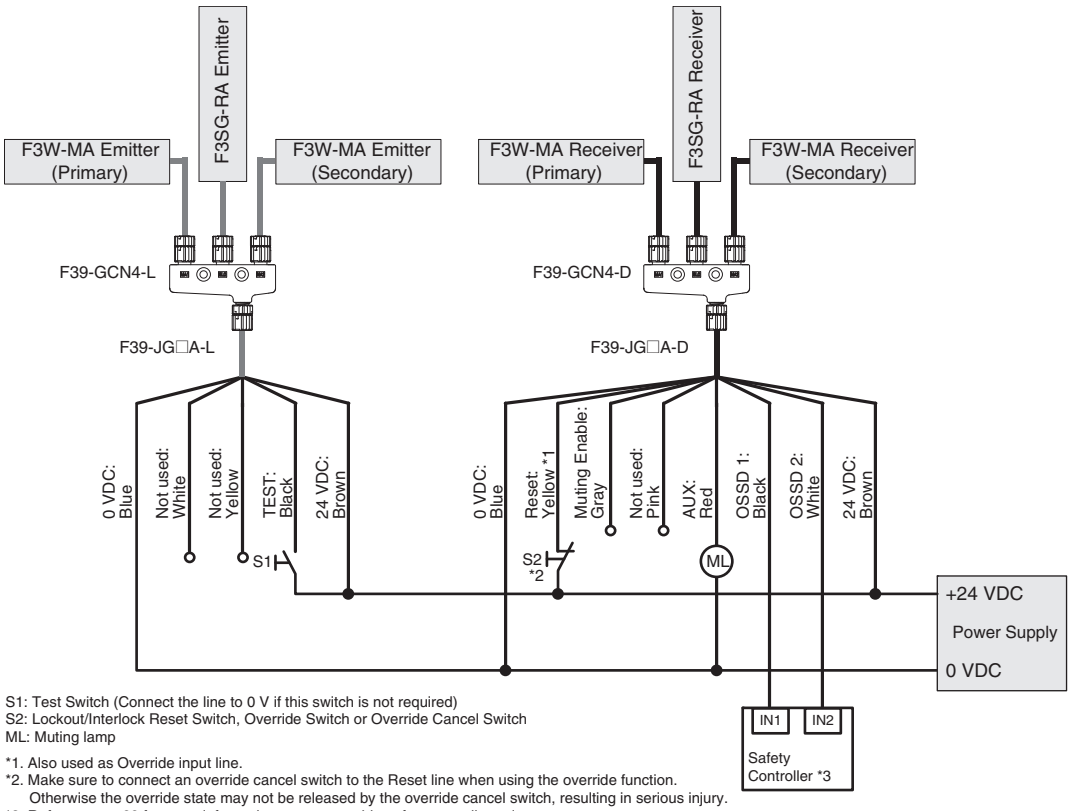
DIP Switch settings*1

		Function	DIP-SW1	DIP-SW2
F3SG-RA	Receiver	Scan Code B	1 ON	1 ON
		EDM Disabled (factory default setting)	2 ON	2 ON
		Auto Reset (factory default setting)	3 ON	3 ON
			4 ON	4 ON
		PNP (factory default setting)	7 ON	7 ON
	Emitter	Scan Code B	1 ON	–
		External Test: 24 V Active (factory default setting)	4 ON	–
F3W-MA Primary	Receiver	Scan Code A	1 ON	1 ON*2
		Chattering and Void Space Prevention 1	2 ON 3 ON	2 ON*2 3 ON*2
		Off-Delay 100 ms	4 ON 5 ON	4 ON*2 5 ON*2
		Muting Enable Disabled (factory default setting)	6 ON	6 ON*2
	Emitter	Scan Code A	1 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



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 29 for more information on connectable safety controller units.

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

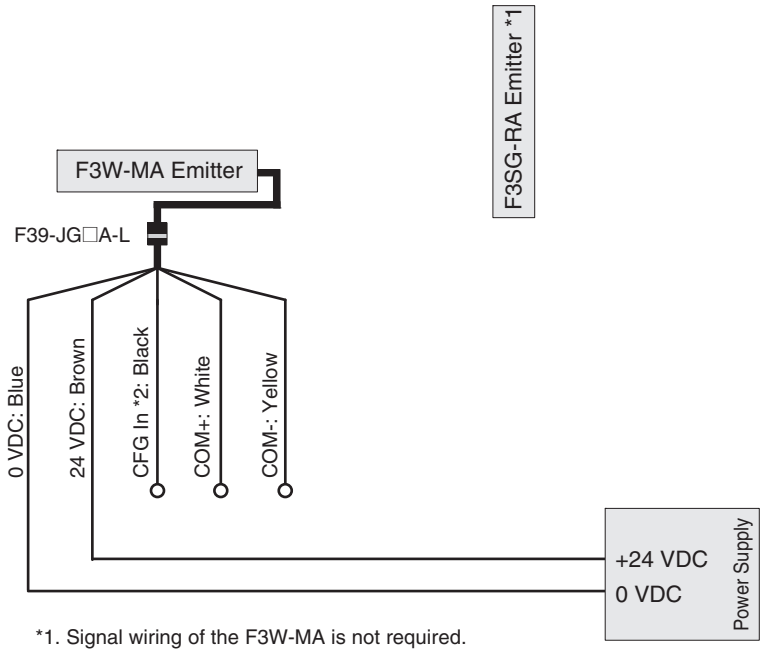
		Function	DIP-SW1	DIP-SW2 *2
F3W-MA	Receiver	Scan Code A	1 ON	1 ON
		Chattering and Void Space Prevention 1	2 ON 3 ON	2 ON 3 ON
		Off-Delay 100 ms	4 ON 5 ON	4 ON 5 ON
		Muting Enable Enabled	6 ON	6 ON
	Emitter	Scan Code A	1 ON	–

□: 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.

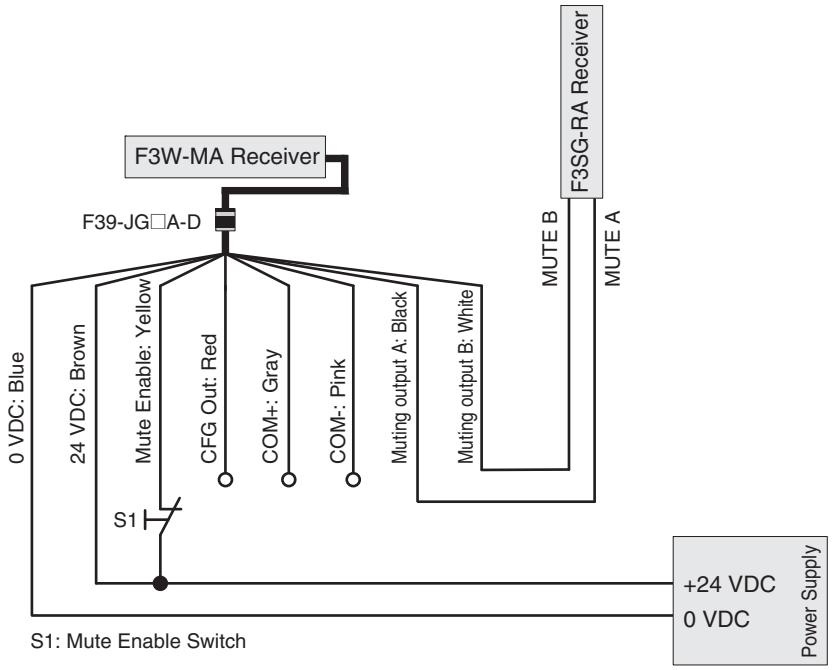
Wiring example

[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

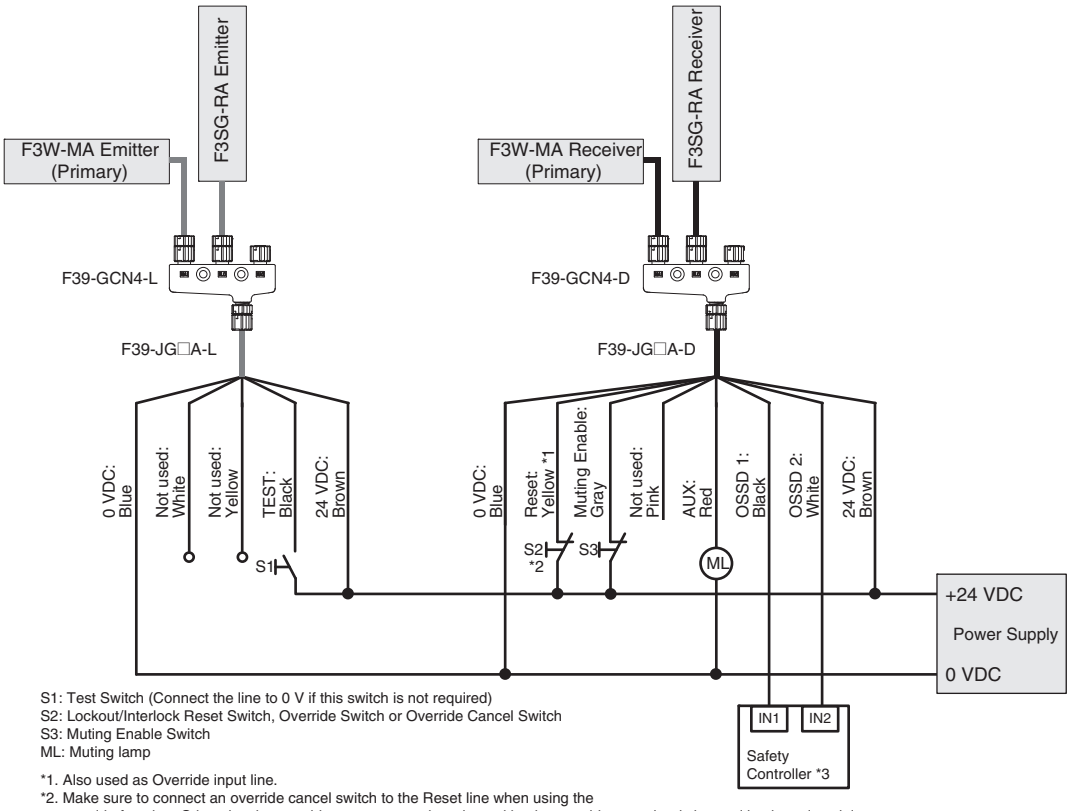
		Function	DIP-SW1	DIP-SW2
F3SG-RA	Receiver	Scan Code A (factory default setting)	1 ON	1 ON
		EDM Disabled (factory default setting)	2 ON	2 ON
		Auto Reset (factory default setting)	3 ON	3 ON
			4 ON	4 ON
		PNP (factory default setting)	7 ON	7 ON
	Emitter	Scan Code A (factory default setting)	1 ON	–
		External Test: 24 V Active (factory default setting)	4 ON	–
F3W-MA	Receiver	Scan Code B (factory default setting)	1 ON	1 ON*2
		Chattering and Void Space Prevention 1	2 ON 3 ON	2 ON*2 3 ON*2
		Off-Delay 100 ms	4 ON 5 ON	4 ON*2 5 ON*2
		Muting Enable Enabled	6 ON	6 ON*2
	Emitter	Scan Code B (factory default setting)	1 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



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
S3: Muting Enable 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 29 for more information on connectable safety controller units.

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 ON	1 ON
		Chattering and Void Space Prevention 1	2 ON 3 ON	2 ON 3 ON
		Off-Delay 100 ms	4 ON 5 ON	4 ON 5 ON
		Muting Enable Enabled	6 ON	6 ON
	Emitter	Scan Code A	1 ON	–
F3W-MA-2	Receiver	Scan Code B (factory default setting)	1 ON	1 ON
		Chattering and Void Space Prevention 1	2 ON 3 ON	2 ON 3 ON
		Off-Delay 100 ms	4 ON 5 ON	4 ON 5 ON
		Muting Enable Enabled	6 ON	6 ON
	Emitter	Scan Code B (factory default setting)	1 ON	–

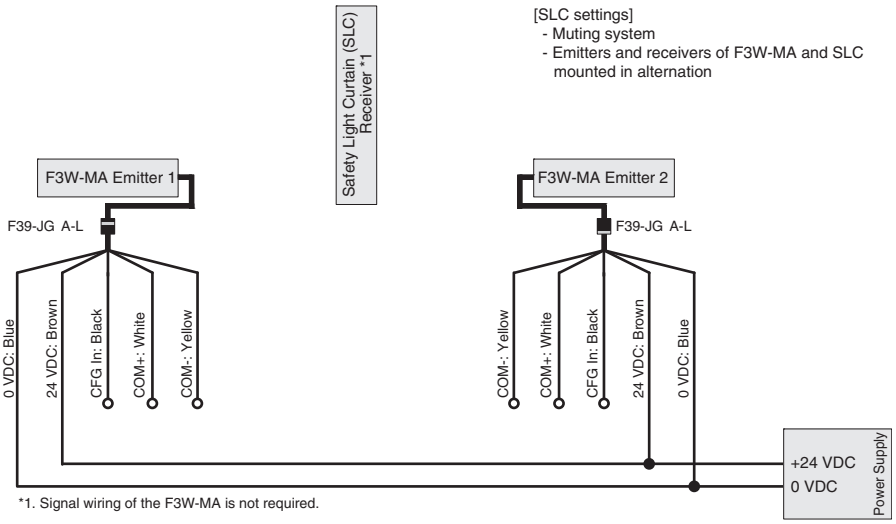
□: Indicates a switch position.

*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*.

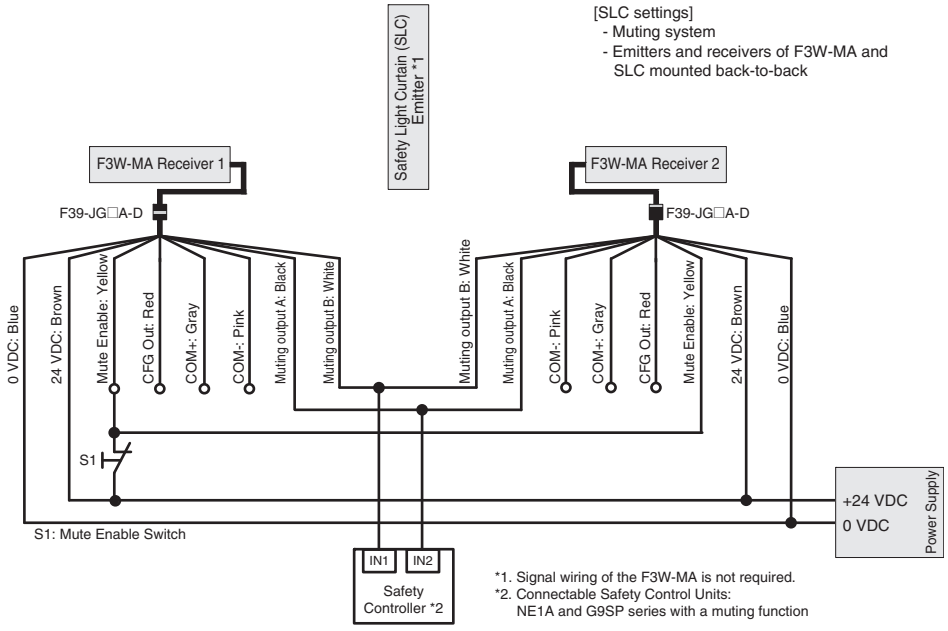
*2.DIP Switch Bank 2 is not used.

Wiring example

[Emitter]

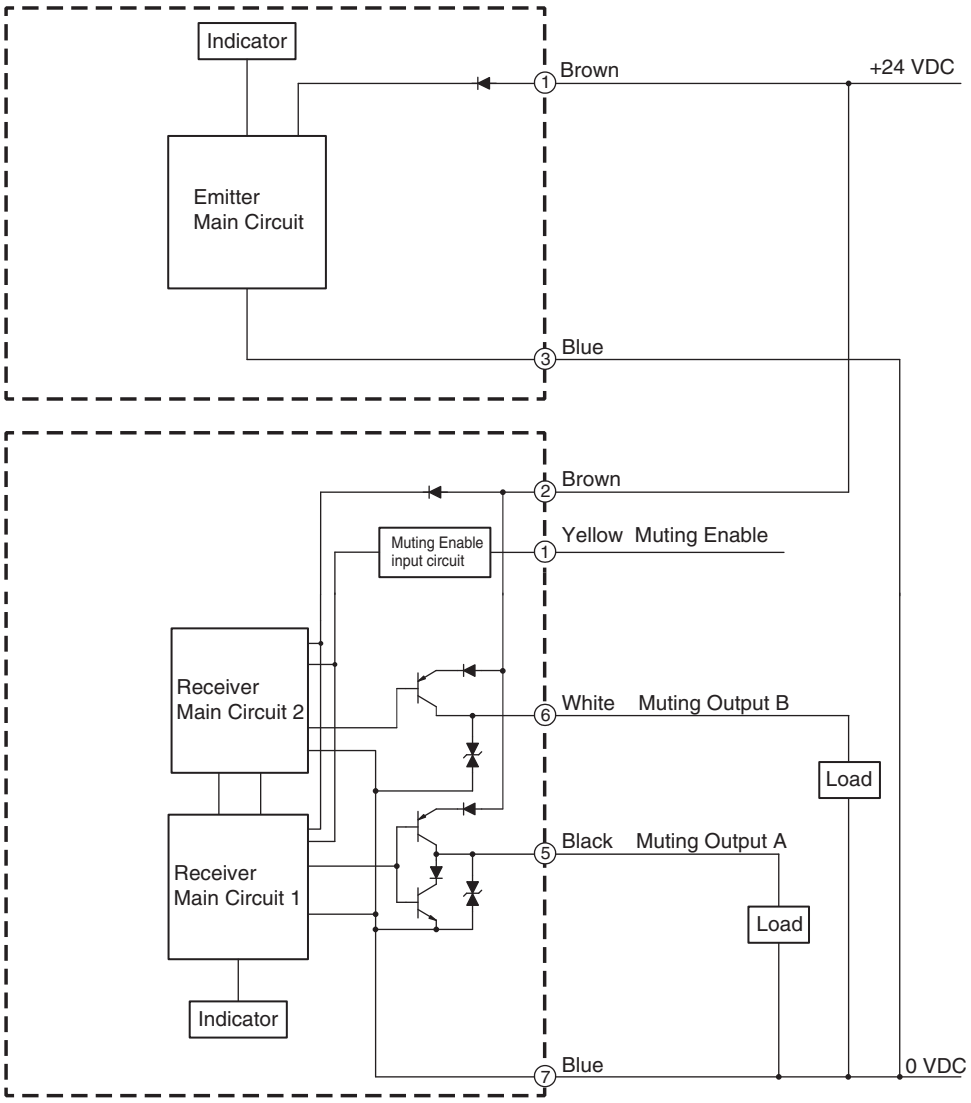


[Receiver]



Input/Output Circuit

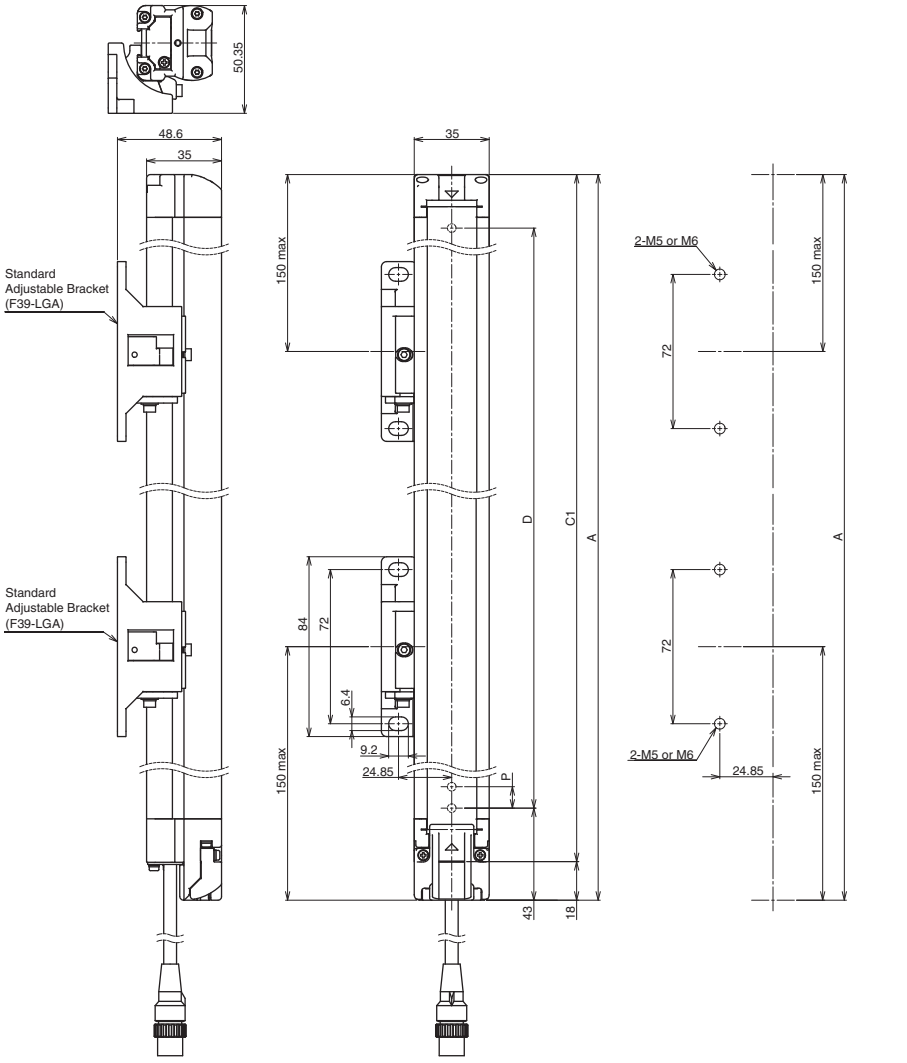
The entire circuit diagram of the F3W-MA is shown below.
The numbers in the circles indicate the connector's pin numbers.



Mounted with Standard Adjustable Brackets (F39-LGA)

(Unit : mm)

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

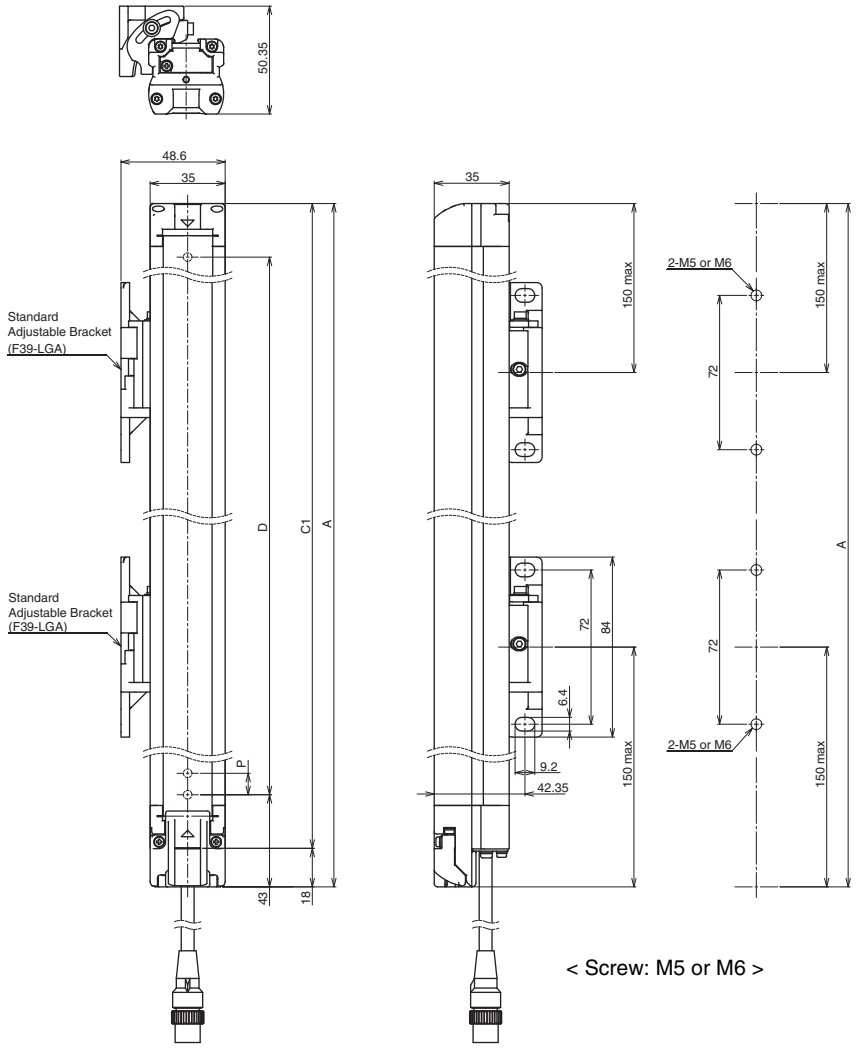


< Screw: M5 or M6 >

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.

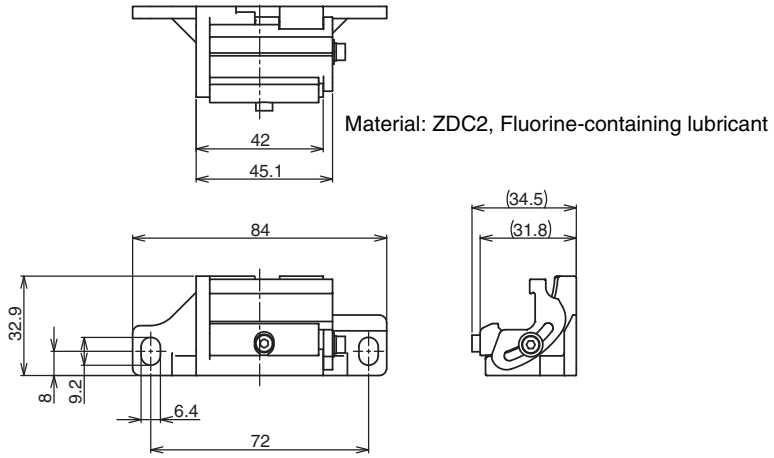
Side Mounting



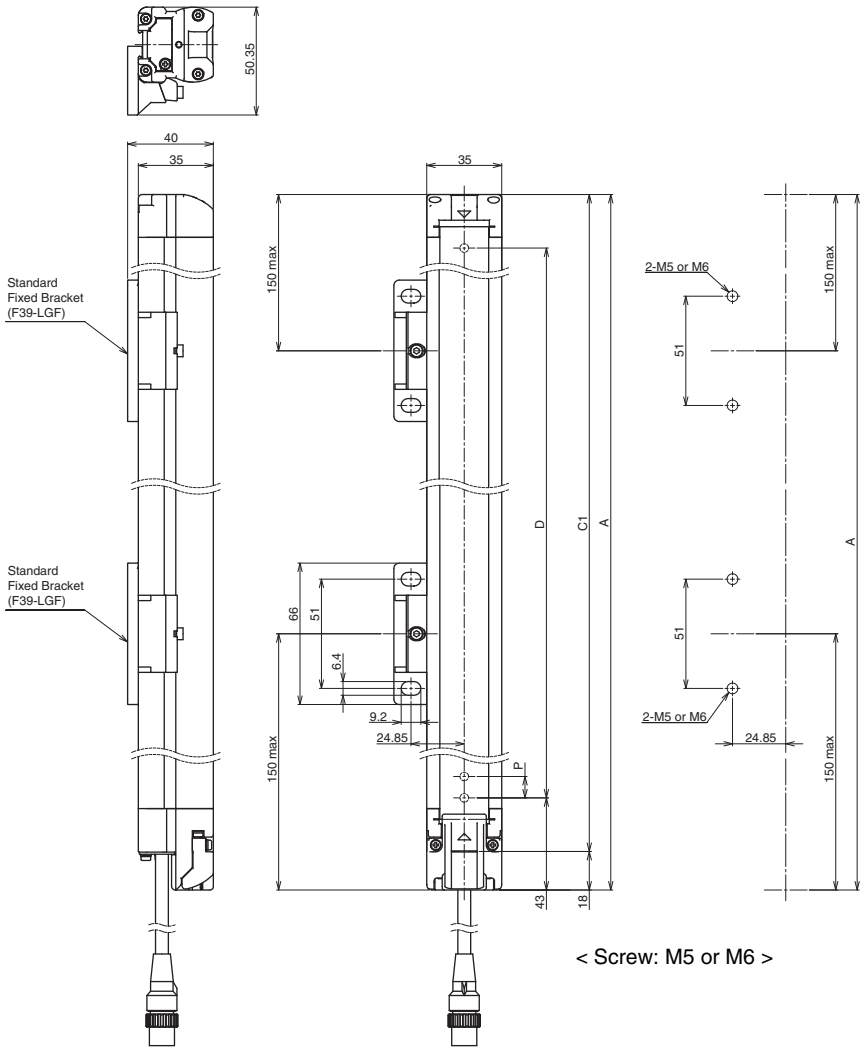
Model	F3W-MA0100P	F3W-MA0300P
Dimension A	208	448
Dimension C1	190	430
Dimension D	140	380
Dimension P	20	20
Number of Standard Adjustable Brackets *	2	2

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

Standard Adjustable Bracket (F39-LGA)



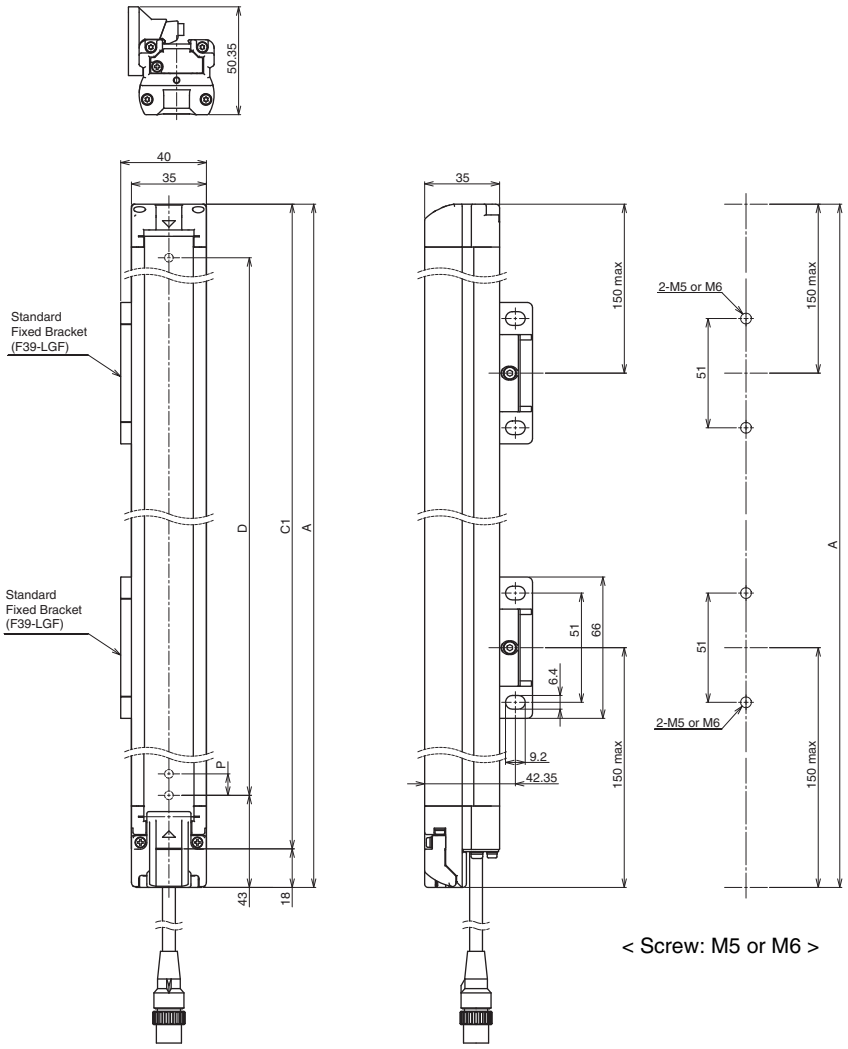
Mounted with Standard Fixed Brackets (F39-LGF)
Backside Mounting



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

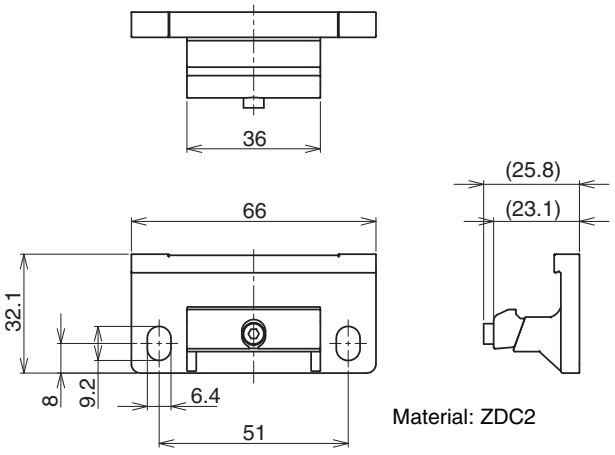


< Screw: M5 or M6 >

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

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

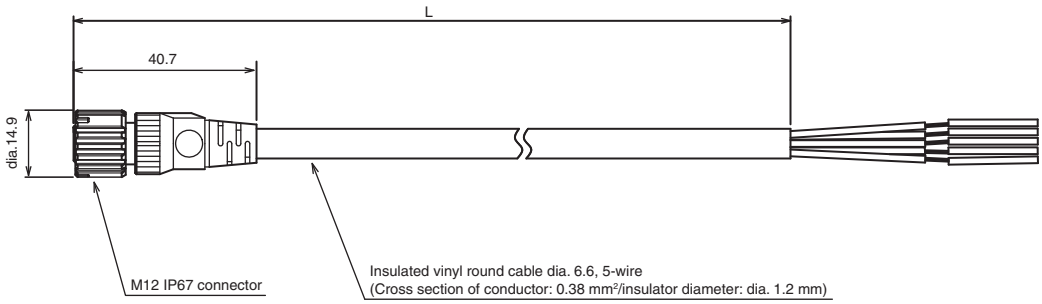
Standard Fixed Bracket (F39-LGF)



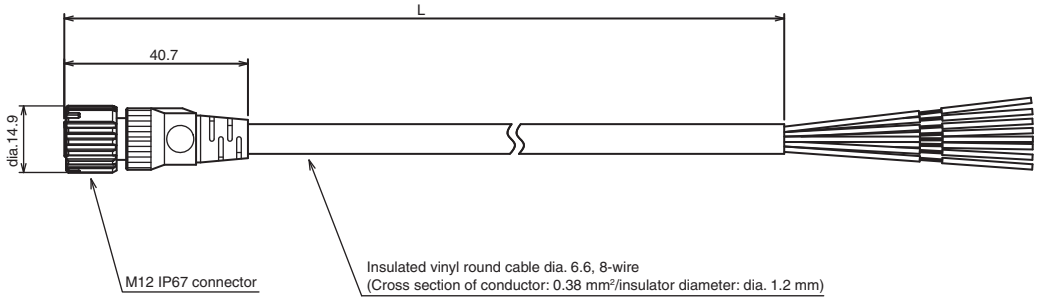
Material: ZDC2

Accessories

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

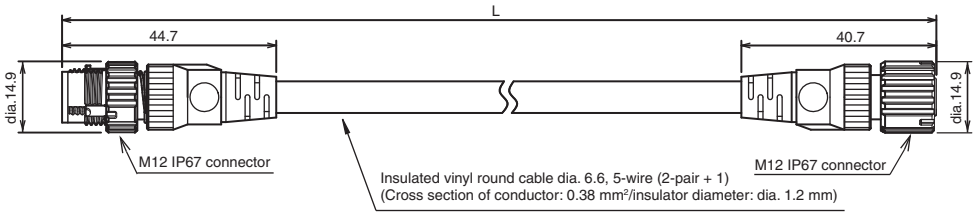


Single-Ended Cable for Receiver (F39-JG□A-D, sold separately)



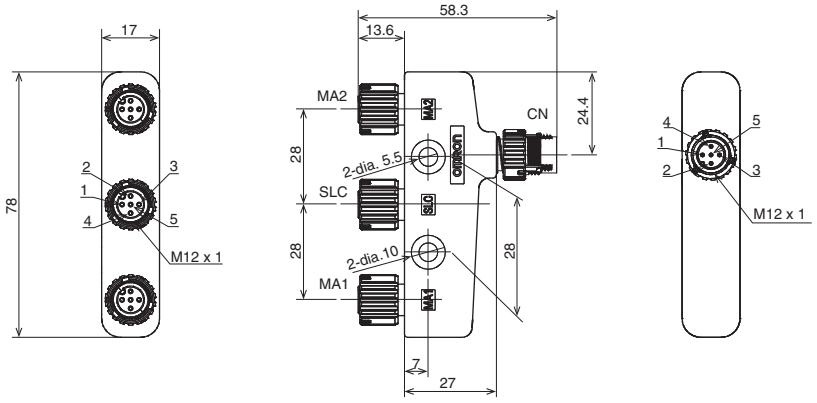
Emitter cable (Gray)	Receiver cable (Black)	L (m)
F39-JG3A-L	**F39-JG3A-D**	3
F39-JG7A-L	**F39-JG7A-D**	7
F39-JG10A-L	**F39-JG10A-D**	10
F39-JG15A-L	**F39-JG15A-D**	15
F39-JG20A-L	**F39-JG20A-D**	20

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

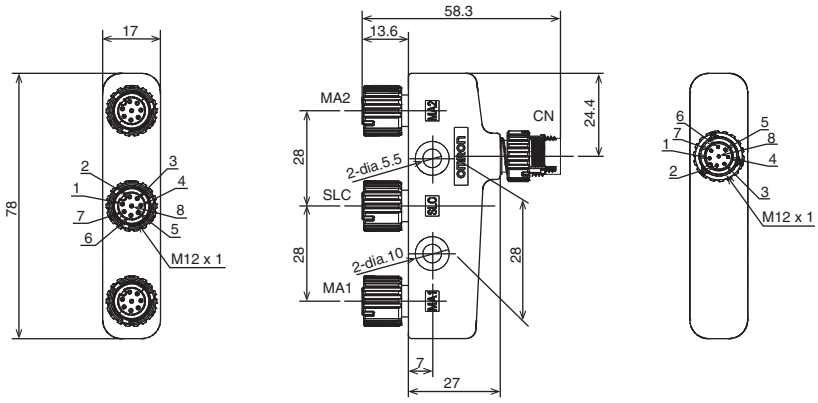


Emitter cable (Gray)	Receiver cable (Black)	L (m)
F39-JGR5B-L	**F39-JGR15B-D**	0.5
F39-JG1B-L	**F39-JG1B-D**	1
F39-JG3B-L	**F39-JG3B-D**	3
F39-JG5B-L	**F39-JG5B-D**	5
F39-JG7B-L	**F39-JG7B-D**	7
F39-JG10B-L	**F39-JG10B-D**	10
F39-JG15B-L	**F39-JG15B-D**	15
F39-JG20B-L	**F39-JG20B-D**	20

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

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