

Safety Light Curtain F3SG-SR Series IP69K Model

F3SG-SR-K

IP69K protection for high-pressure wash-down applications

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



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

F3SG-SR-K

Model Number Legend

IP69K Model F3SG-SR-K

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

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

- Note: 1.** The purpose of this model number legend is to provide understanding of the meaning of specifications from the model number. Models are not available for all combinations of code numbers. See *Ordering Information* on page 75 for details.
- 2.** The bracket is not included. Order brackets sold separately.
- 3.** Connection cables are integrated with the safety light curtain.

Ordering Information

Safety Light Curtain IP69K Model

Main Unit F3SG-SR-K

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

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

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

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


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

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

Accessories (Sold separately)

Optional Accessories for F3SG-SR-K

Bracket

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

F3SG-SR/PG

F3SG-SR-K

Common to
F3SG-SR and F3SG-PG

F3SG-SR-K

Ratings and Specifications

Safety Light Curtain IP69K Model

Main Unit F3SG-SR-K

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

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

Model		F3SG-4SRB□□□□-14-K	F3SG-4SRB□□□□-25-K	
Electrical	Power supply voltage (Vs)	SELV/PELV 24 VDC ±20% (ripple p-p 10% max.)		
	Current consumption	Refer to page 79.		
	Safety outputs (OSSD)	Two PNP or NPN transistor outputs (PNP or NPN is selectable by wiring of power supply.) Load current: 300 mA max., Residual voltage: 2 V max. (except for voltage drop due to cable extension), Capacitive load: 1 µF max., Inductive load: 2.2 H max. *1*2 Leakage current: 1 mA max. (PNP), 2 mA max. (NPN) *3 *1. The residual voltage is 3 V max. when the Intelligent Tap is connected to the sensor. *2. The load inductance is the maximum value when the safety output frequently repeats ON and OFF. When you use the safety output at 4 Hz or less, the usable load inductance becomes larger. *3. These values must be taken into consideration when connecting elements including a capacitive load such as a capacitor.		
	Auxiliary output	Two PNP or NPN transistor 1 outputs (PNP or NPN is selectable by wiring of power supply.) Load current: 100 mA max., Residual voltage: 2 V max. * * The residual voltage is 3 V max. when the Intelligent Tap is connected to the sensor.		
	Output operation mode	Safety output	Light-ON (Safety outputs are turned to the ON state when the receiver receives an emitting signal.)	
		Auxiliary output	Safety output (Inverted signal output: Enable) (default) (Configurable by SD Manager 3)	
	Input voltage	TEST	Light emission stops when connected to 24 VDC ON voltage: Vs-3 V to Vs (short circuit current: approx. 5.0 mA) * OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 6.0 mA) * Light emission stops when connected to 0 VDC ON voltage: 0 to 3 V (short circuit current: approx. 6.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 5.0 mA) *	
		OPERATING RANGE SELECT INPUT	Long: 12 V to Vs (short circuit current: approx. 4.2 mA) * or open Short: 0 to 3 V (short circuit current: approx. 4.2 mA)	
		RESET/EDM	PNP ON voltage: Vs-3 V to Vs (short circuit current: approx. 9.5 mA) * OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 13.0 mA) * NPN ON voltage: 0 to 3 V (short circuit current: approx. 13.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 9.5 mA) *	
		MUTE A/B, RE-RESET, PSDI	PNP ON voltage: Vs-3V to Vs (short circuit current: approx. 4.5 mA) * OFF voltage: 0 V to 1/2 Vs, or open (short circuit current: approx. 7.0 mA) * NPN ON voltage: 0 to 3 V (short circuit current: approx. 7.0 mA) OFF voltage: 1/2 Vs to Vs, or open (short circuit current: approx. 4.5 mA) *	
	* The Vs indicates a supply voltage value in your environment.			
	Overvoltage category (IEC 60664-1)	II		
	Indicators	Refer to page 96.		
Protective circuit	Output short-circuit protection			
Insulation resistance	20 M or higher (500 VDC megger)			
Dielectric strength	1,000 VAC, 50/60 Hz (1 min)			

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

F3SG-SR-K

Model		F3SG-4SRB□□□□-14-K	F3SG-4SRB□□□□-25-K
Functional	Mutual interference prevention	Optical synchronization: The scan code is fixed to Code A. Wired synchronization: in up to 3 sets	
	Test function	Self-test (at power-on, and during operation) External test (light emission stop function by test input)	
	Safety-related functions	Interlock External Device Monitoring (EDM) Pre-Reset PSDI Fixed Blanking/Floating Blanking Reduced Resolution Muting/Override Mutual Interference Prevention PNP/NPN Selection Response Time Adjustment	
Environmental	Ambient temperature	Operating	-30 to 55 °C (non-icing)
		Storage	-30 to 70 °C
	Ambient humidity	Operating	35% to 85% (non-condensing)
		Storage	35% to 95%
	Ambient illuminance	Incandescent lamp: 3,000 lx max. on receiver surface Sunlight: 10,000 lx max. on receiver surface	
	Degree of protection (IEC 60529)	IEC 60529: IP65 and IP67, ISO 20653: IP69K	
	Vibration resistance (IEC 61496-1)	10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps for all 3 axes	
	Shock resistance (IEC 61496-1)	100 m/s ² , 1000 shocks for all 3 axes	
Pollution degree (IEC 60664-1)	3		
Connections	Root cable	Type of connection	Open-ended type
		Number of wires	Emitter: 5, Receiver: 8
		Cable length	15 m
		Cable diameter	6 mm
		Minimum bending radius	R5 mm
	Cable extension	Refer to page 30 for restrictions on cable extension.	
		Root cable	In optical synchronization: 100 m max. * between power supply and emitter and between power supply and receiver In wired synchronization: 100 m max. * between power supply and emitter, between power supply and receiver, and between emitter and receiver * When the Intelligent Tap (F39-SGIT-IL3) is connected to the sensor, this applies in the case of the rated power supply of 24 VDC to 24 VDC +20%.
Material	Pipe: Acrylic resin Cap: SUS316L		
Weight	Refer to page 79.		
Included accessories	Instruction Sheet, Quick Installation Manual, Troubleshooting Guide Sticker		
Conformity	Conforming standards	Refer to page 110.	
	Type of ESPE (IEC 61496-1)	Type 4	
	Performance Level (PL)/ Safety category	PL e/Category 4 (EN ISO 13849-1:2015)	
	PFH _D	1.1×10 ⁻⁸ max. (IEC 61508)	
	Proof test interval T _M	Every 20 years (IEC 61508)	
	SFF	99% (IEC 61508)	
	HFT	1 (IEC 61508)	
Classification	Type B (IEC 61508-2)		

Models/Response Time/Current Consumption/Weight

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

Models and Response Times

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

Models, Current Consumption and Weight

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

F3SG-SR/PG

F3SG-SR-K

Common to
F3SG-SR and F3SG-PG

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

Models and Response Times

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

Models, Current Consumption and Weight

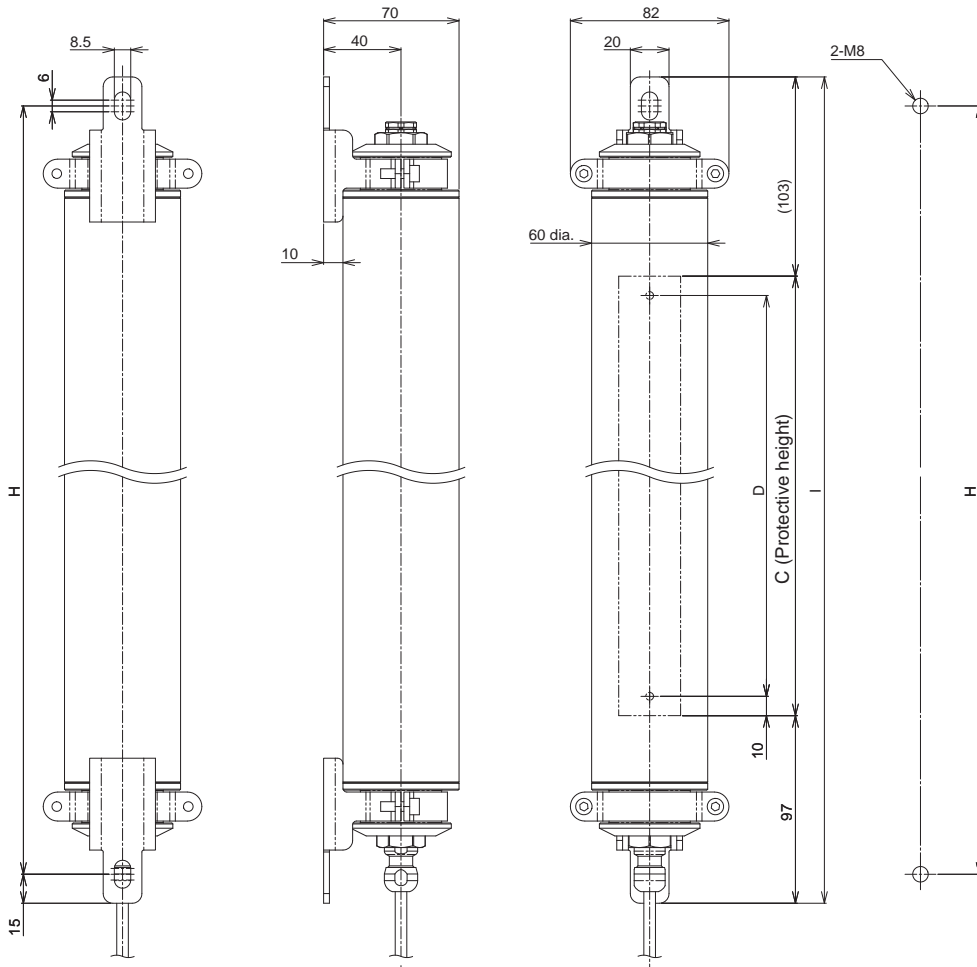
Model	Number of beams	Protective height [mm]	Current consumption [mA]		Weight [kg]	
			Emitter	Receiver	Net	Gross
F3SG-4SRB0320-25-K	16	320	65	97	5.2	6.7
F3SG-4SRB0400-25-K	20	400	66	98	5.5	7.0
F3SG-4SRB0480-25-K	24	480	68	99	5.8	7.4
F3SG-4SRB0560-25-K	28	560	70	99	6.1	7.7
F3SG-4SRB0640-25-K	32	640	72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

Dimensions

F3SG-SR-K Main Unit

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

Side mounting and backside mounting

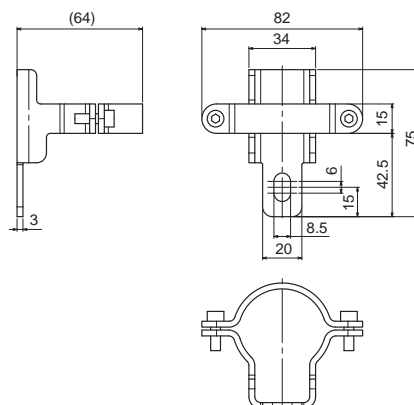


Dimension C	4-digit number in model number (Protective height: Δ)	
Dimension D	F3SG-□SR□△△△△-14	C-20
	F3SG-□SR□△△△△-25	
Dimension H	C+170	
Dimension I	C+200	

Accessories

Bracket

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



Material: SUS316L

F3SG-SR/PG

F3SG-SR-K

Common to F3SG-SR and F3SG-PG

Common to F3SG-SR and F3SG-PG

Common to F3SG-SR and F3SG-PG

Connectable Safety Control Units

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

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

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

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

Connectable safety control units (NPN output)
G9SA-301-P

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

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

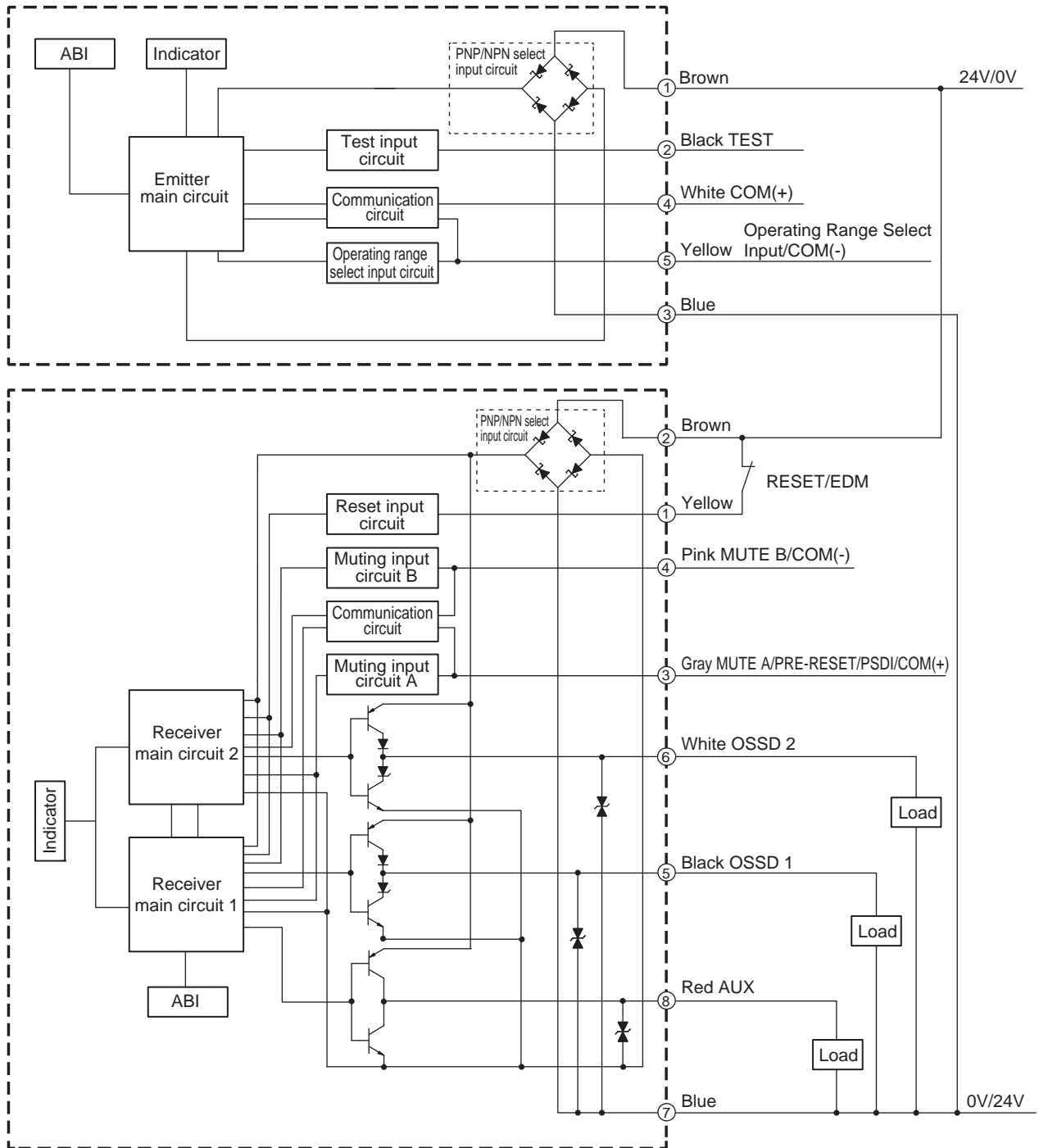
* Connectable to units supporting IO-Link Version 1.1.

Input/Output Circuit

Entire Circuit Diagram

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

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

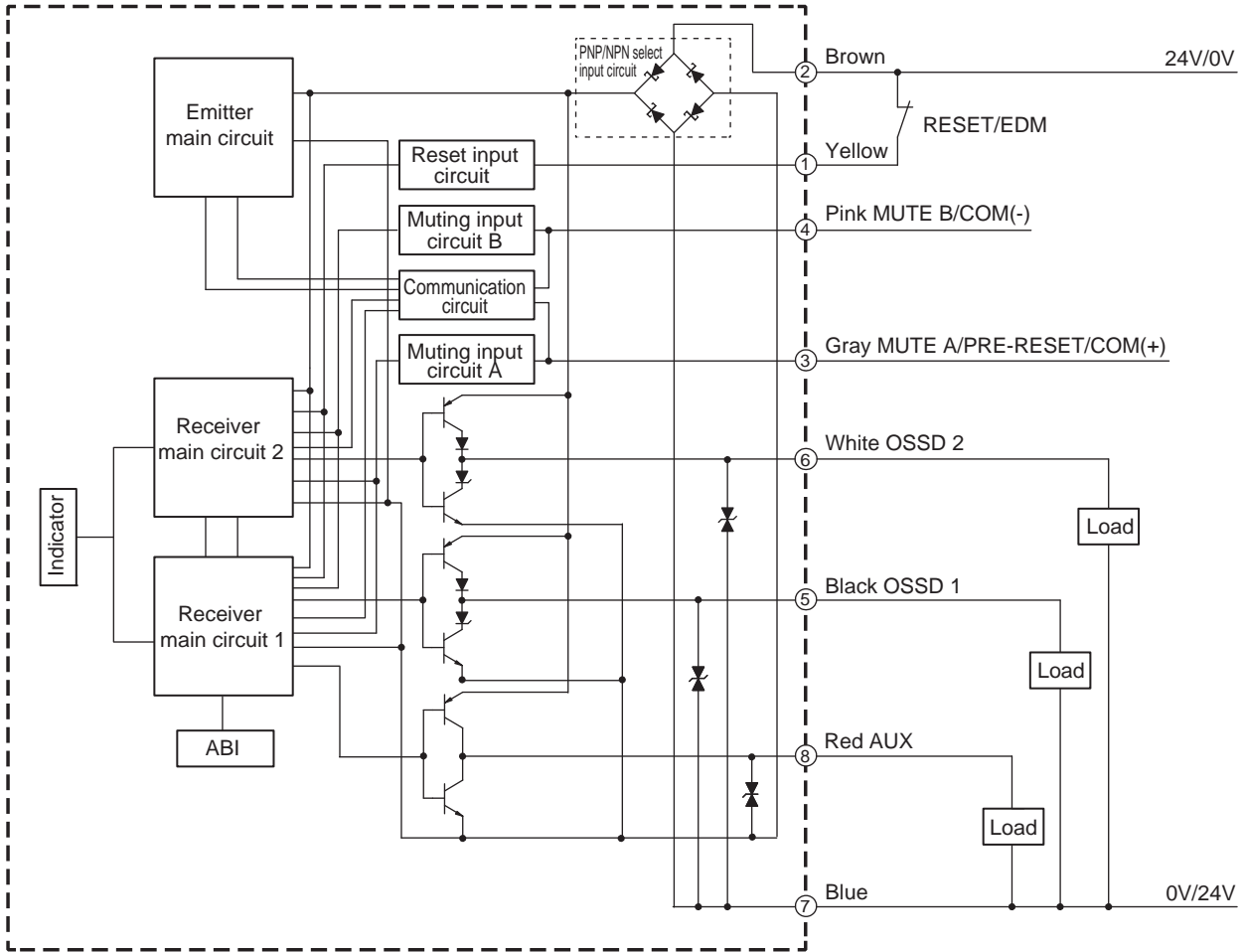


F3SG-SR/PG
 F3SG-SR-K
 Common to F3SG-SR and F3SG-PG

Common to F3SG-SR and F3SG-PG

F3SG-PGA-C

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

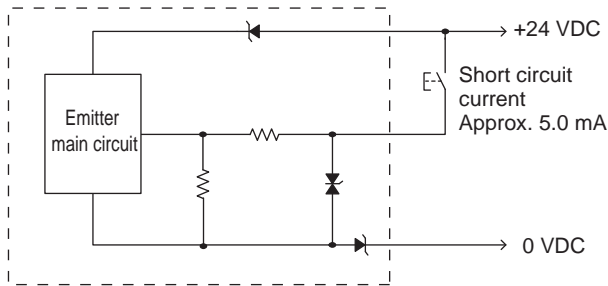


Input Circuit Diagram by Function

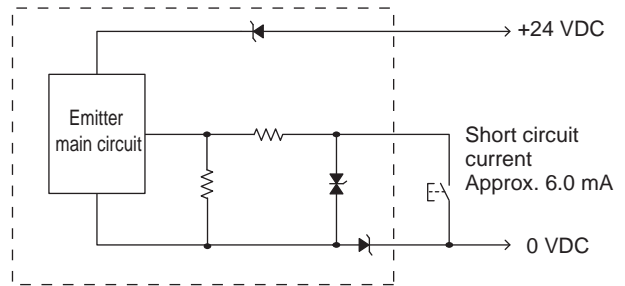
The input circuit diagrams of by function are shown below.

Test Input *1

<Light emission stops when connected to 24 VDC>



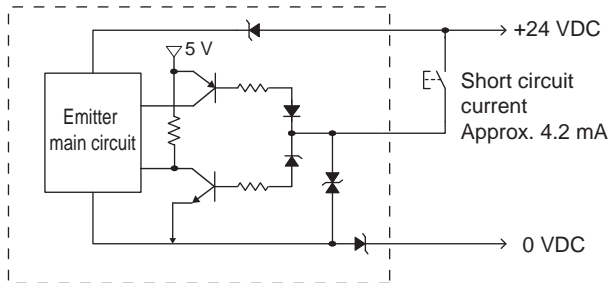
<Light emission stops when connected to 0 V>



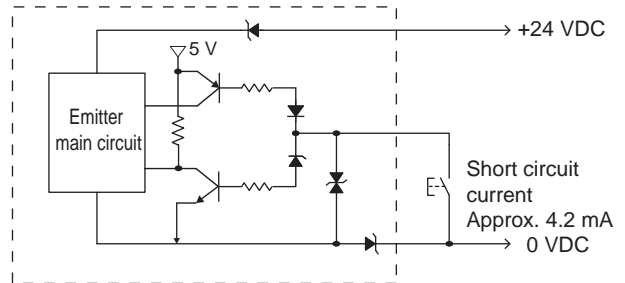
*1. The F3SG-PGA-C does not have a test input function.

Operating Range Select Input *2

<Long>



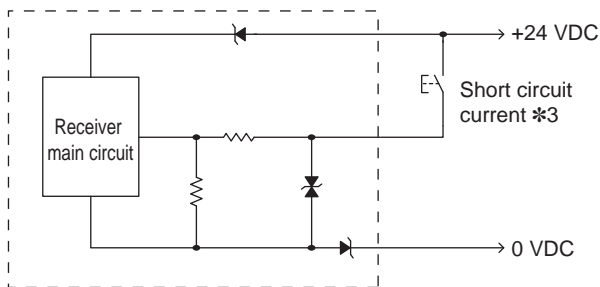
<Short>



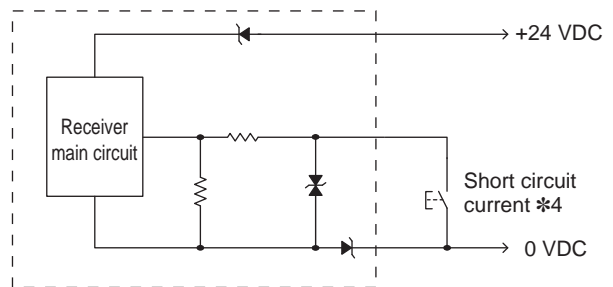
*2. The F3SG-PGA-A/-C do not have an operation range select input function.

RESET/EDM, MUTE A/B

<PNP>



<NPN>



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

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

Common to F3SG-SR and F3SG-PG

Connections (Basic Wiring Diagram)

F3SG-SR/PG

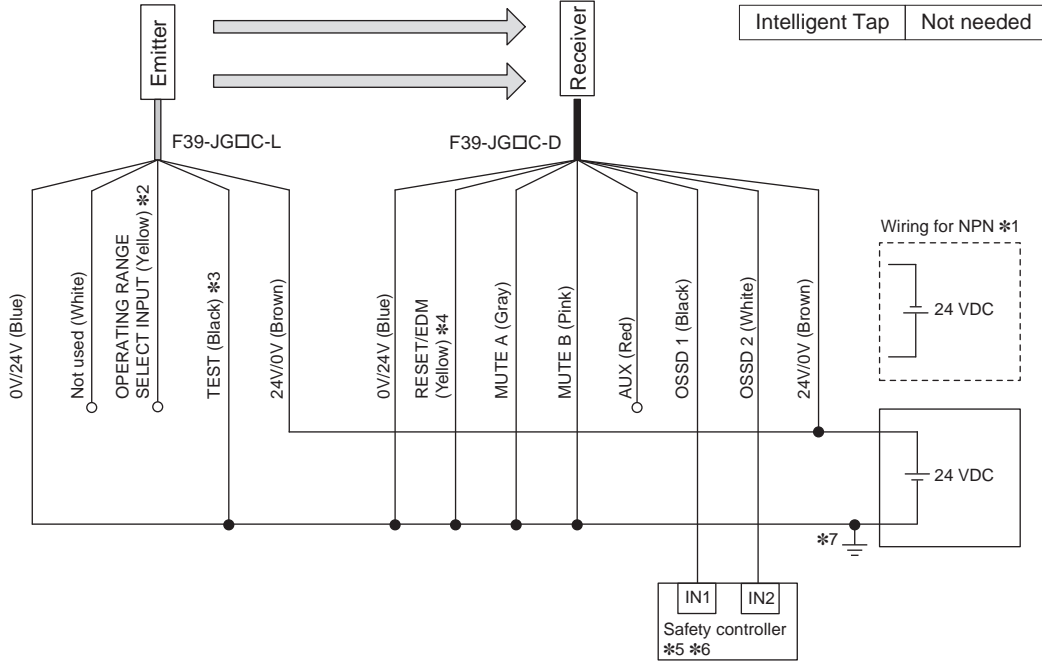
Examples of a motor control system using the F3SG-SR/PG are shown below. The examples are equivalent to up to PLe, Category 4 (ISO 13849-1).

Non-Muting System Wiring Examples

Auto Reset Mode with Optical Synchronization and EDM Unused

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

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



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

Timing chart

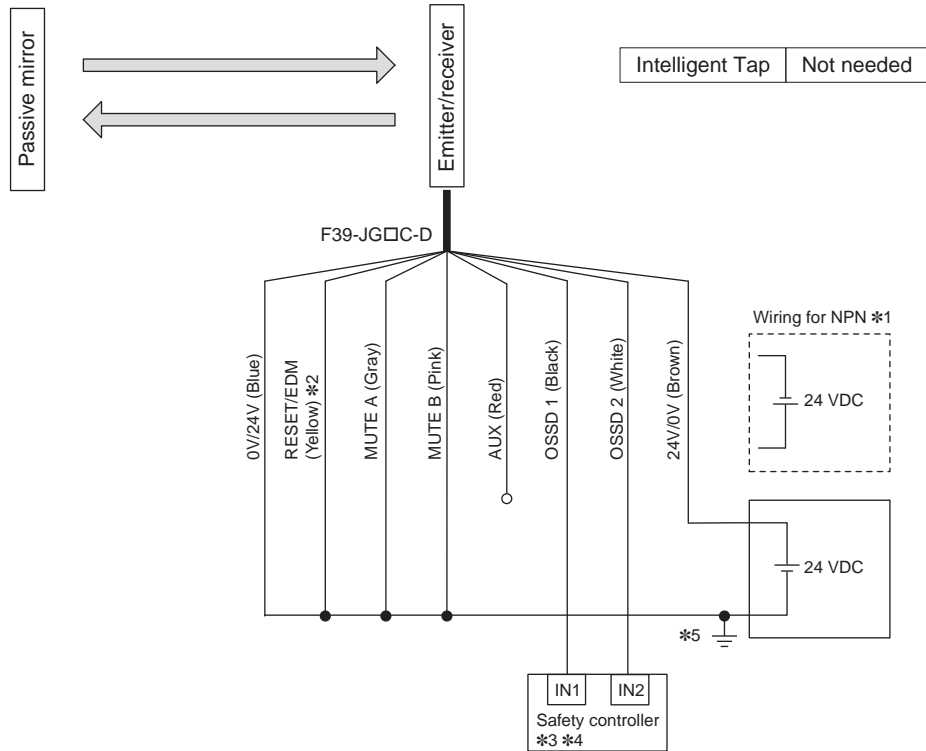


- *1. Reverse the polarity of the power supply when using in the NPN system. Select a safety controller of PNP or NPN type according to the system of your application.
- *2. Connect the line to 0 V if F3SG-SR or F3SG-PGA-L is used in Short Mode.
- *3. If External Test is used, refer to the *User's Manual* (Man.No.Z405).
- *4. Connect the line to 24V/0V (brown) of the receiver via a lockout reset switch (NC contact) if Lockout Reset is used.
- *5. Refer to page 82 for more information.
- *6. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
- *7. This is the case for a PELV circuit.

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

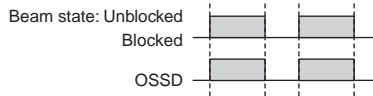
The wiring examples in later pages do not indicate functional earth. To use functional earth, wire an earth cable according to the example above. Refer to the *User's Manual* (Man.No.Z405) for more information.

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



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

Timing chart



- *1. Reverse the polarity of the power supply when using in the NPN system. Select a safety controller of PNP or NPN type according to the system of your application.
- *2. Connect the line to 24V/0V (brown) of the receiver via a lockout reset switch (NC contact) if Lockout Reset is used.
- *3. Refer to page 82 for more information.
- *4. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
- *5. This is the case for a PELV circuit.

Note: Functional earth connection to the F3SG-SR/PG housing is unnecessary when you use the F3SG-SR/PG in a general industrial environment where noise control or stable power supply is considered. However, when you use the F3SG-SR/PG in an environment where there may be excessive noise from surroundings or stable power supply may be interfered, it is recommended the F3SG-SR/PG be connected to functional earth. The wiring examples in later pages do not indicate functional earth. To use functional earth, wire an earth cable according to the example above. Refer to the *User's Manual* (Man.No.Z405) for more information.

F3SG-SR/PG

F3SG-SR-K

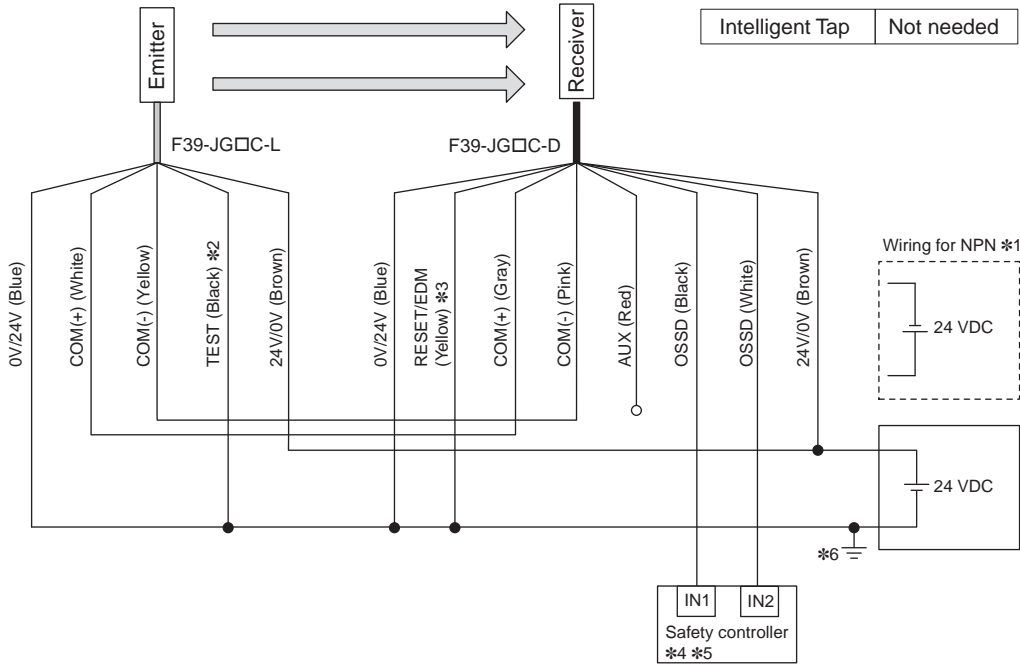
Common to F3SG-SR and F3SG-PG

Common to F3SG-SR and F3SG-PG

Auto Reset Mode with Wired Synchronization and EDM Unused

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

[Wiring Example]



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

Timing chart



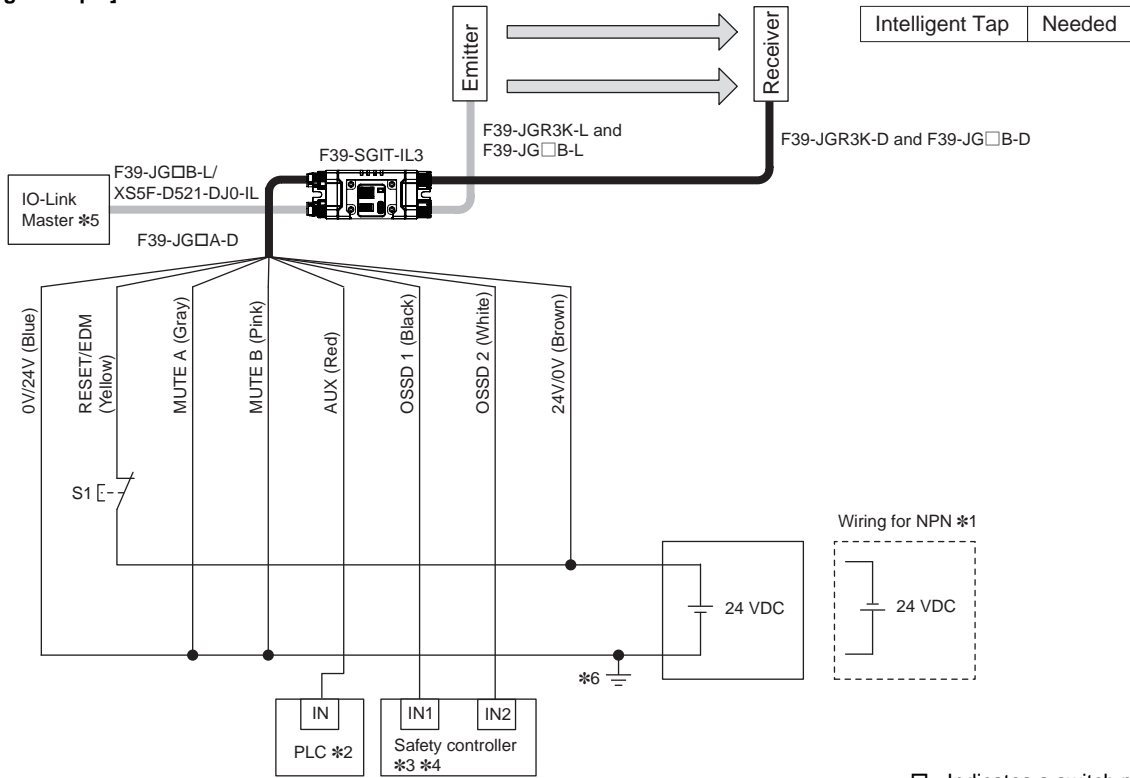
- *1. Reverse the polarity of the power supply when using in the NPN system. Select a safety controller of PNP or NPN type according to the system of your application.
- *2. If External Test is used, refer to the *User's Manual* (Man.No.Z405).
- *3. Connect the line to 24V/0V (brown) of the receiver via a lockout reset switch (NC contact) if Lockout Reset is used.
- *4. Refer to page 82 for more information.
- *5. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
- *6. This is the case for a PELV circuit.

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

Manual Reset Mode with Intelligent Tap

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

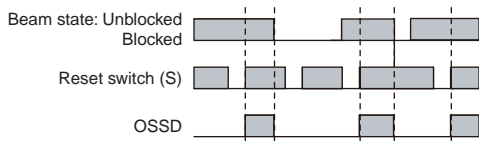
[Wiring Example]



□ : Indicates a switch position.

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

Timing chart



- S1: Lockout/interlock reset switch
 PLC: Programmable logic controller (Used for monitoring only. NOT related to safety system.)
- *1. Reverse the polarity of the power supply when using in the NPN system. Select a PLC and a safety controller of PNP or NPN type according to the system of your application.
 - *2. When connecting to the PLC, the output mode must be changed with the SD Manager 3 according to your application. For the setting this function, refer to the *User's Manual* (Man.No.Z405).
 - *3. Refer to page 82 for more information.
 - *4. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
 - *5. For connecting with the IO-Link Master unit, refer to an instruction manual of the IO-Link Master unit you use.
 - *6. This is the case for a PELV circuit.
 - *7. Set the function with the DIP Switches on the Intelligent Tap or the SD Manager 3, restore the settings to the F3SG-SR/PG, and perform wiring according to the wiring diagram.
 - *8. To set the Short mode, set the function with the DIP Switches on the Intelligent Tap or the SD Manager 3, restore the settings to the F3SG-SR/PG, and perform wiring according to the wiring diagram.
 - *9. When wiring the emitter/receiver of the F3SG-PGA-C, follow the same wiring as for the receiver in the figure above. Wiring of the emitter side is not required

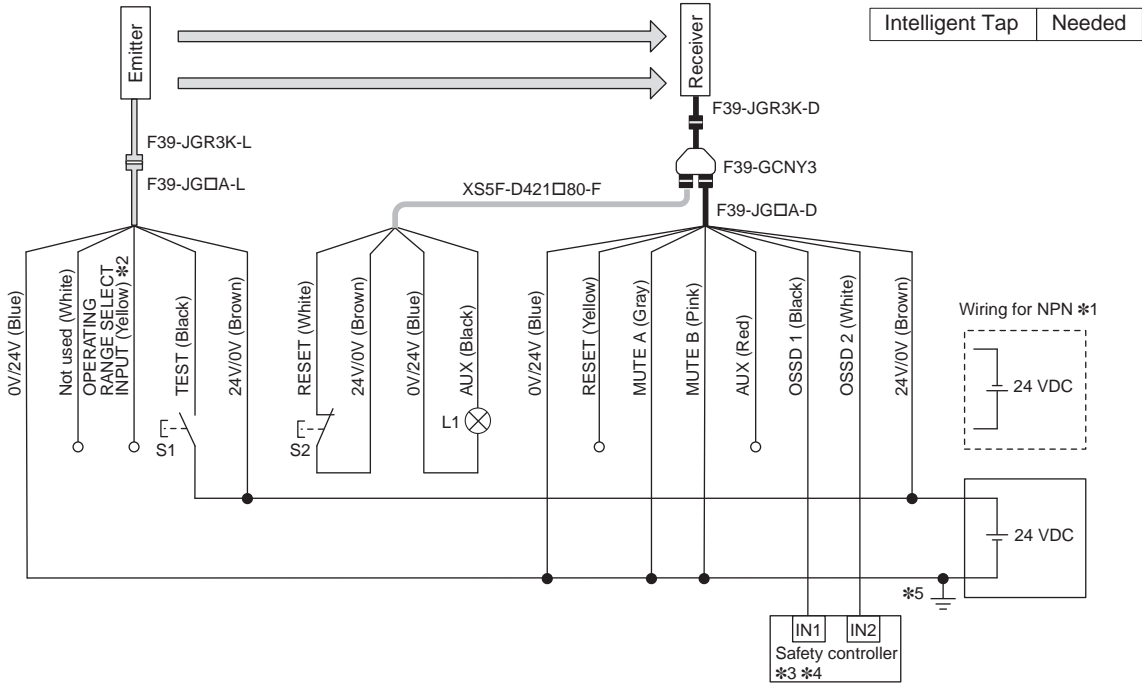
- Note:**
1. When using the Intelligent Tap (F39-SGIT-IL3) with the emitter and receiver connected, the following functions are not available.
 - External Test
 - Operating Range Selection by wiring
 - Optical Synchronization
 2. For the functional earth connection, refer to page 86.

Common to F3SG-SR and F3SG-PG

Manual Reset Mode with Reset Switch Connector

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

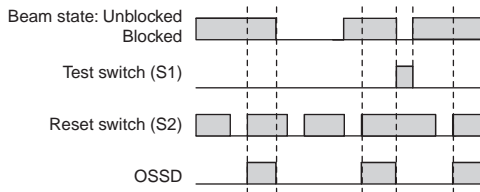
[Wiring Example]



□ : Indicates a switch position.

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

Timing chart



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

- *1. Reverse the polarity of the power supply when using in the NPN system. Select a PLC and a safety controller of PNP or NPN type according to the system of your application.
- *2. Connect the line to 0 VDC if Operating Range Selection is used in Short Mode.
- *3. Refer to page 82 for more information.
- *4. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply. This is the case for a PELV circuit.
- *6. Set the function with the DIP Switches on the Intelligent Tap or the SD Manager 3, restore the settings to the F3SG-SR/PG, and perform wiring according to the wiring diagram.
- *7. This wiring example shows light emission stop when connected to 24 VDC with PNP setting, and light emission stop when connected to 0 VDC with NPN setting. If TEST switch is not needed, refer to the *User's Manual* (Man. No. Z405).
- *8. The F3SG-PGA-C does not support the external test function.
- *9. When wiring the emitter/receiver of the F3SG-PGA-C, follow the same wiring as for the receiver in the figure above. Wiring of the emitter side is not required.

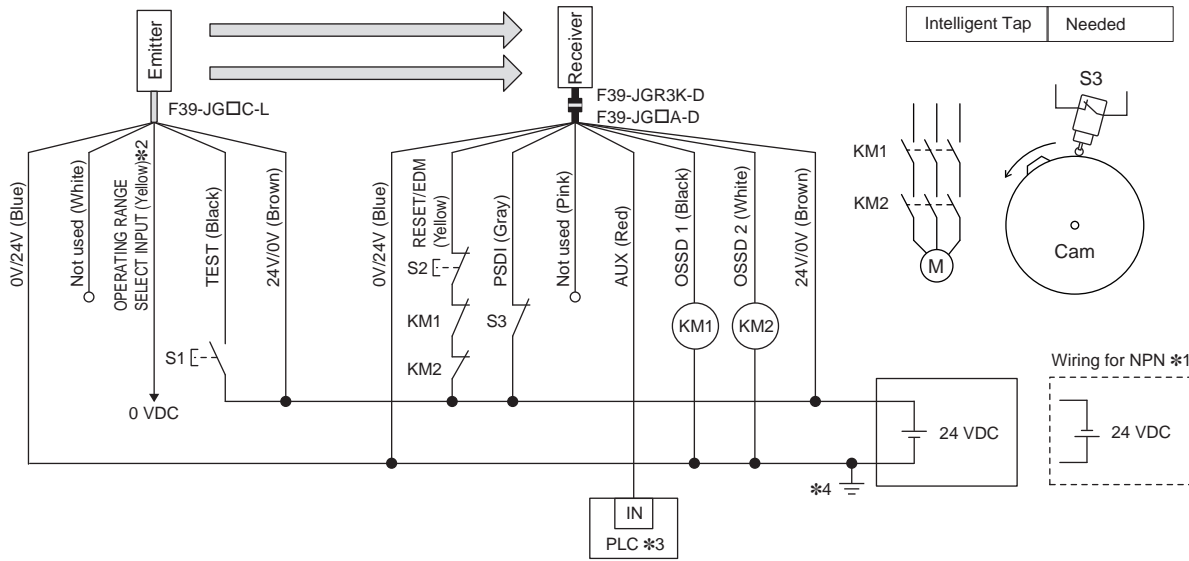
Note: 1. When using the Reset Switch Connector (F39-GCNY3), the following functions are not available.

- External Device Monitoring (EDM)
- 2. For the functional earth connection, refer to page 86.

Double Break with EDM

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

[Wiring Example]

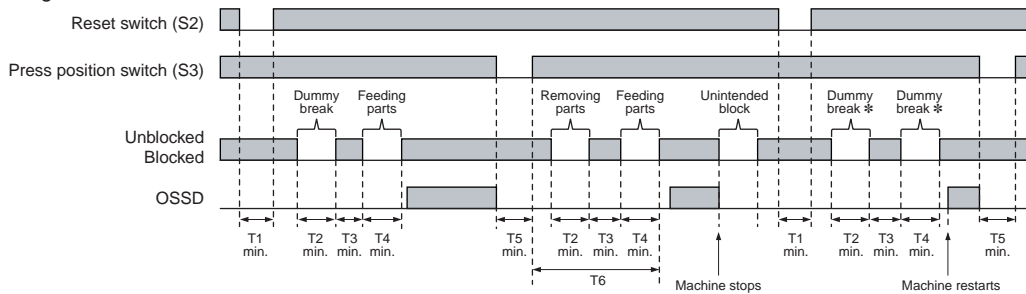


Function	Setting	
	DIP switch	SD Manager 3
EDM	-	[External device monitoring] : Enable *5
Operating Range Selection	Short : Connect the OPERATING RANGE SELECT INPUT line of the emitter to 0 VDC.	
PSDI	N/A	[PSDI] : Double break *5
Non-Muting system	Perform wiring according to the wiring diagram.	
	N/A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

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

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

Timing chart



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

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

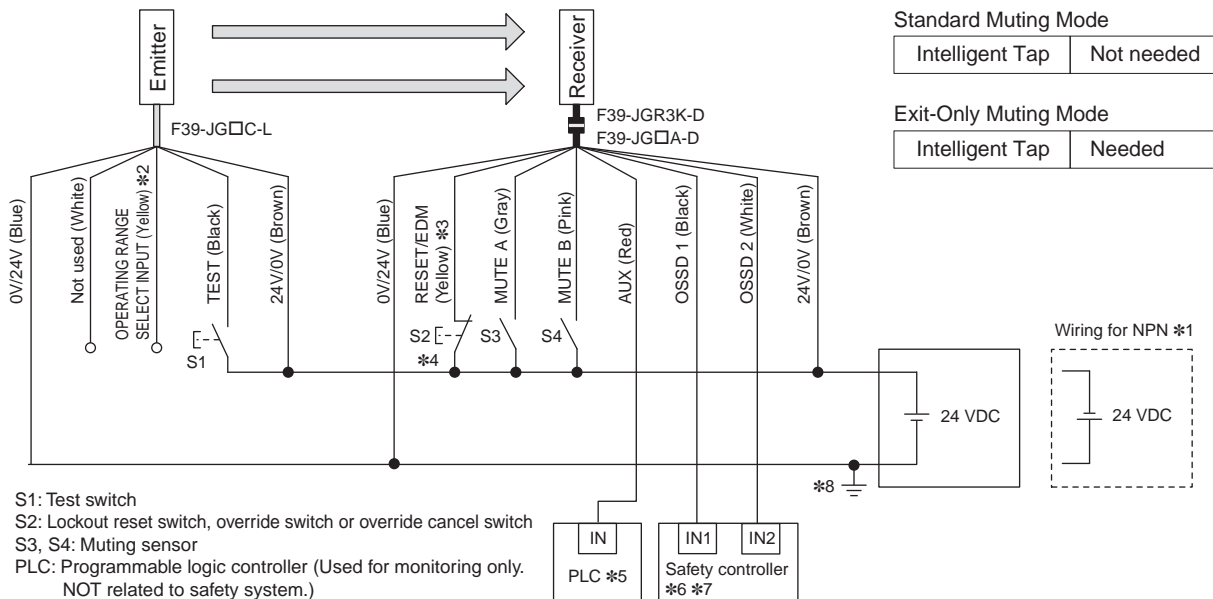
Note: For the functional earth connection, refer to page 86.

Common to F3SG-SR and F3SG-PG

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

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

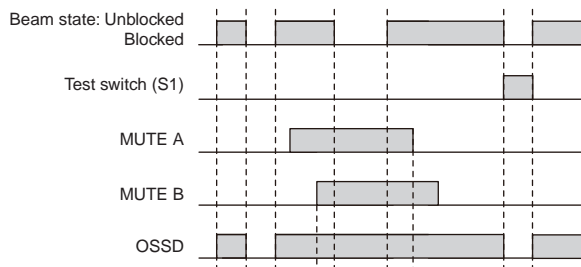
[Wiring Example]



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

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

Timing chart



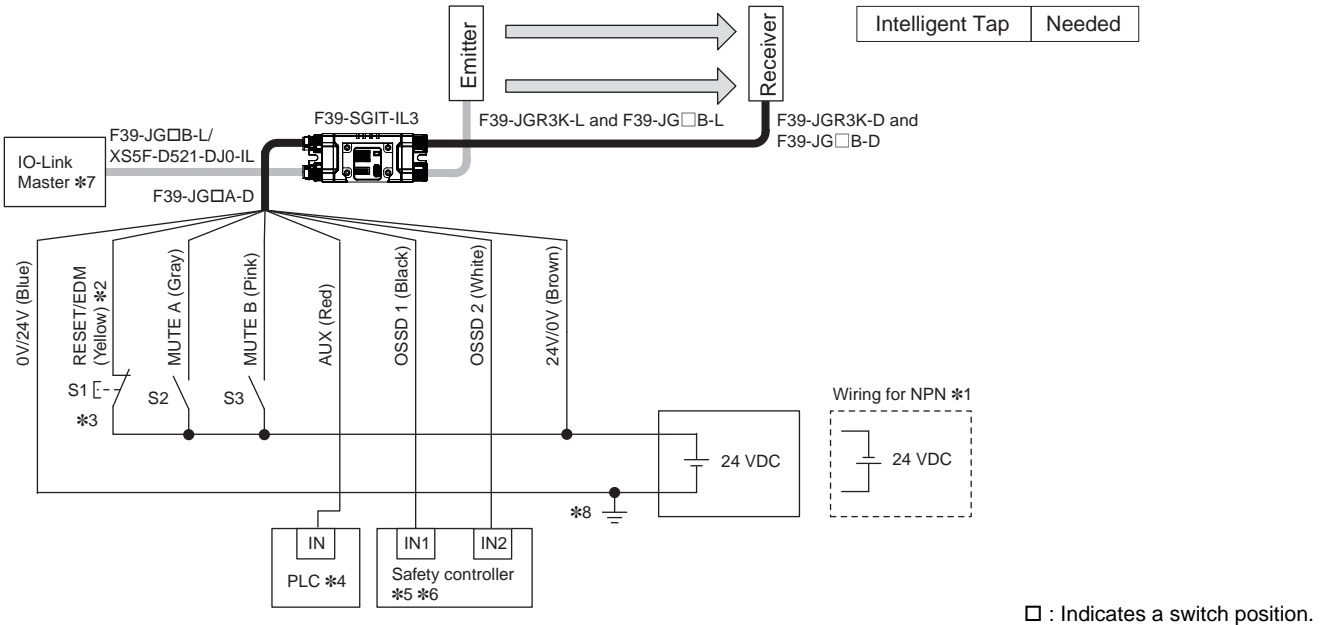
- *1. Reverse the polarity of the power supply when using in the NPN system.
- *2. Connect the line to 0 VDC if Operating Range Selection is used in Short Mode.
- *3. Also used as OVERRIDE INPUT line.
- *4. Make sure to connect an override cancel switch to the RESET line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.
- *5. When connecting to the PLC, the output mode must be changed with the SD Manager 3 according to your application. For the setting this function, refer to the *User's Manual* (Man.No.Z405).
- *6. Refer to page 82 for more information.
- *7. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
- *8. This is the case for a PELV circuit.
- *9. Set the function with the SD Manager 3, restore the settings to the F3SG-SR/PG, and perform wiring according to the wiring diagram.
- *10. This wiring example shows light emission stop when connected to 24 VDC with PNP setting, and light emission stop when connected to 0 VDC with NPN setting. If TEST switch is not needed, refer to the *User's Manual* (Man. No. Z405).
- *11. The F3SG-PGA-C does not support the external test function.
- *12. When wiring the emitter/receiver of the F3SG-PGA-C, follow the same wiring as for the receiver in the figure above. Wiring of the emitter side is not required.

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

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

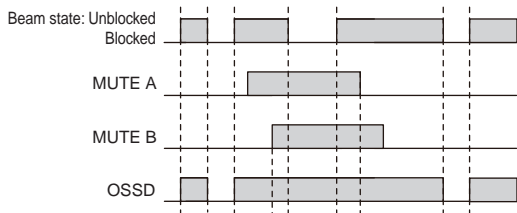
F3SG-SRA	Available	F3SG-PGA-A/L	Available
F3SG-SRB	Available	F3SG-PGA-C	Available *11

[Wiring Example]



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

Timing chart



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

- Note: 1.** When using the Intelligent Tap (F39-SGIT-IL3), the following functions are not available.
- External Test
 - Operating Range Selection by wiring
 - Optical Synchronization
- 2.** For the functional earth connection, refer to page 86.

- *1. Reverse the polarity of the power supply when using in the NPN system. Select a PLC and a safety controller of PNP or NPN type according to the system of your application.
- *2. Also used as OVERRIDE INPUT line.
- *3. Make sure to connect an override cancel switch to the RESET line when using the override function. Otherwise the override state may not be released by the override cancel switch, resulting in serious injury.
- *4. When connecting to the PLC, the output mode must be changed with the SD Manager 3 according to your application. For the setting this function, refer to the *User's Manual* (Man.No.Z405).
- *5. Refer to page 82 for more information.
- *6. The safety controller and the F3SG-SR/PG must share the power supply or be connected to the common terminal of the power supply.
- *7. For connecting with the IO-Link Master unit, refer to an instruction manual of the IO-Link Master unit you use.
- *8. This is the case for a PELV circuit.
- *9. Set the function with the DIP Switches on the Intelligent Tap or SD Manager 3.
- *10. Set the function with the DIP Switches on the Intelligent Tap or SD Manager 3 and wire according to the wiring diagram after restoring the settings to the FE3SG-SR/PG when the F3SG-SR/PG or F3SG-PGA-L is used in Short Mode. The F3SG-PGA-A/C do not support the operating range selection function.
- *11. When wiring the emitter/receiver of the F3SG-PGA-C, follow the same wiring as for the receiver in the figure above. Wiring of the emitter side is not required.

Common to F3SG-SR and F3SG-PG

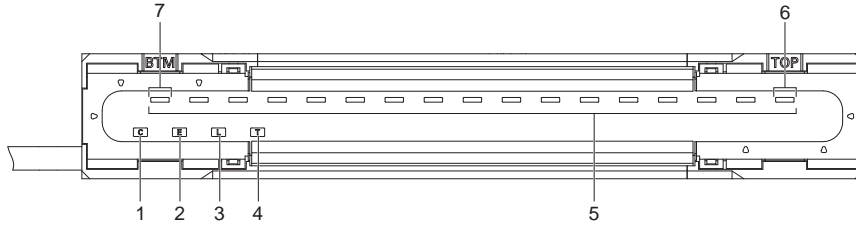
Indicator

LED Indicators on F3SG-SR/PG

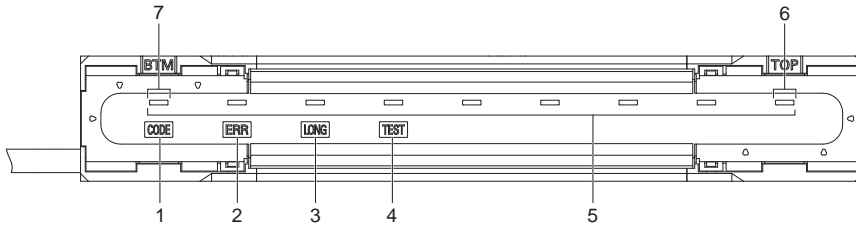
F3SG-SR

<Emitter>

F3SG-□SR□□□□□-14

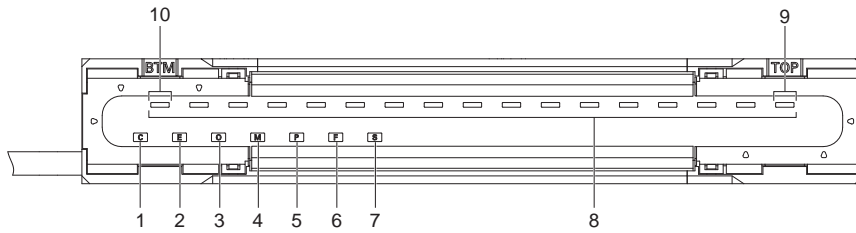


F3SG-□SR□□□□□-25/-45/-85

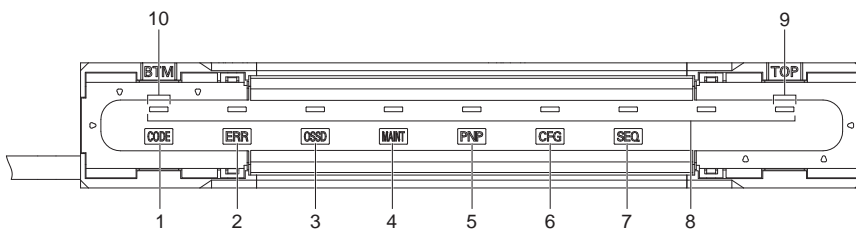


<Receiver>

F3SG-□SR□□□□□-14



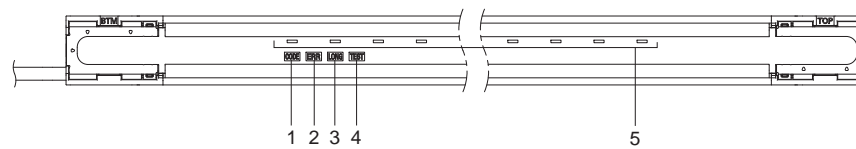
F3SG-□SR□□□□□-25/-45/-85



F3SG-PG

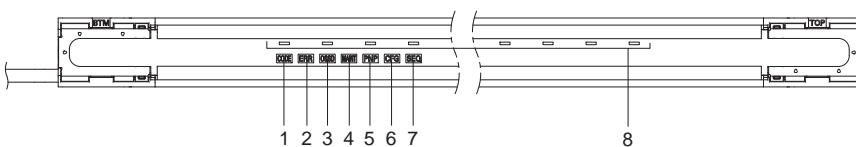
<Emitter>

F3SG-4PGA□□□□□-□A/□L



<Receiver, Emitter/receiver>

F3SG-4PGA□□□□□-□A/□L/□C



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

Emitter (F3SG-SR/PG)

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

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

*2. Configurable by SD Manager 3.

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

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

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

*6. DIP switches is on the Intelligent Tap.

Common to F3SG-SR and F3SG-PG

Receiver (F3SG-SR/PG)

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

*1. Refer to *Troubleshooting* on page 100 for more information on blinking patterns.

*2. Configurable by SD Manager 3.

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

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

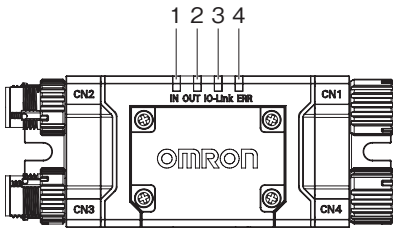
*5. The Area Beam Indicator closer to the "BTM" mark on the F3SG-SR/PG blinks.

*6. DIP switches is on the Intelligent Tap.

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

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

LED Indicators on Intelligent Tap



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

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

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

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

Note: In the SETTING state to make settings with the SD Manager 3, the IN, OUT indicators blink. (IN: Yellow, OUT: Green)

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

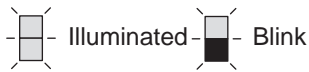
Common to F3SG-SR and F3SG-PG

Troubleshooting

F3SG-SR/PG

LOCKOUT State

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



<Indicator status at lockout: Receiver>

Combination of indicators and error description

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

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

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

<Indicator status at lockout: Emitter>

Combination of indicators and error description

ERR indicator	Other indicators	Error description
<p>Blinking once</p>	or	Operating range selection setting error
	TOP *1 *3	Cap error Other sensor error
	BTM *2 *3	DIP Switch setting error
	---	Communication error Error other than those above

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

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

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

Common to F3SG-SR and F3SG-PG

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

Common to F3SG-SR and F3SG-PG

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

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

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

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

Common to F3SG-SR and F3SG-PG

Warning

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



<Indicator status at warning: Receiver *1>

Combination of indicators and error description

ERR indicator	MAINT indicator	Other indicators	Error description
 E or ERR	 M or MAINT	 F or CFG	Teach-in error
		 S or SEQ	Muting sequence error, Interlock sequence error or PSDI sequence error
	 M or MAINT Orange	Area Beam Indicator Green	Malfuction due to ambient light or vibration
		Area Beam Indicator Orange → After 5 to 10 s →	Low incident light level

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

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

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







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

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

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

Muting Sequence Error Indication




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

SEQ indicator	Cause and measures
 Blinking: Once	Power supply may have been turned ON with muting input A or B being ON. Check the condition of the muting sensors and the F3SG-SR/PG.
	Muting input B may have been turned ON before muting input A was turned ON. Check the condition of the muting sensors.
	Muting input A and B may have been turned ON at the same time. <ul style="list-style-type: none"> • Check the arrangement of the muting sensors. • Check if the wiring of muting input A and B is short-circuited.
	Either muting input A or B may have been turned ON with the F3SG-SR/PG being blocked or INTERLOCK State. Check the condition of the F3SG-SR/PG.
 Blinking: Twice	Muting input B may have been turned ON within T1 min (= 0.1 s *) after muting input A was turned ON. <ul style="list-style-type: none"> • Check that if the muting sensors are installed too close each other. • Check that if the speed of the workpiece is too fast.
	It may have taken T1 max (= 4 s *) or longer for muting input B to be turned ON after muting input A was turned ON. <ul style="list-style-type: none"> • Check that if the muting sensors are installed too far each other. • Check that if the speed of the workpiece is too slow.
	The F3SG-SR/PG may have been blocked after muting input A was turned ON but before muting input B was turned ON. Check the condition of the F3SG-SR/PG.
 Blinking: Four times	The F3SG-SR/PG may have been blocked within 0.08 s after muting input A and B were normally turned ON. <ul style="list-style-type: none"> • Check that if the muting sensor and the F3SG-SR/PG are installed too close each other. • Check that if the speed of the workpiece is too fast.
	Muting may have been released after the F3SG-SR/PG entered the MUTING state but before a workpiece blocked the F3SG-SR/PG. <ul style="list-style-type: none"> • Check that the workpiece still remains. • Check that the speed of the workpiece is too slow.
 Blinking: Five times	The F3SG-SR/PG entered the MUTING state, but muting may have then been released while a workpiece passes through the F3SG-SR/PG. <ul style="list-style-type: none"> • Check that the workpiece still remains. • Check that if the speed of the workpiece is too slow. • Check that the muting sensors have been installed upstream and downstream of the F3SG-SR/PG with the size of workpieces taken into account. (Using four muting sensors)
 Blinking: Six times	Muting may have been released with muting input A and B remained ON after a workpiece passed through the F3SG-SR/PG. <ul style="list-style-type: none"> • Check that the workpiece still remains. • Check that the speed of the workpiece is too slow.
 Blinking: Seven times	The next muting sequence may have started after muting was released but before the initial muting condition was established. <ul style="list-style-type: none"> • Check that if a next workpiece has not entered before the current workpiece passes through the F3SG-SR/PG. • Check that if the interval between workpieces are too narrow.

* Factory default setting

Interlock Sequence Error Indication





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

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

Common to F3SG-SR and F3SG-PG

PSDI Sequence Error Indication

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

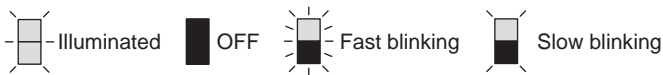
SEQ indicator	Error condition	Cause and measures
 Blinking: Once	●	Power supply may have been turned ON with PSDI input being OFF. Check the condition of the light curtains and PSDI input wiring.
	●	Power supply may have been turned ON with the light curtain blocked. Check the condition of the light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

Notations

- ...Single Break
- ◎...Double Break
- ...Common

Intelligent Tap

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



Combination of indicators and error description

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

Note: 1. The signals output to IO-Link or IN and OUT indicators show the statuses of the F3SG-SR/PG or Intelligent Tap except their LOCKOUT state.

2. The muting inputs A and B are kept in the OFF state when the LOCKOUT state occurs due to the power supply voltage error.

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

Common to F3SG-SR and F3SG-PG

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

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

Bluetooth® Communication Unit

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

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

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

Common to F3SG-SR and F3SG-PG

Legislation and Standards

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

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

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

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

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

Note: The F3SG-SR's with detection capability of 45-mm and 85-mm dia. are not compliant with GB/T 4584. Refer to *Ratings and Specifications* on page 24 for more information on the ratings and specifications by model.

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



Dispose in accordance with applicable regulations.

8. Regions where F39-SGBT can be used

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

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

Related Manuals

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

Safety Precautions

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

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

- Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation.
- Windows, Windows 7, Windows 8, Windows 10, Microsoft .NET Framework, and Surface are registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.
- The official name of Windows 7 is Microsoft Windows 7 Operating System.
- The official name of Windows 8 is Microsoft Windows 8 Operating System.
- The official name of Windows 10 is Microsoft Windows 10 Operating System.
- USB Type-C™ is the trademark of USB Implementers Forum.
- The Bluetooth® word mark and logo are registered trademarks and are owned by the Bluetooth SIG, Inc.
- Google and Android are trademarks of Google LLC.
- Other company names and product names given in this document are trademarks or registered trademarks of respective companies.

Terms and Conditions Agreement

Read and understand this catalog.

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

Warranties.

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

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

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

Limitation on Liability; Etc.

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

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

Suitability of Use.

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

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

Programmable Products.

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

Performance Data.

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

Change in Specifications.

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

Errors and Omissions.

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

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



F3SG-SR/PG

Cat No.F118

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

OMRON Corporation Industrial Automation Company

Kyoto, JAPAN

Contact : www.ia.omron.com

Regional Headquarters

OMRON EUROPE B.V.

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

OMRON ELECTRONICS LLC

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

OMRON ASIA PACIFIC PTE. LTD.

438B Alexandra Road, #08-01/02 Alexandra
Technopark, Singapore 119968
Tel: (65) 6835-3011 Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.

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

Authorized Distributor:

©OMRON Corporation 2022 All Rights Reserved.
In the interest of product improvement,
specifications are subject to change without notice.

CSM_1_2

Cat. No. F117-E1-02 0922 (0622)