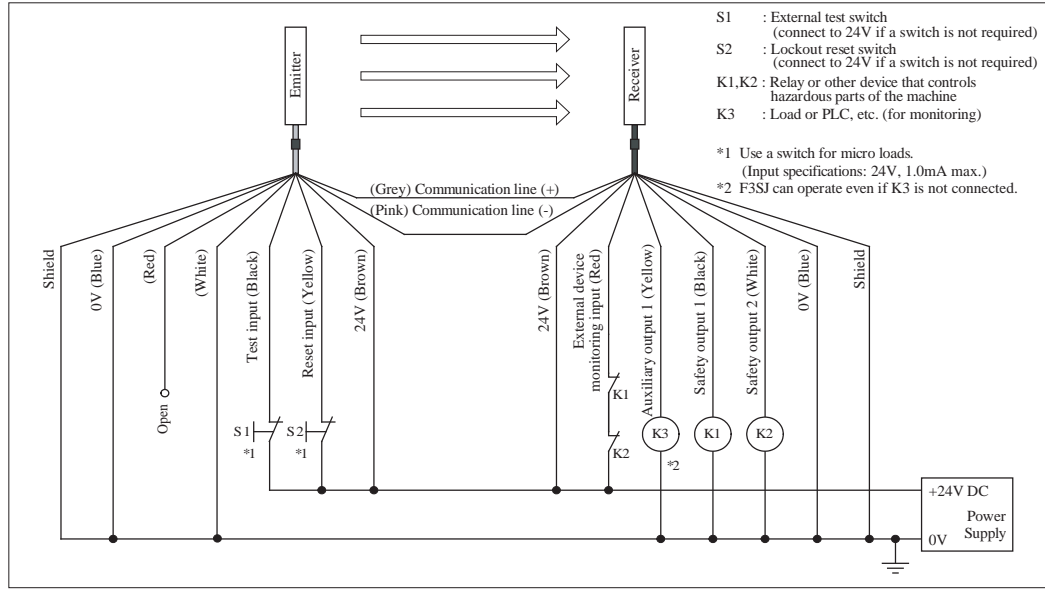


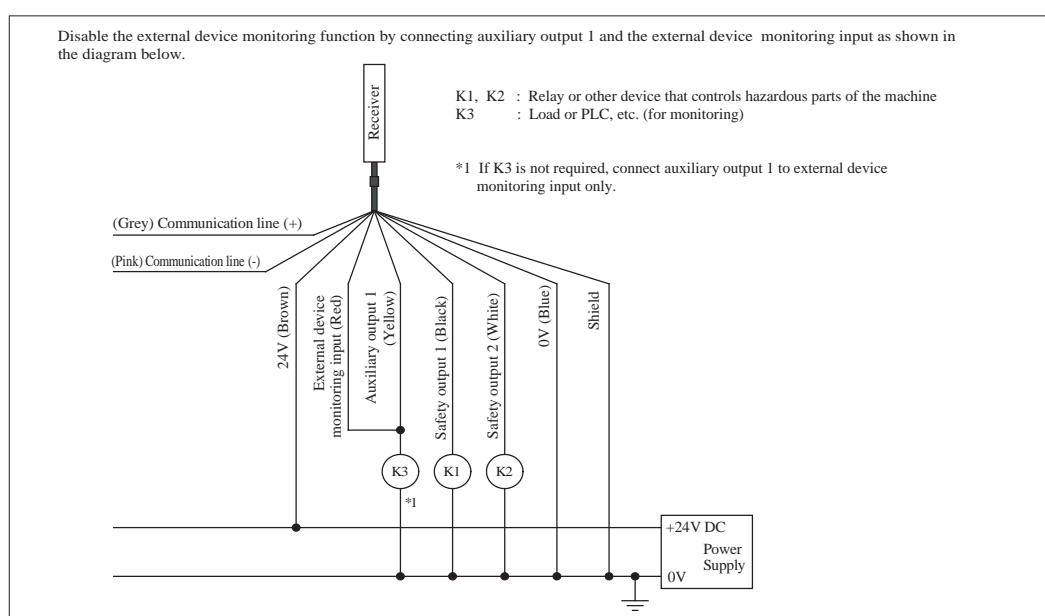
Wiring Diagrams

[Basic System]

Wiring using external device monitoring

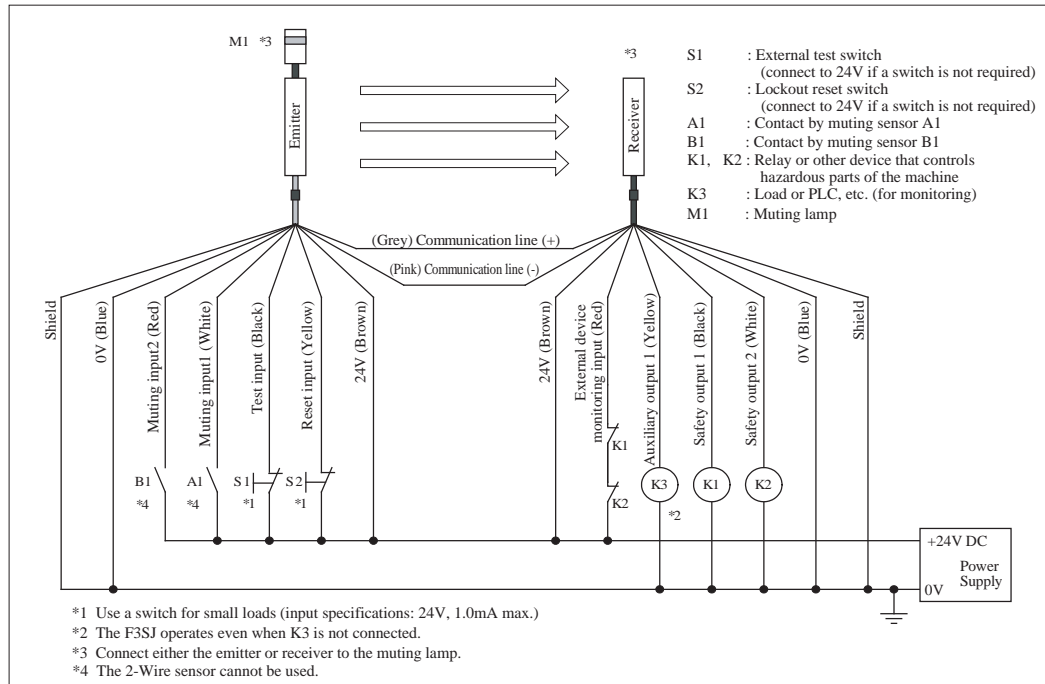


Wiring when external device monitoring function is not used



[Muting System]

Wiring when using muting and external device monitoring functions



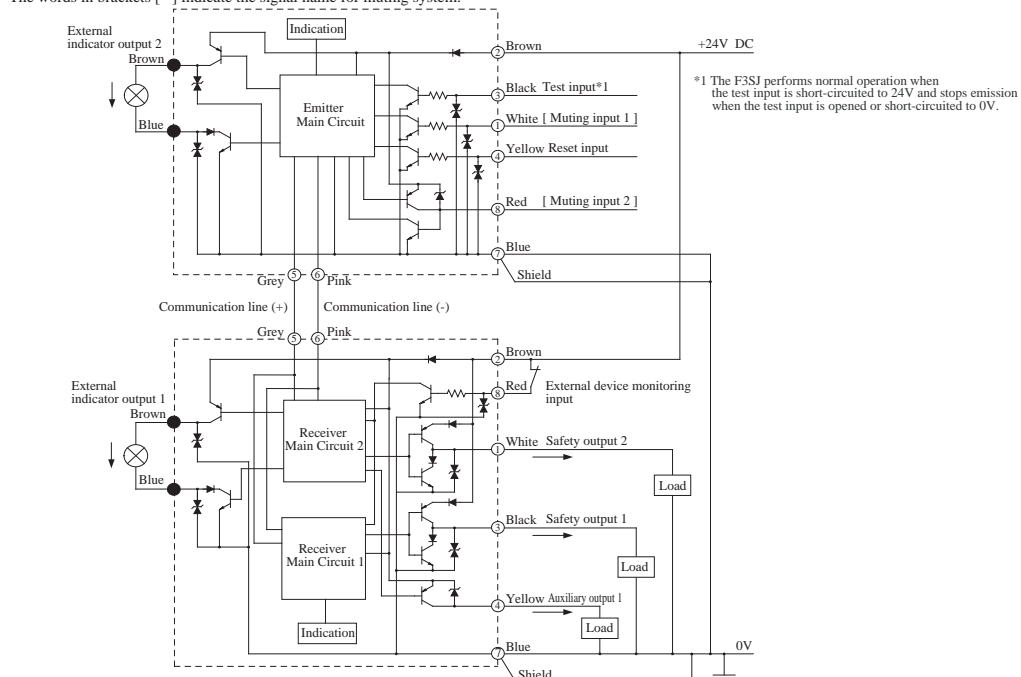
Wiring when external device monitoring function is not required

Wiring diagram is the same as that for "Wiring when external device monitoring function is not used" of the basic system.

Input/Output Circuit

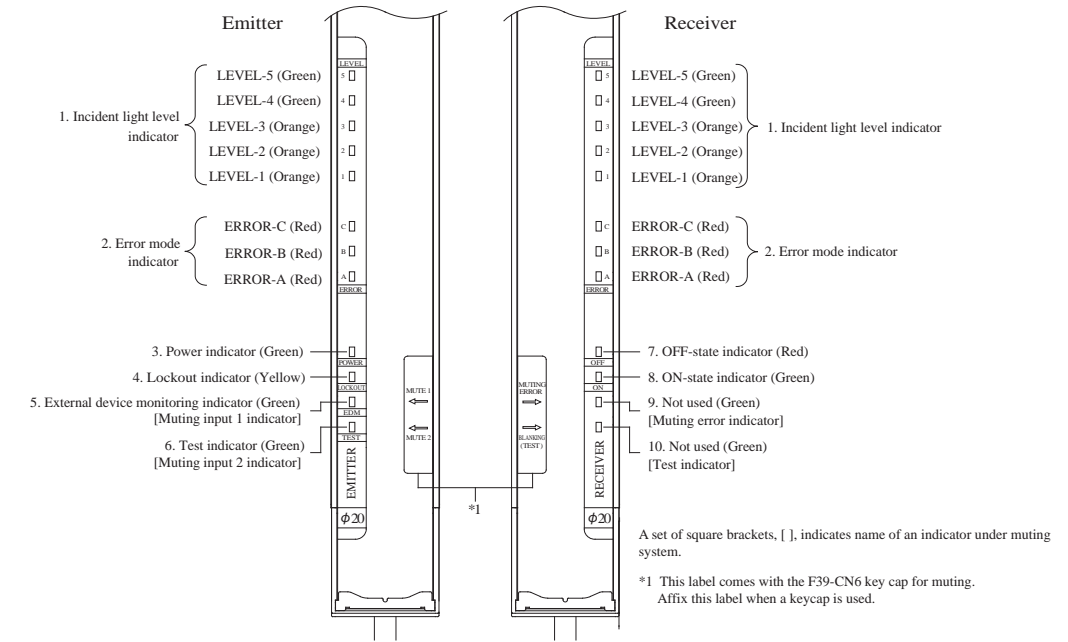
Input/output circuit

The numbers in white circles indicate the connector's pin numbers.
 The black circles indicate connectors for series connection.
 The words in brackets [] indicate the signal name for muting system.



Indicator Display Patterns

Indicators



Indicator display patterns for a basic system

No.	Indicators	LEVEL-1 to 5	ON/Blinking	Description
1	Incident light level indicator	LEVEL-1 to 5	ON	Indication status of LEVEL-1 to 5 shows the incident light level status of the F3SJ.
2	Error mode indicator	ERROR-A to C	ON/Blinking	Turns ON or blinks only when the F3SJ enters lockout, and the cause of the error is indicated by the status of ERROR-A to C indicators. When F3SJ are series-connected, the error mode indicator lamps turn ON or blink according to the details of each error. Affix the error mode label (included) near the F3SJ to allow for quick trouble shooting when errors occur. For details about error mode, refer to " ■ Indication patterns of error mode indicator".
3	Power indicator	POWER	ON	Turns ON while the power is ON.
4	Lockout indicator	LOCKOUT	Blinking	Blinks when in lockout.
5	External device monitoring indicator	EDM	ON	Turns ON when an input is given to external device monitoring input.
6	Test indicator	TEST	Blinking	Blinks when external test is being performed.
7	OFF-state indicator	OFF	ON	Turns ON when safety outputs are OFF.
8	ON-state indicator	ON	ON	Blinks under lockout.
9	—	—	—	—
10	—	—	—	—

Indicator display patterns for a muting system (Indicator display different from a basic system are described.)

No.	Indicators	MUTE1	ON/Blinking	Description
5	Muting input 1 indicator	MUTE1	ON	Turns ON when an input is given to muting input 1.
6	Muting input 2 indicator	MUTE2	Blinking	Blinks under muting/override.
9	Muting error indicator	MUTING ERROR	ON	Turns ON when an input is given to muting input 2.
10	Test indicator	TEST	Blinking	Blinks under muting/override.

Indication patterns of the incident light level indicator

ON	OFF	Incident light level
☒☒☒☒☒☒	☒☒☒☒☒☒	170% or higher of safety output ON level
☒☒☒☒☒☒	☒☒☒☒☒☒	From 130 to less than 170% of safety output ON level
☒☒☒☒☒☒	☒☒☒☒☒☒	From 100 to less than 130% of safety output ON level
☒☒☒☒☒☒	☒☒☒☒☒☒	From 75 to less than 100% of safety output ON level
☒☒☒☒☒☒	☒☒☒☒☒☒	From 50 to less than 75% of safety output ON level
☒☒☒☒☒☒	☒☒☒☒☒☒	Less than 50% of safety output ON level

Operation is possible with incident light level of 100% or more, but to ensure stability, operate when all incident light level indicators

Indication patterns of error mode indicator

A	B	C	Main cause of error
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	Mutual interference or disturbance light.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	Power supply voltage of F3SJ is out of rated range. Insufficient current capacity of power supply.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	Breakage, incorrect wiring of communication line, disconnection of series-connection cable, influence of noise, or other errors.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	The models of the emitter and receiver in a set are different.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	End cap is not attached. Failure of internal circuit of F3SJ.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	Relay is welded or recovery time is too long. Incorrect wiring or breakage of external device monitoring line.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	Incorrect wiring or breakage of reset input line or pin 1 (line color:white) of emitter.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	Incorrect wiring or breakage of reset input line for a muting system.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	Incorrect wiring of safety output 1 or 2. Failure of safety output circuit.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	Incorrect wiring or breakage of series-connection cable.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	Broken series connection cable.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	Incorrect wiring or breakage of communication line.
☒☒☒☒☒☒	☒☒☒☒☒☒	☒☒☒☒☒☒	Effect of noise. F3SJ Failure of internal circuit.

Refer to F3SJ User's manual for details.

Response Times/Power Cable Length

Response times

Protective height [mm]	Number of beams	Response time (ON to OFF) [ms]	Response time (OFF to ON) [ms]
245	16	10	40
260~440	17~29	11	44
455~635	30~42	12	48
650~830	43~55	13	52
845~1010	56~67	14	56
1025~1205	68~80	15	60
1220~1685	81~112	17.5	70
1700~2165	113~144	20	80
2180~2495	145~166	22.5	90

F3SJ-A□□□P20-01TS

Protective height [mm]	Number of beams	Response time (ON to OFF) [ms]	Response time (OFF to ON) [ms]
260~320	13~16	10	40
340~580	17~29	11	44
600~840	30~42	12	48
860~1100	43~55	13	52
1120~1340	56~67	14	56
1360~1600	68~80	15	60
1620~2240	81~112	17.5	70
2260~2500	113~125	20	80

For series connections, use the calculations below.

When 2 sets are series-connected
 Response time (ON to OFF):
 Response time of 1st unit + Response time of 2nd unit - 1 (ms)
 Response time (OFF to ON):
 Response time from the above calculation x 4 (ms)

When 3 sets are series-connected
 Response time (ON to OFF):
 Response time of 1st unit + Response time of 2nd unit + Response time of 3rd unit - 5 (ms)
 Response time (OFF to ON):
 Smaller value of response time (ON to OFF) x 5 (ms) or 200ms

Power cable length

Extension of power cable must be the length shown below or shorter.

- In case F3SJ is directly connected to external power supply, or connected to G9SA-300-SC

Condition	Single	2 connected	3 connected
Incandescent display lamps are used by auxiliary output and/or external indicator output	45m	40m	30m
Incandescent display lamps are not used*	100m	60m	45m

- When connected to F3SP-B1P

Condition	Single	2 connected	3 connected
Incandescent display lamps are - used by external indicator output 2	40m	30m	25m
Incandescent display lamps are - used by external indicator output 1 and/or - used by auxiliary output 1	60m	45m	30m
Incandescent display lamps are not used*	100m	60m	45m

*The F39-A01P□-PAC Dedicated External Indicator Set uses LEDs. Refer to the cable extension lengths for "Incandescent display lamps are not used".