

F3SJ-A

Sensor Mounting Brackets (Sold separately)

Appearance	Specifications	Model	Application	Remarks
	Standard mounting bracket (for top/bottom)	F39-LJ1	(provided with the F3SJ)	2 for an emitter, 2 for a receiver, total of 4 per set
	Flat side mounting bracket	F39-LJ2	Use these small-sized brackets when performing side mounting with standard mounting brackets, so that they do not protrude from the detection surface.	2 for an emitter, 2 for a receiver, total of 4 per set
	Free-location mounting bracket (also used as standard intermediate bracket)	F39-LJ3	Use these brackets for mounting on any place without using standard bracket.	Two brackets per set (For details about the number of required brackets, refer to page 89.)
	F3SN Intermediate Bracket Replacement Spacers	F39-LJ3-SN	When replacing the F3SN with the F3SJ, the mounting hole pitches in the Intermediate Brackets are not the same. This Spacer is placed between the mounting holes to mount the F3SJ.	1 set with 2 pieces
	Top/bottom bracket B (Mounting hole pitch 19 mm)	F39-LJ4	Mounting bracket used when replacing existing area sensors (other than F3SN or F3WN) with the F3SJ. For front mounting. Suitable for mounting hole pitch of 18 to 20 mm.	2 for an emitter, 2 for a receiver, total of 4 per set
	Bracket for replacing short-length F3SN	F39-LJ5	Mounting bracket used when an F3SN with protective height of 300 mm or less is replaced by an F3SJ.	2 for an emitter, 2 for a receiver, total of 4 per set
	Space-saving mounting bracket	F39-LJ8	Use these brackets to mount facing inward. Length is 12 mm shorter than the standard F39-LJ1 bracket.	2 for an emitter, 2 for a receiver, total of 4 per set
	Mounting bracket used when replacing an F3W-C.	F39-LJ9	Mounting bracket used when replacing existing F3W-C series area sensors with the F3SJ. For front mounting or side mounting. Mounting hole pitch 16 mm.	2 for an emitter, 2 for a receiver, total of 4 per set
	Top/bottom bracket C (mounting hole pitch 13 mm)	F39-LJ11	Mounting bracket used when replacing existing area sensors having a mounting pitch of 13 mm with the F3SJ.	2 for an emitter, 2 for a receiver, total of 4 per set

End Cap

Appearance	Model	Remarks
	F39-CN9	For both emitter and receiver. The End Cap can be purchased if lost. (Case: Black)

* This product is for F3SJ-A only.

Key Cap for Muting

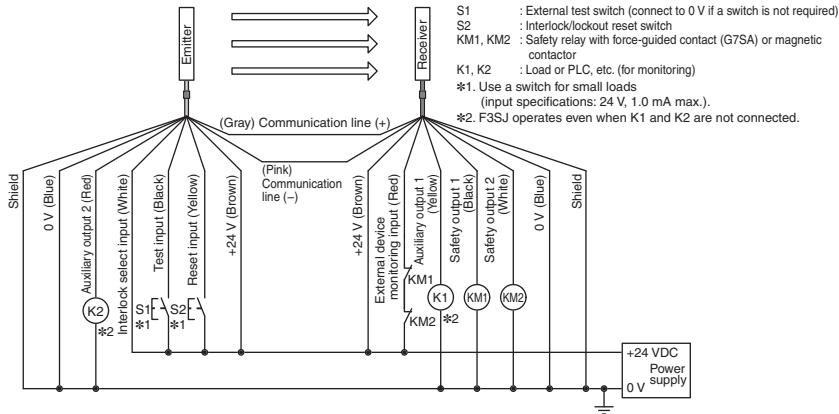
Appearance	Model	Remarks
	F39-CN6	A cap to be attached to the main unit to enable muting function. Attach it to either an emitter or a receiver. (Case: orange)

* This product is for F3SJ-A only.

Basic Wiring Diagram

[PNP Output]

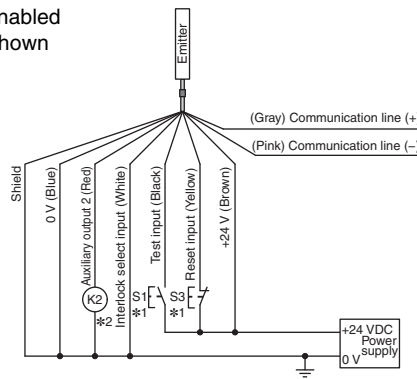
Wiring when using manual reset mode, external device monitoring



Wiring for auto reset mode

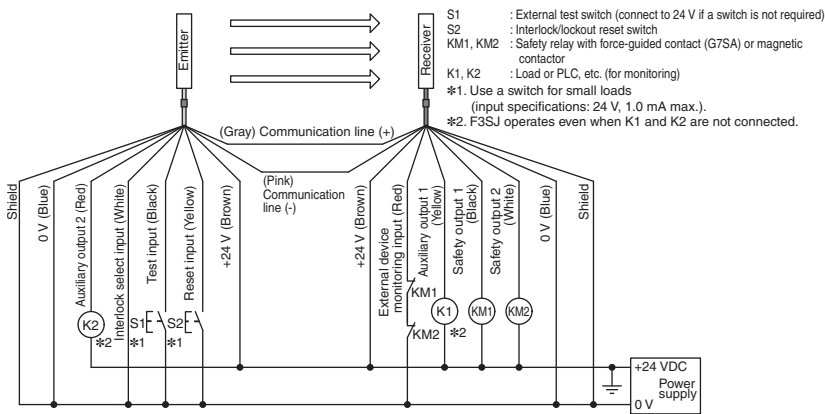
- The auto reset mode will be enabled when the emitter is wired as shown below.

- S1 : External test switch (connect to 0 V if a switch is not required)
 S3 : Lockout reset switch (connect to 24 V if a switch is not required)
 K2 : Load or PLC, etc. (for monitoring)
 *1. Use a switch for small loads (input specifications: 24 V, 1.0 mA max.).
 *2. F3SJ operates even when K2 is not connected.



[NPN Output]

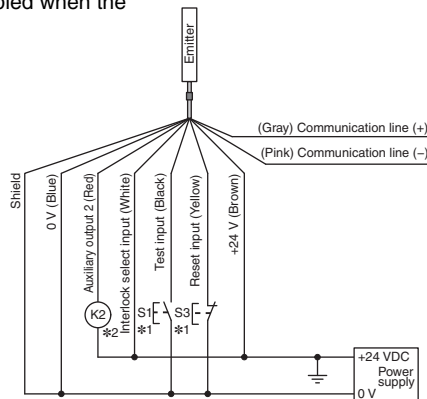
Wiring when using manual reset mode, external device monitoring



Wiring for auto reset mode

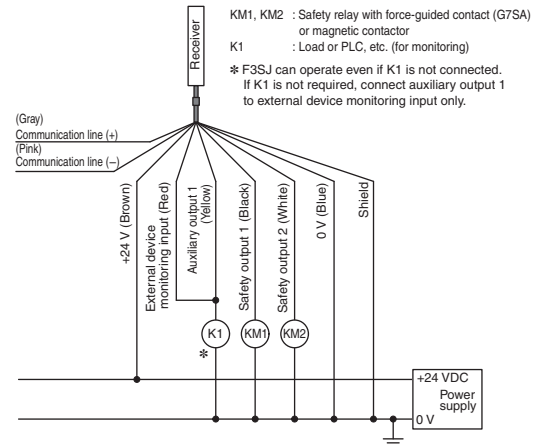
- The auto reset mode will be enabled when the emitter is wired as shown below.

- S1 : External test switch (connect to 24 V if a switch is not required)
 S3 : Lockout reset switch (connect to 0 V if a switch is not required)
 K2 : Load or PLC, etc. (for monitoring)
 *1. Use a switch for small loads (input specifications: 24 V, 1.0 mA max.).
 *2. F3SJ operates even when K2 is not connected.



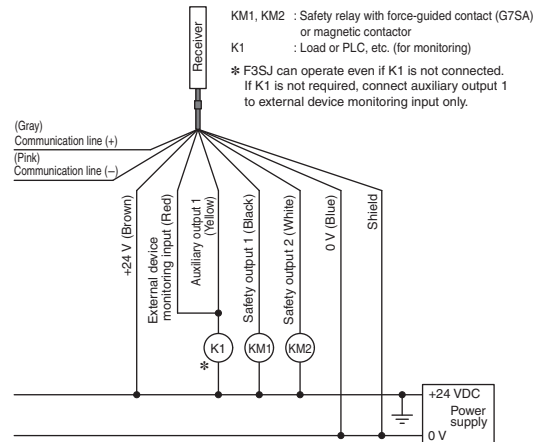
Wiring when the external device monitoring function will not be used

- Use a setting tool to set the external device monitoring function to "Disabled."
- When using an auxiliary output 1 that has not been changed (output operation mode is "control output data," and inverse of safety output signals is "Enabled), the external device monitoring function will be disabled when auxiliary output 1 and the external device monitoring input are connected as shown below.



Wiring when the external device monitoring function will not be used

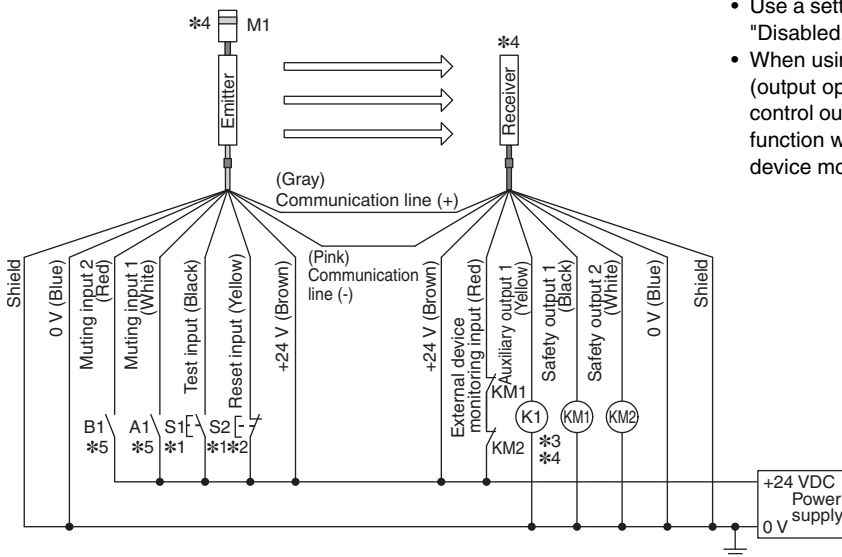
- Use a setting tool to set the external device monitoring function to "Disabled."
- When using an auxiliary output 1 that has not been changed (output operation mode is "safety output data," and inverse of control output signals is "Enabled), the external device monitoring function will be disabled when auxiliary output 1 and the external device monitoring input are connected as shown below.



Basic Wiring Diagram for Muting System

[PNP Output]

Wiring when using muting and external device monitoring functions



- S1 : External test switch (connect to 0 V if a switch is not required)
- S2 : Lockout reset switch (connect to 24 V if a switch is not required)
- A1 : Contact by muting sensor A1
- B1 : Contact by muting sensor B1
- KM1, KM2 : Safety relay with force-guided contact (G7SA) or magnetic contactor
- K1 : Load or PLC, etc. (for monitoring)
- M1 : Muting lamp

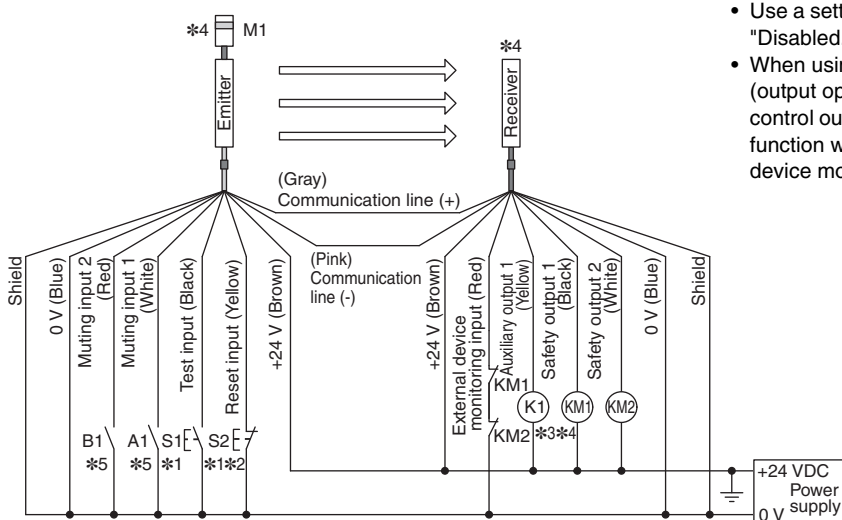
- *1. Use a switch for small loads (input specifications: 24 V, 1.0 mA max.).
- *2. When using the interlock function, this also functions as an interlock reset switch. (Must be set with a setting tool.)
- *3. F3SJ operates even when K1 is not connected.
- *4. Connect the muting lamp to either the external indicator output or auxiliary output 1 for the emitter or the receiver. When connecting the muting lamp to auxiliary output 1, the parameter must be changed with a setting tool.
- *5. Two-wire type muting sensor cannot be used.

When external device monitoring function is not required

- Use a setting tool to set the external device monitoring function to "Disabled."
- When using an auxiliary output 1 that has not been changed (output operation mode is "safety output data," and inverse of control output signals is "Enabled"), the external device monitoring function will be disabled when auxiliary output 1 and the external device monitoring input are connected.

[NPN Output]

Wiring when using muting and external device monitoring functions



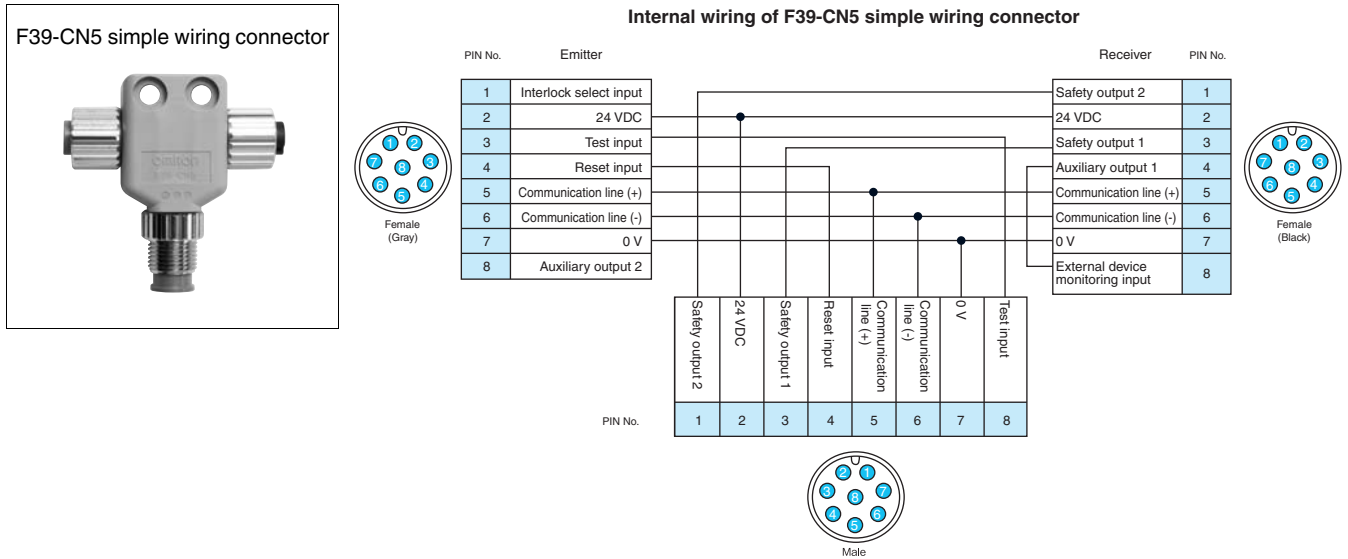
- S1 : External test switch (connect to 24 V if a switch is not required)
- S2 : Lockout reset switch (connect to 0 V if a switch is not required)
- A1 : Contact by muting sensor A1
- B1 : Contact by muting sensor B1
- KM1, KM2 : Safety relay with force-guided contact (G7SA) or magnetic contactor
- K1 : Load or PLC, etc. (for monitoring)
- M1 : Muting lamp

- *1. Use a switch for small loads (input specifications: 24 V, 1.0 mA max.).
- *2. When using the interlock function, this also functions as an interlock reset switch. (Must be set with a setting tool.)
- *3. F3SJ operates even when K1 is not connected.
- *4. Connect the muting lamp to either the external indicator output or auxiliary output 1 for the emitter or the receiver. When connecting the muting lamp to auxiliary output 1, the parameter must be changed with a setting tool.
- *5. Two-wire type muting sensor cannot be used.

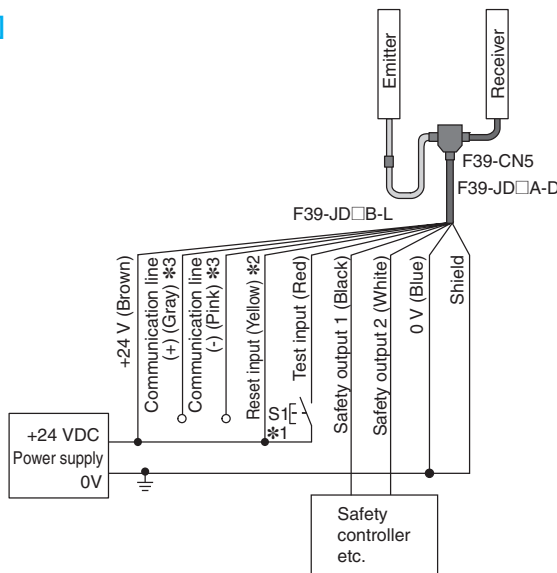
When external device monitoring function is not required

- Use a setting tool to set the external device monitoring function to "Disabled."
- When using an auxiliary output 1 that has not been changed (output operation mode is "safety output data," and inverse of control output signals is "Enabled"), the external device monitoring function will be disabled when auxiliary output 1 and the external device monitoring input are connected.

Wiring Diagram When Using Simple Wiring System



[PNP Output]

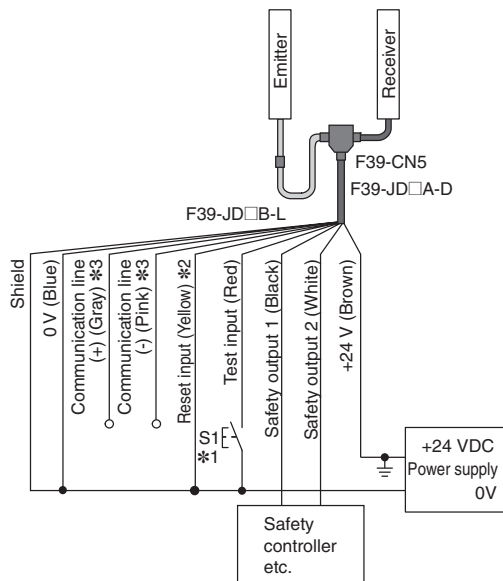


- S1 : External test switch (connect 0 V if a switch is not required)
- *1. Use a switch for small loads (input specifications: 24 V, 1.0 mA max.).
 - *2. When the lockout reset function is used, connect to 24 V via a lockout reset switch (N.C. contact).
 - *3. Make sure the Communication lines are insulated. If the lines are shorted, the F3SJ-A enters the lockout state.

Controllers connectable with PNP output F3SJ series

Safety controller	Model
Safety Network Controller	NE1A series
Safety Controller	G9SP series
Flexible Safety Unit	G9SX series
Safety Relay Unit	G9SA series

[NPN Output]



- S1 : External test switch (connect 24 V if a switch is not required)
- *1. Use a switch for small loads (input specifications: 24 V, 1.0 mA max.).
 - *2. When the lockout reset function is used, connect to 0 V via a lockout reset switch (N.C. contact).
 - *3. Make sure the Communication lines are insulated. If the lines are shorted, the F3SJ-A enters the lockout state.

Controller connectable with NPN output F3SJ series

Safety controller	Model
Safety Relay Unit	G9SA-301-P

Note: When using the Simple Wiring Connector (F39-CN5), the following functions are not available.

- Manual Reset
- External Device Monitoring
- Auxiliary Outputs 1, 2
- Muting/Override

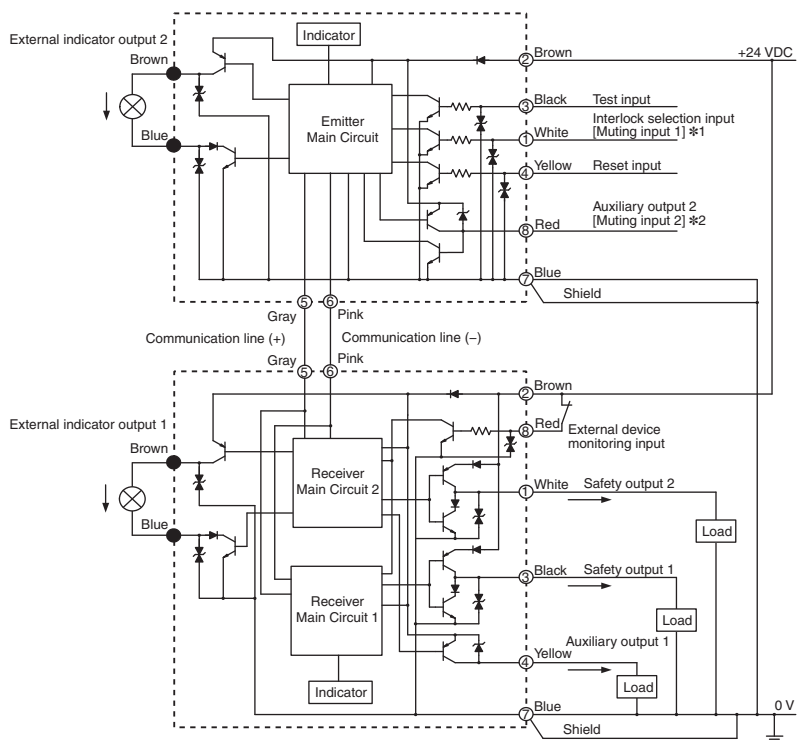
When using the setting tools, make sure to keep the settings in the factory default.

Input/Output Circuit Diagram

Entire Circuit Diagram

[PNP Output]

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

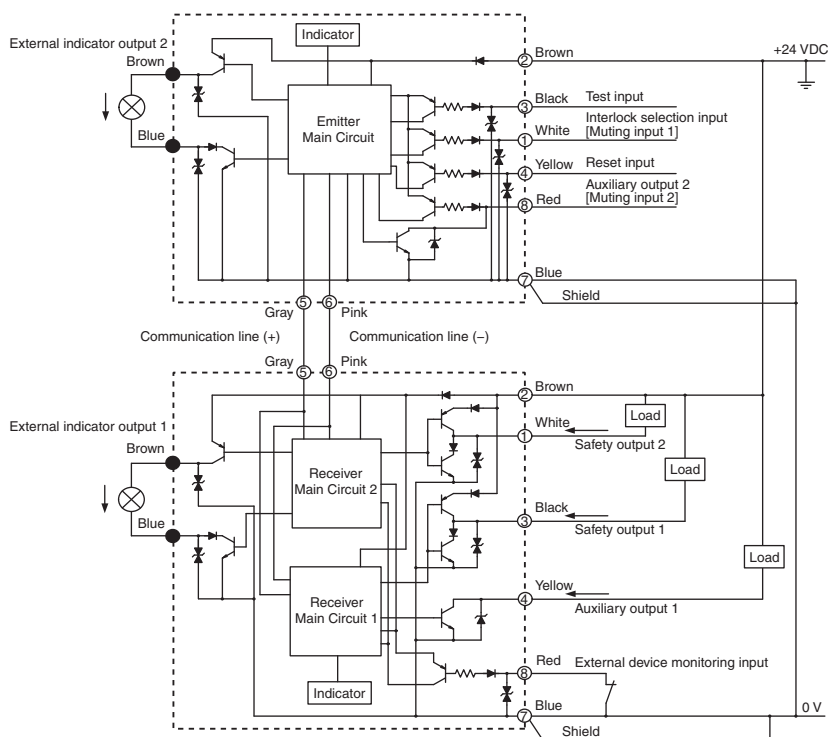


*1. Open or muting input 1 for models with the "-TS" suffix.

*2. Open or muting input 2 for models with the "-TS" suffix.

[NPN Output]

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



F3SJ-A

Connection Circuit Examples

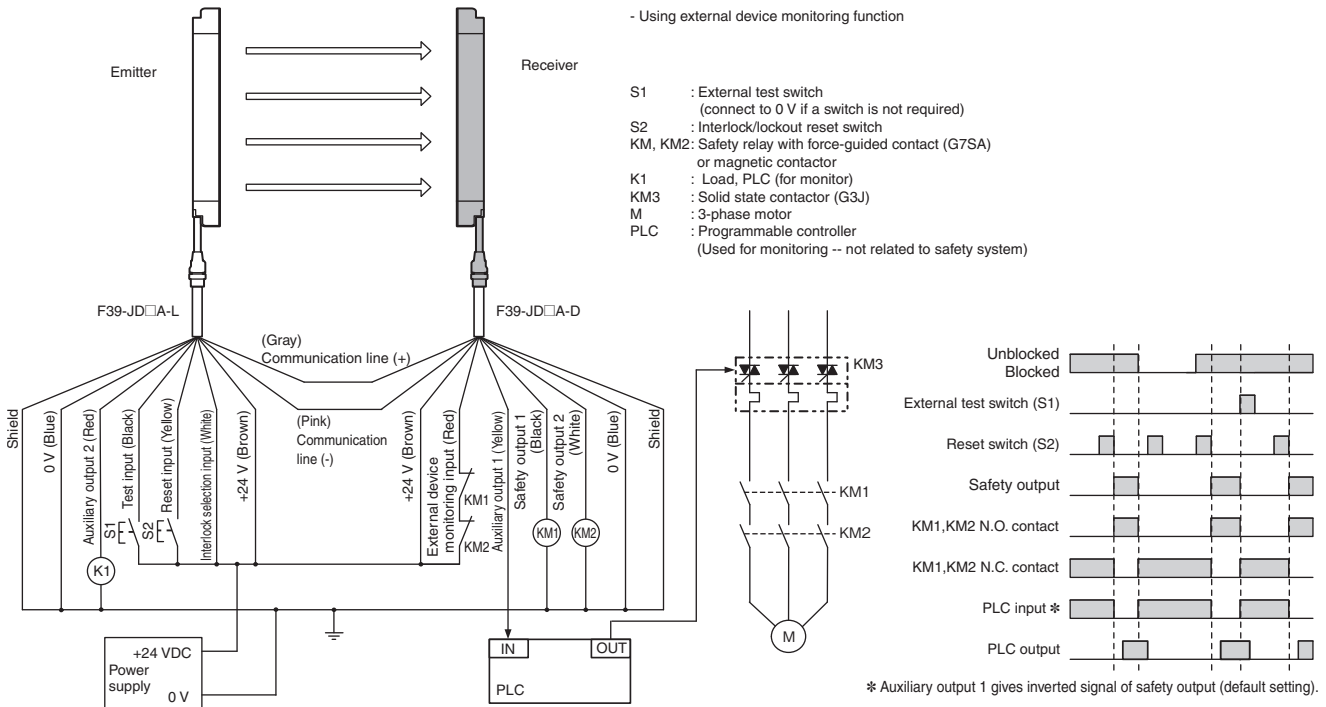
Wiring for single F3SJ-A application [PNP Output]

Highest achievable PL/ safety category	Model	Stop category	Reset
PLe/4 equivalent	Safety Light Curtain F3SJ-A□□□□P□□ Safety Relay G7SA	0	Manual

Note: The above PL is only the evaluation result of the example. The PL must be evaluated in an actual application by the customer after confirming the usage conditions.

● Application Overview

- The power supply to the motor M is turned OFF when the beam is blocked.
- The power supply to the motor M is kept OFF until the beams are unblocked and the reset switch S2 is pressed.



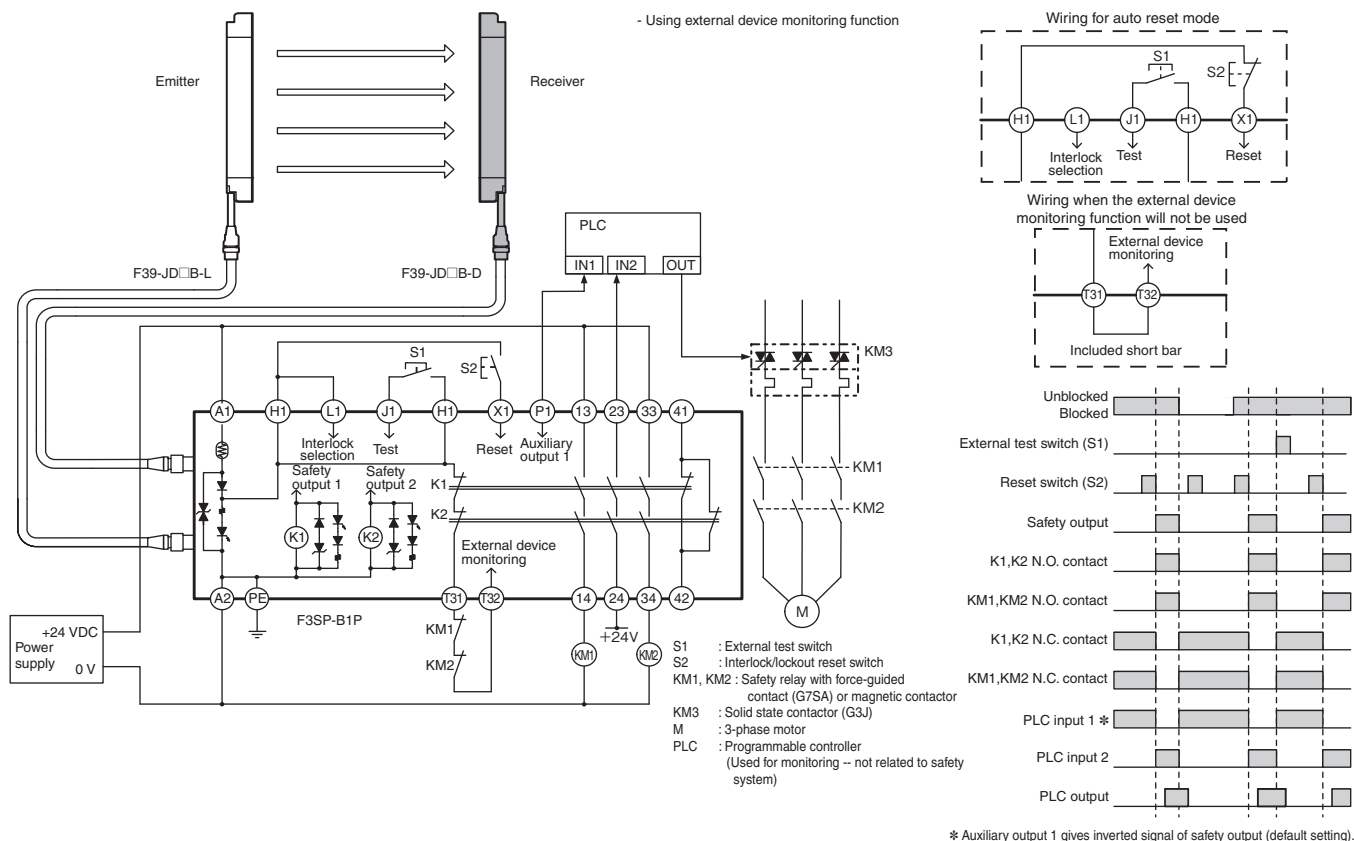
Wiring for connection with a controller F3SP-B1P [PNP Output]

Highest achievable PL/ safety category	Model	Stop category	Reset
PLe/4 equivalent	Safety Light Curtain F3SJ-A□□□□P□□ Control Unit F3SP-B1P Safety Relay G7SA	0	Manual

Note: The above PL is only the evaluation result of the example. The PL must be evaluated in an actual application by the customer after confirming the usage conditions.

● Application Overview

- The power supply to the motor M is turned OFF when the beam is blocked.
- The power supply to the motor M is kept OFF until the beams are unblocked and the reset switch S2 is pressed.



Note: It cannot be used as a muting system when F3SP-B1P is used.

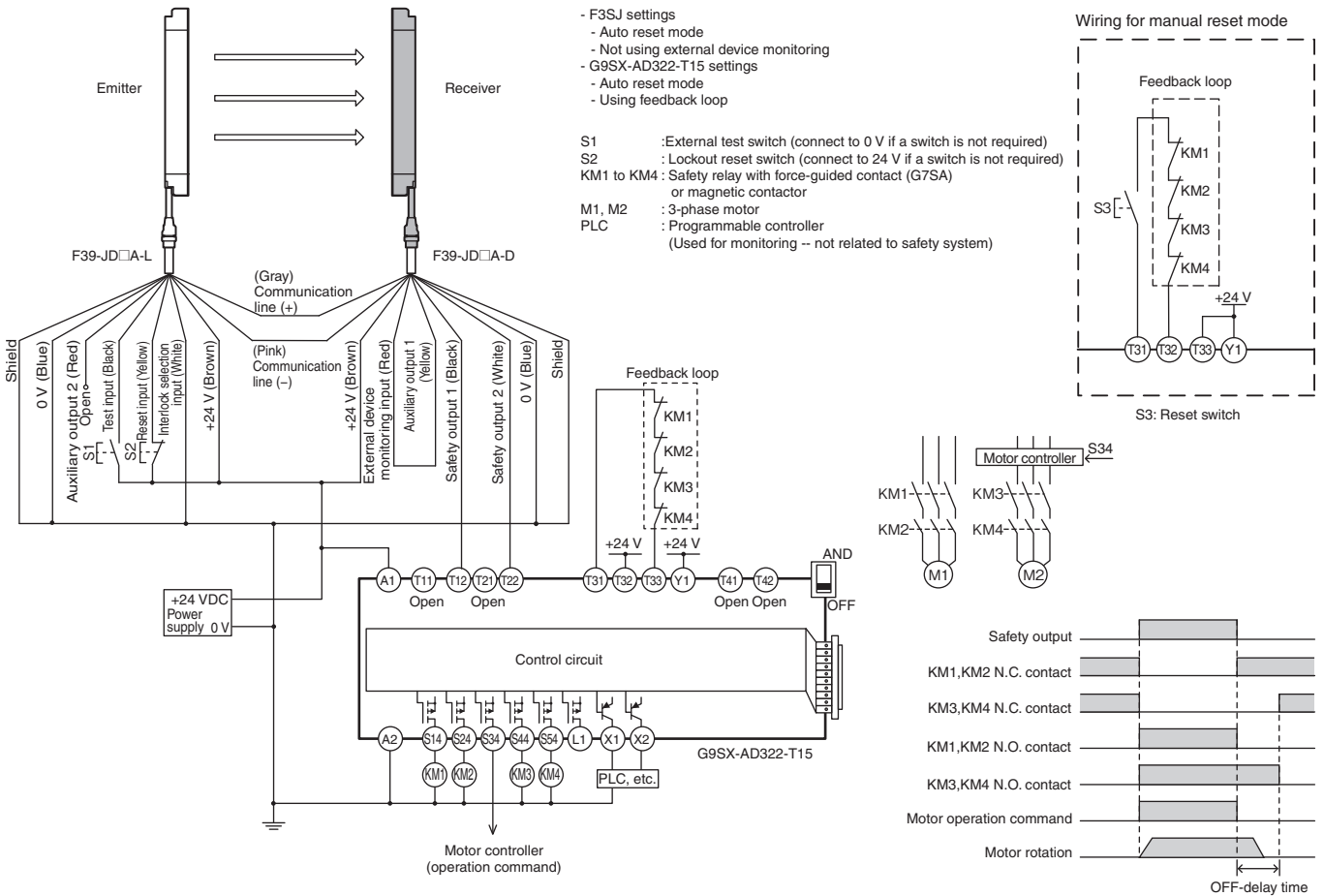
Wiring for connection with a controller G9SX-AD322-T15 [PNP Output]

Highest achievable PL/ safety category	Model	Stop category	Reset
PLe/4 equivalent	Safety Light Curtain F3SJ-A□□□□P□□ Flexible Safety Unit G9SX-AD322-T15 Safety Relay G7SA	M1: 0 M2: 1	Auto

Note: The above PL is only the evaluation result of the example. The PL must be evaluated in an actual application by the customer after confirming the usage conditions.

Application Overview

- The power supply to the motor M1 is turned OFF immediately when the beam is blocked, and stop command is sent to the motor controller for the motor M2.
- The power supply to the motor M2 is turned OFF after OFF-delay time.
- The power supply to the motor M1 and M2 is kept OFF until the beams are unblocked.



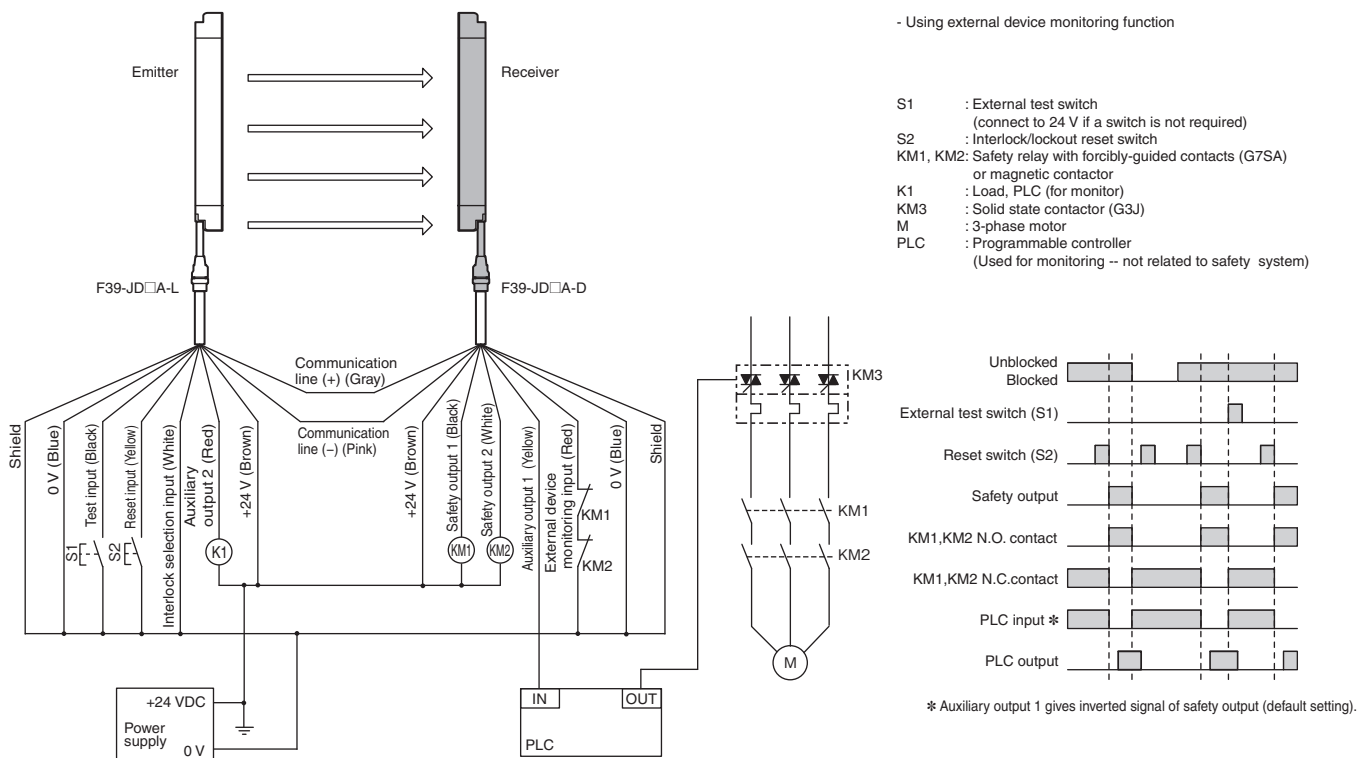
Wiring for single F3SJ-A application [NPN Output]

Highest achievable PL/ safety category	Model	Stop category	Reset
PLe/4 equivalent	Safety Light Curtain F3SJ-A□□□□N□□ Safety Relay G7SA	0	Manual

Note: The above PL is only the evaluation result of the example. The PL must be evaluated in an actual application by the customer after confirming the usage conditions.

● Application Overview

- The power supply to the motor M is turned OFF when the beam is blocked.
- The power supply to the motor M is kept OFF until the beams are unblocked and the reset switch S2 is pressed.



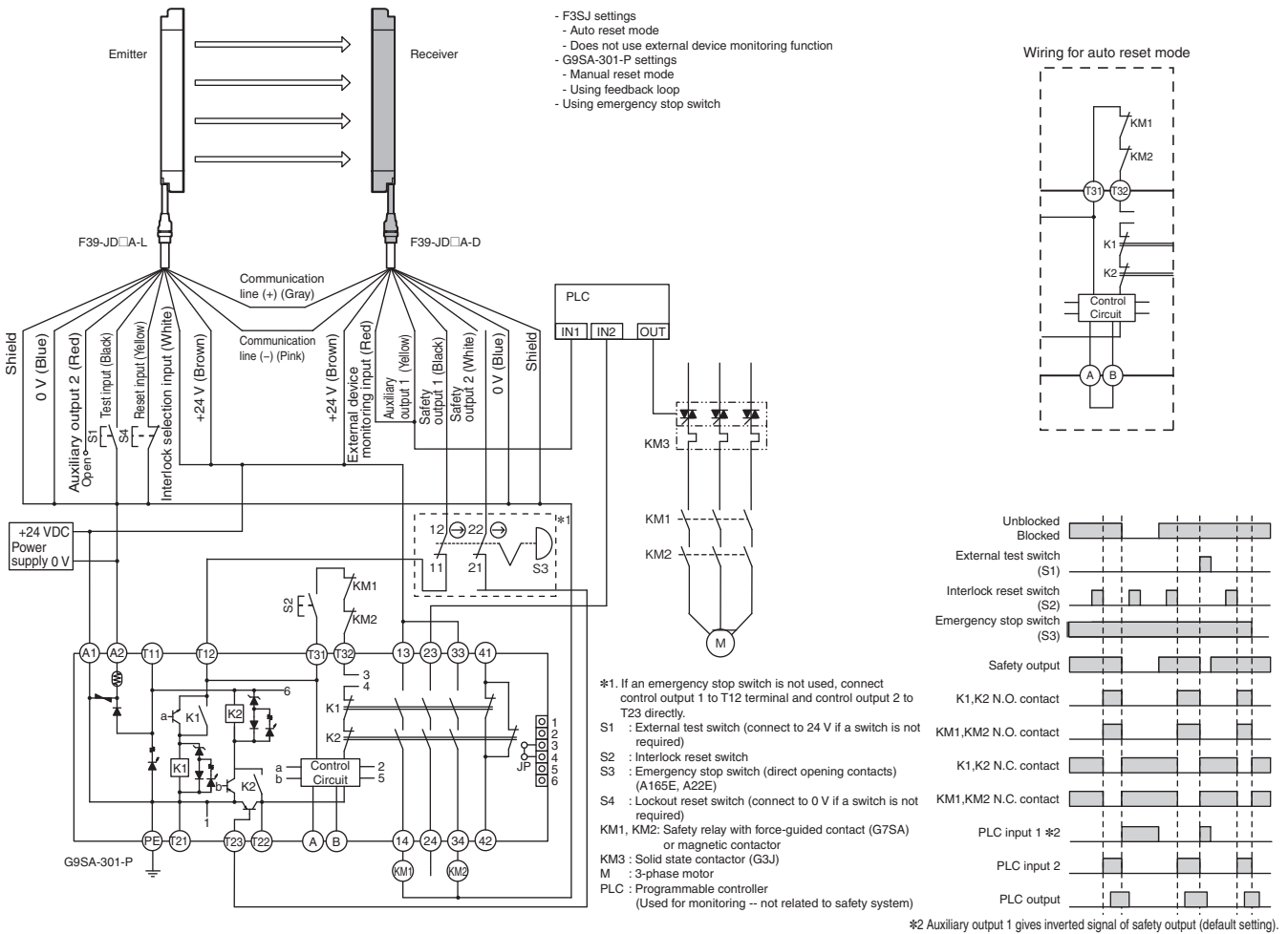
Wiring for connection with a controller G9SA-301-P [NPN Output]

Highest achievable PL/ safety category	Model	Stop category	Reset
PLe/4 equivalent	Safety Light Curtain F3SJ-A□□□□□□□□ Safety Relay Unit G9SA-301-P 24V DC Safety Relay G7SA Emergency Stop Switch A165E/A22E	0	Manual

Note: The above PL is only the evaluation result of the example. The PL must be evaluated in an actual application by the customer after confirming the usage conditions.

● Application Overview

- The power supply to the motor M is turned OFF when the beam is blocked.
- The power supply to the motor M is turned OFF when the emergency stop switch is pressed.
- The power supply to the motor M is kept OFF until the beams are unblocked and the reset switch S2 is pressed while the emergency stop switch is released.

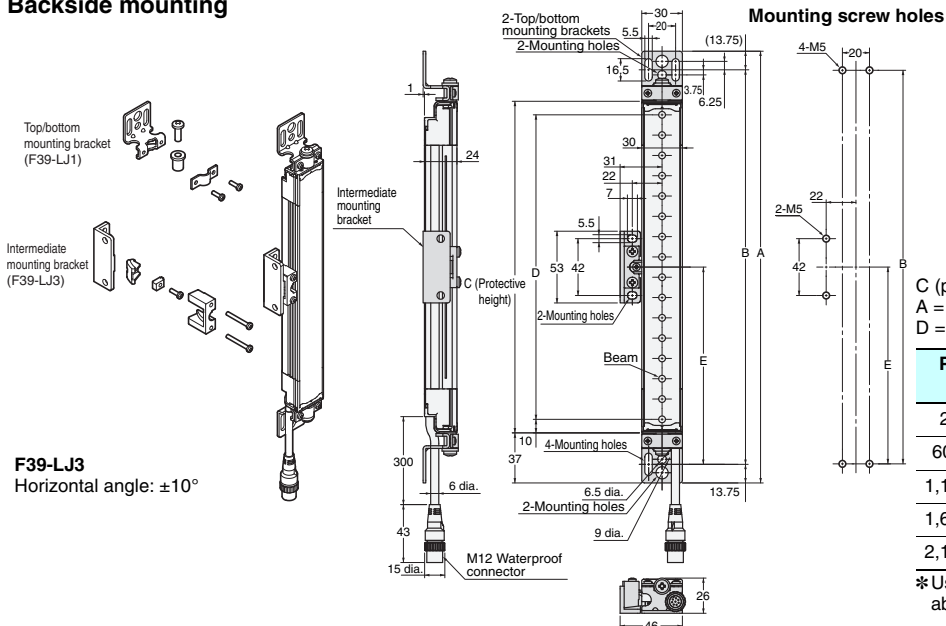


Dimensions

Main Units

When Using Standard Mounting Brackets

Backside mounting



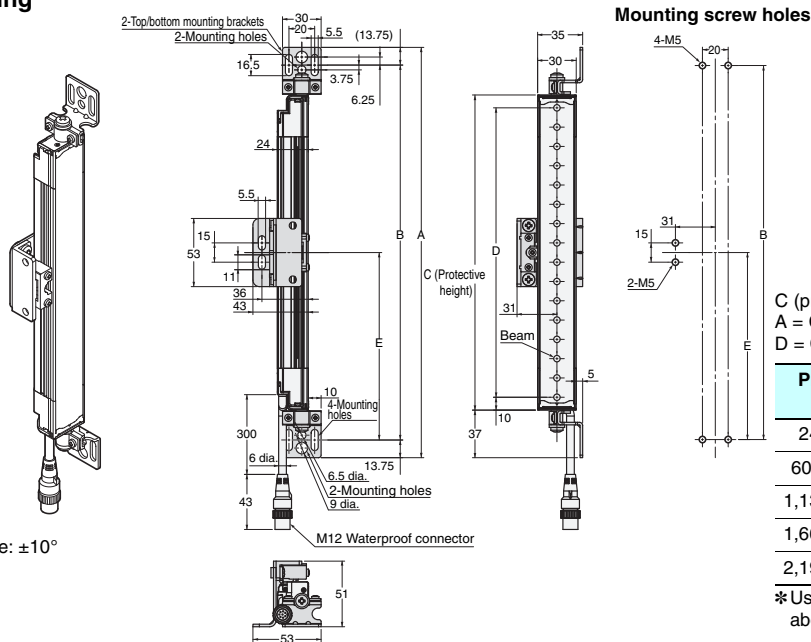
F39-LJ3
Horizontal angle: ±10°

C (protective height): 4-digit number in the table
 $A = C + 74$, $B = C + 46.5$
 $D = C - 20$, $E =$ See table below.

Protective height	Number of intermediate brackets	E *
245 to 596	0	---
600 to 1,130	1	$E = B/2$
1,136 to 1,658	2	$E = B/3$
1,660 to 2,180	3	$E = B/4$
2,195 to 2,500	4	$E = B/5$

* Use $E = 530$ or less when none of the E values shown above are used.

Side mounting



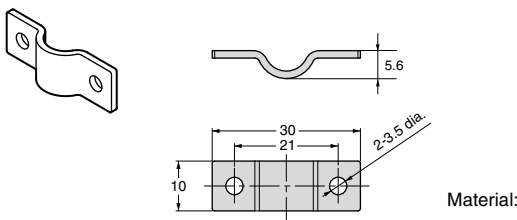
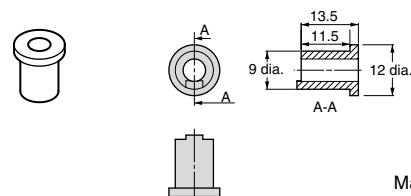
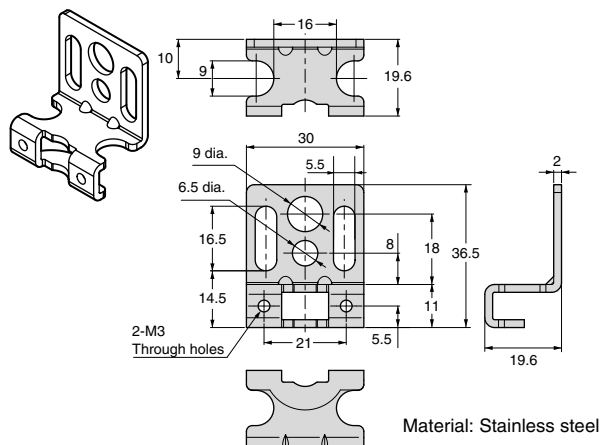
F39-LJ3
Horizontal angle: ±10°

C (protective height): 4-digit number in the table
 $A = C + 74$, $B = C + 46.5$
 $D = C - 20$, $E =$ See table below.

Protective height	Number of intermediate brackets	E *
245 to 596	0	---
600 to 1,130	1	$E = B/2$
1,136 to 1,658	2	$E = B/3$
1,660 to 2,180	3	$E = B/4$
2,195 to 2,500	4	$E = B/5$

* Use $E = 530$ or less when none of the E values shown above are used.

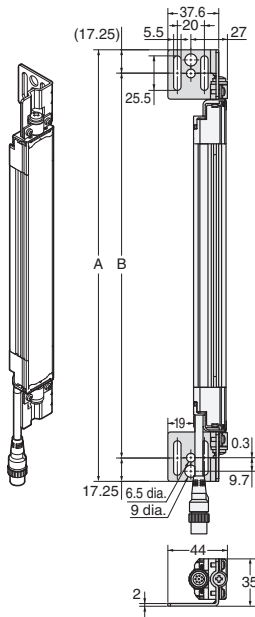
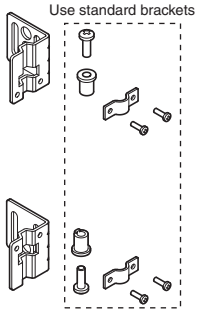
F39-LJ1 Detailed Dimensions of Bracket



Using Side Flat Mounting Bracket (F39-LJ2)

F39-LJ2

Material: Stainless steel



Mounting screw holes



Dimensions A to C

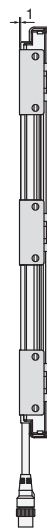
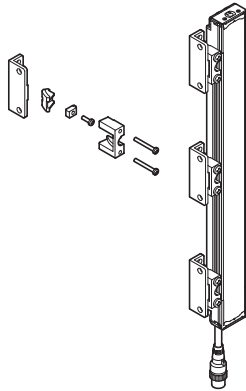
A	C + 74
B	C + 39.5
C	4-digit number of the model name (protective height)

Using Free Location Mounting Bracket (F39-LJ3)

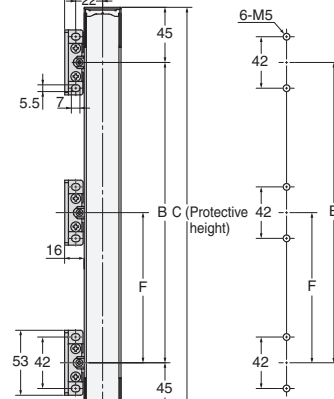
Backside mounting

F39-LJ3

Material: Zinc die-cast
Horizontal angle: $\pm 10^\circ$



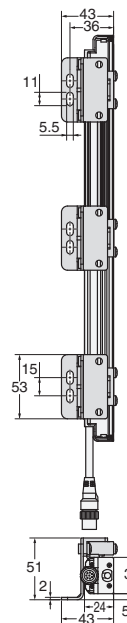
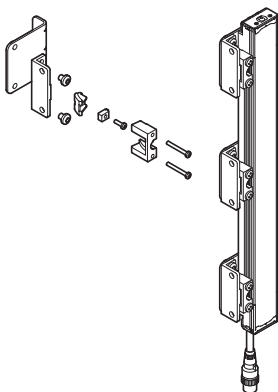
Mounting screw holes



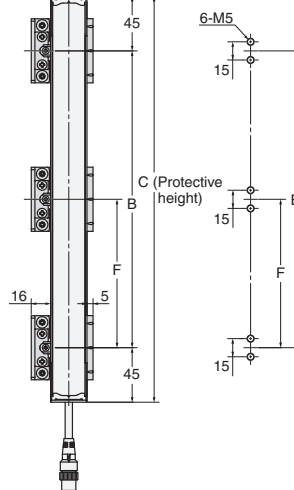
Side mounting

F39-LJ3

Material: Zinc die-cast/
stainless
Horizontal angle: $\pm 10^\circ$



Mounting screw holes



Dimensions B, C, and F

B	C - 90
C	4-digit number of the model name (protective height)
F	Depends on the protective height. See the table on the right.

Dimensions F

Protective height	Number of intermediate brackets	F *
245 to 440	2	---
443 to 785	3	B/2
794 to 1,140	4	B/3
1,145 to 1,490	5	B/4
1,495 to 1,840	6	B/5
1,845 to 2,180	7	B/6
2,195 to 2,500	8	B/7

*Use F = 350 or less when none of the F values shown above are used.

When only F39-LJ3 free-location mounting brackets are used without standard brackets, allow a space of at least 350 mm between the brackets. The number of brackets required varies according to the protective height. For details about the number of required brackets, refer to the table below.

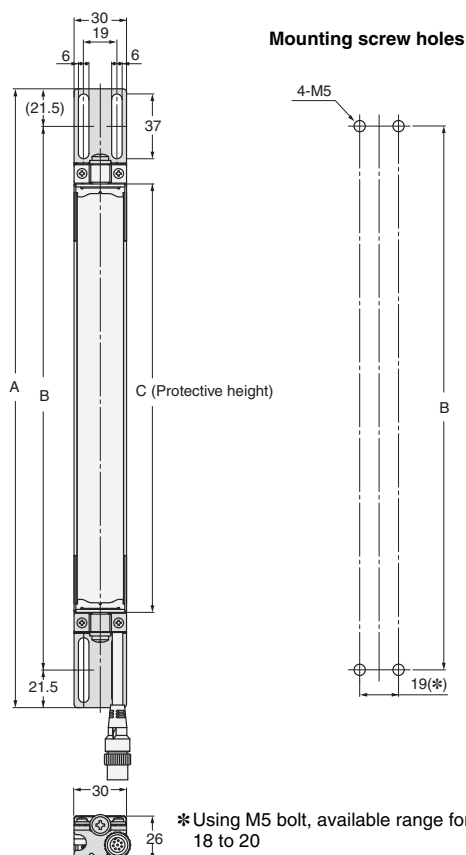
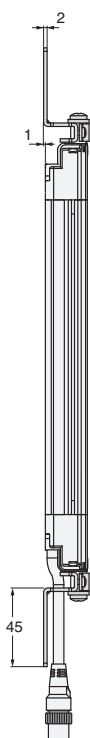
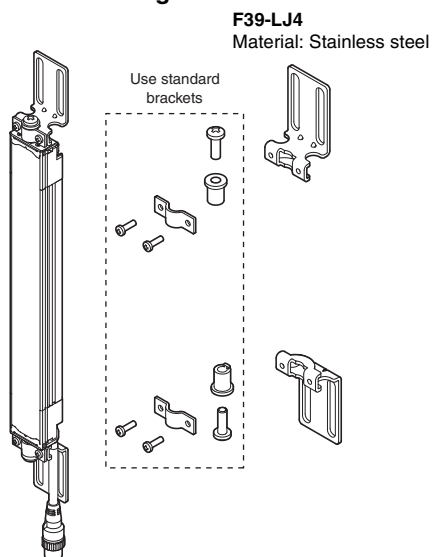
The standard included intermediate brackets are the same as the F39-LJ3 free-location mounting brackets. Purchase brackets as necessary if there are fewer intermediate brackets than required. When intermediate brackets are included, they can be used as free-location mounting brackets.

Required number of F39-LJ3 free-location mounting brackets for 1 F3SJ set (emitter/receiver) (2 pieces are included with F39-LJ3)

Protective height	Number of included free location brackets as intermediate brackets	Number of free location brackets to mount F3SJ	Number of free location bracket sets to be purchased (pcs)
245 to 440	0	4	2 sets (4)
443 to 596	0	6	3 sets (6)
600 to 785	2	6	2 sets (4)
794 to 1,130	2	8	3 sets (6)
1,136 to 1,140	4	8	2 sets (4)
1,145 to 1,490	4	10	3 sets (6)
1,495 to 1,658	4	12	4 sets (8)
1,660 to 1,840	6	12	3 sets (6)
1,845 to 2,180	6	14	4 sets (8)
2,195 to 2,500	8	16	4 sets (8)

Using Top/Bottom Bracket B (F39-LJ4)

Backside mounting



Dimensions A to C

A	C + 109
B	C + 66
C	4-digit number of the model name (protective height)

Note: Refer to the User's Manual for the dimensions for side mounting.