



Safety Light Curtain F3SG-□SR Series

# Quick Installation Manual

**OMRON Corporation**

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Document Title	Man.No.
Safety light Curtain F3SG-□SR Series User's Manual	Z405-E1

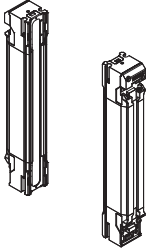


## Introduction


Thank you for purchasing the F3SG-□SR Series Safety Light Curtain (hereinafter referred to as the "F3SG-SR"). The F3SG-SR series is a safety light curtain intended to be used for humans protection. This document contains simple instructions to install the F3SG-SR. Please download the F3SG-SR User's Manual for full contents of the instructions from the website. For details, refer to your local Omron website.

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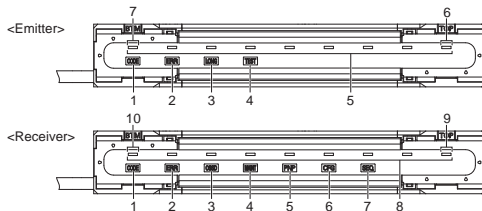
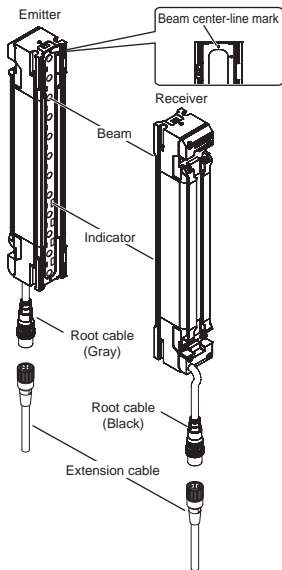
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# 1. What is Included

Product	Quantity												
<p>F3SG-□SR□□□□□□□□□□□□ main unit</p> 	<p>Emitter x 1, Receiver x 1</p> <p>Factory Default Settings</p> <table border="1" data-bbox="423 252 1013 406"> <thead> <tr> <th>Feature</th> <th>Factory Default Setting</th> </tr> </thead> <tbody> <tr> <td>Interlock</td> <td>Auto Reset Mode enabled</td> </tr> <tr> <td>EDM (External Device Monitoring)</td> <td>Disabled</td> </tr> <tr> <td>Auxiliary Output</td> <td>Safety output information (Inverted signal output: Enable)</td> </tr> <tr> <td>Muting</td> <td>Standard Muting Mode</td> </tr> <tr> <td>Override</td> <td>Enabled</td> </tr> </tbody> </table> <p> Refer to <i>F3SG-SR Series User's Manual</i> for more information.</p>	Feature	Factory Default Setting	Interlock	Auto Reset Mode enabled	EDM (External Device Monitoring)	Disabled	Auxiliary Output	Safety output information (Inverted signal output: Enable)	Muting	Standard Muting Mode	Override	Enabled
Feature	Factory Default Setting												
Interlock	Auto Reset Mode enabled												
EDM (External Device Monitoring)	Disabled												
Auxiliary Output	Safety output information (Inverted signal output: Enable)												
Muting	Standard Muting Mode												
Override	Enabled												
<p>End Cap (for Scan Code Selection)</p> 	<p>2 (End cap for Scan Code B is included.)</p>												
<p>Warning Zone Label</p>	<p>1</p>												
<p>Troubleshooting Guide Sticker</p>	<p>2</p>												
<p>Instruction Sheet</p>	<p>7</p>												
<p>Quick Installation Manual</p>	<p>1</p>												

 For ratings/specifications, input/output circuit, LED indicator status and troubleshooting, refer to F3SG-SR Series User's Manual. Root Cable is sold separately

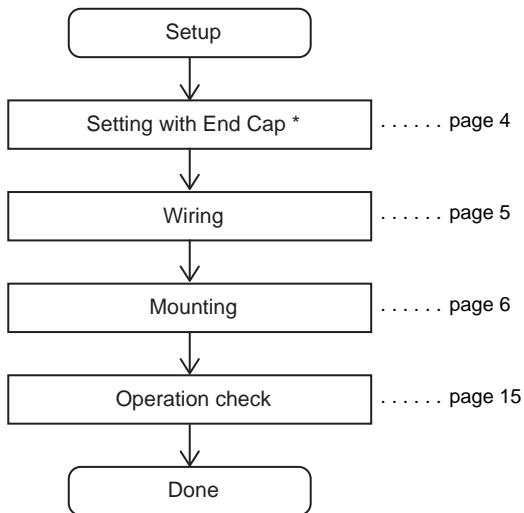
## 2. System Components



Emitter/Receiver	Location	Indicator	Name	F3SG-SRA	F3SG-SRB
Emitter	1	[C] or [CODE]	Scan code	○	○
	2	[E] or [ERR]	Lockout	○	○
	3	[L] or [LONG]	Operating range	○	○
	4	[T] or [TEST]	Test	○	○
	5	-	Area Beam Indicator (ABI)	○	-
	6	On the side of [TOP]	Top-beam-state	-	○
	7	On the side of [BTM]	Bottom-beam-state	-	○
Receiver	1	[C] or [CODE]	Scan code	○	○
	2	[E] or [ERR]	Lockout	○	○
	3	[O] or [OSSD]	ON/OFF	○	○
	4	[M] or [MAINT]	Maintenance	○	○
	5	[P] or [PNP]	PNP/NPN mode	○	○
	6	[F] or [CFG]	Configuration	○	○
	7	[S] or [SEQ]	Sequence	○	○
	8	-	Area Beam Indicator (ABI)	○	-
	9	On the side of [TOP]	Top-beam-state	-	○
	10	On the side of [BTM]	Bottom-beam-state	-	○

○: Support / -: Not supported

## 3. F3SG-SR Setup Procedure Example

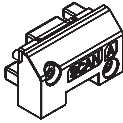
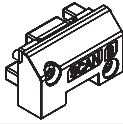


\* Setting with End Cap may be necessary according to your application. For settings with DIP Switch or SD Manager 3, refer to *F3SG-SR Series User's Manual*.



## 4. Setting with End Cap

The F3SG-SR series has End Caps to configure the scan codes at the “TOP” end of the emitter and receiver. In the Optical Synchronization, the use of different scan codes prevents mutual interference between two sets of the F3SG-SR. When changing the scan code, replace the End Cap before installing the F3SG-SR in your site. Make sure to turn the power off the F3SG-SR before replacing the End Cap. In the Wired Synchronization \*, selecting a scan code is unnecessary.

Function	End Cap	Description	Color
Scan code Selection		Scan Code A (factory default setting)	Black
		Scan Code B	White

\*In the Wired Synchronization, F3SG-SR can prevent mutual interference in up to 3 sets.

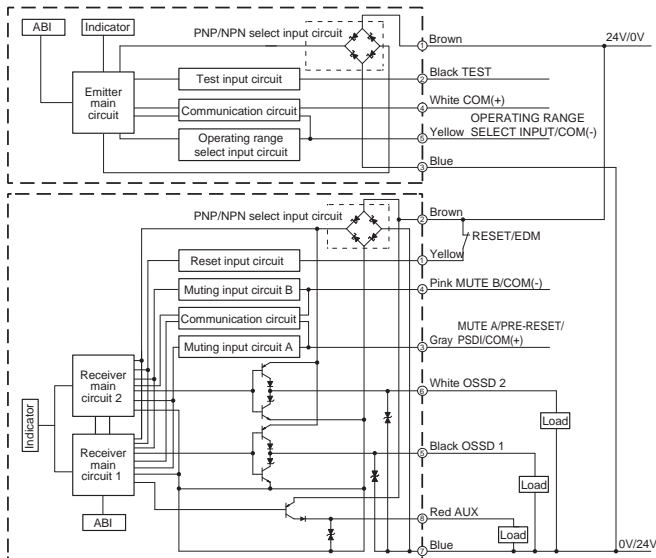


- Do not remove the insulating rubber attached to the End Cap. Failure to do so may cause deterioration of the protective functions.
- When attaching the End Cap, tightly fasten the screw (M2.5, recommended torque: 0.35 N•m). Failure to do so may cause the End Cap to come loose, leading to deterioration of the protective functions.
- The insulating rubber attached to connector of the End Cap may come off when removing the End Cap. If the rubber comes off, place it back to the groove of the connector and insert the connector to the sensor body.



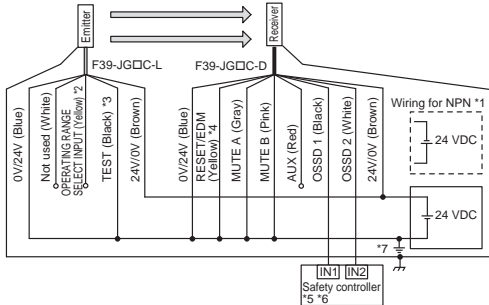
## 5. Entire Circuit Diagram

The entire circuit diagrams of the F3SG-SR are shown below. The numbers in the circles indicate the connector's pin numbers.



# 6. Wiring Examples

## 6-1. Non Muting System Wiring Example (Auto Reset Mode with EDM Unused)



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 emitter and receiver with each other.

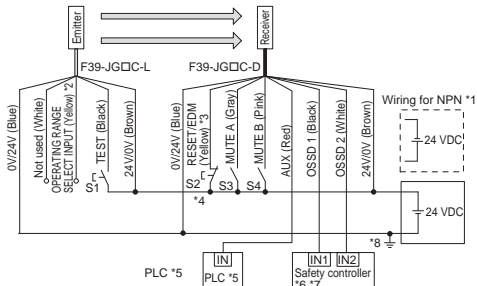
- \*1. Reverse the polarity of the power supply when using in the NPN system. Select a safety controller of PNP or NPN type according to the system of your application.
- \*2. Connect the line to 0 VDC if Operating Range Selection is used in Short Mode.

- \*3. Connect the line to 24V/0V (brown) of the emitter via a test switch (NO contact) if External Test is used.
- \*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 *F3SG-SR Series User's Manual* for more information.
- \*6. The safety controller and the F3SG-SR 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.



- Functional earth connection to the F3SG-SR housing is unnecessary when you use the F3SG-SR in a general industrial environment where noise control or stable power supply is considered. However, when you use the F3SG-SR in an environment where there may be excessive noise from surroundings or stable power supply may be interfered, it is recommended the F3SG-SR be connected to functional earth.
- The wiring example later does not indicate functional earth. To use functional earth, wire an earth cable according to the example above. Refer to *F3SG-SR Series User's Manual* for more information.
- When using the EDM function, set the function with the DIP Switches on the Intelligent Tap or the SD Manager 3, restore the settings to the F3SG-SR, and perform wiring.
- This wiring diagram is the case of not using the EDM function of the F3SG-SR. When using the EDM in the machine control, configure an appropriate circuit in the machine control.

## 6-2. Muting System Wiring Examples (Standard Muting Mode/Exit-Only Muting mode)



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

- S1: Test switch (Connect the line to 0V/24V (blue) of the emitter if this switch is not required.)
- S2: Lockout reset switch, override switch or override cancel switch
- S3, S4: Muting sensor
- 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. 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. Refer to *F3SG-SR Series User's Manual* for more information on setting this function by the SD Manager 3.
- \*6. Refer to *F3SG-SR Series User's Manual* for more information.
- \*7. The safety controller and the F3SG-SR 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 DIP Switches on the Intelligent Tap or the SD Manager 3, restore the settings to the F3SG-SR, and perform wiring according to the wiring diagram.



- When a functional earth is necessary, wire an earth cable according to the example in 6-1. *Non Muting System Wiring Example (Auto Reset Mode with EDM Unused)*. Refer to *F3SG-SR Series User's Manual* for more information.
- When using the Exit-Only Muting, it is necessary to set the function with the Intelligent Tap or the SD Manager 3. For how to use the Intelligent Tap, refer to *F3SG-SR Series User's Manual*.



## 7. Mounting and Beam Alignment

Step1

Check position

↓

Step2

Mount

### 7-1. Mutual Interference Prevention

When two or more F3SG-SR systems are mounted in close proximity to each other, precautions should be taken to avoid one system interfering with another, such as by beam alignment, back-to-back configuration, physical barrier, Scan Code Selection, Operating Range Selection or adjusting the distances from adjacent safety light curtains.

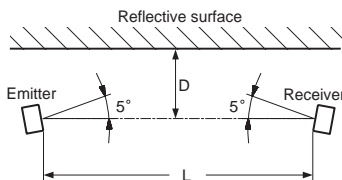
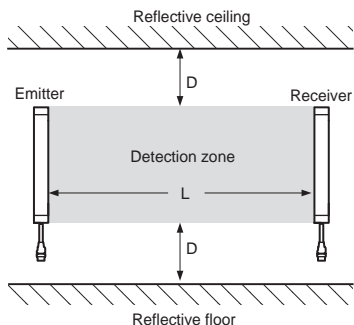
In the Wired Synchronization, mutual interference is prevented in up to 3 sets, using interference light avoidance algorithm.

In the Optical Synchronization, the scan code feature allows for placement of up to 2 sets of the F3SG-SR in close proximity and in line with each other. The distinctive coding of the beams provide for unique operation of a system while in view of another system with a different scan code. Two unique codes are available. The emitter and receiver units must be set to the same scan code for the receiver to enter the MACHINE RUN state. The scan code is selectable by the End Caps on the emitter and receiver units.

### 7-2. Distance from Reflective Surfaces

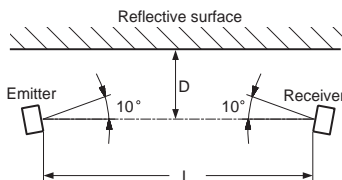
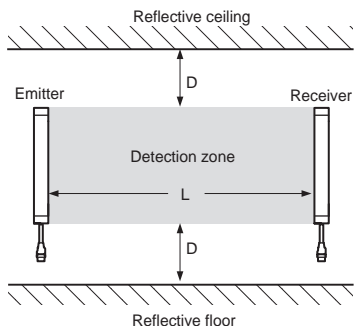
Install the sensor system at distance D or further from highly reflective surfaces such as metallic walls, floors, ceilings, or workpieces, as shown below.

#### ■F3SG-SR (Type 4 ESPE)



Distance between an emitter and a receiver (operating range L)	Allowable installation distance D
0.3 to less than 3 m	0.13 m
3 m or more	$L/2 \times \tan 5^\circ = L \times 0.044$ m

#### ■F3SG-SR (Type 2 ESPE)



Distance between an emitter and a receiver (operating range L)	Allowable installation distance D
0.3 to less than 3 m	0.26 m
3 m or more	$L/2 \times \tan 10^\circ = L \times 0.089$ m

### 7-3. Safety Distance

Safety Distance Formulas according to ISO 13855/EN ISO 13855

#### ■ Detection Zone Orthogonal to Direction of Approach

$S = K \times T + C$  . . . Formula (1)

- S: Safety distance
- K: Approach speed to the detection zone
- T: Total response time of the machine and the F3SG-SR
- C: Additional distance calculated by the detection capability (or object resolution) of the F3SG-SR

#### <Calculation Example for Systems with a Detection Capability of 40 mm or Less>

Use  $K = 2,000$  mm/s and  $C = 8 \times (d - 14)$  mm in formula (1) for the calculation.

$$S = 2,000 \text{ mm/s} \times (T_m + T_s) + 8 \times (d - 14 \text{ mm})$$

- S = Safety distance (mm)
- $T_m$  = Machine's response time (s)
- $T_s$  = Response time of the F3SG-SR from ON to OFF (s)
- d = Detection capability (or object resolution) of the F3SG-SR (mm)

#### <Calculation Example for Systems with Larger Detection Capability than 40mm>

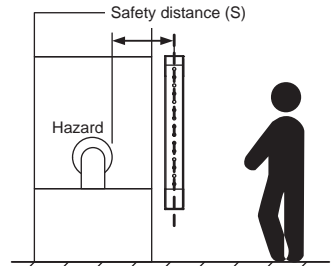
Use  $K = 1,600$  mm/s and  $C = 850$  mm in formula (1) for calculation.

$$S = 1,600 \text{ mm/s} \times (T_m + T_s) + 850 \text{ . . . Formula (4)}$$

- S = Safety distance (mm)
- $T_m$  = Machine's response time (s)
- $T_s$  = Response time of the F3SG-SR from ON to OFF (s)

Please refer to the *F3SG-SR Series User's Manual* for calculation of following safety distance.

- Possible Circumventing by Reaching Over the Detection Zone
- Detection Zone Parallel to Direction of Approach
- Safety Distance Formulas according to ANSI B11.19

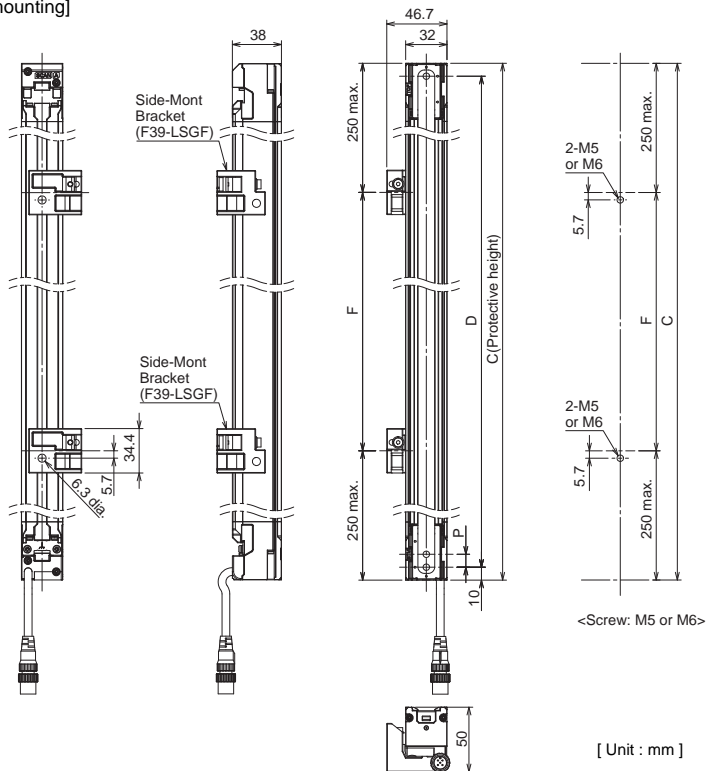




## 7-4. Mounted with Side-Mount Brackets (Intermediate Brackets) (F39-LSGF)

### ■ Dimensions (Check position)

[Backside mounting]



Dimension C	4-digit number of the type name (Protective height: $\Delta$ )	
Dimension D	F3SG-□SR□△△△△-14	C-20
	F3SG-□SR□△△△△-25	
	F3SG-□SR□△△△△-45	C-40
	F3SG-□SR□△△△△-85	
Dimension P	F3SG-□SR□△△△△-14	10
	F3SG-□SR□△△△△-25	20
	F3SG-□SR□△△△△-45	40
	F3SG-□SR□△△△△-85	80

Protective height (Dimension C)	Number of Side-Mount Bracket *	Dimension F
0160 to 1440	2	1000 mm max.
1520 to 2480	3	1000 mm max.

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

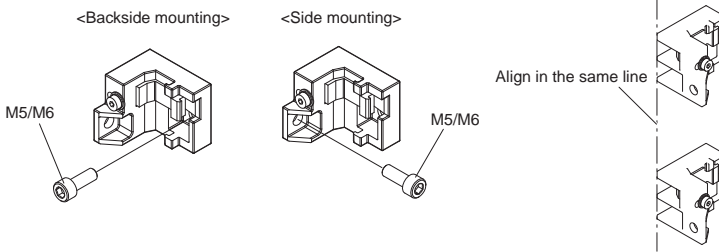


- Use the brackets of specified quantities and locations according to the dimensions. The other brackets than described above may not meet the specified ratings and performance.
- When you use the sensor in a situation where the sensor is under a load, increase the number of the brackets used.
- Beam alignment cannot be performed with Side-Mount Brackets.



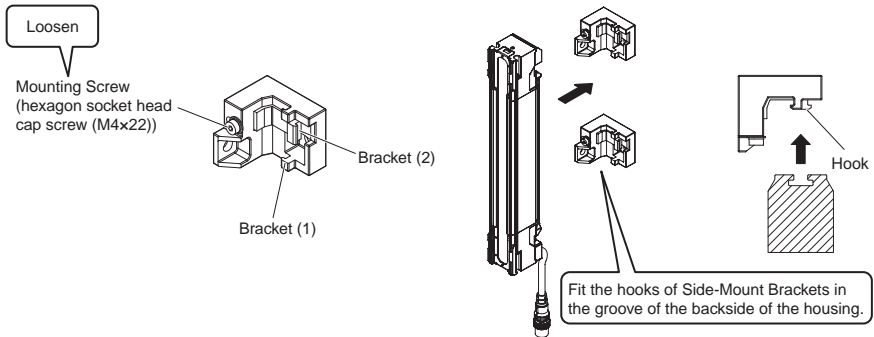
## ■ Mounting

1. Secure the brackets to the wall. When using more than one Side-Mount Brackets, align them in the same line using the sides of the brackets that do not face the wall, before attaching the brackets to the sensor.

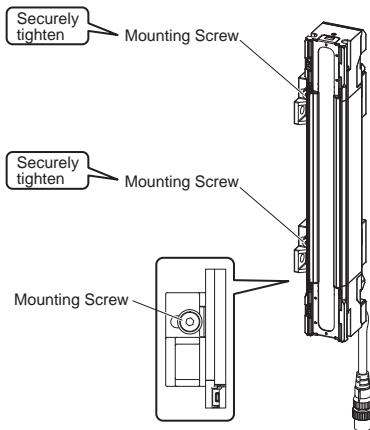


Step1  
Check  
position  
↓  
Step2  
Mount

2. Loosen the Mounting Screws. Then fit the F3SG-SR housing to the brackets.



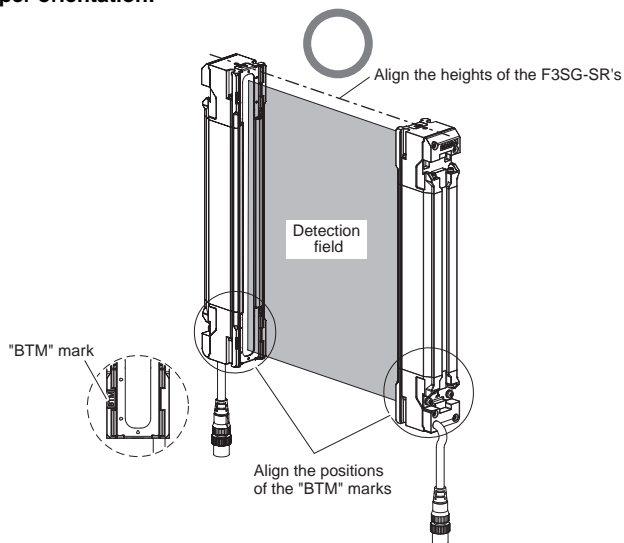
3. Securely tighten the Mounting Screws. Tightening torque: 3.0 N•m (recommended)



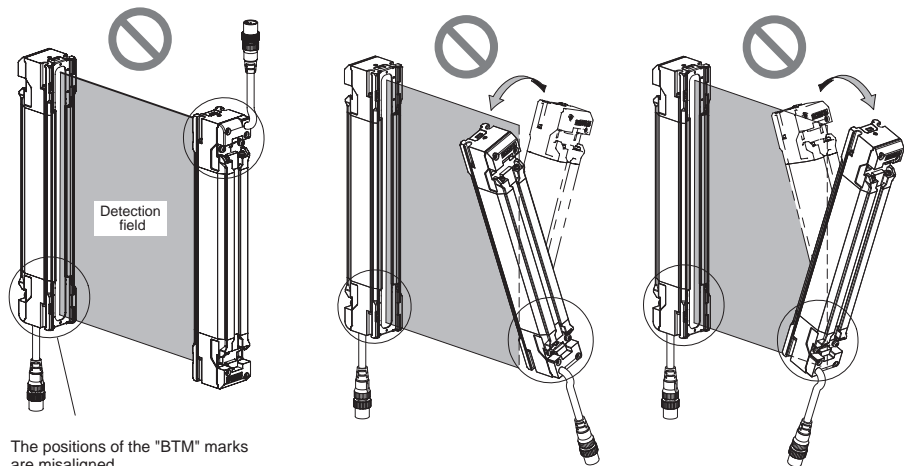
### ■ Proper Mounting (Proper Mounting Orientation)

Mount the emitter and receiver so that the detection surfaces of the emitter and receiver face in parallel to each other as shown below. The detection surfaces of the emitter and receiver not in parallel to each other or misaligned may fail to operate properly.

#### Proper orientation:



#### Wrong orientation:



The positions of the "BTM" marks are misaligned.

The detection surfaces of the emitter and receiver are not in parallel to each other.



## 8. Pre-Operation Checklists / Maintenance Checklists

After wiring, mounting and beam alignment are done, check the operation of the F3SG-SR.

### Pre-Operation Checklists

After installation, the highest level administrator must use the following checklist to verify the operation, placing a check mark in each of the boxes.

#### ■ Checklists

##### - Installation Condition Check

- The machine itself does not prevent the operation of safety functions such as stopping.
- The hazardous part of a machine cannot be reached without passing through the detection zone of the F3SG-SR.
- The system is configured so that the F3SG-SR can always detect a worker who is working in the hazardous zone.
- The interlock reset switch is installed in a location that provides a clear view of the entire hazardous zone and it cannot be activated from within the hazardous zone.
- The pre-reset switch is installed in a location inside the hazardous zone and where it cannot be operated from outside the hazardous zone.
- Safety distance has been calculated. Calculated distance:  $S = ( )$  mm
- Safety distance has been calculated with larger object resolution when the Floating Blanking or Reduced Resolution function is used. Calculated distance:  $S = ( )$  mm
- The actual distance is equal to or greater than the calculated distance. Actual distance =  $( )$  mm
- Reflective surfaces are not installed in prohibited zones.
- Not installed in a retro-reflective configuration.
- When the Muting function is used, a muting sensor must be installed so that MUTING state should not occur when a human body enters a detection zone of the F3SG-SR by mistake.
- When the Muting function is used, a muting sensor must be installed so that MUTING state should not occur when a human body enters a hazardous zone of a machine.
- When the Muting function is used, MUTING state can be checked from where a worker operates or adjust the machine.
- A muting sensor consists of two independent devices.
- It is not used in flammable or explosive atmosphere.

##### - Wiring Check Before Power Is Turned ON

- When the power supply unit is connected to multiple devices, the power supply unit must have tolerance against total rated current of the devices.
- The power supply unit is a 24 VDC unit that conforms to the EMC Directive, Low-voltage Directive, and output holding time specifications.
- The power supply lines are wired with a proper polarity according to the wiring specifications of the PNP or NPN setting.
- Emitter/receiver cables are properly connected to the respective emitters/receivers.
- Double insulation is used between I/O lines and the hazard potential (commercial power supplies, etc.).
- When using PNP output, the outputs are not short-circuited to +24 VDC line. When using NPN output, the outputs are not short-circuited to 0 VDC line.
- When using PNP output, loads are not connected to +24 VDC line. When using NPN output, loads are not connected to 0 VDC line.
- All lines are not connected to commercial power source.
- When using the F3SG-SR, the root cable must not be attached to the connector for the Cascading Cable and vice versa.
- Model of emitter and receiver must be the same.
- When two or more F3SG-SR systems are used, they are in cascade connection or prevented from mutual interference with each other.
- On a secondary sensor farthest from its power supply, the following part is attached:



## - End Cap

- Neither connector, cap, or bracket must be loose.
- Auxiliary output must not be used as safety output.
- When using PNP output, +24 VDC line of the power supply must not be grounded. When using NPN output, 0 VDC line of the power supply must not be grounded.
- Wiring must not be bent, cracked, nor damaged.

## - Operation Check While the Machine Is Stopped

- The test rod is not deformed.

The object resolution may vary depending on the models of the F3SG-SR and settings of the Floating Blanking function or Reduced Resolution function. Use a test rod with an appropriate diameter for inspection. A test rod is not included in the F3SG-SR product package. The model name of test rod is as follows.

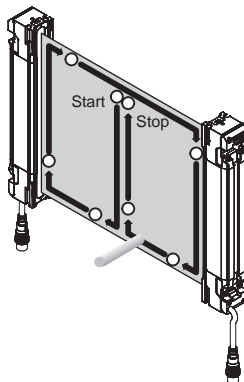
Model name	Diameter *
F39-TRD14	Dia. 14 mm
F39-TRD25	Dia. 25 mm

\* The customer needs to prepare a test rod larger than 25-mm dia.

- The sensor must detect a test rod wherever it is in the detection zone. In other words, when a test rod is inserted into the detection zone, the OSSD indicator turns red.

When the Fixed Blanking function is used, you must ensure that all blanked zones in the detection zone are covered by a hard barrier guard and there must be no zone in the detection zone where the test rod goes undetected.

To check detection, move the test rod as shown in the diagram below.



- When the External Test function is used:
  - When PNP is selected, the OSSD indicator turns red when the TEST line is short-circuited to 9 V to Vs.
  - When NPN is selected, the OSSD indicator turns red when the TEST line is short-circuited to 0 to 3 V.
- When the External Device Monitoring function is used:
  - When the RESET line is open the OSSD indicator remains red regardless of the beam state of the F3SG-SR.
- When the Start Interlock function is used:
  - When the F3SG-SR is turned ON and the F3SG-SR is unblocked, the OSSD indicator remains red. The reset input turns the OSSD indicator to green.
- When the Restart Interlock function is used:
  - When the OSSD indicator is green and the F3SG-SR is blocked and then returned to unblocked state, the OSSD indicator remains red. The reset input turns the OSSD indicator to green.
- When the Muting function is used, minimum muting time limit required must be set.
- When the Muting function's operation mode is Exit-Only Muting mode, minimum muting end wait time required must be set.

- Under the MUTING state, a signal that indicates the MUTING state must be given from the AUX line.
  - When the Override function is used, the minimum override time limit required must be set.
  - Under the OVERRIDE state, a signal that indicates the OVERRIDE state must be given from the AUX line.
- Checking that Hazardous Parts Stop While the Machine Operates
- The hazardous parts stop immediately when a test rod is inserted into the detection zone at 3 positions: "directly in front of the emitter", "directly in front of the receiver", and "between the emitter and receiver". (Use the appropriate test rod.)
  - The hazardous parts remain stopped as long as the test rod is in the detection zone.
  - The hazardous parts stop when the power of the F3SG-SR is turned OFF.
  - The actual response time of the whole machine is equal to or less than the calculated value.

## Maintenance Checklists

To ensure safety, keep a record of the inspection results. When the user is a different person from those who installed or designed the system, he/she must be properly trained for maintenance.

### ■ Checklists

#### - Inspection at Startup and When Changing Operators

- There is no approach route other than through the detection zone of the F3SG-SR.
- Part of the operator's body always remains in the detection zone of the F3SG-SR when working around the machine's hazardous part.
- The actual safety distance is equal to or greater than the calculated value.
- There must be no dirt on or damage to the front window or Spatter Protection Cover (F39-HSG, sold separately) of the F3SG-SR.
- When PNP is selected, OSSD indicator turns red when the TEST line is short-circuited to 9 V to Vs. When NPN is selected, OSSD indicator turns red when the TEST line is short-circuited to 0 to 3 V.
- When the Muting function is used, muting lamp must not be clear due to dirt or degradation.
- The test rod is not deformed.
- When the Start Interlock function is used:  
When the F3SG-SR is turned ON and the F3SG-SR is unblocked, the OSSD indicator remains red. The reset input turns the OSSD indicator to green.
- When the Restart Interlock function is used:  
When the OSSD indicator is green and the F3SG-SR is blocked and then returned to unblocked state, the OSSD indicator remains red. The reset input turns the OSSD indicator to green.
- When the power of the F3SG-SR is turned ON while nothing is in the detection zone, it must operate as follows:  
If Start Interlock is not used: The and OSSD indicator turn green within 3 s after the F3SG-SR is turned ON.  
If Start Interlock is used: The SEQ indicator turns yellow and the OSSD indicator turns red within 3 s after the F3SG-SR is turned ON.
- Nothing should exist in the detection zone and the OSSD indicator must turn ON (red or green) at power on.
- The test rod is detected when it is moved around in the detection zone as shown in the diagram of Pre-Operation Checklists. In other words, when a test rod is inserted into the detection zone, the OSSD indicator turns red.  
When the Fixed Blanking function is used, you must ensure that all blanked zones in the detection zone are covered by a hard barrier guard and there must be no zone in the detection zone where the test rod goes undetected.  
The object resolution may vary depending on the models of the F3SG-SR and settings of the Floating Blanking function or Reduced Resolution function. Use a test rod with an appropriate diameter for inspection. A test rod is not included in the F3SG-SR product package.
- When the Muting function is used, installation condition of muting sensor must not be changed.
- When the Muting function is used, MUTIONG state can be checked from where a worker operates or adjust the machine.
- Neither connector, cap, or bracket must be loose.

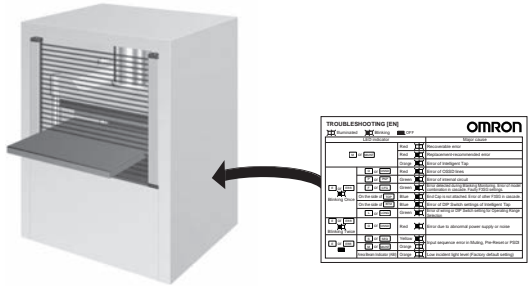
- Checking that Hazardous Parts Stop While the Machine Operates
  - The hazardous parts are movable when nothing is in the detection zone.
  - The hazardous parts stop immediately when a test rod is inserted into the detection zone at 3 positions: "directly in front of the emitter", "directly in front of the receiver", and "between the emitter and receiver". (Use the appropriate test rod.)
  - The hazardous parts remain stopped as long as the test rod is in the detection zone.
  - The hazardous parts stop when the power of the F3SG-SR is turned OFF while nothing is in the detection zone.
  
- Items to Inspect Every 6 Months or When Machine Settings Are Changed
 

In addition to inspection item at operation start, following items must also be verified.

  - The outputs of the F3SG-SR and the machine are properly wired.
  - The total number of times that the control relays/contactors have switched is significantly lower than their design lives.
  - There is no ambient light.
  - Safety distance has been calculated with changed object resolution when the setting of the Floating Blanking or Reduced Resolution function is changed.  
Calculated distance:  $S = ( )\text{mm}$
  - When the Muting function setting is changed, a muting sensor must be installed so that the MUTING state should not occur when a human body enters a detection zone of F3SG-SR by mistake.
  - When the Muting function setting is changed, a muting sensor must be installed so that the MUTING state should not occur when a human body enters a hazardous zone of a machine.
  - When the Muting function setting is changed, a muting sensor must consist of 2 independent devices.
  - When the configuration of the cascade connection is changed, the following part is attached on a secondary sensor farthest from its power supply:
  
- End Cap
  - When using PNP output, +24 VDC line of the power supply must not be grounded. When using NPN output, 0 VDC line of the power supply must not be grounded.
  - Wiring must not be bent, cracked, nor damaged.

## Troubleshooting Guide Sticker

Attach the included Troubleshooting Guide Sticker nearby, if necessary.



 Refer to *Safety Light Curtain F3SG-SR Series User's Manual*.

## Suitability for 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.**

See also Product catalog for Warranty and Limitation of Liability.

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In the interest of product improvement, specifications are subject to change without notice.

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**sti** SAFETY,  
TECHNOLOGY  
& INNOVATION

セーフティライトカーテン F3SG-□SR シリーズ

## クイックインストールマニュアル

オムロン株式会社

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マニュアル名称	マニュアル番号
セーフティライトカーテン 形F3SG-□SR□シリーズ ユーザーズマニュアル	SGFM-726

## はじめに

このたびはセーフティライトカーテン形 F3SG- □ SR シリーズ (以下形 F3SG-SR と呼びます) をお買い上げいただき、ありがとうございます。

形 F3SG-SR シリーズは人体の保護を目的としたセーフティライトカーテンです。本書は形 F3SG-SR の設置についての簡易説明書です。

形 F3SG-SR の取扱説明書の全文は下記の当社ウェブサイトよりダウンロードしてください。

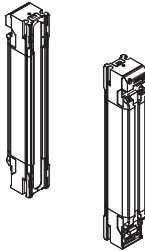


<http://www.fa.omron.co.jp>


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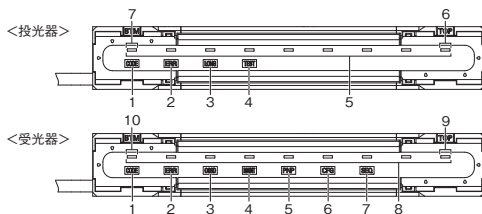
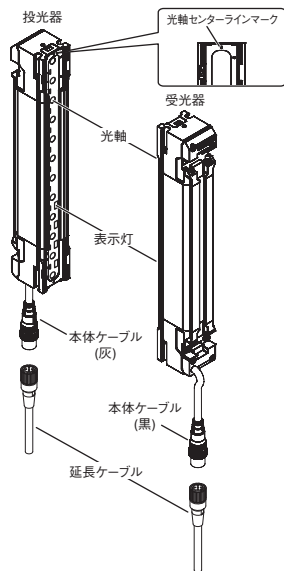


# 1. 同梱物のご確認

製品	数量												
形F3SG-□SR□□□□□□□□□□□□□□□□ 	投光器×1、受光器×1 出荷時設定 <table border="1" data-bbox="565 236 1020 416"> <thead> <tr> <th>機能</th> <th>出荷時設定</th> </tr> </thead> <tbody> <tr> <td>インターロック</td> <td>オートリセットモード</td> </tr> <tr> <td>外部リレーモニタ (EDM)</td> <td>無効</td> </tr> <tr> <td>補助出力</td> <td>制御出力情報 (出力反転機能：有効)</td> </tr> <tr> <td>ミュートィング</td> <td>標準ミュートィングモード</td> </tr> <tr> <td>オーバーライド</td> <td>有効</td> </tr> </tbody> </table> <p> 詳細についてはF3SG-SRシリーズユーザーズマニュアルを参照してください。</p>	機能	出荷時設定	インターロック	オートリセットモード	外部リレーモニタ (EDM)	無効	補助出力	制御出力情報 (出力反転機能：有効)	ミュートィング	標準ミュートィングモード	オーバーライド	有効
機能	出荷時設定												
インターロック	オートリセットモード												
外部リレーモニタ (EDM)	無効												
補助出力	制御出力情報 (出力反転機能：有効)												
ミュートィング	標準ミュートィングモード												
オーバーライド	有効												
終端キャップ (スキャンコード切り替え用) 	2 (スキャンコードB用を同梱)												
警告エリアラベル	1												
トラブルシューティングステッカ	2												
取扱説明書	7												
クイックインストールマニュアル	1												

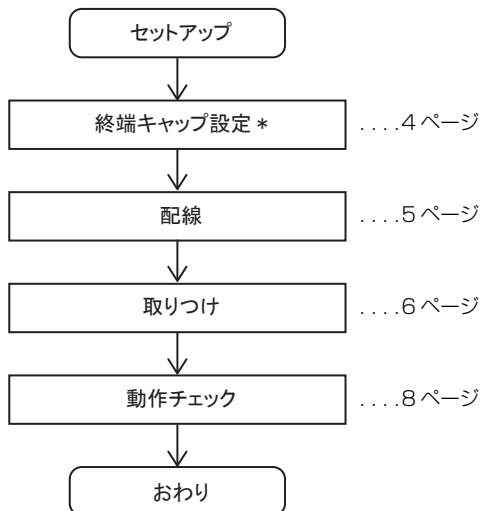
 定格/性能、入出力回路、LED表示灯の点灯パターン、トラブルシューティングについては、形F3SG-SRシリーズユーザーズマニュアルを参照してください。  
 本体ケーブルは別売となっています。

## 2. 各部の名称



投光/受光	位置	表示灯	表示灯名	形F3SG-SRA	形F3SG-SRB
投光器	1	[C]または[CODE]	スキャンコード	○	○
	2	[E]または[ERR]	ロックアウト	○	○
	3	[L]または[LONG]	検出距離	○	○
	4	[T]または[TEST]	外部テスト	○	○
	5	—	エリアビームインジケータ(ABI)	○	—
	6	[TOP]印字の横	上端入光	—	○
	7	[BTM]印字の横	下端入光	—	○
受光器	1	[C]または[CODE]	スキャンコード	○	○
	2	[E]または[ERR]	ロックアウト	○	○
	3	[O]または[OSSD]	ON/OFF	○	○
	4	[M]または[MAINT]	メンテナンス	○	○
	5	[P]または[PNP]	PNP/NPNモード	○	○
	6	[F]または[CFG]	コンフィグレーション	○	○
	7	[S]または[SEQ]	シーケンス	○	○
	8	—	エリアビームインジケータ(ABI)	○	—
	9	[TOP]印字の横	上端入光	—	○
	10	[BTM]印字の横	下端入光	—	○

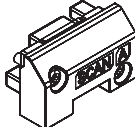
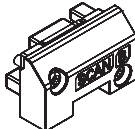
## 3. セットアップ手順



\* 終端キャップによる機能の設定は必要に応じて実施してください。インテリジェントタップのDIP-SW・SD Manager 3を使用した設定については、形 F3SG-SR シリーズユーザズマニュアルを参照してください。

## 4. 終端キャップ設定

TOP 側に、機能設定を行うための終端キャップが取り付けられています。  
 光同期設定時、スキャンコードを切り替えることで、2 セット間の相互干渉を防止します。スキャンコードの変更を行う場合は、形 F3SG-SR を設置する前に事前に終端キャップの交換を行ってください。終端キャップは電源を切った状態で交換してください。有線同期設定時 \* は、スキャンコードの切り替えは不要です。

機能	設定	概要	色
スキャンコード切り替え		スキャンコードA (出荷時設定)	黒
		スキャンコードB	白

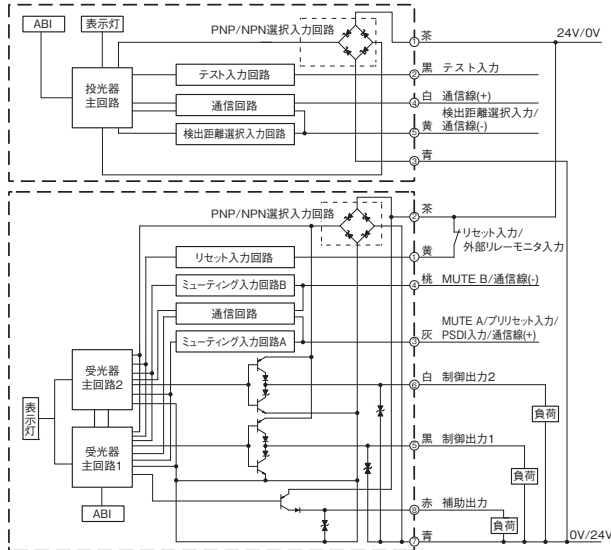
\* 3 セット間の相互干渉を防止可能です。



- ・終端キャップに装着されている絶縁ゴムをはずさないでください。保護機能の劣化につながります。
- ・終端キャップを装着する際は、ネジ(M2.5)を確実に締めてください。(推奨トルク0.35N・m)
- ・脱落および保護機能の劣化につながります。
- ・終端キャップを脱着するとコネクタ部の絶縁ゴムがはすれる場合があります。コネクタに絶縁ゴムをはめ直し、終端キャップをセンサにつけ直してください。

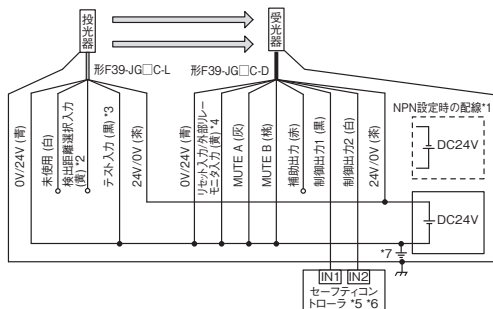
## 5. 入出力回路図 (全体回路図)

形 F3SG-SR の全体回路図を以下に示します。  
 ○内の数字は、コネクタのピン No. を示します。



## 6. 配線例

### 6-1. ミューティングを使用しない配線例 (オートリセットモード、EDM 未使用)



機能	設定方法
外部リレーモニタ (EDM)	EDM無効: 工場出荷時設定
インターロック	オートリセット: 工場出荷時設定
検出距離変更	ロングモード: 投光器 検出距離選択入力線をオープンまたはDC24Vに接続
ミューティング不使用	配線図に従って接続
外部テスト不使用	投光器のテスト入力線を投光器の0V/24V線に接続
光同期	投光器および受光器の通信線を接続しない

- \*3. 外部テスト機能を使用する場合は、テストスイッチ (a接点) を介して投光器の24V/0V (茶) へ接続してください。
- \*4. ロックアウトリセット機能を使用する場合は、ロックアウトリセットスイッチ (b接点) を介して受光器の24V/0V (茶) へ接続してください。
- \*5. 詳細は、形F3SG-SRシリーズユーザーズマニュアルを参照してください。
- \*6. セーフティコントローラと形F3SG-SRIは電源を共通化するか、電源コモンを共通化してください。
- \*7. PELV回路の例です。

- \*1. NPN設定時は電源の極性を反転させて配線してください。接続するセーフティコントローラはPNPまたはNPNの動作モードに対応する機器を選定してください。
- \*2. 検出距離をショートモードで使用する場合は、0Vへ接続してください。

一般的な工業環境 (ノイズや電源の安定供給が考慮されている環境) で使用される場合は、形F3SG-SRの筐体の機能接地は不要です。ただし、電源が多くノイズの影響が懸念される場合、あるいは、電源の安定供給が阻害されるような環境で使用される場合は、形F3SG-SRを機能接地することを推奨いたします。

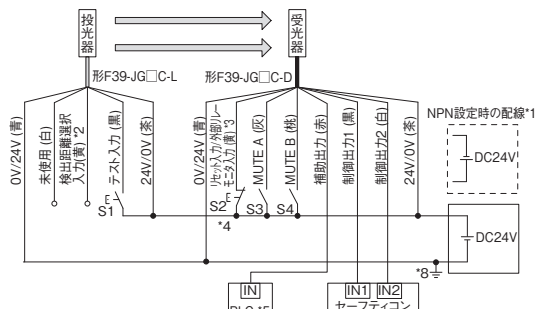
↓ 以降の配線図には機能接地を記載していませんが、機能接地する場合は、機能接地線を上記と同様に配線してください。

機能接地の詳細は、形F3SG-SRシリーズユーザーズマニュアルを参照してください。

EDM機能を使用する場合は、インテリジェントタップのDIP-SWまたはSD Manager 3で設定し、形F3SG-SRIにリストア後、配線してください。

本回路は形F3SG-SRのEDM機能を使用しない例です。設備側でEDMを使用する場合は、適切な制御回路を構成してください。

### 6-2. ミューティングを使用する配線例 (標準ミューティングモード / 出口専用ミューティングモード)



機能	設定方法	
	DIP-SW	SD Manager 3
外部リレーモニタ (EDM)	EDM無効: 工場出荷時設定	— [外部リレーモニタ]: 無効 *9
インターロック	オートリセット: 工場出荷時設定	— [起動時インターロック]: 無効 — [再起動インターロック]: 無効 *9
検出距離変更	ロングモード: 投光器 検出距離選択入力線をオープンまたはDC24Vに接続	— [検出距離変更]: ロングモード *9
標準ミューティング	設定不可	インテリジェントタップ: SD Manager3を使わない場合は配線図に従って接続 [ミューティング機能]: 有効 [ミューティングモード]: 標準ミューティング (設置例1/2) *9
出口専用ミューティング	設定不可	[ミューティング機能]: 有効 [ミューティングモード]: 出口専用ミューティング *9
外部テスト使用	投光器のテスト入力線をスイッチ (a接点) を介して投光器の24V/0V線に配線	
光同期	投光器および受光器の通信線を接続しない	

- S1: テストスイッチ (スイッチが不要な場合は、0V/24V (青) へ接続してください。)
- S2: ロックアウトリセットスイッチ、オーバーライドスイッチまたはオーバーライドキャンセルスイッチ
- S3, S4: ミューティングセンサ
- PLC: プログラマブルロジックコントローラ (モータ用途であり安全システムとは関係ありません。)

- \*1. NPN設定時は電源の極性を反転させて配線してください。接続するPLCおよびセーフティコントローラはPNPまたはNPNの動作モードに対応する機器を選定してください。
- \*2. 検出距離をショートモードで使用する場合は、0Vへ接続してください。
- \*3. オーバーライド入力としても使用。
- \*4. オーバーライド機能を使用する場合、必ずオーバーライドキャンセルスイッチをリセット入力に接続してください。オーバーライドキャンセルスイッチでオーバーライド状態を解除することができます。重傷を負う恐れがあります。
- \*5. PLCに接続する場合は、必要に応じてSD Manager 3で出力モードを変更してください。SD Manager 3による機能変更の詳細は形F3SG-SRシリーズユーザーズマニュアルを参照してください。
- \*6. 詳細は、形F3SG-SRシリーズユーザーズマニュアルを参照してください。
- \*7. セーフティコントローラと形F3SG-SRIは電源を共通化するか、電源コモンを共通化してください。
- \*8. PELV回路の例です。
- \*9. インテリジェントタップのDIP-SWまたはSD Manager3で設定し、形F3SG-SRIにリストア後、配線図に従って配線ください。

機能接地が必要な場合は機能接地線を、「6-1. ミューティングを使用しない配線例 (オートリセットモード、EDM未使用)」と同様に配線してください。機能接地の詳細は、形F3SG-SRシリーズユーザーズマニュアルを参照してください。

↓ 出口専用ミューティングを使用する場合は、インテリジェントタップ・SD Manager 3を使用して設置する必要があります。インテリジェントタップの使用方法の詳細については、形F3SG-SRシリーズユーザーズマニュアルを参照してください。

## 7. 取り付け

Step1

### 7-1. 標準金具（中間金具兼用）（形 F39-LSGF）を取り付ける場合

取り付け位置確認

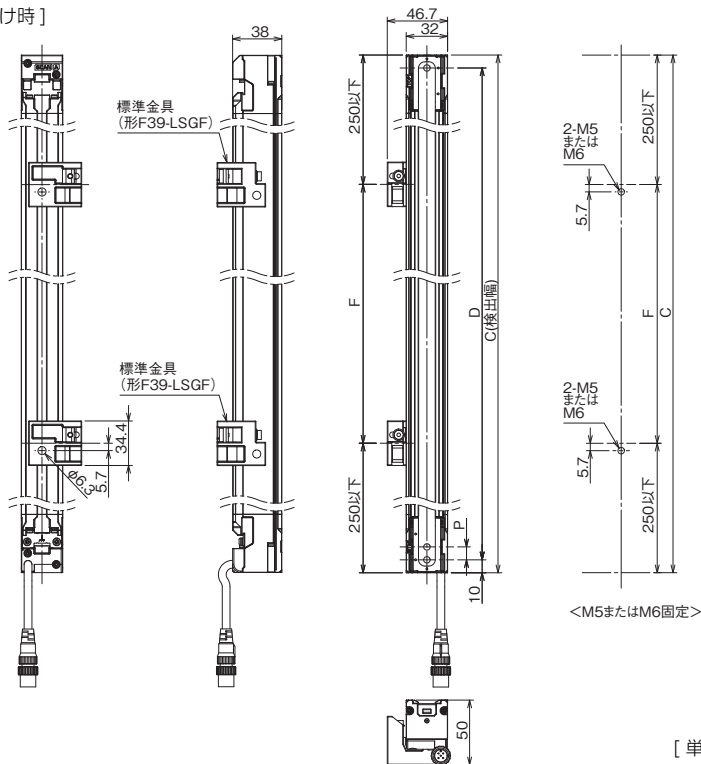
#### ■外形寸法図（取り付け位置確認）

↓

[背面取り付け時]

Step2

取り付け



寸法C	形式中の4桁の数字（検出幅：△）	
寸法D	形F3SG-□SR□△△△△-14	C-20
	形F3SG-□SR□△△△△-25	
	形F3SG-□SR□△△△△-45	C-40
	形F3SG-□SR□△△△△-85	
寸法P	形F3SG-□SR□△△△△-14	10
	形F3SG-□SR□△△△△-25	20
	形F3SG-□SR□△△△△-45	40
	形F3SG-□SR□△△△△-85	80

検出幅（寸法C）	標準金具の数*	寸法F
0160～1440	2	1000mm以下
1520～2480	3	1000mm以下

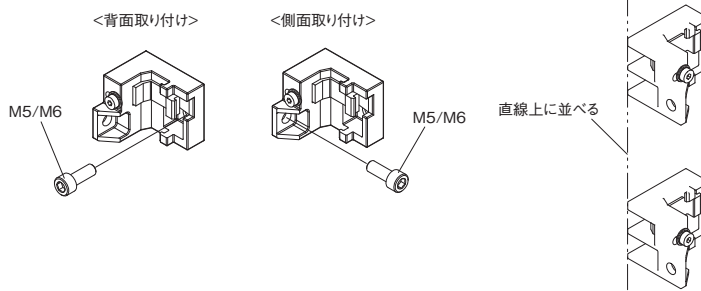
\* センサ片側(投光器または受光器)の取り付けに必要な数量です。



- ・外形寸法図に記載されている規定の数量、位置に従って金具を使用してください。規定に満たない場合、定格/性能を満たすことができません。
- ・センサ本体に加重がかかるようなご使用をされる場合は、金具を追加してください。
- ・標準金具は軸軸調整ができません。

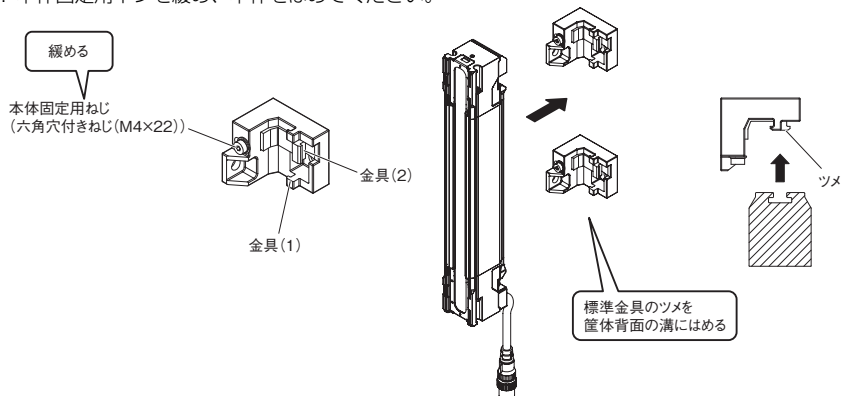
## ■取り付け方法

1. 金具を壁面に取りつけます。複数の金具を使用する場合は、センサを金具と接続する前に、標準金具の壁面と接していない面を使用して、金具が直線上に並ぶように配置してください。

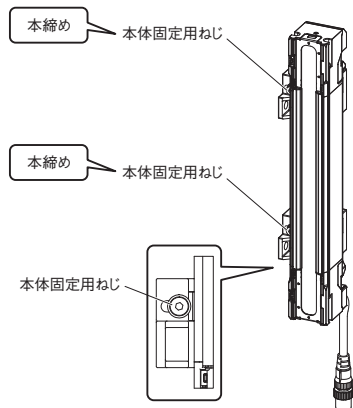


Step1  
取り付け  
位置確認  
↓  
Step2  
取り付け

2. 本体固定用ネジを緩め、本体をはめてください。



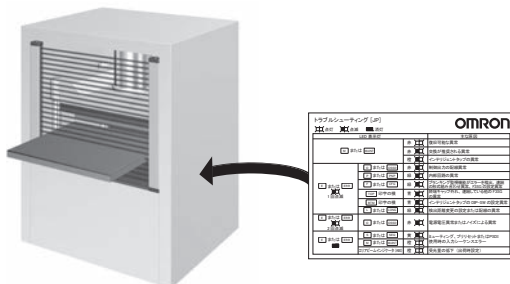
3. 本体固定用ボルトを固定してください (締め付けトルク : 3.0N・m)。





## 8. 動作チェック

終端キャップ設定、配線、取り付け・光軸調整が終わったら、形 F3SG-SR の動作チェックを実施してください。必要に応じて添付のトラブルシューティングステッカを形 F3SG-SR の近くに貼ってください。



トラブルシューティング方法については、形F3SG-SRシリーズユーザーズマニュアルも参照してください。  
<http://www.fa.omron.co.jp>

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- (b) 高い信頼性が必要な用途 (例: ガス・水道・電気等の供給システム、24時間連続運転システム、決済システムほか権利・財産を取扱う用途など)
- (c) 厳しい条件または環境での用途 (例: 屋外に設置する設備、化学的汚染を被る設備、電磁的妨害を被る設備、振動・衝撃を受ける設備など)
- (d) カタログ等に記載のない条件や環境での用途

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#### ●製品に関するお問い合わせ先

お客様相談室

フリー通話 **0120-919-066**

携帯電話・PHS・IP電話などではご利用いただけませんので、下記の電話番号へおかけください。

電話 **055-982-5015** (通話料がかかります)

■営業時間: 8:00~21:00 ■営業日: 365日

#### ●FAXやWebページでもお問い合わせいただけます。

FAX **055-982-5051** / [www.fa.omron.co.jp](http://www.fa.omron.co.jp)

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