Safety Light Curtains
F3SJ-E

SpeedSPEC www.sti.com F3SJE

Rev. 9.11

Safety Light Curtains

- Fast and easy installation
- Resolution: 25 mm (1.01 in.)
- Range: 7 m (23 ft.)
- Protected heights: 185 to 1105 mm (7.28 to 43.50 in.)
- Very compact size: 30 x 30 mm (1.18 x 1.18 in.)
- Cross-talk prevention
- 3 m integrated cables

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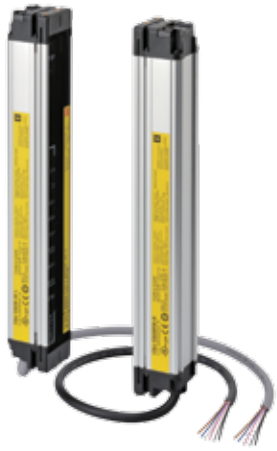
NEW!



Description

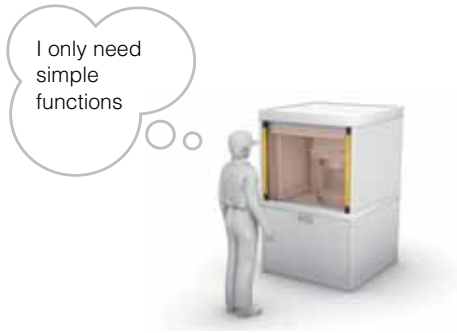
The EASY type safety light curtain is well suited for straight-forward on/off detection applications.

By carefully selecting the available functions, we have reduced man hours necessary for installation by approximately 1/2 when compared with existing Omron STI models.

Reduced installation time means added savings to your project's budget, start with the EASY type.

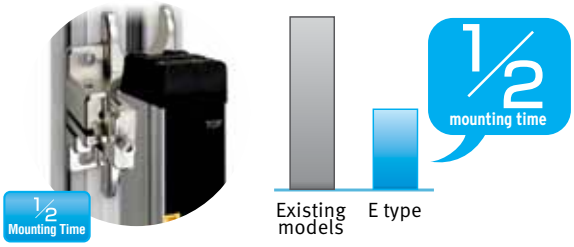
Machine safety first, narrowed down to the simplest functions:

Upon detection of personnel, the machine stops. Simple yet very optimal.



1/2 the mounting time. Fixed response time makes calculation of the safety distance easier.

Reduced wiring, quick mount brackets and easy-to-view alignment beams all add up to cost savings. Additionally, with one fixed response time, it is now easier to calculate the safety distance.



Global Support

Omron STI will support you through the our global network.

Easy-to-view Diagnostics

These indicators enable you to intuitively know the status and cause of any error. This allows faster installation while reducing machine down time.

OMRON SCIENTIFIC TECHNOLOGIES, INC.
USA Tel. 1/888/510-4357 Canada Tel. 1/866/986-6766

For the Latest Information
On the Internet: www.sti.com

OMRON

Specifications

Main Units

F3SJ-E□□□□P25

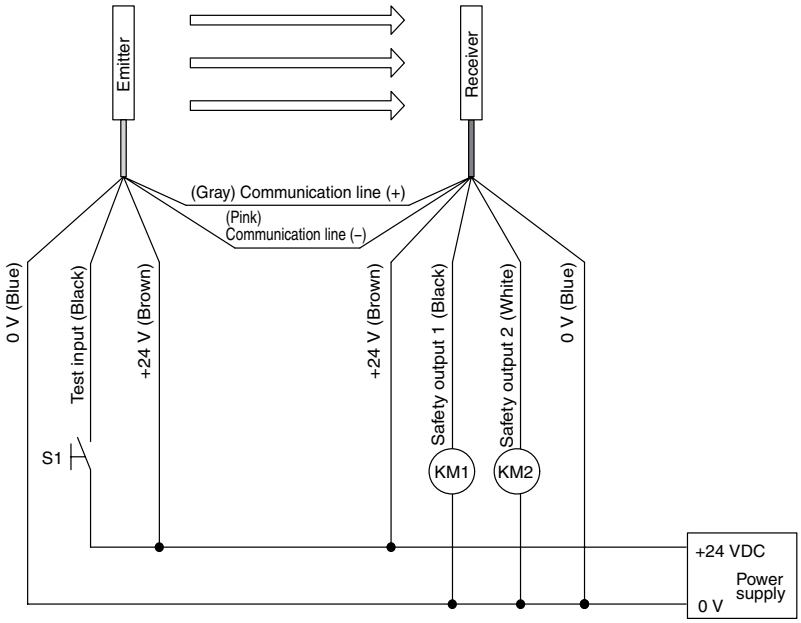
Sensor type		Type 4 safety light curtain
Setting tool connection *1		Parameter settings: Not available
Safety category		Safety purpose of category 4, 3, 2, 1, or B
Detection capability		Opaque objects 25 mm in diameter
Beam gap (P)		20 mm
Number of beams (n)		8 to 54
Protective height (PH)		185 to 1,105 mm
Lens diameter		Diameter 5 mm
Operating range *2		0.2 to 7 m
Response time (under stable light incident condition)	ON to OFF	15 ms max.
	OFF to ON	70 ms max.
Startup waiting time		2 s max.
Power supply voltage (Vs)		SELV/PELV 24 VDC±20% (ripple p-p 10% max.)
Consumption current (no load)	Emitter	Up to 22 beams: 41 mA max., 26 to 42 beams: 57 mA max., 46 to 54 beams: 63 mA max.
	Receiver	Up to 22 beams: 42 mA max., 26 to 42 beams: 47 mA max., 46 to 54 beams: 51 mA max.
Light source (emitted wavelength)		Infrared LED (870 nm)
Effective aperture angle (EAA)		Based on IEC 61496-2. Within ±2.5° for both emitter and receiver when the detection distance is 3 m or over
Safety outputs (OSSD)		Two PNP transistor outputs, load current 200 mA max., residual voltage 2 V max. (except for voltage drop due to cable extension), Leakage current 1 mA max., load inductance 2.2 H max. *3 Maximum capacity load 1 µF *4
Output operation mode		Safety output: On when receiving light
Input voltage		ON voltage: Vs-3 V to Vs *5 OFF voltage: 0 V to 1/2 Vs or open
Mutual interference prevention function		Mutual interference prevention algorithm prevents interference in up to 3 sets.
Test function		Self test (at power-ON and at power distribution) External test (emission stop function by test input)
Protection circuit		Output short-circuit protection, and power supply reverse polarity protection
Ambient temperature		Operating: -10 to 55°C (non-freezing), Storage: -25 to 70°C
Ambient humidity		Operating: 35% to 85% (no condensation), Storage: 35% to 95% RH
Operating ambient light intensity		Incandescent lamp: 3,000 lx max., Sunlight: 10,000 lx max.
Insulation resistance		20 MΩ min. (at 500 VDC)
Dielectric strength		1,000 VAC 50/60 Hz, 1 min
Degree of protection		IP65 (IEC 60529)
Vibration resistance		Malfunction: 10 to 55 Hz, Multiple amplitude of 0.7 mm, 20 sweeps in X, Y, and Z directions
Shock resistance		Malfunction: 100 m/s2, 1,000 times each in X, Y, and Z directions
Pollution degree		Pollution degree 3 (IEC 60664-1)
Power cable		Connection method: Pull-out type, cable length 3 m Number of wires: Emitter: 5 wires, receiver: 6 wires Cable diameter: Dia. 6 mm Allowable bending radius: R5 mm
Extension cable		30 m max. *6
Material		Case: Aluminum Cap: ABS resin, PBT Optical cover: PMMA resin (acrylic) Cable: Oil resistant PVC
Weight (packed state)		Weight (g) = (protective height) x 2.6 + 800
Accessories		Test rod, User's Manual (CD-ROM) *7
Applicable standards		IEC 61496-1, EN 61496-1 UL 61496-1, Type 4 ESPE (Electro-Sensitive Protective Equipment) IEC 61496-2, CLC/TS 61496-2, UL 61496-2, Type 4 AOPD (Active Opto-electronic Protective Devices) IEC 61508-1 to -3, EN 61508-1 to -3 SIL3 IEC 13849-1: 2006, EN ISO 13849-1: 2008 (PLe, Cat.4) UL 508, UL 1998, CAN/CSA C22.2 No.14, CAN/CSA C22.2 No.0.8

*1. Do not use the Support Software and Setting Console for F3SJ-A. Operation cannot be guaranteed.
*2. Use of the Spatter Protection Cover causes a 10% maximum sensing distance attenuation.
*3. 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.
*4. These values must be taken into consideration when connecting elements including a capacitive load such as capacitor.
*5. The Vs indicates a voltage value in your environment.
*6. To extend a cable of the F3SJ-E, refer to "Chapter 3 Wiring (Extension Cable)" in the User's Manual.
*7. Mounting brackets are sold separately.

Wiring

Basic Wiring Diagram

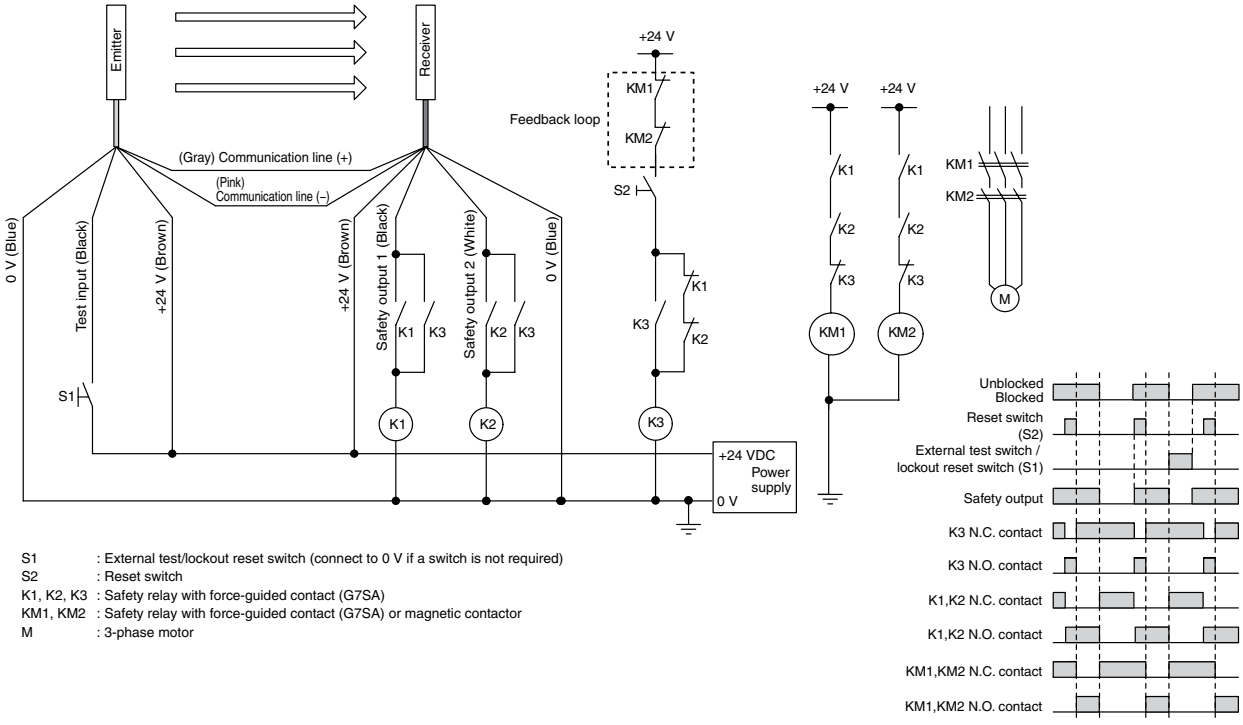
Wiring when using a test input line



S1 : External test/lockout reset switch (connect to 0 V if a switch is not required)
KM1, KM2 : Safety relay with force-guided contact (G7SA) or magnetic contactor

Connection Circuit Examples

Wiring for single F3SJ-E application (category 4) (PNP Output)



S1 : External test/lockout reset switch (connect to 0 V if a switch is not required)
S2 : Reset switch
K1, K2, K3 : Safety relay with force-guided contact (G7SA)
KM1, KM2 : Safety relay with force-guided contact (G7SA) or magnetic contactor
M : 3-phase motor

Dimensions

(mm)

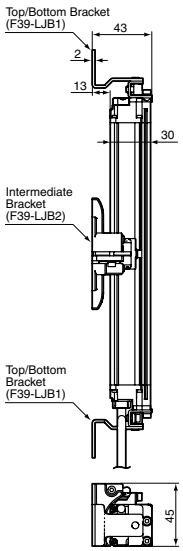
F3SJ-E/F3SJ-B Dimensions

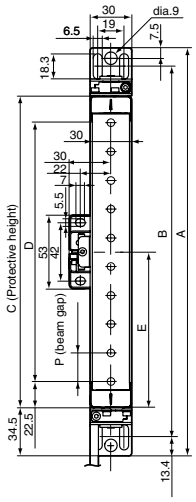
The dimensions of the F3SJ-E and F3SJ-B are the same except for connector cables and cable leads.

Main Units

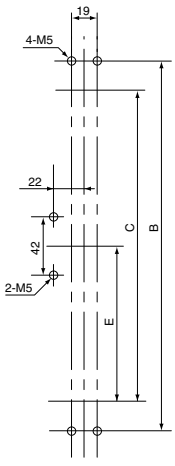
Mounting Top/Bottom and Intermediate Brackets

Backside mounting

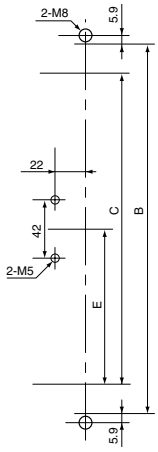




Mounting screw holes



<M5 screw fixed>

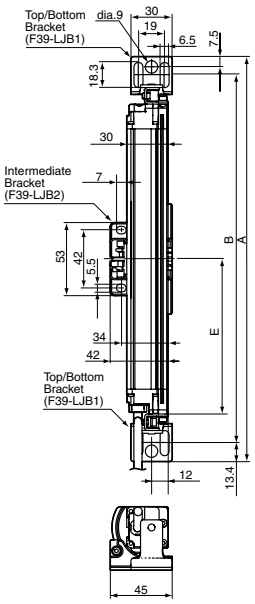


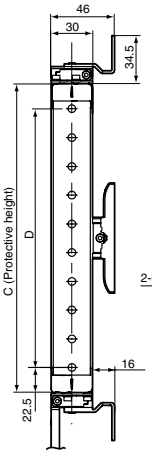
<M8 screw fixed>

C (protective height): 4-digit number in the table
A = C + 69, B = C + 42.2
D = C - 45, E = See table below, P = 20

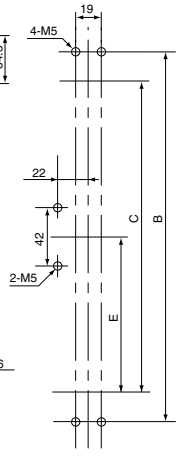
Protective height	Number of intermediate brackets	E
185 to 1,105	0	—
1,185 to 1,345	1	C/2 max.
1,425 to 2,065	2	C/3 max.

Side mounting

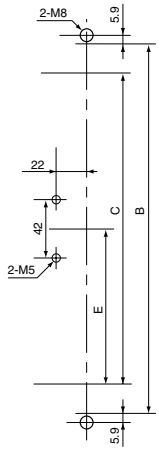




Mounting screw holes



<M5 screw fixed>



<M8 screw fixed>

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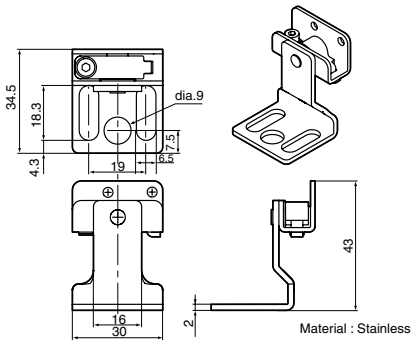
A = C + 69, B = C + 42.2
D = C - 45, E = See table below, P = 20

Protective height	Number of intermediate brackets	E
185 to 1,105	0	—
1,185 to 1,345	1	C/2 max.
1,425 to 2,065	2	C/3 max.

Dimensions of top/bottom bracket for F39-LJB1



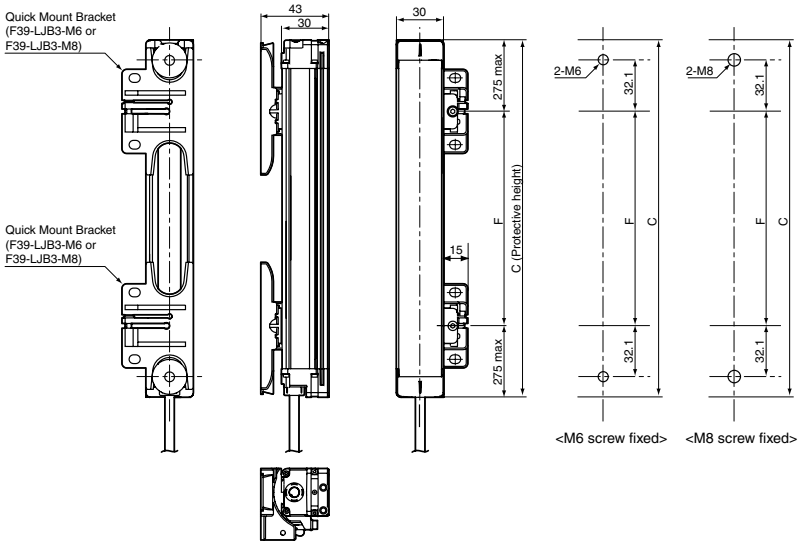
Dimensions (continued)

(mm)

Main Units

When Using Quick Mount Brackets

Backside mounting

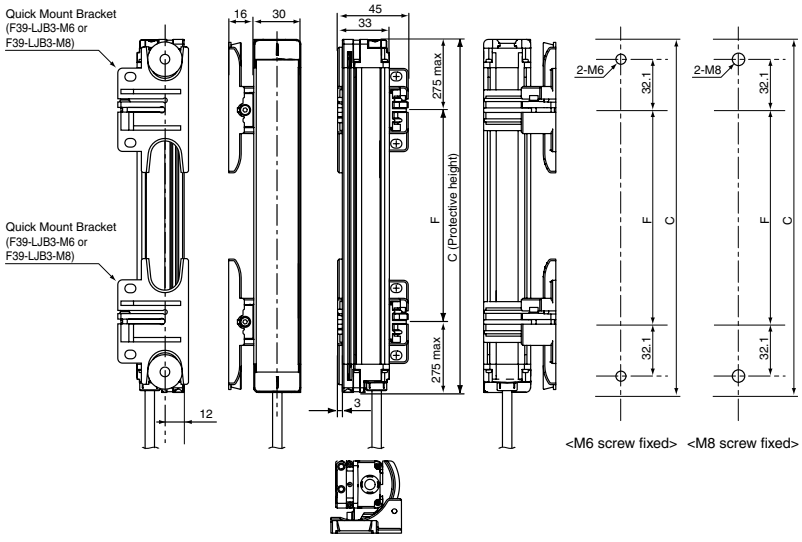


Mounting screw holes

C (protective height): 4-digit number in the table
F = See the table below.

Protective height	Number of intermediate brackets	F
185 to 1,105	2	555 mm max.
1,185 to 1,585	3	555 mm max.
1,665 to 2,065	4	555 mm max.

Side mounting



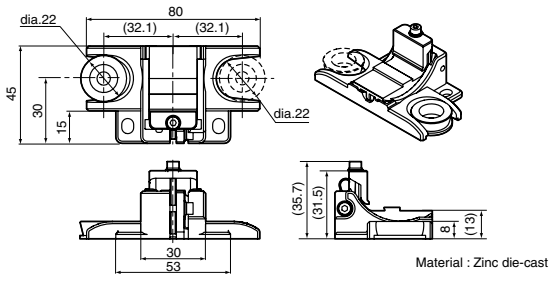
Mounting screw holes

C (protective height): 4-digit number in the table
F = See the table below.

Protective height	Number of intermediate brackets	F
185 to 1,105	2	555 mm max.
1,185 to 1,585	3	555 mm max.
1,665 to 2,065	4	555 mm max.

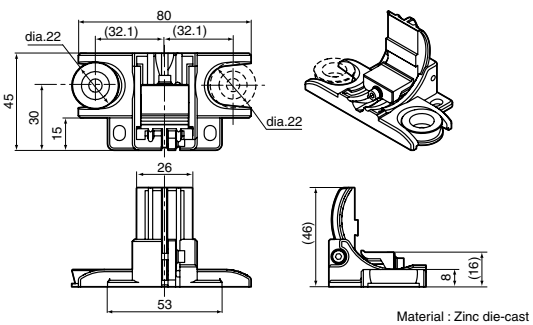
Dimensions of quick mount bracket for F39-LJB3

Backside mounting



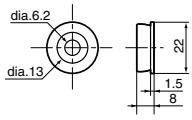
Material : Zinc die-cast

Side mounting



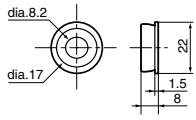
Material : Zinc die-cast

Quick mount M6 bracket



Material : Stainless

Quick mount M8 bracket



Material : Stainless

Ordering

Main Units

Safety Light Curtains

Application	Detection capability	Beam gap	Operating range	Protective height (mm)	Model
					PNP output
Hand protection	Dia. 25 mm	20 mm	0.2 to 7 m	185 to 1,105	F3SJ-E□□□□P25

Safety Light Curtain Model List

Please contact our sales representatives.

F3SJ-E Series (20 mm pitch)

Model	Number of beams	Protective height [mm] *
F3SJ-E0185P25	8	185
F3SJ-E0225P25	10	225
F3SJ-E0305P25	14	305
F3SJ-E0385P25	18	385
F3SJ-E0465P25	22	465
F3SJ-E0545P25	26	545
F3SJ-E0625P25	30	625
F3SJ-E0705P25	34	705
F3SJ-E0785P25	38	785
F3SJ-E0865P25	42	865
F3SJ-E0945P25	46	945
F3SJ-E1025P25	50	1,025
F3SJ-E1105P25	54	1,105

*Protective height (mm) = Total sensor length

= Highlighted **Rapid Delivery** products are available for shipment today or within **THREE** days.

Accessories (sold separately)

Relays with Forcibly Guided Contacts

Type	Appearance	Specifications	Model	Remarks
G7SA Relays with Forcibly Guided Contacts		• Nodes: 4 • Contact type: 2A2B • Rated switch load: 250 VAC 6A, 30 VDC 6A	G7SA-2A2B	For information on the G7SA see page H3 or visit www.sti.com.
		• Nodes: 4 • Contact type: 3NO+1NC • Rated switch load: 250 VAC 6A, 30 VDC 6A	G7SA-3A1B	
G7S-□-E Relays with Forcibly Guided Contacts		• Nodes: 6 • Contact type: 4NO+2NC • Rated switch load: 250 VAC 10 A, 30 VDC 10 A	G7S-4A2B-E	For information on the G7S-□-E see page H8 or visit www.sti.com.
		• Nodes: 6 • Contact type: 3NO+3NC • Rated switch load: 250 VAC 10 A, 30 VDC 10 A	G7S-3A3B-E	

Laser Pointer

Appearance	Output	Model
	Laser Pointer for F3SJ	F39-PTJ

(Continued on next page)

Ordering (continued)

Accessories (sold separately) (continued)

Sensor Mounting Bracket (sold separately)

Appearance	Specifications	Model	Application	Remarks
	Top/bottom bracket	F39-LJB1	Top/bottom bracket for F3SJ-E/B	2 for the emitter, 2 for the receiver, total of 4 per set
	Intermediate bracket	F39-LJB2 *1 *2	In combination use with top/bottom bracket for F3SJ-E/B Can be used as free-location bracket.	1 set with 2 pieces
	Quick mount bracket	F39-LJB3-M6 *1	Quick mount bracket for F3SJ-E/B Supports M6 slide nut for aluminum frame.	1 set with 2 pieces
		F39-LJB3-M8 *2	Quick mount bracket for F3SJ-E/B Supports M8 slide nut for aluminum frame.	
	M6 slide nut	F39-LJB3-M6K *1	Spare slide nut for use with Quick mount bracket.	Hexagon socket head cap screws (M6 x 10) are included.
	M8 slide nut	F39-LJB3-M8K *2		Hexagon socket head cap screws (M8 x 14) are included.
	Compatible mounting bracket	F39-LJB4	Mounting bracket used when replacing existing area sensors (F3SJ-A or F3SN) with the F3SJ-E/B.	2 for the emitter, 2 for the receiver, total of 4 per set

Note: All the sensor mounting brackets for the F3SJ-E are sold separately.
*1. Combining F39-LJB2 and F39-LJB3-M6K makes F39-LJB3-M6.
*2. Combining F39-LJB2 and F39-LJB3-M8K makes F39-LJB3-M8.

For information on Resource Modules, see page D59.

For information on safety light curtain accessories, see page D74.

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