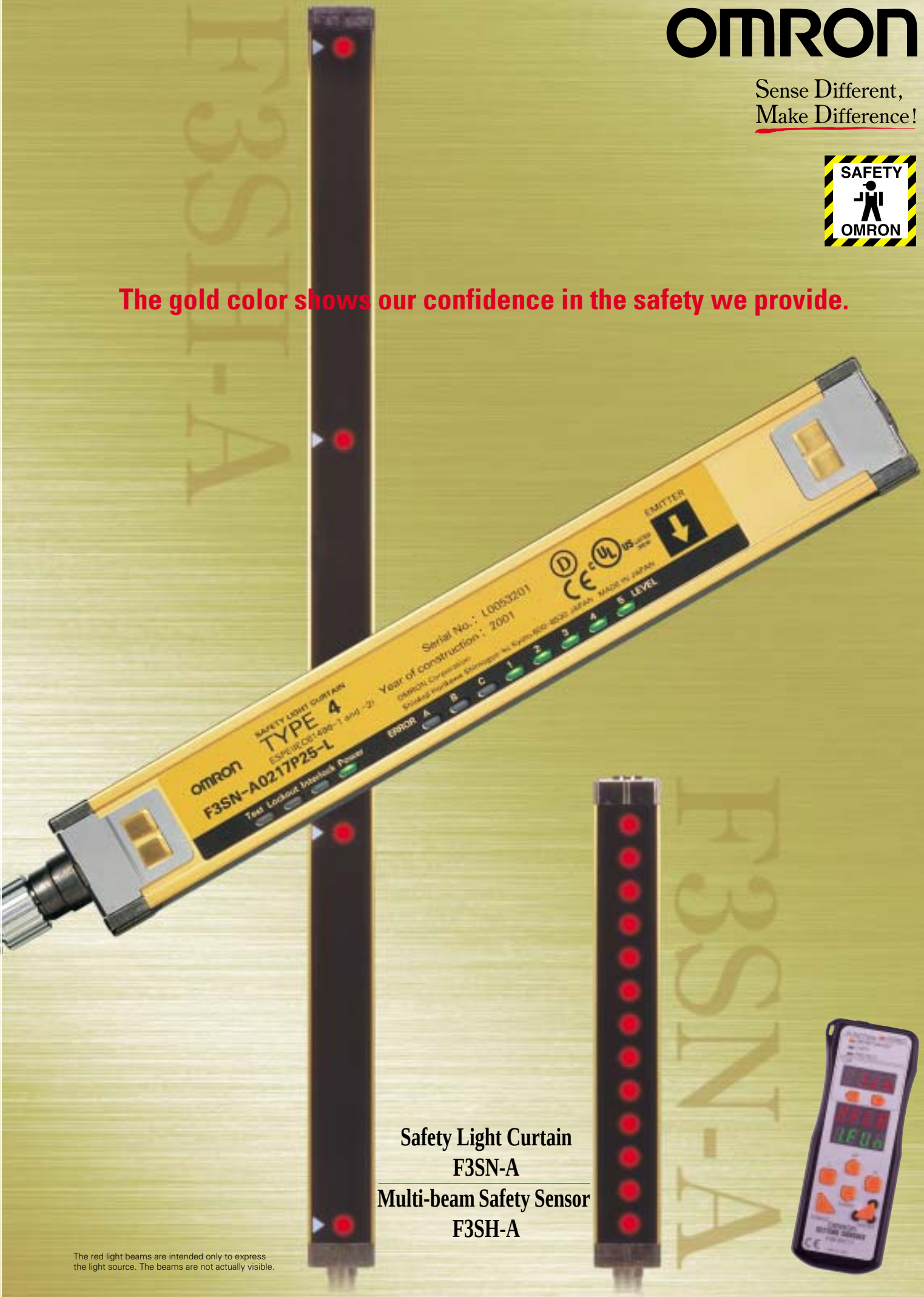
OMRON

Sense Different,
Make Difference!

SAFETY
OMRON

The gold color shows our confidence in the safety we provide.

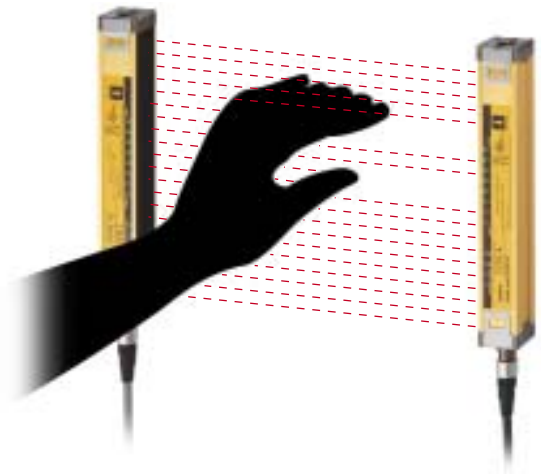


Safety Light Curtain
F3SN-A
Multi-beam Safety Sensor
F3SH-A

The red light beams are intended only to express the light source. The beams are not actually visible.

The Ideal Safety Sensor for Every Application

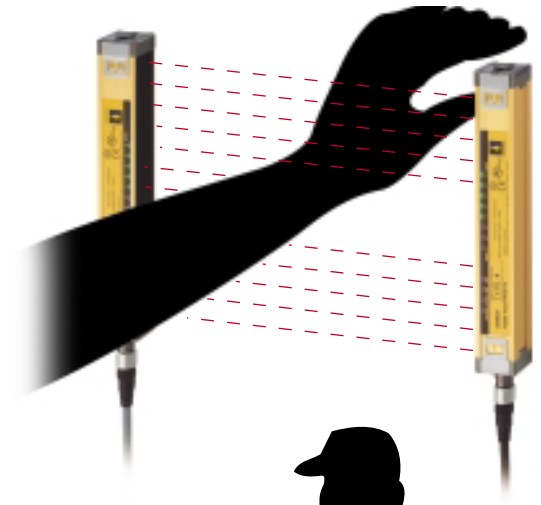
OMRON provides safety two ways: The Safety Light Curtain and the Multi-beam Safety Sensor



Finger Protection

Safety Light Curtain
F3SN-A○○○○P14

- Operating range: 7 m
- Detection capability: 14 mm dia. (Beam gap: 9 mm)
- Protective height: 189 to 1,125 mm

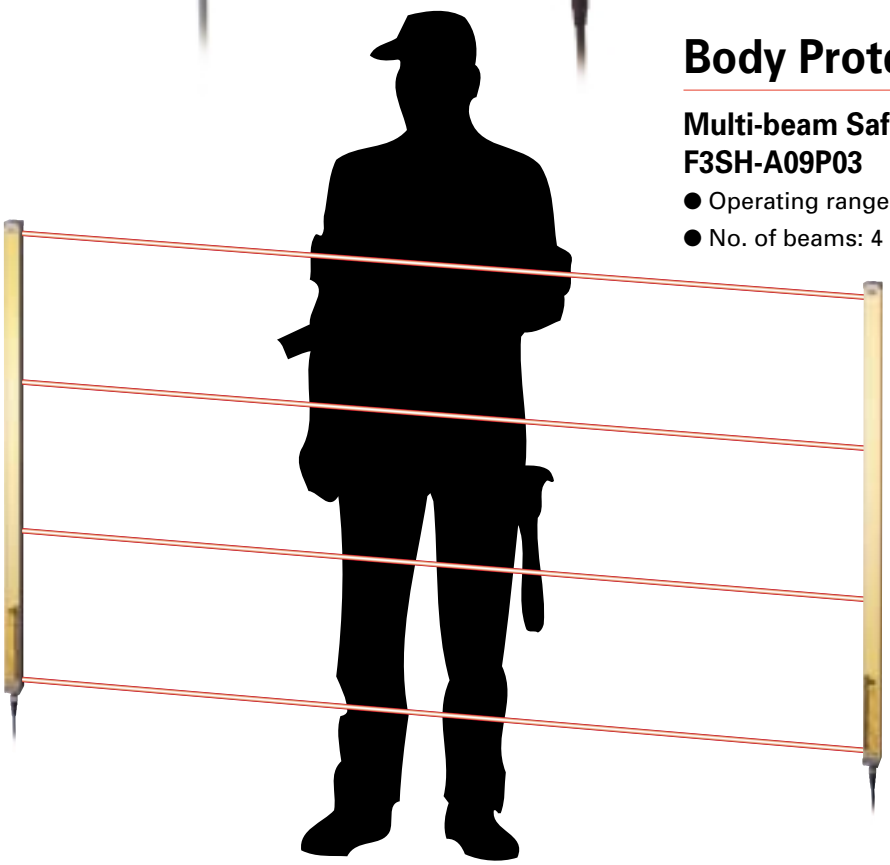


Hand Protection

Safety Light Curtain
F3SN-A○○○○P25

- **Operating range**: 10 m
- Detection capability: 25 mm dia. (Beam gap: 15 mm)
- Protective height: 217 to 1,822 mm

OMRON will manufacture two types of Sensors for detection applications based on horizontal position: Sensors with 40-mm diameter detection capability (beam gap: 30 mm) and Sensors with 70-mm diameter detection capability (beam gap: 60 mm). Consult your dealer or OMRON representative.



Body Protection

Multi-beam Safety Sensor
F3SH-A09P03

- Operating range: 10 m
- No. of beams: 4 beams with beam gap of 300 mm

Highest Level Safety Design Prevents Mechanical Accidents

Complete Safety Design

Output turns OFF via self diagnostics.

Safety Design of F3SN-A

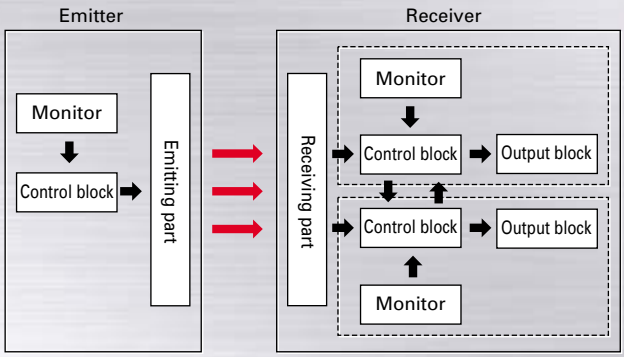
Safety Design Backed by Technology

Pursuing safety with the highest level of safety design and FMEA

We pursued the safety of F3SN-A/F3SH-A to the limit with the mutual check of two CPUs, safe design by dual circuits of signal control and output, and FMEA*, which verifies the safety of the operations.

*FMEA : Failure Mode & Effects Analysis

Block diagram of the circuit



Conforms to Global Safety Standards for Safety Sensors

Type 4 Level Sensor Specified by IEC and EN Standards

Conforms to the now mandatory international standards for safety sensors: IEC61496-1, IEC61496-2, and EN61496-1. The F3SN-A and F3SH-A are type 4 Sensors meeting the highest safety standards of category 4.

Conforms to EU Machinery Directives

Certification for EC type-examination in accordance with the EU Machinery Directive and conformity to EMC Directives has been obtained from DEMKO. The F3SN-A/F3SH-A can be used with confidence in machinery and equipment destined for Europe.

Certification for United States and Canada from UL in the United States

Can be used with machinery designed for OSHA regulations and ANSI standards.

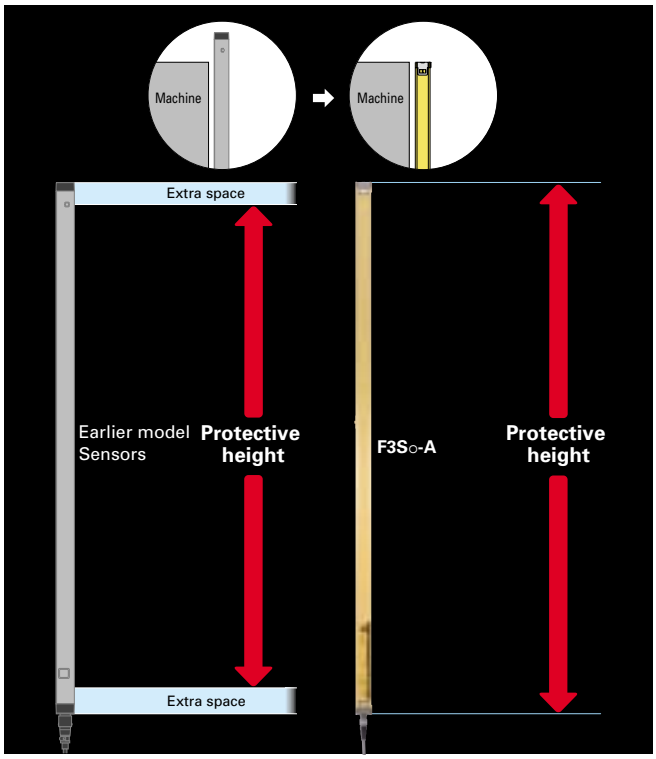
Certified for UL Listing based on UL508, IEC61496-1, and IEC61496-2 and UL Listing for Canadian safety standards. Can be used with machinery that will be used under OSHA regulations (29 CFR 1910. 212), which are stipulated under the Occupational Safety and Health Act of 1970. Also fulfills the requirements for ANSI/RIA R15.06-1999, the United States Safety Requirements for Industrial Robots and Robot Systems. The F3SN-A/F3SH-A can be confidently used with machinery and equipment bound for the United States and Canada.

UL CE IEC61496-1 IEC61496-2 Type 4

OMRON can provide an F3SN-A/F3SH-A Sensor sized to perfectly fit the Hazardous area.

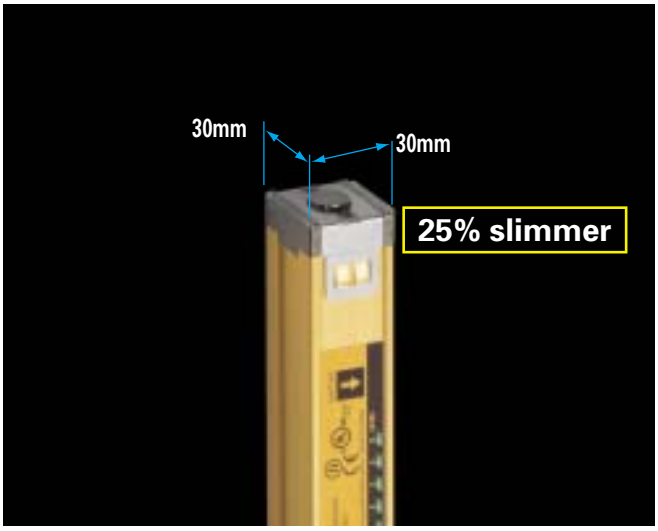
Perfectly Meeting User Needs with Innovative Concepts

Same Protective height and Sensor Length Limits extra space to a minimum.



Compact Sensor

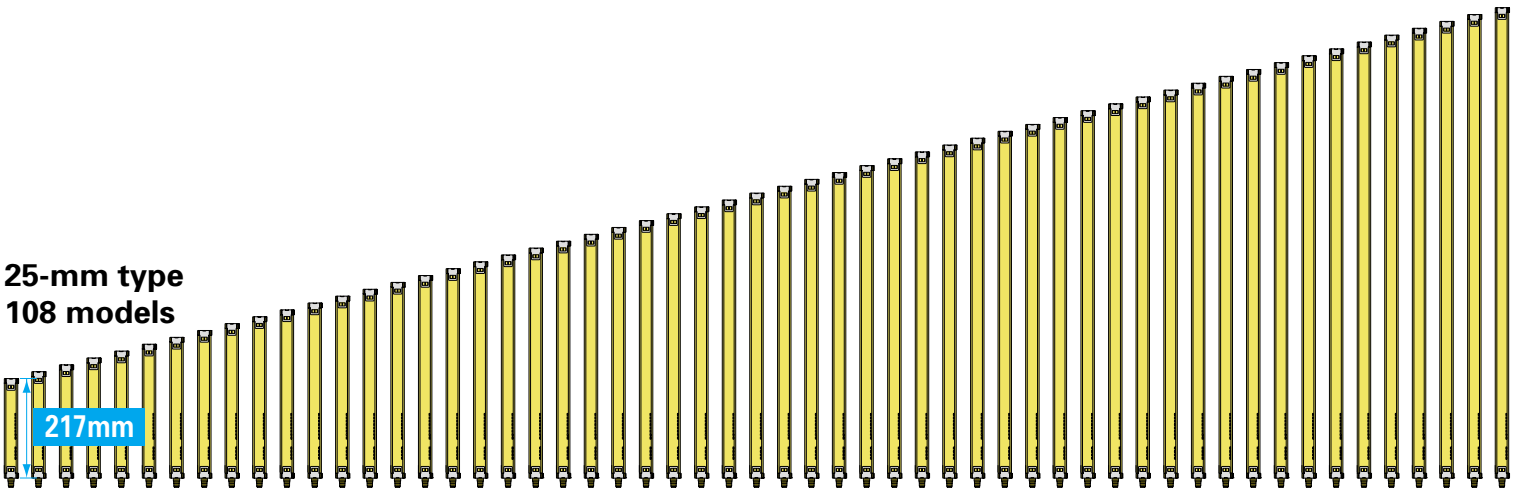
OMRON has successfully developed a compact Sensor surface area (30×30 mm) in a Type 4 Safety Light Curtain with built-in amp. The new F3SN-A/F3SH-A is 25% smaller than earlier OMRON models.



Select the Perfect Length

Select a detection capability of either 14-mm diameter (Beam gap: 9 mm) or 25-mm diameter (Beam gap: 15mm). For the 14-mm diameter type, OMRON has created 53 models, at 18-mm intervals (all odd-numbered beams from 21 beams = 189 mm to 125 beams = 1,125 mm). For the 25-mm diameter type, OMRON has created 108 models, at 15-mm intervals (all beams from 13 beams = 217 mm to 120 beams = 1,822 mm).

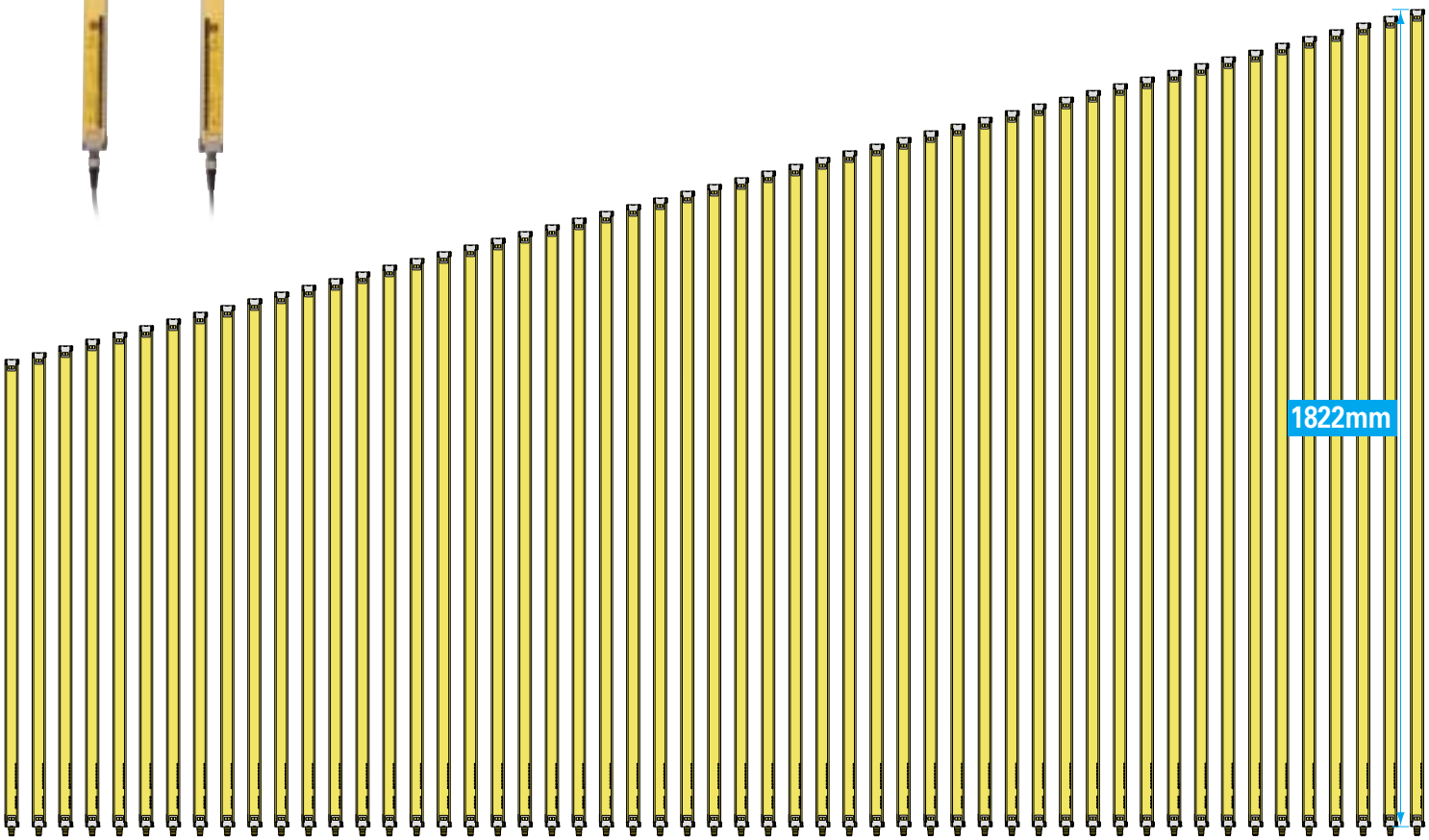
25-mm type
108 models



Connect up to 3 sets in series.
Prevents mutual interference.

Up to 3 sets can be connected in series by using both the standard model and a series-connection model with a connector. You can create a 3-set system by just wiring one set – no need to wire three sets separately as was required with earlier models. This facilitates protection for all dangerous machine and device surfaces. Mutual interference is also prevented.

Order model number
F3SN-A○○○○P○○-01 to
receive the type supplied with the
connector for the series-connection.



Setting Console
All Functions Can be Set Easily and Safely

Easy Function Settings, Monitoring, and Copying to Multiple Sensors

In earlier Sensor models, function settings were made using an internal DIP switch, and switch operation used to be very difficult after Sensor was mounted.
That's why we added a Setting Console.
Just connect the Sensor Cable when it is time to make the function settings and you can easily make blanking and all other settings directly from the Setting Console.

Password Protection
Prevents inadvertent changes to settings.

Function indicator

Communications connection indicator (power supply display)

Channel display
Applicable Sensor when connected in series.

Mode display

Operation keys:
UP: Changes mode and increases numeric values
DOWN: Changes mode and reduces numeric values
R: Changes mode or moves to next digit
L: Changes mode or moves to next digit
CANCEL: Cancels operation
ENTER: Confirms operation

Actual size

Two Types of Blanking Functions

Blanking functions change the Safety Light Curtain detection patterns.

Basic Pattern 1: Floating Blanking

Disables detection for 1, 2, or 3 non-specific beams. Output is turned OFF if more than the specified number of beams are obstructed. Ideal for applications where a robot arm for removing workpieces passes through the Safety Light Curtain detection zone at irregular intervals.

Basic Pattern 2: Fixed Blanking

Uses a teaching technique to mask and disable specific beams. Ideal for applications where part of a machine or jig is always inside the fixed detection zone of the Safety Light Curtain.

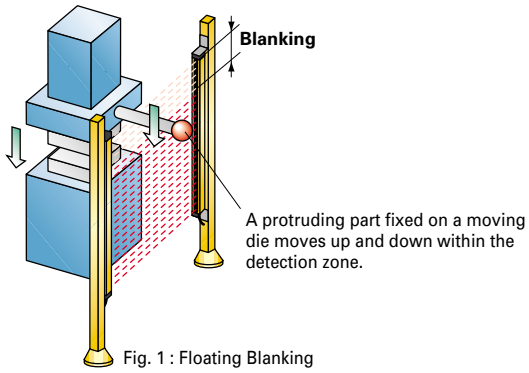


Fig. 1 : Floating Blanking

There is a danger if fixed blanking is not used because a hand could enter under the light curtain if the work bench shifts out of the zone.

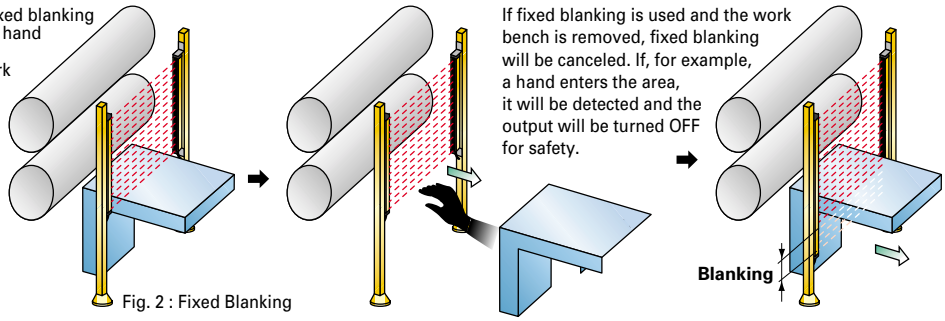


Fig. 2 : Fixed Blanking

Other Function Settings from the Setting Console

Auxiliary Output: Can select outputs such as Dark-ON, Light-ON, Light diagnosis, and Lockout.
External Indicator Output: Can select external indicator output from Dark-ON, Light-ON, Light diagnosis, and Lockout.
EDM (External Device Monitoring) function: Monitors for external relay contact welding.
Interlock Function: Sets interlock for when power is turned ON or the system is restarted.
Copy Settings Function: Copies Sensor settings to another Sensor.
Protect Function: Prohibits or limits changes to Sensor settings.

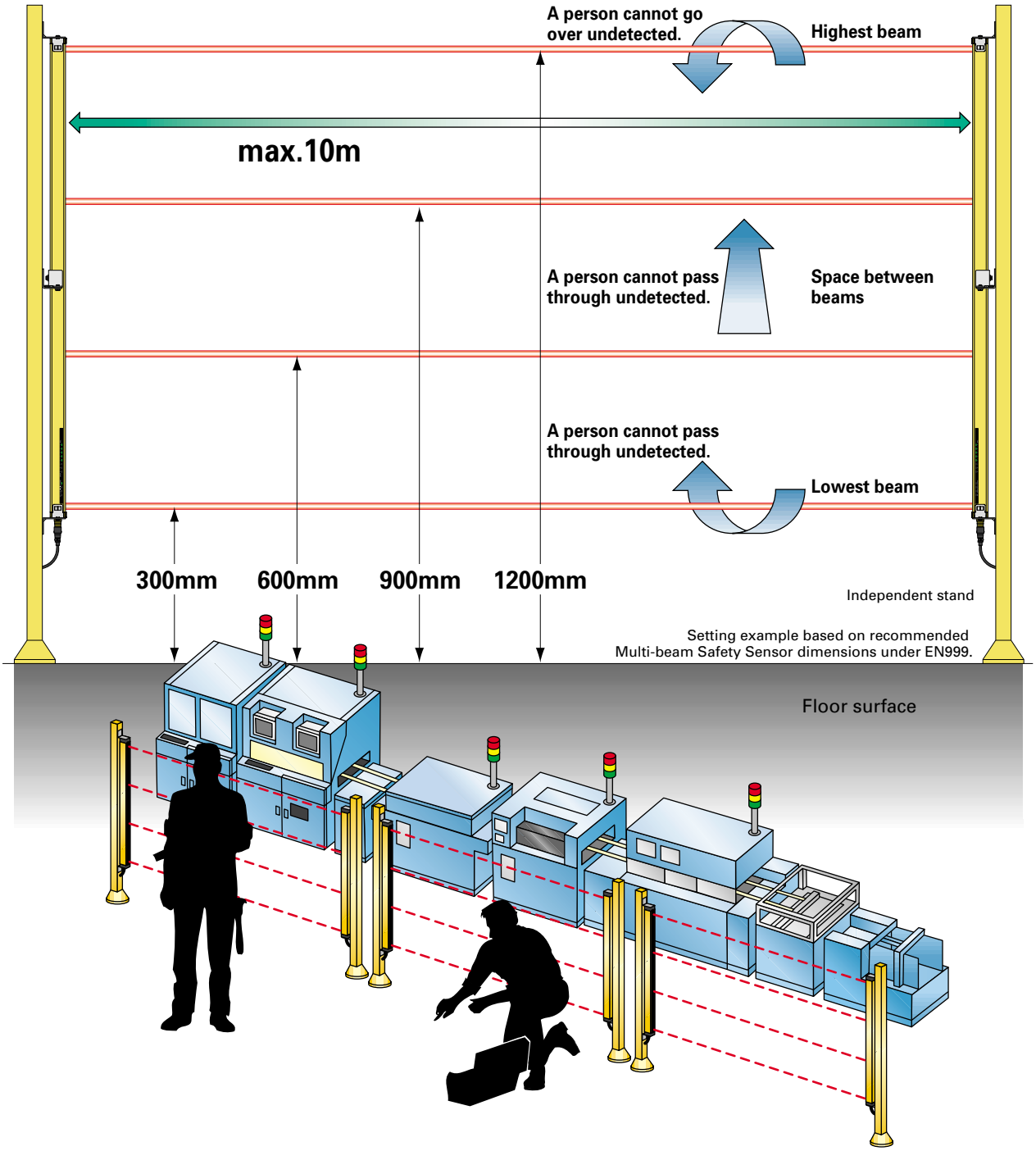
F3SH-A
Multi-beam Safety Sensor

The F3SH-A enables human body detection using the 4-beam dimensions recommended by EN Standards.

300-mm gap using 4 beams. Detects whole-body intrusion.

The EN999 Standard concerns machine safety, in particular the positioning of protective devices in relation to the approach speed of part of a human body. The values in the table indicate the heights from the reference surface (such as the floor) for each beam of a 4-optical-beam Sensor recommended as most effective under EN999. The F3SH-A Beam gap matches the recommended dimensions and can, therefore, detect intrusion under the lowest beam or over the highest beam, for settings shown in the following diagram.

No. of beams	Height from basic surface, such as floor (in mm)
4	300,600,900,1200



Making Safety Easier to Work With

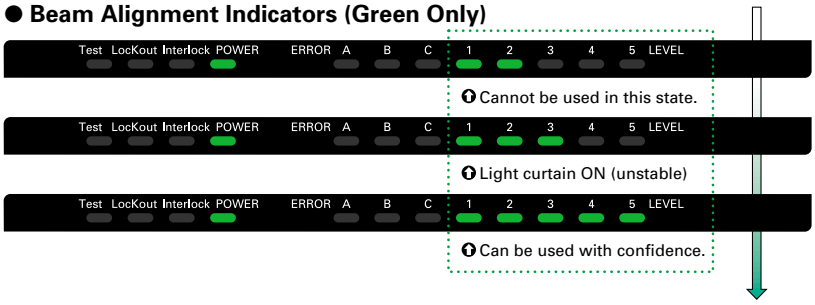
The Sensor Unit also has a variety of safety functions. Suitable for all kinds of safety circuit systems.

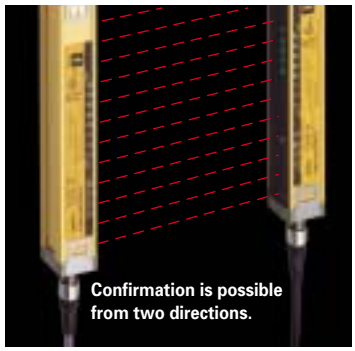
- Interlock functions
- Auto reset / Manual reset selection
- EDM (External Device Monitoring) function

Indicator bar included. Even easier to use.

Easy beam alignment using indicators. Reliable installation.

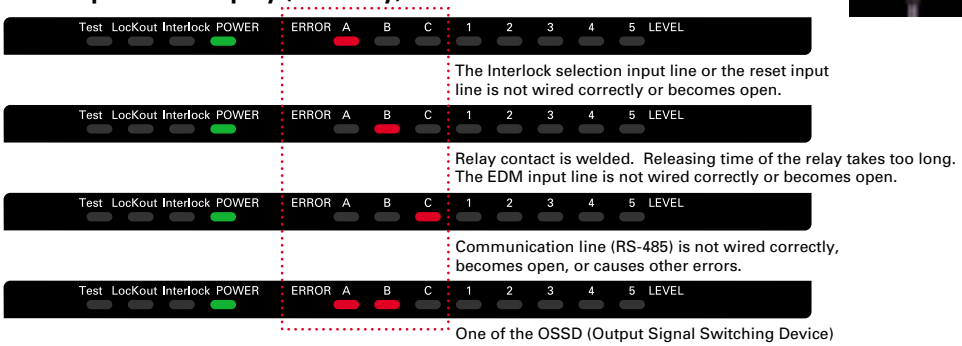
● Beam Alignment Indicators (Green Only)





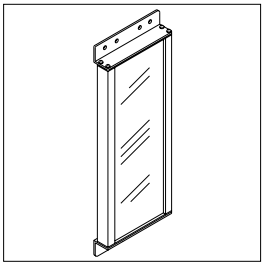
Easy to identify the type of error. Improves safety.

● Example Error Display (Red Only)

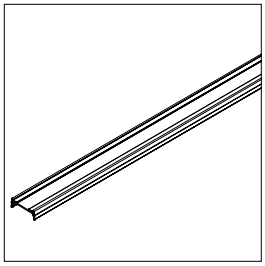


Complete Accessories (Optional)

● F39-A External Indicators
Requires series-connection models (models ending in -01) for connection. Indicator timing, i.e., the signal type, can be selected using the Setting Console.



● F39-MLG Mirror
Note:Reduces operating range by 12% with each unit.



● F39-HN
Spatter Protection Cover

Specification

■ Safety Light Curtain

Infrared

Detection capability	Beam gap	Appearance	Operating Range	No. of beams	Protective Height	Connector for Series-Connection	Model *1
ϕ14mm	9mm		0.2 to 7m	21 to 125 (odd numbers only)	Every 18 mm from 189 to 1,125 mm	No	**F3SN-A○○○○P14**
						Yes	**F3SN-A○○○○P14-01**
ϕ25mm	15mm		0.2 to 10m	13 to 120	Every 25 mm from 217 to 1,822 mm	No	**F3SN-A○○○○P25**
						Yes	**F3SN-A○○○○P25-01**

*1 The ○○○○ in the model numbers indicates the protective height (in mm).
*2 F3SN-A ○○○○ P14-01 is a customized model produced at the OMRON plant.
Consult with your dealer or OMRON representative when ordering this model.

■ Multi-beam Safety Sensor

Infrared

Beam gap	Appearance	Operating Range	No. of beams	Outermost-beam gap	Connector for Series-Connection	Model
300mm		0.2 to 10m	4	900mm	No	**F3SH-A09P03**
					Yes	**F3SH-A09P03-01**

■ Accessories (Optional)

Control Unit

Appearance	Output	Model
	Relay, 3NO+1NC	**F3SP-B1P**

Setting Console

Appearance	Model	Accessories
	**F39-MC11**	One branching connector, one connector cap, 2-m cable, manual

Single-ended Connector cable (Emitter and Receiver Set)

Appearance	Cable length	Specification	Model
	3m	M12 connector (8 pins)	F39-JC3A
	7m		F39-JC7A
	10m		F39-JC10A
	15m		F39-JC15A

Double-ended Connector cable (Emitter and Receiver Set)

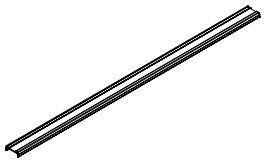
Appearance	Cable length	Specification	Model	Application
	0.2m	M12 connector (8 pins)	F39-JCR2B	Series connection or connection with F3SP-B1P
	3m		F39-JC3B	
	7m		F39-JC7B	Connection with F3SP-B1P*
	10m		F39-JC10B	
	15m		F39-JC15B	

*Cannot be used for series-connection models.

External indicators (Separate Models for Emitters and Receivers)

Appearance	Specification	Indicator	Type	Model
	M12 connector for PNP output	red	Emitter	**F39-A01PR-L**
			Receiver	**F39-A01PR-D**
		green	Emitter	**F39-A01PG-L**
			Receiver	**F39-A01PG-D**

Spatter Protection Cover (includes two pieces for Emitter and Receiver)

Appearance	Applicable Models	Model *
	F3SN-A○○○○P14	**F39-HN○○○○-14**
	F3SN-A○○○○P25 F3SN-A○○○○P25-01	**F39-HN○○○○-25**
	F3SH-A09P03	**F39-HH09-03**

*The same four digits are used for the ○○○○ in the model numbers as for the Sensor detection height (indicated by the ○○○○ in the Sensor model number).

Mirror (Reduces operating range by 12% with each unit)

Mirror Material	Height(mm)	Depth(mm)	Length(mm)	Model
Glass Mirror	145	32	406	**F39-MLG0406**
			610	**F39-MLG0610**
			711	**F39-MLG0711**
			914	**F39-MLG0914**
			1,067	**F39-MLG1067**
			1,219	**F39-MLG1219**
			1,422	**F39-MLG1422**
			1,626	**F39-MLG1626**
			1,830	**F39-MLG1830**
			2,134	**F39-MLG2134**

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Note:Specifications subject to change without notice.

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