

# The Gold Standard of Safety Light Curtains For Category 4 Hazard



F3SN-A/F3SH-A  
Safety Light Curtains



Solve it with the problem solvers.

**OMRON**<sup>®</sup>

# Selection, setup, monitoring and maintenance of safety light curtains just got easier



## Easy to configure

Omron has taken away the complexity of selecting a safety light curtain system. The emitter/receiver pair alone is a fully self-contained, intelligent Type 4 system that requires no additional controls. However, a typical system includes the light curtain emitter/receiver pair, a safety relay unit and a pair of connector cables. Models with connectors at each end allow series connection of two more pairs of emitters and receivers.

## Setting Console . . . an efficient tool for setup and maintenance

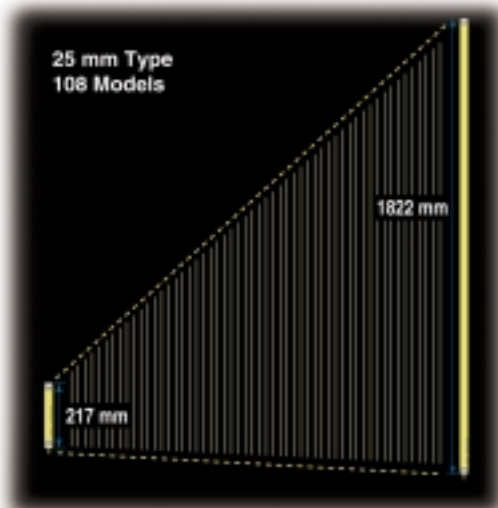
The hand-held setting console is Omron's unique answer to simplify setup. Set blanking, auxiliary output response and security levels; monitor operations and upload/download setups to other light curtains with the setting console. The auxiliary output and beacon indicator can be set to respond to seven different conditions to match the application requirements. This eliminates time-consuming manual setups as well as the need for special-function control boxes.

## Always watching out for your operator

The safety light curtain continuously monitors areas for changes in pattern that indicate operator access to the hazardous area so the system will shut down.

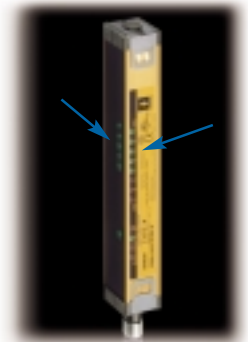
## Industry's widest selection of sizes

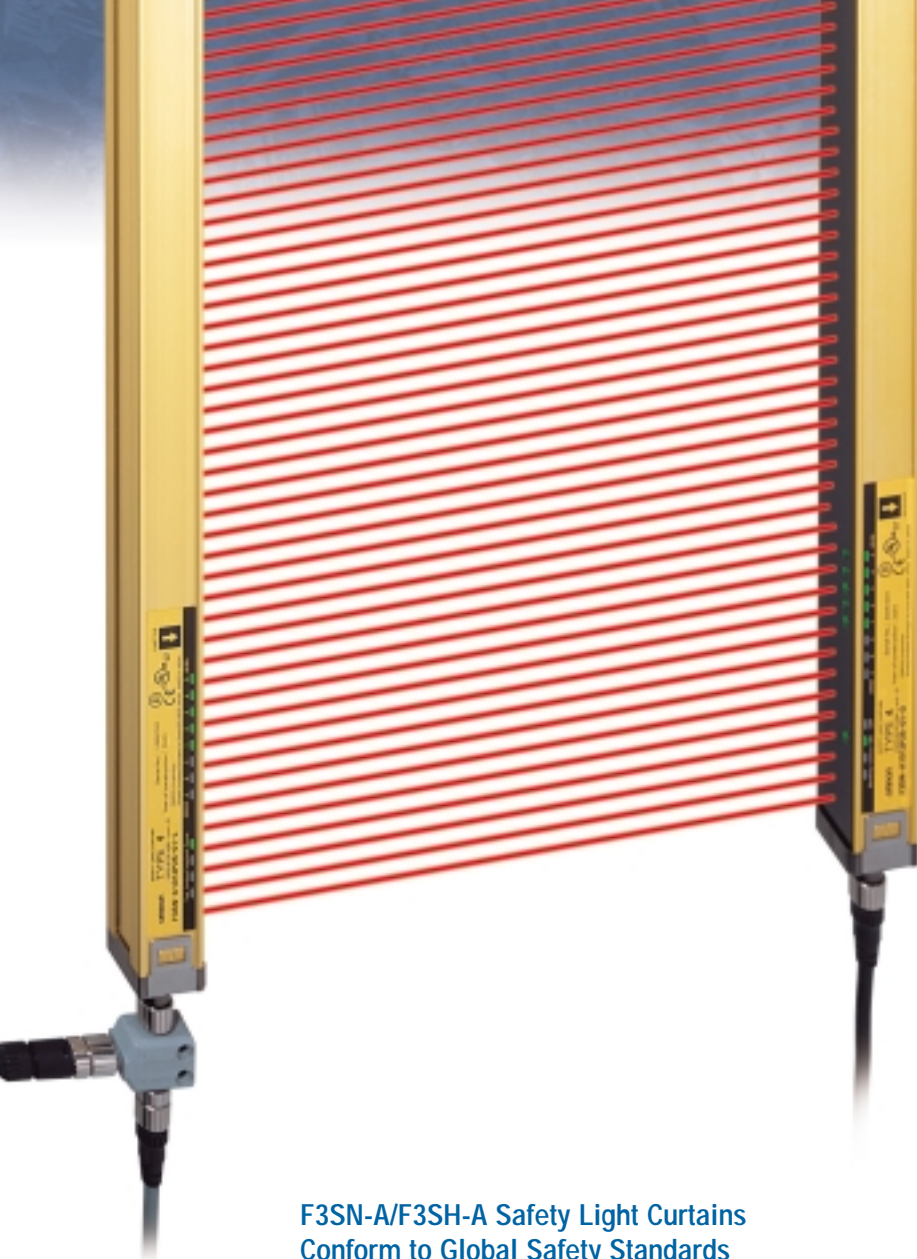
Omron lets you specify light curtains in incremental sizes, by the number of beams, to exactly match the protective height you need for the application. This saves you money with each installation. There is no unprotected space at top and bottom, so the protective height is equal to the light curtain's overall height on hand-protection models.



## Built-in diagnostics reduce downtime

Indicators on the side and face of each emitter and receiver let operators troubleshoot for faults safely at the install location on the machine.





**F3SN-A/F3SH-A Safety Light Curtains  
Conform to Global Safety Standards  
Independently Tested and Certified**

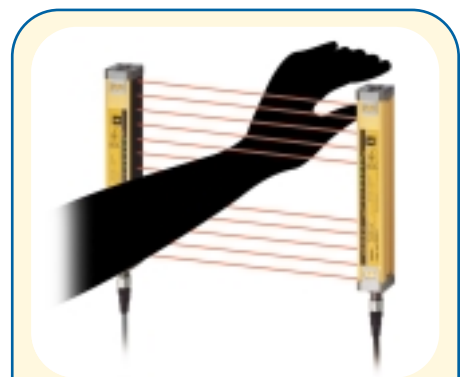
- Examined in accordance with Machinery Directive 98/37/EC
- Conforms to EMC Directive 89/336/EEC
- EN61496-1 (Type 4 ESPE) by Demko
- IEC61496-1 (Type 4 ESPE) by UL and Demko
- IEC61496-2 (Type 4 AOPD) by UL and Demko
- UL1998 Programmable System by UL
- UL Listing based on UL508 for both US and Canada
- OSHA regulations (29 CFR 1910.212)
- ANSI/RIA R15.06-1999 US Safety Requirements for Industrial Robots and Robot Systems.

*Certificates of compliance are available for inspection.*



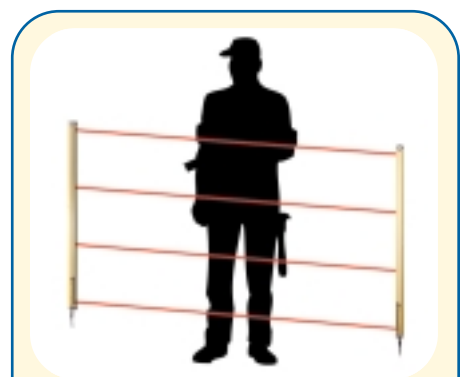
**Finger protection**

- Detection capability: 14 mm dia. min.
- Beam gap: 9 mm
- Operating range: up to 7 m
- Protective height: 189 to 1125 mm available



**Hand protection**

- Detection capability: 25 mm, 40 mm, 70 mm dia. min.
- Beam gap: 15 mm, 30 mm, 60 mm
- Operating range: up to 10 m
- Protective height: 217 to 1822 mm available



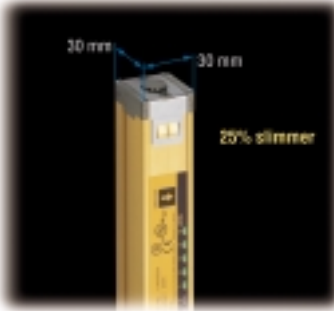
**Body protection**

- Beam gap: 300 mm
- Operating range: 10 m
- Protective height: 900 mm

# Easy to Configure

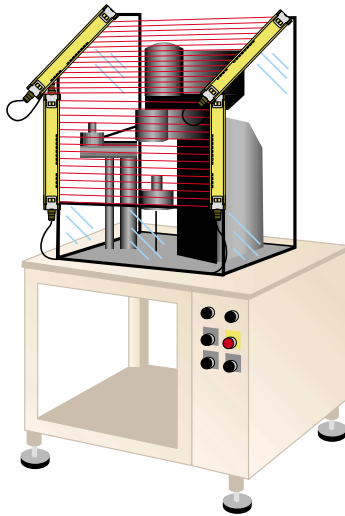
## Slim, clean design

The slim profile of Omron's F3SN-A light curtains measures just 30 x 30 mm (1.18 x 1.18 inches). The gold anodized aluminum housing withstands rugged use, with an IP65 enclosure rating for "ingress protection" against dust and water spray. The emitter/receiver pair has M12 connectors at each end, so it's ready for fast cable connection at installation and during servicing. A wide range of cable lengths is available to match your installation needs, sold in pairs or singly for emitter or receiver.



## Series connectable

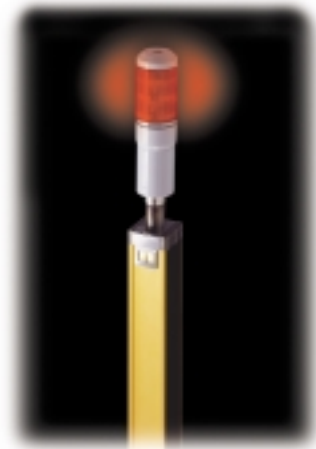
Configuration convenience sets F3SN-A apart from other systems. You can connect in series up to three pairs of light curtains, or 240 beams maximum, to protect any shape area around machinery. This flexibility lets you handle the typical installation of top-and-side protection with two pairs of light curtains.



## Beacon indicators

Omron also offers external beacons that mount directly to the top of emitters and receivers to signal different conditions. This eliminates separate circuitry and programming to handle the job. The optional beacon indicator threads into an M12 connector on emitter or receiver. The beacon can be programmed to show the following output status:

- Light-ON operation
- Dark-ON operation
- Light diagnosis
- Lockout



## Ready to work

Each F3SN-A light curtain contains the circuitry for monitoring and full functionality of a standalone Type 4 device even without ever connecting a control box. We suggest adding our safety relay unit for a system requiring 5-amp switching capacity. It's nice to know all the smarts are right there at the hazard area, protecting your operators at the machine.

## Specifications

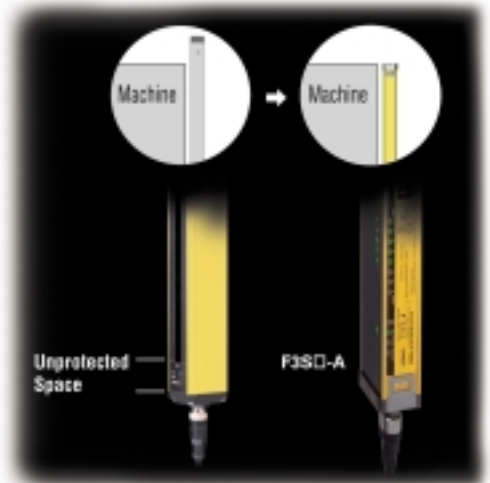
- 24 VDC power supply, 7 W rating
- Two PNP transistor safety outputs rated 300 mA, 24 VDC
- One programmable PNP auxiliary non-safety output rated 50 mA, 24 VDC
- External reset input (auto or manual)
- External device monitoring input (EDM)

## Reduce the safety distance

The fast response time for F3SN-A light curtains, even when connected to the F3SP-B1P safety relay unit, lets you mount the light curtain closer to the hazard point. Our response time is a maximum of 25 ms. The safety distance is how far away the light curtain has to be located from the hazard. Compare the response time of F3SN-A to other systems, and you will find Omron helps reduce your safety footprint around machinery by as much as half or more, freeing up floor space in your plant.

## Protective height = Sensor length

Omron's F3SN-A safety light curtains for hand-protection are designed with no unprotected space above or below, so the entire height is protected. Models with P25, P40 and P70 at the end of the part number offer this space-saving design.



Extra length is required for some light curtains to eliminate unprotected space. F3SN-A's short caps eliminate the unprotected space.

# Unique Setting Console

Access full light curtain functionality, shorten setup and troubleshooting

## Upload/download settings

Use the hand-held setting console to simply set these important functions.

- Fixed and floating blanking
- Auxiliary and beacon indicator outputs
- External device monitoring
- Unit identification number
- Settings security levels

Once set, use the *Copy Settings* function to store settings in a memory bank for emergency reloading or transfer them to another identical machine's safety light curtain system. The console comes with an M12 tee-connector.

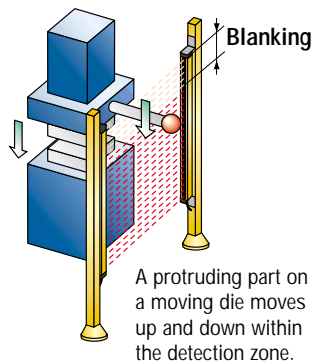
## Two types of blanking functions

Blanking functions let you modify the safety light curtain's detection patterns to accommodate workpieces entering/leaving the hazard area or fixtures that will be in place during operation.

### Floating blanking

Use floating blanking to disable detection of up to three non-specific beams. Output is turned OFF if more than the specified number of beams is obstructed. This is ideal for applications where a robot arm for removing work pieces passes through the safety light curtain detection zone at irregular intervals.

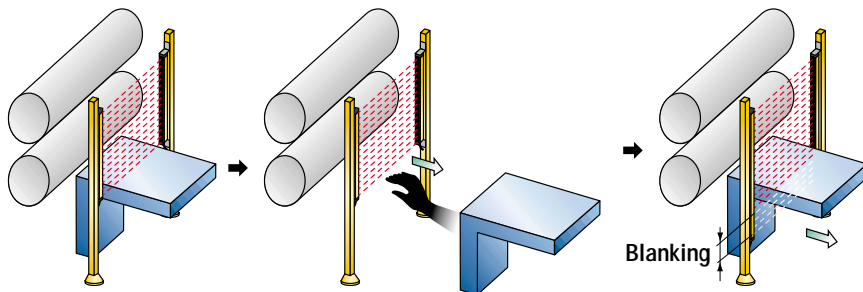
- 1 to 3 beams can be blanked
- Zones can be "taught" with a work piece of set up manually
- *Sequential mode only* can be enabled so beams have to be broken consecutively
- Maximum number of beams and zones can be limited in *Protect* mode



### Fixed blanking

Use fixed blanking to mask and disable specific beams. It is ideal for applications where a part of a machine or jig is always inside the fixed detection zone of the safety light curtain.

- 1 to 9 beams can be blanked
- 1 to 3 zones can be selected
- Zones can be taught with a workpiece or set up manually
- Maximum number of beams and zones can be limited in *Protect* mode



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

If fixed blanking is used and the workbench is removed, fixed blanking will be cancelled. If, for example, a hand enters the area, it will be detected, and the output will be turned OFF for safety.



**Function indicators:**  
Monitor/Set  
Copy  
Protect

**Communication connection indicator**

**Channel display**  
Identifies 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

## More Function Settings

### Auxiliary output/Beacon indicator

These programmable outputs can be set to respond to seven conditions:

- Light-ON
- Dark-ON
- Light diagnosis
- Lockout
- Outermost beam (Aux. only)
- Blanking (Aux. only)
- Specified beam (Aux. only)

The auxiliary PNP transistor output is rated for 50 mA at 24 VDC.

### External Device Monitoring (EDM)

The EN/IEC standards to protect against Category 4 hazards require an independent monitoring circuit for external device contacts such as those in safety contactors. If the contacts stick or weld, the light curtain goes into lockout mode until the problem is resolved. This function meets the requirements for control reliable operations.

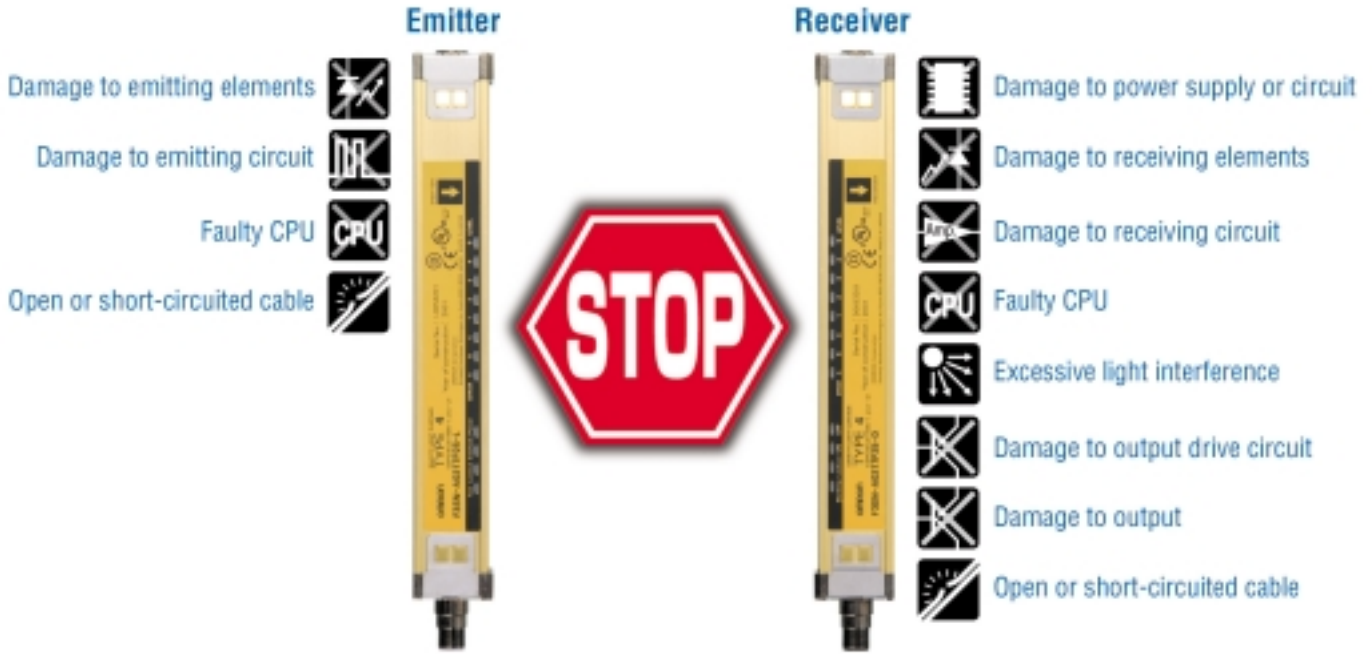
### Security protections

Set Bank Lock, Password and setting limitations to prevent tampering and unauthorized changes. Bank Lock prevents overwriting of setting when information is set or uploaded into the setting console. Protect the console with a 4-digit password to disallow setting changes. Setting limitation can be preset for the maximum numbers of allowable fixed blanked beams, floating blanked beams and the number of zones.

# Built-in Diagnostics

## Continuously monitor operation, simplify troubleshooting

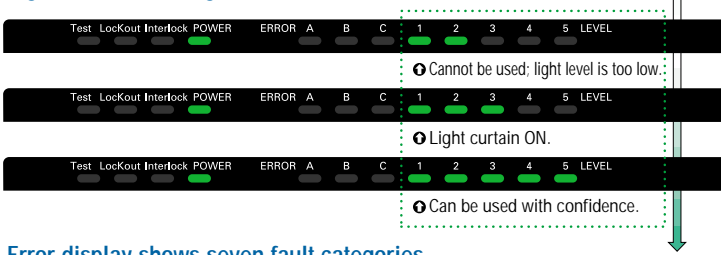
The F3SN-A automatically checks for internal circuit problems, open or short-circuited cables and abnormal incident light. If a problem occurs, the safety light curtain ensures that the machinery will stop by outputting the OFF signal, as when an intrusion is detected.



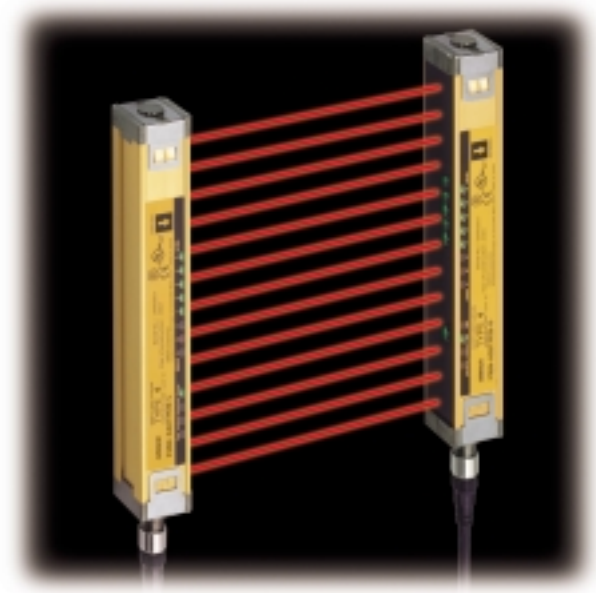
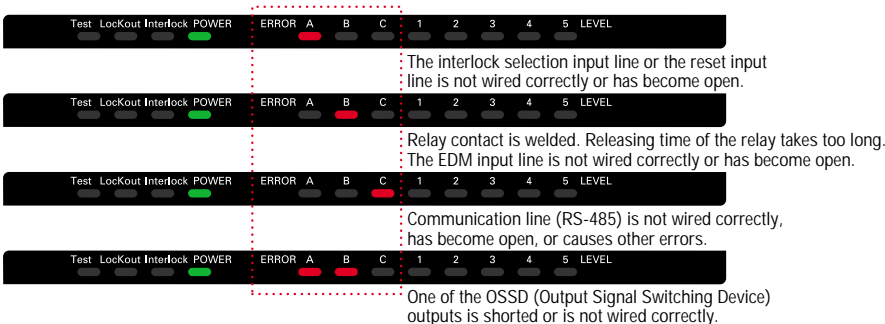
## Indicator Bars Simplify Troubleshooting

Omron has built in two sets of indicators on the side and face of both the emitter and receiver, so troubleshooting for faults can be done quickly and safely at the machine. Both emitter and receiver have indicators that show seven types of functional errors (red) and light intensity indicators (green) that help with alignment. The emitter also has status indicators for power-ON, interlock activated, lockout and test modes. The receiver shows status of blanking or lockout activation, and ON-state or OFF-state outputs. Stickers showing the legend to interpret error lights can be posted near the light curtain.

### Light level/beam alignment indicators



### Error display shows seven fault categories



Confirmation is possible from two directions.

# Ordering Information

## Safety Light Curtains Standard model sizes

### Finger Protection Models

Part number	Protective Height	Actual Height	No. of Beams	Specifications
F3SN-A0207P14	200 mm	207 mm	23	Operating range: 0.2 to 7 m Detection capability: 14 mm object Beam gap: 9 mm
F3SN-A0297P14	300 mm	297 mm	33	
F3SN-A0405P14	400 mm	405 mm	45	
F3SN-A0495P14	500 mm	495 mm	55	
F3SN-A0603P14	600 mm	603 mm	67	
F3SN-A0711P14	700 mm	711 mm	79	
F3SN-A0801P14	800 mm	801 mm	89	
F3SN-A0909P14	900 mm	909 mm	101	
F3SN-A0999P14	1000 mm	999 mm	111	
F3SN-A1107P14	1100 mm	1107 mm	123	

### Hand Protection Models

Part numbers for 40 mm and 70 mm object detection sizes end in P40 and P70 instead of P25.

Part number	Protective Height	Actual Height	No. of Beams	Specifications
F3SN-A0307P25 (-01)	12 inches	307 mm	19	Operating range: 0.2 to 10 m  <b>P25 models:</b> Detection capability: 25 mm object Beam gap: 15 mm  <b>P40 models:</b> Detection capability: 40 mm object Beam gap: 30 mm  <b>P70 models:</b> Detection capability: 70 mm object Beam gap: 60 mm
F3SN-A0457P25 (-01)	18 inches	457 mm	29	
F3SN-A0607P25 (-01)	24 inches	607 mm	39	
F3SN-A0757P25 (-01)	30 inches	757 mm	49	
F3SN-A0907P25 (-01)	36 inches	907 mm	59	
F3SN-A1057P25 (-01)	42 inches	1057 mm	69	
F3SN-A1207P25 (-01)	48 inches	1207 mm	79	
F3SN-A1357P25 (-01)	54 inches	1357 mm	89	
F3SN-A1507P25 (-01)	60 inches	1507 mm	99	
F3SN-A1657P25 (-01)	66 inches	1657 mm	109	
F3SN-A1807P25 (-01)	72 inches	1807 mm	119	

### Body Protection Models

Part number	Protective Height	No. of Beams	Operating Range	Detection Capability
F3SH-A09P03 (-01)	900 mm	4	0.2 to 10 m	300 mm dia. object

Note: For light curtains wired for series-connection, add "-01" suffix to the part number.

### Cables

Part number	Description	Length
F39-JC3A	Single-ended M12 connector cable (pair)	3 m
F39-JC7A	Single-ended M12 connector cable (pair)	7 m
F39-JC10A	Single-ended M12 connector cable (pair)	10 m
F39-JC15A	Single-ended M12 connector cable (pair)	15 m
F39-JCR2B*	Double-ended M12 connector cable (pair)	0.2 m
F39-JC3B*	Double-ended M12 connector cable (pair)	3 m
F39-JC7B	Double-ended M12 connector cable (pair)	7 m
F39-JC10B	Double-ended M12 connector cable (pair)	10 m
F39-JC15B	Double-ended M12 connector cable (pair)	15 m

Note: \* indicates cables that can be used with the series-connection light curtain models (-01 suffix).

### Additional Products

Part number	Description
F3SP-B1P	Control Unit with safety relay, 3 NO + 1 NC
F39-MC11	Setting Console, one branching connector, one connector cable (2 m length), manual
F39-A01PR-L	External beacon, red, for emitter, M12
F39-A01PR-D	External beacon, red, for receiver, M12
F39-A01PG-L	External beacon, green, for emitter, M12
F39-A01PG-D	External beacon, green, for receiver, M12

# Omron Offers a Wide Range of Safety Solutions



## Safety Relays

Compact track-mount safety relay units provide reliable control with force-guided contacts. Economical plug-in safety relays let you build the control system appropriate for your application.



## Safety Door and Positive Opening Limit Switches

Omron's interlock safety door switches are suitable for use with safety doors, gates and guards. All our safety switches feature positive opening contacts and a range of lock and actuator designs.



## Type 2 Safety Light Curtains

Buy only the amount of safety protection you need based on the type of hazard and save on each installation. For hazardous environment categories B, 1 and 2, Omron's F3S-B Type 2 safety light curtain provides a reliable solution. It offers external device monitoring and programmable blanking.



## 16 and 22 mm E-Stop Switches

Designed for no-tools installation, these two-part snap-together emergency stop switches are available in illuminated and non-illuminated models.

# OMRON®

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