

NEW

OMRON

F3SP-U2P

Safety Sensor Muting Controller

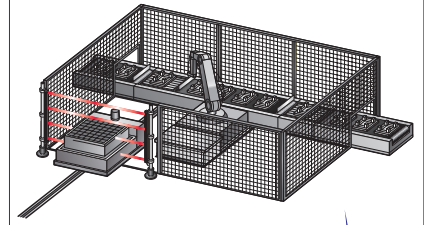


Take Full Advantage of F3SN Functionality!

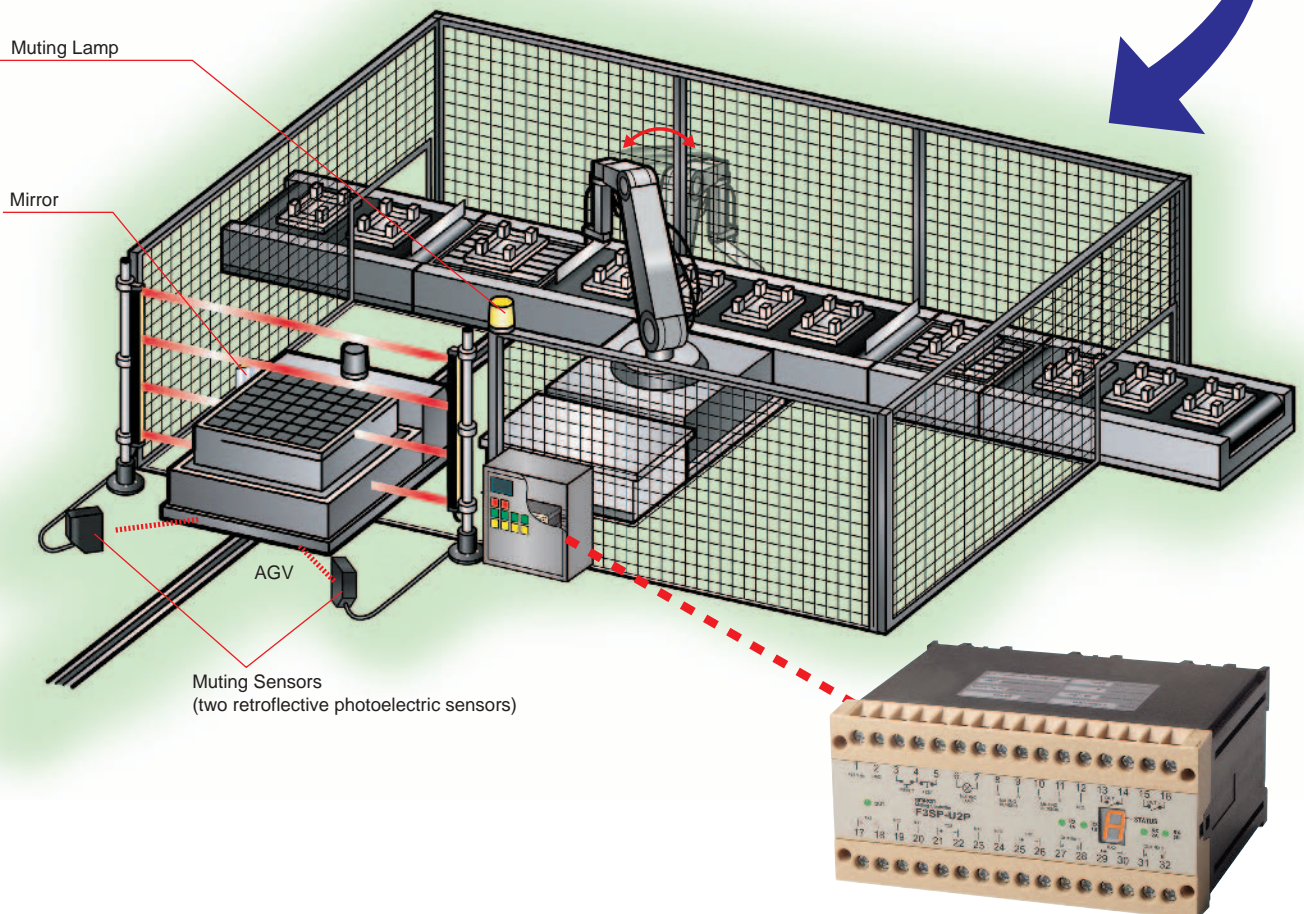
**Enhanced light curtain usefulness.
Detection only when there is danger.**

Previous Problem

As the workpiece is handed to the robot, the AGV shuts OFF the safety light curtain and processing stops.



Two Muting Sensors installed in front of the safety light curtain enable distinguishing between workpieces and humans by observing differences in operation timing.



Complies with Safety Category 4.



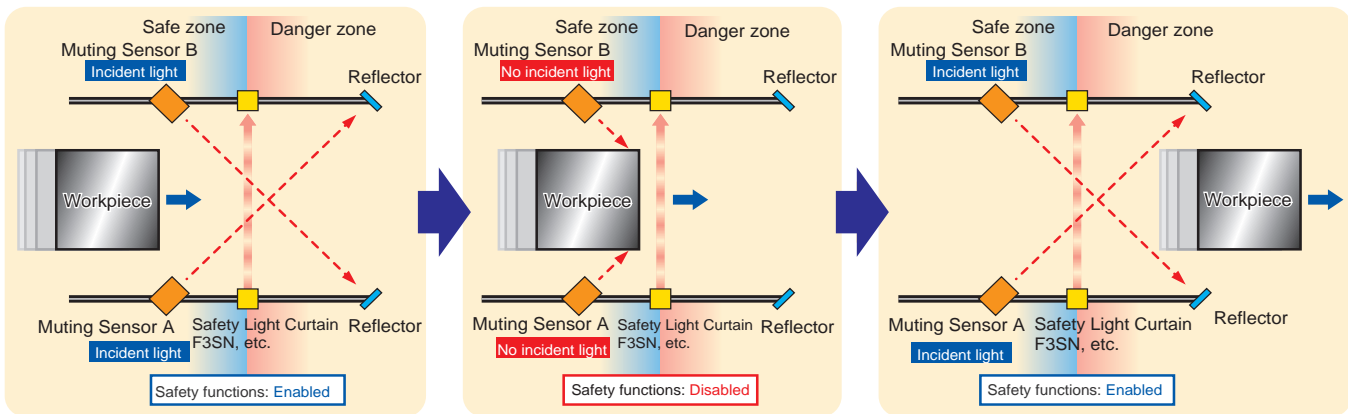
Features

The F3SP-U2P Controller is equipped with safety circuits and is used to add a muting function to Safety Sensors.

Muting

Muting temporarily disables safety functions when workpieces, conveyance pallets, or other items pass into the Safety Sensor detection zone.

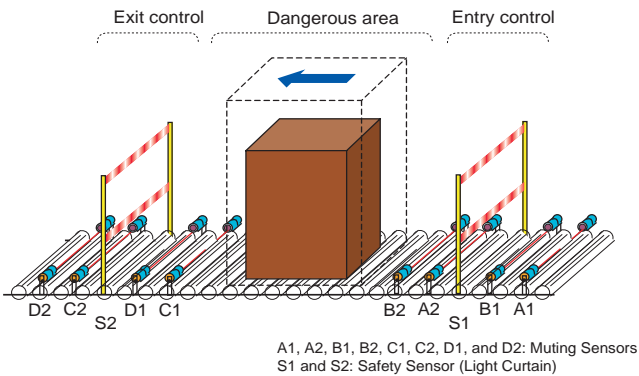
Note: Refer to the definition in international standard IEC61496-1 (JIS B9704-1), 3-16 Muting: A temporary automatic suspension of a safety function(s) by safety-related parts of the control system.



Note: The F3SP-U2P Muting Controller distinguishes between entry of a workpiece and a human using differences in the detection timing between Muting Sensors A and B. Adjust the installation locations and detection directions for Muting Sensors A and B so that the light for both sensors will not be blocked by the passing of a human.

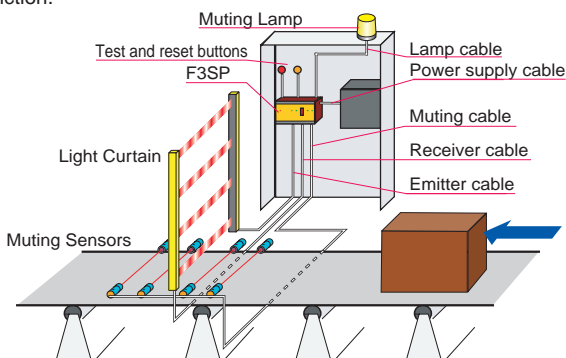
Connect Two Safety Sensors (Maximum)

Using two Safety Sensors is ideal for line loading and unloading areas.



Muting Lamp Output

It is essential to install a Muting Lamp to notify workers in the area when the muting function is in effect. The F3SP-U2P has a built-in diagnostic function with which errors such as burned out Muting Lamp bulbs are detected by means of the current to disable the muting function.



Compliance with Safety Category 4

Safety Category 4 can be complied with by connecting to type 4 sensors, such as the F3SN-A, F3SH, F3SL, or F3SS. Connecting to a type 2 sensor, such as the F3SN-B, complies with Safety Category 2.

Complies with International Standards

EC Directive compliance has been certified by TÜV Product Service, an independent German certification body. (CE marking)
For use in North America, the cUL Mark has been certified.

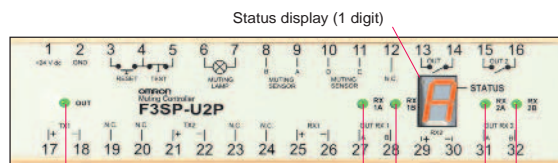


Either Two or Four Muting Sensors per Safety Sensor

The sensors that determine the timing of muting to distinguish between workpieces and humans are the Muting Sensors. Either of the following two installation methods can be used. With the first method, they are installed so that the optical axes of two through-beam or retroreflective photoelectric sensors cross. With the other method, four through-beam or retroreflective photoelectric sensors are installed and, in parallel with the safety sensors, proximity sensors or limit switches are installed, two each front and back. The muting sensor output must be a PNP transistor or NO contact output.

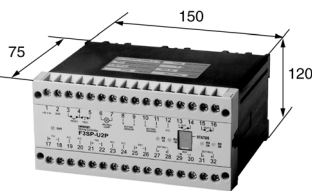
Status Indicators

Operating status and errors are displayed on a 7-segment LED display and sensor input indicators. They are effective during installation and for recovery from errors.



Output indicator (Green/red bicolor indicator) Sensor 1 input indicators (Green x 2) Sensor 2 input indicators (Green x 2)

Ordering Information

Appearance	Model
	F3SP-U2P

Ratings and Performance (For details, refer to the user manual.)

Item	F3SP-U2P
Safety category	Up to Category 4.
Number of light curtains connected	2 sets max. (See note 1.)
Power supply voltage	24 VDC \pm 10% (ripple p-p 10% max.)
Current consumption	8 W max. (not including Muting Lamps and Sensors) (See note 2.)
Response time	30 ms max.
Connectable light curtains	OMRON F3SN, F3SH, F3SL, and F3SS
Outputs	2 NO contacts, 250 VAC, 2.5 A max,
Inputs	Test inputs: NC contacts Reset inputs: NO contacts Muting sensor inputs: PNP transistor or NO contact; 4 sets max.
Indicators/Displays	Output indicators (Red/green LED indicators): Lit red when output is OFF. Lit green when output is ON. Input indicators (4 green LED indicators): Lit green when 24 V is input. Status display (7-segment, 1 digit) Displays F3SP status.
Test functions	Self-test (After power ON and during operation) External test (by test input)
Safety-related functions	Auto reset/manual reset (interlock) Muting function and override function
Applicable Muting Lamps	Incandescence lamp, 24 VDC, 3 to 7 W (See notes 1 and 2.)
Ambient temperature	During operation: -10 to 50 °C During storage: -30 to 70 °C (with no freezing or condensation)
Ambient humidity	15% to 95% (with no condensation)
Degree of protection	IEC60529 standard IP20
Vibration resistance (malfunction)	10 to 55 Hz, 0.7-mm double amplitude, 20 sweeps each in X, Y and Z directions
Shock resistance (malfunction)	100 m/s ² 1,000 times each in X, Y, and Z directions
Weight (packaged)	Approx. 870 g
Accessories	User manual

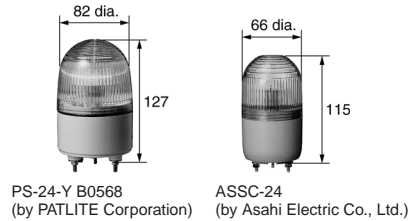
Note 1. The total power consumption cannot exceed 24 W, which is the F3SP fuse (self-resetting) rating.

- Light curtain
- Muting lamp: 3 to 7 W
- F3SP alone (without load current): 8 W

2. A Muting Lamp is required even when the muting function is not used.

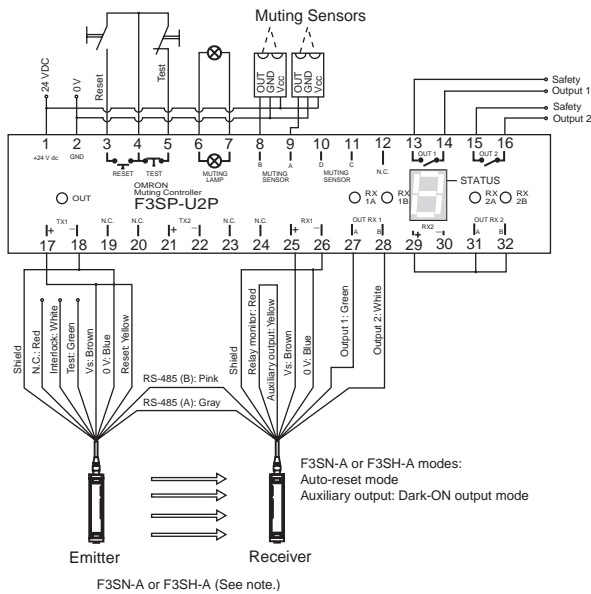
The following are recommended. (The power consumption is 5 W for either one.)

- PS-24-Y B0568: By PATLITE Corporation. (Incandescence electric bulbs must be used for replacements. Fault detection will not function if an LED lamp is used.)
- ASSC-24: By Asahi Electric Co., Ltd.

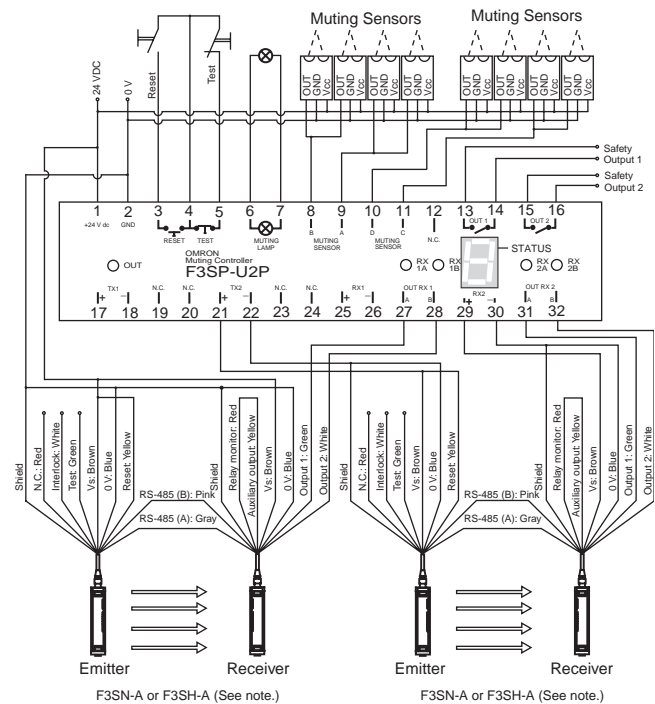


Connection Examples (Complies with Category 4)

Using One Safety Light Curtain and Two Muting Sensors



Using Two Safety Light Curtains and Eight Muting Sensors



When two Safety Light Curtains are connected, there is a possibility of exceeding the F3SP-U2P's rated power consumption of 24 W. As shown in the wiring diagram, provide 24 V directly from an external power supply to either of the Safety Light Curtains.

F3SN-A or F3SH-A modes:

- Auto-reset mode
- Auxiliary output: Dark-ON output mode.

Note: When an F3SN-B is connected, Category 2 is satisfied.

Precautions for Safe Use

! WARNING

The Muting Controller temporarily disables Safety Sensor outputs. If it is installed or used incorrectly, not only can safety not be assured, but an extremely dangerous situation may result.

- This datasheet is simply a guide to selecting products. Before attempting to operate the product, carefully read and understand the information provided in the user manual provided with the product.
- Carefully consider the installation environment and the performance and functionality of the equipment before using the product.
- Have a risk assessment carried out by qualified personnel before using the product.
- The product is designed to be used in combination with special safety sensors. Do not use it in combination with other sensors that do not conform to applicable international standards.

● Applicable International Standards

The following international standards apply when implementing muting control. Refer to these standards when constructing actual safety circuits, and make sure that requirements are satisfied.

- EN954-1, ISO13849-1 Safety on machinery: Safety-related parts of control systems, Part 1: General principles for design, Section 5.9 Muting.

- IEC61496-1 Safety of machinery: Electro-sensitive protective equipment, Part 1: General requirements and tests, Annex A, A.7 Muting.
- EN 415-4: "Safety of packaging machines part 4. Palletizers and depalletizers" Annex A, A2.2 Muting
- ANSI B11.19-1990 "for Machine Tools - Safeguarding When Referenced by the Other B11 Machine Tool Safety Standards - Performance Criteria for the Design, Construction, Care, and Operation" 4.2.3 Presence-Sensing Devices: Electro-Optical and Radio Frequency (R.F.)