

# Optical Touch Switch SW-100 SERIES

- FIBER SENSORS
- LASER SENSORS
- PHOTOELECTRIC SENSORS
- MICRO PHOTOELECTRIC SENSORS
- AREA SENSORS
- LIGHT CURTAINS**
- PRESSURE / FLOW SENSORS
- INDUCTIVE PROXIMITY SENSORS
- PARTICULAR USE SENSORS
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- Single Beam Sensor
- Light Curtains
- Control Units
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Related Information

■ General terms and conditions..... F-17    ■ General precautions ..... P.1405



[panasonic-electric-works.net/sunx](http://panasonic-electric-works.net/sunx)



Conforming to OSHA / ANSI

## Gentle start-up switches in accordance with ergonomics

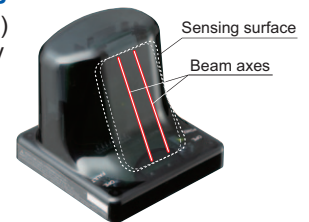
Greater convenience with less stress on the hands.  
Inventive start-up switches in accordance with ergonomics.

**SW-101**



### Operate the switch simply by touching it

This is an optical-type switch (two beam axes) which allows you to start equipment simply by touching the sensing surface to interrupt the light beams.



### Reduces load on hands and fingers

Provides a zero force, low impact, machine control solution.

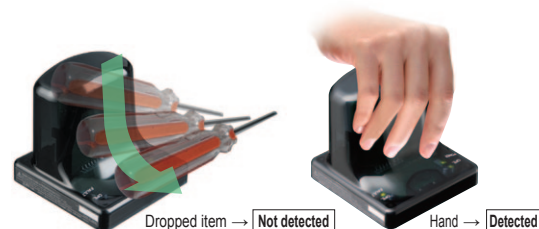
### Prevents medical issues

The switch reduces the possibility of medical problems that are associated with high impact push buttons, such as tendonitis or carpal tunnel syndrome.

## Reduction in false operation from dropped objects

**SW-101**

The response time is set for a slight delay so that the switch will not respond a falling object, such as a dropped tool. The switch is designed so that it will operate when touched by hand, but false operation will rarely occur when something is dropped onto it.



## A switch that pursues the prevention requirement for malfunctioning as required by ISO 13851 (JIS B 9712) two-hand control devices

**SW-111**

### Safeguard prevents false operation

**SW-111** saves the hassle of making an additional safeguard. In addition, with its ISO 13851 complying shape, even a knock on the elbow will not cause a false operation (light interruption).

**No false operation by wrist**



**No false operation by elbow**

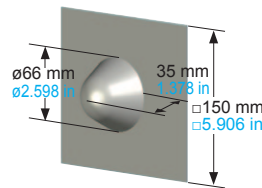


**No false operation by plastic sheet**



### Experimental cone (ISO 13851)

**SW-111** does not produce false operation on the experimental cone specified by ISO 13851.



## Intended startup is possible

**SW-111**

**SW-111**'s detection does not operate when a hand is just placed onto the unit.

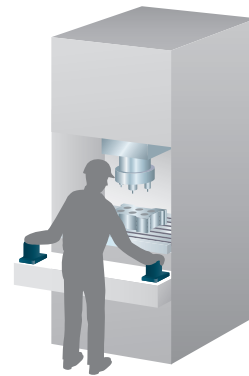
With a design that only detects when fingers are bent in and lightly grip onto the unit, an intended startup is possible.



Detection does not operate when a hand is only placed onto the unit.



Detection only operates when fingers are bent in and lightly grip onto the unit.

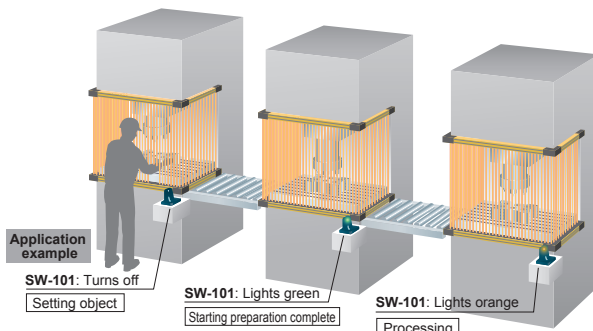


### Application example

When used as two-hand control devices

## Equipped with external input indicators

Two sets of external input indicators (two colors) are provided, so that they can be used as operation indicators for a variety of purposes.



## Prevents false operation caused by dirt

If the light is continuously interrupted for more than 10 sec. by dust, etc., the switch is disabled and the fault indicator (yellow) illuminates.

## Uses a long-life Photo-MOS relay

Because a Photo-MOS relay is used for the output, a single unit can be configured without a specific output polarity. In addition, there is no need for periodic replacement of parts such as contact-type relays.

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**SW-100**

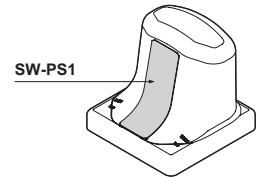
**ORDER GUIDE**

Designation	Appearance	Model No.	Power supply	Output
Optical touch switch		<b>SW-101</b>	12 to 24V DC ±10 %	Semiconductor Photo-MOS relay output × 3
	With safeguard			

**OPTIONS**

Designation	Model No.	Description
Mounting tool	<b>SW-MT1</b>	Tool for tightening mounting nuts with a commercially-available wrench.
Sensing surface protective sheet for SW-101	<b>SW-PS1</b>	A transparent stick-on sheet that protects the sensing surface of <b>SW-101</b> from dirt and scratches. <u>5 sheets per set</u>

Sensing surface protective sheet for SW-101

**SPECIFICATIONS**

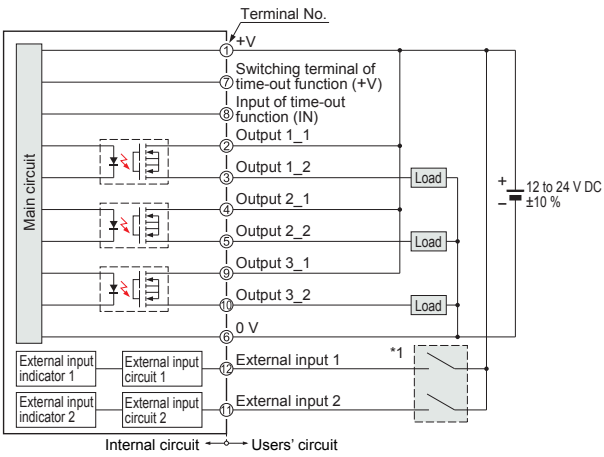
Item	Designation	Optical touch switch	
	Model No.	<b>SW-101</b>	With safeguard <b>SW-111</b>
Sensing method	Thru-beam type photoelectric sensor (2 beam axes)		
Applicable standards	CSA 22.2 No.14, CSA 22.2 No.0.8, ANSI / NFPA 79, UL 508, EN 60947-5-2 (EMC only)		
Power supply	12 to 24 V DC ±10 % Ripple P-P 10 % or less		
Current consumption	100 mA or less (excluding external connection load)		
Outputs	Semiconductor Photo-MOS relay output × 3 <ul style="list-style-type: none"> <li>• Maximum load current: 100 mA</li> <li>• Applied voltage: 30 V DC or less (between output and +V)</li> <li>• Residual voltage: 1.5 V or less (at 100 mA of load current)</li> </ul>		
Output operation	Output 1 : When an object is detected (beam is interrupted): OFF / When an object is not detected (beam is received): ON Output 2, 3 : When an object is detected (beam is interrupted): ON / When an object is not detected (beam is received): OFF		
Short-circuit protection	Incorporated		
Response time	100 ms or less when an object is detected, 50 ms or less when an object is not detected		
Time-out function	Switchable either effective or ineffective by short-circuiting terminals (disabled when short-circuited)		
External input	0 to 1 V or 10 V to +V: Valid (External input indicator lights up), 4 to 6 V or Open: Invalid (External input indicator lights off)		
Indicators	Power indicator (POWER)	Green LED (lights up when the power is ON)	
	Operation indicator (OPE.)	Green LED (lights up when an object is detected)	
	External input indicator 1	Green LED (lights up when external input 1 is valid)	
	External input indicator 2	Orange LED (lights up when external input 2 is valid)	
	Fault indicator (FAULT)	Yellow LED (blinks or lights up when fault occurs)	
Environmental resistance	Protection	IP65 (IEC), TYPE 1 (UL 50) (excluding terminal part)	
	Ambient temperature	-25 to +50 °C <b>-13 to +122 °F</b> (No dew condensation or icing allowed), Storage: -30 to +70 °C <b>-22 to +158 °F</b>	
	Ambient humidity	30 to 85 % RH, Storage: 30 to 85 % RH	
	Ambient illuminance	Incandescent light: 3,000 lx at the light-receiving face	
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure	
	Insulation resistance	20 MΩ, or more, with 500 V DC megger between all supply terminals connected together and enclosure	
	Vibration resistance	10 to 500 Hz frequency, 3 mm <b>0.118 in</b> amplitude in X, Y and Z directions for two hours each	10 to 150 Hz frequency, 0.75 mm <b>0.030 in</b> amplitude in X, Y and Z directions for two hours each
Shock resistance	500 m/s <sup>2</sup> acceleration (50 G approx.) in X, Y and Z directions for three times each		
Removable-type terminals	Connector	3.5 mm <b>0.138 in</b> pitch, 2-level socket: 12 pins	
	Terminal part	3.5 mm <b>0.138 in</b> pitch spring-cage terminals: 6 pins × 2 (FMC1,5 / 6-ST-3,5 manufactured by Phoenix Contact)	
Cable	0.2 to 1.5 mm <sup>2</sup> [including single wire or ferrule (sleeve)]		
Maximum cable length	Up to 20 m <b>65.617 ft</b> (for cable from 0.2 to 0.3 mm <sup>2</sup> ), Up to 100 m <b>328.084 ft</b> (for cable from 0.3 to 1.5 mm <sup>2</sup> )		
Material	Enclosure: Polycarbonate, Polyester, O-ring: Silicone rubber, Mounting nut: PBT, Mounting packing: Silicone rubber		
Weight	Net weight: 130 g approx. Gross weight: 200 g approx.		Net weight: 150 g approx. Gross weight: 220 g approx.

Note: Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C +73.4 °F.

**I/O CIRCUIT AND WIRING DIAGRAMS**

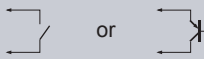
**I/O circuit diagram**

**If case of connecting output to Minus common**



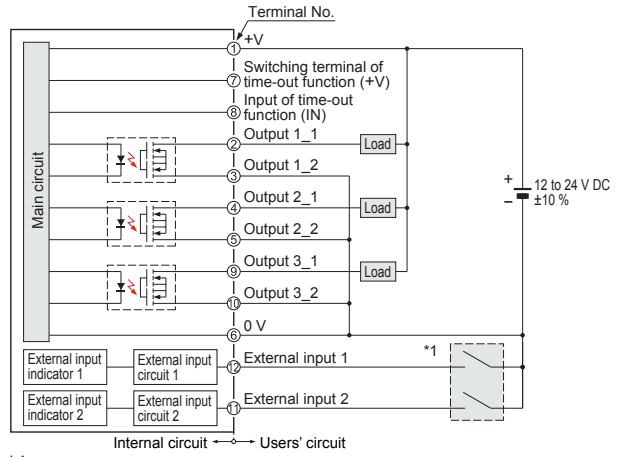
\*1

Non-voltage contact or PNP open-collector transistor



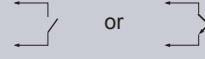
Contact "closed" or transistor "ON": Valid (External input indicator lights up)  
 Contact "open" or transistor "OFF": Invalid (External input indicator lights off)

**If case of connecting output to Plus common**



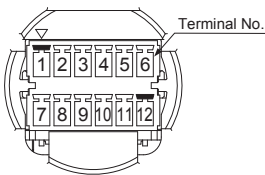
\*1

Non-voltage contact or NPN open-collector transistor



Contact "closed" or transistor "ON": Valid (External input indicator lights up)  
 Contact "open" or transistor "OFF": Invalid (External input indicator lights off)

**Terminal arrangement diagram**



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## PRECAUTIONS FOR PROPER USE

Refer to General precautions.



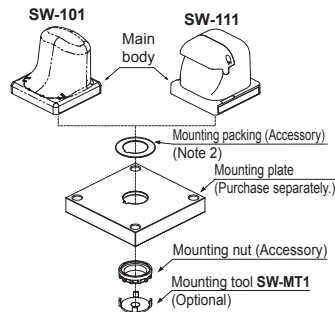
- Never use this product in a device for personnel protection.
- In case of using devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.
- Do not use this product as a device for emergency stop.
- This product is used to start up the machinery. Securing safety for the start-up of machinery should be performed separately.
- When using the products for two-hand control, comply with the following contents.
  - Select a model of a control device for two-hand control, based on results of risk assessment.
  - Make sure to use a controller for two-hand control which complies with ISO 13851 (EN 574, JIS B 9712)
  - For another requirements such as mounting of this product, or prevention of accidental actuation and of defeat etc., comply with ISO 13851 (EN 574, JIS B 9712) and ANSI B11.1, B11.9. Furthermore, comply with the regulations established by national or regional security committees (Occupational Safety and Health Administration: OSHA, the European Standardization Committee, etc.)

### Others

- When the power of the thru-beam type photoelectric sensor inside the main body turns on in beam interrupted status, output 1 turns ON and output 2 and 3 turn OFF, then the fault indicator (yellow) lights up. In this case, once beam is received, the fault indicator lights off and the sensor returns to normal operation.
- Use a power supply unit conforming to the EMC Directive and the Low Voltage Directive. (Only for use in Europe)
- Use a power supply unit conforming to Class 2. (Only for use in the North America)
- Use a power supply unit with an output holding time of 20 ms or more.
- Do not use during the initial transient time (300 ms approx.) after the power supply is switched on.

### Mounting

- Fasten a mounting nut (accessory) from the reverse side of the mounting plate. (Note 1)  
The tightening torque should be 2 to 3 N·m.

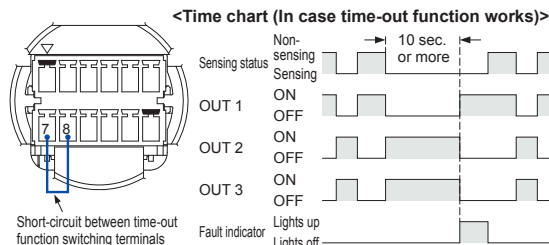


- Notes: 1) A mounting tool (**SW-MT1**) for fastening the mounting nut is available separately. The shape of fastening part of **SW-MT1** is M10 nut.
- 2) Make sure to use the attached mounting packing, or waterproof property will be invalid.

### Time-out function

- Unintended beam interrupted status caused by dirt on the sensing surface, etc. can be monitored. When beam interrupted status (sensing status) continues for 10 sec. or more, output 1 turns ON and output 2 and 3 turn OFF (output status is the same as non-sensing status.)
- This function can be invalid by short-circuiting “between switching terminals of time-out function (terminal No. 7 and No. 8)” as described below.

Note: When time-out function is operated, the fault indicator (yellow) lights up. In this case, once beam is received, the fault indicator lights off and the sensor returns to normal operation.



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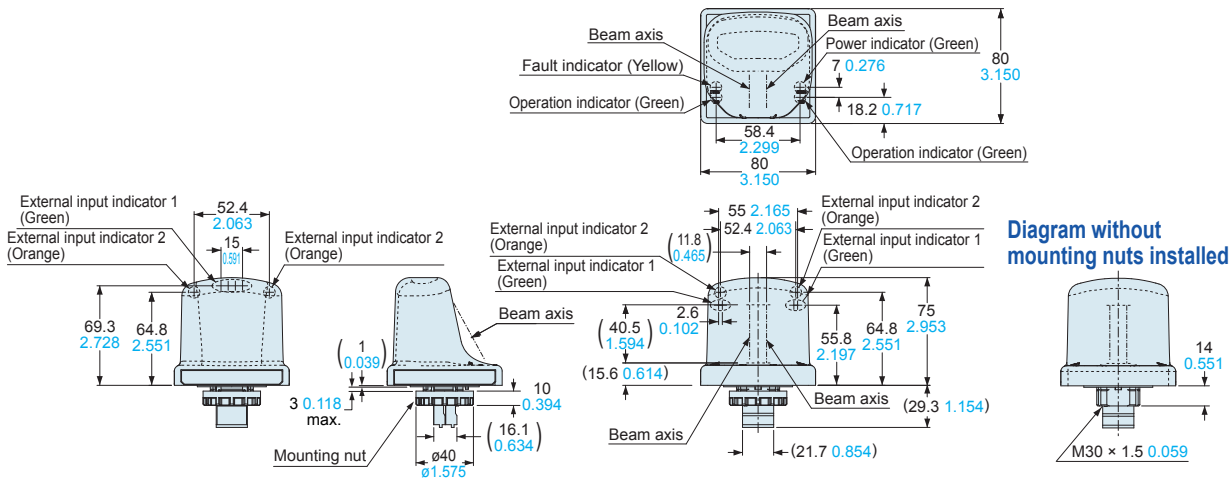


**DIMENSIONS (Unit: mm in)**

The CAD data in the dimensions can be downloaded from our website.

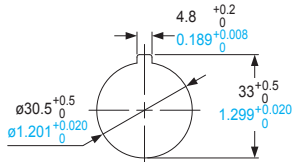
**SW-101**

Optical touch switch

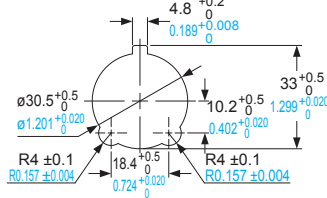


**Panel cut-out dimensions**

<When mounting with a resin plate>



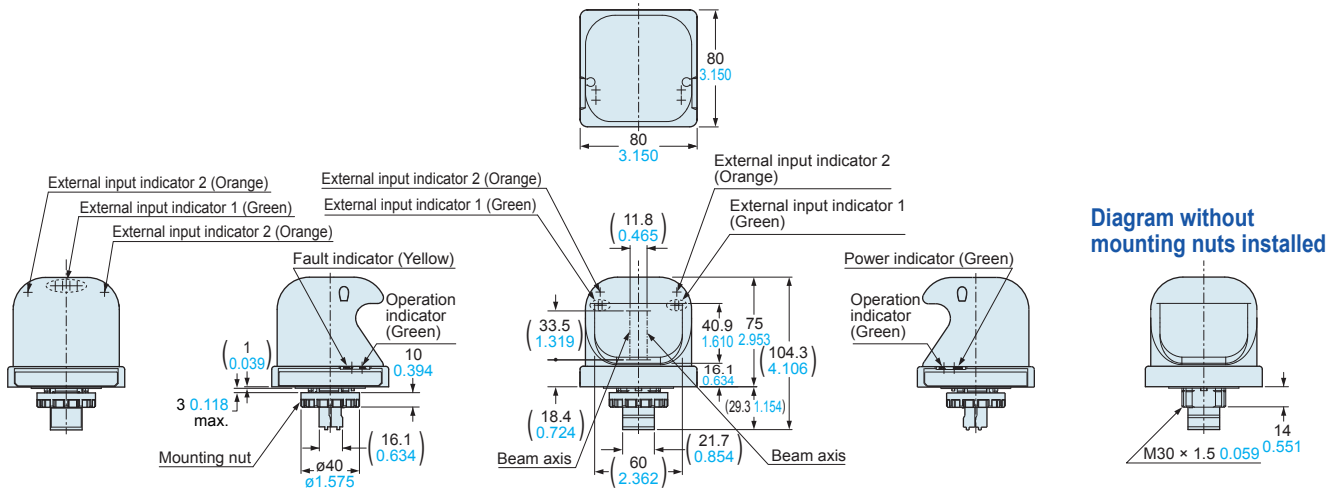
<When mounting with a metal plate>



Note: The panel thickness should be 3 mm 0.118 in or less.

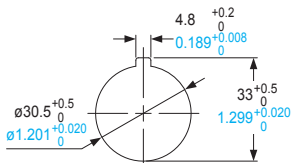
**SW-111**

Optical touch switch

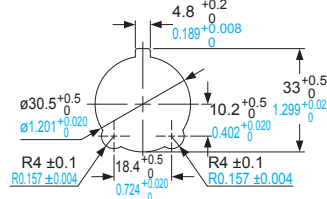


**Panel cut-out dimensions**

<When mounting with a resin plate>



<When mounting with a metal plate>



Note: The panel thickness should be 3 mm 0.118 in or less.

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