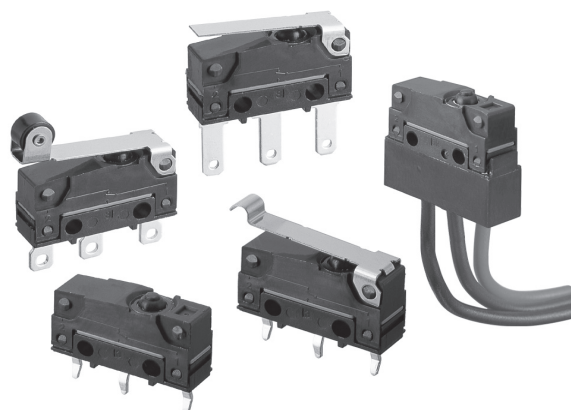


# Sealed Subminiature Basic Switch

## D2SW-P

### Sealed Basic Switch with Simplified Construction, Mounting Compatible with SS and D2SW Series.

- Sealed to IEC IP67.
- Switch rating of 2A at 250 VAC possible with a single-leaf movable spring. Models for micro loads are also available.
- Solder, quick-connect terminals (#110), PCB terminals and molded lead wires are available. Even-pitched PCB terminals are also standardized.



## Ordering Information

| Rating | Actuator               | Terminal | Solder terminals | Quick-connect terminals (#110) | PCB terminals |             | Molded lead wires |
|--------|------------------------|----------|------------------|--------------------------------|---------------|-------------|-------------------|
|        |                        |          |                  |                                | Uneven pitch  | Even pitch  |                   |
| 2A     | Pin plunger            |          | D2SW-P2H         | D2SW-P2T                       | D2SW-P2D      | D2SW-P2B    | D2SW-P2M          |
|        | Hinge lever            |          | D2SW-P2L1H       | D2SW-P2L1T                     | D2SW-P2L1D    | D2SW-P2L1B  | D2SW-P2L1M        |
|        | Hinge roller lever     |          | D2SW-P2L2H       | D2SW-P2L2T                     | D2SW-P2L2D    | D2SW-P2L2B  | D2SW-P2L2M        |
|        | Simulated roller lever |          | D2SW-P2L3H       | D2SW-P2L3T                     | D2SW-P2L3D    | D2SW-P2L3B  | D2SW-P2L3M        |
| 0.1A   | Pin plunger            |          | D2SW-P01H        | D2SW-P01T                      | D2SW-P01D     | D2SW-P01B   | D2SW-P01M         |
|        | Hinge lever            |          | D2SW-P01L1H      | D2SW-P01L1T                    | D2SW-P01L1D   | D2SW-P01L1B | D2SW-P01L1M       |
|        | Hinge roller lever     |          | D2SW-P01L2H      | D2SW-P01L2T                    | D2SW-P01L2D   | D2SW-P01L2B | D2SW-P01L2M       |
|        | Simulated roller lever |          | D2SW-P01L3H      | D2SW-P01L3T                    | D2SW-P01L3D   | D2SW-P01L3B | D2SW-P01L3M       |

**Note:** Consult your OMRON sales representative for details on SPST-NO and SPST-NC models.

### Model Number Legend

D2SW-P        

1   2   3   4

#### 1. Ratings

2: 2 A at 250 VAC  
01: 0.1 A at 30 VDC

#### 2. Actuator

None: Pin plunger  
L1: Hinge lever  
L2: Hinge roller lever  
L3: Simulated roller lever

#### 3. Contact Form

None: SPDT  
-2: SPST-NC\*  
-3: SPST-NO\*

\*Lead wire versions only

#### 4. Terminals

H: Solder terminals  
T: Quick-connect terminals (#110)  
D: PCB terminals (Uneven pitch)  
B: PCB terminals (even pitch)  
M: Molded lead wires

# Specifications

## ■ Characteristics

| Item                                        | Model                                                                                                                                                                                                                     |                                                                                                                        |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
|                                             | D2SW-P2                                                                                                                                                                                                                   | D2SW-P01                                                                                                               |
| Operating speed                             | 0.1 mm to 500 mm/s (pin plunger models)                                                                                                                                                                                   |                                                                                                                        |
| Operating frequency                         | Mechanical: 120 operations/min max.<br>Electrical: 20 operations/min max.                                                                                                                                                 |                                                                                                                        |
| Insulation resistance                       | 100 MΩ min. (at 500 VDC)                                                                                                                                                                                                  |                                                                                                                        |
| Contact resistance                          | Terminal models: 50 mΩ max.<br>Molded lead wire models: 100 mΩ max.                                                                                                                                                       | Terminal models: 100 mΩ max.<br>Molded lead wire models: 150 mΩ max.                                                   |
| Dielectric strength (see note 2)            | 1,000 VAC, 50/60 Hz for 1 min. between terminals of the same polarities<br>1,500 VAC, 50/60 Hz for 1 min. between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal parts | 600 VAC, 50/60 Hz for 1 min. between terminals of the same polarities                                                  |
| Vibration resistance (see note 3)           | Malfunction: 10 to 55 Hz, 1.5-mm double amplitude                                                                                                                                                                         |                                                                                                                        |
| Shock resistance (see note 3)               | Destruction: 1,000 m/s <sup>2</sup> (approx. 100 G) max.<br>Malfunction: 300 m/s <sup>2</sup> (approx. 30 G) max.                                                                                                         |                                                                                                                        |
| Degree of protection                        | IEC IP67 (excluding the terminals on terminal models)                                                                                                                                                                     |                                                                                                                        |
| Degree of protection against electric shock | Class I                                                                                                                                                                                                                   |                                                                                                                        |
| Proof tracking index (PTI)                  | 175                                                                                                                                                                                                                       |                                                                                                                        |
| Ambient operating temperature               | -20°C to 70°C (at 60% RH max.) with no icing                                                                                                                                                                              |                                                                                                                        |
| Ambient operating humidity                  | 85% max. (for 5°C to 35°C)                                                                                                                                                                                                |                                                                                                                        |
| Life expectancy                             | Mechanical: 1,000,000 operations min. (60 operations/min.)<br>Electrical: 50,000 operations min. (20 operations/min.)                                                                                                     | Mechanical: 1,000,000 operations min. (60 operations/min.)<br>Electrical: 200,000 operations min. (20 operations/min.) |
| Weight                                      | Approx. 2 g (pin plunger models with terminals)                                                                                                                                                                           |                                                                                                                        |

**Note:** 1. The data given above are initial values.

2. The dielectric strength shown is measured using a separator between the switch and metal mounting plate.

3. For the pin plunger models, the above values apply for both the free position and total travel position. For the lever models, the values apply at the total travel position. Contact opening or closing time is within 1 ms.

## ■ Ratings

| Model    | Rated voltage | Resistive load |
|----------|---------------|----------------|
| D2SW-P2  | 30 VDC        | 2 A            |
|          | 250 VAC       |                |
| D2SW-P01 | 30 VDC        | 0.1 A          |
|          | 125 VAC       |                |

**Note:** The ratings values apply under the following test conditions.

Ambient temperature: 20±2°C

Ambient humidity: 65±5%

Operating frequency: 20 operations/min.

## ■ Approved Standards

Consult your OMRON sales representative for specific models with standard approvals.

### UL Recognized CSA Certified

| Rated voltage | D2SW-P2 | D2SW-P01 |
|---------------|---------|----------|
| 125 VAC       | —       | 0.1 A    |
| 250 VAC       | 2 A     | —        |
| 30 VDC        | 2 A     | 0.1 A    |

## ■ Contact Specifications

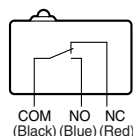
| Item                               | D2SW-P2         | D2SW-P01      |
|------------------------------------|-----------------|---------------|
| Specification                      | Rivet           | Crossbar      |
| Material                           | Silver alloy    | Gold alloy    |
| Gap (standard value)               | 0.5 mm          |               |
| Minimum applicable load (see note) | 160 mA at 5 VDC | 1 mA at 5 VDC |

**Note:** Minimum applicable loads are indicated by N standard reference values. This value represents the failure rate at a 60% ( $\lambda_{60}$ ) reliability level (JIS C5003).

The equation  $\lambda_{60}=0.5 \times 10^{-6}$  / operations indicates that a failure rate of 1/2,000,000 operations can be expected at a reliability level of 60%.

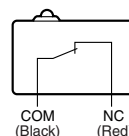
## ■ Contact Form

### SPDT



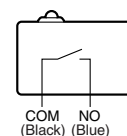
### SPST-NC

(wire models, only)



### SPST-NO

(wire models, only)



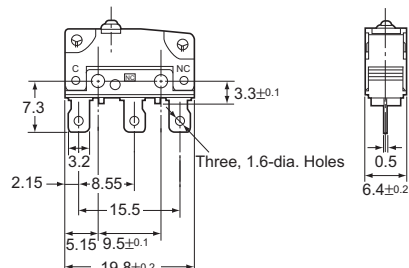
**Note:** Lead wire colors are indicated in parentheses.

# Dimensions

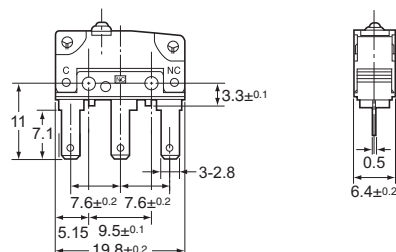
## ■ Terminals

- Note:** 1. All units are in millimeters unless otherwise indicated.  
2. Terminal plate thickness is 0.5 mm for all models.

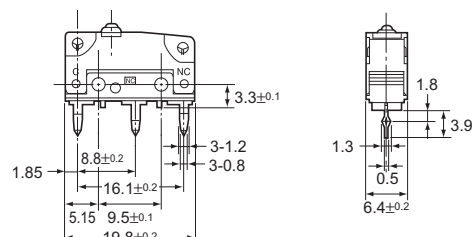
### Solder Terminals



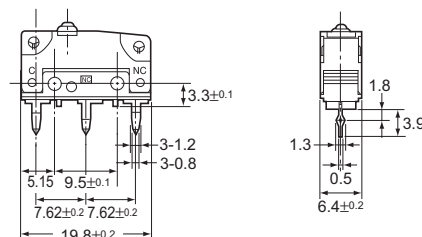
### Quick-connect Terminals (#110)



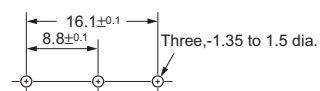
### PCB Terminals (Uneven pitch)



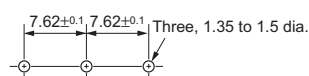
### PCB Terminals (Even pitch)



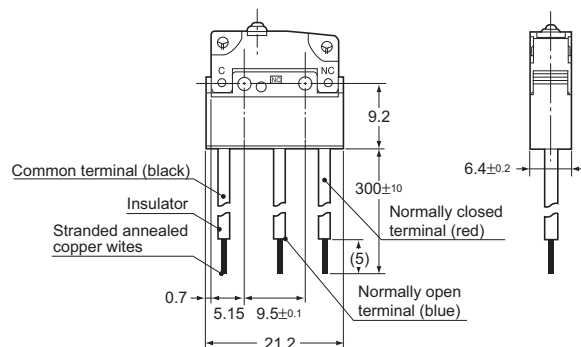
### PCB Mounting Dimensions (Reference)



### PCB Mounting Dimensions (Reference)



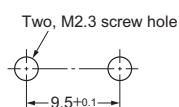
### Molded Lead Wires



## ■ Mounting Holes

All switches may be panel mounted using M2.3 mounting screws with plane washers or spring washers to securely mount the switch. Tighten the screws to a torque of 0.23 to 0.26 N·m

Exceeding the specified torque may result in deterioration of the sealing or damage.



# Dimensions and Operating Characteristics

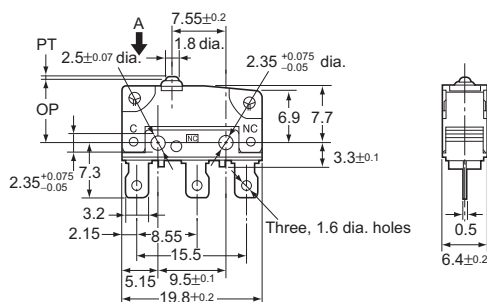
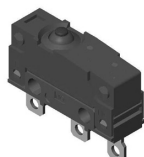
**Note:** 1. Unless otherwise specified, all units are in millimeters and a tolerance of  $\pm 0.4$  mm applies to all dimensions

2. The following illustrations and drawings are for solder terminal models. Refer to *Terminals* section for details on models with quick-connect terminals (#110) or PCB terminals or molded lead wires.

3. The operating characteristics are for operation in the A direction (↓).

## Pin Plunger Models

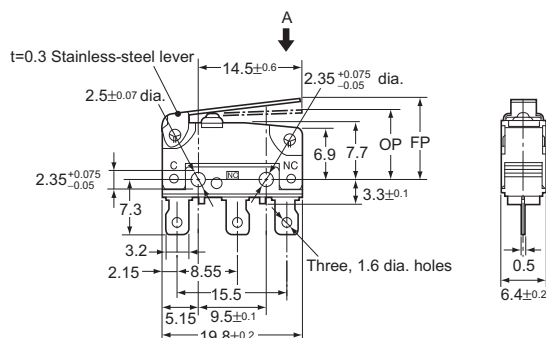
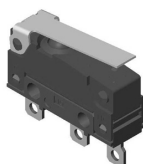
D2SW-P2□□  
D2SW-P01□□



|         |            |
|---------|------------|
| OF max. | 183 gf     |
| RF min. | 20 gf      |
| PT max. | 0.6 mm     |
| OT min. | 0.4 mm     |
| MD max. | 0.15 mm    |
| OP      | 8.4±0.3 mm |

## Hinge Lever Models

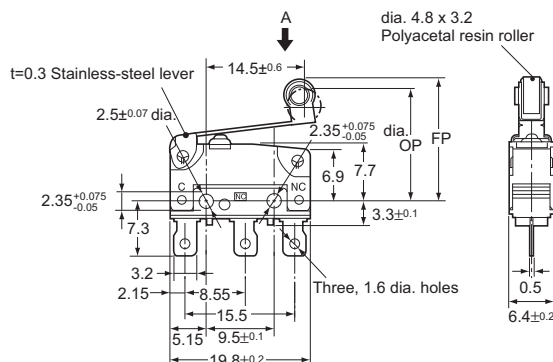
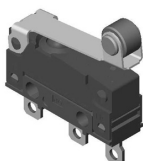
D2SW-P2L1□□  
D2SW-P01L1□□



|         |            |
|---------|------------|
| OF max. | 61 gf      |
| RF min. | 5 gf       |
| OT min. | 0.8 mm     |
| MD max. | 0.8 mm     |
| FP max. | 13.6 mm    |
| OP      | 8.8±0.8 mm |

## Hinge Roller Lever Models

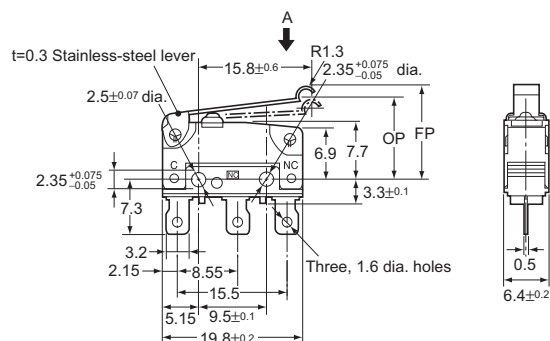
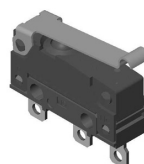
D2SW-P2L2□□  
D2SW-P01L2□□



|         |             |
|---------|-------------|
| OF max. | 61 gf       |
| RF min. | 5 gf        |
| OT min. | 0.8 mm      |
| MD max. | 0.8 mm      |
| FP max. | 19.3 mm     |
| OP      | 14.5±0.8 mm |

## Simulated Roller Lever Models

D2SW-P2L3□□  
D2SW-P01L3□□



|         |             |
|---------|-------------|
| OF max. | 61 gf       |
| RF min. | 5 gf        |
| OT min. | 0.8 mm      |
| MD max. | 0.8 mm      |
| FP max. | 15.5 mm     |
| OP      | 10.7±0.8 mm |

# Precautions

Be sure to read the precautions and information common to all Snap Action and Detection Switches, contained in the Technical User's Guide, "Snap Action Switches, Technical Information" for correct use.

## Correct Use

### Mounting

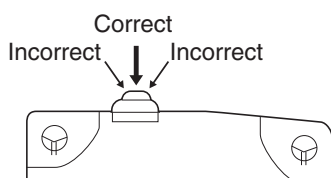
Turn OFF the power supply before mounting or removing the Switch, wiring, or performing maintenance or inspection. Failure to do so may result in electric shock or burning.

Mount the Switch onto a flat surface. Mounting on an uneven surface may cause deformation of the Switch, resulting in faulty operation or damage.

### Operating Body

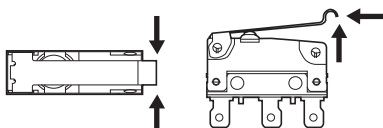
Use an operating body with low frictional resistance and of a shape that will not interfere with the sealing rubber, otherwise the plunger may be damaged or the sealing may deteriorate.

With the pin plunger models, set the Switch so that the plunger can be pushed in from directly above. Since the plunger is covered with a rubber cap, applying a force from lateral directions may cause damage to the plunger or reduction in the sealing capability



### Handling

Do not handle the Switch in a way that may cause damage to the sealing rubber. When handling the Switch, ensure that uneven pressure or, as shown in the following diagram, pressure in a direction other than the operating direction is not applied to the Actuator, otherwise the Actuator or Switch may be damaged, or durability may be decreased.



### Wiring Molded Lead Wire Models

When wiring molded lead wire models, ensure that there is no weight on the wire or that there are no sharp bends near the parts where the wire is drawn out. Otherwise, damage to the Switch or deterioration in the sealing may result.

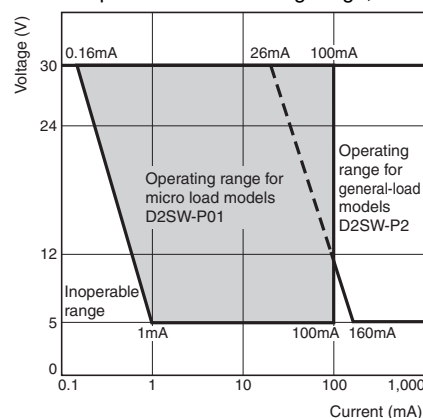
### Operating Stroke Setting

Set the operating stroke so that the actuator is completely disengaged when the switch is in the free position (FP), and is pushed to a point between 60% and 90% of the OT distance after the switch is operated.

Insufficient or excessive pushing of the actuator may result in decreased switch durability or damage to the switch.

### Using Micro Loads

Using a model for ordinary loads to switch microloads may result in faulty operation. Instead, use the models that are designed for microloads and that operate in the following range;



However, even when using microload models within the operating range shown above, if inrush current or inductive voltage spikes occur when the contact is opened or closed, then contact wear may increase and so decrease the service life. Therefore, insert a contact protection circuit where necessary.

## ■ Cautions

### Degree of Protection

Do not use this product in water. Although these models satisfy the test conditions for the standard given below, this test is to check the ingress of water into the switch enclosure after submerging the Switch in water for a given time. Satisfying this test condition does not mean that the Switch can be used in water.

IEC 60529: 2001 Degrees of protection provided by enclosures (IP Code)

Code: IP67 (The test to meet the standard checks for water intrusion after immersion for 30 minutes.)

Do not operate the Switch when it is exposed to water spray, or when water drops adhere to the Switch surface, or during sudden temperature changes, otherwise water may intrude into the interior of the Switch due to a suction effect.

Prevent the Switch from coming into contact with oil and chemicals. Otherwise, damage to or deterioration of Switch materials may result.

Do not use the Switch in areas where it is exposed to silicon adhesives, oil, or grease, otherwise faulty contact may result due to the generation of silicon oxide.

The environment-resistant performance of the switch differs depending on operating loads, ambient atmospheres, and installation conditions, etc. Please perform an operating test of the switch in advance under actual usage conditions.

### Connecting to Terminals

#### Connecting to Solder Terminals

When soldering the lead wire to the terminal, first insert the lead wire conductor through the terminal hole and then conduct soldering.

Make sure that the temperature at the tip of the soldering iron is 350 to 400°C. Do not take more than 3 seconds to solder the switch terminal, and do not impose external force on the terminal for 1 min. after soldering. Improper soldering involving an excessively high temperature or excessive soldering time may deteriorate the characteristics of the Switch.

#### Connecting to Quick-connect Terminals

Wire the quick-connect terminals (#110) with receptacles. Insert the terminals straight into the receptacles. Do not impose excessive force on the terminal in the horizontal direction, otherwise the terminal may be deformed or the housing may be damaged.

#### Connecting to PCB Terminal Boards

When using automatic soldering baths, we recommend soldering at 260±5°C within 5 seconds. Make sure that the liquid surface of the solder does not flow over the edge of the board.

When soldering by hand, as a guideline, solder with a soldering iron with a tip temperature of 350 to 400°C within 3 seconds, and do not apply any external force for at least 1 minute after soldering. When applying solder, keep the solder away from the case of the Switch and do not allow solder or flux to enter the case.

### Side-actuated (Cam/Dog) Operation

When using a cam or dog to operate the Switch, factors such as the operating speed, operating frequency, push-button indentation, and material and shape of the cam or dog will affect the durability of the Switch. Confirm performance specifications under actual operation conditions before using the Switch in applications.



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**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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