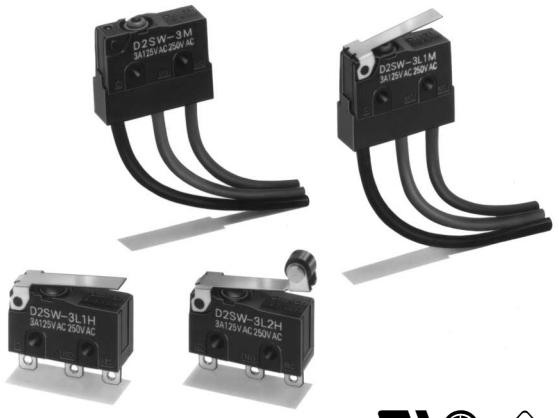
OMRON

Sealed Subminiature Basic Switch

D2SW

Sealed Subminiature Basic Switch Conforming to IP67 (Molded Lead Wire Type Only)

- Use of epoxy resin assures stable sealing, making this switch ideal for places subject to water spray or excessive dust.
- Ideal for automobiles, automatic vending machines, refrigerators, ice-making equipment, bath equipment, hot-water supply systems, air conditioners, and industrial equipment, which require high environmental resistance.
- Models available with conformance to safety standards, including UL, CSA and VDE.



Ordering Information

■ Model Number Legend

D2SW-□□□□

1 2 3 4

1. Ratings
- 01: 0.1 A at 30 VDC
- 3: 3 A at 125 VAC

2. Actuator
- None: Pin plunger
- L1: Hinge lever
- L2: Hinge roller lever
- L3: Simulated roller lever

3. Contact Form
- None: SPDT
- -2: SPST-NC (Molded lead wire model only)
- -3: SPST-NO (Molded lead wire model only)

4. Terminals
- H: Solder terminal (HS for UL and CSA approval)
- D: PCB terminal (DS for UL and CSA approval)
- T: Quick-connect terminal (#110) (TS for UL and CSA approval)
- M: Molded lead wire (MS for UL and CSA approval)

■ List of Models

Actuator		Model	
		3 A	0.1A
Pin plunger	Solder terminals	D2SW-3H	D2SW-01H
	Quick-connect terminals (#110)	D2SW-3T	D2SW-01T
	PCB terminals	D2SW-3D	D2SW-01D
	Molded lead wires	D2SW-3M	D2SW-01M
Hinge lever	Solder terminals	D2SW-3L1H	D2SW-01L1H
	Quick-connect terminals (#110)	D2SW-3L1T	D2SW-01L1T
	PCB terminals	D2SW-3L1D	D2SW-01L1D
	Molded lead wires	D2SW-3L1M	D2SW-01L1M
Simulated roller lever	Solder terminals	D2SW-3L3H	D2SW-01L3H
	Quick-connect terminals (#110)	D2SW-3L3T	D2SW-01L3T
	PCB terminals	D2SW-3L3D	D2SW-01L3D
	Molded lead wires	D2SW-3L3M	D2SW-01L3M
Hinge roller lever	Solder terminals	D2SW-3L2H	D2SW-01L2H
	Quick-connect terminals (#110)	D2SW-3L2T	D2SW-01L2T
	PCB terminals	D2SW-3L2D	D2SW-01L2D
	Molded lead wires	D2SW-3L2M	D2SW-01L2M

Note: 1. The standard lengths of the molded lead wires (AV0.5f) of models incorporating them are 30 cm.
2. Contact your OMRON representative for details on SPST-NO and SPST-NC models.
3. Specify model numbers with “HS,” “DS,” “TS,” or “MS” at the end for UL/CSA-approved products (e.g., D2SW-3H → D2SW-3HS).

Specifications

■ Ratings

Model	Rated voltage	Non-inductive load				Inductive load			
		Resistive load		Lamp load		Inductive load		Motor load	
		NC	NO	NC	NO	NC	NO	NC	NO
D2SW-3	125 VAC	3 A		1 A	0.5 A	1 A	0.5 A	1 A	0.5 A
	250 VAC	2 A		0.5 A	0.3 A	0.5 A	0.3 A	0.5 A	0.3 A
	30 VDC	3 A		1 A		1 A		1 A	
D2SW-01	125 VAC	0.1 A		---		---		---	
	30 VDC	0.1 A		---		---		---	

Note: 1. The above current ratings are the values of the steady-state current.
2. Inductive load has a power factor of 0.7 min. (AC) and a time constant of 7 ms max. (DC).
3. Lamp load has an inrush current of 10 times the steady-state current.
4. Motor load has an inrush current of 6 times the steady-state current.
5. The ratings values apply under the following test conditions:
Ambient temperature: 20±2°C
Ambient humidity: 65±5%
Operating frequency: 30 operations/min

■ Characteristics

Item	D2SW-3	D2SW-01
Operating speed	0.1 mm to 1 m/s (at pin plunger models)	
Operating frequency	Mechanical: 300 operations/min Electrical: 60 operations/min	
Insulation resistance	100 MΩ min. (at 500 VDC)	
Contact resistance	30 mΩ max. (initial value) for terminal models	50 mΩ max. (initial value) for terminal models
	50 mΩ max. (initial value) for molded lead wire models	70 mΩ max. (initial value) for molded lead wire models
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between terminals of the same polarity 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 (see note 1)	600 VAC, 50/60 Hz for 1 min between terminals of the same polarity 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 (see note 1)
Vibration resistance (see note 2)	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude	
Shock resistance (see note 2)	Destruction: 1,000 m/s^2 {approx. 100G} max. Malfunction: 300 m/s^2 {approx. 30G} max.	
Life expectancy (see note 3)	Mechanical: 5,000,000 operations min. (OT value)	
	Electrical: 200,000 operations min. (3 A at 125 VAC), 100,000 operations min. (2 A at 250 VAC)	Electrical: 200,000 operations min.
Degree of protection	IP67 for molded lead wire models IP50 for terminal models	
Degree of protection against electric shock	Class 1	
Proof tracking index (PTI)	175	
Ambient temperature	Operating: –40°C to 85°C (at ambient humidity of 60% max.) (with no icing)	
Ambient humidity	Operating: 95% max. (for 5°C to 35°C)	
Weight	Approx. 2 g (for a pin plunger model with terminal)	

Note: 1. The dielectric strength shown is for models with a Separator.
2. For the pin plunger models, the above values apply for use at the free position, operating position, and total travel position. For the lever models, they apply at the total travel position.
3. For testing conditions, contact your OMRON sales representative.

■ Approved Standards

UL1054 (File No. E41515)
CSA C22.2 No.55 (File No. LR21642)

Rated voltage	D2SW-3	D2SW-01
125 VAC 250 VAC	3 A 2 A	0.1 A ---
30 VDC	3 A	0.1 A

VDE/EN61058-1 (IEC601058-1) (File No. 85002)

Rated voltage	D2SW-01
125 VAC	0.1 A

Testing conditions: 5E4 (50,000 operations), T85 (0°C to 85°C)

■ Contact Specifications

Item		D2SW-3	D2SW-01
Contact	**Specification**	Rivet	Crossbar
	Material	Silver	Gold alloy
	Gap (standard value)	0.5 mm	
Inrush current	**NC**	20 A max.	1 A max.
	NO	10 A max.	1 A max.
Minimum applicable load		160 mA at 5 VDC	1 mA at 5 VDC

■ Separators (Insulation Sheet)

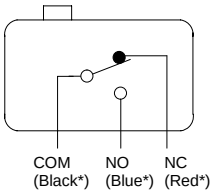
Applicable switch	Thickness (mm)	Model
SS, D2S, D2SW	0.18	Separator for SS0.18
	0.4	Separator for SS0.4

Separator for SS□

Note: The material is EAVTC (Epoxide Alkyd Varnished Tetron Cloth) and can withstand temperatures up to 130°C.

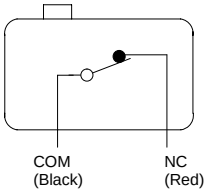
■ Contact Form

SPDT

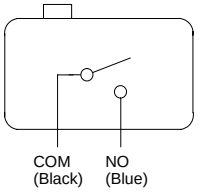


*Indicates the color of the lead wire.

SPST-NC



SPST-NO

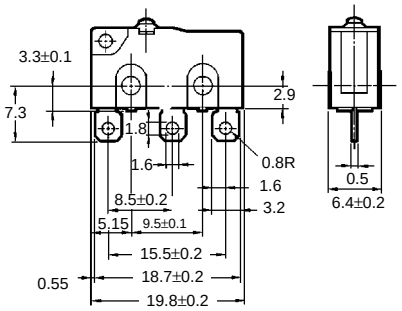


Dimensions

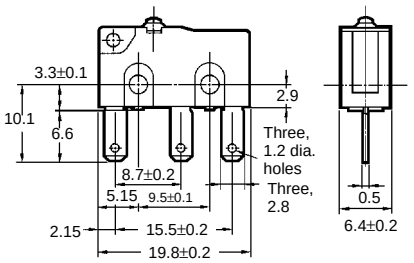
■ Terminals

Note: All units are in millimeters unless otherwise indicated.

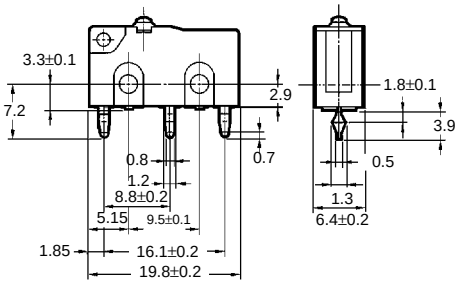
Solder Terminals (H)



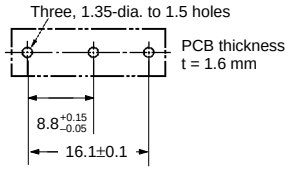
Quick-connect Terminals (#110) (T)



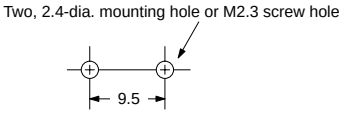
PCB Terminals (D)



PCB Mounting



■ Mounting Holes



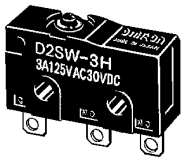
■ Dimensions and Operating Characteristics

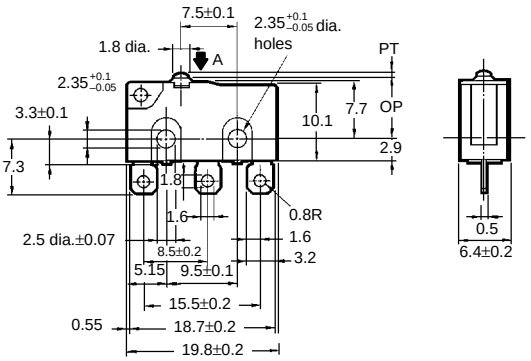
Note:
1. All units are in millimeters unless otherwise indicated.
2. The following illustrations and dimensions are for models with soldered terminals. Refer to *Terminals* for models with quick-connect and PCB terminals (#110).
3. The dimensions not described are the same as those of models with pin plungers.
4. Unless otherwise specified, tolerance of ±0.4 mm applies to all dimensions.
5. The □ in the model number is for a terminal code such as H, T, D, or M.
6. The operating characteristics are for operation in the A direction (⬇).

Terminal Models

Pin Plunger

D2SW-3□
D2SW-01□

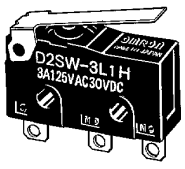


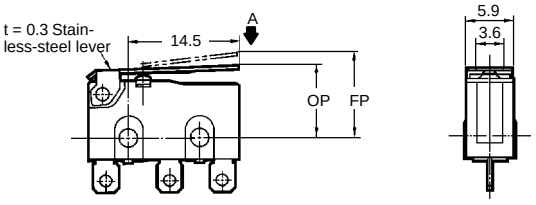


OF	1.77 N {180 gf}
RF min.	0.29 N {30 gf}
PT max.	0.6 mm
OT min.	0.5 mm
MD max.	0.1 mm
OP	8.4±0.3 mm

Hinge Lever

D2SW-3L1□
D2SW-01L1□

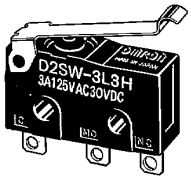


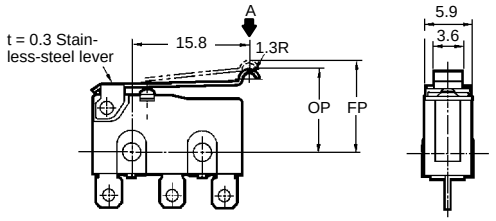


OF	0.59 N {60 gf}
RF min.	0.06 N {6 gf}
OT min.	1.0 mm
MD max.	0.8 mm
FP max.	13.6 mm
OP	8.8±0.8 mm

Simulated Roller Lever

D2SW-3L3□
D2SW-01L3□

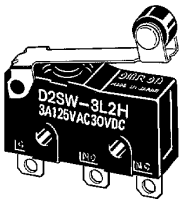


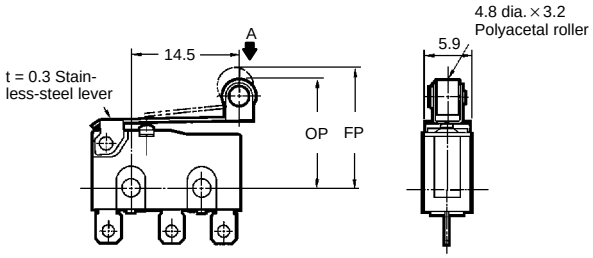


OF	0.59 N {60 gf}
RF min.	0.06 N {6 gf}
OT min.	1.0 mm
MD max.	0.8 mm
FP max.	15.5 mm
OP	10.7±0.8 mm

Hinge Roller Lever

D2SW-3L2□
D2SW-01L2□



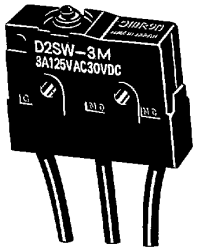


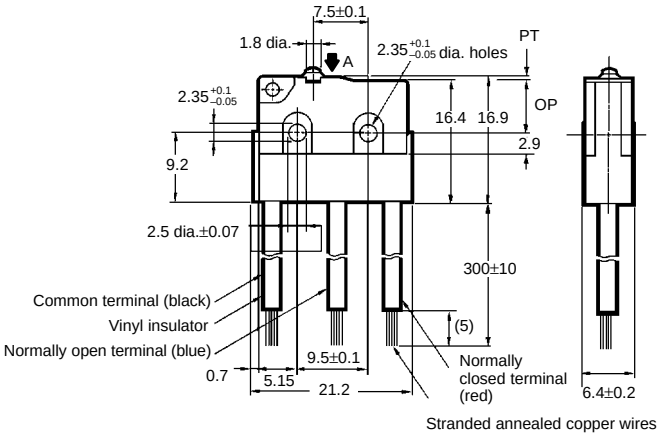
OF	0.59 N {60 gf}
RF min.	0.06 N {6 gf}
OT min.	1.0 mm
MD max.	0.8 mm
FP max.	19.3 mm
OP	14.5±0.8 mm

Molded Lead Wire Model

Pin Plunger

D2SW-3M
D2SW-01M





OF max.	1.77 N {180 gf}
RF min.	0.29 N {30 gf}
PT max.	0.6 mm
OT min.	0.5 mm
MD max.	0.1 mm
OP	8.4±0.3 mm

Precautions

Refer to pages 26 to 33 for common precautions.

■ Cautions

Degree of Protection

Do not use the Switch underwater. The Switch was tested and found to meet the conditions necessary to meet the following standard. The test checks for water intrusion after immersion for a specified time period. The test does not check for switching operation underwater.

IEC Publication 529, degree of protection IP67.

Protection Against Chemicals

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

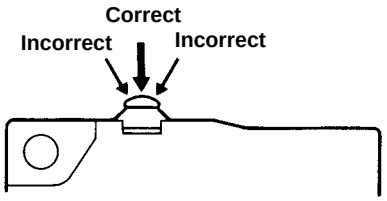
■ Correct Use

Mounting

Use 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 {2.3 to 2.7 kgf • cm}.

Operation

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.



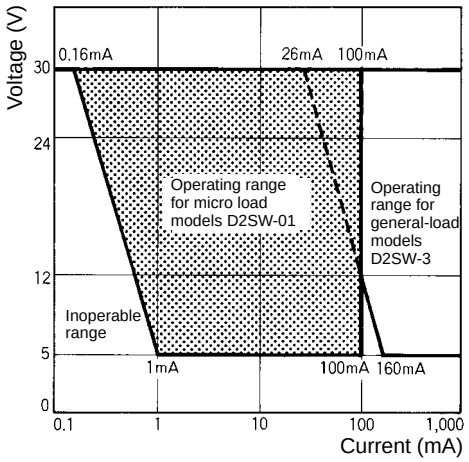
Handling

Handle the Switch carefully so as not to break the sealing rubber of the plunger.

Using Micro Loads

Using a model for ordinary loads to open or close the contact of a micro load circuit may result in faulty contact. Use models that operate in the following range. However, even when using micro load models within the operating range shown below, if inrush current occurs when the contact is opened or closed, it may increase contact wear and so decrease life expectancy. Therefore, insert a contact protection circuit where necessary.

The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% (λ 60). The equation, $\lambda\ 60 = 0.5 \times 10^{-6}$/operations indicates that the estimated malfunction rate is less than 1/2,000,000 operations with a reliability level of 60%.



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. C097-E1-01B