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.

RoHS Compliant

Ordering Information

■ Model Number Legend

D2SW-□□□□
1 2 3 4

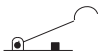
1. Ratings
- 3: 3 A at 125 VAC
- 01: 0.1 A at 30 VDC

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

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

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

■ List of Models

Actuator		Rating	Model	
		Contact form	3 A	0.1 A
Pin plunger 	Solder terminals	SPDT	D2SW-3H	D2SW-01H
	PCB terminals	SPDT	D2SW-3D	D2SW-01D
	Quick-connect terminals (#110)	SPDT	D2SW-3T	D2SW-01T
	Molded lead wire terminals (300 mm)	SPDT	D2SW-3M	D2SW-01M
		SPST-NC	D2SW-3-2M	D2SW-01-2M
		SPST-NO	D2SW-3-3M	D2SW-01-3M
Hinge lever 	Solder terminals	SPDT	D2SW-3L1H	D2SW-01L1H
	PCB terminals	SPDT	D2SW-3L1D	D2SW-01L1D
	Quick-connect terminals (#110)	SPDT	D2SW-3L1T	D2SW-01L1T
	Molded lead wire terminals (300 mm)	SPDT	D2SW-3L1M	D2SW-01L1M
		SPST-NC	D2SW-3L1-2M	D2SW-01L1-2M
		SPST-NO	D2SW-3L1-3M	D2SW-01L1-3M
Hinge roller lever 	Solder terminals	SPDT	D2SW-3L2H	D2SW-01L2H
	PCB terminals	SPDT	D2SW-3L2D	D2SW-01L2D
	Quick-connect terminals (#110)	SPDT	D2SW-3L2T	D2SW-01L2T
	Molded lead wire terminals (300 mm)	SPDT	D2SW-3L2M	D2SW-01L2M
		SPST-NC	D2SW-3L2-2M	D2SW-01L2-2M
		SPST-NO	D2SW-3L2-3L3M	D2SW-01L2-3M
Simulated roller lever 	Solder terminals	SPDT	D2SW-3L3H	D2SW-01L3H
	PCB terminals	SPDT	D2SW-3L3D	D2SW-01L3D
	Quick-connect terminals (#110)	SPDT	D2SW-3L3T	D2SW-01L3T
	Molded lead wire terminals (300 mm)	SPDT	D2SW-3L3M	D2SW-01L3M
		SPST-NC	D2SW-3L3-2M	D2SW-01L3-2M
		SPST-NO	D2SW-3L3-3L2M	D2SW-01L3-3M

Note: **1.** The standard lengths of the molded lead wires (AV0.5f) of models incorporating them are 300 mm.
2. Add “HS,” “DS,” “TS,” or “MS” to the end of the model number for the UL/CSA-approved version.
(e.g., D2SW-3H → D2SW-3HS).
Consult your OMRON sales representative for details.

Specifications

■ Ratings

Model	Item Rated voltage	Resistive load
D2SW-3	250 VAC	2 A
	125 VAC	3 A
	30 VDC	3 A
D2SW-01	125 VAC	0.1 A
	30 VDC	0.1 A

Note: 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 (pin plunger models)	
Operating frequency	Mechanical: 300 operations/min max. Electrical: 30 operations/min max.	
Insulation resistance	100 MΩ min. (at 500 VDC)	
Contact resistance (initial value)	30 mΩ max. for terminal models	50 mΩ max. for terminal models
	50 mΩ max. for molded lead wire models	70 mΩ max. for molded lead wire models
Dielectric strength (see note 2)	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	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
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^2 {approx. 100G} max. Malfunction: 300 m/s^2 {approx. 30G} max.	
Durability (see note 4)	Mechanical:5,000,000 operations min. (60 operations/min)	
	Electrical: 200,000 operations min. (30 operations/min) (3 A at 125 VAC), 100,000 operations min. (30 operations/min) (2 A at 250 VAC)	Electrical: 200,000 operations min. (30 operations/min)
Degree of protection	IEC IP67 (excluding the terminals on terminal models)	
Degree of protection against electric shock	Class 1	
Proof tracking index (PTI)	175	
Ambient operating temperature	–40°C to 85°C (at ambient humidity of 60% max.) (with no icing or condensation)	
Ambient operating humidity	95% max. (for 5°C to 35°C)	
Weight	Approx. 2 g (pin plunger models with terminals)	

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

2. The dielectric strength shown is for models with a Separator.

3. 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.

4. For testing conditions, consult your OMRON sales representative.

■ Approved Standards

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

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

EN61058-1 (File No. 85002, VDE approval)

Rated voltage	D2SW-3	D2SW-01
125 VAC	---	0.1 A
250 VAC	2 A	---
30 VDC	2 A	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 (see note)		160 mA at 5 VDC	1 mA at 5 VDC

Note: For more information on the minimum applicable load, refer to *Using Micro Loads* on page page 7.

■ Separators (Insulation Sheet)

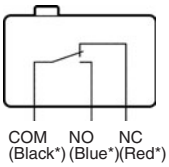
Applicable switch	Thickness (mm)	Model
SS, D2S, D2SW	0.18	Separator for SS0.18
	0.4	Separator for SS0.4

Separator for SS□

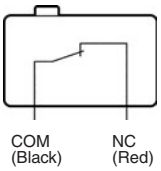
Note: The material is EAVTC (Epoxide Alkyd Varnished Tetron Cloth) and can withstand temperatures up to 130°C.

■ Contact Form

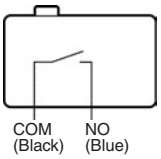
SPDT



SPST-NC



SPST-NO



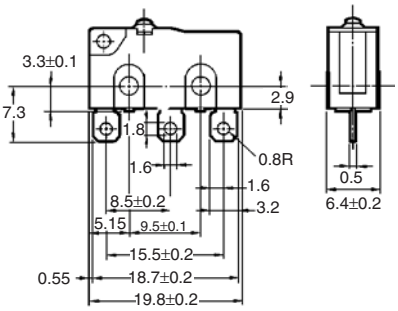
*Indicates the color of the lead wire.

Dimensions

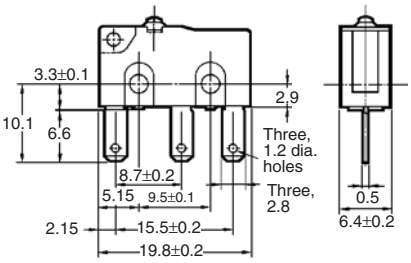
■ Terminals

Note: All units are in millimeters unless otherwise indicated.

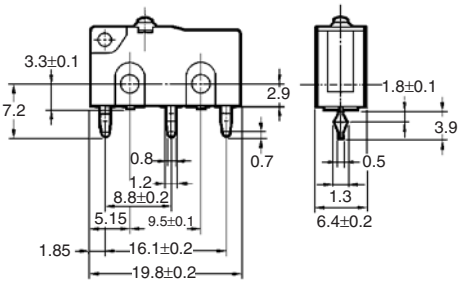
Solder Terminals (H)



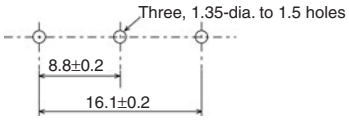
Quick-connect Terminals (#110) (T)



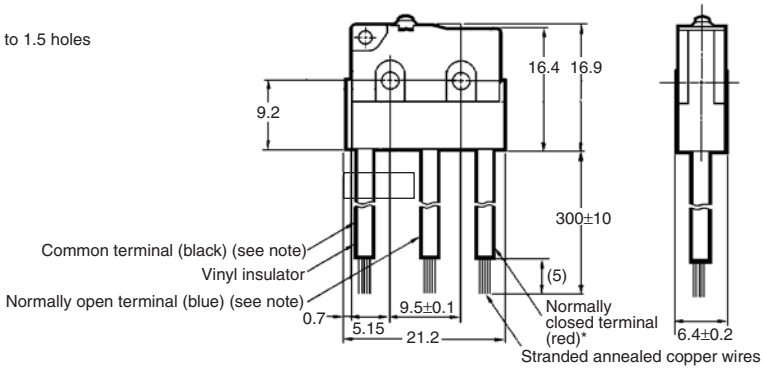
PCB Terminals (D)



PCB Mounting

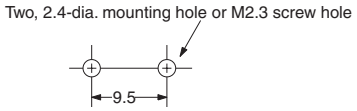


Molded Lead Wires



* UL/CSA approved models have UL approved wiring.

■ Mounting Holes

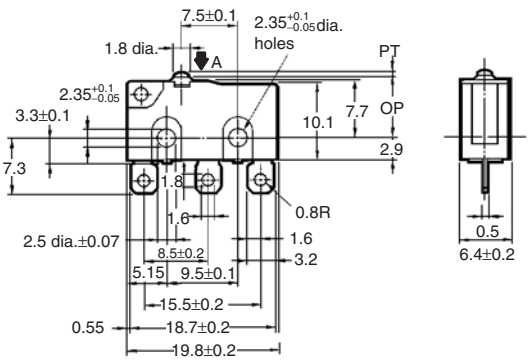


■ Dimensions and Operating Characteristics

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 (⬇).

Pin Plunger Models

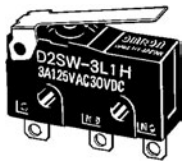
D2SW-3□
D2SW-01□

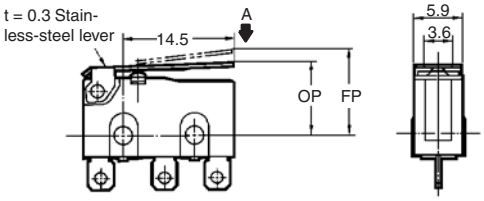


OF	0.59 N {60 gf}
RF min.	0.06 N {6 gf}
OT min.	1.0 mm
MD max.	0.8 mm
FP max.	13.6 mm
OP	8.8±0.8 mm

Hinge Lever Models

D2SW-3L1□
D2SW-01L1□

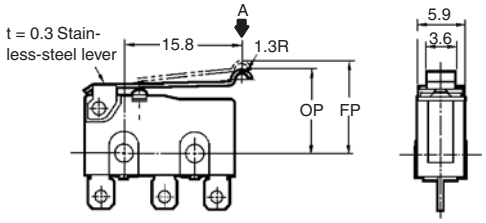




OF	0.59 N {60 gf}
RF min.	0.06 N {6 gf}
OT min.	1.0 mm
MD max.	0.8 mm
FP max.	13.6 mm
OP	8.8±0.8 mm

Simulated Roller Lever Models

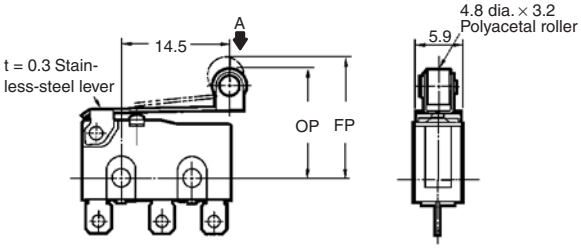
D2SW-3L3□
D2SW-01L3□



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 Models

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

Precautions

Refer to *General Information*.

■ 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.

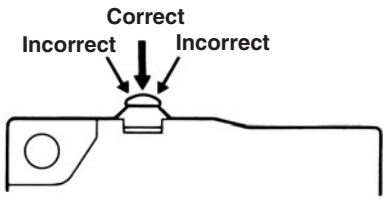
■ Correct Use

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}.

Operating Body

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.



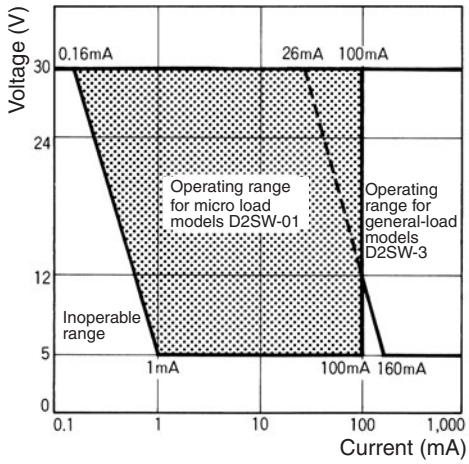
Handling

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 durability. 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, λ 60 = 0.5×10^{-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-E1-02