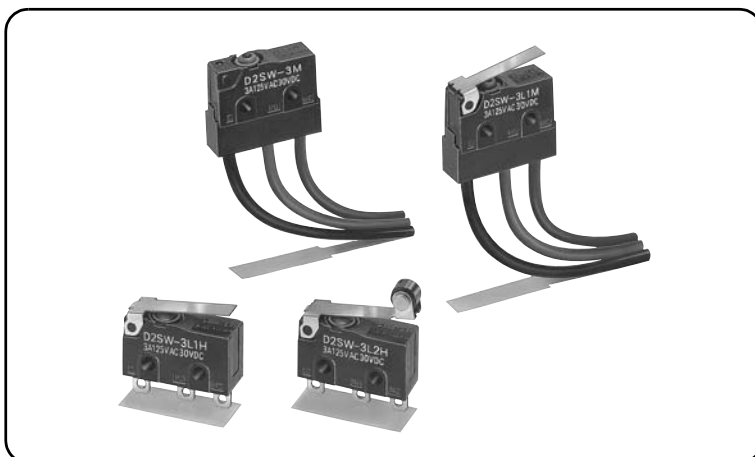


D2SW-AQ

Sealed Subminiature Basic Switch

Sealed Subminiature Basic Switch Conforming to IP67 (Excluding the terminals on terminal models)

- 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 equipments, which require high environmental resistance.



Model Number Legend

D2SW-1 2 3 4 5 -AQ

1. Ratings

3 : 125 VAC 3 A
01 : 30 VDC 0.1 A

2. Actuator

None : Pin plunger
L1 : Hinge lever
L2 : Hinge roller lever
L3 : Simulated roller hinge 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 : Solder terminals
D : Self-clinching PCB terminals
T : Quick-connect terminals (#110)
M : Molded lead wires

5. Length of the molded lead wire

None : 300 mm
-0 : 1,000 mm

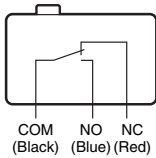
List of Models

Due to the idiosyncrasies of the automotive parts industry, a business decision is required on individual items to determine when to start supply. Contact your OMRON representative for information on individual models.

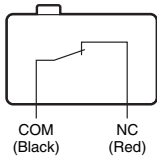
Actuator	Terminals	Ratings Contact form	3 A	0.1 A
Pin plunger 	Solder terminals	SPDT	D2SW-3H-AQ	D2SW-01H-AQ
	Quick-connect terminals (#110)		D2SW-3T-AQ	D2SW-01T-AQ
	PCB terminals		D2SW-3D-AQ	D2SW-01D-AQ
	Molded lead wire terminals (300 mm)	SPDT	D2SW-3M-AQ	D2SW-01M-AQ
		SPST-NC	D2SW-3-2M-AQ	D2SW-01-2M-AQ
		SPST-NO	D2SW-3-3M-AQ	D2SW-01-3M-AQ
Hinge lever 	Solder terminals	SPDT	D2SW-3L1H-AQ	D2SW-01L1H-AQ
	Quick-connect terminals (#110)		D2SW-3L1T-AQ	D2SW-01L1T-AQ
	PCB terminals		D2SW-3L1D-AQ	D2SW-01L1D-AQ
	Molded lead wire terminals (300 mm)	SPDT	D2SW-3L1M-AQ	D2SW-01L1M-AQ
		SPST-NC	D2SW-3L1-2M-AQ	D2SW-01L1-2M-AQ
		SPST-NO	D2SW-3L1-3M-AQ	D2SW-01L1-3M-AQ
Hinge roller lever 	Solder terminals	SPDT	D2SW-3L2H-AQ	D2SW-01L2H-AQ
	Quick-connect terminals (#110)		D2SW-3L2T-AQ	D2SW-01L2T-AQ
	PCB terminals		D2SW-3L2D-AQ	D2SW-01L2D-AQ
	Molded lead wire terminals (300 mm)	SPDT	D2SW-3L2M-AQ	D2SW-01L2M-AQ
		SPST-NC	D2SW-3L2-2M-AQ	D2SW-01L2-2M-AQ
		SPST-NO	D2SW-3L2-3M-AQ	D2SW-01L2-3M-AQ
Simulated roller hinge lever 	Solder terminals	SPDT	D2SW-3L3H-AQ	D2SW-01L3H-AQ
	Quick-connect terminals (#110)		D2SW-3L3T-AQ	D2SW-01L3T-AQ
	PCB terminals		D2SW-3L3D-AQ	D2SW-01L3D-AQ
	Molded lead wire terminals (300 mm)	SPDT	D2SW-3L3M-AQ	D2SW-01L3M-AQ
		SPST-NC	D2SW-3L3-2M-AQ	D2SW-01L3-2M-AQ
		SPST-NO	D2SW-3L3-3M-AQ	D2SW-01L3-3M-AQ
	Molded lead wire terminals (1,000mm)	SPDT	D2SW-3L3M-0-AQ	D2SW-01L3M-0-AQ

Contact Form

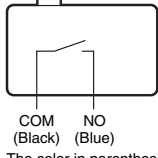
●SPDT



●SPST-NC (Molded lead wire models only)



●SPST-NO (Molded lead wire models only)



The color in parentheses indicates the color of the lead wire.

Separator (Sold Separately), Terminal Connector (Sold Separately) ➡ Refer to your OMRON website.

Contact Specifications

Item		Model	D2SW-3 models	D2SW-01 models
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 (reference value) *			160 mA at 5 VDC	1 mA at 5 VDC

* Please refer to "Using Micro Loads" in "Precautions" for more information on the minimum applicable load.

Ratings

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

Note. The above rating values apply under the following test conditions.

- (1) Ambient temperature: $20 \pm 2^\circ\text{C}$
- (2) Ambient humidity: $65 \pm 5\%$
- (3) Operating frequency: 30 operations/min

Characteristics

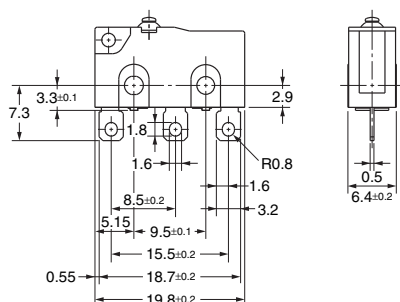
Item		Model	D2SW-3 models	D2SW-01 models
Permissible operating speed			0.1 mm to 1 m/s (for pin plunger models)	
Permissible operating frequency	Mechanical	300 operations/min		
	Electrical	60 operations/min		
Insulation resistance			100 mΩ min. (at 500 VDC with insulation tester)	
Contact resistance (initial value)	For terminal models	30 mΩ max.	50 mΩ max.	
	For molded lead wire models (300mm)	50 mΩ max.	70 mΩ max.	
	For molded lead wire models (1,000mm)	200 mΩ max.	250 mΩ max.	
Dielectric strength *1	Between terminals of the same polarity	1,000 VAC 50/60 Hz for 1 min	600 VAC 50/60 Hz for 1 min	
	Between current-carrying metal parts and ground	1,500 VAC 50/60 Hz for 1 min		
	Between terminals and non-current-carrying metal parts	1,500 VAC 50/60 Hz for 1 min		
Vibration resistance *2	Malfunction	10 to 55 Hz, 1.5 mm double amplitude		
Shock resistance	Destruction	1,000 m/s ² {approx. 100G} max.		
	Malfunction *2	300 m/s ² {approx. 30G} max.		
Durability * 3	Mechanical	5,000,000 operations min. (60 operations/min)		
	Electrical	200,000 operations min. (30 operations/min) (125 VAC 3 A) 100,000 operations min. (30 operations/min) (250 VAC 2 A)	200,000 operations min. (30 operations/min)	
Degree of protection	For terminal models	IEC IP67 (excluding the terminals on terminal models)		
	For molded lead wire models	IEC IP67		
Degree of protection against electric shock			Class I	
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 (for pin plunger models with terminals)	

Note. The data given above are initial values.

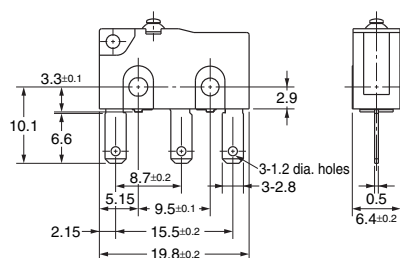
- *1. The values for dielectric strength shown are for models with a Separator. Refer to your OMRON website.
- *2. For the pin plunger models, the above values apply for use at the free position and total travel position. For the lever models, they apply at the total travel position. Close or open circuit of the contact is 1 ms max.
- *3. For testing conditions, consult your OMRON sales representative.

Terminals and Shapes (Unit: mm)

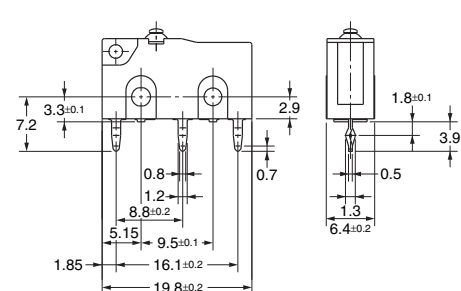
●Solder terminals



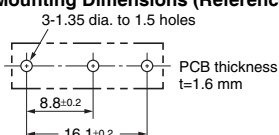
●Quick-connect terminals (#110)



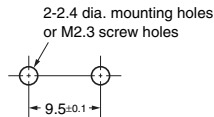
●PCB terminals



<PCB Mounting Dimensions (Reference)>



Mounting Holes (Unit: mm)



Dimensions (Unit: mm) / Operating Characteristics

Models with terminals

The illustrations and dimensions are for models with solder terminals. Refer to "Terminals and Shapes" of the previous page for models with quick-connect terminals (#110) and PCB terminals.

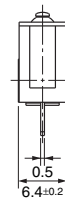
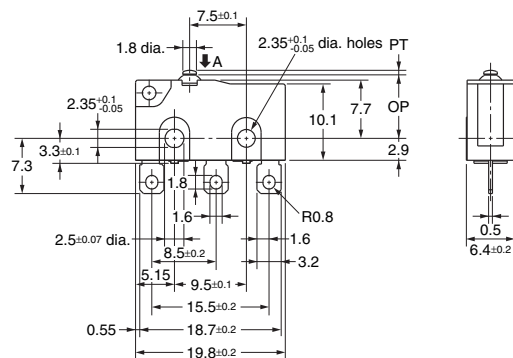
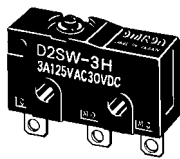
(Note. The dimensions not described are the same as those of models with pin plungers.)

The □ is replaced with the code for the terminal that you need. See the "List of Models" for available combinations of models.

●Pin Plunger Models

D2SW-3□-AQ

D2SW-01□-AQ

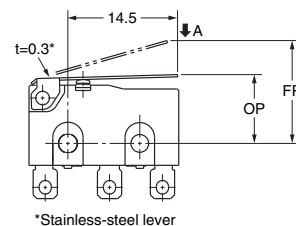
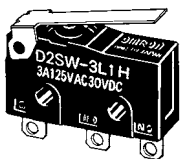


Operating Force	OF	Max.	1.77 N {180 gf}
Releasing Force	RF	Min.	0.29 N {30 gf}
Pretravel	PT	Max.	0.6 mm
Overtravel	OT	Min.	0.5 mm
Movement Differential	MD	Max.	0.1 mm
Operating Position	OP		8.4±0.3 mm

●Hinge Lever Models

D2SW-3L1□-AQ

D2SW-01L1□-AQ

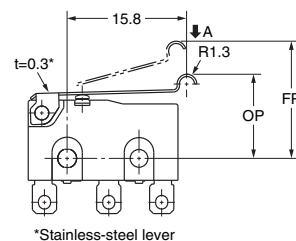
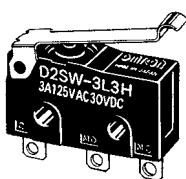


Operating Force	OF	Max.	0.59 N {60 gf}
Releasing Force	RF	Min.	0.06 N {6 gf}
Overtravel	OT	Min.	1.0 mm
Movement Differential	MD	Max.	0.8 mm
Free Position	FP	Max.	13.6 mm
Operating Position	OP		8.8±0.8 mm

●Simulated Roller Hinge Lever Models

D2SW-3L3□-AQ

D2SW-01L3□-AQ

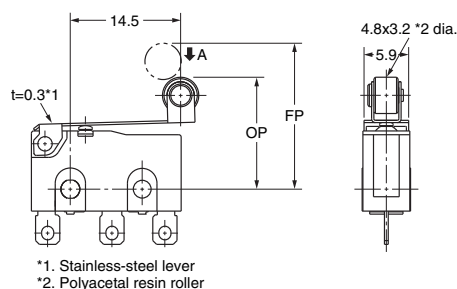
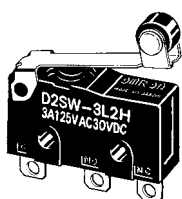


Operating Force	OF	Max.	0.59 N {60 gf}
Releasing Force	RF	Min.	0.06 N {6 gf}
Overtravel	OT	Min.	1.0 mm
Movement Differential	MD	Max.	0.8 mm
Free Position	FP	Max.	15.5 mm
Operating Position	OP		10.7±0.8 mm

●Hinge Roller Lever Models

D2SW-3L2□-AQ

D2SW-01L2□-AQ



Operating Force	OF	Max.	0.59 N {60 gf}
Releasing Force	RF	Min.	0.06 N {6 gf}
Overtravel	OT	Min.	1.0 mm
Movement Differential	MD	Max.	0.8 mm
Free Position	FP	Max.	19.3 mm
Operating Position	OP		14.5±0.8 mm

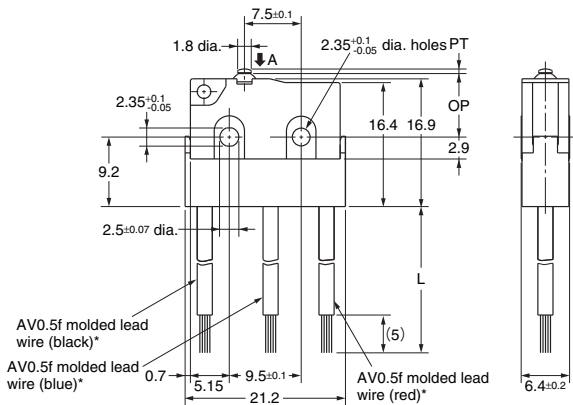
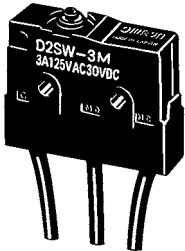
Note 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

Note 2. The operating characteristics are for operation in the A direction (↓).

Models with lead wires

Pin plunger models are shown as representatives. Dimensions and operation characteristics of other actuator models are the same as those of terminal models. The illustration and drawing shown is the SPDT model. SPST-NC model and SPST-NO model are omitted in the illustration below.

- Pin Plunger Models
- D2SW-3M-AQ
- D2SW-3M-0-AQ
- D2SW-01M-AQ
- D2SW-01M-0-AQ



Operating Force	OF	Max.	1.77 N {180 gf}
Releasing Force	RF	Min.	0.29 N {30 gf}
Pretravel	PT	Max.	0.6 mm
Overtravel	OT	Min.	0.5 mm
Movement Differential	MD	Max.	0.1 mm
Operating Position	OP		8.4±0.3 mm

Dimensions		
	300 mm type	1,000 mm type
L	300±10	1,000±30

* UL/CSA approved models have UL approved wiring (AWG22 UL1015).

Note 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
Note 2. The operating characteristics are for operation in the A direction (↓).

Precautions

Please refer to "Safety Precautions for All Detection Switches" on page 15 for correct use.

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, however, the test checks for water intrusion after immersion for a specified time period, not for switching operation underwater.

JIS C0920:

Degrees of protection provided by enclosures of electrical apparatus (IP Code)

IEC 60529:

Degrees of protection provided by enclosures (IP Code)

Degree of protection:IP67

(check water intrusion after immersion for 30 min submerged 1 m underwater)

●Protection Against Chemicals

Prevent the Switch from coming into contact with oil or chemicals.

Otherwise, damage to or deterioration of Switch materials may result.

●Soldering

• 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.

Complete the soldering at the iron tip temperature between 350 to 400°C within 5 seconds, and do not apply any external force for 1 minute after soldering. Soldering at a excessively high temperature or soldering for more than 5 seconds 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. Applying excessive external force laterally may cause deformation of terminals and may damage the housings.

• Connecting to PCB terminals

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 terminals manually, complete the soldering at the iron tip temperature between 350 to 400°C within 5 seconds, and do not apply any external force for 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 flow into the case.

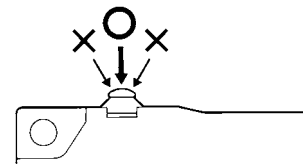
Correct Use

●Mounting

Use M2.3 mounting screw 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

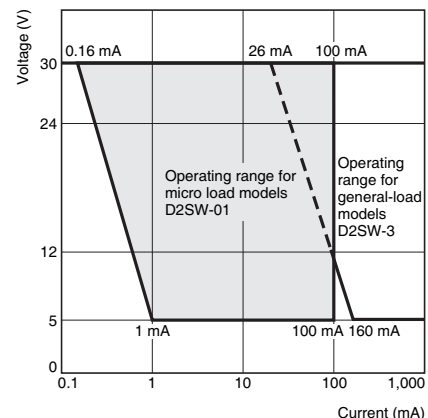
Handle the Switch carefully so as not to break the sealing rubber.

●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 following operating range, if inrush current occurs when the contact is opened or closed, it may increase the contact wear and so decrease durability. Therefore, insert a contact protection circuit where necessary. The N-level reference value applies for the minimum applicable load. This value indicates the malfunction reference level for the reliability level of 60% (λ_{60}).

(JIS C5003)

The equation, $\lambda_{60}=0.5 \times 10^{-6} / \text{operations}$ indicates that the estimated malfunction rate is less than $\frac{1}{2,000,000}$ operations with a reliability level of 60%.



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Japan

<https://components.omron.com/jp>