

Subminiature Basic Switch (Sealed) – D2SW

High-quality Sealed Sub Miniature Basic Switch Conforming to IP67 (Lead wire type only)

- ROHS Compliant.
- Monoblock construction assures high sealing capability and is ideal for dusty places or where water is sprayed.
- A wide operating temperature range of -40°C to 85°C is ideal for any operating environment.
- Ideal for the automobile, agricultural machinery, automatic vending machine, refrigerator, ice-manufacturing, bath equipment, hot-water supply, air conditioner, and factory machine industries, which require highly environment-resistive capabilities.



Ordering Information

Model Number Legend

D2SW-□□□□
1 2 3 4

1. Ratings

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

2. Actuator

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

3. Contact Form

None: SPDT
-2: SPST-NC (Lead wire model only)
-3: SPST-NO (Lead wire model only)

4. Terminals

H, HS: Solder terminal (HS for UL and CSA approval)
D, DS: PCB terminal (DS for UL and CSA approval)
T, TS: Quick-connect terminal (#110) (TS for UL and CSA approval)
M, MS: With 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
	With 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
	With 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
	With 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
	With lead wires	D2SW-3L2M	D2SW-01L2M

Note: 1. The standard lengths of the lead wires (AV0.5f) of models incorporating them are 30cm.

2. Consult your Omron sales representative for details on SPST-NO and SPST-NC models.

3. Add "HS", "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

Type	Rated Load	Item	Resistive Load
D2SW-3	250VAC		3A
	125VAC		2A
	30VDC		3A
D2SW-01	125VAC		0.1A
	30VDC		0.1A

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

Ambient temperature: 20±2°C

Ambient humidity: 65±5%

Operating frequency: 30 operations/min

Switching Capacity per Load (Reference Values)

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.

■ 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: 30 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 lead wire models	70 mΩ max. (initial value) for 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 (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 3)	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude	
Shock resistance (see note 3)	Destruction: 1,000m/s ² (approx. 100G) max. Malfunction: 300 m/s ² (approx. 30G) max.	
	Life expectancy (see note 4)	
Life expectancy (see note 4)	Mechanical: 5,000,000 operations min. (OT value)	
	Electrical: 200,000 operations min. (30 operations/min) (3A at 125VAC)	Electrical: 200,000 operations min. (30 operations/min)
	100,000 operations min (30 operations/min) (2A at 250VAC)	
Degree of protection	IEC IP67 (excluding the terminals on terminal model)	
Proof tracking index (PTI)	175	
Degree of protection against shock	Class 1	
Ambient temperature	Operating: -40°C to 85°C (at ambient humidity of 60%) (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 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, contact your OMRON sales representative.

Subminiature Basic Switch (Sealed) – D2SW

■ Approved Standards

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

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

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

Rated voltage	D2SW-01□H
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	0.5 mm
Inrush current	NC	20 A max.	1 A max.
	NO	10 A max.	1 A max.
Minimum applicable load		1 mA at 5VDC	160mA at 5VDC

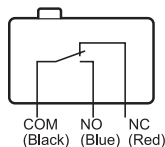
Note: For more information on the minimum applicable load, refer to Using Micro Loads.

■ Separators (Insulation Sheet)

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

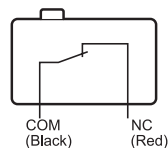
■ Contact Form

SPDT



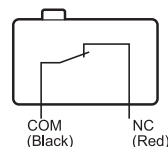
SPST-NC

(Molded lead wire models only)



SPST-NO

(Molded lead wire models only)

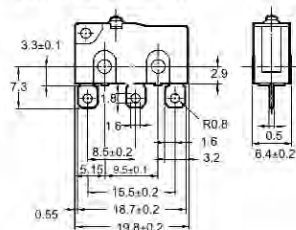


Note: AV 0.5f wires are used for standard lead wire model.
UL1015 AWG22 wires are used for UL/CSA approved models.

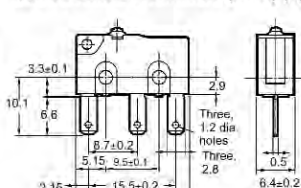
Dimensions

■ Terminals

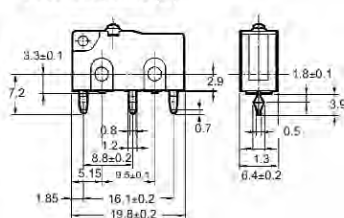
Solder Terminals (H)



Quick-connect Terminals (#110) (T)



PCB Terminals (D)



■ Dimensions and Operating Characteristics

Note: 1. All units are in millimeters unless otherwise indicated.

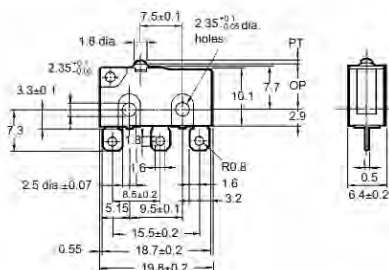
- The following illustrations and dimensions are for models with soldered terminals. Refer to *Terminals* for models with quick-connect and PCB terminals (#110).
- The dimensions not described are the same as those of models with pin plungers.
- Unless otherwise specified, tolerance of ± 0.4 mm applies to all dimensions.
- The □ in the model number is for a terminal code such as H, T, D, or M.

Terminal Models

Pin Plunger

D2SW-3□

D2SW-01□

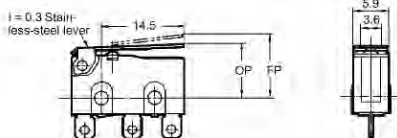


OF	1.77 N {180 gf}
RF min.	0.29 N {30 gf}
PT max.	0.6 mm
OT min.	0.5 mm
MD max.	0.1 mm
OP	8.4±0.3 mm

Hinge Lever

D2SW-3L1□

D2SW-01L1□

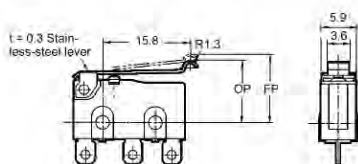


OF	0.59 N {60 gf}
RF min.	0.06 N {6 gf}
OT min.	1.0 mm
MD max.	0.8 mm
FP max.	13.6 mm
OP	8.8±0.8 mm

Simulated Roller Lever

D2SW-3L3□

D2SW-01L3□

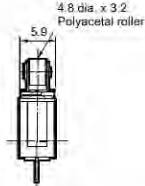
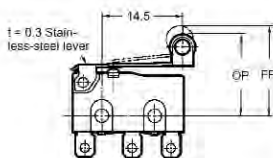


OF	0.59 N {60 gf}
RF min.	0.06 N {6 gf}
OT min.	1.0 mm
MD max.	0.8 mm
FP max.	15.5 mm
OP	10.7±0.8 mm

Subminiature Basic Switch (Sealed) – D2SW

Hinge Roller Lever

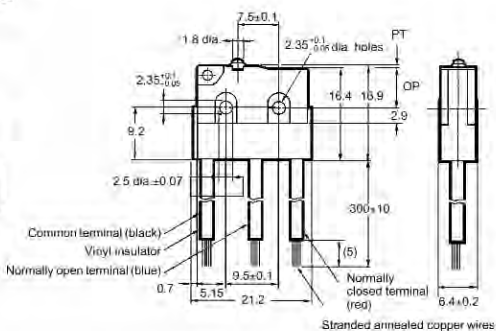
D2SW-3L2□
D2SW-01L2□



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

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

Note: AV 0.5f wires are used for standard lead wire model.
UL1015 AWG22 wires are used for UL/CSA approved models

Precautions

■ Cautions

Mounting Dimensions

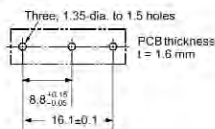
Use two M3 mounting screws with spring washers to mount the Switch. Tighten the screws to a torque of 0.23 to 0.26 N • m {2.3 to 2.7 kgf • cm}.

Mounting Holes

Two, 2.4-dia. mounting hole or M2.3 screw hole



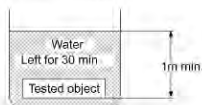
PCB Mounting



Degree of Protection

The D2SW was tested underwater and passed the following water-tightness tests, which however, does not mean that the D2SW can be used in the water.

IEC Publication 529, degree of protection IP67. Refer to the following illustration for the test method.



■ Using Micro Loads

Using a model for ordinary loads to open or close the contact of a microload 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.

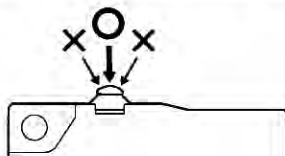
The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% (λ_{60}). The equation, $\lambda_{60} = 0.5 \times 10^{-6}$ /operations indicates that the estimated malfunction rate is less than 1/2,000,000 operations with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

Protection Against Chemicals

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

Operation

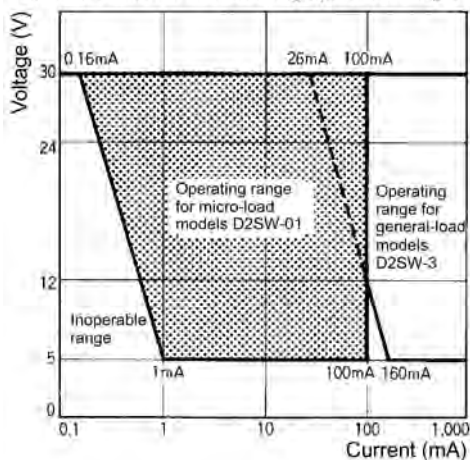
With the pin plunger models, set the Switch so that the plunger can be pushed in from directly above. Since the plunger is covered with a rubber cap, applying a force from lateral directions may cause damage to the plunger or reduction in the sealing capability.



Handling

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

Use the Switch in the following operation range.



ALL DIMENSIONS SHOWN ARE IN MILLIMETRES.

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