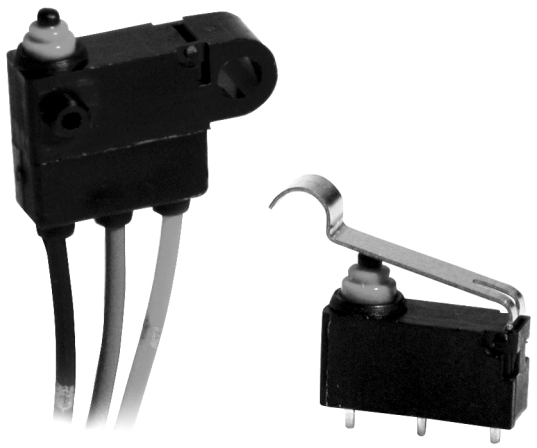
Sealed Subminiature Snap Action Switch
D2HW

Smallest Sealed Snap-Action Switch in the Industry With a Long Stroke For Reliable ON/OFF Action

- Conforms to IP67 (lead wire type) and IP50 (terminal type)
- Case dimensions 22% smaller than conventional models
- Extra-long stroke even without levers (OT: 1.4 mm)
- All models are lead-free, including lead wire models
- RoHS Compliant



Ordering Information

■ PCB-MOUNTED MODELS

Actuator	Terminals		Contact form	Model		
				With posts on right 	With posts on left 	Without posts 
Pin plunger	For PCB	Straight	SPDT	---	---	**D2HW-A201D**
		Angled		**D2HW-BR201DR**	**D2HW-BL201DL**	---
Hinge lever 		Straight		---	---	**D2HW-A211D**
		Angled		**D2HW-BR211DR**	**D2HW-BL211DL**	---
Long hinge lever 		Straight		---	---	**D2HW-A221D**
		Angled		**D2HW-BR221DR**	**D2HW-BL221DL**	---
Simulated roller lever 		Straight		---	---	**D2HW-A231D**
		Angled		**D2HW-BR231DR**	**D2HW-BL231DL**	---

■ MODELS WITH SOLDER TERMINALS OR LEAD WIRE TERMINALS

Actuator	Terminals		Contact form	Model		
				With posts on right 	With posts on left 	M3-screw mounting 
Pin plunger	Solder		SPDT	**D2HW-BR201H**	**D2HW-BL201H**	**D2HW-C201H**
	Lead wire	Downwards	SPDT	**D2HW-BR201M**	**D2HW-BL201M**	**D2HW-C201M**
			SPST-NC	**D2HW-BR202M**	**D2HW-BL202M**	**D2HW-C202M**
			SPST-NO	**D2HW-BR203M**	**D2HW-BL203M**	**D2HW-C203M**

(This table continues on the next page.)

Ordering Information – continued from previous page

Actuator	Terminals		Contact form	Model		
				With posts on right 	With posts on left 	M3-screw mounting 
Pin plunger 	Lead wire	Right-side	SPST-NC	**D2HW-BR202MR**	**D2HW-BL202MR**	**D2HW-C202MR**
			SPST-NO	**D2HW-BR203MR**	**D2HW-BL203MR**	**D2HW-C203MR**
		Left-side	SPST-NC	**D2HW-BR202ML**	**D2HW-BL202ML**	**---**
			SPST-NO	**D2HW-BR203ML**	**D2HW-BL203ML**	**---**
Hinge lever 	Solder		SPDT	**D2HW-BR211H**	**D2HW-BL211H**	**D2HW-C211H**
	Lead wire	Downwards	SPDT	**D2HW-BR211M**	**D2HW-BL211M**	**D2HW-C211M**
			SPST-NC	**D2HW-BR212M**	**D2HW-BL212M**	**D2HW-C212M**
			SPST-NO	**D2HW-BR213M**	**D2HW-BL213M**	**D2HW-C213M**
		Right-side	SPST-NC	**D2HW-BR212MR**	**D2HW-BL212MR**	**D2HW-C212MR**
			SPST-NO	**D2HW-BR213MR**	**D2HW-BL213MR**	**D2HW-C213MR**
		Left-side	SPST-NC	**D2HW-BR212ML**	**D2HW-BL212ML**	**---**
			SPST-NO	**D2HW-BR213ML**	**D2HW-BL213ML**	**---**
Long hinge lever 	Solder		SPDT	**D2HW-BR221H**	**D2HW-BL221H**	**D2HW-C221H**
	Lead wire	Downwards	SPDT	**D2HW-BR221M**	**D2HW-BL221M**	**D2HW-C221M**
			SPST-NC	**D2HW-BR222M**	**D2HW-BL222M**	**D2HW-C222M**
			SPST-NO	**D2HW-BR223M**	**D2HW-BL223M**	**D2HW-C223M**
		Right-side	SPST-NC	**D2HW-BR222MR**	**D2HW-BL222MR**	**D2HW-C222MR**
			SPST-NO	**D2HW-BR223MR**	**D2HW-BL223MR**	**D2HW-C223MR**
		Left-side	SPST-NC	**D2HW-BR222ML**	**D2HW-BL222ML**	**---**
			SPST-NO	**D2HW-BR223ML**	**D2HW-BL223ML**	**---**
Simulated roller lever 	Solder		SPDT	**D2HW-BR231H**	**D2HW-BL231H**	**D2HW-C231H**
	Lead wire	Downwards	SPDT	**D2HW-BR231M**	**D2HW-BL231M**	**D2HW-C231M**
			SPST-NC	**D2HW-BR232M**	**D2HW-BL232M**	**D2HW-C232M**
			SPST-NO	**D2HW-BR233M**	**D2HW-BL233M**	**D2HW-C233M**
		Right-side	SPST-NC	**D2HW-BR232MR**	**D2HW-BL232MR**	**D2HW-C232MR**
			SPST-NO	**D2HW-BR233MR**	**D2HW-BL233MR**	**D2HW-C233MR**
		Left-side	SPST-NC	**D2HW-BR232ML**	**D2HW-BL232ML**	**---**
			SPST-NO	**D2HW-BR233ML**	**D2HW-BL233ML**	**---**
Leaf lever 	Solder		SPDT	**D2HW-BR261H**	**D2HW-BL261H**	**D2HW-C261H**
	Lead wire	Downwards	SPDT	**D2HW-BR261M**	**D2HW-BL261M**	**D2HW-C261M**
			SPST-NC	**D2HW-BR262M**	**D2HW-BL262M**	**D2HW-C262M**
			SPST-NO	**D2HW-BR263M**	**D2HW-BL263M**	**D2HW-C263M**
		Right-side	SPST-NC	**D2HW-BR262MR**	**D2HW-BL262MR**	**D2HW-C262MR**
			SPST-NO	**D2HW-BR263MR**	**D2HW-BL263MR**	**D2HW-C263MR**
		Left-side	SPST-NC	**D2HW-BR262ML**	**D2HW-BL262ML**	**---**
			SPST-NO	**D2HW-BR263ML**	**D2HW-BL263ML**	**---**
Simulated leaf lever 	Solder		SPDT	**D2HW-BR271H**	**D2HW-BL271H**	**D2HW-C271H**
	Lead wire	Downwards	SPDT	**D2HW-BR271M**	**D2HW-BL271M**	**D2HW-C271M**
			SPST-NC	**D2HW-BR272M**	**D2HW-BL272M**	**D2HW-C272M**
			SPST-NO	**D2HW-BR273M**	**D2HW-BL273M**	**D2HW-C273M**
		Right-side	SPST-NC	**D2HW-BR272MR**	**D2HW-BL272MR**	**D2HW-C272MR**
			SPST-NO	**D2HW-BR273MR**	**D2HW-BL273MR**	**D2HW-C273MR**
		Left-side	SPST-NC	**D2HW-BR272ML**	**D2HW-BL272ML**	**---**
			SPST-NO	**D2HW-BR273ML**	**D2HW-BL273ML**	**---**

(This table continues on the next page.)

Ordering Information – continued from previous page

Actuator	Terminals		Contact form	Model		
				With posts on right 	With posts on left 	M3-screw mounting 
Long leaf lever 	Lead wire	Downwards	SPDT	**D2HW-BR281M**	**D2HW-BL281M**	**D2HW-C281M**
			SPST-NC	**D2HW-BR282M**	**D2HW-BL282M**	**D2HW-C282M**
			SPST-NO	**D2HW-BR283M**	**D2HW-BL283M**	**D2HW-C283M**
		Right-side	SPST-NC	**---**	**---**	**D2HW-C282MR**
			SPST-NO	**---**	**---**	**D2HW-C283MR**

Note: 1. The length of standard lead wires (AWG20) for lead wire models is 30 cm (12 in).

Note: 2. Optional post length (1.5 mm on left or right) also available. Contact your Omron representative for more information.

Specifications

■ CHARACTERISTICS

Item	Specification
Operating speed	1 mm to 500 mm/s (for pin plunger models)
Operating frequency	30 operations/min
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance (initial value)	100 mΩ max. (lead wire models: 150 mΩ max.)
Dielectric strength	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	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Malfunction: 300 m/s^2 max.
Life expectancy	Mechanical: 1,000,000 operations min. (30 operations/min) Electrical: 100,000 operations min. (20 operations/min)
Degree of protection	IP67 for lead wire type, IP50 for terminal type
Degree of protection against electric shock	Class I
Proof tracking index (PTI)	175
Switch category	A (IEC 335)
Ambient operating temperature	-40 to 85°C (with no icing)
Ambient operating humidity	95% max. (in temperature range 5° to 35°C)
Weight	Approx. 0.7 g (for pin plunger models with terminals)

■ OPERATING CHARACTERISTICS

Part number	D2HW-□20□□		D2HW-□21□□		D2HW-□22□□	
Characteristic	**Models without posts**	**Models with posts and M3-mounting models**	**Models without posts**	**Models with posts and M3-mounting models**	**Models without posts**	**Models with posts and M3-mounting models**
OF max.	76 gf		76 gf		50 g	
RF min.	10 gf		7 gf		3 gf	
MD max.	0.25 mm		0.5 mm		0.8 mm	
OT ref.	1.4 mm		1.6 mm		2.5 mm	
FP max.	11.2 mm	7.2 mm	12.8 mm	8.8 mm	15.5 mm	11.5 mm
OP	10.4±0.2 mm	6.4±0.2 mm	11.5±0.5 mm	7.5±0.5 mm	13.3±0.8 mm	9.3±0.8 mm
TTP max.	9.1 mm	5.1 mm	10 mm	6 mm	11 mm	7 mm

Operating Characteristics – continued from previous page

Part number	D2HW-□23□□		D2HW-□26□□	D2HW-□27□□	D2HW-□28□□
Characteristic	**Models without posts**	**Models with posts and M3-mounting models**	**Models with posts and M3-mounting models**	**Models with posts and M3-mounting models**	**Models with posts and M3-mounting models**
OF max.	66 gf		183 gf	183 gf	92 gf
RF min.	5 gf		20 gf	20 gf	5 gf
MD max.	0.5 mm		0.2 mm	0.5 mm	0.7 mm
OT ref.	1.9 mm		1.8 mm	2.0 mm	2.8 mm
FP max.	16.5 mm	12.5 mm	9.3 mm	12.5 mm	19 mm
OP	15.2±0.5 mm	11.2±0.5 mm	7.4±0.5 mm	10.8±0.5 mm	15.4±1.5 mm
TTP max.	13.5 mm	9.5 mm	5.8 mm	8.9 mm	12.8 mm

■ RATINGS

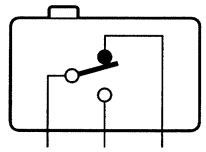
Rated voltage (V)	Resistive load
12 VDC	2 A
24 VDC	1 A
42 VDC	0.5 A

Minimum applicable load (see note)	1 mA at 5 VDC

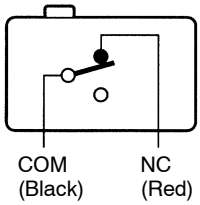
Note: Minimum applicable loads are indicated by N standard reference values. This value represents the failure rate at a 60% (λ60) reliability level (JIS C5003). The equation $\lambda 60 = 0.5 \times 10^{-6}$/operations indicates that a failure rate of 1/2,000,000 operations can be expected at a reliability level of 60%.

■ CONTACT FORM

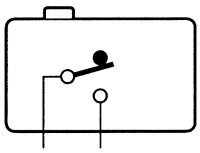
SPDT Contacts



SPST-NC Contacts (Lead Wire Models)



SPST-NO Contacts (Lead Wire Models)



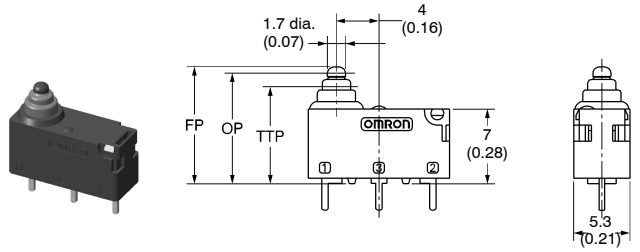
Note: Lead wire colors are indicated in parentheses.

Dimensions

Unit: mm (inch)

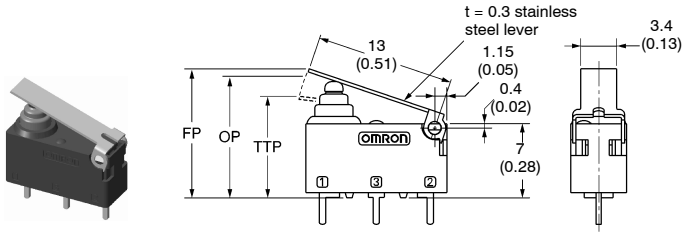
■ PIN PLUNGER

D2HW-□20□□



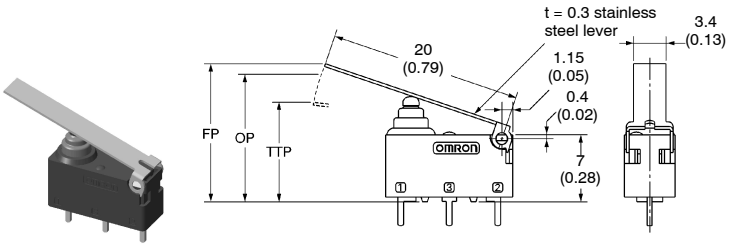
■ HINGE LEVER

D2HW-□21□□



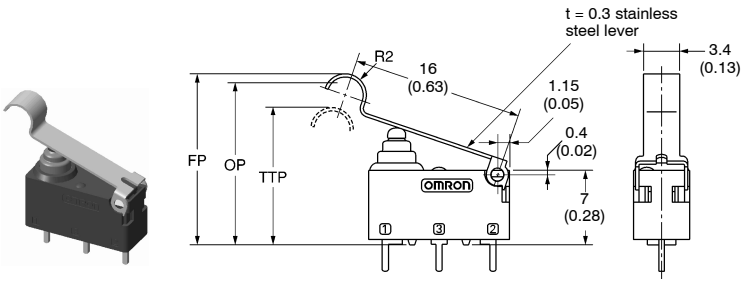
■ LONG HINGE LEVER

D2HW-□22□□



■ SIMULATED ROLLER LEVER

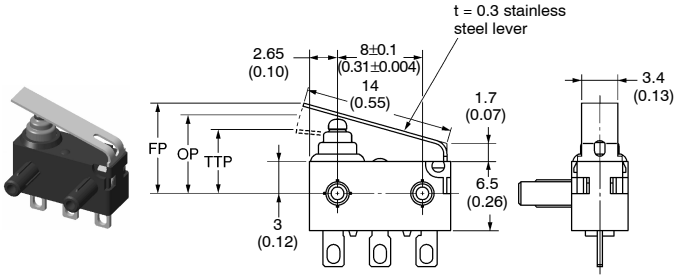
D2HW-□23□□



Unit: mm (inch)

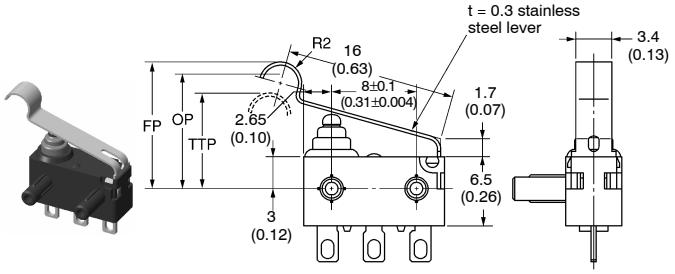
■ LEAF LEVER

D2HW-□26□□



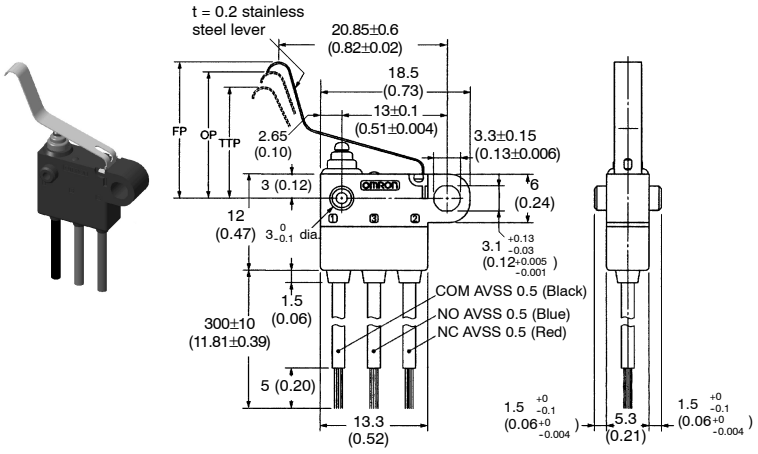
■ SIMULATED LEAF LEVER

D2HW-□27□□



■ LONG LEAF LEVER

D2HW-□28□□

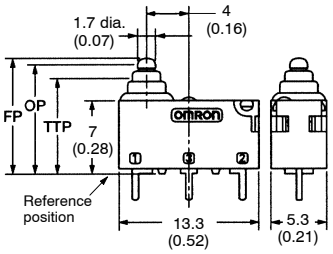


Note: Dimensions not indicated in the above diagrams have a tolerance of ±0.2 mm.

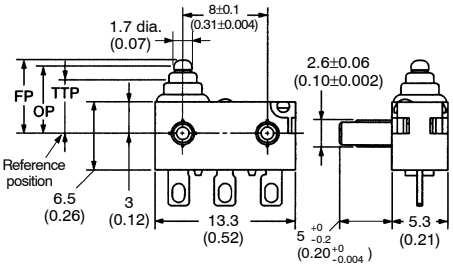
■ MOUNTING STRUCTURE AND REFERENCE POSITIONS

The reference positions used for FP, OP, and TTP values are as shown below for each type of mounting.

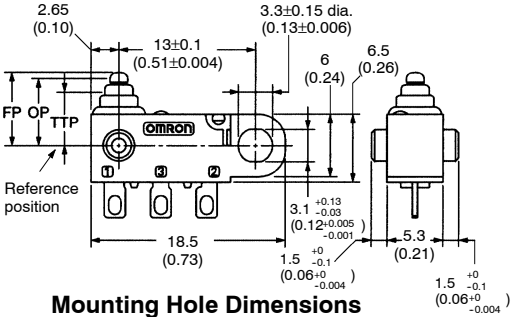
D2HW-A□
Models without Posts



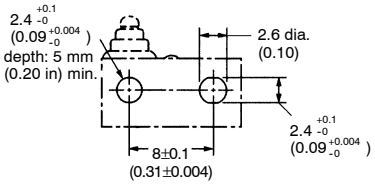
D2HW-B□
Models with Posts



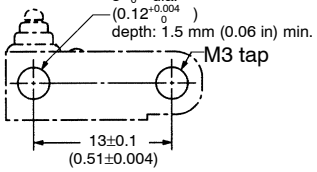
D2HW-C□
M3-screw Mounting Models



Mounting Hole Dimensions (Reference)

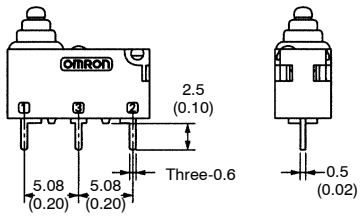


Mounting Hole Dimensions (Reference)

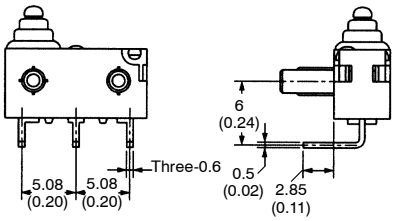


■ TERMINALS

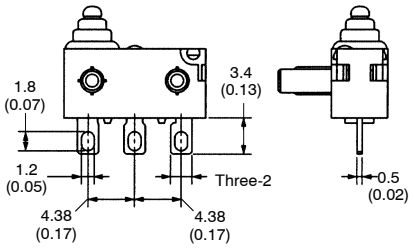
Straight PCB Terminals



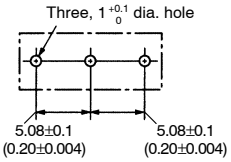
Angled PCB Terminals



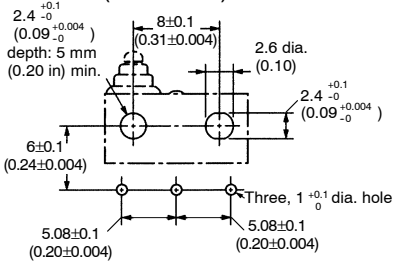
Solder Terminals



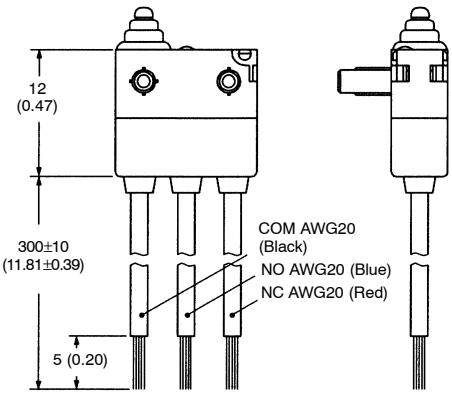
PCB Cutout Dimensions (Reference)



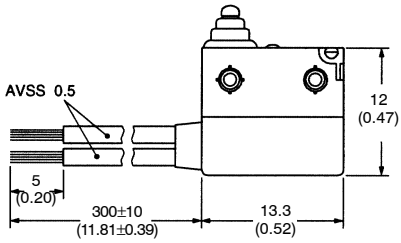
PCB Cutout Dimensions (Reference)



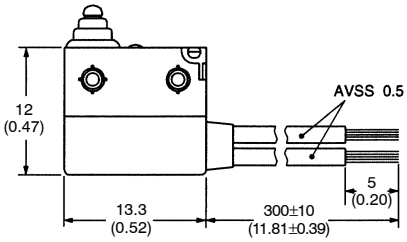
Lead Wires Downwards



Lead Wires on Left-side



Lead Wires on Right-side



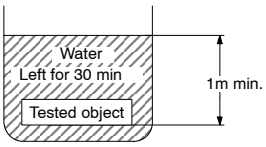
Precautions

■ CAUTIONS

Degree of Protection

Do not use this product in water. Although lead wire 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.

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



Protection Against Chemicals

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

Terminal Connection

To solder the lead wire to the terminal, first entwine the conducting part around the terminal hole. Solder using a soldering iron rated at 30 W max. within 3 s.

Applying a soldering iron for too long a time or using one that is rated at more than 30 W may degrade the Switch characteristics.

When soldering PCB terminals to the PCB, ensure that the surface area of the flux or the solder does not exceed that of the PCB.

Side-actuated (cam) Operation

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

■ CORRECT USE

Mounting

Always turn OFF the power supply before mounting or dismounting, wiring, or performing maintenance inspections. Failure to do so may result in electric shock or burning.

Mount M3-screw mounted models securely, using M3 mounting screws with plain or spring washers. Tighten the screws to a torque of 0.29 N·m max. Tightening the screws to a torque exceeding this may result in deterioration of the sealing or damage to the product.

For models with posts, secure the posts by thermal caulking or by pressing into an attached device. When pressed into an attached device, provide guides on the opposite ends of the posts to ensure that they do not fall out or rattle.

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

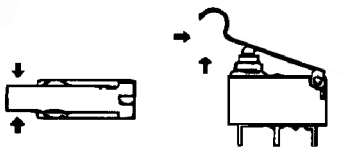
Operating Body

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.

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 below, pressure in a direction other than the operating direction is not applied to the actuator, otherwise the actuator or switch may be damaged, or the service life my be reduced.



Wiring Lead Wire Models

When wiring lead wire models, ensure that there is no tension 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.

Using the Switch with Micro Loads

Even when the Switch is used within the appropriate operating range, power surges may shorten its service life. Insert a contact protection circuit as required.

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