

Subminiature Basic Switch



SSG

Global Subminiature Basic Switch Conforming to EN, UL, and CSA Standards

- A wide operating temperature range of -25°C to 125°C is available for at high-temperature use.
- PCB terminal models are resistant to flux.
- Even-pitched PCB terminals.
- Mounting hole size of M2.2.
- RoHS Compliant.



Ordering Information

Actuator	Rating	OF max.	Solder	Quick-connect terminal (#110)	PCB
Pin plunger 	5 A	153 gf	SSG-5H	SSG-5T	SSG-5P
		51 gf	SSG-5H-5	SSG-5T-5	SSG-5P-5
	0.1 A	153 gf	SSG-01H	SSG-01T	SSG-01P
		51 gf	SSG-01H-5	SSG-01T-5	SSG-01P-5
Hinge lever 	5 A	61 gf	SSG-5L1H	SSG-5L1T	SSG-5L1P
		20 gf	SSG-5L1H-5	SSG-5L1T-5	SSG-5L1P-5
	0.1 A	61 gf	SSG-01L1H	SSG-01L1T	SSG-01L1P
		20 gf	SSG-01L1H-5	SSG-01L1T-5	SSG-01L1P-5
Simulated roller lever 	5 A	61 gf	SSG-5L3H	SSG-5L3T	SSG-5L3P
		20 gf	SSG-5L3H-5	SSG-5L3T-5	SSG-5L3P-5
	0.1 A	61 gf	SSG-01L3H	SSG-01L3T	SSG-01L3P
		20 gf	SSG-01L3H-5	SSG-01L3T-5	SSG-01L3P-5
Hinge roller lever 	5 A	61 gf	SSG-5L2H	SSG-5L2T	SSG-5L2P
		20 gf	SSG-5L2H-5	SSG-5L2T-5	SSG-5L2P-5
	0.1 A	61 gf	SSG-01L2H	SSG-01L2T	SSG-01L2P
		20 gf	SSG-01L2H-5	SSG-01L2T-5	SSG-01L2P-5

Note: SPST models are also available, but not listed in the above table.

Model Number Legend

SSG-□□□□□
1 2 3 4 5

1. Ratings

5: 5 A at 125 VAC
01: 0.1 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
-3: SPST-NO

5. Maximum Operating Force (see note)

None: 153 gf
-5: 51 gf

Note: These OF values are for the pin plunger models.

4. Terminals

H: Solder terminals
T: Quick-connect terminals (#110)
P: PCB terminals (SPDT only)

Consult Omron regarding the following:
- SPST-NC and SPST-NO versions
(Solder and QC terminals, only)

Specifications

■ Characteristics

Operating speed	0.1 mm to 1 m/second (pin plunger models)
Operating frequency	Mechanical: 400 operations per minute max. Electrical: 30 operations per minute max.
Insulation resistance	100 MΩ
Contact resistance	153 gf: SSG-5 models : 30 mΩ max. SSG-01 models: 50 mΩ max.
	51 gf: SSG-5 models: 50 mΩ max. SSG-01 models 100 mΩ max.
Dielectric strength (See note 2)	1,000 VAC (600 VAC for SSG-01H and SSG-01T), 50/60 Hz for 1 minute between contacts of same polarity 1,500 VAC, 50/60 Hz for 1 minute between each terminal and ground and between each terminal and non-current-carrying metal parts
Vibration resistance (see note 3)	Malfunction: 10 to 2,000 Hz, 196 m/s ² (Approx. 20G)
Shock resistance (see note 3)	Malfunction: 490 m/s ² (approx. 50G) max.
Degree of protection	IEC IP40
Degree of protection against electric shock	Class I
Proof tracking index (PTI)	175
Ambient operating temperature	-25° to 125°C (at 60% RH max.) with no icing or condensation
Ambient operating humidity	85% max. (for 5°C to 35°C)
Service life	Mechanical: 10 million operations min. at 60 operations per minute Electrical: 200,000 operations min. at 30 operations per minute
Weight	Approx. 1.6 g pin plunger type

Note: 1. Data shown are of initial value.

2. The dielectric strength values shown is measured using a separator between the switch and metal mounting plate.

3. For pin plunger models, the above values apply for use at the free position and total travel position. For the lever models, the values apply at the total travel position with contact separation < 10μs max.

■ Ratings

General Ratings

Rated voltage	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	5 A (0.1 A)		1.5 A	0.7 A	3 A		2.5 A	1.3 A
250 VAC	3 A		1 A	0.5 A	2 A		1.5 A	0.8 A
8 VDC	5 A		2 A		5 A		3 A	
14 VDC	5 A		2 A		4 A		3 A	
30 VDC	4 A(0.1 A)		2 A		3 A		3 A	
125 VDC	0.4 A		0.05 A		0.4 A		0.05 A	
250 VDC	0.2 A		0.03 A		0.2 A		0.05 A	

Note: 1. The values in the parentheses are for the SSG-01.

2. The above current ratings are the values of the steady-state current.

3. Inductive load has a power factor of 0.7 min. (AC) and a time constant of 7 ms max. (DC).

4. Lamp load has an inrush current of 10 times the steady-state current.

5. Motor load has an inrush current of 6 times the steady-state current.

6. If the Switch is used in a DC circuit and is subjected to a surge current, connect a surge suppressor across the switch.

7. The electrical rating applies under the following test conditions:

Ambient Temperature = 20±2°C, Ambient Humidity = 65±5%, Operating frequency = 30 operations/minute

Approved Standards

UL Recognized (File No. E41515)
 CSA Certified (File No. LR21642)

Rated Voltage	SSG-5	SSG-01
125 VAC	5 A	0.1 A
250 VAC	3 A	- - -
30 VDC	- - -	0.1 A

EN61058-1 - - TÜV Rheinland approval
 (File No. J9451449)

Rated Voltage	SSG-5	SSG-01
250 VAC	5 A	- - -
30 VDC	- - -	0.1 A

Testing conditions: 5E4 (50,000 operations), T125 (0°C to 125°C)

Note: The rated values approved by each of the safety standards (e.g. UL, CSA) may be different from the performance characteristics individually defined in this catalog.

Contact Specifications

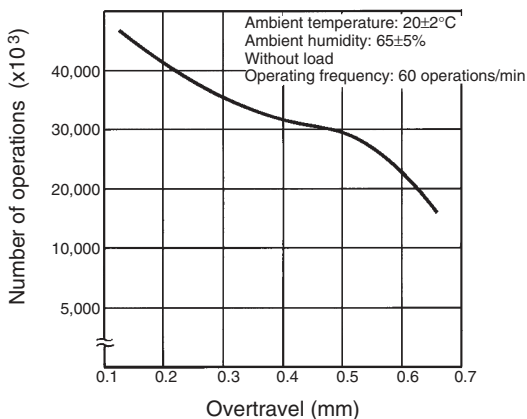
Item	SSG-5	SSG-01H(T)	SSG-01P
Specification	Rivet	Crossbar	
Material	Silver	Gold alloy	Gold alloy
Gap (standard value)	0.5 mm	0.25 mm	0.5 mm
Inrush current	NC: 20A max. NO: 10A max.	1A max.	1A max.
Minimum applicable load (see note)	160 mA at 5 VDC	1 mA at 5 VDC	

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

Engineering Data

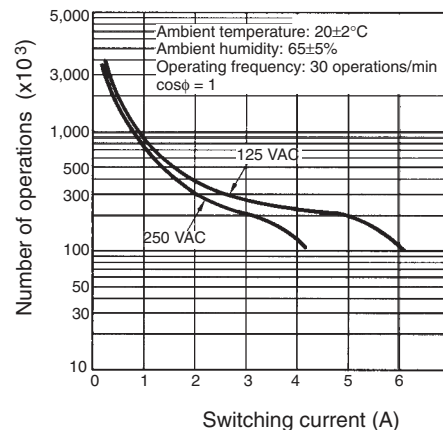
Mechanical Service Life

SSG-5 Models



Electrical Service Life

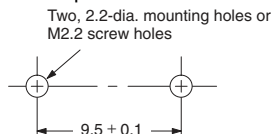
SSG-5 Models



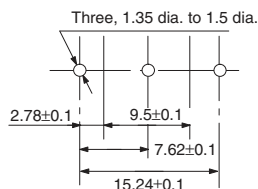
Mounting

Panel Mounting

All switches may be panel mounted using M2.2 mounting screws with plane washers or spring washers to securely mount the switch. Tighten the screws to a torque of 0.20 to 0.24 N·m.

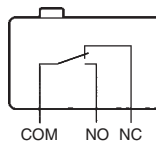


PCB Layout

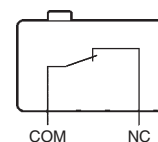


Contact Form

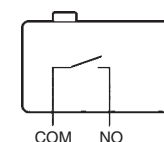
SPDT



SPST-NC



SPST-NO



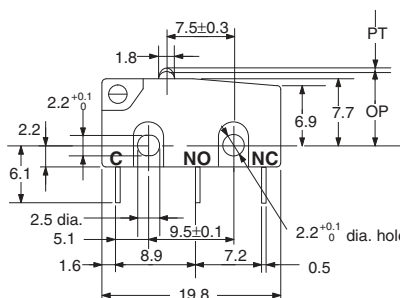
* Consult Omron for SPST-NC and SPST-NO contact form types ordering information.

Dimensions

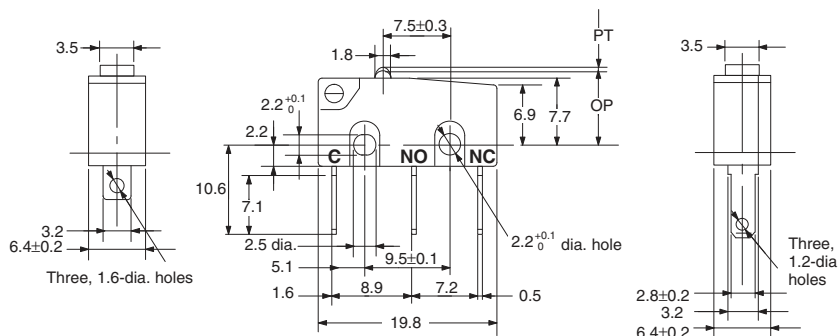
■ Terminals

Note: 1. Unless otherwise specified, all units are in millimeters and a tolerance of ± 0.4 mm applies to all dimensions

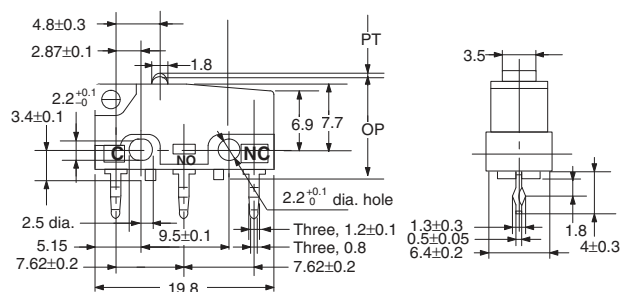
Solder Terminals



Quick-connect Terminals (#110)



PCB Terminals



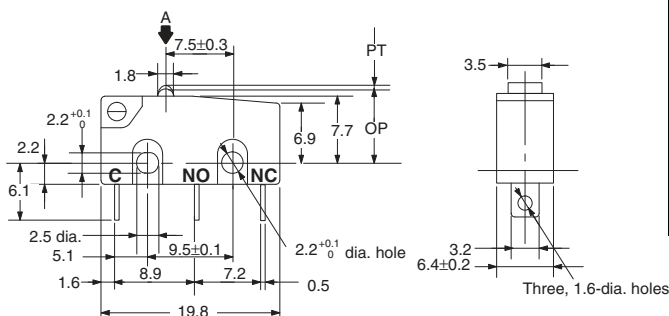
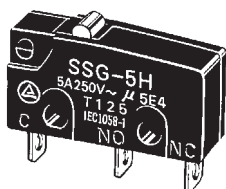
■ Dimensions and Operating Characteristics

- Note:** 1. Unless otherwise specified, all units are in millimeters and a tolerance of ± 0.25 mm applies to all dimensions
 2. Every actual model number includes the code instead of □ for the kind of terminals incorporated by the model.
 3. The operating characteristics are for operation in the A direction(▼)

Solder/Quick-connect Terminal

Pin Plunger Models

- SSG-01□
 SSG-5□
 SSG-01□-5
 SSG-5□-5

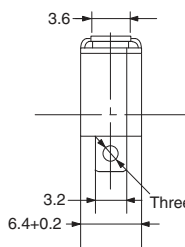
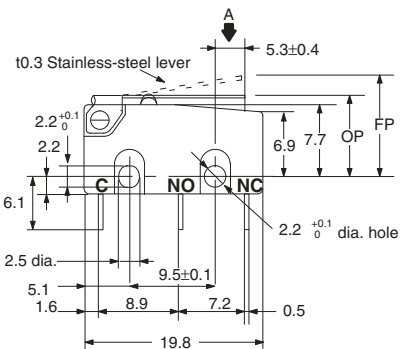
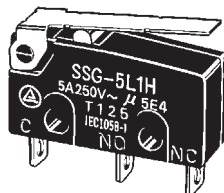


Model	SSG-01□ SSG-5□	SSG-01□-5 SSG-5□-5
OF max.	153 gf	51 gf
RF min.	25 gf	4 gf
PT max.	0.6 mm	
OT min.	0.4 mm	
MD max.	0.1 mm	
FP max.	---	
OP	8.4±0.3 mm	

- Note:** 1. Unless otherwise specified, all units are in millimeters and a tolerance of ± 0.25 mm applies to all dimensions
 2. Every actual model number includes the code instead of \square for the kind of terminals incorporated by the model.
 3. The operating characteristics are for operation in the A direction(\blacktriangledown)

Hinge Lever Models

- SSG-01L1 \square
 SSG-5L1 \square
 SSG-01L1 \square -5
 SSG-5L1 \square -5

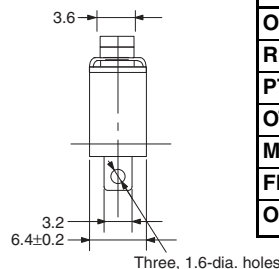
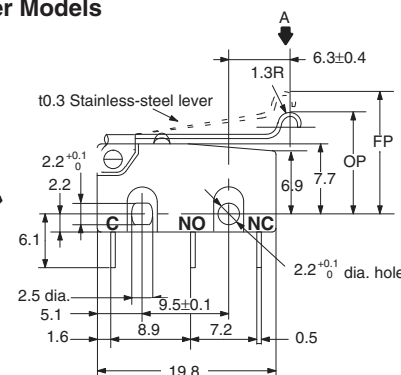
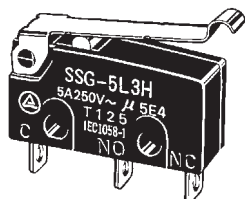


Model	SSG-01L1 \square SSG-5L1 \square	SSG-01L1 \square -5 SSG-5L1 \square -5
OF max.	61 gf	20 gf
RF min.	6 gf	2 gf
PT max.	---	
OT min.	1.0 mm	
MD max.	0.8 mm	
FP max.	13.6 mm	
OP	8.8 ^{+1.0} / _{-0.6} mm	

Note: Also available are models with a hinge lever length of 26.1 mm under the following model numbers: SSG-01L14 \square , SSG-5L14 \square , SSG01L14 \square -5, and SSG-5L14 \square -5. Contact your OMRON representative for these models.

Simulated Roller Lever Models

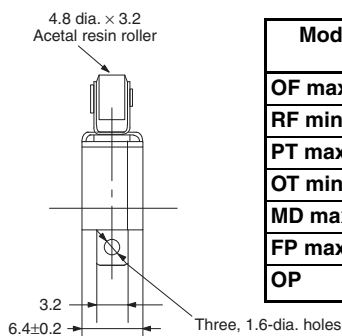
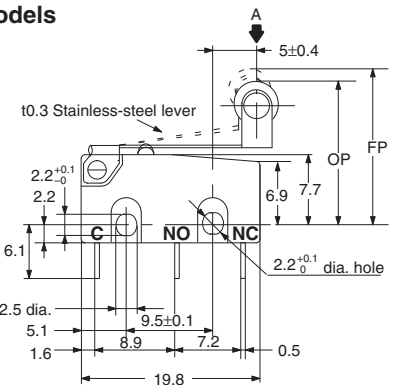
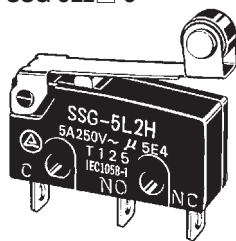
- SSG-01L3 \square
 SSG-5L3 \square
 SSG-01L3 \square -5
 SSG-5L3 \square -5



Model	SSG-01L3 \square SSG-5L3 \square	SSG-01L3 \square -5 SSG-5L3 \square -5
OF max.	61 gf	20 gf
RF min.	6 gf	2 gf
PT max.	---	
OT min.	1.0 mm	
MD max.	0.8 mm	
FP max.	15.5 mm	
OP	10.7 ^{+1.0} / _{-0.6} mm	

Hinge Roller Lever Models

- SSG-01L2 \square
 SSG-5L2 \square
 SSG-01L2 \square -5
 SSG-5L2 \square -5

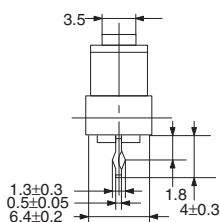
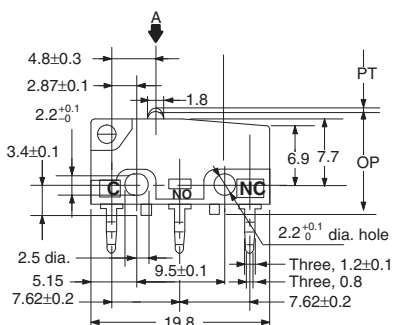
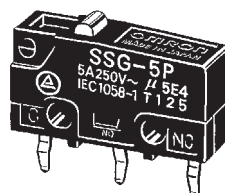


Model	SSG-01L2 \square SSG-5L2 \square	SSG-01L2 \square -5 SSG-5L2 \square -5
OF max.	61 gf	20 gf
RF min.	6 gf	2 gf
PT max.	---	
OT min.	1.0 mm	
MD max.	0.8 mm	
FP max.	19.0 mm	
OP	14.5 ^{+1.0} / _{-0.6} mm	

PCB Terminal

Pin Plunger

- SSG-01P
 SSG-5P
 SSG-01P-5
 SSG-5P-5

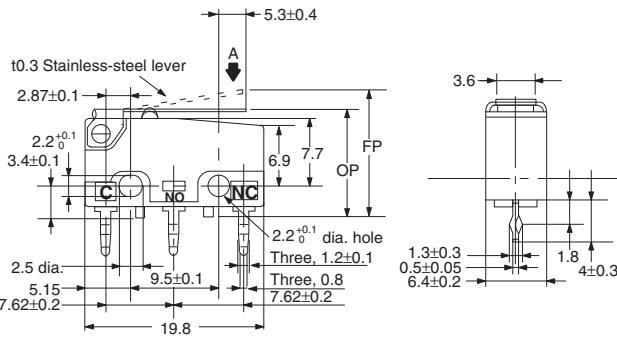
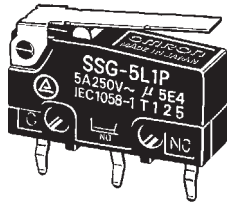


Model	SSG-01P SSG-5P	SSG-01P-5 SSG-5P-5
OF max.	153 gf	51 gf
RF min.	25 gf	4 gf
PT max.	0.6 mm	
OT min.	0.4 mm	
MD max.	0.1 mm	
FP max.	---	
OP	11.8±0.4 mm	

Note: 1. Unless otherwise specified, all units are in millimeters and a tolerance of ± 0.25 mm applies to all dimensions
 2. The operating characteristics are for operation in the A direction(▼)

Hinge Lever Models

SSG-01L1P
 SSG-5L1P
 SSG-01L1P-5
 SSG-5L1P-5

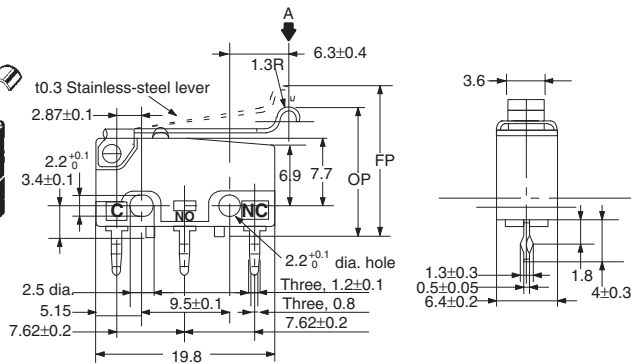
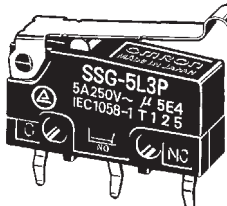


Model	SSG-01L1P SSG-5L1P	SSG-01L1P-5 SSG-5L1P-5
OF max.	61 gf	20 gf
RF min.	6 gf	2 gf
PT max.	---	
OT min.	1.0 mm	
MD max.	0.8 mm	
FP max.	17.0 mm	
OP	12.2 ^{+1.1} / _{-0.7} mm	

Note: Also available are models with a hinge lever length of 26.1 mm under the following model numbers: SSG-01L14P, SSG-5L14P, SSG01L14P-5, and SSG-5L14P-5. Contact your OMRON representative for these models.

Simulated Roller Lever Models

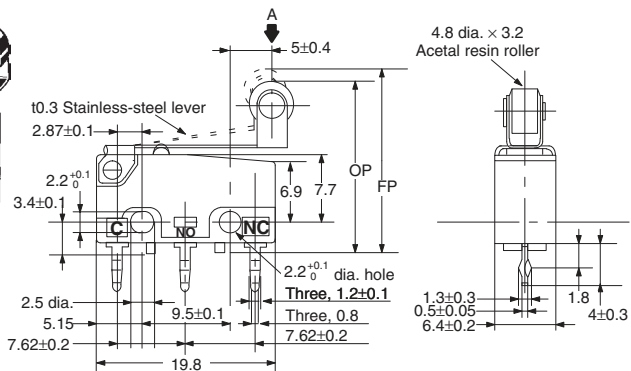
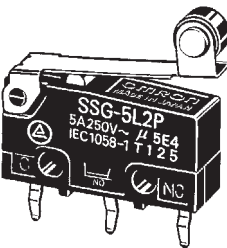
SSG-01L3P
 SSG-5L3P
 SSG-01L3P-5
 SSG-5L3P-5



Model	SSG-01L3P SSG-5L3P	SSG-01L3P-5 SSG-5L3P-5
OF max.	61 gf	20 gf
RF min.	6 gf	2 gf
PT max.	---	
OT min.	1.0 mm	
MD max.	0.8 mm	
FP max.	18.9 mm	
OP	14.4 ^{+1.1} / _{-0.7} mm	

Hinge Roller Lever Models

SSG-01L2P
 SSG-5L2P
 SSG-01L2P-5
 SSG-5L2P-5



Model	SSG-01L2P SSG-5L2P	SSG-01L2P-5 SSG-5L2P-5
OF max.	61 gf	20 gf
RF min.	6 gf	2 gf
PT max.	---	
OT min.	1.0 mm	
MD max.	0.8 mm	
FP max.	22.4 mm	
OP	17.9 ^{+1.1} / _{-0.7} mm	

Precautions

Be sure to read the precautions and information common to all Snap Action and Detection Switches, contained in the Technical User's Guide, "Snap Action Switches, Technical Information" for correct use.

Correct Use

Mounting

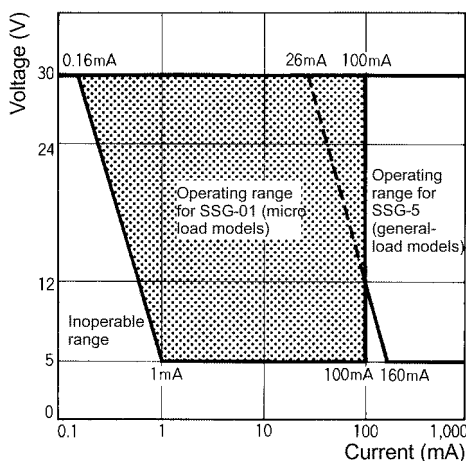
Mount the switch onto a flat surface. Mounting on an uneven surface may cause deformation of the switch, resulting in faulty operation or breakage in the housing.

Operating Stroke

Make sure that the operating stroke is 70% to 100% of the rated OT distance. Do not operate the actuator exceeding the OT distance, otherwise the life expectancy of the switch may be shortened.

Using Microloads

Using a model for ordinary loads to switch microloads may result in faulty operation. Instead, use the models that are designed for microloads and that operate in the following range;



However, even when using microload models within the operating range shown above, if inrush current or inductive voltage spikes occur when the contact is opened or closed, then contact wear may increase and so decrease the service life. Therefore, insert a contact protection circuit where necessary.

Cautions

Handling

Turn OFF the power supply before mounting or removing the switch, wiring, or performing maintenance for inspection. Failure to do so may result in electric shock or burning

Terminal Connection

When soldering the lead wire to the terminal, first insert the lead wire conductor through the terminal hole and then solder.

Make sure that the capacity of the soldering iron is 60 W (temperature of soldering iron: 350°C to 400°C) maximum. Do not take more than 3 seconds to solder the switch terminal. Improper soldering involving an excessively high temperature or excessive soldering time may deteriorate the characteristics of the switch.

Be sure to apply only the minimum required amount of flux. The switch may have contact failures if flux intrudes in the interior of the switch.

Use the following lead wires to connect to the solder terminals;

Model	Conductor size
SSG-01	AWG 22 to 20
SSG-5	AWG 20 to 18

To automatically solder the Switch to a PCB in a soldering bath, complete soldering within 5 seconds at a temperature of 260 +/- 5°C and avoid the overflow of flux onto the surface of the PCB where the Switch or other parts are mounted.

Wire the quick-connect terminals (#110) with receptacles. Insert the terminals straight into the receptacles. Do not impose excessive force on the terminal in the horizontal direction, otherwise the terminal may be deformed or the housing may be damaged.

Insulation Distance

Use a separator between the switch and metal mounting panels, to ensure proper dielectric characteristics are achieved.

The Switch does not have a ground terminal. The minimum distance through insulation should be 0.9 mm per IEC61058-1. If proper insulation for the end product cannot be secured, additional insulation such as a Separator or insulation cover should be attached.

All sales are subject to Omron Electronic Components LLC standard terms and conditions of sale, which can be found at http://www.components.omron.com/components/web/webfiles.nsf/sales_terms.html

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

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