

Subminiature Basic Switch

SS

Subminiature Basic Switch Offers Long Life and High Reliability

- A design that combines simplicity and stability by the use of two split springs ensures a long durability of 30,000,000 operations.
- A variety of models are available, with operating force ranging from low to high.
- Available by 10.1 A, 5 A, and 0.1 A models.

RoHS Compliant





Ordering Information

■ Model Number Legend



1. Ratings

10: 10.1 A at 125 VAC5: 5 A at 125 VAC01: 0.1 A at 30 VDC

2. Actuator

None: Pin plunger
GL: Hinge lever
GL13: Simulated roller lever
GL2: Hinge roller lever

3. Maximum Operating Force (see note 1)

None: 1.47 N {150 gf} -F: 0.49 N {50 gf} (0.1 A, 5 A) -E: 0.25 N {25 gf} (0.1 A)

Note: These values are for pin plunger models.

4. Contact Form

None: SPDT -2: SPST-NC -3: SPST-NO

5. Terminals

None: Solder terminals

T: Quick-connect terminals (#110)
D: PCB terminals (see note 2)

6. Special Code

None: Standard (85°C)
-T: Heat resistive (120°C)

■ List of Models

Standard Models

Actuator	Terminal	Contact Form	Rating OF max.	10.1 A	5 A	0.1 A
Pin plunger	Solder terminal	SPDT	1.47 N {150 gf}	SS-10	SS-5	SS-01
		SPST-NC		SS-10-2	SS-5-2	SS-01-2
		CPST-NO		SS-10-3	SS-5-3	SS-01-3
	Quick-connect	SPDT		SS-10T	SS-5T	SS-01T
	terminal (#110)	SPST-NC		SS-10-2T	SS-5-2T	SS-01-2T
		CPST-NO		SS-10-3T	SS-5-3T	SS-01-3T
	PCB terminal	SPDT		SS-10D	SS-5D	SS-01D
		SPST-NC		SS-10-2D	SS-5-2D	SS-01-2D
		CPST-NO		SS-10-3D	SS-5-3D	SS-01-3D
	Solder terminal	SPDT	0.49 N {50 gf}		SS-5-F	SS-01-F
		SPST-NC			SS-5-F-2	SS-01-F-2
		CPST-NO			SS-5-F-3	SS-01-F-3
	Quick-connect	SPDT			SS-5-FT	SS-01-FT
	terminal (#110)	SPST-NC			SS-5-F-2T	SS-01-F-2T
		CPST-NO			SS-5-F-3T	SS-01-F-3T
	PCB terminal	SPDT			SS-5-FD	SS-01-FD
		SPST-NC			SS-5-F-2D	SS-01-F-2D
		CPST-NO			SS-5-F-3D	SS-01-F-3D
	Solder terminal	SPDT	0.25 N {25 gf}			SS-01-E
		SPST-NC				SS-01-E-2
		CPST-NO				SS-01-E-3
	Quick-connect terminal (#110)	SPDT				SS-01-ET
		SPST-NC				SS-01-E-2T
		CPST-NO				SS-01-E-3T
	PCB terminal	SPDT				SS-01-ED
		SPST-NC				SS-01-E-2D
		CPST-NO				SS-01-E-3D
Hinge lever	Solder terminal	SPDT	0.49 N {50 gf}	SS-10GL	SS-5GL	SS-01GL
		SPST-NC		SS-10GL-2	SS-5GL-2	SS-01GL-2
		CPST-NO		SS-10GL-3	SS-5GL-3	SS-01GL-3
	Quick-connect	SPDT		SS-10GLT	SS-5GLT	SS-01GLT
	terminal (#110)	SPST-NC		SS-10GL-2T	SS-5GL-2T	SS-01GL-2T
		CPST-NO		SS-10GL-3T	SS-5GL-3T	SS-01GL-3T
	PCB terminal	SPDT		SS-10GLD	SS-5GLD	SS-01GLD
		SPST-NC		SS-10GL-2D	SS-5GL-2D	SS-01GL-2D
		CPST-NO		SS-10GL-3D	SS-5GL-3D	SS-01GL-3D
	Solder terminal	SPDT	0.16 N {16 gf}		SS-5GL-F	SS-01GL-F
		SPST-NC			SS-5GL-F-2	SS-01GL-F-2
		CPST-NO			SS-5GL-F-3	SS-01GL-F-3
	Quick-connect	SPDT			SS-5GL-FT	SS-01GL-FT
	terminal (#110)	SPST-NC			SS-5GL-F-2T	SS-01GL-F-2T
		CPST-NO			SS-5GL-F-3T	SS-01GL-F-3T

Actuator	Terminal	Contact Form	Rating OF max.	10.1 A	5 A	0.1 A
Hinge lever	PCB terminal	SPDT	0.16 N {16 gf}		SS-5GL-FD	SS-01GL-FD
		SPST-NC			SS-5GL-F-2D	SS-01GL-F-2D
		CPST-NO			SS-5GL-F-3D	SS-01GL-F-3D
	Solder terminal	SPDT	0.08 N {8 gf}			SS-01GL-E
		SPST-NC				SS-01GL-E-2
		CPST-NO				SS-01GL-E-3
	Quick-connect	SPDT				SS-01GL-ET
	terminal (#110)	SPST-NC				SS-01GL-E-2T
		CPST-NO				SS-01GL-E-3T
	PCB terminal	SPDT				SS-01GL-ED
		SPST-NC				SS-01GL-E-2D
		CPST-NO				SS-01GL-E-3D
Simulated roller lever	Solder terminal	SPDT	0.49 N {50 gf}	SS-10GL13	SS-5GL13	SS-01GL13
		SPST-NC		SS-10GL13-2	SS-5GL13-2	SS-01GL13-2
		CPST-NO		SS-10GL13-3	SS-5GL13-3	SS-01GL13-3
	Quick-connect	SPDT		SS-10GL13T	SS-5GL13T	SS-01GL13T
	terminal (#110)	SPST-NC		SS-10GL13-2T	SS-5GL13-2T	SS-01GL13-2T
		CPST-NO		SS-10GL13-3T	SS-5GL13-3T	SS-01GL13-3T
	PCB terminal	SPDT		SS-10GL13D	SS-5GL13D	SS-01GL13D
		SPST-NC		SS-10GL13-2D	SS-5GL13-2D	SS-01GL13-2D
		CPST-NO		SS-10GL13-3D	SS-5GL13-3D	SS-01GL13-3D
	Solder terminal	SPDT	0.16 N {16 gf}		SS-5GL13-F	SS-01GL13-F
		SPST-NC]		SS-5GL13-F-2	SS-01GL13-F-2
		CPST-NO			SS-5GL13-F-3	SS-01GL13-F-3
	Quick-connect	SPDT			SS-5GL13-FT	SS-01GL13-FT
	terminal (#110)	SPST-NC			SS-5GL13-F-2T	SS-01GL13-F-2T
		CPST-NO			SS-5GL13-F-3T	SS-01GL13-F-3T
	PCB terminal	SPDT			SS-5GL13-FD	SS-01GL13-FD
		SPST-NC			SS-5GL13-F-2D	SS-01GL13-F-2D
		CPST-NO			SS-5GL13-F-3D	SS-01GL13-F-3D
	Solder terminal	SPDT	0.08 N {8 gf}			SS-01GL13-E
		SPST-NC				SS-01GL13-E-2
		CPST-NO				SS-01GL13-E-3
	Quick-connect	SPDT				SS-01GL13-ET
	terminal (#110)	SPST-NC				SS-01GL13-E-2T
		CPST-NO				SS-01GL13-E-3T
	PCB terminal	SPDT				SS-01GL13-ED
		SPST-NC				SS-01GL13-E-2D
		CPST-NO				SS-01GL13-E-3D

Actuator	Terminal	Contact Form	Rating OF max.	10.1 A	5 A	0.1 A
Hinge roller lever	Solder terminal	SPDT	0.49 N {50 gf}	SS-10GL2	SS-5GL2	SS-01GL2
		SPST-NC		SS-10GL2-2	SS-5GL2-2	SS-01GL2-2
		CPST-NO]	SS-10GL2-3	SS-5GL2-3	SS-01GL2-3
	Quick-connect	SPDT]	SS-10GL2T	SS-5GL2T	SS-01GL2T
	terminal (#110)	SPST-NC		SS-10GL2-2T	SS-5GL2-2T	SS-01GL2-2T
		CPST-NO		SS-10GL2-3T	SS-5GL2-3T	SS-01GL2-3T
	PCB terminal	SPDT		SS-10GL2D	SS-5GL2D	SS-01GL2D
		SPST-NC		SS-10GL2-2D	SS-5GL2-2D	SS-01GL2-2D
		CPST-NO		SS-10GL2-3D	SS-5GL2-3D	SS-01GL2-3D
	Solder terminal	SPDT	0.16 N {16 gf}		SS-5GL2-F	SS-01GL2-F
		SPST-NC			SS-5GL2-F-2	SS-01GL2-F-2
		CPST-NO			SS-5GL2-F-3	SS-01GL2-F-3
	Quick-connect terminal (#110)	SPDT			SS-5GL2-FT	SS-01GL2-FT
		SPST-NC			SS-5GL2-F-2T	SS-01GL2-F-2T
		CPST-NO			SS-5GL2-F-3T	SS-01GL2-F-3T
	PCB terminal	SPDT			SS-5GL2-FD	SS-01GL2-FD
		SPST-NC			SS-5GL2-F-2D	SS-01GL2-F-2D
		CPST-NO]		SS-5GL2-F-3D	SS-01GL2-F-3D
	Solder terminal	SPDT	0.08 N {8 gf}			SS-01GL2-E
		SPST-NC]			SS-01GL2-E-2
		CPST-NO				SS-01GL2-E-3
	Quick-connect	SPDT]			SS-01GL2-ET
	terminal (#110)	SPST-NC				SS-01GL2-E-2T
		CPST-NO	1			SS-01GL2-E-3T
	PCB terminal	SPDT				SS-01GL2-ED
		SPST-NC				SS-01GL2-E-2D
		CPST-NO				SS-01GL2-E-3D

Heat resistive models

Actuator	Terminal	Contact Form	Rating OF max.	10.1 A	5 A	0.1 A
Pin plunger	Solder terminal	SPDT	1.47 N {150 gf}	SS-10-T	SS-5-T	SS-01-T
	Quick-connect			SS-10T-T	SS-5T-T	SS-01T-T
	PCB terminal			SS-10D-T	SS-5D-T	SS-01D-T
Hinge lever	Solder terminal		0.49 N {50 gf}	SS-10GL-T	SS-5GL-T	SS-01GL-T
	Quick-connect			SS-10GLT-T	SS-5GLT-T	SS-01GLT-T
<u> </u>	PCB terminal			SS-10GLD-T	SS-5GLD-T	SS-01GLD-T
Simulated roller lever	Solder terminal		0.49 N {50 gf}	SS-10GL13-T	SS-5GL13-T	SS-01GL13-T
	Quick-connect			SS-10GL13T-T	SS-5GL13T-T	SS-01GL13T-T
	PCB terminal			SS-10GL13D-T	SS-5GL13D-T	SS-01GL13D-T
Hinge roller lever	Solder terminal		0.49 N {50 gf}	SS-10GL02-T	SS-5GL02-T	SS-01GL02-T
P	Quick-connect			SS-10GL02T-T	SS-5GL02T-T	SS-01GL02T-T
	PCB terminal			SS-10GL02D-T	SS-5GL02D-T	SS-01GL02D-T

Specifications

■ Ratings

	Item	Resistive load
Model	Rated voltage	
SS-10	250 VAC	10.1 A
SS-5	125 VAC 250 VAC	5 A 3 A
SS-01	125 VAC	0.1 A
	30 VDC	0.1 A

Note: The ratings values apply under the following test condi-

tions:

Ambient temperature: 20±2°C Ambient humidity: 65±5%

Operating frequency: 30 operations/min

■ Characteristics

Operating speed	0.1 mm to 1 m/s (pin plunger models)				
Operating frequency	Mechanical:400 operations/min max. Electrical:30 operations/min max.				
Insulation resistance	100 M Ω min. (at 500 VDC)				
Contact resistance	OF 1.47 N {150 gf}: SS-10, SS-5 models:30 mΩ max.				
(initial value)	SS-01 models:50 m Ω max.				
	OF 0.49 N {50 gf}: SS-5 models:50 m Ω max. SS-01 models:100 m Ω max.				
	OF 0.25 N {25 gf}: SS-01 models:150 mΩ max.				
Dielectric strength (see note 2)	1,000 VAC (600 VAC for SS-01 models), 50/60 Hz for 1 min between terminals of the same polarities 1,500 VAC, 50/60 Hz for 1 min between current-carrying metal part and ground, and between each terminal and non-current-carrying metal part				
Vibration resistance (see note 3)	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude				
Shock resistance	Destruction: OF 1.47 N {150 gf}:1,000 m/s ² {approx. 100G} max.				
(see note 4)	OF 0.25 N {25gf}/0.49 N {50 gf}:500 m/s ² {approx. 50G} max.				
	Malfunction: OF 1.47 N {150 gf}:300 m/s ² {approx. 30G} max.				
	OF 0.25 N {25 gf}/0.49 N {50 gf}:200 m/s ² {approx. 20G} max.				
Durability (see note 5)	Mechanical: 30,000,000 operations min. (60 operations/min) (Refer to the following <i>Engineering Data</i> .)				
	10,000,000 operations min. (60 operations/min) for SS-10 models Electrical: 200,000 operations min. (30 operations/min) (Refer to the following <i>Engineering Data</i> .)				
	50,000 operations min. (30 operations/min) for SS-10 models				
Degree of protection	IEC IP40				
Degree of protection against electrical shock	Class I				
Proof Tracking Index (PTI)	175				
Ambient operating temperature	-25°C to 85°C (at ambient humidity of 60% max.) (with no icing or condensation)				
Ambient operating humidity	85% max. (for 5°C to 35°C)				
Weight	Approx. 1.6 g (pin plunger models)				

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

- $\textbf{2.} \ \ \text{The dielectric strength shown in the table indicates a value for models with a Separator.}$
- 3. For the pin plunger models, the above values apply for use at both the free position and total travel position. For the lever models, they apply at the total travel position.
- 4. Lever-type models: Total travel position (with a contact separation time of 1 ms max.)
- 5. For testing conditions, contact 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	SS-10	SS-5	SS-01
125 VAC 250 VAC	 10.1 A	5 A 3 A	0.1 A
30 VDC			0.1 A

EN61058-1 (File No. 129246 for SS-5, 125256 for SS-10, VDE approval)

Rated voltage	SS-10	SS-5
250 VAC	10 A	5 A

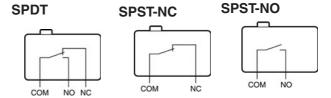
Testing conditions: 5E4 (50,000 operations); T85 (0°C to 85°C).

■ Contact Specifications

	Item	SS-10	SS-5	SS-01
Contact	Specification	Rivet		Crossbar
	Material	Silver alloy	Silver	Gold alloy
	Gap (standard value)	0.5 mm		0.25 mm
Inrush	NC	20 A max.		1 A max.
current	NO	15 A max.	10 A max.	1 A max.
Minimum (see note	applicable load e)	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 9.

■ Contact Form

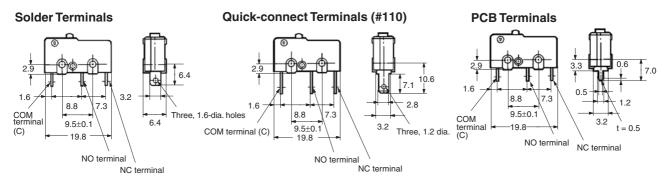


Dimensions

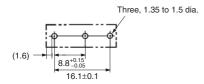
Note: All units are in millimeters unless otherwise indicated.

■ Terminals

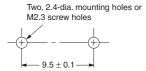
Terminal plate thickness is 0.5 mm for all models.



PCB Mounting Dimensions (Reference)



■ Mounting Holes



■ Dimensions and Operating Characteristics

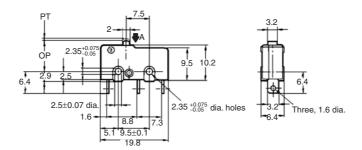
Note: 1. All units are in millimeters unless otherwise indicated.

- 2. The following illustration and drawing are for solder terminal models. Refer to page 6 for details on models with quick-connect terminals (#110) or PCB terminals.
- 3. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.
- 4. The operating characteristics are for operation in the A direction (.).

Pin Plunger Models

SS-10 SS-5(-F) SS-01(-F, -E)



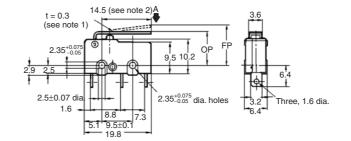


Model	SS-10	SS-5 SS-01	SS-5-F SS-01-F	SS-01-E
OF max.	1.47 N {150 gf}	1.47 N {150 gf}	0.49 N {50 gf}	0.25 N {25 gf}
RF min.	0.25 N {25 gf}	0.25 N {25 gf}	0.04 N {4 gf}	0.02 N {2 gf}
PT max.	0.6 mm	0.5 mm	0.5 mm	0.5 mm
OT min.	0.4 mm	0.5 mm	0.5 mm	0.5 mm
MD max.	0.12 mm	0.1 mm	0.1 mm	0.1 mm
OP	8.4±0.5 mm			•

Hinge Lever Models SS-10GL

SS-10GL SS-5GL(-F) SS-01GL(-F, -E)





Note: 1. Stainless-steel lever

2. Besides the SS-□GL models with a hinge lever length of 14.5, the SS-□GL11 models with a hinge lever length of 18.5, the SS-□GL111 models with a hinge lever length of 22.6, and the SS-□GL1111 models with a hinge lever length of 37.8 are available. Contact your OMRON representative for these models

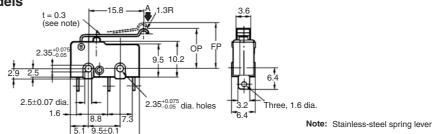
Model	SS-10GL	SS-5GL SS-01GL	SS-5GL-F SS-01GL-F	SS-01GL-E
OF max.	0.49 N {50 gf}	0.49 N {50 gf}	0.16 N {16 gf}	0.08 N {8 gf}
RF min.	0.06 N {6 gf}	0.06 N {6 gf}	0.02 N {2 gf}	0.01 N {1 gf} (reference value)
OT min.	1.0 mm	1.2 mm	1.2 mm	1.2 mm
MD max.	1.0 mm	0.8 mm	0.8 mm	0.8 mm
FP max.	13.6 mm	•	•	•
OP	8.8±0.8 mm			

Note: The values indicated in parentheses are reference values for cases when the installation direction is such that the lever weight is not applied to the plunger.



SS-10GL13 SS-5GL13(-F) SS-01GL13(-F, -E)





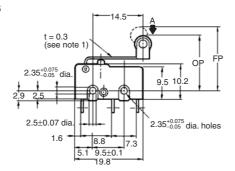
Model	SS-10GL13	SS-5GL13 SS-01GL13	SS-5GL13-F SS-01GL13-F	SS-01GL13-E
OF max.	0.49 N {50 gf}	0.49 N {50 gf}	0.16 N {16 gf}	0.08 N {8 gf}
RF min.	0.06 N {6 gf}	0.06 N {6 gf}	0.02 N {2 gf}	0.01 N {1 gf} (reference value)
OT min.	1.0 mm	1.2 mm	1.2 mm	1.2 mm
MD max.	1.0 mm	0.8 mm	0.8 mm	0.8 mm
FP max.	15.5 mm			•
OP	10.7±0.8 mm			

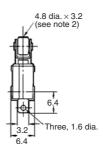
Note: The values indicated in parentheses are reference values for cases when the installation direction is such that the lever weight is not applied to the plunger.

Hinge Roller Lever Models

SS-10GL2 SS-5GL2(-F) SS-01GL2(-F, -E)







Note: 1. Stainless-steel spring lever 2. Polyacetal resin roller

Model	SS-10GL2	SS-5GL2 SS-01GL2	SS-5GL2-F SS-01GL2-F	SS-01GL2-E
OF max.	0.49 N {50 gf}	0.49 N {50 gf}	0.16 N {16 gf}	0.08 N {8 gf}
RF min.	0.06 N {6 gf}	0.06 N {6 gf}	0.02 N {2 gf}	0.01 N {1 gf} (reference value)
OT min.	1.0 mm	1.2 mm	1.2 mm	1.2 mm
MD max.	1.0 mm	0.8 mm	0.8 mm	0.8 mm
FP max.	19.3 mm	•	•	•
OP	14.5±0.8 mm			

Note: The values indicated in parentheses are reference values for cases when the installation direction is such that the lever weight is not applied to the plunger.

Precautions

Refer to General Information.

■ Cautions

Terminal Connection

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

Make sure that the capacity of the soldering iron is 60 W maximum. Do not take more than 350°C for the temperature at the tip of the soldering iron. Do not take more than 5 s 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 into the interior of the Switch.

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

Model	Conductor size		
SS-5	0.5 to 0.75 mm ²		
SS-10	0.75 mm ²		

If the PCB terminal models are soldered in the solder bath, flux will permeate inside the Switch and cause contact failure. Therefore, manually solder the PCB terminal.

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

According to EN61058-1, the minimum insulation thickness for this Switch should be 1.1 mm and minimum clearance distance between the terminal and mounting plate should be 1.6 mm. If the insulation distance cannot be provided in the product incorporating the Switch, either use a Switch with insulation barrier or use a Separator to ensure sufficient insulation distance. Refer to Separator.

■ Correct Use

Mounting

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

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 $N \cdot m$ {2.3 to 2.7 kgf·cm}.

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.

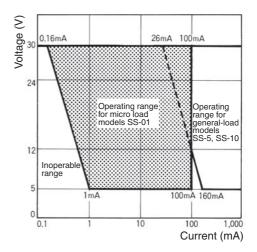
Operating Stroke Setting

Take particular care in setting the operating stroke for the pin plunger models. 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 durability of the Switch may be shortened.

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%.



■ Separators

Applicable Switch	Thickness (mm)	Model (see note)
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 its heat-resisting temperature is 130°C.

Connector

Refer to Terminal Connectors.

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. B032-E1-12