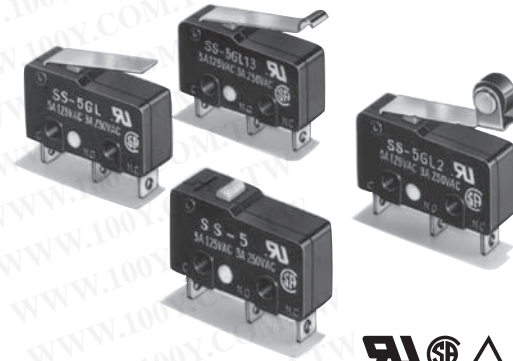


Snap Action Switch













SS

Subminiature Snap Action Switch

- Economical, subminiature snap action switch offers long service life (30 million operations minimum)
- All models are free from overtravel restrictions, permit easy setting
- Wide switching capacity range from microvoltage/current loads (1 mA at 5 VDC to high-capacity loads 10.1 A at 250 VAC)
- Standard operating force, low force or super-low force models available
- RoHS Compliant



Ordering Information

| Rating | Actuator | Contact OF | PCB terminal | | | Soldered terminal | Tab (#110) terminal |
|--------|--|------------|--------------|-------------|--------------|-------------------|---------------------|
| | | | Straight | Left-angled | Right-angled | | |
| 0.1 A | Pin plunger  | 25 g | SS-01-ED | — | — | SS-01-E | SS-01-ET |
| | | 50 g | SS-01-FD | — | — | SS-01-F | SS-01-FT |
| | | 150 g | SS-01D | SS-01D1 | SS-01D2 | SS-01 | SS-01T |
| | Hinge lever  | 8 g | SS-01GL-ED | — | — | SS-01GL-E | SS-01GL-ET |
| | | 16 g | SS-01GL-FD | — | — | SS-01GL-F | SS-01GL-FT |
| | | 50 g | SS-01GLD | SS-01GLD1 | SS-01GLD2 | SS-01GL | SS-01GLT |
| | Simulated roller lever  | 8 g | SS-01GL13-ED | — | — | SS-01GL13-E | SS-01GL13-ET |
| | | 16 g | SS-01GL13-FD | — | — | SS-01GL13-F | SS-01GL13-FT |
| | | 50 g | SS-01GL13D | — | — | SS-01GL13 | SS-01GL13T |
| | Hinged roller lever  | 8 g | SS-01GL2-ED | — | — | SS-01GL2-E | SS-01GL2-ET |
| | | 16 g | SS-01GL2-FD | — | — | SS-01GL2-F | SS-01GL2-FT |
| | | 50 g | SS-01GL2D | — | — | SS-01GL2 | SS-01GL2T |
| 5 A | Pin plunger  | 50 g | SS-5-FD | SS-5-FD1 | SS-5-FD2 | SS-5-F | SS-5-FT |
| | | 150 g | SS-5D | SS-5D1 | SS-5D2 | SS-5 | SS-5T |
| | Hinge lever  | 16 g | SS-5GL-FD | SS-5GL-FD1 | SS-5GL-FD2 | SS-5GL-F | SS-5GL-FT |
| | | 50 g | SS-5GLD | SS-5GLD1 | SS-5GLD2 | SS-5GL | SS-5GLT |
| | Simulated roller lever  | 16 g | SS-5GL13-FD | — | SS-5GL13-FD2 | SS-5GL13-F | SS-5GL13-FT |
| | | 50 g | SS-5GL13D | SS-5GL13D1 | SS-5GL13D2 | SS-5GL13 | SS-5GL13T |
| | Hinge roller lever  | 16 g | SS-5GL2-FD | SS-5GL2-FD1 | SS-5GL2-FD2 | SS-5GL2-F | SS-5GL2-FT |
| | | 50 g | SS-5GL2D | SS-5GL2D1 | SS-5GL2D2 | SS-5GL2 | SS-5GL2T |
| 10 A | Pin plunger  | 150 g | SS-10D | — | — | SS-10 | SS-10T |
| | Hinge lever  | 50 g | SS-10GLD | — | — | SS-10GL | SS-10GLT |
| | Simulated roller lever  | 50 g | SS-10GL13D | — | — | SS-10GL13 | SS-10GL13T |
| | Hinge roller lever  | 50 g | SS-10GL2D | — | — | SS-10GL2 | SS-10GL2T |

Model Number Legend

SS-□□□□□
1 2 3 4 5

1. Ratings

10: 10.1 A at 125 VAC
5: 5 A at 125 VAC
01: 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)

None: 150 gf
-F: 50 gf (0.1A and 5A versions)
-E: 25 gf (0.1A versions)

4. Contact Form

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

5. Terminals

None: Solder terminals
T: Quick-connect terminals (#110)
D: Straight PCB terminals
D1: Left-angled PCB terminals
D2: Right-angled PCB terminals

Note: These OF values are for the pin plunger models.
Consult Omron regarding the following:
- SPST-NC and SPST-NO versions
- High temperature versions that are rated from -25°C to 120°C
- Left and Right angled PCB terminal versions

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 at 500 VDC |
| Contact resistance | 150 gf: SS-10, SS-5 models: 30 mΩ max. SS-01 models: 50 mΩ max. 50 gf: SS-5 models: 50 mΩ max. SS-01 models: 100 mΩ max. 25 gf: SS-01 models: 150 mΩ max. |
| Dielectric strength (See note 2) | 1,000 VAC (600 VAC for SS-01), 50/60 Hz for 1 minute between terminals of same polarity 1,500 VAC, 50/60 Hz for 1 minute between current-carrying metal parts and ground and between each terminal and noncurrent-carrying metal parts |
| Vibration resistance (see note 3) | Malfunction: 10 to 55 Hz, 1.5 mm double amplitude |
| Shock resistance (see note 3) | 150 gf: Destruction: 1,000 m/s ² (approx. 100G) max. Malfunction: 300 m/s ² (approx. 30G) max. 50 gf and 25gf: Destruction: 500 m/s ² (approx. 50G) max. Malfunction: 200 m/s ² (approx. 20G) max. |
| Degree of protection | IEC IP40 |
| Degree of protection against electric shock | Class I |
| Proof tracking index (PTI) | 175 |
| Ambient operating temperature | -25° to 85°C (at 60% RH max.) with no icing |
| Ambient operating humidity | 85% max. (for 5°C to 35°C) |
| Service life | Mechanical: 30 million operations min. at 60 operations per minute (SS-01, SS-5) 10 million operations min. at 60 operations per minute (SS-10) Electrical: 200,000 operations min. at 30 operations per minute (SS-01, SS-5) 50,000 operations min. at 30 operations per minute (SS-10) |
| 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 value apply for use at the free position and total travel position. For the lever models, the values apply at the total travel position.

■ Ratings (reference values)

| Switch series: | SS-10 and SS-5 | | | | | | | | SS-01 | |
|----------------|----------------|----|-----------|-------|----------------|-----|------------|-------|----------------|----|
| | Resistive load | | Lamp load | | Inductive load | | Motor load | | Resistive Load | |
| | NC | NO | NC | NO | NC | NO | NC | NO | NC | NO |
| 125 VAC | 5 A (10.1A) | | 1.5 A | 0.7 A | 3 A | | 2.5 A | 1.3 A | 0.1 A | |
| 250 VAC | 3 A (10.1A) | | 1 A | 0.5 A | 2 A | | 1.5 A | 0.8 A | --- | |
| 8 VDC | 5 A (10.1A) | | 2 A | | 5 A | 4 A | 3 A | | 0.1 A | |
| 14 VDC | 5 A (10.1A) | | 2 A | | 4 A | | 3 A | | 0.1 A | |
| 30 VDC | 4 A | | 2 A | | 3 A | | 3 A | | 0.1 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 | | 0.03 A | | --- | |

- Note:**
1. Data in parentheses apply to the SS-10 models only.
 2. The above current ratings are the values of the steady-state current.
 3. Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC). The inductive load rating of the SS-10 is the same as that of SS-5.
 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 inrush current or surge, 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 | SS-10 | SS-5 | SS-01 |
|---------------|--------|------|-------|
| 125 VAC | --- | 5 A | 0.1 A |
| 250 VAC | 10.1 A | 3 A | --- |
| 30 VDC | --- | --- | 0.1 A |

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

| Rated Voltage | SS-10 | SS-5 |
|---------------|--------|------|
| 250 VAC | 10.1 A | 5 A |

EN61058-1 - - TÜV Rheinland approval
(File No. J9451450)

| Rated Voltage | SS-10 | SS-5 |
|---------------|--------|------|
| 250 VAC | 10.1 A | 5 A |

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

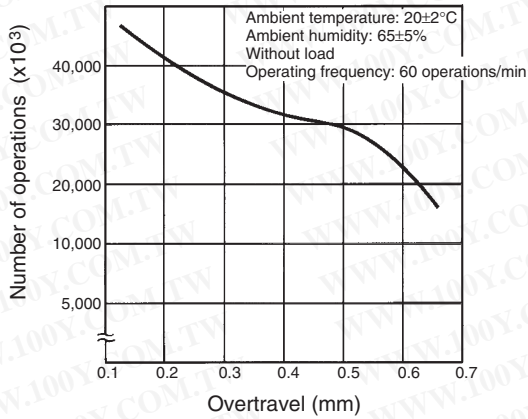
| Item | SS-10 | SS-5 | SS-01 |
|------------------------------------|------------------------------|------------------------------|---------------|
| Specification | Rivet | | Crossbar |
| Material | Silver alloy | Silver | Gold alloy |
| Gap (standard value) | 0.5 mm | | 0.25 mm |
| Inrush current | NC: 20A max. NO: 15A max. | NC: 20A max. NO: 10A 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

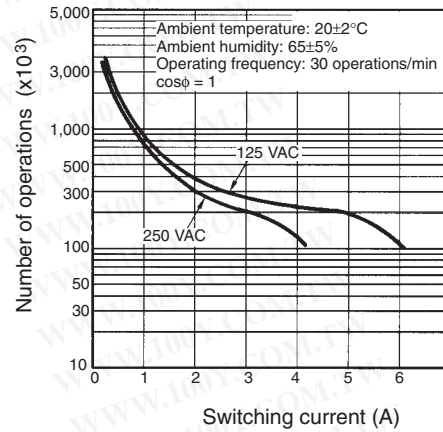
Mechanical Service Life

SS-01, SS-5 Models
(Pin Plunger Models)



Electrical Service Life

SS-5 Models
(Pin Plunger Models)

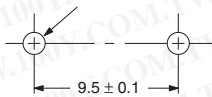


Mounting

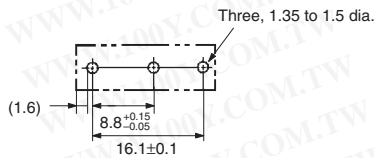
Panel Mounting

All switches may be panel mounted using 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-m.

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

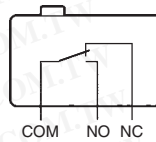


PCB Layout

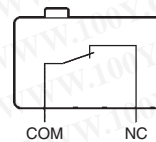


Contact Form

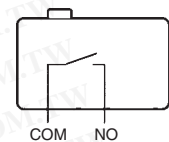
SPDT



SPST-NC



SPST-NO



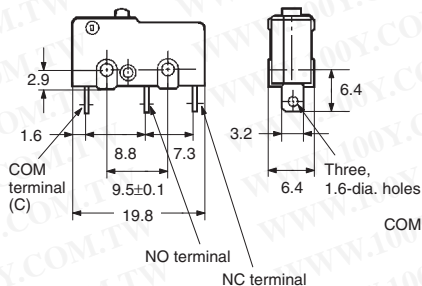
* Consult Omron for SPST-NC and SPST-NO contact form types ordering information.

Dimensions

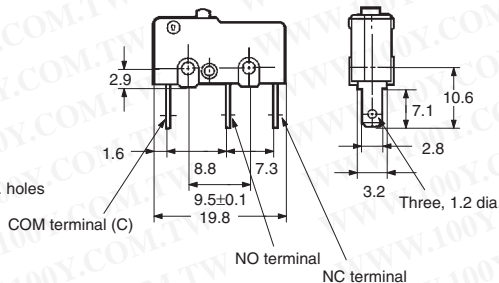
■ Terminals

- Note:** 1. Unless otherwise specified, all units are in millimeters and a tolerance of ± 0.4 mm applies to all dimensions
 2. Terminal plate thickness is 0.5 mm for all models.

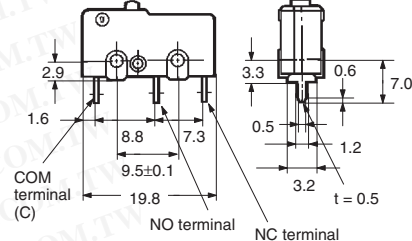
Solder Terminals



Quick-connect Terminals (#110)

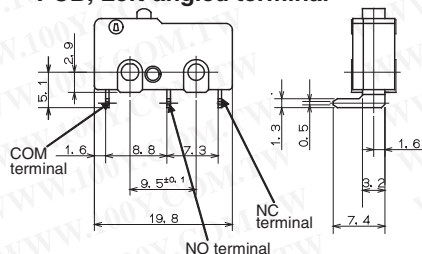


PCB Terminals

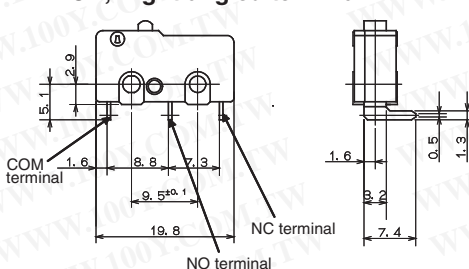


Note: Terminal plate thickness is 0.5 mm for all models.

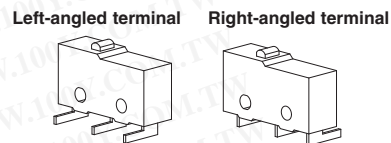
PCB, Left-angled terminal



PCB, Right-angled terminal



Note: Angled terminal directions are shown below.

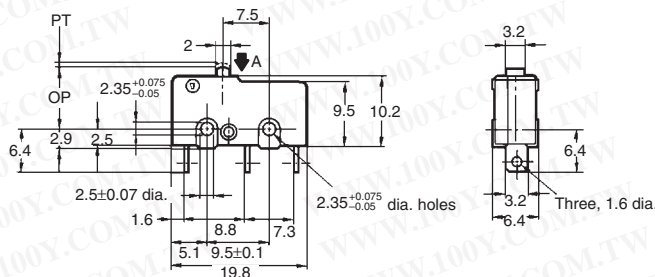
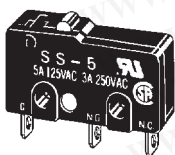


■ Dimensions and Operating Characteristics

- Note:** 1. Unless otherwise specified, all units are in millimeters and a tolerance of ± 0.4 mm applies to all dimensions
 2. The following illustrations and dimensions are for solder terminal models. Refer to "Terminals" for models with quick-connect terminals (#110) or PCB terminals.
 3. The operating characteristics are for operation in the A direction (↓)

Pin Plunger Models

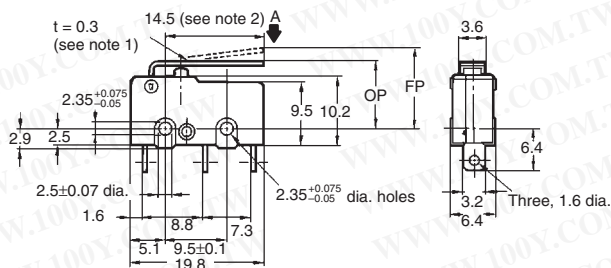
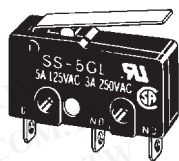
SS-01(-E, -F)
 SS-5(-F)
 SS-10



| Characteristics | Part number | | | |
|-----------------|--------------|-----------------|-------------|---------|
| | SS-01-E | SS-01-F, SS-5-F | SS-01, SS-5 | SS-10 |
| OF max. | 25 g | 50 g | 150 g | 150 g |
| RF min. | 2 g | 4 g | 25 g | 25 g |
| PT max. | 0.5 mm | 0.5 mm | 0.5 mm | 0.6 mm |
| OT min. | 0.5 mm | 0.5 mm | 0.5 mm | 0.4 mm |
| MD max. | 0.1 mm | 0.1 mm | 0.1 mm | 0.12 mm |
| OP | 8.4 ± 0.5 mm | | | |

Hinge Lever Models

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

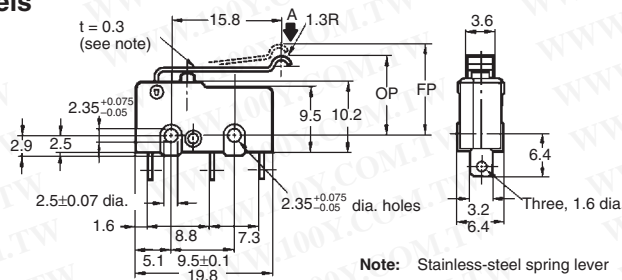
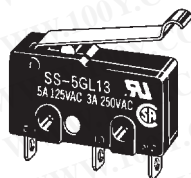


- Note:**
1. Stainless-steel lever
 2. Besides the SS-□GL models with a hinge lever length of 14.5, the SS-□GL11 models with a hinge lever length of 18.5, the SS-□GL111 models with a hinge lever length of 22.6, and the SS-□GL1111 models with a hinge lever length of 37.8 are available. Contact your OMRON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

| Characteristics | SS-01GL-E | SS-01GL-F, SS-5GL-F | SS-01GL, SS-5GL | SS-10GL |
|-----------------|--------------|---------------------|-----------------|---------|
| OF max. | 8 g | 16 g | 50 g | 50 g |
| RF min. | 1 g | 2 g | 6 g | 6 g |
| OT min. | 1.2 mm | 1.2 mm | 1.2 mm | 1.0 mm |
| MD max. | 0.8 mm | 0.8 mm | 0.8 mm | 1.0 mm |
| FP max. | 13.6 mm | | | |
| OP | 8.8 ± 0.8 mm | | | |

Simulated Roller Lever Models

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

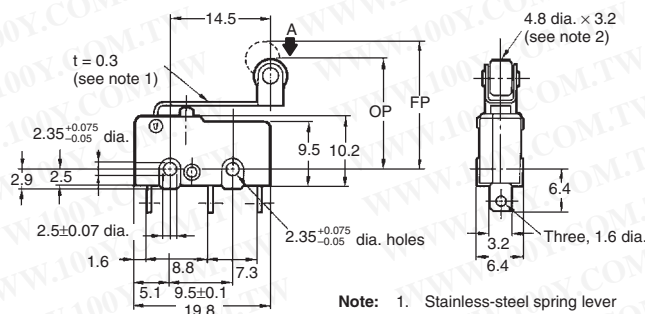
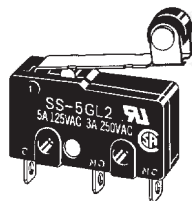


Note: Stainless-steel spring lever

| Characteristics | SS-10GL13-E | SS-10GL13-F, SS-5GL13-F | SS-01GL13, SS-5GL13 | SS-10GL13 |
|-----------------|-------------|-------------------------|---------------------|-----------|
| OF max. | 8 g | 16 g | 50 g | 50 g |
| RF min. | 1 g | 2 g | 6 g | 6 g |
| OT min. | 1.2 mm | 1.2 mm | 1.2 mm | 1.0 mm |
| MD max. | 0.8 mm | 0.8 mm | 0.8 mm | 1.0 mm |
| FP max. | 15.5 mm | | | |
| OP | 10.7±0.8 mm | | | |

Hinge Roller Lever Models

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



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

| Characteristics | SS-01GL2-E | SS-01GL2-F, SS-5GL2-F | SS-01GL2, SS-5GL2 | SS-10GL2 |
|-----------------|---------------|-----------------------|-------------------|----------|
| OF max. | 8 g | 16 g | 50 g | 50 g |
| RF min. | 1 g | 2 g | 6 g | 6 g |
| OT min. | 1.2 mm | 1.2 mm | 1.2 mm | 1.0 mm |
| MD max. | 0.8 mm | 0.8 mm | 0.8 mm | 1.0 mm |
| FP max. | 19.3 mm | | | |
| OP | 14.5 ± 0.8 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

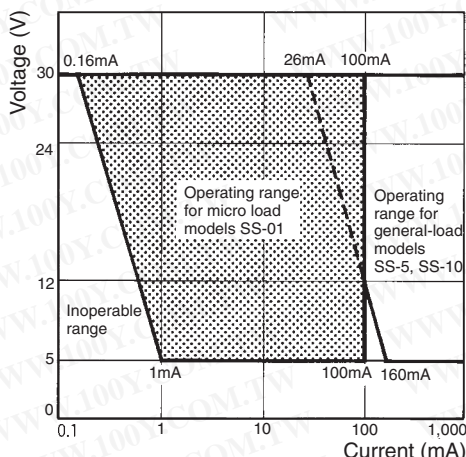
Mount the switch onto a flat surface. Mounting on an uneven surface may cause deformation of the switch, resulting in faulty operation or breakage in the housing.

Operating Stroke

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 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 maximum. Do not take more than 5 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 |
|-------|-----------------------------|
| SS-5 | 0.5 to 0.75 mm ² |
| SS-10 | 0.75 mm ² |

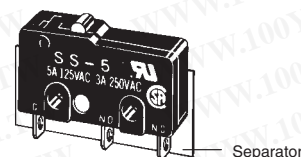
If the PCB terminal models are soldered in a solder bath, flux will permeate inside the switch and cause contact failure. Therefore, manually solder the PCB terminal.

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

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

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.



MEMO

Omron Electronic Components, LLC

Terms and Conditions of Sales

I. GENERAL

- Definitions:** The words used herein are defined as follows.
 - Terms:** These terms and conditions
 - Seller:** Omron Electronic Components LLC and its subsidiaries
 - Buyer:** The buyer of Products, including any end user in section III through VI
 - Products:** Products and/or services of Seller
 - Including:** Including without limitation
- Offer/Acceptance:** These Terms are deemed part of all quotations, acknowledgments, invoices, purchase orders and other documents, whether electronic or in writing, relating to the sale of Products by Seller. Seller hereby objects to any Terms proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
- Distributor:** Any distributor shall inform its customer of the contents after and including section III of these Terms.

II. SALES

- Prices/Payment:** All prices stated are current, subject to change without notice by Seller. Buyer agrees to pay the price in effect at the time the purchase order is accepted by Seller. Payments for Products received are due net 30 days unless otherwise stated in the invoice. Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice.
- Discounts:** Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (a) the invoice is paid according to Seller's payment terms and (b) Buyer has no past due amounts owing to Seller.
- Interest:** Seller, at its option, may charge Buyer 1.5% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
- Orders:** Seller will accept no order less than 200 U.S. dollars net billing.
- Currencies:** If the prices quoted herein are in a currency other than U.S. dollars, Buyer shall make remittance to Seller at the then current exchange rate most favorable to Seller; provided that if remittance is not made when due, Buyer will convert the amount to U.S. dollars at the then current exchange rate most favorable to Seller available during the period between the due date and the date remittance is actually made.
- Governmental Approvals:** Buyer shall be responsible for all costs involved in obtaining any government approvals regarding the importation or sale of the Products.
- Taxes:** All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Seller or required to be collected directly or indirectly by Seller for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Seller.
- Financial:** If the financial position of Buyer at any time becomes unsatisfactory to Seller, Seller reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Seller may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts.
- Cancellation, Etc:** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Seller fully against all costs or expenses arising in connection therewith.
- Force Majeure:** Seller shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
- Shipping/Delivery:** Unless otherwise expressly agreed in writing by Seller:
 - All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Seller), at which point title to and all risk of loss of the Products shall pass from Seller to Buyer, provided that Seller shall retain a security interest in the Products until the full purchase price is paid by Buyer;
 - Delivery and shipping dates are estimates only; and
 - Seller will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
- Claims:** Any claim by Buyer against Seller for shortage or damage to the Products occurring before delivery to the carrier or any claim related to pricing or other charges must be presented in detail in writing to Seller within 30 days of receipt of shipment.

III. PRECAUTIONS

- Suitability:** IT IS THE BUYER'S SOLE RESPONSIBILITY TO ENSURE THAT ANY OMRON PRODUCT IS FIT AND SUFFICIENT FOR USE IN A MOTORIZED VEHICLE APPLICATION. BUYER SHALL BE SOLELY RESPONSIBLE FOR DETERMINING APPROPRIATENESS OF THE PARTICULAR PRODUCT WITH RESPECT TO THE BUYER'S APPLICATION INCLUDING (A) ELECTRICAL OR ELECTRONIC COMPONENTS, (B) CIRCUITS, (C) SYSTEM ASSEMBLIES, (D) END PRODUCT, (E) SYSTEM, (F) MATERIALS OR SUBSTANCES OR (G) OPERATING ENVIRONMENT. Buyer acknowledges that it alone has determined that the Products will meet their requirements of the intended use in all cases. Buyer must know and observe all prohibitions of use applicable to the Product/s.
- Use with Attention:** The followings are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible use of any Product, nor to imply that any use listed may be suitable for any Product:
 - Outdoor use, use involving potential chemical contamination or electrical interference.

- Use in consumer Products or any use in significant quantities.
 - Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
 - Systems, machines, and equipment that could present a risk to life or property.
- Prohibited Use:** NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
 - Motorized Vehicle Application:** USE OF ANY PRODUCT/S FOR A MOTORIZED VEHICLE APPLICATION MUST BE EXPRESSLY STATED IN THE SPECIFICATION BY SELLER.
 - Programmable Products:** Seller shall not be responsible for the Buyer's programming of a programmable Product.

IV. WARRANTY AND LIMITATION

- Warranty:** Seller's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Seller (or such other period expressed in writing by Seller). SELLER MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT ALL OTHER WARRANTIES, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS.
- Buyer Remedy:** Seller's sole obligation hereunder shall be to replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product or, at Seller's election, to repay or credit Buyer an amount equal to the purchase price of the Product; provided that there shall be no liability for Seller or its affiliates unless Seller's analysis confirms that the Products were correctly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Seller before shipment.
- Limitation on Liability:** SELLER AND ITS AFFILIATES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. FURTHER, IN NO EVENT SHALL LIABILITY OF SELLER OR ITS AFFILIATES EXCEED THE INDIVIDUAL PRICE OF THE PRODUCT ON WHICH LIABILITY IS ASSERTED.
- Indemnities:** Buyer shall indemnify and hold harmless Seller, its affiliates and its employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Seller is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products.

V. INFORMATION; ETC.

- Intellectual Property:** The intellectual property embodied in the Products is the exclusive property of Seller and its affiliates and Buyer shall not attempt to duplicate it in any way without the written permission of Seller. Buyer (at its own expense) shall indemnify and hold harmless Seller and defend or settle any action brought against Seller to the extent that it is based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
- Property/Confidentiality:** Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Seller. All information and materials supplied by Seller to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
- Performance Data:** Performance data is provided as a guide in determining suitability and does not constitute a warranty. It may represent the result of Seller's test conditions, and the users must correlate it to actual application requirements.
- Change In Specifications:** Product specifications and descriptions may be changed at any time based on improvements or other reasons. It is Seller's practice to change part numbers when published ratings or features are changed, or when significant engineering changes are made. However, some specifications of the Product may be changed without any notice.
- Errors And Omissions:** The information on Seller's website or in other documentation has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.
- Export Controls:** Buyer shall comply with all applicable laws, regulations and licenses regarding (a) export of the Products or information provided by Seller; (b) sale of Products to forbidden or other proscribed persons or organizations; (c) disclosure to non-citizens of regulated technology or information.

VI. MISCELLANEOUS

- Waiver:** No failure or delay by Seller in exercising any right and no course of dealing between Buyer and Seller shall operate as a waiver of rights by Seller.
- Assignment:** Buyer may not assign its rights hereunder without Seller's written consent.
- Law:** These Terms are governed by Illinois law (without regard to conflict of laws). Federal and state courts in Cook County, Illinois have exclusive jurisdiction for any dispute hereunder.
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- Severability:** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision.

Certain Precautions on Specifications and Use

- Suitability for Use.** Seller shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in Buyer's application or use of the Product. At Buyer's request, Seller will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given:
 - Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
 - Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
 - Use in consumer products or any use in significant quantities.
 - Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this product.

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