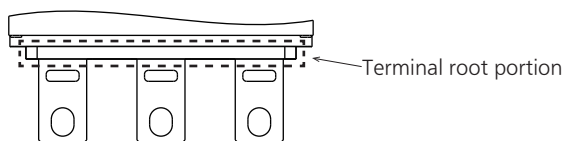


CAUTIONS FOR USE

■ Soldering conditions

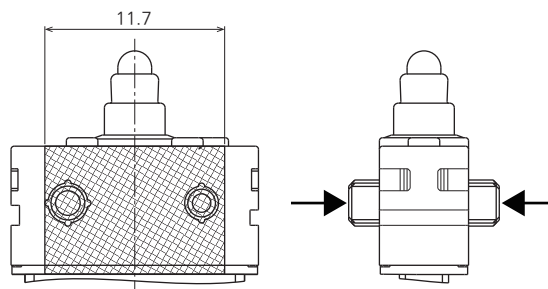
- In the case of solder terminal type.
<IMPORTANT>The application of excessive heat upon the switch when soldering can cause degradation of switch operation.
Therefore, be sure to keep within the conditions given below.
And in case melted resin is found around the terminal root portion please do not use the switch as too much soldering heat might be applied.



- Manual soldering
Use soldering irons (max. 350 °C, within 3 seconds) capable of temperature adjustment.
This is to prevent deterioration due to soldering heat.
Care should be taken not to apply force to the terminals during soldering. (More than one second interval is required to apply heat at each terminal.) Please consult us if you intend to use a soldering iron that exceeds 60 W.
- Automatic soldering
Soldering must be done as following 260 °C: within 6 seconds, 350 °C: within 3 seconds.
- Don't push the plunger (or lever) on soldering state and after 30 seconds.

■ Mounting

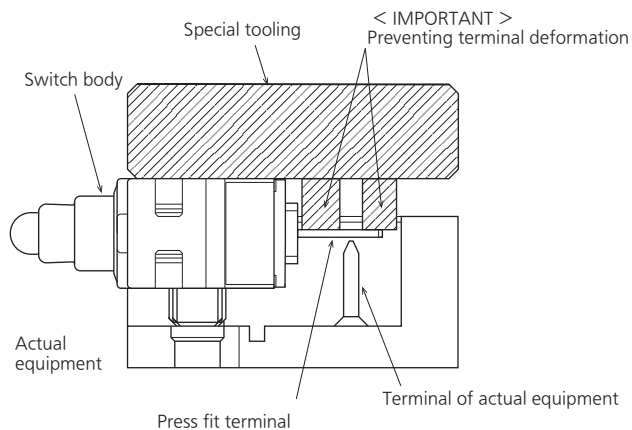
- <IMPORTANT>Please avoid use in which load would be applied to the sides (hatch part (both sides) shown right) of the switch in the direction indicated by the arrows. This could cause erroneous operation.



- Be sure to maintain adequate insulating clearance between each terminal and ground.
- The positioning of the switch should be such that direct force is not applied to the pushbutton or actuator in its free position. The operating force to the pushbutton should only be applied in a perpendicular direction.
- When slanted press operation is applied to pin plunger type switches by an operation cam, the endurance life may greatly vary depending on the use of grease for sliding, operation angle, operating speed, operation frequency, press amount of the actual equipment in advance should be implemented.
- After mounting please make sure no pulling load will be applied to the switch terminals, wire lead.

■ Mounting of press fit terminal type

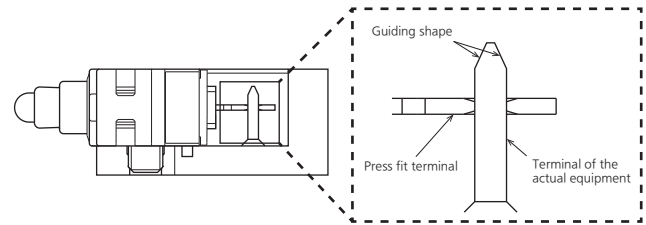
- < IMPORTANT > To prevent damage of the switch body and deterioration of contact reliability due to the deformation of the press fit terminal, please be sure to keep the following conditions.
 1. The switch should be mounted by using the special tooling to keep the switch in the vertical state to the actual equipment and insert the terminal while supporting both the switch body and the terminal part (Two places) with the tooling (Please see the below drawing) .
 2. The switch is not the stopper of the tool.
 3. The insertion is allowed only one time. The switch and the terminal of the actual machine once inserted cannot be use because there is a risk of deterioration of contact reliability due to the sufficient contact pressure may not be secured.



- < IMPORTANT > Be sure to apply a sealing material to the terminal part, fix the switch completely and seal the terminal part to prevent deterioration of contact reliability in the connected part by the press fit terminal of the switch and the terminal of the actual equipment due to vibration, impact, humidity and gas. An unsealed switch should not be used. The hard type sealing material is recommended.

Additionally, it is necessary to select a sealing material which does not cause sulfuration, oxidation sealing materials. For the selection of a sealing material, the sufficient verification by using the actual equipment should be implemented in advance.

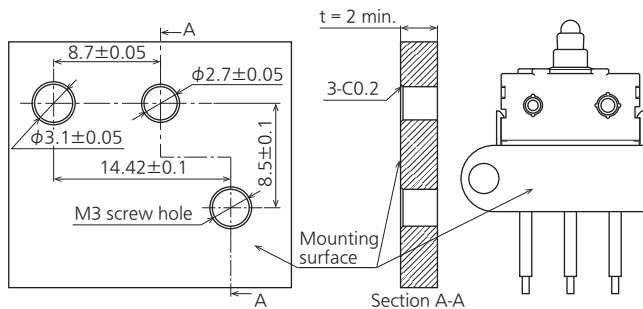
- < IMPORTANT > The terminal on the actual machine side should be provided with a guiding shape. And the press fit terminal of the switch should be inserted deeper than the guiding shape of the terminal on the actual machine side.



- < IMPORTANT > The contact reliability at terminal connecting portion may highly deteriorate because of the mounting shape and the terminal of the actual equipment, the material of the special tooling for insertion, and the insertion method of the switch. Please make sure to consult us if you consider using press fit terminal type, and the sufficient verification by using the actual equipment should be implemented in advance.

■ Mounting of wire leads type

- < IMPORTANT > To secure the switch, please use M3 small screws on a flat surface and tighten using a maximum torque of 0.29 N · m. Be sure to verify the quality under actual conditions of use because the switch plastic might be deformed according to that the kind of the screw (size of screw head etc.), the diameter of the washer and the presence of washer.
And use of adhesive lock is recommended to prevent loosening of the screws. When using an adhesive, care should be taken not to apply the adhesive to the switch operating portion.
- Refer to the figure below for recommendation of mounting hole dimension.
※ In the case of right 2 bosses type.



- In the case of left 2 bosses type, recommendation of mounting hole dimension is mirror symmetry of the above figure.
- Please tighten the screws while the seal cover surface is in full contact with the mounting surface.

■ Cautions regarding the circuit

- < IMPORTANT > In order to prevent malfunction in set devices caused by bounce and chattering during the ON-OFF switch operation, please verify the validity of the circuit under actual operating conditions and temperature range.
- When switching inductive loads (relays, solenoids, buzzers, etc.), it is recommended that contact protection element such as diode, varistor, etc., is introduced to prevent contact failure caused by electric discharge.
- Not only at actual equipment, but there also is a possibility of fusing current or deformation of contact according to the condition of inspection load circuit or evaluation circuit at the production line which may lead to temporary large current or inrush current. Thus, please take enough consideration with your circuit design and confirm that there will be no excessive load.

■ Please verify under actual conditions.

- Please assure the quality and reliability of the switch under the worst condition of the actual usage.

■ Selection of switch

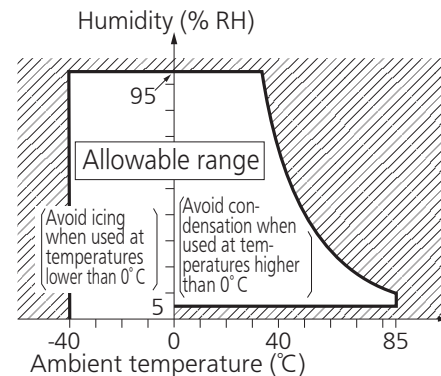
- Please make your selection so that there will be no problems even if the operating characteristics vary up to ±20 % from the standard values.

■ Oil-proof and chemical-proof characteristics

- The rubber cap swells when exposed to oil and chemicals. The extent of swelling will vary widely depending on the type and amount of oil and chemicals. Check with the actual oil or chemicals used. In particular, be aware that solvents such as freon, chlorine, toluene, alcohol etc., cannot be used.

■ Operation environment

- Although continuous operation of the switch is possible within the range of ambient temperature (humidity), as the humidity range differs depending on the ambient temperature, the humidity range indicated below should be used. Continuous use near the limit of the range should be avoided. This temperature-humidity range does not guarantee permanent performance.



■ Others

- < IMPORTANT > To prevent breakage of the sealing rubber cap due to contact, please handle the switch with care so that there is no contact with the rubber cap when handling the switch as it will affect the immersion proof of the switch.
- Please remember that this switch cannot be used under water. Also, please be warned that switching and sudden temperature changes with the presence of water droplets can cause seepage into the unit.
- When a source of silicone gas (Silicone rubber, Silicone coating materials and silicone filling materials etc.) is used around the switch, the silicone gas (low molecular weight siloxane etc.) may be produced.
The produced silicone gas may penetrate the plastic case and enter the inside of switch.
When the switch is kept and used in this condition, silicone compound may adhere to the switch contacts, is changed to the insulator and cause the contact failure.
Please do not use any source of silicone gas around the switch.
- Do not use in areas where flammable or explosive gases from gasoline and thinner, etc., may be present.
- Do not exceed the total travel position (TTP) and press the actuator. This could cause operation failure. Also, when switching at high speed or under shock even within the operation limit, the working life may decrease.
Therefore, please be sure to verify the quality under actual conditions of use.
- If the switch is used while the plunger is pressed all the time, failure to return the switch plunger may occur due to surrounding temperature and humidity, adherence of oils such as oil, grease, etc., solvents and chemicals.
Please be sure to verify the quality under the actual use conditions.
- Please make considerations so that the switch does not become the stopper for the moving part.
- Do not use the switch which was dropped by mistakes when handling. If it is used, abnormal operation characteristics and sealing performance may occur.
- In case of applying coating to movable parts (actuator, plunger, etc.) , the quality of the product is not guaranteed because it may cause a product failure.
- Please do not wash the switch as failures may occur.
Do not apply ultrasonic vibrations and high frequency vibration to a switch because it may have an impact on the characteristics of the switch.
- Please do not constantly apply a tensile load to wire leads when fixing them.
- Small black spots and scratches may occur on the surface of the product, but if there is no problem with the product performance, it will be shipped as a non-defective product.