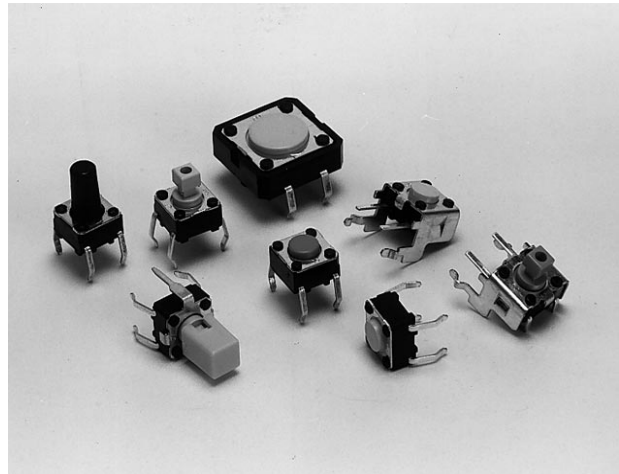


Mechanical Key Switch

B3F

A Wide Range of Models: 6 x 6 mm, 12 x 12 mm, Vertical and High-force.

- Excellent tactile feel combined with high life expectancy.
- Available in stick packaging for automatic mounting to PCBs.
- Up to 2.55 N (260-gf) operating force for a firmer operating touch.
- Pushbuttons available in nine colors.



Ordering Information

6 x 6 mm Models

| Type | Plunger | Height x pitch | Operating force (OF) | Without ground terminal | | With ground terminal | | |
|------------------------|------------------------|----------------|----------------------|-------------------------|-------------------|----------------------|-------------------|-----|
| | | | | Bags * | Sticks (90/stick) | Bags * | Sticks (75/stick) | |
| Standard (B3F-1□□□) | Flat | 4.3 x 6.5 mm | 0.98 N (100 gf) | B3F-1000 | B3F-1000S | B3F-1100 | B3F-1100S | |
| | | | 1.47 N (150 gf) | B3F-1002 | B3F-1002S | B3F-1102 | B3F-1102S | |
| | | | 2.55 N (260 gf) | B3F-1005 | B3F-1005S | B3F-1105 | B3F-1105S | |
| | | 5.0 x 6.5 mm | 0.98 N (100 gf) | B3F-1020 | B3F-1020S | B3F-1120 | B3F-1120S | |
| | | | 1.47 N (150 gf) | B3F-1022 | B3F-1022S | B3F-1122 | B3F-1122S | |
| | | | 2.55 N (260 gf) | B3F-1025 | B3F-1025S | B3F-1125 | B3F-1125S | |
| | Projected | 7.3 x 6.5 mm | 0.98 N (100 gf) | B3F-1050 | B3F-1050S | B3F-1150 | B3F-1150S | |
| | | | 1.47 N (150 gf) | B3F-1052 | B3F-1052S | B3F-1152 | B3F-1152S | |
| | | | 2.55 N (260 gf) | B3F-1055 | B3F-1055S | B3F-1155 | B3F-1155S | |
| | Extended | 9.5 x 6.5 mm | 0.98 N (100 gf) | B3F-1070 | --- | --- | --- | |
| | Vertical (B3F-3□□□) | Flat | 3.15 mm | 0.98 N (100 gf) | --- | --- | B3F-3100 | --- |
| | | | | 1.47 N (150 gf) | --- | --- | B3F-3102 | --- |
| 2.55 N (260 gf) | | | | --- | --- | B3F-3105 | --- | |
| 3.85 mm | | | 0.98 N (100 gf) | --- | --- | B3F-3120 | --- | |
| | | | 1.47 N (150 gf) | --- | --- | B3F-3122 | --- | |
| | | | 2.55 N (260 gf) | --- | --- | B3F-3125 | --- | |
| Projected | | 6.15 mm | 0.98 N (100 gf) | --- | --- | B3F-3150 | --- | |
| | | | 1.47 N (150 gf) | --- | --- | B3F-3152 | --- | |
| | | | 2.55 N (260 gf) | --- | --- | B3F-3155 | --- | |

* (100 / bag)

| Plunger type | Flat | Projected | Extended | Flat (vertical) | Projected (vertical) |
|--------------|--------|-----------|----------|-----------------|----------------------|
| Appearance | 4.3 or | 7.3 | 9.5 | 3.15 or 3.85 | 6.15 |

12 x 12 mm Models

| Type | Plunger (or LED color) | Height x pitch | Operating force (OF) | Without ground terminal | | With ground terminal | |
|---|------------------------|----------------|----------------------|-------------------------|--------------------|----------------------|-------------------|
| | | | | Bags ** | Sticks (45/stick)* | Bags ** | Sticks (45/stick) |
| Standard (B3F-4□□□) | Flat | 4.3 x 12.5 mm | 1.27 N (130 gf) | B3F-4000 | B3F-4000S | B3F-4100 | B3F-4100S |
| | | | 2.55 N (260 gf) | B3F-4005 | B3F-4005S | B3F-4105 | B3F-4105S |
| | Projected | 7.3 x 12.5 mm | 1.27 N (130 gf) | B3F-4050 | B3F-4050S | B3F-4150 | B3F-4150S |
| | | | 2.55 N (260 gf) | B3F-4055 | B3F-4055S | B3F-4155 | B3F-4155S |
| Long life expectancy (B3F-5□□□0) | Flat | 4.3 x 12.5 mm | 1.27 N (130 gf) | B3F-5000 | B3F-5000S | B3F-5100 | B3F-5100S |
| | Projected | 7.3 x 12.5 mm | | B3F-5050 | B3F-5050S | B3F-5150 | B3F-5150S |
| High reliability gold-plated (B3F-5□□□1) | Flat | 4.3 x 12.5 mm | 1.27 N (130 gf) | B3F-5001 | B3F-5001S | B3F-5101 | B3F-5101S |
| | Projected | 7.3 x 12.5 mm | | B3F-5051 | B3F-5051S | B3F-5151 | B3F-5151S |
| Surface illumination (B3F-9□□□□) | Red LED | 7.3 x 12.5 mm | 1.27 N (130 gf) | --- | B3F-9100 | --- | --- |
| | Green LED | | | --- | B3F-9200 | --- | --- |
| | Yellow LED | | | --- | B3F-9300 | --- | --- |

* 36 per stick for B3F-9□□□□.

** (100 / bag)

■ Accessories (order separately)

Special keytops are available for projected plunger models. See page 27 (Product B32).

Specifications

■ Ratings

| | |
|--------------------|--|
| Switching capacity | 5 to 24 VDC, 1 to 50 mA (resistive load) |
| Insulation voltage | 30 VDC |

■ Characteristics

| | |
|-----------------------|--|
| Contact form | SPST-NO |
| Contact resistance | 100 mΩ max. (at 5 VDC, 1 mA; initial value.) |
| Insulation resistance | 100 MΩ min. (at 250 VDC) |
| Dielectric strength | 500 VAC, 50/60 Hz for 1 min |
| Bounce time | 5 ms max. |
| Vibration resistance | Malfunction: 10 to 55 Hz, 1.5 mm double amplitude |
| Shock resistance | Destruction: 1,000 m/s ² min. (Approx. 100 G min.) Malfunction: 100 m/s ² min. (Approx. 10G min.) |
| Life expectancy | B3F-1□□□, -3□□□: 100-gf OF: 1,000,000 operations min. 150-gf OF: 300,000 operations min. 260-gf OF: 100,000 operations min. B3F-4□□□: 130-gf OF: 3,000,000 operations min. 260-gf OF: 1,000,000 operations min. B3F-5□□□: 10,000,000 operations min. B3F-9□□□: 1,000,000 operations min. |
| Ambient temperature | -25°C to 70°C (with no icing) |
| Ambient humidity | 35% to 85% |
| Weight | 6 x 6 mm models: approx. 0.25 g 12 x 12 mm models: approx. 0.85 g |

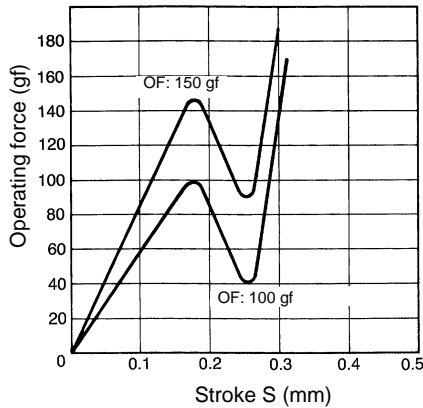
■ Operating Characteristics

| Model | B3F-1□□□, -3□□□ | | | B3F-4□□□, -5□□□, -9□□□ | |
|-----------------------|---|----------------------------|----------------------------|--|----------------------------|
| | 100 gf models | 150 gf models | 260 gf models | 130 gf models | 260 gf models |
| | B3F-1□□□0, -3□□□0 | B3F-1□□□2, -3□□□2 | B3F-1□□□5, -3□□□5 | B3F-4□□□0, -5□□□0, -9□□□0 | B3F-4□□□5 |
| Operating force (OF) | 0.98±0.32 N (100±30 gf) | 1.47±0.49 N (150±50 gf) | 2.55±0.69 N (260±70 gf) | 1.27±0.49 N (130±50 gf) | 2.55±0.69 N (260±70 gf) |
| Reset force (RF min.) | 0.2 N (20 gf) | 0.49 N (50 gf) | 0.49 N (50 gf) | 0.29 N (30 gf) | 0.49 N (50 gf) |
| Pretravel (PT) | 0.25 ^{+0.2} / _{-0.1} mm | | | 0.3 ^{+0.2} / _{-0.1} mm | |

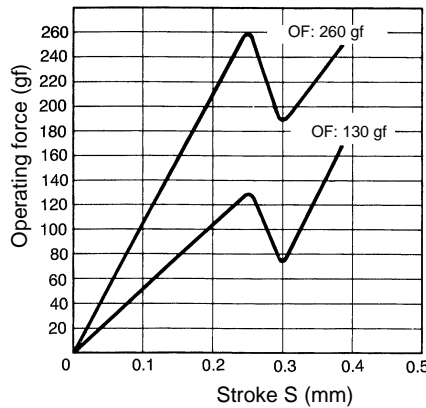
Engineering Data

Operating Force vs. Stroke (Typical)

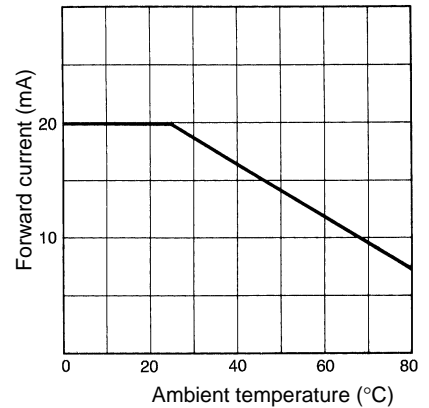
B3F-1□□□, -3□□□



B3F-4□□□, -5□□□, -9□□□



Forward Current Derating Curve



Note: To determine illuminated current of surface illumination types (B3F-9□□□), refer to the above forward current derating curve.

Dimensions

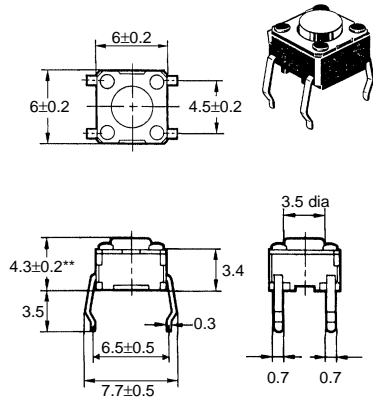
Note: 1. Unless otherwise stated, a tolerance of $\pm 0.4\text{mm}$ applies to all dimensions
2. No terminal numbers appear on the switches. To orient a switch in the "bottom view" position, turn it so that the terminals are on the up and down sides and the word OMRON is right-side up.



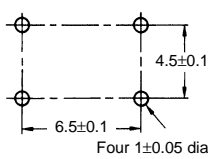
6 x 6 mm Models

Standard, Flat Plunger Type (without Ground Terminal)

B3F-1000, -1002, -1005, -1020**, -1022**, -1025**

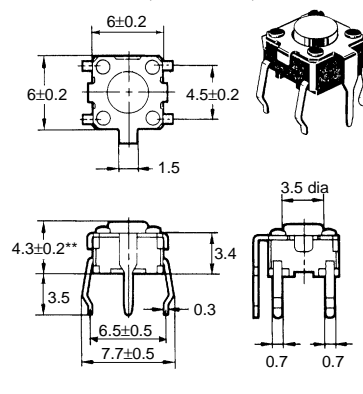


PCB Mounting (Top View)

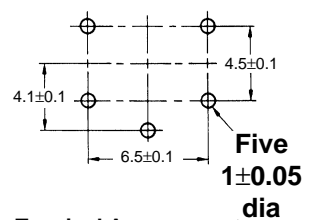


Standard, Flat Plunger Type (with Ground Terminal, Pitch: 6.5 mm)

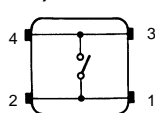
B3F-1100, -1102, -1105, -1120**, -1122**, -1125**



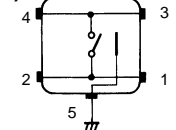
PCB Mounting (Top View)



Terminal Arrangement / Internal Connections (Top View)



Terminal Arrangement / Internal Connections (Top View)

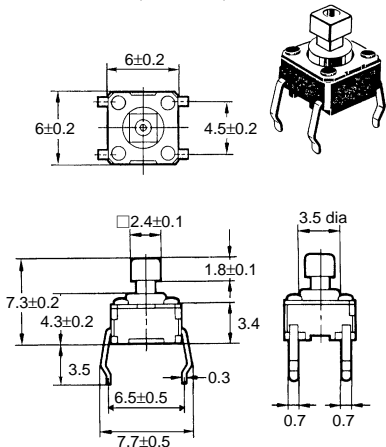


**Height of B3F-1020, -1022, -1025 is 5 ± 0.2 mm.

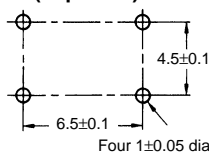
**Height of B3F-1120, -1122, -1125 is 5 ± 0.2 mm.

Standard, Projected Plunger Type (without Ground Terminal)

B3F-1050, -1052, -1055

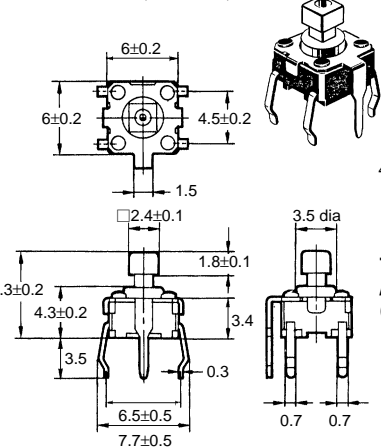


PCB Mounting (Top View)

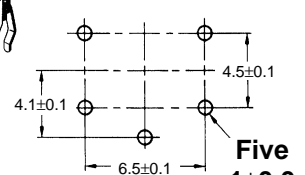


Standard, Projected Plunger Type (with Ground Terminal)

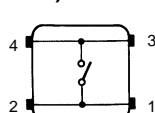
B3F-1150, -1152, -1155



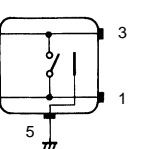
PCB Mounting (Top View)



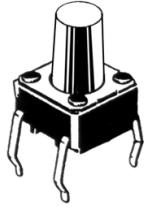
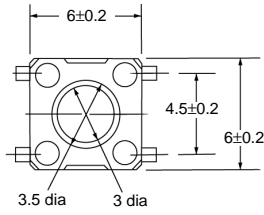
Terminal Arrangement / Internal Connections (Top View)



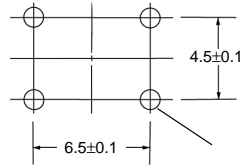
Terminal Arrangement / Internal Connections (Top View)



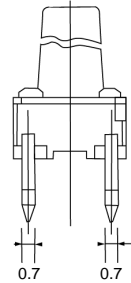
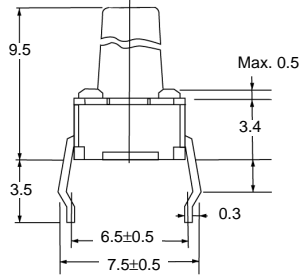
**Extended Type
B3F-1070**



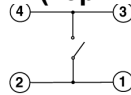
**PCB Mounting
(Top View)**



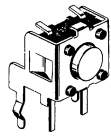
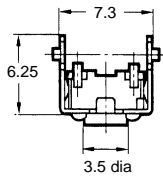
four 1.0
dia ± 0.05



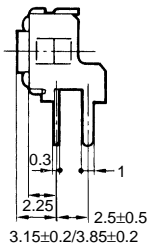
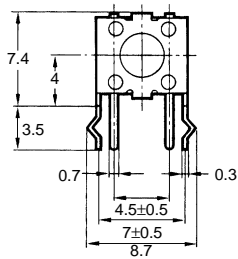
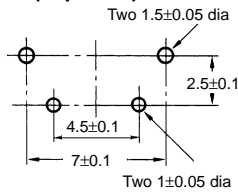
**Internal Connections
(Top View)**



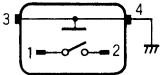
**Vertical, Flat Plunger Type
(Height: 3.15 mm) B3F-3100, -3102, -3105**
(Height: 3.85 mm) B3F-3120, -3122, -3125



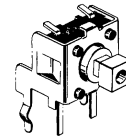
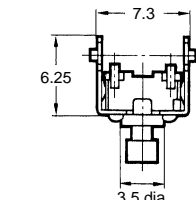
**PCB Mounting
(Top View)**



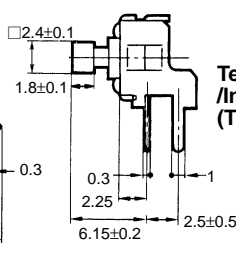
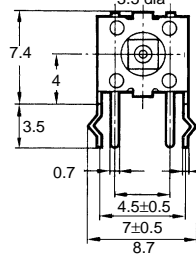
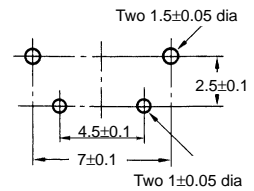
**Terminal Arrangement
/Internal Connections
(Top View)**



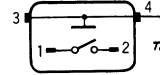
**Vertical, Projected Plunger Type
(Height: 6.15 mm) B3F-3150, -3152, -3155**



**PCB Mounting
(Top View)**



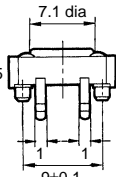
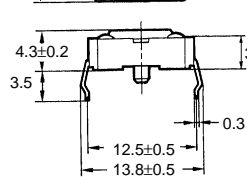
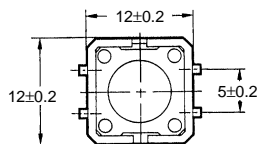
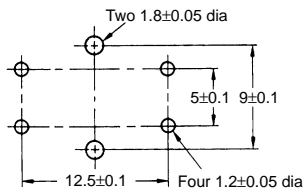
**Terminal Arrangement
/Internal Connections
(Top View)**



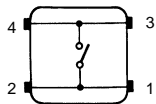
**12 x 12 mm Models
Standard, Long Life Expectancy,
High Reliability, Flat Plunger Type
(without Ground Terminal)
B3F-4000, -4005, -5000, -5001**



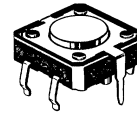
**PCB Mounting
(Top View)**



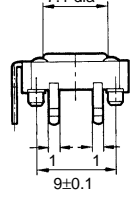
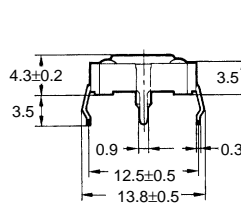
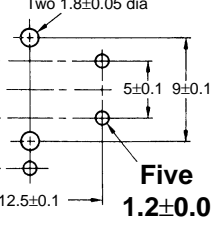
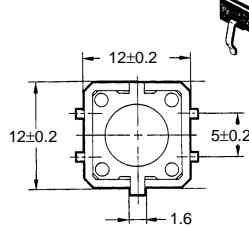
**Terminal Arrangement
/Internal Connections
(Top View)**



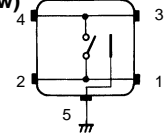
**Standard, Long Life Expectancy,
High Reliability, Flat Plunger Type
(with Ground Terminal)
B3F-4100, -4105, -5100, -5101**



**PCB Mounting
(Top View)**

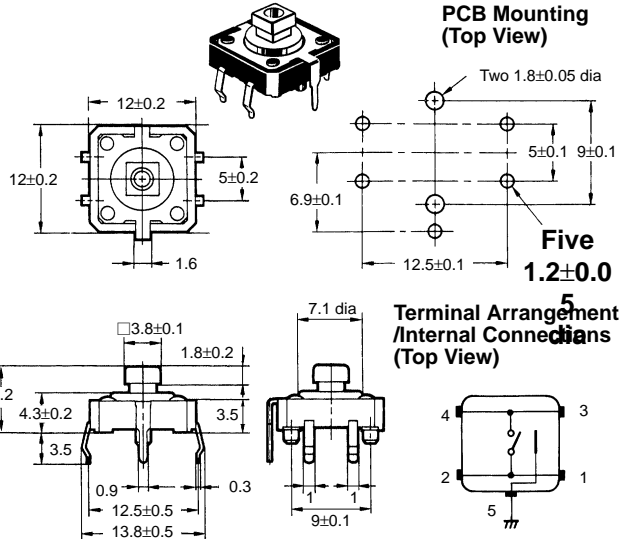
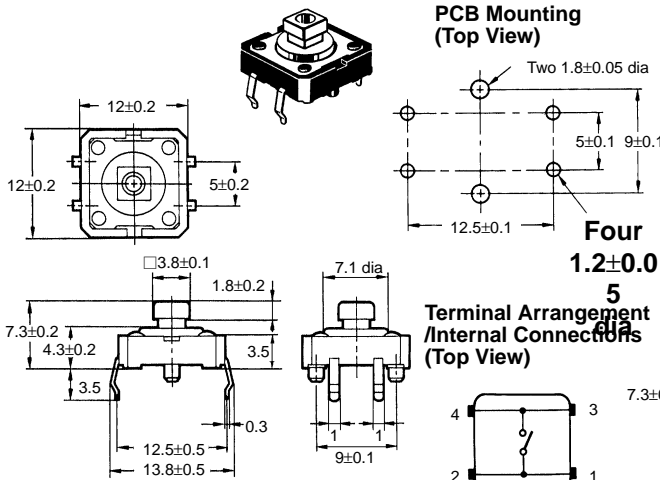


**Terminal Arrangement
/Internal Connections
(Top View)**

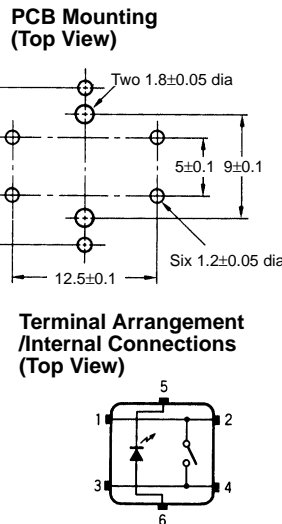
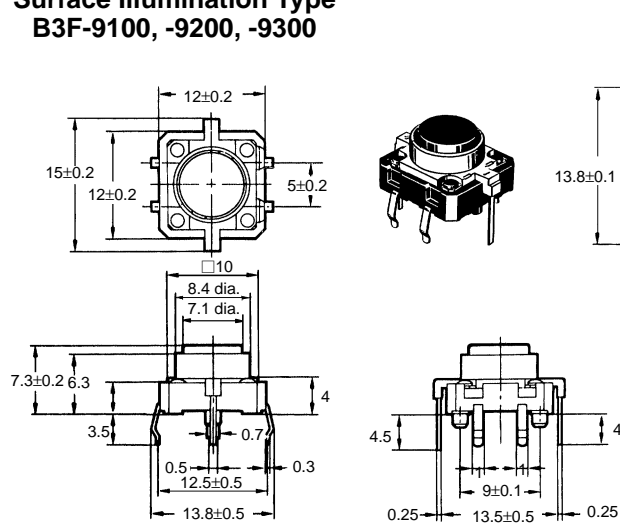


**Standard, Long Life Expectancy,
High Reliability, Projected Plunger
Type (without Ground Terminal)
B3F-4050, -4055, -5050, -5051**

**Standard, Long Life Expectancy,
High Reliability, Projected Plunger
Type (with Ground Terminal)
B3F-4150, -4155, -5150, -5151**



**Surface Illumination Type
B3F-9100, -9200, -9300**



Precautions

- Do not apply additional force to the plunger once it has stopped moving.
- Solder at $260^{\circ}\pm 5^{\circ}\text{C}$ within five seconds and within two tries.
- Do not wash the switches. The switches may be damaged by solvents if either wiped off using solvents or immersed in solvents.
- Do not allow flux or flux foam to penetrate onto the component side of the PCB.
- Use a single-sided PCB with a thickness of 1.6 mm. The switches may be damaged due to instability or heat from soldering if other PCBs (other thickness or through holes) are used. If it is necessary to use another PCB, test the compatibility and processing in advance.
- The switches are not sealed and should be protected with a resin sheet as shown below when used in dust-prone environments.

