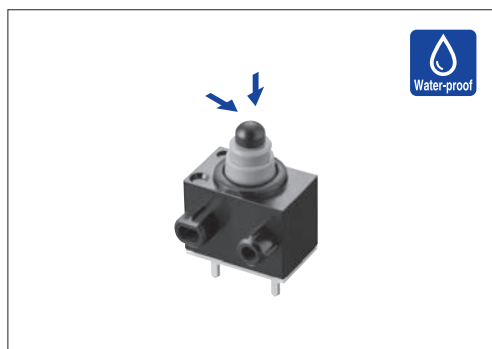


Industry's smallest size, with main unit dimensions of 8.3×5.3×7mm



### Typical Specifications



| Items                                                  |              | Specifications                                                                |
|--------------------------------------------------------|--------------|-------------------------------------------------------------------------------|
| Rating (max.)/(min.)<br>(Resistive load)               |              | 0.1A 12V DC / 50μA 5V DC                                                      |
| Contact resistance<br>(Initial / After operating life) |              | 500mΩ max. / 1Ω max. (Standard type)<br>500mΩ max. / 3Ω max. (Long-life type) |
| Operating force                                        |              | 1±0.5N                                                                        |
| Operating life                                         | Without load | 300,000cycles (Standard type)<br>1,000,000cycles (Long-life type)             |
|                                                        | With load    | 300,000cycles (Standard type)<br>1,000,000cycles (Long-life type)             |

### Product Line

| Poles | Positions | Circuit | Terminal type         | Main body form   | Minimum order unit (pcs) |        | Packing specifications type | Product No.   |                | Drawing No. |
|-------|-----------|---------|-----------------------|------------------|--------------------------|--------|-----------------------------|---------------|----------------|-------------|
|       |           |         |                       |                  | Japan                    | Export |                             | Standard type | Long-life type |             |
| 1     | 1         | N.O.    | For PC board          | Boss-both sides  | 1,755                    | 7,020  | A                           | SPVQ810100    | SPVQ830100     | 1           |
|       |           |         | Angle                 | Boss-single side |                          |        |                             | SPVQ810300    | SPVQ830300     | 2           |
|       |           |         | For PC board          | Without boss     |                          |        |                             | SPVQ810400    | SPVQ830400     | 3           |
|       |           |         |                       | Boss-single side |                          |        |                             | SPVQ810500    | SPVQ830500     | 4           |
|       |           |         | For Lead              | Boss-single side |                          |        |                             | SPVQ810600    | SPVQ830600     | 5           |
|       |           |         |                       | Boss-both sides  |                          |        |                             | SPVQ810700    | SPVQ830700     | 6           |
|       |           |         | Press fit             | Boss-both sides  |                          |        |                             | SPVQ810800    | SPVQ830800     | 7           |
|       |           |         |                       | Boss-single side |                          |        |                             | SPVQ811000    | SPVQ831000     | 8           |
|       |           | N.C.    | For PC board          | Boss-both sides  | 1,755                    | 7,020  | A                           | SPVQ820100    | —              | 1           |
|       |           |         | Angle                 | Boss-single side |                          |        |                             | SPVQ820300    | —              | 9           |
|       |           |         | For PC board          | Without boss     |                          |        |                             | SPVQ820400    | —              | 3           |
|       |           |         |                       | Boss-single side |                          |        |                             | SPVQ820500    | —              | 4           |
|       |           |         | For Lead              | Boss-single side |                          |        |                             | SPVQ820600    | —              | 10          |
|       |           |         |                       | Boss-both sides  |                          |        |                             | SPVQ820700    | —              | 11          |
|       |           |         | Press fit             | Boss-both sides  |                          |        |                             | SPVQ820800    | —              | 7           |
|       |           |         |                       | Boss-single side |                          |        |                             | SPVQ821000    | —              | 12          |
|       |           | N.O.    | With wire (Downwards) | Boss-single side | 400                      | 1,600  | B                           | SPVQ850100*   | —              | 13          |
|       |           |         | With wire (Downwards) | Boss-both sides  |                          |        |                             | SPVQ850200*   | —              | 14          |
|       |           |         | With wire (Left side) | Boss-single side |                          |        |                             | SPVQ850300*   | —              | 15          |
|       |           |         | With wire (from side) | Boss-both sides  |                          |        |                             | SPVQ850500*   | —              | 16          |
|       |           | N.C.    | With wire (Downwards) | Boss-single side |                          |        |                             | SPVQ860100*   | —              | 17          |
|       |           |         | With wire (Downwards) | Boss-both sides  |                          |        |                             | SPVQ860200*   | —              | 14          |
|       |           |         | With wire (Left side) | Boss-single side |                          |        |                             | SPVQ860300*   | —              | 18          |
|       |           |         | With wire (from side) | Boss-both sides  |                          |        |                             | SPVQ860500*   | —              | 16          |

### Notes

- ※ Products with a wire will be supplied as follows.
  - Unless specified, the length of the lead wire is 250mm. Color is either red, black or yellow. Please consult us for length modification.
  - Please specify circuits (N.O. or N.C.) for wired (side) types. Unless specified, the circuit will apply N.O.
  - Product with wire will be build-to-order.
- This unit cannot be used in water (IP67 rating, except for terminal).

### Packing Specifications

#### Tray

| Packing specifications type | Number of packages (pcs.) |                        | Export package measurements (mm) |
|-----------------------------|---------------------------|------------------------|----------------------------------|
|                             | 1 case /Japan             | 1 case /export packing |                                  |
| <b>A</b>                    | 1,755                     | 7,020                  | 540×360×270                      |

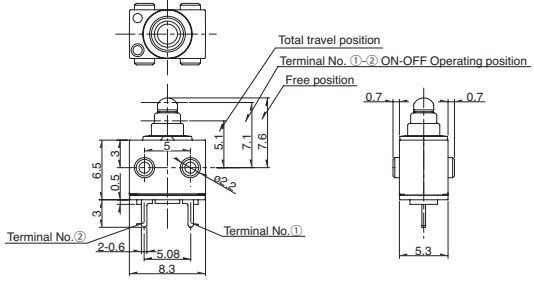
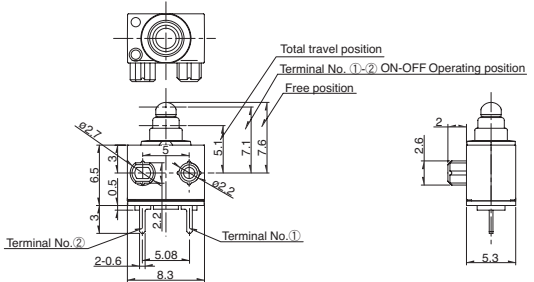
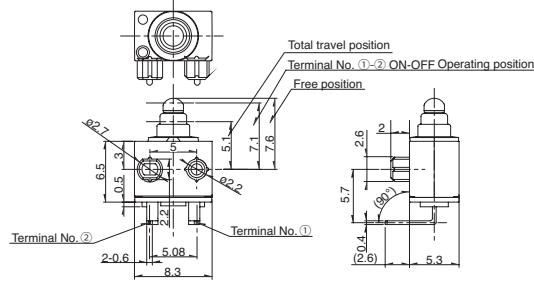
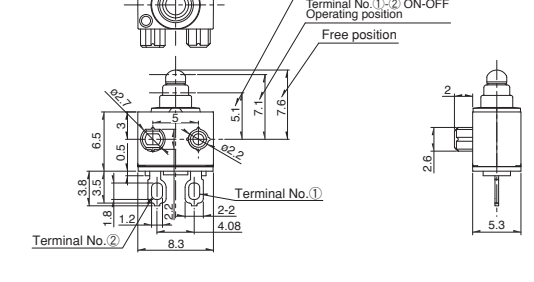
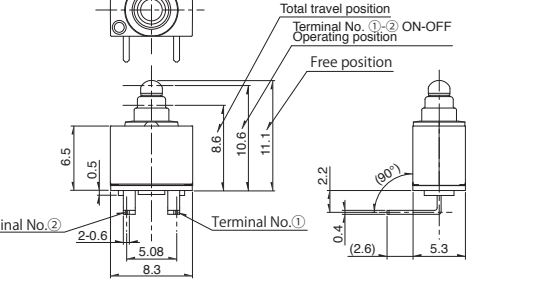
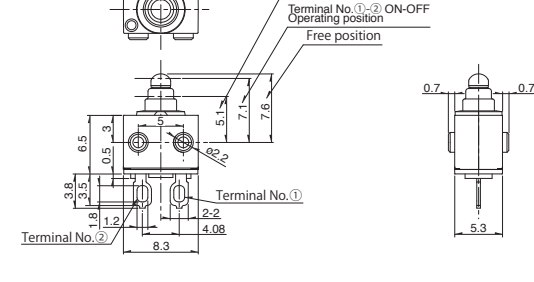
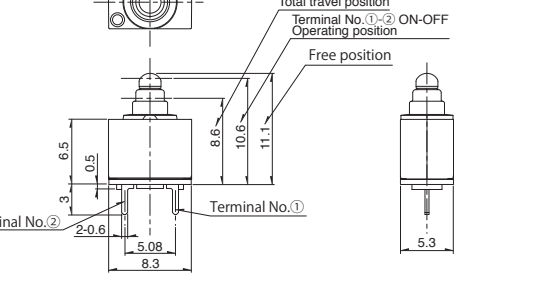
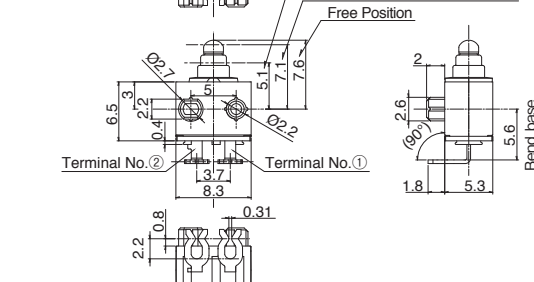
#### Bulk

| Packing specifications type | Number of packages (pcs.) |                        | Export package measurements (mm) |
|-----------------------------|---------------------------|------------------------|----------------------------------|
|                             | 1 case /Japan             | 1 case /export packing |                                  |
| <b>B</b>                    | 400                       | 1,600                  | 555×375×223                      |

Refer to P.71 for soldering conditions.

■ Dimensions

Unit:mm

| No. | Style                                                                               | No. | Style                                                                                |
|-----|-------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------|
| 1   |    | 5   |    |
| 2   |   | 6   |   |
| 3   |  | 7   |  |
| 4   |  | 8   |  |

Detector  
Slide  
Push  
Rotary  
Power  
Dual-In-line  
Package Type  
General-purpose Type  
Water-proof Type

## Dimensions

Unit:mm

| No. | Style | No. | Style |
|-----|-------|-----|-------|
| 9   |       | 12  |       |
| 10  |       | 13  |       |
| 11  |       | 14  |       |

## Dimensions

Unit:mm

| No. | Style                                                                                                                                                                                                                                                                                                                                 | No. | Style                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15  | <p>AVSS0.3F</p> <p>Total travel position<br/>operating force standard measurement position</p> <p>Terminal No. ①~②<br/>(Terminal No. ①~② Operating position)</p> <p>Free Position</p> <p>No. ② (Red)</p> <p>No. ① (Black)</p> <p>Dimensions: 8.3, 5.3, 2.6, 7.6, 7.1, (5.4), 5.1, 9.0, 3, 6.5, 11.6, 2.2, 1.7, (8.3), 250, (5.3).</p> | 17  | <p>AVSS0.3F</p> <p>Total travel position<br/>operating force standard measurement position</p> <p>Terminal No. ①~②<br/>Operating position</p> <p>Free Position</p> <p>No. ② (Red)</p> <p>No. ① (Black)</p> <p>Dimensions: 8.3, 5.3, 2.6, 7.6, 7.1, (5.4), 5.1, 9.0, 3, 6.5, 11.6, 2.2, 1.7, (8.3), 250, (5.3).</p>                                                                                                              |
| 16  | <p>AVSS0.3F</p> <p>Total travel position<br/>Operating force standard measurement position</p> <p>Terminal No. ①~②<br/>(Terminal No. ①~② Operating position)</p> <p>Free Position</p> <p>No. ② (Red)</p> <p>No. ① (Black)</p> <p>Dimensions: 8.3, 5.3, 2.6, 7.6, 7.1, (5.4), 5.1, 9.0, 3, 6.5, 11.6, 2.2, 1.7, (8.3), 250, (5.3).</p> | 18  | <p>AVSS0.3F</p> <p>Total travel position<br/>(The top of the plunger)</p> <p>Operating force standard measurement position<br/>(The top of the plunger)</p> <p>Terminal No. ①~②<br/>(Terminal No. ①~② Operating position)</p> <p>Free position<br/>(The top of the plunger)</p> <p>No. ② (Red)</p> <p>No. ① (Black)</p> <p>Dimensions: 8.3, 5.3, 2.6, 7.6, 7.1, (5.4), 5.1, 9.0, 3, 6.5, 11.6, 2.2, 1.7, (8.3), 250, (5.3).</p> |

### Circuit Diagram

The diagram illustrates the two states of a normally open contact. In the 'Normal Open' state, the contact is open, and no current flows. In the 'Normal Close' state, the contact is closed, allowing current to flow from terminal 1 to terminal 2.

# SPVQ8 Water-proof Type

Detector

Slide

Push

Rotary

Power

Dual In-line  
Package Type

General-  
purpose Type

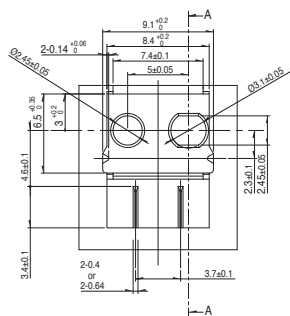
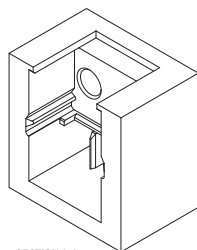
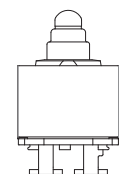
Water-proof  
Type

Recommended Unit Terminal Shape for Press-Fit Terminals (Normally Open)

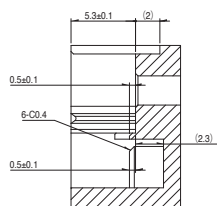
Style

SPVQ811000, SPVQ831000

Unit:mm



SECTION A-A

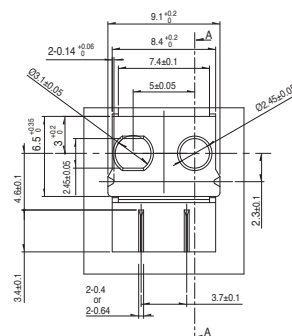
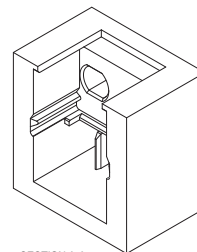
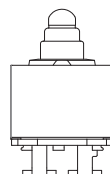


Recommended Unit Terminal Shape for Press-Fit Terminals (Normally Closed)

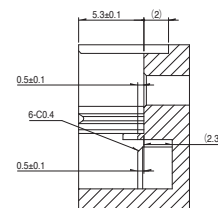
Style

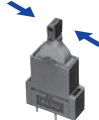
SPVQ821000

Unit:mm



SECTION A-A



| Series                            |                                                               | Water-proof Type                                                                  |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|-----------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                   |                                                               | SPVQ8                                                                             | SPVQ9                                                                             | SPVQA                                                                             | SPVQC                                                                               | SSCN                                                                                |
| Photo                             |                                                               |  |  |  |  |  |
| Operation type                    |                                                               | Two-way                                                                           |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Dimensions (mm)                   | W                                                             | 8.3                                                                               | 15.4                                                                              | 15.2                                                                              | 15.4                                                                                | 13                                                                                  |
|                                   | D                                                             | 5.3                                                                               | 8.4                                                                               | 6.4                                                                               | 7.4                                                                                 | 5                                                                                   |
|                                   | H                                                             | 6.5                                                                               | 7.5                                                                               | 7.95                                                                              | 7.5                                                                                 | 15                                                                                  |
| Operating temperature range       |                                                               | -40℃ to +85℃                                                                      |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Automotive use                    |                                                               |  |  |  |  |  |
| Life cycle (availability)         |                                                               |  |  |  |  |  |
| Poles / Positions                 |                                                               | 1/1                                                                               | 2/2                                                                               | 1/1<br>1/2                                                                        | 2/2                                                                                 | 1/2                                                                                 |
| Rating (max.)<br>(Resistive load) |                                                               | 0.1A 12V DC                                                                       | 50mA 26V DC                                                                       | 0.1A 12V DC                                                                       | 50mA 18V DC                                                                         | 0.1A 12V DC                                                                         |
| Rating (min.)<br>(Resistive load) |                                                               | 50μA 5V DC                                                                        |                                                                                   |                                                                                   |                                                                                     | 100μA 5V DC                                                                         |
| Durability                        | Operating life without load                                   | 300,000cycles<br>1Ω max. or<br>1,000,000cycles<br>3Ω max.                         | 300,000cycles<br>200mΩ max.                                                       | 300,000cycles<br>1Ω max.                                                          | 300,000cycles<br>200mΩ max.                                                         | 100,000cycles<br>1Ω max.                                                            |
|                                   | Operating life with load<br>Rating (max.)<br>(Resistive load) | 300,000cycles<br>1Ω max. or<br>1,000,000cycles<br>3Ω max.                         | 300,000cycles<br>200mΩ max.                                                       | 300,000cycles<br>1Ω max.                                                          | 300,000cycles<br>200mΩ max.                                                         | 100,000cycles<br>1Ω max.                                                            |
| Electrical performance            | Initial contact resistance                                    | 500mΩ max.                                                                        | 75mΩ max.                                                                         | 500mΩ max.                                                                        | 75mΩ max.                                                                           | 500mΩ max.                                                                          |
|                                   | Insulation resistance                                         | 100MΩ min. 500V DC                                                                |                                                                                   |                                                                                   | 100MΩ min. 250V DC                                                                  | 100MΩ min. 500V DC                                                                  |
|                                   | Voltage proof                                                 | 500V AC for 1minute                                                               |                                                                                   |                                                                                   | 250V AC for 1minute                                                                 | 500V AC for 1minute                                                                 |
| Mechanical performance            | Terminal strength                                             | 3N for 1minute (with terminal)<br>Wire strength 30N for 1minute (with wire)       | 3N for 1minute                                                                    |                                                                                   |                                                                                     |                                                                                     |
|                                   | Actuator strength                                             | 20N                                                                               |                                                                                   |                                                                                   |                                                                                     | 10N                                                                                 |
| Environmental performance         | Cold                                                          | -40℃ 500h                                                                         |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|                                   | Dry heat                                                      | 85℃ 500h                                                                          |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|                                   | Damp heat                                                     | 60℃, 90 to 95% RH 500h                                                            |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| Operation force                   |                                                               | 1±0.5N                                                                            |                                                                                   |                                                                                   |                                                                                     | 2N max.                                                                             |
| Page                              |                                                               | 60                                                                                | 65                                                                                | 66                                                                                | 69                                                                                  | 70                                                                                  |

|                                        |    |
|----------------------------------------|----|
| Detector Switches Soldering Conditions | 71 |
| Detector Switches Cautions             | 72 |

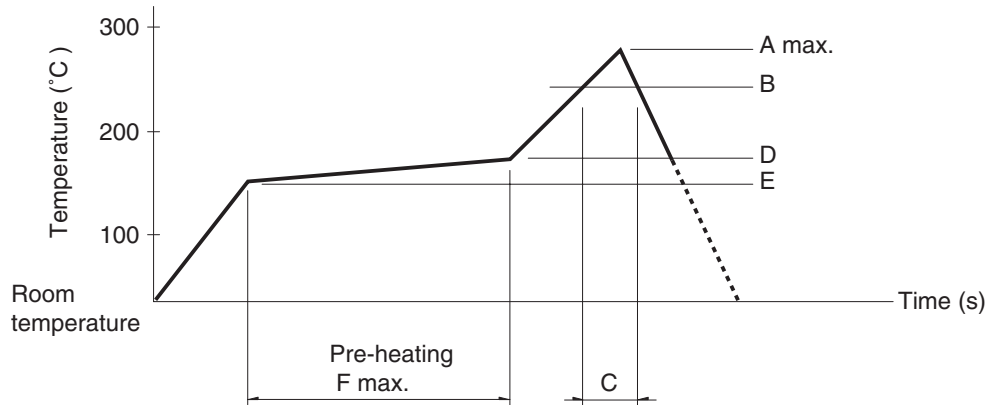
#### Note

● Indicates applicability to all products in the series.

# Detector Switches Soldering Conditions

## Example of Reflow Soldering Condition

1. Heating method: Double heating method with infrared heater.
2. Temperature measurement: Thermocouple  $\phi 0.1$  to  $0.2$  CA (K) or CC (T) at soldering portion (copper foil surface).  
A heat resisting tape should be used for fixed measurement.
3. Temperature profile



| Series (Reflow type) | A (°C) 3s max. | B (°C) | C (s) | D (°C) | E (°C) | F (s) |
|----------------------|----------------|--------|-------|--------|--------|-------|
| SPPB                 | 250            | 230    | 40    | 180    | 150    | 120   |
| SPPW8                |                |        | 35    |        |        |       |
| SPVE                 | 260            |        | 40    |        |        |       |
| SPVL                 |                |        |       |        |        |       |
| SPVM                 |                |        |       |        |        |       |
| SPVN                 |                |        |       |        |        |       |
| SPVR                 |                |        |       |        |        |       |
| SPVS                 |                |        |       |        |        |       |
| SPVT                 |                |        |       |        |        |       |
| SSCM                 |                |        |       |        |        |       |
| SSCQ                 |                |        |       |        |        |       |
| SPVQC                | 250            |        |       |        |        |       |

## Notes

1. The condition mentioned above is the temperature on the mounting surface of a PC board. There are cases where the PC board's temperature greatly differs from that of the switch, surface depending on the PC board's material, size, thickness, etc.  
The above-stated conditions shall also apply to switch surface temperatures.
2. Soldering conditions differ depending on reflow soldering machines.  
Prior verification of soldering condition is highly recommended.

## Reference for Hand Soldering

| Series                                                                          | Soldering temperature | Soldering time |
|---------------------------------------------------------------------------------|-----------------------|----------------|
| <b>SPVS, SPVN, SPVT, SPVM, SPVR, SPVE, SPPW8, SSCQ, SSCM, SPVL, SSCT, SPVQC</b> | 350±5°C               | 3s max.        |
| <b>SPVQ1, SPVQ3, SPVQ6, SPVQ7, SPVQ8, SPVQ9, SSCN, SPVQA</b>                    | 300±10°C              | 3 + 1 / 0s     |
| <b>SPPB (Reflow)</b>                                                            | 300±5°C               | 5s max.        |
| <b>SSCF, SPPB (For Lead, Dip)</b>                                               | 350±10°C              | 3 + 1 / 0s     |

## Reference for Dip Soldering

(For PC board terminal types)

| Series                                                       | Items                  |                 | Dip soldering         |                       |
|--------------------------------------------------------------|------------------------|-----------------|-----------------------|-----------------------|
|                                                              | Preheating temperature | Preheating time | Soldering temperature | Duration of immersion |
| <b>SSCT, SPVQ1, SPVQ3, SPVQ6, SPVQ7, SPVQ8, SPVQ9, SPVQA</b> | 100±10°C               | 60s max.        | 260±5°C               | 5±1s                  |
| <b>SPPW8, SPPB</b>                                           | 100 °C max.            | 60s max.        | 255±5°C               | 5±1s                  |
| <b>SSCF</b>                                                  | —                      |                 | 260±5°C               | 5±1s                  |