

SPVQ7 Water-proof Type

Slim type with body height of 6.7mm



Detector

Slide

Push

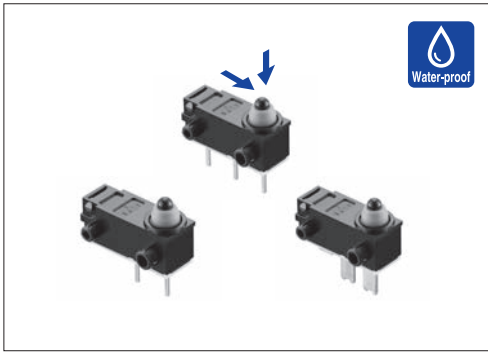
Rotary

Power

Dual-in-line Package Type

General-purpose Type

Water-proof Type



Typical Specifications

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

Product Line

| Poles | Positions | Change over timing | Operating part shape | Terminal type | Main body form | Minimum order unit (pcs) | | Product No. | Drawing No. |
|-------|----------------------|--------------------|----------------------|-------------------|-------------------|--------------------------|--------|-------------------|-------------|
| | | | | | | Japan | Export | | |
| 1 | 2 | Non shorting | Push | For PC board | Boss - left side | 1,350 | 5,400 | SPVQ710100 | 1 |
| | | | | | Boss - right side | | | SPVQ710200 | 2 |
| | | | | | Boss - left side | | | SPVQ710300 | 3 |
| | | | | | Boss - right side | | | SPVQ710400 | 4 |
| | For Lead | | | | Boss - left side | | | SPVQ740300 | 5 |
| | | | | | Boss - right side | | | SPVQ740400 | 6 |
| | | | | | Boss - left side | | | SPVQ740100 | 7 |
| | | | | | Boss - right side | | | SPVQ740200 | 8 |
| | For Lead (hole type) | | | Boss - left side | SPVQ740500 | | | 9 | |
| | | | | Boss - right side | SPVQ740600 | | | 10 | |

Note

This unit cannot be used in water (IP67 rating, except for terminal).

Packing Specifications

Tray

| Number of packages (pcs.) | | Export package measurements (mm) |
|---------------------------|------------------------|----------------------------------|
| 1 case /Japan | 1 case /export packing | |
| 1,350 | 5,400 | 540×360×270 |

Dimensions

| No. | Style | No. | Style |
|-----|-------|-----|-------|
| 1 | | 2 | |

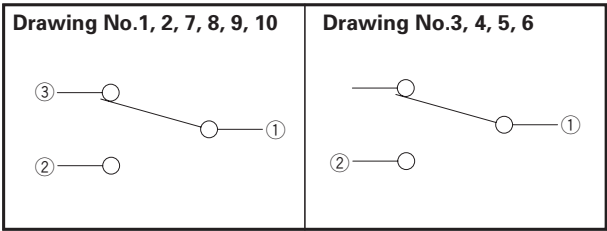
Refer to P.71 for soldering conditions.

■ Dimensions

Unit:mm

| No. | Style | No. | Style |
|-----|-------|-----|-------|
| 3 | | 7 | |
| 4 | | 8 | |
| 5 | | 9 | |
| 6 | | 10 | |

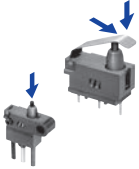
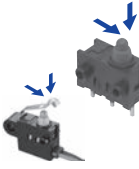

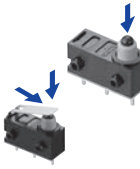






■ Circuit Diagram



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

Detector Switches

List of Varieties

| Series | | Water-proof Type | | | | |
|--------------------------------|--|---|---|---|---|---|
| | | SPVQ1 | SPVQ3 | SPVQ4H | SPVQ6 | SPVQ7 |
| Photo | |  |  |  |  |  |
| Operation type | | One-way Two-way | Two-way | | One-way Two-way | Two-way |
| Dimensions (mm) | W | 13.3 | 13 | 19 | 13.3 | 14.7 |
| | D | 5.8 | | 6 | 5.3 | 5.4 |
| | H | 8 | 8.35 | 11.9 | 7 | 6.7 |
| Operating temperature range | | -40°C to +85°C | | | | |
| Automotive use | | ● | ● | ● | ● | ● |
| Life cycle (availability) | |  |  |  |  |  |
| Poles / Positions | | 1/2 | 1/1 1/2 | | 1/2 | 1/1 1/2 |
| Rating (max.) (Resistive load) | | 0.1A 12V DC | 0.1A 12V DC or 0.3A 16V DC | 0.1A 12V DC | | |
| Rating (min.) (Resistive load) | | 50μA 3V DC | 50μA 5V DC or 1mA 5V DC | 1mA 5V DC | 50μA 5V DC | |
| Durability | Operating life without load | 300,000cycles 1Ω max. | 300,000cycles or 1,200,000cycles 1Ω max. | 300,000cycles 1Ω max. | | |
| | Operating life with load Rating (max.) (Resistive load) | 300,000cycles 1Ω max. | 300,000cycles or 1,200,000cycles 1Ω max. | 300,000cycles 1Ω max. | | |
| Electrical performance | Initial contact resistance | 500mΩ max. | | | | |
| | Insulation resistance | 100MΩ min. 500V DC | | | | |
| | Voltage proof | 500V AC for 1minute | | | | |
| Mechanical performance | Terminal strength | 3N for 1minute (with terminal) Wire strength 30N for 1minute (with wire) | Wire strength 30N for 1 minute | | 3N for 1minute | |
| | Actuator strength | 20N | | | | |
| Environmental performance | Cold | -40°C 500h | | | | |
| | Dry heat | 85°C 500h | | | | |
| | Damp heat | 60°C, 90 to 95% RH 500h | | | | |
| Operation force | | 2N max. 5.9N max. | 1±0.5N 3N max. | 3N max. | 1±0.5N 3N max. | 1±0.5N |
| Page | | 46 | 50 | 55 | 56 | 58 |

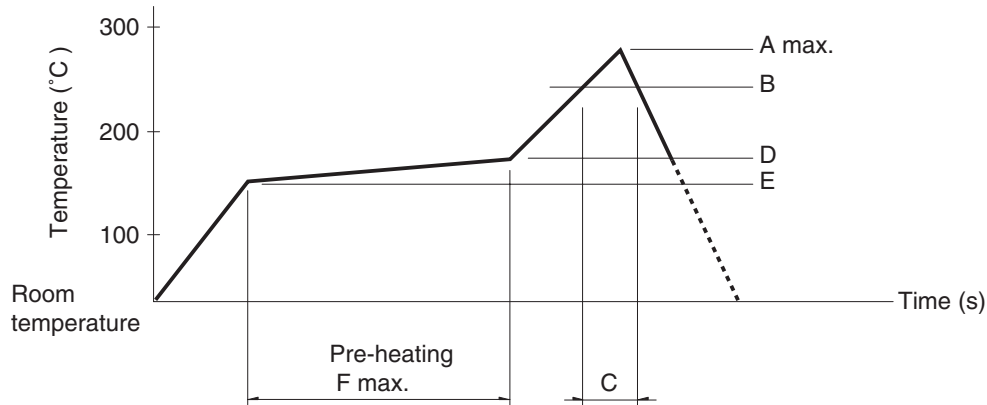
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|--|----|
| Detector Switches Soldering Conditions | 71 |
| Detector Switches Cautions | 72 |

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 |
|---|-----------------------|----------------|
| SPVS, SPVN, SPVT, SPVM, SPVR, SPVE, SPPW8, SSCQ, SSCM, SPVL, SSCT, SPVQC | 350±5°C | 3s max. |
| SPVQ1, SPVQ3, SPVQ6, SPVQ7, SPVQ8, SPVQ9, SSCN, SPVQA | 300±10°C | 3 +1 / 0s |
| SPPB (Reflow) | 300±5°C | 5s max. |
| SSCF, SPPB (For Lead, Dip) | 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 |
| SSCT, SPVQ1, SPVQ3, SPVQ6, SPVQ7, SPVQ8, SPVQ9, SPVQA | 100±10°C | 60s max. | 260±5°C | 5±1s |
| SPPW8, SPPB | 100 °C max. | 60s max. | 255±5°C | 5±1s |
| SSCF | — | | 260±5°C | 5±1s |