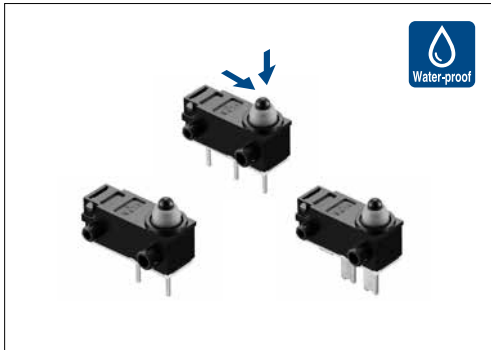


SPVQ7 Water-proof Type

Slim type with body height of 6.7mm



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	SPVQ710103	1
					Boss - right side			SPVQ710203	2
					Boss - left side			SPVQ710304	3
					Boss - right side			SPVQ710404	4
	For Lead				Boss - left side			SPVQ740303	5
					Boss - right side			SPVQ740403	6
					Boss - left side			SPVQ740103	7
					Boss - right side			SPVQ740203	8
	For Lead (hole type)			Boss - left side	SPVQ740502			9	
				Boss - right side	SPVQ740602			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	

SPVQ7 Water-proof Type

Detector

Slide

Push

Rotary

Power

Dual-in-line Package Type

General-purpose Type

Water-proof Type

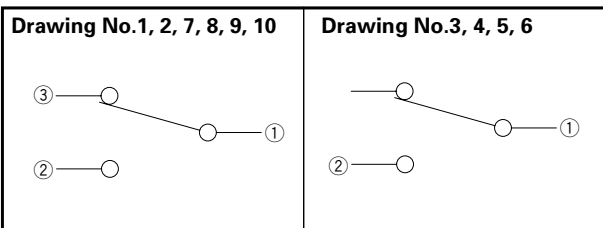
Fast Switching Type

Dimensions

Unit:mm


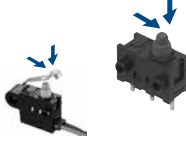






No.	Style	No.	Style
3	<p>Technical drawing of style 3 detector. Dimensions include: 12.2 (width), 5.4 (height), 2.2 (hole offset), 9.53 (terminal offset), 12.13 (terminal width), 3.1 (terminal radius), 6.7 (total height), 3.6 (terminal height), 4.25 max. (plunger height), 2.6 (plunger offset), 7.45 max. (total height), 6.95 (terminal offset), 5.35 (terminal width), 6.55 (terminal radius), 14.7 (terminal spacing), 2-0.6 (terminal offset), 5.08 (terminal offset), 5.08 (terminal offset), 4.63 (terminal offset).</p> <p>Labels: The top of the plunger (Measurement position), Terminal No. ①-② ON starting position, Free position, Limit total travel position, Terminal No. ①, Terminal No. ②.</p>	7	<p>Technical drawing of style 7 detector. Dimensions include: 12.2 (width), 5.4 (height), 2.2 (hole offset), 9.53 (terminal offset), 12.13 (terminal width), 3.1 (terminal radius), 6.7 (total height), 3.6 (terminal height), 4.25 max. (plunger height), 2.6 (plunger offset), 7.45 max. (total height), 6.95 (terminal offset), 5.35 (terminal width), 6.55 (terminal radius), 14.7 (terminal spacing), 3-2.5 (terminal offset), 4.13 (terminal offset), 4.13 (terminal offset), 4.63 (terminal offset).</p> <p>Labels: The top of the plunger (Measurement position), Terminal No. ①-② ON starting position, Terminal No. ①-③ OFF starting position, Limit total travel position, Terminal No. ①, Terminal No. ②.</p>
4	<p>Technical drawing of style 4 detector. Dimensions include: 12.2 (width), 5.4 (height), 2.2 (hole offset), 9.53 (terminal offset), 12.13 (terminal width), 3.1 (terminal radius), 6.7 (total height), 3.6 (terminal height), 4.25 max. (plunger height), 2.6 (plunger offset), 7.45 max. (total height), 6.95 (terminal offset), 5.35 (terminal width), 6.55 (terminal radius), 14.7 (terminal spacing), 2-0.6 (terminal offset), 5.08 (terminal offset), 5.08 (terminal offset), 4.63 (terminal offset).</p> <p>Labels: Terminal No. ①-② ON starting position, Free position, The top of the plunger (Measurement position), Limit total travel position, Terminal No. ①, Terminal No. ②.</p>	8	<p>Technical drawing of style 8 detector. Dimensions include: 12.2 (width), 5.4 (height), 2.2 (hole offset), 9.53 (terminal offset), 12.13 (terminal width), 3.1 (terminal radius), 6.7 (total height), 3.6 (terminal height), 4.25 max. (plunger height), 2.6 (plunger offset), 7.45 max. (total height), 6.95 (terminal offset), 5.35 (terminal width), 6.55 (terminal radius), 14.7 (terminal spacing), 3-2.5 (terminal offset), 4.13 (terminal offset), 4.13 (terminal offset), 4.63 (terminal offset).</p> <p>Labels: Terminal No. ①-③ ON starting position, Terminal No. ①-③ OFF starting position, The top of the plunger (Measurement position), Limit total travel position, Terminal No. ①, Terminal No. ②, Terminal No. ③.</p>
5	<p>Technical drawing of style 5 detector. Dimensions include: 12.2 (width), 5.4 (height), 2.2 (hole offset), 9.53 (terminal offset), 12.13 (terminal width), 3.1 (terminal radius), 6.7 (total height), 3.6 (terminal height), 4.25 max. (plunger height), 2.6 (plunger offset), 7.45 max. (total height), 6.95 (terminal offset), 5.35 (terminal width), 6.55 (terminal radius), 14.7 (terminal spacing), 2-2.5 (terminal offset), 4.13 (terminal offset), 4.13 (terminal offset), 4.63 (terminal offset).</p> <p>Labels: The top of the plunger (Measurement position), Terminal No. ①-② ON starting position, Free position, Limit total travel position, Terminal No. ①, Terminal No. ②.</p>	9	<p>Technical drawing of style 9 detector. Dimensions include: 12.2 (width), 5.4 (height), 2.2 (hole offset), 9.53 (terminal offset), 12.13 (terminal width), 3.1 (terminal radius), 6.7 (total height), 3.6 (terminal height), 4.25 max. (plunger height), 2.6 (plunger offset), 7.45 max. (total height), 6.95 (terminal offset), 5.35 (terminal width), 6.55 (terminal radius), 14.7 (terminal spacing), 3-1.3 (terminal offset), 3-2.5 (terminal offset), 4.13 (terminal offset), 4.13 (terminal offset), 4.63 (terminal offset).</p> <p>Labels: Terminal No. ①-② ON starting position, Terminal No. ①-③ OFF starting position, The top of the plunger (Measurement position), Free position, Limit total travel position, Terminal No. ①, Terminal No. ②, Terminal No. ③.</p>
6	<p>Technical drawing of style 6 detector. Dimensions include: 12.2 (width), 5.4 (height), 2.2 (hole offset), 9.53 (terminal offset), 12.13 (terminal width), 3.1 (terminal radius), 6.7 (total height), 3.6 (terminal height), 4.25 max. (plunger height), 2.6 (plunger offset), 7.45 max. (total height), 6.95 (terminal offset), 5.35 (terminal width), 6.55 (terminal radius), 14.7 (terminal spacing), 2-2.5 (terminal offset), 4.13 (terminal offset), 4.13 (terminal offset), 4.63 (terminal offset).</p> <p>Labels: Terminal No. ①-② ON starting position, Free position, The top of the plunger (Measurement position), Limit total travel position, Terminal No. ①, Terminal No. ②.</p>	10	<p>Technical drawing of style 10 detector. Dimensions include: 12.2 (width), 5.4 (height), 2.2 (hole offset), 9.53 (terminal offset), 12.13 (terminal width), 3.1 (terminal radius), 6.7 (total height), 3.6 (terminal height), 4.25 max. (plunger height), 2.6 (plunger offset), 7.45 max. (total height), 6.95 (terminal offset), 5.35 (terminal width), 6.55 (terminal radius), 14.7 (terminal spacing), 3-1.3 (terminal offset), 3-2.5 (terminal offset), 4.13 (terminal offset), 4.13 (terminal offset), 4.63 (terminal offset).</p> <p>Labels: Terminal No. ①-② ON starting position, Terminal No. ①-③ OFF starting position, Free position, The top of the plunger (Measurement position), Limit total travel position, Terminal No. ①, Terminal No. ②, Terminal No. ③.</p>

Circuit Diagram



Detector Switches

List of Varieties

Series		Water-proof Type			
		SPVQ1	SPVQ3	SPVQ6	SPVQ7
Photo					
Operation type		One-way Two-way	Two-way	One-way Two-way	Two-way
Dimensions (mm)	W	13.3	13	13.3	14.7
	D	5.8		5.3	5.4
	H	8	8.35	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			
Rating (min.) (Resistive load)		50μA 3V DC	50μA 5V DC		
Durability	Operating life without load	300,000cycles 1Ω max.			
	Operating life with load Rating (max.) (Resistive load)	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	3N for 1minute (with terminal) Wire strength 30N for 1minute (with wire)	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.		1±0.5N
Page		43	45	50	53

Detector Switches Soldering Conditions	66
Detector Switches Cautions	67

Note

- Indicates applicability to all products in the series.

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
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, 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