

SPVQ8 Water-proof Type

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



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. (Standard type) 500mΩ max. / 3Ω max. (Long-life type)
Operating force		1±0.5N
Operating life	Without load	300,000cycles (Standard type) 1,000,000cycles (Long-life type)
	With load	300,000cycles (Standard type) 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	SPVQ810101	SPVQ830101	1	
			Angle	Boss-single side				SPVQ810301	SPVQ830301	2	
				Without boss				SPVQ810401	SPVQ830401	3	
			For PC board	Boss-single side				SPVQ810501	SPVQ830501	4	
			For Lead	Boss-both sides				SPVQ810601	SPVQ830601	5	
				Boss-single side				SPVQ810703	SPVQ830701	6	
			Press fit	Boss-both sides				SPVQ810801	SPVQ830801	7	
			Press fit	Boss-single side				SPVQ811004	SPVQ831001	8	
			N.C.	For PC board				Boss-both sides	SPVQ820101	—	1
				Angle				Boss-single side	SPVQ820301	—	9
								Without boss	SPVQ820401	—	3
				For PC board				Boss-single side	SPVQ820501	—	4
		For Lead		Boss-both sides	SPVQ820601	—	10				
				Boss-single side	SPVQ820704	—	11				
		Press fit	Boss-both sides	SPVQ820801	—	7					
		Press fit	Boss-single side	SPVQ821004	—	12					
		N.O.	With wire (Downwards)	Boss-single side	SPVQ850100*	—	13				
				Boss-both sides	SPVQ850200*	—	14				
				Boss-single side	SPVQ850300*	—	15				
				Boss-both sides	SPVQ850500*	—	16				
			With wire (from side)	Boss-single side	SPVQ860100*	—	17				
				Boss-both sides	SPVQ860200*	—	14				
				Boss-single side	SPVQ860300*	—	18				
				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 or black. 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	
A	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	400	1,600	555×375×223

Refer to P.73 for soldering conditions.

SPVQ8 Water-proof Type

Dimensions

Unit:mm

No.	Style	No.	Style
1	<p>Technical drawing of SPVQ8 style 1 switch. Dimensions include: 6.5, 0.5, 3, 2-0.6, 5.08, 8.3, 0.2, 5.1, 7.1, 7.6, 0.8, 5.3. Labels: Total travel position, Terminal No. ①-② ON-OFF Operating position, Free position, Terminal No. ①, Terminal No. ②.</p>	5	<p>Technical drawing of SPVQ8 style 5 switch. Dimensions include: 6.5, 0.5, 3, 2-0.6, 5.08, 8.3, 0.2, 5.1, 7.1, 7.6, 0.8, 5.3, 2.6, 2. Labels: Total travel position, Terminal No. ①-② ON-OFF Operating position, Free position, Terminal No. ①, Terminal No. ②.</p>
2	<p>Technical drawing of SPVQ8 style 2 switch. Dimensions include: 6.5, 0.5, 3, 2-0.6, 5.08, 8.3, 0.2, 5.1, 7.6, 2.6, 2, 6.7, 0.4, (2.6), 5.3. Labels: Total travel position, Terminal No. ①-② ON-OFF Operating position, Free position, Terminal No. ①, Terminal No. ②.</p>	6	<p>Technical drawing of SPVQ8 style 6 switch. Dimensions include: 6.5, 0.5, 3, 2-0.6, 5.08, 8.3, 0.2, 5.1, 7.6, 2.6, 2, 3.8, 3.5, 1.8, 1.2, 2-2, 4.08, 5.3. Labels: Total travel position, Terminal No. ①-② ON-OFF Operating position, Free position, Terminal No. ①, Terminal No. ②.</p>
3	<p>Technical drawing of SPVQ8 style 3 switch. Dimensions include: 6.5, 0.5, 2-0.6, 5.08, 8.3, 8.6, 10.6, 11.1, 2.2, 0.4, (2.6), 5.3, (90°). Labels: Total travel position, Terminal No. ①-② ON-OFF Operating position, Free position, Terminal No. ①, Terminal No. ②.</p>	7	<p>Technical drawing of SPVQ8 style 7 switch. Dimensions include: 6.5, 0.5, 3, 2-0.6, 5.08, 8.3, 0.2, 5.1, 7.6, 3.8, 3.5, 1.8, 1.2, 2-2, 4.08, 5.3. Labels: Total travel position, Terminal No. ①-② ON-OFF Operating position, Free position, Terminal No. ①, Terminal No. ②.</p>
4	<p>Technical drawing of SPVQ8 style 4 switch. Dimensions include: 6.5, 0.5, 3, 2-0.6, 5.08, 8.3, 8.6, 10.6, 11.1, 5.3. Labels: Total travel position, Terminal No. ①-② ON-OFF Operating position, Free position, Terminal No. ①, Terminal No. ②.</p>	8	<p>Technical drawing of SPVQ8 style 8 switch. Dimensions include: 6.5, 0.5, 3, 2-0.6, 5.08, 8.3, 0.2, 5.1, 7.6, 2.6, 2, 1.8, 5.3, 0.8, 0.31, 2.2, 0.8, 5.6, Bend base, (90°). Labels: Total travel position, Terminal ①-② Operating position, Free Position, Terminal No. ①, Terminal No. ②.</p>

Dimensions

Unit:mm

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

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

SPVQ8 Water-proof Type

Detector
Slide
Push
Rotary
Power
Dual-in-line Package Type
General-purpose Type
Waterproof Type
Fast Switching Type

Dimensions

Unit:mm

No.	Style	No.	Style
15		17	
16		18	

Circuit Diagram



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

Unit:mm

Style

SPVQ811004, SPVQ831001



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

Unit:mm

Style

SPVQ821004



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

Series		Water-proof Type			Fast Switching Type		
		SPVQ8	SPVQ9	SSCN	SPVQ9	SPVQC	SPVQE
Photo							
Operation type		Two-way					
Dimensions (mm)	W	8.3	15.2	13	15.4	15.4	17.2
	D	5.3	6.4	5	8.4	7.4	12
	H	6.5	7.95	15	7.5	7.5	7.5
Operating temperature range		-40°C to +85°C					
Automotive use		●	●	●	●	●	●
Life cycle (availability)							
Poles / Positions		1/1	1/1 1/2	1/2	2/2	2/2	3/2
Rating (max.) (Resistive load)		0.1A 12V DC			50mA 26V DC	50mA 18V DC	
Rating (min.) (Resistive load)		50µA 5V DC		100µA 5V DC	50µA 5V DC		
Durability	Operating life without load	300,000cycles 1Ω max. or 1,000,000cycles 3Ω max.	300,000cycles 1Ω max.	100,000cycles 1Ω max.	300,000cycles 200mΩ max.		300,000 cycles CIRCUIT ①-②-③ and ④-⑤-⑥ 200mΩ max. CIRCUIT ⑦-⑧-⑨ 1Ω max.
	Operating life with load Rating (max.) (Resistive load)	300,000cycles 1Ω max. or 1,000,000cycles 3Ω max.	300,000cycles 1Ω max.	100,000cycles 1Ω max.	300,000cycles 200mΩ max.		300,000 cycles CIRCUIT ①-②-③ and ④-⑤-⑥ 200mΩ max. CIRCUIT ⑦-⑧-⑨ 1Ω max.
Electrical performance	Initial contact resistance	500mΩ max.			75mΩ max.		CIRCUIT ①-②-③ and ④-⑤-⑥ 75mΩ max. CIRCUIT ⑦-⑧-⑨ 250mΩ max.
	Insulation resistance	100MΩ min. 500V DC				100MΩ min. 250V DC	100MΩ min. 100V DC
	Voltage proof	500V AC for 1minute				250V AC for 1minute	100V AC for 1minute
Mechanical performance	Terminal strength	3N for 1minute (with terminal) Wire strength 30N for 1minute (with wire)	3N for 1minute				
	Actuator strength	20N		10N	20N		
Environmental performance	Cold	-40°C 500h					
	Dry heat	85°C 500h					
	Damp heat	60°C, 90 to 95% RH 500h					
Operation force		1±0.5N		2N max.	1±0.5N		
Page		61	66	69	70	71	72

Detector Switches Soldering Conditions 73
 Detector Switches Cautions 74

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, SPVQE	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, SPVQE	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

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