

SPVQA Water-proof Type

Fork terminals allow connection without solder



Detector

Slide

Push

Rotary

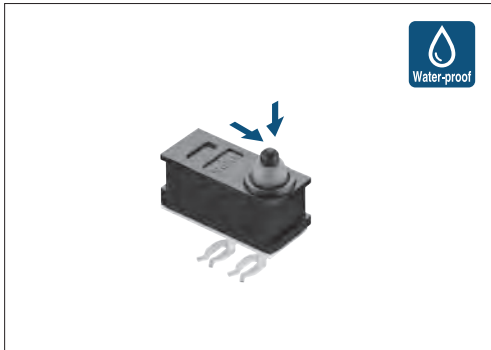
Power

Dual-in-line
Package Type

General-
purpose Type

Water-proof
Type

Fast Switching
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	1	Non shorting	Push	Press fit (Without terminal No.3)	Without boss L type	1,200	4,800	SPVQA10103	1
					Without boss R type			SPVQA10203	2
				Press fit (Without terminal No.2)	Without boss L type			SPVQA10302	3
					Without boss R type			SPVQA10402	4
	Press fit			Without boss L type	SPVQA10504			5	
				Without boss R type	SPVQA10604			6	
	For PC board (Without terminal No.3) For PC board			Without boss				SPVQA20103	7
				Without boss				SPVQA20203	8

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	
1,200	4,800	540×360×270

Dimensions

Unit:mm

No.	Style	No.	Style
1		2	

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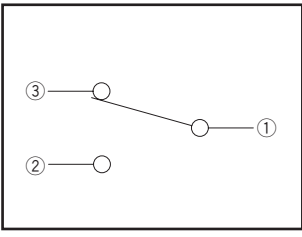
Fast Switching Type

Dimensions

Unit:mm

No.	Style	No.	Style
3	<p>Technical drawing of detector style 3. Dimensions include 15.2, 12.2, 6.4, 0.7, 3.5, 3.22, 11.48, 2-0.31, 0.8, 3.8, 3.6, 7.95, 4.1max, 0.4, 1.8, and $\phi 2$. Labels include 'Limit total travel position', 'Terminal No. ①-③ OFF starting position', 'Free position', 'The top of the plunger (Measurement position)', 'Terminal No. ③', 'Terminal No. ①', and 'Terminal No. ②'.</p>	6	<p>Technical drawing of detector style 6. Dimensions include 15.2, 12.2, 6.4, 0.7, 3.5, 3.22, 11.48, 2-0.31, 0.8, 3.8, 3.6, 7.95, 4.1max, 0.4, 1.8, and $\phi 2$. Labels include 'Limit total travel position', 'Terminal No. ①-② ON starting position', 'Terminal No. ①-③ OFF starting position', 'Free position', 'The top of the plunger (Measurement position)', 'Terminal No. ③', 'Terminal No. ②', and 'Terminal No. ①'.</p>
4	<p>Technical drawing of detector style 4. Dimensions include 15.2, 12.2, 6.4, 0.7, 3.5, 3.22, 11.48, 2-0.31, 0.8, 3.8, 3.6, 7.95, 4.1max, 0.4, 1.8, and $\phi 2$. Labels include 'Limit total travel position', 'Terminal No. ①-③ OFF starting position', 'Free position', 'The top of the plunger (Measurement position)', 'Terminal No. ③', 'Terminal No. ②', and 'Terminal No. ①'.</p>	7	<p>Technical drawing of detector style 7. Dimensions include 15.2, 12.2, 6.4, 0.7, 3.5, 3.22, 11.48, 2-0.31, 0.8, 3.8, 3.6, 7.95, 4.1max, 0.4, 1.8, and $\phi 2$. Labels include 'Limit total travel position', 'Terminal No. ①-② ON starting position', 'Free position', 'The top of the plunger (Measurement position)', 'Terminal No. ③', 'Terminal No. ①', and 'Terminal No. ②'.</p>
5	<p>Technical drawing of detector style 5. Dimensions include 15.2, 12.2, 6.4, 0.7, 3.5, 3.22, 11.48, 2-0.31, 0.8, 3.8, 3.6, 7.95, 4.1max, 0.4, 1.8, and $\phi 2$. Labels include 'Limit total travel position', 'Terminal No. ①-② ON starting position', 'Terminal No. ①-③ OFF starting position', 'Free position', 'The top of the plunger (Measurement position)', 'Terminal No. ③', 'Terminal No. ①', and 'Terminal No. ②'.</p>	8	<p>Technical drawing of detector style 8. Dimensions include 15.2, 12.2, 6.4, 0.7, 3.5, 3.22, 11.48, 2-0.31, 0.8, 3.8, 3.6, 7.95, 4.1max, 0.4, 1.8, and $\phi 2$. Labels include 'Limit total travel position', 'Terminal No. ①-② ON starting position', 'Terminal No. ①-③ OFF starting position', 'Free position', 'The top of the plunger (Measurement position)', 'Terminal No. ③', 'Terminal No. ①', and 'Terminal No. ②'.</p>

Circuit Diagram



Detector

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Water-proof
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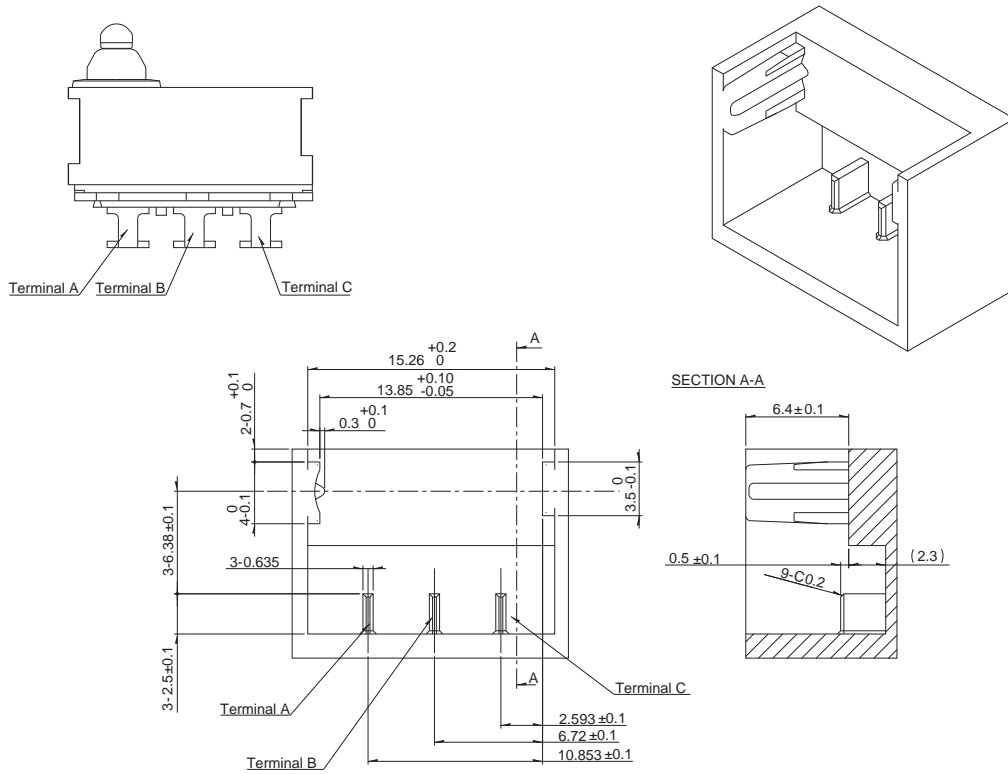
Fast Switching
Type


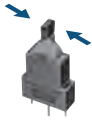






Reference Drawing for Unit Terminals

Unit:mm

Style

SPVQA10504



Series		Water-proof Type		Fast Switching Type		
		SPVQA	SSCN	SPVQ9	SPVQC	
Photo						
Operation type		Two-way				
Dimensions (mm)	W	15.2	13	15.4	15.4	
	D	6.4	5	8.4	7.4	
	H	7.95	15	7.5		
Operating temperature range		-40°C to +85°C				
Automotive use		●	●	●	●	
Life cycle (availability)						
Poles / Positions		1/1 1/2	1/2	2/2		
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.	100,000cycles 1Ω max.	300,000cycles 200mΩ max.	—	
	Operating life with load Rating (max.) (Resistive load)	300,000cycles 1Ω max.	100,000cycles 1Ω max.	300,000cycles 200mΩ max.		
Electrical performance	Initial contact resistance	500mΩ max.		75mΩ max.		
	Insulation resistance	100MΩ min. 500V DC			100MΩ min. 250V DC	
	Voltage proof	500V AC for 1minute			250V AC for 1minute	
Mechanical performance	Terminal strength	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		
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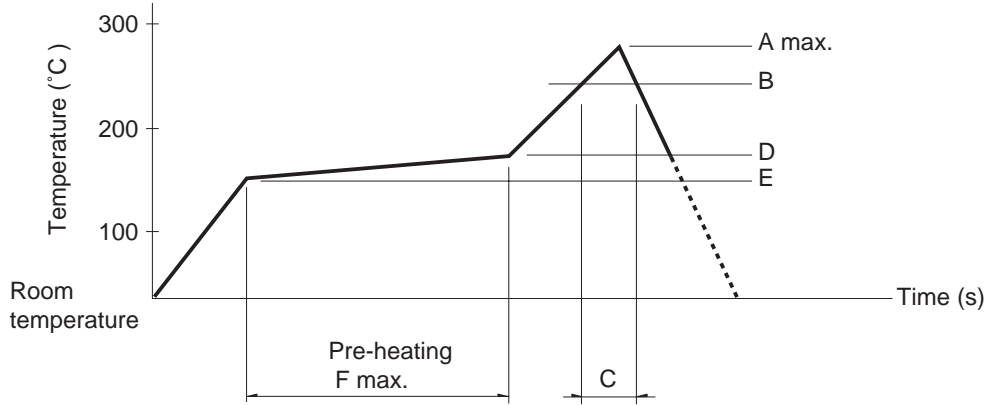
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Note
 ● Indicates applicability to all products in the series.

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
SPVE						
SPVL						
SPVM						
SPVN						
SPVR	260	230	40	180	150	120
SPVS						
SPVT						
SSCM	250	230	40	180	150	120
SSCQ						
SPVQC	250	230	40	180	150	120

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.
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, 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