

SPVQ1 Water-proof Type

Water-proof structure with 3mm long travel



Detector

Slide

Push

Rotary

Power

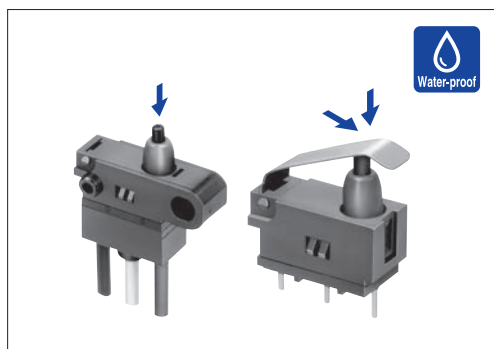
Dual-in-line
Package Type

General-
purpose Type

Water-proof
Type

Fast Switching
Type

Typical Specifications



Items		Specifications	
Rating (max.)/(min.) (Resistive load)		0.1A 12V DC / 50μA 3V DC	
Contact resistance (Initial / After operating life)		500mΩmax. / 1Ωmax.	
Operating force		Push type	Actuator type
		2N max.	5.9N max.
Operating life	Without load	300,000cycles	
	With load	300,000cycles (0.1A 12V DC)	

Product Line

Poles	Positions	Changeover 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	Normal	600	2,400	SPVQ140100	1
					Boss - right side			SPVQ140200	5
					Boss - left side			SPVQ140300	6
					Boss - both sides			SPVQ140400	7
			Actuator A		Normal			SPVQ130200	1
					Boss - right side			SPVQ130400	5
					Boss - left side			SPVQ130500	6
					Boss - both sides			SPVQ130600	7
			Actuator B		Normal			SPVQ130300	1
					Boss - right side			SPVQ130700	5
					Boss - left side			SPVQ130800	6
					Boss - both sides			SPVQ130900	7
			Push	With wire	With a screw hole	180	720	SPVQ120500※	2
					Boss - right side	100	400	SPVQ120600※	8
					Boss - left side			SPVQ120700※	9
					Boss - both sides			SPVQ120800※	10
			Actuator A		With a screw hole	180	720	SPVQ111200※	3
			Actuator B					SPVQ111700※	4

Notes

- ※ Products with a wire will be supplied as follows.
 - The length of lead wire is 250mm. For length modification, please contact us.
 - Product with wire will be build-to-order.
- This unit cannot be used in water (IP67 rating, except for terminal).

Packing Specifications

Tray

Product No.	Number of packages (pcs.)		Export package measurements (mm)
	1 case /Japan	1 case /export packing	
SPVQ130200, SPVQ130300, SPVQ130400, SPVQ130500, SPVQ130600, SPVQ130700, SPVQ130800, SPVQ130900, SPVQ140100, SPVQ140200, SPVQ140300, SPVQ140400	600	2,400	540×360×230

Bulk

Product No.	Number of packages (pcs.)		Export package measurements (mm)
	1 case /Japan	1 case /export packing	
SPVQ111200, SPVQ111700, SPVQ120500	180	720	555×375×223
SPVQ120600, SPVQ120700, SPVQ120800	100	400	540×360×230

Refer to P.73 for soldering conditions.

Dimensions

Unit:mm

No.	Style	Actuator configuration
1		Push Actuator A Actuator B
2		
3		

Detector

Slide

Push

Rotary

Power

Dual-in-line
Package Type

General-
purpose Type

Water-proof
Type

Fast Switching
Type

Unit:mm

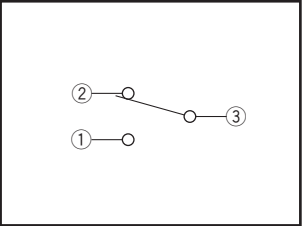
No.	Style	
4	Technical drawing of Style 4 actuator. The side view shows dimensions: 7.5, $\phi 1.6$, $\phi 3.3$, 3.5, 8.5, 2.9, 1.8, 11.6, 12.6, 0.7, 3.1, 6.2, 9, 10. Labels include "Free position", "ON starting position", "Total travel position", "Terminal No. ③", "Terminal No. ②", and "Terminal No. ①". The front view shows dimensions: 8.4, 5.8, 4, 2.3, and 2$\phi 0.3$.	
5	Technical drawing of Style 5 actuator. The side view shows dimensions: 5.8, 5, 3.5, 9.15, 8.45, 6.15, 3.5, 4.5, 2.6, 8, 5, 5, 10.4, 2.9, 0.4, 2.6, 0.4, 2.6, 7.5, $\phi 1.6$, 2.6, 0.4, 3.5, 6.15, 8.45, 9.15, 4.5, 2.6, 8, 5, 5, 10.4, 2.9. Labels include "Free position", "ON starting position", "Total travel position", "Terminal No. ①", "Terminal No. ②", and "Terminal No. ③". The front view shows dimensions: 5.8, 5, 3.5, and 0.4.	Actuator configuration Push Diagram of Push actuator configuration. Dimensions: 6.15, 8.45, 9.15. Labels: "Total travel position", "ON starting position".
6	Technical drawing of Style 6 actuator. The side view shows dimensions: 7.5, $\phi 1.6$, 2.6, 0.4, 2.6, 0.4, 3.5, 6.15, 8.45, 9.15, 4.5, 2.6, 8, 5, 5, 10.4, 2.9, 3-0.6, 8, 5, 5, 10.4, 2.9. Labels include "Total travel position", "ON starting position", "Free position", "Terminal No. ③", "Terminal No. ②", and "Terminal No. ①". The front view shows dimensions: 5.8, 5, 3.5, and 0.4.	Actuator A Diagram of Actuator A configuration. Dimensions: 7.2, 9.8, 10.5. Labels: "Total travel position", "ON starting position".
7	Technical drawing of Style 7 actuator. The side view shows dimensions: 8, 7.5, $\phi 1.6$, 2.6, 0.4, 2.6, 0.4, 3.5, 6.15, 8.45, 9.15, 4.5, 2.6, 8, 5, 5, 10.4, 2.9, 3-0.6, 8, 5, 5, 10.4, 2.9. Labels include "Total travel position", "ON starting position", "Free position", "Terminal No. ③", "Terminal No. ②", and "Terminal No. ①". The front view shows dimensions: 5.8, 5, 3.5, and 0.4.	Actuator B Diagram of Actuator B configuration. Dimensions: 6.2, 9, 10. Labels: "Total travel position", "ON starting position".

■ Dimensions

Unit:mm

No.	Style	Actuator configuration
0		Push
0		
10		

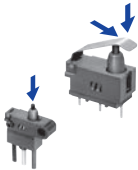
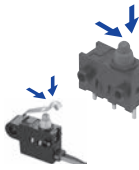
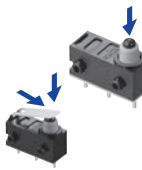
■ Circuit Diagram



Detector
Slide
Push
Rotary
Power
Dual-in-line Package Type
General- purpose Type
Water-proof Type
Fast Switching 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℃ to +85℃				
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 strenght 30N for1 minute	3N for 1minute	
	Actuator strength	20N				
Environmental performance	Cold	-40℃ 500h				
	Dry heat	85℃ 500h				
	Damp heat	60℃, 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
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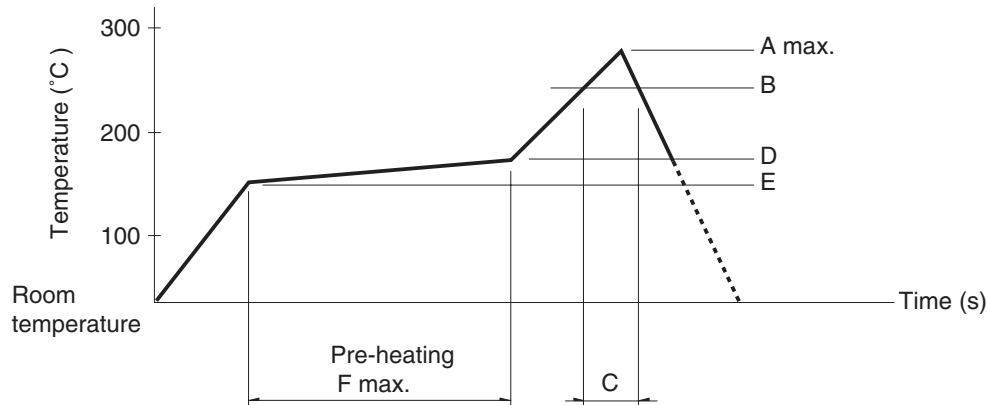
Note

● 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
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