

Water-proof Type Detector Switch

SPVQ3 Series

Clip-type contact structure with a stroke of 3mm for high reliability in the minute electric current range.



Car Use

Features

- The double-sided sliding contact structure of our original clip type ensures applications best suited for minute electrical reas while assuring greater contact reliability.
- The long 3mm stroke ensures superb usability.
- The water resistance conforms to IP67.
- The actuator can be operated vertically or at an angle.
- The operation life can correspond 1,000,000 cycles.
- Application can be developed to variants including those with lead wires and with an actuator.
- Free from mechanical operating noises, thus ensuring superb silent operation.

Applications

- Detection of in-car mechanical drives (door operations, trunk/back door operations, and shift lever positions)
- Detection of mechanical drives in home electric appliances to be used in surrounding wet areas

Typical Specifications

Items		Specifications	
Rating (max.) (Resistive load)		0.1A 12V DC	
Voltage drop (Initial performance/After lifetime)		0.2V max./0.3V max.	
Operating force		Push type	
		1±0.5N	
Operating life	Without load	Normal type 300,000 cycles	Long life type 1,000,000 cycles
	With load	300,000 cycles (0.1A 12V DC)	1,000,000 cycles (0.1A 12V DC)

Power

Push

Slide

Rotary

Encoders

Detector

Dual-in-line
Package Type

Multi Control
Devices

TACT

Custom-
Products

For other detailed specifications, see P.304

Dimensions

Unit:mm

No.	Style
1	<p>Technical drawing of Style 1 detector switch. Front view shows dimensions: 13mm width, 4mm height, 4.35mm terminal spacing, 0.9mm terminal offset, 2.3mm terminal width, 5mm terminal pitch, 3.3mm mounting hole offset, 6.1mm terminal offset, 6.4mm terminal offset, 8.4mm terminal offset, 8.7mm terminal offset, 9.1mm terminal offset, and $\phi 2.5$ terminal diameter. Labels include Terminal No. ①, Terminal No. ②, Terminal No. ③, Terminal No. ③-① ON starting point, Terminal No. ③-② OFF starting point, Free position, Operating force measurement position, Total travel position, and PC board mounting face.</p> <p>Side view shows a 5.8mm width and 0.5mm mounting height.</p>
2	<p>Technical drawing of Style 2 detector switch. Front view shows dimensions: 13mm width, 4mm height, 4.35mm terminal spacing, 7.45mm terminal offset, 1.5mm terminal offset, 1.2mm terminal offset, 2.2mm terminal offset, 2.3mm terminal width, 4.35mm terminal pitch, 6.1mm terminal offset, 6.4mm terminal offset, 8.4mm terminal offset, 8.7mm terminal offset, 9.1mm terminal offset, and $\phi 2.5$ terminal diameter. Labels include Terminal No. ①, Terminal No. ②, Terminal No. ③, Terminal No. ③-① ON starting point, Terminal No. ③-② OFF starting point, Free position, Operating force measurement position, Total travel position, and PC board mounting face.</p> <p>Side view shows a 5.8mm width and 0.5mm mounting height.</p>
3	<p>Technical drawing of Style 3 detector switch. Front view shows dimensions: 13mm width, 4mm height, 4.15mm terminal spacing, 0.9mm terminal offset, 2.3mm terminal width, 5mm terminal pitch, 6.1mm terminal offset, 6.4mm terminal offset, 8.4mm terminal offset, 8.7mm terminal offset, 9.1mm terminal offset, and $\phi 2.5$ terminal diameter. Labels include Terminal No. ①, Terminal No. ②, Terminal No. ③, Terminal No. ③-① ON starting point, Terminal No. ③-② OFF starting point, Free position, Operating force measurement position, Total travel position, and PC board mounting face.</p> <p>Side view shows a 5.8mm width, 6mm mounting height, 0.5mm mounting offset, and 2.6mm mounting offset.</p>
4	<p>Technical drawing of Style 4 detector switch. Front view shows dimensions: 13mm width, 4mm height, 4.15mm terminal spacing, 0.9mm terminal offset, 2.3mm terminal width, 5mm terminal pitch, 6.1mm terminal offset, 6.4mm terminal offset, 8.4mm terminal offset, 8.7mm terminal offset, 9.1mm terminal offset, and $\phi 2.5$ terminal diameter. Labels include Terminal No. ①, Terminal No. ②, Terminal No. ③, Terminal No. ③-① ON starting point, Terminal No. ③-② OFF starting point, Free position, Operating force measurement position, Total travel position, and PC board mounting face.</p> <p>Side view shows a 5.8mm width, 6mm mounting height, 0.5mm mounting offset, and 2.6mm mounting offset.</p>

Power

Push

Slide

Rotary

Encoders

Detector

Dual-in-line
Package Type

Multi Control
Devices

TACT

Custom-
Products

Dimensions

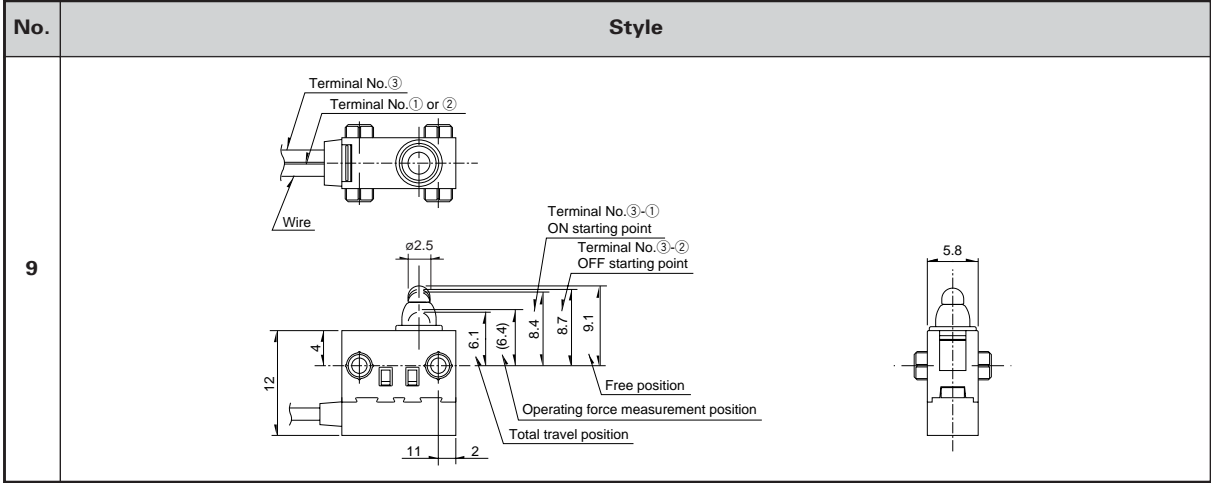
Unit:mm

- Power
- Push
- Slide
- Rotary
- Encoders
- Detector**
- Dual-in-line Package Type
- Multi Control Devices
- TACT
- Custom-Products

No.	Style	
5		
6		
7		
8		

Dimensions

Unit:mm



Power

Push

Slide

Rotary

Encoders

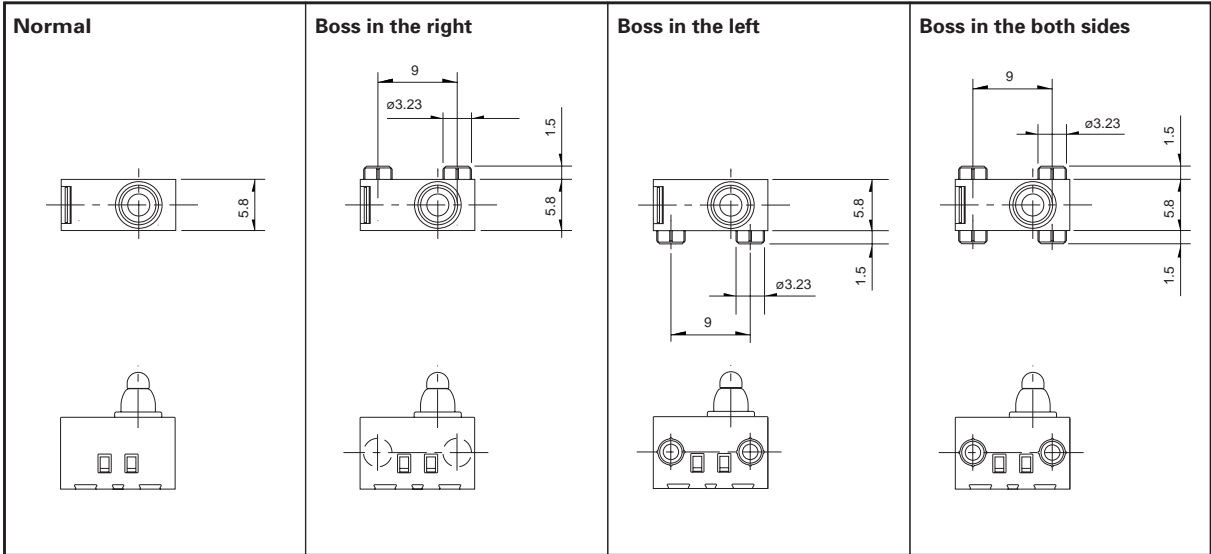
Detector

Dual-in-line
Package Type

Multi Control
Devices

Styles

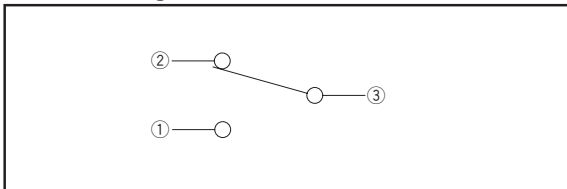
Unit:mm



TACT

Custom-
Products

Circuit Diagram



Products Specifications

Items		Series										
		SPVC1	SPVF	SSCU	SSCT	SSCF	SSCN	SPVQ1	SPVQ3	SPVQ4	SSCW	SREF
Power	Operating temperature range	-10°C to +60°C					-40°C to +85°C					-10°C to +60°C
	Rating (max.) (Resistive load)	10mA 16V DC	1mA 5V DC	0.1A 12V DC								1mA 5V DC
Push	Electrical performance	Initial contact resistance	1 Ω max.	500mΩ max.	70mΩ max.	20mΩ max.	100mΩ max.	500mΩ max.				1 Ω max.
Slide		Insulation resistance	100MΩ min. 100V DC		100MΩ min. 250V DC		100MΩ min. 100V DC	100MΩ min. 500V DC			100MΩ min. 250V DC	100MΩ min. 100V DC
Rotary		Voltage proof	100V AC for 1 min.		250V AC for 1 min.		100V AC for 1 min.	500V AC for 1 min.			250V AC for 1 min.	100V AC for 1 min.
Encoders	Mechanical performance	Robustness of terminal	3N for 1 min.	3N for 30 s	3N for 1 min.		5N for 1 min.	3N for 1 min.			—	
Detector		Robustness of actuator	10N	1N	5N	10N			20N		5N	
Dual-in-line Package Type		Vibration	10 to 55 to 10Hz/min., the amplitude is 1.5mm for all the frequencies, in the 3 direction of X, Y and Z for 2 hours respectively									
Multi Control Devices		Resistance to soldering heat	Manual soldering	350±10°C, 3 ⁺¹ ₋₀ s	300±10°C, 3 ⁺¹ ₋₀ s	350±5°C, 3s max.		350±10°C, 3 ⁺¹ ₋₀ s	300±10°C, 3 ⁺¹ ₋₀ s			—
TACT	Dip soldering		260±5°C, 3s max.	260±5°C, 5±1s	—	260±5°C, 5±1s		—	260±5°C, 5±1s		—	
Custom-Products	Reflow soldering		—									
Durability	Operating life without load	25,000 cycles 2Ω max.	100,000 cycles 1Ω max.	10,000 cycles 100mΩ max.	10,000 cycles 40mΩ max.	50,000 cycles 200mΩ max.	100,000 cycles 1Ω max.	300,000 cycles 1Ω max.	300,000 cycles or 1,000,000 cycles 1Ω max.	300,000 cycles 1Ω max.	100,000 cycles 1Ω max.	150,000 cycles 2Ω max.
	Operating life with load	(10mA 16V DC) 25,000 cycles 2Ω max.	(1mA 5V DC) 100,000 cycles 1Ω max.	(0.1A 12V DC) 10,000 cycles 150mΩ max.	(0.1A 12V DC) 10,000 cycles 60mΩ max.	(0.1A 12V DC) 50,000 cycles 300mΩ max.	(0.1A 12V DC) 100,000 cycles 1Ω max.	(0.1A 12V DC) 300,000 cycles 1Ω max.	(0.1A 12V DC) 300,000 cycles or 1,000,000 cycles 1Ω max.	(0.1A 12V DC) 300,000 cycles 1Ω max.	(0.1A 12V DC) 100,000 cycles 1Ω max.	(1mA 5V DC) 150,000 cycles 2Ω max.
Environmental performance	Cold	-20±2°C for 96h	-40±2°C for 96h	-20±2°C for 96h			-40±2°C for 500h					-20±2°C for 96h
	Dry heat	85±2°C for 96h					85±2°C for 500h					85±2°C for 96h
	Damp heat	40±2°C, 90 to 95%RH for 96h					60±2°C, 90 to 95%RH for 500h					40±2°C, 90 to 95%RH for 96h