

# Waterproof Power Switch (with Built-in Detector Switches)

SDKR Series

Our uni-body waterproof combination switch for AC (power supply) and DC (detector) power contributes to the cost-effective design.

Power
Push
Slide
Rotary
Encoders
Jog Shuttle
Telephone-hook
Detector
Vibration Sensors
Dual-in-line Package Type
Multi Control Devices
TACT
Push Type
Rocker Type
Slide Type



## Features

- Waterproof power switch. (Conform to IEC Standard IP67)
- One switch closure with built-in AC power switch and DC circuitry switch.
- Built-in DC switch enables the auto-power-off function using relay-integrated circuitry.
- Small-sized composite construction permits high density mounting on a printed circuit board.

## Applications

- A set with an auto-off function, requiring no standby power, for washing machines, tumble dryers, dishwashers, dehumidifiers, kerosene fan heaters, ect.

## Ratings and Safety Standards

Items	Specifications
AC Switch	1A 125V AC,0.5A 250V AC(Resistive load)
DC Switch	10mA 5V DC
Ratings satisfying local electrical appliance and material safety law	1A 125V AC

## Products Line

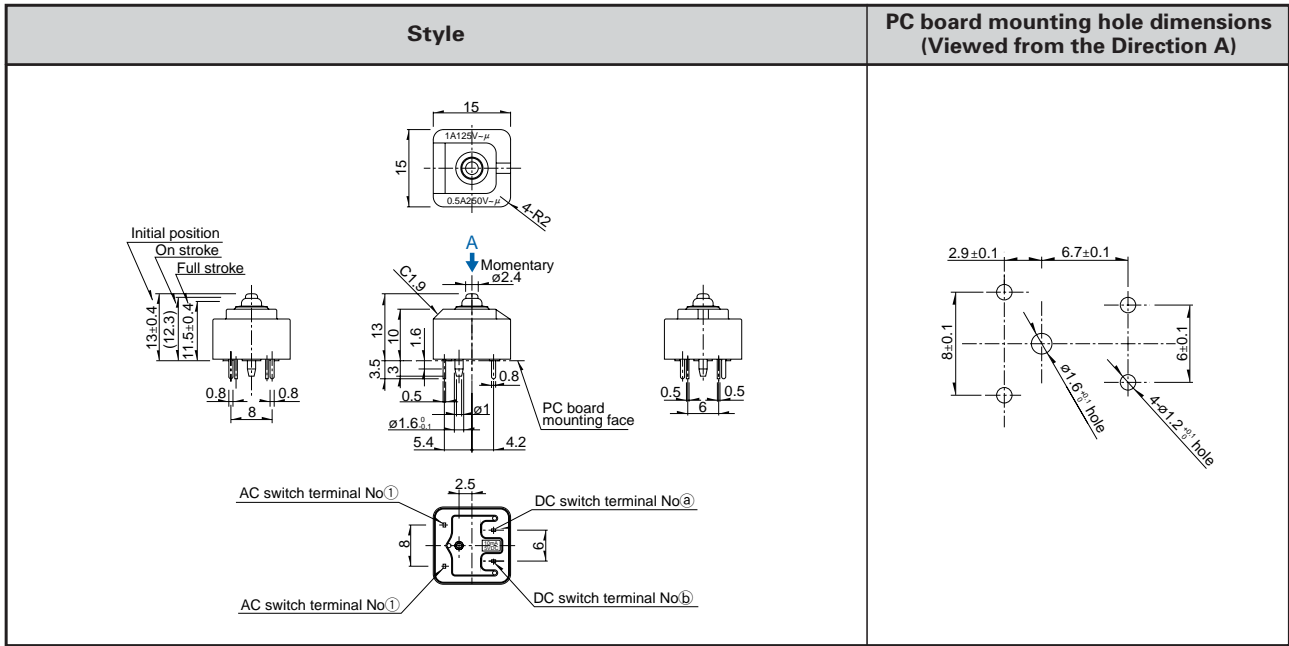
Circuit arrangement	Travel (mm)	Operating force	Terminal style	Minimum packing unit (pcs.)	Products No.
SPST	1.5	2.5±1.5N	PC board	150	SDKRA10100

## Notes

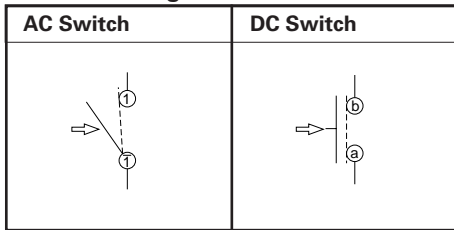
1. This product is not be used under water.
2. Depending on loading conditions, Nitrogen Oxide (NO<sub>x</sub>) and moisture may be generated due to ark occurring at opening and closure. Because of NO<sub>x</sub> and humid, nitric acid (HNO<sub>3</sub>) is generated, causing corrosion of metal inside switch as well as functional failure. Please use contact protection circuit (ark suppressing circuit) or design a unit circuit such as ark is reduced when circuit opens.

■ Dimensions

Unit : mm



■ Circuit Diagram (Viewed from the Direction A)



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## Products Specifications

Items	Type	Push												
	Series	SDDL	SDKL	SDKVB	SDDF SDDFD SDDFE	SDKEA	SDKVA	SDKVC	SDKVD	SDKN	SDKS	SDKQ	SDKR	
Power	Operating temperature range	-10°C to +60°C							-20°C to +60°C	-30°C to +60°C	-10°C to +60°C	-10°C to +85°C		
Push	Rating	TV-3	TV-5	TV-8	8A /128A 250V	TV-5	TV-8	0.25A 250V AC 0.5A 125V AC	2A 250V AC 4A 125V AC	3A 125V AC L	0.5A 250V AC 1A 125V AC			
Slide	Electrical performance	Contact resistance							100mΩ max.		50mΩ max.	100mΩ max.		
Rotary		Insulation resistance							500MΩ min. 500V DC		100MΩ min. 500V DC	500MΩ min. 500V DC		
Encoders		Voltage proof		1,000V AC for 1 min.	1,500V AC for 1 min.	2,000V AC for 1 min.	1,500V AC for 1 min.	1,000V AC for 1 min.	1,500V AC for 1 min.	1,000V AC for 1 min.				
Jog Shuttle	Mechanical performance	Robustness of terminal							10N for 1 min.	50N for 1 min.	70N for 1 min.	—	5N for 1 min.	
Telephone-hook		Robustness of actuator	Operating direction		100N			20N		100N				
Detector			Perpendicular direction		20N				30N		20N			
Vibration Sensors	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											
Dual-in-line Package Type	Solderability		230±5°C, 3±0.5s							—		230±5°C, 3±0.5s		
Multi Control Devices	Resistance to soldering heat	Manual soldering		350±10°C, 3±0.5s	360±10°C, 3±0.5s (SDDFD, SDDFE: 300±10°C, 3±0.5s)	300±10°C, 3±0.5s	350±10°C, 3±0.5s	—		300±10°C, 3±0.5s				
TACT		Dip soldering		260±5°C, 10±1s			260±5°C, 5±1s	260±5°C, 10±1s	—		260±5°C, 10±1s			
Push Type	Durability	Operating life			25,000 cycles	10,000 cycles	25,000 cycles	6,000 cycles	12,000 cycles	100,000 cycles	refer to individual product spec.			
Rocker Type		Load =as ratings												
Slide Type	Environmental performance	Cold							-20±2°C for 96h	-30±2°C for 96h	-40±2°C for 96h	-25±2°C for 240h	-20±2°C for 240h	
		Dry heat							85±2°C for 96h				85±2°C for 240h	
		Damp heat							40±2°C, 90 to 95%RH for 96h				40±2°C, 90 to 95%RH for 240h	60±2°C, 90 to 95%RH for 1000h

## Safety Standards

### 1. Safety Standards Outline

Safety standards are established by a country or an organization representing it to protect general users from electrical shock and fire hazards. It establishes standards for electrical devices and components. For electrical equipment manufacturers, utilizing switches that have been safety-approved ensures the safety of the switch. The use of a safety-approved switch also simplifies at least one part of the process of obtaining certification by safety testing.

### 2. Major Safety Standards

#### (1) Electrical Appliance and Material Safety Law

The conventional [Electrical Appliance and Material Control Law] has changed to [Electrical Appliance and Material Safety Law] and has been enforced since April 1, 2001. Electrical appliances are categorized into special electric appliances and parts (formerly Class A) and Electrical appliances other than the special electric appliances (formerly Class B). Special electric appliances are required to receive goodness of fit test at a certified test agency and to store the certificate. Also, penal provisions have been reinforced.

#### (2) UL (Underwriters Laboratories Inc.)

Underwriters Laboratories Inc. (UL) is the American safety approving organization. Its purpose is to ensure consumer safety and protect them from fire hazards. State law requires that equipment to be exported to the United States utilize UL approved power switches or power switches meeting UL standards and capable of passing UL tests.

#### (3) CSA (Canadian Standards Association)

Canadian Standards Association (CSA) is the Canadian safety testing association and tests electrical and other equipment to ensure the safety of individuals and prevent fire hazards. Provincial law requires that the power switches used in equipment for export to Canada be CSA approved or meet CSA standards.

#### (4) SEMKO (Svenska Elektriska Materielkontrollanstalten)

Svenska Elektriska Materielkontrollanstalten (SEMKO) is the Swedish safety testing organization. Its purpose is to prevent electrical shock and fires due to home electrical appliances. Nearly all electrical appliances sold in Sweden must be approved by SEMKO.

#### (5) BS (British Standard)

British Standard (BS) is the industrial and safety standards of Great Britain. It is made up of such organizations as the BSI and BEAB. It conducts investigations of electrical equipment for verification of safety. Electrical devices do not have to conform to this standard but those that do have a competitive advantage in the marketplace.

#### (6) VDE (Verband Deutscher Electrotechniker)

Verband Deutscher Electrotechniker (VDE) is the German safety testing organization. It is particularly concerned with preventing hazards to human life and fires. Approval is not mandatory but fines are levied against those companies whose unapproved products cause accidents. Therefore, in reality, conformity is a necessity.

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### 3. Standard Certification System

#### (1) CB Scheme

This is the international system to simplify the safety certification processes of each country for the purpose of using a safety test certificate (CB Scheme) based on the IEC standard issued by the certification test agency. This system can be used for the power switch to acquire the certificates of European countries and China because the IEC and EN standards conform.

#### (2) Mutual authentication system of the North American nations

A mutual authentication system is effective with the UL (in the U.S.A.) and CSA (in Canada) and the "C-UL-US" makes UL approved goods sellable in Canada, while the "NRTL/C" makes CSA approved goods sellable in the U.S.A.

### 4. Explanation of Safety Standard Terms

#### 1. Three insulation classes of the safety standards of IEC standards

Switches are classed according to their type of insulation.

##### (a) Switches for Class I Appliances

Switches for use with appliances utilizing power plugs with ground pins having a normal level of insulation.

##### (b) Switches for Class II Appliances

Switches for use with appliances having no ground pin and utilizing double or reinforced insulation.

#### 2. Micro-gap Construction

This construction is one of the classifications of switches under the IEC standard. Switches in this class have a contact gap of less than 3mm. These switches bear the  $\mu$  mark. In some case, use of Micro-gap switches may be limited in IEC standard. (Can not be utilized with outdoor electrical implements or computer equipment without power plugs.)

#### 3. Switches not covered in the Electrical Appliance and Material Safety Law

Switches with [structure specialized for building into machines] are precluded from the special electric appliances and parts, and are not required to undergo a goodness of fit test. However, the technology standard must satisfy no less than the special electric appliances and parts. The major reasons for preclusion from the Electrical Appliance and Material Safety Law are as follows: All of our power switches are precluded.

(1) All except for unipolar/single-throw, unipolar/double-throw, bipolar/single-throw.

(2) All with signal changing-over switch attached.

(3) All with lead, fasten, wire-wrapping and printed terminals.

(4) All without knobs and handles for manual operation.

#### 4. Approval type number

The approval type number means the type number on the safety standard described in the safety standard approval certificate or approval list. Therefore, the approval type number is different from the product number. There are cases where the approval type number varies with the acquired standard, rating, etc. even in the same series of products. When the set manufacturer applies for the set safety standard, the application must be made with the approval type number for the switch to be used.

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# Safety Standards

## 5. Meaning of the Marking of Power Switch Ratings

Safety standard name Classification of rating	Electrical appliance and material safety law	UL, CSA	IEC standard
For electronic appliances	All Alps power switches are not governed by the electrical appliance and material safety law.	<p><b>TV rating</b></p> <p>TV - 5</p> <p>Rated current</p> <p>Symbol on TV rating</p> <p>NOTE : When not indicated rated voltage is 120V AC</p> <p>SDKL, SDDF, etc</p>	<p><b>Rating for electronic appliances</b></p> <p>5A / 80A 250V ~</p> <p>Rated surge current</p> <p>Rated normal current</p> <p>Rated voltage</p> <p>Alternating current</p> <p>SDKL, SDDF, etc</p>
For general appliances		<p><b>Ampere rating</b></p> <p>AC 125V 5A</p> <p>Rated current</p> <p>Rated voltage</p> <p>Alternating current</p> <p>SDDJE, etc</p>	<p><b>Rating for resistive appliance</b></p> <p>5A / 250V ~</p> <p>Rated current</p> <p>Rated voltage</p> <p>Alternating current</p>
For motors		<p><b>Horsepower rating</b></p> <p>AC 125V 1/2 HP</p> <p>Output of applicable motor</p> <p>Rated voltage</p> <p>Alternating current</p>	<p><b>Rating for resistance and motor load</b></p> <p>3 (2) / 250 ~</p> <p>Rated current under resistive load</p> <p>Rated current of applicable motor</p> <p>Rating voltage</p> <p>Alternating current</p>

**Power switches for electronic appliances:** Mainly power switches for electronic appliances such as TV sets, radios and amplifiers. However, if the voltage and current levels are below the ratings, they may be used in other electric appliances.

**Power switches for general appliances:** These switches are for use in appliances other than electronic appliances or motor appliances that have current surges. However, if the rating of the switch is  $1/\sqrt{2}$  or above the surge current of the circuit and meets construction requirements, it may be used in other devices.

**Power switches for motor appliances:** Mainly for appliances that are motor driven, such as copiers, vacuum cleaners, etc.

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