

# General Specifications

## Electrical Capacity (Resistive Load)

**Logic Level:** 0.4VA maximum @ 28V AC/DC maximum  
(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)  
Note: Find additional explanation of operating range in Supplement section.

## Other Ratings

**Contact Resistance:** 50 milliohms maximum  
**Insulation Resistance:** 500 megohms minimum @ 500V DC  
**Dielectric Strength:** 500V AC minimum between contacts for 1 minute minimum;  
500V AC minimum between contacts & case for 1 minute minimum  
**Mechanical Life:** 100,000 operations minimum for On-None-On & On-Off-On  
50,000 operations minimum for other circuits  
**Electrical Life:** 50,000 operations minimum  
**Nominal Operating Force:** 1.47N (momentary); 1.18N (maintained) for .394" (10.0mm) toggles  
2.73N (momentary); 1.84N (maintained) for all other toggles  
**Contact Timing:** Nonshorting (break-before-make)  
**Angle of Throw:** 26°

## Materials & Finishes

**Toggle:** Glass fiber reinforced polyamide for antistatic; nickel plated brass for all others  
**Case Housing:** Glass fiber reinforced polyamide  
**Support Bracket:** Tin plated phosphor bronze  
**Movable Contact:** Phosphor bronze with gold plating  
**Stationary Contacts:** Brass with gold plating  
**Terminals:** Brass with gold plating

## Environmental Data

**Operating Temperature Range:** -30°C through +85°C (-22°F through +185°F)  
**Humidity:** 90 ~ 95% humidity for 240 hours @ 40°C (104°F)  
**Vibration:** 10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 2 hours  
**Shock:** 50G (490m/s<sup>2</sup>) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

## PCB Processing

**Soldering:** Wave Soldering Recommended. See Profile A in Supplement section.  
Manual Soldering: See Profile B in Supplement section.  
**Cleaning:** Automated cleaning. See Cleaning Specifications in Supplement section.

## Standards & Certifications

The A Series toggles have not been tested for UL recognition or CSA certification. These switches are designed for use in a low-voltage, low-current, logic-level circuit. When used as intended in a logic-level circuit, the results do not produce hazardous energy.

# Distinctive Characteristics

Subminiature size saves space on PC boards.

Specifically developed for logic-level applications.

Totally sealed body construction prevents contact contamination and allows time- and money-saving automated soldering and cleaning.

Award-winning STC contact mechanism with benefits unavailable in conventional mechanisms: smoother, positive detent actuation, increased contact stability and unparalleled logic-level reliability. (Additional STC details in Terms & Acronyms; see Supplement contents.)

Molded-in, epoxy sealed or ultrasonically welded terminals lock out flux, solvents, and other contaminants.

.100" x .100" (2.54mm x 2.54mm) terminal spacing conforms to standard PC board grid spacing.

Toggle option in antistatic material available for dissipating electrostatic discharges.

Matching indicators available.



Actual Size



A  
Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

Supplement

### TYPICAL SWITCH ORDERING EXAMPLE



### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

#### A12JV



## POLES & CIRCUITS

Pole	Model	Toggle Position ( ) = Momentary			Connected Terminals			Throw & Schematics
		Up 	Center 	Down 	Up 	Center 	Down 	
SP	A11	OFF	NONE	ON	OPEN	OPEN	3-1	SPST 
SP	A12 A13 A15 A1R A18 A19 A1S	ON ON ON (ON) (ON) ON (ON)	NONE OFF NONE NONE OFF OFF OFF	ON ON (ON) ON (ON) (ON) ON	2-3	OPEN	2-1	SPDT 
DP	A22 A23 A25 A2R A28 A29 A2S	ON ON ON (ON) (ON) ON (ON)	NONE OFF NONE NONE OFF OFF OFF	ON ON (ON) ON (ON) (ON) ON	2-3 5-6	OPEN	2-1 5-4	DPDT 

Note: Terminal numbers are not actually on the switch.

### For 3 Throw (3-on)

Connected Terminals & Schematics					External Connection
Pole	Model	Up	Center	Down	
SP	A24 A26 A27	ON (ON) ON	ON ON ON	ON (ON) (ON)	<p>The SP3T model utilizes a double pole base.</p> <p>External connections must be made during field installation.</p> 
					

## TOGGLES

Standard Material & Finish: Brass with Bright Nickel    Material & Finish for J2: Matte finish black glass fiber reinforced polyamide

**A** .394" (10.0mm) Bat



**J** .248" (6.3mm) Bat



**J2** .248" (6.3mm) Antistatic Bat

Dissipating 20Kv ESD: Straight PC  
Dissipating 10Kv ESD: Straight PC with Bracket, Right Angle, & Vertical



**E** .394" (10.0mm) Flatted



**H** .248" (6.3mm) Flatted



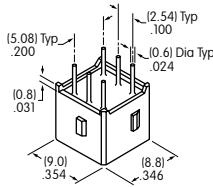
**K** Snap Top for Paddles



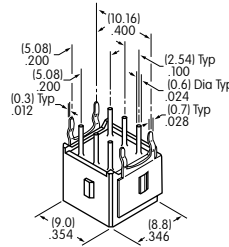
## PC TERMINALS

Use of a support bracket is recommended to increase PCB mounting strength and stability.

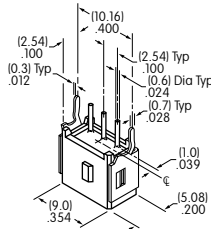
**P** Straight



**B** Straight with Bracket



**B1** Straight with Inline Bracket Single Pole only



**H** Right Angle with Bracket



**V** Vertical with Bracket



**V1** Vertical with Inline Bracket Single Pole only



## CAPS & PADDLES

**G** AT4003  
.394" (10.0mm) Bat Lever Cap

Material: PVC  
Colors Available:  
A, B, C



**J** AT4064  
.248" (6.3mm) Bat Lever Cap

Material: PVC  
Colors Available:  
A, B, C



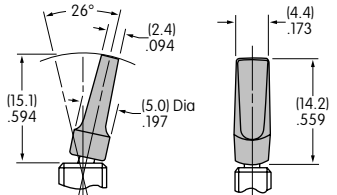
**A** AT467  
Short Paddle

Material: Polyamide  
Colors Available:  
A, B, C, E, F, G, H



**B** AT468  
Long Paddle

Material: Polyamide  
Colors Available:  
A, B, C, E, F, G, H



### Color Codes:

- A** Black
- B** White
- C** Red
- E** Yellow
- F** Green
- G** Blue
- H** Gray

## TYPICAL SWITCH DIMENSIONS

### Single Pole



### Straight PC



A11 models do not have Terminal 2

**A12AP**

### Double Pole



### Straight PC



**A22AP**

### Single Pole



### Straight PC • Bracket

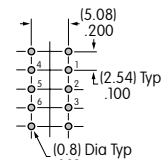
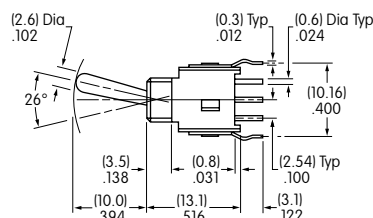


B Terminals

B1 Terminals

**A12AB**

### Double Pole



### Straight PC • Bracket



**A22AB**

## TYPICAL SWITCH DIMENSIONS

Toggles  
A

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

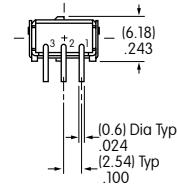
Indicators

Accessories

Supplement

### Right Angle PC

### Single Pole



A12AH

### Right Angle PC

### Double Pole



A22AH

### Vertical PC

### Single Pole



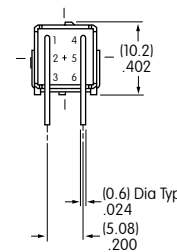
A12AV

V Terminals

V1 Terminals

### Vertical PC

### Double Pole



A22AV

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## NKK Switches:

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[A12KV-AA](#) [A13AB1-GA](#) [A22AW-GA](#) [A11JV1-RO](#) [A11JW](#) [A12EB-RO](#) [A12EH-RO](#) [A12EV-RO](#) [A12HB-RO](#) [A12HH-](#)  
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[A18KH-AB-RO](#) [A18KV1-AG-RO](#) [A19JH-RO](#) [A1RAV](#) [A1SJV](#) [A22AW](#) [A22EW](#) [A22HB-RO](#) [A22HW](#) [A22JW](#) [A22KB-](#)  
[BB-RO](#) [A23EV](#) [A23EW](#) [A23JH-RO](#) [A23JV-RO](#) [A23JW](#) [A24AH](#) [A24HB-RO](#) [A24HW](#) [A24JW](#) [A24KB](#) [A25AP](#)  
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[A18JV1-JC](#) [A18JV1](#) [A18KV1-BF](#) [A18EV1](#) [A12AB-RO](#) [A13JV-RO](#) [A18EH-RO](#) [A12JH-RO](#) [A24JH-RO](#) [A13AV1-RO](#)  
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