Series B

Process Sealed Subminiature Antistatic Toggles

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 for 1 minute minimum
  - 100,000 operations minimum for On-None-On & On-Off-On
  - 50,000 operations minimum for other circuits
  - 50,000 operations minimum for locking lever models
- **Mechanical Life:**
  - 100,000 operations minimum for On-None-On & On-Off-On
  - 50,000 operations minimum for other circuits
  - 50,000 operations minimum for locking lever models
- **Electrical Life:** 50,000 operations minimum
- **Nominal Operating Force:**
  - Toggles A, A1 & E: 1.47N (momentary); 1.18N (maintained)
  - Toggles J & H: 2.72N (momentary); 1.84N (maintained)
  - Toggle L: 0.59N
- **Contact Timing:** Nonshorting (break-before-make)
- **Angle of Throw:** 26°

Materials & Finishes

- **Toggle:** Nickel plated brass
- **Bushing:** Carbon blended polyamide; nickel plated zinc alloy for locking levers & threaded bushing
- **Gasket:** Nitrile butadiene rubber
- **Case Housing:** Glass fiber reinforced polyamide
- **Support Bracket:** Tin plated phosphor bronze
- **Movable Contact:** Phosphor bronze with gold plating
- **Stationary Contacts:** Copper alloy with gold plating
- **Terminals:** Copper alloy with gold plating

Environmental Data

- **Operating Temperature Range:** ~30°C through +85°C (~22°F through +185°F)
- **Humidity:** 90 ~ 95% humidity for 96 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/s²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

Installation

- **Mounting Torque:** .30 ~ .45Nm (2.65 ~ 3.98 lb•in) for A1 actuator with threaded bushing only

PCB Processing

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

Standards & Certifications

- **Flammability Standards:** UL94V-0 available
- **The B 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.

Antistatic superstructure, consisting of the carbon impregnated bushing and the support bracket, prevents static discharge to the contacts. Static electricity from an operator’s touch travels from actuator through the bushing and bracket to the PC board.

Locking lever mechanism offered as a toggle option.

Optional threaded, 6mm diameter bushing for panel seal mounting meets IP65 of IEC 60529 specifications (similar to NEMA 4 and 13).

Totally sealed body construction prevents contact contamination and allows time- and money-saving soldering and cleaning. Epoxy sealed terminals lock out flux and other contaminants.

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 section.)

.100” x .100” (2.54mm x 2.54mm) terminal spacing conforms to standard PC board grid spacing.
# Series B

## Process Sealed Subminiature Antistatic Toggles

### TYPICAL SWITCH ORDERING EXAMPLE

<table>
<thead>
<tr>
<th>Poles</th>
<th>Toggles</th>
<th>Optional Caps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SPDT</td>
<td>A .394&quot; (10.0mm) Bat</td>
<td>G .394&quot; (10.0mm) Bat Lever Cap</td>
</tr>
<tr>
<td>2 DPDT</td>
<td>A1 .315&quot; (8.0mm) Bat with Panel Seal Threaded Bushing (Straight PC only)</td>
<td>J .248&quot; (6.3mm) Bat Lever Cap</td>
</tr>
<tr>
<td></td>
<td>J .248&quot; (6.3mm) Bat</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E .394&quot; (10.0mm) Flatted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>H .248&quot; (6.3mm) Flatted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L Locking Lever (with Circuits 2 &amp; 3 only)</td>
<td></td>
</tr>
</tbody>
</table>

### Circuits

<table>
<thead>
<tr>
<th>2</th>
<th>ON</th>
<th>NONE</th>
<th>ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>5</td>
<td>ON</td>
<td>NONE</td>
<td>(ON)</td>
</tr>
<tr>
<td>*R</td>
<td>(ON)</td>
<td>NONE</td>
<td>ON</td>
</tr>
</tbody>
</table>

### PC Terminals

<table>
<thead>
<tr>
<th>P</th>
<th>Straight</th>
</tr>
</thead>
<tbody>
<tr>
<td>*B</td>
<td>Straight with Bracket</td>
</tr>
<tr>
<td>*H</td>
<td>Right Angle with Bracket</td>
</tr>
<tr>
<td>*V</td>
<td>Vertical with Bracket</td>
</tr>
</tbody>
</table>

### Cap Colors

- A Black
- B White
- C Red

### Description for Typical Ordering Example

**B12AB**

- .394" (10.0mm) Bat Toggle
- Straight PC Terminals with Bracket
- SPDT ON-NONE-ON Circuit

*Reverse circuits R & S available with right angle & vertical only

*Bracketed models are ESD protected*
## Process Sealed Subminiature Antistatic Toggles

### Series B

#### POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Toggle Position</th>
<th>Connected Terminals</th>
<th>Throw &amp; Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>B12</td>
<td>ON</td>
<td>ON</td>
<td>2-3 OPEN 2-1 SPDT</td>
</tr>
<tr>
<td></td>
<td>B13</td>
<td>ON</td>
<td>OFF (ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B15</td>
<td>(ON)</td>
<td>NONE (ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B1R</td>
<td>(ON)</td>
<td>NONE (ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B18</td>
<td>(ON)</td>
<td>OFF (ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B19</td>
<td>(ON)</td>
<td>OFF (ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B1S</td>
<td>(ON)</td>
<td>OFF (ON)</td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td>B22</td>
<td>ON</td>
<td>ON</td>
<td>2-3 5-6 OPEN 2-1 5-4 DPDT</td>
</tr>
<tr>
<td></td>
<td>B23</td>
<td>ON</td>
<td>OFF (ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B25</td>
<td>(ON)</td>
<td>NONE (ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B2R</td>
<td>(ON)</td>
<td>NONE (ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B28</td>
<td>(ON)</td>
<td>OFF (ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B29</td>
<td>(ON)</td>
<td>OFF (ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B2S</td>
<td>(ON)</td>
<td>OFF (ON)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

#### TOGGLES

Standard Material & Finish: Brass with Bright Nickel

- **A** .394” (10.0mm) Bat
- **A1** .315” (8.0mm) Bat with Panel Seal Threaded Bushing
- **J** .248” (6.3mm) Bat

- **E** .394” (10.0mm) Flatted
- **H** .248” (6.3mm) Flatted
- **L** Locking Lever

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PC TERMINALS

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

P  Straight

B  Straight with Bracket

H  Right Angle with Bracket

V  Vertical with Bracket

OPTIONAL CAPS

G  AT4003 .394” (10.0mm) Bat Lever Cap

J  AT4064 .248” (6.3mm) Bat Lever Cap

Material: PVC
Colors Available: A, B, C

Color Codes:

A  Black  B  White  C  Red
TYPICAL SWITCH DIMENSIONS

Single Pole

Straight PC

Double Pole

Straight PC

Single Pole

Straight PC • Bracket

Double Pole

Straight PC • Bracket

Single Pole

Right Angle PC
**TYPICAL SWITCH DIMENSIONS**

Panel Seal • Single Pole  
Threaded Bushing • Straight PC

Panel Seal • Double Pole  
Threaded Bushing • Straight PC

**STANDARD HARDWARE & PANEL CUTOUT**

**AT513M**  
**Metric Hex Nut**

- Material: Brass, Nickel plated

**AT063**  
**Gasket**

- Material: Nitrile butadiene rubber

- Maximum Panel Thickness with Standard Hardware: .087” (2.2mm)