AB Series ........................................ C6
0.4VA Logic Level; Process Sealed
Straight, Right Angle, & Vertical PC

BB Series ....................................... C12
Antistatic; 0.4VA Logic Level; Process Sealed
Straight, Right Angle, & Vertical PC

DB Series ....................................... C18
0.4VA Logic Level
Threaded Bushing with Straight PC
Smooth Bushing with Straight, Right Angle, & Vertical PC

EB Series ...................................... C24
3A Power Level & 0.4VA Logic Level
Solder Lug & Straight PC
Bushing Mount

EB Series ...................................... C30
3A Power Level
Solder Lug & Straight PC
Snap-in Mount

FB Series ...................................... C38
500mA Power Level & 0.4VA Logic Level
PC Turret
Bushing Mount
GB Series ........................................  C44
0.4VA Logic Level; Process Sealed
Straight, Right Angle, & Vertical PC

GB2 Series .......................................  C48
0.4VA Logic Level
Straight & Right Angle PC

G3B Series .......................................  C52
0.4VA Logic Level; Process Sealed
Gull Wing Terminals
Upright & Right Angle Mount

JP Series .........................................  C58
10A or 16A Power Level
Solder Lug
Snap-in Mount

M2B Series .......................................  C64
1A Power Level & 0.4VA Logic Level
Process Sealed
Straight, Right Angle, & Vertical PC

MB2000 Series .................................  C72
6A Power Level & 0.4VA Logic Level
Solder Lug, Quick Connect, Straight PC, & Wirewrap
Bushing Mount
MB2000 Series .................... C80
6A Power Level & 0.4VA Logic Level
Straight, Right Angle, & Vertical PC
PCB Mount

MB2000 Series .................... C87
6A Power Level & 0.4VA Logic Level
Solder Lug, Quick Connect, Straight PC, & Wirewrap
Large Bushing (12mm)

MB2400 Series .................... C96
3A Power Level & 0.4VA Logic Level
Solder Lug, Straight PC, & Wirewrap
Bushing Mount

MB2400 Series .................... C102
3A Power Level & 0.4VA Logic Level
Straight, Right Angle, & Vertical PC
PCB Mount

MB2400 Series .................... C108
3A Power Level & 0.4VA Logic Level
Solder Lug, Straight PC, & Wirewrap
Snap-in Mount

MB2500 Series .................... C116
3A Power Level & 0.4VA Logic Level
Solder Lug & Straight PC
Bushing Mount
MB2500 Series ..................... C121
3A Power Level & 0.4VA Logic Level
Solder Lug & Straight PC
PCB Mount

MB2500 Series ..................... C124
3A Power Level & 0.4VA Logic Level
Solder Lug
Snap-in Mount

SB Series ............................ C128
3A to 15A Power Level
Solder Lug & Screw Lug
Bushing Mount

SB4011 Series ...................... C38
3A Power Level
Solder Lug
Bushing Mount

SCB Series ........................... C131
15A & 1/2 HP Power Level
Quick Connect
Bushing Mount

WB Series ............................ C134
Environmentally Sealed
6A Power Level
Solder Lug, Screw Lug, & Wire Lead
Bushing Mount
### 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  
- **Mechanical Life:** 50,000 operations minimum  
- **Electrical Life:** 50,000 operations minimum  
- **Nominal Operating Force:** 2.55N  
- **Contact Timing:** Nonshorting (break-before-make)  
- **Travel:** Pretravel .028” (0.7mm); Overtravel .016” (0.4mm); Total Travel .043” (1.1mm)

#### Materials & Finishes
- **Plunger:** Polyacetal  
- **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 Temp 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
- **Cap Installation Force:** 49.03N (11.2 lbf) maximum downward force on actuator

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

#### Standards & Certifications
The AB Series pushbuttons 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 (1/3 size of Series M switches) 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 section.)

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.

Matching indicators available.
TYPICAL SWITCH ORDERING EXAMPLE

AB 2 5 A P — H A

Poles
1 SPST SPDT
2 DPDT

Circuits
1 OFF (ON)
5 ON (ON)
( ) = Momentary

PC Terminals
P Straight
B Straight with Bracket
B1 Straight with Inline Bracket (SP only)
H Right Angle with Bracket
V Vertical with Bracket
V1 Vertical with Inline Bracket (SP only)

Poles
1 SPST
2 SPDT

Circuits
1 OFF (ON)
5 ON (ON)

Plungers
A .213” (5.4mm) Long
*B .183” (4.65mm) Long
*C .080” (2.03mm) Long
(cannot be used with cap)

Caps
F .201” (5.1mm) Diameter
H .295” (7.5mm) Diameter

Cap Colors
A Black
B White
C Red

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE
AB25AP-HA

.213” (5.4mm) Long White Plunger
Black .295” (7.5mm) Diameter Cap
DPDT
ON-(ON) Circuit

Straight PC Terminals
Process Sealed Subminiature Pushbuttons

POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Plunger Position ( ) = Momentary</th>
<th>Connected Terminals</th>
<th>Throw &amp; Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>AB11</td>
<td>Normal</td>
<td>Normal</td>
<td>SPST</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ON)</td>
<td>OPEN</td>
<td>INTERNAL</td>
</tr>
<tr>
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<td>3-1</td>
<td>CONNECTION</td>
</tr>
<tr>
<td>SP</td>
<td>AB15</td>
<td>ON</td>
<td>(ON)</td>
<td>SPDT</td>
</tr>
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<td></td>
<td>2-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-1</td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td>AB25</td>
<td>ON</td>
<td>(ON)</td>
<td>DPDT</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>2-3 5-6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-1 5-4</td>
<td></td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

PLUNGERS

- **A** .213” (5.4mm) Long
- **B** .183” (4.6mm) Long (on SP only)
- **C** .080” (2.03mm) Long (on SP only)

Standard Plunger Color: White  Contact factory for red or black options.

PC TERMINALS

- **P** Straight
- **B** Straight with Bracket
- **H** Right Angle with Bracket
- **V** Vertical with Bracket

Use of a support bracket is recommended to increase PCB mounting strength and stability. B1 & V1 terminal dimensions appear on the pushbutton drawings which follow.

SLIP-ON CAPS

- **F** AT475 .201” (5.1mm) Diameter Cap
- **H** AT496 .295” (7.5mm) Diameter Cap

Material: Polyamide
For use with plungers A & B only.

Colors Available: **A** Black  **B** White  **C** Red
TYPICAL SWITCH DIMENSIONS

Single Pole (Double Throw)

Right Angle PC

AB15AH-FA

Double Pole

Right Angle PC

AB25AH-FA

Single Pole

Vertical PC • Inline Bracket

AB11 model does not have terminal 2.

AB11AV1-FA

Single Pole

Vertical PC

AB11 model does not have terminal 2.

AB15AV-FA

Double Pole

Vertical PC

AB25AV-FA

www.nkkswitches.com
**Series BB**  
Process Sealed Subminiature Antistatic Pushbuttons

## 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
- **Mechanical Life:** 50,000 operations minimum (momentary)  
25,000 operations minimum (alternate action)
- **Electrical Life:** 50,000 operations minimum (momentary)  
25,000 operations minimum (alternate action)
- **Nominal Operating Force:** 2.55N (momentary); 2.94N (alternate action)
- **Contact Timing:** Nonshorting
- **Travel:**  
  - Momentary: Pretravel .028” (0.7mm); Overtravel .016” (0.4mm); Total Travel .043” (1.1mm)
  - Alternate: Pretravel .039” (1.0mm); Overtravel .039” (1.0mm); Total Travel .079” (2.0mm)

### Materials & Finishes

- **Plunger:** Polyacetal
- **Bushing:** Carbon blended polyamide
- **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 Temp 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

- **Cap Installation Force:** 49.03N (11.2 lbf) maximum downward force on actuator; actuator must be in UP position to remove cap from alternate action models

### PCB Processing

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

### Standards & Certifications

- **Flammability Standards:** UL94V-0 available
  The BB Series pushbuttons 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 (1/3 size of Series M switches) saves space on PC boards.

Specifically developed for logic-level applications.

Available in momentary and maintained circuits.

Industry’s smallest alternate action (maintained) pushbutton with latchdown feature providing visible, audible, and tactile feedback.

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 the actuator through the bushing and bracket to the PC board.

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.)

Smooth, 6mm diameter bushing simplifies panel layout.

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

.100” x .100” (2.54mm x 2.54mm) terminal spacing conforms to standard PC board grids.
Series BB
Process Sealed Subminiature Antistatic Pushbuttons

TYPICAL SWITCH ORDERING EXAMPLE

BB 1 5 A H — F A

Poles
1 SPDT
2 DPDT

Circuits
5 ON (ON)
( ) Momentary
6 ON ON

Alternate Action has Latchdown.
BB16 has a Double Pole case.

Plunger
A .213” (5.4mm) Long

Caps
F .201” (5.1mm) Diameter
H .295” (7.5mm) Diameter

Cap Colors
A Black
B White
C Red

PC Terminals
P Straight
*B Straight with Bracket
*H Right Angle with Bracket
*V Vertical with Bracket
W Straight Long
*Bracketed models are ESD protected

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE
BB15AH-FA

Black .201” (5.1mm) Diameter Cap
.SPDT ON-(ON) Circuit
Right Angle PC Terminals
 .213” (5.4mm) Long White Plunger
Process Sealed Subminiature Antistatic Pushbuttons

Series BB

POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Connected Terminals</th>
<th>Throw &amp; Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>BB15</td>
<td>2-3</td>
<td>SPDT</td>
</tr>
<tr>
<td></td>
<td>BB16</td>
<td>2-1</td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td>BB25</td>
<td>2-3 5-6</td>
<td>DPDT</td>
</tr>
<tr>
<td></td>
<td>BB26</td>
<td>2-1 5-4</td>
<td></td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

PLUNGERS

A

.213” (5.4mm) Long

Standard Plunger Color: White

Contact factory for other colors and lengths.

PC TERMINALS

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

Both single pole and double pole alternate action models have double pole bases.

See Typical Switch Dimensions for details.

SLIP-ON CAPS

F

AT475

.201” (5.1mm) Diameter Cap

Material: Polyamide

Colors Available: A Black  B White  C Red

H

AT496

.295” (7.5mm) Diameter Cap

Material: Polyamide
**Series BB**

*Process Sealed Subminiature Antistatic Pushbuttons*

**TYPICAL SWITCH DIMENSIONS**

### Straight PC

**BB15AP-FA**

### Single Pole

### Straight PC

**BB25AP-FA**

### Double Pole

**BB16AP**

### Momentary & Alternate

### Alternate

### Straight PC • Bracket

**BB15AB-FA**

### Single Pole

### Straight PC • Bracket

**BB25AB-FA**

### Double Pole

**BB16AB**

### Momentary & Alternate

### Alternate
**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:** 1,000 megohms minimum @ 500V DC
- **Dielectric Strength:** 1,000V AC minimum between contacts for 1 minute minimum; 1,500V AC minimum between contacts & case for 1 minute minimum
- **Mechanical Life:** 200,000 operations minimum
- **Electrical Life:** 100,000 operations minimum
- **Nominal Operating Force:**
  - Single Pole: 1.96N
  - Double Pole: 2.94N
- **Travel:** Pretravel .020" (0.5mm); Overtravel .020" (0.5mm); Total Travel .039" (1.0mm)

**Materials & Finishes**
- **Plunger:** Brass with nickel plating
- **Bushing:** Brass with nickel plating
- **Frame:** Stainless steel
- **Case:** Glass fiber reinforced polyamide
- **Movable Contacts:** Copper with gold plating
- **Stationary Contacts:** Phosphor bronze with gold plating
- **Terminals:** Brass with gold plating

**Environmental Data**
- **Operating Temp Range:** –10°C through +70°C (+14°F through +158°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:** 1.47Nm (13.0 lb-in) for double nut; 0.68Nm (6.0 lb-in) for single nut
- **Cap Installation Force:** 78.5N (17.65 lbf) maximum downward force on actuator

**PCB Processing**
- **Soldering:** Wave Soldering Recommended. See Profile A in Supplement section.
- **Cleaning:** These devices are not process sealed. Hand clean locally using alcohol based solution.

**Standards & Certifications**

The DB Series pushbuttons have not been tested for UL recognition or CSA certification. These switches are designed for use in 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

Both PCB and panel mounting options available.

Choice of cap sizes in .315” (8.0mm) and .394” (10.0mm) diameter cap design for simple, snap-on installation.

High torque bushing prevents rotation and separation from metal frame during installation.

Stainless steel frame resists corrosion.

Snap action contacts give smooth actuation, short stroke, light touch, and audible feedback. This mechanism also provides long mechanical life.

Molded-in terminals prevent entry of solder flux, dust, and other contaminants.

.100” x .100” (2.54mm x 2.54mm) terminal spacing conforms to standard PC board grid spacing. Round terminals for easier through-hole mounting on PC boards.
TYPICAL SWITCH ORDERING EXAMPLE

DB25 21 B

**POLES & CIRCUITS**

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
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</thead>
<tbody>
<tr>
<td>SP</td>
<td>DB2511</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1 3-2</td>
<td>SPDT</td>
</tr>
<tr>
<td>DP</td>
<td>DB2521</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1 6-4 3-2 6-5</td>
<td>DPDT</td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

**DESCRIPTION FOR TYPICAL ORDERING EXAMPLE**

DB2521B with AT443E Cap

Yellow .315" (8.0mm) Diameter Cap

Smooth Bushing & Straight PC Terminals with Bracket
Light Touch Miniature Pushbuttons

TYPICAL SWITCH DIMENSIONS

Single Pole

Straight PC

Double Pole

Straight PC

Single Pole

Straight PC with Bracket

Double Pole

Straight PC with Bracket

DB2511P with AT443C

DB2521P with AT442A

DB2511B with AT442C

DB2521B with AT443E
**OPTIONAL CAPS & COLORS**

**AT443**
- .315” (8.0mm) Diameter Snap-on Cap

<table>
<thead>
<tr>
<th>Cap Color</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Black</td>
</tr>
<tr>
<td>B</td>
<td>White</td>
</tr>
<tr>
<td>C</td>
<td>Red</td>
</tr>
</tbody>
</table>

Cap Material: Polycarbonate  Finish: Glossy

**AT442**
- .394” (10.0mm) Diameter Snap-on Cap

<table>
<thead>
<tr>
<th>Cap Color</th>
<th>Color</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Black</td>
</tr>
<tr>
<td>B</td>
<td>White</td>
</tr>
<tr>
<td>C</td>
<td>Red</td>
</tr>
</tbody>
</table>

Cap Material: Polycarbonate  Finish: Glossy

**HARDWARE**

**Standard Hardware**
- AT513M Metric Hexagon Nut
  - Material: Brass with Nickel Plating

**Optional Hardware**
- AT507M Metric Locking Ring
  - Material: Steel with Zinc/Chromate

**INSTALLATION/ASSEMBLY**

2 AT513M Metric Hexagon Nuts  1 AT509 Internal Tooth Lockwasher

Optional Hardware: AT507M Metric Locking Ring

Note: Cap must be snapped on after the switch is mounted into the panel.

**PANEL CUTOUTS & THICKNESSES**

With Standard Hardware  Without Bottom Hex Nut  With Standard Hardware & Optional Locking Ring

Maximum Effective Panel Thickness: .118” (3.0mm)  Maximum Effective Panel Thickness: .185” (4.7mm)  Maximum Effective Panel Thickness: .087” (2.2mm)
Series EB Light Touch Miniature Pushbuttons

General Specifications

Electrical Capacity (Resistive Load)

- **Power Level (silver):** 3A @ 125V AC for silver contacts
- **Logic Level (gold):** 0.4VA maximum @ 28V AC/DC maximum for gold contacts
  
  (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)

  Note: Find additional explanation of operating range in Supplement section.

Other Ratings

- **Contact Resistance:** 10 milliohms maximum for silver; 20 milliohms maximum for gold
- **Insulation Resistance:** 1,000 megohms minimum @ 500V DC
- **Dielectric Strength:** 1,000V AC minimum between contacts for 1 minute minimum;
  1,500V AC minimum between contacts and case for 1 minute minimum
- **Mechanical Life:** 100,000 operations minimum
- **Electrical Life:** 25,000 operations minimum for silver;
  50,000 operations minimum for gold
- **Nominal Operating Force:** Single Pole: 1.75N for Momentary and 2.49N for Alternate Action
  Double Pole: 2.30N for Momentary and 3.05N for Alternate Action
- **Travel:**
  - Momentary: Pretravel .047” (1.2mm); Overtravel .016” (0.4mm); Total Travel .063” (1.6mm)
  - Alternate: Pretravel .071” (1.8mm); Overtravel .016” (0.4mm); Total Travel .087” (2.2mm)

Materials & Finishes

- **Plunger:** Brass with nickel plating
- **Bushing:** Brass with nickel plating
- **Frame:** Stainless steel
- **Case:** Melamine phenolic resin (UL94V-0)
- **Movable Contacts:** Copper with silver or gold plating
- **Stationary Contacts:** Silver & copper with silver or gold plating
- **Terminals:** Copper with silver or gold plating

Environmental Data

- **Operating Temp Range:** –10°C through +70°C (+14°F through +158°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:** 1.47Nm (13.0 lb-in) for double nut; 0.68Nm (6.0 lb-in) for single nut
- **Cap Installation Force:** 78.5N (17.65 lbf) maximum downward force on actuator
- **Soldering Time & Temp:** Wave Solder (Straight PC): See Profile B in Supplement section.
- **Cleaning:** These devices are not process sealed. Hand clean locally using alcohol based solution.

Standards & Certifications

- **Flammability Standards:** UL94V-0 case
- **UL:** File No. E44145 - Recognized only when ordered with marking on switch.
  Add “/U” or “/CUL” before first dash in part number to order UL recognized switch.
  All single and double pole models recognized at 3A @ 125V AC.
- **CSA:** File No. 023535_0_000 - Certified only when ordered with marking on switch.
  Add “/C” before first dash in part number to order CSA certified switch.
  Single pole solder lug and PC models certified at 3A @ 125V AC; double pole PC models certified at 3A @ 125V AC.
**Distinctive Characteristics**

Power and logic level capabilities available to suit varying applications.

Bushing and snap-in mount versions available; snap-in models offer many style and color choices to enhance front panel appearance.

Light touch actuation.

High torque bushing prevents rotation and separation from metal frame during installation.

Stainless steel frame resists corrosion.

Case of heat resistant resin meets UL 94V-0 flammability rating.

Higher insulating barriers protect against crossover in double pole devices.

1,500V dielectric strength between contacts and case is accomplished by clinching the frame away from the terminals.

Epoxy sealed terminals prevent entry of solder flux and other contaminants.
Series EB

Light Touch Miniature Pushbuttons

TYPICAL SWITCH ORDERING EXAMPLE

<table>
<thead>
<tr>
<th>No Code</th>
<th>Contacts, Ratings, &amp; Terminals</th>
<th>Colors</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Silver Contacts; Solder Lug Terminals 3A @ 125V AC</td>
<td>A Black</td>
</tr>
<tr>
<td>G</td>
<td>Gold Contacts; Solder Lug Terminals 0.4VA max @ 28V AC/DC max</td>
<td>B White</td>
</tr>
<tr>
<td>P</td>
<td>Silver Contacts; Straight PC Terminals; 3A @ 125V AC</td>
<td>C Red</td>
</tr>
<tr>
<td>PG</td>
<td>Gold Contacts; Straight PC Terminals 0.4VA max @ 28V AC/DC max</td>
<td>E Yellow</td>
</tr>
<tr>
<td>F</td>
<td>Gold Contacts; Solder Lug Terminals 0.4VA max @ 28V AC/DC max</td>
<td>F Green</td>
</tr>
<tr>
<td>H</td>
<td>Gold Contacts; Solder Lug Terminals 0.4VA max @ 28V AC/DC max</td>
<td>G Blue</td>
</tr>
<tr>
<td>I</td>
<td>Silver Contacts; Straight PC Terminals 3A @ 125V AC</td>
<td>H Gray</td>
</tr>
</tbody>
</table>

IMPORTANT:

Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA recognized only when ordered with marking on the switch. Specific models, ratings, & ordering instructions are noted on the General Specifications page.

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

EB2065-BF

- Green .315” (8.0mm) Diameter Cap
- Silver Contacts & Solder Lug Terminals with 3-Amp Rating
- SPDT ON-ON Circuit
**Light Touch Miniature Pushbuttons**

### POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>EB2011</td>
<td>ON</td>
<td>ON</td>
<td>2-3 2-1</td>
<td>SPDT</td>
</tr>
<tr>
<td></td>
<td>EB2065</td>
<td>(ON)</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td>EB2061</td>
<td>ON</td>
<td>(ON)</td>
<td>2-3 5-6 2-1 5-4</td>
<td>DPDT</td>
</tr>
<tr>
<td></td>
<td>EB2085</td>
<td>ON</td>
<td>(ON)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

### CONTACT MATERIALS, RATINGS, & TERMINALS

- **No Code**
  - Solder Lug
  - Silver Contacts
  - Power Level: 3A @ 125V AC

- **G**
  - Solder Lug
  - Gold Contacts
  - Logic Level: 0.4VA max @ 28V AC/DC max
  - Complete explanation of operating range in Supplement section.

- **P**
  - Straight PC
  - Silver Contacts
  - Power Level: 3A @ 125V AC

- **PG**
  - Straight PC
  - Gold Contacts
  - Logic Level: 0.4VA max @ 28V AC/DC max
  - Complete explanation of operating range in Supplement section.

### PCB Footprints

**Single Pole**

**Double Pole**

![PCB Footprints Diagram]

---

*www.nkkswitches.com*
Series EB

Light Touch Miniature Pushbuttons

CAPS & COLORS

B AT443
.315” (8.0mm) Diameter Snap-on Cap

Cap Colors Available:
A Black  F Green
B White   G Blue
C Red     H Gray
E Yellow

Cap Material: Polycarbonate  Finish: Glossy

C AT442
.394” (10.0mm) Diameter Snap-on Cap

Cap Colors Available:
A Black  F Green
B White   G Blue
C Red     H Gray
E Yellow

Cap Material: Polycarbonate  Finish: Glossy

Plunger Extension
Due to a difference in plunger lengths on the momentary and alternate action models, cap distance from top of bushing varies.

TYPICAL SWITCH DIMENSIONS

Solder Lug

M6 P0.75

Keyway

Solder Lug

Keyway

EB2011-BA

EB2061-BA

Single Pole

M6 P0.75

For Momentary Devices

Double Pole

For Momentary Devices

EB2011-BA

EB2061-BA

EB2061-BA
HARDWARE

Installation/Assembly

2 AT513M Metric Hexagon Nuts
1 AT509 Internal Tooth Lockwasher

Material:
Brass with Nickel Plating

Material:
Steel with Zinc/Cromate

Optional Hardware:
AT507M Metric Locking Ring

Note: Cap must be snapped on after the switch is mounted into the panel.

PANEL CUTOUTS & THICKNESSES

Maximum Effective Panel Thickness:
.118” (3.0mm)

Maximum Effective Panel Thickness:
.055” (1.4mm)

Maximum Effective Panel Thickness:
.185” (4.7mm)

See Accessories & Hardware section for optional Conical Nuts:
AT512M used with cap AT443 and AT512CM used with cap AT442.
Series EB

Light Touch Miniature Pushbuttons

TYPICAL SWITCH

EB20

11

B

J23

Poles & Circuits

Contact, Ratings, & Terminals

Cap Colors

<table>
<thead>
<tr>
<th>Poles &amp; Circuits</th>
<th>Contacts, Ratings, &amp; Terminals</th>
<th>Cap Colors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 SPDT ON (ON)</td>
<td>Silver Contacts; Solder Lug Terminals 3A @ 125V AC</td>
<td>A Black</td>
</tr>
<tr>
<td>65 SPDT ON ON</td>
<td>Gold Contacts; Solder Lug Terminals 0.4VA max @ 28V AC/DC max</td>
<td>B White</td>
</tr>
<tr>
<td>61 DPDT ON (ON)</td>
<td>Silver Contacts; Straight PC Terminals; 3A @ 125V AC</td>
<td>C Red</td>
</tr>
<tr>
<td>85 DPDT ON ON</td>
<td>Gold Contacts; Straight PC Terminals 0.4VA max @ 28V AC/DC max</td>
<td>E Yellow</td>
</tr>
</tbody>
</table>

Cap Extensions & Bezel Types

<table>
<thead>
<tr>
<th>Low Rise</th>
<th>High Rise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Momentary</td>
<td>Momentary</td>
</tr>
<tr>
<td>Alternate</td>
<td>Alternate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J20 J30 J40 J50</td>
</tr>
<tr>
<td>J21 J31 J41 J51</td>
</tr>
<tr>
<td>J22 J32 J42 J52</td>
</tr>
<tr>
<td>J23 J33 J43 J53</td>
</tr>
<tr>
<td>J24 J34 J44 J54</td>
</tr>
</tbody>
</table>

IMPORTANT:

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DESCRIPTION FOR TYPICAL ORDERING EXAMPLE WITHOUT BEZEL

EB2011-A-J40

Without Bezel

Black Cap with High Rise Extension

SPDT ON-(ON) Circuit

Silver Contacts & Solder Lug Terminals with 3-Amp Rating
Bezel Colors

<table>
<thead>
<tr>
<th>Bezel without LEDs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A Black</td>
<td>F Green</td>
</tr>
<tr>
<td>B White</td>
<td>G Blue</td>
</tr>
<tr>
<td>C Red</td>
<td>H Gray</td>
</tr>
<tr>
<td>E Yellow</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bezel with 1 Round LED</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A Black</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bezel with 2 Round or Rectangular LEDs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A Black</td>
<td></td>
</tr>
</tbody>
</table>

Led Colors

<table>
<thead>
<tr>
<th>1 LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Red</td>
</tr>
<tr>
<td>F Green</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 LEDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top LED</td>
</tr>
<tr>
<td>C Red</td>
</tr>
<tr>
<td>E Yellow</td>
</tr>
<tr>
<td>F Green</td>
</tr>
</tbody>
</table>

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE WITH BEZEL

EB2011-B-J23ACF

Black Bezel with 2 Round LEDs:
- Top LED Red
- Bottom LED Green

White Cap with Low Rise Extension

Silver Contacts & Solder Lug

Terminals with 3-Amp Rating

SPDT ON-(ON) Circuit

www.nkkswitches.com
### Series EB

**Light Touch Miniature Pushbuttons**

#### POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>EB2011 EB2065</td>
<td>ON ON</td>
<td>(ON) ON</td>
<td>2-3 2-1</td>
<td>SPDT</td>
</tr>
<tr>
<td>DP</td>
<td>EB2061 EB2085</td>
<td>ON ON</td>
<td>(ON) ON</td>
<td>2-3 5-6 2-1 5-4</td>
<td>DPDT</td>
</tr>
</tbody>
</table>

**Note:** Terminal numbers are not actually on the switch.

#### CONTACT MATERIALS, RATINGS, & TERMINALS

**No Code**

- **Solder Lug**
  - Silver Contacts
  - **Power Level** 3A @ 125V AC

**G**

- **Solder Lug**
  - Gold Contacts
  - **Logic Level** 0.4VA maximum @ 28V AC/DC maximum
  - Complete explanation of operating range in Supplement section.

**P**

- **Straight PC**
  - Silver Contacts
  - **Power Level** 3A @ 125V AC

**PG**

- **Straight PC**
  - Gold Contacts
  - **Logic Level** 0.4VA maximum @ 28V AC/DC maximum
  - Complete explanation of operating range in Supplement section.

#### PCB Footprints

- **Single Pole**
  - Diagram showing footprint details

- **Double Pole**
  - Diagram showing footprint details

---

**Contact Information**

- www.nkkswitches.com
Light Touch Miniature Pushbuttons

Series EB

CAP COLORS

Factory Assembled on the Switch:
Square snap-on cap AT465, snap-in mounter AT529, and optional bezels which follow.

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

CAP EXTENSIONS & BEZEL TYPES

<table>
<thead>
<tr>
<th>Cap Extension</th>
<th>J20</th>
<th>J30</th>
<th>J40</th>
<th>J50</th>
</tr>
</thead>
<tbody>
<tr>
<td>without Bezel</td>
<td>Low Rise Momentary</td>
<td>Low Rise Alternate</td>
<td>High Rise Momentary</td>
<td>High Rise Alternate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>J21</th>
<th>J31</th>
<th>J41</th>
<th>J51</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Rise Momentary</td>
<td>Low Rise Alternate</td>
<td>High Rise Momentary</td>
<td>High Rise Alternate</td>
</tr>
</tbody>
</table>

AT207 Bezel without LED

- E Yellow
- A Black
- B White
- C Red

Material: Polycarbonate
Finish: Glossy

Maximum Panel Thickness
.039” ~ 1.57” (1.0mm ~ 4.0mm)
Cutout applies to SP & DP

Low Rise  Single Pole  Double Pole


Supplement
Toggles
Rockers
Programmable Illuminated PBs
Keylocks
Rotaries
Slides
Tactiles
Tilts
Touch
Indicators
Accessories

www.nkkswitches.com

C33
## Series EB

**Light Touch Miniature Pushbuttons**

### CAP EXTENSIONS & BEZEL TYPES

#### Cap Extension with Bezel

- **J22**: Low Rise Momentary AT208 Bezel with 1 Round LED (AT070 LED)
  - **A**: Black
  - Material: Polycarbonate
  - Finish: Glossy
  - LED colors and specifications on next to last page of this EB section.

#### Cap Extension with Bezel

- **J23**: Low Rise Momentary AT212 Bezel with 2 Round LEDs (AT617 LEDs)
  - **A**: Black
  - Material: Polycarbonate
  - Finish: Glossy
  - LED colors and specifications on next to last page of this EB section.

#### Maximum Panel Thickness

- .039" ~ .126" 
- (1.0mm ~ 3.2mm)

#### Cutout applies to SP & DP

---

**EB2011-B-J42AC**

- **High Rise Single Pole**
  - Material: Polycarbonate
  - Finish: Glossy
  - LED colors and specifications on next to last page of this EB section.

**EB2065-B-J33ACF**

- **Low Rise Single Pole**
  - Material: Polycarbonate
  - Finish: Glossy
  - LED colors and specifications on next to last page of this EB section.

---

[For Momentary Devices]

[For Alternate Devices]
## CAP EXTENSIONS & BEZEL TYPES

<table>
<thead>
<tr>
<th>Cap Extension with Bezel</th>
<th>J24</th>
<th>J34</th>
<th>J44</th>
<th>J54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Rise Momentary</td>
<td>Low Rise Alternate</td>
<td>High Rise Momentary</td>
<td>High Rise Alternate</td>
<td></td>
</tr>
</tbody>
</table>

### AT213 Bezel with 2 Rectangular LEDs (AT618 LEDs)

**A** Black

**Material:** Polycarbonate  
**Finish:** Glossy

Maximum Panel Thickness .039" ~ .126" (1.0mm ~ 3.2mm)  
Cutout applies to SP & DP

For Alternate Devices

Maximum Panel Thickness .039" ~ .126" (1.0mm ~ 3.2mm)  
Cutout applies to SP & DP

**LED colors and specifications on next page of this EB section.**
LED COLORS & SPECIFICATIONS

Bezel Orientation on Switch

<table>
<thead>
<tr>
<th></th>
<th>AT070 LED</th>
<th>AT617 LED</th>
<th>AT618 LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Bezel</td>
<td>AT208</td>
<td>AT212</td>
<td>AT213</td>
</tr>
<tr>
<td>with 1 LED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT070 LED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT617 LED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT618 LED</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Lead lengths may differ from manufacturing lot to lot. The longer lead is the anode (+).

<table>
<thead>
<tr>
<th></th>
<th>AT070</th>
<th>AT617</th>
<th>AT618</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Red</td>
<td>Green</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yellow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Green</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yellow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Green</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum Forward Current</th>
<th>I_FM</th>
<th>I_FM</th>
<th>I_FM</th>
</tr>
</thead>
<tbody>
<tr>
<td>25mA, 30mA</td>
<td>25mA</td>
<td>30mA</td>
<td>25mA</td>
</tr>
<tr>
<td>30mA</td>
<td>30mA</td>
<td>25mA</td>
<td>30mA</td>
</tr>
<tr>
<td>20mA</td>
<td>20mA</td>
<td>20mA</td>
<td>20mA</td>
</tr>
<tr>
<td>20mA</td>
<td>20mA</td>
<td>20mA</td>
<td>20mA</td>
</tr>
<tr>
<td>2.8V</td>
<td>2.1V</td>
<td>2.0V</td>
<td>2.1V</td>
</tr>
<tr>
<td>2.1V</td>
<td>2.0V</td>
<td>2.1V</td>
<td>2.25V</td>
</tr>
<tr>
<td>4V</td>
<td>5V</td>
<td>5V</td>
<td>5V</td>
</tr>
<tr>
<td>5V</td>
<td>5V</td>
<td>5V</td>
<td>5V</td>
</tr>
<tr>
<td>0.33 mA/°C</td>
<td>0.40 mA/°C</td>
<td>0.40 mA/°C</td>
<td>0.33 mA/°C</td>
</tr>
<tr>
<td>0.40 mA/°C</td>
<td>0.40 mA/°C</td>
<td>0.40 mA/°C</td>
<td>0.40 mA/°C</td>
</tr>
<tr>
<td>0.33 mA/°C</td>
<td>0.33 mA/°C</td>
<td>0.33 mA/°C</td>
<td>0.33 mA/°C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient Temperature Range (when used with a bezel)</th>
<th>AT070</th>
<th>AT617</th>
<th>AT618</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10° ~ +70°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-15° ~ +70°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-25° ~ +50°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The electrical specifications shown are determined at a basic temperature of 25°C. LED circuit is independent of switch operation. LED is colored in OFF state.

If the source voltage is greater than the rated voltage of the LED, a ballast resistor must be connected in series with the lamp. The ballast resistor calculation and more lamp detail are shown in the Supplement section.
NKK Switches can provide custom legends for caps. Contact factory for more information.

**Recommended Print Method:**
Screen Print or Pad Print

Epoxy based ink is recommended.

Suggested Printable Area for Cap

Shaded areas are printable areas.

AT465

AT465
## General Specifications

### FB Series

#### Electrical Capacity (Resistive Load)
- **Power Level:** 500mA @ 125V AC for silver
- **Logic Level:** 0.4VA max. @ 28V AC/DC max. for gold
  (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
  
  **Note:** Find additional explanation in Supplement section.

#### Other Ratings
- **Contact Resistance:** 30 milliohms maximum for silver; 30 milliohms maximum for gold
- **Insulation Resistance:** 100 megohms minimum @ 500V DC
- **Dielectric Strength:** 1,000V AC minimum between contacts & between contacts & case for 1 minute minimum
- **Mechanical Life:** 50,000 operations minimum
- **Electrical Life:** 50,000 operations minimum
- **Nominal Operating Force:** 2.16N
- **Travel:**
  - Pretravel .043” (1.1mm)
  - Overtravel .022” (0.57mm)
  - Total Travel .065” (1.67mm)

#### Materials & Finishes
- **Plunger:** Polyacetal
- **Bushing:** Brass with nickel plating
- **Case:** Phenolic resin
- **Movable Contactor:** Copper with silver or gold plating
- **Stationary Contacts:** Phosphor bronze with silver or gold plating
- **Terminals:** Phosphor bronze with silver or gold plating

#### Environmental & Installation Data
- **Operating Temp Range:** –10°C through +70°C (+14°F through +158°F)
- **Soldering Time & Temperature:** Manual Soldering:
  - See Profile A in Supplement section.

### SB Series

#### Electrical Capacity (Resistive Load)
- **Power Level:** 3A @ 125V AC or 2A @ 250V AC or
  2A @ 30V DC for silver
- **Logic Level:** 0.4VA max. @ 28V AC/DC max. for gold
  (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
  
  **Note:** Find explanation of operating range in Supplement section.

#### Other Ratings
- **Contact Resistance:** 10 milliohms maximum for silver; 20 milliohms maximum for gold
- **Insulation Resistance:** 200 megohms minimum @ 500V DC
- **Dielectric Strength:** 1,000V AC minimum between contacts & between contacts & case for 1 minute minimum
- **Mechanical Life:** 30,000 operations minimum
- **Electrical Life:** 10,000 operations minimum
- **Nominal Operating Force:** 4.90N
- **Travel:**
  - Normally Open:
    - Total Travel .088” (2.24mm)
  - Normally Closed:
    - Total Travel .088” (2.24mm)

#### Materials & Finishes
- **Plunger:** Black: Phenolic resin
- **Bushing:** Red: Urea formaldehyde resin
- **Case:** Brass with nickel plating
- **Movable Contactor:** Phenolic resin
- **Stationary Contacts:** Copper with silver or gold plating
- **Terminals:** Copper with silver or gold plating

#### Environmental & Installation Data
- **Operating Temp Range:** –10°C through +70°C (+14°F through +158°F)
- **Soldering Time & Temperature:** Manual Soldering:
  - See Profile A in Supplement section.

#### Standards & Certifications
- **UL:** File No. E44145 - Recognized only when ordered with marking on switch.
  Add “/U” or “/CUL” before dash in part number to order UL recognized switch.
  Models rated 0.5A @ 125V AC Single pole;
  Momentary action circuit with solder lug terminations.

- **CSA:** File No. 023535_0_000 - Certified only when ordered with marking on switch.
  Add “/C” before dash in part number to order CSA certified switch.
  SB series rated 3A @ 125V AC & 2A @ 250V AC.
  Single pole: Momentary action circuit with solder lug terminations.
Distinctive Characteristics

Optional caps in different colors to vary appearance as needed.

Low operating force for ease of actuation.

Rear panel bushing mount with compact behind panel dimension.

Internal antijamming feature to protect the contacts from damage due to excessive force on the plunger.

Self-cleaning contacts make FB models highly reliable.

Low cost device of rugged one-piece bushing and housing construction.

Reliability of construction with an internal guide to maintain contact alignment.

FB15ANEP and SB4011NO models have epoxy sealed terminals.
Series FB

.5 Amp Momentary Pushbuttons

TYPICAL SWITCH ORDERING EXAMPLE

FB 15AN EP 2 — F A

**Pole & Circuit**

<table>
<thead>
<tr>
<th>Pole &amp; Circuit</th>
<th>15AN SPST OFF (ON)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( ) = Momentary</td>
<td></td>
</tr>
</tbody>
</table>

**Contact Materials & Ratings**

<table>
<thead>
<tr>
<th>Contact</th>
<th>Silver Contacts 500mA @ 125V AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contact</th>
<th>Gold Contacts 0.4V A max. @ 28V AC/DC max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Terminals**

<table>
<thead>
<tr>
<th>Terminals</th>
<th>EP</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ep</td>
<td>Epoxy Sealed PC/Turret</td>
<td></td>
</tr>
<tr>
<td>No Epoxy PC</td>
<td>PC/Turret</td>
<td></td>
</tr>
</tbody>
</table>

**Cap Colors**

<table>
<thead>
<tr>
<th>Cap Colors</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Black</td>
</tr>
<tr>
<td>B White</td>
</tr>
<tr>
<td>C Red</td>
</tr>
</tbody>
</table>

**Caps**

<table>
<thead>
<tr>
<th>Caps</th>
</tr>
</thead>
<tbody>
<tr>
<td>F .201” (5.1mm) Dia.</td>
</tr>
<tr>
<td>H .295” (7.5mm) Dia.</td>
</tr>
</tbody>
</table>

**IMPORTANT:**

Switches are supplied without UL & cULus marking unless specified.

UL & cULus recognized only when ordered with marking on the switch.

Specific models, ratings, & ordering instructions are noted on the General Specifications page.

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

FB15ANEP2-FA

.201” (5.1mm) Diameter

Black Cap

Silver Contacts & 500-Milliamp Rating

SPST OFF-(ON) Circuit

Epoxy Sealed PC/Turret Terminals

POLE & CIRCUIT

<table>
<thead>
<tr>
<th>Plunger Position ( ) = Momentary</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pole Model</td>
<td>Normal Down</td>
<td>Normal Down</td>
</tr>
<tr>
<td>SP FB15AN</td>
<td>OFF (ON)</td>
<td>OPEN 1-2 SPST</td>
</tr>
</tbody>
</table>

C40  www.nkkswitches.com
**.5 Amp Momentary Pushbuttons**

**TERMINALS**

| EP  | Epoxy Sealed PC/Turret Terminals | P  | No Epoxy PC/Turret Terminals |

**CONTACT MATERIALS & RATINGS**

| 2   | Silver Contacts | Power Level | 500mA @ 125V AC |
| 4   | Gold Contacts   | Logic Level  | 0.4VA maximum @ 28V AC/DC maximum |

Complete explanation of operating range in Supplement section.

**TYPICAL SWITCH DIMENSIONS**

Plunger is white polyacetal.

**SLIP-ON CAPS & COLORS**

| F  | AT475 .201" (5.1mm) Diameter |
|    | AT496 .295" (7.5mm) Diameter |

Material: Polyamide  
Finish: Glossy

**STANDARD HARDWARE & PANEL CUTOUT**

| AT536 Hex Nut | Panel Thickness: .110" (2.8mm) maximum |

Material: Brass with nickel plating

---

www.nkkswitches.com
**TYPICAL SWITCH ORDERING EXAMPLE**

**SB40**

**Pole & Circuits**
- **11NO**
- **11NC**

**Plunger Colors**
- **No Code**: Black
- **C**: Red

**Contact Materials & Ratings**
- **No Code**: Silver Contacts
  - 3A @ 125V AC or 2A @ 250V AC
- **G**: Gold Contacts
  - 0.4VA max. @ 28V AC/DC max.

**Bushings**
- **M**: Metric Threaded M12 P1
- **H**: Inch Threaded 15/32-32 NS

**Slip-On Cap & Colors**
- **No Code**: Without Cap
- **2A**: Black
- **2B**: White
- **2C**: Red
- **2E**: Yellow
- **2F**: Green
- **2G**: Blue

**DESCRIPTION FOR TYPICAL ORDERING EXAMPLE**

**SB4011NOM**

- Standard Black Plunger without Slip-on Cap
- Metric Threaded Bushing
- Silver Contacts with 3-Amp Rating

**POLE & CIRCUITS**

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Plunger Position</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>SB4011NO</td>
<td>OFF (ON)</td>
<td>OPEN 1-2</td>
<td>SPST NO 1-2</td>
</tr>
<tr>
<td></td>
<td>SB4011NC</td>
<td>ON (OFF)</td>
<td>1-2 OPEN</td>
<td></td>
</tr>
</tbody>
</table>

**IMPORTANT:**

Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA recognized only when ordered with marking on the switch. Specific models, ratings, & ordering instructions are noted on the General Specifications page.
TYPICAL SWITCH DIMENSIONS

**Metric Bushing**

**SB4011NOM**

Hardware provided:
1 AT504 Knurled Face Nut
1 AT508 Lockwasher
1 AT527M Hex Mounting Nut

Panel Thickness: .157” (4.0mm)
Details in Hardware & Accessories section.

**Inch Bushing**

**SB4011NCH**

Hardware provided:
2 AT503H Hex Mounting Nuts
1 AT508 Lockwasher

Panel Thickness: .157” (4.0mm)
Details in Hardware & Accessories section.

SLIP-ON CAP & COLORS

**AT422**

.394” (10.0mm) Diameter Cap

Material: Polyethylene
Finish: Matte

2A Black 2C Red 2F Green
2B White 2E Yellow 2G Blue

www.nkkswitches.com
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: 80 milliohms maximum
Insulation Resistance: 500 megohms minimum @ 500V DC
Dielectric Strength: 500V AC minimum for 1 minute minimum
Mechanical Life: 50,000 operations minimum
Electrical Life: 50,000 operations minimum
Nominal Operating Force: 1.70N
Travel: Pretravel .035” (0.9mm); Overtravel .008” (0.2mm); Total Travel .043” (1.1mm)

Materials & Finishes

Actuator: Polyacetal
Case: Glass fiber reinforced polyamide
Sealing Rings: Nitrile butadiene rubber
Movable Contacts: Phosphor bronze with gold plating
Stationary Contacts: Phosphor bronze with gold plating
Base: Glass fiber reinforced polyamide
Mounting Bracket: Phosphor bronze with tin plating
Terminals: Phosphor bronze with gold plating

Environmental Data

Operating Temp 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

Cap Installation Force: 39.1N (8.8 lbf) maximum downward force on actuator

PCB Processing

Soldering: Wave Soldering Recommended: See Profile A in Supplement section.
Manual Soldering: See Profile A in Supplement section.

Standards & Certifications

The GB Series pushbuttons 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

Ultra-miniature size allows high density mounting, and extremely light weight of 0.25 gram makes these switches ideal for handheld equipment.

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 section.)

.100” x .100” (2.54mm x 2.54mm) terminal spacing conforms to standard PC board grid-spacing. Round terminals facilitate easier through-hole mounting on PC boards.

Matching indicators available.
**Series GB**

**Process Sealed Ultra-Miniature Pushbuttons**

---

### TYPICAL SWITCH ORDERING EXAMPLE

<table>
<thead>
<tr>
<th>GB</th>
<th>1</th>
<th>5</th>
<th>A</th>
<th>H</th>
<th>X</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Poles</strong></td>
<td><strong>Circuits</strong></td>
<td><strong>PC Terminals</strong></td>
<td><strong>Cap Colors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>SPDT</td>
<td>5</td>
<td>ON</td>
<td>(ON)</td>
<td>P</td>
<td>Straight</td>
</tr>
<tr>
<td>2</td>
<td>DPDT</td>
<td></td>
<td></td>
<td></td>
<td>H</td>
<td>Right Angle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V</td>
<td>Vertical</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Plunger**

A

.130” (3.3mm) Long Plunger

**Slip-on Cap**

X

.157” (4.0mm) Diameter

---

### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

GB15AH-XC

.130” (3.3mm) Long Plunger with .157” (4.0mm) Diameter Red Cap

---

### POLES & CIRCUITS

**Plunger Position**

( ) = Momentary

**Connected Terminals**

**Throw & Schematics**

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Normal</th>
<th>Down</th>
<th>Note: Terminal numbers are not actually on the switch.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>GB15</td>
<td>ON</td>
<td>(ON)</td>
<td>5-6</td>
<td>5-4</td>
<td>SPDT</td>
</tr>
<tr>
<td>DP</td>
<td>GB25</td>
<td>ON</td>
<td>(ON)</td>
<td>5-6</td>
<td>2-3</td>
<td>2-1</td>
</tr>
</tbody>
</table>

---

### PLUNGER

A

.130” (3.3mm) Long Plunger

---

### PC TERMINALS

**P**

Straight

**H**

Right Angle

**V**

Vertical
SLIP-ON CAP & COLORS

**AT4063**
.157” (4.0mm) Diameter Slip-on Cap

- **Material:** Polyamide
- **Finish:** Glossy

**Actual Size**

**Cap Colors Available:**
- A: Black
- B: White
- C: Red

TYPICAL SWITCH DIMENSIONS

**Single & Double Pole**

- **Slot:** 0.094”
- **Dia:** 0.157”

**P/N This Side:**
- 016

**GB25AP-XC**

**Straight PC**

**Cover Diameter:** 0.200”

**GB25AH-XC**

**Right Angle PC**

**Slot:** 0.094”

**Dia:** 0.157”

**P/N This Side:**
- 016

**GB25AV-XC**

**Vertical PC**

**Slot:** 0.094”

**Dia:** 0.157”

**P/N This Side:**
- 016

On single pole switches terminals 1 & 3 are support pins.
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: 80 milliohms maximum
- Insulation Resistance: 500 megohms minimum @ 500V DC
- Dielectric Strength: 500V AC minimum for 1 minute minimum
- Mechanical Life: 50,000 operations minimum
- Electrical Life: 50,000 operations minimum
- Nominal Operating Force: 1.0N
  - Travel: Pretravel .020" (0.5mm); Overtravel .023 (0.6mm); Total Travel .043" (1.1mm)

Materials & Finishes

- Actuator: Glass fiber reinforced polyamide (UL94V-0)
- Case: Glass fiber reinforced polyamide (UL94V-0)
- Movable Contacts: Phosphor bronze with gold plating
- Stationary Contacts: Brass with gold plating
- Base: Glass fiber reinforced polyamide (UL94V-0)
- Mounting Bracket: Phosphor bronze with tin plating
- Terminals: Brass with gold plating

Environmental Data

- Operating Temperature Range: –25°C through +70°C (–13°F through +158°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/s²) 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.
- Cleaning: These devices are not process sealed. Hand clean locally using alcohol based solution.

Standards & Certifications

- Flammability Standards: UL94V-0 actuator, case, & base

The GB2 Series pushbuttons 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.
Ultra-Thin Pushbuttons

Series GB2

Distinctive Characteristics

Unique, off-center actuator allows high density setup and easy actuation while avoiding accidental operation in compact environments.

Side-by-side, block mounting can be achieved by use of bracket AT546 on straight PC mounting types.

Off-Momemtary On Circuit.

Black, white, and red snap-on caps available.

Extremely thin size allows high density PCB mounting and makes these switches ideal for handheld equipment.

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.)

Molded-in, epoxy sealed terminals lock out flux and other contaminants.

.100” x .100” (2.54mm x 2.54mm) terminal spacing conforms to standard PC board grid spacing for straight and angle mounting.
Series GB2

TYPICAL SWITCH ORDERING EXAMPLE

GB2

1

5

A

B

Pole

1

SPST

Circuit

5

OFF

(ON)

( ) = Momentary

Plunger

A

Standard

PC Terminals

P

Straight

B

Straight with Bracket

H

Right Angle 1 Switch

2H

Right Angle 2 Switches

Cap Colors

With P, B, or H Terminals for Single Switches

A

Black

B

White

C

Red

With Terminal Code 2H for 2 Right Angle Switches

Upper

*Lower

A

Black

A

B

White

B

C

Red

C

* Nearest to PC Board

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

GB215AB

Standard Plunger

SPST

OFF-(ON) Circuit

Straight PC Terminals with Bracket

POLE & CIRCUIT

Plunger Position

( ) = Momentary

Connected Terminals

Throw & Schematics

Pole

Model

Normal

Down

Normal

Down

Note: Terminal numbers are not actually on the switch.

SP

GB215

OFF

(ON)

OPEN

1-2

1-2 3-4

SPST

SPST with 2 switches

TYPICAL SWITCH DIMENSIONS

Straight PC

Single Pole

GB215AP

www.nkkswitches.com
Series GB2

Ultra-Thin Pushbuttons

TYPICAL SWITCH DIMENSIONS

Single Pole

Straight PC with Bracket

Single Pole with 1 Switch

Right Angle PC

Single Pole with 2 Switches

Right Angle PC

SNAP-ON CAP & MOUNTING BRACKET

A  AT4137 Rectangular Snap-on Cap
   Black

B  AT4137 Rectangular Snap-on Cap
   White

C  AT4137 Rectangular Snap-on Cap
   Red

Material: PBT
Finish: Glossy

Actual Size

AT546
   Mounting Bracket
   for Block Mounting

Material:
   Phosphor Bronze
   with Tin Plating
Series G3B  
Ultra-Miniature Process Sealed SMT Pushbuttons

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:** 80 milliohms maximum
- **Insulation Resistance:** 500 megohms minimum @ 500V DC
- **Dielectric Strength:** 500V AC minimum for 1 minute minimum
- **Mechanical Life:** 50,000 operations minimum
- **Electrical Life:** 50,000 operations minimum
- **Nominal Operating Force:** 2.0N
- **Travel:** Pretravel: .024” (0.6mm); Overtravel: .019” (0.5mm); Total Travel: .043” (1.1mm)

**Materials & Finishes**
- **Actuator:** Polyphenylene sulfide (UL94V-0)
- **Case:** Polyphenylene sulfide (UL94V-0)
- **Sealing Rings:** Nitrile butadiene rubber
- **Movable Contacts:** Phosphor bronze with gold plating
- **Stationary Contacts:** Phosphor bronze with gold plating
- **Base:** Polyphenylene sulfide (UL94V-0)
- **Terminals:** Phosphor bronze 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 ~ 500Hz 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:** It is recommended that the body of models for upright mounting without bracket be fastened to a panel or similar support for protection of solder joints from mechanical stress.
- **Coplanarity:** See specifications in Terms & Acronyms in Supplement section.

**Processing**
- **Soldering:** Reflow Soldering Recommended. See Profile B in Supplement section.
- **Manual Soldering:** See Profile B in Supplement section.
- **Cleaning:** Automated cleaning. See Cleaning specifications in Supplement section.

**Standards & Certifications**
- **Flammability Standard:** UL94V-0 actuator, case & base

The G3B Series pushbuttons 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

Ultra-miniature size allows high density mounting, and extremely light weight of 0.6 gram makes these switches ideal for handheld equipment.


Heat resistant resin used for housing, base, and plunger allows vapor phase and infrared convection reflow soldering.

Combination of design features achieves total seal and allows automated processing techniques, including flux cleaning procedures: one-piece bushing and housing, rubber seals surrounding actuator and base, epoxy at joint of case and base, and molded-in, epoxy-sealed terminals.

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.)

Gull-wing terminals provide mechanical stability during soldering and simplified solder joint inspection.

Coplanarity: all considered surfaces must lie between two parallel planes that area maximum distance apart of .0059” (0.15mm). (Additional coplanarity details in Terms and Acronyms in the Supplement section.)
Series G3B
Ultra-Miniature Process Sealed SMT Pushbuttons

TYPICAL SWITCH ORDERING EXAMPLE

<table>
<thead>
<tr>
<th>Poles</th>
<th>SPDT</th>
<th>DPDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plunger</th>
<th>.130&quot; (3.3mm) Long</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Gull Wing for Upright Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Gull Wing for Upright with Bracket</td>
</tr>
<tr>
<td>B</td>
<td>Gull Wing for Right Angle</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Colors</th>
<th>A Black</th>
<th>B White</th>
<th>C Red</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Packaging</th>
<th>No Code</th>
<th>Partitioned Tray for Upright &amp; Right Angle - Any Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>Tape-Reel for Right Angle Only 500 Pieces/Reel</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>Stick-Tube for Upright Mount 50 Pieces/Stick</td>
</tr>
</tbody>
</table>

Optional Caps

<table>
<thead>
<tr>
<th>Slip-on Cap</th>
<th>.157&quot; (4.0mm) Diameter (For installation after processing only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Compatible Cap</td>
<td>.157&quot; (4.0mm) Diameter (Combines with R or S packaging only)</td>
</tr>
</tbody>
</table>

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

G3B15AB

.130" (3.3mm) Long Plunger

Packaged in Partitioned Tray

SPDT ON-(ON) Circuit

Gull Wing Terminals for Upright with Bracket Mount

POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Plunger Position</th>
<th>Connected Terminals</th>
<th>Throw &amp; Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>G3B15</td>
<td>Normal</td>
<td>5-6</td>
<td>SPDT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Down</td>
<td>5-4</td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td>G3B25</td>
<td>Normal</td>
<td>5-6 2-3</td>
<td>DPDT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Down</td>
<td>5-4 2-1</td>
<td></td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.
Ultra-Miniature Process Sealed SMT Pushbuttons

Series G3B

PLUNGER & OPTIONAL CAPS

A  
.130" (3.3mm)
Long Plunger

X  
AT4063 Slip-on Cap
.157" (4.0mm) Diameter
Available with bulk packaging only. Cap must be installed after processing.
Material: Polyamide
Finish: Glossy

Y  
Process Compatible Cap
.157" (4.0mm) Diameter
Factory assembled. Available with tape-reel or stick-tube packaging only.
Caution: Pulling force specification for this cap is not warranted after reflow processing.
Material: Polyamide
Finish: Glossy

Cap Colors Available: A Black  B White  C Red

TYPICAL SWITCH DIMENSIONS

Single & Double Pole

Upright Mounting

Single & Double Pole

Upright Mounting with Bracket

Right Angle Mounting

Single Pole

Double Pole

www.nkkswitches.com
Series G3B
Ultra-Miniature Process Sealed SMT Pushbuttons

Pad Layouts for Surface Mount Terminals

Single Pole
Double Throw

Double Pole
Double Throw

Upright Mounting

Upright Mounting with Bracket

Right Angle Mounting

PACKAGING

No Code
Partitioned Tray for Upright & Right Angle

Any quantity

If the G3 upright models are ordered in less than 50-piece increments or the right angle models in less than 500-piece increments, the switches are packaged in a partitioned tray. No code is required.

Tape-Reel for Right Angle

500 pieces per reel

Switches must be ordered in 500-piece increments when tape-reel packaging is selected.

This packaging meets EIA-481-D Standard for “16mm and 24mm Embossed Carrier Taping of Surface Mount Components for Automatic Handling.”
PACKAGING (CONTINUED)

**Stick-Tube for Upright Mount**

50 pieces per stick

Switches must be ordered in 50-piece increments when stick-tube packaging is selected.

---

**Tape-Reel Packaging for Right Angle Mount**

Each tape-reel of 550 pockets contains 500 switches.

Minimum Leader Length: 7.87” (200mm)  Minimum Trailer Length: 1.97” (50mm)

---

**Stick-Tube Packaging for Upright Mount**

Each stick-tube contains 50 switches.

\[ L = \text{Length} \]

- **G3B Upright (code P)**
  - 18.31” (465mm)

- **G3B Upright with Bracket (code B)**
  - 21.26” (540mm)

---

www.nkkswitches.com
Series JP  
Internationally Approved Pushbuttons

**General Specifications**

**Electrical Capacity (Resistive Load)**
- **Power Level:** 10A @ 125/250V AC for JPM models & 16A @ 125/250V AC for JPL models

**Other Ratings**
- **Contact Resistance:** 20 milliohms maximum
- **Insulation Resistance:** 1,000 megohms minimum @ 500V DC
- **Dielectric Strength:** 2,000V AC minimum between contacts for 1 minute minimum; 4,000V AC minimum between contacts & case for 1 minute minimum
- **Mechanical Life:** 25,000 operations minimum
- **Electrical Life:** 25,000 operations minimum
- **Nominal Operating Force:**
  - JPM Single Pole 3.53N & Double Pole 6.47N
  - JPL Single Pole 4.51N & Double Pole 9.02 N
- **Contact Timing:**
  - Nonshorting (break before make)
- **Latchdown:**
  - Normal position - flush with barrier; latchdown position - .079" (2.0mm) below normal
- **Travel:**
  - Pretravel .059" (1.5mm); Overtravel .071" (1.8mm); Total Travel .130" (3.3mm)

**Materials & Finishes**
- **Housing/Frame & Barrier:** Polyamide (UL94V-0)
- **Interior Seal:** Polyphenylene sulfide (UL94V-0)
- **Case/Base:** Melamine (UL94V-0)
- **Movable Contacts:** Silver alloy
- **Stationary Contacts:** Silver alloy plus copper
- **Terminals:** Brass with silver plating

**Environmental Data**
- **Operating Temp Range:** –10°C through +70°C (+14°F through +158°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)
- **Process Seal:** Dust resistant inner seal

**Installation**
- **Soldering Time & Temp:** Manual Soldering: See Profile A in Supplement section.

**Standards & Certifications**
- **Flammability Standards:**
  - UL94V-0 for housing/frame, barrier, interior seal, & case/base

- **TV Ratings for UL:**
  - JPM (TV-5) Overload Test @ 125V AC for 50 operations:
    - Steady State Current (rms) 7.5A; Minimum Inrush Current (peak) 111A
  - JPM (TV-5) Endurance Test @ 125V AC for 25,000 operations:
    - Steady State Current (rms) 5A; Minimum Inrush Current (peak) 78A
  - JPL (TV-8) Overload Test @ 125V AC for 50 operations:
    - Steady State Current (rms) 12A; Minimum Inrush Current (peak) 163A
  - JPL (TV-8) Endurance Test @ 125V AC for 25,000 operations:
    - Steady State Current (rms) 8A; Minimum Inrush Current (peak) 117A

- **UL:** File No. E44145 - Recognized only when ordered with marking on switch.
  - Add “/U” or “/CUL” before dash in part number to order UL recognized switch.
  - All JPM models certified at 10A @ 125V AC, TV5 & JPL models at 16A @ 125V AC, TV8.

- **VDE:** License No. 40028887 - Approved only when ordered with marking on switch.
  - Add “/V” before dash in part number to order VDE approved switch.
  - All JPM models approved at steady state 5A, inrush 80A, resistive 10A, & motor load 6A all at 250V AC.
  - License No. 40039784
  - All JPL models approved at steady state 8A, inrush 128A, resistive 16A, & motor load 8A all at 250V AC.
Distinctive Characteristics

Industry’s first molded pushbutton with TV rating. Designed to handle large inrush current. JPM models certified for TV-5 rating and JPL models for TV-8 rating.

Prominent external insulating barriers increase insulation resistance and dielectric strength.

Constructed for dust resistance with interior seal of polyphenylene sulfide (PPS) between actuator and contact area.

Specially designed to break light contact welds.

Snap-action contact mechanism.

Terminals are molded in and epoxy sealed to lock out flux, dust, and other contaminants.

Outer case of heat resistant resin meets UL’s 94V-0 flammability standard.
**TYPICAL SWITCH ORDERING EXAMPLE**

**Series JP**

**Ratings**
- **M**: TV-5 Rated
  - 10A @ 125/250V AC
- **L**: TV-8 Rated
  - 16A @ 125/250V AC

**Actuators**
- **B**: Flat Cap with Barrier Flange
- **P**: Plunger with Flat Flange; cap not supplied with plunger

**Poles**
- 1: SPST
- 2: DPST

**Circuit**
- 6: OFF ON
  - (Alternate Action with Latchdown)

**Cap Colors**
- **A**: Black
- **B**: Ivory
- **C**: Red
- **H**: Gray

**IMPORTANT:**
Switches are supplied without UL & VDE markings unless specified.
UL recognized only when ordered with marking on the switch.
VDE approved only when ordered with marking on the switch.
Specific models, ratings, & ordering instructions are noted on the General Specifications page.

**DESCRIPTION FOR TYPICAL ORDERING EXAMPLE**

**JPM26B-H**

Gray Flat Cap with Barrier Flange

TV-5 Rated
- 10A @ 125/250V AC

DPST OFF-ON Circuit
Internationally Approved Pushbuttons

Series JP

RATINGS

<table>
<thead>
<tr>
<th>Type</th>
<th>Power Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV-5</td>
<td>10A @ 125/250V AC</td>
</tr>
<tr>
<td>TV-8</td>
<td>16A @ 125/250V AC</td>
</tr>
</tbody>
</table>

Note: See General Specifications page to find complete explanation of TV ratings.

POLES & CIRCUIT

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Connected Terminals</th>
<th>Throw &amp; Schematics</th>
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<td>SP</td>
<td>JPM16</td>
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<td>SPST</td>
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<td>JPL16</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>ON</td>
<td>OPEN</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-1a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>JPL26</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>ON</td>
<td>OPEN</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-1a</td>
<td>2-2a</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Terminal numbers are actually on the switch.

ACTUATORS

**B** Flat Cap with Barrier Flange

The barrier is an integral part of the switch. This housing is black, molded polyamide matte finish material.

Cap details below.

**P** Plunger with Flat Flange

The flange is an integral part of the switch. This housing is black, molded polyamide matte finish material.

No cap supplied.

CAP COLORS

AT3021 Flat Cap for Actuator Type B with Barrier Flange

Cap Material: Polyphenylene Oxide

Finish: Matte

Cap Colors Available:

- **A** Black
- **B** Ivory
- **C** Red
- **H** Gray

The cap is flush with the barrier in normal position and .079” (2.0mm) below that in latchdown position.

The latchdown feature on this alternate action device provides visible, audible, and tactile feedback. This design gives smooth, responsive operation.
Panel Thickness Range applies to both JPM & JPL models.

-0.039" ~ 0.157"
(1.0mm ~ 4.0mm)

**JPM & JPL Solder Lug/1.187"(4.75mm) Quick Connect Terminals**

This switch assembly, when used with connectors, is not VDE approved.

**TYPICAL SWITCH DIMENSIONS**

**Flat Cap with Barrier Flange**

This switch assembly, when used with connectors, is not VDE approved.

**JPM26B-H**

**Plunger with Flat Flange**

**JPL16P**

Single pole model does not have terminals 2 & 2a.

Single pole model does not have terminals 2 & 2a.
General Specifications

Electrical Capacity (Resistive Load)

- **Power Level (silver):** 1A @ 125V AC or 1A @ 30V DC
- **Logic Level (gold):** 0.4VA maximum @ 28V AC/DC maximum
- **Logic/Power Level:** Combines silver & gold ratings

Note: Find additional explanation of dual rating & operating range in Supplement section.

Other Ratings

- **Contact Resistance:** 20 milliohms maximum for silver; 30 milliohms maximum for gold
- **Insulation Resistance:** 1,000 megohms minimum @ 500V DC
- **Dielectric Strength:** 1,000V AC minimum between contacts for 1 minute minimum; 1,500V AC minimum between contacts & case for 1 minute minimum
- **Mechanical Life:** 200,000 operations minimum
- **Electrical Life:** 25,000 operations minimum for silver; 100,000 operations minimum for gold
- **Nominal Operating Force:** Single pole 2.94N & double pole 4.90N
- **Contact Timing:** Nonshorting (break-before-make)
- **Travel:** Pretravel .023” (0.6mm); Overtravel .016” (0.4mm); Total Travel .039” (1.0mm)

Materials & Finishes

- **Plunger:** Brass with nickel plating
- **Support Bracket:** Brass with tin plating
- **Bushing/Housing:** Glass fiber reinforced polyamide (UL94V-0)
- **Sealing Ring:** Nitrile butadiene rubber
- **Base:** Glass fiber reinforced polyamide (UL94V-0)
- **Movable Contacts:** Silver alloy with silver plating (code W); copper with gold plating (code G); or silver alloy with gold plating (code A)
- **Stationary Contacts:** Silver alloy with silver plating (code W); copper with gold plating (code G); or silver alloy with gold plating (code A)
- **Terminals:** Brass with silver or gold plating

Environmental Data

- **Operating Temp 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

- **Cap Installation Force:** 49.0N (11.0 lbf) for plunger A & 79.4N (17.9 lbf) for plunger B

PCB Processing

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

Standards & Certifications

- **Flammability Standards:** UL94V-0 rated bushing/housing & base
- **UL:** File No. E44145 - Recognized only when ordered with marking on switch.
  Add "/U" or "/CUL" before dash in part number to order UL recognized switch.
  All models recognized at 1A @ 125V AC, 1A @ 30V DC, or 0.4A @ 28V DC.
- **CSA:** File No. 023535_0_000 - Certified only when ordered with marking on switch.
  Add "/C" before dash in part number to order CSA certified switch.
  All models certified at 1A @ 125V AC, 1A @ 30V DC, or 0.4A @ 28V DC.
Distinctive Characteristics

Snap-acting contact mechanism gives short travel, sensitive actuation, light touch, smooth feel, audible feedback, and a longer electrical life.

Single unit construction of the bushing and top of the housing gives protection from cleaning fluids or other liquids.

O-ring surrounding actuator at top of bushing interior prevents liquids from reaching switch mechanism.

Ultrasonic welding of upper and lower housing seals out contaminants and allows automated soldering and cleaning.

Terminals are epoxy sealed to prevent entry of flux, solvents, and other contaminants.

Bracketed models have crimped bracket legs to ensure secure PC mounting and prevent dislodging during automated soldering.

Logic level and power capabilities are available to suit varying applications.
**Series M2**

Process Sealed Miniature Pushbuttons

### TYPICAL SWITCH ORDERING EXAMPLE

**M2B**  **15**  **A**  **A5**  **G**  **30**  **F**  **C**

#### Poles & Circuits

<table>
<thead>
<tr>
<th></th>
<th>SPDT</th>
<th>ON</th>
<th>(ON)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>DPDT</td>
<td>ON</td>
<td>(ON)</td>
</tr>
</tbody>
</table>

( ) = Momentary

#### Plungers

- **A**: 0.282” (7.16mm) Long for cap codes F & H
- **B**: 0.307” (7.8mm) Long for cap codes B & C

#### Bushing

- **A5**: 0.250” (6.35mm) Double Flattened

#### Contact Materials & Ratings

<table>
<thead>
<tr>
<th></th>
<th>Contact Material &amp; Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>W</strong></td>
<td>Silver; Rated 1A @ 125V AC &amp; 1A @ 30V DC</td>
</tr>
<tr>
<td><strong>G</strong></td>
<td>Gold; Rated 0.4VA maximum @ 28V AC/DC maximum</td>
</tr>
<tr>
<td><strong>A</strong></td>
<td>Gold over Silver; Rated 1A @ 125V AC &amp; 0.4VA max @ 28V AC/DC max</td>
</tr>
</tbody>
</table>

#### PC Terminals

<table>
<thead>
<tr>
<th></th>
<th>Terminal Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>Straight</td>
</tr>
<tr>
<td>13</td>
<td>Straight with .460” (11.7mm) Bracket</td>
</tr>
<tr>
<td>30</td>
<td>.150” (3.81mm) Right Angle</td>
</tr>
<tr>
<td>40</td>
<td>.150” (3.81mm) Vertical</td>
</tr>
</tbody>
</table>

#### Snap-on Caps

For Plunger A
- **F**: .201” (5.1mm) Diameter

For Plunger B
- **B**: .315” (8.0mm) Diameter
- **C**: .394” (10.0mm) Diameter

#### Cap Colors

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

* For cap codes B & C only

### IMPORTANT:

Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA recognized only when ordered with marking on the switch. Specific models, ratings, & ordering instructions are noted on the General Specifications page.

### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

**M2B15AA5G30-FC**

- .250” (6.35mm) Bushing with Double Flat
- Red .201” (5.1mm) Diameter Cap on .282” (7.16mm) Long Plunger
- SPDT ON-(ON) Circuit
- Right Angle PC Terminals
- Gold Contacts with 0.4VA Rating
# Process Sealed Miniature Pushbuttons

## Series M2

### POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Normal</th>
<th>Down</th>
<th>Throw &amp; Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>M2B15</td>
<td>ON</td>
<td>(ON)</td>
<td>1-3</td>
<td>1-2</td>
<td>SPDT</td>
</tr>
<tr>
<td>DP</td>
<td>M2B25</td>
<td>ON</td>
<td>(ON)</td>
<td>1-3 4-6</td>
<td>1-2 4-5</td>
<td>DPDT</td>
</tr>
</tbody>
</table>

- **Note:** Terminal numbers are not actually on the switch.

### PLUNGERS

- **A** .282” (7.16mm) Long
  - For cap codes F & H
  - Material: Chrome over brass

- **B** .307” (7.8mm) Long
  - For cap codes B & C
  - Material: Chrome over brass

### BUSHING

- **A5** .250” (6.35mm) Double Flatted

### CONTACT MATERIALS & RATINGS

- **W** Silver over Silver
  - Power Level: 1A @ 125V AC & 1A @ 30V DC

- **G** Gold over Brass or Copper
  - Logic Level: 0.4VA maximum @ 28V AC/DC maximum

- **A** Gold over Silver
  - Power Level or Logic Level: 1A @ 125V AC or 0.4VA maximum @ 28V AC/DC maximum

- **Note:** This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section for complete explanation of dual rating and operating range.
Series M2
Process Sealed Miniature Pushbuttons

PC TERMINALS

03 Straight

13 Straight with .460” (11.7mm) Bracket

30 .150” (3.81mm) Right Angle

40 .150” (3.81mm) Vertical

SNAP-ON CAPS

For Plunger Type A

F AT475 .201” (5.1mm) Diameter
Material: Polyamide
Colors Available: A, B, C

H AT496 .295” (7.5mm) Diameter
Material: Polyamide
Colors Available: A, B, C

For Plunger Type B

B AT443 .315” (8.0mm) Diameter
Material: Polycarbonate

C AT442 .394” (10.0mm) Diameter
Material: Polycarbonate

Cap Colors Codes:
A Black  B White  C Red  E Yellow  F Green  G Blue  H Gray
TYPICAL SWITCH DIMENSIONS

Single Pole

Straight PC

Double Pole

Straight PC

Single & Double Pole

Straight PC • Bracket
**General Specifications**

### Electrical Capacity (Resistive Load)
- **Power Level (silver):** 6A @ 125V AC & 3A @ 250V AC or 3A @ 30V DC
- **Logic Level (gold):** 0.4VA maximum @ 28V AC/DC maximum (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
- **Logic/Power Level (gold over silver):** Combines silver & gold ratings

Note: Find additional explanation dual rating & operating range in Supplement section.

### Other Ratings
- **Contact Resistance:** 10 milliohms maximum for silver; 20 milliohms maximum for gold
- **Insulation Resistance:** 1,000V AC minimum between contacts for 1 minute minimum;
  1,500V AC minimum between contacts & case for 1 minute minimum
- **Dielectric Strength:** 1,000V AC minimum between contacts for 1 minute minimum;
  1,500V AC minimum between contacts & case for 1 minute minimum
- **Mechanical Life:** 50,000 operations minimum for splashproof models; 100,000 for all other models
- **Electrical Life:** 25,000 operations minimum for silver; 50,000 operations minimum for gold
  50,000 operations minimum for silver at 3A @ 125V AC
- **Nominal Operating Force:**
  - Momentary Action: 1-pole 9.32N; 2-pole 16.18N; 4-pole 25.54N;
  - Alternate Action: 1-pole 4.41N; 2-pole 7.06N; 4-pole 11.77N
- **Contact Timing:** Slow make, slow break
- **Plunger Travel:**
  - Screw-on Cap (Mom.)
  - Screw-on Cap (Alt.)
  - Snap-on Cap (Mom. & Alt.)
- **Pretravel:** .028” (0.71mm)
- **Overtravel:** .043” (1.09mm)
- **Total Travel:** .071” (1.80mm)

### Materials & Finishes
- **Plunger:** Brass w/nickel plating; polyacetal w/B1 bushing
- **Frame:** Stainless steel
- **Movable Contactor:** Phosphor bronze with silver or gold plating
- **Movable Contacts:** Silver alloy (code W); copper with gold plating (code G); or silver alloy with gold plating (code A)
- **Stationary Contacts:** Silver with silver plating (code W); copper or brass with gold plating (code G); or silver with gold plating (code A)
- **Terminals:** Copper or brass with silver plating; copper or brass with gold plating

### Environmental Data
- **Operating Temp 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)
- **Sealing:** B3 & D3 bushing options equivalent to IP67

### Installation
- **Mounting Torque:** 1.5Nm (13.0 lb•in) for double nut; 0.7Nm (6.0 lb•in) for single nut
- **Cap Installation Force:** 80.0N (18.0 lbf) maximum downward force on actuator
- **Soldering Time & Temp:** Wave Soldering (PC version): See Profile A in Supplement section.
  Manual Soldering: See Profile A in Supplement section.
- **Process Seal:** These devices are not process sealed. Hand clean locally using alcohol based solution.

### Standards & Certifications
- **Flammability Standards:** UL94V-0 case
- **UL:** File No. E44145 - Recognized only when ordered with marking on switch.
  Add “/U” or “/CUL” before dash in part number to order UL recognized switch.
  All models recognized at 6A @ 125V AC or 3A @ 250V AC or 0.4VA max. @ 28V DC max.
- **CSA:** File No. 023535_0_000 - Certified only when ordered with marking on switch.
  Add “/C” before dash in part number to order CSA certified switch.
  All models certified at 6A @ 125V AC or 3A @ 250V AC or 0.4VA max. @ 28V max.
Distinctive Characteristics

Guide interlocked with actuator block prevents window locking and maintains correct plunger alignment to assure contact stability.

Employs an over-center actuator mechanism, which diminishes sparking and increases operating life in AC circuits.

High torque bushing construction prevents rotation or separation from frame during installation.

Splashproof option (D3 and B3 bushing codes) features an o-ring within the bushing and one under the face nut to protect from splashed, sprayed, or spilled liquids.

High insulating barriers, formed in the molded diallyl phthalate case, increase isolation of circuits in multipole devices.

Prominent external insulating barriers increase insulation resistance and dielectric strength.

Epoxy sealed terminals prevent entry of solder flux and other contaminants.

Clinching of the frame to the case well above the base and terminals provides 1,500V dielectric strength.
Series MB2000

Bushing Mount Miniature Pushbuttons

TYPICAL SWITCH ORDERING EXAMPLE

<table>
<thead>
<tr>
<th>MB 2011</th>
<th>S</th>
<th>S1</th>
<th>W 01</th>
<th>C</th>
<th>A</th>
</tr>
</thead>
</table>

**Poles & Circuits**
- MB2011 SPDT ON (ON)
- MB2065 SPDT ON ON
- MB2061 DPDT ON (ON)
- MB2085 DPDT ON ON
- MB2181 4PDT ON (ON)
- MB2185 4PDT ON ON

**Contact Materials & Ratings**
- **W** Silver
  - Rated 6A @ 125V AC & 3A @ 250V AC
- **G** Gold
  - Rated 0.4VA max @ 28V AC/DC max
  - Gold over Silver
  - Rated 6A @ 125V AC & 0.4VA max @ 28V AC/DC max

**Caps**
- **B** .315” (8.0mm) Diameter
- **C** .394” (10.0mm) Diameter

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

**Plunger Types**
- **S** Plunger for Screw-on Caps
- **L** Plunger for Snap-on Caps

**Bushings**
- **S1** .335” (8.5mm)
  - Threaded with Keyway
- **S2** .335” (8.5mm)
  - Smooth with Keyway
- **S4** .335” (8.5mm)
  - Metric Threaded with Keyway
- **D1** .335” (8.5mm)
  - Threaded with D-Flat
- **D3** .335” (8.5mm)
  - Threaded Splashproof without Keyway

**Terminals**
- **01** Solder Lug
- **02** Quick Connect
- **03** .250” (6.35mm) Straight PC
- **05** .425” (10.8mm) Wirewrap
- **06** .750” (19.05mm) Wirewrap
- **07** .964” (24.5mm) Wirewrap
- **08** 1.062” (27.0mm) Wirewrap

**IMPORTANT:**
Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA recognized only when ordered with marking on the switch. Specific models, ratings, & ordering instructions are noted on the General Specifications page.

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

MB2011SS1W01-CA

- Black .394” (10.0mm) Diameter Cap
- Plunger for Screw-on Caps
- .335” (8.5mm) Threaded Bushing with Keyway
- Silver Contacts with 6-Amp Rating
- Solder Lug Terminals
## POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2011</td>
<td>ON</td>
<td>(ON)</td>
<td>2-3 2-1</td>
<td>SPDT</td>
</tr>
<tr>
<td></td>
<td>MB2065</td>
<td>ON</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td>MB2061</td>
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<td>(ON)</td>
<td>2-3 5-6 2-1 5-4</td>
<td>DPDT</td>
</tr>
<tr>
<td></td>
<td>MB2085</td>
<td>ON</td>
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<td></td>
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<tr>
<td>4P</td>
<td>MB2181</td>
<td>ON</td>
<td>(ON)</td>
<td>2-3 5-6 8-9 11-12</td>
<td>4PDT</td>
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<tr>
<td></td>
<td>MB2185</td>
<td>ON</td>
<td>ON</td>
<td>8-7 11-10</td>
<td></td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

---

## PLUNGER TYPES

On alternate action models, after transferring circuit, the plunger returns to its original position and does not latch down.

### Plunger for Screw-on Caps

<table>
<thead>
<tr>
<th>Momentary Plunger Length</th>
<th>Momentary Cap Location</th>
<th>Alternate Plunger Length</th>
<th>Alternate Cap Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.9</td>
<td>1.18</td>
<td>2.9</td>
<td>1.18</td>
</tr>
<tr>
<td>3.0</td>
<td>1.15</td>
<td>3.0</td>
<td>1.15</td>
</tr>
<tr>
<td>2.85</td>
<td>1.04</td>
<td>2.85</td>
<td>1.04</td>
</tr>
<tr>
<td>2.85</td>
<td>1.04</td>
<td>2.85</td>
<td>1.04</td>
</tr>
</tbody>
</table>

### Plunger for Snap-on Caps

<table>
<thead>
<tr>
<th>Momentary &amp; Alternate Plunger Length</th>
<th>Momentary &amp; Alternate Cap Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.85</td>
<td>1.04</td>
</tr>
<tr>
<td>2.85</td>
<td>1.04</td>
</tr>
</tbody>
</table>
BUSHINGS

**S1** .335” (8.5mm) Threaded with Keyway

**S2** .335” (8.5mm) Smooth with Keyway

**S4** .335” (8.5mm) Metric Threaded with Keyway

Maximum Panel Thickness with Standard Hardware: .154” (3.9mm)

**D1** .335” (8.5mm) Threaded with D Flat

**D3** .335” (8.5mm) Threaded Splashproof without Keyway

Maximum Panel Thickness with Standard Hardware: .154” (3.9mm)

Panel Cutouts

For S1, S2, or S4 Bushing with Keyway

For S1 or S4 Bushing with Optional Locking Ring

For D1 Bushing with D Flat

For D3 Bushing without Keyway

Standard hardware for bushings S1, S4, & D1 includes 2 hex nuts & 1 lockwasher; D3 bushing has 1 hex nut & 1 o-ring. Standard & optional hardware are illustrated following the Typical Switch Dimension drawings.

CONTACT MATERIALS & RATINGS

<table>
<thead>
<tr>
<th>Material</th>
<th>Power Level or Logic Level</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver over Silver</td>
<td>Power Level</td>
<td>6A @ 125V AC &amp; 3A @ 250V AC</td>
</tr>
<tr>
<td>Gold over Brass or Copper</td>
<td>Logic Level</td>
<td>0.4VA maximum @ 28V AC/DC maximum</td>
</tr>
<tr>
<td>Gold over Silver</td>
<td>Power Level or Logic Level</td>
<td>6A @ 125V AC &amp; 3A @ 250V AC or 0.4VA maximum @ 28V AC/DC maximum</td>
</tr>
</tbody>
</table>

Note: Complete explanation of operating range in Supplement section.

Note: This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section for complete explanation of dual rating and operating range.
## Bushing Mount Miniature Pushbuttons

### Series MB2000

#### TERMINALS

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Solder Lug</td>
<td>.016&quot; (0.41mm) Width, 0.031&quot; (0.79mm) Diameter</td>
</tr>
<tr>
<td>02</td>
<td>.062” (1.57mm) Wide Quick Connect</td>
<td>.079&quot; (2.03mm) Diameter</td>
</tr>
<tr>
<td>03</td>
<td>.250” (6.35mm) Straight PC</td>
<td>.085&quot; (2.16mm) Diameter</td>
</tr>
<tr>
<td>05</td>
<td>.425” (10.8mm) Wirewrap or Extended PC</td>
<td>.189&quot; (4.80mm) Diameter</td>
</tr>
<tr>
<td>06</td>
<td>.750” (19.05mm) Wirewrap or Extended PC</td>
<td>.250&quot; (6.35mm) Diameter</td>
</tr>
<tr>
<td>07</td>
<td>.964” (24.5mm) Wirewrap or Extended PC</td>
<td>.315&quot; (8.00mm) Diameter</td>
</tr>
<tr>
<td>08</td>
<td>1.062” (27.0mm) Wirewrap or Extended PC</td>
<td>.394&quot; (10.00mm) Diameter</td>
</tr>
</tbody>
</table>

#### CAPS & CAP COLORS

- **B** AT413 .315” (8.00mm) Diameter Screw-on Cap
  - Cap Material: PBT
  - Finish: Glossy
  - For use with Plunger Code S

- **C** AT443 .315” (8.00mm) Diameter Snap-on Cap
  - Cap Material: Polycarbonate
  - Finish: Glossy
  - For use with Plunger Code L

- **C** AT407 .394” (10.00mm) Diameter Screw-on Cap
  - Cap Material: PBT
  - Finish: Glossy
  - For use with Plunger Code S

- **C** AT442 .394” (10.00mm) Diameter Snap-on Cap
  - Cap Material: Polycarbonate
  - Finish: Glossy
  - For use with Plunger Code L

Cap Colors Available: A Black, B White, C Red, E Yellow, F Green, G Blue, H Gray
TYPICAL SWITCH DIMENSIONS

**Solder Lug**

**Single Pole**

**Double Pole**

**Four Pole**

MB2011SS1W01-CA

MB2061SS1W01-CA

MB2181SS1W01-CA
**HARDWARE**

### Standard Hardware

- **AT513** for Inch
- **AT513M** for Metric
- **Hexagon Nut**
  - 2 included with each switch (1 with splashproof models)
  - Material: Brass with Nickel plating

- **AT509** Lockwasher
  - 1 included with each switch (not with splashproof models)
  - Material: Steel with Zinc/Chromate

### Optional Hardware

- **AT516** O-ring for Splashproof Bushing
  - 1 included with each splashproof model
  - Material: Nitrile butadiene rubber

- **AT507** for Inch
- **AT507M** for Metric
  - Locking Ring
  - Material: Steel with Zinc/Chromate

### Optional Mounting Collars/Conical Nuts

- **AT512** for Inch
- **AT512M** for Metric
  - Conical Nut
  - Used with .315" (8.0mm) Diameter Cap (cap code B)
  - Material: Brass with chrome plating

- **AT512CH** for Inch
- **AT512CM** for Metric
  - Conical Nut
  - Used with .394" (10.0mm) Diameter Cap (cap code C)
  - Material: Brass with chrome plating

### Optional Splashproof Boots for S Plunger

- **AT4041** for Inch
- **AT4041M** for Metric
  - Boot for Momentary
  - Material: Silicone rubber

- **AT4042** for Inch
- **AT4042M** for Metric
  - Boot for Alternate
  - Material: Silicone rubber

---

**Dimension A = Cap Height**

- .091” (2.3mm) for Momentary with Plunger Code S
- .157” (4.0mm) for Alternate with Plunger Code S
- .142” (3.6mm) for Momentary & Alternate with Plunger Code L

Optional Conical Nuts fit with all 8.5mm bushing options except the D3 & S2 bushings.

**Operating Life**

- **100,000** for Momentary
- **30,000** for Alternate

Boots for momentary devices are accompanied by a threaded adaptor which extends the length of the plunger.
## TYPICAL SWITCH ORDERING EXAMPLE

**MB** 2011 **S** **S2** **G** 13 — **C** **A**

### Poles & Circuits

<table>
<thead>
<tr>
<th>Number</th>
<th>Setting</th>
<th>Contact Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>SPDT</td>
<td>ON (ON)</td>
</tr>
<tr>
<td>2065</td>
<td>SPDT</td>
<td>ON ON</td>
</tr>
<tr>
<td>2061</td>
<td>DPDT</td>
<td>ON (ON)</td>
</tr>
<tr>
<td>2085</td>
<td>DPDT</td>
<td>ON ON</td>
</tr>
<tr>
<td>2181</td>
<td>4PDT</td>
<td>ON (ON)</td>
</tr>
<tr>
<td>2185</td>
<td>4PDT</td>
<td>ON ON</td>
</tr>
</tbody>
</table>

( ) = Momentary

4-pole not for use with right angle terminals

### Contact Materials & Ratings

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
<th>Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>Silver</td>
<td>Rated 6A @ 125V AC &amp; 3A @ 250V AC</td>
</tr>
<tr>
<td>G</td>
<td>Gold</td>
<td>Rated 0.4VA max @ 28V AC/DC max</td>
</tr>
<tr>
<td>A</td>
<td>Gold over Silver</td>
<td>Rated 6A @ 125V AC &amp; 0.4VA max @ 28V AC/DC max</td>
</tr>
</tbody>
</table>

### Bushings

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2</td>
<td>.335” (8.5mm) Smooth with Keyway</td>
</tr>
<tr>
<td>S1</td>
<td>.335” (8.5mm) Threaded with Keyway</td>
</tr>
<tr>
<td>A2</td>
<td>.200” (5.08mm) Smooth with Keyway Only Available in Part Numbers MB2011SA2G31 &amp; MB2011SA2W31</td>
</tr>
</tbody>
</table>

### Caps

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>.315” (8.0mm) Diameter</td>
</tr>
<tr>
<td>C</td>
<td>.394” (10.0mm) Diameter</td>
</tr>
</tbody>
</table>

### Cap Colors

<table>
<thead>
<tr>
<th>Letter</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Black</td>
</tr>
<tr>
<td>B</td>
<td>White</td>
</tr>
<tr>
<td>C</td>
<td>Red</td>
</tr>
<tr>
<td>E</td>
<td>Yellow</td>
</tr>
<tr>
<td>F</td>
<td>Green</td>
</tr>
<tr>
<td>G</td>
<td>Blue</td>
</tr>
<tr>
<td>H</td>
<td>Gray</td>
</tr>
</tbody>
</table>

### Terminals

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>.250” (6.35mm) Straight PC with Bracket</td>
</tr>
<tr>
<td>40</td>
<td>.150” (3.81mm) Vertical PC</td>
</tr>
<tr>
<td>45</td>
<td>.100” (2.54mm) Vertical PC</td>
</tr>
<tr>
<td>30</td>
<td>Right Angle PC with .646” (16.4mm) Support to Terminals Available in 1- &amp; 2-pole only</td>
</tr>
<tr>
<td>31</td>
<td>Right Angle PC with .500” (12.7mm) Support to Terminals Available in 1-pole only</td>
</tr>
</tbody>
</table>

### IMPORTANT:

Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA recognized only when ordered with marking on the switch. Specific models, ratings, & ordering instructions are noted on the General Specifications page.

---

**DESCRIPTION FOR TYPICAL ORDERING EXAMPLE**

MB2011SS2G13-CA

- Black .394” (10.0mm) Diameter Cap
- .335” (8.5mm) Smooth Bushing with Keyway
- Gold Contacts with 0.4VA Rating
- SPDT ON-(ON) Circuit
- .250” (6.35mm) Straight PC Terminals with Bracket
POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal Keyway</th>
<th>Plunger Position ( ) = Momentary</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2011</td>
<td>ON</td>
<td>2-3</td>
<td>2-1 SPDT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MB2065</td>
<td>ON</td>
<td>(ON)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td>MB2061</td>
<td>ON</td>
<td>2-3 5-6</td>
<td>2-1 5-4 DPDT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MB2085</td>
<td>ON</td>
<td>(ON)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4P</td>
<td>MB2181</td>
<td>ON</td>
<td>2-3 5-6 8-9 11-12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MB2185</td>
<td>ON</td>
<td>(ON)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

PLUNGER TYPE

On alternate action models, after transferring circuit, the plunger returns to its original position and does not latch down.

S
Plunger for Screw-on Caps

S2 .335” (8.5mm) Smooth with Keyway
S1 .335” (8.5mm) Threaded with Keyway
A2 .200” (5.08mm) Smooth with Keyway

BUSHINGS

S2 .335” (8.5mm) Smooth with Keyway
S1 .335” (8.5mm) Threaded with Keyway
A2 .200” (5.08mm) Smooth with Keyway

Standard hardware: 2 hex nuts (AT513H) & 1 lockwasher (AT509)
Optional hardware: Locking ring (AT507)

Only available in part numbers MB2011SA2W31 & MB2011SA2G31

Panel Cutouts

For S2, S1, or A2 Bushing with Keyway
With Optional Locking Ring
Maximum Panel Thickness with Standard Hardware: .154” (3.9mm)
Series MB2000
Bracket PC Mount Miniature Pushbuttons

CONTACT MATERIALS & RATINGS

<table>
<thead>
<tr>
<th>Letter</th>
<th>Contact Material/Level</th>
<th>Power Level</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>Silver over Silver</td>
<td>6A @ 125V AC &amp; 3A @ 250V AC</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Gold over Brass or Copper</td>
<td>Logic Level</td>
<td>0.4VA maximum @ 28V AC/DC maximum</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note: Complete explanation of operating range in Supplement section.</td>
</tr>
<tr>
<td>A</td>
<td>Gold over Silver</td>
<td>6A @ 125V AC &amp; 3A @ 250V AC or 0.4VA maximum @ 28V AC/DC maximum</td>
<td>Note: This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section for complete explanation of dual rating and operating range.</td>
</tr>
</tbody>
</table>

TERMINALS

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>.250” (6.35mm) Straight PC with Bracket</td>
</tr>
<tr>
<td>40</td>
<td>.150” (3.81mm) Vertical PC</td>
</tr>
<tr>
<td>45</td>
<td>.100” (2.54mm) Vertical PC</td>
</tr>
<tr>
<td>30</td>
<td>Right Angle PC with .646” (16.4mm) Support to Terminal</td>
</tr>
<tr>
<td>31</td>
<td>Right Angle PC with .500” (12.7mm) Support to Terminal</td>
</tr>
</tbody>
</table>

CAPS & CAP COLORS

<table>
<thead>
<tr>
<th>Letter</th>
<th>Cap Material</th>
<th>Cap Color</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>PBT</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cap Diameter: .315” (8.0mm)</td>
<td>Screw-on Cap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cap Material: PBT</td>
<td>Finish: Glossy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AT413</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>PBT</td>
<td>Red</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cap Diameter: .394” (10.0mm)</td>
<td>Screw-on Cap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cap Material: PBT</td>
<td>Finish: Glossy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AT407</td>
<td></td>
</tr>
</tbody>
</table>

Cap Colors Available: A Black, B White, C Red, E Yellow, F Green, G Blue, H Gray

Note: Full dimensioned drawings appear on the following pages.
TYPICAL SWITCH DIMENSIONS

Single Pole

Straight PC with Bracket

Double Pole

Straight PC with Bracket

Four Pole

Straight PC with Bracket

Keyway

MB2011SS2G13-CA

MB2061SS2G13-CA

MB2181SS2G13-CA
### Series MB2000
Bracket PC Mount Miniature Pushbuttons

#### TYPICAL SWITCH DIMENSIONS

<table>
<thead>
<tr>
<th>.150&quot; (3.81mm) Vertical PC</th>
<th>Single Pole</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="MB2011SS2G40-CA.png" alt="Image" /></td>
<td><img src="MB2061SS2G40-CA.png" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>.150&quot; (3.81mm) Vertical PC</th>
<th>Double Pole</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="MB2011SS2G40-CA.png" alt="Image" /></td>
<td><img src="MB2061SS2G40-CA.png" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>.150&quot; (3.81mm) Vertical PC</th>
<th>Four Pole</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="MB2181SS2G40-CA.png" alt="Image" /></td>
<td><img src="MB2181SS2G40-CA.png" alt="Image" /></td>
</tr>
</tbody>
</table>

Note: Dimensions are in inches and millimeters. For detailed specifications, refer to the NKK Switches website.

**Series MB2000**

**Bracket PC Mount Miniature Pushbuttons**

**TYPICAL SWITCH DIMENSIONS**

<table>
<thead>
<tr>
<th>.150&quot; (3.81mm) Vertical PC</th>
<th>Single Pole</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="MB2011SS2G40-CA.png" alt="Image" /></td>
<td><img src="MB2061SS2G40-CA.png" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>.150&quot; (3.81mm) Vertical PC</th>
<th>Double Pole</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="MB2011SS2G40-CA.png" alt="Image" /></td>
<td><img src="MB2061SS2G40-CA.png" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>.150&quot; (3.81mm) Vertical PC</th>
<th>Four Pole</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="MB2181SS2G40-CA.png" alt="Image" /></td>
<td><img src="MB2181SS2G40-CA.png" alt="Image" /></td>
</tr>
</tbody>
</table>

Note: Dimensions are in inches and millimeters. For detailed specifications, refer to the NKK Switches website.
TYPICAL SWITCH DIMENSIONS

Single Pole

.100” (2.54mm) Vertical PC

MB2011SS2G45-CA

Double Pole

.100” (2.54mm) Vertical PC

MB2061SS2G45-CA

Four Pole

.100” (2.54mm) Vertical PC

MB2181SS2G45-CA
Series MB2000
Bracket PC Mount Miniature Pushbuttons

TYPICAL SWITCH DIMENSIONS

Right Angle PC

Single Pole

MB2011SS2G30-CA

Right Angle PC

Double Pole

MB2061SS2G30-CA

Right Angle PC

with .500” (12.7mm) Support to Terminal

Single Pole

MB2011SA2G31-CA
**TYPICAL SWITCH ORDERING EXAMPLE**

```
MB  2011  S  B1  W  01  —  D  A
```

**Poles & Circuits**
- 2011: SPDT ON (ON)
- 2065: SPDT ON ON
- 2061: DPDT ON (ON)
- 2085: DPDT ON ON
- 2181: 4PDT ON (ON)
- 2185: 4PDT ON ON

**Contact Materials & Ratings**
- **W**: Silver
  - Rated 6A @ 125V AC & 3A @ 250V AC
- **G**: Gold
  - Rated 0.4VA max @ 28V AC/DC max

**Caps**
- B: .315” (8.0mm) Diameter
- C: .394” (10.0mm) Diameter
- D: .520” (13.2mm) Diameter
- E: .748” (19.0mm) Diameter

**Caps**

**Cap Colors**
- A: Black
- B: White
- C: Red
- D: Amber
- E: Yellow
- F: Green
- G: Blue
- H: Gray

*Not available with cap code E*

**Bushing**
- B1: .472” (12.0mm) Threaded with Keyway
- B3: .472” (12.0mm) Threaded w/Splashproof

**Contact Materials & Ratings**
- **W**: Silver
  - Rated 6A @ 125V AC & 3A @ 250V AC
- **G**: Gold
  - Rated 0.4VA max @ 28V AC/DC max

**Terminals**
- 01: Solder Lug
- 02: Quick Connect
- 03: .250” (6.35mm) Straight PC
- 05: .425” (10.8mm) Wirewrap
- 06: .750” (19.05mm) Wirewrap
- 07: .964” (24.5mm) Wirewrap
- 08: 1.062” (27.0mm) Wirewrap

**IMPORTANT:**

Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA recognized only when ordered with marking on the switch. Specific models, ratings, & ordering instructions are noted on the General Specifications page.

**DESCRIPTION FOR TYPICAL ORDERING EXAMPLE**

**MB2011SB1W01-DA**

- **Black .520” (13.2mm) Diameter Cap**
- **.472” (12.0mm) Diameter Cap**
- **Plunger for Screw-on Caps**
- **.472” (12.0mm) Diameter**
- **Threaded with Keyway**
- **Silver Contacts with 6-Amp Rating**
- **SPDT ON-(ON) Circuit**
- **Solder Lug Terminals**
Series MB2000
Large Bushing Miniature Pushbuttons

POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal Keyway</th>
<th>Down</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2011</td>
<td>ON</td>
<td>(ON)</td>
<td>2-3  2-1</td>
<td>SPDT</td>
</tr>
<tr>
<td></td>
<td>MB2065</td>
<td>ON</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td>MB2061</td>
<td>ON</td>
<td>(ON)</td>
<td>2-3  5-6</td>
<td>DPDT</td>
</tr>
<tr>
<td></td>
<td>MB2085</td>
<td>ON</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4P</td>
<td>MB2181</td>
<td>ON</td>
<td>(ON)</td>
<td>2-3  5-6  8-9 11-12</td>
<td>4PDT</td>
</tr>
<tr>
<td></td>
<td>MB2185</td>
<td>ON</td>
<td>ON</td>
<td>2-1  5-4  8-7 11-10</td>
<td></td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

PLUNGER TYPE

S: Plunger for Screw-on Caps
Plunger is plastic for B1 bushing.

On alternate action models, after transferring circuit, the plunger returns to its original position, and does not latch down.

BUSHINGS

B1: .472" (12.0mm) Diameter Threaded with Keyway
Maximum Panel Thickness with Standard Hardware: .217" (5.5mm)

B3: .472" (12.0mm) Diameter Threaded Splashproof
Maximum Panel Thickness with Standard Hardware: .217" (5.5mm)

CONTACT MATERIALS & RATINGS

W: Silver over Silver
Power Level 6A @ 125V AC & 3A @ 250V AC

G: Gold over Brass or Copper
Logic Level 0.4VA maximum @ 28V AC/DC maximum

Note: Complete explanation of operating range in Supplement section.

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Series MB2000

Large Bushing Miniature Pushbuttons

TERMINALS

01  Solder Lug

02  .062” (1.57mm) Wide Quick Connect

03  .250” (6.35mm) Straight PC

04  .250” (6.35mm) Rocker

05  .425” (10.8mm) Wirewrap or Extended PC

06  .750” (19.05mm) Wirewrap or Extended PC

07  .964” (24.5mm) Wirewrap or Extended PC

08  1.062” (27.0mm) Wirewrap or Extended PC

CAPS & CAP COLORS

B AT078 .315” (8.0mm) Diameter Screw-on Cap

C AT079 .394” (10.0mm) Diameter Screw-on Cap

D AT414 .520” (13.2mm) Diameter Screw-on Cap

E AT412 .748” (19.0mm) Diameter Screw-on Cap

Material: Polystyrene
Finish: Glossy
Colors Available: A B C E F G H

Material: Polystyrene
Finish: Glossy
Colors Available: A B C E F G H

Material: PBT
Finish: Glossy
Colors Available: A B C E F G H

Material: Polystyrene
Finish: Glossy
Colors Available: A B C F

Cap Color Codes: A Black  B White  C Red  D Amber  E Yellow  F Green  G Blue  H Gray

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Series MB2000

Large Bushing Miniature Pushbuttons

TYPICAL SWITCH DIMENSIONS

Solder Lug

Single Pole

Keyway

Double Pole

Keyway

Four Pole

MB2011SB1W01-DA

MB2061SB1W01-DA

MB2181SB1W01-DA

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**Large Bushing Miniature Pushbuttons**  
**Series MB2000**

### HARDWARE

**Standard Hardware for B1 Bushing**

- **AT503M**  
  Hex Face Nut  
  Material:  
  Brass with Chrome plating

- **AT508**  
  Lockwasher  
  Material:  
  Steel with Zinc/Cromate

- **AT527M**  
  Hex Nut  
  Material:  
  Steel with Nickel plating

- **AT506M**  
  Locking Ring  
  Material:  
  Steel with Zinc/Cromate

**Standard Hardware for B3 Bushing**

- **AT503M**  
  Hex Face Nut  
  Material:  
  Brass with Chrome plating

- **AT401P**  
  O-ring  
  Material:  
  Nitrile butadiene rubber

**Optional Splashproof Boot for B1 Bushing**

- **AT4043**  
  Splashproof Boot  
  Material:  
  Silicone Rubber  
  Operating Life:  
  10,000 for momentary  
  30,000 for alternate action

When using a splashproof boot, no cap is required.
The MB2000 pushbutton series offers flexibility to accommodate a variety of applications. Using a basic large bushing model, different accessories can be assembled onto the switch to achieve the mounting variations shown on the following two pages.

These switches have:
- 12mm diameter threaded bushing with keyway
- Silver contacts
- 6-Amp rating
- Solder lug terminals

Other 12mm bushing options can be used; see details in preceding Large Bushing Ordering tables.

**CUSTOM ASSEMBLY ORDERING EXAMPLE**

**Poles & Circuits**

<table>
<thead>
<tr>
<th>Model</th>
<th>Poles</th>
<th>Circuits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>SPDT</td>
<td>ON (ON)</td>
<td></td>
</tr>
<tr>
<td>2065</td>
<td>SPDT</td>
<td>ON ON</td>
<td></td>
</tr>
<tr>
<td>2061</td>
<td>DPDT</td>
<td>ON (ON)</td>
<td></td>
</tr>
<tr>
<td>2085</td>
<td>DPDT</td>
<td>ON ON</td>
<td></td>
</tr>
</tbody>
</table>

4-pole available

( ) = Momentary

**Mounter Shapes For Shroud**

<table>
<thead>
<tr>
<th>Model</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Round</td>
</tr>
<tr>
<td>5</td>
<td>Rectangular</td>
</tr>
</tbody>
</table>

**Cap Colors For Shroud**

<table>
<thead>
<tr>
<th>Color</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Black</td>
</tr>
<tr>
<td>B</td>
<td>White</td>
</tr>
<tr>
<td>C</td>
<td>Red</td>
</tr>
<tr>
<td>F</td>
<td>Green</td>
</tr>
<tr>
<td>G</td>
<td>Blue</td>
</tr>
<tr>
<td>H</td>
<td>Gray</td>
</tr>
</tbody>
</table>

**Mounter Colors For Shroud**

<table>
<thead>
<tr>
<th>Color</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Black</td>
</tr>
<tr>
<td>B</td>
<td>White</td>
</tr>
<tr>
<td>C</td>
<td>Red</td>
</tr>
<tr>
<td>H</td>
<td>Gray</td>
</tr>
</tbody>
</table>

**Cap Colors For Snap-In**

<table>
<thead>
<tr>
<th>Color</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Black</td>
</tr>
<tr>
<td>B</td>
<td>White</td>
</tr>
<tr>
<td>C</td>
<td>Red</td>
</tr>
<tr>
<td>F</td>
<td>Green</td>
</tr>
</tbody>
</table>

**Round Shroud**

MB2011SB1W01-4C-A

**Rectangular Shroud**

MB2011SB1W01-5C-A

See custom assemblies on following pages.
Large Bushing Miniature Pushbuttons

Series MB2000

Mounter Shapes for Shrouds

4  AT455 Round
   Material: Polycarbonate
   Colors: A B H

5  AT453 Rectangular
   Material: Polycarbonate
   Colors: A B H

Caps & Cap Colors for Shrouds

AT454 Round Insert Cap
   Material: Polycarbonate
   Colors: A B C F G H

AT452 Rectangular Insert Cap
   Material: Polycarbonate
   Colors: A B C F G H

AT080 Screw Adaptor for Insert Caps
   Material: Brass

Color Codes:

A  Black  B  White  C  Red  F  Green  G  Blue  H  Gray
Series MB2000
Large Bushing Miniature Pushbuttons

CUSTOM ASSEMBLY WITH ROUND SHROUD

MB2011SB1W01-4C-A

Single Pole

MB2011SB1W01-5C-A

Double Pole

Effective Panel Thickness:
.217” (5.5mm) maximum

CUSTOM ASSEMBLY WITH RECTANGULAR SHROUD

Effective Panel Thickness:
.217” (5.5mm) maximum
General Specifications

Electrical Capacity (Resistive Load)

- **Power Level (silver):** 3A @ 125V AC
- **Logic Level (gold):** 0.4VA maximum @ 28V AC/DC maximum (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
- **Logic/Power Level:** Combines silver & gold ratings

Note: Find additional explanation of dual rating & operating range in Supplement section.

Other Ratings

- **Contact Resistance:** 20 milliohms maximum for silver; 30 milliohms maximum for gold
- **Insulation Resistance:** 1,000 megohms minimum @ 500V DC
- **Dielectric Strength:** 1,000V AC minimum between contacts for 1 minute minimum; 1,500V AC minimum between contacts & case for 1 minute minimum
- **Mechanical Life:** 200,000 operations minimum
- **Electrical Life:** 25,000 operations minimum for silver; 100,000 operations minimum for gold
- **Nominal Operating Force:** Single pole 2.45N; double pole 3.92N
- **Travel:** Pretravel .024" (0.6mm); Overtravel .016" (0.4mm); Total Travel .039" (1.0mm)

Materials & Finishes

- **Plunger:** Brass with nickel plating
- **Bushing:** Brass with nickel plating
- **Frame:** Stainless steel
- **Case:** Polybutylene terephthalate (PBT) (UL94V-0)
- **Base:** Diallyl phthalate resin (UL94V-0)
- **Movable Contactor:** Phosphor bronze with silver or gold plating
- **Movable Contacts:** Silver alloy (code W); copper with gold plating (code G); or silver alloy with gold plating (code A)
- **Stationary Contacts:** Silver alloy with silver plating (code W); copper or brass with gold plating (code G); or silver with gold plating (code A)
- **Terminals:** Copper or brass with silver plating; copper or brass with gold plating

Environmental Data

- **Operating Temp 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 3 shocks in each direction)

Installation

- **Mounting Torque:** 1.5Nm (13.0 lb-in) for double nut; 0.7Nm (6.0 lb-in) for single nut
- **Cap Installation Force:** 80.0N (18.0 lbf) maximum downward force on actuator
- **Soldering:** Wave Soldering (PC version): See Profile B in Supplement section.
- **Manual Soldering:** See Profile B in Supplement section.
- **Cleaning:** These devices are not process sealed. Hand clean locally using alcohol based solution.

Standards & Certifications

- **UL:** File No. E44145 - Recognized only when ordered with marking on switch.
- **CSA:** File No. 023535_0_000 - Certified only when ordered with marking on switch.

Cleaning Specifications in Supplement section.

Flammability Standards:

- **UL:** File No. E44145 - Recognized only when ordered with marking on switch.
- **CSA:** File No. 023535_0_000 - Certified only when ordered with marking on switch.

Add “/U” or “/CUL” before dash in part number to order UL recognized switch.

All single and double pole models recognized at 3A @ 125V AC or 0.4VA max. @ 28V DC max.

Add “/C” before dash in part number to order CSA certified switch.

Single pole models with PC, solder lug, or Wirewrap terminals & double pole with PC or Wirewrap terminals certified at 3A @ 125V AC or 0.4VA @ 28V maximum.

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Distinctive Characteristics

Snap-acting mechanism gives smooth actuation, short stroke, light touch, and audible feedback. This mechanism also provides long mechanical life.

High torque bushing construction prevents rotation or separation from frame during installation.

Antijamming design protects contacts from damage due to excessive downward force on the actuator.

Compatible companions with M series toggles. Body, bushing, and footprint dimensions ideal for mounting MB2400 pushbuttons and M toggles next to one another.

Stainless steel frame resists corrosion.

 Longer center solder lug terminal simplifies wiring and soldering.

Silver contacts of specially composed alloy for hardness.

Epoxy sealed terminals prevent entry of solder flux and other contaminants.

Prominent external insulating barriers increase insulation resistance and dielectric strength.
Series MB2400
Snap-Action Bushing Mount Pushbuttons

**TYPICAL SWITCH ORDERING EXAMPLE**

**Caps**
- F .201" (5.1mm) Diameter
- H .295" (7.5mm) Diameter

**Cap Colors**
- A Black
- B White
- C Red

**Bushings**
- E1 .285" (7.24mm) Threaded with D Flat
- E2 .285" (7.24mm) Smooth with D Flat
- A1 .280" (7.1mm) Threaded with Keyway
- A2 .280" (7.1mm) Smooth with Keyway
- S1 .350" (8.9mm) Threaded with Keyway
- S2 .350" (8.9mm) Smooth with Keyway

**Contact Materials & Ratings**
- W Silver Rated 3A @ 125V AC
- G Gold Rated 0.4VA max @ 28V AC/DC max
- A Gold over Silver Rated 3A @ 125V AC & 0.4VA max @ 28V AC/DC max

**Terminals**
- 01 Solder Lug
- 03 .250" (6.35mm) Straight PC
- 05 .425" (10.8mm) Wirewrap
- 06 .750" (19.05mm) Wirewrap
- 07 .964" (24.5mm) Wirewrap

**Important:**
Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA recognized only when ordered with marking on the switch. Specific models, ratings, & ordering instructions are noted on the General Specifications page.

**DESCRIPTION FOR TYPICAL ORDERING EXAMPLE**

**MB2411E1W01-FA**

- Black .201" (5.1mm) Diameter Cap
- .285" (7.24mm) Threaded Bushing with D Flat
- SPDT ON-(ON) Circuit
- Silver Contacts with 3-Amp Rating
- Solder Lug Terminals

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**POLES & CIRCUITS**

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2411</td>
<td>ON</td>
<td>(ON)</td>
<td>1-3 1-2</td>
<td>SPDT</td>
</tr>
<tr>
<td>DP</td>
<td>MB2461</td>
<td>ON</td>
<td>(ON)</td>
<td>1-3 4-6 1-2 4-5</td>
<td>DPDT</td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

**BUSHINGS**

Note: Plunger selection is not required for MB2400 pushbuttons. The plunger can be used with or without a cap.

**E1** .285” (7.24mm) Threaded with D Flat

**A1** .280” (7.1mm) Threaded with Keyway

**S1** .350” (8.9mm) Threaded with Keyway

**E2** .285” (7.24mm) Smooth with D Flat

**A2** .280” (7.1mm) Smooth with Keyway

**S2** .350” (8.9mm) Smooth with Keyway

**Panel Cutouts**

For A1, A2, S1, or S2 Bushing with Keyway

For E1 or E2 Bushing with D Flat

With Optional Locking Ring

Standard hardware includes 2 hex nuts & 1 lockwasher. Hardware is illustrated following the Typical Switch Dimension drawings.
Series MB2400  Snap-Action Bushing Mount Pushbuttons

CONTACT MATERIALS & RATINGS

<table>
<thead>
<tr>
<th>Letter</th>
<th>Material</th>
<th>Power Level</th>
<th>Logic Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>Silver over Silver</td>
<td>3A @ 125V AC</td>
<td>0.4VA maximum @ 28V AC/DC maximum</td>
</tr>
<tr>
<td>G</td>
<td>Gold over Brass or Copper</td>
<td>3A @ 125V AC</td>
<td>0.4VA maximum @ 28V AC/DC maximum</td>
</tr>
</tbody>
</table>

Note: Complete explanation of operating range in Supplement section.

TERMINALS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Wire Wrap or PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Solder Lug</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>.250” (6.35mm)</td>
<td>Straight PC</td>
</tr>
<tr>
<td>05</td>
<td>.425” (10.8mm)</td>
<td>Wirewrap or Extended PC</td>
</tr>
<tr>
<td>06</td>
<td>.750” (19.05mm)</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>.964” (24.5mm)</td>
<td></td>
</tr>
</tbody>
</table>

Caps & Cap Colors

<table>
<thead>
<tr>
<th>Letter</th>
<th>Cap Diameter</th>
<th>Material</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>.201” (5.1mm)</td>
<td>Polyamide</td>
<td>Glossy</td>
</tr>
<tr>
<td>H</td>
<td>.295” (7.5mm)</td>
<td>Polyamide</td>
<td>Glossy</td>
</tr>
</tbody>
</table>

Cap Colors Available: A Black B White C Red
Snap-Action Bushing Mount Pushbuttons

Series MB2400

TYPICAL SWITCH DIMENSIONS

Single Pole

Solder Lug

Double Pole

Solder Lug

HARDWARE

Standard Hardware

AT513H Inch Threaded Hexagon Nut

2 included with each switch

Material:
Brass with Nickel Plating

AT509 Lockwasher

1 included with each switch

Material:
Steel with Zinc/Cromate

Optional Hardware

AT507H Locking Ring for A1 or S1 Bushing

Material:
Steel with Zinc/Cromate

AT515 Locking Ring for E1 Bushing

Material:
Steel with Zinc/Cromate

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# Series MB2400

**Snap-Action Bracket PC Mount Pushbuttons**

## TYPICAL SWITCH ORDERING EXAMPLE

### MB24 11 A2 G 40 – F A

<table>
<thead>
<tr>
<th>Poles &amp; Circuits</th>
<th>Contact Materials &amp; Ratings</th>
<th>Caps</th>
<th>Cap Colors</th>
<th>Bushings</th>
<th>Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 SPDT ON</td>
<td>Silver Rated 3A @ 125V AC</td>
<td>F .201” (5.1mm) Dia.</td>
<td>A Black</td>
<td>A2 .280” (7.1mm) Smooth with Keyway</td>
<td>With Bracket</td>
</tr>
<tr>
<td>61 DPDT ON</td>
<td>Gold Rated 0.4VA max @ 28V AC/DC max</td>
<td>H .295” (7.5mm) Dia.</td>
<td>B White</td>
<td>A1 .280” (7.1mm) Smooth with Keyway</td>
<td>13 .250” (6.35mm) Straight PC with .465” (11.8mm) Bracket</td>
</tr>
<tr>
<td></td>
<td>Gold over Silver Rated 3A @ 125V AC &amp; 0.4VA max @ 28V AC/DC max</td>
<td></td>
<td>C Red</td>
<td>E2 .285” (7.24mm) Smooth with D Flat</td>
<td>15 .425” (10.8mm) Straight PC with .630” (16.0mm) Bracket</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E1 .285” (7.24mm) Threaded with D Flat</td>
<td>17 .964” (24.5mm) Straight PC with 1.150” (29.2mm) Bracket</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S2 .350” (8.9mm) Smooth with Keyway</td>
<td>With Reinforced Bracket</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S1 .350” (8.9mm) Threaded with Keyway</td>
<td>23 .250” (6.35mm) Straight PC with .465” (11.8mm) Bracket</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25 .425” (10.8mm) Straight PC with .630” (16.0mm) Bracket</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>26 .750” (19.05mm) Straight PC with .953” (24.2mm) Bracket</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>With Terminal Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30 Right Angle PC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40 Vertical PC</td>
</tr>
</tbody>
</table>

### IMPORTANT:

Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA recognized only when ordered with marking on the switch. Specific models, ratings, & ordering instructions are noted on the General Specifications page.

### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

**MB2411A2G40-FA**

- .280” (7.1mm) Smooth Bushing with Keyway
- Black .201” (5.1mm) Diameter Cap
- SPDT ON-(ON) Circuit
- Vertical PC Terminals
- Gold Contacts with 0.4VA Rating

![Diagram](image-url)
**Series MB2400**

**POLES & CIRCUITS**

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2411</td>
<td>ON</td>
<td>(ON)</td>
<td>1-3 1-2</td>
<td>SPDT</td>
</tr>
<tr>
<td>DP</td>
<td>MB2461</td>
<td>ON</td>
<td>(ON)</td>
<td>1-3 4-6 1-2 4-5</td>
<td>DPDT</td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

**BUSHINGS**

Note: Plunger selection is not required for MB2400 pushbuttons. The plunger can be used with or without a cap.

**A2**
.280” (7.1mm) Smooth with Keyway

**E2**
.285” (7.24mm) Smooth with D Flat

**S2**
.350” (8.9mm) Smooth with Keyway

**A1**
.280” (7.1mm) Threaded with Keyway

**E1**
.285” (7.24mm) Threaded with D Flat

**S1**
.350” (8.9mm) Threaded with Keyway

Maximum Panel Thickness with Standard Hardware:
- A1: .068” (1.74mm)
- E1: .068” (1.74mm)
- S1: .134” (3.40mm)

**Panel Cutouts**

For A1, A2, S1, or S2 Bushing with Keyway

For E1 or E2 Bushing with D Flat

With Optional Locking Ring

Standard hardware includes 2 hex nuts & 1 lockwasher. Hardware is illustrated following the Typical Switch Dimension drawings.
Series MB2400
Snap-Action Bracket PC Mount Pushbuttons

CONTACT MATERIALS & RATINGS

<table>
<thead>
<tr>
<th></th>
<th>Power Level</th>
<th>Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>W Silver over Silver</td>
<td></td>
<td>3A @ 125V AC</td>
</tr>
<tr>
<td>G Gold over Brass or Copper</td>
<td></td>
<td>Logic Level 0.4VA maximum @ 28V AC/DC maximum</td>
</tr>
</tbody>
</table>

Note: Complete explanation of operating range in Supplement section.

<table>
<thead>
<tr>
<th></th>
<th>Power Level or Logic Level</th>
<th>Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Gold over Silver</td>
<td></td>
<td>3A @ 125V AC or 0.4VA maximum @ 28V AC/DC maximum</td>
</tr>
</tbody>
</table>

Note: This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section for complete explanation of dual rating and operating range.

TERMINALS

Straight PC Mount with Bracket

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Diameter Cap</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>.250&quot; (6.35mm)</td>
<td>.425&quot; (10.8mm) Terminal with .465&quot; (11.8mm) Bracket</td>
</tr>
<tr>
<td>15</td>
<td>.964&quot; (24.5mm)</td>
<td>.630&quot; (16.0mm) Terminal with 1.150&quot; (29.2mm) Bracket</td>
</tr>
</tbody>
</table>

Straight PC Mount with Reinforced Bracket

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Diameter Cap</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>25</td>
<td>.750&quot; (19.05mm)</td>
<td>.630&quot; (16.0mm) Terminal with .953&quot; (24.2mm) Bracket</td>
</tr>
</tbody>
</table>

TERMINALS:

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Diameter Cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>.250&quot; (6.35mm)</td>
</tr>
<tr>
<td>26</td>
<td>.750&quot; (19.05mm)</td>
</tr>
</tbody>
</table>

PCB footprints are on the following Typical Switch Dimension pages.

CAPS & CAP COLORS

<table>
<thead>
<tr>
<th>Caps &amp; Cap Colors</th>
<th>Material: Polyamide</th>
<th>Finish: Glossy</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT475</td>
<td>.201&quot; (5.1mm)</td>
<td>Diameter Cap</td>
</tr>
<tr>
<td>AT496</td>
<td>.295&quot; (7.5mm)</td>
<td>Diameter Cap</td>
</tr>
<tr>
<td>Cap Colors</td>
<td>A Black</td>
<td>B White</td>
</tr>
<tr>
<td></td>
<td>C Red</td>
<td></td>
</tr>
</tbody>
</table>
# TYPICAL SWITCH DIMENSIONS

## Straight PC • Bracket

<table>
<thead>
<tr>
<th>Terminal Code</th>
<th>Terminal Length:</th>
<th>Bracket Length:</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1.150 (29.2mm)</td>
</tr>
</tbody>
</table>

## Straight PC • Reinforced Bracket

<table>
<thead>
<tr>
<th>Terminal Code</th>
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</tr>
<tr>
<td>26</td>
<td>.750 (19.05mm)</td>
<td>.953 (24.2mm)</td>
</tr>
</tbody>
</table>
HARDWARE

Standard Hardware

AT513H Inch Threaded
Hexagon Nut
2 included with each switch
Material:
Brass with Nickel Plating

AT509
Lockwasher
1 included with each switch
Material:
Steel with Zinc/Chromate

Optional Hardware

AT507H
Locking Ring
for A1 or S1 Bushing
Material:
Steel with Zinc/Chromate

AT515
Locking Ring
for E1 Bushing
Material:
Steel with Zinc/Chromate

www.nkkswitches.com
**Series MB2400**  
Snap-Action Snap-in Mount Pushbuttons

**TYPICAL SWITCH**

**MB24**

**Poles & Circuits**

<table>
<thead>
<tr>
<th></th>
<th>SPDT</th>
<th>ON (ON)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

( ) = Momentary

**Contact Materials & Ratings**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>Silver Rated 3A @ 125V AC</td>
</tr>
<tr>
<td>G</td>
<td>Gold Rated 0.4VA max @ 28V AC/DC max</td>
</tr>
<tr>
<td></td>
<td>Gold over Silver Rated 3A @ 125V AC &amp; 0.4VA max @ 28V AC/DC max</td>
</tr>
</tbody>
</table>

**Cap & Cap Colors**

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

**Mounting Frame**

J  Snap-in Frame

**Terminals**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Solder Lug</td>
</tr>
<tr>
<td>03</td>
<td>.250” (6.35mm) Straight PC</td>
</tr>
<tr>
<td>05</td>
<td>.425” (10.8mm) Wirewrap</td>
</tr>
<tr>
<td>06</td>
<td>.750” (19.05mm) Wirewrap</td>
</tr>
<tr>
<td>07</td>
<td>.964” (24.5mm) Wirewrap</td>
</tr>
</tbody>
</table>

**IMPORTANT:**

Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA recognized only when ordered with marking on the switch. Specific models, ratings, & ordering instructions are noted on the General Specifications page.

**DESCRIPTION FOR TYPICAL ORDERING EXAMPLE**

**MB2411JW01-C**

Red Cap  
SPDT ON-(ON) Circuit  
Silver Contacts with 3-Amp Rating  
Snap-in Frame  
Solder Lug Terminals
**Series MB2400**

**Snap-Action Snap-in Mount Pushbuttons**

**ORDERING EXAMPLE**

![Diagram of pushbutton with optional bezels, bezel colors, and LED colors]

<table>
<thead>
<tr>
<th>Optional Bezels</th>
<th>Bezel Colors</th>
<th>LED Colors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bezel without LEDs</td>
<td>A Black</td>
<td>1 LED</td>
</tr>
<tr>
<td>*2 Bezel with 1 Round LED</td>
<td>B White</td>
<td>C Red</td>
</tr>
<tr>
<td>*3 Bezel with 2 Round LEDs</td>
<td>C Red</td>
<td>F Green</td>
</tr>
<tr>
<td>*4 Bezel with 2 Rectangular LEDs</td>
<td>E Yellow</td>
<td>2 LEDs</td>
</tr>
<tr>
<td></td>
<td>F Green</td>
<td>Top LED</td>
</tr>
<tr>
<td></td>
<td>G Blue</td>
<td>C Red</td>
</tr>
<tr>
<td></td>
<td>H Gray</td>
<td>E Yellow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F Green</td>
</tr>
</tbody>
</table>

*Available in Black color only

**DESCRIPTION FOR TYPICAL ORDERING EXAMPLE**

**MB2411JW01-C-3A-CF**

- Red Cap
- Snap-in Frame
- SPDT ON-(ON) Circuit
- Silver Contacts with 3-Amp Rating
- Solder Lug Terminals
- 1 Red LED
- 1 Green LED
- Black Bezel with 2 Round LEDs

Visit www.nkkswitches.com for more information.
Series MB2400
Snap-Action Snap-in Mount Pushbuttons

POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Plunger Position</th>
<th>Connected Terminals</th>
<th>Down</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2411</td>
<td>ON</td>
<td>Normal</td>
<td>1-3</td>
<td>(ON)</td>
<td>SPDT</td>
</tr>
<tr>
<td>DP</td>
<td>MB2461</td>
<td>ON</td>
<td>Normal</td>
<td>1-3 4-6</td>
<td>(ON)</td>
<td>DPDT</td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

MOUNTING FRAME

Panel Thickness without Bezel: .039” ~ .157” (1.0mm ~ 4.0mm)
Panel Thickness with Bezel: .039” ~ .126” (1.0mm ~ 3.2mm)

CONTACT MATERIALS & RATINGS

W
Silver over Silver
Power Level
3A @ 125V AC

G
Gold over Brass or Copper
Logic Level
0.4VA maximum @ 28V AC/DC maximum
Note: Complete explanation of operating range in Supplement section.

A
Gold over Silver
Power Level
3A @ 125V AC
or Logic Level
0.4VA maximum @ 28V AC/DC maximum
Note: This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section for complete explanation of dual rating and operating range.

TERMINALS

01 Solder Lug
03 .250” (6.35mm) Straight PC

05 .425” (10.8mm)
06 .750” (19.05mm)
07 .964” (24.5mm)

Refer to footprints if using as extended PC terminal.
Dimension A = terminal lengths as shown beside the code boxes at left.

www.nkkswitches.com
Snap-Action Snap-in Mount Pushbuttons

Series MB2400

CAP & CAP COLORS

AT465
.453” (11.5mm)
Square Cap

Material: Polycarbonate
Finish: Glossy

Contact factory for matte finish.

Legend details at end of this section.

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

OPTIONAL SNAP-IN BEZELS & BEZEL COLORS

1. AT207 Bezel

Material: Polycarbonate
Finish: Glossy

Contact factory for matte finish.

2. AT208 Bezel

for AT070 LED

Material: Polycarbonate
Finish: Glossy

Contact factory for matte finish.

Black
LED colors & specifications on next page.

A (12.5)mm .492”
B (6.25)mm .246”

3. AT212 Bezel

for AT617 LED

Material: Polycarbonate
Finish: Semi-glossy

Black
LED colors & specifications on next page.

A (18.4)mm .724”

4. AT213 Bezel

for AT618 LED

Material: Polycarbonate
Finish: Semi-glossy

Black
LED colors & specifications on next page.

A (18.4)mm .724”

Bezel Assembly

1. Pry out tab on bezel to a 45° angle.
2. Insert switch frame under tab and snap on the bezel.
3. Push tab back into place.
4. Snap assembled bezel and switch into panel.
**LED COLORS & SPECIFICATIONS**

**Bezel Orientation on Switch**

**AT070 LED**
For Bezel AT208
with 1 LED

**AT617 LED**
For Bezel AT212
with 2 Round LEDs

**AT618 LED**
For Bezel AT213
with 2 Rectangular LEDs

<table>
<thead>
<tr>
<th></th>
<th>AT070</th>
<th>AT617</th>
<th>AT618</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Color</strong></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td><strong>Red</strong></td>
<td>Green</td>
<td>Red</td>
<td>Red</td>
</tr>
<tr>
<td><strong>Green</strong></td>
<td></td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
<tr>
<td><strong>Maximum Forward Current</strong></td>
<td>$I_{FM}$</td>
<td>$I_{FM}$</td>
<td>$I_{FM}$</td>
</tr>
<tr>
<td></td>
<td>25mA</td>
<td>30mA</td>
<td>25mA</td>
</tr>
<tr>
<td><strong>Typical Forward Current</strong></td>
<td>$I_{F}$</td>
<td>$I_{F}$</td>
<td>$I_{F}$</td>
</tr>
<tr>
<td></td>
<td>20mA</td>
<td>20mA</td>
<td>20mA</td>
</tr>
<tr>
<td><strong>Forward Voltage</strong></td>
<td>$V_{F}$</td>
<td>$V_{F}$</td>
<td>$V_{F}$</td>
</tr>
<tr>
<td></td>
<td>2.8V</td>
<td>2.0V</td>
<td>2.2V</td>
</tr>
<tr>
<td><strong>Maximum Reverse Voltage</strong></td>
<td>$V_{RM}$</td>
<td>$V_{RM}$</td>
<td>$V_{RM}$</td>
</tr>
<tr>
<td></td>
<td>4V</td>
<td>5V</td>
<td>5V</td>
</tr>
<tr>
<td><strong>Current Reduction Rate Above 25°C</strong></td>
<td>$\Delta I$</td>
<td>$\Delta I$</td>
<td>$\Delta I$</td>
</tr>
<tr>
<td></td>
<td>0.33 mA/°C</td>
<td>0.40 mA/°C</td>
<td>0.33 mA/°C</td>
</tr>
<tr>
<td><strong>Ambient Temperature Range (when used with a bezel)</strong></td>
<td>$-10° \sim +70°C$</td>
<td>$-15° \sim +70°C$</td>
<td>$-25° \sim +70°C$</td>
</tr>
</tbody>
</table>

*Note: Lead lengths may differ from manufacturing lot to lot. The longer lead is the anode (+).*

The electrical specifications shown are determined at a basic temperature of 25°C. LED circuit is independent of switch operation. LED is colored in OFF state.

If the source voltage is greater than the rated voltage of the LED, a ballast resistor must be connected in series with the LED. The ballast resistor calculation and more lamp detail are shown in the Supplement section.

**TYPICAL SWITCH DIMENSIONS**

**Solder Lug**

**Single Pole**

**Double Pole**

---

MB2411JW01-C
**TYPICAL SWITCH DIMENSIONS**

**Single & Double Pole**

**Solder Lug • AT207 Bezel**

MB2411JW01-C-1A

**Single Pole**

**Solder Lug • AT208 Bezel**

MB2411JW01-C-2A-C

**Double Pole**

**Solder Lug • AT212 Bezel**

MB2411JW01-C-3A-CF

**Solder Lug • AT213 Bezel**

MB2461JW01-C-4A-CF

**Circuit Mark This Side**

- (1.1) x (2.0) Typ
- (4.3) Sq
- 0.043 x 0.079

- (2.0) Typ
- (4.3) Sq
- 0.079 x 0.157

- (4.3) Sq
- 0.118 x 0.236

- (1.1) x (2.0) Typ
- (4.3) Sq
- 0.043 x 0.079

- (2.0) Typ
- (4.3) Sq
- 0.079 x 0.157

- (4.3) Sq
- 0.118 x 0.236

- (1.1) x (2.0) Typ
- (4.3) Sq
- 0.043 x 0.079

- (2.0) Typ
- (4.3) Sq
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- 0.118 x 0.236

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- 0.043 x 0.079

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- (2.0) Typ
- (4.3) Sq
- 0.079 x 0.157

- (4.3) Sq
- 0.118 x 0.236

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- (4.3) Sq
- 0.043 x 0.079

- (2.0) Typ
- (4.3) Sq
- 0.079 x 0.157

- (4.3) Sq
- 0.118 x 0.236
NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Area for Cap

Recommended Print Method:
Screen Print or Pad Print
Epoxy based ink is recommended.

AT465
AT465

Shaded areas are printable areas.
Series MB2500
Snap-Action Pushbuttons

General Specifications

Electrical Capacity (Resistive Load)
- Power Level (code W): 3A @ 125V AC
- Logic Level (code G): 0.4VA maximum @ 28V AC/DC maximum
  (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
- Logic/Power Level (code A): Combines W & G ratings
  Note: See Supplement section to find explanation of operating range.

Other Ratings
- Contact Resistance: 20 milliohms maximum for silver; 30 milliohms maximum for gold
- Insulation Resistance: 1,000 megoohms minimum @ 500V DC
- Dielectric Strength: 1,000V AC minimum between contacts for 1 minute minimum;
  1,500V AC minimum between contacts & case for 1 minute minimum
- Mechanical Life: 200,000 operations minimum
- Electrical Life: 25,000 operations minimum for silver; 100,000 operations minimum for gold
- Nominal Operating Force: Single pole 2.45N; double pole 3.92N
  Travel: Pretravel .024” (0.6mm); Overtravel .016” (0.4mm); Total Travel .039” (1.0mm)

Materials & Finishes
- Plunger: Brass with nickel plating
- Bushing: Brass with nickel plating
- Mounting & Body Frames: Stainless steel
- Support Bracket: Brass with tin plating
- Case: Polybutylene terephthalate (PBT) (UL94V-0)
- Base: Diallyl phthalate resin
- Movable Contactor: Phosphor bronze with silver or gold plating
- Movable Contacts: Silver alloy (code W); copper with gold plating (code G)
- Stationary Contacts: Silver with silver plating (code W); copper or brass with gold plating (code G)
- Terminals: Copper with silver plating; copper or brass with gold plating

Environmental Data
- Operating Temp Range: –30°C through +85°C (–22°F through +185°F)
- Humidity: 90 ~ 95% humidity for 100 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: 1.5Nm (13 lb•in) for double nut; 0.7Nm (6 lb•in) for single nut
- Cap Installation Force: 80N (18 lbf) maximum downward force on actuator

Processing
- Soldering: Wave Soldering Recommended: See Profile B in Supplement section.
- Cleaning: These devices are not process sealed. Hand clean locally using alcohol based solution.

Standards & Certifications
- Flammability Standards: UL94V-0 Case
  UL: File No. E44145 - Recognized only when ordered with marking on switch.
  Add “/U” or “/CUL” before dash in part number to order UL recognized switch.
  All single & double pole models recognized at 3A @ 125V AC or 0.4VA max. @ 28V AC/DC max.
  CSA: File No. 023535_0_000 - Certified only when ordered with marking on switch.
  Add “/C” before dash in part number to order CSA certified switch.
  Single pole & double pole models certified at 3A @ 125V AC or 0.4VA max. @ 28V AC/DC max.
Distinctive Characteristics

Short stroke and light touch.

Antijamming design protects contacts from damage due to excessive downward force on the actuator.

High torque bushing construction prevents rotation or separation from frame during installation.

Stainless steel frame resists corrosion.

Longer center solder lug terminal simplifies wiring and soldering.

Patented silver contacts of specially composed alloy for hardness.

Epoxy sealed terminals prevent entry of solder flux and other contaminants.

Snap-acting mechanism gives smooth actuation and audible feedback.

Prominent external insulating barriers increase insulation resistance and dielectric strength.
Series MB2500

Snap-Action Bushing Mount Pushbuttons

TYPICAL SWITCH ORDERING EXAMPLE

MB25  11  S4  W  01  —  B  C

Poles & Circuits

11  SPDT  ON  (ON)
21  DPDT  ON  (ON)

( ) = Momentary

Contact Materials & Ratings

W  Silver
Rated 3A @ 125V AC

G  Gold
Rated 0.4VA max @ 28V AC/DC max

Bushing

S4  .315” (8.0mm)
Threaded with Keyway

Caps

B  .315” (8.0mm)
Diameter

C  .394” (10.0mm)
Diameter

Caps Colors

A  Black
B  White
C  Red
E  Yellow
F  Green
G  Blue

Terminals

01  Solder Lug

03  .250” (6.35mm)
Straight PC

IMPORTANT:

Switches are supplied without UL, cULus & CSA marking unless specified.
UL, cULus & CSA recognized only when ordered with marking on the switch.
Specific models, ratings, & ordering instructions are noted on the General Specifications page.

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

MB2511S4W01-BC

Red .315” (8.0mm)
Diameter Cap

SPDT  ON-(ON) Circuit

Silver Contacts with 3-Amp Rating

.315” (8.0mm) Threaded Bushing with Keyway

Solder Lug Terminals
Snap-Action Bushing Mount Pushbuttons

**Series MB2500**

**POLES & CIRCUITS**

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal Keyway</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2511</td>
<td>ON (ON)</td>
<td>3-1 3-2</td>
<td>SPDT 3 (COM)</td>
</tr>
<tr>
<td>DP</td>
<td>MB2521</td>
<td>ON (ON)</td>
<td>3-1 6-4 3-2 6-5</td>
<td>DPDT 3 (COM) 6</td>
</tr>
</tbody>
</table>

**Note:** Terminal numbers are not actually on the switch.

**BUSHING**

S4 .315” (8.0mm) Threaded with Keyway

**Panel Cutouts**

- **Without Keyway**
- **With Keyway**
- **With Optional Locking Ring**

Maximum Panel Thickness with Standard Hardware: .134” (3.4mm)

**Standard Hardware**

- AT513M Threaded Hex Nut
- AT509 Lockwasher

2 included with each switch

Brass with nickel plating

**Optional Hardware**

- AT507M Locking Ring

Steel with zinc/chromate

**CONTACT MATERIALS & RATINGS**

<table>
<thead>
<tr>
<th>Silver over Silver</th>
<th>Power Level</th>
<th>3A @ 125V AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold over Brass or Copper</td>
<td>Logic Level</td>
<td>0.4VA maximum @ 28V AC/DC maximum</td>
</tr>
</tbody>
</table>

Note: Complete explanation of operating range in Supplement section.
Series MB2500
Snap-Action Bushing Mount Pushbuttons

TERMINALS

01 Solder Lug

03 .250" (6.35mm) Straight PC

C120
Indicators
Accessories
Supplement
Tactiles
Keylocks
Rotaries
Slides
Tactiles
Tilt
Touch
Supplement
Indicators
www.nkkswitches.com

CAPS & CAP COLORS

B AT443 .315" (8.0mm) Diameter Cap

C AT442 .394" (10.0mm) Diameter Cap

Material: Polycarbonate
Finish: Glossy

Material: Polycarbonate
Finish: Glossy

Cap Colors Available:
A Black
B White
C Red
E Yellow
F Green
G Blue

TYPICAL SWITCH DIMENSIONS

Solder Lug

Single Pole

MB2511S4W01-BC

MB2521S4W01-BC

Solder Lug

Double Pole

Epoxy Seal (2.0) .079
Epoxy Seal (4.0) .157
Thk = (0.8) .031
(1.1) .043
(2.0) .079

Solder Lug Single Pole
Solder Lug Double Pole

MB2511S4W01-BC
MB2521S4W01-BC
TYPICAL SWITCH ORDERING EXAMPLE

**Series MB2500**

**MB25**

**Poles & Circuits**

| 11 | SPDT | ON (ON) |
| 21 | DPDT | ON (ON) |

( ) = Momentary

**Contact Materials & Ratings**

<table>
<thead>
<tr>
<th>Caps</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>.315&quot; (8.0mm)</td>
</tr>
<tr>
<td>C</td>
<td>.394&quot; (10.0mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>W</th>
<th>Silver</th>
<th>Rated 3A @ 125V AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Gold</td>
<td>Rated 0.4VA max @ 28V AC/DC max</td>
</tr>
</tbody>
</table>

**Caps Colors**

<table>
<thead>
<tr>
<th>A</th>
<th>Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>White</td>
</tr>
<tr>
<td>C</td>
<td>Red</td>
</tr>
<tr>
<td>E</td>
<td>Yellow</td>
</tr>
<tr>
<td>F</td>
<td>Green</td>
</tr>
<tr>
<td>G</td>
<td>Blue</td>
</tr>
</tbody>
</table>

**Bushing**

| S2 | .300" (7.6mm) Smooth with Keyway |

**Terminals**

| 13 | .250" (6.35mm) Straight PC with Bracket |
| 30 | Right Angle (Single Pole only) |
| 45 | Vertical PC |

**TYPICAL SWITCH ORDERING EXAMPLE**

MB2511S2G13-BC

**Description for Typical Ordering Example**

MB2511S2G13-BC

Red .315" (8.0mm) Diameter Cap

SPDT ON-(ON) Circuit

Gold Contacts with 0.4VA Rating

.300" (7.6mm) Smooth Bushing with Keyway

.250" (6.35mm) Straight PC Terminals with Bracket

**IMPORTANT:**

Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA recognized only when ordered with marking on the switch. Specific models, ratings, & ordering instructions are noted on the General Specifications page.
## POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2511</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1  3-2</td>
<td>SPDT</td>
</tr>
<tr>
<td>DP</td>
<td>MB2521</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1  6-4  3-2  6-5</td>
<td>DPDT</td>
</tr>
</tbody>
</table>

**Note:** Terminal numbers are not actually on the switch.

### BUSHING

**S2** .300” (7.6mm) Smooth with Keyway

### CONTACT MATERIALS & RATINGS

**W** Silver over Silver  
Power Level  
3A @ 125V AC

**G** Gold over Brass or Copper  
Logic Level  
0.4VA maximum @ 28V AC/DC maximum

**Note:** Complete explanation of operating range in Supplement section.

### TERMINALS

**13** .250” (6.35mm) Terminal with .465” (11.8mm) Bracket  

**30** Right Angle PC  
Single Pole only

**45** Vertical PC
Snap-Action Bracket PC Mount Pushbuttons

Series MB2500

CAPS & CAP COLORS

<table>
<thead>
<tr>
<th>Style</th>
<th>Description</th>
<th>Material</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>AT443 .315” (8.0mm) Diameter Cap</td>
<td>Polycarbonate</td>
<td>Glossy</td>
</tr>
<tr>
<td>C</td>
<td>AT442 .394” (10.0mm) Diameter Cap</td>
<td>Polycarbonate</td>
<td>Glossy</td>
</tr>
</tbody>
</table>

Cap Colors Available:

A: Black  B: White  C: Red  E: Yellow  F: Green  G: Blue

TYPICAL SWITCH DIMENSIONS

Single Pole  Double Pole  Straight PC • Bracket

Keyway

MB2511S2G13-BC

MB2511S2G30-BC

MB2511S2G45-BC

www.nkkswitches.com
**Series MB2500**
Snap-Action Snap-in Mount Pushbuttons

**TYPICAL SWITCH ORDERING EXAMPLE**

**MB25**

**Poles & Circuits**

<table>
<thead>
<tr>
<th>Pole</th>
<th>Type</th>
<th>On/Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>SPDT</td>
<td>ON (ON)</td>
</tr>
<tr>
<td>21</td>
<td>DPDT</td>
<td>ON (ON)</td>
</tr>
</tbody>
</table>

( ) = Momentary

**Contact Materials & Ratings**

<table>
<thead>
<tr>
<th>Contact</th>
<th>Material</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>Silver</td>
<td>Rated 3A @ 125V AC</td>
</tr>
<tr>
<td>G</td>
<td>Gold</td>
<td>Rated 0.4VA max @ 28V AC/DC max</td>
</tr>
</tbody>
</table>

**Cap & Cap Colors**

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

**Mounting Frame**

J: Snap-in Frame

**Terminals**

01: Solder Lug

**IMPORTANT:**

Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA recognized only when ordered with marking on the switch. Specific models, ratings, & ordering instructions are noted on the General Specifications page.

**DESCRIPTION FOR TYPICAL ORDERING EXAMPLE**

**MB2511JW01-A**

- Black Cap
- SPDT ON-(ON) Circuit
- Silver Contacts with 3-Amp Rating
- Snap-in Frame
- Solder Lug Terminals
**POLES & CIRCUITS**

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Connected Terminals</th>
<th>Normal</th>
<th>Down</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2511</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1 3-2</td>
<td>SPDT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td>MB2521</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1 6-4 3-2 6-5</td>
<td>DPDT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Terminal numbers are not actually on the switch.*

**MOUNTING FRAME**

*Panel Cutout for Single Pole without Bezel*

*Panel Cutout for Double Pole without Bezel*

Panel Thickness without Bezel: .039” ~ .157” (1.0mm ~ 4.0mm)
Panel Thickness with Bezel: .039” ~ .126” (1.0mm ~ 3.2mm)

**CONTACT MATERIALS & RATINGS**

*W* Silver over Silver  
Power Level  
3A @ 125V AC

*G* Gold over Brass or Copper  
Logic Level  
0.4VA maximum @ 28V AC/DC maximum

*Note: Complete explanation of operating range in Supplement section.*

**TERMINALS**

*Solder Lug*

**CAP & CAP COLORS**

**AT465**  
.453” (11.5mm) Square Cap

Material: Polycarbonate  
Finish: Glossy

Contact factory for matte finish.

Cap Colors Available:  
A Black  B White  C Red  E Yellow  F Green  G Blue  H Gray
## Series MB2500
Snap-Action Snap-in Mount Pushbuttons

### TYPICAL SWITCH DIMENSIONS

#### Solder Lug
![MB2511JW01-A]

#### Single Pole
![MB2511JW01-A]

#### Double Pole
![MB2521JW01-C]

### OPTIONAL SNAP-IN BEZELS & BEZEL COLORS

#### AT207 Bezel
Material: Polycarbonate
Finish: Glossy
Colors:
Black, White, Red, Yellow, Green, Blue, Gray
Contact factory for matte finish.

#### AT208 Bezel for AT070 LED
Material: Polycarbonate
Finish: Glossy
Color: Black
Contact factory for matte finish.

#### AT212 Bezel for AT617 LED
Material: Polycarbonate
Finish: Semi-glossy
Color: Black
Snap-Action Snap-in Mount Pushbuttons

Series MB2500

OPTIONAL SNAP-IN BEZELS & BEZEL COLORS

AT213 Bezel for AT618 LED

Material: Polycarbonate
Finish: Semi-glossy
Color: Black

Bezel Assembly

1. Pry out tab on bezel to a 45° angle.
2. Insert switch frame under tab and snap on the bezel.
3. Push tab back into place.
4. Snap assembled bezel and switch into panel.

LED COLORS & SPECIFICATIONS

Bezel Orientation on Switch

AT070 LED
For Bezel AT208 with 1 LED

AT617 LED
For Bezel AT212 with 2 Round LEDs

AT618 LED
For Bezel AT213 with 2 Rectangular LEDs

Note: Lead lengths may differ from manufacturing lot to lot. The longer lead is the anode (+).

<table>
<thead>
<tr>
<th></th>
<th>AT070</th>
<th>AT617</th>
<th>AT618</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
</tr>
<tr>
<td>Green</td>
<td>Green</td>
<td>Yellow</td>
<td>Green</td>
</tr>
</tbody>
</table>

- Maximum Forward Current $I_{FR}$
  - AT070: 25mA
  - AT617: 30mA
  - AT618: 25mA

- Typical Forward Current $I_T$
  - AT070: 20mA
  - AT617: 20mA
  - AT618: 20mA

- Forward Voltage $V_F$
  - AT070: 2.8V
  - AT617: 2.0V
  - AT618: 2.25V

- Maximum Reverse Voltage $V_{RM}$
  - AT070: 4V
  - AT617: 5V
  - AT618: 5V

- Current Reduction Rate Above 25°C $\Delta I$
  - AT070: 0.33 mA/°C
  - AT617: 0.40 mA/°C
  - AT618: 0.33 mA/°C

- Ambient Temperature Range (when used with a bezel)
  - AT070: -10° ~ +70°C
  - AT617: -15° ~ +70°C
  - AT618: -25° ~ +70°C

The electrical specifications shown are determined at a basic temperature of 25°C. LED circuit is independent of switch operation. LED is colored in OFF state.

If the source voltage is greater than the rated voltage of the LED, a ballast resistor must be connected in series with the LED. The ballast resistor calculation and more lamp detail are shown in the Supplement section.

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C127
Series SB
Low/Medium Capacity Pushbuttons

GENERAL SPECIFICATIONS FOR SB25, SB60s, SB221s, SB265

Electrical Capacity (Resistive Load)

Power Level: Shown in the following tables

Other Ratings

Contact Resistance: 10 milliohms maximum
Insulation Resistance: 200 megohms minimum @ 500V DC for SB221s, SB25, & SB265; 1,000 megohms minimum @ 500V DC for SB60s.
Dielectric Strength: 1,500V AC minimum for SB265 & SB25 for 1 minute minimum; 2,000V AC minimum between contacts for SB221s & SB60s for 1 minute minimum; 1,500V AC minimum between contacts & case for SB221s & SB60s for 1 minute minimum
Mechanical Life: 50,000 operations minimum for SB221s; 30,000 operations minimum for SB25, SB60s, SB265
Electrical Life: 10,000 operations minimum
Total Travel: SB221s .116” (2.95mm); SB60s .094” (2.4mm); SB265 .213” (5.4mm); SB25 .195” (4.95mm)
Operating Temp Range: –10°C through +70°C (+14°F through +158°F)

Materials & Finishes

Cap: Polybutylene terephthalate (PBT) (AT414)
Plunger: Polyacetal or brass with nickel plating
Bushings: Brass with nickel plating
Cases: Phenolic resin or melamine phenolic resin
Case Covers: Steel with zinc plating
Movable & Stationary Contacts: Copper with silver plating for SB221s; silver alloy with silver plating for SB25, SB60s, & SB265
Terminals: Copper with tin plating for SB25 & SB60s; copper with silver plating for SB265

Installation


Standards & Certifications

UL: File No. E44145 - Recognized only when ordered with marking on switch. Add “/U” or “/CUL” to end of part number to order UL recognized switch. UL or cULus recognition designated beside part numbers on following pages. See Supplement section to find UL or cULus rating details.

CSA: File No. 023535_0_000 - Certified only when ordered with marking on switch. Add “/C” to end of part number to order CSA certified switch. CSA certification designated beside part numbers on following pages. See Supplement section to find CSA rating details.
### Single Pole with Solder Lug or Screw Lug

<table>
<thead>
<tr>
<th>Model</th>
<th>* Approvals</th>
<th>Pole &amp; Throw</th>
<th>Pushbutton Position/Connected Terminals</th>
<th>Electrical Capacity (Resistive)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Normal (</td>
<td>Keyway</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Keyway</td>
<td></td>
</tr>
<tr>
<td>SB221NO</td>
<td></td>
<td>SPST</td>
<td>OFF</td>
<td>–</td>
</tr>
<tr>
<td>SB221NC</td>
<td></td>
<td>SPST</td>
<td>ON</td>
<td>1-4</td>
</tr>
<tr>
<td>SB221TNO</td>
<td></td>
<td>SPST</td>
<td>OFF</td>
<td>–</td>
</tr>
<tr>
<td>SB221TNC</td>
<td></td>
<td>SPST</td>
<td>ON</td>
<td>1-4</td>
</tr>
</tbody>
</table>

Suffix T = Screw Lug  
Throw & Schematic: SPST

**Notes:** Standard Hardware: AT504M Knurled Nut, AT508 Lockwasher, AT527M Hex Backup Nut. See Accessories & Hardware section.

### Double Pole with Solder Lug

<table>
<thead>
<tr>
<th>Model</th>
<th>* Approvals</th>
<th>Pole &amp; Throw</th>
<th>Pushbutton Position/Connected Terminals</th>
<th>Electrical Capacity (Resistive)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Normal (</td>
<td>Keyway</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Keyway</td>
<td></td>
</tr>
<tr>
<td>SB61A</td>
<td></td>
<td>DPDT</td>
<td>ON</td>
<td>2-3</td>
</tr>
<tr>
<td>SB61B</td>
<td></td>
<td>DPDT</td>
<td>(ON)</td>
<td>2-3</td>
</tr>
<tr>
<td>SB63A</td>
<td></td>
<td>DPDT</td>
<td>(ON)</td>
<td>2-3</td>
</tr>
</tbody>
</table>

Lockdown for SB63A is achieved by actuating and then turning the button clockwise.  
Throw & Schematic: DPDT

**Notes:** Standard Hardware: AT504M Knurled Nut, AT508 Lockwasher, AT527M Hex Backup Nut. See Accessories & Hardware section.

---

**Panel Thickness**:  .193" (4.9mm)  
**Supplied with**: AT414 Black Cap
## Series SB

### Low/Medium Capacity Pushbuttons

**DOUBLE POLE WITH SOLDER LUG**

* UL, cULus & CSA recognized only when ordered with marking on switch (see General Specs)

<table>
<thead>
<tr>
<th>Model</th>
<th>*Approvals</th>
<th>Pole &amp; Throw</th>
<th>Pushbutton Position/Connected Terminals</th>
<th>Electrical Capacity</th>
<th>Resistive</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB25</td>
<td>✔</td>
<td>DPDT</td>
<td>Normal: ON 2-3 5-6 Down: ON 2-1 5-4</td>
<td>AC 125V</td>
<td>15A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AC 250V</td>
<td>9A</td>
</tr>
</tbody>
</table>

**Throw & Schematic:**

**SB25**

Supplied with AT414 Black Cap

**Panel Thickness**

.193” (4.9mm)

**Notes:**

Standard Hardware: AT504M Knurled Nut, AT508 Lockwasher, AT527M Hex Backup Nut. See Accessories & Hardware section.

---

**SINGLE POLE WITH SOLDER LUG**

* UL, cULus & CSA recognized only when ordered with marking on switch (see General Specs)

<table>
<thead>
<tr>
<th>Model</th>
<th>*Approvals</th>
<th>Pole &amp; Throw</th>
<th>Pushbutton Position/Connected Terminals</th>
<th>Electrical Capacity</th>
<th>Resistive</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB265</td>
<td>✔</td>
<td>SPST</td>
<td>Normal: ON 1-4 Down: OFF</td>
<td>AC 125V</td>
<td>6A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AC 250V</td>
<td>3A</td>
</tr>
</tbody>
</table>

**Throw & Schematic:**

**SB265**

Supplied with Chrome Plated Brass Cap

**Panel Thickness**

.291” (7.4mm)

**Notes:**

Standard Hardware: AT504M Knurled Nut, AT508 Lockwasher, AT527M Hex Backup Nut. See Accessories & Hardware section.
Snap Switch Pushbuttons

Series SCB

GENERAL SPECIFICATIONS

Electrical Capacity
- Resistive Load: 1.5A & 1/2 HP @ 125 or 250V AC for high capacity models
- Lamp Load: 5A @ 125V AC

Other Ratings
- Contact Resistance: 15 milliohms maximum
- Insulation Resistance: 100 megohms minimum @ 500V DC
- Dielectric Strength: 1,000V AC minimum between contacts for 1 minute minimum; 1,500V AC minimum between contacts & case for 1 minute minimum
- Mechanical Life: 1,000,000 operations minimum
- Electrical Life: 50,000 operations minimum
- Travel: Pretravel .047” (1.19mm); Overtravel .040” (1.01mm); Differential .011” (0.27mm)
- Operating Temp Range: -40°C through +85°C (-40°F through +185°F)

Materials & Finishes
- Caps & Shrouds: Polycarbonate with glossy finish or PBT
- Plunger: Polyacetal or brass with nickel plating
- Bushing: Steel with zinc plating or glass fiber reinforced polyamide
- Case: Polyester
- Movable & Stationary Contacts: Silver alloy
- Terminals: Brass with silver plating

Standards & Certifications
- UL: Internal snap switch is UL recognized.
- CSA: Internal snap switch is CSA certified.

TYPICAL SWITCH ORDERING EXAMPLE

SCB 2 5 P 15 A 4 CA

Poles
1 SPDT
2 DPDT

Circuits
5 ON (ON)
6 ON ON
( ) = Momentary

Bushings
P Plastic (with momentary only)
S Steel

Termsinals
A .187” (4.75mm) Quick Connect
B .250” (6.35mm) Quick Connect

Caps & Shrouds
For Momentary
3 .520” (13.2mm) Diameter Cap

For Momentary & Alternate Action
4 Round Cap & Shroud (AT454 & AT455)
5 Rectangular Cap & Shroud (AT452 & AT453)

Colors
Caps Shrouds
A Black A
B White B
C Red –
F Green –
G Blue –
H Gray H

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

SCB25P15A-4CA

Round Red Cap with Black Shroud
Plastic Bushing
.187” (4.75mm) Quick Connect Terminals
15A Rating

Note: Standard hardware is provided with caps. See Bushing detail for more information.

www.nkkswitches.com
# Series SCB

## Snap Switch Pushbuttons

### POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Normal</th>
<th>Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>SCB15</td>
<td>ON</td>
<td>ON</td>
<td>(ON)</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td>SCB16</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>1-3</td>
</tr>
<tr>
<td>DP</td>
<td>SCB25</td>
<td>ON</td>
<td>ON</td>
<td>(ON)</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td>SCB26</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>1-3</td>
</tr>
</tbody>
</table>

| Note: Terminal numbers are actually on the switch. |

### BUSHINGS

- **P**: Plastic (for Momentary only)
- **S**: Steel

- **Maximum Effective Panel Thickness:***
  - **.165” (4.2mm) without Shroud**
  - **.157” (4.0mm) with Shroud**

- **Maximum Effective Panel Thickness:**
  - **Momentary: .177” (4.5mm) without Shroud**
  - **.157” (4.0mm) with Shroud**
  - **Alternate Action: .354” (9.0mm)**

### Standard Hardware Provided with Caps

- **Cap Option 3**: AT504M Knurled Face Nut, AT508 Lockwasher, AT527M Hex Mounting Nut
- **Cap Options 4 & 5**: AT508 Lockwasher & AT527M Hex Mounting Nut

### TERMINALS

- **A**: .187” (4.75mm) Quick Connect
- **B**: .250” (6.35mm) Quick Connect
Snap Switch Pushbuttons

Series SCB

TYPICAL SWITCH DIMENSIONS

.520” (13.2mm) Dia. Cap • .187” (4.75mm) Quick Connect

SCB15S15A-3C

Round Cap & Shroud • .187” (4.75mm) Quick Connect

SCB25P15A-4CA

Rectangular Cap & Shroud • .250” (6.35mm) Quick Connect

SCB26S15B-5CA

www.nkkswitches.com
Series WB  Environmentally Sealed Pushbuttons

General Specifications

**Electrical Capacity (Resistive Load)**
- **Power Level:** 6A @ 125V AC & 3A @ 250V AC or 6A @ 30V DC

**Other Ratings**
- **Contact Resistance:** 10 milliohms maximum for solder lug & screw terminal models
- **Insulation Resistance:** 30 milliohms maximum for wire lead terminal models
- **Dielectric Strength:** 200 megaohms minimum @ 500V DC
- **Mechanical Life:** 1,500V AC minimum for 1 minute minimum
- **Electrical Life:** 10,000 operations minimum
- **Contact Timing:** Break before make
- **Total Travel:** Alternate Action .177” (4.5mm); Momentary Action .110” (2.8mm)

**Materials & Finishes**
- **Plunger:** Brass with nickel plating
- **Bushing & Outer Case:** Fiberglass reinforced polyamide (UL94V-0 outer case)
- **Inner Case:** Melamine
- **Inner Sealing Ring:** Silicone rubber
- **Outer Sealing Ring:** Nitrile butadiene rubber
- **Movable Contactor:** Copper with silver plating
- **Movable Contacts:** Silver alloy with silver plating
- **Stationary Contacts:** Silver alloy with silver plating
- **Terminals:** Brass with tin plating
- **Wire Lead Covers:** Heat resistant polyvinyl chloride (Leads are AWG 16.)

**Environmental Data**
- **Operating Temp Range:** -30°C through +70°C (-22°F through +158°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:** 1.5Nm (13 lb-in)
- **Soldering Time & Temp:** Manual Soldering: See Profile A in Supplement section.

**Standards & Certifications**
- **Flammability Standards:** UL94V-0 outer case
- **Wiring Material Standards:** UL AWM 1015 Recognized at Flammability VW-1;
  - Temperature Range ~20°C ~ +105°C, Maximum Load 600V; AWG 16
  - CSA TEW 105 Certified at Temperature Range ~20°C ~ +105°C;
  - Maximum Load 600V
Distinctive Characteristics

Single unit construction of the bushing and case gives added protection from environmental elements.

Specially designed contact mechanism for breaking light welds.

Minimal contact bounce is achieved with specially designed interlocked switching mechanism.

Outer housing of heat resistant resin meets UL 94V-0 flammability standard and provides high arc and tracking resistance.

Solder lug and screw terminal models meet IP67 of IEC60529 Standards at front panel (dust tight and water protected for temporary immersion). Behind panel standard is IP60 (dust tight but not water protected).

Wire lead models conform fully to IP67 of IEC60529 Standards at front and behind panel (dust tight and water protected for temporary immersion). These models are epoxy sealed at the switch base and covered by an outer case for further protection from dust and water (not operable under water).
Series WB
Environmental Sealed Pushbuttons

TYPICAL SWITCH ORDERING EXAMPLE

<table>
<thead>
<tr>
<th>Poles</th>
<th>Circuits</th>
<th>Terminals</th>
<th>Caps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SPDT</td>
<td>2 ON-ON</td>
<td>S Solder Lug</td>
<td>.520” (13.2mm) Dia.</td>
</tr>
<tr>
<td></td>
<td>5 ON (ON)</td>
<td>T Screw Lug</td>
<td>.748” (19.0mm) Dia.</td>
</tr>
</tbody>
</table>

Cap Colors

A Black
B White
C Red
* D Amber
* E Yellow
F Green
* G Blue
* H Gray
* Not available with cap code E

DESCRIPTION FOR
TYPICAL ORDERING EXAMPLE

WB12S-DA

Solder Lug Terminals

POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Actuator Position ( ) = Momentary</th>
<th>Connected Terminals</th>
<th>Throw &amp; Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pole</td>
<td>Model</td>
<td>Normal Flat</td>
</tr>
<tr>
<td>SP</td>
<td>WB12</td>
<td>ON</td>
</tr>
<tr>
<td>SP</td>
<td>WB15</td>
<td>ON</td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on wire lead models.

STANDARD WIRE COLOR SCHEME

Terminals Numbers & Wire Colors

<table>
<thead>
<tr>
<th>Models</th>
<th>1a</th>
<th>1</th>
<th>1b</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB12L, WB15L</td>
<td>White</td>
<td>Black</td>
<td>Red</td>
</tr>
</tbody>
</table>

Wire leads are covered with heat resistant vinyl in accordance to UL 1015 and CSA TEW 105 Standards for Appliance Wiring Material (AWM).

TYPICAL SWITCH DIMENSIONS

Solder Lug

Panel Thickness

.157” (4.0mm)
Environmentally Sealed Pushbuttons

Series WB

TYPICAL SWITCH DIMENSIONS

Screw Lug

Panel Thickness .157” (4.0mm)

Wire Lead

Panel Thickness .157” (4.0mm)

CAPS & CAP COLORS

D AT414 .520” (13.2mm) Diameter

Colors Available: A B C D E F G H

Material: PBT Finish: Glossy

E AT412 .748” (19.0mm) Diameter

Colors Available: A B C F

Material: Polystyrene Finish: Glossy

STANDARD HARDWARE

AT503M Hex Face Nut

Material: Brass with chrome plating

1 supplied with each switch

Internal Tooth Lockwasher

Material: Phosphor bronze/chromate

1 supplied with each switch

AT401P O-ring

Material: Nitrile butadiene rubber

1 supplied with each switch

www.nkkswitches.com

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