Series KB

Miniature Pushbuttons

General Specifications

Electrical Capacity (Resistive Load)
- Power Level (silver): 1A @ 125/250V AC or 1A @ 30V DC
- Logic Level (gold): 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: For Silver: 1,000V AC minimum between contacts for 1 minute minimum & 1,500V AC minimum between contacts & case for 1 minute minimum; For Gold: 750V AC minimum between contacts for 1 minute minimum & 1,500V AC minimum between contacts & case for 1 minute minimum
- Mechanical Life: 100,000 operations minimum
- Electrical Life: 50,000 operations minimum for silver; 100,000 operations minimum for gold
- Nominal Operating Force: Single pole 0.98 ~ 2.45N for maintained & 0.98 ~ 1.96N for momentary; Double pole 1.47 ~ 3.43N for maintained & 1.47 ~ 2.94N for momentary
- Contact Timing: Nonshorting (break-before-make)
  - Travel: Pretravel .087” (2.2mm); Overtravel .031” (0.8mm); Total Travel .118” (3.0mm)

Materials & Finishes
- Housing: Polyamide (UL94V-0)
- Movable Contactor: Silver for power circuit; copper with gold plating for logic level circuit
- Stationary Contacts: Silver for power circuit; copper with gold plating for logic level circuit
- Housing Base: Polyamide (UL94V-0)
- Terminal Base: Polyester
- Common Terminals: Phosphor bronze with silver flash plating for power circuit; Phosphor bronze with gold flash plating for logic level circuit
- End Terminals: Brass with silver flash plating for power circuit; Brass with gold flash plating for logic level circuit
- Lamp Terminals: Phosphor bronze with nickel flash plating

Environmental Data
- Operating Temperature Range: –25°C through +50°C (–13°F through +122°F) for Illuminated
  -25°C through +70°C (–13°F through +158°F) for Nonilluminated
- 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: 0.78Nm (6.9 lb-in) maximum
- Cap Installation Force: 4.51N (1.0 lbf) maximum downward force on cap

Standards & Certifications
- Flammability Standards: UL94V-0 housing & housing base
- 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.
  Single & double pole models recognized at 1A @ 125/250V AC, 1A @ 30V DC, & 0.4VA @ 28V DC.
- 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 & double pole models recognized at 1A @ 125/250V AC, 1A @ 30V DC, & 0.4VA @ 28V DC.
Distinctive Characteristics

Bright illumination with numerous color variations. Spot illumination available. Square, rectangular, and round shaped caps.

Front panel relamping.

Choice of bright or super bright LEDs in red, amber, green, white, and blue.

Latchdown feature gives indication of circuit status. Audible and tactile feedback with smooth and responsive operation.

Snap-action mechanism for long life.

Stainless steel frame on snap-in models has a specially designed projection, which prevents rotation and correctly orients switch in panel.

12mm body diameter.

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

8mm panel thickness capability. Rear panel bushing or snap-in mounting.

Optional PCB adaptors in straight and right angle types.

Matching indicators available.
Series KB

Miniature Pushbuttons

TYPICAL SWITCH

KB 1 5 C K W01

Poles

<table>
<thead>
<tr>
<th></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>

Shapes

<table>
<thead>
<tr>
<th>Shape</th>
<th>Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Square</td>
</tr>
<tr>
<td>C</td>
<td>Round</td>
</tr>
<tr>
<td>R</td>
<td>Rectangular</td>
</tr>
</tbody>
</table>

Housing

<table>
<thead>
<tr>
<th>Code</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>Black only</td>
</tr>
</tbody>
</table>

Barrier Type

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No Barrier</td>
</tr>
<tr>
<td>B</td>
<td>With Barrier</td>
</tr>
</tbody>
</table>

Contacts & Terminals

<table>
<thead>
<tr>
<th>Code</th>
<th>Contacts</th>
<th>Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>W01</td>
<td>Silver</td>
<td>Contacts and Solder Lug Terminals 1A @ 125/250V AC</td>
</tr>
<tr>
<td>G01</td>
<td>Gold</td>
<td>Contacts and Solder Lug Terminals 0.4VA @ 28V AC/DC</td>
</tr>
</tbody>
</table>

Circuits

<table>
<thead>
<tr>
<th>Circuit</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>ON (ON)</td>
</tr>
<tr>
<td>6</td>
<td>ON ON</td>
</tr>
</tbody>
</table>

{ } = Momentary
Alternate Action with Latchdown

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

KB15CKW01-12-FF

12-volt Incandescent Lamp
Round with Bushing Mounting
SPDT ON-(ON) Circuit
Solid Cap with Green Lens and Green Filter
Black Housing
Silver Contacts and Solder Lug Terminals; Rated 1A @ 125/250V AC

www.nkkswitches.com
**ORDERING EXAMPLE**

---

**Lamps**

- **Solid Cap: Lens/Filter Colors**
  - **05**: 5-volt
  - **12**: 12-volt
  - **No Code**: Nonilluminated

- **Add to Order Code**: Solid Cap (A) or Insert Cap (05)

---

**Cap Types & Colors**

- **Solid Cap: Lens/Filter Colors**
  - **A**: Black/None (Nonilluminated Only, Available in Square and Round Only)
  - **BB**: White/White
  - **FB**: Green/White
  - **CB**: Red/White
  - **FF**: Green/Green
  - **CC**: Red/Red
  - **GB**: Blue/White
  - **EB**: Yellow/White
  - **GG**: Blue/Blue

---

**Incandescent or Neon Used with Insert Cap**

- **05**: 5-volt
- **12**: 12-volt
- **01**: 110-volt Neon
- **No Code**: Nonilluminated

---

**Bright LED Used with Cap for LED**

<table>
<thead>
<tr>
<th>Colors</th>
<th>Resistor</th>
</tr>
</thead>
<tbody>
<tr>
<td>5C Red</td>
<td>No Code</td>
</tr>
<tr>
<td>5D Amber</td>
<td>05</td>
</tr>
<tr>
<td>5F Green</td>
<td>12</td>
</tr>
</tbody>
</table>

---

**LED Cap: Lens/Filter Colors**

- **AB**: Square Spot Illuminated Black Cap/White Window
- **JB**: Clear/White
- **JC**: Clear/Red
- **JE**: Clear/Yellow
- *** JF**: Clear/Green
- *** JG**: Clear/Blue

* JF & JG not suitable with neon.

---

**LED Cap: Lens/Diffuser Colors**

- **AB**: Square Spot Illuminated Black Cap/White Window
- **JB**: Clear/White
- **JC**: Clear/Red
- **JD**: Clear/Amber
- **JF**: Clear/Green
- **JE**: Clear/Yellow

---

**Supplement**

- **D25**

---
**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>KB15</td>
<td>ON</td>
<td>(ON)</td>
<td>ON</td>
<td>2-3</td>
</tr>
<tr>
<td></td>
<td>*KB16</td>
<td>*ON</td>
<td>*ON</td>
<td>*ON</td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td>KB25</td>
<td>ON</td>
<td>(ON)</td>
<td>ON</td>
<td>2-3</td>
</tr>
<tr>
<td></td>
<td>*KB26</td>
<td>*ON</td>
<td>*ON</td>
<td>*ON</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Switch is marked with “+” and “−”. Lamp circuit is isolated and requires external power source.

* When in latchdown position for the alternate circuit, cap position is .055” (1.4mm) above the built-in bezel.

**MOUNTING TYPES & SHAPES**

**Bushing Mounting**

- **S .551” (14.0mm) Square**
  - No barrier
  - With barrier

- **C .551” (14.0mm) Round**
  - No barrier
  - With barrier

- **R .551” x .728” (14.0mm x 18.5mm) Rectangular**
  - No barrier
  - With barrier

Bezel or barrier is an integral part of the switch body. One mounting nut AT057 supplied with each switch.

**Snap-in Mounting**

- **K .551” (14.0mm) Square**
  - No barrier
  - With barrier

- **M .551” (14.0mm) Round**
  - No barrier
  - With barrier

- **N .551” x .728” (14.0mm x 18.5mm) Rectangular**
  - No barrier
  - With barrier

Bezel or barrier is an integral part of the switch body.

**Panel Cutouts**

- **Without Keyway**
  - Panel Thickness: .020” ~ .315” (0.5 ~ 8.0mm)
  - (12.3) Dia 484

- **With Keyway**
  - Panel Thickness: .039” ~ .138” (1.0 ~ 3.5mm)
  - (12.3) Dia 484

Panel thicknesses, when using optional accessories, are shown with the accessories at the end of this KB section.

**HOUSING**

- **K Housing available in black only.** Bezel or barrier is an integral part of the switch body.
CONTACT MATERIALS, RATINGS & TERMINALS

| W | Silver Contacts | Power Level | 1A @ 125V AC & 250V AC |
| G | Gold Contacts   | Logic Level | 0.4VA maximum @ 28V AC/DC |

Complete explanation of operating range in Supplement section.

AT055 Crossover Guard

A partitioned plastic guard is supplied with each switch to provide insulation between terminals.

Installation steps:
1. Identify wire-to-terminal connections.
2. Thread wires through the guard.
3. Solder the connections.
4. Push the guard fully onto the switch body.

BARRIER TYPE

<table>
<thead>
<tr>
<th>No Code</th>
<th>No Barrier</th>
<th>B</th>
<th>With Barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Built-in bezel</td>
<td></td>
<td>Built-in barrier only available for Square and Rectangular</td>
</tr>
</tbody>
</table>

LAMP COLORS & SPECIFICATIONS

The electrical specifications shown are determined at a basic temperature of 25°C.
LED circuit is isolated and requires external power source. Polarity marks are on the bottom of the switch.
If the source voltage exceeds the rated voltage, a ballast resistor is required.
The resistor value can be calculated by using the formula in the Supplement section.
Ambient Temperature Range for lamps below: –25°C ~ +50°C.

Incandescent & Neon Lamps

<table>
<thead>
<tr>
<th>AT611</th>
<th>AT615</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incandescent</td>
<td>Neon</td>
</tr>
</tbody>
</table>

Recommended Resistors for Neon:
33K ohms for 110V AC;
100K ohms for 220V AC

<table>
<thead>
<tr>
<th>AT611</th>
<th>AT615</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incandescent</td>
<td>Neon</td>
</tr>
</tbody>
</table>

Bright LED with Resistor

<table>
<thead>
<tr>
<th>AT634</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEDs are colored in OFF state.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AT634</th>
<th>AT634</th>
<th>AT634</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-volt</td>
<td>12-volt</td>
<td>24-volt</td>
</tr>
<tr>
<td>2-element with 1 Resistor</td>
<td>4-element with 2 Resistors</td>
<td>4-element with 2 Resistors</td>
</tr>
</tbody>
</table>

Recommended Resistor Codes

<table>
<thead>
<tr>
<th>Color Codes:</th>
<th>Resistor Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Amber</td>
</tr>
</tbody>
</table>

Maximum Forward Current: $I_{FM}$
Typical Forward Current: $I_f$
Forward Voltage: $V_f$
Maximum Reverse Voltage: $V_{RM}$
Current Reduction Rate Above 25°C: $\Delta I_f$
# Series KB

## LAMP COLORS & SPECIFICATIONS

### Bright LED without Resistor

<table>
<thead>
<tr>
<th>Model</th>
<th>Color Code</th>
<th>Red</th>
<th>Amber</th>
<th>Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT635</td>
<td>5C</td>
<td>30mA</td>
<td>30mA</td>
<td>30mA</td>
</tr>
<tr>
<td></td>
<td>5D</td>
<td>20mA</td>
<td>20mA</td>
<td>20mA</td>
</tr>
<tr>
<td></td>
<td>5F</td>
<td>1.9V</td>
<td>2.0V</td>
<td>2.1V</td>
</tr>
</tbody>
</table>

### Super Bright Single Element LED

<table>
<thead>
<tr>
<th>Model</th>
<th>Color Code</th>
<th>Red</th>
<th>Amber</th>
<th>Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT625G Blue</td>
<td>6B</td>
<td>White</td>
<td>6F</td>
<td>Green</td>
</tr>
</tbody>
</table>

### CAP TYPES & COLOR COMBINATIONS

<table>
<thead>
<tr>
<th>Color Codes</th>
<th>A Black</th>
<th>B White</th>
<th>C Red</th>
<th>E Yellow</th>
<th>F Green</th>
<th>G Blue</th>
<th>J Clear</th>
</tr>
</thead>
</table>

**Solid Cap for Incandescent Lamp & Nonilluminated**

- A: Nonilluminated Only; Square & Round Only
- BB, FB, CB, FF, CC, GB, EB, GG

**Insert Cap for Incandescent or Neon Lamp & Nonilluminated**

- JB, JF, JC, JG

### Specifications

- **AT635**
  - LEDs are colored in OFF state.
  - Color Codes: 5C, 5D, 5F
  - Maximum Forward Current: 30mA, 30mA, 30mA
  - Typical Forward Current: 20mA, 20mA, 20mA
  - Forward Voltage: 1.9V, 2.0V, 2.1V
  - Maximum Reverse Voltage: 5V, 5V, 5V
  - Current Reduction Rate Above 25°C: 0.42mA/°C
  - Ambient Temperature Range: -25°C ~ +50°C

- **AT625G Blue**
  - Color: 6B, 6F, 6G
  - Maximum Forward Current: 30mA, 30mA, 30mA
  - Typical Forward Current: 20mA, 20mA, 20mA
  - Forward Voltage: 3.3V, 3.3V, 3.3V
  - Maximum Reverse Voltage: 7V, 7V, 7V
  - Current Reduction Rate Above 25°C: 0.40mA/°C, 0.40mA/°C, 0.40mA/°C
  - Ambient Temperature Range: -25°C ~ +50°C

### Lens/Filter Colors Available:

- **Solid Cap**
  - A: Nonilluminated Only; Square & Round Only
  - BB, FB, CB, FF, CC, GB, EB, GG

- **Insert Cap**
  - JB, JF, JC, JG

- **Lamp AT611**
  - Translucent Colored Lens
  - Translucent Colored Filter

- **Lamp AT615**
  - Transparent Clear Lens
  - Translucent Colored Filter
CAP TYPES & COLOR COMBINATIONS

<table>
<thead>
<tr>
<th>Color Codes:</th>
<th>A Black</th>
<th>B White</th>
<th>C Red</th>
<th>D Amber</th>
<th>E Yellow</th>
<th>F Green</th>
<th>G Blue</th>
<th>J Clear</th>
</tr>
</thead>
</table>

Spot Illuminated Cap for Bright LED without Resistor or with Resistor

Cap/Window Colors Available:

**AB**

Opaque Black Cap with Translucent White Window for Spot Illumination

AT4051

Square

Material: Polycarbonate

Finish: Matte

Bright LED AT635

Bright LED AT634

Cap for Bright LED without Resistor or LED with Resistor

Lens/Diffuser Colors Available: (AT4133, 4132, 4134 white diffusers; AT4158, 4160, 4159 colored diffusers)

**JB**

AT4133

Square

AT4132

Round

AT4134

Rectangular

Transparent Clear Lens

Translucent Diffuser

**JC**

AT4158

**JD**

AT4160

**JF**

AT4159

Material: Polycarbonate

Finish: Glossy

Bright LED AT635

Bright LED AT634

Cap for Super Bright LED

Lens/Diffuser Colors Available:

**JB**

AT4133

Square

AT4132

Round

AT4134

Rectangular

Translucent Clear Lens

Translucent White Diffuser

Material: Polycarbonate

Finish: Glossy

Super Bright LEDs AT625

AT631 AT632
Series KB
Miniature Pushbuttons

TYPICAL SWITCH DIMENSIONS

Square • Bushing Mount

Single & Double Pole

Round • Bushing Mount

Single & Double Pole

Rectangular • Bushing Mount

Single & Double Pole

KB15SKW01-05-GG
Single pole models do not have terminals 4, 5, & 6.

KB25CKW01-05-GG
Single pole models do not have terminals 4, 5, & 6.

KB15RKW01-05-GG
Single pole models do not have terminals 4, 5, & 6.
TYPICAL SWITCH DIMENSIONS

Single & Double Pole

Square • Snap-in Mount

Single pole models do not have terminals 4, 5, & 6.

KB16KKW01-05-CB

Single & Double Pole

Round • Snap-in Mount

Single pole models do not have terminals 4, 5, & 6.

KB26MKW01-05-CB

Single & Double Pole

Rectangular • Snap-in Mount

Single pole models do not have terminals 4, 5, & 6.

KB16NKW01-05-CB

www.nkkswitches.com
TYPICAL SWITCH DIMENSIONS

Square • Barrier • Bushing Mount

Single & Double Pole

KB15SKW01B-6G-JB

Single pole models do not have terminals 4, 5, & 6.

Square • Barrier • Snap-in Mount

Single & Double Pole

KB15KKW01B-5C-JC

Single pole models do not have terminals 4, 5, & 6.

Rectangular • Barrier • Bushing Mount

Single & Double Pole

KB15RKW01B-5F-JF

Single pole models do not have terminals 4, 5, & 6.

Rectangular • Barrier • Snap-in Mount

Single & Double Pole

KB15NKW01B-5D-JD

Single pole models do not have terminals 4, 5, & 6.
**OPTIONAL ACCESSORIES**

**PCB Adapters**

**AT701**  
Single Pole  
Straight PC  
Terminals

**AT702**  
Double Pole  
Straight PC  
Terminals

Material: Glass fiber reinforced polyamide  
Note: Order adaptors separately

**Dust Covers**

Panel Thickness Range: .020 ~ .268" (0.5 ~ 6.8mm) for Bushing Mounting; .020 ~ .079" (0.5 ~ 2.0mm) for Snap-in Mounting

Dust Covers reduce the depth of switch behind panel by .047" (1.2mm).

**AT495**  
For Square & Round  
(not for Barrier type)

**AT4025**  
For Rectangular  
(not for Barrier type)

Material:  
Lid: PVC  
PVC loses pliability below 0°C (32°F).  
Base: Polyamide
OPTIONAL ACCESSORIES

AT494
For Square & Round
(not for Barrier type)

AT4024
For Rectangular
(not for Barrier type)

Protective Guards

Panel Thickness Range:

.020” ~ .268”
(0.5 ~ 6.8mm)
for Bushing Mounting

.020” ~ .091”
(0.5 ~ 2.3mm)
for Snap-in Mounting

Protective Guards reduce the depth of switch behind panel by .047” (1.2mm).

Material: Cover: Polycarbonate
Base: Polyamide

ASSEMBLY INSTRUCTIONS

Cap Removal & Installation
For alternate action models cap must be in UP position for cap removal. Indentations on opposite sides of the cap provide an easy way to lift the cap out of the holder, using either the finger nails, or cap extractor AT109.

LED Polarity & Orientation in Lamp Socket
Super Bright LEDs AT625, AT631, & AT632 are electrostatic sensitive.

AT108 Socket Wrench
for Bushing Mounting

AT109 Cap Extractor

AT111 Lamping Tool

Overtightening the mounting nut may damage the switch housing.

ATTENTION ELECTROSTATIC SENSITIVE DEVICES
LEGENDS

NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Area for KB Lens

**Recommended Methods:** Screen Print or Pad Print on Lens. Epoxy based ink is recommended.

Shaded areas are printable areas.

Suggested Printable Area for Film Insert

**Recommended Print Method:** Laser Print

Film Insert: Clear Polyester, 4 mil max. thickness

Shaded areas are printable areas.