

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 ~ 2.94N
 Double pole 1.47 ~ 3.43N
Contact Timing: Nonshorting (break-before-make)
Travel: Pretravel .087" (2.2mm); Overtravel .031" (0.8mm); Total Travel .118" (3.0mm)

Materials & Finishes

Housing: Glass fiber reinforced 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: Glass fiber reinforced 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 silver 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
Soldering Time & Temperature: Manual Soldering: See Profile A in Supplement section.

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.

Miniature Pushbuttons

Series KB

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.

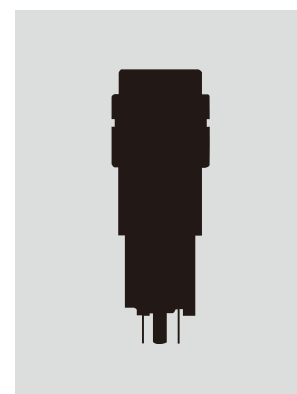
8mm panel thickness capability. Rear panel bushing or snap-in mounting.

Optional PCB adaptors in straight and right angle types.

Matching indicators available.



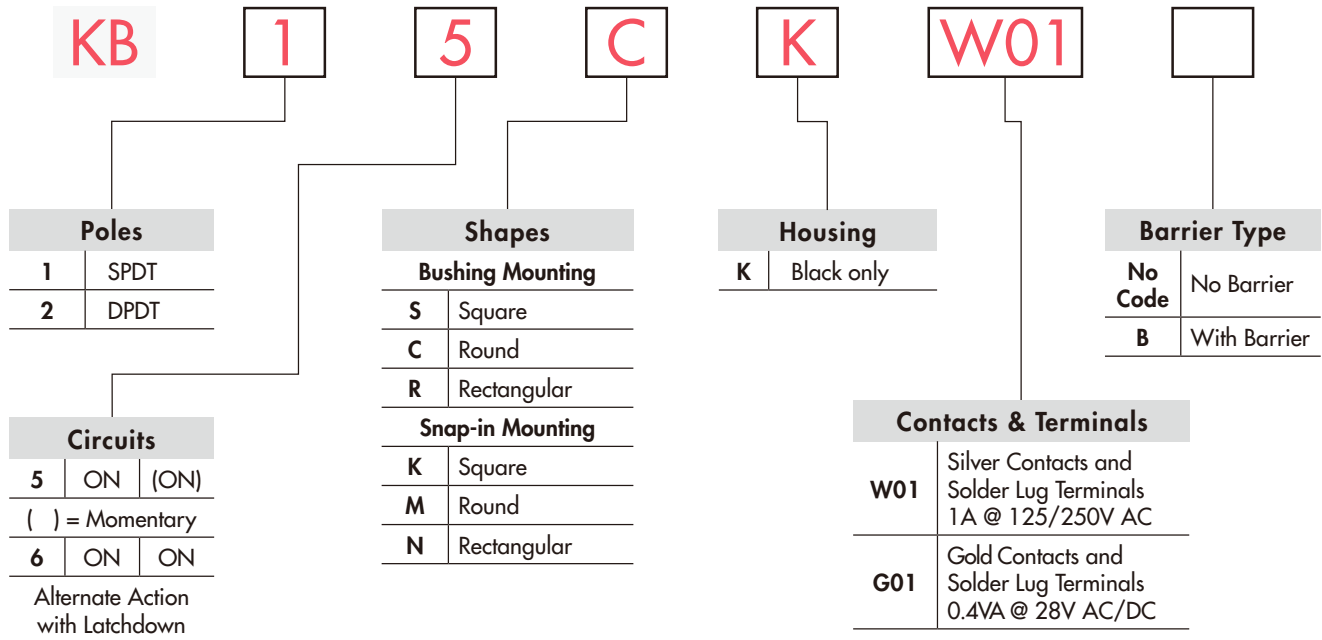
Actual Size



Series KB

Miniature Pushbuttons

TYPICAL SWITCH



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

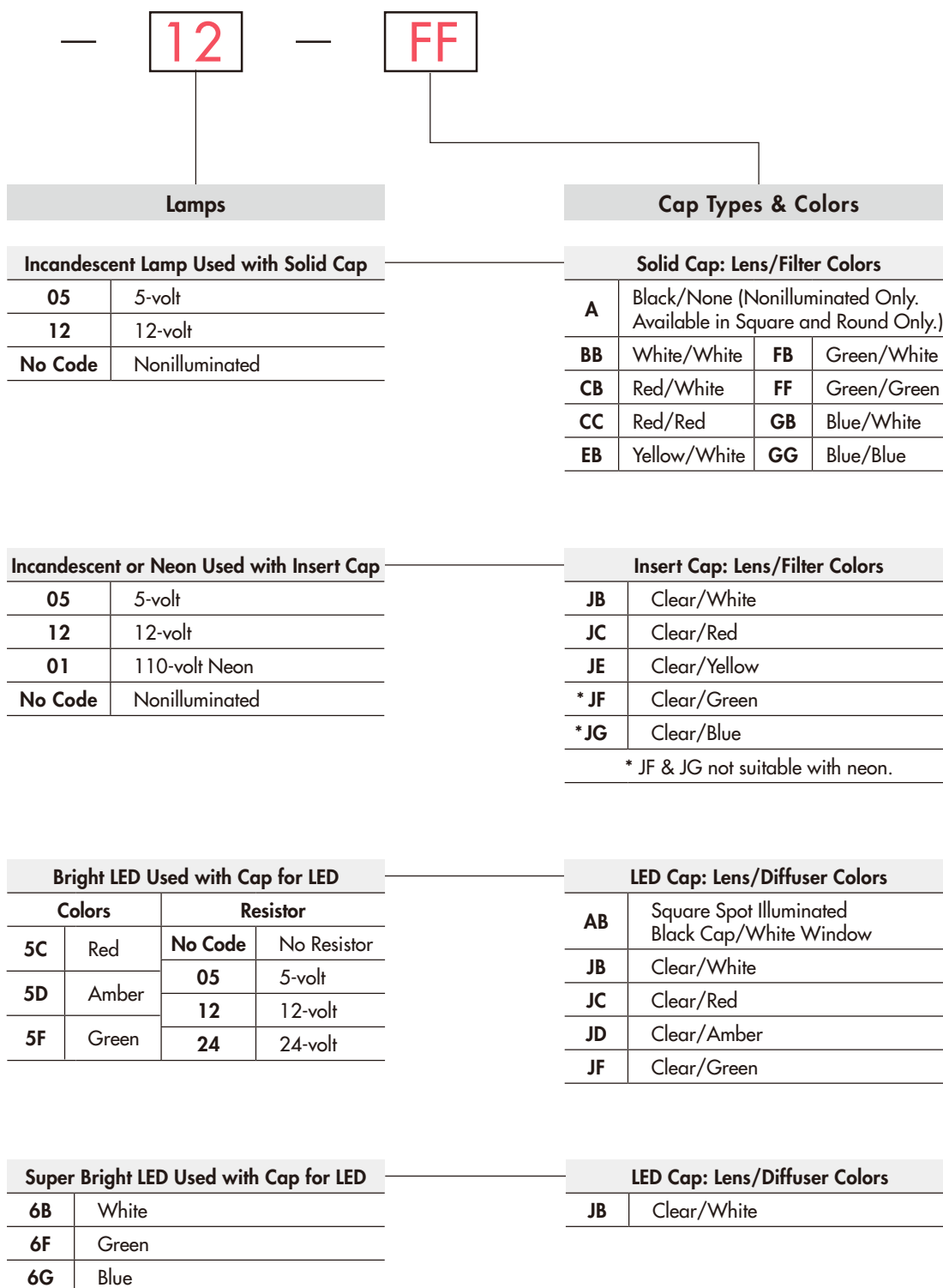
KB15CKW01-12-FF



Miniature Pushbuttons

Series KB







ORDERING EXAMPLE



Series KB

Miniature Pushbuttons

POLES & CIRCUITS

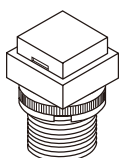
Pole	Model	Plunger Position () = Momentary		Connected Terminals		Throw & Switch/Lamp Schematics
		Normal 	Down 	Normal 	Down 	
SP	KB15 *KB16	ON ON	(ON) ON	2-3	2-1	SPDT  L (+) — () — (-) L
DP	KB25 *KB26	ON ON	(ON) ON	2-3 5-6	2-1 5-4	DPDT  L (+) — () — (-) L

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

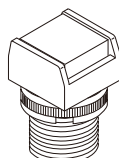
MOUNTING TYPES & SHAPES

Bushing Mounting

S

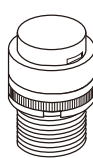
.551" (14.0mm)
Square


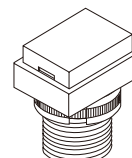
No barrier



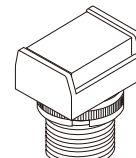
With barrier

C

.551" (14.0mm)
Round

R

.551" x .728" (14.0mm x 18.5mm)
Rectangular


No barrier

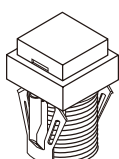


With barrier

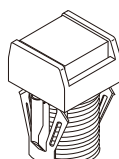
Bezel or barrier is an integral part of the switch body. One mounting nut AT057 supplied with each switch.

Snap-in Mounting

K

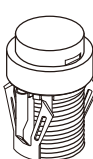
.551" (14.0mm)
Square


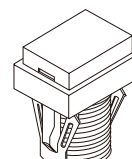
No barrier



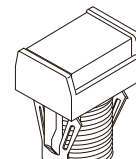
With barrier

M

.551" (14.0mm)
Round

N

.551" x .728" (14.0mm x 18.5mm)
Rectangular


No barrier

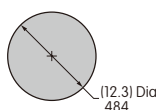
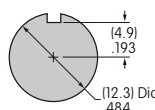


With barrier

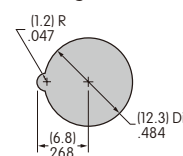
Bezel or barrier is an integral part of the switch body.

Panel Cutouts

Bushing Mounting

Without
Keyway

Panel Thickness:
.020" ~ .315"
(0.5 ~ 8.0mm)

With
Keyway

Snap-in Mounting

Panel Thickness:
.039" ~ .138"
(1.0 ~ 3.5mm)


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.

Miniature Pushbuttons

Series KB

CONTACT MATERIALS, RATINGS & TERMINALS



Silver Contacts

Power Level
1A @ 125V AC & 250V AC

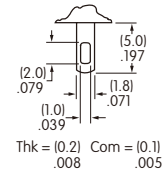


Solder Lug



Gold Contacts

Logic Level
0.4VA maximum @ 28V AC/DC



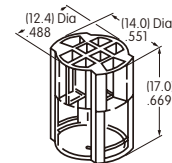
Complete explanation of operating range in Supplement section.

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



No Barrier
Built-in bezel



With Barrier
Built-in barrier only available for Square and Rectangular

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

AT611 Incandescent	AT615 Neon		05	12	01	Recommended Resistors for Neon: 33K ohms for 110V AC; 100K ohms for 220V AC
		Voltage	V	5V AC	12V AC	110V AC
		Current	I	115mA	60mA	1.5mA
		Endurance	Hours	7,000 average	10,000	10,000

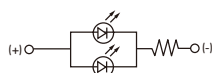


No Lamp

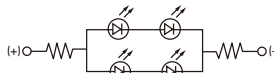
Bright LED with Resistor

AT634	Color Codes:	Red	Amber	Green	Resistor Codes		
		5C	5D	5F	05	12	24
LEDs are colored in OFF state. 	Maximum Forward Current	I_{FM}			—	—	—
	Typical Forward Current	I_F			25mA	20mA	10mA
	Forward Voltage	V_F			5V	12V	24V
	Maximum Reverse Voltage	V_{RM}			4V	8V	16V
	Current Reduction Rate Above 25°C	ΔI_F			—	—	—

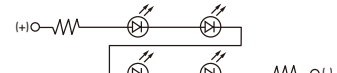
AT634
5-volt
2-element
with 1 Resistor



AT634
12-volt
4-element
with 2 Resistors



AT634
24-volt
4-element
with 2 Resistors


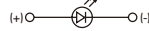


Series KB




Miniature Pushbuttons

LAMP COLORS & SPECIFICATIONS

Bright LED without Resistor

<div>AT635</div> <div>LEDs are colored in OFF state.</div> <div></div> <div></div> <div>T-1½ Bi-pin</div>	RedAmberGreen			No CodeNo Resistor					
	Color Codes			5C	5D	5F	Red	Amber	Green
	Maximum Forward Current			I _{FM}			30mA	30mA	30mA
	Typical Forward Current			I _F			20mA	20mA	20mA
	Forward Voltage			V _F			1.9V	2.0V	2.1V
	Maximum Reverse Voltage			V _{RM}			5V	5V	5V
	Current Reduction Rate Above 25°C			ΔI _F			0.42mA/°C		
	Ambient Temperature Range						-25° ~ +50°C		

Super Bright Single Element LED

<div>AT625G Blue</div> <div>AT631B White</div> <div>AT632F Green</div> <div></div> <div></div> <div>T-1 Bi-pin</div>	<div>ATTENTION ELECTROSTATIC SENSITIVE DEVICES</div>	Color	<div>6B</div> White	<div>6F</div> Green	<div>6G</div> Blue
	Maximum Forward Current	I_{FM}	30mA	30mA	30mA
	Typical Forward Current	I_F	20mA	20mA	20mA
	Forward Voltage	V_F	3.3V	3.3V	3.3V
	Maximum Reverse Voltage	V_{RM}	7V	7V	7V
	Current Reduction Rate Above 25°C	ΔI_F	0.40mA/°C	0.40mA/°C	0.40mA/°C
	Ambient Temperature Range	-25° ~ +50°C			

CAP TYPES & COLOR COMBINATIONS

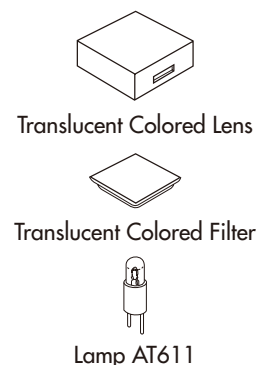
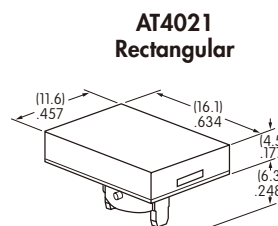
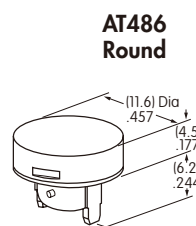
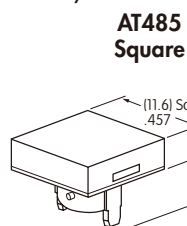
Color Codes: A Black B White C Red E Yellow F Green G Blue J Clear

Solid Cap for Incandescent Lamp & Nonilluminated

Lens/Filter Colors Available:

A Nonilluminated Only;
Square & Round Only

BB	FB
CB	FF
CC	GB
EB	GG



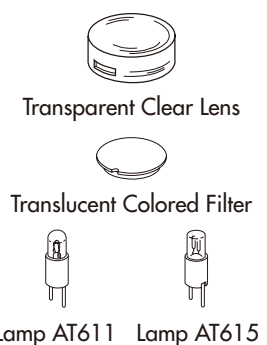
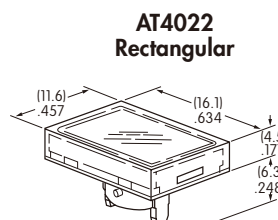
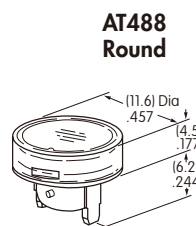
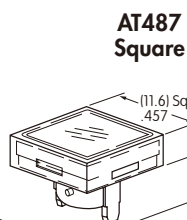
Material: Polycarbonate Finish: Glossy

Insert Cap for Incandescent or Neon Lamp & Nonilluminated

Lens/Filter Colors Available:

JB	JF
JC	JG
JE	

JF and JG not suitable with neon lamp.



Material: Polycarbonate Finish: Glossy

Miniature Pushbuttons

Series KB

CAP TYPES & COLOR COMBINATIONS

Color Codes: A Black B White C Red D Amber E Yellow F Green G Blue J Clear

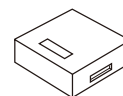
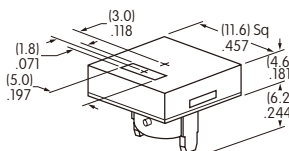
Spot Illuminated Cap for Bright LED without Resistor or with Resistor

Cap/Window Colors Available:

AB

Opaque Black Cap with
Translucent White Window
for Spot Illumination

AT4051
Square



Bright LED
AT635

Bright LED
AT634

Material: Polycarbonate Finish: Matte

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

AT4132

AT4134

Square

Round

Rectangular



Transparent Clear Lens

JC

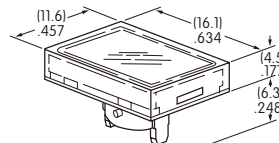
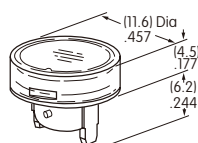
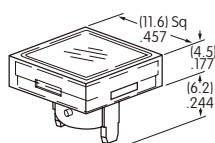
AT4158

AT4160

AT4159

JD

JF



Translucent Diffuser



Bright LED
AT635

Bright LED
AT634

Material: Polycarbonate Finish: Glossy

Cap for Super Bright LED

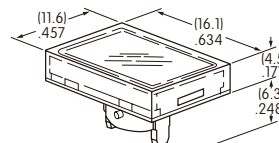
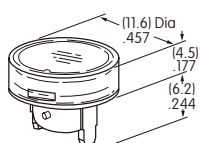
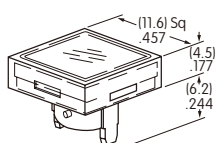
Lens/Diffuser Colors Available:

JB

AT4133
Square

AT4132
Round

AT4134
Rectangular



Translucent Clear Lens



Translucent White Diffuser



Super Bright LEDs
AT625
AT631 AT632

Material: Polycarbonate Finish: Glossy

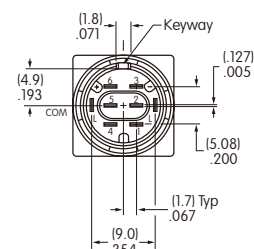
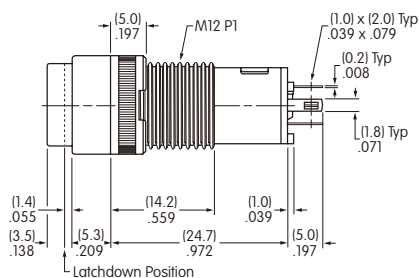
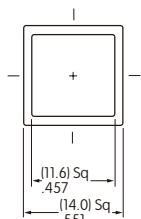
Series KB

Miniature Pushbuttons

TYPICAL SWITCH DIMENSIONS

Square • Bushing Mount

Single & Double Pole

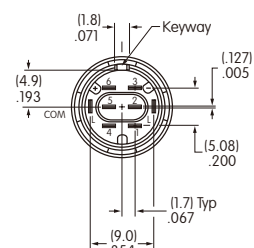
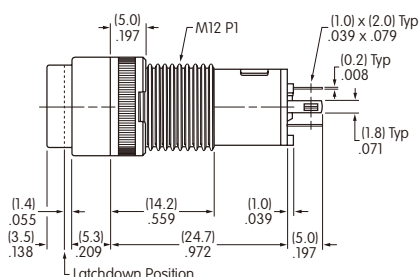
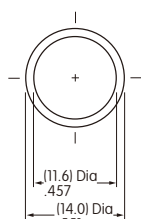


KB15SKW01-05-GG

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

Round • Bushing Mount

Single & Double Pole

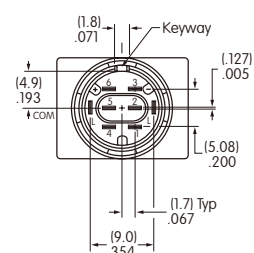
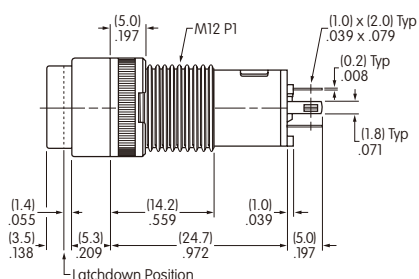
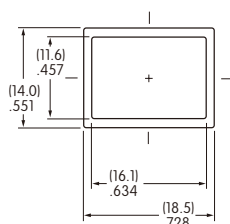


KB25CKW01-05-GG

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

Rectangular • Bushing Mount

Single & Double Pole



KB15RKW01-05-GG

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

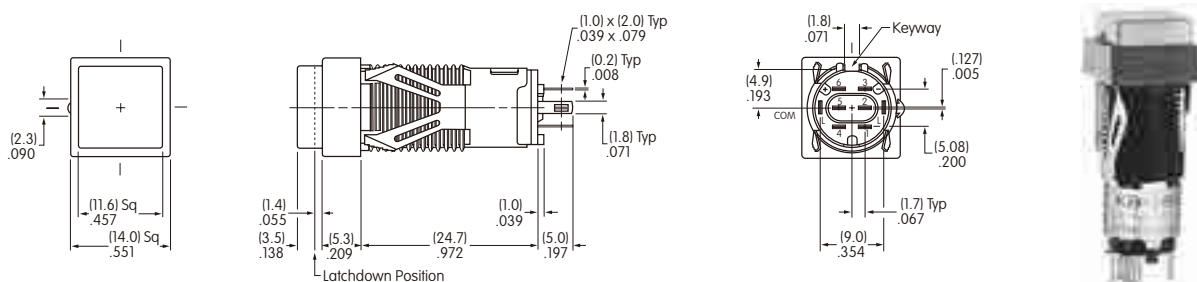
Miniature Pushbuttons

Series KB

TYPICAL SWITCH DIMENSIONS

Single & Double Pole

Square • Snap-in Mount

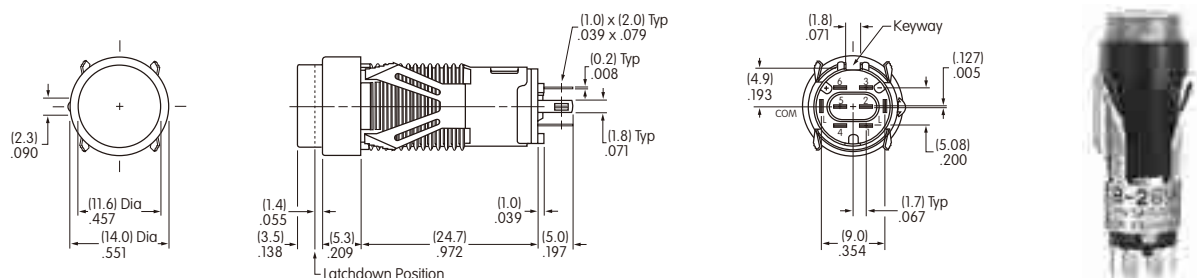


Single pole models do not have terminals 4, 5, & 6.

KB16KKW01-05-CB

Single & Double Pole

Round • Snap-in Mount

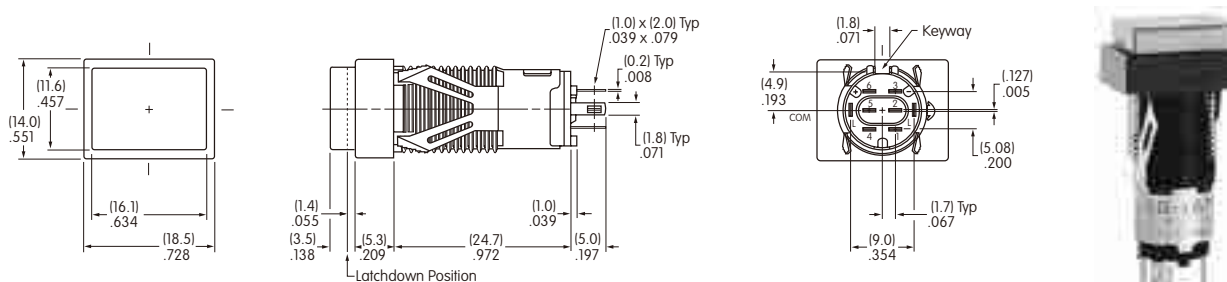


Single pole models do not have terminals 4, 5, & 6.

KB26MKW01-05-CB

Single & Double Pole

Rectangular • Snap-in Mount



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

KB16NKW01-05-CB

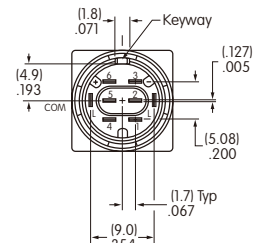
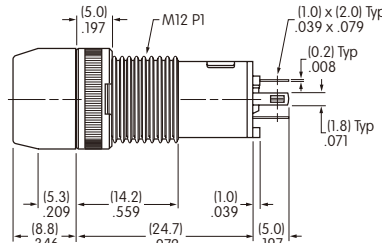
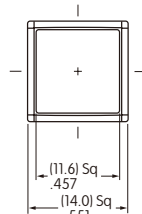
Series KB

Miniature Pushbuttons

TYPICAL SWITCH DIMENSIONS

Square • Barrier • Bushing Mount

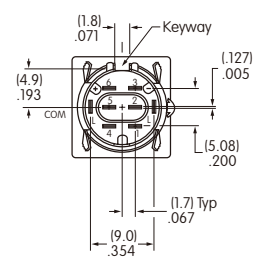
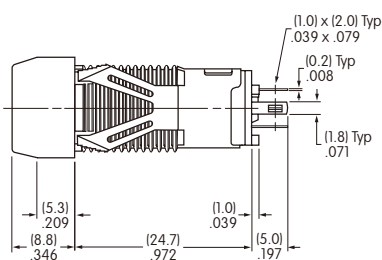
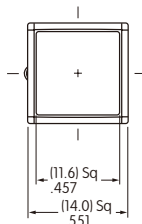
Single & Double Pole


KB15SKW01B-6G-JB

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

Square • Barrier • Snap-in Mount

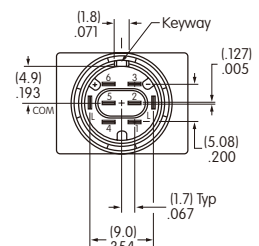
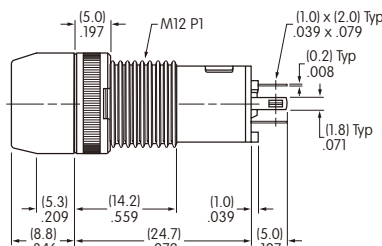
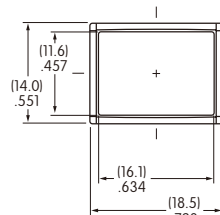
Single & Double Pole


KB15KKW01B-5C-JC

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

Rectangular • Barrier • Bushing Mount

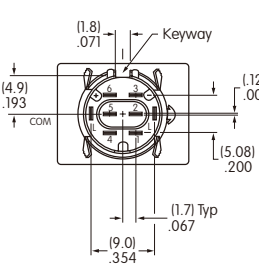
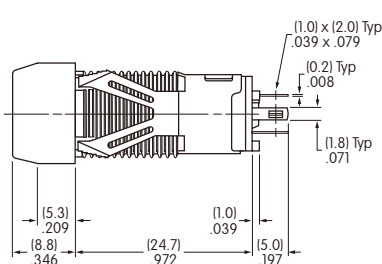
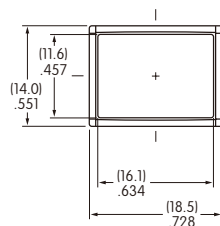
Single & Double Pole


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.

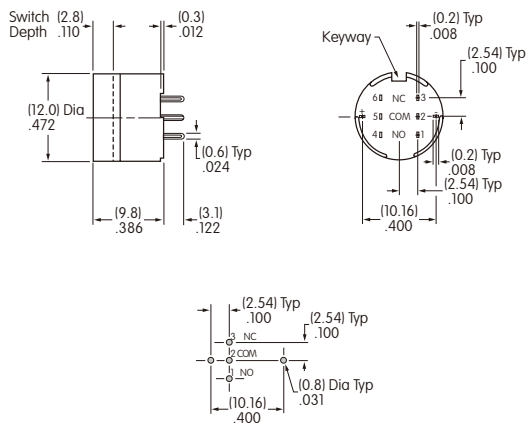
Miniature Pushbuttons

Series KB

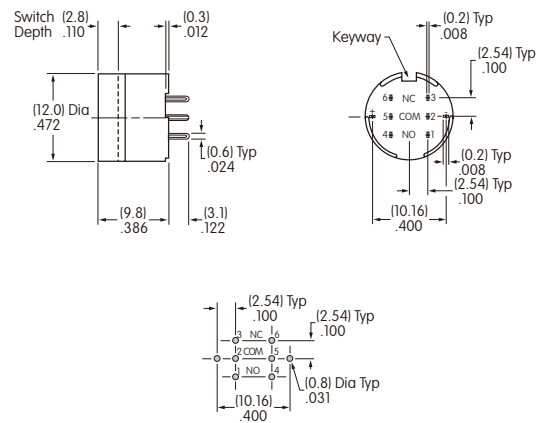
OPTIONAL ACCESSORIES

PCB Adaptors

AT701
Single Pole
Straight PC
Terminals



AT702
Double Pole
Straight PC
Terminals

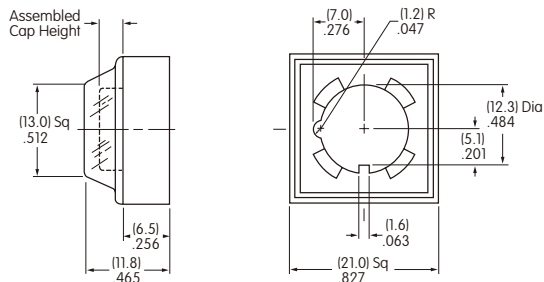


Material: Glass fiber reinforced polyamide Note: Order adaptors separately

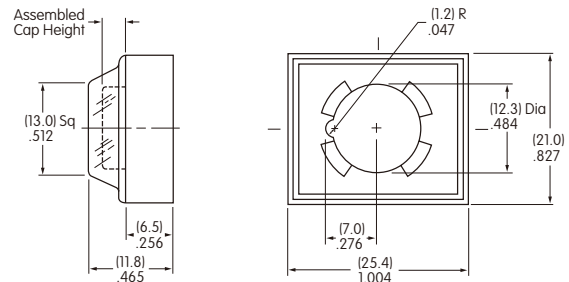
Dust Covers

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

Series KB

Miniature Pushbuttons

OPTIONAL ACCESSORIES

Protective Guards

AT494
For Square & Round
(not for Barrier type)



AT4024
For Rectangular
(not for Barrier type)

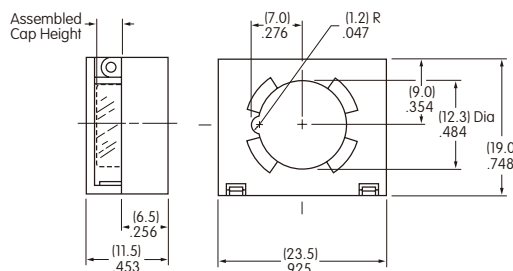
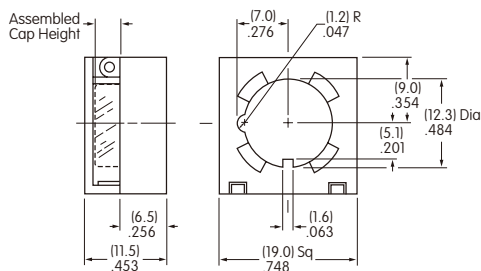


Panel Thickness
Range:

.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).



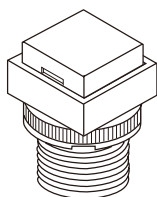
Material: Cover: Polycarbonate

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.



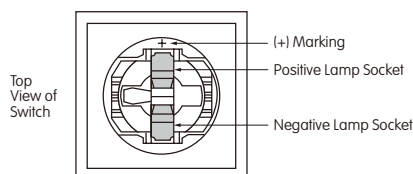
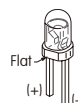
LED
AT635



LED
AT634

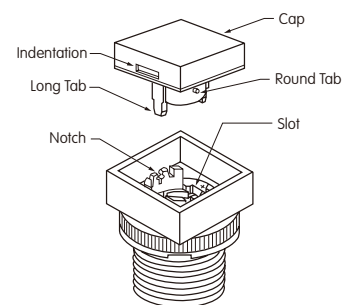


LEDs
AT625
AT631
AT632



Cap Replacement

Note that the cap has a pair of round tabs and a pair of long tabs which should be used for correctly replacing the cap in its holder. Using the long tabs as guides, slide the cap with the long tabs moving into the slots on opposite sides of the cap holder. Then, the round tabs will snap into notches on the other two sides of the holder.



AT108 Socket Wrench for Bushing Mounting

Overtightening the
mounting nut
may damage the
switch housing.



AT109 Cap Extractor



AT111 Lamping Tool



Miniature Pushbuttons

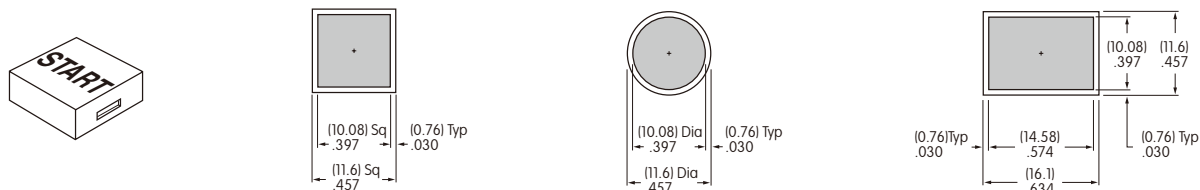
Series KB

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.

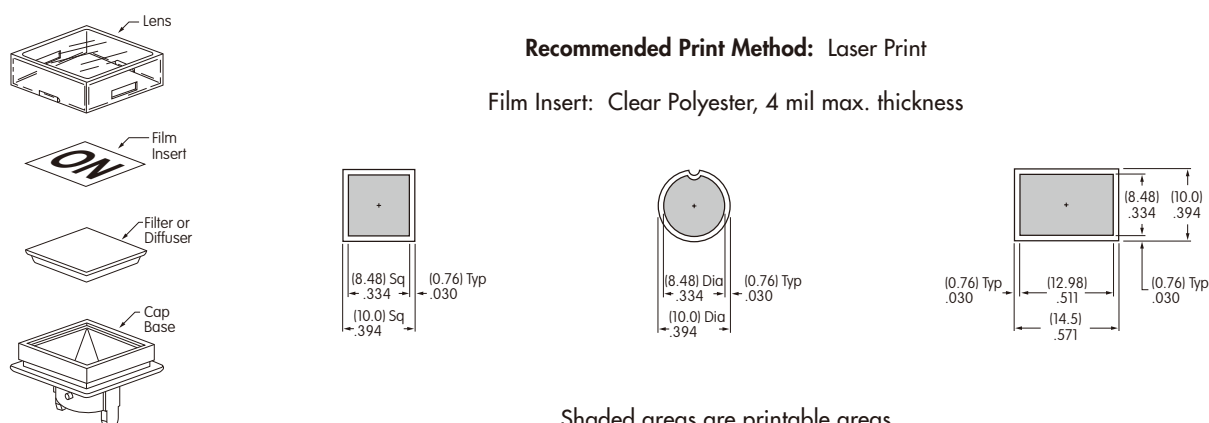


Shaded areas are printable areas.

Suggested Printable Area for Film Insert

Recommended Print Method: Laser Print

Film Insert: Clear Polyester, 4 mil max. thickness



Shaded areas are printable areas.