

# Distinctive Characteristics

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

Incandescent, LED, and neon lamps. 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 (.472") body diameter.

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

8mm (.315") panel thickness capability. Rear panel bushing or snap-in mounting.

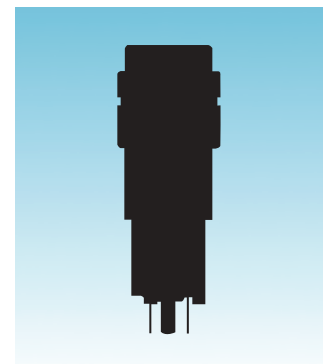
Optional PCB adaptors in straight and right angle types.

Nonilluminated models available and shown in Pushbutton section.

Matching indicators available and shown in Indicator section.



Actual Size



# General Specifications

## Electrical Capacity (Resistive Load)

**Power Level (code W):** 1A @ 125/250V AC or 1A @ 30V DC  
**Logic Level (code G):** 0.4VA maximum @ 28V AC/DC maximum  
 Note: See Supplement Index (page Z1) to find explanation of operating range.

## 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 100 ~ 250 grams for maintained & 100 ~ 200 grams for momentary;  
 Double pole 150 ~ 350 grams for maintained & 150 ~ 300 grams for momentary  
**Contact Timing:** Nonshorting (break-before-make)  
**Travel:** 2.2mm (.087") pretravel; 0.80mm (.031") overtravel; 3.0mm (.118") total travel

## Materials & Finishes

**Housing:** Polyamide  
**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 **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 Temp Range:** -25°C through +50°C (-13°F through +122°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/s<sup>2</sup>) acceleration (tested in 6 right angled directions, with 3 shocks in each direction)

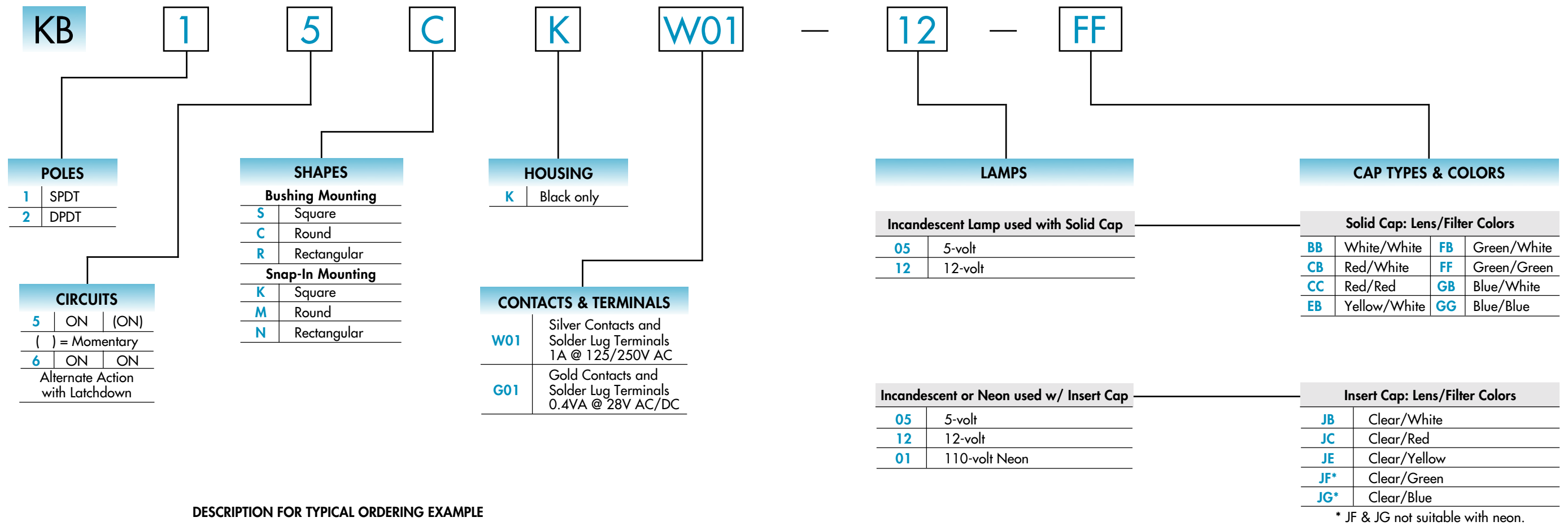
## Installation

**Mounting Torque:** .78Nm (6.9 lb•in) maximum  
**Cap Installation Force:** 4.51N (1.0 lbf) maximum downward force on cap  
**Soldering Time & Temperature:** 3 seconds @ 350°C or 5 seconds @ 270°C  
**Process Seal:** Not available

## Standards & Certifications

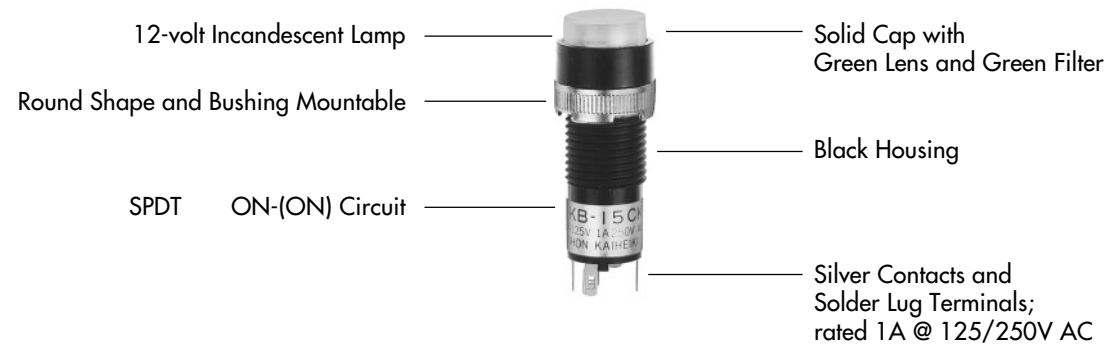
**Flammability Standards:** UL94V-0 housing & base  
**UL Recognized:** Single & double pole models recognized at 1A @ 125/250V AC, 1A @ 30V DC, & 0.4A @ 28V DC; UL File No. WOYR2.E44145; add "/U" to end of part number to order UL mark on switch.  
  
**CSA Certified:** Single & double pole models recognized at 1A @ 125/250V AC, 1A @ 30V DC, & 0.4VA @ 28V maximum; CSA File No. 023535-0-000; add "/C" to end of part number to order CSA mark on switch.  


TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

KB15CKW01-12-FF



IMPORTANT:



Switches are supplied without UL & CSA marking unless specified. Specific models & ratings noted on General Specifications page.

Bright LED used with Cap for LED			
Colors		Resistor	
5C	Red	No Code	No Resistor
5D	Amber	05	5-volt
5F	Green	12	12-volt
		24	24-volt
Super Bright LED used with Cap for LED			
6B	White		
6F	Green		
6G	Blue		

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

LED Cap: Lens/Diffuser Colors	
JB	Clear/White

## POLES & CIRCUITS

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

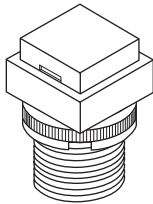
\* When in latched position for the alternate circuit, cap position is 1.4mm (.055") above the built-in bezel.

## SHAPES & MOUNTING TYPES

### Bushing Mounting

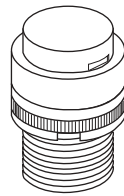
**S**

.551" Square



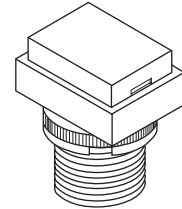
**C**

.551" Round



**R**

.551" x .728" Rectangular

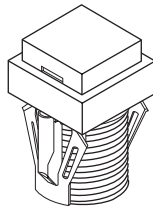


The bezel is an integral part of the switch body. One mounting nut AT057 supplied with each switch.

### Snap-In Mounting

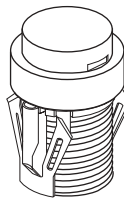
**K**

.551" Square



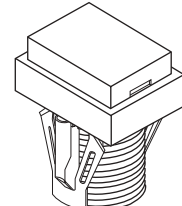
**M**

.551" Round



**N**

.551" x .728" Rectangular

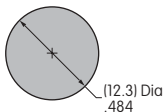


The bezel is an integral part of the switch body.

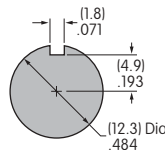
### Panel Cutouts

#### Bushing Mounting

Without Keyway



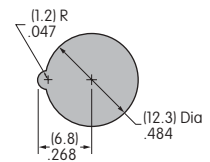
Panel Thickness:  
0.5 ~ 8mm  
(.020 ~ .315")



With Keyway

#### Snap-In Mounting

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



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. Shroud is an integral part of the switch body.

## CONTACT MATERIALS, RATINGS, & TERMINALS

**W** Silver Contacts

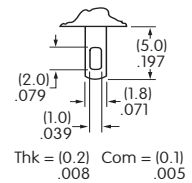
**Power Level**  
1A @ 125V AC & 250V AC

**G** Gold Contacts

**Logic Level**  
0.4VA maximum @ 28V AC/DC

**01** Solder Lug

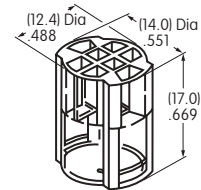
The .039" x .079" oblong hole accommodates one solid 20-gauge wire or two solid or stranded 22-gauge wires.



See Supplement Index (page Z1) for complete explanation of operating range.

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.



## LAMP CODES & SPECIFICATIONS



Electrical specifications are determined at a basic temperature of 25°C. Lamp circuit is independent of switch operation.

For dimension drawings of lamps see the Accessories & Hardware Index (page Y1).



If the source voltage is greater than rated voltage, a ballast resistor is required. The ballast resistor calculation and more lamp detail are shown in the Supplement; see Supplement Index (page Z1).

Ambient Temperature Range for lamps below: -25°C ~ +50°C.


### Incandescent & Neon Lamps

			<b>05</b>	<b>12</b>	<b>01</b>	Recommended Resistors for Neon: 33K ohms for 110V AC; 100K ohms for 220V AC
<b>AT611</b> Incandescent	<b>AT615</b> Neon	Voltage	5V AC	12V AC	110V AC	
		Current	115mA	60mA	1.5mA	
T-1 Bi-pin		Endurance	7,000 average		10,000	

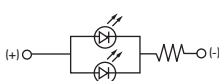
### Bright LED without Resistor

		Red	Amber	Green	<b>No Code</b> No Resistor			
<b>AT635</b>		<b>5C</b>	<b>5D</b>	<b>5F</b>				
LEDs are colored in OFF state.		Color Codes:			$I_{FM}$	30mA	30mA	30mA
					$I_F$	20mA	20mA	40mA
T-1 1/2 Bi-pin					$V_F$	1.9V	2.0V	2.1V
					$V_{RM}$	5V	5V	5V
					$\Delta I_F$	0.42mA/°C	0.29mA/°C	0.42mA/°C

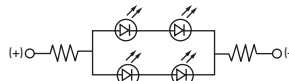
### Bright LED with Resistor

		Red	Amber	Green	Resistor Codes			
<b>AT634</b>		<b>5C</b>	<b>5D</b>	<b>5F</b>	<b>05</b>	<b>12</b>	<b>24</b>	
LEDs are colored in OFF state.		Color Codes:			$I_{FM}$	—	—	—
					$I_F$	25mA	20mA	10mA
					$V_F$	5V	5V	5V
					$V_{RM}$	4V	8V	16V
					$\Delta I_F$	—	—	—

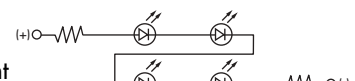
**AT634**  
5-volt  
2-element  
with 1 Resistor



**AT634**  
12-volt  
4-element  
with 2 Resistors






**AT634**  
24-volt  
4-element  
with 2 Resistors



## LAMP CODES & SPECIFICATIONS

### Super Bright Single Element LED

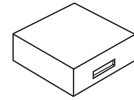
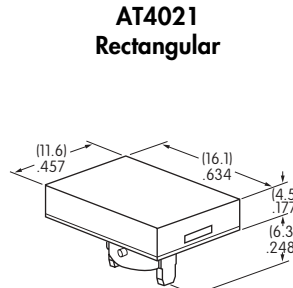
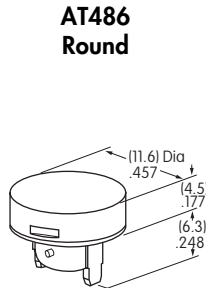
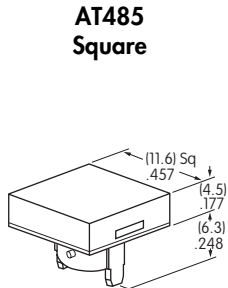
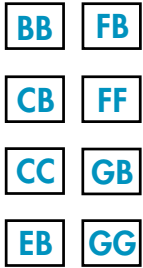
<p>AT625G Blue</p> <p>AT631B White</p> <p>AT632F Green</p>  <p>T-1 Bi-pin</p>			Color	<b>6B</b> White	<b>6F</b> Green	<b>6G</b> Blue	
			Forward Peak Current	$I_{FM}$	30mA	30mA	30mA
			Continuous Forward Current	$I_F$	20mA	20mA	20mA
			Forward Voltage	$V_F$	3.6V	3.5V	3.6V
			Reverse Peak Voltage	$V_{RM}$	5V	5V	5V
			Current Reduction Rate Above 25°C	$\Delta I_F$	0.50mA/°C	0.50mA/°C	0.50mA/°C
			Ambient Temperature Range		-25°C ~ +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

Lens/Filter Colors Available:



Translucent Colored Lens



Translucent Colored Filter

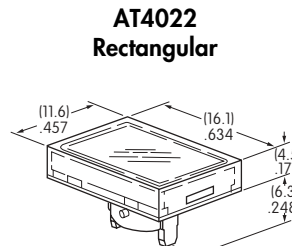
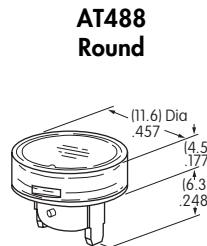
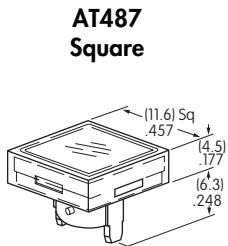


Lamp AT611

Material: Polycarbonate Finish: Glossy

### Insert Cap for Incandescent or Neon Lamp

Lens/Filter Colors Available:



Transparent Clear Lens



Translucent Colored Filter



Lamp AT611 Lamp AT615

JF and JG not suitable with neon lamp.

Material: Polycarbonate Finish: Glossy

## CAP TYPES & COLOR COMBINATIONS

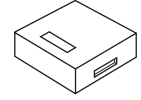
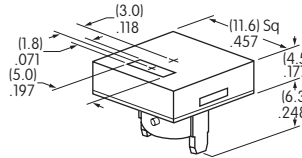
Color Codes: A Black B White C Red D Amber E Yellow F Green G Blue J Clear

### 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**

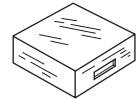
Square

**AT4132**

Round

**AT4134**

Rectangular



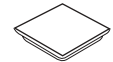
Transparent Clear Lens

**JC**

**AT4158**

**AT4160**

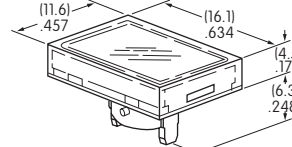
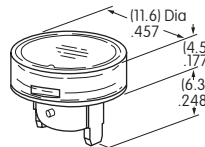
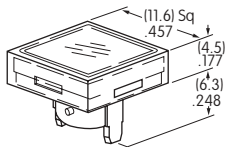
**AT4159**



Translucent Diffuser

**JD**

**JF**



Bright LED  
AT635

Bright LED  
AT634

Material: Polycarbonate Finish: Glossy

### Cap for Super Bright LED

Lens/Diffuser Colors Available:

**JB**

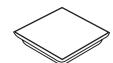
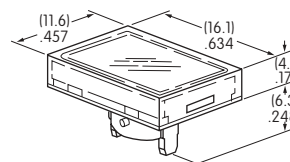
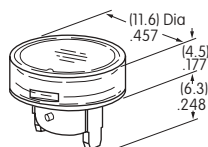
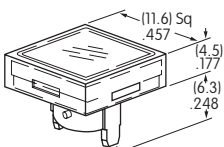
**AT4133**  
Square

**AT4132**  
Round

**AT4134**  
Rectangular



Translucent Clear Lens



Translucent White Diffuser

Super Bright LEDs  
AT625  
AT631 AT632

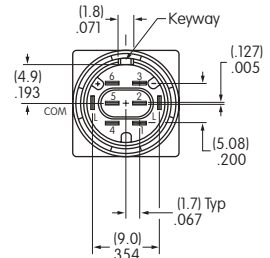
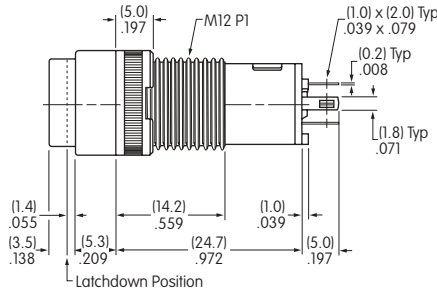
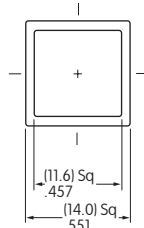


Material: Polycarbonate Finish: Glossy

## TYPICAL SWITCH DIMENSIONS

### Square • Bushing Mounting

### Single & Double Pole

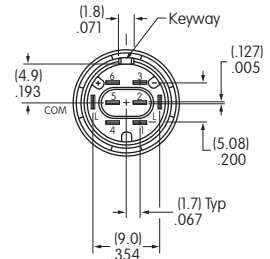
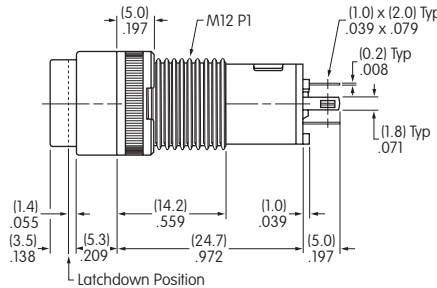
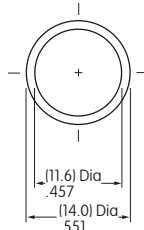


**KB15SKW01-05-GG**

Terminals 4, 5, & 6 are not on single pole models.

### Round • Bushing Mounting

### Single & Double Pole

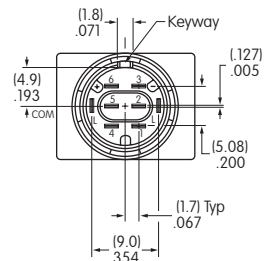
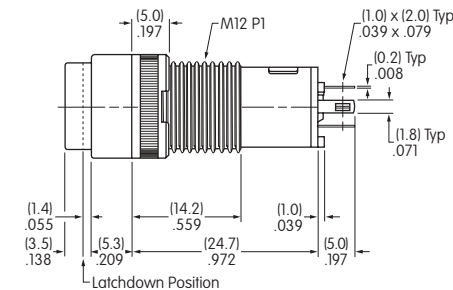
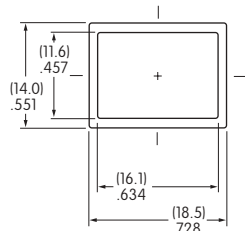


**KB25CKW01-05-GG**

Terminals 4, 5, & 6 are not on single pole models.

### Rectangular • Bushing Mounting

### Single & Double Pole



**KB15RKW01-05-GG**

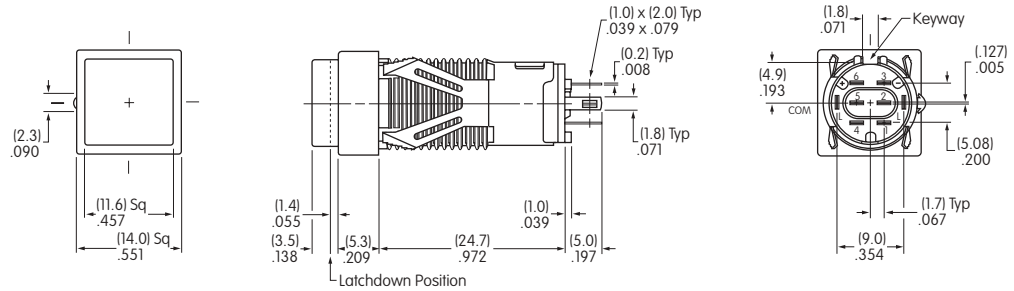
Terminals 4, 5, & 6 are not on single pole models.



## TYPICAL SWITCH DIMENSIONS

### Square • Snap-In Mounting

### Single & Double Pole

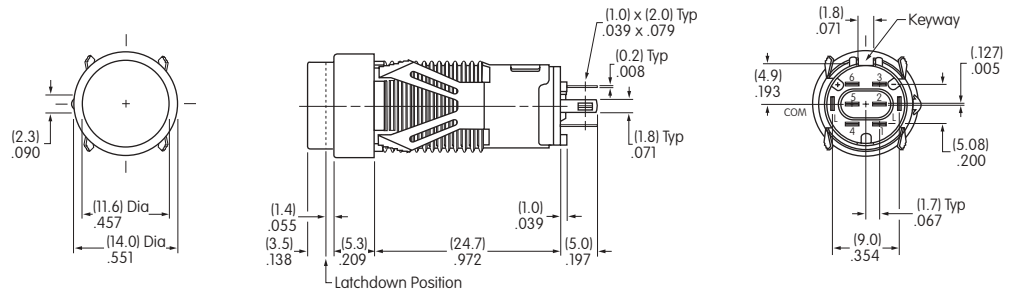


KB16KKW01-05-CB

Terminals 4, 5, & 6 are not on single pole models.

### Round • Snap-In Mounting

### Single & Double Pole

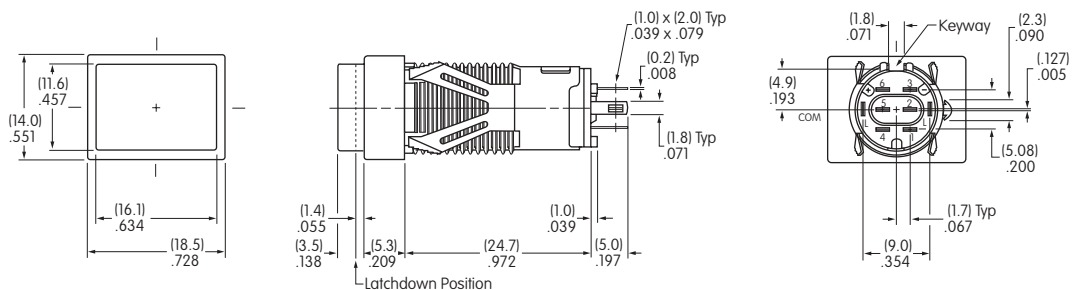


KB26MKW01-05-CB

Terminals 4, 5, & 6 are not on single pole models.

### Rectangular • Snap-In Mounting

### Single & Double Pole



KB16NKW01-05-CB

Terminals 4, 5, & 6 are not on single pole models.

## OPTIONAL ACCESSORIES

### PCB Adaptors

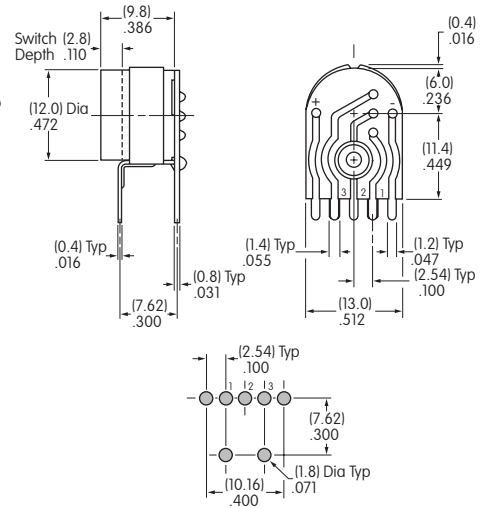
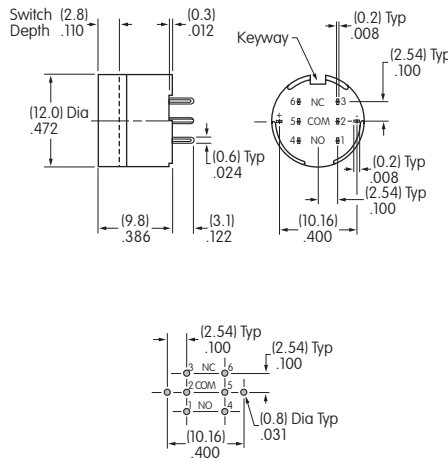
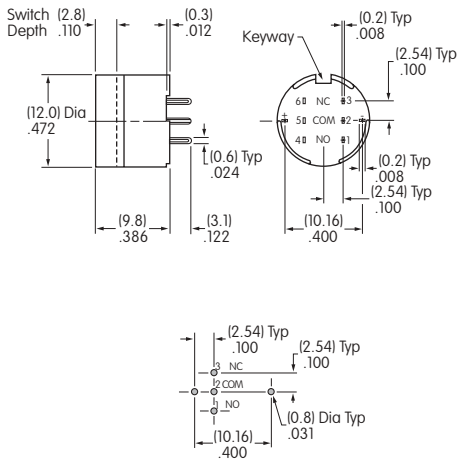
**AT701**  
Single Pole  
Straight PC  
Terminals



**AT702**  
Double Pole  
Straight PC  
Terminals



**AT077**  
Single Pole  
Right Angle PC  
Terminals



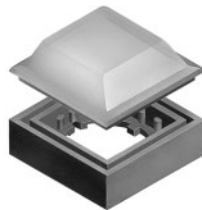
Material: Glass reinforced polyamide

Note: Order adaptors separately.

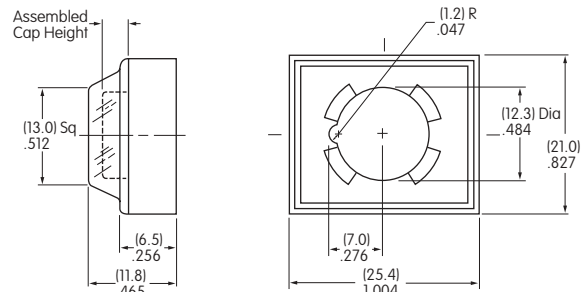
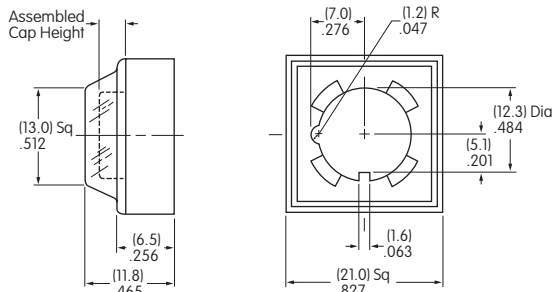
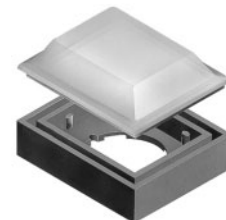
### Splash Covers

Panel Thickness Range: 0.5 ~ 6.8mm (.020 ~ .268") for Bushing Mounting 0.5 ~ 2.0mm (.020 ~ .079") for Snap-in Mounting  
 Splash Covers reduce the depth of switch behind panel by .047".

**AT495**  
For Square & Round



**AT4025**  
For Rectangular

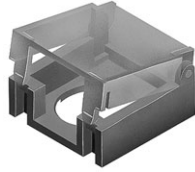


Material: Lid: PVC PVC loses pliability below 0°C (32°F). Base: Polyamide

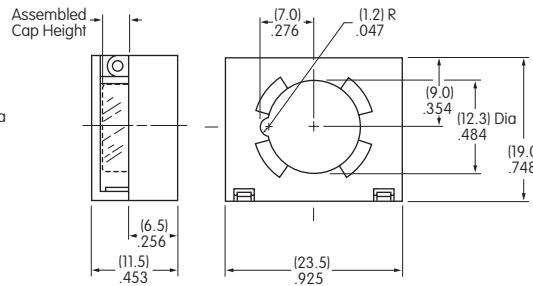
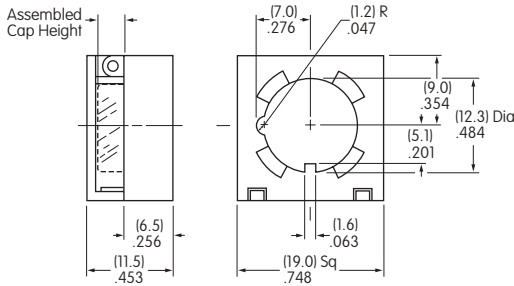
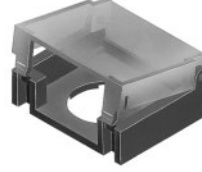
## OPTIONAL ACCESSORIES

### Protective Guards

**AT494**  
For Square & Round



**AT4024**  
For Rectangular



Panel Thickness  
Range:

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

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

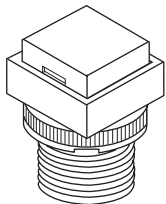
Protective Guards reduce  
the depth of switch  
behind panel by .047".

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

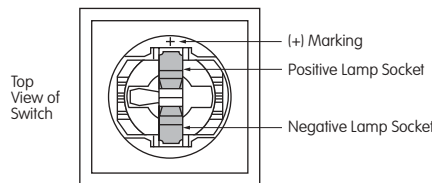
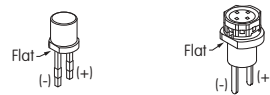
Super Bright LEDs AT625, AT631, & AT632 are electrostatic sensitive.



LED  
AT635

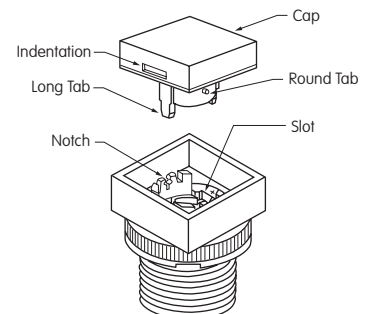
LED  
AT634

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**



## LEGENDS

General information and basic specifications are presented here for customers who want to do their own legends.

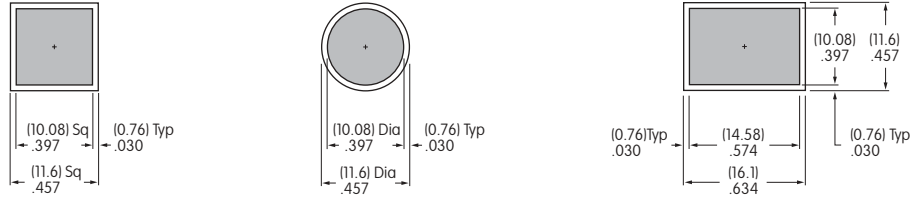
### Suggested Printable Area for Lens



**Recommended Print Method:**

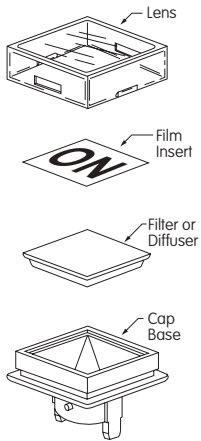
Screen Print or Pad Print

Epoxy based ink is recommended.



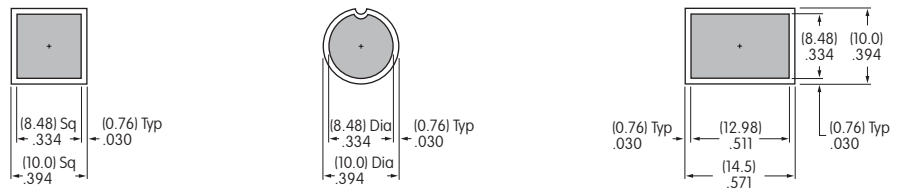
Shaded areas are printable areas.

### Suggested Printable Area for Film Insert



**Film Material and Thickness:**  
Clear Polyester, 4 mil max.

**Recommended Print Method:**  
Screen Print with Epoxy Based Ink



Shaded areas are printable areas.

### Additional Methods

Additional methods for legends are engraving the lens and laser printing on film inserts.  
Maximum depth for engraving is 0.3 mm (.012") on the cap lens.  
Enamel paint is recommended to fill the engraved area.

## LEGEND PACKET



1. To order caps with legends, contact the factory and request the KB Legend Packet.
2. Once you determine your desired legend, fill out the ordering work sheet included in the packet.
3. Return the completed work sheet to receive a quotation.