

General Specifications

Electrical Capacity (Resistive Load)

Power Level (silver): 5A @ 125/250V AC or 5A @ 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 for silver; 100 milliohms maximum for gold
Insulation Resistance: 200 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 for momentary;
 200,000 operations minimum for alternate action
Electrical Life: 10,000 operations minimum for silver;
 200,000 operations minimum for gold
Nominal Operating Force: Single Pole: 1.90N
 Double Pole: 2.55N
Contact Timing: Break before make
Travel: Pretravel .067" (1.7mm); Overtravel .024" (0.6mm); Total Travel .091" (2.3mm)

Materials & Finishes

Housing/Bezel: Glass fiber reinforced polyamide (UL94V-0)
Snap-in Frame: Stainless steel
Movable Contactor: Phosphor bronze
Movable Contacts: Silver alloy or copper with gold plating
Stationary Contacts: Silver alloy or copper with gold plating
Switch Terminals: Phosphor bronze with silver or gold plating
Lamp Terminals: Brass with tin plating
Base: Glass fiber reinforced liquid crystal polymer (UL94V-0)

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 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)

Installation

Cap Installation Force: 15.0N maximum downward force on cap

Processing

Soldering: Wave Soldering (PC version): See Profile A in Supplement section.
 Manual Soldering: 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 housing/bezel & 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.
 UL recognized only when ordered switch body with cap assembled.
 All single & double pole models recognized at 5A @ 125/250V AC or 0.014A @ 28V DC.

Distinctive Characteristics

Wide selection of illumination effects is achieved with single and bicolor, 1- or 6-element LEDs in flat, beveled, or sculptured caps.

Alternating legends (patent pending) in choice of sculptured or flat caps, combined with super bright bicolor LED.

Combination of PCB mountability and short body allows use in compact applications.

Small behind panel dimension for snap-in mounting in tight spaces.

Snap-acting contact mechanism provides sensitive actuation with audible feedback; quick-make, quick-break characteristic limits arcing and prolongs electrical life.

Latchdown mechanism, independent of switching mechanism, gives outstanding stability and reliability plus visible and tactile indication of circuit status.

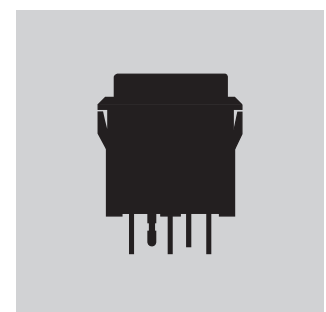
Terminals are epoxy sealed to lock out flux, solvents, and other contaminants.

Momentary and alternate action circuits available in the same space-saving body size.

Matching indicators available.



Actual Size



Toggles

Rockers

Pushbuttons

D Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

Supplement

TYPICAL SWITCH

ORDERING EXAMPLE

UB2

1

5

SK

G

03

Poles

1	SPDT
2	DPDT

Circuits

5	ON	(ON)
---	----	------

() = Momentary

6	ON	ON
---	----	----

Alternate Action with Latchdown

Mounting Types

PCB Mounting

SK	Square
----	--------

* Snap-in Mounting

KK	Square
----	--------

* Standard with Solder Lug terminals

Terminals

01	Solder Lug (for Snap-in Mounting)
03	Straight PC

Contacts & Ratings

W	Silver Rated 5A @ 125/250V AC
G	Gold Rated 0.4VA max @ 28V AC/DC max

IMPORTANT:

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

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

UB215SKG035C-1JC

Gold Contacts with 0.4VA Rating

Square with PCB Mounting

Straight PC Terminals

Red, Bright LED and Sculptured Cap with Clear Lens and Red Diffuser

SPDT ON-(ON) Circuit

5C

1JC

LEDs

Bright LED

5C	Red
5D	Amber
5F	Green

Super Bright LED

6B	White
6F	Green
6G	Blue

Super Bright Bicolor LED

6CF	Red/Green
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Nonilluminated

N	Nonilluminated
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Cap Types & Colors

Sculptured Cap Lens/Diffuser Colors

1JB	Clear/White
1JC	Clear/Red
1JD	Clear/Amber
1JF	Clear/Green

Beveled Cap & Colors

2B	White
2C	Red
2D	Amber
2F	Green

Flat Cap Lens/Diffuser Colors

3JB	Clear/White
3JC	Clear/Red
3JD	Clear/Amber
3JF	Clear/Green

Sculptured Cap Lens/Diffuser Color

1JB	Clear/White
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Beveled Cap & Color

2B	White
----	-------

Flat Cap Lens/Diffuser Color

3JB	Clear/White
-----	-------------

Sculptured Cap Lens/Diffuser Color

1JB	Clear/White
-----	-------------

Beveled Cap & Color

2B	White
----	-------

Flat Cap Lens/Diffuser Color

3JB	Clear/White
-----	-------------

Sculptured Cap with Alternating Legend

4J	Clear Lens
----	------------

Flat Cap with Alternating Legend

5J	Clear Lens
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Sculptured Cap Lens/Insert Colors

4JA	Clear/Black	4JD	Clear/Amber
4JB	Clear/White	4JF	Clear/Green
4JC	Clear/Red		

Beveled Cap & Colors

5A	Black	5D	Amber
5B	White	5F	Green
5C	Red		

Alternating Legends

01	ON/OFF
02	START/STOP
04	OPEN/CLOSE

POLES & CIRCUITS

Pole	Model	Plunger Position () = Momentary		Connected Terminals		Throw & Switch/Lamp Schematics
		Normal 	Down 	Normal 	Down 	
SP	UB215 *UB216	ON ON	(ON) ON	1-3	1-2	SPDT  
DP	UB225 *UB226	ON ON	(ON) ON	1-3 4-6	1-2 4-5	DPDT  

* When in latchdown position for the alternate circuit, cap positions above the housing are:
.059" (1.5mm) for snap-in models & .276" (7.0mm) for PCB models.

MOUNTING TYPES & SHAPES

PCB Mounting



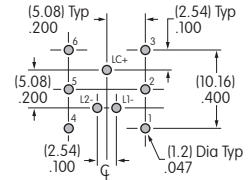
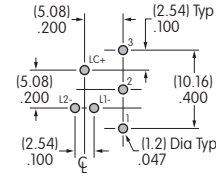
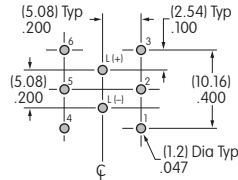
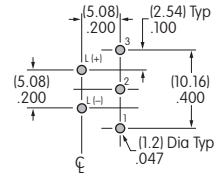
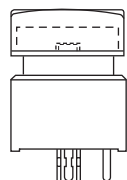
Square

SP, Single Color LED

DP, Single Color LED

SP, Bicolor LED

DP, Bicolor LED



Snap-in Mounting (Solder Lug)



Square with Built-in Bezel



Panel Thickness:
.039 ~ .126"
(1.0 ~ 3.2mm)

CONTACT MATERIALS & RATINGS



Silver Contacts

Power Level

5A @ 125V AC & 250V AC



Gold Contacts

Logic Level

0.4VA maximum @ 28V AC/DC maximum

Complete explanation of operating range in Supplement section.

SWITCH & LAMP TERMINALS



Solder Lug

For Switch & Bright LED

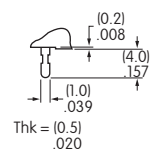
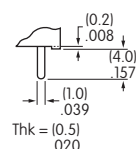
For Super Bright & Bicolor LED



Straight PC

For Switch & Bright LED

For Super Bright & Bicolor LED



BRIGHT LED & CAPS

The electrical specifications shown are determined at a basic temperature of 25°C.
LED circuit is isolated and requires an 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.
The LED is an integral part of the switch and not available separately.

Electrical Specifications for Bright LED

		5C	5D	5F	
	Color	Red	Amber	Green	Unit
Maximum Forward Current	I _{FM}	30	30	25	mA
Typical Forward Current	I _F	20	20	20	mA
Forward Voltage	V _F	1.85	2.0	2.1	V
Maximum Reverse Voltage	V _{RM}	5	5	5	V
Current Reduction Rate Above 25°C	ΔI _F	0.40	0.42	0.46	mA/°C
Ambient Temperature Range		-25° ~ +50°			°C

Bright Single Color LED with 1 element



Caps for Bright LED



Lens/Diffuser Colors Available:

- JB** Clear/White
- JC** Clear/Red
- JD** Clear/Amber
- JF** Clear/Green

Cap Colors Available:

- B** White
- C** Red
- D** Amber
- F** Green

Lens/Diffuser Colors Available:

- JB** Clear/White
- JC** Clear/Red
- JD** Clear/Amber
- JF** Clear/Green

Material: Polycarbonate Finish: Glossy

SUPER BRIGHT LEDs & CAPS

The electrical specifications shown are determined at a basic temperature of 25°C.
LED circuit is isolated and requires an 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.

The LED is an integral part of the switch and not available separately.

Electrical Specifications for Super Bright LEDs

Super Bright LEDs are Electrostatic Sensitive	Color	6B	6F	6G	Unit
		White	Green	Blue	
Maximum Forward Current	I_{FM}	20	30	25	mA
Typical Forward Current	I_F	15	20	20	mA
Forward Voltage	V_F	3.3	3.5	3.6	V
Maximum Reverse Voltage	V_{RM}	5	5	5	V
Current Reduction Rate Above 25°C	ΔI_F	0.25	0.50	0.40	mA/°C
Ambient Temperature Range		-20° ~ +50°			°C

Super Bright Single Color LED with 1 element



Caps for Super Bright LED

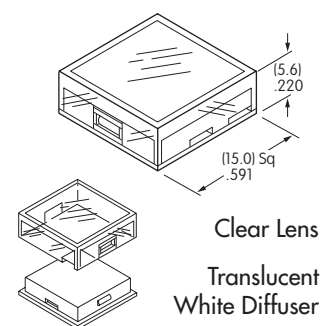
1JB AT3074JB Sculptured Clear Lens/White Diffuser



2B AT3075B Beveled White Cap



3JB AT3076JB Flat Clear Lens/White Diffuser



Material: Polycarbonate

Finish: Glossy

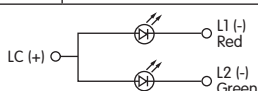
SUPER BRIGHT BICOLOR LED & CAPS

Electrical Specifications for Super Bright Bicolor LED

The electrical specifications shown are determined at a basic temperature of 25°C.
LED circuit is isolated and requires an external power source.
Polarity marks are on bottom of 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 Supplement Section.
The LED is an integral part of the switch and not available separately.

Super Bright LEDs are Electrostatic Sensitive	Color	6CF	Unit
		Red/Green	
Maximum Forward Current	I_{FM}	30/25 (25/22 for Amber)	mA
Typical Forward Current	I_F	20/20	mA
Forward Voltage	V_F	2.1/3.5	V
Maximum Reverse Voltage	V_{RM}	4/4	V
Current Reduction Rate Above 25°C	ΔI_F	0.40/0.33	mA/°C
Ambient Temperature Range		-25° ~ +50°	°C

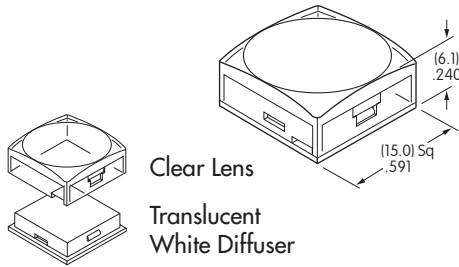
Super Bright Bicolor LED with 2 elements



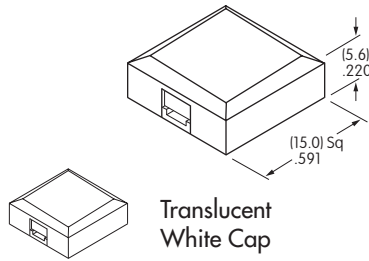
Amber color is achieved by lighting red and green simultaneously, but is not suitable for Alternating Legends.

Caps for Super Bright Bicolor LED

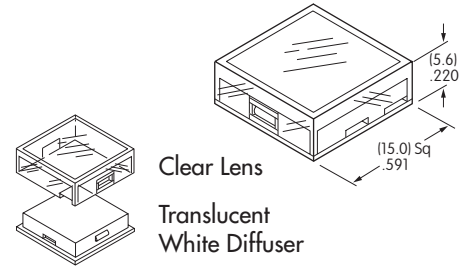
1JB AT3074JB Sculptured Clear Lens/White Diffuser



2B AT3075B Beveled White Cap



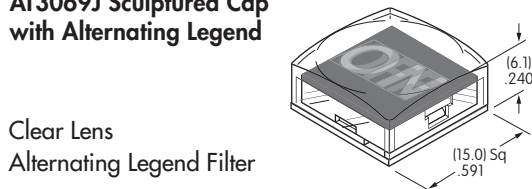
3JB AT3076JB Flat Clear Lens/White Diffuser



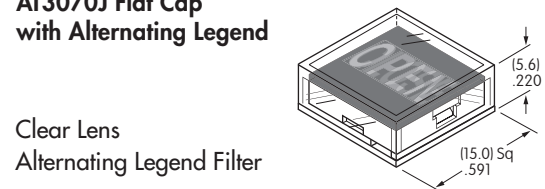
Material: Polycarbonate Finish: Glossy

Alternating Legend Caps for Super Bright Bicolor LED

4J AT3069J Sculptured Cap with Alternating Legend

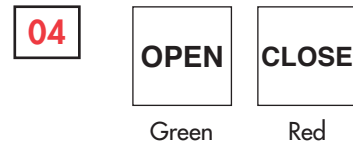
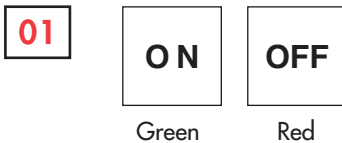


5J AT3070J Flat Cap with Alternating Legend



Material: Polycarbonate Finish: Glossy

Standard Alternating Legend Pairs



Cap illumination is alternating green/red; legend text is black.
Contact factory for other Alternating Legends.

Legend illustrations are approximate representations of the actual characters on the filters.

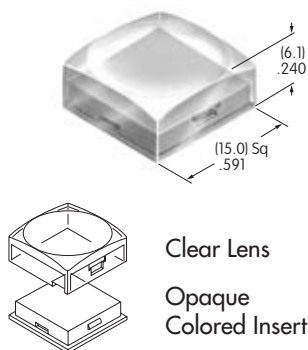
No Code No Lamp

CAP TYPES & COLOR COMBINATIONS FOR NONILLUMINATED

4 AT3073 Sculptured

Lens/Insert
Colors Available:

- JA** Clear/Black
- JB** Clear/White
- JC** Clear/Red
- JD** Clear/Amber
- JF** Clear/Green



Material: Polycarbonate
Finish: Glossy

5 AT3077 Beveled

Cap
Colors Available:

- A** Black
- B** White
- C** Red
- D** Amber
- F** Green



Material: Polycarbonate
Finish: Glossy

TYPICAL SWITCH DIMENSIONS

Bright & Super Bright LED Straight PC



UB215SKG035C-1JC

Bright Single Color LED

Super Bright Single Color LED

Single Pole

Double Pole

Bicolor LED Straight PC



UB225SKG03CF-1JB

Bicolor LED Side View

Single Pole

Double Pole

Bright LED Solder Lug



UB216KKW015F-1JF

Single Color LED Side View

Single Pole

Double Pole

Super Bright LED Solder Lug



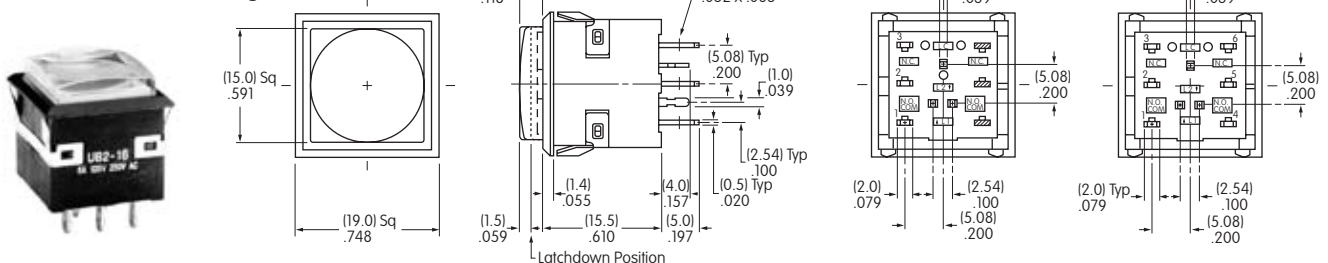
UB226KKW016F-1JF

Single Color LED Side View

Single Pole

Double Pole

Bicolor LED Solder Lug



UB216KKW01CF-1JB

Bicolor LED Side View

Single Pole

Double Pole

OPTIONAL ACCESSORIES

Protective Guard for Snap-in Model

AT4141

Opens 90°
Closes manually

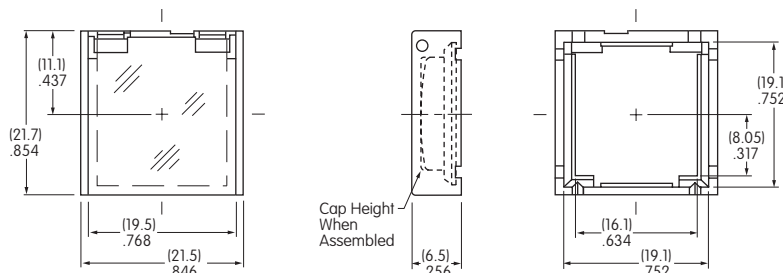


Materials:

Cover: Clear Polycarbonate
Base: Black GFR Polyamide

Recommended Panel Thickness:

.039" ~ .106" (1.0mm ~ 2.7mm)



Spring Loaded Protective Guard for Snap-in Mounting of PCB Model

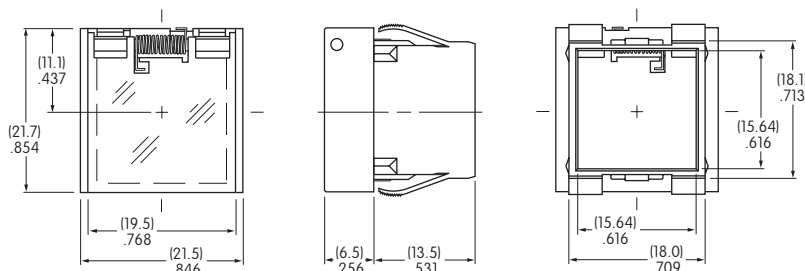
AT4170

Opens 180°
Closes automatically



Materials:

Cover: Clear Polycarbonate
Base: Black Polyamide
Coil Spring: Stainless Steel

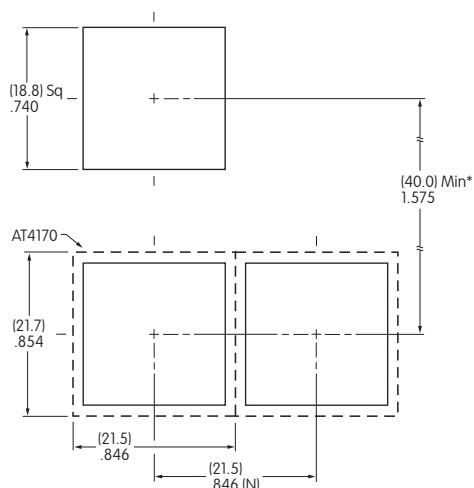


Recommended Panel Thickness:

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

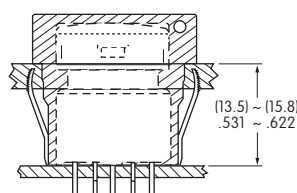
Recommended Panel-to-PCB Range:

.531" ~ .622"
(13.5mm ~ 15.8mm)



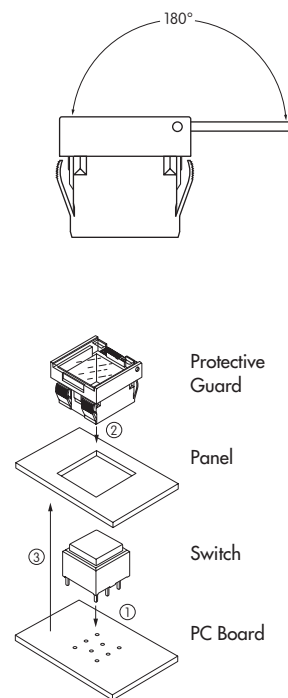
(N) = Number of switches

* Minimum dimension allows opening of cover to 180°



Installation

- 1 Install switch onto PC board.
- 2 Snap protective guard into panel.
- 3 Join the two assemblies.



OPTIONAL ACCESSORIES

Spring Loaded Protective Guard for Snap-in Model

AT4142

Opens 180°
Closes automatically

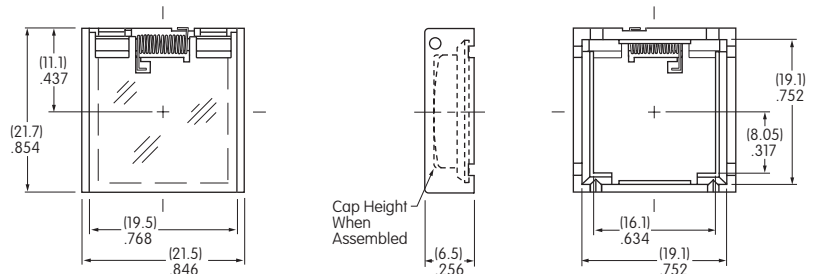


Materials:

Cover: Clear Polycarbonate
Base: Black GFR Polyamide
Coil Spring: Stainless Steel

Recommended Panel Thickness:

.039" ~ .106" (1.0mm ~ 2.7mm)

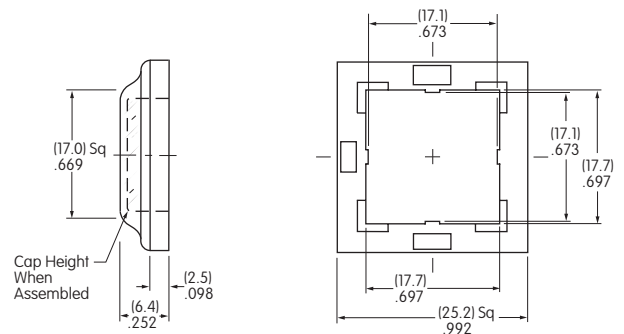
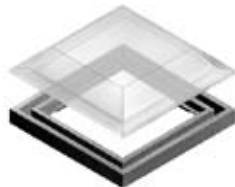


Dust Cover

AT4145 Not for use with barriers.

Materials:

Lid: Clear PVC
Operating temperature range:
0°C ~ +70°C (32°F ~ 158°C).
Gasket: Polyethylene



Recommended Panel Thickness

.039" ~ .098" (1.0mm ~ 2.5mm)

Barriers for Snap-in Mount

AT4143 End

AT4144 Center



Cutouts for more than 1 Switch:

$A = .799" (20.3mm) \times \text{Number of Switches} + .051" (1.3mm)$

Material: Polyamide

LEGENDS

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

Suggested Printable Area for UB2 Lens, Film Insert or Diffuser

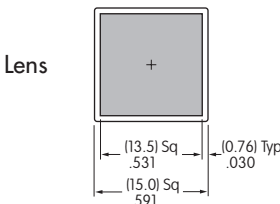
Recommended Methods: Laser Etch on clear lens, Screen Print or Pad Print on lens;
Laser Print on film insert.

Shaded areas are printable areas.

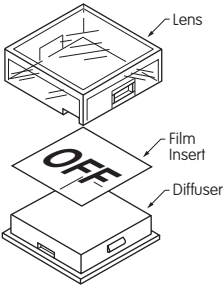
Beveled Cap



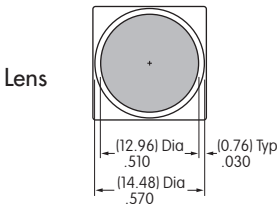
Flat Cap



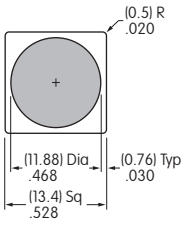
Film Insert or Diffuser



Sculptured Cap



Film Insert or Diffuser



Film Insert: Clear Polyester 4 mil maximum thickness