# Distinctive Characteristics

Carefully designed light diffusion and filtering system produces bright, full surface illumination with front panel relamping.

Spot illumination available in single and bicolor LEDs.

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

Stainless steel clips provide secure mounting with a wide range of panel thicknesses.

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

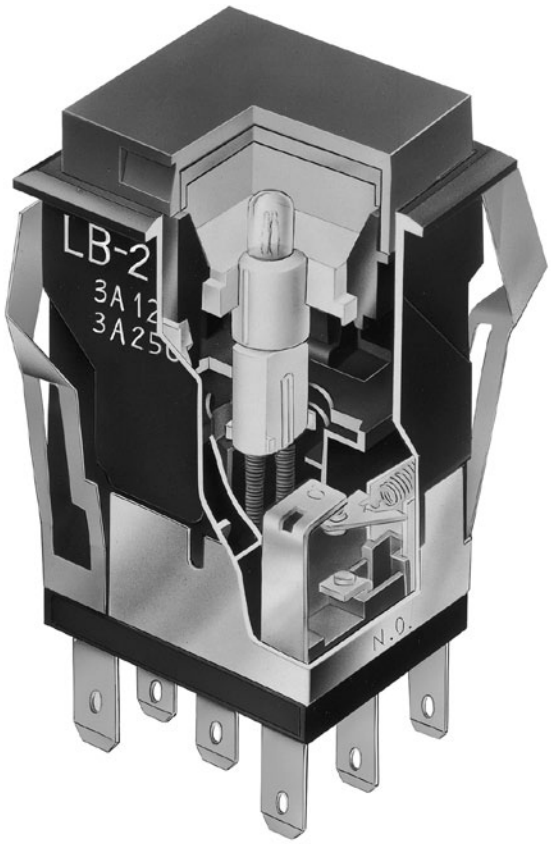
Snap-action contact mechanism gives long electrical life and sensitivity of actuation.

Combination solder lug and .110" quick connect terminals are epoxy sealed to prevent entry of flux, dust, and other contaminants.

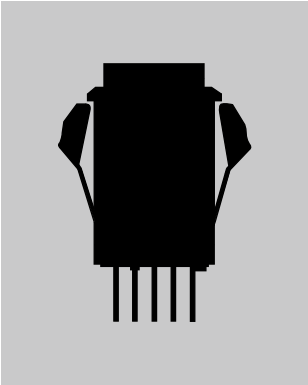
Panel sealed model meets IP65 of IEC60529 specifications (similar to NEMA 4 & 13).

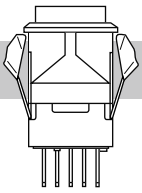
Compact switch design minimizes behind panel depth.

Matching indicators available.

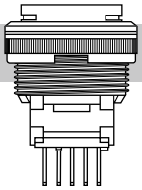



Actual Size





Snap-in Mount Page D46



Panel Seal Page D57

# General Specifications

## Electrical Capacity (Resistive Load)

**Power Level (silver):** 3A @ 125V AC or 3A @ 250V AC or 3A @ 30V DC
**Logic Level (gold):** 0.4VA maximum @ 28V AC/DC maximum
(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)

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 circuit
200,000 operations minimum for maintained circuit
**Electrical Life:** 100,000 operations minimum
**Nominal Operating Force:** 5.39N
**Contact Timing:** Nonshorting (break-before-make)
**Travel:** Pretravel .059" (1.5mm); Overtravel .059" (1.5mm); Total Travel .118" (3.0mm)

## Materials & Finishes

**Housing:** Glass fiber reinforced polyamide (UL94V-0)
**O-ring:** Nitrile butadiene rubber
**Inner Seal:** Silicone rubber
**Movable Contact:** Silver alloy or copper with gold plating
**Stationary Contacts:** Silver alloy or copper with gold plating
**Base:** Liquid crystal polymer (UL94V-0)
**Switch Terminals:** Phosphor bronze with silver or gold plating
**Lamp Terminals:** Brass 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
Note: When used with a polyvinyl chloride splash cover, the lowest limit is 0°C (32°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$^2$) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

**Sealing:** IP65 of IEC60529 standard (similar to NEMA 4 & 13)

## Installation

**Mounting Torque:** 1.96Nm (17.35 lb•in) maximum
**Cap Installation Force:** 3.92N maximum downward force on cap
**Quick Connect Force:** 52.95N maximum downward force on connector
**Soldering Time & Temperature:** Manual Soldering: See Profile A in Supplement section.

## Standards & Certifications

**Flammability Standards:** UL94V-0 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.
All models recognized at 3A @ 125V or 250V AC or 0.4VA @ 28V AC/DC maximum.
**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.
All models certified at 3A @ 125V or 250V AC or 0.4VA @ 28V AC/DC maximum.

## TYPICAL SWITCH

LB 1 6 W K W01

### Poles

| | |
|---|---|
| 1 | SPDT |
| 2 | DPDT |

### Circuits

| | | |
|---|---|---|
| 5 | ON | (ON) |
| ( ) = Momentary | | |
| 6 | ON | ON |
| Alternate Action with Latchdown | | |

### Shape

| | |
|---|---|
| W | Round |

### Housing

| | |
|---|---|
| K | Black |
| G | Gray |

### Contacts & Terminals

| | |
|---|---|
| W01 | Silver Contacts<br>Rated 3A @ 125/250V AC<br>Solder Lug/Quick Connect Terminals |
| G01 | Gold Contacts<br>Rated 0.4VA @ 28V AC/DC<br>Solder Lug/Quick Connect Terminals |

### 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

**LB16WKW01-5C12-JC**

Red, 12-volt, Bright LED with Resistor

Round Shape

Black Housing

Clear Cap with Red Diffuser

SPDT ON-ON Circuit

Silver Contacts
Rated 3A @ 125/250V AC;
Solder Lug/Quick Connect Terminals



Standard Size Panel Seal Pushbuttons
Series LB

## ORDERING EXAMPLE

— 5C 12 — JC

### Lamps

| Incandescent Lamp Used with Solid Cap | |
|---|---|
| 05 | 5-volt |
| 12 | 12-volt |
| No Code | Nonilluminated |

| Incandescent or Neon Used with Insert Cap | |
|---|---|
| 01 | 110-volt Neon |
| 05 | 5-volt Incandescent |
| 12 | 12-volt Incandescent |
| No Code | Nonilluminated |

| Bright LED Used with LED Cap | | | |
|---|---|---|---|
| Colors | | Resistor | |
| 5C | Red | No Code | No Resistor |
| 5D | Amber | 05 | 5-volt |
| | | 12 | 12-volt |
| 5F | Green | 24 | 24-volt |

| Super Bright LED Used with LED Cap | |
|---|---|
| 6B | White |
| 6F | Green |
| 6G | Blue |

### Cap Types & Colors

| Solid Cap: Lens/Filter Colors | |
|---|---|
| BJ | White/Clear |
| CJ | Red/Clear |
| EJ | Yellow/Clear |
| FJ | Green/Clear |
| GJ | Blue/Clear |

| Insert Cap: Lens/Filter Colors | |
|---|---|
| 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 | |
|---|---|
| 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: Normal | Down | Connected Terminals: Normal | Down | Throw & Switch/Lamp Schematics |
|---|---|---|---|---|---|---|
| SP | LB15<br>*LB16 | ON<br>ON | (ON)<br>ON | 1-3 | 1-2 | SPDT |
| DP | LB25<br>*LB26 | ON<br>ON | (ON)<br>ON | 1-3 4-6 | 1-2 4-5 | DPDT |

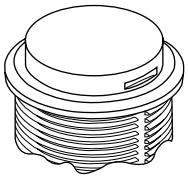
Notes: Switch is marked with NC, NO, COM, L+, L–. Lamp circuit is isolated and requires external power source.



* When in latchdown position for the alternate circuit, cap position is .039″ (1.0mm) above the built-in bezel.

## SHAPE & PANEL CUTOUT

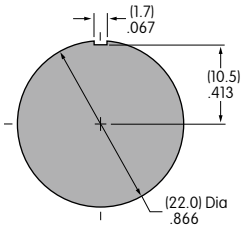
**W** **.866″ (22.0mm) Round**



Recommended Panel Thickness:
.039″ ~ .157″ (1.0mm ~ 4.0mm)

Recommended Panel Thickness with Splash Cover:
.039″ ~ .138″ (1.0mm ~ 3.5mm)

Overtightening the mounting nut AT074 may damage the switch housing.




## HOUSING

**Housing Colors Available:** **K** Black **G** Gray

## CONTACT MATERIALS, RATINGS & TERMINALS

**W01** **Silver Contacts**

**G01** **Gold Contacts**

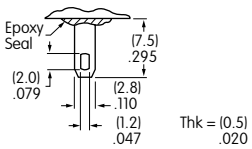
**Power Level**
**3A @ 125V AC & 250V AC**

**Logic Level**
**0.4VA max. @ 28V AC/DC max.**

Complete explanation of operating range in Supplement section.

**Solder Lug/Quick Connect**

Optional PCB adaptors AT711 & AT712 available; illustrated in previous snap-in subsection.




## INCANDESCENT & NEON LAMP CODES & SPECIFICATIONS

**AT607 & AT607N**

T-1 Bi-pin

| | | 05 | 12 | 01 * |
|---|---|---|---|---|
| AT607 Incandescent 5-volt or 12-volt; AT607N Neon 110-volt | | | | |
| Voltage | V | 5V AC | 12V AC | 110V AC |
| Current | I | 115mA | 60mA | 1.5mA |
| Endurance | Avg. Hours | 10,000 | | 10,000 |
| Ambient Temp. Range | | –25°C ~ +50°C | | |

The electrical specifications shown are determined at a basic temperature of 25°C. Lamp circuit is isolated and requires external power source.

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

## LED 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 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.
Additional lamp detail is shown in the Accessories & Hardware section.

### Bright LED without Resistor

**AT635**

LEDs are colored in OFF state.

T-1½ Bi-pin

| Color Codes | Red 5C | Amber 5D | Green 5F | No Code No Resistor 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 | | | $\Delta I_F$ | 0.42mA/°C | | |
| Ambient Temperature Range | | | | −25° ~ +50°C | | |

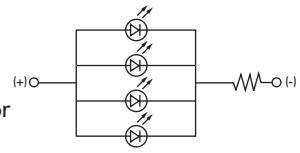
### Bright LED with Resistor

**AT627 with Resistor**

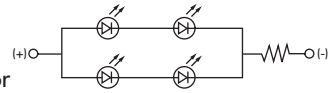
T-1 Bi-pin

| Color Codes: | Red 5C | Amber 5D | Green 5F | Resistor Codes 05 | 12 | 24 |
|---|---|---|---|---|---|---|
| Maximum Forward Current | | | $I_{FM}$ | — | — | — |
| Typical Forward Current | | | $I_F$ | 52mA | 26mA | 13mA |
| Forward Voltage | | | $V_F$ | 5V | 12V | 24V |
| Maximum Reverse Voltage | | | $V_{RM}$ | 4V | 8V | 16V |
| Current Reduction Rate Above 25°C | | | $\Delta I_F$ | 0.50mA/°C | | |
| Ambient Temperature Range | | | | −25° ~ +50°C | | |

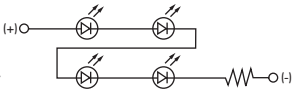
AT627
5-volt
4-element
with Resistor




AT627
12-volt
4-element
with Resistor




AT627
24-volt
4-element
with Resistor




### Super Bright Single Element LED

**AT625G Blue**
**AT631B White**
**AT632F Green**

T-1 Bi-pin

ATTENTION ELECTROSTATIC SENSITIVE DEVICES

| Color | | 6B White | 6F Green | 6G Blue |
|---|---|---|---|---|
| Maximum Forward Current | $I_{FM}$ | 30mA | 30mA | 30mA |
| Typical Forward Current | $I_F$ | 20mA | 20mA | 20mA |
| Forward Voltage | $V_F$ | 3.6V | 3.3V | 3.3V |
| Maximum Reverse Voltage | $V_{RM}$ | 5V | 7V | 7V |
| Current Reduction Rate Above 25°C | $\Delta I_F$ | 0.50mA/°C | 0.40mA/°C | 0.40mA/°C |
| Ambient Temperature Range | | −25° ~ +50°C | | |

**No Code** **No Lamp**

## CAP TYPES & COLOR COMBINATIONS

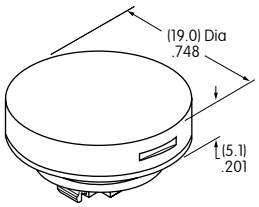
**Color Codes:** **B** White **C** Red **D** Amber **E** Yellow **F** Green **G** Blue **J** Clear

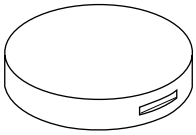
### Solid Cap for Incandescent Lamp & Nonilluminated

**Lens/Filter Colors Available:**

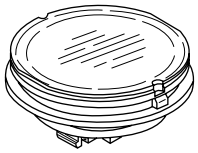
BJ FJ CJ GJ EJ

**AT4054**

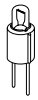


Translucent Colored Lens



Transparent Clear Filter



Lamp AT607

Material: Polycarbonate Finish: Glossy

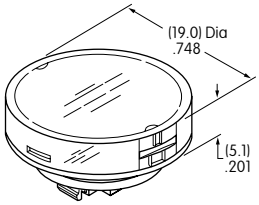
### Insert Cap for Incandescent or Neon Lamp & Nonilluminated

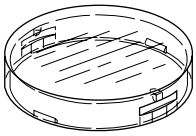
**Lens/Filter Colors Available:**

JB JF JC JG JE

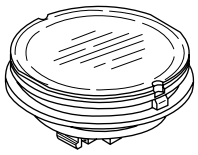
JF and JG not suitable with neon lamp.

**AT4055**

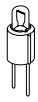


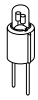
Transparent Clear Lens



Translucent Colored Filter



Lamp AT607



Lamp AT607N

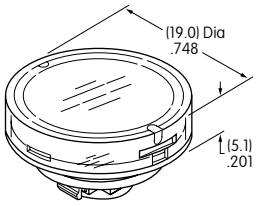
Material: Polycarbonate Finish: Glossy

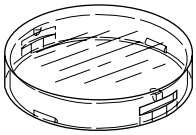
### Cap for Bright LED without Resistor

**Lens/Diffuser Colors Available:**

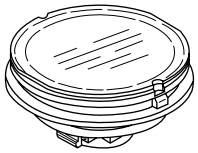
JB JC JD JF

**AT4179**



Transparent Clear Lens



Translucent Colored Diffuser

Bright LED AT635

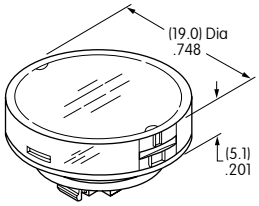
Material: Polycarbonate Finish: Glossy

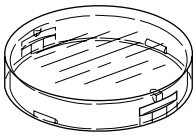
### Cap for Bright LED with Resistor

**Lens/Diffuser Colors Available:**

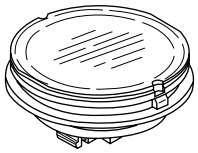
JB JC JD JF

**AT4165**

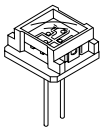


Transparent Clear Lens



Translucent Colored Diffuser



Bright LED AT627

Material: Polycarbonate Finish: Glossy

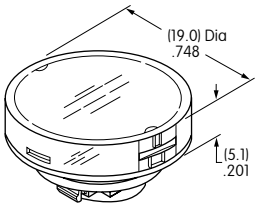
## CAP TYPES & COLOR COMBINATIONS

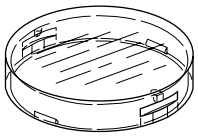
### Cap for Super Bright LEDs

**JB** **Clear Lens**
**White Diffuser**

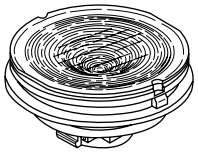
Material:
Polycarbonate
Finish: Glossy

**AT4131**



Transparent
Clear Lens

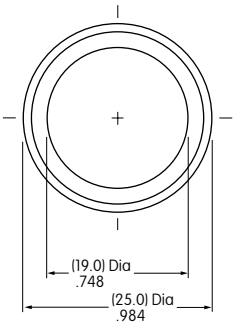


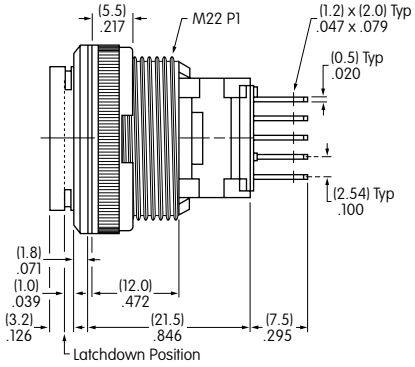
Translucent
Colored Diffuser

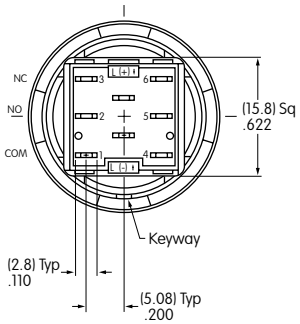
LEDs
AT625
AT631
AT632

## TYPICAL SWITCH DIMENSIONS

### Single & Double Pole




### Panel Seal

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

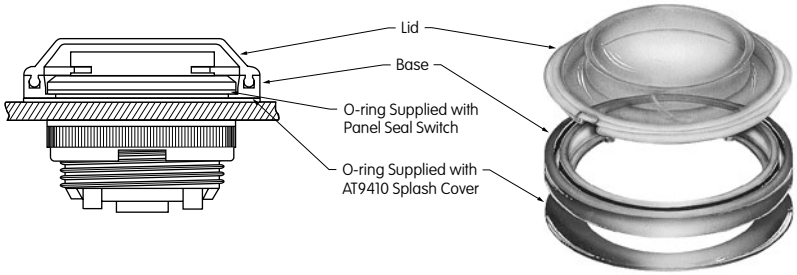
**LB25WKW01-12-JC**

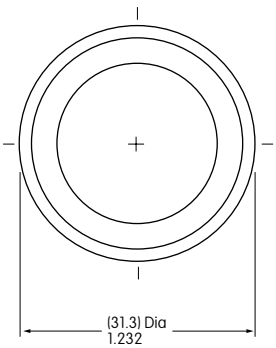
## OPTIONAL ACCESSORIES

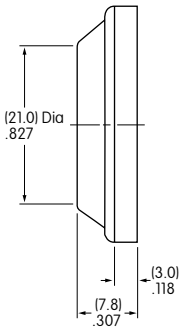
### AT9410 Splash Cover for Panel Seal

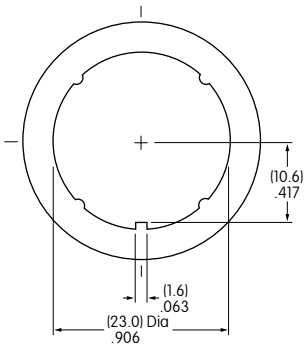
Materials:
- Lid: PVC (loses pliability below 0°C/32°F)
- Base: Polyethylene
- O-ring: NBR

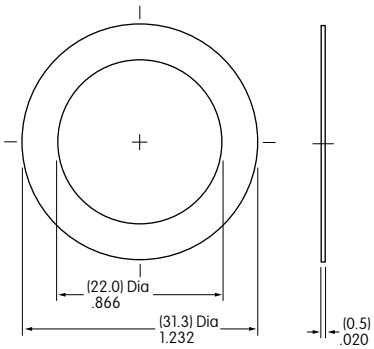
Recommended Panel Thickness:
.039″ ~ .138″ (1.0mm ~ 3.5mm)



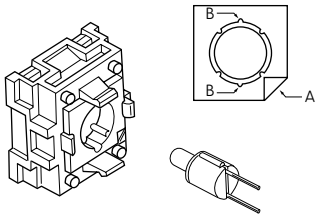



## ASSEMBLY INSTRUCTIONS

### Lamp Installation & LED Orientation

**Incandescent & Neon Lamps AT607 & AT607N**

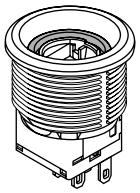
Align projections on lamp with grooves (B) in holder when inserting lamp. To correctly join the lamp holder and cap base, match the cut corners (A).




**Bright LED AT627**

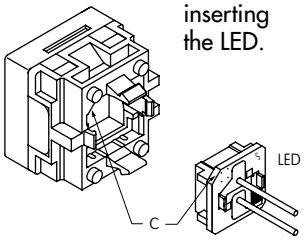
**Panel Seal Models**

For panel seal models, Bright LED must first be inserted into the lamp socket which is built into the switch. The cap can then be placed on the switch.



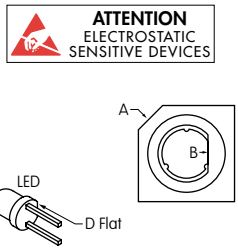
**Snap-in Models**

For snap-in models, Bright LED must be inserted into the cap first. Align cut corners (C) when inserting the LED.




**Bright & Super Bright LEDs AT625, AT631, AT632, AT635**

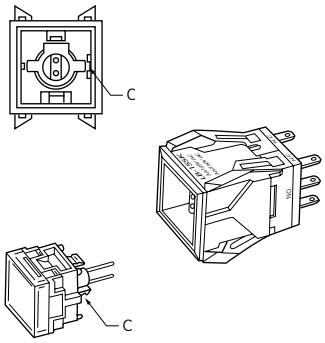
Align D-flat on LED with flat (B) in holder when inserting the LED.
To correctly join the lamp holder and cap base, match the cut corners (A).







### Switch & Cap Assembly

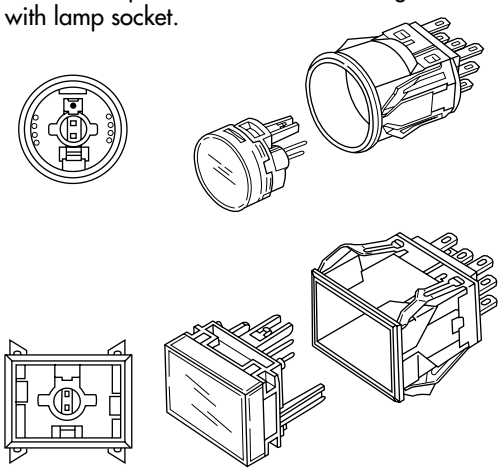


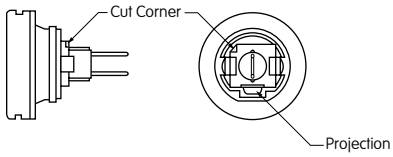

**Square**

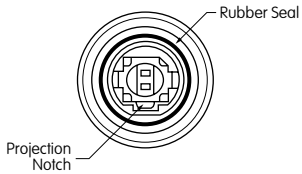
Match projection (C) on cap assembly with groove (C) inside switch. Lamp terminals will then be aligned correctly with lamp socket.

**Round & Rectangular**

Match clip on cap assembly with receptacle inside switch. Lamp terminals will then be aligned correctly with lamp socket.





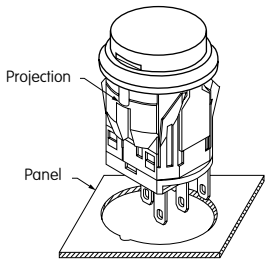

**Panel Seal**

With Lamps AT607, AT607N, and LEDs AT614, AT625, AT631, AT632: Match projection on cap assembly with notch inside switch. Lamp terminals will then be aligned correctly with lamp socket.

### Installation & Maintenance

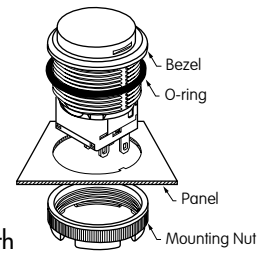
**Snap-in Mount**

Snap-in clip holds all switches firmly in place.
To mount round switch, match the antirotation projection on switch with guide cut in panel. Snap into panel cutout.



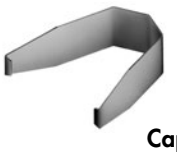

**Panel Seal Bushing Mount**

Insert switch from the front of the panel with the o-ring between the built-in bezel and the panel. Install mounting nut AT075 (supplied with switch) from the rear of the panel.
Overtightening mounting nut may damage the switch housing.




**Lamp Replacement**

Actuator must be in UP position.
Pull off cap with cap extractor AT109.
Replace lamp and reassemble as shown above.



**AT109**
**Cap Extractor**

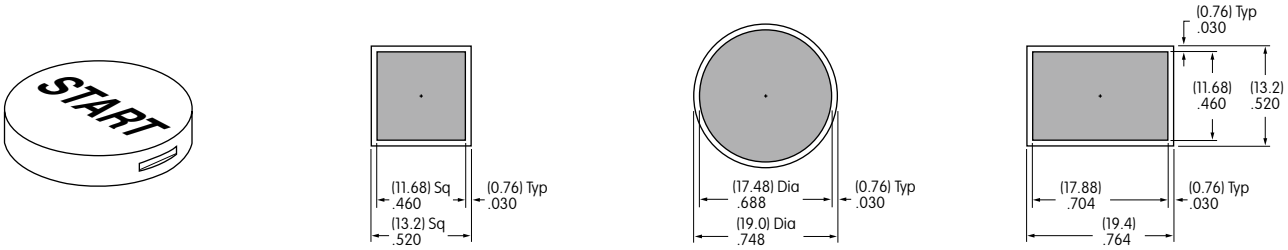
**AT112**
**Socket Wrench**

## LEGENDS

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

### Suggested Printable Area for Lens

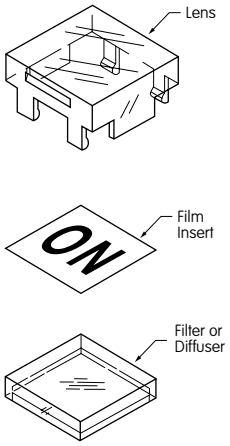
**Recommended Methods:** Laser Etch on clear lens, Screen Print, or Pad Print on lens.
Epoxy based ink is recommended.



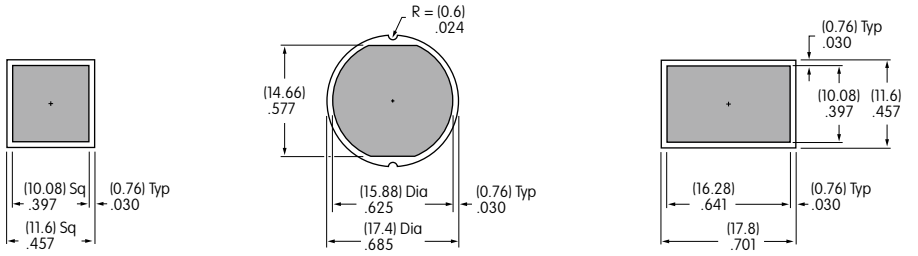

Shaded areas are printable areas.

### Suggested Printable Area for Film Insert

**Recommended Print Method:** Laser Print or Screen Print with Epoxy based ink




Film Insert: Clear Polyester, 4 mil max. thickness




Shaded areas are printable areas.

ООО «ЛайфЭлектроникс» “LifeElectronics” LLC

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

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- *Специальные условия для постоянных клиентов.*
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- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

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- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

*Тел: +7 (812) 336 43 04 (многоканальный)*
*Email: org@lifeelectronics.ru*

***www.lifeelectronics.ru***