

# General Specifications

## Electrical Capacity

**Power Level:** 5A @ 125V AC, 3A @ 250V AC, & 3A @ 30V DC

## Other Ratings

**Contact Resistance:** 10 milliohms maximum

**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:** 30,000 operations minimum

**Electrical Life:** 10,000 operations minimum

**Nominal Operating Force:** 9.94N for rockers & 4.41N for paddles

**Angle of Throw:** 24° for On-None-(On); 28° for all other circuits

## Materials & Finishes

**Housing:** Stainless steel

**Movable Contacts:** Silver alloy

**Stationary Contacts:** Silver

**Base:** Phenolic resin

**Common Terminal:** Copper with silver plating

**End Terminals:** Copper with silver plating

**Lamp Terminals:** Phosphor bronze with nickel plating

## Environmental Data

**Operating Temperature Range:** -10°C through +50°C (+14°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 3 right angled directions, with 3 shocks in each direction)

## Installation

**Cap Installation Force:** 9.80N (2.2 lbf) for rockers;

19.61N (4.4 lbf) for paddle

**Soldering Time & Temperature:** Manual Soldering: See Profile A in Supplement section.

## Standards & Certifications

**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 5A @ 125V AC & 3A @ 250V AC.

## Distinctive Characteristics

Industry's first miniature snap-in, lighted rocker switch.

Actuators in various styles operate with firm, well-defined movements.

Interlocking actuator prevents switch failure due to jamming or window locking.

Two bezel sizes adapt to varied panel cutouts.

Unique stainless steel retaining clips securely hold switches over a range of panel thicknesses, even when exposed to vibration.

Space conserving front panel mounting with minimum behind panel dimension of .902" (22.9mm).

Durable stainless steel housing prevents corrosion.

Isolated lamp circuit for incandescent, LED, and neon lamps. Front panel relamping.

Built-in protective cover shields contacts from dust.

Epoxy sealed solder lug terminals lock out flux, dust, and other contaminants.

Extended lamp terminal for ease of wiring.

Matching indicators available.



Actual Size



Toggles

**B** Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

Supplement

### TYPICAL SWITCH ORDERING EXAMPLE

**MLW30**

**2**

**5**

**12**

**DC**

**1A**

#### Poles

|   |              |
|---|--------------|
| 1 | SPDT         |
| 2 | SP3T<br>DPDT |

#### Circuits

|   |      |      |      |
|---|------|------|------|
| 2 | ON   | NONE | ON   |
| 3 | ON   | OFF  | ON   |
| 5 | ON   | NONE | (ON) |
| 8 | (ON) | OFF  | (ON) |
| 9 | ON   | OFF  | (ON) |
| 0 | ON   | ON   | ON   |

( ) = Momentary

#### Lamps

##### Incandescent & Neon Lamps

|    |                                           |
|----|-------------------------------------------|
| 00 | No Lamp                                   |
| 06 | 6-volt                                    |
| 12 | 12-volt                                   |
| 18 | 18-volt                                   |
| 24 | 24-volt                                   |
| 28 | 28-volt                                   |
| N  | 110-volt (not suitable with green & blue) |

##### Single Element LED Colors

|   |        |
|---|--------|
| C | Red    |
| E | Yellow |
| F | Green  |

#### Cap Types & Colors

##### Rocker

|    |        |
|----|--------|
| RA | Black  |
| RB | White  |
| RC | Red    |
| RD | Orange |
| RE | Yellow |
| RF | Green  |
| RG | Blue   |

##### Paddle

|    |        |
|----|--------|
| PA | Black  |
| PB | White  |
| PC | Red    |
| PD | Orange |
| PE | Yellow |
| PF | Green  |
| PG | Blue   |

##### Design Rocker

|    |        |
|----|--------|
| DB | White  |
| DC | Red    |
| DD | Orange |
| DF | Green  |
| DG | Blue   |

##### LED Rocker

|    |        |
|----|--------|
| LB | White  |
| LC | Red    |
| LE | Yellow |
| LF | Green  |

##### Sculptured Rocker

|    |        |
|----|--------|
| SB | White  |
| SC | Red    |
| SE | Yellow |
| SF | Green  |

#### Bezels/Colors

##### Standard

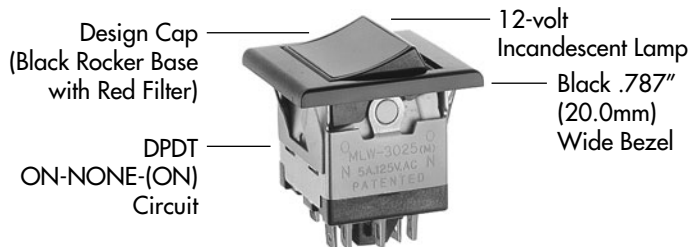
|    |        |
|----|--------|
| 1A | Black  |
| 1B | White  |
| 1C | Red    |
| 1D | Orange |
| 1E | Yellow |
| 1F | Green  |
| 1G | Blue   |
| 1H | Gray   |

##### Large

|    |        |
|----|--------|
| 2A | Black  |
| 2B | White  |
| 2C | Red    |
| 2D | Orange |
| 2E | Yellow |
| 2F | Green  |
| 2G | Blue   |
| 2H | Gray   |

#### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

**MLW3025-12-DC-1A**



Note: Wire harness & cable assemblies offered only in Americas

#### IMPORTANT:

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



## POLES & CIRCUITS

| Pole | Model   | Rocker Position<br>( ) = Momentary |        |      | Connected Terminals |        |         | Throw & Power/Lamp Schematics |
|------|---------|------------------------------------|--------|------|---------------------|--------|---------|-------------------------------|
|      |         | Up                                 | Center | Down | Up                  | Center | Down    |                               |
| SP   | MLW3012 | ON                                 | NONE   | ON   |                     |        |         | SPDT<br>                      |
|      | MLW3013 | ON                                 | OFF    | ON   |                     |        |         |                               |
|      | MLW3015 | ON                                 | NONE   | (ON) | 2-1                 | OPEN   | 2-3     |                               |
|      | MLW3018 | (ON)                               | OFF    | (ON) |                     |        |         |                               |
|      | MLW3019 | ON                                 | OFF    | (ON) |                     |        |         |                               |
| DP   | MLW3022 | ON                                 | NONE   | ON   |                     |        |         | DPDT<br>                      |
|      | MLW3023 | ON                                 | OFF    | ON   |                     |        |         |                               |
|      | MLW3025 | ON                                 | NONE   | (ON) | 2-1 5-4             | OPEN   | 2-3 5-6 |                               |
|      | MLW3028 | (ON)                               | OFF    | (ON) |                     |        |         |                               |
|      | MLW3029 | ON                                 | OFF    | (ON) |                     |        |         |                               |

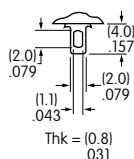
## For 3 Throw (3-On)

| Pole                        | Model   | Up | Center | Down | Connected Terminals & Schematics |         |         | External Connection                                                                                            |
|-----------------------------|---------|----|--------|------|----------------------------------|---------|---------|----------------------------------------------------------------------------------------------------------------|
| SP                          | MLW3020 | ON | ON     | ON   |                                  |         |         | The SP3T model utilizes a double pole base.<br><br>External connection must be made during field installation. |
| With External Connection    |         |    |        |      | 2-1                              | 2-4     | 2-6     |                                                                                                                |
| Without External Connection |         |    |        |      | 2-1 5-4                          | 2-3 5-4 | 2-3 5-6 |                                                                                                                |

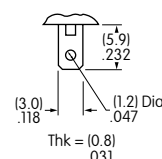
## TERMINALS

### Switch Terminals.

Center terminal is .020" (0.5mm) longer



### Lamp Terminals



## 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 Accessories & Hardware section.

For neon, 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.

### Incandescent & Neon Lamps for Solid & Design Caps

|                                                                                                                       |                                                                                                                |                                                                                                          |               |               |               |               |               |                |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------|---------------|---------------|---------------|---------------|----------------|
| <div>AT602<br/>Incandescent</div>  | <div>AT602N<br/>Neon</div>  | <div>L(+)  L(-)</div> | <div>06</div> | <div>12</div> | <div>18</div> | <div>24</div> | <div>28</div> | <div>N</div>   |
|                                                                                                                       |                                                                                                                | Voltage <div>V</div>                                                                                     | 6V AC         | 12V AC        | 18V AC        | 24V AC        | 28V AC        | 110V AC        |
|                                                                                                                       |                                                                                                                | Current <div>I</div>                                                                                     | 80mA          | 50mA          | 35mA          | 25mA          | 22mA          | 1.5mA          |
|                                                                                                                       |                                                                                                                | MSCP                                                                                                     | .159          | .215          | .398          | .215          | .247          | NA             |
|                                                                                                                       |                                                                                                                | Endurance <div>Hours</div>                                                                               | 2,000 Average |               |               |               |               | 15,000 Average |
|                                                                                                                       |                                                                                                                | Ambient Temperature Range                                                                                | -10°C ~ +50°C |               |               |               |               | -10°C ~ +50°C  |
|                                                                                                                       |                                                                                                                | Recommended Resistor for Neon: 33K ohms for 110V AC; 100K ohms for 220V AC                               |               |               |               |               |               |                |

00

No Lamp

Code 00 indicates that no lamp is used.

T-1 ½ Pilot Slide Base

T-1 1/2 Pilot Slide Base

### LED COLOR CODES & SPECIFICATIONS

#### Single Element LED

##### AT622 LED



T-1 1/4 Pilot Slide Base

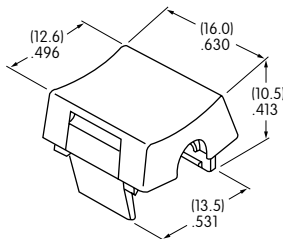
Resistor value calculation is shown in the Supplement.

| Color                             | <b>C</b> Red           | <b>E</b> Yellow | <b>F</b> Green |
|-----------------------------------|------------------------|-----------------|----------------|
| Forward Peak Current              | $I_{FM}$ 30mA          | 30mA            | 30mA           |
| Typical Forward Current           | $I_F$ 20mA             | 20mA            | 20mA           |
| Forward Voltage                   | $V_F$ 1.85V            | 2.0V            | 2.1V           |
| Reverse Peak Voltage              | $V_{RM}$ 5V            | 5V              | 5V             |
| Current Reduction Rate Above 25°C | $\Delta I_F$ 0.40mA/°C | 0.40mA/°C       | 0.40mA/°C      |
| Ambient Temperature Range         | -10°C ~ +50°C          |                 |                |

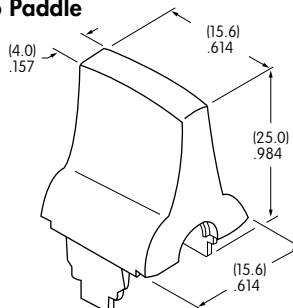
### CAP TYPES & COLORS

#### For Incandescent or Neon Lamps

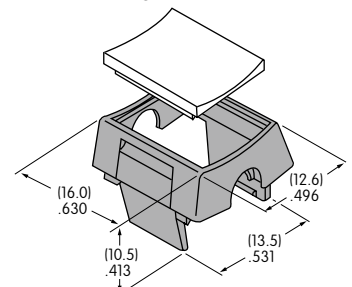
##### RA AT405 Rocker



##### PA AT426 Paddle



##### DB AT438 Design Rocker



Material: Translucent Polycarbonate Standard Finish: Glossy  
Black Rocker/Paddle not for use with lamp

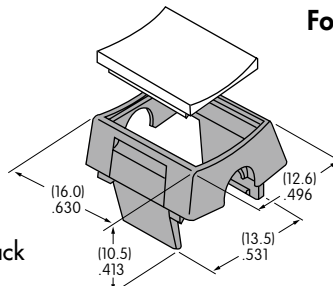
Translucent Colored Filter  
Opaque Black Rocker Base

#### For LED

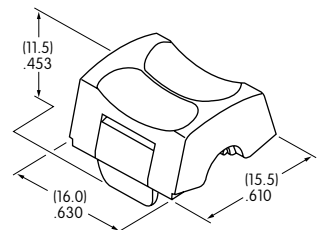
##### LB AT4125 LED Rocker



Translucent Colored Diffuser and Opaque Black Rocker Base



##### SB AT4127 Sculptured Rocker



Material: Translucent Polycarbonate Standard Finish: Glossy

Color Codes:



Black



White



Red



Orange



Yellow



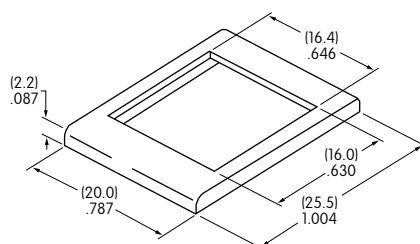
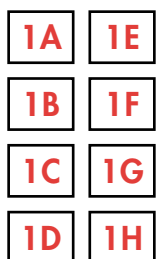
Green



Blue

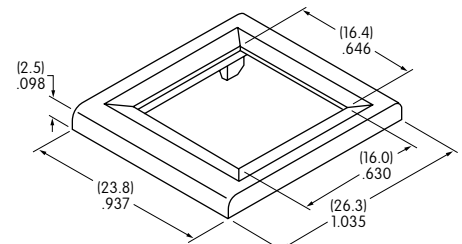
### OPTIONAL BEZELS

#### AT204 Standard Bezel .787" (20.0mm) Wide



Material: Polycarbonate Standard Finish: Glossy

#### AT9201 Large Bezel .937" (23.8mm) Wide



Material: Polycarbonate Standard Finish: Glossy

Loggles



**MLW3022-12-PC**



**MLW3022-12-RC-1A**

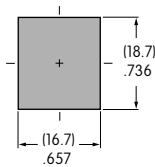


**MLW3022-12-PC-2A**

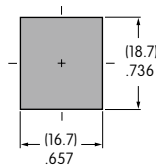


**MLW3022-C-SC-1A**

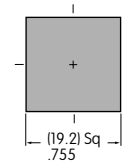
### PANEL CUTOUTS & THICKNESSES



Without Bezel  
.039" ~ .157" (1.0mm ~ 4.0mm)



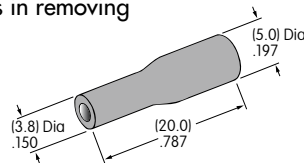
With Standard Bezel AT204  
.039" ~ .118" (1.0mm ~ 3.0mm)



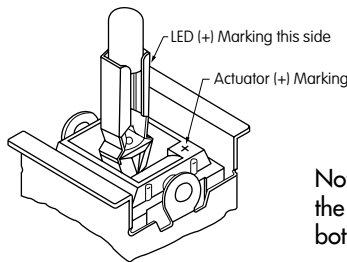
With Large Bezel AT9201  
.039" ~ .118" (1.0mm ~ 3.0mm)

### INSTALLATION & MAINTENANCE

Lamps and LEDs can be changed without removing the switch from the panel. The lamp extractor AT107 assists in removing lamps and LEDs.



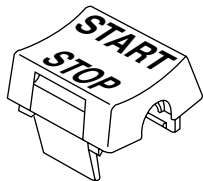
**AT107**  
Lamp Extractor



Note: When changing LEDs, match the positive polarity markings on both lamp base and actuator block.

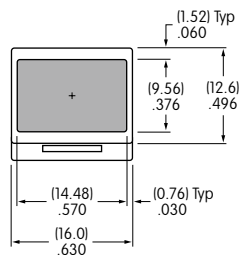
### LEGENDS

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

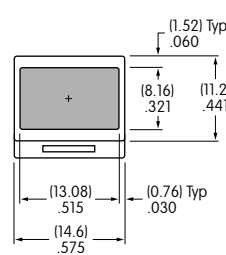


**Recommended Print Method:**  
Pad Print  
Epoxy based ink is recommended

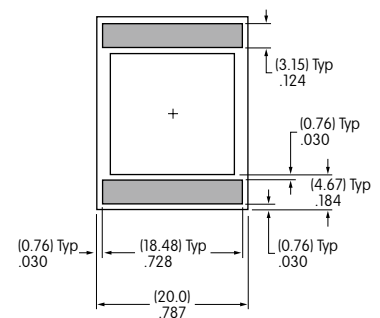
Rocker



Design Rocker & LED Rocker



Bezel



Shaded areas are printable areas.

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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