# Series MLW

Snap-in Mount Power Rated Switches

## 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<br>(not suitable w/green & blue) |

| Double 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

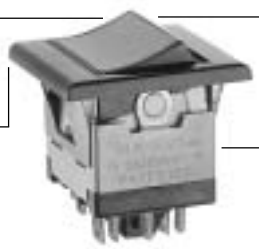
| .787" Wide | |
|---|---|
| 1A | Black |
| 1B | White |
| 1C | Red |
| 1D | Orange |
| 1E | Yellow |
| 1F | Green |
| 1G | Blue |
| 1H | Gray |
| **.937" Wide** | |
| 2A | Black |
| 2B | White |
| 2C | Red |
| 2D | Orange |
| 2E | Yellow |
| 2F | Green |
| 2G | Blue |
| 2H | Gray |

**IMPORTANT:**

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

### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

MLW3025-12-DC-1A



## GENERAL SPECIFICATIONS

### Electrical Capacity (Resistive Load)

**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; 1,500V AC minimum between contacts & case
**Mechanical Life:** 30,000 operations minimum
**Electrical Life:** 10,000 operations minimum
**Nominal Operating Force:** 1014 grams for rockers & 450 grams for paddles
**Angle of Throw:** 26°

### 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 with nickel plating

### Environmental Data

**Operating Temp 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 acceleration (tested in 3 right angled directions, with 3 shocks in each direction)

### Installation

**Cap Installation Force:** 1.0 kg (2.2 lbs) for AT405 cap;
2.0 kg (4.4 lbs) for AT426 cap
**Soldering Time & Temperature:** 3 seconds @ 350°C or 5 seconds @ 270°C
**Process Seal:** Not available

### Standards & Certifications

**UL Recognized:** All double pole models recognized at 5A @ 125V AC & 3A @ 250V AC; UL File No. E44145
**CSA Certified:** All double pole models recognized at 5A @ 125V AC & 3A @ 250V AC; CSA File No. LR23535

# Series MLW

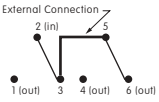
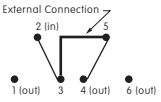
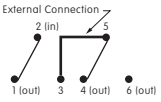
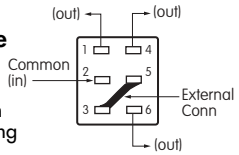
**Snap-in Mount Power Rated Switches**

## POLES & CIRCUITS

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

Notes: Terminal numbers are not actually on the switch.
Lamp circuit is isolated & requires an external power source.

### For 3 Throw (3-On)

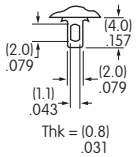
| Pole | Model | Up | Center | Down | Connected Terminals & Schematics | | | External Connection |
|---|---|---|---|---|---|---|---|---|
| SP | MLW3020 | ON | ON | ON |  |  |  | **The SP3T model utilizes a double pole base.**<br>External connection must be made during field installation.<br>  |
| With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



## TERMINALS

**Power Terminals**

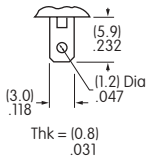
.043" x .079" oblong holes accommodate one solid 18-gauge wire or two solid or stranded 22-gauge wires.




Center terminal is .020" longer.

**Lamp Terminals**

Lamp terminals have .047" diameter holes which accommodate one solid 18-gauge wire.




## 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 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).


### Incandescent Lamp for Solid and Design Caps

**AT602 Incandecent** **AT602N Neon**

T-1½ Pilot Slide Base

| | | 06 | 12 | 18 | 24 | 28 | N |
|---|---|---|---|---|---|---|---|
| Voltage | V | 6V | 12V | 18V | 24V | 28V | 110V |
| Current | I | 80mA | 50mA | 35mA | 25mA | 22mA | 1.5mA |
| MSCP | | .159 | .215 | .398 | .215 | .247 | NA |
| Endurance | Hrs | 2,000 average | | | | | 25,000 average |
| Ambient Temp Range | | -10 ~ +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.

## LED COLORS & SPECIFICATIONS

**Double Element LED**

**AT622 LED**

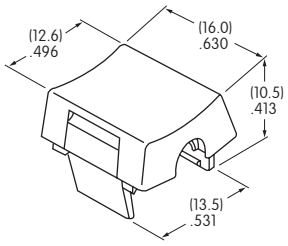
T-1¾ Pilot Slide Base

| LEDs are colored in OFF state. | | C Red | E Yellow | F Green |
|---|---|---|---|---|
| Forward Peak Current | $I_{FM}$ | 30mA | 30mA | 30mA |
| Continuous Forward Current | $I_F$ | 20mA | 20mA | 20mA |
| Forward Voltage | $V_F$ | 1.85V | 4.2V | 4.3V |
| Reverse Peak Voltage | $V_{RM}$ | 5V | 8V | 8V |
| Current Reduction Rate Above 25°C | $\Delta I_F$ | 0.40mA/°C | 0.32mA/°C | 0.42mA/°C |
| Ambient Temp Range | | -10 ~ +50°C | | |

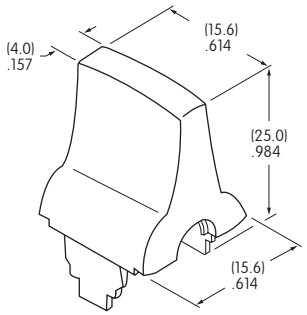
## CAP TYPES & COLORS

**For Incandescent or Neon Lamps**

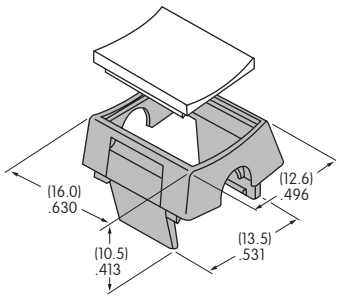
RA RB RC RD RE RF RG — **AT405 Rocker**




PA PB PC PD PE PF PG — **AT426 Paddle**




DB DC DD DF DG — **AT438 Design Rocker**

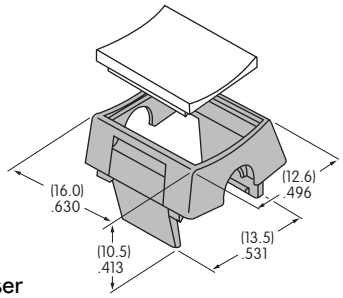



Material: Translucent Polycarbonate Standard Finish: Glossy
Black Rocker/Paddle not for use with lamp

Translucent Colored Filter
Opaque Black Rocker Base

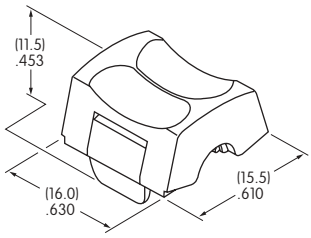
**For LED**

LB LC LE LF — **AT4125 LED Rocker**




Translucent Colored Diffuser
Opaque Black Rocker Base

SB SC SE SF — **AT4127 Sculptured Rocker**



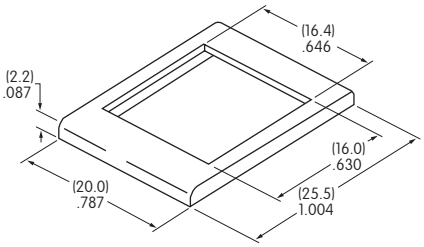

Material: Translucent Polycarbonate Standard Finish: Glossy

**Color Codes:** **A** Black **B** White **C** Red **D** Orange **E** Yellow **F** Green **G** Blue

## OPTIONAL BEZELS

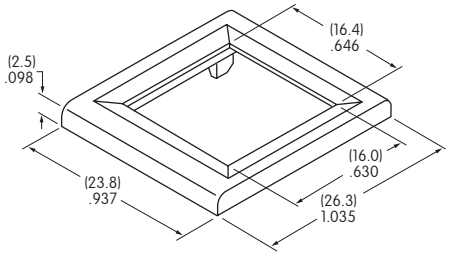
**AT204**
**.787" Wide Bezel (Standard)**

| | |
|---|---|
| 1A | 1E |
| 1B | 1F |
| 1C | 1G |
| 1D | 1H |




**AT9201**
**.937" Wide Bezel (Large)**

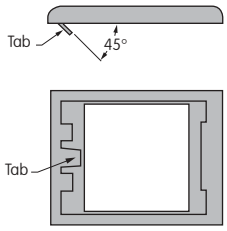
| | |
|---|---|
| 2A | 2E |
| 2B | 2F |
| 2C | 2G |
| 2D | 2H |



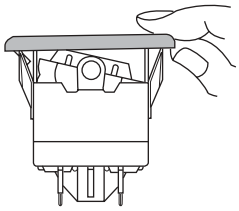

Material: Polycarbonate Standard Finish: Glossy

**Color Codes:** **A** Black **B** White **C** Red **D** Orange **E** Yellow **F** Green **G** Blue **H** Gray

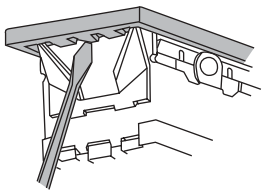
### Bezel Assembly



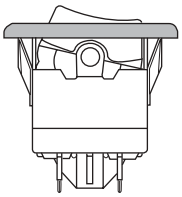

1. Pry out tab on bezel to a 45° angle.



2. Insert switch frame under tab and snap on bezel.



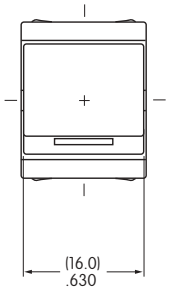
3. Push tab back into place.

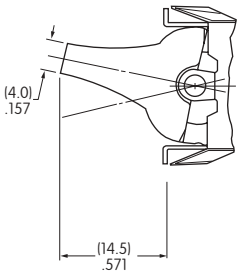


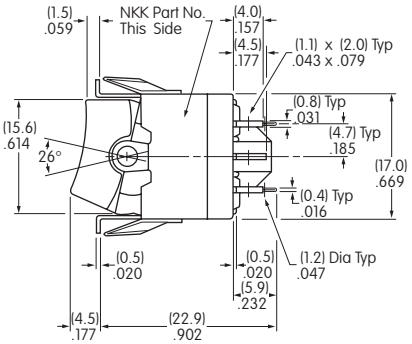
4. Snap cap onto switch.

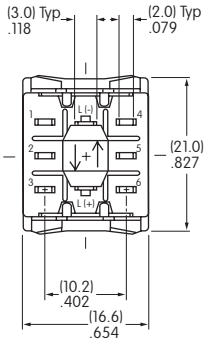
## TYPICAL SWITCH DIMENSIONS

**Without Bezel** **Single & Double Pole**



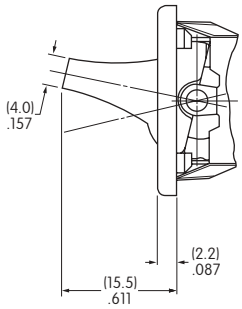

MLW3022-12PC

Actuator in UP position.

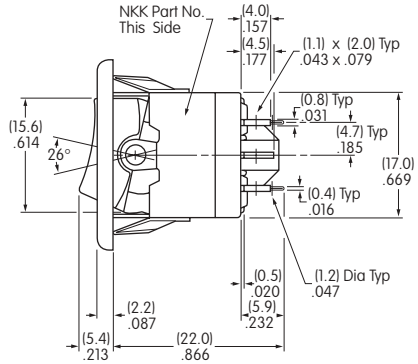
Terminals 4, 5, & 6 are not on single pole models.

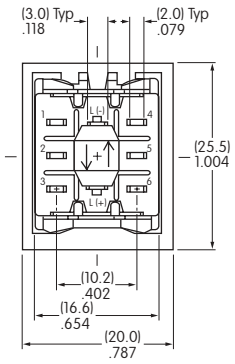
## TYPICAL SWITCH DIMENSIONS

### Standard Bezel




### Single & Double Pole



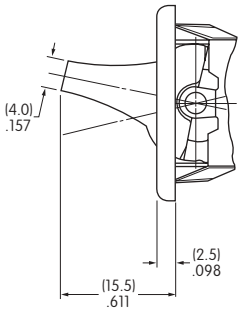




**MLW3022-12RC-1A**

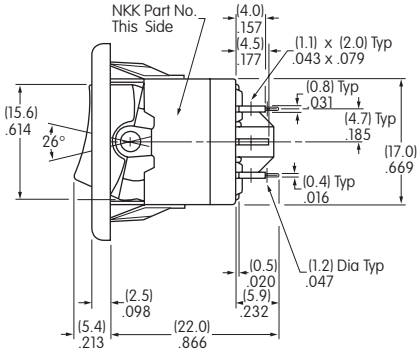
Actuator in UP position.

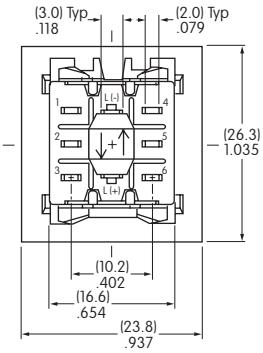
Terminals 4, 5, & 6 are not on single pole models.

### Large Bezel




### Single & Double Pole



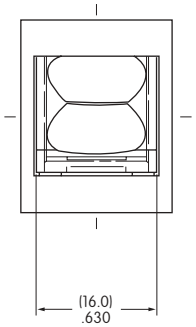




**MLW3022-12PC-2A**

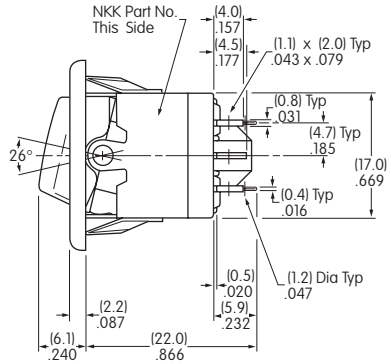
Actuator in UP position.

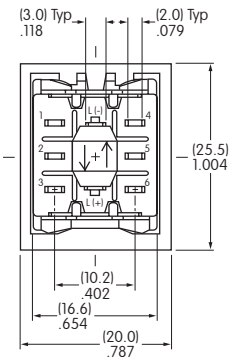
Terminals 4, 5, & 6 are not on single pole models.

### Sculptured Cap




### Single & Double Pole



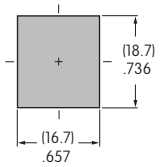




**MLW3022-CSC-1A**

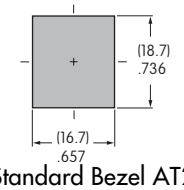
Actuator in UP position.

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

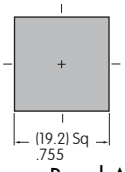
## PANEL CUTOUTS & THICKNESSES




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




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

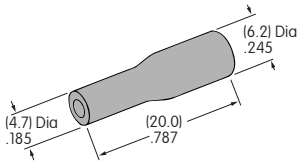


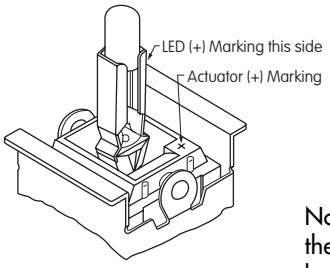

With Large Bezel AT9201
1.0 ~ 3.0 mm(.039 ~ .118")

## 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**



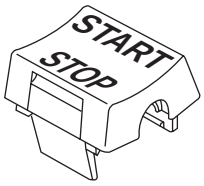



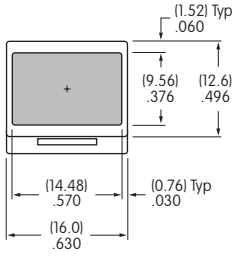

Note: When changing LEDs, match the positive polarity markings on both lamp base and actuator block.

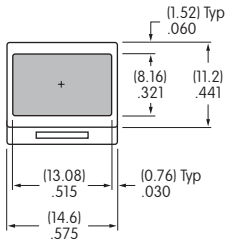
## LEGENDS

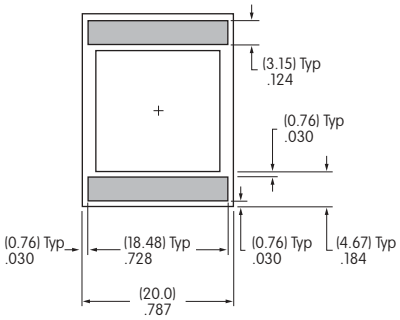
General information and basic specifications are presented here for customers who want to do their own legends.

### Suggested Printable Area for Lens




**Recommended Print Method:**

Screen Print or Pad Print

Epoxy based ink
is recommended.

Rocker

Design Rocker
& LED Rocker

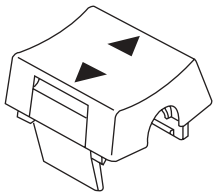
Printable areas
on Bezel

Shaded areas are printable areas.

### Additional Methods

An additional method for legends is engraving the lens.
Maximum depth for engraving is 0.3 mm (.012″) on the cap lens.
Enamel paint is recommended to fill the engraved area.

## LEGEND PACKET FOR ORDERING CAPS WITH LEGENDS



1. To order caps with legends, contact the factory and request the MLW 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.