

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/s²) 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.

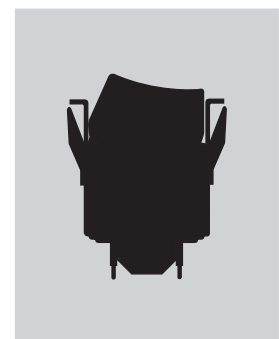
Epoxy sealed solder lug terminals lock out flux, dust, and other contaminants.

Extended lamp terminal for ease of wiring.

Matching indicators available.



Actual Size



- Supplement
- Accessories
- Indicators
- Touch
- Tilt
- Tactiles
- Slides
- Rotaries
- Keylocks
- Programmable
- Illuminated PB
- Pushbuttons
- B** Rockers
- Toggle

TYPICAL SWITCH ORDERING EXAMPLE

MLW30

2

5

12

DC

1A

Poles

| | |
|---|--------------|
| 1 | SPDT |
| 2 | SP3T 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

Design Cap
(Black Rocker Base
with Red Filter)

DPDT
ON-NONE-(ON)
Circuit



12-volt
Incandescent Lamp
Black .787"
(20.0mm)
Wide Bezel

IMPORTANT:



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

POLES & CIRCUITS

| Pole | Model | Rocker Position () = Momentary | | | Connected Terminals | | | Throw & Power/Lamp Schematics |
|------|---|------------------------------------|-----------------------------------|----------------------------------|---------------------|--------|---------|---|
| | | Down | Center | Up | Down | Center | Up | |
| SP | MLW3012 MLW3013 MLW3015 MLW3018 MLW3019 | ON ON ON (ON) ON | NONE OFF NONE OFF OFF | ON ON (ON) (ON) (ON) | 2-3 | OPEN | 2-1 | Notes: Terminal numbers are not actually on switch. Lamp circuit is isolated and requires an external power source. SPDT |
| DP | MLW3022 MLW3023 MLW3025 MLW3028 MLW3029 | ON ON ON (ON) ON | NONE OFF NONE OFF OFF | ON ON (ON) (ON) (ON) | 2-3 5-6 | OPEN | 2-1 5-4 | DPDT |

For 3 Throw (3-On)

| Pole | Model | Down | Center | Up | Connected Terminals & Schematics | | | External Connection |
|-----------------------------|---------|------|--------|----|----------------------------------|---------|---------|---|
| SP | MLW3020 | ON | ON | ON | | | | <p>The SP3T model utilizes a double pole base.</p> <p>External connection must be made during field installation.</p> |
| 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

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

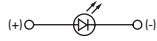
| AT602 Incandescent | AT602N Neon | | 06 | 12 | 18 | 24 | 28 | N | |
|--------------------------|--|-------|---------------|--|--------|--------|--------|---------|----------------|
| | Voltage | V | 6V AC | 12V AC | 18V AC | 24V AC | 28V AC | 110V AC | |
| | Current | I | 80mA | 50mA | 35mA | 25mA | 22mA | 1.5mA | |
| | MSCP | | .159 | .215 | .398 | .215 | .247 | NA | |
| | Endurance | Hours | 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 | | | | | | | | |
| T-1 1/2 Pilot Slide Base | | | 00 | No Lamp Code 00 indicates that no lamp is used. | | | | | |

Toggles
 Rockers
 Pushbuttons
 Illuminated PB
 Programmable
 Keylocks
 Rotaries
 Slides
 Tactiles
 Tilt
 Touch
 Indicators
 Accessories
 Supplement

LED COLOR CODES & SPECIFICATIONS

Single Element LED

| AT622 LED | Resistor value calculation is shown in the Supplement. | Color | C Red | E Yellow | F Green |
|-----------------------------------|--|---------------|-------------------------|-----------------|----------------|
| | | | Maximum Forward Current | I_{FM} | 30mA |
| Typical Forward Current | I_F | 20mA | 20mA | 20mA | |
| Forward Voltage | V_F | 1.85V | 2.0V | 2.1V | |
| Maximum Reverse Voltage | V_{RM} | 5V | 5V | 5V | |
| Current Reduction Rate Above 25°C | ΔI_F | 0.40mA/°C | 0.40mA/°C | 0.40mA/°C | |
| T-1¼ Pilot Slide Base | Ambient Temperature Range | -10°C ~ +50°C | | | |

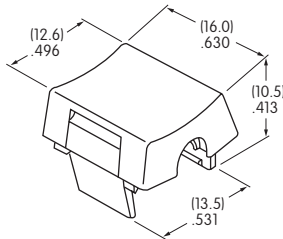


CAP TYPES & COLORS

For Incandescent or Neon Lamps

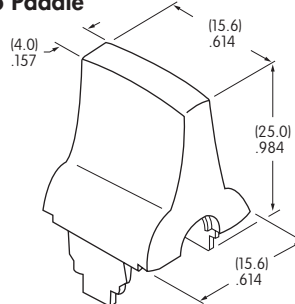
RA AT405 Rocker

- RB
- RE
- RC
- RF
- RD
- RG



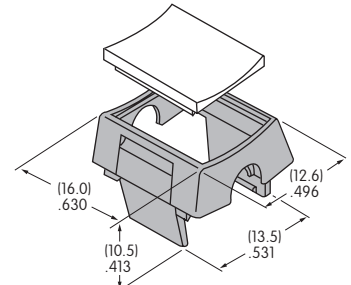
PA AT426 Paddle

- PB
- PE
- PC
- PF
- PD
- PG



DB AT438 Design Rocker

- DC
- DD
- DF
- DG



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

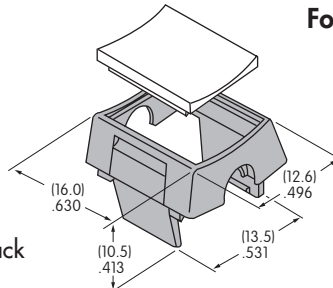
Translucent Colored Filter
Opaque Black Rocker Base

For LED

LB AT4125 LED Rocker

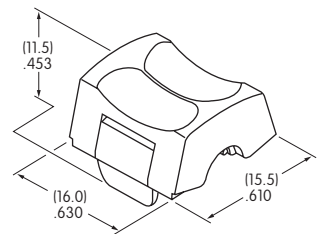
- LC
- LE
- LF

Translucent Colored Diffuser
and Opaque Black
Rocker Base



SB AT4127 Sculptured Rocker

- SC
- SE
- SF



Material: Translucent Polycarbonate Standard Finish: Glossy

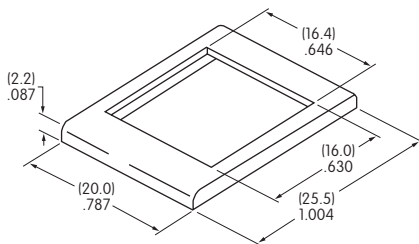
Color Codes:

- A** Black
- B** White
- C** Red
- D** Orange
- E** Yellow
- F** Green
- G** Blue

OPTIONAL BEZELS

AT204 Standard Bezel .787" (20.0mm) Wide

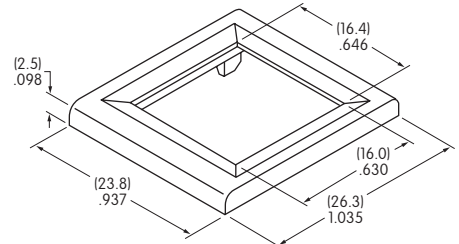
- 1A
- 1E
- 1B
- 1F
- 1C
- 1G
- 1D
- 1H



Material: Polycarbonate Standard Finish: Glossy

AT9201 Large Bezel .937" (23.8mm) Wide

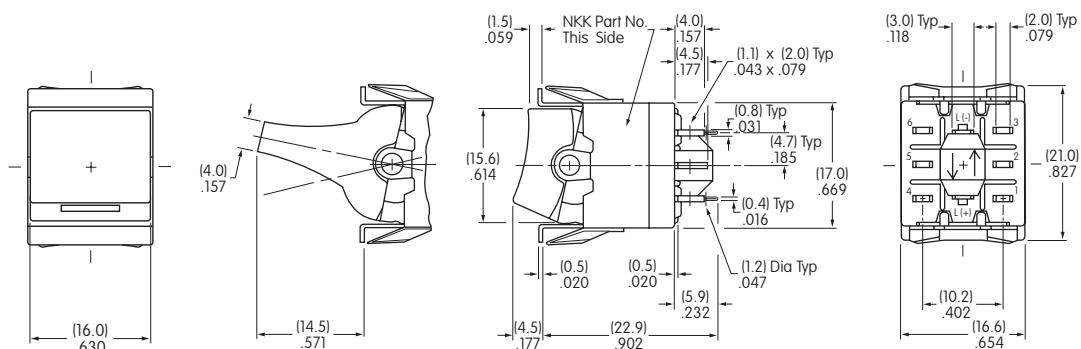
- 2A
- 2E
- 2B
- 2F
- 2C
- 2G
- 2D
- 2H



Material: Polycarbonate Standard Finish: Glossy

Toggles
Rockers
Pushbuttons
Illuminated PB
Programmable
Keylocks
Rotaries
Slides
Tactiles
Tilt
Touch
Indicators
Accessories
Supplement

TYPICAL SWITCH DIMENSIONS



Actuator in UP position

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

Without Bezel
Single & Double Pole



MLW3022-12-PC



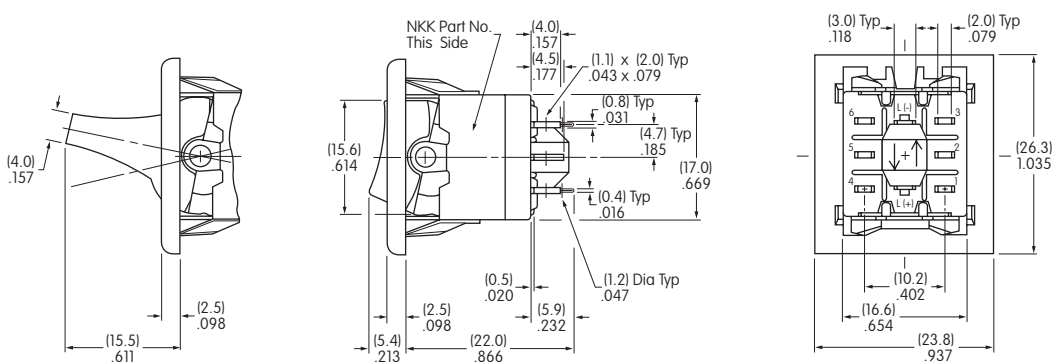
Actuator in UP position

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

Standard Bezel
Single & Double Pole



MLW3022-12-RC-1A



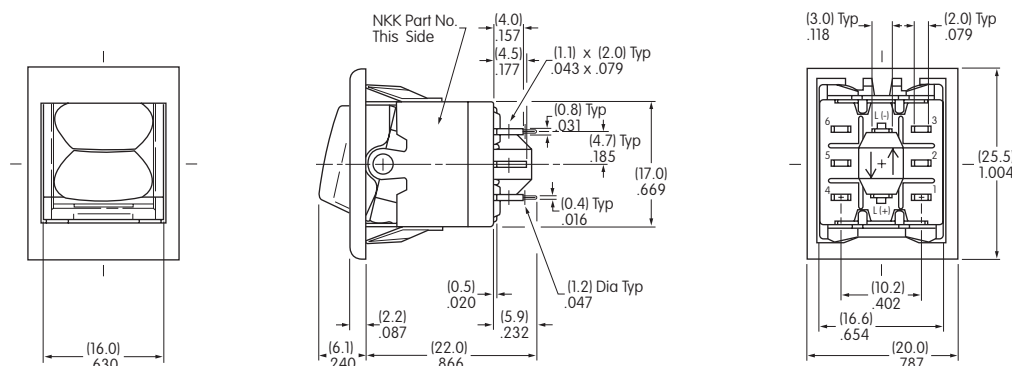
Actuator in UP position

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

Large Bezel
Single & Double Pole



MLW3022-12-PC-2A



Actuator in UP position

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

Sculptured Cap
Single & Double Pole



MLW3022-C-SC-1A

- Toggle
- B** Rockers
- Pushbuttons
- Illuminated PB
- Programmable
- Keylocks
- Rotaries
- Slides
- Tactiles
- Tilt
- Touch
- Indicators
- Accessories
- Supplement

PANEL CUTOUTS & THICKNESSES



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



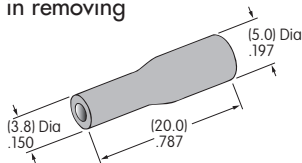
With Standard Bezel AT204
.039" ~ .118" (1.0mm ~ 3.0mm)



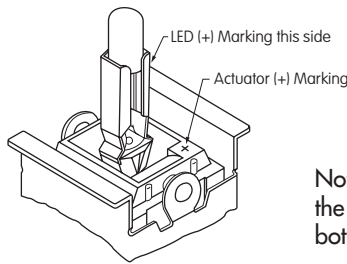
With Large Bezel AT9201
.039" ~ .118" (1.0mm ~ 3.0mm)

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



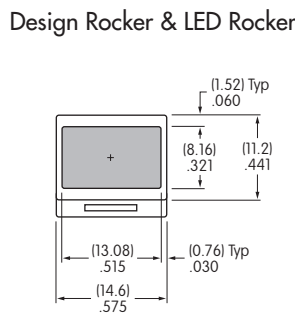
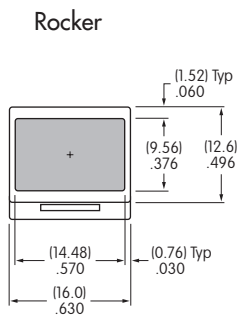
Note: When changing LEDs, match the positive polarity markings on both lamp base and actuator block.

LEGENDS

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



Recommended Print Method:
Pad Print
Epoxy based ink is recommended



Shaded areas are printable areas.