

# General Specifications

## B Electrical Capacity (Resistive Load)

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Power Level (silver):</b> | Maximum rating varies by model number<br><b>MN12, MN22:</b> 6A @ 125V AC, 3A @ 250V AC, 4A @ 30V DC<br><b>MN13, MN15, MN18, MN19, MN23, MN25:</b> 6A @ 125V AC, 3A @ 250V AC, 3A @ 30V DC<br><b>MN28, MN29:</b> 4A @ 125V AC, 3A @ 250V AC, 3A @ 30V DC<br><b>MN24, MN26, MN27:</b> 3A @ 125V AC, 2A @ 250V AC, 2A @ 30V DC<br><b>MN32:</b> 4A @ 125V AC, 2A @ 250V AC, 3A @ 30V DC<br><b>MN33, MN35, MN38, MN39:</b> 4A @ 125V, 2A @ 250V, 2A @ 30V<br>Recommended minimum voltage/current: 0.1A @ 2V AC/DC<br>4A @ 30V DC for On-None-On; 3A @ 30V DC for all other circuits |
| <b>Logic Level (gold):</b>   | 0.4VA maximum @ 28V AC/DC maximum<br>(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## Other Ratings

|                               |                                                                                                                              |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Contact Resistance:</b>    | 10 milliohms maximum for silver; 20 milliohms maximum for gold                                                               |
| <b>Insulation Resistance:</b> | 1,000 megohms minimum @ 500V DC                                                                                              |
| <b>Dielectric Strength:</b>   | 1,000V AC minimum between contacts for 1 minute minimum;<br>1,500V AC minimum between contacts and case for 1 minute minimum |
| <b>Mechanical Life:</b>       | 50,000 operations minimum                                                                                                    |
| <b>Electrical Life:</b>       | 25,000 operations minimum for silver; 50,000 operations minimum for gold                                                     |
| <b>Angle of Throw:</b>        | 25°                                                                                                                          |

## Materials & Finishes

|                                            |                                                                                 |
|--------------------------------------------|---------------------------------------------------------------------------------|
| <b>Actuator Clip &amp; Mounting Frame:</b> | Stainless steel or beryllium copper for spring                                  |
| <b>Body Frame:</b>                         | Stainless steel                                                                 |
| <b>Case:</b>                               | Diallyl phthalate resin (UL94V-0)                                               |
| <b>Movable Contacts:</b>                   | Silver alloy (code W); copper with gold plating (code G)                        |
| <b>Stationary Contacts:</b>                | Silver with silver plating (code W); copper or brass with gold plating (code G) |
| <b>Terminals:</b>                          | Copper or brass with silver plating; or copper or brass with gold plating       |

## Environmental Data

|                              |                                                                                                                                              |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Operating Temp Range:</b> | -30°C through +85°C (-22°F through +185°F)                                                                                                   |
| <b>Humidity:</b>             | 90 ~ 95% humidity for 240 hours @ 40°C (104°F)                                                                                               |
| <b>Vibration:</b>            | 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 |
| <b>Shock:</b>                | 500m/s <sup>2</sup> acceleration (tested in 6 right angled directions, with 5 shocks in each direction)                                      |

## Processing

|                   |                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Soldering:</b> | Wave Soldering (PC version) for Gold: See Profile A in Supplement section.<br>Manual Soldering for Gold: See Profile A in Supplement section.<br>Wave Soldering (PC version) for Silver: See Profile B in Supplement section.<br>Manual Soldering for Silver: See Profile B in Supplement section.<br>Note: Actuator must be in OFF (center) position while soldering. |
| <b>Cleaning:</b>  | These devices are not process sealed. Hand clean locally using alcohol based solution.                                                                                                                                                                                                                                                                                 |

## Standards & Certifications

|                                |                                                                 |
|--------------------------------|-----------------------------------------------------------------|
| <b>Flammability Standards:</b> | UL94V-0 for case                                                |
| <b>UL:</b>                     | Contact NKK Switches for UL or CUL marking option requirements. |

# Distinctive Characteristics

Three methods of panel mounting: flat frame for flush with face or subpanel, snap-in, and PCB.

High insulating barriers increase isolation of circuits in multipole devices and provide added protection to contact points.

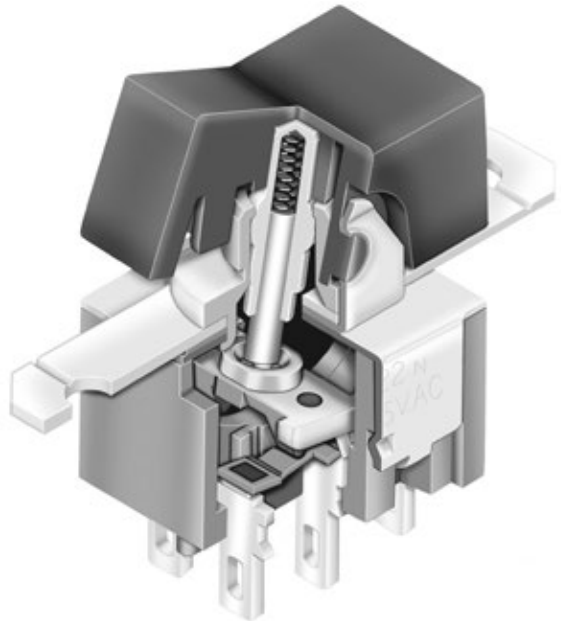
The molded diallyl phthalate case has a UL94V-0 flammability rating.

Epoxy sealed terminals prevent entry of solder flux and other contaminants.

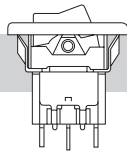
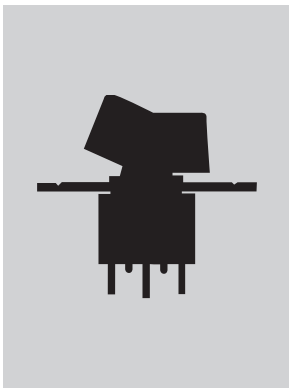
Prominent external insulating barriers increase insulation resistance and dielectric strength.

Bias guard prevents misalignment of contacts; interlocking of actuator block with rocker and internal guide does not allow transmission of diagonal force on rocker to reach contact mechanism.

Clinching of the frame to the case well above the base and terminals provides 1,500V dielectric strength.

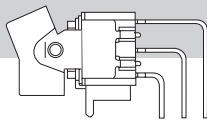


Actual Size



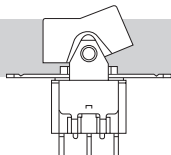
Snap-in Mount

Page B64



Bracket PC Mount

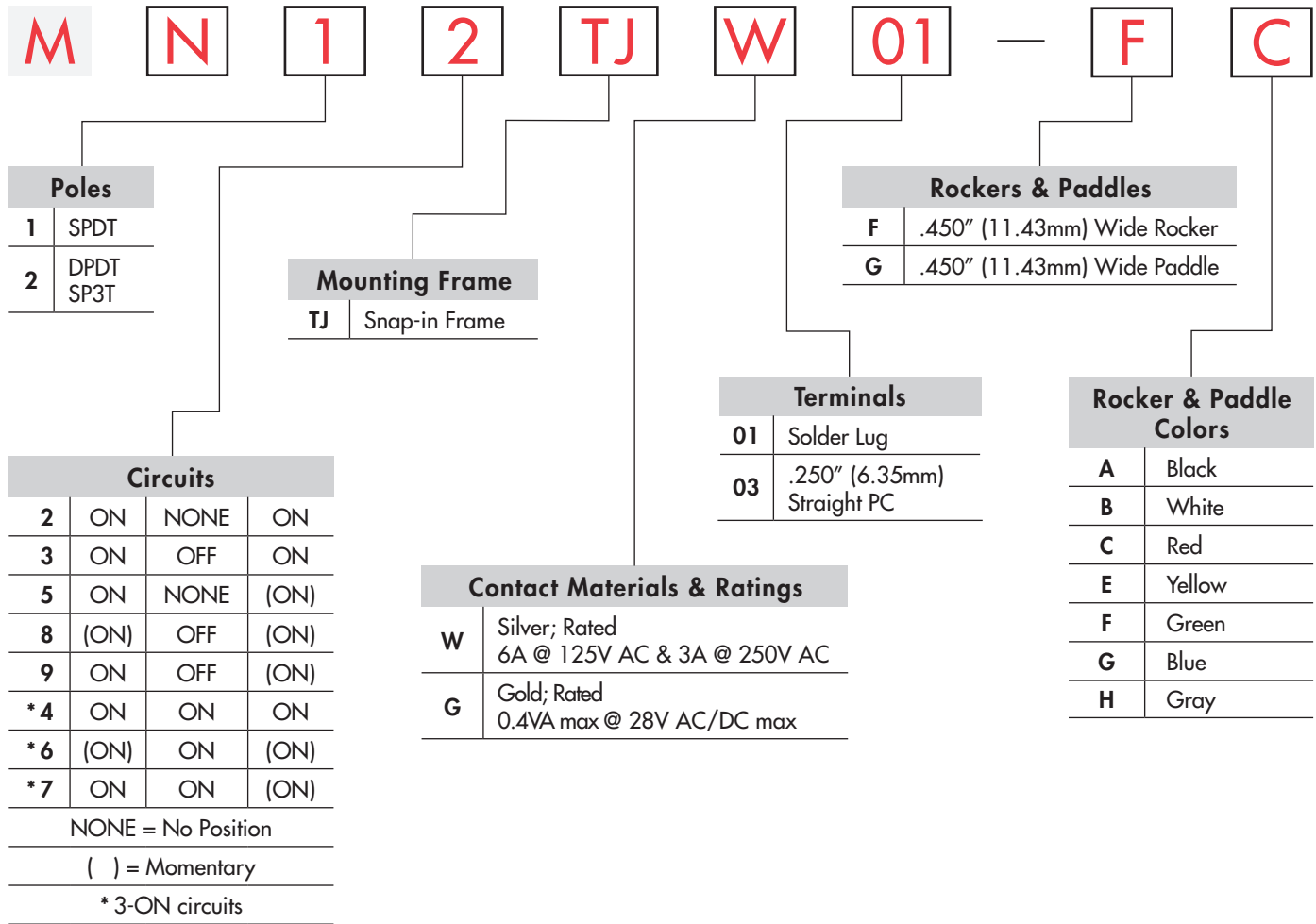
Page B72



Flat Frame Mount

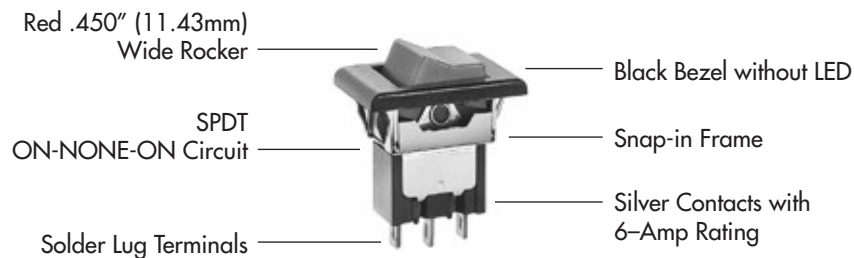
Page B81

### TYPICAL SWITCH

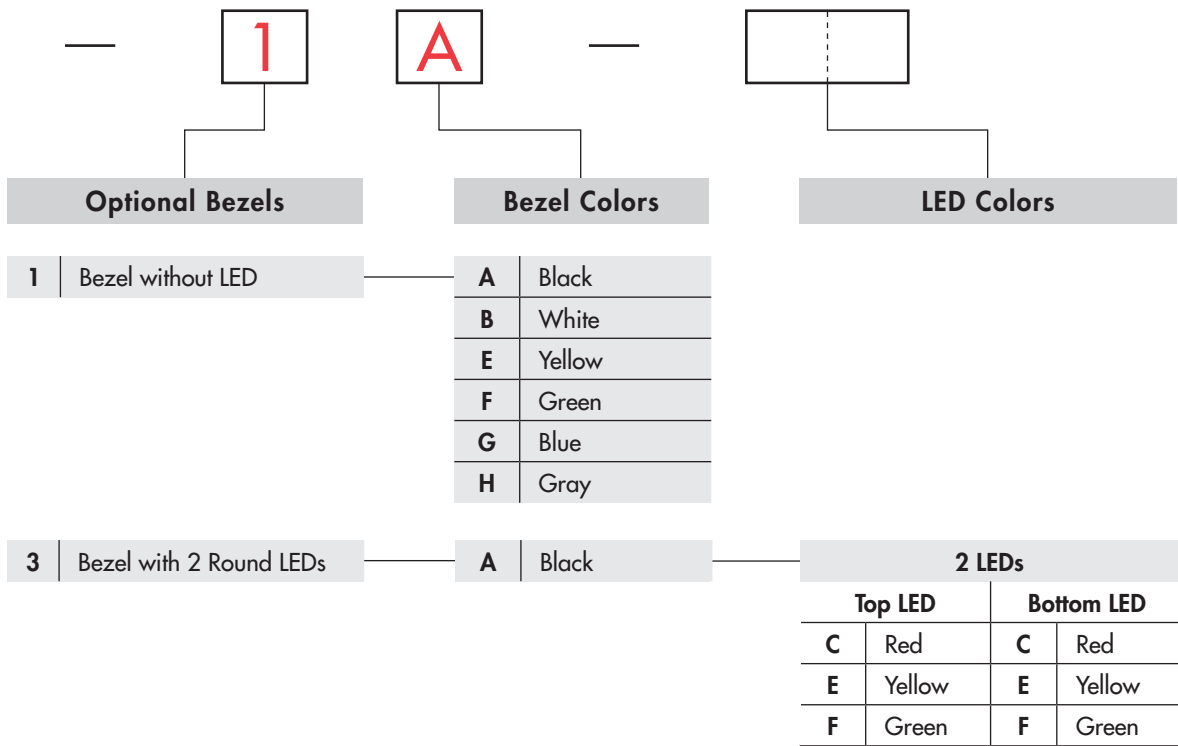


### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

**MN12TJW01-FC-1A**

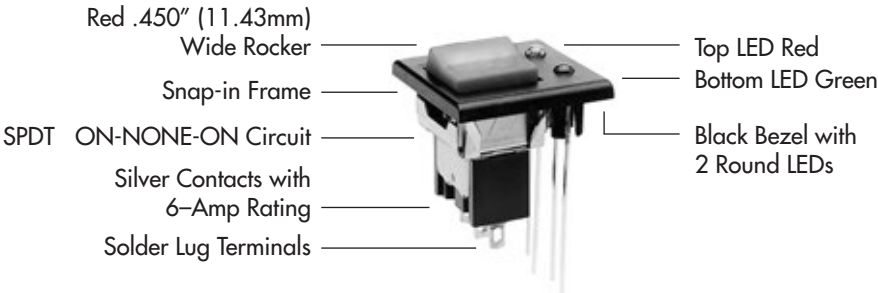


ORDERING EXAMPLE

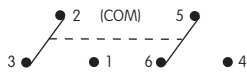


DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

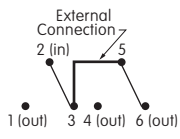
MN12TJW01-FC-3A-CF



## POLES &amp; CIRCUITS

|      |       | Rocker Position<br>NONE = No Position ( ) = Momentary                                     |                                                                                             |                                                                                         | Connected Terminals                                                                       |                                                                                             |                                                                                          | Throw & Schematics                                                                          |
|------|-------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Pole | Model | Down<br> | Center<br> | Up<br> | Down<br> | Center<br> | Up<br> | Note: Terminal numbers are not actually on the switch.                                      |
| SP   | MN12  | ON                                                                                        | NONE                                                                                        | ON                                                                                      | 2-3                                                                                       | OPEN                                                                                        | 2-1                                                                                      | SPDT<br> |
|      | MN13  | ON                                                                                        | OFF                                                                                         | ON                                                                                      |                                                                                           |                                                                                             |                                                                                          |                                                                                             |
|      | MN15  | ON                                                                                        | NONE                                                                                        | (ON)                                                                                    |                                                                                           |                                                                                             |                                                                                          |                                                                                             |
|      | MN18  | (ON)                                                                                      | OFF                                                                                         | (ON)                                                                                    |                                                                                           |                                                                                             |                                                                                          |                                                                                             |
|      | MN19  | ON                                                                                        | OFF                                                                                         | (ON)                                                                                    |                                                                                           |                                                                                             |                                                                                          |                                                                                             |
| DP   | MN22  | ON                                                                                        | NONE                                                                                        | ON                                                                                      | 2-3 5-6                                                                                   | OPEN                                                                                        | 2-1 5-4                                                                                  | DPDT<br> |
|      | MN23  | ON                                                                                        | OFF                                                                                         | ON                                                                                      |                                                                                           |                                                                                             |                                                                                          |                                                                                             |
|      | MN25  | ON                                                                                        | NONE                                                                                        | (ON)                                                                                    |                                                                                           |                                                                                             |                                                                                          |                                                                                             |
|      | MN28  | (ON)                                                                                      | OFF                                                                                         | (ON)                                                                                    |                                                                                           |                                                                                             |                                                                                          |                                                                                             |
|      | MN29  | ON                                                                                        | OFF                                                                                         | (ON)                                                                                    |                                                                                           |                                                                                             |                                                                                          |                                                                                             |

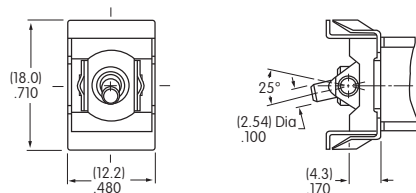
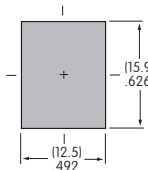
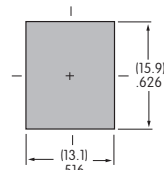
## For 3 Throw (3-On)

|      |              | Connected Terminals & Schematic                                               |                                                                               |                                                                               | External Connection                                                                                                                                                                                  |
|------|--------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pole | Model        | Down                                                                          | Center                                                                        | Up                                                                            |                                                                                                                                                                                                      |
| SP   | MN24         | ON                                                                            | ON                                                                            | ON                                                                            | The SP3T model utilizes a double pole base.<br><br>External connection must be made during field installation.<br> |
|      | MN26<br>MN27 | (ON)<br>ON                                                                    | ON<br>ON                                                                      | (ON)<br>(ON)                                                                  |                                                                                                                                                                                                      |
|      |              | External Connection<br>2 (in) 5 (out)<br>1 (out) 3 4 (out) 6 (out)<br>2-3 5-6 | External Connection<br>2 (in) 5 (out)<br>1 (out) 3 4 (out) 6 (out)<br>2-3 5-4 | External Connection<br>2 (in) 5 (out)<br>1 (out) 3 4 (out) 6 (out)<br>2-1 5-4 |                                                                                                                                                                                                      |

## MOUNTING FRAME

TJ

## Snap-in Frame

Panel Cutout for  
Single Pole  
without BezelPanel Cutout for  
Double Pole  
without Bezel

Panel Thickness without Bezel: .039" ~ .126" (1.0mm ~ 3.2mm)

Panel Thickness with Bezel: .039" ~ .098" (1.0mm ~ 2.5mm)

## CONTACT MATERIALS &amp; RATINGS

W

Silver  
Power Level

MN12, MN22: 6A @ 125V AC, 3A @ 250V AC, 4A @ 30V DC

MN13, MN15, MN18, MN19, MN23, MN25: 6A @ 125V AC, 3A @ 250V AC, 3A @ 30V DC

MN28, MN29: 4A @ 125V AC, 3A @ 250V AC, 3A @ 30V DC

MN24, MN26, MN27: 3A @ 125V AC, 2A @ 250V AC, 2A @ 30V DC

G

Gold

Logic Level

0.4VA maximum @ 28V AC/DC maximum

Note: Complete explanation of operating range in Supplement section.

Gold over Silver

Power Level or Logic Level

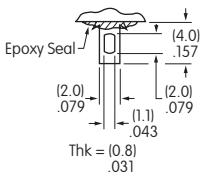
See above for each rating

Note: Gold over silver is available as a custom option. This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

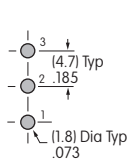
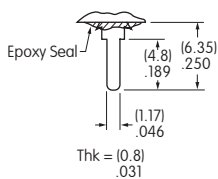
Snap-In Mount Miniature Rockers

TERMINALS

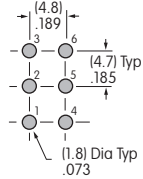
01 Solder Lug



03 .250" (6.35mm) Straight PC



Single Pole



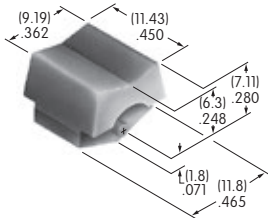
Double Pole

ROCKERS & PADDLES

F AT4150  
.450" (11.43mm)  
Wide Rocker

Material: Polyamide  
Finish: Matte

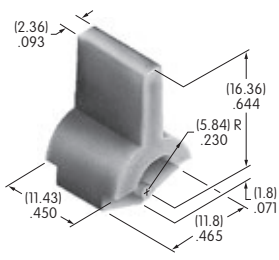
Colors Available:  
A, B, C, E, F, G, H



G AT4151  
.450" (11.43mm)  
Wide Paddle

Material: Polyamide  
Finish: Matte

Colors Available:  
A, B, C, E, F, G, H



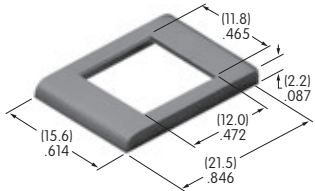
Cap Colors Available: A Black B White C Red E Yellow F Green G Blue H Gray

OPTIONAL SNAP-IN BEZELS & BEZEL COLORS

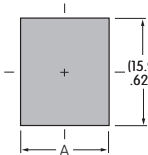
1 AT2107 Bezel

Material:  
Polyamide

Finish:  
Matte



A Black F Green  
B White G Blue  
E Yellow H Gray

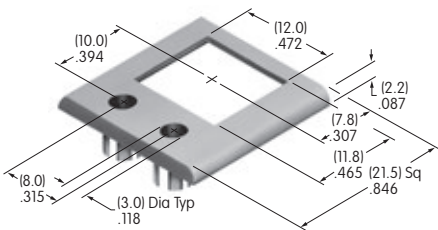


|   | Single Pole       | Double Pole       |
|---|-------------------|-------------------|
| A | (12.5)mm<br>.492" | (13.1)mm<br>.516" |

3 AT212 Bezel  
for AT617 LED

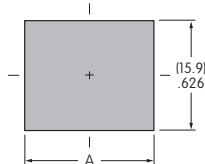
Material:  
Polycarbonate

Finish:  
Semi-glossy



A Black

LED colors and  
specifications  
are on the  
following page.



|   | Single Pole       | Double Pole       |
|---|-------------------|-------------------|
| A | (18.4)mm<br>.724" | (18.7)mm<br>.736" |

Toggles

Rockers B

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

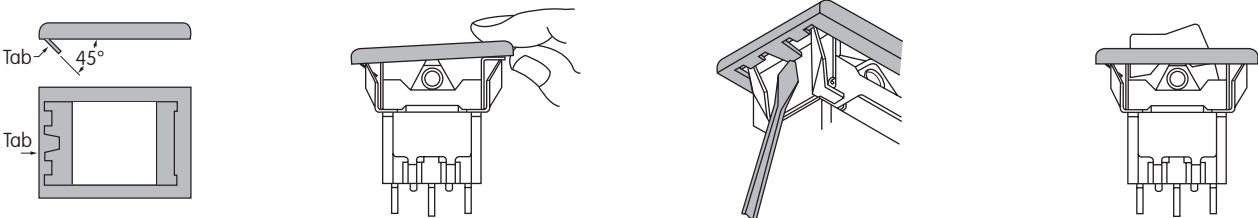
Indicators

Accessories

Supplement

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 assembled bezel and switch into panel.

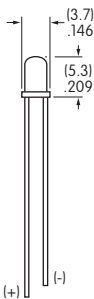
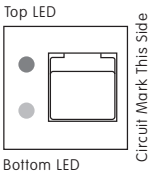


LED COLORS & SPECIFICATIONS

AT617 LED  
For Bezel AT212  
with 2 Round LEDs

Note: Lead lengths may differ from manufacturing lot to lot. The longer lead is the anode (+).

Bezel Orientation on Switch



| AT617 LED                                          |              |              |                 |                |
|----------------------------------------------------|--------------|--------------|-----------------|----------------|
|                                                    | Color        | <b>C</b> Red | <b>E</b> Yellow | <b>F</b> Green |
| Maximum Forward Current                            | $I_{FM}$     | 30mA         | 30mA            | 30mA           |
| Typical Forward Current                            | $I_F$        | 20mA         | 20mA            | 20mA           |
| Forward Voltage                                    | $V_F$        | 2.1V         | 2.1V            | 2.2V           |
| Maximum Reverse 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 (when used with a bezel) |              | -15° ~ +70°C |                 |                |

The electrical specifications shown are determined at a basic temperature of 25°C.  
The LED circuit is independent of switch operation. LED is colored in OFF state.

If the source voltage is greater than the rated voltage of the LED, a ballast resistor must be connected in series with the lamp. The ballast resistor calculation and more lamp detail are shown in the Supplement section.

LEGENDS

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

Suggested Printable Area for Cap

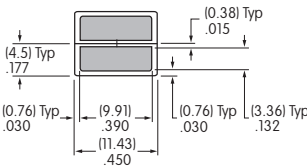
Recommended Print Method:

Pad Print

Epoxy based ink is recommended.



AT4150

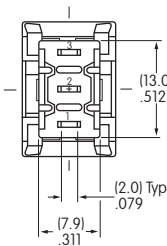
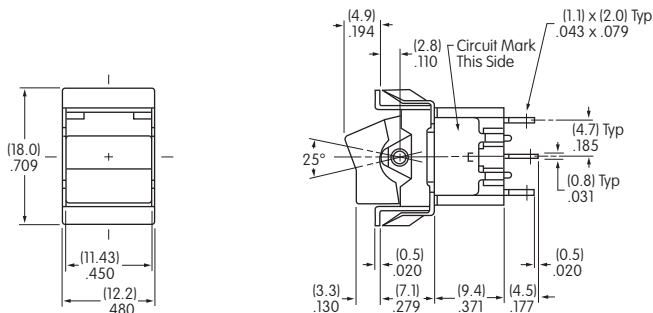


Shaded areas are printable areas.

## TYPICAL SWITCH DIMENSIONS

### Single Pole

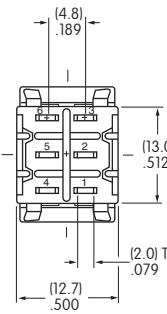
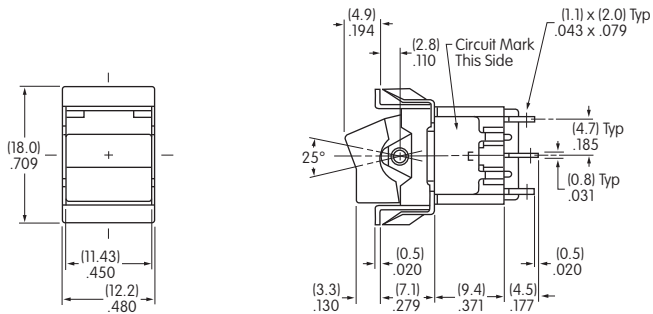
### Snap-in Frame • Solder Lug



MN12TJW01-FC

### Double Pole

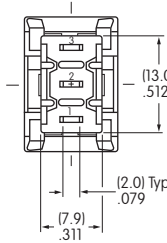
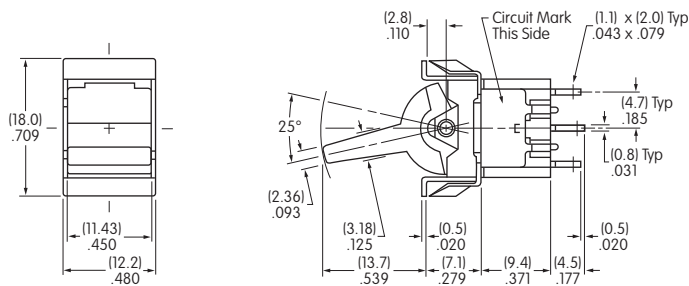
### Snap-in Frame • Solder Lug



MN22TJW01-FC

### Single Pole

### Snap-in Frame • Solder Lug

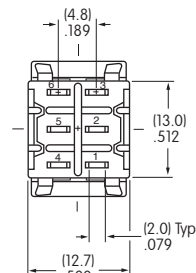
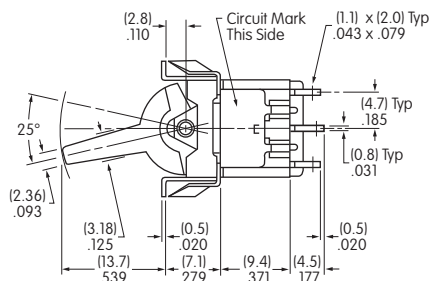
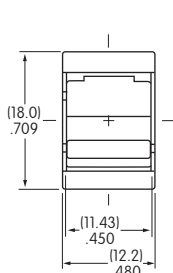


MN12TJW01-GC

### TYPICAL SWITCH DIMENSIONS

#### Snap-in Frame • Solder Lug

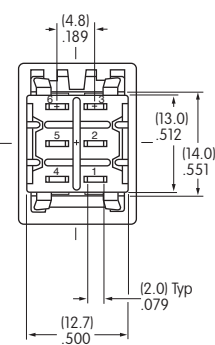
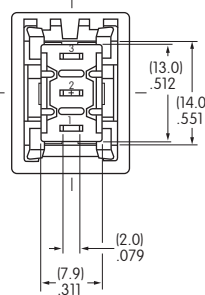
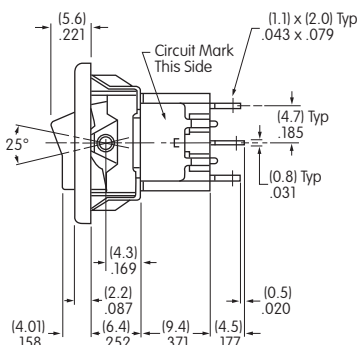
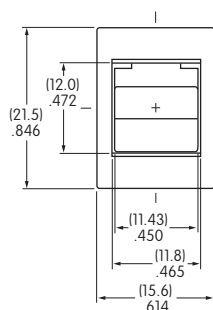
#### Double Pole



MN22TJW01-GC

#### Snap-in Frame • AT2107 Bezel • Solder Lug

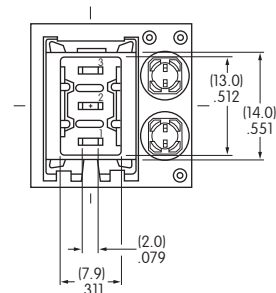
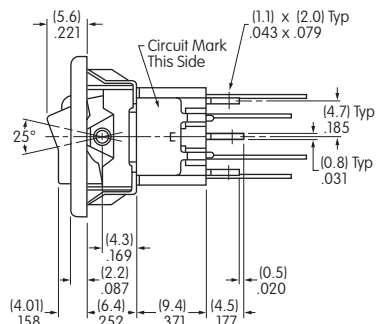
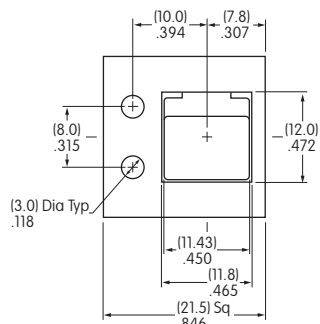
#### Single & Double Pole



MN12TJW01-FC-1A

#### Snap-in Frame • AT212 Bezel • Solder Lug

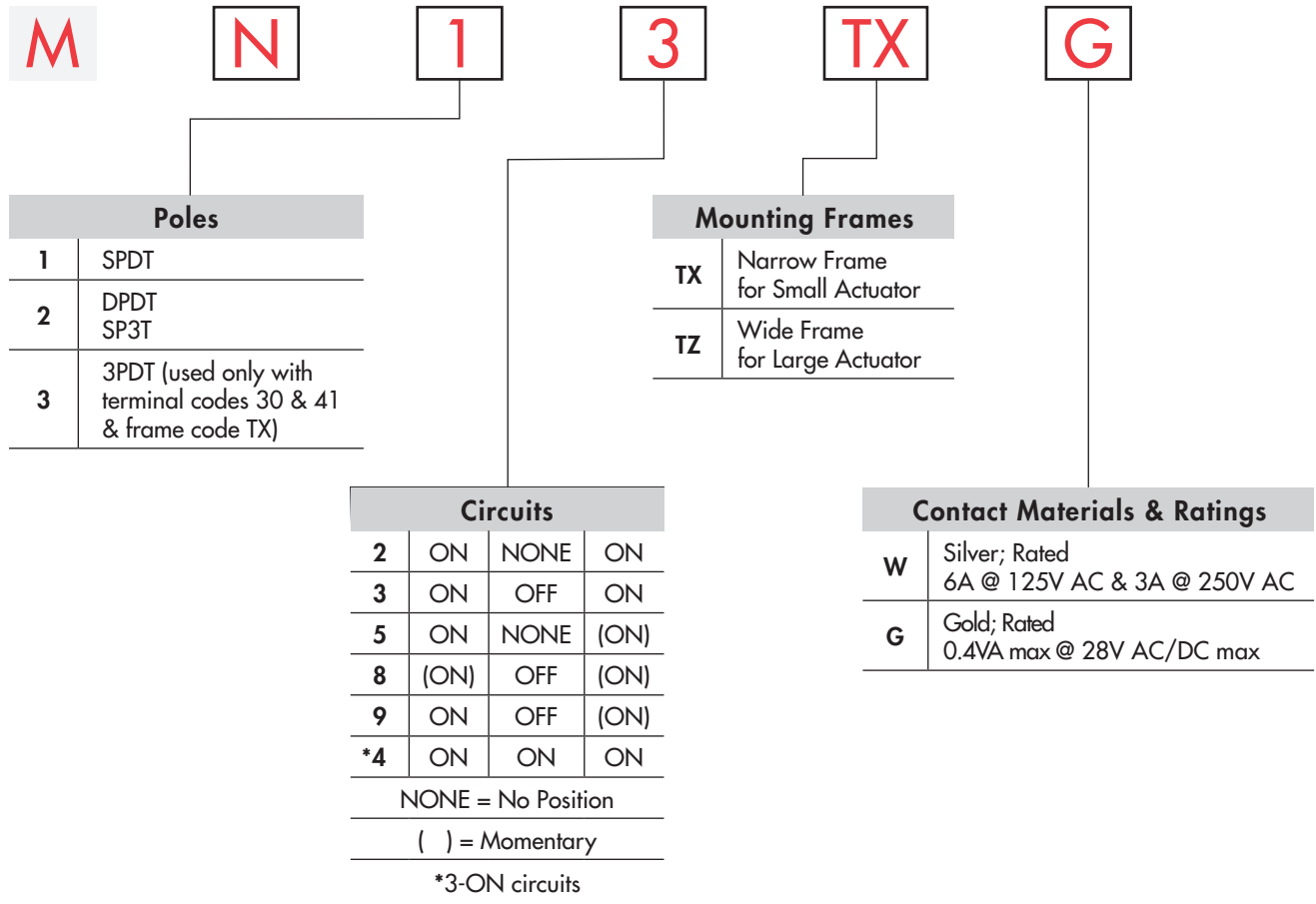
#### Single Pole



MN12TJW01-FC-3A-CF

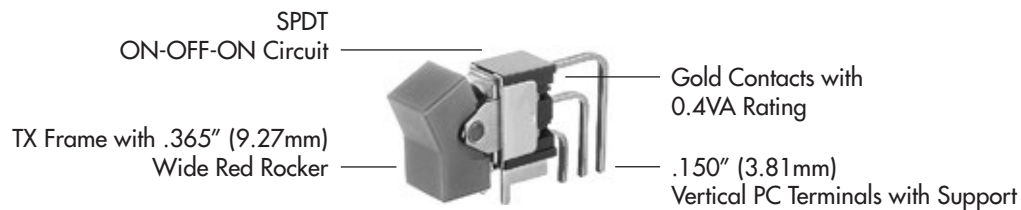


### TYPICAL SWITCH



### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

**MN13TXG41-DC**



ORDERING EXAMPLE

|                                             |                                                        |
|---------------------------------------------|--------------------------------------------------------|
| <div>41</div>                               |                                                        |
| Terminals For TX & TZ Frames                |                                                        |
| Straight PC with Bracket (1-2 Pole only)    |                                                        |
| 13                                          | .250" (6.35mm) Straight PC with .465" (11.8mm) Bracket |
| Terminals For TX Frame Only                 |                                                        |
| Right Angle PC with Support (1-3 Pole only) |                                                        |
| 30                                          | .150" (3.81mm) Right Angle PC                          |
| Vertical PC with Support (1-3 Pole)         |                                                        |
| 41                                          | .150" (3.81mm) Vertical PC                             |

D

C

Rockers & Paddles

Small Actuators (TX Frame)

|   |                                |
|---|--------------------------------|
| D | .365" (9.27mm)<br>Wide Rocker  |
| E | .365" (9.27mm)<br>Wide Paddle  |
| F | .450" (11.43mm)<br>Wide Rocker |
| G | .450" (11.43mm)<br>Wide Paddle |

Large Actuators (TZ Frame)

|   |                                |
|---|--------------------------------|
| J | .595" (15.11mm)<br>Wide Rocker |
| H | .595" (15.11mm)<br>Wide Paddle |

|                        |        |
|------------------------|--------|
| Rocker & Paddle Colors |        |
| A                      | Black  |
| B                      | White  |
| C                      | Red    |
| E                      | Yellow |
| F                      | Green  |
| G                      | Blue   |
| H                      | Gray   |

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

## POLES &amp; CIRCUITS

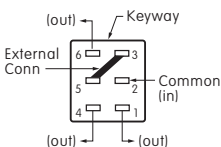
| Pole | Model | Rocker Position<br>NONE = No Position ( ) = Momentary |        |      | Connected Terminals |        |             | Throw & Schematics                                                                                                                      |
|------|-------|-------------------------------------------------------|--------|------|---------------------|--------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------|
|      |       | Down                                                  | Center | Up   | Down                | Center | Up          |                                                                                                                                         |
| SP   | MN12  | ON                                                    | NONE   | ON   |                     |        |             | SPDT<br>Note: Terminal numbers are not actually on the switch.<br>* Reverse circuits available for vertical mount SP & DP upon request. |
|      | MN13  | ON                                                    | OFF    | ON   |                     |        |             |                                                                                                                                         |
|      | *MN15 | ON                                                    | NONE   | (ON) | 2-3                 | OPEN   | 2-1         |                                                                                                                                         |
|      | MN18  | (ON)                                                  | OFF    | (ON) |                     |        |             |                                                                                                                                         |
|      | *MN19 | ON                                                    | OFF    | (ON) |                     |        |             |                                                                                                                                         |
| DP   | MN22  | ON                                                    | NONE   | ON   |                     |        |             | DPDT                                                                                                                                    |
|      | MN23  | ON                                                    | OFF    | ON   |                     |        |             |                                                                                                                                         |
|      | *MN25 | ON                                                    | NONE   | (ON) | 2-3 5-6             | OPEN   | 2-1 5-4     |                                                                                                                                         |
|      | MN28  | (ON)                                                  | OFF    | (ON) |                     |        |             |                                                                                                                                         |
|      | *MN29 | ON                                                    | OFF    | (ON) |                     |        |             |                                                                                                                                         |
| 3P   | MN32  | ON                                                    | NONE   | ON   |                     |        |             | 3PDT                                                                                                                                    |
|      | MN33  | ON                                                    | OFF    | ON   |                     |        |             |                                                                                                                                         |
|      | *MN35 | ON                                                    | NONE   | (ON) | 2-3 5-6 8-9         | OPEN   | 2-1 5-4 8-7 |                                                                                                                                         |
|      | MN38  | (ON)                                                  | OFF    | (ON) |                     |        |             |                                                                                                                                         |
|      | *MN39 | ON                                                    | OFF    | (ON) |                     |        |             |                                                                                                                                         |

## For 3 Throw (3-On)

## Connected Terminals &amp; Schematics

| Pole | Model | Down | Center | Up   | Down | Center | Up |
|------|-------|------|--------|------|------|--------|----|
| SP   | MN24  | ON   | ON     | ON   |      |        |    |
|      | MN26  | (ON) | ON     | (ON) |      |        |    |
|      | MN27  | ON   | ON     | (ON) |      |        |    |
|      |       |      |        |      |      |        |    |

The SP3T model utilizes a double pole base.



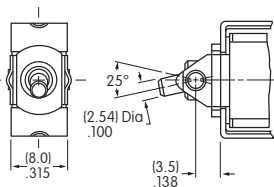
External connection must be made during field installation.

## MOUNTING FRAMES

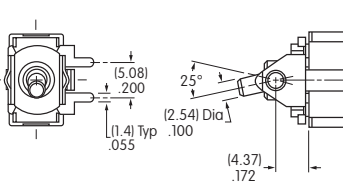
TX

Narrow Mounting Frame for Small Actuators with Straight PC Terminals (codes 13, 15, 17, 23, 25, & 26) or with Angle PC Terminals (codes 30 & 41)

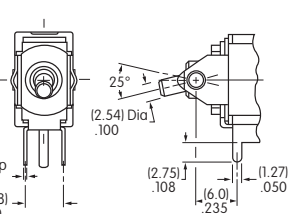
Straight PC Mounting



Right Angle PC Mounting



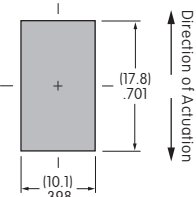
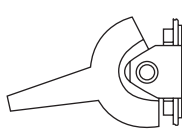
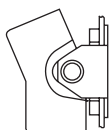
Vertical PC Mounting



Small Actuators & Panel Cutouts for TX Frame (actuator details on the following pages)

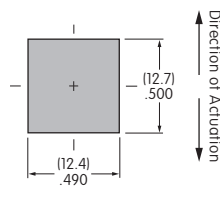
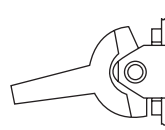
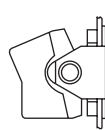
AT4148

AT4149



AT4150

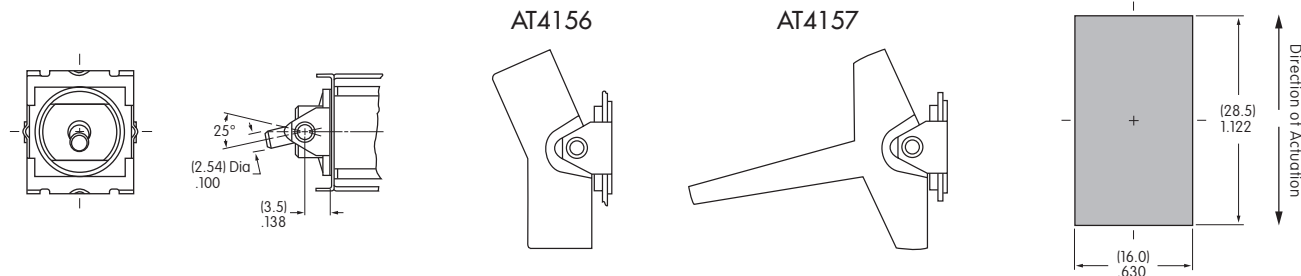
AT4151



MOUNTING FRAMES

**TZ** Wide Mounting Frame for Large Actuators with Straight PC Terminals  
(codes 13, 15, 17, 23, 25, & 26)

Large Actuators & Panel Cutouts for TZ Frame  
(actuator details on the following pages)



CONTACT MATERIALS & RATINGS

**W** Silver Power Level

- MN12, MN22: 6A @ 125V AC, 3A @ 250V AC, 4A @ 30V DC
- MN13, MN15, MN18, MN19: 6A @ 125V AC, 3A @ 250V AC, 3A @ 30V DC
- MN23, MN25: 6A @ 125V AC, 3A @ 250V AC, 3A @ 30V DC
- MN28, MN29: 4A @ 125V AC, 3A @ 250V AC, 3A @ 30V DC
- MN24: 3A @ 125V AC, 2A @ 250V AC, 2A @ 30V DC
- MN32: 4A @ 125V AC, 2A @ 250V AC, 3A @ 30V DC
- MN33, MN35, MN38, MN39: 4A @ 125V AC, 2A @ 250V AC, 2A @ 30V AC

**G** Gold Logic Level 0.4VA maximum @ 28V AC/DC maximum

Note: Complete explanation of operating range in Supplement section.

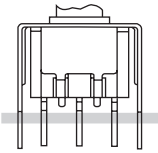
Gold over Silver Power Level or Logic Level See above for ratings

Note: Gold over silver is available as a custom option. This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

TERMINALS

For TX and TZ 1-2 Pole Straight PC Mount with Bracket

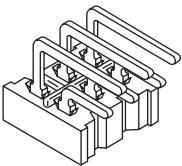
**13** .250" (6.35mm) Terminal with .465" (11.8mm) Bracket



PCB footprints are on the following Typical Switch Dimension pages.

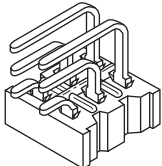
For TX 1-3 Pole Right Angle PC Mount

**30** .150" (3.81mm) Right Angle PC



For TX 1-4 Pole Vertical PC Mount

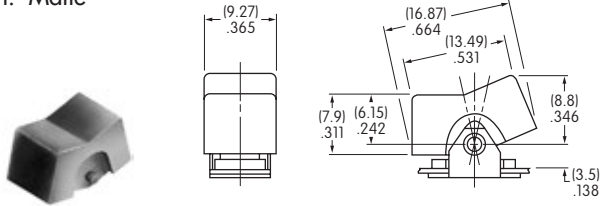
**41** .150" (3.81mm) Vertical PC



### ROCKERS & PADDLES FOR TX MOUNTING FRAMES

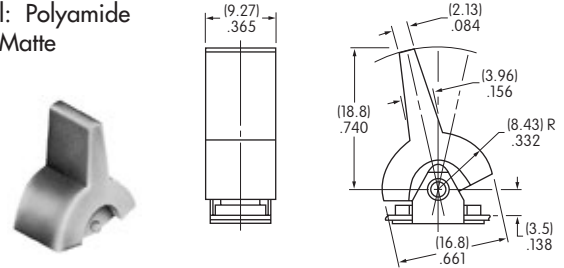
#### **D** AT4148 .365" (9.27mm) Wide Rocker

Material: Polyamide  
Finish: Matte



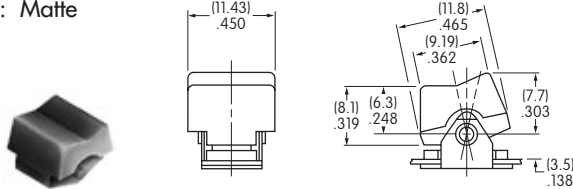
#### **E** AT4149 .365" (9.27mm) Wide Paddle

Material: Polyamide  
Finish: Matte



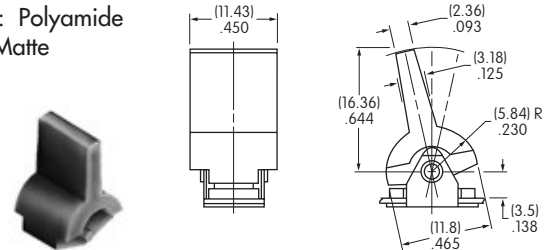
#### **F** AT4150 .450" (11.43mm) Wide Rocker

Material: Polyamide  
Finish: Matte



#### **G** AT4151 .450" (11.43mm) Wide Paddle

Material: Polyamide  
Finish: Matte



Cap Colors  
Available:



Black



White



Red



Yellow



Green



Blue

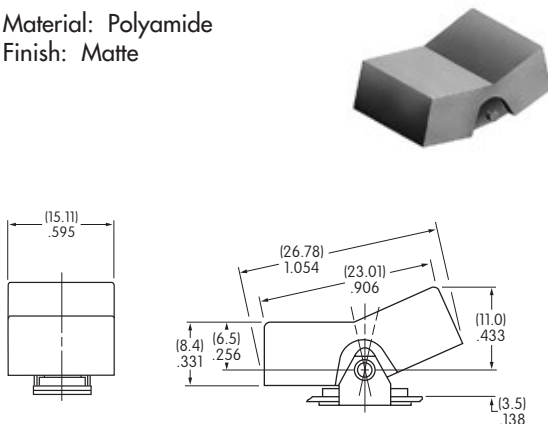


Gray

### ROCKERS & PADDLES FOR TZ MOUNTING FRAMES

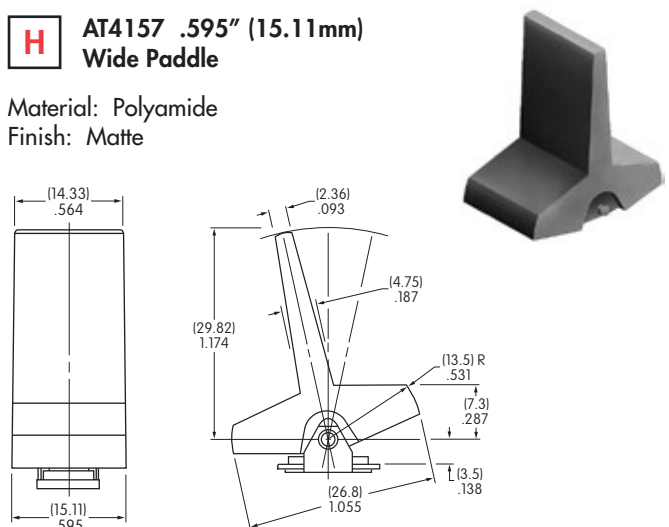
#### **J** AT4156 .595" (15.11mm) Wide Rocker

Material: Polyamide  
Finish: Matte



#### **H** AT4157 .595" (15.11mm) Wide Paddle

Material: Polyamide  
Finish: Matte



Cap Colors  
Available:



Black



White



Red



Yellow



Green



Blue



Gray

OPTIONAL SNAP-IN PANEL FRAMES

Used with AT4148 Rocker and AT4149 Paddle

Toggles

**B** Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

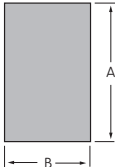
Supplement

**AT064-1**

Accommodates .047" ~ .090"  
(1.2 ~ 2.3mm) panel thickness

Material: Polyamide  
Finish: Matte  
Color: Black

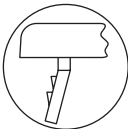
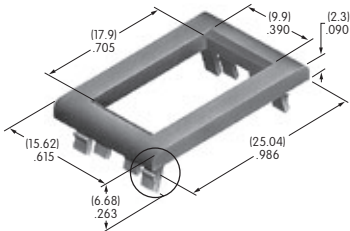
Mounted separately from switches



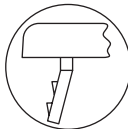
Cutout Tolerances:  
Dimension A:  
.797" ~ .803" (20.24 ~ 20.4mm)  
Dimension B:  
.495" ~ .505" (12.57 ~ 12.83mm)

**AT064-2**

Accommodates .062" ~ .125"  
(1.57 ~ 3.18mm) panel thickness



AT064-1 Enlarged Detail



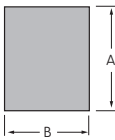
Used with AT4150 Rocker and AT4151 Paddle

**AT065-1**

Accommodates .047" ~ .090"  
(1.2 ~ 2.3mm) panel thickness

Material: Polyamide  
Finish: Matte  
Color: Black

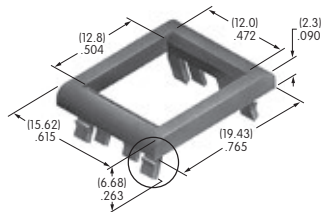
Mounted separately from switches



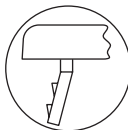
Cutout Tolerances:  
Dimension A:  
.595" ~ .605" (15.11 ~ 15.37mm)  
Dimension B:  
.495" ~ .500" (12.57 ~ 12.7mm)

**AT065-2**

Accommodates .062" ~ .125"  
(1.57 ~ 3.18mm) panel thickness



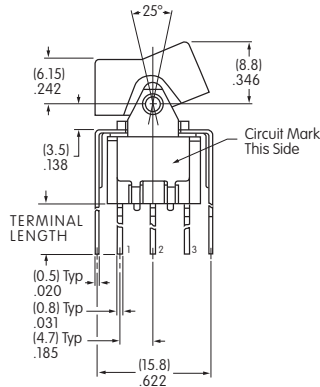
AT065-1 Enlarged Detail



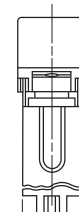
AT065-2 Enlarged Detail

### TYPICAL SWITCH DIMENSIONS

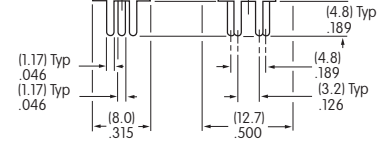
#### Straight PC • Bracket



#### Single Pole

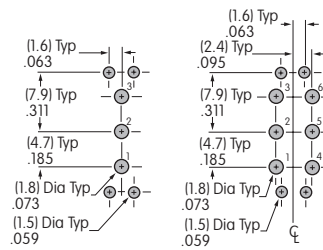


#### Double Pole



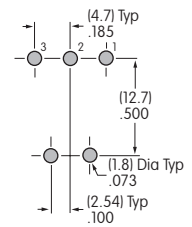
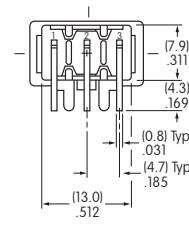
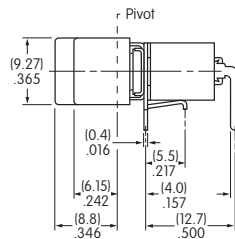
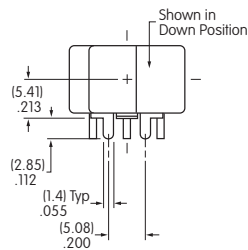
#### MN12TXG13-DC

| Terminal Code: | Terminal Length: | Bracket Length: |
|----------------|------------------|-----------------|
| 13             | .250" (6.35mm)   | .465" (11.8mm)  |



#### .150" (3.81mm) Right Angle PC

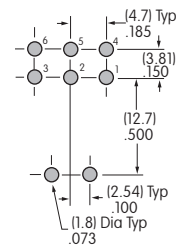
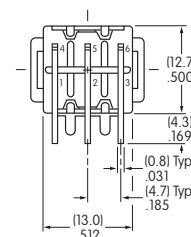
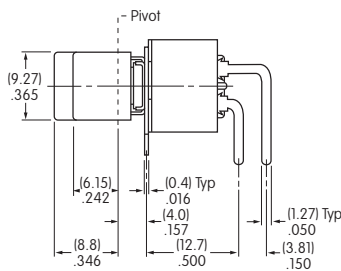
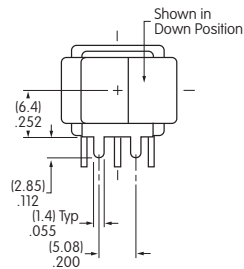
#### Single Pole



#### MN12TXG30-DC

#### .150" (3.81mm) Right Angle PC

#### Double Pole

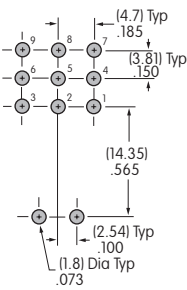
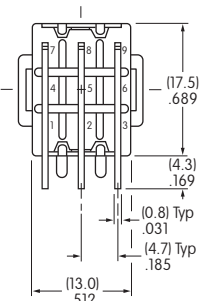
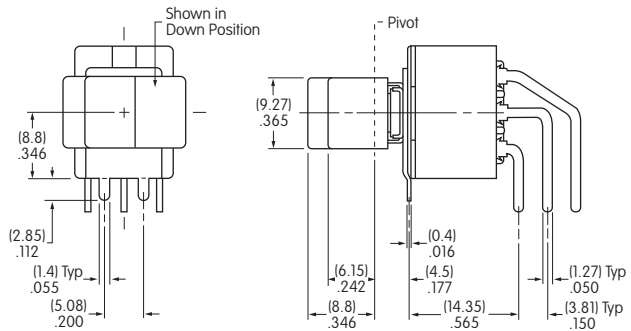


#### MN22TXG30-DC

TYPICAL SWITCH DIMENSIONS

Three Pole

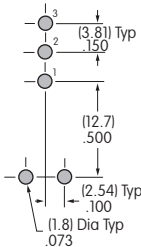
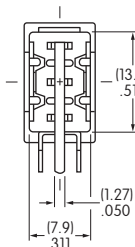
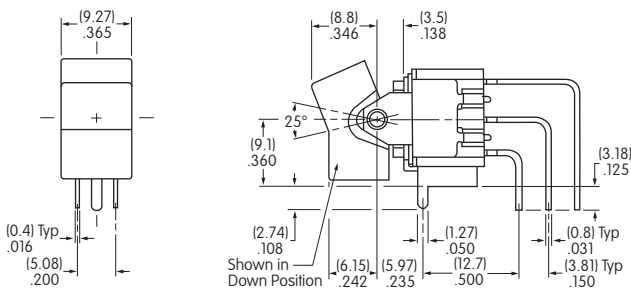
.150" (3.81mm) Right Angle PC



MN32TXG30-DC

Single Pole

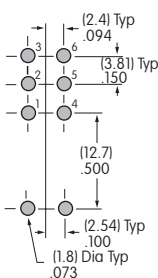
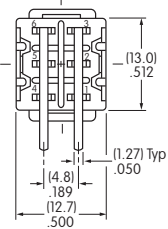
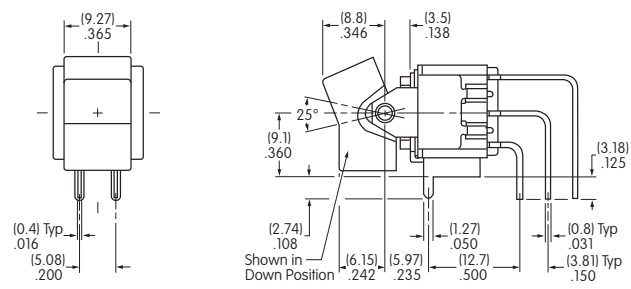
.150" (3.81mm) Vertical PC



MN12TXG41-DC

Double Pole

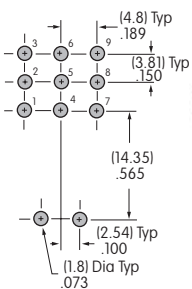
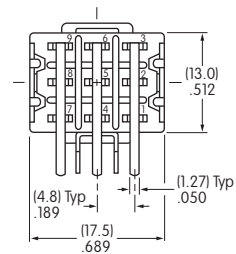
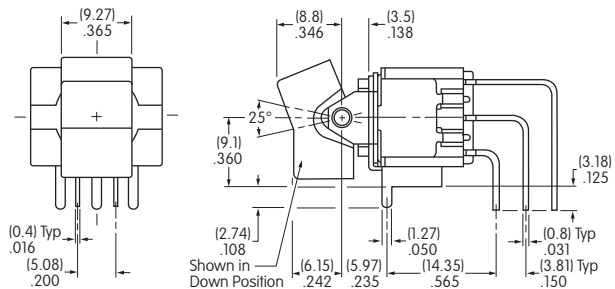
.150" (3.81mm) Vertical PC



MN22TXG41-DC

Three Pole

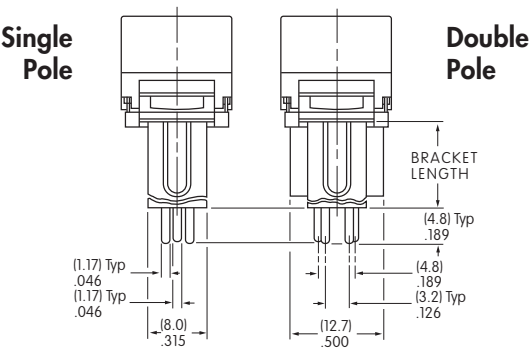
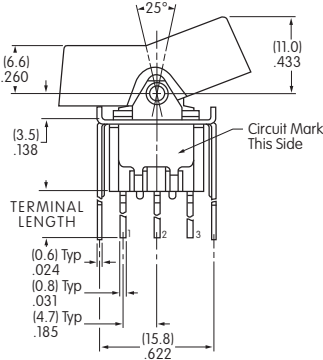
.150" (3.81mm) Vertical PC



MN32TXG41-DC

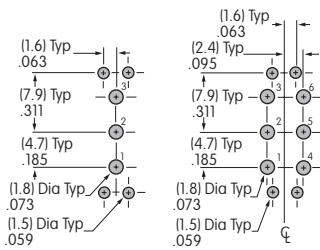
TYPICAL SWITCH DIMENSIONS

Straight PC • Bracket



MN12TZG13-JC

| Terminal Code: | Terminal Length: | Bracket Length: |
|----------------|------------------|-----------------|
| 13             | .250" (6.35mm)   | .465" (11.8mm)  |



LEGENDS

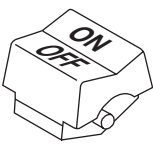
NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Area for Cap

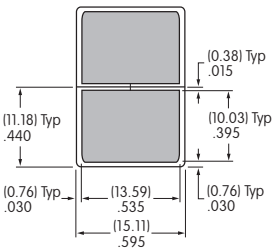
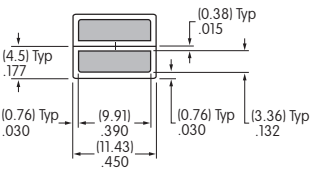
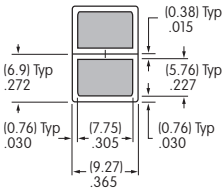
AT4148



AT4150



AT4156



Shaded areas are printable areas.

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

TYPICAL SWITCH ORDERING EXAMPLE

M

N

1

2

TN

W

01

—

D

C

B

| Poles |              |
|-------|--------------|
| 1     | SPDT         |
| 2     | DPDT<br>SP3T |
| 3     | 3PDT         |

| Circuits |      |      |      |
|----------|------|------|------|
| 2        | ON   | NONE | ON   |
| 3        | ON   | OFF  | ON   |
| 8        | (ON) | OFF  | (ON) |
| *4       | ON   | ON   | ON   |

NONE = No Position  
( ) = Momentary  
\*3-ON circuits

| Mounting Frame |                                   |
|----------------|-----------------------------------|
| TN             | .272" (6.9mm) Wide<br>Flat Frame  |
| TY             | .504" (12.8mm) Wide<br>Flat Frame |

| Contact Materials<br>& Ratings |                                              |
|--------------------------------|----------------------------------------------|
| W                              | Silver; Rated 6A @ 125V<br>AC & 3A @ 250V AC |
| G                              | Gold; Rated 0.4VA max @<br>28V AC/DC max     |

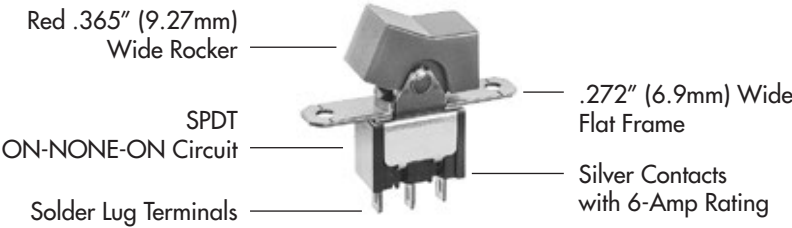
| Terminals |                               |
|-----------|-------------------------------|
| 01        | Solder Lug                    |
| 03        | .250" (6.35mm)<br>Straight PC |

| Rockers & Paddles          |                                |
|----------------------------|--------------------------------|
| Small Actuators (TN Frame) |                                |
| D                          | .365" (9.27mm)<br>Wide Rocker  |
| E                          | .365" (9.27mm)<br>Wide Paddle  |
| F                          | .450" (11.43mm)<br>Wide Rocker |
| G                          | .450" (11.43mm)<br>Wide Paddle |
| Large Actuators (TY Frame) |                                |
| J                          | .595" (15.11mm)<br>Wide Rocker |
| H                          | .595" (15.11mm)<br>Wide Paddle |

| Rocker & Paddle<br>Colors |        |
|---------------------------|--------|
| A                         | Black  |
| B                         | White  |
| C                         | Red    |
| E                         | Yellow |
| F                         | Green  |
| G                         | Blue   |
| H                         | Gray   |

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

MN12TNW01-DC



### POLES & CIRCUITS

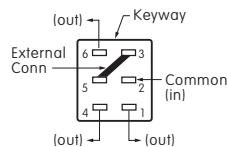
| Pole | Model                | Rocker Position<br>NONE = No Position ( ) = Momentary |                    |                  | Connected Terminals |      |                | Throw & Schematics                                             |
|------|----------------------|-------------------------------------------------------|--------------------|------------------|---------------------|------|----------------|----------------------------------------------------------------|
|      |                      | Down                                                  | Center             | Up               | Down                |      | Up             |                                                                |
| SP   | MN12<br>MN13<br>MN18 | ON<br>ON<br>(ON)                                      | NONE<br>OFF<br>OFF | ON<br>ON<br>(ON) | 2-3                 | OPEN | 2-1            | Note: Terminal numbers are not actually on the switch.<br>SPDT |
| DP   | MN22<br>MN23<br>MN28 | ON<br>ON<br>(ON)                                      | NONE<br>OFF<br>OFF | ON<br>ON<br>(ON) | 2-3 5-6             | OPEN | 2-1 5-4        | DPDT                                                           |
| 3P   | MN32<br>MN33<br>MN38 | ON<br>ON<br>(ON)                                      | NONE<br>OFF<br>OFF | ON<br>ON<br>(ON) | 2-3 5-6<br>8-9      | OPEN | 2-1 5-4<br>8-7 | 3PDT                                                           |

For 3 Throw (3-On)

### Connected Terminals & Schematics

| Pole | Model | Down | Center | Up | Down    | Center  | Up      |
|------|-------|------|--------|----|---------|---------|---------|
| SP   | MN24  | ON   | ON     | ON | 2-3 5-6 | 2-3 5-4 | 2-1 5-4 |

The SP3T model utilizes a double pole base.

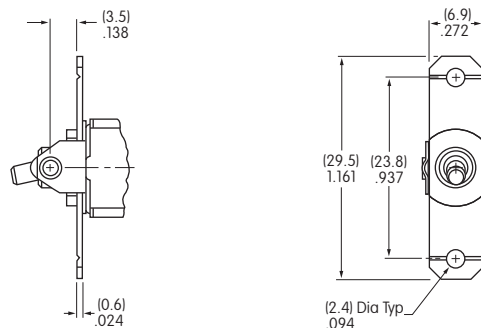


External connection must be made during field installation.

### MOUNTING FRAMES

**TN** .272" (6.9mm) Wide Flat Frame

Small Actuators & Panel Cutouts for TN Frame  
(actuator details on the following pages)

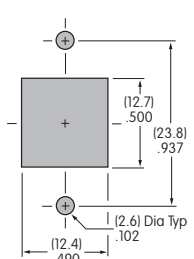
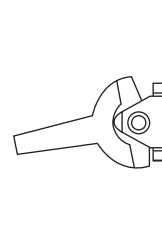
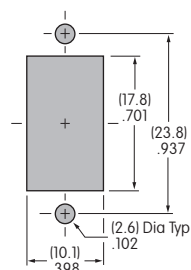
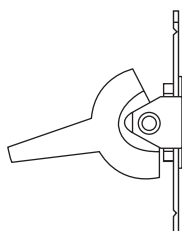
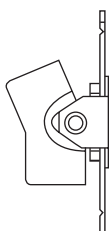


AT4148

AT4149

AT4150

AT4151



MOUNTING FRAMES

Toggles

**B** Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

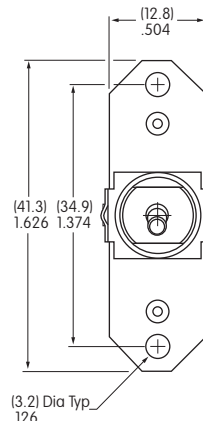
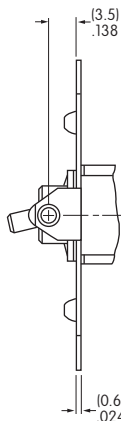
Accessories

Supplement

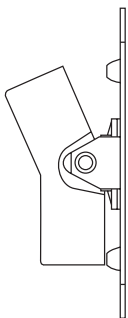
**TY**

.504" (12.8mm) Wide Flat Frame

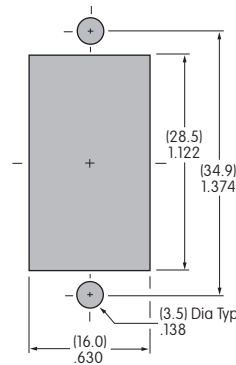
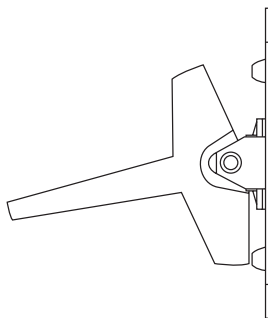
Large Actuators & Panel Cutout for TY Frame  
(actuator details on the following pages)



AT4156



AT4157



CONTACT MATERIALS & RATINGS

**W**

Silver Power Level

**MN12, MN22:** 6A @ 125V AC, 3A @ 250V AC, 4A @ 30V DC  
**MN13, MN18, MN23:** 6A @ 125V AC, 3A @ 250V AC, 3A @ 30V DC  
**MN28:** 4A @ 125V AC, 3A @ 250V AC, 3A @ 30V DC  
**MN32:** 4A @ 125V AC, 2A @ 250V AC, 3A @ 30V DC  
**MN33, MN38:** 4A @ 125V AC, 2A @ 250V AC, 2A @ 30V DC  
**MN24:** 3A @ 125V AC, 2A @ 250V AC, 2A @ 30V DC

**G**

Gold

Logic Level

0.4VA maximum @ 28V AC/DC maximum

Note: Complete explanation of operating range in Supplement section.

Gold over Silver

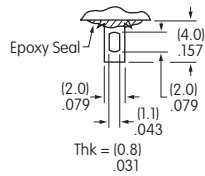
Power Level  
or Logic Level

See above for each rating

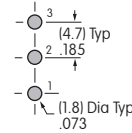
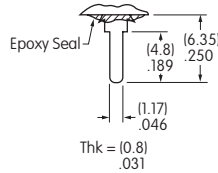
Note: Gold over silver is available as a custom option. This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

### TERMINALS

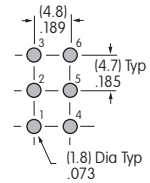
#### 01 Solder Lug



#### 03 .250" (6.35mm) Straight PC



Single Pole



Double Pole

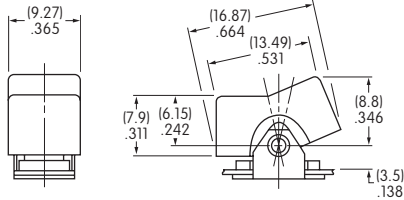
### ROCKERS & PADDLES

#### For TN Frame

#### D AT4148 .365" (9.27mm) Wide Rocker



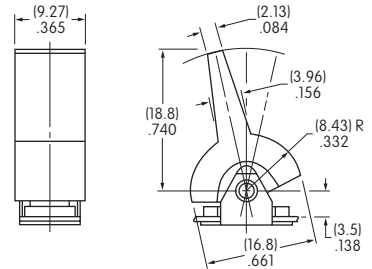
Material:  
Polyamide  
Finish: Matte



#### E AT4149 .365" (9.27mm) Wide Paddle



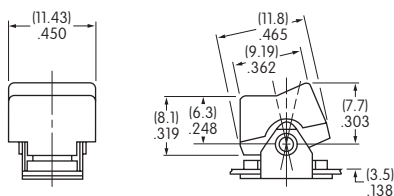
Material:  
Polyamide  
Finish: Matte



#### F AT4150 .450" (11.43mm) Wide Rocker



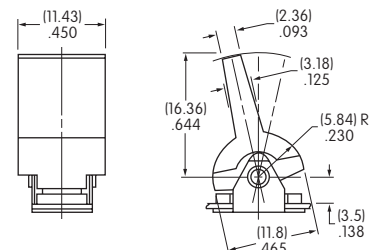
Material:  
Polyamide  
Finish: Matte



#### G AT4151 .450" (11.43mm) Wide Paddle



Material:  
Polyamide  
Finish: Matte



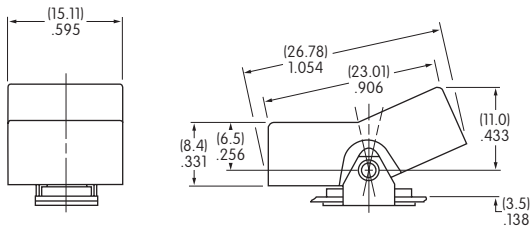
Flat Frame Mount Miniature Rockers

ROCKERS & PADDLES

For TY Frame

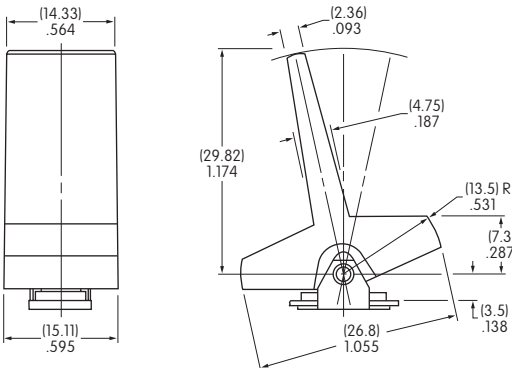
**J** AT4156 .595" (15.11mm)  
Wide Rocker

Material:  
Polyamide  
Finish: Matte



**H** AT4157 .595" (15.11mm)  
Wide Paddle

Material:  
Polyamide  
Finish: Matte

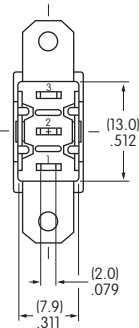
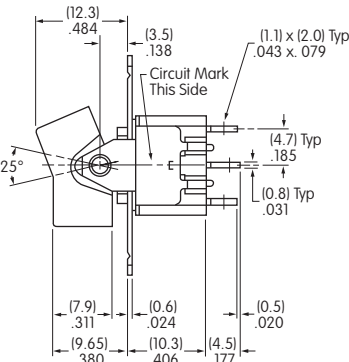
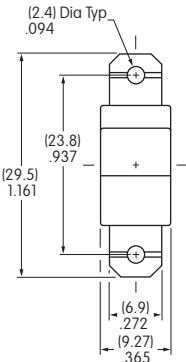


Cap Colors Available: **A** Black **B** White **C** Red **E** Yellow **F** Green **G** Blue **H** Gray

TYPICAL SWITCH DIMENSIONS

Single Pole

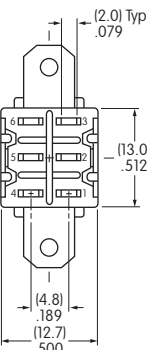
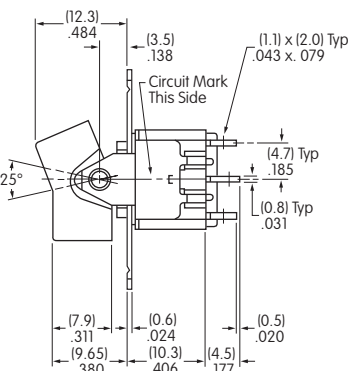
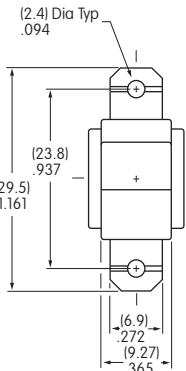
TN Frame • Solder Lug



MN12TNW01-DC

Double Pole

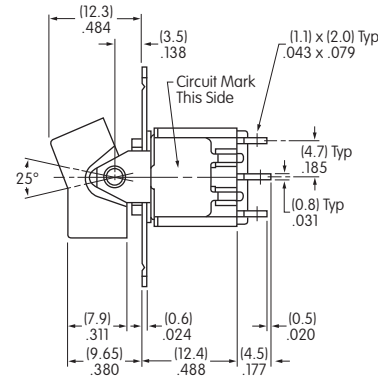
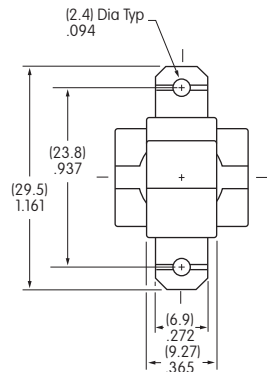
TN Frame • Solder Lug



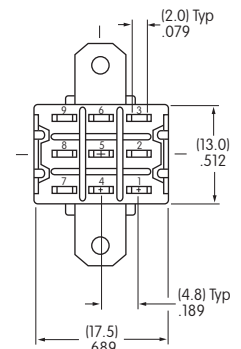
MN22TNW01-DC

### TYPICAL SWITCH DIMENSIONS

#### TN Frame • Solder Lug

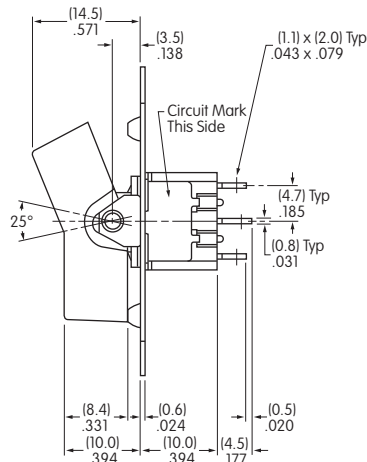
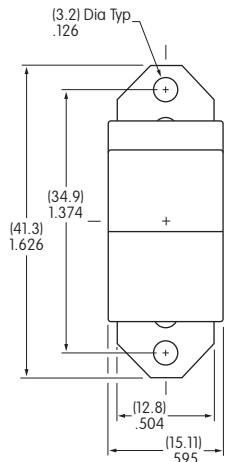


#### Three Pole

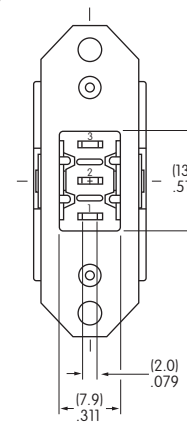


MN32TNW01-DC

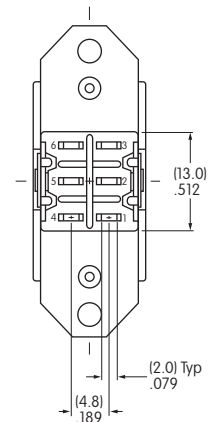
#### TY Frame • Solder Lug



#### Single Pole



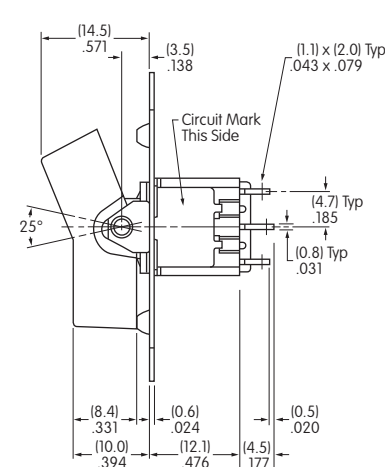
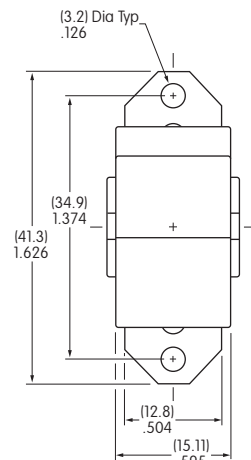
#### Double Pole



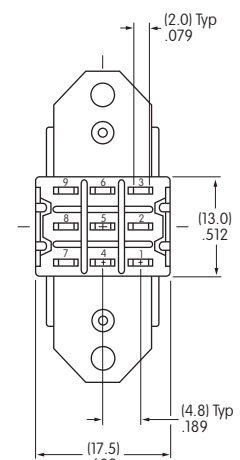
MN12TYW01-JC

Double pole has barrier between terminals.

#### TY Frame • Solder Lug



#### Three Pole



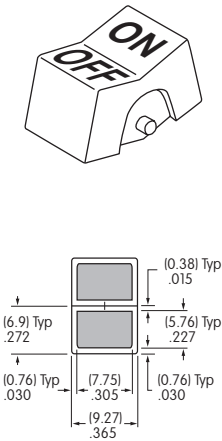
MN32TYW01-JC

LEGENDS

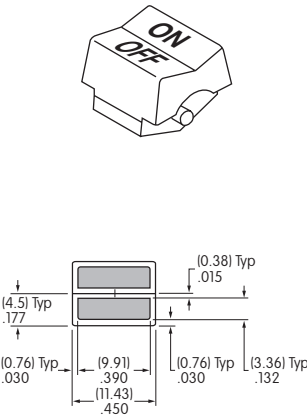
NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Area for Caps

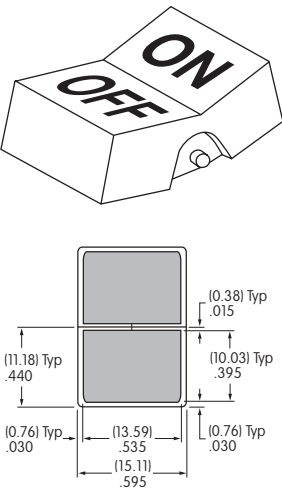
AT4148



AT4150



AT4156



Shaded areas are printable areas.

Recommended Print Method:

Pad Print

Epoxy based ink is recommended.

Toggles

B  
Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

Supplement