

# 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.

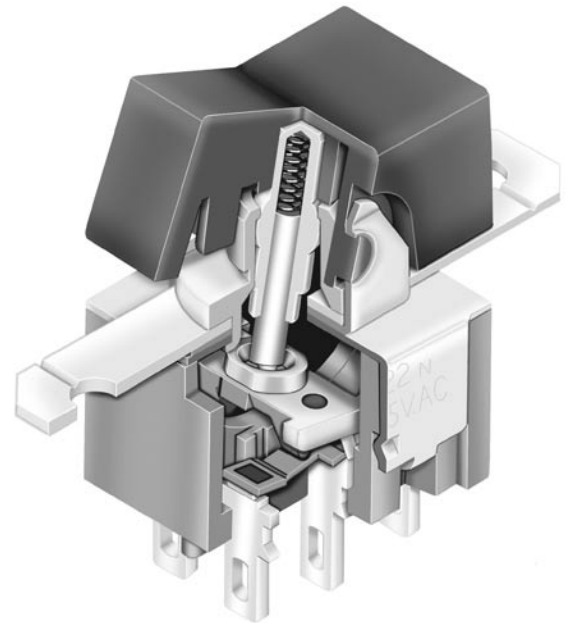
The molded diallyl phthalate case has a UL 94V-0 flammability rating.

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

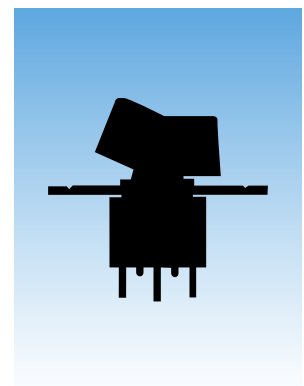
Prominent external insulating barriers increase insulation resistance and dielectric strength.

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



# General Specifications

## Electrical Capacity (Resistive Load)

<b>Power Level (code W):</b>	6A @ 125V AC & 3A @ 250V AC 4A @ 30V DC for On-None-On; 3A @ 30V DC for all other circuits
<b>Logic Level (code G):</b>	0.4VA maximum @ 28V AC/DC maximum (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
<b>Logic/Power Level (code A):</b>	Combines W & G ratings Note: Find additional explanation of dual rating & operating range in Supplement section.

## 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; 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; 50,000 operations minimum for silver at 3A @ 125V AC
<b>Angle of Throw:</b>	25°

## Materials & Finishes

<b>Actuator Clip &amp; Mounting Frame:</b>	Stainless Steel
<b>Body Frame:</b>	Stainless steel
<b>Case:</b>	Diallyl phthalate resin (UL94V-0)
<b>Movable Contactor:</b>	Phosphor bronze with silver or gold plating
<b>Movable Contacts:</b>	Silver alloy (code W); copper with gold plating (code G); or silver alloy with gold plating (code A)
<b>Stationary Contacts:</b>	Silver with silver plating (code W); copper or brass with gold plating (code G); or silver with gold plating (code A)
<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 96 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>	50G (490m/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. Manual Soldering for Gold: See Profile A in Supplement section. Wave Soldering (PC version) for Silver: See Profile B in Supplement section. Manual Soldering for Silver: See Profile B in Supplement section. 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 Recognized:</b>	All models recognized at 6A @ 125V AC or 3A @ 250V AC or 0.4VA maximum @ 28V DC maximum; UL File No. WOYR2.E44145; add "/U" to end of part number to order UL mark on switch.
 <b>CSA Certified:</b>	All models recognized at 6A @ 125V AC or 3A @ 250V AC or 0.4VA maximum @ 28V maximum; CSA File No. 023535-0-000; add "/C" to end of part number to order CSA mark on switch.

### TYPICAL SWITCH ORDERING EXAMPLE

**M20** **1** **2** **TN** **W** **01** **D** **C**

POLES	
1	SPDT
2	DPDT SP3T
3	3PDT
4	4PDT DP3T

MOUNTING FRAMES	
TN	.272" (6.9mm) Wide Flat Frame
TY	.504" (12.8mm) Wide Flat Frame

CONTACT MATERIALS & RATINGS	
W	Silver; Rated 6A @ 125V AC & 3A @ 250V AC
G	Gold; Rated 0.4VA max @ 28V AC/DC max
A	Gold over Silver; Rated 6A @ 125V AC & 0.4VA max @ 28V AC/DC max

ROCKERS & PADDLES	
<b>Small Actuators (TN Frame)</b>	
D	.365" (9.27mm) Wide Rocker
E	.365" (9.27mm) Wide Paddle
F	.450" (11.43mm) Wide Rocker
G	.450" (11.43mm) Wide Paddle
<b>Large Actuators (TY Frame)</b>	
J	.595" (15.11mm) Wide Rocker
H	.595" (15.11mm) Wide Paddle

CIRCUITS			
2	ON	NONE	ON
3	ON	OFF	ON
5	ON	NONE	(ON)
8	(ON)	OFF	(ON)
9	ON	OFF	(ON)
*4	ON	ON	ON
*6	(ON)	ON	(ON)
*7	ON	ON	(ON)

( ) = Momentary  
\* 3-ON circuits

TERMINALS	
01	Solder Lug
03	.250" (6.35mm) Straight PC

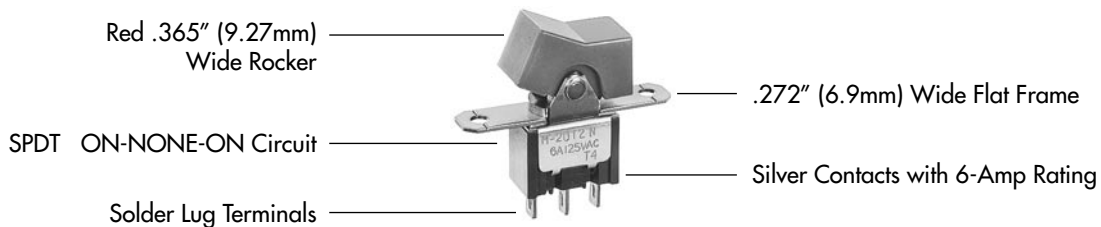
ROCKER & PADDLE COLORS	
A	Black
B	White
C	Red
E	Yellow
F	Green
G	Blue
H	Gray

**IMPORTANT:**


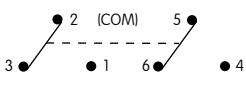
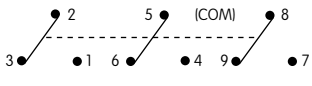
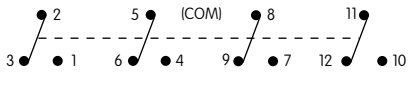
Switches are supplied without UL & CSA marking unless specified. Specific models & ratings noted on General Specifications page.

### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

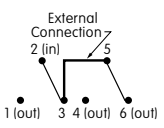
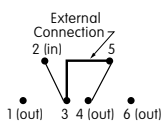
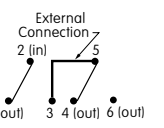
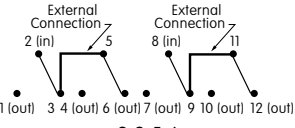
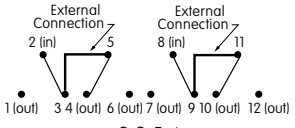
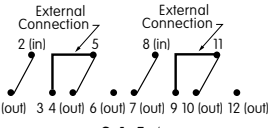
#### M2012TNW01-DC



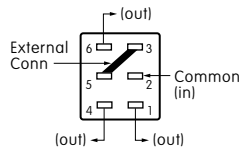
### POLES & CIRCUITS

Pole	Model	Rocker Position ( ) = Momentary			Connected Terminals			Throw & Schematics
		Down	Center	Up	Down	Center	Up	
SP	M2012 M2013 M2015 M2018 M2019	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3	OPEN	2-1	Note: Terminal numbers are not actually on the switch.  
DP	M2022 M2023 M2025 M2028 M2029	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6	OPEN	2-1 5-4	
3P	M2032 M2033 M2035 M2038 M2039	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6 8-9	OPEN	2-1 5-4 8-7	
4P	M2042 M2043 M2045 M2048 M2049	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6 8-9 11-12	OPEN	2-1 5-4 8-7 11-10	

### For 3 Throw (3-On)

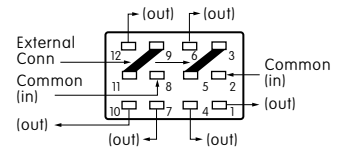
Pole	Model	Down	Center	Up	Connected Terminals & Schematics
SP	M2024 M2026 M2027	ON (ON) ON	ON ON ON	ON (ON) (ON)	 2-3 5-6  2-3 5-4  2-1 5-4
DP	M2044 M2046 M2047	ON (ON) ON	ON ON ON	ON (ON) (ON)	 2-3 5-6 8-9 11-12  2-3 5-4 8-9 11-10  2-1 5-4 8-7 11-10

The SP3T model utilizes a double pole base.



External connection must be made during field installation.

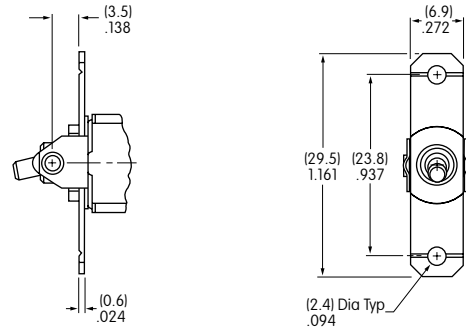
The DP3T model utilizes a four pole base.



External connection must be made during field installation.

### MOUNTING FRAMES

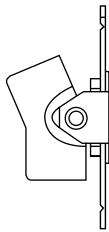
**TN** .272" (6.9mm)  
Wide Flat Frame



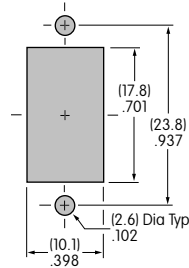
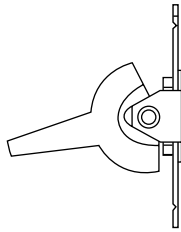
Mounting hardware kit HK-1, as shown on the following page, must be ordered separately.

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

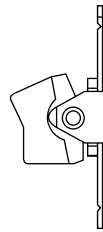
AT4148



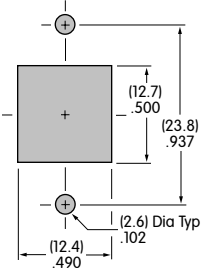
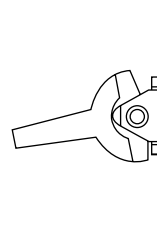
AT4149



AT4150



AT4151

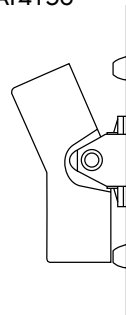


**TY** .504" (12.8mm)  
Wide Flat Frame

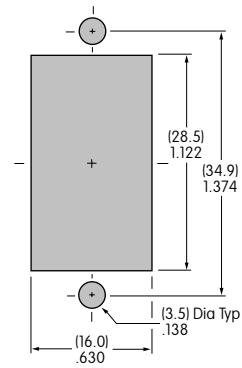
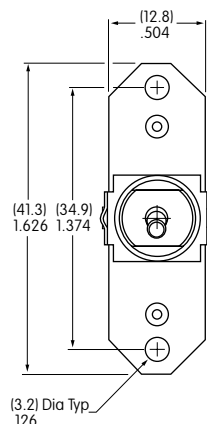
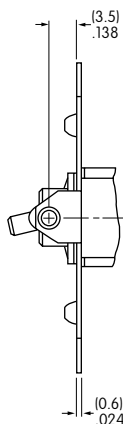
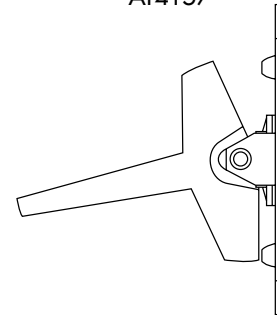
Large Actuators & Panel Cutout for TY Frame (actuator details on the following pages)

Mounting hardware kit HK-2, as shown on the following page, must be ordered separately.

AT4156

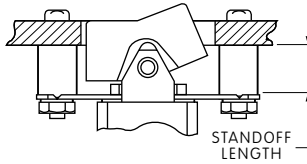


AT4157



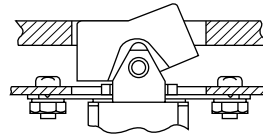
### MOUNTING FRAMES (CONTINUED)

#### Face Panel Mounting



Flat frame devices may also be mounted to the face panel. Standoffs are used to recess the actuator and achieve an attractive front panel appearance.

#### Subpanel Mounting



These devices are especially designed for subpanel mounting. When installed on a mounting plate behind the panel, hardware is completely concealed and the front panel retains a clean, attractive appearance.

Optional Hardware Kits for Subpanel or Face Panel Mounting			
Frame	Panel Thickness	Standoff Length	Hardware Kit Number
TN Frame	.125" (3.175mm)	.233" (5.918mm)	HK-1
TY Frame	.125" (3.175mm)	.312" (7.925mm)	HK-2
Hardware kits include: 2 stainless steel screws, 2 hex nuts, 2 lockwashers, & 2 standoffs			

#### Optional Snap-in Panel Frames



AT064-1  
AT064-2

Further details are shown in the previous bracketed PC mount subsection.



AT065-1  
AT065-2

### CONTACT MATERIALS & RATINGS

**W**

Silver over Silver

Power Level

6A @ 125V AC & 3A @ 250V AC

**G**

Gold over Brass or Copper

Logic Level

0.4VA maximum @ 28V AC/DC maximum

Note: See Supplement section to find complete explanation of operating range.

**A**

Gold over Silver

Power Level  
or Logic Level

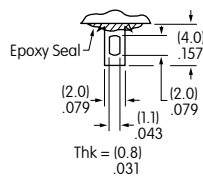
6A @ 125V AC  
or 0.4VA maximum @ 28V AC/DC maximum

Note: 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

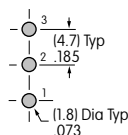
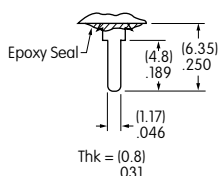
**01**

Solder Lug

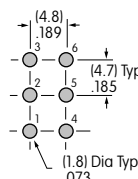


**03**

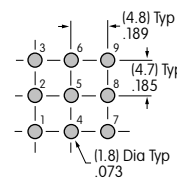
.250" (6.35mm)  
Straight PC



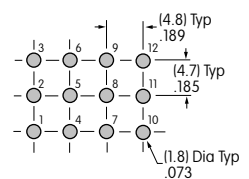
Single Pole



Double Pole



Three Pole



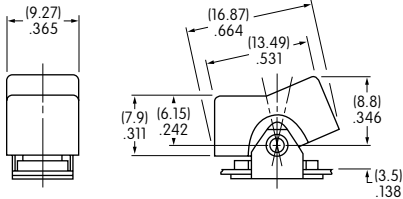
Four Pole

### ROCKERS & PADDLES

#### For TN Frame

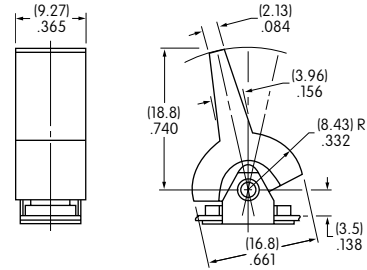
**D** AT4148 .365" (9.27mm)  
Wide Rocker

Material: Polyamide  
Finish: Matte



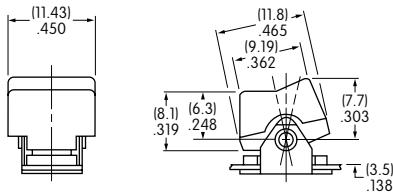
**E** AT4149 .365" (9.27mm)  
Wide Paddle

Material: Polyamide  
Finish: Matte



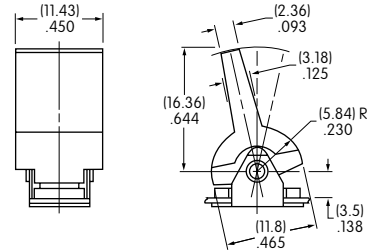
**F** AT4150 .450" (11.43mm)  
Wide Rocker

Material: Polyamide  
Finish: Matte



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

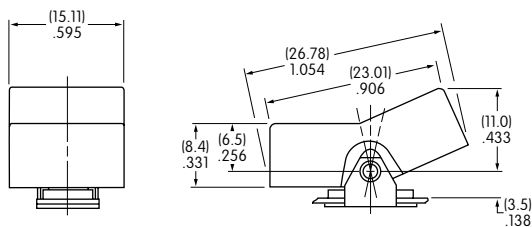
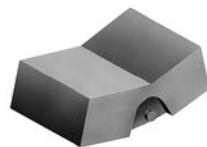
Material: Polyamide  
Finish: Matte



#### For TY Frame

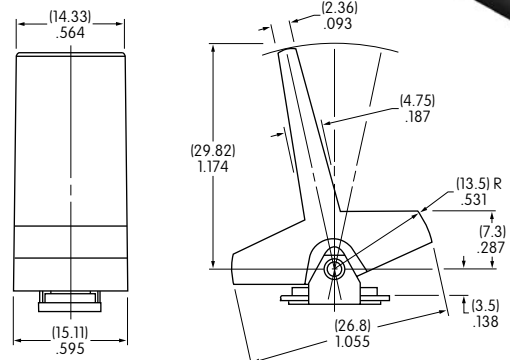
**J** AT4156 .595" (15.11mm)  
Wide Rocker

Material: Polyamide  
Finish: Matte



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

Material: Polyamide  
Finish: Matte



Cap Colors Available:



Black



White



Red



Yellow



Green



Blue



Gray

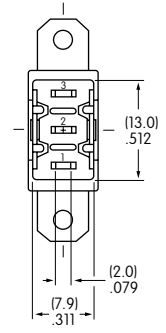
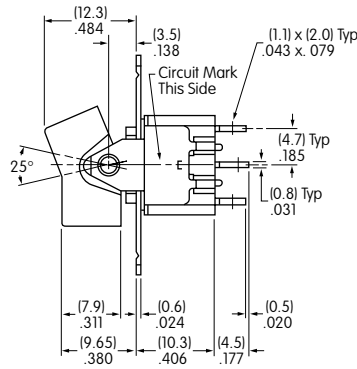
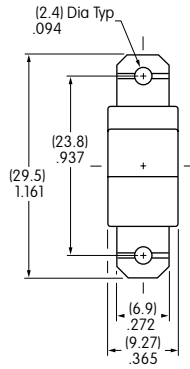
### TYPICAL SWITCH DIMENSIONS

#### TN Frame • Solder Lug



M2012TNW01-DC

#### Single Pole

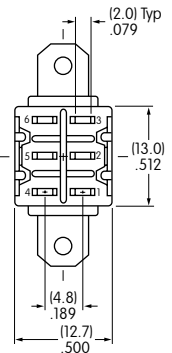
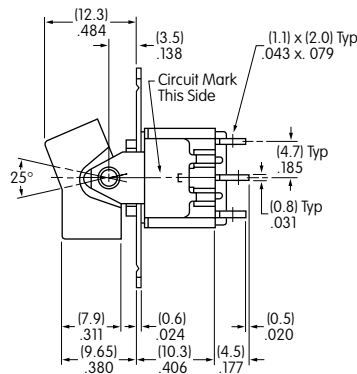
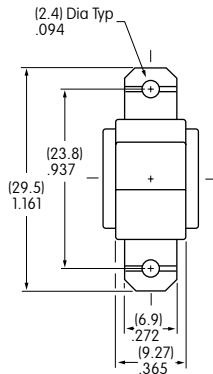


#### TN Frame • Solder Lug



M2022TNW01-DC

#### Double Pole

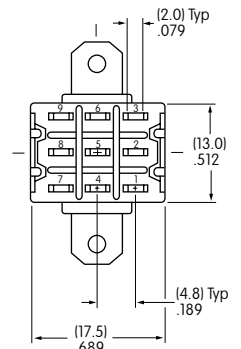
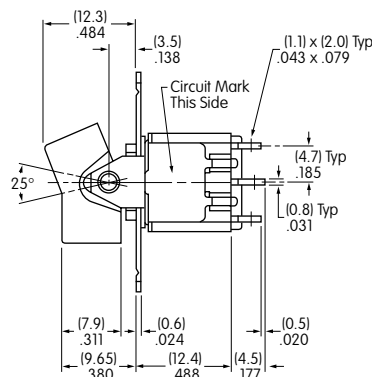
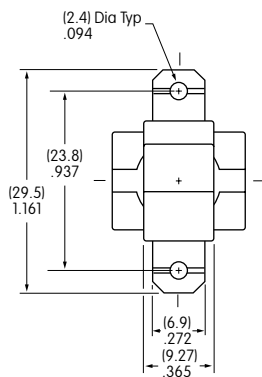


#### TN Frame • Solder Lug



M2032TNW01-DC

#### Three Pole

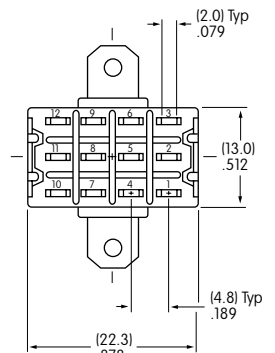
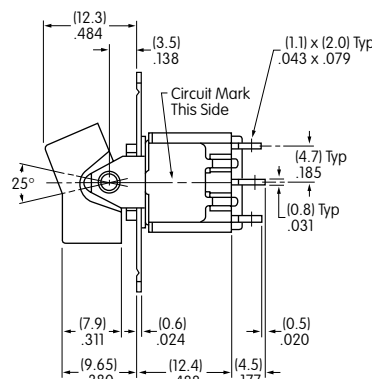
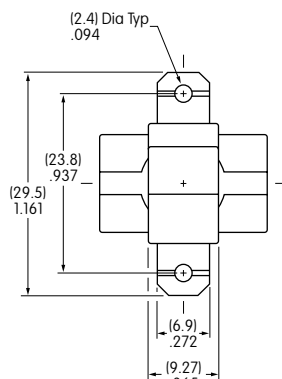


#### TN Frame • Solder Lug



M2042TNW01-DC

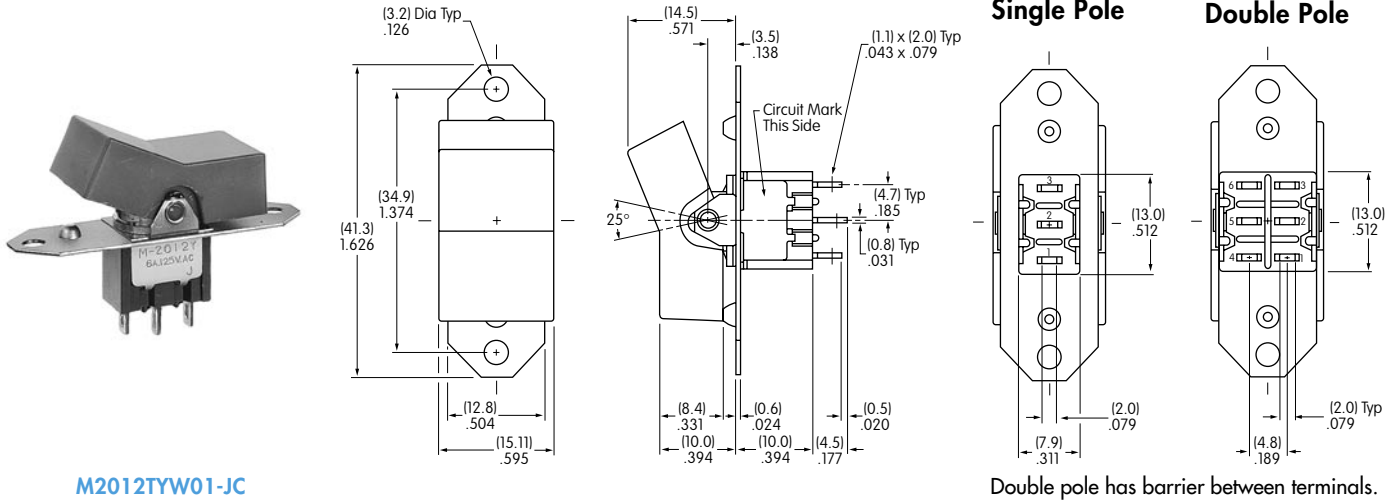
#### Four Pole





### TYPICAL SWITCH DIMENSIONS

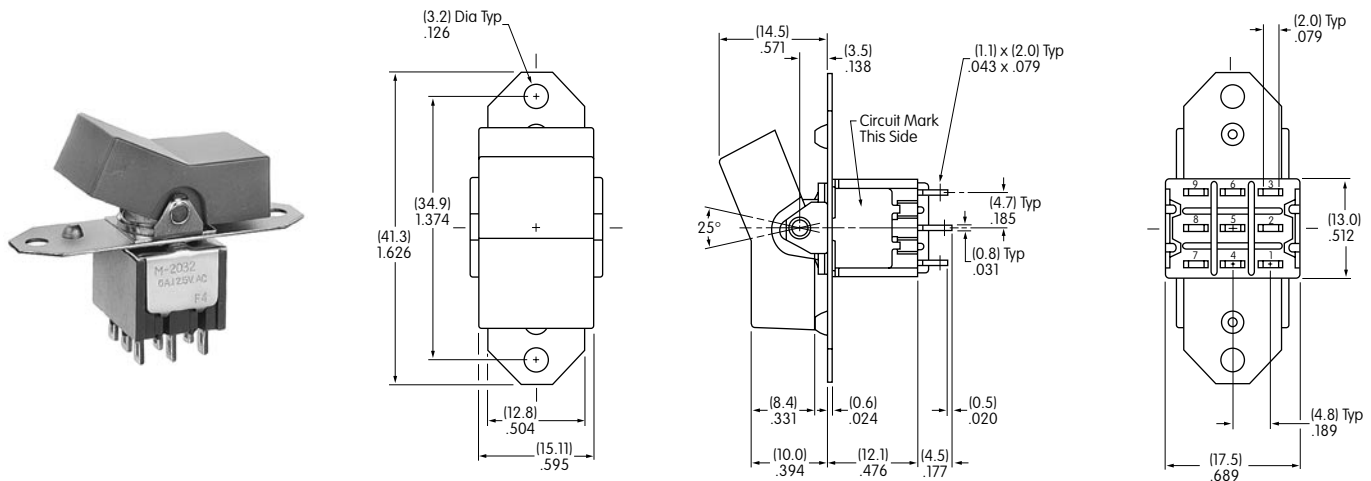
#### TY Frame • Solder Lug



M2012TYW01-JC

#### TY Frame • Solder Lug

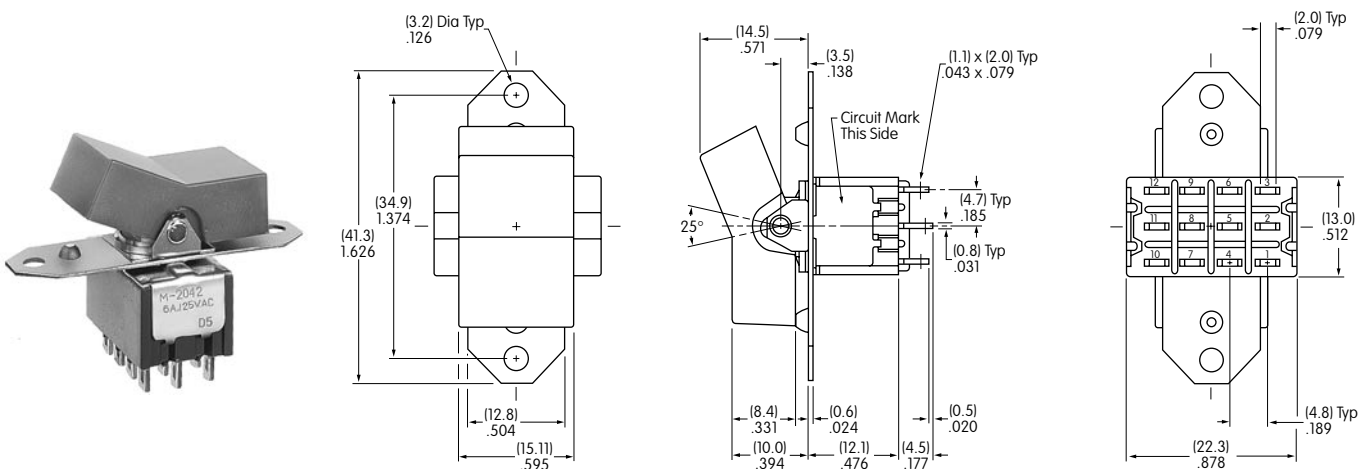
#### Three Pole



M2032TYW01-JC

#### TY Frame • Solder Lug

#### Four Pole



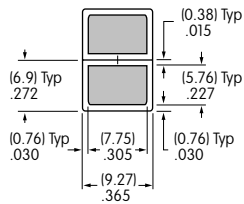
M2042TYW01-JC

## LEGENDS

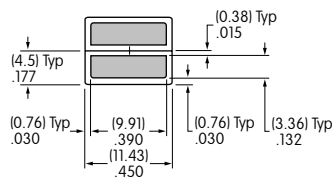
General information and basic specifications are presented here for customers who want to do their own legends.

### Suggested Printable Area for Cap

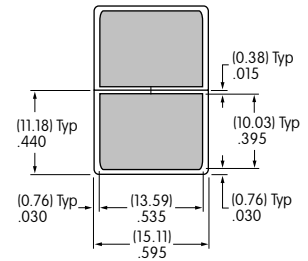
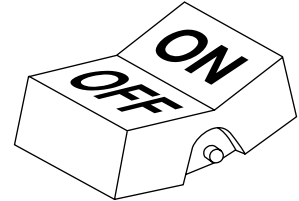
AT4148



AT4150



AT4156



Shaded areas are printable areas.

#### Recommended Print Method:

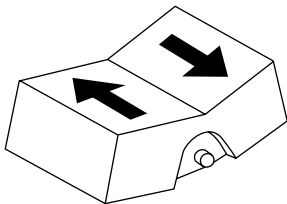
Screen Print or Pad Print

Epoxy based ink is recommended.

#### Additional Method

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

## LEGEND PACKET



1. To order caps with legends contact the factory and request the M Rocker 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.