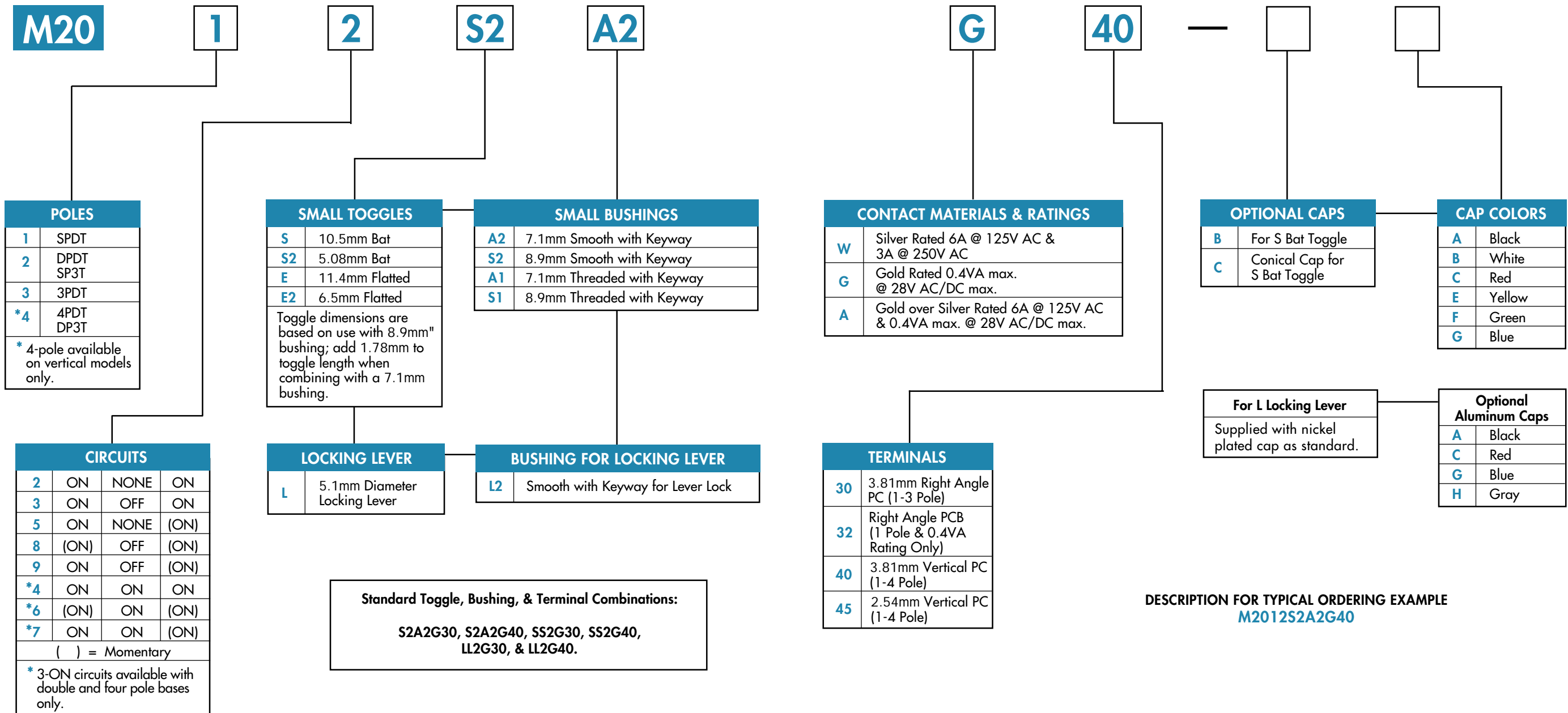
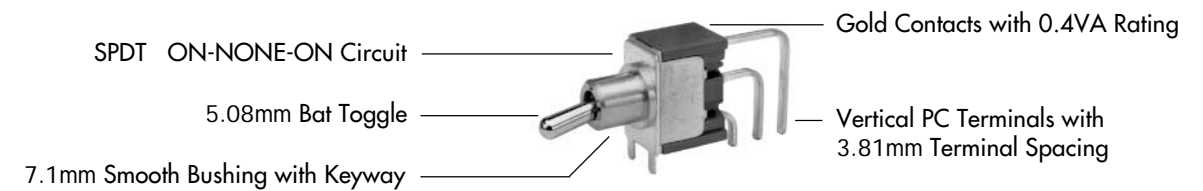


## TYPICAL SWITCH ORDERING EXAMPLE



**IMPORTANT:**

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





### GENERAL SPECIFICATIONS

#### Electrical Capacity (Resistive Load)

- Power Level (code W):** 6A @ 125V AC & 3A @ 250V AC or  
4A @ 30V DC for On-None-On; 3A @ 30V DC for all other circuits
- Logic Level (code G):** 0.4VA maximum @ 28V AC/DC maximum
- Logic/Power Level (code A):** Combines W & G ratings
- Note: See [Supplement Index](#) to find explanation of dual rating and operating range.

#### Other Ratings

- Contact Resistance:** 10 milliohms maximum for silver; 20 milliohms maximum for gold
- Insulation Resistance:** 1,000 megohms minimum @ 500V DC
- Dielectric Strength:** 1,000V AC minimum between contacts; 1,500V AC minimum between contacts and case
- Mechanical Life:** 100,000 operations minimum;  
50,000 operations minimum for flat, locking, & splashproof devices
- Electrical Life:** 25,000 operations minimum for silver; 50,000 operations minimum for gold;  
50,000 operations minimum for silver at 3A @ 125V AC
- Nominal Operating Force:** 400 grams for Single Pole                      450 grams for Double Pole  
700 grams for Three Pole                                      800 grams for Four Pole
- Angle of Throw:** 25°

#### Materials & Finishes

- Toggle:** Brass with chrome plating
- Bushing:** Brass with nickel plating
- Frame:** Stainless steel
- Support Bracket:** Stainless steel with tin-lead plating
- Case:** Diallyl phthalate resin
- Movable Contactor:** Phosphor bronze with silver or gold plating
- Movable Contacts:** Silver alloy (code W); copper with gold plating over nickel plating (code G); or  
silver alloy with gold plating over nickel plating (code A)
- Stationary Contacts:** Silver with silver plating (code W); copper or brass with gold plating  
over nickel plating (code G); or silver with gold plating over nickel plating (code A)
- Terminals:** Copper or brass with silver plating; or copper or brass with gold plating over nickel

#### Environmental Data

- Operating Temp Range:** -30°C through +85°C (-22°F through +185°F)
- Humidity:** 90 ~ 95% humidity for 96 hours @ 40°C (104°F)
- Vibration:** 10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range  
& returning in 1 minute; 3 right angled directions for 2 hours
- Shock:** 50g acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

#### Installation

- Mounting Torque:** 15kgf/cm (13lb/in) for double nut; 7kgf/cm (6lb/in) for single nut
- Soldering Time & Temperature:** 3 seconds @ 350°C or 5 seconds @ 270°C
- Process Seal:** Not available

#### Standards & Certifications







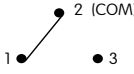
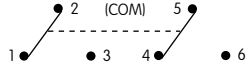
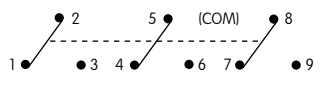
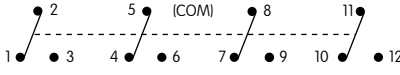
- Flammability Standards:** UL94V-0 available
- UL Recognized:** All models recognized at 6A @ 125V AC or 3A @ 250V AC or  
0.4VA maximum @ 28V AC/DC maximum; UL File No. E44145
- CSA Certified:** All models certified at 6A @ 125V AC or 3A @ 250V AC or  
0.4VA maximum @ 28V AC/DC maximum; CSA File No. LR23535



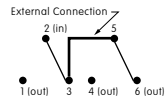
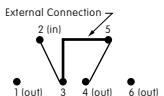
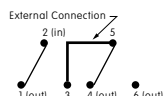
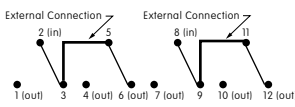
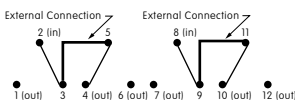
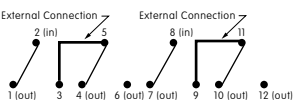
# Series M

## Miniature Toggle Switches

### POLES & CIRCUITS

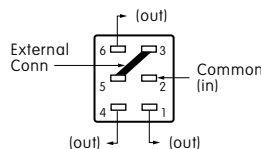
		Toggle Position ( ) = Momentary			Connected Terminals			Throw & Schematics
Pole	Model	Down 	Center 	Up 	Down 	Center 	Up 	
SP	M2012 M2013 M2015* M2018 M2019*	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) ON ON	2-3	OPEN	2-1	Note: Terminal numbers are not actually on the switch. * Reverse circuits available upon request.  SPDT 
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	DPDT 
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	3PDT 
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	4PDT 

### 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      2-3 5-4      2-1 5-4 8-9 11-12      8-9 11-10      8-7 11-10

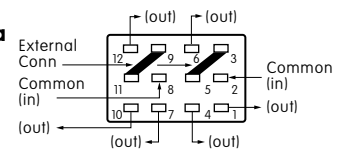
The SP3T model utilizes a double pole base.

External connection must be made during field installation.



The DP3T model utilizes a double pole base.

External connection must be made during field installation.



### SMALL TOGGLES

**Important:**

Toggle length changes based on bushing selected. All illustrations are shown with 8.9mm long bushing. When using a 7.1mm long bushing, toggle length increases 1.78mm.

**Standard Material & Finish:**

Brass with Bright Chrome

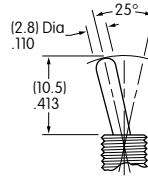
**Optional Finishes:**

Contact factory for satin chrome or black.

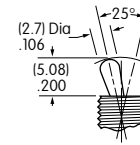
**Other Toggle Options:**

Contact factory for other toggle options.

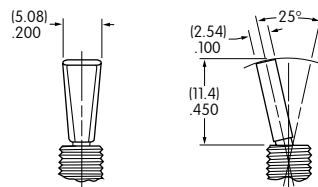
**S** 10.5mm Bat



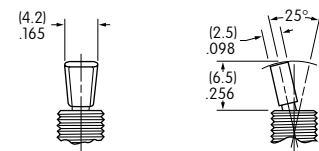
**S2** 5.08mm Bat



**E** 11.4mm Flatted

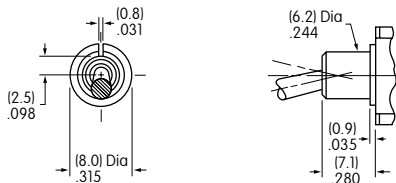


**E2** 6.5mm Flatted

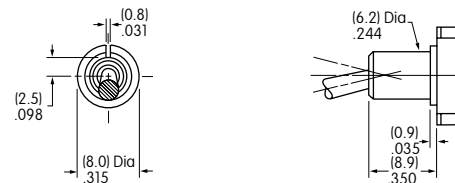


### SMALL BUSHINGS

**A2** 7.1mm Smooth with Keyway

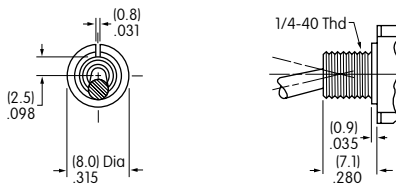


**S2** 8.9mm Smooth with Keyway

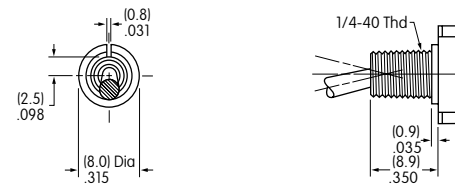


When using this bushing, toggle length is increased by 1.78mm.

**A1** 7.1mm Threaded with Keyway



**S1** 8.9mm Threaded with Keyway

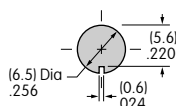


When using this bushing, toggle length is increased by 1.78mm.  
Max. Panel Thickness w/Standard Hardware: 0.8mm (.031")

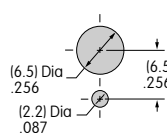
Max. Panel Thickness w/Standard Hardware: 2.6mm (.102")

### Panel Cutouts

For A2, S2, A1, or S1 Bushing with Keyway



For A1 or S1 Bushing with Locking Ring



**Standard Hardware:**

- 2 hex nuts (AT513M)
- 1 lockwasher (AT509)
- 1 Locking ring (AT507M)

Dimensions

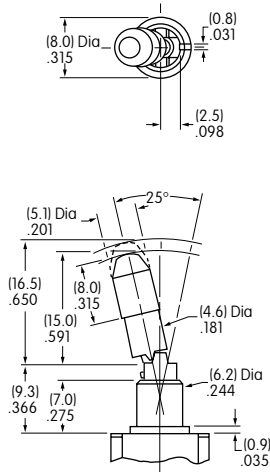


# Series M

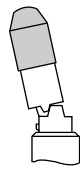
Miniature Toggle Switches

## LOCKING LEVER & BUSHING

### LL2 Smooth with Keyway



### Cap for Locking Lever

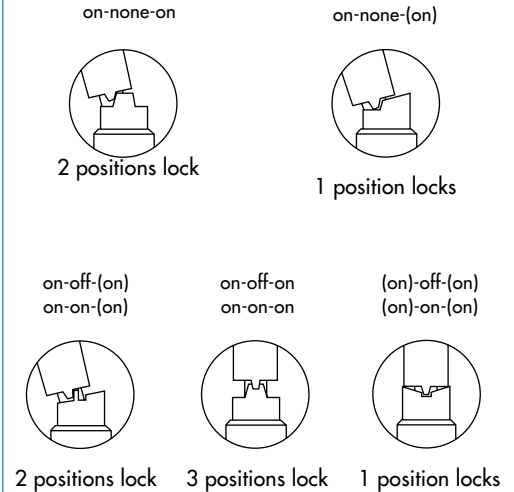


Supplied with Cap AT427  
**Cap Material:**  
 Brass with Nickel Plating  
**Lever Material & Finish:**  
 Brass with Chrome Plating

### Color Codes for Optional Anodized Aluminum Caps

- |                |                                  |
|----------------|----------------------------------|
| <b>A</b> Black | <b>C</b> Red                     |
| <b>G</b> Blue  | <b>H</b> Gray (natural aluminum) |

### Locking Mechanism



## CONTACT MATERIALS & RATINGS

**W** Silver over Silver      Power Level      6A @ 125V AC & 3A @ 250V AC

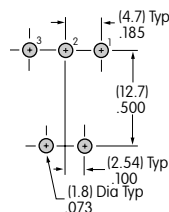
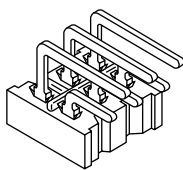
**G** Gold over Brass or Copper      Logic Level      0.4VA maximum @ 28V AC/DC maximum  
 Note: See [Supplement Index](#) to find complete explanation of operating range.

**A** Gold over Silver      Power Level or Logic Level      6A @ 125V AC or 0.4VA maximum @ 28V AC/DC maximum

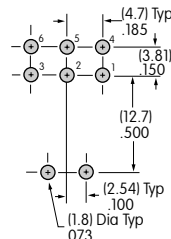
Note: This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See [Supplement Index](#) to find complete explanation of dual rating and operating range.

## TERMINALS

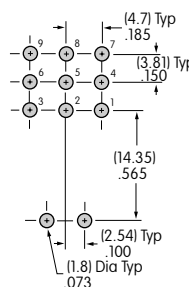
### 30 3.81mm Right Angle PC (1-3 Pole)



Single Pole

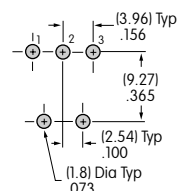
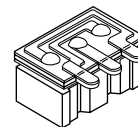


Double Pole



Three Pole

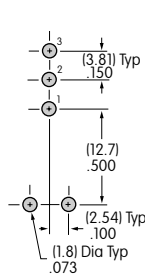
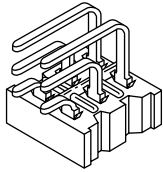
### 32 Right Angle PCB with Reverse Circuit (1 Pole & 0.4VA Rating Only)



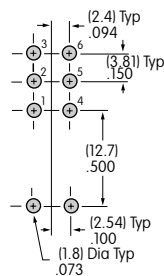
Terminal dimensions are shown on the Typical Switch Dimensions pages which follow.

### TERMINALS (Continued)

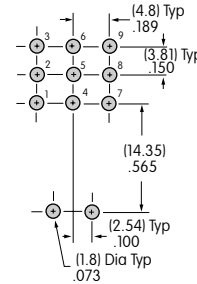
#### 40 3.81mm Vertical PC (1-4 Pole)



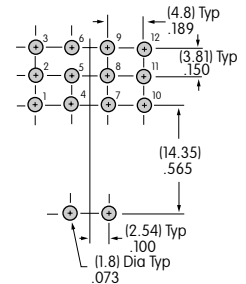
Single Pole



Double Pole

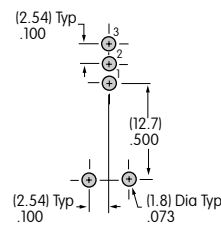
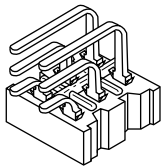


Three Pole

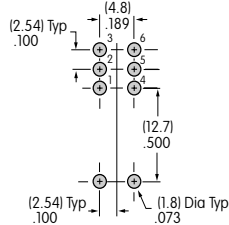


Four Pole

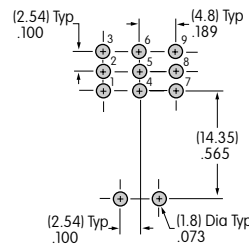
#### 45 2.54mm Vertical PC (1-4 Pole)



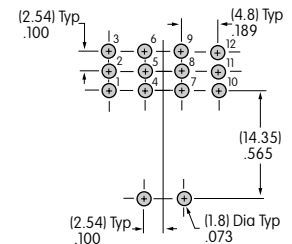
Single Pole



Double Pole



Three Pole



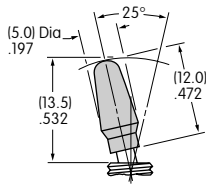
Four Pole

Terminal dimensions are shown on the Typical Switch Dimensions pages which follow.

### OPTIONAL CAPS & CAP COLORS

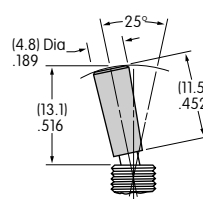
#### B AT415 For S Bat Toggle

Material: Polyethylene



#### C AT444 Conical Cap for S Bat Toggle

Material: Polyethylene

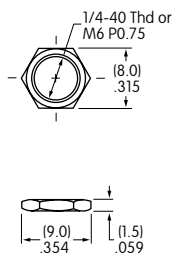


#### Colors Available

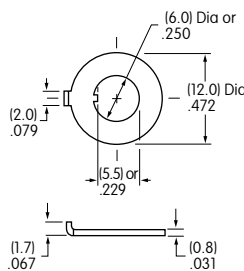
<b>A</b> Black	<b>E</b> Yellow
<b>B</b> White	<b>F</b> Green
<b>C</b> Red	<b>G</b> Blue

### STANDARD HARDWARE

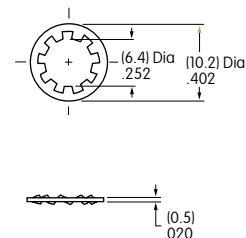
**AT513M for Metric**  
**AT513H for Inch**  
**Hex Nut (2 per switch)**  
Nickel/Brass



**AT507M for Metric**  
**AT507H for Inch**  
**Locking Ring (1 per switch)**  
Steel with Chromate/Zinc



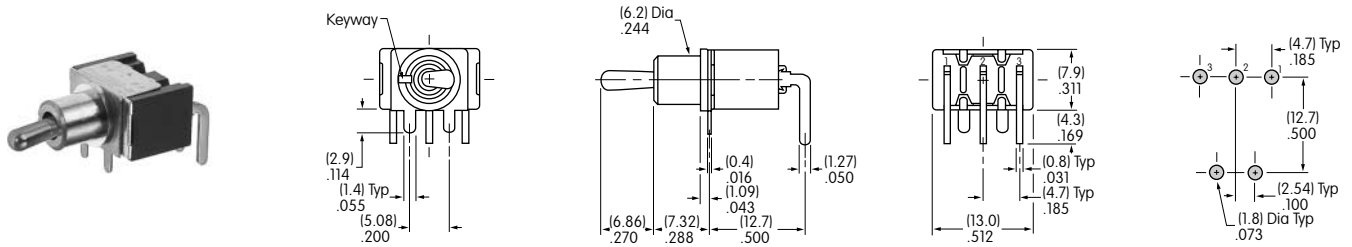
**AT509 Lockwasher (1 per switch, none with splashproof)**  
Steel with Chromate/Zinc



### TYPICAL SWITCH DIMENSIONS

#### 3.81mm Right Angle PC

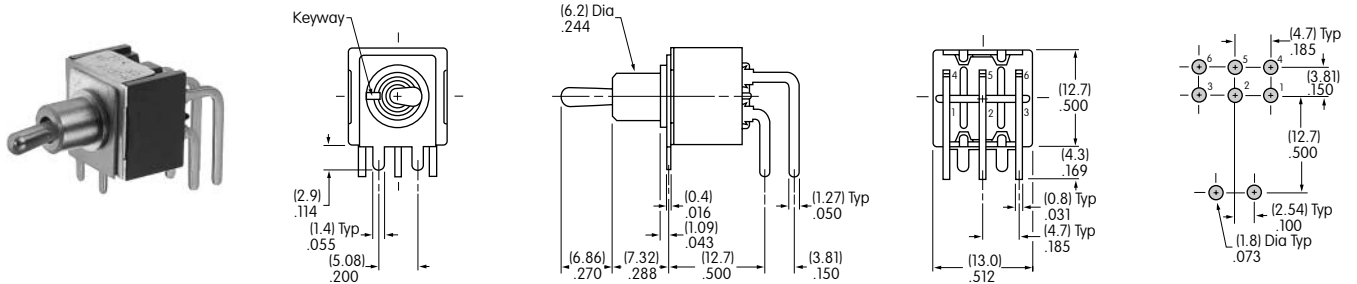
#### Single Pole



M2012S2A2G30

#### 3.81mm Right Angle PC

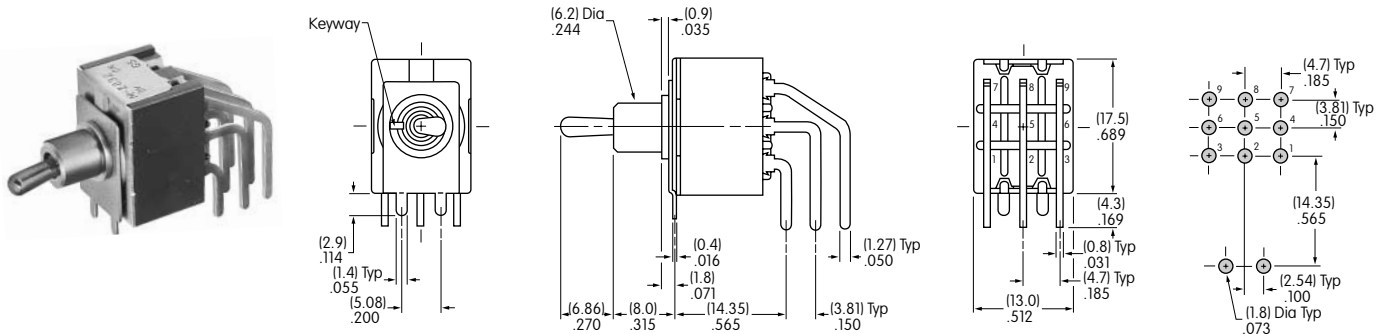
#### Double Pole



M2022S2A2G30

#### 3.81mm Right Angle PC

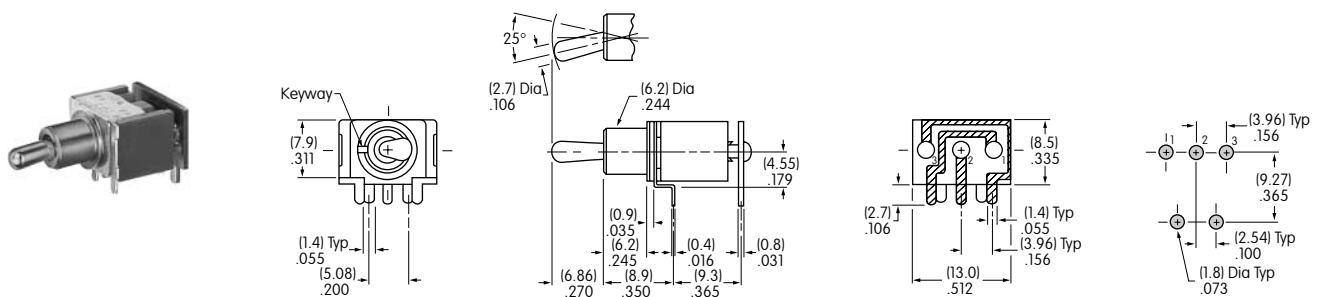
#### Three Pole



M2032S2A2G30

#### Right Angle PCB

#### Single Pole • Reverse Circuit



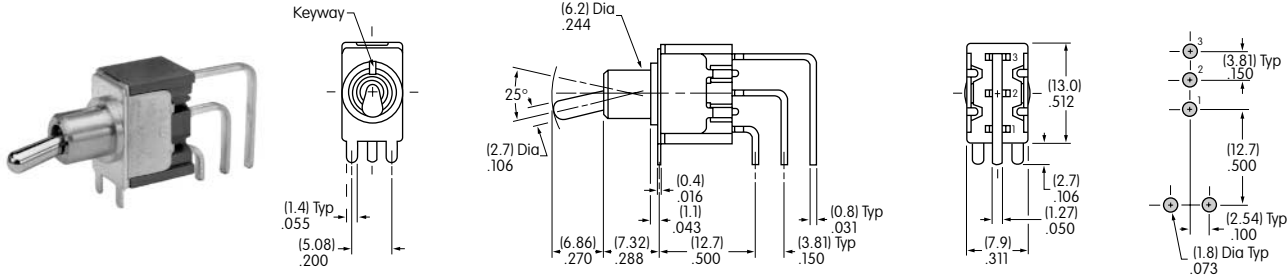
M2012S2A2G32



### TYPICAL SWITCH DIMENSIONS

#### 3.81mm Vertical PC

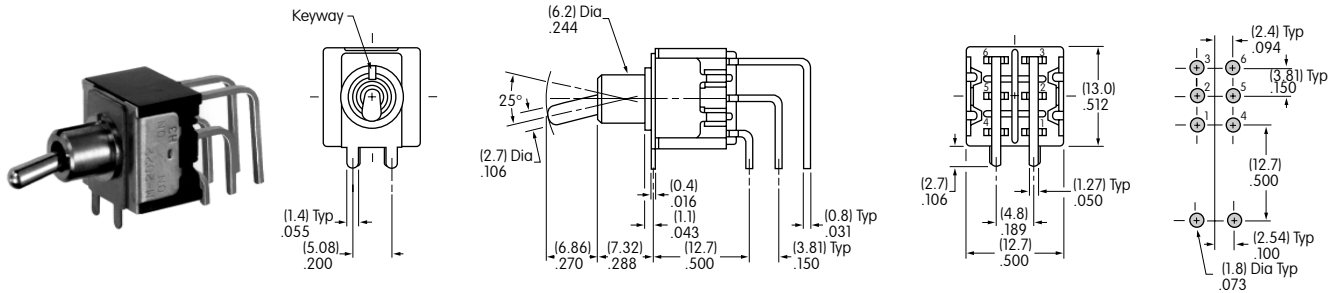
#### Single Pole



M2012S2A2G40

#### 3.81mm Vertical PC

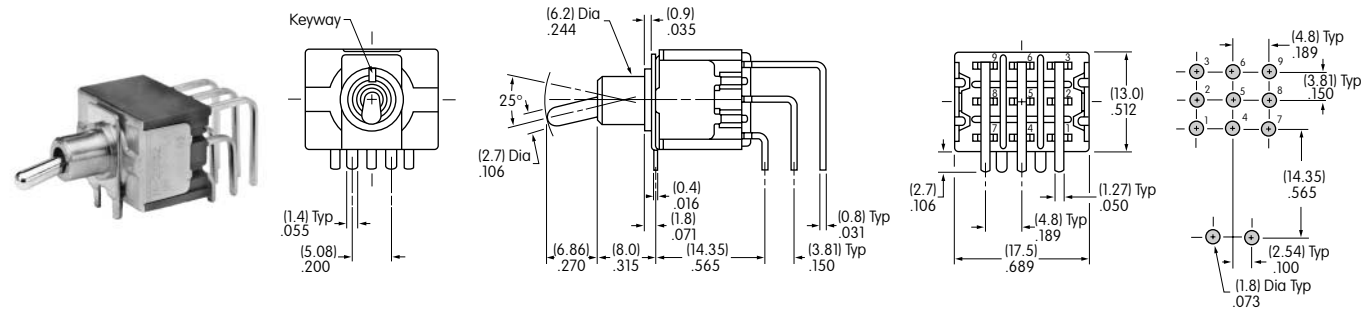
#### Double Pole



M2022S2A2G40

#### 3.81mm Vertical PC

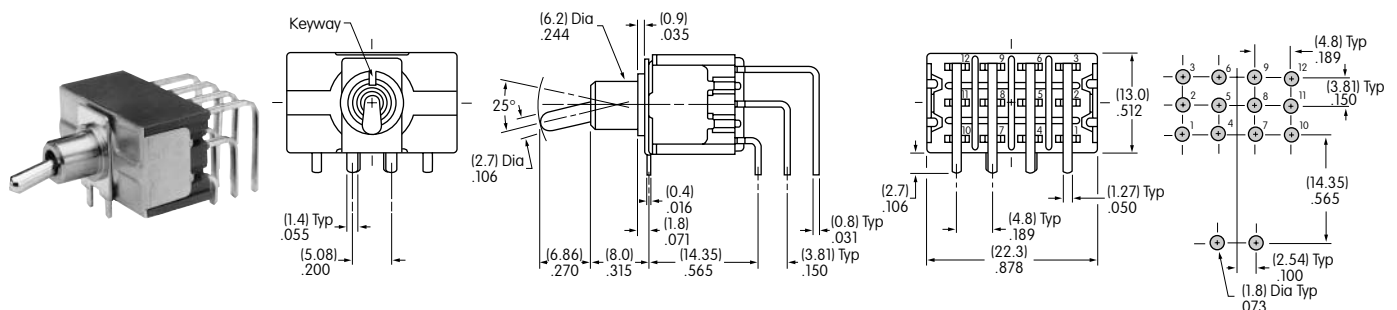
#### Three Pole



M2032S2A2G40

#### 3.81mm Vertical PC

#### Four Pole



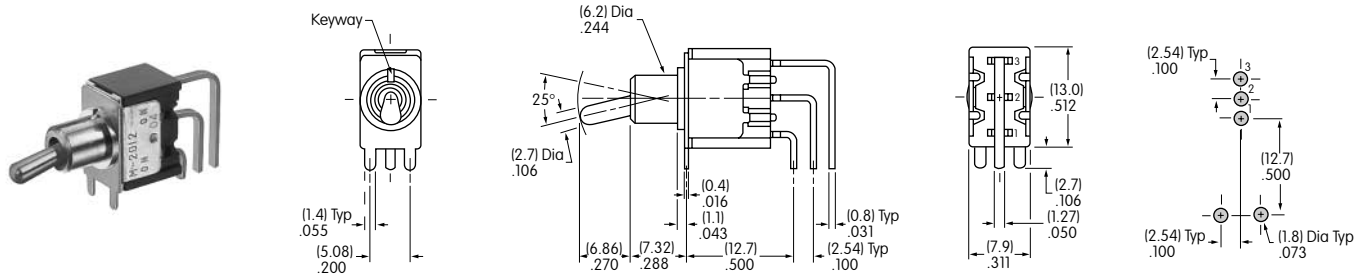
M2042S2A2G40



### TYPICAL SWITCH DIMENSIONS

#### 2.54mm Vertical PC

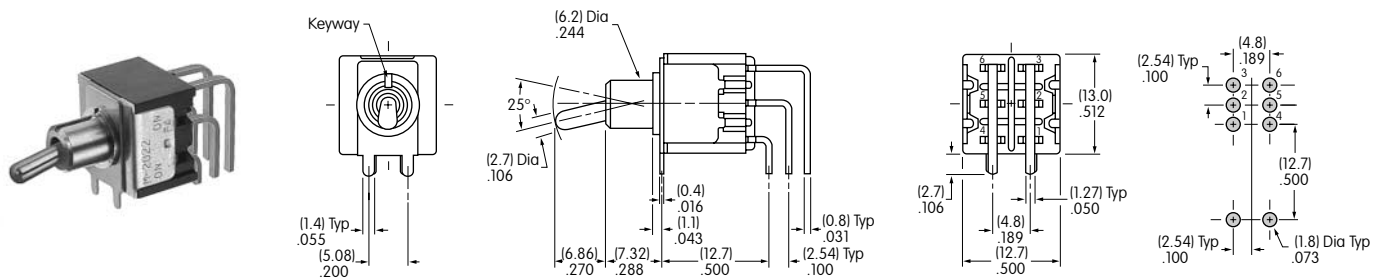
#### Single Pole



M2012S2A2G45

#### 2.54mm Vertical PC

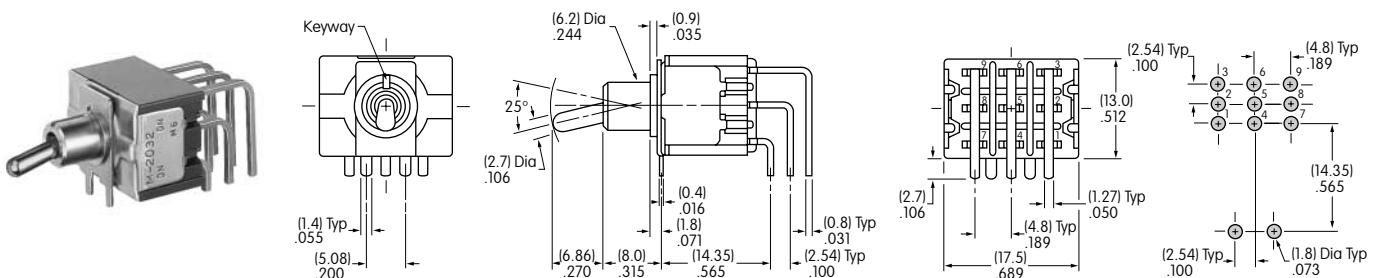
#### Double Pole



M2022S2A2G45

#### 2.54mm Vertical PC

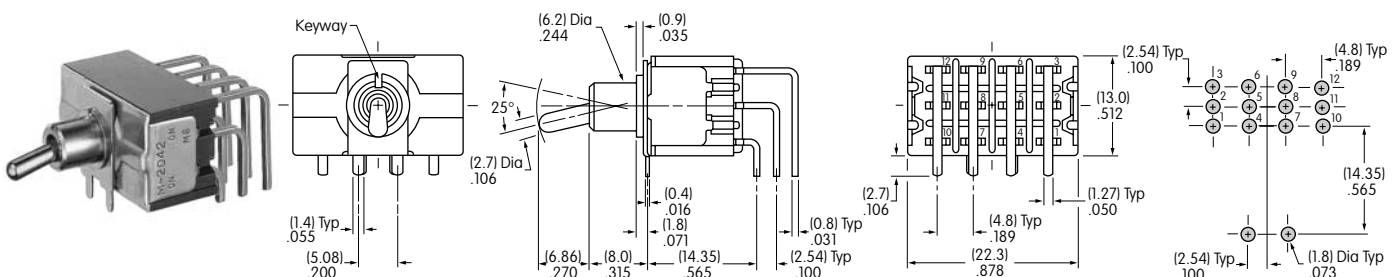
#### Three Pole



M2032S2A2G45

#### 2.54mm Vertical PC

#### Four Pole



M2042S2A2G45