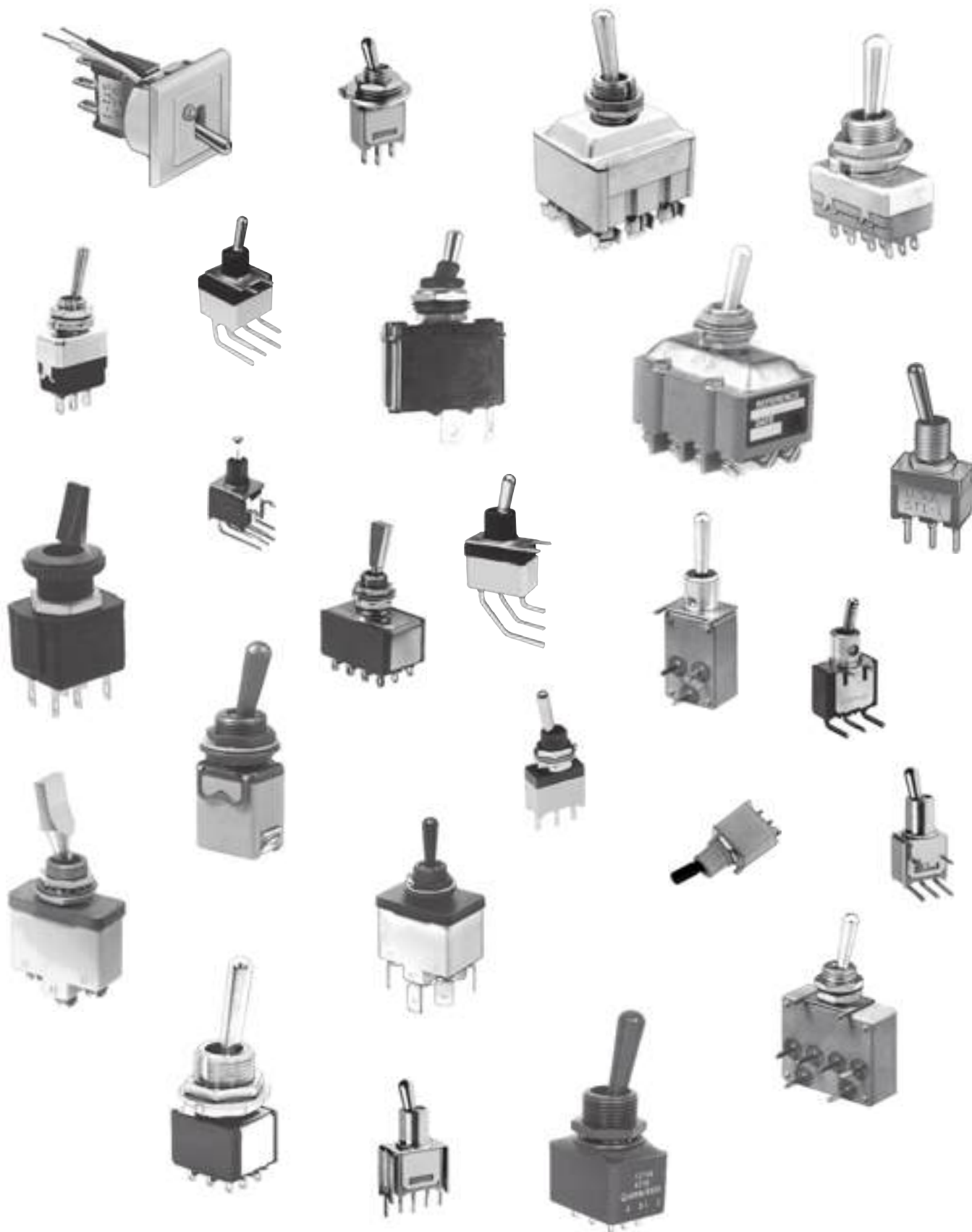


# TOGGLE SWITCHES

SEE TOGGLE SWITCH SELECTION GUIDE ON NEXT PAGE

A

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



# TOGGLE SWITCHES

**TOGGLE SWITCH SELECTION GUIDE:** This catalog contains an extensive variety of toggle switches with numerous options and accessories. To facilitate easy selection of the desired switch for your application, this guide lists the various Series with some key selection parameters.

| SERIES             | SIZE      | RATINGS (Max. in bold)                                                                                        | POLES       | SMT MOUNT | PANEL MOUNT | P. C. MOUNT | UL | CSA | VDE | WASHABLE | ESD PROTECTION | PAGE(S) |
|--------------------|-----------|---------------------------------------------------------------------------------------------------------------|-------------|-----------|-------------|-------------|----|-----|-----|----------|----------------|---------|
| TL                 | TINY      | <b>0.4VA 20V</b>                                                                                              | SP          | X         |             |             |    |     |     | X        | X              | A3-A6   |
| TL                 | TINY      | <b>1/2A 48V</b> 0.4VA 20V                                                                                     | SP,DP       |           |             | X           |    |     |     | X        | X              | A7-A10  |
| ZL <i>New!</i>     | TINY      | <b>0.5A 48V</b> 0.4VA 20V                                                                                     | SP          |           | X           | X           |    |     |     |          |                | A11-A13 |
| 21000N <i>New!</i> | MINIATURE | <b>4A 125VAC</b> 2A 250VAC<br>4A 30VDC                                                                        | SP,DP       |           |             | X           |    |     |     |          |                | A14-A15 |
| S                  | MINIATURE | 0.4VA 20V 2A 250VAC<br><b>5A 125VAC</b> 4A 30VDC                                                              | SP,DP       |           |             | X           | X  |     |     | X        | X              | A16-A19 |
| SF                 | MINIATURE | 0.4VA 20V 2A 250VAC<br><b>5A 125VAC</b> 4A 30VDC                                                              | SP          |           | X           |             | X  |     |     | X        | X              | A20-A22 |
| 5000               | MINIATURE | 0.4VA 20V 3A 250VAC<br><b>6A 125VAC</b> 4A 30VDC                                                              | SP,DP,3P,4P |           | X           | X           | X  | X   |     |          |                | A23-A40 |
| 55000              | MINIATURE | <b>6A 125VAC</b> 3A 250VAC                                                                                    | SP,DP       |           | X           | X           | X  | X   | X   |          |                | A41-A44 |
| ST                 | MINIATURE | <b>6A 125VAC</b> 0.4VA 20V<br>3A 250VAC 7A 30VDC                                                              | SP,DP       |           | X           | X           | X  | X   |     |          |                | A45-A58 |
| 11000              | STANDARD  | <b>4A 125VAC</b> 2A 250VAC<br>4A 30VDC                                                                        | SP,DP,3P,4P |           | X           | X           |    |     |     |          |                | A59-A62 |
| 12000              | STANDARD  | <b>4A 125VAC</b> 2A 250VAC<br>4A 30VDC                                                                        | DP,3P,4P    |           | X           | X           |    |     |     |          |                | A63-A66 |
| 12000X778          | STANDARD  | <b>4A 125VAC</b> 2A 250VAC<br>4A 28VDC                                                                        | DP,3P,4P    |           | X           |             |    |     |     |          |                | A67-A71 |
| 4100&4200          | STANDARD  | <b>6A 125VAC</b> 3A 250VAC<br>6A 30VDC                                                                        | DP          |           | X           |             | X  | X   | X   |          |                | A72-A73 |
| 4600               | STANDARD  | <b>6A 125VAC</b> 4A 250VAC                                                                                    | SP,DP       |           | X           |             | X  | X   | X   |          |                | A74-A75 |
| 1500 <i>New!</i>   | STANDARD  | <b>10A 125VAC</b> 6A 250VAC                                                                                   | SP          |           | X           |             |    |     |     |          |                | A76     |
| 6000 <i>New!</i>   | STANDARD  | <b>10A 125VAC</b> 5A 250VAC<br>6.5A 30VDC                                                                     | SP,DP,3P,4P |           | X           |             |    |     |     |          |                | A77-A79 |
| 3600NF <i>New!</i> | STANDARD  | <b>12A 28VDC</b><br>6A 250VAC                                                                                 | SP,DP       |           | X           |             |    |     |     |          |                | A80-A81 |
| 3500 <i>New!</i>   | STANDARD  | <b>15A 125VAC</b> 10A 250VAC<br>10A 28VDC                                                                     | SP,DP       |           | X           |             |    |     |     |          |                | A82-A85 |
| 600H&NH            | STANDARD  | <b>20A 125VAC</b> 15A 250VAC<br>10A 24VDC<br>15A 1/2HP125/250VAC<br><b>PEAK CURRENT 150A</b><br><b>250VAC</b> | SP,DP,3P    |           | X           |             | X  | X   | X   |          |                | A86-A90 |

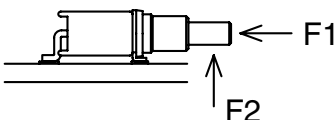
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

## DESIGNED EXCLUSIVELY FOR SURFACE MOUNTING

SMT TL Series switches incorporate many desirable features that include:

- **Higher protection against p.c. board tear-offs**

The switch operating force is approx. .56 lbs. while forces required to tear switch off p.c. board are approx. 38 lbs. (F1) and 14 lbs. (F2).



- **Tape & reel packaging**

Recommended for:

- economy
- suitability for automated placement
- handling of large quantities of components per packaging unit
- positive component positioning
- protection of terminals against damage during handling
- high static resistance

- **Reflow solderable**

- High temperature plastic materials
- Tin plated grounding brackets
- Tin-lead alloy over nickel terminal plating
- Terminals turned outward to prevent the shadow effect in infrared soldering and to permit visual inspection of the solder joints
- .021" (0.55mm) air gap between p.c. board and switch case
- End stackable pitch .400" (10.16mm)
- Available with positioning pins to assure correct switch orientation during the reflow process and provide additional mechanical integrity

- **Protected against electrostatic discharges (ESD) up to 10 KV.**

- **Washable**

Switches are designed to withstand cleaning processes, including hot water under pressure.

Surface mount devices (SMD) are subject to more stringent constraints of temperature, solderability, sealing and space savings than through-hole components.

To meet these requirements, APEM has designed a family of tiny surface mount switches that include TL Series toggle switches, TP Series pushbutton switches, TR Series rocker switches & TG Series slide switches. See pushbutton, rocker & slide switch sections of catalog for TP, TR & TG Series respectively.



# TL SERIES - SMT WASHABLE TINY TOGGLE SWITCHES

## ELECTRICAL SPECIFICATIONS

|                                          |                                                                          |
|------------------------------------------|--------------------------------------------------------------------------|
| <b>Contact ratings (resistive lds.):</b> | 0.4 VA at 20 V max. (AC or DC)                                           |
| <b>Minimum load:</b>                     | 10 mA at 50 mV or 10 $\mu$ A at 5 VD                                     |
| <b>Initial contact resistance:</b>       | 20 milliohms maximum                                                     |
| <b>Insulation resistance:</b>            | 1000 M $\Omega$ min. at 500 VDC                                          |
| <b>Dielectric strength:</b>              | 1000 V rms between terminals & frame. 500 V rms between terminals        |
| <b>Electrical life (at full load):</b>   | 2 position switches: 60,000 cycles<br>3 position switches: 30,000 cycles |
| <b>Static resistance:</b>                | 10 KV (Schaffner equipment)                                              |

## GENERAL SPECIFICATIONS

|                                     |                                     |
|-------------------------------------|-------------------------------------|
| <b>Operating temperature range:</b> | -40°C to +85°C                      |
| <b>Moisture resistance:</b>         | 21 days per IEC 512-6 test 11c      |
| <b>Vibration resistance:</b>        | 10-500 Hz/10g per IEC 512-4 test 6d |
| <b>Shock resistance:</b>            | 50 g per IEC 512-4 test 6c          |

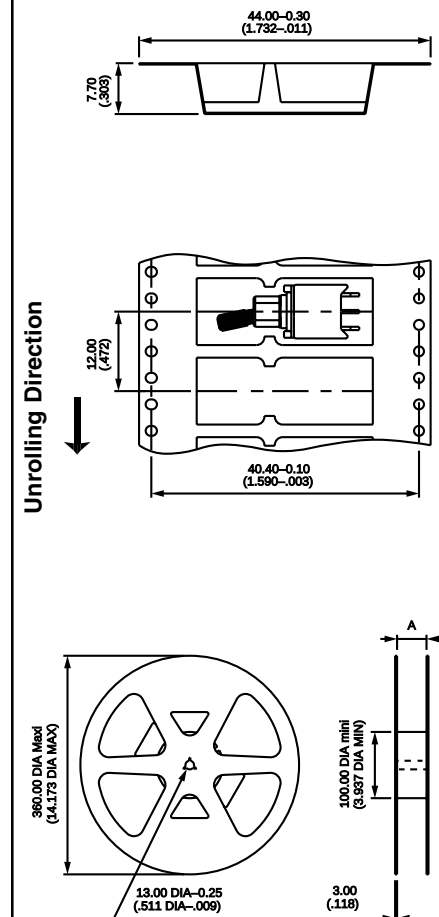
## MATERIALS

|                            |                                                               |
|----------------------------|---------------------------------------------------------------|
| <b>Case:</b>               | High temperature plastic UL94V-0                              |
| <b>Actuator:</b>           | Nickel plated brass with high temperature plastic UL94V-0 cap |
| <b>Grounding brackets:</b> | Tin plated steel (includes positioning pins)                  |
| <b>Contacts:</b>           | Gold plated brass                                             |
| <b>Terminals:</b>          | Brass with tin-lead alloy over nickel plate                   |
| <b>Terminal seal:</b>      | Epoxy                                                         |

## SOLDERING AND CLEANING

|                          |                                                           |
|--------------------------|-----------------------------------------------------------|
| <b>Reflow soldering:</b> | Infrared, vapor phase and infrared convection             |
| <b>Washable:</b>         | Per IEA-RS448-2: water and detergent preferred. Solvents. |

## PACKAGING



### Standard packaging unit:

700 pieces  
Tape meeting international standard IEC Publication 286-3 (EIA481A)  
Start leader: 15.7" (400mm) min.  
Dimension 'A': 1.732" (44.00mm)

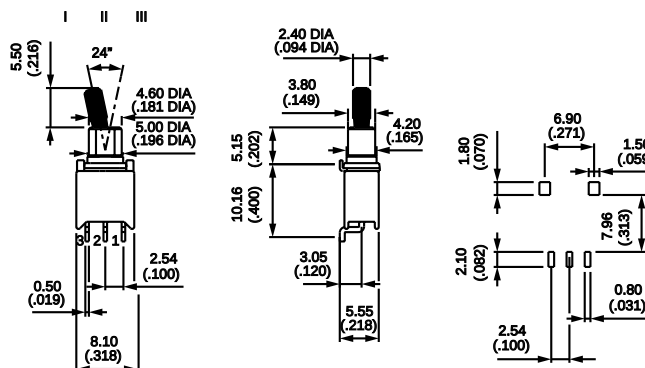
# TL SERIES - SMT WASHABLE TINY TOGGLE SWITCHES

A

## Single pole toggle switches



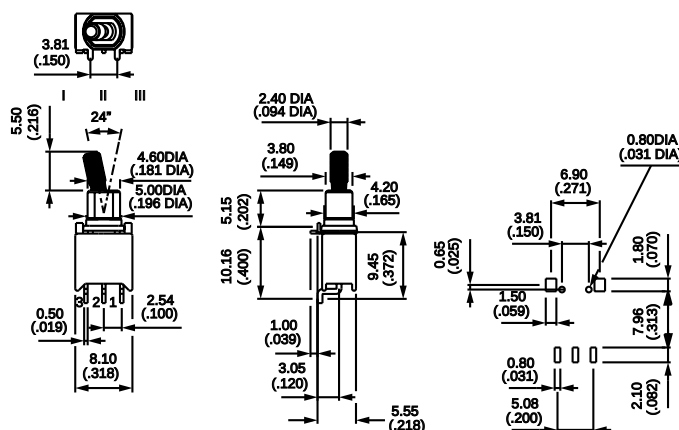
| MODEL NO.        | CIRCUIT |     |     |
|------------------|---------|-----|-----|
| TL36WS84000      | ON      | -   | ON  |
| TL39WS84000      | ON      | OFF | ON  |
| TL37WS84000      | MOM     | OFF | MOM |
| TL38WS84000      | ON      | OFF | MOM |
| TL32WS84000      | ON      | -   | MOM |
| Handle position: | III     | II  | I   |



## Single pole toggle switches with positioning pins

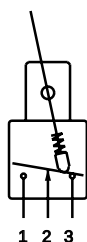


| MODEL NO.        | CIRCUIT |     |     |
|------------------|---------|-----|-----|
| TL36WS84065      | ON      | -   | ON  |
| TL39WS84065      | ON      | OFF | ON  |
| TL37WS84065      | MOM     | OFF | MOM |
| TL38WS84065      | ON      | OFF | MOM |
| TL32WS84065      | ON      | -   | MOM |
| Handle position: | III     | II  | I   |

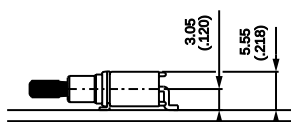


## SWITCH ACTION

ON - ON Model shown



## P.C. BOARD DIMENSIONS



## LED INDICATOR IN TINY TOGGLE PACKAGE

### ELECTRICAL SPECIFICATIONS

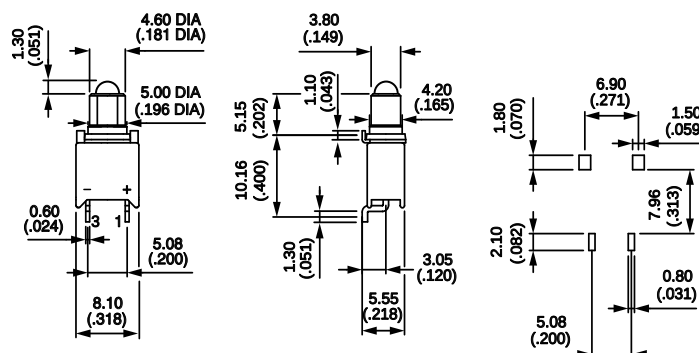
|                               |                                                                                                                                                    |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Forward voltage:</b>       | Red; 3.0 volts at 10 milliamps (2V typical)<br>Green; 3.0 volts at 20 milliamps (2.2V typical)<br>Yellow; 3.0 volts at 10 milliamps (2.1V typical) |
| <b>Reverse voltage:</b>       | 5.0 volts minimum                                                                                                                                  |
| <b>Viewing angle (total):</b> | 90°                                                                                                                                                |
| <b>Wavelength:</b>            | Red; 635 nm<br>Green; 565 nm<br>Yellow; 585 nm                                                                                                     |

### PACKAGING

Tape & reel



| MODEL NO.   | COLOR  |
|-------------|--------|
| TV01WS00100 | Red    |
| TV02WS00100 | Green  |
| TV03WS00100 | Yellow |



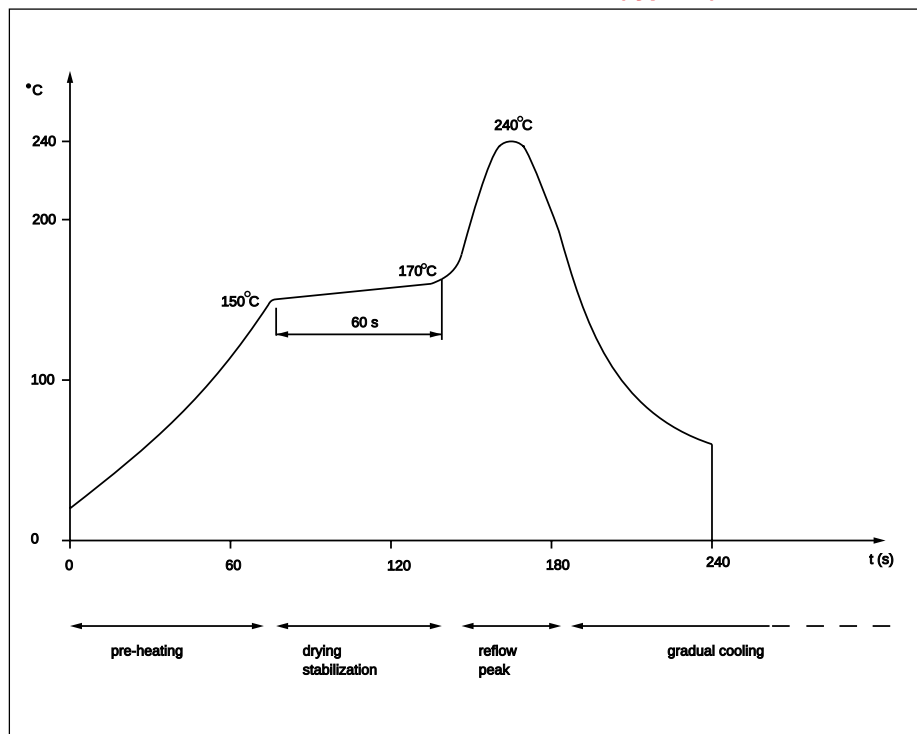
# TL SERIES - SMT WASHABLE TINY TOGGLE SWITCHES

## REFLOW SOLDERING - STANDARD PROFILE

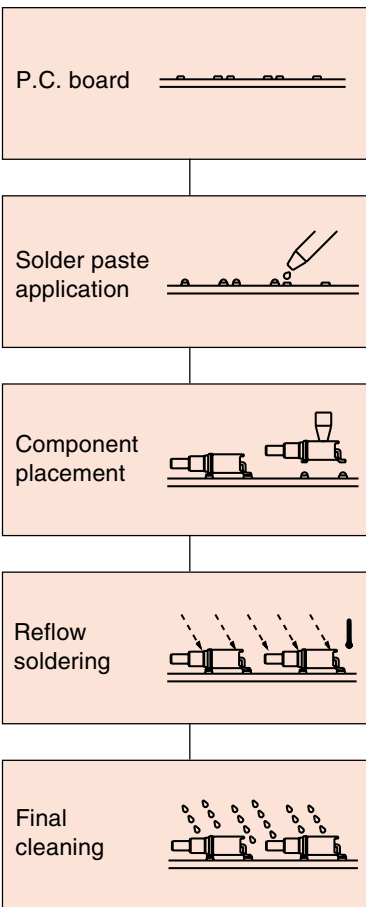
The printed circuit board, carried by a conveyor belt, travels through the reflow soldering oven and experiences the following programmed cycles:

- pre-heat to a maximum of 200°C for 30 seconds
- reflow at a maximum of 245°C for 10 seconds
- final cleaning

### TEMPERATURE/TIME PROFILE (typical)

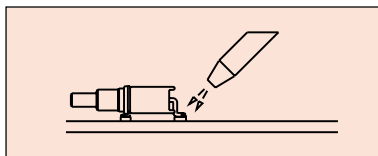


### PROCESSING STEPS



### P.C. BOARD REWORK RECOMMENDATIONS

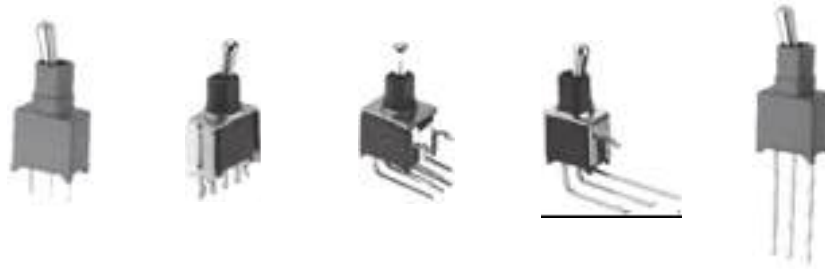
Hot air reflow technique is preferred. Avoid the use of a soldering iron.



**Caution:** Excessive and/or repeated high temperature exposure may affect switch performance & reliability.

## TL SERIES - WASHABLE TINY TOGGLE SWITCHES, P.C. MOUNTING

A



### FEATURES

- Wave solderable.
- Fully sealed for process compatibility.
- Ultra-compact case size.
- 

### SPECIFICATIONS

|                                           |                                                                                                  |
|-------------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | Gold plated brass; 0.4 Volt-Amps max. at 20 V max.<br>Silver plated brass; 0.5 Amps at 48 V max. |
| <b>Minimum load:</b>                      | 10 mA at 50 mV - 10 $\mu$ A at 5 VDC                                                             |
| <b>Initial contact resistance:</b>        | 20 milliohms maximum                                                                             |
| <b>Insulation resistance:</b>             | 1000 megohms minimum at 500 VDC                                                                  |
| <b>Dielectric strength:</b>               | 1000 V rms minimum between terminals and frame. 500 V rms between terminals..                    |
| <b>Electrical life:</b>                   | 2 position switches - 60,000 cycles minimum.<br>3 position switches - 30,000 cycles minimum.     |
| <b>Operating temperature range:</b>       | -30°C to +85°C                                                                                   |
| <b>Washing:</b>                           | Permissible with water, detergents and freons.                                                   |

### MATERIALS

|                                  |                             |
|----------------------------------|-----------------------------|
| <b>Contacts &amp; Terminals:</b> | Gold or silver plated brass |
| <b>Actuator:</b>                 | Nickel plated brass         |
| <b>Bracket:</b>                  | Tin plated steel            |
| <b>Case:</b>                     | PBT                         |
| <b>Terminal seal:</b>            | Epoxy                       |

### ABOUT THIS SERIES

The material in this series is organized in the following sequence:

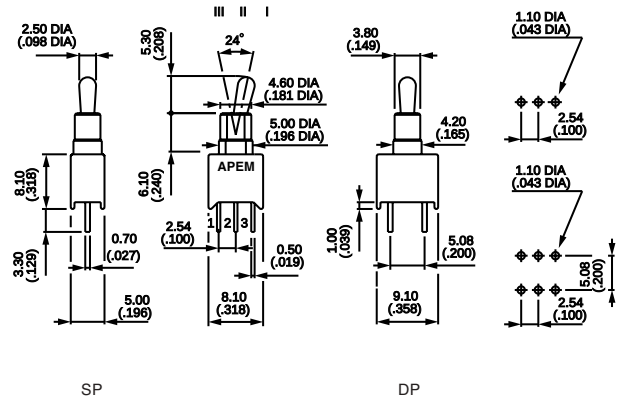
- a. Completely specified switch models
- b. 'build your own switch' order format
- c. Option drawings & special options

# TL SERIES - WASHABLE TINY TOGGLE SWITCHES, P.C. MOUNTING

## Straight p.c. terminals - gold plated brass contacts



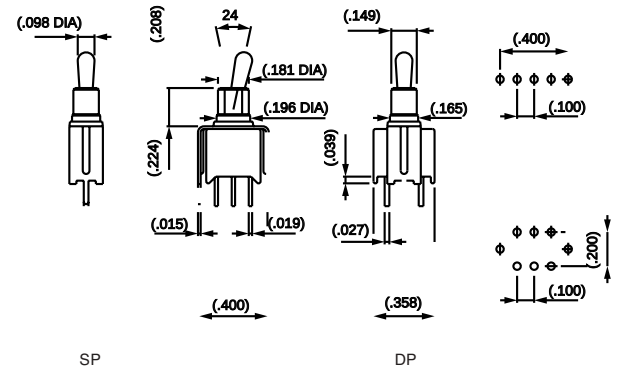
| SINGLE POLE<br>MODEL NO.     | DOUBLE POLE<br>MODEL NO. | CIRCUIT |     |     |
|------------------------------|--------------------------|---------|-----|-----|
| TL36P000000                  | TL46P000000              | ON      | -   | ON  |
| TL39P000000                  | TL49P000000              | ON      | OFF | ON  |
| TL37P000000                  | TL47P000000              | MOM     | OFF | MOM |
| TL38P000000                  | TL48P000000              | ON      | OFF | MOM |
| TL32P000000                  | TL42P000000              | ON      | -   | MOM |
| Handle position (see dwg.) : |                          | III     | II  | I   |
| Terminals connected: SP & DP |                          | 2-3     |     | 2-1 |
| DP                           |                          | 5-6     |     | 4-5 |



## Straight p.c. terminals - mounting bracket - gold plated brass contacts



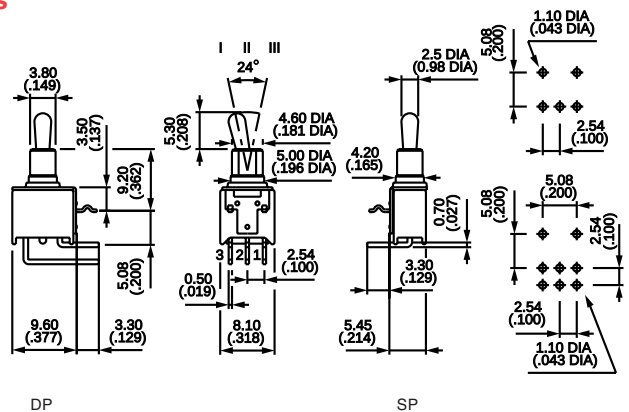
| SINGLE POLE<br>MODEL NO.     | DOUBLE POLE<br>MODEL NO. | CIRCUIT |     |     |
|------------------------------|--------------------------|---------|-----|-----|
| TL36Y000050                  | TL46Y000050              | ON      | -   | ON  |
| TL39Y000050                  | TL49Y000050              | ON      | OFF | ON  |
| TL37Y000050                  | TL47Y000050              | MOM     | OFF | MOM |
| TL38Y000050                  | TL48Y000050              | ON      | OFF | MOM |
| TL32Y000050                  | TL42Y000050              | ON      | -   | MOM |
| Handle position (see dwg.) : |                          | III     | II  | I   |
| Terminals connected: SP & DP |                          | 2-3     |     | 2-1 |
| DP                           |                          | 5-6     |     | 4-5 |



## Horizontal right angle terminals - gold plated brass contacts



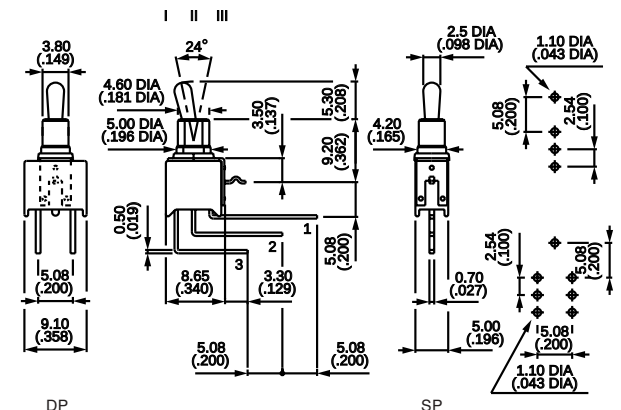
| SINGLE POLE<br>MODEL NO.     | DOUBLE POLE<br>MODEL NO. | CIRCUIT |     |     |
|------------------------------|--------------------------|---------|-----|-----|
| TL36W000050                  | TL46W000050              | ON      | -   | ON  |
| TL39W000050                  | TL49W000050              | ON      | OFF | ON  |
| TL37W000050                  | TL47W000050              | MOM     | OFF | MOM |
| TL38W000050                  | TL48W000050              | ON      | OFF | MOM |
| TL32W000050                  | TL42W000050              | ON      | -   | MOM |
| Handle position (see dwg.) : |                          | III     | II  | I   |
| Terminals connected: SP & DP |                          | 2-3     |     | 2-1 |
| DP                           |                          | 5-6     |     | 4-5 |



## Vertical right angle terminals - gold plated brass contacts



| SINGLE POLE<br>MODEL NO.     | DOUBLE POLE<br>MODEL NO. | CIRCUIT |     |     |
|------------------------------|--------------------------|---------|-----|-----|
| TL36WW000050                 | TL46WW000050             | ON      | -   | ON  |
| TL39WW000050                 | TL49WW000050             | ON      | OFF | ON  |
| TL37WW000050                 | TL47WW000050             | MOM     | OFF | MOM |
| TL38WW000050                 | TL48WW000050             | ON      | OFF | MOM |
| TL32WW000050                 | TL42WW000050             | ON      | -   | MOM |
| Handle position (see dwg.) : |                          | III     | II  | I   |
| Terminals connected: SP & DP |                          | 2-3     |     | 2-1 |
| DP                           |                          | 5-6     |     | 4-5 |



# TL SERIES - WASHABLE TINY TOGGLE SWITCHES, P.C. MOUNTING

A

## Wire-wrap terminals - gold plated brass contacts



| SINGLE POLE<br>MODEL NO.     | DOUBLE POLE<br>MODEL NO. | CIRCUIT |     |     |
|------------------------------|--------------------------|---------|-----|-----|
| TL36MW00000                  | TL46MW00000              | ON      | -   | ON  |
| TL39MW00000                  | TL49MW00000              | ON      | OFF | ON  |
| TL37MW00000                  | TL47MW00000              | MOM     | OFF | MOM |
| TL38MW00000                  | TL48MW00000              | ON      | OFF | MOM |
| TL32MW00000                  | TL42MW00000              | ON      | -   | MOM |
| Handle position (see dwg.) : |                          | III     | II  | I   |
| Terminals connected:         |                          | SP & DP | 2-3 | 2-1 |
|                              |                          | DP      | 5-6 | 4-5 |

SP

DP

**Additional ordering information:** Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

## 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.  
( Allowable options are shown below each respective box).

### Model Structure:

| Series            | Number of poles      | Electrical functions | Terminals                     |
|-------------------|----------------------|----------------------|-------------------------------|
| <b>T</b> <b>L</b> | <input type="text"/> | <input type="text"/> | <input type="text"/>          |
|                   | 3 Single pole        | 6 ON - ON            | P 0 Straight p.c.             |
|                   | 4 Double pole        | 9 ON OFF ON          | Y 0 Straight p.c.with bracket |
|                   |                      | 7 MOM OFF MOM        | W 0 Horizontal right angle    |
|                   |                      | 8 ON OFF MOM         | W W Vertical right angle      |
|                   |                      | 2 ON - MOM           | M W Wire-wrap                 |

### Options:

#### Contact & terminal mat'ls.

- 0 Brass, gold plated
- 1 Brass, silver plated
- 3 Brass, gold plated - (1.27 microns gold)
- 8 Brass, gold plated contacts with tin plated terminals
- 9 Contacts brass, gold plated - (1.27 microns gold) and tin plated terminals

#### Actuators & case colors

Specify 00, 01, 02, 03, 04, 05, 30, 40, 50, 51, 52, 53, 54, 55, 56, 90, or 94  
See drawings below with specifications and dimensions.

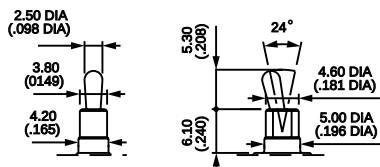
#### Special options

- 0 0 No special requirement
  - 5 0 Crimped bracket terminals - specify for models with brackets
- See additional listings on following page.

Example of completely specified model number: **TL36W015150**

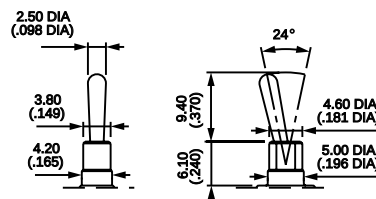
## OPTION DRAWINGS

### Brass actuators & case colors



#### Short (standard)

|               | Blue case | Black case |
|---------------|-----------|------------|
| nickel plated | 00        | 50         |
| matte black   | 01        | 51         |

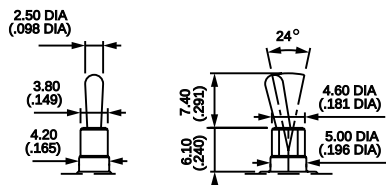


#### Long

|               | Blue case | Black case |
|---------------|-----------|------------|
| nickel plated | 02        | 52         |
| matte black   | 03        | 53         |

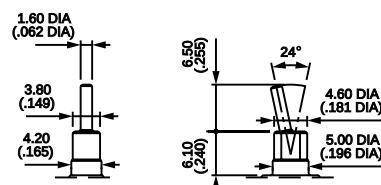
# TL SERIES - WASHABLE TINY TOGGLE SWITCHES, P.C. MOUNTING

## Brass actuators & case colors (cont'd.)



Medium

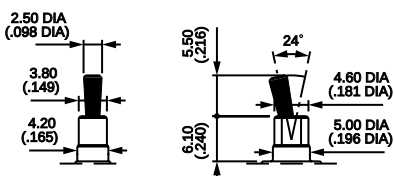
|               | Blue case | Black case |
|---------------|-----------|------------|
| nickel plated | 04        | 54         |
| matte black   | 05        | 55         |



Cylindrical

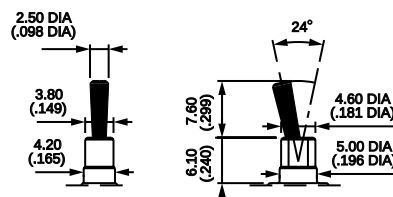
|               | Black case |
|---------------|------------|
| nickel plated | 56         |

## Black plastic insulative actuators & case colors (protects against electrostatic discharges (ESD) up to 10 KV)



Short

|  | Blue case | Black case |
|--|-----------|------------|
|  | 40        | 94         |



Long

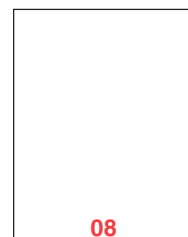
|  | Blue case | Black case |
|--|-----------|------------|
|  | 30        | 90         |

## SPECIAL OPTIONS

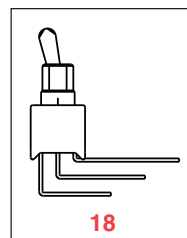
- 00** No special requirement
- 07** Trimmed terminals for **WW** models only - .125" (3.2mm).
- 08** Extended terminals for **W0** models only.
- 18** **WW** models without mounting bracket.
- 20** Mounting bracket for **WW** models with p.c. board spacer tab.
- 25** Trimmed terminals for all models except **WW** - .196" (5mm).
- 30** Wire-wrap terminals on models with **Y** bracket.
- 50** Crimped bracket terminals (retains switch on p.c. board during assembly and soldering). For models with **W0**, **WW** & **Y0** terminals.



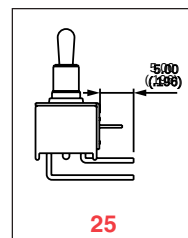
07



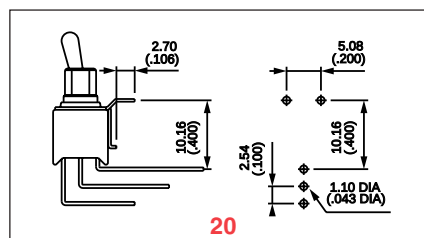
08



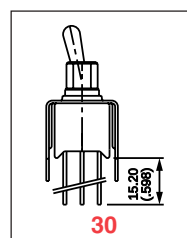
18



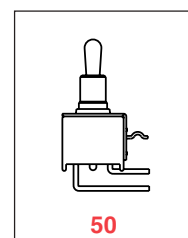
25



20



30



50

## New! ZL SERIES - TINY TOGGLE SWITCHES, PANEL & P.C. MTG.

A



### FEATURES

- Metal bushing, threaded with flat or keyway, or plain.
- Wave solderable.
- Ultra-compact case size.
- SPDT models with epoxy sealed terminals.

### SPECIFICATIONS

|                                           |                                                                                                                                                                        |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | Gold plated brass; 0.4 Volt-Amps max. at 20 V max.<br>Silver plated brass; 0.5 Amps at 48 V max.                                                                       |
| <b>Minimum load:</b>                      | 10 mA at 50 mV - 10 $\mu$ A at 5 VDC                                                                                                                                   |
| <b>Initial contact resistance:</b>        | 20 milliohms maximum                                                                                                                                                   |
| <b>Insulation resistance:</b>             | 1000 megohms minimum at 500 VDC                                                                                                                                        |
| <b>Dielectric strength:</b>               | 1000 V rms minimum between terminals and frame. 500 V rms between terminals..                                                                                          |
| <b>Electrical life:</b>                   | Gold contacts: 2 position - 60,000 cycles min. - 3 position - 30,000 cycles min.<br>Silver contacts: 2 position - 20,000 cycles min. - 3 position - 10,000 cycles min. |
| <b>Operating temperature range:</b>       | -30°C to +85°C                                                                                                                                                         |
| <b>Moisture resistance:</b>               | 21 days 95% (NFC 20-603 - IEC 8-2-3)                                                                                                                                   |
| <b>Torque:</b>                            | 1Nm (0.96 ft-lbs) max. applied between 2 nuts                                                                                                                          |
| <b>Panel thickness (max.):</b>            | 1.5mm (.059") with 2 nuts - 3mm (.118") with 1 nut                                                                                                                     |
| <b>Hardware:</b>                          | Threaded models supplied with 2 hex nuts 7mm (.275") across flats, 1 locking ring and 1 lockwasher. See hardware section of catalog.                                   |

### MATERIALS

|                                  |                             |
|----------------------------------|-----------------------------|
| <b>Contacts &amp; Terminals:</b> | Gold or silver plated brass |
| <b>Actuator:</b>                 | Nickel plated brass         |
| <b>Bushing:</b>                  | Tin plated zamac            |
| <b>Bracket:</b>                  | Tin plated steel            |
| <b>Case:</b>                     | UL94-VO thermoplastic       |
| <b>Terminal seal:</b>            | Epoxy                       |

### ABOUT THIS SERIES

The material in this series is organized in the following sequence:

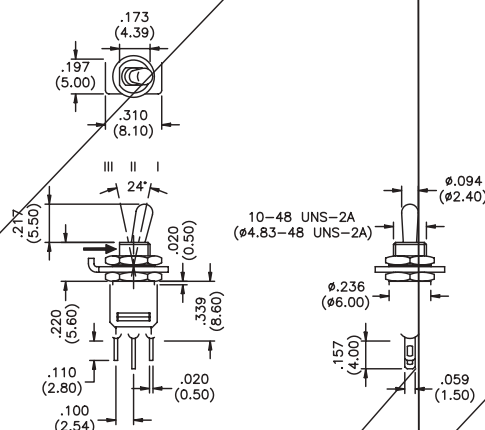
- a. Completely specified switch models
- b. 'build your own switch' order format
- c. Option drawings

# New! ZL SERIES - TINY TOGGLE SWITCHES, PANEL & P.C. MTG.

## Solder lug terminals - silver contacts - threaded bushing



| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| ZL31S0102                       | ON      | -   | OFF |
| ZL36S0102                       | ON      | -   | ON  |
| ZL39S0102                       | ON      | OFF | ON  |
| ZL37S0102                       | MOM     | OFF | MOM |
| ZL38S0102                       | ON      | OFF | MOM |
| ZL32S0102                       | ON      | -   | MOM |
| Handle position<br>(see dwg.) : |         |     |     |
|                                 | III     | II  | I   |



## Straight p.c. terminals - gold contacts - threaded bushing



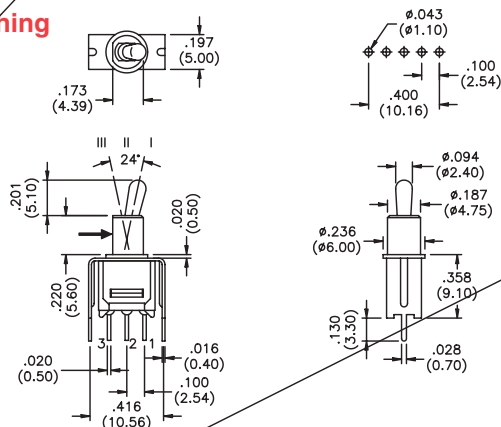
| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| ZL31P0002                       | ON      | -   | OFF |
| ZL36P0002                       | ON      | -   | ON  |
| ZL39P0002                       | ON      | OFF | ON  |
| ZL37P0002                       | MOM     | OFF | MOM |
| ZL38P0002                       | ON      | OFF | MOM |
| ZL32P0002                       | ON      | -   | MOM |
| Handle position<br>(see dwg.) : |         |     |     |
|                                 | III     | II  | I   |

16.20mm (.598") wire-wrap terminals  
also available - to specify substitute  
**MW** for **P0** in above model numbers.

## Straight p.c. terminals - mtg. bracket - gold contacts - plain bushing



| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| ZL31Y0000                       | ON      | -   | OFF |
| ZL36Y0000                       | ON      | -   | ON  |
| ZL39Y0000                       | ON      | OFF | ON  |
| ZL37Y0000                       | MOM     | OFF | MOM |
| ZL38Y0000                       | ON      | OFF | MOM |
| ZL32Y0000                       | ON      | -   | MOM |
| Handle position<br>(see dwg.) : |         |     |     |
|                                 | III     | II  | I   |



## Horizontal right angle terminals - gold contacts - plain bushing



| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| ZL31W0000                       | ON      | -   | OFF |
| ZL36W0000                       | ON      | -   | ON  |
| ZL39W0000                       | ON      | OFF | ON  |
| ZL37W0000                       | MOM     | OFF | MOM |
| ZL38W0000                       | ON      | OFF | MOM |
| ZL32W0000                       | ON      | -   | MOM |
| Handle position<br>(see dwg.) : |         |     |     |
|                                 | III     | II  | I   |

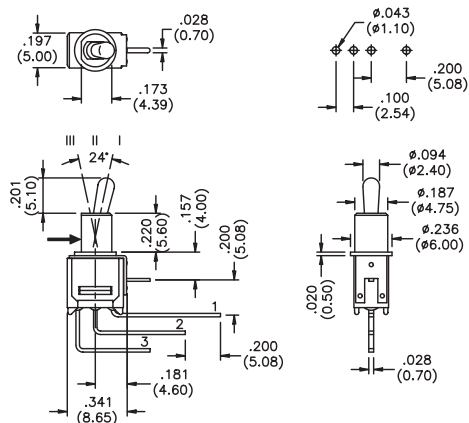
# New! ZL SERIES - TINY TOGGLE SWITCHES, PANEL & P.C. MTG.

A

## Vertical right angle terminals - gold contacts - plain bushing



| MODEL NO.                                | CIRCUIT |     |     |
|------------------------------------------|---------|-----|-----|
| ZL31WW000                                | ON      | -   | OFF |
| ZL36WW000                                | ON      | -   | ON  |
| ZL39WW000                                | ON      | OFF | ON  |
| ZLS7WW000                                | MOM     | OFF | MOM |
| ZL38WW000                                | ON      | OFF | MOM |
| ZL32WW000                                | ON      | -   | MOM |
| Handle position<br>(see dwg.) : III II I |         |     |     |



**Additional ordering information:** Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

## 'BUILD YOUR OWN SWITCH' ORDER FORMAT

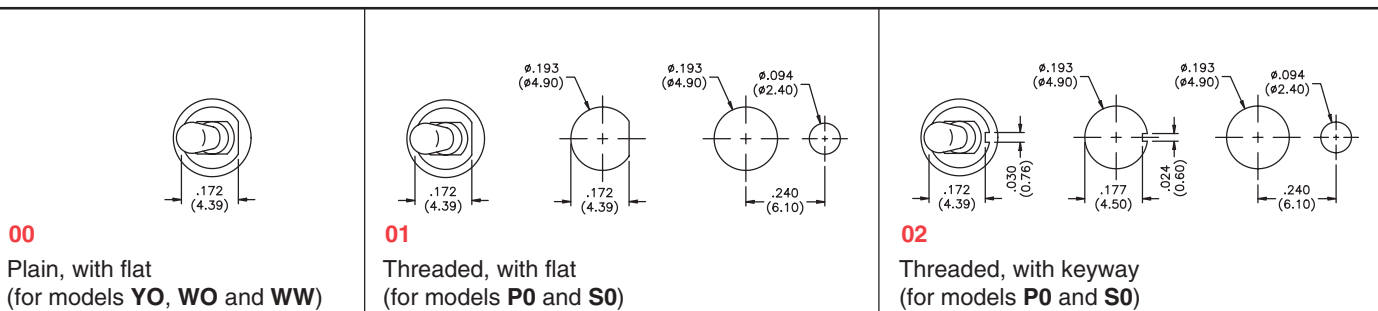
Fill in boxes with selections shown for complete model number.  
( Allowable options are shown below each respective box).

| Series     | Single pole | Electrical functions                                                                                                            | Terminals                                                                                                                                                                                  | Contact & terminal mat'ls.                                                                                        | Bushings                                                                             |
|------------|-------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Z L</b> | <b>3</b>    |                                                                                                                                 |                                                                                                                                                                                            |                                                                                                                   |                                                                                      |
|            |             | <b>1</b> ON - OFF<br><b>6</b> ON - ON<br><b>9</b> ON OFF ON<br><b>7</b> MOM OFF MOM<br><b>8</b> ON OFF MOM<br><b>2</b> ON - MOM | <b>S 0</b> Solder lug<br><b>P 0</b> Straight p.c.<br><b>Y 0</b> Straight p.c. with bracket<br><b>W 0</b> Horizontal right angle<br><b>W W</b> Vertical right angle<br><b>M W</b> Wire-wrap | <b>0</b> Brass, gold plated<br><b>1</b> Brass, silver plated<br><b>3</b> Brass, gold plated - (1.27 microns gold) | <b>0 0</b> Plain<br><b>0 1</b> Threaded with flat<br><b>0 2</b> Threaded with keyway |

Example of completely specified model number: **ZL36S0302**

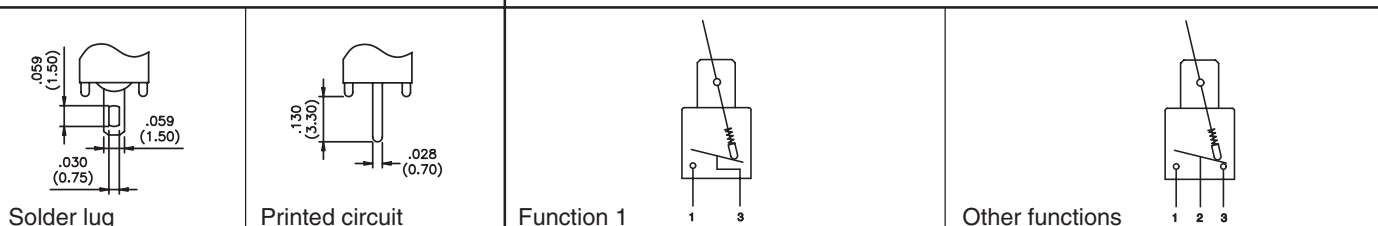
Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

## BUSHINGS



## TERMINALS

## CROSS SECTIONS



# New! 21000N SERIES - MINIATURE TOGGLE SWITCHES



## FEATURES

- SPDT & DPDT models with uniform low profile height for p.c. mounting.
- Threaded or plain bushing with mounting bracket.
- Epoxy terminal sealing standard on all models.
- Straight p.c. terminals designed for wave soldering.

## SPECIFICATIONS

|                                           |                                                                                                |
|-------------------------------------------|------------------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | 2 Amps at 250 VAC, 4 Amps at 125 VAC or 4 Amps at 30 VDC                                       |
| <b>Initial contact resistance:</b>        | 20 milliohms maximum                                                                           |
| <b>Insulation resistance:</b>             | 1000 megohms min. at 500 VDC                                                                   |
| <b>Dielectric strength:</b>               | 1000 V rms min. - between terminals<br>2000 V rms min. - between poles and terminals and frame |
| <b>Electrical life (resistive):</b>       | 20,000 cycles minimum                                                                          |
| <b>Operating temperature range:</b>       | -40°C to +85°C                                                                                 |

## MATERIALS

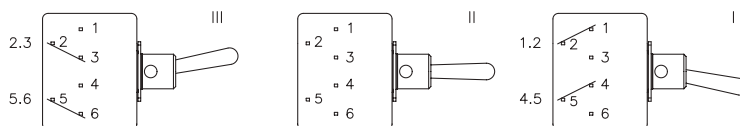
|                                  |                                                                                                               |
|----------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Contacts &amp; Terminals:</b> | Silver                                                                                                        |
| <b>Actuator:</b>                 | Chrome plated brass                                                                                           |
| <b>Bushing:</b>                  | Nickel plated brass                                                                                           |
| <b>Case &amp; Cover:</b>         | PBT                                                                                                           |
| <b>Terminal seal:</b>            | Epoxy                                                                                                         |
| <b>Hardware:</b>                 | Panel mounting models supplied with 2 Hex Nuts .314" (8mm) across flats<br>(See hardware section of catalog). |

## POSITIONS AND CONNECTIONS

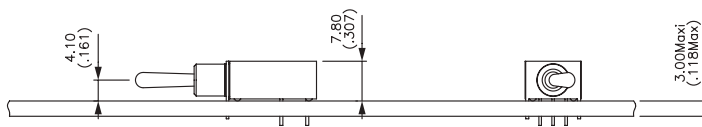
### CIRCUIT

|                                     |     |     |
|-------------------------------------|-----|-----|
| ON                                  | -   | ON  |
| ON                                  | OFF | ON  |
| MOM                                 | OFF | MOM |
| Consult factory for other circuits. |     |     |

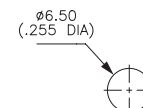
### VIEWED FROM BOTTOM OF SWITCH



## PRINTED CIRCUIT BOARD MOUNTING



## PANEL CUT-OUT



# New! 21000N SERIES - MINIATURE TOGGLE SWITCHES

A

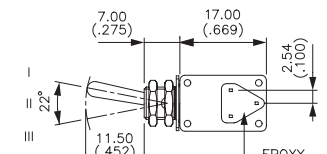
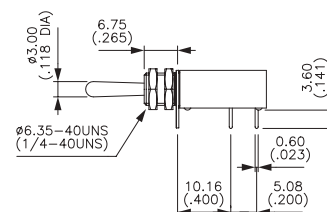
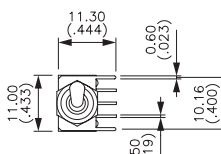
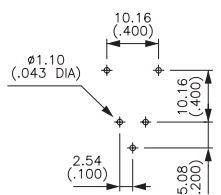
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

## Threaded bushing - single pole



| MODEL NO.                       | CIRCUIT |     |    |
|---------------------------------|---------|-----|----|
| 21136NA                         | ON      | -   | ON |
| 21139NA                         | ON      | OFF | ON |
| 21137NA                         | MOM     | OFF | ON |
| Handle position<br>(see dwg.) : |         |     |    |
| Terminals conn.                 | 2-3     | 1-2 |    |

Consult factory for other configurations.

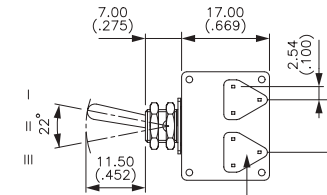
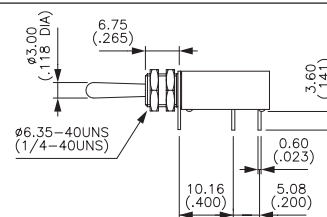
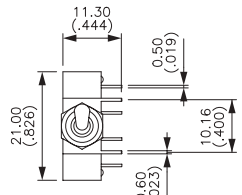
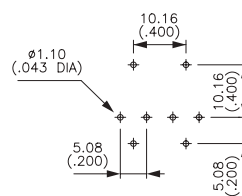


## Threaded bushing - double pole



| MODEL NO.                       | CIRCUIT |     |    |
|---------------------------------|---------|-----|----|
| 21146NA                         | ON      | -   | ON |
| 21149NA                         | ON      | OFF | ON |
| 21147NA                         | MOM     | OFF | ON |
| Handle position<br>(see dwg.) : |         |     |    |
| Terminals conn.                 | 2-3     | 1-2 |    |
|                                 | 5-6     | 4-6 |    |

Consult factory for other configurations.

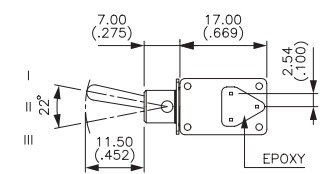
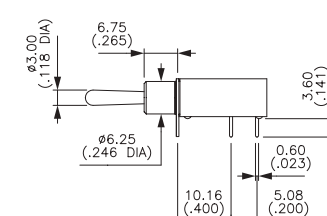
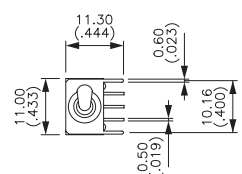
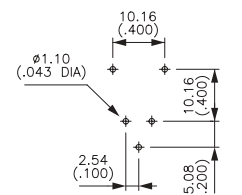


## Plain bushing - single pole



| MODEL NO.                       | CIRCUIT |     |    |
|---------------------------------|---------|-----|----|
| 21236NA                         | ON      | -   | ON |
| 21239NA                         | ON      | OFF | ON |
| 21237NA                         | MOM     | OFF | ON |
| Handle position<br>(see dwg.) : |         |     |    |
| Terminals conn.                 | 2-3     | 1-2 |    |

Consult factory for other configurations.

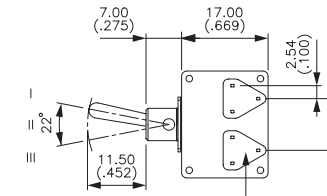
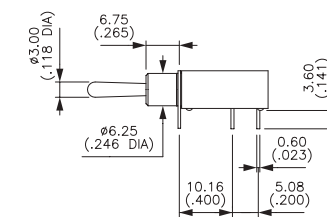
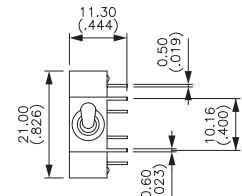
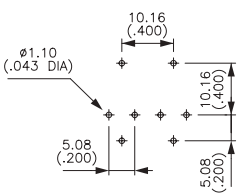


## Plain bushing - double pole

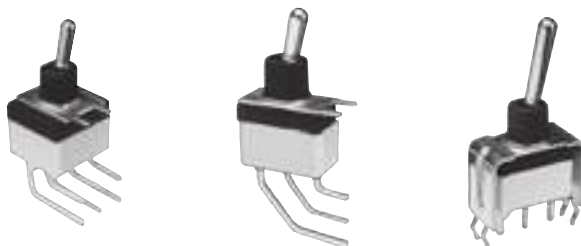


| MODEL NO.                       | CIRCUIT |     |    |
|---------------------------------|---------|-----|----|
| 21246NA                         | ON      | -   | ON |
| 21249NA                         | ON      | OFF | ON |
| 21247NA                         | MOM     | OFF | ON |
| Handle position<br>(see dwg.) : |         |     |    |
| Terminals conn.                 | 2-3     | 1-2 |    |
|                                 | 5-6     | 4-6 |    |

Consult factory for other configurations.



# S SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, P.C. MOUNTING



## FEATURES

- Wave solderable.
- Fully sealed for process compatibility.
- SPDT & DPDT models.
- Compact case size with ESD protection options.
- Agency recognition (see below).

## SPECIFICATIONS

|                                           |                                                                                                                                                                                                                                                          |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | Gold plated brass; 0.4 Volt-Amps max. at 20 V max.<br>Silver; 2 Amps at 250 VAC, 5 Amps at 125 VAC or 4 Amps at 30 VDC.<br>Gold plated silver; 2 Amps at 250 VAC, 5 Amps at 125 VAC or 4 Amps at 30 VDC. Gold plating withstands up to 300 mA at 30 VDC. |
| <b>Initial contact resistance:</b>        | 10 milliohms maximum                                                                                                                                                                                                                                     |
| <b>Insulation resistance:</b>             | 1000 megohms minimum                                                                                                                                                                                                                                     |
| <b>Dielectric strength:</b>               | 1000 V rms minimum                                                                                                                                                                                                                                       |
| <b>Electrical life:</b>                   | Gold: 2 positions - 100,000 cycles min. 3 positions - 50,000 cycles min.<br>Silver: 40,000 cycles minimum.                                                                                                                                               |
| <b>Operating temperature range:</b>       | -20°C to +85°C                                                                                                                                                                                                                                           |
| <b>Washing:</b>                           | Permissible with water, detergents and freons.                                                                                                                                                                                                           |

## MATERIALS

|                                  |                                                 |
|----------------------------------|-------------------------------------------------|
| <b>Contacts &amp; Terminals:</b> | Gold plated brass, silver or gold plated silver |
| <b>Actuator:</b>                 | Chrome plated brass                             |
| <b>Bracket:</b>                  | Tin plated steel                                |
| <b>Case:</b>                     | UL94V-0 - Polyamide, glass filled or PES        |
| <b>Terminal seal:</b>            | Epoxy                                           |

## AGENCY RECOGNITION



UL, CECC, GAM T1 (military)  
 Availability: consult factory for details of recognized models.  
 Marking: to order switches marked UL or CECC, complete the appropriate box of the ordering format.  
 GAM T1 listing does not appear on the switches.

## ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models
- 'build your own switch' order format
- Option drawings & special options
- Miscellaneous

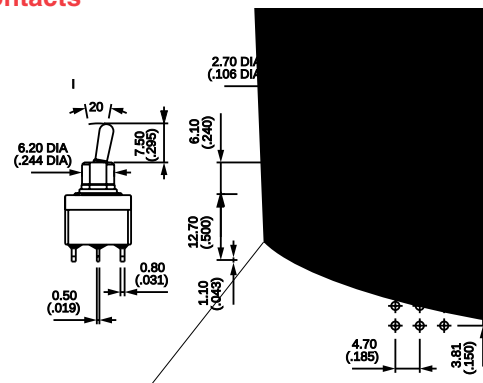
# S SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, P.C. MOUNTING

A

## Horizontal right angle terminals - .185" spacing - gold plated brass contacts

| SINGLE POLE<br>MODEL NO.     | DOUBLE POLE<br>MODEL NO. | CIRCUIT |     |     |
|------------------------------|--------------------------|---------|-----|-----|
| SW236CD7                     | SW246CD7                 | ON      | -   | ON  |
| SW239CD7                     | SW249CD7                 | ON      | OFF | ON  |
| SW237CD7                     | SW247CD7                 | MOM     | OFF | MOM |
| SW238CD7                     | SW248CD7                 | ON      | OFF | MOM |
| SW232CD7                     | SW242CD7                 | ON      | -   | MOM |
| -                            | SW244THCD7*              | ON      | ON  | ON  |
| Handle position (see dwg.) : |                          | III     | II  | I   |
| Terminals connected: SP & DP |                          | 2-3     |     | 2-1 |
| DP                           |                          | 5-6     |     | 4-5 |

\* Function 4: SP in DP case - see diagram at end of section.



## Horizontal right angle terminals - .200" spacing - gold plated brass contacts

| SINGLE POLE<br>MODEL NO.     | DOUBLE POLE<br>MODEL NO. | CIRCUIT |     |     |
|------------------------------|--------------------------|---------|-----|-----|
| SW036CD7                     | SW046CD7                 | ON      | -   | ON  |
| SW039CD7                     | SW049CD7                 | ON      | OFF | ON  |
| SW037CD7                     | SW047CD7                 | MOM     | OFF | MOM |
| SW038CD7                     | SW048CD7                 | ON      | OFF | MOM |
| SW032CD7                     | SW042CD7                 | ON      | -   | MOM |
| -                            | SW044THCD7*              | ON      | ON  | ON  |
| Handle position (see dwg.) : |                          | III     | II  | I   |
| Terminals connected: SP & DP |                          | 2-3     |     | 2-1 |
| DP                           |                          | 5-6     |     | 4-5 |

\* Function 4: SP in DP case - see diagram at end of section.

## Vertical right angle terminals - gold plated brass contacts

| SINGLE POLE<br>MODEL NO.     | DOUBLE POLE<br>MODEL NO. | CIRCUIT |     |     |
|------------------------------|--------------------------|---------|-----|-----|
| SWW236CD7                    | SWW246CD7                | ON      | -   | ON  |
| SWW239CD7                    | SWW249CD7                | ON      | OFF | ON  |
| SWW237CD7                    | SWW247CD7                | MOM     | OFF | MOM |
| SWW238CD7                    | SWW248CD7                | ON      | OFF | MOM |
| SWW232CD7                    | SWW242CD7                | ON      | -   | MOM |
| -                            | SWW244THCD7*             | ON      | ON  | ON  |
| Handle position (see dwg.) : |                          | III     | II  | I   |
| Terminals connected: SP & DP |                          | 2-3     |     | 2-1 |
| DP                           |                          | 5-6     |     | 4-5 |

\* Function 4: SP in DP case - see diagram at end of section.

## Straight p.c. terminals - mounting bracket - gold plated brass contacts

| SINGLE POLE<br>MODEL NO.     | DOUBLE POLE<br>MODEL NO. | CIRCUIT |     |     |
|------------------------------|--------------------------|---------|-----|-----|
| SY236CD7                     | SY246CD7                 | ON      | -   | ON  |
| SY239CD7                     | SY249CD7                 | ON      | OFF | ON  |
| SY237CD7                     | SY247CD7                 | MOM     | OFF | MOM |
| SY238CD7                     | SY248CD7                 | ON      | OFF | MOM |
| SY232CD7                     | SY242CD7                 | ON      | -   | MOM |
| -                            | SY244THCD7*              | ON      | ON  | ON  |
| Handle position (see dwg.) : |                          | III     | II  | I   |
| Terminals connected: SP & DP |                          | 2-3     |     | 2-1 |
| DP                           |                          | 5-6     |     | 4-5 |

\* Function 4: SP in DP case - see diagram at end of section.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# S SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, P.C. MOUNTING

**Additional ordering information:** Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

## 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number. Allowable options are shown below each respective box.

Note: 'NONE' indicates box may be left empty.

### Model Structure:

| Series                         | Terminals                                                                                    | Bushing & terminals                                           | Number of poles                                               | Electrical functions                                                                                                                                                                      |
|--------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="text" value="S"/> | <input type="text" value="W"/> <input type="text" value="W"/> <input type="text" value="Y"/> | <input type="text" value="2"/> <input type="text" value="0"/> | <input type="text" value="3"/> <input type="text" value="4"/> | <input type="text" value="6"/> <input type="text" value="9"/> <input type="text" value="7"/> <input type="text" value="8"/> <input type="text" value="2"/> <input type="text" value="4"/> |
|                                | horizontal<br>rt. angle mtg.                                                                 | Terminal spacing<br>.185" (4,7mm) or<br>.150" (3,81mm)        | Single pole<br>Double pole                                    | ON - ON<br>ON OFF ON<br>MOM OFF MOM<br>ON OFF MOM<br>ON - MOM<br>ON ON ON                                                                                                                 |
|                                | vertical<br>rt. angle mtg.                                                                   | Terminal spacing<br>.200" (5,08mm)<br>(SY & SW models)        |                                                               |                                                                                                                                                                                           |
|                                | Bracket mtg.                                                                                 | All models have plain bushing                                 |                                                               |                                                                                                                                                                                           |

### Options:

| Contact materials                                                                            | Actuators                                                                                                                                                  | Agency recognition                                                                                                                                                                                                          | Special options                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="text" value="A"/> <input type="text" value="A"/> <input type="text" value="C"/> | <input type="text" value="7"/> <input type="text" value="1"/> <input type="text" value="3"/> <input type="text" value="1"/> <input type="text" value="8"/> | <input type="text" value="NONE"/> <input type="text" value="U"/> <input type="text" value="L"/> <input type="text" value="C"/> <input type="text" value="E"/> <input type="text" value="C"/> <input type="text" value="C"/> | <input type="text" value="NONE"/> <input type="text" value="F"/> <input type="text" value="X"/> <input type="text" value="6"/> <input type="text" value="0"/> <input type="text" value="1"/> <input type="text" value="X"/> <input type="text" value="6"/> <input type="text" value="9"/> <input type="text" value="6"/> |
| Silver<br>Silver, gold plated<br>Brass, gold plated                                          | Short (standard)<br>Long<br><b>Insulated actuators:</b><br>Long<br>Short                                                                                   | (NONE)<br>Consult factory for availability.                                                                                                                                                                                 | (NONE)<br>Tin plated terminals<br>Silver plated brass contacts<br>Longer bushing (for insulated actuators)                                                                                                                                                                                                               |

Examples of completely specified model numbers:

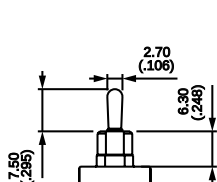
**SW236CD7, SW244THAD11ULX696**

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

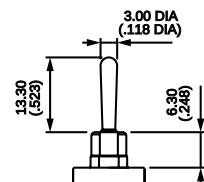
## OPTION DRAWINGS

### ACTUATORS

#### CHROME PLATED BRASS



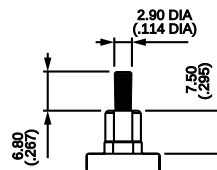
**7** Standard



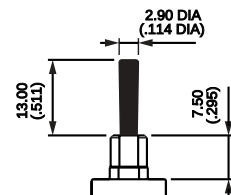
**13** Long

#### INSULATED

Protects against electrostatic discharges (ESD) up to 12 KV.  
Color: black Note: must be ordered with option **X696**.



**8** Short



**11** Long

### SPECIAL OPTIONS

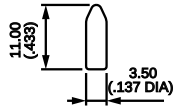
- F** Tin plated terminals.
- X601** Silver plated brass contacts. Lower rating. Minimum quantity: 5000 pcs.
- X696** Longer bushing - .295" (7.5mm). Specify for actuators **8** and **11**.

# S SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, P.C. MOUNTING

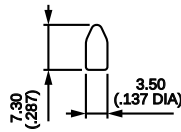
A

## OPTION DRAWINGS & MISCELLANEOUS

### INSULATING CAPS (replace '0' in part numbers with color code)



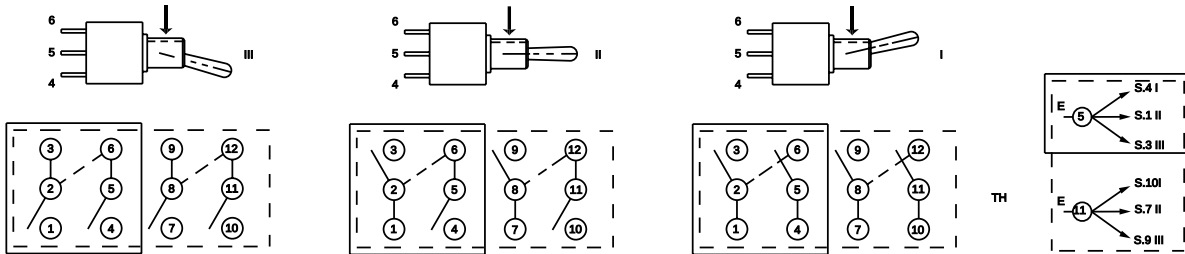
**U270** For actuator 13



**U1710** For actuator 7

- |     |        |
|-----|--------|
| 1   | blue   |
| 2   | black  |
| 3   | green  |
| 4   | grey   |
| 5   | yellow |
| 6   | red    |
| 7/1 | white  |
| 9   | orange |

### WIRING for function 4 switch



Above diagrams are viewed from bottom of switch.

Equivalent to single pole 3 throw switch. Dotted lines between terminals 2 & 6 and 8 & 12 indicate external jumpers to be added by customer

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

## SF SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, PANEL MTG.



### FEATURES

- Insulated threaded bushing.
- Fully sealed for process compatibility.
- SPDT models.
- Compact case size with ESD protection options.
- Agency recognition (see below).

### SPECIFICATIONS

|                                           |                                                                                                                                                                                                                                                          |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | Gold plated brass; 0.4 Volt-Amps max. at 20 V max.<br>Silver; 2 Amps at 250 VAC, 5 Amps at 125 VAC or 4 Amps at 30 VDC.<br>Gold plated silver; 2 Amps at 250 VAC, 5 Amps at 125 VAC or 4 Amps at 30 VDC. Gold plating withstands up to 300 mA at 30 VDC. |
| <b>Initial contact resistance:</b>        | 10 milliohms maximum                                                                                                                                                                                                                                     |
| <b>Insulation resistance:</b>             | 1000 megohms minimum                                                                                                                                                                                                                                     |
| <b>Dielectric strength:</b>               | 1000 V rms minimum                                                                                                                                                                                                                                       |
| <b>Electrical life:</b>                   | Gold: 2 positions - 100,000 cycles min. 3 positions - 50,000 cycles min.<br>Silver: 40,000 cycles minimum.                                                                                                                                               |
| <b>Operating temperature range:</b>       | -20°C to +85°C                                                                                                                                                                                                                                           |
| <b>Washing:</b>                           | Permissible with water, detergents and freons.                                                                                                                                                                                                           |

### MATERIALS

|                                  |                                                                                                                    |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Contacts &amp; Terminals:</b> | Gold plated brass, silver or gold plated silver                                                                    |
| <b>Actuator:</b>                 | Chrome plated brass                                                                                                |
| <b>Bracket:</b>                  | Tin plated steel                                                                                                   |
| <b>Case:</b>                     | UL94V-0 - Polyamide, glass filled or PES                                                                           |
| <b>Terminal seal:</b>            | Epoxy                                                                                                              |
| <b>Hardware:</b>                 | Supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog. |

### AGENCY RECOGNITION



UL, CECC, GAM T1 (military)  
 Availability: consult factory for details of recognized models.  
 Marking: to order switches marked UL or CECC, complete the appropriate box of the ordering format.  
 GAM T1 listing does not appear on the switches.

### ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models
- 'build your own switch' order format
- Option drawings
- Miscellaneous

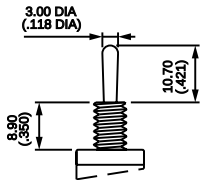


# SF SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, PANEL MTG.

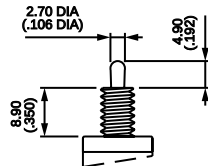
## OPTION DRAWINGS & MISCELLANEOUS

### ACTUATORS

#### Chrome plated brass



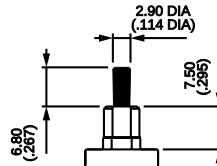
**00** Standard



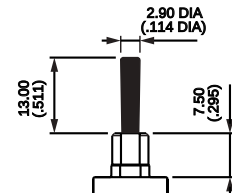
**01** Short

#### INSULATED LEVERS

Insulates against electrostatic discharges (ESD) up to 12 KV. Color: black



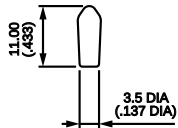
**08** Short



**11** Long

### INSULATING CAPS (replace '0' in part numbers with color code)

For actuator 00 only

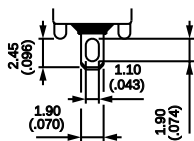


- |     |        |
|-----|--------|
| 1   | blue   |
| 2   | black  |
| 3   | green  |
| 4   | grey   |
| 5   | yellow |
| 6   | red    |
| 7/1 | white  |
| 9   | orange |

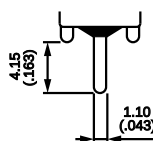
**10**

**U270** If ordered separately

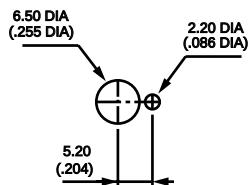
### MISCELLANEOUS



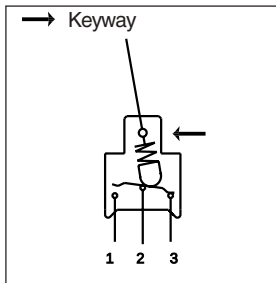
Solder lug terminal



P.C. terminal



Panel Cut-out



## 5000 SERIES - MINIATURE TOGGLE SWITCHES

A

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



### FEATURES

- Broadest selection offered in miniature switches.
- SPDT, DPDT, 3PDT & 4PDT models with numerous options.
- Numerous configurations for panel, panel & p.c. and p.c. mounting.
- Extensive agency recognition (see below).

### SPECIFICATIONS

|                                           |                                                                                                                                                                                                                                                         |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | Gold plated brass; 0.4 Volt-Amps max. at 20 V max.<br>Silver; 3 Amps at 250 VAC, 6 Amps at 125 VAC or 4 Amps at 30 VDC<br>Gold plated silver; 3 Amps at 250 VAC, 6 Amps at 125 VAC or 4 Amps at 30 VDC. Gold plating withstands up to 100 mA at 30 VDC. |
| <b>Initial contact resistance:</b>        | 10 milliohms maximum                                                                                                                                                                                                                                    |
| <b>Insulation resistance:</b>             | 1000 megohms min. at 500 VDC                                                                                                                                                                                                                            |
| <b>Dielectric strength:</b>               | 1000 V rms min. - between terminals<br>1500 V rms min. - between poles and terminals and frame                                                                                                                                                          |
| <b>Electrical life:</b>                   | Gold: 100,000 cycles min.<br>Silver (at full load): SP & DP - 50,000 cycles min. 3P: 40,000 cycles min.<br>4P: 30,000 cycles min.                                                                                                                       |
| <b>Operating temperature range:</b>       | -40°C to +85°C                                                                                                                                                                                                                                          |

### MATERIALS

|                                  |                                                                                                                                             |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contacts &amp; Terminals:</b> | Gold plated brass, silver or gold plated silver                                                                                             |
| <b>Actuator:</b>                 | Chrome plated brass                                                                                                                         |
| <b>Bushing:</b>                  | Nickel plated brass                                                                                                                         |
| <b>Housing:</b>                  | Stainless steel or tin plated steel                                                                                                         |
| <b>Case:</b>                     | Diallyl phthalate (DAP)                                                                                                                     |
| <b>Terminal seal:</b>            | Epoxy                                                                                                                                       |
| <b>Hardware:</b>                 | Panel mounting models supplied with 2 Hex Nuts .314" (8mm) across flats,<br>1 Locking Ring & 1 Lockwasher. See hardware section of catalog. |

### AGENCY RECOGNITION



UL, CSA, CECC, LNZ, GAM T1, QPL (Europe), MUAHAG, NATO. Availability: Consult factory for details of recognized models. Marking: To order switches marked UL, CSA or CECC, complete the appropriate box of the ordering format. Other listings do not appear on the switches.

### ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models:
  - Panel mounting
  - Panel and/or p.c. mounting
  - P.C. mounting
- 'build your own switch' order format
- Option drawings & special options
- Panel cut-outs & miscellaneous

### ALSO IN THIS SERIES

5000 Series switches for peak currents - for switching power supplies, DC-DC converters, motors, etc. See specifications on last page of completely specified models.

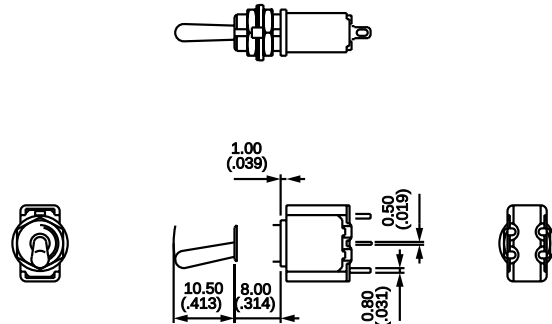
VDE approved 5000 Series models - see 55000 Series following.



# 5000 SERIES - MINIATURE TOGGLE SWITCHES

## Single pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 5636AB                          | ON      | -   | ON  |
| 5639AB                          | ON      | OFF | ON  |
| 5637AB                          | MOM     | OFF | MOM |
| 5638AB                          | ON      | OFF | MOM |
| 5632AB                          | ON      | -   | MOM |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals<br>connected          | 2-3     |     | 1-2 |



## Double pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 5646AB                          | ON      | -   | ON  |
| 5649AB                          | ON      | OFF | ON  |
| 5647AB                          | MOM     | OFF | MOM |
| 5648AB                          | ON      | OFF | MOM |
| 5642AB                          | ON      | -   | MOM |
| 5644THAB*                       | ON      | ON  | ON  |
| 5644TH1RAB*                     | ON      | ON  | MOM |
| 5644TH2RAB*                     | MOM     | ON  | MOM |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals<br>connected:         | 2-3     |     | 1-2 |
|                                 | 5-6     |     | 4-5 |

\* Function 4: SP in DP case. see diagram at end of section

## Three pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 5656AB                          | ON      | -   | ON  |
| 5659AB                          | ON      | OFF | ON  |
| 5657AB                          | MOM     | OFF | MOM |
| 5658AB                          | ON      | OFF | MOM |
| 5652AB                          | ON      | -   | MOM |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals<br>connected:         | 2-3     |     | 1-2 |
|                                 | 5-6     |     | 4-5 |
|                                 | 8-9     |     | 7-8 |

## Four pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals -silver contacts

| MODEL NO.       | CIRCUIT |     |       |
|-----------------|---------|-----|-------|
| 5666AB          | ON      | -   | ON    |
| 5669AB          | ON      | OFF | ON    |
| 5667AB          | MOM     | OFF | MOM   |
| 5668AB          | ON      | OFF | MOM   |
| 5662AB          | ON      | -   | MOM   |
| 5664THAB*       | ON      | ON  | ON    |
| 5664TH1RAB*     | ON      | ON  | MOM   |
| 5664TH2RAB*     | MOM     | ON  | MOM   |
| Handle position | III     | II  | I     |
| Terminals       | 2-3     |     | 1-2   |
| connected:      | 5-6     |     | 4-5   |
|                 | 8-9     |     | 7-8   |
|                 | 11-12   |     | 10-11 |

\* Function 4: SP in DP case. see diagram at end of section.

# 5000 SERIES - MINIATURE TOGGLE SWITCHES

A

## Single pole - flatted actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 5636AB9                         | ON      | -   | ON  |
| 5639AB9                         | ON      | OFF | ON  |
| 5637AB9                         | MOM     | OFF | MOM |
| 5638AB9                         | ON      | OFF | MOM |
| 5632AB9                         | ON      | -   | MOM |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals<br>connected          | 2-3     |     | 1-2 |

## Double pole - flatted actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

| MODEL NO.        | CIRCUIT |     |     |
|------------------|---------|-----|-----|
| 5646AB9          | ON      | -   | ON  |
| 5649AB9          | ON      | OFF | ON  |
| 5647AB9          | MOM     | OFF | MOM |
| 5648AB9          | ON      | OFF | MOM |
| 5642AB9          | ON      | -   | MOM |
| 5644THAB9*       | ON      | ON  | ON  |
| 5644TH1RAB9*     | ON      | ON  | MOM |
| 5644TH2RAB9*     | MOM     | ON  | MOM |
| Handle position: | III     | II  | I   |
| Terminals        | 2-3     |     | 1-2 |
| connected:       | 5-6     |     | 4-5 |

\* Function 4: SP in DP case. see diagram at end of section.

## Three pole - flatted actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 5656AB9                         | ON      | -   | ON  |
| 5659AB9                         | ON      | OFF | ON  |
| 5657AB9                         | MOM     | OFF | MOM |
| 5658AB9                         | ON      | OFF | MOM |
| 5652AB9                         | ON      | -   | MOM |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals                       | 2-3     |     | 1-2 |
| connected:                      | 5-6     |     | 4-5 |
|                                 | 8-9     |     | 7-8 |

## Four pole - flatted actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

| MODEL NO.       | CIRCUIT |     |       |
|-----------------|---------|-----|-------|
| 5666AB9         | ON      | -   | ON    |
| 5669AB9         | ON      | OFF | ON    |
| 5667AB9         | MOM     | OFF | MOM   |
| 5668AB9         | ON      | OFF | MOM   |
| 5662AB9         | ON      | -   | MOM   |
| 5664THAB9*      | ON      | ON  | ON    |
| 5664TH1RAB9*    | ON      | ON  | MOM   |
| 5664TH2RAB9*    | MOM     | ON  | MOM   |
| Handle position | III     | II  | I     |
| Terminals       | 2-3     |     | 1-2   |
| connected:      | 5-6     |     | 4-5   |
|                 | 8-9     |     | 7-8   |
|                 | 11-12   |     | 10-11 |

\* Function 4: SP in DP case. see diagram at end of section.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 5000 SERIES - MINIATURE TOGGLE SWITCHES

## Single pole - standard actuator - 1/4-40 threaded bushing - quick connect terminals - silver contacts

| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 5236ZA                          | ON      | -   | ON  |
| 5239ZA                          | ON      | OFF | ON  |
| 5237ZA                          | MOM     | OFF | MOM |
| 5238ZA                          | ON      | OFF | MOM |
| 5232ZA                          | ON      | -   | MOM |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals<br>connected:         | 2-3     | 1-2 |     |

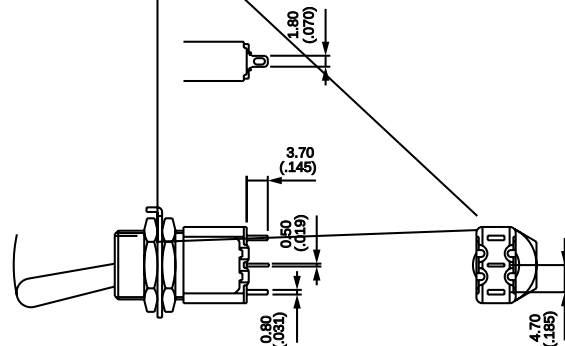
## Double pole - standard actuator - 1/4-40 threaded bushing - quick connect terminals - silver contacts

| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 5246ZA                          | ON      | -   | ON  |
| 5249ZA                          | ON      | OFF | ON  |
| 5247ZA                          | MOM     | OFF | MOM |
| 5248ZA                          | ON      | OFF | MOM |
| 5242ZA                          | ON      | -   | MOM |
| 5244THZA*                       | ON      | ON  | ON  |
| 5244TH1RZA*                     | ON      | ON  | MOM |
| 5244TH2RZA*                     | MOM     | ON  | MOM |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals<br>connected:         | 2-3     | 1-2 | 4-5 |

\* Function 4: SP in DP case. see diagram at end of section.

## Single pole - large actuator - 15/32-32 threaded bushing - solder lug terminals - silver contacts

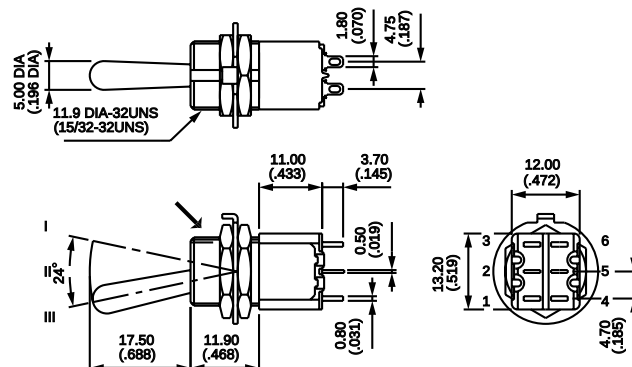
| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 5636MAB                         | ON      | -   | ON  |
| 5639MAB                         | ON      | OFF | ON  |
| 5637MAB                         | MOM     | OFF | MOM |
| 5638MAB                         | ON      | OFF | MOM |
| 5632MAB                         | ON      | -   | MOM |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals<br>connected:         | 2-3     | 1-2 |     |



## Double pole - large actuator - 15/32-32 threaded bushing - solder lug terminals - silver contacts

| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 5646MAB                         | ON      | -   | ON  |
| 5649MAB                         | ON      | OFF | ON  |
| 5647MAB                         | MOM     | OFF | MOM |
| 5648MAB                         | ON      | OFF | MOM |
| 5642MAB                         | ON      | -   | MOM |
| 5644MTHAB*                      | ON      | ON  | ON  |
| 5644MTH1RAB*                    | ON      | ON  | MOM |
| 5644MTH2RAB*                    | MOM     | ON  | MOM |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals<br>connected:         | 2-3     | 1-2 | 4-5 |

\* Function 4: SP in DP case. see diagram at end of section.



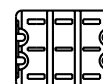
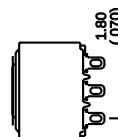
# 5000 SERIES - MINIATURE TOGGLE SWITCHES

A

## Three pole - large actuator - 15/32-32 threaded bushing - solder lug terminals - silver contacts



| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 5656MAB                        | ON      | -   | ON  |
| 5659MAB                        | ON      | OFF | ON  |
| 5657MAB                        | MOM     | OFF | MOM |
| 5658MAB                        | ON      | OFF | MOM |
| 5652MAB                        | ON      | -   | MOM |
| Handle position<br>(see dwg.): | III     | II  | I   |
| Terminals<br>connected:        | 2-3     | 1-2 |     |
|                                | 5-6     | 4-5 |     |
|                                | 8-9     | 7-8 |     |



## Four pole - large actuator - 15/32-32 threaded bushing - solder lug terminals - silver contacts



| MODEL NO.                      | CIRCUIT |       |     |
|--------------------------------|---------|-------|-----|
| 5666MAB                        | ON      | -     | ON  |
| 5669MAB                        | ON      | OFF   | ON  |
| 5667MAB                        | MOM     | OFF   | MOM |
| 5668MAB                        | ON      | OFF   | MOM |
| 5662MAB                        | ON      | -     | MOM |
| 5664MTHAB*                     | ON      | ON    | ON  |
| 5664MTH1RAB*                   | ON      | ON    | MOM |
| 5664MTH2RAB*                   | MOM     | ON    | MOM |
| Handle position<br>(see dwg.): | III     | II    | I   |
| Terminals<br>connected:        | 2-3     | 1-2   |     |
|                                | 5-6     | 4-5   |     |
|                                | 8-9     | 7-8   |     |
|                                | 11-12   | 10-11 |     |

\* Function 4: SP in DP case. see diagram at end of section.

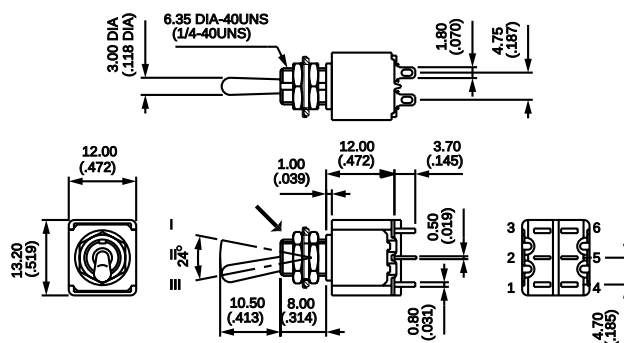
## Single pole - standard actuator - 1/4-40 splashproof bushing - solder lug terminals - silver contacts

| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 5636AKB                        | ON      | -   | ON  |
| 5639AKB                        | ON      | OFF | ON  |
| 5637AKB                        | MOM     | OFF | MOM |
| 5638AKB                        | ON      | OFF | MOM |
| 5632AKB                        | ON      | -   | MOM |
| Handle position<br>(see dwg.): | III     | II  | I   |
| Terminals<br>connected:        | 2-3     | 1-2 |     |

## Double pole - standard actuator - 1/4-40 splashproof bushing - solder lug terminals - silver contacts

| MODEL NO.               | CIRCUIT |     |     |
|-------------------------|---------|-----|-----|
| 5646AKB                 | ON      | -   | ON  |
| 5649AKB                 | ON      | OFF | ON  |
| 5647AKB                 | MOM     | OFF | MOM |
| 5648AKB                 | ON      | OFF | MOM |
| 5642AKB                 | ON      | -   | MOM |
| 5644THAKB*              | ON      | ON  | ON  |
| 5644TH1RAKB*            | ON      | ON  | MOM |
| 5644TH2RAKB*            | MOM     | ON  | MOM |
| Handle position:        | III     | II  | I   |
| Terminals<br>connected: | 2-3     | 1-2 |     |
|                         | 5-6     | 4-5 |     |

\* Function 4: SP in DP case. see diagram at end of section.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

## 5000 SERIES - MINIATURE TOGGLE SWITCHES

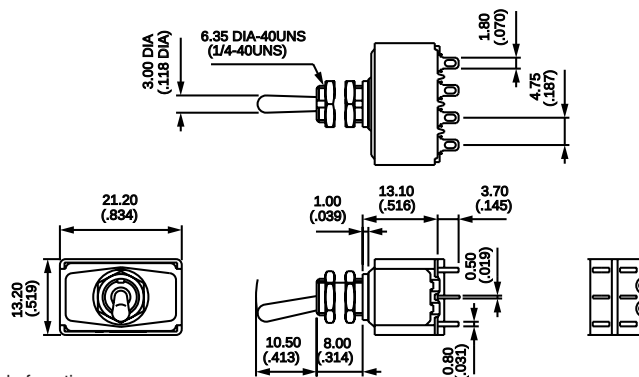
### Three pole - standard actuator - 1/4-40 splashproof bushing - solder lug terminals - silver contacts

| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 5656AKB                         | ON      | -   | ON  |
| 5659AKB                         | ON      | OFF | ON  |
| 5657AKB                         | MOM     | OFF | MOM |
| 5658AKB                         | ON      | OFF | MOM |
| 5652AKB                         | ON      | -   | MOM |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals<br>connected:         | 2-3     |     | 1-2 |
|                                 | 5-6     |     | 4-5 |
|                                 | 8-9     |     | 7-8 |

### Four pole - standard actuator - 1/4-40 splashproof bushing - solder lug terminals - silver contacts

| MODEL NO.               | CIRCUIT |     |       |
|-------------------------|---------|-----|-------|
| 5666AKB                 | ON      | -   | ON    |
| 5669AKB                 | ON      | OFF | ON    |
| 5667AKB                 | MOM     | OFF | MOM   |
| 5668AKB                 | ON      | OFF | MOM   |
| 5662AKB                 | ON      | -   | MOM   |
| 5664THAKB*              | ON      | ON  | ON    |
| 5664TH1RAKB*            | ON      | ON  | MOM   |
| 5664TH2RAKB*            | MOM     | ON  | MOM   |
| Handle position:        | III     | II  | I     |
| Terminals<br>connected: | 2-3     |     | 1-2   |
|                         | 5-6     |     | 4-5   |
|                         | 8-9     |     | 7-8   |
|                         | 11-12   |     | 10-11 |

\* Function 4: SP in DP case. see diagram at end of section.



### Single pole - locking actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 1 locked position               |         |     |     |
| 5636AB-1V                       | ON      | -   | ON  |
| 2 locked positions              |         |     |     |
| 5636AB-2V                       | ON      | -   | ON  |
| 3 locked positions              |         |     |     |
| 5639AB-3V                       | ON      | OFF | ON  |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals<br>connected:         | 2-3     |     | 1-2 |

### Double pole - locking actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 1 locked position               |         |     |     |
| 5646AB-1V                       | ON      | -   | ON  |
| 2 locked positions              |         |     |     |
| 5646AB-2V                       | ON      | -   | ON  |
| 3 locked positions              |         |     |     |
| 5649AB-3V                       | ON      | OFF | ON  |
| Handle position<br>(see dwg.) : | III     | II  | I   |
| Terminals<br>connected:         | 2-3     |     | 1-2 |
|                                 | 5-6     |     | 4-5 |

# 5000 SERIES - MINIATURE TOGGLE SWITCHES

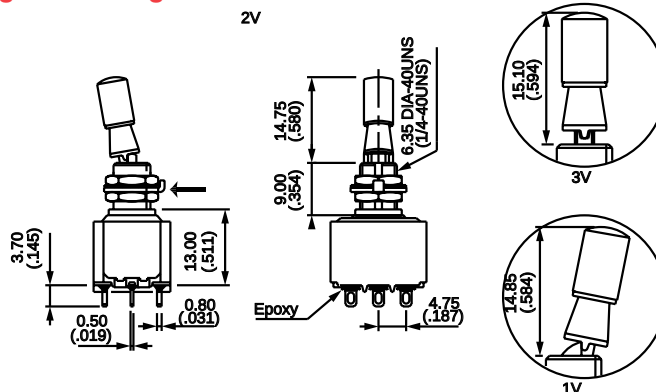
A

## Three pole - locking actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts



| MODEL NO.                              | CIRCUIT |     |    |
|----------------------------------------|---------|-----|----|
| 1 locked position<br><b>5656AB-1V</b>  | ON      | -   | ON |
| 2 locked positions<br><b>5656AB-2V</b> | ON      | -   | ON |
| 3 locked positions<br><b>5659AB-3V</b> | ON      | OFF | ON |
| Handle position<br>(see dwg.):         | III     | II  | I  |
| Terminals<br>connected:                | 2-3     | 1-2 |    |
|                                        | 5-6     | 4-5 |    |
|                                        | 8-9     | 7-8 |    |

→ Keyway

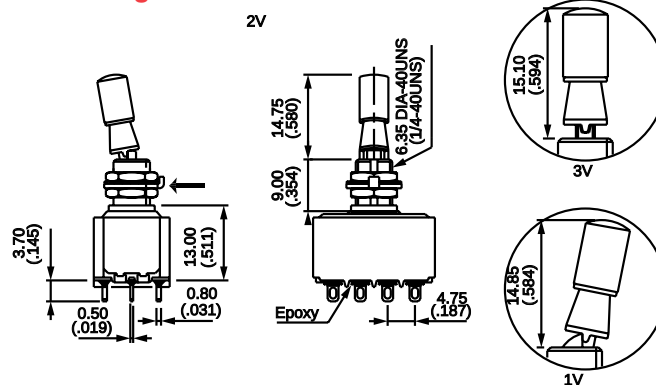


## Four pole - locking actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts



| MODEL NO.                              | CIRCUIT |       |    |
|----------------------------------------|---------|-------|----|
| 1 locked position<br><b>5666AB-1V</b>  | ON      | -     | ON |
| 2 locked positions<br><b>5666AB-2V</b> | ON      | -     | ON |
| 3 locked positions<br><b>5669AB-3V</b> | ON      | OFF   | ON |
| Handle position<br>(see dwg.):         | III     | II    | I  |
| Terminals<br>connected:                | 2-3     | 1-2   |    |
|                                        | 5-6     | 4-5   |    |
|                                        | 8-9     | 7-8   |    |
|                                        | 11-12   | 10-11 |    |

→ Keyway



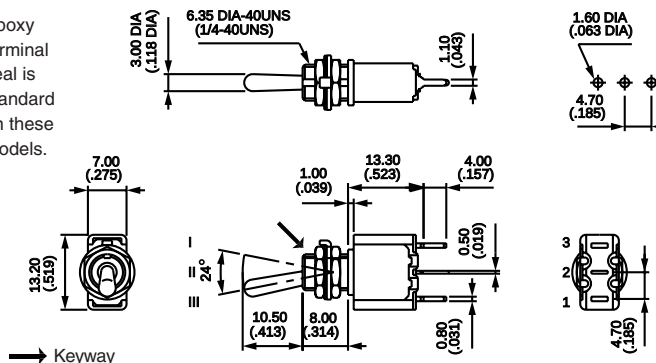
## Single pole - standard actuator - 1/4-40 threaded bushing - straight p.c. terminals - gold or silver contacts



| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| <b>5236CDB</b>                 | ON      | -   | ON  |
| <b>5239CDB</b>                 | ON      | OFF | ON  |
| <b>5237CDB</b>                 | MOM     | OFF | MOM |
| <b>5238CDB</b>                 | ON      | OFF | MOM |
| <b>5232CDB</b>                 | ON      | -   | MOM |
| Handle position<br>(see dwg.): | III     | II  | I   |
| Terminals<br>connected:        | 2-3     | 1-2 |     |

Note: above models have gold contacts.  
Substitute 'A' for 'CD' for silver contacts.

Epoxy  
terminal  
seal is  
standard  
on these  
models.



→ Keyway

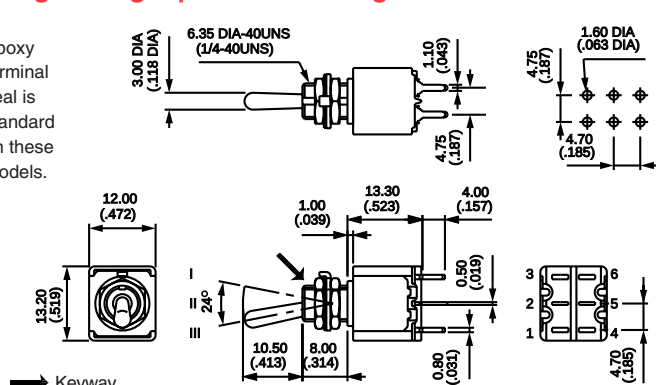
## Double pole - standard actuator - 1/4-40 threaded bushing - straight p.c. terminals - gold or silver contacts



| MODEL NO.               | CIRCUIT |     |     |
|-------------------------|---------|-----|-----|
| <b>5246CDB</b>          | ON      | -   | ON  |
| <b>5249CDB</b>          | ON      | OFF | ON  |
| <b>5247CDB</b>          | MOM     | OFF | MOM |
| <b>5248CDB</b>          | ON      | OFF | MOM |
| <b>5242CDB</b>          | ON      | -   | MOM |
| <b>5244THCDB*</b>       | ON      | ON  | ON  |
| <b>5244TH1RCDB*</b>     | ON      | ON  | MOM |
| <b>5244TH2RCDB*</b>     | MOM     | ON  | MOM |
| Handle position:        | III     | II  | I   |
| Terminals<br>connected: | 2-3     | 1-2 |     |
|                         | 5-6     | 4-5 |     |

\* Function 4: SP in DP case. see diagram at end of section. Note: above models have gold contacts.  
Substitute 'A' for 'CD' for silver contacts.

Epoxy  
terminal  
seal is  
standard  
on these  
models.



→ Keyway

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 5000 SERIES - MINIATURE TOGGLE SWITCHES

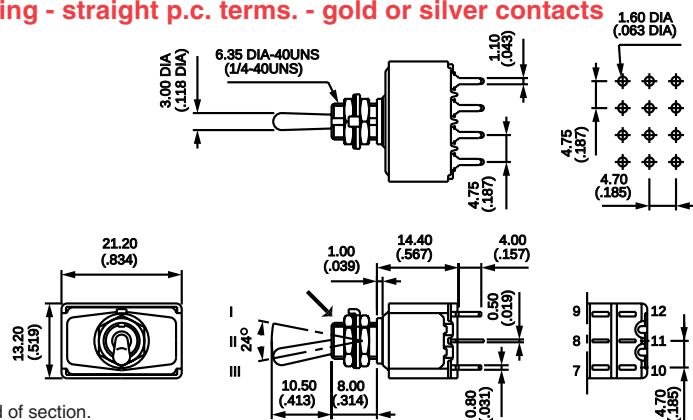
## Three pole - standard actuator - 1/4-40 threaded bushing - straight p.c. terminals - gold or silver contacts

| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 5256CDB                        | ON      | -   | ON  |
| 5259CDB                        | ON      | OFF | ON  |
| 5257CDB                        | MOM     | OFF | MOM |
| 5258CDB                        | ON      | OFF | MOM |
| 5252CDB                        | ON      | -   | MOM |
| Handle position<br>(see dwg.): | III     | II  | I   |
| Terminals<br>connected:        | 2-3     | 1-2 |     |
|                                | 5-6     | 4-5 |     |
|                                | 8-9     | 7-8 |     |

## Four pole - standard actuator - 1/4-40 threaded bushing - straight p.c. terms. - gold or silver contacts

| MODEL NO.                      | CIRCUIT |       |     |
|--------------------------------|---------|-------|-----|
| 5266CDB                        | ON      | -     | ON  |
| 5269CDB                        | ON      | OFF   | ON  |
| 5267CDB                        | MOM     | OFF   | MOM |
| 5268CDB                        | ON      | OFF   | MOM |
| 5262CDB                        | ON      | -     | MOM |
| 5264THCDB*                     | ON      | ON    | ON  |
| 5264TH1RCDB*                   | ON      | ON    | MOM |
| 5264TH2RCDB*                   | MOM     | ON    | MOM |
| Handle position<br>(see dwg.): | III     | II    | I   |
| Terminals<br>connected:        | 2-3     | 1-2   |     |
|                                | 5-6     | 4-5   |     |
|                                | 8-9     | 7-8   |     |
|                                | 11-12   | 10-11 |     |

\* Function 4: SP in DP case. see diagram at end of section.



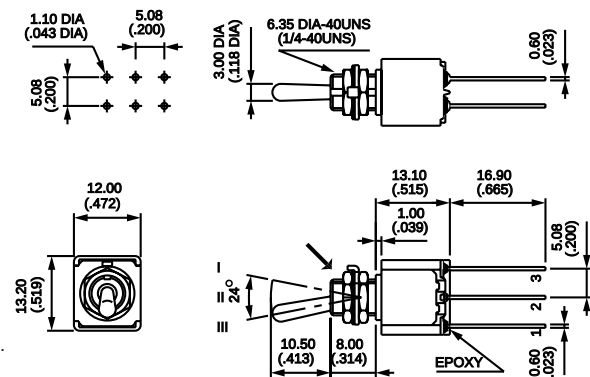
## Single pole - standard actuator - 1/4-40 threaded bushing - wire-wrap terminals - gold or silver contacts

| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 5236MIWRCD                     | ON      | -   | ON  |
| 5239MIWRCD                     | ON      | OFF | ON  |
| 5237MIWRCD                     | MOM     | OFF | MOM |
| 5238MIWRCD                     | ON      | OFF | MOM |
| 5232MIWRCD                     | ON      | -   | MOM |
| Handle position<br>(see dwg.): | III     | II  | I   |
| Terminals<br>connected:        | 2-3     | 1-2 |     |

## Double pole - standard actuator - 1/4-40 threaded bushing - wire-wrap terminals - gold or silver contacts

| MODEL NO.               | CIRCUIT |     |     |
|-------------------------|---------|-----|-----|
| 5246MIWRCD              | ON      | -   | ON  |
| 5249MIWRCD              | ON      | OFF | ON  |
| 5247MIWRCD              | MOM     | OFF | MOM |
| 5248MIWRCD              | ON      | OFF | MOM |
| 5242MIWRCD              | ON      | -   | MOM |
| 5244MIWRTHCD*           | ON      | ON  | ON  |
| 5244MIWRTH1RCD*         | ON      | ON  | MOM |
| 5244MIWRTH2RCD*         | MOM     | ON  | MOM |
| Handle position:        | III     | II  | I   |
| Terminals<br>connected: | 2-3     | 1-2 |     |
|                         | 5-6     | 4-5 |     |

\* Function 4: SP in DP case. see diagram at end of section.



# 5000 SERIES - MINIATURE TOGGLE SWITCHES

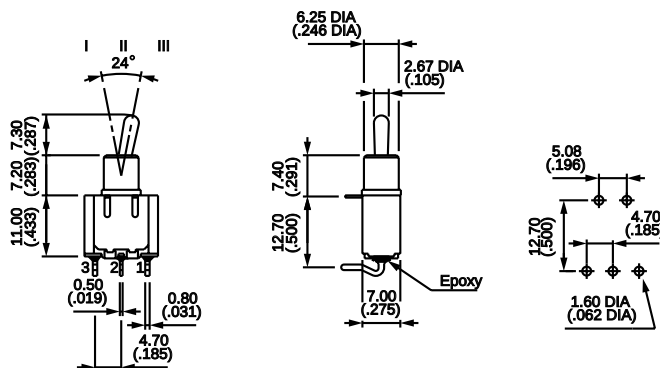
A

## Single pole - short actuator - 1/4" smooth bushing - horizontal rt. angle p.c. terms. - gold or silver contacts



| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 5236WCDB16X404                 | ON      | -   | ON  |
| 5239WCDB16X404                 | ON      | OFF | ON  |
| 5237WCDB16X404                 | MOM     | OFF | MOM |
| 5238WCDB16X404                 | ON      | OFF | MOM |
| 5232WCDB16X404                 | ON      | -   | MOM |
| Handle position<br>(see dwg.): | III     | II  | I   |
| Terminals<br>connected:        | 2-3     |     | 1-2 |

Note: above models have gold contacts.  
Substitute 'A' for 'CD' for silver contacts.



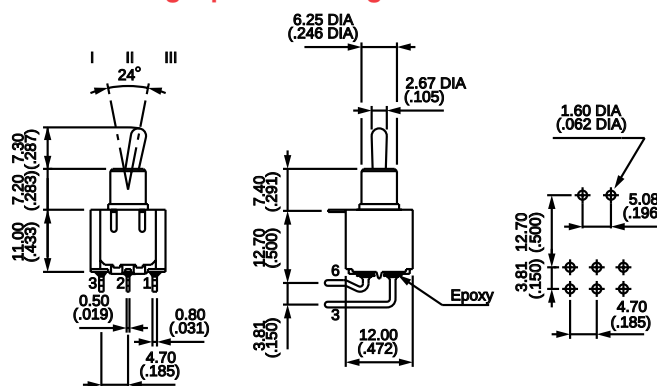
## Double pole - short actuator - 1/4" smooth bushing - horizontal rt. angle p.c. terms. - gold or silver contacts



| MODEL NO.                       | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 5246WCDB16X404                  | ON      | -   | ON  |
| 5249WCDB16X404                  | ON      | OFF | ON  |
| 5247WCDB16X404                  | MOM     | OFF | MOM |
| 5248WCDB16X404                  | ON      | OFF | MOM |
| 5242WCDB16X404                  | ON      | -   | MOM |
| 5244WTHCDB16X404*               | ON      | ON  | ON  |
| 5244WTH1RCDB16X404*             | ON      | ON  | MOM |
| 5244WTH2RCDB16X404*             | MOM     | ON  | MOM |
| Handle position:<br>(see dwg.): | III     | II  | I   |
| Terminals<br>connected:         | 2-3     |     | 1-2 |
|                                 | 5-6     |     | 4-5 |

Note: Listed models have gold contacts. Substitute 'A' for 'CD' for silver contacts.

\* Function 4: SP in DP case. see diagram at end of section.

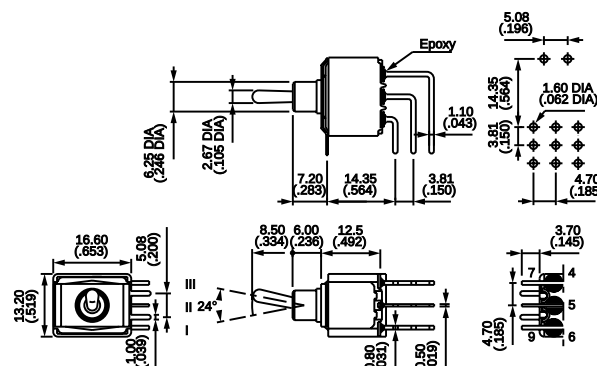


## Three pole - short actuator - 1/4" smooth bushing - horizontal rt. angle p.c. terms. - gold or silver contacts



| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 5256WCDB16                     | ON      | -   | ON  |
| 5259WCDB16                     | ON      | OFF | ON  |
| 5257WCDB16                     | MOM     | OFF | MOM |
| 5258WCDB16                     | ON      | OFF | MOM |
| 5252WCDB16                     | ON      | -   | MOM |
| Handle position<br>(see dwg.): | III     | II  | I   |
| Terminals<br>connected:        | 2-3     |     | 1-2 |
|                                | 5-6     |     | 4-5 |
|                                | 8-9     |     | 7-8 |

Note: above models have gold contacts.  
Substitute 'A' for 'CD' for silver contacts.

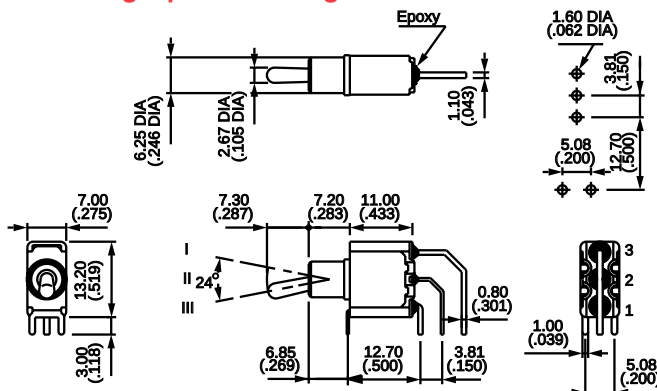


## Single pole - short actuator - 1/4" smooth bushing - vertical rt. angle p.c. terms. - gold or silver contacts



| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 5236WWCDB16X445                | ON      | -   | ON  |
| 5239WWCDB16X445                | ON      | OFF | ON  |
| 5237WWCDB16X445                | MOM     | OFF | MOM |
| 5238WWCDB16X445                | ON      | OFF | MOM |
| 5232WWCDB16X445                | ON      | -   | MOM |
| Handle position<br>(see dwg.): | III     | II  | I   |
| Terminals<br>connected:        | 2-3     |     | 1-2 |

Note: above models have gold contacts.  
Substitute 'A' for 'CD' for silver contacts.



## 5000 SERIES - MINIATURE TOGGLE SWITCHES

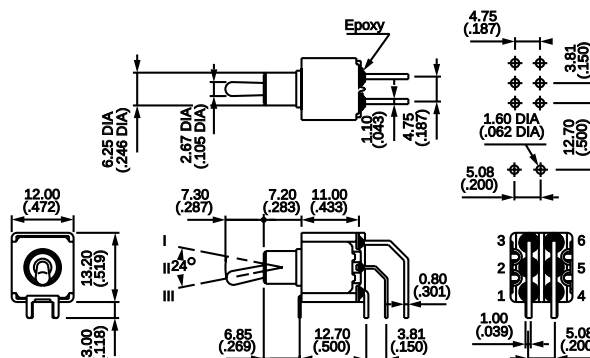
**Double pole - short actuator - 1/4" smooth bushing - vertical rt. angle p.c. terms. - gold or silver contacts**



| MODEL NO.            | CIRCUIT |     |     |
|----------------------|---------|-----|-----|
| 5246WWCDB16X445      | ON      | -   | ON  |
| 5249WWCDB16X445      | ON      | OFF | ON  |
| 5247WWCDB16X445      | MOM     | OFF | MOM |
| 5248WWCDB16X445      | ON      | OFF | MOM |
| 5242WWCDB16X445      | ON      | -   | MOM |
| 5244WWTHCDB16X445*   | ON      | ON  | ON  |
| 5244WWTH1RCDB16X445* | ON      | ON  | MOM |
| 5244WWTH2RCDB16X445* | MOM     | ON  | MOM |
| Handle position:     | III     | II  | I   |
| Terminals            | 2-3     |     | 1-2 |
| connected:           | 5-6     |     | 4-5 |

Note: Listed models have gold contacts. Substitute 'A' for 'CD' for silver contacts.

\* Function 4: SP in DP case. see diagram at end of section.

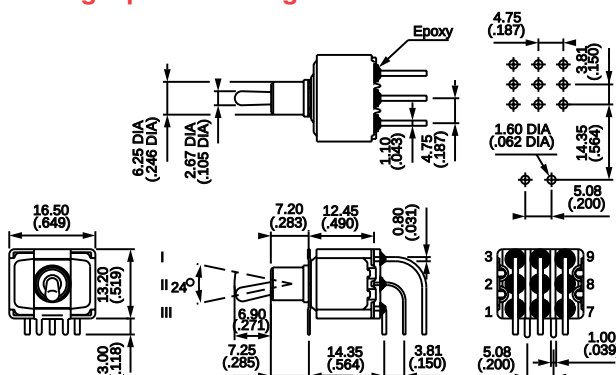


**Three pole - short actuator - 1/4" smooth bushing - vertical rt. angle p.c. terms. - gold or silver contacts**



| MODEL NO.        | CIRCUIT |     |     |
|------------------|---------|-----|-----|
| 5256WWCDB16X514  | ON      | -   | ON  |
| 5259WWCDB16X514  | ON      | OFF | ON  |
| 5257WWCDB16X514  | MOM     | OFF | MOM |
| 5258WWCDB16X514  | ON      | OFF | MOM |
| 5252WWCDB16X514  | ON      | -   | MOM |
| Handle position: | III     | II  | I   |
| Terminals        | 2-3     |     | 1-2 |
| connected:       | 5-6     |     | 4-5 |
|                  | 8-9     |     | 7-8 |

Note: above models have gold contacts.  
Substitute 'A' for 'CD' for silver contacts.



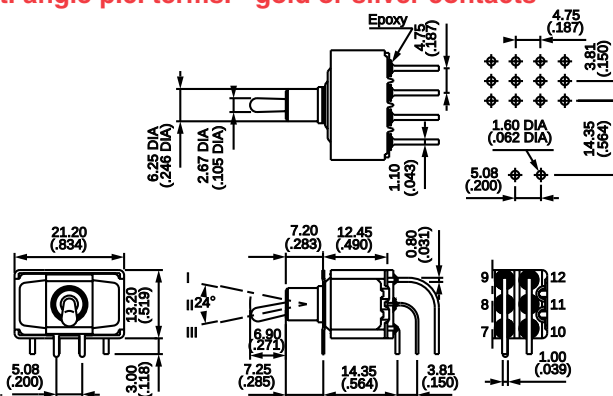
**Four pole - short actuator - 1/4" smooth bushing - vertical rt. angle p.c. terms. - gold or silver contacts**



| MODEL NO.            | CIRCUIT |     |       |
|----------------------|---------|-----|-------|
| 5266WWCDB16X514      | ON      | -   | ON    |
| 5269WWCDB16X514      | ON      | OFF | ON    |
| 5267WWCDB16X514      | MOM     | OFF | MOM   |
| 5268WWCDB16X514      | ON      | OFF | MOM   |
| 5262WWCDB16X514      | ON      | -   | MOM   |
| 5264WWTHCDB16X514*   | ON      | ON  | ON    |
| 5264WWTH1RCDB16X514* | ON      | ON  | MOM   |
| 5264WWTH2RCDB16X514* | MOM     | ON  | MOM   |
| Handle position:     | III     | II  | I     |
| Terminals            | 2-3     |     | 1-2   |
| connected:           | 5-6     |     | 4-5   |
|                      | 8-9     |     | 7-8   |
|                      | 11-12   |     | 10-11 |

Note: Listed models have gold contacts. Substitute 'A' for 'CD' for silver contacts.

\* Function 4: SP in DP case. see diagram at end of section.

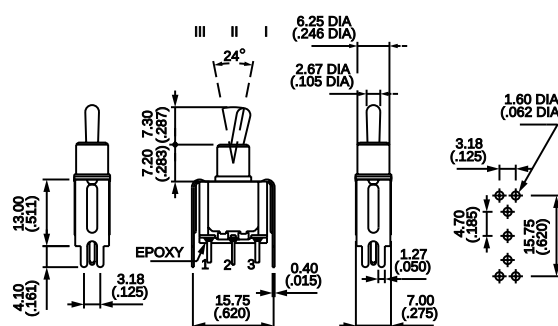


**Single pole - short actuator - 1/4" smooth bush. - straight p.c. terms. - bracket mtg. - gold or silver contacts**



| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 5236YCDB16X445                 | ON      | -   | ON  |
| 5239YCDB16X445                 | ON      | OFF | ON  |
| 5237YCDB16X445                 | MOM     | OFF | MOM |
| 5238YCDB16X445                 | ON      | OFF | MOM |
| 5232YCDB16X445                 | ON      | -   | MOM |
| Handle position<br>(see dwg.): | III     | II  | I   |
| Terminals                      |         |     |     |
| connected:                     | 2-3     |     | 1-2 |

Note: above models have gold contacts.  
Substitute 'A' for 'CD' for silver contacts.



# 5000 SERIES - MINIATURE TOGGLE SWITCHES

A

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

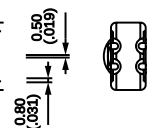
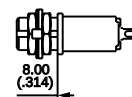
| MODEL NO.            | CIRCUIT |     |     |
|----------------------|---------|-----|-----|
| 5246YCDB16X445       | ON      | -   | ON  |
| 5249YCDB16X445       | ON      | OFF | ON  |
| 5247YCDB16X445       | MOM     | OFF | MOM |
| 5248YCDB16X445       | ON      | OFF | MOM |
| 5242YCDB16X445       | ON      | -   | MOM |
| 5244YTHCDB16X445*    | ON      | ON  | ON  |
| 5244YTH1RCDB16X445*  | ON      | ON  | MOM |
| 5244YTH2RCDB16X445*  | MOM     | ON  | MOM |
| Handle position:     | III     | II  | I   |
| Terminals connected: | 2-3     | 1-2 | 4-5 |

\* Function 4: SP in DP case. see diagram at end of section.

## Single pole - paddle actuator - 1/4" threaded bushing - solder lug terminals - silver contacts

| MODEL NO.            | CIRCUIT |     |     |
|----------------------|---------|-----|-----|
| 5636AB4N+U242N       | ON      | -   | ON  |
| 5639AB4N+U242N       | ON      | OFF | ON  |
| 5637AB4N+U242N       | MOM     | OFF | MOM |
| 5638AB4N+U242N       | ON      | OFF | MOM |
| 5632AB4N+U242N       | ON      | -   | MOM |
| Handle position:     | III     | II  | I   |
| Terminals connected: | 2-3     | 1-2 |     |

Above models have black paddle.



## Double pole - paddle actuator - 1/4" threaded bushing - solder lug terminals - silver contacts

| MODEL NO.            | CIRCUIT |     |     |
|----------------------|---------|-----|-----|
| 5646AB4N+U242N       | ON      | -   | ON  |
| 5649AB4N+U242N       | ON      | OFF | ON  |
| 5647AB4N+U242N       | MOM     | OFF | MOM |
| 5648AB4N+U242N       | ON      | OFF | MOM |
| 5642AB4N+U242N       | ON      | -   | MOM |
| 5644THAB4N+U242N*    | ON      | ON  | ON  |
| 5644TH1RAB4N+U242N*  | ON      | ON  | MOM |
| 5644TH2RAB4N+U242N*  | MOM     | ON  | MOM |
| Handle position:     | III     | II  | I   |
| Terminals connected: | 2-3     | 1-2 | 4-5 |

\*Function 4: SP in DP case. see diagram at end of section  
Above models have black paddle.

# 5000 SERIES - MINIATURE TOGGLE SWITCHES

## 5000 Series switches for peak currents

- 2-120 amps at 60 VDC - 10,000 cycles minimum.
- 3-40 amps at 125/250 VAC - 10,000 cycles minimum.
- Silver nickel alloy (AgNi) contacts.

Other specifications same as 5000 Series.

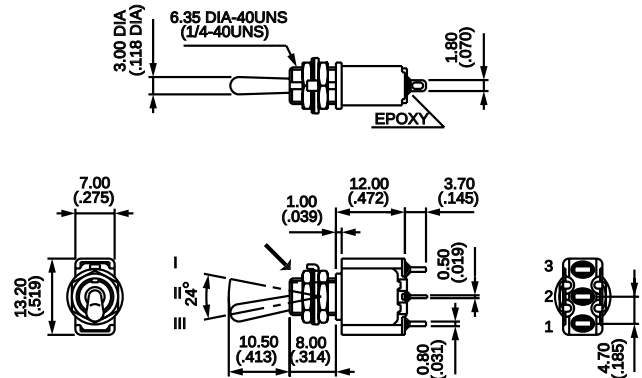
Also see 'Switches for Peak Currents' technical page in rear of catalog.

### Single pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals



MODEL NO.  
5636ABX814

CIRCUIT  
ON - ON



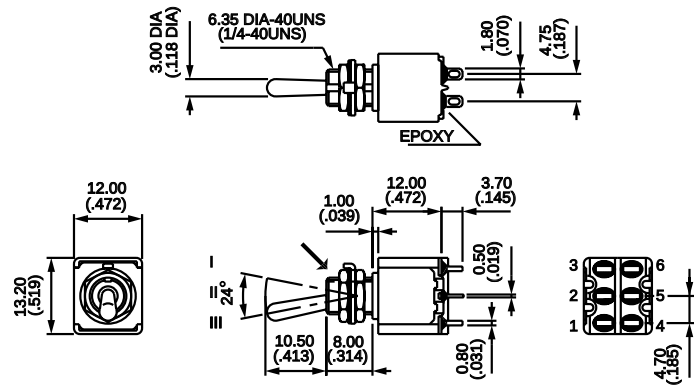
→ Keyway

### Double pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals



MODEL NO.  
5646ABX814

CIRCUIT  
ON - ON



→ Keyway

# 5000 SERIES - MINIATURE TOGGLE SWITCHES

A

**Additional ordering information:** Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

## 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

### Model Structure:

| Series | Terminals & bushings                                                                                                                                                                             | Number of poles                                               | Electrical functions                                                                                                                                                                                                   | Terminals                                                                                                                                                                                                                                                     | (For function 4 models only) connections / functions              | Contact materials                                             |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------|
| 5      |                                                                                                                                                                                                  |                                                               |                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                               |                                                                   |                                                               |
|        |                                                                                                                                                                                                  | 3 Single pole<br>4 Double pole<br>5 Three pole<br>6 Four pole | 6 ON - ON<br>9 ON OFF ON<br>7 MOM OFF MOM<br>8 ON OFF MOM<br>2 ON - MOM<br>4* ON ON ON<br>4* ON ON MOM<br>4* MOM ON MOM<br>* specify selection from 'connections/ functions' box also - (For double & four pole only). | (NONE)<br>M Solder lugs with 15/32-32 (11.9mm) bushing<br>M I W R Wire-wrap (epoxy term. seal standard)<br>W Horizontal right angle p.c.<br>W W Vertical right angle p.c.<br>Y Straight p.c. w/mounting brk't.<br>Z Quick connect (epoxy term. seal standard) | (NONE)<br>T H ON ON ON<br>T H 1 R ON ON MOM<br>T H 2 R MOM ON MOM | A Silver<br>A D Silver, gold plated<br>C D Brass, gold plated |
|        | 2 Straight p.c., right angle, quick connect or wire-wrap terminals with 1/4-40 (6.35mm) threaded bushing.<br>6 Solder lug terminals with 1/4-40 (6.35mm) or 15/32-32 (11.9mm) threaded bushings. |                                                               |                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                               |                                                                   |                                                               |

### Options:

| Black finish                                                                       | Sealing                                                                                                                                        | Actuators                                                                                                                                                                                                                                                                                               | Agency Recognition                                                                                                                                 | Special options                  | Caps and paddles                                                                                                                       |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                    |                                                                                                                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                    |                                  |                                                                                                                                        |
| (NONE)<br>G Matte black finish on bushing, actuator & hardware.                    | (NONE) Unless standard - (see Terminals above)<br>B Epoxy sealed terminals<br>K Front panel sealing with o-ring & gasket.<br>K B Both of above | (NONE)<br>1 3 Standard<br>2<br>7<br>8 Flat<br>9 Flat<br>1 2 Flat<br>1 6<br>1 7<br>2 1 Insulated<br>2 2<br>2 3<br>2 4 Large (long)<br>2 5<br>2 7 Large (short)<br>4 N For paddles only<br>1 V Locking (1 position)<br>2 V Locking (2 positions)<br>3 V Locking (3 positions)<br>(see actuator drawings). | (NONE)<br>U L<br>C S A<br>V D E<br>L N Z Telecommunications listing<br>G A M Military listing<br>(consult factory for details of approved models). | (NONE)<br>See listing on pg. C39 | (NONE)<br>Caps<br>U 2 7 0<br>U 1 7 1 0<br>U 6 4 0<br>Paddles<br>U 2 4 0 N<br>U 2 9 0 N<br>U 3 9 0 N<br>(see drawings and color codes). |
| Examples of completely specified model numbers:<br><b>5636AB, 5244WWTH2RAB16UL</b> |                                                                                                                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                    |                                  |                                                                                                                                        |

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

# 5000 SERIES - MINIATURE TOGGLE SWITCHES

## OPTION DRAWINGS

### SEALING

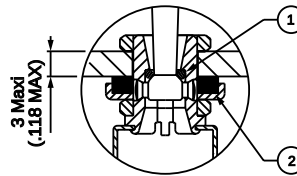
**(NONE)** Indicates no terminal sealing.

**B** Indicates epoxy terminal sealing.  
Note: for models with 'Z' and 'MIWR' epoxy terminal sealing is standard and need not be specified with 'B'.

**K** Indicates front panel sealing with o-ring (1) and gasket (2) to protect the switch from water and dust. Withstands 1 bar pressure. Available on models with 1/4" (6.35mm) or 15/32" (11.9mm) threaded bushings. Not available with actuators 8,9, 12, 22 or 23.

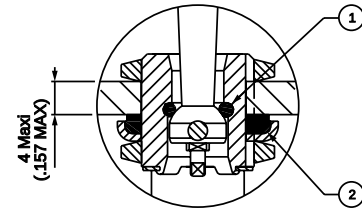
**K B** Includes both **B** and **K** above.

**K** with 1/4" (6.35mm)  
keyway bushing



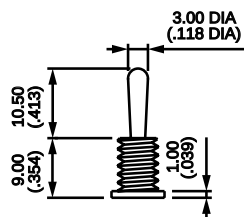
Includes gasket washer **U360**

**K** with 15/32" (11.9mm)  
flatted bushing

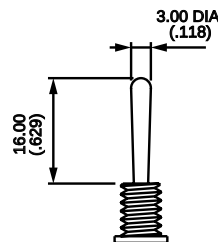


Includes gasket washer **U60**

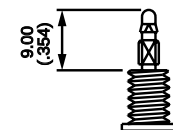
### ACTUATORS for 1/4" (6.35mm) threaded bushings



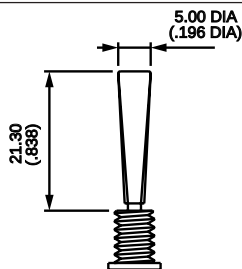
**13** Standard



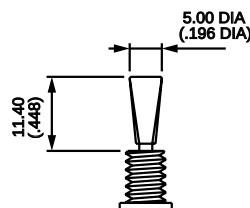
**2**



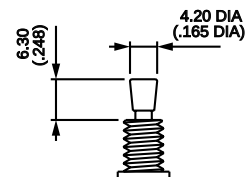
**4N** For use with paddles only



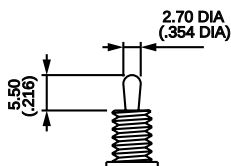
**8** Not available with option K



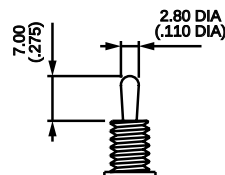
**9** Not available with option K



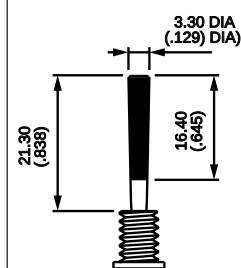
**12** Not available with option K



**16**

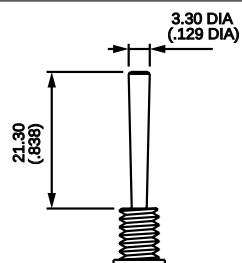


**17**

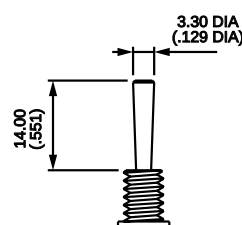


**21** Specify **U640** insulative extension with this actuator and replace '0' with color selection below.

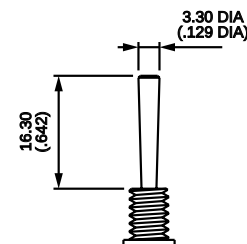
|           |          |
|-----------|----------|
| 1 blue    | 2 black  |
| 3 green   | 4 grey   |
| 5 yellow  | 6 red    |
| 7/1 white | 9 orange |



**22** Not available with option K



**23** Not available with option K



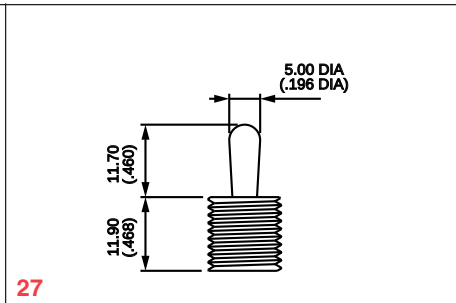
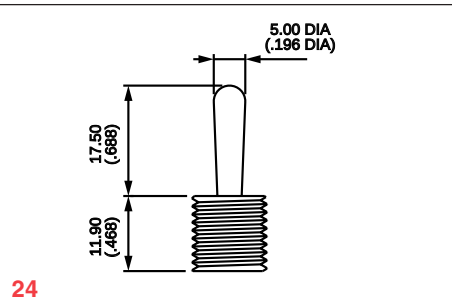
**25** Not available with option K

# 5000 SERIES - MINIATURE TOGGLE SWITCHES

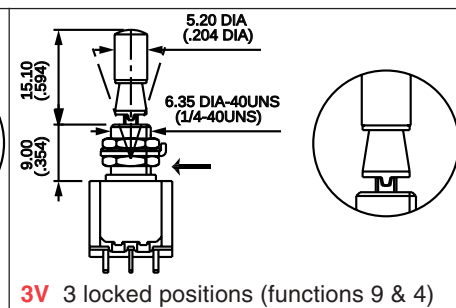
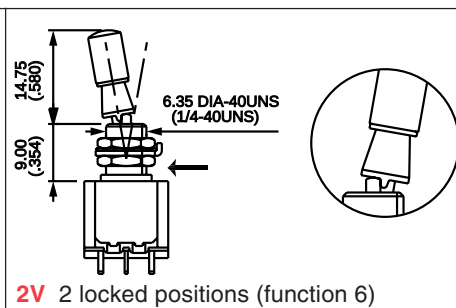
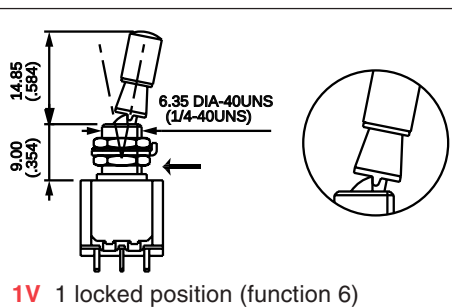
A

## OPTION DRAWINGS (cont'd.)

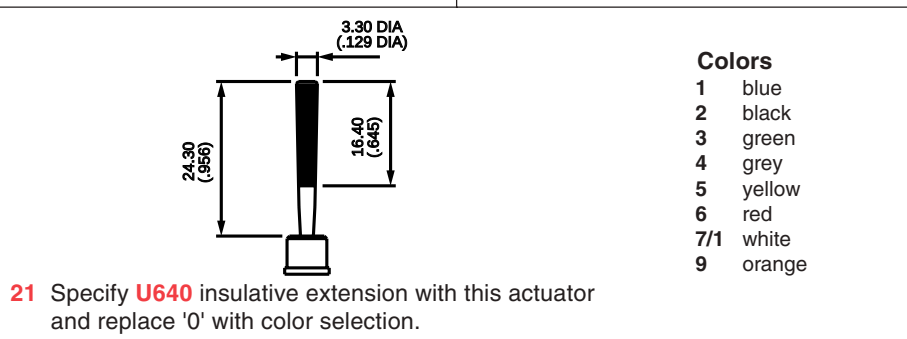
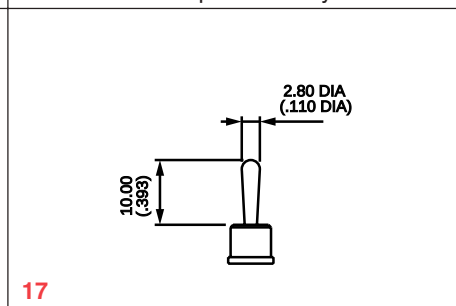
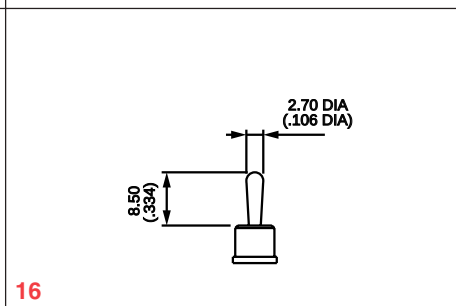
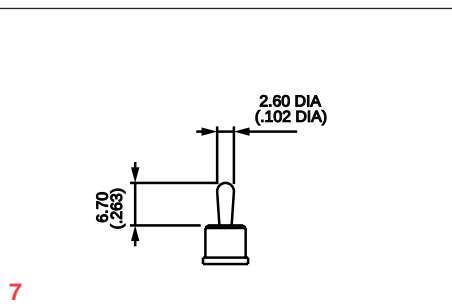
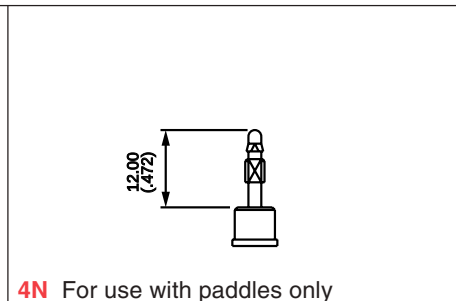
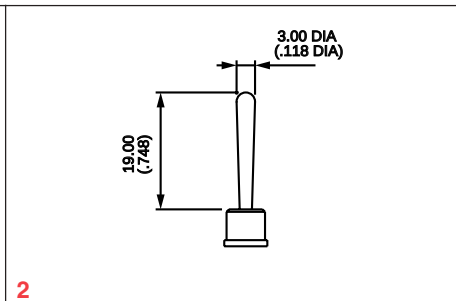
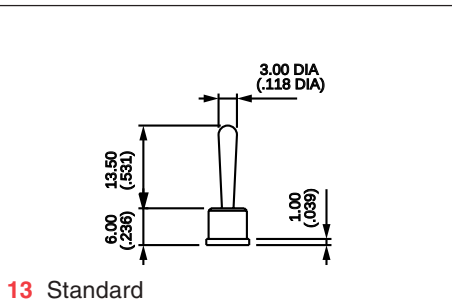
### ACTUATORS for 15/32" (11.9mm) threaded bushings



### LOCKING ACTUATORS for 1/4" (6.35mm) threaded bushings Other locking actuator styles available - consult factory.



### ACTUATORS for smooth bushing models (W, WW & Y)



#### Colors

- 1 blue
- 2 black
- 3 green
- 4 grey
- 5 yellow
- 6 red
- 7/1 white
- 9 orange

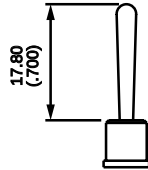
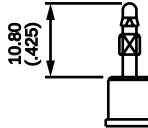
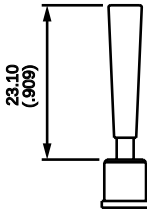
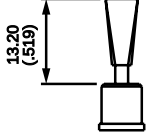
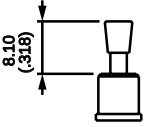
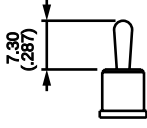
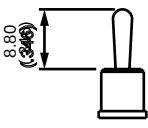
Note that for switches with mounting brackets, the actuator length may be reduced by .015" (0.4mm). Refer to individual switch drawings. '

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 5000 SERIES - MINIATURE TOGGLE SWITCHES

## OPTION DRAWINGS (cont'd.)

**ACTUATORS** for switches with X404 and X445 options (see 'special options' pages following)

|                                                                                                                                         |                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>13</b> Standard</p>                                                                                                               |  <p><b>2</b></p>                                       |  <p><b>4N</b> For use with paddles only</p>                                                                                                                                                                                                                                                         |
|  <p><b>8</b> Not available w/function 2 (ON - MOM)</p> |  <p><b>9</b> Not available w/function 2 (ON - MOM)</p> |  <p><b>12</b> Not available w/function 2 (ON - MOM)</p>                                                                                                                                                                                                                                             |
|  <p><b>16</b></p>                                    |  <p><b>17</b></p>                                    | <p><b>21</b> Specify <b>U640</b> insulative extension with this actuator and replace '0' with color selection below.</p> <p><b>Colors</b></p> <ul style="list-style-type: none"> <li><b>1</b> blue</li> <li><b>2</b> black</li> <li><b>3</b> green</li> <li><b>4</b> grey</li> <li><b>5</b> yellow</li> <li><b>6</b> red</li> <li><b>7/1</b> white</li> <li><b>9</b> orange</li> </ul> |
| <p><b>22</b> Not available with sealing option K or X408</p>                                                                            | <p><b>23</b></p>                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                        |

**INSULATING CAPS** (replace '0' in part numbers below with color code)

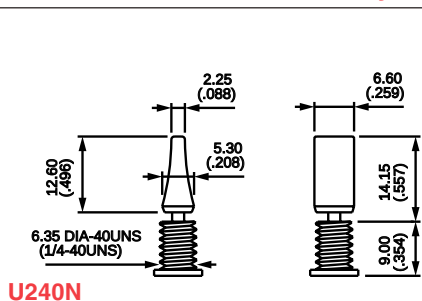
|                                                                     |                                                                    |                                                                                                              |
|---------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <p><b>U270</b> For actuator <b>13</b> and threaded bushing only</p> | <p><b>U1040</b> For actuator <b>13</b> and smooth bushing only</p> | <p><b>U1710</b> For actuator <b>17</b> and threaded bushing or actuator <b>7</b> and smooth bushing only</p> |
|---------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|

# 5000 SERIES - MINIATURE TOGGLE SWITCHES

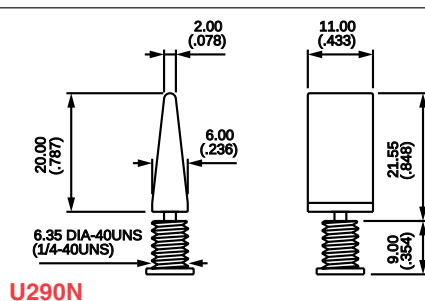
A

## OPTION DRAWINGS (cont'd.)

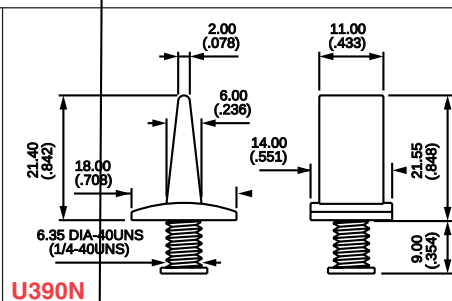
**PADDLES for actuator 4N only.** Mat'l: UL94HB Polyamide (replace '0' in part numbers below with color code from preceeding pg.)



U240N



U290N



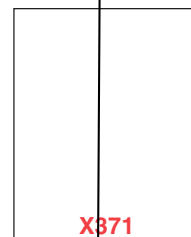
U390N

## SPECIAL OPTIONS

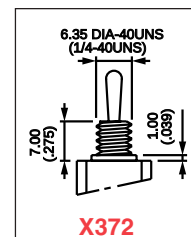
- F** Tin plated terminals (for p.c. terminals only).
- X371** Smooth bushing .246" (6.25mm) instead of standard threaded bushing.
- X372** Threaded bushing 1/4" (6.35mm). Height .274" (7mm).
- X386** Threaded bushing 1/4" (6.35mm) to replace plain bushing on models with **W**, **WW** & **Y**.
- X404** Switches with **W** option with short actuator and offset terminal bends (see Page A25).
- X435** .732" (18.6mm) long p.c. terminals - epoxy terminal seal standard.
- X438** Smooth bushing .246" (6.25mm). Height .283" (7.2mm) without shoulder.
- X442** Threaded bushing 1/4" (6.35mm). Height .389" (9.9mm).
- X445** Smooth bushing .283" (7.2mm) for **W**, **WW** & **Y** models. Available with same actuators, insulating cap and paddles as X404.
- X500** Threaded bushing 1/4" (6.35mm). Height .354" (9mm) without shoulder.
- X507** .293" (10mm) long p.c. terminals.
- X512** 1.062" (27mm) long p.c. terminals - epoxy terminal seal standard.
- X514** Spacing .564" (14.35mm) instead of .500" (12.7mm) for 3 and 4 pole **WW** models.
- X515** Smooth bushing .246" (6.25mm) without shoulder.
- X601** Silver plated brass contacts. Ratings - 0.2 amps 250 VAC, 0.4 amps 125 VAC or 0.5 amps 30 VDC. Electrical life : 20,000 cycles min. Minimum quantity: 5000 pcs.
- X681** Satin chrome actuator for flat actuators.
- X729** 1/299" (33mm) long p.c. terminals.
- X764** Special customer specified marking.
- X769** Red anodized locking lever top.
- X806** Smooth bushing .246" (6.25mm) instead of standard threaded bushing and silver plated brass contacts.
- X814** Switches for peak current. See pg. A28.
- X916** Locking lever on model with smooth bushing.

### Printed circuit terminal lengths

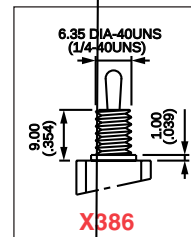
| Option      | Length L      |
|-------------|---------------|
| <b>X435</b> | .732 (18.6mm) |
| <b>X507</b> | .293 (10mm)   |
| <b>X512</b> | 1.062 (27mm)  |
| <b>X729</b> | 1.299 (33mm)  |



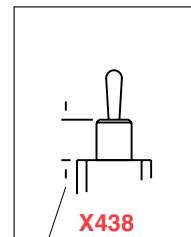
X371



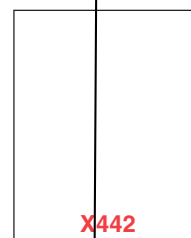
X372



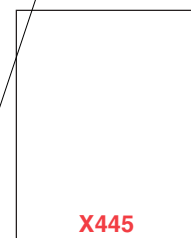
X386



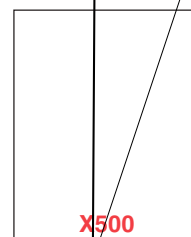
X438



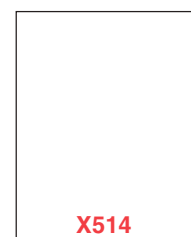
X442



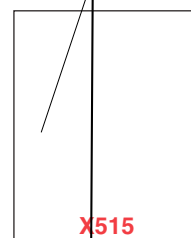
X445



X500



X514



X515



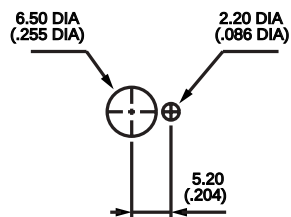
X916

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

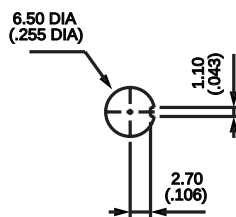
# 5000 SERIES - MINIATURE TOGGLE SWITCHES

## PANEL CUT-OUTS & MISCELLANEOUS

### PANEL CUT-OUTS for 1/4" (6.35mm) bushings

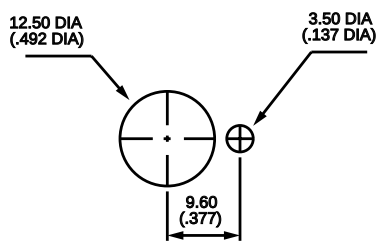


Standard (with locking ring supplied)

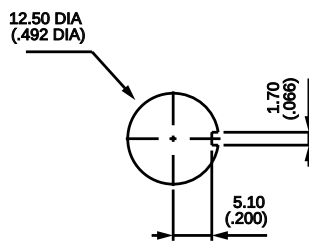


With K sealing option

### PANEL CUT-OUTS for 15/32" (11.9mm) bushings

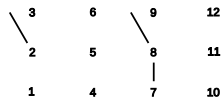
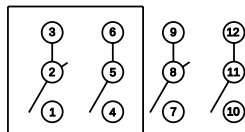
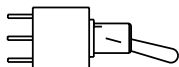


Standard (with locking ring supplied)



With K sealing option

### WIRING for function 4 switch



Equivalent to single pole 3 throw switch. Dotted lines between terminals 2 & 6 and 8 & 12 indicate external jumpers to be added by customer.

## 55000 SERIES - VDE APPROVED MINIATURE TOGGLE SWITCHES



### FEATURES

- VDE, UL and CSA recognition standard on all models.
- SPDT & DPDT models with numerous options.
- Configurations for panel, panel & p.c. and p.c. mounting.
- Epoxy terminal sealing standard on all models.

### SPECIFICATIONS

|                                           |                                                                                                |
|-------------------------------------------|------------------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | 3 Amps at 250 VAC, 6 Amps at 125 VAC                                                           |
| <b>Initial contact resistance:</b>        | 10 milliohms maximum                                                                           |
| <b>Insulation resistance:</b>             | 1000 megohms min. at 500 VDC                                                                   |
| <b>Dielectric strength:</b>               | 1000 V rms min. - between terminals<br>2000 V rms min. - between poles and terminals and frame |
| <b>Electrical life (resistive):</b>       | 50,000 cycles minimum                                                                          |
| <b>Operating temperature range:</b>       | -40°C to +85°C                                                                                 |
| <b>Insulation:</b>                        | Class 1 per IEC 1058-1                                                                         |
| <b>Contact opening:</b>                   | less than .118" (3mm)                                                                          |
| <b>Creepage distance &amp; air gap:</b>   | .118" (3mm) minimum                                                                            |

### MATERIALS

|                                  |                                                                                                                                             |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contacts &amp; Terminals:</b> | Silver                                                                                                                                      |
| <b>Actuator:</b>                 | Chrome plated brass with insulating vinyl cap or UL94HB polyamide paddle                                                                    |
| <b>Bushing:</b>                  | Nickel plated brass                                                                                                                         |
| <b>Housing:</b>                  | Stainless steel                                                                                                                             |
| <b>Case:</b>                     | Diallyl phthalate (DAP)                                                                                                                     |
| <b>Terminal seal:</b>            | Epoxy                                                                                                                                       |
| <b>Hardware:</b>                 | Panel mounting models supplied with 2 Hex Nuts .314" (8mm) across flats,<br>1 Locking Ring & 1 Lockwasher. See hardware section of catalog. |

### AGENCY RECOGNITION



VDE, UL & CSA  
Standard, and marked on all models

### ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models
- 'build your own switch' order format
- Option drawings & miscellaneous

# 55000 SERIES - VDE APPROVED MINIATURE TOGGLE SWITCHES

## 1/4-40 threaded bushing - solder lug terminals

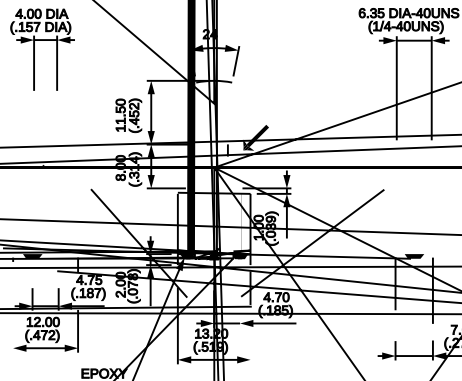
| SINGLE POLE<br>MODEL NO.       | CIRCUIT |     |    |
|--------------------------------|---------|-----|----|
| 55636AVDEULCSA+U272            | ON      | -   | ON |
| 55639AVDEULCSA+U272            | ON      | OFF | ON |
| DOUBLE POLE<br>MODEL NO.       | CIRCUIT |     |    |
| 55646AVDEULCSA+U272            | ON      | -   | ON |
| 55649AVDEULCSA+U272            | ON      | OFF | ON |
| Handle position<br>(see dwg.): | III     | II  | I  |
| Terminals<br>connected:        | 2-3     | 1-2 |    |
|                                | 5-6     | 4-5 |    |

Above models have black cap.

## 1/4-40 threaded bushing - straight p.c. terminals

| SINGLE POLE<br>MODEL NO.       | CIRCUIT |     |    |
|--------------------------------|---------|-----|----|
| 55236AVDEULCSA+U272            | ON      | -   | ON |
| 55239AVDEULCSA+U272            | ON      | OFF | ON |
| DOUBLE POLE<br>MODEL NO.       | CIRCUIT |     |    |
| 55246AVDEULCSA+U272            | ON      | -   | ON |
| 55249AVDEULCSA+U272            | ON      | OFF | ON |
| Handle position<br>(see dwg.): | III     | II  | I  |
| Terminals<br>connected:        | 2-3     | 1-2 |    |
|                                | 5-6     | 4-5 |    |

Above models have black cap.



## 1/4" smooth bushing - horizontal right angle p.c. terminals

| SINGLE POLE<br>MODEL NO.       | CIRCUIT |     |    |
|--------------------------------|---------|-----|----|
| 55236WAVDEULCSA+U1042          | ON      | -   | ON |
| 55239WAVDEULCSA+U1042          | ON      | OFF | ON |
| DOUBLE POLE<br>MODEL NO.       | CIRCUIT |     |    |
| 55246WAX433VDEULCSA+U1042      | ON      | -   | ON |
| 55249WAX433VDEULCSA+U1042      | ON      | OFF | ON |
| Handle position<br>(see dwg.): | III     | II  | I  |
| Terminals<br>connected:        | 2-3     | 1-2 |    |
|                                | 5-6     | 4-5 |    |

Above models have black cap.

Vertical right angle p.c. terminals also available on request.

## 1/4-40 threaded bushing - quick-connect terminals

| SINGLE POLE<br>MODEL NO.       | CIRCUIT |     |    |
|--------------------------------|---------|-----|----|
| 55236ZAVDEULCSA+U272           | ON      | -   | ON |
| 55239ZAVDEULCSA+U272           | ON      | OFF | ON |
| DOUBLE POLE<br>MODEL NO.       | CIRCUIT |     |    |
| 55246ZAVDEULCSA+U272           | ON      | -   | ON |
| 55249ZAVDEULCSA+U272           | ON      | OFF | ON |
| Handle position<br>(see dwg.): | III     | II  | I  |
| Terminals<br>connected:        | 2-3     | 1-2 |    |
|                                | 5-6     | 4-5 |    |

Above models have black cap.

# 55000 SERIES - VDE APPROVED MINIATURE TOGGLE SWITCHES

A

**Additional ordering information:** Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

## 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

### Model Structure:

| Series | Terminals & bushings                                                                                                                                                         | Number of poles                              | Electrical functions                   | Terminals                                                                       | Contact material     |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------|----------------------|
| 5 5    | <input type="text"/>                                                                                                                                                         | <input type="text"/>                         | <input type="text"/>                   | <input type="text"/>                                                            | <input type="text"/> |
|        | <b>2</b> Printed circuit or quick-connect terminals with 1/4-40 (6.35mm) threaded or smooth bushing.<br><b>6</b> Solder lug terminals with 1/4-40 (6.35mm) threaded bushing. | <b>3</b> Single pole<br><b>4</b> Double pole | <b>6</b> ON - ON<br><b>9</b> ON OFF ON | <b>(NONE)</b><br><b>W</b> Horizontal right angle p.c.<br><b>Z</b> Quick connect | <b>A</b> Silver      |

### Options:

#### Actuators

**NONE**

**4 N** For paddles

#### Agency Recognition

VDE, UL & CSA standard

#### Insulating caps and paddles

Caps

**U 2 7 0**

**U 1 0 4 0**

Paddles

**U 2 4 0 N**

**U 2 9 0 N**

**U 3 9 0 N**

(see drawings and color codes).

Note:  
VDE requires cap or paddle selection.

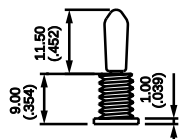
Example of completely specified model number:

**55236ZAVDEULCSA+U272**

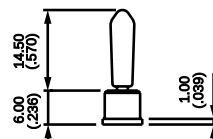
Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

## OPTION DRAWINGS

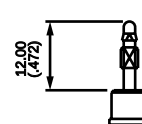
### ACTUATORS



**13** for threaded bushing models  
Cap U270 is required

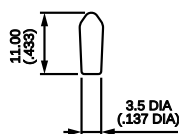


**13** for smooth bushing models  
Cap U1040 is required

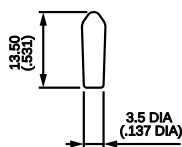


**4N** For use with paddles only  
Paddle U240N, U290N or U 390N is required.

**INSULATING CAPS** supplied cemented to lever (replace '0' in part number with color code)



**U270** for threaded bushing models



**U1040** for smooth bushing models

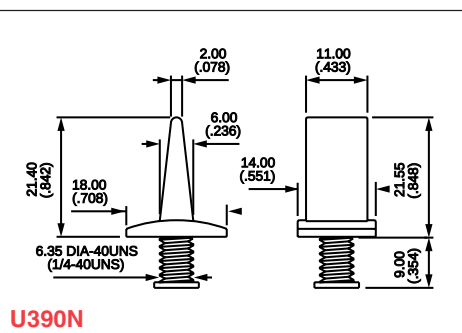
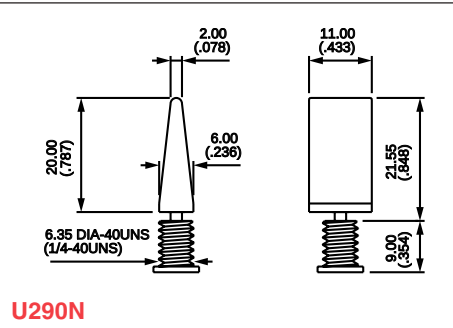
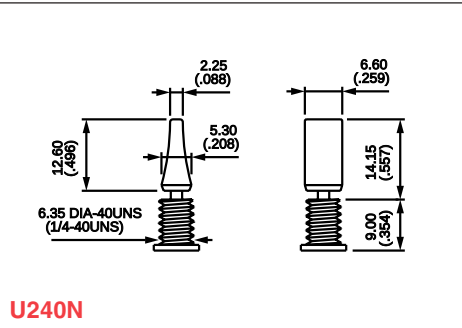
#### Colors

- 1 blue
- 2 black
- 3 green
- 4 grey
- 5 yellow
- 6 red
- 7/1 white
- 9 orange

# 55000 SERIES - VDE APPROVED MINIATURE TOGGLE SWITCHES

## OPTION DRAWINGS & MISCELLANEOUS

**PADDLES** for use with lever 4N Note: Order Paddle separately.  
(shown with threaded bushing)



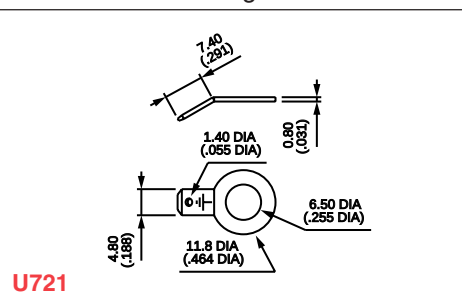
Replace '0' in part numbers  
with color code.

### Colors

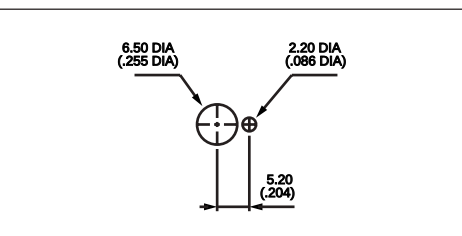
- 1 blue
- 2 black
- 3 green
- 4 grey
- 5 yellow
- 6 red
- 7/1 white
- 9 orange

**GROUNDING LUG** Note: Order Grounding Lug separately.

**IMPORTANT:** required on models with threaded bushing if panel is non-metallic or not connected to ground.



**PANEL CUT-OUT** for 1/4" threaded bushing



# ST SERIES - MINIATURE TOGGLE SWITCHES

A



## FEATURES

- Dry circuit through power ratings .
- Ultra-rugged construction SPDT & DPDT models with numerous options.
- Panel, panel & p.c. and p.c. mounting models, lighted and unlighted.

## SPECIFICATIONS

|                                           |                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | (Q) power models - coin silver: 6 Amps at 125 VAC, 3 Amps at 250 VAC or 7 Amps at 30 VDC.<br>(B) dry circuit models - gold over nickel over brass: 0.4 VA max. at 20 V max.<br>UL models - coin silver: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor). UL file no. E66367. CSA models - coin silver: same ratings as UL models. CSA file no. LR54592-1. |
| <b>Initial contact resistance:</b>        | 3 milliohms max. at 3 VDC, 0.1 Amp.                                                                                                                                                                                                                                                                                                                                 |
| <b>Insulation resistance:</b>             | Greater than 200,000 megohms between terminals & case ground.                                                                                                                                                                                                                                                                                                       |
| <b>Dielectric strength:</b>               | Greater than 2000 VAC for 1 minute between terminals & case ground.                                                                                                                                                                                                                                                                                                 |
| <b>Electrical life (resistive loads):</b> | 100,000 cycles min. for ST1-1 & ST2-1. Other models, 40,000 cycles min.                                                                                                                                                                                                                                                                                             |
| <b>Operating temperature range:</b>       | -30°C to +85°C                                                                                                                                                                                                                                                                                                                                                      |

## MATERIALS

|                                  |                                                                                                                                                                                                                                                                          |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contacts:</b>                 | Coin silver for power, UL & CSA models. Gold over nickel over brass for dry circuit models.                                                                                                                                                                              |
| <b>Actuator:</b>                 | Brass, bright nickel or chrome plated.                                                                                                                                                                                                                                   |
| <b>Bushing:</b>                  | Nickel plated brass                                                                                                                                                                                                                                                      |
| <b>Strap:</b>                    | Stainless steel                                                                                                                                                                                                                                                          |
| <b>Case:</b>                     | Melamine Phenolic, color red                                                                                                                                                                                                                                             |
| <b>Terminal seal:</b>            | Epoxy (optional)                                                                                                                                                                                                                                                         |
| <b>Support bracket:</b>          | Brass or steel, tin plated                                                                                                                                                                                                                                               |
| <b>Spring mounting bracket:</b>  | Stainless steel                                                                                                                                                                                                                                                          |
| <b>Bezel &amp; bezel insert:</b> | Nylon. Available in black, red & white. Consult factory for other colors.                                                                                                                                                                                                |
| <b>Hardware:</b>                 | See 'Miscellaneous' section.                                                                                                                                                                                                                                             |
| <b>LED:</b>                      | Intensity: 2.0 mcd at 10 mA. Forward voltage: 2.0V (3.0V max.). Max. continuous forward current: 15 mA for red, 30 mA for green & 20 mA for yellow. Red is standard. Yellow & green are optional. Specifications are subject to change without notice - consult factory. |

## AGENCY RECOGNITION



UL, & CSA. Marking: Switches ordered by UL model number are supplied with recognition marking. Switches ordered by UL model no. and with 'CSA' added at end of model no. are supplied with both recognitions marked.

## ABOUT THIS SERIES

The material in this series is organized in the following sequence:

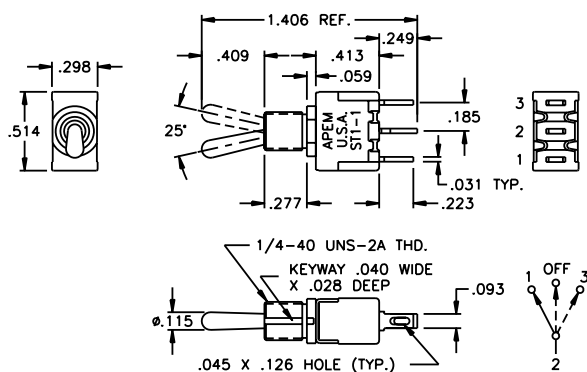
- Completely specified switch models
- Miscellaneous
- 'build your own switch' order format
- Option drawings & information
- Panel cut-outs

# ST SERIES - MINIATURE TOGGLE SWITCHES

## Solder lug terminals - panel mounting

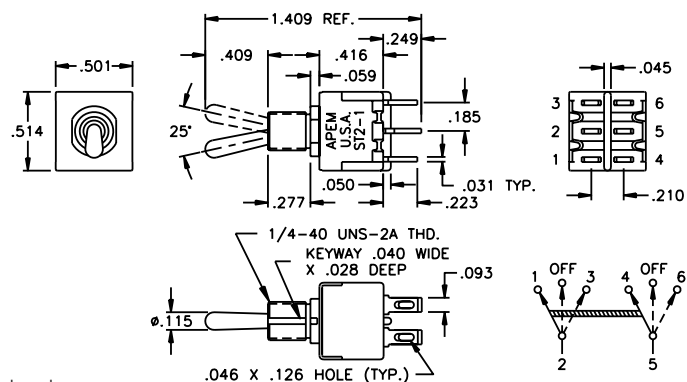
SINGLE  
POLE

DOUBLE  
POLE



SINGLE POLE

Terminal numbers  
for reference only



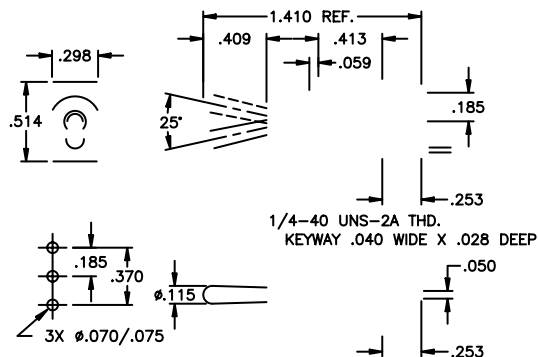
DOUBLE POLE

|                                   | POWER CKT.<br>MODEL NO. | UL MODEL NO. |  |  |  | Key<br>way |
|-----------------------------------|-------------------------|--------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------|
| Single pole                       | ST1-1KMZQ               | UL11KMZQ     | ON                                                                                  | NONE                                                                                | ON                                                                                  |            |
|                                   | ST1-2KMZQ               | UL12KMZQ     | ON                                                                                  | OFF                                                                                 | ON                                                                                  |            |
|                                   | ST1-3KMZQ               | UL13KMZQ     | MOM                                                                                 | OFF                                                                                 | MOM                                                                                 |            |
|                                   | ST1-4KMZQ               | UL14KMZQ     | ON                                                                                  | OFF                                                                                 | MOM                                                                                 |            |
|                                   | ST1-5KMZQ               | UL15KMZQ     | ON                                                                                  | NONE                                                                                | MOM                                                                                 |            |
| Double pole                       | ST2-1KMZQ               | UL21KMZQ     | ON                                                                                  | NONE                                                                                | ON                                                                                  |            |
|                                   | ST2-2KMZQ               | UL22KMZQ     | ON                                                                                  | OFF                                                                                 | ON                                                                                  |            |
|                                   | ST2-3KMZQ               | UL23KMZQ     | MOM                                                                                 | OFF                                                                                 | MOM                                                                                 |            |
|                                   | ST2-4KMZQ               | UL24KMZQ     | ON                                                                                  | OFF                                                                                 | MOM                                                                                 |            |
|                                   | ST2-5KMZQ               | UL25KMZQ     | ON                                                                                  | NONE                                                                                | MOM                                                                                 |            |
|                                   | ST2-6KMZQ               | UL26KMZQ     | ON                                                                                  | ON                                                                                  | ON                                                                                  |            |
|                                   | ST2-7KMZQ               | UL27KMZQ     | ON                                                                                  | ON                                                                                  | MOM                                                                                 |            |
|                                   | ST2-8KMZQ               | UL28KMZQ     | MOM                                                                                 | ON                                                                                  | MOM                                                                                 |            |
| Terminals connected (-6, -7 & -8) |                         |              | 1-2,<br>4-5                                                                         | 1-2,<br>5-6                                                                         | 2-3,<br>5-6                                                                         |            |

## Straight p.c. terminals - panel mounting

SINGLE  
POLE

DOUBLE  
POLE



SINGLE POLE

Terminal numbers  
for reference only

|                                   | DRY CKT.<br>MODEL NO. | UL MODEL NO. |  |  |  | Key<br>way |
|-----------------------------------|-----------------------|--------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------|
| Single pole                       | ST1-1KMCB             | UL11KMCB     | ON                                                                                    | NONE                                                                                  | ON                                                                                    |            |
|                                   | ST1-2KMCB             | UL12KMCB     | ON                                                                                    | OFF                                                                                   | ON                                                                                    |            |
|                                   | ST1-3KMCB             | UL13KMCB     | MOM                                                                                   | OFF                                                                                   | MOM                                                                                   |            |
|                                   | ST1-4KMCB             | UL14KMCB     | ON                                                                                    | OFF                                                                                   | MOM                                                                                   |            |
|                                   | ST1-5KMCB             | UL15KMCB     | ON                                                                                    | NONE                                                                                  | MOM                                                                                   |            |
| Double pole                       | ST2-1KMCB             | UL21KMCB     | ON                                                                                    | NONE                                                                                  | ON                                                                                    |            |
|                                   | ST2-2KMCB             | UL22KMCB     | ON                                                                                    | OFF                                                                                   | ON                                                                                    |            |
|                                   | ST2-3KMCB             | UL23KMCB     | MOM                                                                                   | OFF                                                                                   | MOM                                                                                   |            |
|                                   | ST2-4KMCB             | UL24KMCB     | ON                                                                                    | OFF                                                                                   | MOM                                                                                   |            |
|                                   | ST2-5KMCB             | UL25KMCB     | ON                                                                                    | NONE                                                                                  | MOM                                                                                   |            |
|                                   | ST2-6KMCB             | UL26KMCB     | ON                                                                                    | ON                                                                                    | ON                                                                                    |            |
|                                   | ST2-7KMCB             | UL27KMCB     | ON                                                                                    | ON                                                                                    | MOM                                                                                   |            |
|                                   | ST2-8KMCB             | UL28KMCB     | MOM                                                                                   | ON                                                                                    | MOM                                                                                   |            |
| Terminals connected (-6, -7 & -8) |                       |              | 1-2,<br>4-5                                                                           | 1-2,<br>5-6                                                                           | 2-3,<br>5-6                                                                           |            |

DOUBLE POLE

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# ST SERIES - MINIATURE TOGGLE SWITCHES

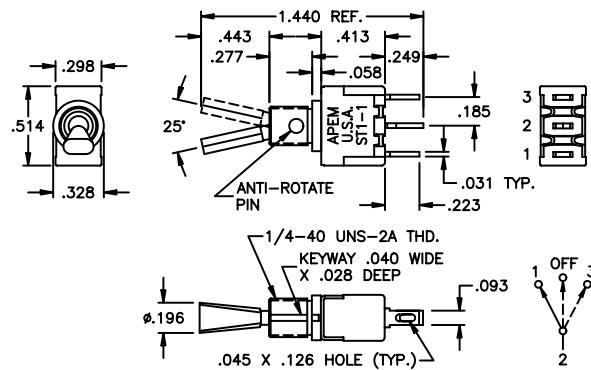
A

## Flatted actuator - panel mounting

SINGLE POLE



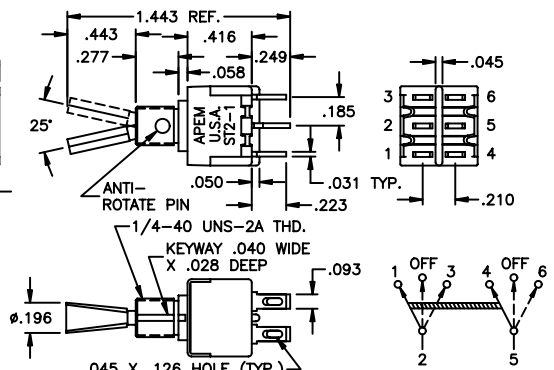
DOUBLE POLE



SINGLE POLE

Terminal numbers for reference only

|                                   | POWER CKT. MODEL NO. | UL MODEL NO. |          |          |          | Key way |
|-----------------------------------|----------------------|--------------|----------|----------|----------|---------|
| Single pole                       | ST1-1F1MZQ           | UL11F1MZQ    | ON       | NONE     | ON       |         |
|                                   | ST1-2F1MZQ           | UL12F1MZQ    | ON       | OFF      | ON       |         |
|                                   | ST1-3F1MZQ           | UL13F1MZQ    | MOM      | OFF      | MOM      |         |
|                                   | ST1-4F1MZQ           | UL14F1MZQ    | ON       | OFF      | MOM      |         |
|                                   | ST1-5F1MZQ           | UL15F1MZQ    | ON       | NONE     | MOM      |         |
| Double pole                       | ST2-1F1MZQ           | UL21F1MZQ    | ON       | NONE     | ON       |         |
|                                   | ST2-2F1MZQ           | UL22F1MZQ    | ON       | OFF      | ON       |         |
|                                   | ST2-3F1MZQ           | UL23F1MZQ    | MOM      | OFF      | MOM      |         |
|                                   | ST2-4F1MZQ           | UL24F1MZQ    | ON       | OFF      | MOM      |         |
|                                   | ST2-5F1MZQ           | UL25F1MZQ    | ON       | NONE     | MOM      |         |
|                                   | ST2-6F1MZQ           | UL26F1MZQ    | ON       | ON       | ON       |         |
|                                   | ST2-7F1MZQ           | UL27F1MZQ    | ON       | ON       | MOM      |         |
|                                   | ST2-8F1MZQ           | UL28F1MZQ    | MOM      | ON       | MOM      |         |
| Terminals connected (-6, -7 & -8) |                      |              | 1-2, 4-5 | 1-2, 5-6 | 2-3, 5-6 |         |



DOUBLE POLE

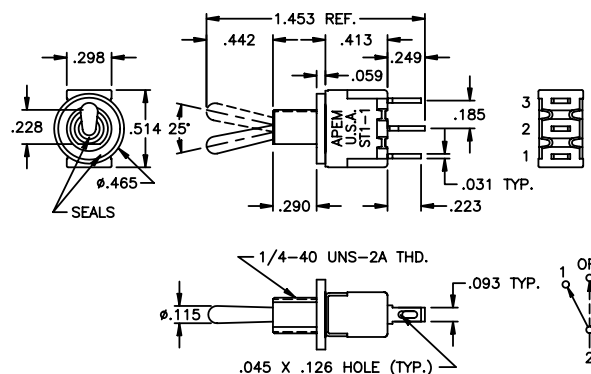
## Splashproof bushing - panel mounting

An 'o'-ring placed internally between the actuator and the bushing, and a gasket placed externally between the bushing flange and mounting panel provides static protection from 3.3 ft. (1 meter) of water for 30 minutes.

SINGLE POLE



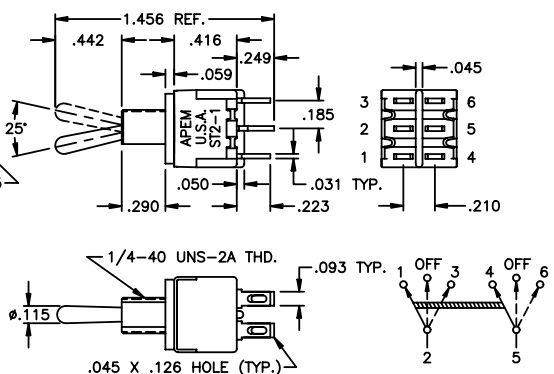
DOUBLE POLE



SINGLE POLE

Terminal numbers for reference only

|                                   | POWER CKT. MODEL NO. | UL MODEL NO. |          |          |          | Key way |
|-----------------------------------|----------------------|--------------|----------|----------|----------|---------|
| Single pole                       | ST1-1KHZQ            | UL11KHZQ     | ON       | NONE     | ON       |         |
|                                   | ST1-2KHZQ            | UL12KHZQ     | ON       | OFF      | ON       |         |
|                                   | ST1-3KHZQ            | UL13KHZQ     | MOM      | OFF      | MOM      |         |
|                                   | ST1-4KHZQ            | UL14KHZQ     | ON       | OFF      | MOM      |         |
|                                   | ST1-5KHZQ            | UL15KHZQ     | ON       | NONE     | MOM      |         |
| Double pole                       | ST2-1KHZQ            | UL21KHZQ     | ON       | NONE     | ON       |         |
|                                   | ST2-2KHZQ            | UL22KHZQ     | ON       | OFF      | ON       |         |
|                                   | ST2-3KHZQ            | UL23KHZQ     | MOM      | OFF      | MOM      |         |
|                                   | ST2-4KHZQ            | UL24KHZQ     | ON       | OFF      | MOM      |         |
|                                   | ST2-5KHZQ            | UL25KHZQ     | ON       | NONE     | MOM      |         |
|                                   | ST2-6KHZQ            | UL26KHZQ     | ON       | ON       | ON       |         |
|                                   | ST2-7KHZQ            | UL27KHZQ     | ON       | ON       | MOM      |         |
|                                   | ST2-8KHZQ            | UL28KHZQ     | MOM      | ON       | MOM      |         |
| Terminals connected (-6, -7 & -8) |                      |              | 1-2, 4-5 | 1-2, 5-6 | 2-3, 5-6 |         |



DOUBLE POLE

# ST SERIES - MINIATURE TOGGLE SWITCHES

## 15/32" threaded bushing - panel mounting

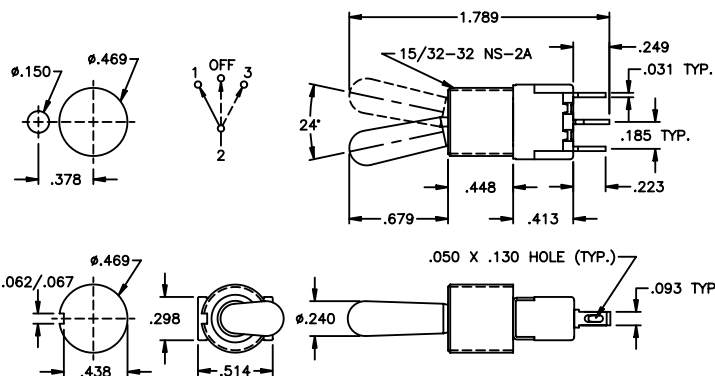
**SINGLE  
POLE  
WITH T1  
ACTUATOR**



**DOUBLE  
POLE  
WITH T2  
ACTUATOR**

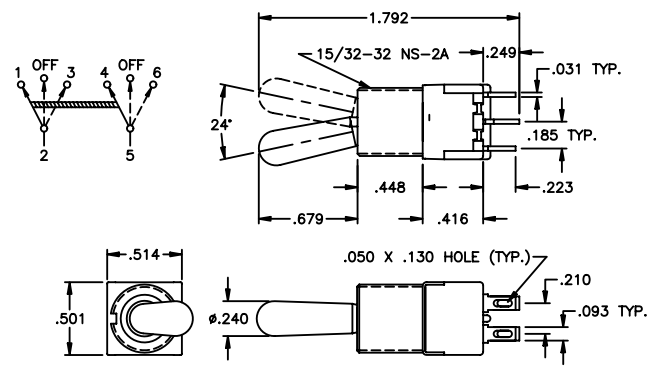


|                                   | POWER CKT.<br>MODEL NO. | UL MODEL NO. |             |             |             | Key<br>way |
|-----------------------------------|-------------------------|--------------|-------------|-------------|-------------|------------|
| Single pole                       | ST1-1T1M4ZQ             | UL11T1M4ZQ   | ON          | NONE        | ON          |            |
|                                   | ST1-2T1M4ZQ             | UL12T1M4ZQ   | ON          | OFF         | ON          |            |
|                                   | ST1-3T1M4ZQ             | UL13T1M4ZQ   | MOM         | OFF         | MOM         |            |
|                                   | ST1-4T1M4ZQ             | UL14T1M4ZQ   | ON          | OFF         | MOM         |            |
|                                   | ST1-5T1M4ZQ             | UL15T1M4ZQ   | ON          | NONE        | MOM         |            |
| Double pole                       | ST2-1T1M4ZQ             | UL21T1M4ZQ   | ON          | NONE        | ON          |            |
|                                   | ST2-2T1M4ZQ             | UL22T1M4ZQ   | ON          | OFF         | ON          |            |
|                                   | ST2-3T1M4ZQ             | UL23T1M4ZQ   | MOM         | OFF         | MOM         |            |
|                                   | ST2-4T1M4ZQ             | UL24T1M4ZQ   | ON          | OFF         | MOM         |            |
|                                   | ST2-5T1M4ZQ             | UL25T1M4ZQ   | ON          | NONE        | MOM         |            |
|                                   | ST2-6T1M4ZQ             | UL26T1M4ZQ   | ON          | ON          | ON          |            |
|                                   | ST2-7T1M4ZQ             | UL27T1M4ZQ   | ON          | ON          | MOM         |            |
|                                   | ST2-8T1M4ZQ             | UL28T1M4ZQ   | MOM         | ON          | MOM         |            |
| Terminals connected (-6, -7 & -8) |                         |              | 1-2,<br>4-5 | 1-2,<br>5-6 | 2-3,<br>5-6 |            |



**SINGLE POLE**

Terminal numbers  
for reference only



**DOUBLE POLE**

## Straight p.c. terminals with bracket - p.c. mounting

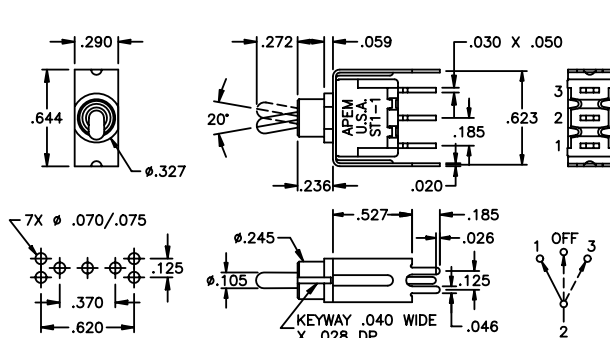
**SINGLE  
POLE**



**DOUBLE  
POLE**

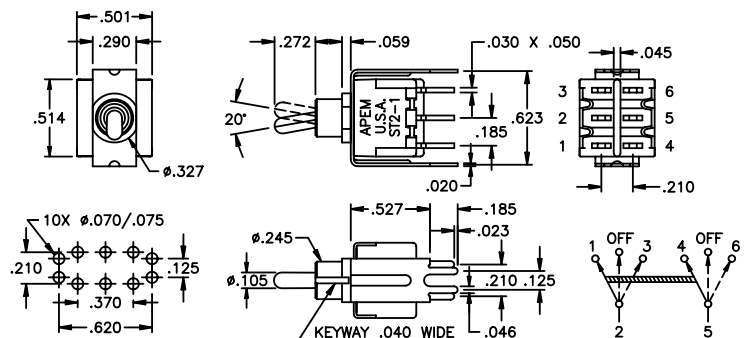


|                                   | DRY CKT.<br>MODEL NO. | UL MODEL NO. |             |             |             | Key<br>way |
|-----------------------------------|-----------------------|--------------|-------------|-------------|-------------|------------|
| Single pole                       | ST1-1L3S3V30B         | UL11L3S3V30Q | ON          | NONE        | ON          |            |
|                                   | ST1-2L3S3V30B         | UL12L3S3V30Q | ON          | OFF         | ON          |            |
|                                   | ST1-3L3S3V30B         | UL13L3S3V30Q | MOM         | OFF         | MOM         |            |
|                                   | ST1-4L3S3V30B         | UL14L3S3V30Q | ON          | OFF         | MOM         |            |
|                                   | ST1-5L3S3V30B         | UL15L3S3V30Q | ON          | NONE        | MOM         |            |
| Double pole                       | ST2-1L3S3V30B         | UL21L3S3V30Q | ON          | NONE        | ON          |            |
|                                   | ST2-2L3S3V30B         | UL22L3S3V30Q | ON          | OFF         | ON          |            |
|                                   | ST2-3L3S3V30B         | UL23L3S3V30Q | MOM         | OFF         | MOM         |            |
|                                   | ST2-4L3S3V30B         | UL24L3S3V30Q | ON          | OFF         | MOM         |            |
|                                   | ST2-5L3S3V30B         | UL25L3S3V30Q | ON          | NONE        | MOM         |            |
|                                   | ST2-6L3S3V30B         | UL26L3S3V30Q | ON          | ON          | ON          |            |
|                                   | ST2-7L3S3V30B         | UL27L3S3V30Q | ON          | ON          | MOM         |            |
|                                   | ST2-8L3S3V30B         | UL28L3S3V30Q | MOM         | ON          | MOM         |            |
| Terminals connected (-6, -7 & -8) |                       |              | 1-2,<br>4-5 | 1-2,<br>5-6 | 2-3,<br>5-6 |            |



**SINGLE POLE**

Terminal numbers  
for reference only



**DOUBLE POLE**

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# ST SERIES - MINIATURE TOGGLE SWITCHES

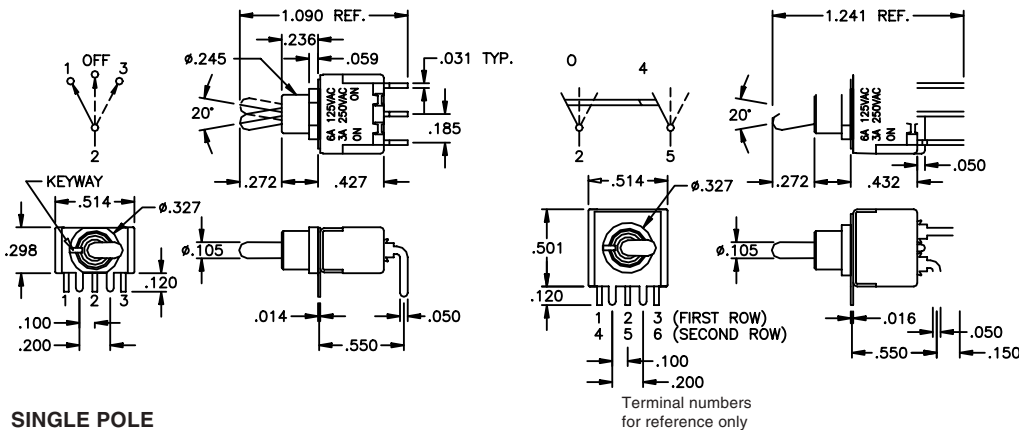
A

## Horizontal right angle p.c. terminals - p.c. mounting

SINGLE  
POLE

DOUBLE  
POLE

|                                   | DRY CKT.<br>MODEL NO. | UL MODEL NO. |  |  |  | Key<br>way |
|-----------------------------------|-----------------------|--------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------|
| Single pole                       | ST1-1L3S3AB           | UL11L3S3AQ   | ON                                                                                  | NONE                                                                                | ON                                                                                  |            |
|                                   | ST1-2L3S3AB           | UL12L3S3AQ   | ON                                                                                  | OFF                                                                                 | ON                                                                                  |            |
|                                   | ST1-3L3S3AB           | UL13L3S3AQ   | MOM                                                                                 | OFF                                                                                 | MOM                                                                                 |            |
|                                   | ST1-4L3S3AB           | UL14L3S3AQ   | ON                                                                                  | OFF                                                                                 | MOM                                                                                 |            |
|                                   | ST1-5L3S3AB           | UL15L3S3AQ   | ON                                                                                  | NONE                                                                                | MOM                                                                                 |            |
| Double pole                       | ST2-1L3S3AB           | UL21L3S3AQ   | ON                                                                                  | NONE                                                                                | ON                                                                                  |            |
|                                   | ST2-2L3S3AB           | UL22L3S3AQ   | ON                                                                                  | OFF                                                                                 | ON                                                                                  |            |
|                                   | ST2-3L3S3AB           | UL23L3S3AQ   | MOM                                                                                 | OFF                                                                                 | MOM                                                                                 |            |
|                                   | ST2-4L3S3AB           | UL24L3S3AQ   | ON                                                                                  | OFF                                                                                 | MOM                                                                                 |            |
|                                   | ST2-5L3S3AB           | UL25L3S3AQ   | ON                                                                                  | NONE                                                                                | MOM                                                                                 |            |
|                                   | ST2-6L3S3AB           | UL26L3S3AQ   | ON                                                                                  | ON                                                                                  | ON                                                                                  |            |
|                                   | ST2-7L3S3AB           | UL27L3S3AQ   | ON                                                                                  | ON                                                                                  | MOM                                                                                 |            |
|                                   | ST2-8L3S3AB           | UL28L3S3AQ   | MOM                                                                                 | ON                                                                                  | MOM                                                                                 |            |
| Terminals connected (-6, -7 & -8) |                       |              | 1-2,<br>4-5                                                                         | 1-2,<br>5-6                                                                         | 2-3,<br>5-6                                                                         |            |



SINGLE POLE

DOUBLE POLE

## Vertical right angle p.c. terminals - p.c. mounting

SINGLE  
POLE

DOUBLE  
POLE

|                                   | DRY CKT.<br>MODEL NO. | UL MODEL NO. |  |  |  | Key<br>way |
|-----------------------------------|-----------------------|--------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------|
| Single pole                       | ST1-1L3S3V-1B         | UL11L3S3V-1Q | ON                                                                                    | NONE                                                                                  | ON                                                                                    |            |
|                                   | ST1-2L3S3V-1B         | UL12L3S3V-1Q | ON                                                                                    | OFF                                                                                   | ON                                                                                    |            |
|                                   | ST1-3L3S3V-1B         | UL13L3S3V-1Q | MOM                                                                                   | OFF                                                                                   | MOM                                                                                   |            |
|                                   | ST1-4L3S3V-1B         | UL14L3S3V-1Q | ON                                                                                    | OFF                                                                                   | MOM                                                                                   |            |
|                                   | ST1-5L3S3V-1B         | UL15L3S3V-1Q | ON                                                                                    | NONE                                                                                  | MOM                                                                                   |            |
| Double pole                       | ST2-1L3S3V-1B         | UL21L3S3V-1Q | ON                                                                                    | NONE                                                                                  | ON                                                                                    |            |
|                                   | ST2-2L3S3V-1B         | UL22L3S3V-1Q | ON                                                                                    | OFF                                                                                   | ON                                                                                    |            |
|                                   | ST2-3L3S3V-1B         | UL23L3S3V-1Q | MOM                                                                                   | OFF                                                                                   | MOM                                                                                   |            |
|                                   | ST2-4L3S3V-1B         | UL24L3S3V-1Q | ON                                                                                    | OFF                                                                                   | MOM                                                                                   |            |
|                                   | ST2-5L3S3V-1B         | UL25L3S3V-1Q | ON                                                                                    | NONE                                                                                  | MOM                                                                                   |            |
|                                   | ST2-6L3S3V-1B         | UL26L3S3V-1Q | ON                                                                                    | ON                                                                                    | ON                                                                                    |            |
|                                   | ST2-7L3S3V-1B         | UL27L3S3V-1Q | ON                                                                                    | ON                                                                                    | MOM                                                                                   |            |
|                                   | ST2-8L3S3V-1B         | UL28L3S3V-1Q | MOM                                                                                   | ON                                                                                    | MOM                                                                                   |            |
| Terminals connected (-6, -7 & -8) |                       |              | 1-2,<br>4-5                                                                           | 1-2,<br>5-6                                                                           | 2-3,<br>5-6                                                                           |            |

SINGLE POLE

Terminal numbers  
for reference only

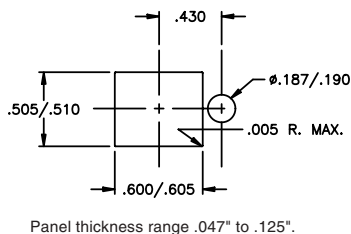
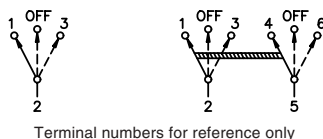
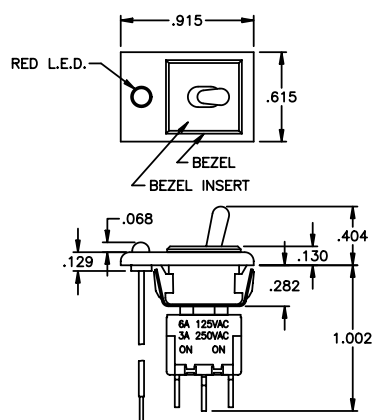
DOUBLE POLE

# ST SERIES - MINIATURE TOGGLE SWITCHES

## Snap-in bezel with outboard LED

PATENT NO.  
Des. 282,524

UL11KMZQJ6128



|                                   | POWER CKT.<br>MODEL NO. | UL MODEL NO.  | USA marking on opposite side |          |          |
|-----------------------------------|-------------------------|---------------|------------------------------|----------|----------|
|                                   |                         |               | ON                           | NONE     | ON       |
| Single pole                       | ST1-1KMZQJ6122          | UL11KMZQJ6122 | ON                           | NONE     | ON       |
|                                   | ST1-2KMZQJ6122          | UL12KMZQJ6122 | ON                           | OFF      | ON       |
|                                   | ST1-3KMZQJ6122          | UL13KMZQJ6122 | MOM                          | OFF      | MOM      |
|                                   | ST1-4KMZQJ6122          | UL14KMZQJ6122 | ON                           | OFF      | MOM      |
|                                   | ST1-5KMZQJ6122          | UL15KMZQJ6122 | ON                           | NONE     | MOM      |
| Double pole                       | ST2-1KMZQJ6122          | UL21KMZQJ6122 | ON                           | NONE     | ON       |
|                                   | ST2-2KMZQJ6122          | UL22KMZQJ6122 | ON                           | OFF      | ON       |
|                                   | ST2-3KMZQJ6122          | UL23KMZQJ6122 | MOM                          | OFF      | MOM      |
|                                   | ST2-4KMZQJ6122          | UL24KMZQJ6122 | ON                           | OFF      | MOM      |
|                                   | ST2-5KMZQJ6122          | UL25KMZQJ6122 | ON                           | NONE     | MOM      |
|                                   | ST2-6KMZQJ6122          | UL26KMZQJ6122 | ON                           | ON       | ON       |
|                                   | ST2-7KMZQJ6122          | UL27KMZQJ6122 | ON                           | ON       | MOM      |
|                                   | ST2-8KMZQJ6122          | UL28KMZQJ6122 | MOM                          | ON       | MOM      |
| Terminals connected (-6, -7 & -8) |                         |               | 1-2, 4-5                     | 1-2, 5-6 | 2-3, 5-6 |

Above models have black bezel and insert.

## Snap-in bezel with 0, 1 or 2 inboard LEDs

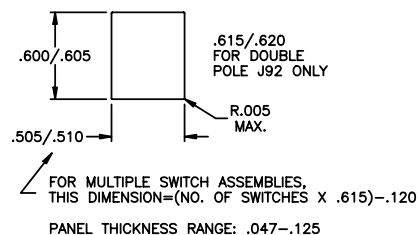
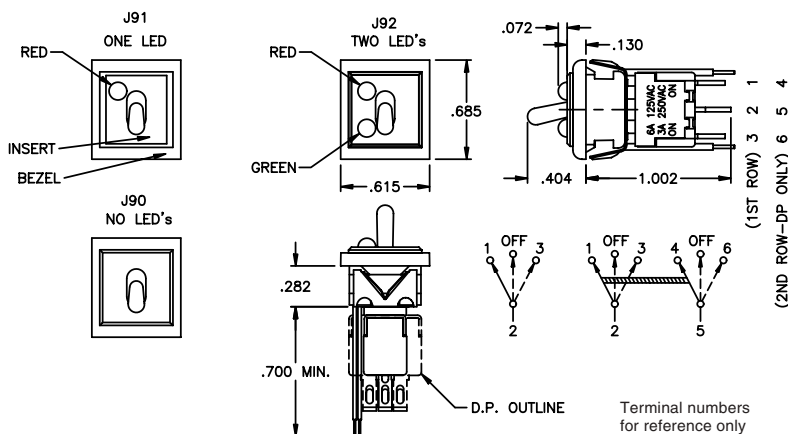
PATENT NO.  
Des. 282,524

ST1-1KMZQJ9128



|                                   | POWER CKT.<br>MODEL NO. | UL MODEL NO.  | USA marking on opposite side |          |          |
|-----------------------------------|-------------------------|---------------|------------------------------|----------|----------|
|                                   |                         |               | ON                           | NONE     | ON       |
| Single pole                       | ST1-1KMZQJ9122          | UL11KMZQJ9122 | ON                           | NONE     | ON       |
|                                   | ST1-2KMZQJ9122          | UL12KMZQJ9122 | ON                           | OFF      | ON       |
|                                   | ST1-3KMZQJ9122          | UL13KMZQJ9122 | MOM                          | OFF      | MOM      |
|                                   | ST1-4KMZQJ9122          | UL14KMZQJ9122 | ON                           | OFF      | MOM      |
|                                   | ST1-5KMZQJ9122          | UL15KMZQJ9122 | ON                           | NONE     | MOM      |
| Double pole                       | ST2-1KMZQJ9122          | UL21KMZQJ9122 | ON                           | NONE     | ON       |
|                                   | ST2-2KMZQJ9122          | UL22KMZQJ9122 | ON                           | OFF      | ON       |
|                                   | ST2-3KMZQJ9122          | UL23KMZQJ9122 | MOM                          | OFF      | MOM      |
|                                   | ST2-4KMZQJ9122          | UL24KMZQJ9122 | ON                           | OFF      | MOM      |
|                                   | ST2-5KMZQJ9122          | UL25KMZQJ9122 | ON                           | NONE     | MOM      |
|                                   | ST2-6KMZQJ9122          | UL26KMZQJ9122 | ON                           | ON       | ON       |
|                                   | ST2-7KMZQJ9122          | UL27KMZQJ9122 | ON                           | ON       | MOM      |
|                                   | ST2-8KMZQJ9122          | UL28KMZQJ9122 | MOM                          | ON       | MOM      |
| Terminals connected (-6, -7 & -8) |                         |               | 1-2, 4-5                     | 1-2, 5-6 | 2-3, 5-6 |

Above models have black bezel and insert.



# ST SERIES - MINIATURE TOGGLE SWITCHES

A

## Bezel for p.c. mounted switches with 0, 1 or 2 LEDs

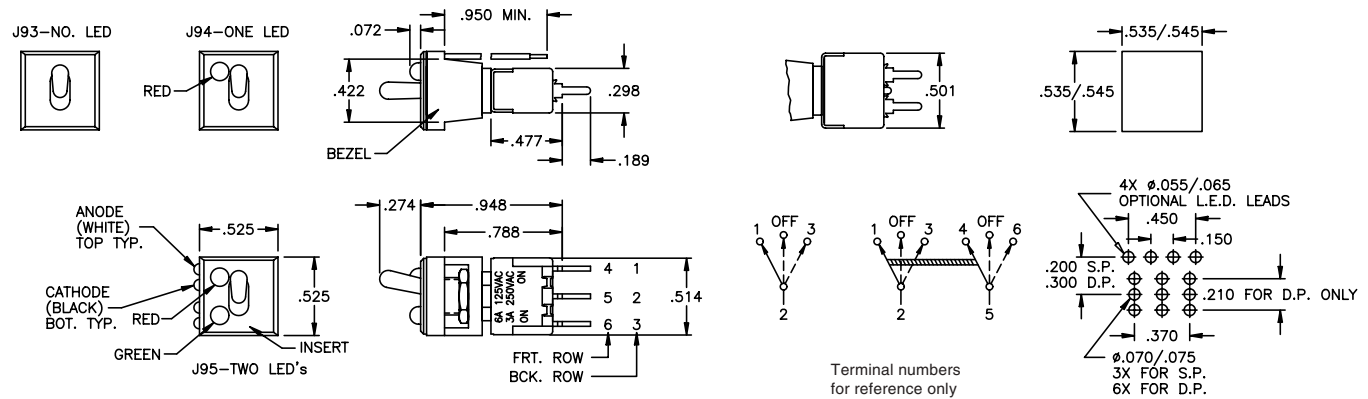
PATENT NO.  
Des. 282,524

ST1-1KMCBJ9488



|                                   | DRY CKT.<br>MODEL NO. | UL MODEL NO.  | USA marking on opposite side |             |             |
|-----------------------------------|-----------------------|---------------|------------------------------|-------------|-------------|
| Single pole                       | ST1-1KMCBJ9422        | UL11KMCCJ9422 | ON                           | NONE        | ON          |
|                                   | ST1-2KMCBJ9422        | UL12KMCCJ9422 | ON                           | OFF         | ON          |
|                                   | ST1-3KMCBJ9422        | UL13KMCCJ9422 | MOM                          | OFF         | MOM         |
|                                   | ST1-4KMCBJ9422        | UL14KMCCJ9422 | ON                           | OFF         | MOM         |
|                                   | ST1-5KMCBJ9422        | UL15KMCCJ9422 | ON                           | NONE        | MOM         |
| Double pole                       | ST2-1KMCBJ9422        | UL21KMCCJ9422 | ON                           | NONE        | ON          |
|                                   | ST2-2KMCBJ9422        | UL22KMCCJ9422 | ON                           | OFF         | ON          |
|                                   | ST2-3KMCBJ9422        | UL23KMCCJ9422 | MOM                          | OFF         | MOM         |
|                                   | ST2-4KMCBJ9422        | UL24KMCCJ9422 | ON                           | OFF         | MOM         |
|                                   | ST2-5KMCBJ9422        | UL25KMCCJ9422 | ON                           | NONE        | MOM         |
|                                   | ST2-6KMCBJ9422        | UL26KMCCJ9422 | ON                           | ON          | ON          |
|                                   | ST2-7KMCBJ9422        | UL27KMCCJ9422 | ON                           | ON          | MOM         |
|                                   | ST2-8KMCBJ9422        | UL28KMCCJ9422 | MOM                          | ON          | MOM         |
| Terminals connected (-6, -7 & -8) |                       |               | 1-2,<br>4-5                  | 1-2,<br>5-6 | 2-3,<br>5-6 |

Above models have black bezel and insert.



## Bezel for p.c. mounted switches with 0, 1 or 2 LEDs

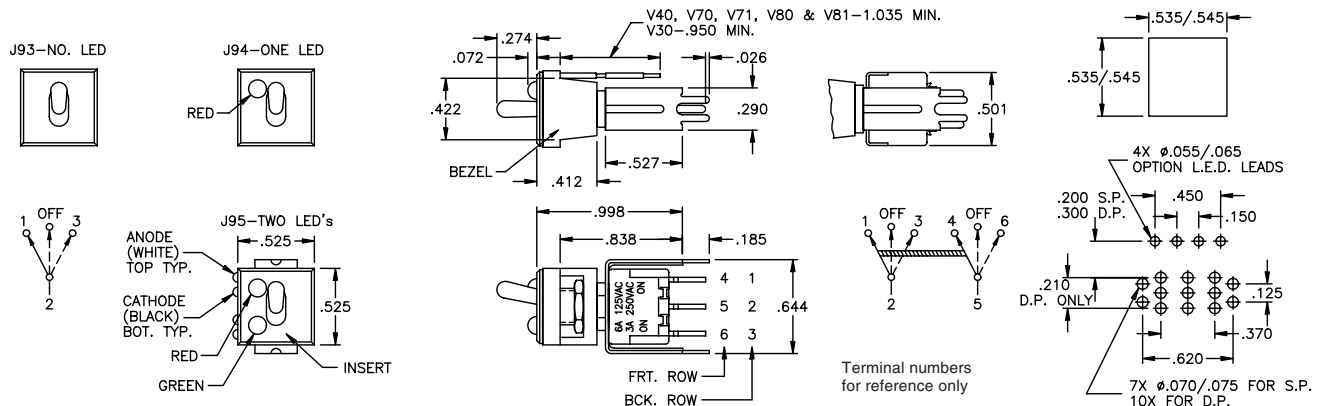
PATENT NO.  
Des. 282,524

ST1-1KMV30QJ9488



|                                   | DRY CKT.<br>MODEL NO. | UL MODEL NO.    | USA marking on opposite side |             |             |
|-----------------------------------|-----------------------|-----------------|------------------------------|-------------|-------------|
| Single pole                       | ST1-1KMV30BJ9422      | UL11KMV30QJ9422 | ON                           | NONE        | ON          |
|                                   | ST1-2KMV30BJ9422      | UL12KMV30QJ9422 | ON                           | OFF         | ON          |
|                                   | ST1-3KMV30BJ9422      | UL13KMV30QJ9422 | MOM                          | OFF         | MOM         |
|                                   | ST1-4KMV30BJ9422      | UL14KMV30QJ9422 | ON                           | OFF         | MOM         |
|                                   | ST1-5KMV30BJ9422      | UL15KMV30QJ9422 | ON                           | NONE        | MOM         |
| Double pole                       | ST2-1KMV30BJ9422      | UL21KMV30QJ9422 | ON                           | NONE        | ON          |
|                                   | ST2-2KMV30BJ9422      | UL22KMV30QJ9422 | ON                           | OFF         | ON          |
|                                   | ST2-3KMV30BJ9422      | UL23KMV30QJ9422 | MOM                          | OFF         | MOM         |
|                                   | ST2-4KMV30BJ9422      | UL24KMV30QJ9422 | ON                           | OFF         | MOM         |
|                                   | ST2-5KMV30BJ9422      | UL25KMV30QJ9422 | ON                           | NONE        | MOM         |
|                                   | ST2-6KMV30BJ9422      | UL26KMV30QJ9422 | ON                           | ON          | ON          |
|                                   | ST2-7KMV30BJ9422      | UL27KMV30QJ9422 | ON                           | ON          | MOM         |
|                                   | ST2-8KMV30BJ9422      | UL28KMV30QJ9422 | MOM                          | ON          | MOM         |
| Terminals connected (-6, -7 & -8) |                       |                 | 1-2,<br>4-5                  | 1-2,<br>5-6 | 2-3,<br>5-6 |

Above models have black bezel and insert.



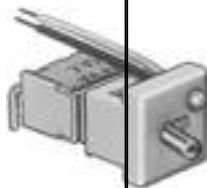
# ST SERIES - MINIATURE TOGGLE SWITCHES

## Bezel for right angle p.c. mtd. switches with 0, 1 or 2 LEDs

PATENT NO.  
Des. 282,524

ST1-1KMA-1BJ9488

| Poles | Option | Dim. A | Dim. B    |
|-------|--------|--------|-----------|
| SP    | A      | .148   | .045 max. |
| SP    | A-1    | .164   | .095 max. |
| DP    | A      | .250   | .300 max. |
| DP    | A-1    | .266   | .350 max. |



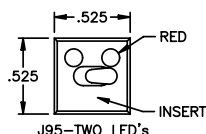
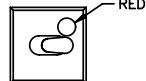
|                                   | DRY CKT.<br>MODEL NO. | UL MODEL NO.    | USA marking on opposite side |          |          |
|-----------------------------------|-----------------------|-----------------|------------------------------|----------|----------|
|                                   |                       |                 | ON                           | NONE     | ON       |
| Single pole                       | ST1-1KMA-1BJ9422      | UL11KMA-1QJ9422 | ON                           | NONE     | ON       |
|                                   | ST1-2KMA-1BJ9422      | UL12KMA-1QJ9422 | ON                           | OFF      | ON       |
|                                   | ST1-3KMA-1BJ9422      | UL13KMA-1QJ9422 | MOM                          | OFF      | MOM      |
|                                   | ST1-4KMA-1BJ9422      | UL14KMA-1QJ9422 | ON                           | OFF      | MOM      |
|                                   | ST1-5KMA-1BJ9422      | UL15KMA-1QJ9422 | ON                           | NONE     | MOM      |
| Double pole                       | ST2-1KMA-1BJ9422      | UL21KMA-1QJ9422 | ON                           | NONE     | ON       |
|                                   | ST2-2KMA-1BJ9422      | UL22KMA-1QJ9422 | ON                           | OFF      | ON       |
|                                   | ST2-3KMA-1BJ9422      | UL23KMA-1QJ9422 | MOM                          | OFF      | MOM      |
|                                   | ST2-4KMA-1BJ9422      | UL24KMA-1QJ9422 | ON                           | OFF      | MOM      |
|                                   | ST2-5KMA-1BJ9422      | UL25KMA-1QJ9422 | ON                           | NONE     | MOM      |
|                                   | ST2-6KMA-1BJ9422      | UL26KMA-1QJ9422 | ON                           | ON       | ON       |
|                                   | ST2-7KMA-1BJ9422      | UL27KMA-1QJ9422 | ON                           | ON       | MOM      |
|                                   | ST2-8KMA-1BJ9422      | UL28KMA-1QJ9422 | MOM                          | ON       | MOM      |
| Terminals connected (-6, -7 & -8) |                       |                 | 1-2, 4-5                     | 1-2, 5-6 | 2-3, 5-6 |

Above models have black bezel and insert.

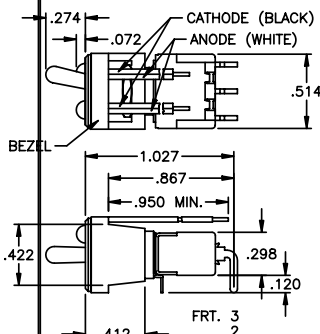
J93—NO. LED



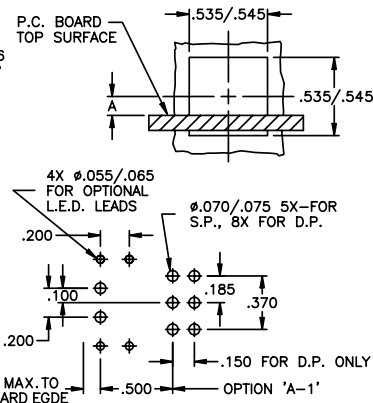
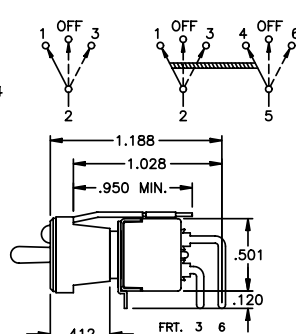
J94—ONE LED



J95—TWO LED's



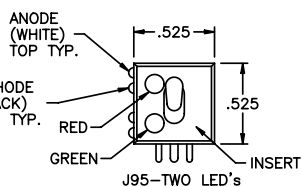
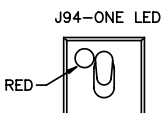
Terminal numbers  
for reference only



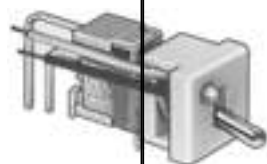
## Bezel for right angle p.c. mtd. switches with 0, 1 or 2 LEDs

PATENT NO.  
Des. 282,524

ST1-1KMV-1BJ9488

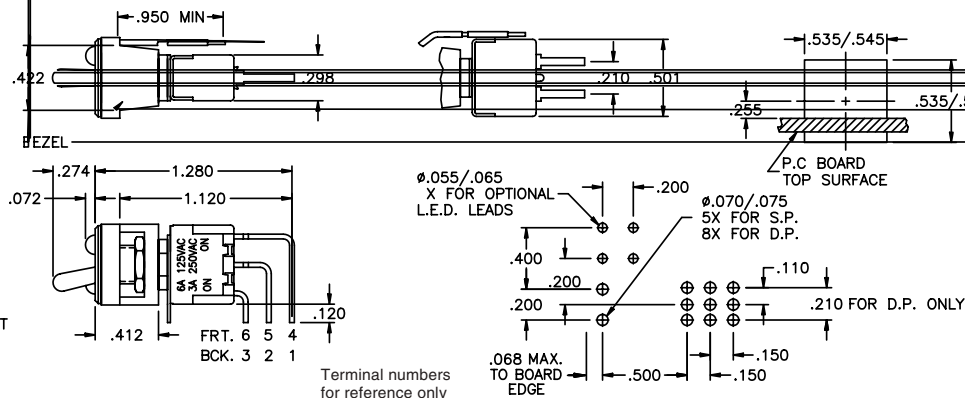


J95—TWO LED's



|                                   | DRY CKT.<br>MODEL NO. | UL MODEL NO.    | USA marking on opposite side |          |          |
|-----------------------------------|-----------------------|-----------------|------------------------------|----------|----------|
|                                   |                       |                 | ON                           | NONE     | ON       |
| Single pole                       | ST1-1KMV-1BJ9422      | UL11KMV-1QJ9422 | ON                           | NONE     | ON       |
|                                   | ST1-2KMV-1BJ9422      | UL12KMV-1QJ9422 | ON                           | OFF      | ON       |
|                                   | ST1-3KMV-1BJ9422      | UL13KMV-1QJ9422 | MOM                          | OFF      | MOM      |
|                                   | ST1-4KMV-1BJ9422      | UL14KMV-1QJ9422 | ON                           | OFF      | MOM      |
|                                   | ST1-5KMV-1BJ9422      | UL15KMV-1QJ9422 | ON                           | NONE     | MOM      |
| Double pole                       | ST2-1KMV-1BJ9422      | UL21KMV-1QJ9422 | ON                           | NONE     | ON       |
|                                   | ST2-2KMV-1BJ9422      | UL22KMV-1QJ9422 | ON                           | OFF      | ON       |
|                                   | ST2-3KMV-1BJ9422      | UL23KMV-1QJ9422 | MOM                          | OFF      | MOM      |
|                                   | ST2-4KMV-1BJ9422      | UL24KMV-1QJ9422 | ON                           | OFF      | MOM      |
|                                   | ST2-5KMV-1BJ9422      | UL25KMV-1QJ9422 | ON                           | NONE     | MOM      |
|                                   | ST2-6KMV-1BJ9422      | UL26KMV-1QJ9422 | ON                           | ON       | ON       |
|                                   | ST2-7KMV-1BJ9422      | UL27KMV-1QJ9422 | ON                           | ON       | MOM      |
|                                   | ST2-8KMV-1BJ9422      | UL28KMV-1QJ9422 | MOM                          | ON       | MOM      |
| Terminals connected (-6, -7 & -8) |                       |                 | 1-2, 4-5                     | 1-2, 5-6 | 2-3, 5-6 |

Above models have black bezel and insert.



Terminal numbers  
for reference only



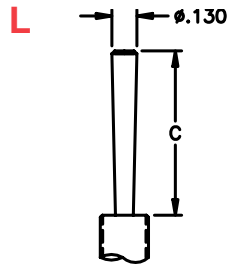


# ST SERIES - MINIATURE TOGGLE SWITCHES

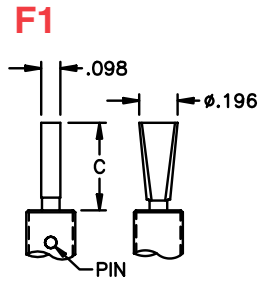
A

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

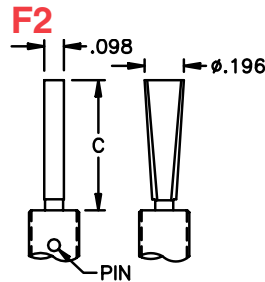
## ACTUATOR OPTIONS



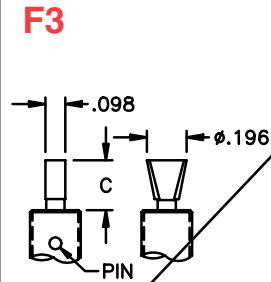
**L**  
LONG ROUND



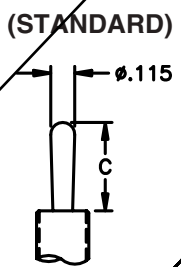
**F1**  
FLATTED



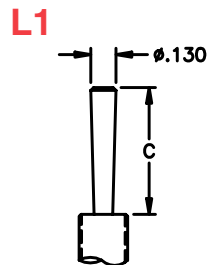
**F2**  
LONG FLATTED



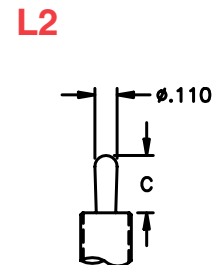
**F3**  
SHORT FLATTED



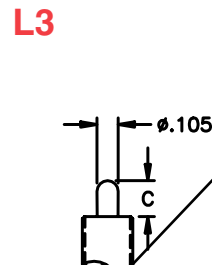
**K (STANDARD)**  
ROUND



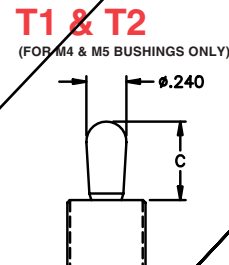
**L1**  
MEDIUM ROUND



**L2**  
SHORT ROUND



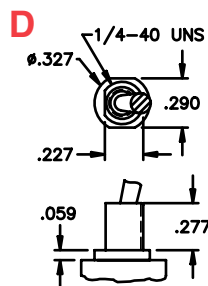
**L3**  
SHORT ROUND



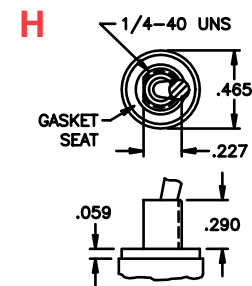
**T1 & T2**  
(FOR M4 & M5 BUSHINGS ONLY)  
LONG & SHORT ROUND

**T3 & T4**  
Same as T1 & T2 respectively except with positive internal keying and sideways support to provide more ruggedness in harsh applications.  
Available only with M4 bushing

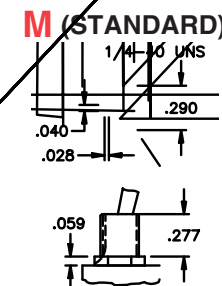
## BUSHING OPTIONS



**D**  
THREADED



**H**  
SPLASHPROOF



**M (STANDARD)**  
THREADED

**Y**  
LONG THREADED

**S2**

NON THREADED

**S3**

NON THREADED

**M4 & M5**

THREADED

M5 FEATURES  
'O'-RING FOR  
SPLASHPROOF  
APPLICATIONS

## ACTUATOR & BUSHING COMPATIBILITY TABLE WITH DIMENSIONS FOR SELECTIONS

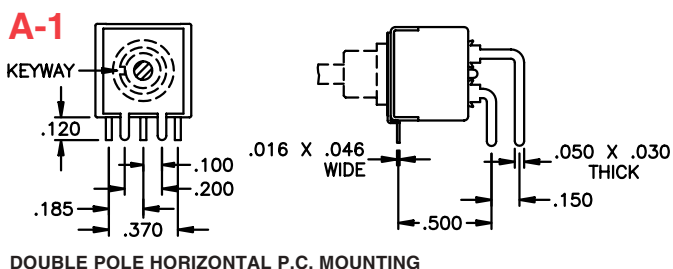
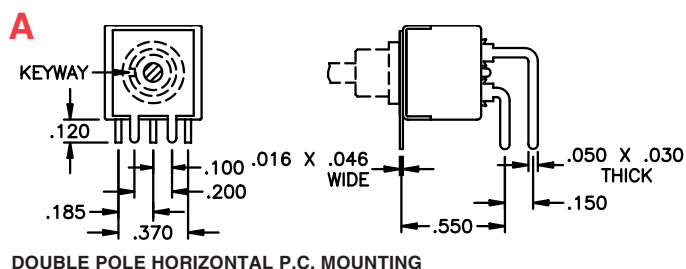
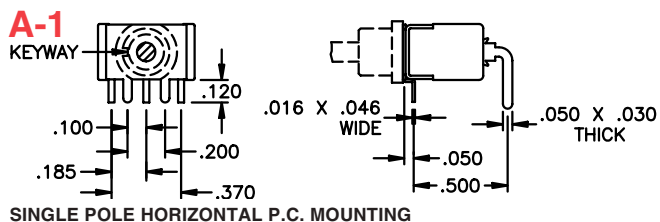
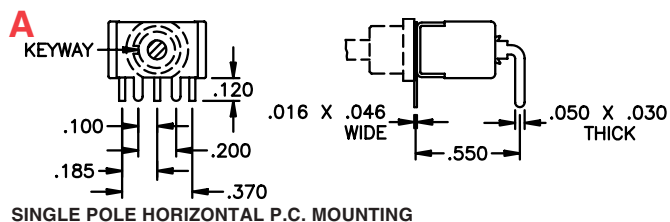
| Bushing Option | Bushing Dims. |       | Actuator length dimension C |      |      |      |      |      |      |      |      |      |
|----------------|---------------|-------|-----------------------------|------|------|------|------|------|------|------|------|------|
|                | Dim A         | Dim B | F1                          | F2   | F3   | K    | L    | L1   | L2   | L3   | T1   | T2   |
| <b>D</b>       | .277          | .060  | N/A                         | N/A  | N/A  | .410 | .840 | .640 | .270 | .170 | N/A  | N/A  |
| <b>H</b>       | .290          | .060  | N/A                         | N/A  | N/A  | .410 | .840 | .640 | .270 | .170 | N/A  | N/A  |
| <b>M</b>       | .277          | .060  | .450                        | .650 | .250 | .410 | .840 | .640 | .270 | .170 | N/A  | N/A  |
| <b>Y</b>       | .330          | .040  | N/A                         | N/A  | N/A  | .410 | .840 | .640 | .270 | .170 | N/A  | N/A  |
| <b>S2</b>      | .277          | .060  | .450                        | .650 | .250 | .410 | .840 | .640 | .270 | .170 | N/A  | N/A  |
| <b>S3</b>      | .177          | .060  | N/A                         | N/A  | N/A  | .510 | .940 | .740 | .370 | .270 | N/A  | N/A  |
| <b>M4</b>      | .448          | -     | N/A                         | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | .460 | .687 |
| <b>M5</b>      | .448          | -     | N/A                         | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | .460 | .687 |

N/A - NOT AVAILABLE

CONSULT FACTORY FOR SPECIAL REQUIREMENTS

# ST SERIES - MINIATURE TOGGLE SWITCHES

## TERMINATION OPTIONS



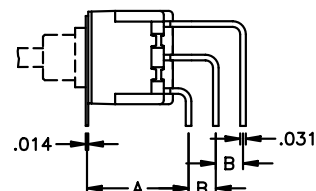
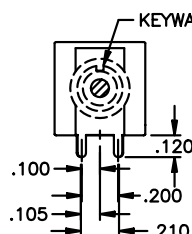
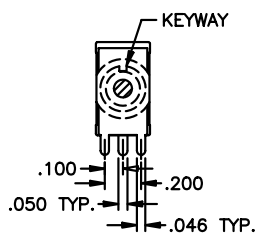
## V, V-1 & V-2

FRONT VIEW  
SINGLE POLE

FRONT VIEW  
DOUBLE POLE

SIDE VIEW - SINGLE & DOUBLE POLE

| Option | Dim. A | Dim. B |
|--------|--------|--------|
| V      | .550   | .150   |
| V-1    | .500   | .150   |
| V-2    | .500   | .100   |

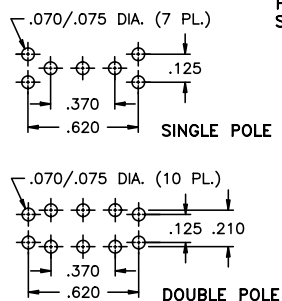


VERTICAL P.C. MOUNTING

## V30, V40, V70, V80, V31, V41, V71 & V81

PANEL LAYOUT  
V30, V31, V40 & V41

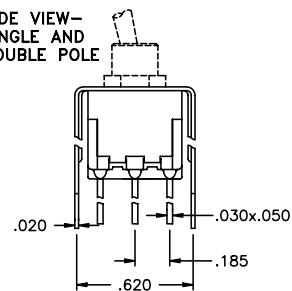
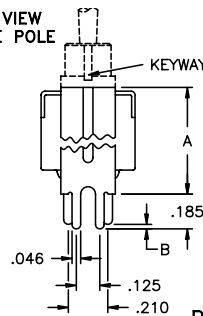
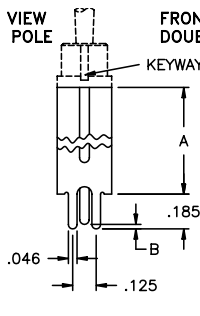
| Option  | Dim. A | Dim. B |
|---------|--------|--------|
| V30-V31 | .527   | .024   |
| V40-V41 | .647   | .048   |



FRONT VIEW  
SINGLE POLE

FRONT VIEW  
DOUBLE POLE

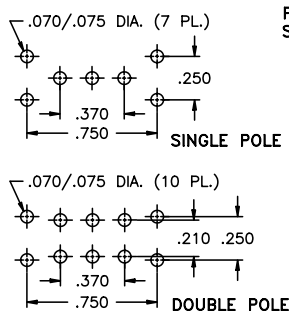
SIDE VIEW -  
SINGLE AND  
DOUBLE POLE



PRINTED CIRCUIT MOUNTING

PANEL LAYOUT  
V70, V71,  
V80 & V81

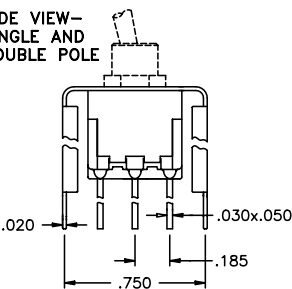
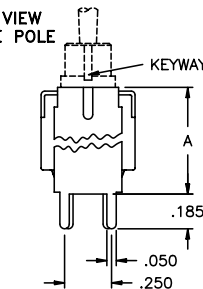
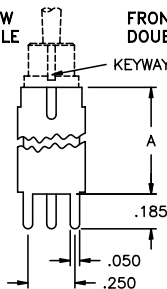
| Option  | Dim. A |
|---------|--------|
| V70-V71 | .630   |
| V80-V81 | .953   |



FRONT VIEW  
SINGLE POLE

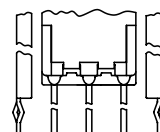
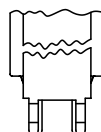
FRONT VIEW  
DOUBLE POLE

SIDE VIEW -  
SINGLE AND  
DOUBLE POLE



PRINTED CIRCUIT MOUNTING

V31, V41, V71 & V81 ARE THE SAME AS V30, V40, V70 & V80 RESPECTIVELY, EXCEPT WITH CRIMPED LEG DESIGN FOR P.C. BOARD RETENTION, AS SHOWN TO RIGHT.

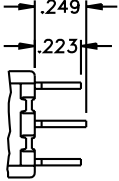
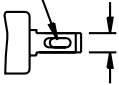
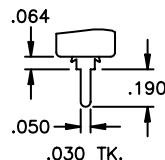
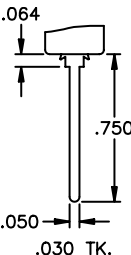
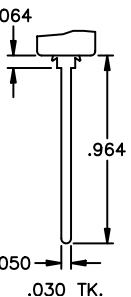
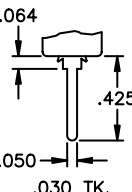
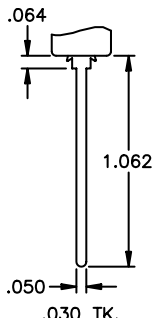


# ST SERIES - MINIATURE TOGGLE SWITCHES

A

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

## TERMINATION OPTIONS (CONT'D.)

| Z                                                                                                                                                                                           | C                                                                                                           | W                                                                                                    | W1                                                                                                        | W3                                                                                                           | X                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| <br><br><b>SOLDER LUG</b> | <br><b>PRINTED CIRCUIT</b> | <br><b>WIREWRAP</b> | <br><b>LONG WIREWRAP</b> | <br><b>SHORT WIREWRAP</b> | <br><b>EXTRA LG. WIREWRAP</b> |

## CONTACT MATERIAL OPTIONS

|          |                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>B</b> | Dry circuit - gold over nickel over brass.<br>RATING: 0.4 Volt-Amps (VA) max. at 20 V max.<br>ELECTRIC LIFE: 100,000 cycles min. (ST1-1 & ST2-1 only - other models 40,000 cycles min.)                                                                                                                                                                                                                       |
| <b>Q</b> | Power circuit - coin silver.<br>RATING: 6 Amps at 125 VAC, 3 Amps at 250 VAC or 7 Amps at 30 VDC (resistive loads).<br>ELECTRIC LIFE: 100,000 cycles min. (ST1-1 & ST2-1 only - other models 40,000 cycles min.)                                                                                                                                                                                              |
| <b>G</b> | Dry circuit or power circuit - gold over nickel over coin silver.<br>RATINGS & ELECTRIC LIFE: Same as B & Q above - i.e. - can be used in either dry circuit or power circuit, however once used in power circuit, switch cannot be re-used in dry circuit. This option satisfies those customers who have both dry circuit and power circuit requirements, but prefer to inventory only one switch for both. |
| <b>N</b> | Dry circuit - gold over nickel over brass. Note- less gold than B option.<br>RATING: 0.4 Volt-Amps (VA) max. at 20 V max.<br>ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.                                                                                                                                                                                                                       |
| <b>T</b> | Power circuit - Silver plate over brass.<br>RATING: 3 Amps at 125 VAC or 1.5 Amps at 250 VAC (resistive loads).<br>ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.                                                                                                                                                                                                                                 |

Solder dipped terminals and custom contact plating available - contact factory.

## UL & CSA OPTIONS

|            |                                                                                                                                                                                                                                                                                                                                                                            |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>UL</b>  | For power circuits - coin silver<br>RATING: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor).<br>Underwriter Laboratories file no. E66367. To specify, order UL model no. Note - applicable only to terminations with coin silver contacts (Q or G options).                                                                                                      |
| <b>CSA</b> | For power circuits - coin silver<br>RATING: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor). Canadian Standards Association file no. LR54592-1. To specify, UL model number, then add 'CSA' to complete switch number. Note - applicable only to terminations with coin silver contacts (Q or G options) as CSA recognizes switches for power applications only. |

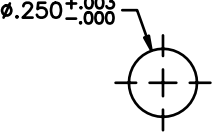
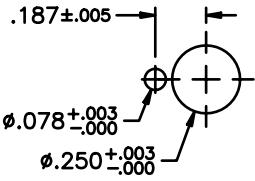
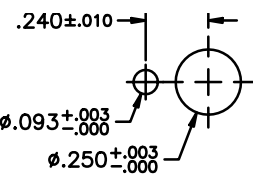
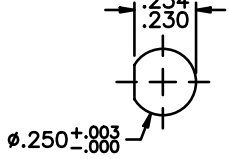
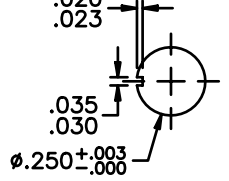
## SEALING & MISCELLANEOUS OPTIONS

|                                                                                                                                                                                                                                                                    |                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>E</b>                                                                                                                                                                                                                                                           | <b>/R</b>                                                                                                           |
| <p>Epoxy terminal sealing: Available with all terminal configurations.</p> <p>The space between terminal &amp; case hole is sealed with epoxy all around terminal.</p> <p>Provides maximum protection from entry of flux or contaminants into the switch case.</p> | <p>To specify reverse switch action on non-symmetrical models with bushing keyway, add '/R' to switch model no.</p> |
|                                                                                                                                                                                                                                                                    | <b>22</b>                                                                                                           |
|                                                                                                                                                                                                                                                                    | <p>Black finish is available on actuator, bushing &amp; hardware. To specify, add '-22' to switch model no.</p>     |

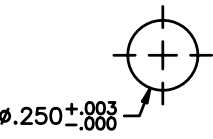
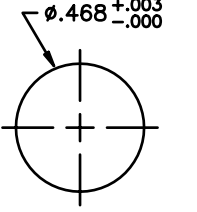
# ST SERIES - MINIATURE TOGGLE SWITCHES

## PANEL CUT-OUTS

### Cut-outs that accept all 1/4-40 threaded bushings:

|                                                                                                         |                                                                                                                     |                                                                                                                     |                                                                                                          |                                                                                                                         |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|  <p>Without keying</p> |  <p>With A107 anti-rotate ring</p> |  <p>With A158 anti-rotate ring</p> |  <p>With D bushing</p> |  <p>With slotted keyway bushings</p> |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|

### Cut-outs that accept non-threaded 1/4" bushings and 15/32" threaded bushings:

|                                                                                                                                 |                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|  <p>Accepts all non-threaded 1/4" bushings</p> |  <p>15/32" threaded bushings</p> |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|

# 11000 SERIES - PROFESSIONAL TOGGLE SWITCHES

A



## FEATURES

- Designed for high rel defense, space and telecommunications applications.
- SPDT, DPDT, 3PDT & 4PDT models with 1/4-40 threaded bushing.
- Models for panel and p.c. mounting.
- Bright chrome or matte black finish on bushing, actuator and hardware.

## SPECIFICATIONS

|                                           |                                                                                                                                                                                                           |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | Silver & gold plated silver; 2 Amps at 250 VAC, 4 Amps at 125 VAC or 4 Amps at 30 VDC. (Less than 100 mA 30 VDC to prevent damage to gold plating.)<br>Gold rivet; 200 mA at 250 VAC or 400 mA at 125 VAC |
| <b>Initial contact resistance:</b>        | 10 milliohms maximum                                                                                                                                                                                      |
| <b>Insulation resistance:</b>             | 1000 megohms min. at 500 VDC                                                                                                                                                                              |
| <b>Dielectric strength:</b>               | 1000 V rms min. - between terminals<br>2000 V rms min. - between poles and terminals and frame                                                                                                            |
| <b>Electrical life:</b>                   | Silver: 50,000 cycles min. Gold plated silver: 20,000 cycles min.<br>Gold rivet: 2 positions - 80,000 cycles min. 3 positions - 50,000 cycles min.                                                        |
| <b>Low level or mechanical life:</b>      | 2 positions - 150,000 cycles min. 3 positions - 100,000 cycles min.                                                                                                                                       |
| <b>Operating temperature range:</b>       | -40°C to +85°C                                                                                                                                                                                            |

## MATERIALS

|                       |                                                                                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Contacts :</b>     | Silver, gold plated silver or solid gold rivet                                                                     |
| <b>Actuator:</b>      | Chrome plated brass                                                                                                |
| <b>Bushing:</b>       | Nickel plated brass                                                                                                |
| <b>Housing:</b>       | Nickel plated brass                                                                                                |
| <b>Case:</b>          | Diallyl phthalate (DAP)                                                                                            |
| <b>Terminal seal:</b> | Epoxy                                                                                                              |
| <b>Hardware:</b>      | Supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog. |

## AGENCY RECOGNITION

CECC, LNZ, GAM T1, QPL (Europe), MUAHAG

Availability: Consult factory for details of recognized models.

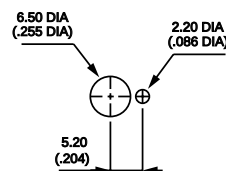
Marking: To order switches marked CECC or ESA/SCC, complete the appropriate box of the ordering format. Other listings do not appear on the switches.

## ABOUT THIS SERIES

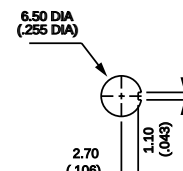
The material in this series is organized in the following sequence:

- Completely specified switch models
- 'build your own switch' order format
- Option drawings

## PANEL CUT-OUTS



Standard



With K sealing option

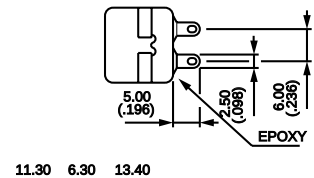
# 11000 SERIES - PROFESSIONAL TOGGLE SWITCHES

## Solder lug terminals - single pole - silver contacts

| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 11136A                         | ON      | -   | ON  |
| 11139A                         | ON      | OFF | ON  |
| 11137A                         | MOM     | OFF | MOM |
| 11138A                         | ON      | OFF | MOM |
| Handle position<br>(see dwg.): | I       | II  | III |

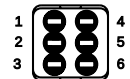
## Solder lug terminals - double pole - silver contacts

| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 11146A                         | ON      | -   | ON  |
| 11149A                         | ON      | OFF | ON  |
| 11147A                         | MOM     | OFF | MOM |
| 11148A                         | ON      | OFF | MOM |
| Handle position<br>(see dwg.): | I       | II  | III |



11.30 6.30 13.40

26



0.70

## Solder lug terminals - three pole - silver contacts

| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 11156A                         | ON      | -   | ON  |
| 11159A                         | ON      | OFF | ON  |
| 11157A                         | MOM     | OFF | MOM |
| 11158A                         | ON      | OFF | MOM |
| Handle position<br>(see dwg.): | I       | II  | III |

## Solder lug terminals - four pole - silver contacts

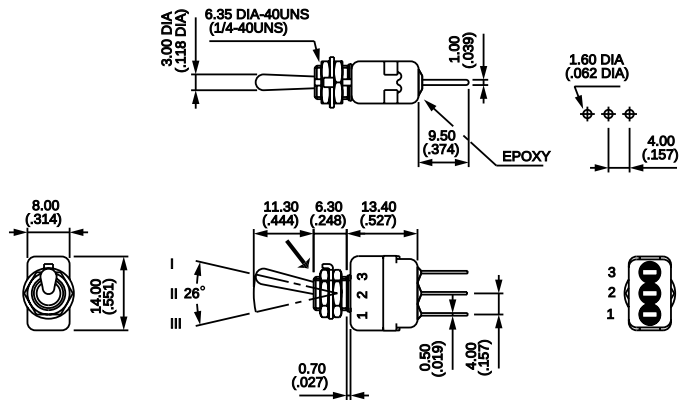
| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 11166A                         | ON      | -   | ON  |
| 11169A                         | ON      | OFF | ON  |
| 11167A                         | MOM     | OFF | MOM |
| 11168A                         | ON      | OFF | MOM |
| Handle position<br>(see dwg.): | I       | II  | III |

# 11000 SERIES - PROFESSIONAL TOGGLE SWITCHES

A

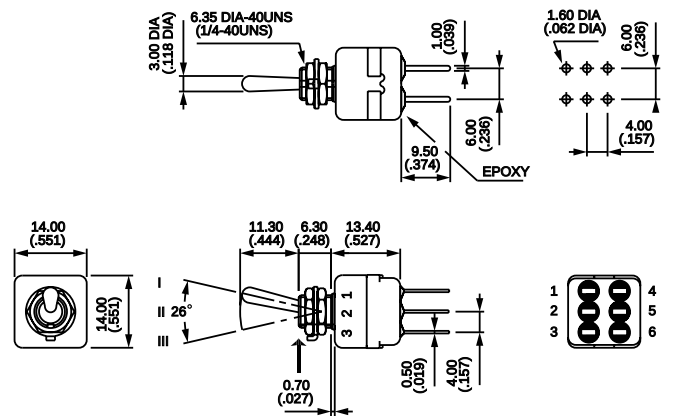
## Straight p.c. terminals - single pole - silver contacts

| MODEL NO.                      | CIRCUIT |    |     |
|--------------------------------|---------|----|-----|
| 11236A                         | ON      | -  | ON  |
| Handle position<br>(see dwg.): | I       | II | III |



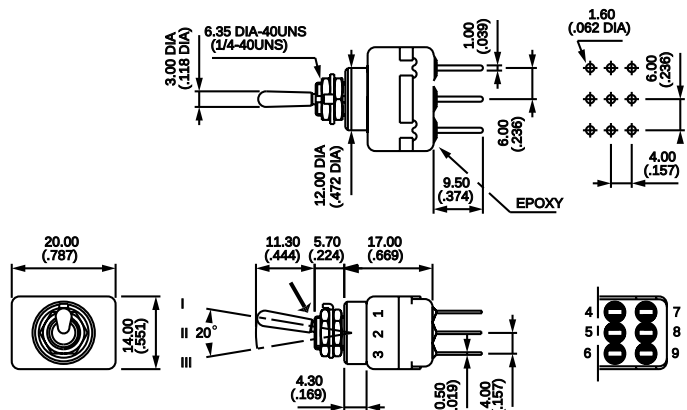
## Straight p.c. terminals - double pole - silver contacts

| MODEL NO.                      | CIRCUIT |    |     |
|--------------------------------|---------|----|-----|
| 11246A                         | ON      | -  | ON  |
| Handle position<br>(see dwg.): | I       | II | III |



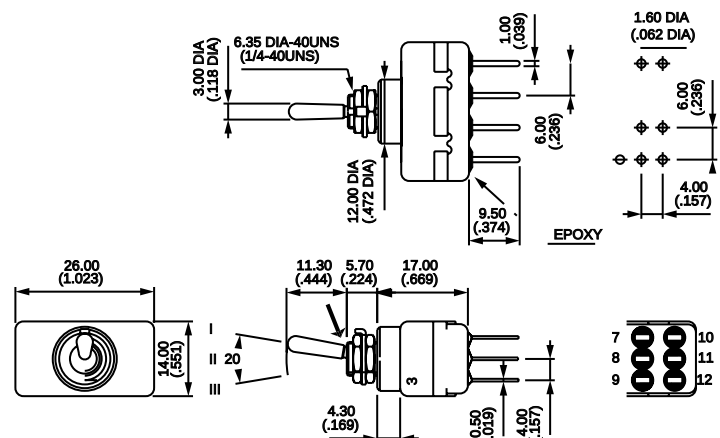
## Straight p.c. terminals - three pole - silver contacts

| MODEL NO.                      | CIRCUIT |    |     |
|--------------------------------|---------|----|-----|
| 11256A                         | ON      | -  | ON  |
| Handle position<br>(see dwg.): | I       | II | III |



## Straight p.c. terminals - four pole - silver contacts

| MODEL NO.                      | CIRCUIT |    |     |
|--------------------------------|---------|----|-----|
| 11266A                         | ON      | -  | ON  |
| Handle position<br>(see dwg.): | I       | II | III |



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

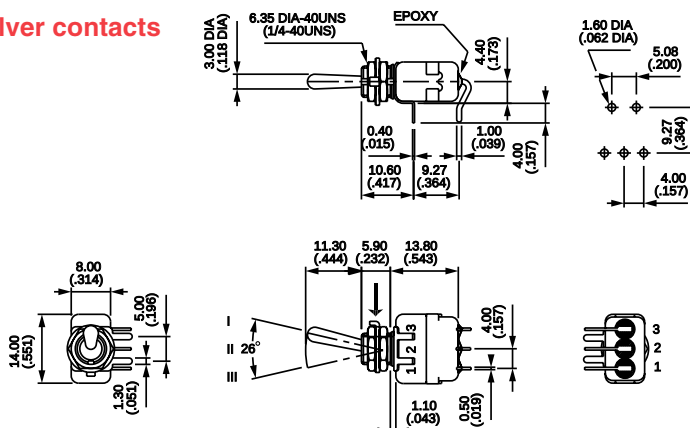
# 11000 SERIES - PROFESSIONAL TOGGLE SWITCHES

## Horizontal right angle p.c. terminals - single pole - silver contacts



| MODEL NO.                      | CIRCUIT |    |     |
|--------------------------------|---------|----|-----|
| 11136WA                        | ON      | -  | ON  |
| Handle position<br>(see dwg.): | I       | II | III |

→ Keyway



**Additional ordering information:** Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

## 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

### Model Structure:

| Series | Terminals & bushings                                                                                          | Number of poles                                               | Electrical functions                                      | Terminals                                                             | Contact materials                                                      |
|--------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------|
| 1      | 1                                                                                                             |                                                               |                                                           |                                                                       |                                                                        |
|        | 1 Solder lug or right angle terminals<br>2 Straight p.c. terminals<br>(all models have 1/4-40 thd'd. bushing) | 3 Single pole<br>4 Double pole<br>5 Three pole<br>6 Four pole | 6 ON - ON<br>9 ON OFF ON<br>7 MOM OFF MOM<br>8 ON OFF MOM | (NONE)<br>W Horizontal right angle p.c.- function 6, single pole only | A Silver<br>A D 2 Gold plated silver (2 microns)<br>D Solid gold rivet |

### Options:

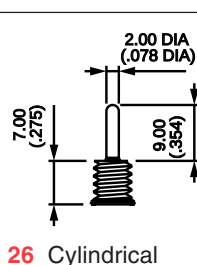
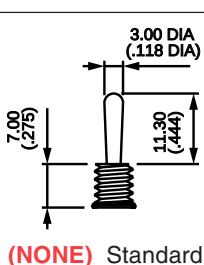
| Black finish                                                    | Sealing                                                                                              | Actuators                                      | Special options                              | Approvals/listings                                                                                                                                         |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (NONE)<br>G Matte black finish on bushing, actuator & hardware. | (NONE)<br>K Epoxy sealed terminals std'd. Front panel sealing with o-ring & gasket. (not avail. w/W) | (NONE)<br>2 6 Cylindrical (see actuator dwgs.) | (NONE)<br>F Tin plated terminals (p.c. only) | (NONE)<br>C E C C<br>L N Z Telecommunications<br>G A M Military<br>M U A H A G<br>Q P L (Europe only)<br>(consult factory for details of approved models). |

Example of completely specified model number:

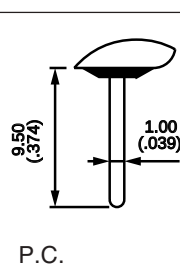
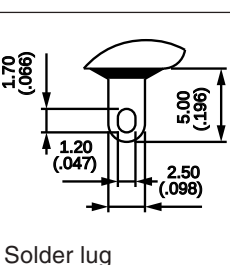
**11136WAD2GFCECC**

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

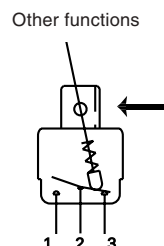
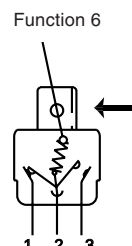
### ACTUATOR OPTIONS



### TERMINALS



### SWITCH ACTION (arrow indicates keyway)



# 12000 SERIES - PROFESSIONAL TOGGLE SWITCHES

A



## FEATURES

- Designed for high rel defense, space and telecommunications applications.
- DPDT, 3PDT & 4PDT models with 15/32-32 threaded bushing.
- Models for panel and p.c. mounting.
- Supplied with 2 Hex Nuts, 1 Locking Ring & 1 Lockwasher.
- Bright chrome or matte black finish on bushing, actuator and hardware.

## SPECIFICATIONS

|                                           |                                                                                                                                                                                                           |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | Silver & gold plated silver; 2 Amps at 250 VAC, 4 Amps at 125 VAC or 4 Amps at 30 VDC. (Less than 100 mA 30 VDC to prevent damage to gold plating.)<br>Gold rivet; 200 mA at 250 VAC or 400 mA at 125 VAC |
| <b>Initial contact resistance:</b>        | 10 milliohms maximum                                                                                                                                                                                      |
| <b>Insulation resistance:</b>             | 1000 megohms min. at 500 VDC                                                                                                                                                                              |
| <b>Dielectric strength:</b>               | 1000 V rms min. - between terminals<br>2000 V rms min. - between poles and terminals and frame                                                                                                            |
| <b>Electrical life:</b>                   | Silver: 50,000 cycles min. Gold plated silver: 20,000 cycles min.<br>Gold rivet: 2 positions - 80,000 cycles min. 3 positions - 50,000 cycles min.                                                        |
| <b>Low level or mechanical life:</b>      | 2 positions - 150,000 cycles min. 3 positions - 100,000 cycles min.                                                                                                                                       |
| <b>Operating temperature range:</b>       | -40°C to +85°C                                                                                                                                                                                            |

## MATERIALS

|                       |                                                                                                            |
|-----------------------|------------------------------------------------------------------------------------------------------------|
| <b>Contacts :</b>     | Silver, gold plated silver or solid gold rivet                                                             |
| <b>Actuator:</b>      | Chrome plated brass                                                                                        |
| <b>Bushing:</b>       | Nickel plated brass                                                                                        |
| <b>Housing:</b>       | Nickel plated brass                                                                                        |
| <b>Case:</b>          | Diallyl phthalate (DAP)                                                                                    |
| <b>Terminal seal:</b> | Epoxy                                                                                                      |
| <b>Hardware:</b>      | Supplied with 2 Hex Nuts .551" (14mm) across flats and 1 Locking Ring.<br>See hardware section of catalog. |

## AGENCY RECOGNITION

CECC, LNZ, GAM T1, QPL (Europe), MUAHAG

Availability: consult factory for details of recognized models.

Marking: to order switches marked CECC or ESA/SCC, complete the appropriate box of the ordering format.

Other recognized marks do not appear on the switches.

## ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- a. Completely specified switch models:
- b. Option drawings
- c. 'build your own switch' order format & miscellaneous

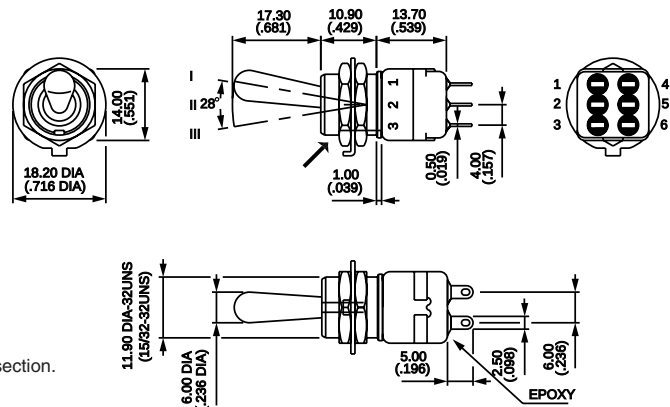
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 12000 SERIES - PROFESSIONAL TOGGLE SWITCHES

## Solder lug terminals - double pole - silver contacts

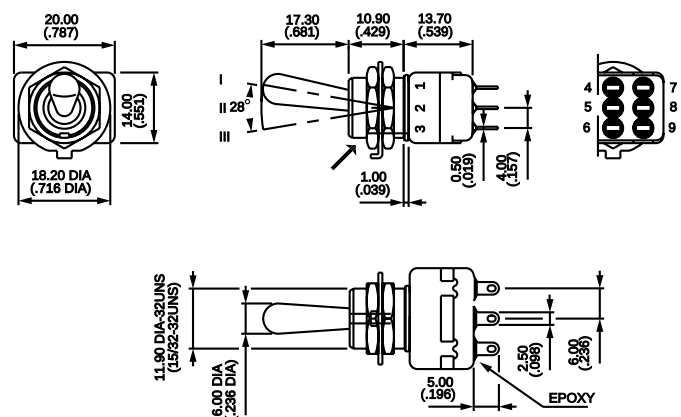
| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 12146A                         | ON      | -   | ON  |
| 12149A                         | ON      | OFF | ON  |
| 12147A                         | MOM     | OFF | MOM |
| 12148A                         | ON      | OFF | MOM |
| 12144A*                        | ON      | ON  | ON  |
| 121441RA*                      | ON      | ON  | MOM |
| 121442RA*                      | MOM     | ON  | MOM |
| 12145A                         | -       | ON  | MOM |
| Handle position<br>(see dwg.): | I       | II  | III |

\*Function 4: SP in DP case, See diagram at end of section.



## Solder lug terminals - three pole - silver contacts

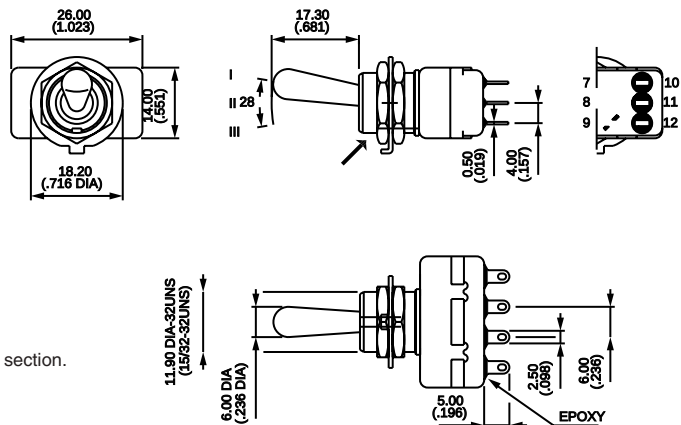
| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 12156A                         | ON      | -   | ON  |
| 12159A                         | ON      | OFF | ON  |
| 12157A                         | MOM     | OFF | MOM |
| 12158A                         | ON      | OFF | MOM |
| Handle position<br>(see dwg.): | I       | II  | III |



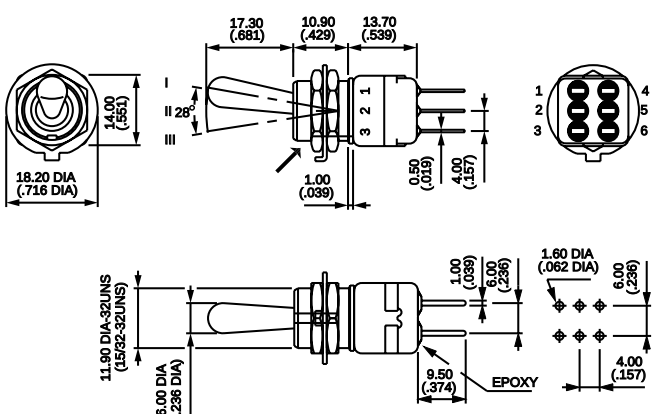
## Solder lug terminals - four pole - silver contacts

| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 12166A                         | ON      | -   | ON  |
| 12169A                         | ON      | OFF | ON  |
| 12167A                         | MOM     | OFF | MOM |
| 12168A                         | ON      | OFF | MOM |
| 12164A*                        | ON      | ON  | ON  |
| 121641RA*                      | ON      | ON  | MOM |
| 121642RA*                      | MOM     | ON  | MOM |
| Handle position<br>(see dwg.): | I       | II  | III |

\*Function 4: SP in DP case, See diagram at end of section.



## Straight p.c. terminals - double pole - silver contacts



# 12000 SERIES - PROFESSIONAL TOGGLE SWITCHES

A

**Straight p.c. terminals - three pole - silver contacts**

**Straight p.c. terminals - four pole - silver contacts**

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

| ACTUATOR OPTIONS                                   |                                           | TERMINALS                                      |      |
|----------------------------------------------------|-------------------------------------------|------------------------------------------------|------|
| <b>13</b> Standard                                 | <b>12</b> Short lever                     | Solder lug                                     | P.C. |
| LOCKING ACTUATOR OPTIONS (arrow indicates keyway ) |                                           |                                                |      |
| <b>1V</b> 1 locked position (function 6)           | <b>2V</b> 2 locked positions (function 6) | <b>3V</b> 3 locked positions (functions 9 & 4) |      |

# 12000 SERIES - PROFESSIONAL TOGGLE SWITCHES

**Additional ordering information:** Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

## 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

### Model Structure:

| Series | Terminals & bushings                                                                                | Number of poles                              | Electrical functions                                                                                                                                                                                                 | Momentary for function 4                  | Contact materials                                                      |
|--------|-----------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------------------------------|
| 1 2    | <input type="text"/>                                                                                | <input type="text"/>                         | <input type="text"/>                                                                                                                                                                                                 | <input type="text"/>                      | <input type="text"/>                                                   |
|        | 1 Solder lug or terminals<br>2 Straight p.c. terminals<br>(all models have 15/32-32 thd'd. bushing) | 4 Double pole<br>5 Three pole<br>6 Four pole | 6 ON - ON<br>9 ON OFF ON<br>7 MOM OFF MOM<br>8 ON OFF MOM<br>5 - ON MOM<br>4 ON ON ON<br>4* ON ON MOM<br>4* MOM ON MOM<br>* specify selection from 'Mom. for function 4' box also -<br>(For double & four pole only) | (NONE)<br>1 R ON ON MOM<br>2 R MOM ON MOM | A Silver<br>A D 2 Gold plated silver (2 microns)<br>D Solid gold rivet |

Example of completely specified model number:  
**121442RAD2GFCECC**

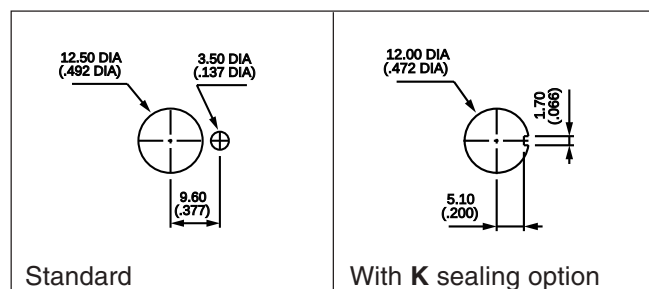
### Options:

| Black finish                                                    | Sealing                                                                             | Actuators                                                                                                                                  | Special options                              | Agency Recognition                                                                                                                                         |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="text"/>                                            | <input type="text"/>                                                                | <input type="text"/>                                                                                                                       | <input type="text"/>                         | <input type="text"/>                                                                                                                                       |
| (NONE)<br>G Matte black finish on bushing, actuator & hardware. | (NONE) Epoxy sealed terminals std'd.<br>K Front panel sealing with o-ring & gasket. | (NONE) Standard<br>1 2 Short<br>1 V Locking (1 position)<br>2 V Locking (2 positions)<br>3 V Locking (3 positions)<br>(see actuator dwgs.) | (NONE)<br>F Tin plated terminals (p.c. only) | (NONE)<br>C E C C<br>L N Z Telecommunications<br>G A M Military<br>M U A H A G<br>Q P L (Europe only)<br>(consult factory for details of approved models). |

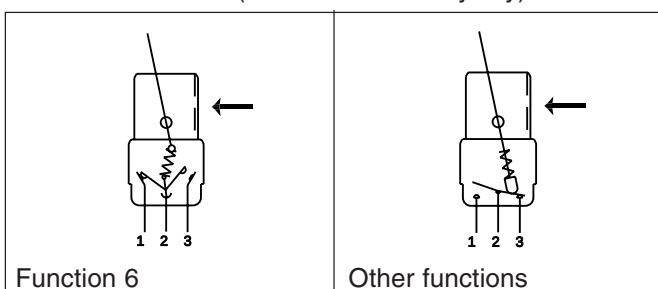
Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

## MISCELLANEOUS

### PANEL CUT-OUTS

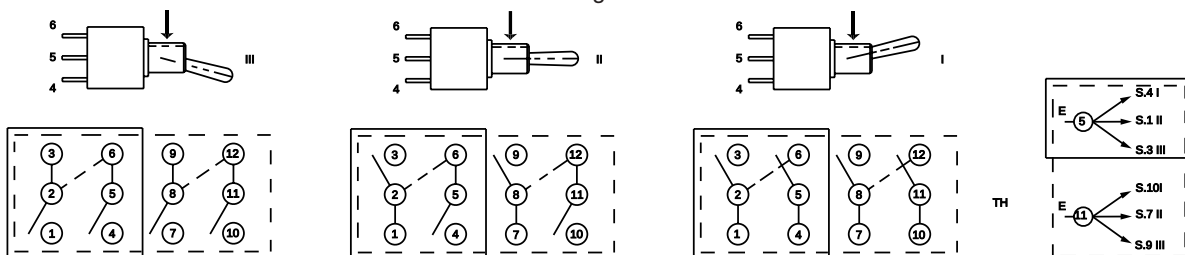


### SWITCH ACTION (arrow indicates keyway)



### WIRING for function 4 switch

Below diagrams are viewed from bottom of switch.



Equivalent to single pole 3 throw switch. Dotted lines between terminals 2 & 6 and 8 & 12 indicate external jumpers to be added by customer.

# 12000X778 SERIES - HIGH PERFORMANCE TOGGLE SWITCHES

A



## FEATURES

- Designed for high reliability environments.
- Double shell case for high mechanical strength & high electrical insulation.
- Pinned actuator for ruggedness and permanent grounding to switch bushing.
- Panel sealed to IP 67 and fully sealed switch body.
- DPDT, 3PDT & 4PDT models with 15/32-32 threaded bushing with flat.
- Highly reliable for low level or power applications.
- Matte black finish on body, bushing, actuator and hardware.

## SPECIFICATIONS

|                                           |                                                                                                                                                                              |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | 2 Amps at 250 VAC, 4 Amps at 125 VAC or 4 Amps at 28 VDC. (Less than 300 mA at 28 VDC to prevent damage to gold plating). Minimum load - 10 mA at 50 mV, 10 $\mu$ A at 5 VDC |
| <b>Initial contact resistance:</b>        | 10 milliohms maximum                                                                                                                                                         |
| <b>Insulation resistance:</b>             | 1000 megohms min. at 500 VDC                                                                                                                                                 |
| <b>Dielectric strength:</b>               | 1000 V rms min. - between terminals<br>2000 V rms min. - between poles and terminals and frame                                                                               |
| <b>Electrical life:</b>                   | At 2 Amps 250 VAC or 4 Amps at 28 VDC - 20,000 cycles min. (10,000 for functions 4 & 5)<br>At low level (10 mA 50 mV) - 40,000 cycles min. (20,000 for functions 4 & 5)      |
| <b>Operating temperature range:</b>       | -40°C to +85°C                                                                                                                                                               |
| <b>Environmental:</b>                     | Shock: 50g - 11 ms (IEC 68-2-27). Vibration: 10-500 Hz - 10 g (IEC 68-2-6). Salt spray: 96 hrs.(IEC 68-2-11) Humidity: 56days,93% R.H.,40°C (IEC 68-2-3).                    |

## MATERIALS

|                   |                                                                           |
|-------------------|---------------------------------------------------------------------------|
| <b>Contacts :</b> | Solid rivet - gold plated silver/nickel alloy                             |
| <b>Actuator:</b>  | Black chrome plated brass                                                 |
| <b>Bushing:</b>   | Black chrome plated brass                                                 |
| <b>Case:</b>      | Diallyl phthalate (DAP) with plastic external shell, epoxy sealed         |
| <b>Hardware:</b>  | Supplied with 1 Hex Nut with black finish. See drawing at end of section. |

## AGENCY RECOGNITION

CECC, GAM , QPL (Europe), MUAHAG & DAT (French defense military). Marking: Many models have full CECC recognition and are marked CECC. Consult factory for list of recognized models.

## ABOUT THIS SERIES

The material in this series is organized in the following sequence:

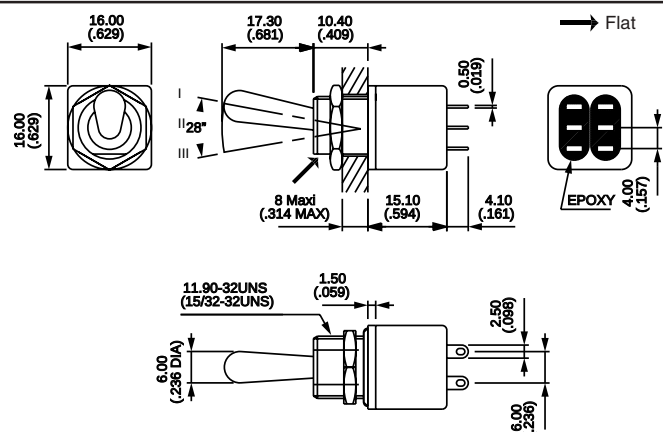
- Completely specified switch models
- Option drawings
- 'build your own switch' order format
- Miscellaneous and Positions & Connections

# 12000X778 SERIES - HIGH PERFORMANCE TOGGLE SWITCHES

## Solder lug terminals - double pole



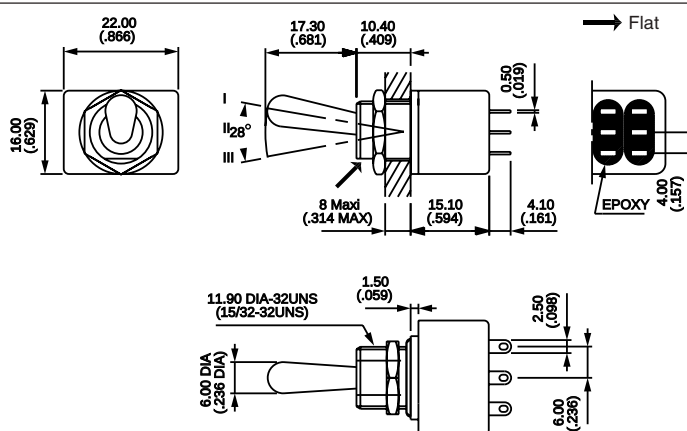
| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 12146X778                      | ON      | -   | ON  |
| 12149X778                      | ON      | OFF | ON  |
| 12147X778                      | MOM     | OFF | MOM |
| 12148X778                      | ON      | OFF | MOM |
| 12144X778                      | ON      | ON  | ON  |
| 121441RX778                    | ON      | ON  | MOM |
| 121442RX778                    | MOM     | ON  | MOM |
| 12145X778                      | -       | ON  | MOM |
| Handle position<br>(see dwg.): | I       | II  | III |



## Solder lug terminals - three pole



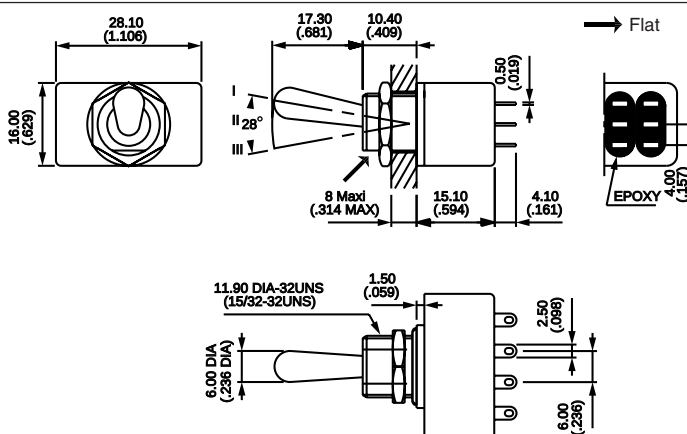
| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 12156X778                      | ON      | -   | ON  |
| 12159X778                      | ON      | OFF | ON  |
| 12157X778                      | MOM     | OFF | MOM |
| 12158X778                      | ON      | OFF | MOM |
| Handle position<br>(see dwg.): | I       | II  | III |



## Solder lug terminals - four pole



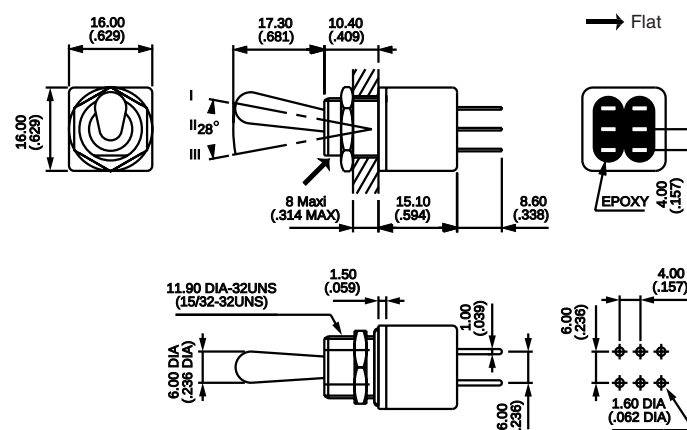
| MODEL NO.                      | CIRCUIT |     |     |
|--------------------------------|---------|-----|-----|
| 12166X778                      | ON      | -   | ON  |
| 12169X778                      | ON      | OFF | ON  |
| 12167X778                      | MOM     | OFF | MOM |
| 12168X778                      | ON      | OFF | MOM |
| 12164X778                      | ON      | ON  | ON  |
| 121641RX778                    | ON      | ON  | MOM |
| 121642RX778                    | MOM     | ON  | MOM |
| Handle position<br>(see dwg.): | I       | II  | III |



## Straight p.c. terminals - double pole



| MODEL NO.                      | CIRCUIT |    |     |
|--------------------------------|---------|----|-----|
| 12246X778                      | ON      | -  | ON  |
| Handle position<br>(see dwg.): | I       | II | III |



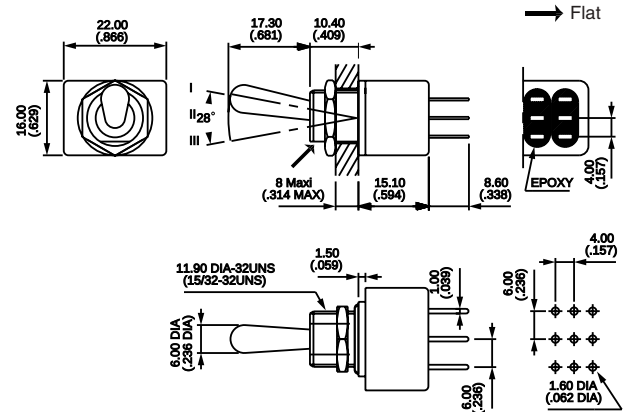
# 12000X778 SERIES - HIGH PERFORMANCE TOGGLE SWITCHES

A

## Straight p.c. terminals - three pole



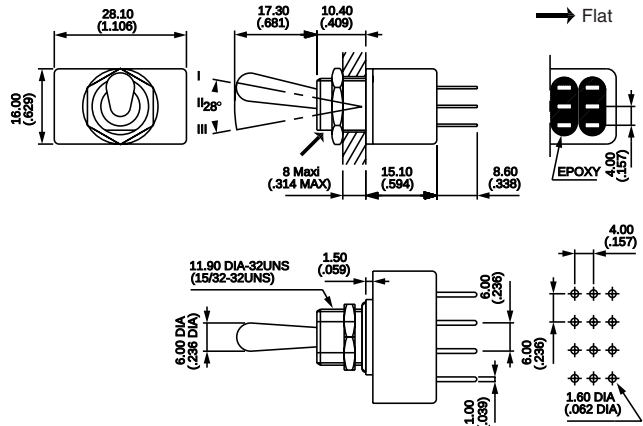
| MODEL NO.                   | CIRCUIT |    |     |
|-----------------------------|---------|----|-----|
| 12256X778                   | ON      | -  | ON  |
| Handle position (see dwg.): | I       | II | III |



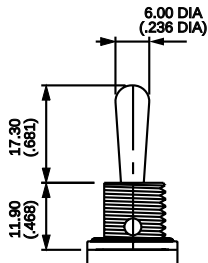
## Straight p.c. terminals - four pole



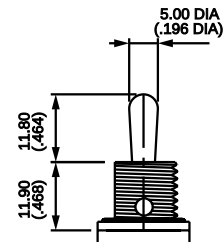
| MODEL NO.                   | CIRCUIT |    |     |
|-----------------------------|---------|----|-----|
| 12266X778                   | ON      | -  | ON  |
| Handle position (see dwg.): | I       | II | III |



### ACTUATOR OPTIONS

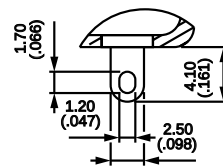


(NONE) Standard

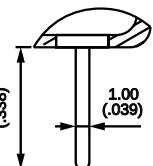


12 Short

### TERMINALS

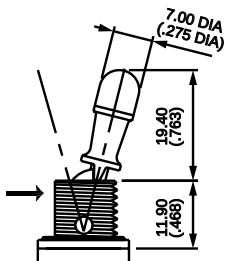


1 Solder lug

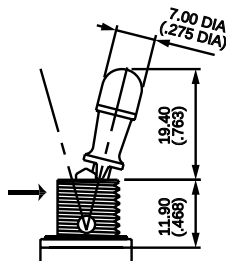


2 P.C.

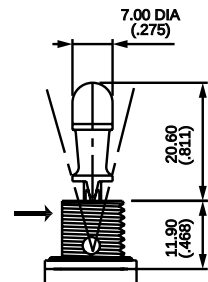
### LOCKING ACTUATOR OPTIONS (arrow indicates flat)



1V 1 locked position (function 6)



2V 2 locked positions (function 6)



3V 3 locked positions (functions 9 & 4)

Security Guards available - see Miscellaneous & Accessories section D.

# 12000X778 SERIES - HIGH PERFORMANCE TOGGLE SWITCHES

**Additional ordering information:** Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

## 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

### Model Structure:

| Series                                                        | Terminals & bushings                      | Number of poles      | Electrical functions                                    | Momentary for function 4 |
|---------------------------------------------------------------|-------------------------------------------|----------------------|---------------------------------------------------------|--------------------------|
| <input type="text" value="1"/> <input type="text" value="2"/> | <input type="text"/>                      | <input type="text"/> | <input type="text"/>                                    | <input type="text"/>     |
|                                                               | 1 Solder lug or terminals                 | 4 Double pole        | 6 ON - ON                                               | (NONE)                   |
|                                                               | 2 Straight p.c. terminals                 | 5 Three pole         | 9 ON OFF ON                                             | 1 R ON ON MOM            |
|                                                               | (all models have 15/32-32 thd'd. bushing) | 6 Four pole          | 7 MOM OFF MOM                                           | 2 R MOM ON MOM           |
|                                                               |                                           |                      | 8 ON OFF MOM                                            |                          |
|                                                               |                                           |                      | 5 - ON MOM                                              |                          |
|                                                               |                                           |                      | 4 ON ON ON                                              |                          |
|                                                               |                                           |                      | 4* ON ON MOM                                            |                          |
|                                                               |                                           |                      | 4* MOM ON MOM                                           |                          |
|                                                               |                                           |                      | * specify selection from 'Mom. for function 4' box also |                          |

### Options:

| Actuators                 | Special options                                                                                                             | Approvals/listings                                |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| <input type="text"/>      | <input type="text" value="X"/> <input type="text" value="7"/> <input type="text" value="7"/> <input type="text" value="8"/> | <input type="text"/>                              |
| (NONE) Standard           | High performance                                                                                                            | (NONE)                                            |
| 1 2 Short                 |                                                                                                                             | C E C C                                           |
| 1 V Locking (1 position)  |                                                                                                                             | (consult factory for details of approved models). |
| 2 V Locking (2 positions) |                                                                                                                             |                                                   |
| 3 V Locking (3 positions) |                                                                                                                             |                                                   |
| (see actuator dwgs.)      |                                                                                                                             |                                                   |

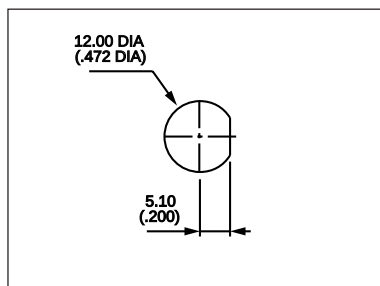
Example of completely specified model number:

**121442R3VX778CECC**

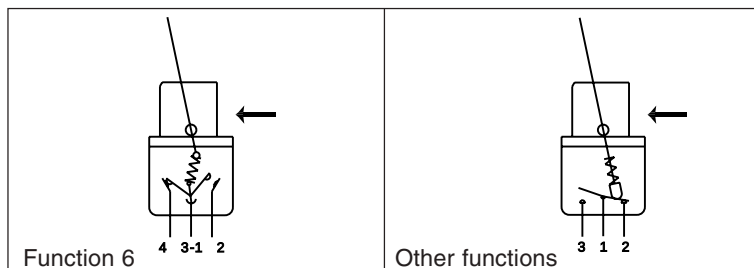
Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

## MISCELLANEOUS

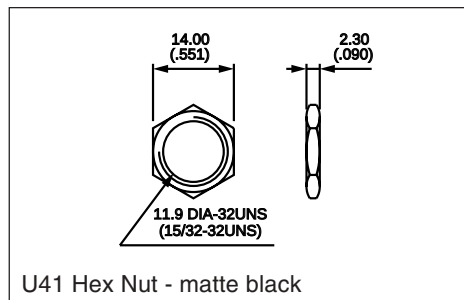
### PANEL CUT-OUT



### SWITCH ACTION (arrow indicates flat)



### STANDARD HARDWARE



# 12000X778 SERIES - HIGH PERFORMANCE TOGGLE SWITCHES

A

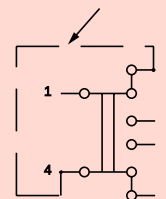
## POSITIONS AND CONNECTIONS

| Function | Lever position & connections |       |            | Terminal identification |
|----------|------------------------------|-------|------------|-------------------------|
|          | I                            | II    | III (flat) |                         |
| 12146    | ON                           | -     | ON         |                         |
|          | (1-3)-4                      |       | (1-3)-2    |                         |
|          | (5-7)-8                      |       | (5-7)-6    |                         |
| 12147    | MOM                          | OFF   | MOM        |                         |
| 12148    | ON                           | OFF   | MOM        |                         |
| 12149    | ON                           | OFF   | ON         |                         |
| 12148CT  | MOM                          | OFF   | ON         |                         |
|          | 1-2                          |       | 1-3        |                         |
|          | 4-5                          |       | 4-6        |                         |
| 12145    | -                            | ON    | MOM        |                         |
|          |                              | 1-2   | 1-3        |                         |
|          |                              | 4-5   | 4-6        |                         |
| 12144    | ON                           | ON    | ON         |                         |
| 121441R  | MOM                          | ON    | ON         |                         |
| 121442R  | MOM                          | ON    | MOM        |                         |
|          | 1-2                          | 1-3   | 1-3        |                         |
|          | 4-5                          | 4-5   | 4-6        |                         |
| 12156    | ON                           | -     | ON         |                         |
|          | (1-3)-4                      |       | (1-3)-2    |                         |
|          | (5-7)-8                      |       | (5-7)-6    |                         |
|          | (9-11)-12                    |       | (9-11)-10  |                         |
| 12166    | ON                           | -     | ON         |                         |
|          | 1A-3A                        |       | 1A-2A      |                         |
|          | 1C-3C                        |       | 1C-2C      |                         |
|          | 1E-3E                        |       | 1E-2E      |                         |
|          | 1G-3G                        |       | 1G-2G      |                         |
| 12164    | ON                           | ON    | ON         |                         |
|          | 1A-2A                        | 1A-2A | 1A-3A      |                         |
|          | 1C-2C                        | 1C-3C | 1C-3C      |                         |
|          | 1E-2E                        | 1E-2E | 1E-3E      |                         |
|          | 1G-2G                        | 1G-3G | 1G-3G      |                         |

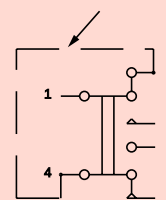
### Wiring for 3 way switches (function 4)

Arrow indicates external jumper added by customer.

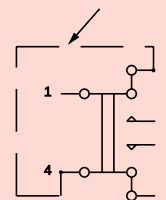
12144



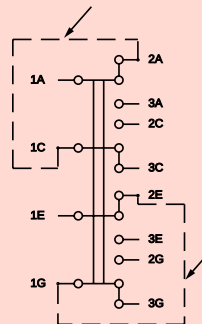
121441R



121442R



12164



## 4100 & 4200 SERIES - VDE APPROVED TOGGLE SWITCHES



### FEATURES

- VDE frequent duty listing standard on all models.
- DPDT panel mounting models with solder lugs or p.c. terminals.
- Knee action quick-break toggle mechanism.
- Insulated actuator & bushing with actuator color options.

### SPECIFICATIONS

|                                           |                                                                      |
|-------------------------------------------|----------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | 3 Amps at 250 VAC, 6 Amps at 125 VAC or 30 VDC                       |
| <b>Initial contact resistance:</b>        | 10 milliohms maximum                                                 |
| <b>Insulation resistance:</b>             | 1000 megohms min. at 500 VDC                                         |
| <b>Dielectric strength:</b>               | 2000 V rms min. - between terminals and between poles                |
| <b>Electrical life (resistive):</b>       | 50,000 cycles 3 Amps 250 VAC. 10,000 cycles 6 Amps 125 VAC or 30 VDC |
| <b>Operating temperature range:</b>       | -20°C to +55°C                                                       |

### MATERIALS

|                  |                                                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contacts:</b> | Silver inlay                                                                                                                                             |
| <b>Actuator:</b> | Polyamide 6-6                                                                                                                                            |
| <b>Bushing:</b>  | Polyamide 6-6                                                                                                                                            |
| <b>Case:</b>     | Phenolic resin                                                                                                                                           |
| <b>Hardware:</b> | Supplied with 1 Hex Nut p/n U166 and 1 insulating Knurled Nut p/n U520.<br>Knurled Nut supplied same color as actuator. See hardware section of catalog. |

### AGENCY RECOGNITION



VDE (frequent duty), UL & CSA  
VDE, UL & CSA marking is standard.

Note: Ideal switch for pump manufacturers.

# 4100 & 4200 SERIES - VDE APPROVED TOGGLE SWITCHES

A

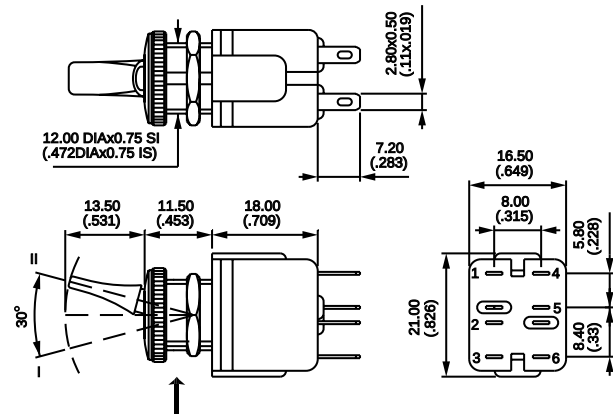
## Solder lug terminals - 4100



| DOUBLE POLE<br>MODEL NO.        | CIRCUIT  |
|---------------------------------|----------|
| 4141A22UU                       | ON - OFF |
| 4146A22UU                       | ON - ON  |
| Handle position<br>(see dwg.) : | II I     |

Above models have black actuator.

→ Keyway



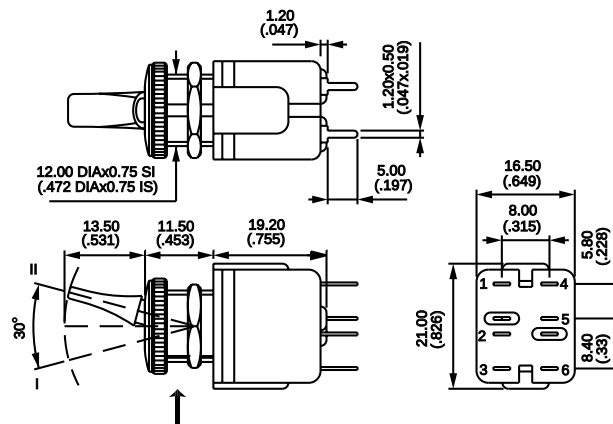
## Straight p.c. terminals - 4200



| DOUBLE POLE<br>MODEL NO.        | CIRCUIT  |
|---------------------------------|----------|
| 4241A22UU                       | ON - OFF |
| 4246A22UU                       | ON - ON  |
| Handle position<br>(see dwg.) : | II I     |

Above models have black actuator.

→ Keyway



## OPTIONS & MISCELLANEOUS

### ACTUATOR COLORS

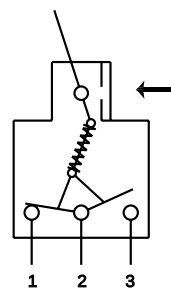
The last numeric digit in above switch model numbers indicates actuator and knurled mounting nut color. Other selections:

#### Colors

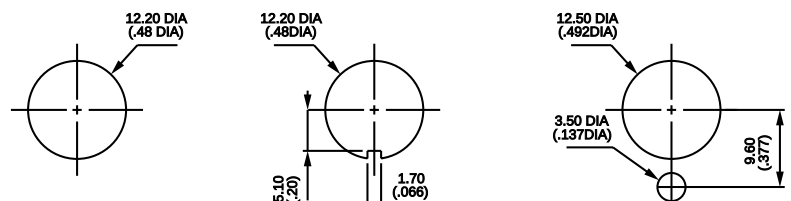
- 1 blue
- 2 black
- 3 green
- 4 grey
- 5 yellow
- 6 red
- 7/1 white
- 9 orange

### SWITCH ACTION

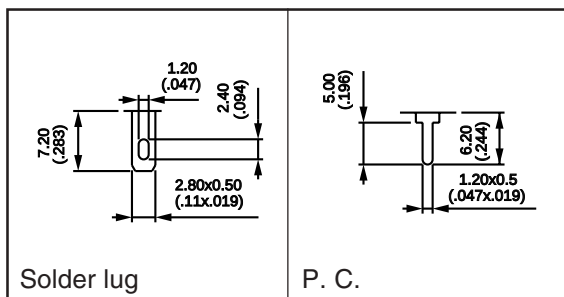
Arrow indicates keyway



### PANEL CUT-OUTS



## TERMINALS



Solder lug

P. C.

## 4600 SERIES - UL, CSA & VDE RECOGNIZED TOGGLE SWITCHES



### FEATURES

- High current & voltage ratings in small case.
- SPDT & DPDT panel mounting models with solder lug/quick-connect terminals.
- Insulated actuator & bushing with lever color options.

### SPECIFICATIONS

|                                     |                                                                                                                                                           |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contact ratings:</b>             | 4 Amps at 250 VAC, 6 Amps at 125 VAC (resistive loads)<br>UL/CSA: 3 Amps at 250 VAC, 6 Amps at 125 VAC<br>VDE: ON-OFF & ON-ON models only - 4(2)A 380 VAC |
| <b>Initial contact resistance:</b>  | 10 milliohms maximum                                                                                                                                      |
| <b>Insulation resistance:</b>       | 1000 megohms min. at 500 VDC                                                                                                                              |
| <b>Dielectric strength:</b>         | 2000 V rms min. - between terminals and between poles                                                                                                     |
| <b>Electrical life (resistive):</b> | 10,000 cycles minimum at full load                                                                                                                        |
| <b>Operating temperature range:</b> | -20°C to +55°C                                                                                                                                            |

### MATERIALS

|                  |                                                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contacts:</b> | Silver                                                                                                                                                   |
| <b>Actuator:</b> | Polyamide 6-6                                                                                                                                            |
| <b>Bushing:</b>  | Polyamide 6-6                                                                                                                                            |
| <b>Case:</b>     | Melamine phenolic                                                                                                                                        |
| <b>Hardware:</b> | Supplied with 1 Hex Nut p/n U166 and 1 insulating Knurled Nut p/n U520.<br>Knurled Nut supplied same color as actuator. See hardware section of catalog. |

### AGENCY RECOGNITION



VDE for functions ON-OFF & ON-ON. UL & CSA for all functions.  
Switches are supplied with recognized mark.

# 4600 SERIES - UL, CSA & VDE RECOGNIZED TOGGLE SWITCHES

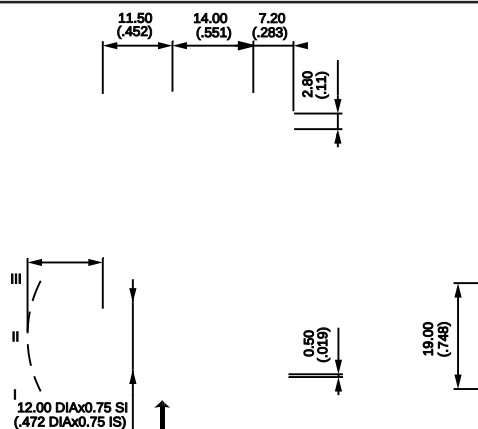
A

## Solder lug/quick-connect terminals - single pole



| SINGLE POLE<br>MODEL NO.        | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 4631A22UU                       | ON      | -   | OFF |
| 4636A22UU                       | ON      | -   | ON  |
| 4639A22UU                       | ON      | OFF | ON  |
| Handle position<br>(see dwg.) : | III     | II  | I   |

Above models have black actuator.



## Solder lug/quick-connect terminals - double pole



| DOUBLE POLE<br>MODEL NO.        | CIRCUIT |     |     |
|---------------------------------|---------|-----|-----|
| 4641A22UU                       | ON      | -   | OFF |
| 4646A22UU                       | ON      | -   | ON  |
| 4649A22UU                       | ON      | OFF | ON  |
| Handle position<br>(see dwg.) : | III     | II  | I   |

Above models have black actuator.

## OPTIONS & MISCELLANEOUS

### ACTUATOR COLORS

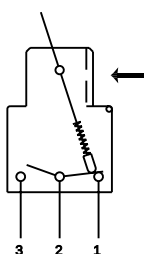
The last '2' in above switch model numbers indicates actuator and knurled mounting nut color. Other selections:

#### Colors

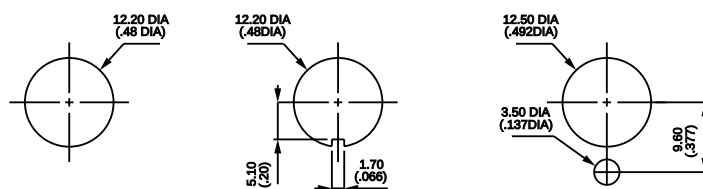
- 1 blue
- 2 black
- 3 green
- 4 grey
- 5 yellow
- 6 red
- 7/1 white
- 9 orange

### SWITCH ACTION

Arrow indicates keyway

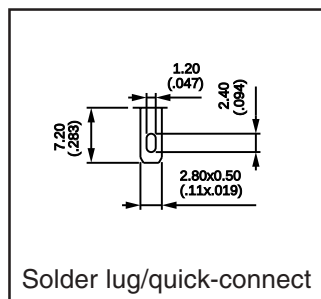


### PANEL CUT-OUTS

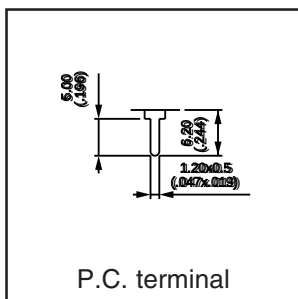


Panel thickness: .196" (5mm) max. between 2 nuts

## TERMINALS



Solder lug/quick-connect



P.C. terminal

To specify P.C. terminals replace 46 with 44 in part no.- example: 4631A22UU becomes 4431A22UU

# New! 1500 SERIES - TOGGLE SWITCHES W/INSULATED LEVER & BUSHING



## FEATURES

- High current & voltage ratings in small case.
- SPDT panel mounting models with solder lug or quick-connect terminals.
- Insulated actuator & bushing with lever color options.

## SPECIFICATIONS

|                                     |                                                                                                      |
|-------------------------------------|------------------------------------------------------------------------------------------------------|
| <b>Contact ratings &amp; life:</b>  | 6 Amps at 250 VAC (10,000 cycles), 10 Amps at 125 VAC (6,000 cycles).<br>(Above loads are resistive) |
| <b>Initial contact resistance:</b>  | 10 milliohms maximum                                                                                 |
| <b>Insulation resistance:</b>       | 1000 megohms min. at 500 VDC                                                                         |
| <b>Dielectric strength:</b>         | 2000 V rms min. - between terminals and between terminals & metal panel                              |
| <b>Operating temperature range:</b> | -20°C to +55°C                                                                                       |
| <b>Torque:</b>                      | 0.95 Nm (.700 ft. lb.) between 2 nuts                                                                |
| <b>Panel thickness:</b>             | 4.5 mm (.177") between 2 nuts                                                                        |

## MATERIALS

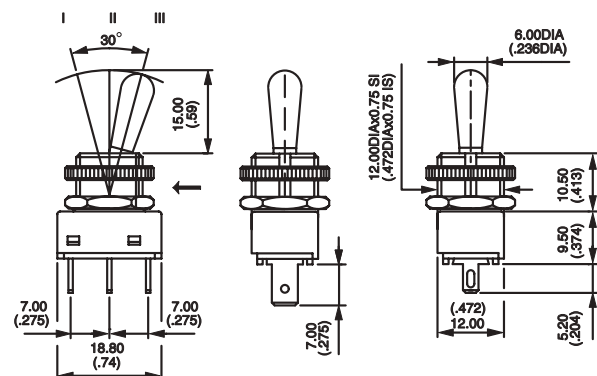
|                  |                                                                                                  |
|------------------|--------------------------------------------------------------------------------------------------|
| <b>Contacts:</b> | Silver                                                                                           |
| <b>Actuator:</b> | Polyamide                                                                                        |
| <b>Bushing:</b>  | Polyamide                                                                                        |
| <b>Case:</b>     | Polyamide                                                                                        |
| <b>Hardware:</b> | Supplied with 1 Hex Nut p/n U166 and 1 Knurled Nut p/n U411.<br>See hardware section of catalog. |

## Solder lug or quick-connect (.185"x.031") terminals

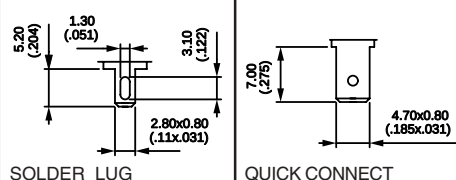


| MODEL NUMBER                    |            |           |
|---------------------------------|------------|-----------|
| SOLD. LUG                       | QUICK-CON. | CIRCUIT   |
| 1531A2L12                       | 1531A8L12  | ON - OFF  |
| 1536A2L12                       | 1536A8L12  | ON - ON   |
| 1539A2L12                       | 1539A8L12  | ON OFF ON |
| Handle position<br>(see dwg.) : |            |           |
|                                 |            | I II III  |

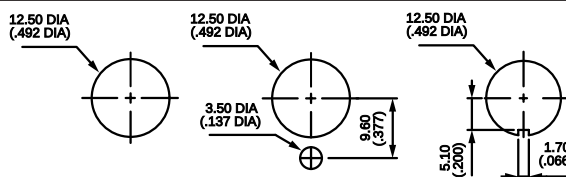
Above models have black actuator - consult factory for other actuators and colors.



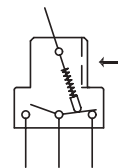
## TERMINALS



## PANEL CUT-OUTS



## SWITCH ACTION





## FEATURES

- 1, 2, 3 & 4 pole models for military applications include portable measuring equipment generators, beacons and fixed and mobile radiotransmitters.
- AIR 8461 (maintenance only).
- Sealing and locking lever applications.
- Matte black finish on actuator and bushing.

## SPECIFICATIONS

|                                           |                                               |        |        |            |
|-------------------------------------------|-----------------------------------------------|--------|--------|------------|
| <b>Contact ratings (voltage/current):</b> | 30VDC                                         | 250VAC | 125VAC | 115V 400Hz |
| Resistive load                            | 6.5A                                          | 5A     | 10A    | 7A         |
| Inductive load                            | 5A                                            | 3A     | 6A     | 5A         |
| Lamp load                                 | 3A                                            | 1A     | 3A     | 3.5A       |
| <b>Initial contact resistance:</b>        | 10 milliohms maximum at 1A 2VDC               |        |        |            |
| <b>Insulation resistance:</b>             | 1000 megohms min. at 500 VDC                  |        |        |            |
| <b>Dielectric strength:</b>               | 2000 V rms min. - between terminals           |        |        |            |
|                                           | 3000 V rms min. - between terminals and frame |        |        |            |
| <b>Electrical life:</b>                   | 10,000 cycles at full load.                   |        |        |            |
| <b>Operating temperature range:</b>       | -40°C to +85°C                                |        |        |            |
| <b>Torque:</b>                            | 1.50 Nm (1.10 ft.lb.) max. applied to nut     |        |        |            |
| <b>Panel thickness:</b>                   | 5 mm (.196") max.                             |        |        |            |

## MATERIALS

|                   |                                                                                                                                             |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contacts :</b> | Silver                                                                                                                                      |
| <b>Actuator:</b>  | Black, chrome plated brass                                                                                                                  |
| <b>Bushing:</b>   | Black, chrome plated brass                                                                                                                  |
| <b>Case:</b>      | Diallylphthalate (DAP)                                                                                                                      |
| <b>Hardware:</b>  | Supplied with 2 matte black nuts (U41), matte black locking ring (U12) and zinc plated lockwasher (U13). (See hardware section of catalog). |

## ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models
- Options & miscellaneous

# New! 6000 SERIES - TOGGLE SWITCHES FOR MILITARY APPLICATIONS

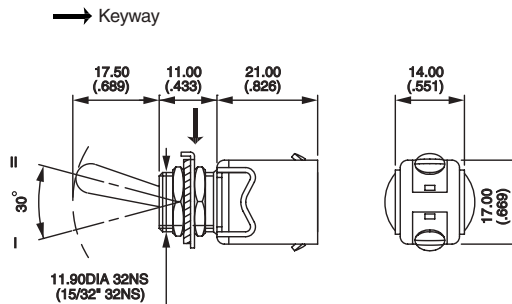
## CORRESPONDING AMERICAN SPECIFICATIONS (note: APEM models not MIL approved as of catalog printing.)

| Double pole, screw terminals |            | Double pole, solder lug terminals |            | Four pole, screw terminals |            |
|------------------------------|------------|-----------------------------------|------------|----------------------------|------------|
| APEM                         | MIL S3950  | APEM                              | MIL S3950  | APEM                       | MIL S3950  |
| 664103LM                     | MS35059-22 | 664103LM/2                        | MS35059-9  | 666103LM                   |            |
| 664203LM                     | MS35059-29 | 664203LM/2                        | MS35059-10 | 666103LM                   |            |
| 664303LM                     | MS35059-30 | 664303LM/2                        | MS35059-11 | 666103LM                   |            |
| 664403LM                     | MS35059-26 | 664403LM/2                        | MS35059-17 | 666103LM                   | MS25068-26 |
| 664603LM                     | MS35059-23 | 664603LM/2                        | MS35059-15 | 666103LM                   | MS25068-23 |
| 664703LM                     | MS35059-27 | 664703LM/2                        | MS35059-18 | 666103LM                   | MS25068-27 |
| 664803LM                     | MS35059-31 | 664803LM/2                        | MS35059-19 | 666103LM                   | MS25068-31 |
| 664903LM                     | MS35059-21 | 664903LM/2                        | MS35059-16 | 666103LM                   | MS25068-21 |

### Single pole -screw terminals



| Model No. | I    | II  |
|-----------|------|-----|
| 6421A03LM | ON - | OFF |

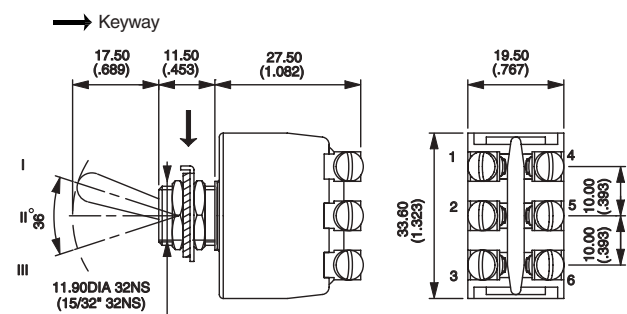


### Double pole - screw terminals



| Model No. | III | II  | I       |
|-----------|-----|-----|---------|
|           | 2-1 |     | 2-3     |
|           | 5-4 |     | 5-6     |
| 664103LM  | ON  | -   | OFF     |
| 664203LM  | ON  | -   | mom.OFF |
| 664303LM  | MOM | -   | OFF     |
| 664403LM* | ON  | ON  | ON      |
| 664503LM  | MOM | -   | ON      |
| 664603LM  | ON  | -   | ON      |
| 664703LM  | MOM | OFF | MOM     |
| 664803LM  | ON  | OFF | MOM     |
| 664903LM  | ON  | OFF | ON      |

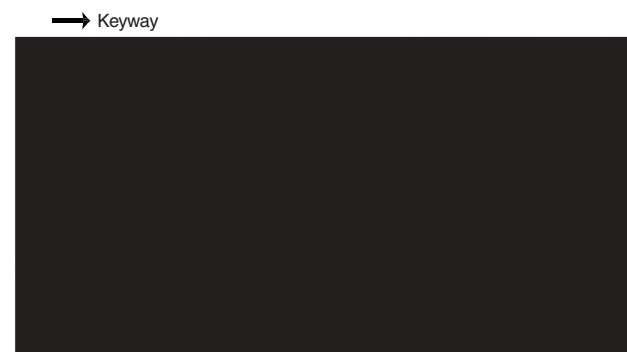
\* - Function 4: SP in DP case. See specs.  
for 600H & 600NH series.



### Three pole - screw terminals



| Model No. | III | II  | I       |
|-----------|-----|-----|---------|
|           | 2-1 |     | 2-3     |
|           | 5-4 |     | 5-6     |
|           | 9-7 |     | 8-9     |
| 665103LM  | ON  | -   | OFF     |
| 665203LM  | ON  | -   | mom.OFF |
| 665303LM  | MOM | -   | OFF     |
| 665503LM  | MOM | -   | ON      |
| 665603LM  | ON  | -   | ON      |
| 665703LM  | MOM | OFF | MOM     |
| 665803LM  | ON  | OFF | MOM     |
| 665903LM  | ON  | OFF | ON      |



### Double pole - screw terminals



| Model No. | III       | II  | I         |
|-----------|-----------|-----|-----------|
|           | 2-1,5-4,  |     | 2-3,5-6,  |
|           | 8-7,11-10 |     | 8-9,11-12 |
| 666103LM  | ON        | -   | OFF       |
| 666203LM  | ON        | -   | mom.OFF   |
| 666303LM  | MOM       | -   | OFF       |
| 666403LM* | ON        | ON  | ON        |
| 666503LM  | MOM       | -   | ON        |
| 666603LM  | ON        | -   | ON        |
| 666703LM  | MOM       | OFF | MOM       |
| 666803LM  | ON        | OFF | MOM       |
| 666903LM  | ON        | OFF | ON        |

\* - Function 4: SP in DP case. See specs.  
for 600H & 600NH series.



# **New!** 6000 SERIES - TOGGLE SWITCHES FOR MILITARY APPLICATIONS

**A**

## OPTIONS & MISCELLANEOUS

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# New! 3600NF SERIES - SEALED TOGGLE SWITCHES FOR OUTSIDE APPLICATIONS



## FEATURES

- Multiple seals - 'o' ring between lever & bushing, mounted half length boot & nylon washer, case/covergasket, sealing washer and molded-in terminal inserts
- SPDT & DPDT panel mounting models with screw or solder lug/quick-connect terminals.

## SPECIFICATIONS

|                                           |                                                                                       |
|-------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Contact ratings (resistive loads):</b> | 12A 28VDC, 6A 250VAC                                                                  |
| <b>Initial contact resistance:</b>        | 10 milliohms maximum at 1 amp 2 VDC                                                   |
| <b>Insulation resistance:</b>             | 1000 megohms min. at 500 VDC                                                          |
| <b>Dielectric strength:</b>               | 2500 V rms min. - between terminals, 3000 V rms min - between terminals & metal frame |
| <b>Electrical life (resistive):</b>       | 10,000 cycles minimum at full load                                                    |
| <b>Operating temperature range:</b>       | -40°C to +85°C                                                                        |
| <b>Torque:</b>                            | 1.50 Nm (1.10 ft. lb.) applied to nut                                                 |
| <b>Panel thickness:</b>                   | 5 mm (.196") max.                                                                     |

## MATERIALS

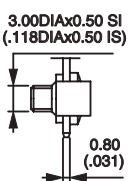
|                  |                                                                                                   |
|------------------|---------------------------------------------------------------------------------------------------|
| <b>Contacts:</b> | Silver                                                                                            |
| <b>Actuator:</b> | Nickel plated brass                                                                               |
| <b>Bushing:</b>  | Nickel plated brass                                                                               |
| <b>Case:</b>     | Phenolic                                                                                          |
| <b>Hardware:</b> | Supplied with 1/2 length sealing boot & nylon washer, 1 sealing washer & 1 nickel plated hex nut. |

## AGENCY RECOGNITION

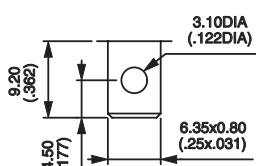


Availability: consult factory for details of recognized models.

## TERMINALS



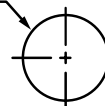
Screw



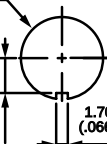
Sold. lug/Quick-connect

## PANEL CUT-OUTS

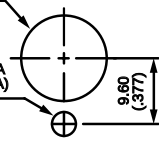
12.50 DIA  
(.492 DIA)



12.50 DIA  
(.492 DIA)



12.50 DIA  
(.492 DIA)



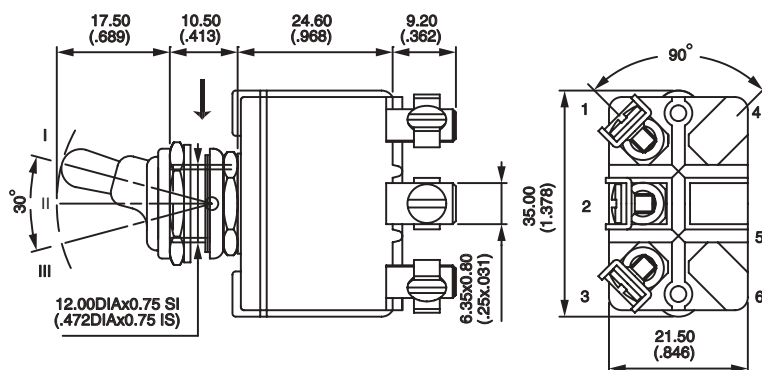
# New! 3600NF SERIES - SEALED TOGGLE SWITCHES FOR OUTSIDE APPLICATIONS

A

## Screw terminals - single pole



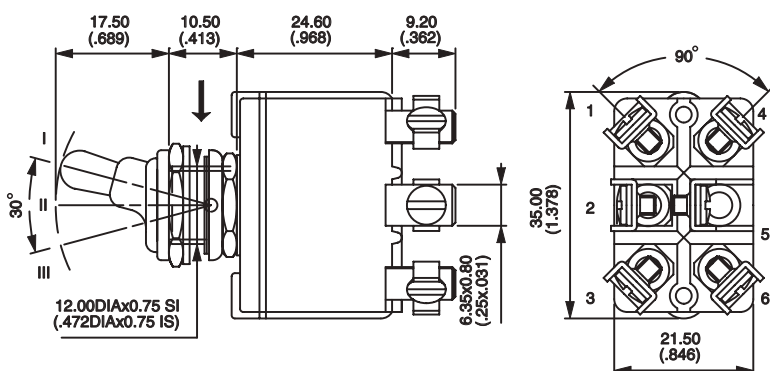
| MOD. NO                     | CIRCUIT |     |     |
|-----------------------------|---------|-----|-----|
| 3631NF                      | ON      | -   | OFF |
| 3635NF                      | MOM     | -   | ON  |
| 3636NF                      | ON      | -   | ON  |
| 3637NF                      | MOM     | OFF | MOM |
| 3638NF                      | ON      | OFF | MOM |
| 3639NF                      | ON      | OFF | ON  |
| Handle pos.<br>(see dwg.) : | I       | III | II  |
|                             | 2-1     |     | 2-3 |



## Screw terminals - double pole



| MOD. NO                     | CIRCUIT |     |     |
|-----------------------------|---------|-----|-----|
| 3641NF                      | ON      | -   | OFF |
| 3644NF*                     | ON      | ON  | ON  |
| 3645NF                      | MOM     | -   | ON  |
| 3646NF                      | ON      | -   | ON  |
| 3647NF                      | MOM     | OFF | MOM |
| 3648NF                      | ON      | OFF | MOM |
| 3649NF                      | ON      | OFF | ON  |
| Handle pos.<br>(see dwg.) : | I       | III | II  |
|                             | 2-1     |     | 2-3 |
|                             | 5-4     |     | 5-6 |

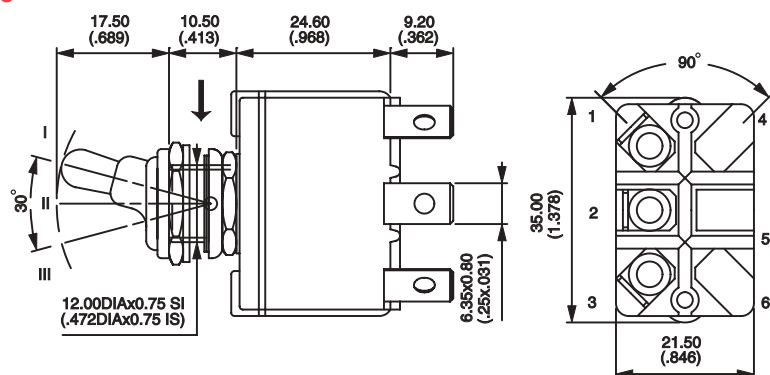


\* Function 4: SP in DP case -  
see specs. for 600H - 600 NH series.

## Solder lug/quick-connect terminals - single pole



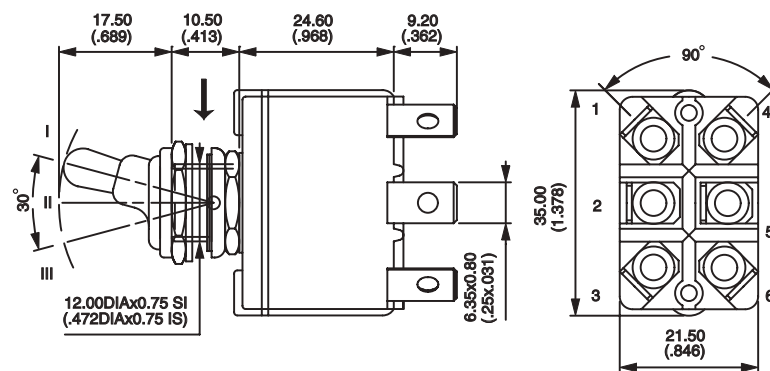
| MOD. NO                     | CIRCUIT |     |     |
|-----------------------------|---------|-----|-----|
| 3631NF/2                    | ON      | -   | OFF |
| 3635NF/2                    | MOM     | -   | ON  |
| 3636NF/2                    | ON      | -   | ON  |
| 3637NF/2                    | MOM     | OFF | MOM |
| 3638NF/2                    | ON      | OFF | MOM |
| 3639NF/2                    | ON      | OFF | ON  |
| Handle pos.<br>(see dwg.) : | I       | III | II  |
|                             | 2-1     |     | 2-3 |



## Solder lug/quick-connect terminals - double pole



| MOD. NO                     | CIRCUIT |     |     |
|-----------------------------|---------|-----|-----|
| 3641NF/2                    | ON      | -   | OFF |
| 3644NF/2*                   | ON      | ON  | ON  |
| 3645NF/2                    | MOM     | -   | ON  |
| 3646NF/2                    | ON      | -   | ON  |
| 3647NF/2                    | MOM     | OFF | MOM |
| 3648NF/2                    | ON      | OFF | MOM |
| 3649NF/2                    | ON      | OFF | ON  |
| Handle pos.<br>(see dwg.) : | I       | III | II  |
|                             | 2-1     |     | 2-3 |
|                             | 5-4     |     | 5-6 |



\* Function 4: SP in DP case -  
see specs. for 600H - 600 NH series.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# New! 3500 SERIES - MILITARY STYLE SEALED TOGGLE SWITCHES



## FEATURES

- Sealed to withstand 1 bar pressure at front panel & 0.1 bar pressure total immersion.
- SPDT & DPDT panel mtg. models with 15/32 32NS (11.90 32NS) threaded bushing.
- Approved to European standards CECC 96000.
- Numerous lever styles, including locking types.

## SPECIFICATIONS

|                                     |                                                                                      |
|-------------------------------------|--------------------------------------------------------------------------------------|
| <b>Contact ratings :</b>            | See table on next page                                                               |
| <b>Initial contact resistance:</b>  | 10 milliohms maximum at 1A 2VDC                                                      |
| <b>Insulation resistance:</b>       | 1000 megohms min.                                                                    |
| <b>Dielectric strength:</b>         | 2500 V rms min. - between terminals<br>3000 V rms min. - between terminals and frame |
| <b>Electrical life:</b>             | 40,000 cycles at full load.                                                          |
| <b>Operating temperature range:</b> | -40°C to +85°C                                                                       |
| <b>Torque:</b>                      | 2 Nm (1.47 ft.lb.) max. applied to nut                                               |
| <b>Moisture resistance:</b>         | 56 days                                                                              |

## MATERIALS

|                                  |                                   |
|----------------------------------|-----------------------------------|
| <b>Contacts :</b>                | Silver cadmium oxide alloy        |
| <b>Actuator:</b>                 | Chrome or nickel plated brass     |
| <b>Bushing &amp; cover:</b>      | Zamac                             |
| <b>Case:</b>                     | Mineral filled polyester, UL94-VO |
| <b>Terminal seal:</b>            | Molded-in inserts                 |
| <b>Case &amp; actuator seal:</b> | Silicone rubber                   |

## AGENCY RECOGNITION

### CECC 92601-004

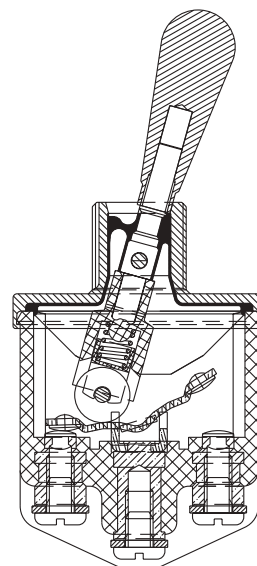
Availability: Consult factory for details of recognized models.

Marking: To order switches marked CECC, complete the appropriate box of the ordering format

## ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models
- Terminals & panel cut-outs
- 'build your own switch' order format
- Options & miscellaneous



**SWITCH CROSS SECTION**

**New!**

# 3500 SERIES - MILITARY STYLE SEALED TOGGLE SWITCHES

**A**

## CONTACT RATINGS AND GENERAL PERFORMANCE

| FUNCTIONS                         | According to<br>UL1054, CSA22.2                                                        | According to<br>CEE24, IEC65                                             | Direct current                                                                           | According to<br>CECC 96201-004             |
|-----------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------|
| <b>ON-OFF<br/>&amp;<br/>ON-ON</b> | 6,000 cycles, T65°C<br>20A, 125VAC, 3/4HP<br>15A 250VAC, 1.5HP<br>T5, 115VAC, 50/400Hz | 10,000 cycles, T55°C<br>20(9)A 125VAC<br>15(6)A 250VAC<br>15/150A 250VAC | 10,000 cycles, T20°C<br>15A 28VDC resistive<br>10A 28VDC inductive<br>5A 28VDC lamp load | 10,000 cycles<br>16A 250 VAC<br>15A 32 VDC |
| <b>ON-OFF-ON</b>                  | 6,000 cycles, T65°C<br>18A, 125VAC, 1/2HP<br>10A 250VAC, 1/2HP<br>T2, 115VAC, 50/400Hz | 10,000 cycles, T55°C<br>15(6)A 125VAC<br>10(4)A 250VAC<br>10/150A 250VAC | 10,000 cycles, T20°C<br>10A 28VDC resistive<br>8A 28VDC inductive<br>3A 28VDC lamp load  |                                            |
| <b>OTHER<br/>FUNCTIONS</b>        | 6,000 cycles, T65°C<br>15A, 125VAC<br>10A 250VAC<br>T2, 115VAC, 50/400Hz               | 10,000 cycles, T55°C<br>15A 125VAC<br>10A 250VAC<br>10/150A 250VAC       | 10,000 cycles, T20°C<br>10A 28VDC resistive<br>8A 28VDC inductive<br>3A 28VDC lamp load  |                                            |

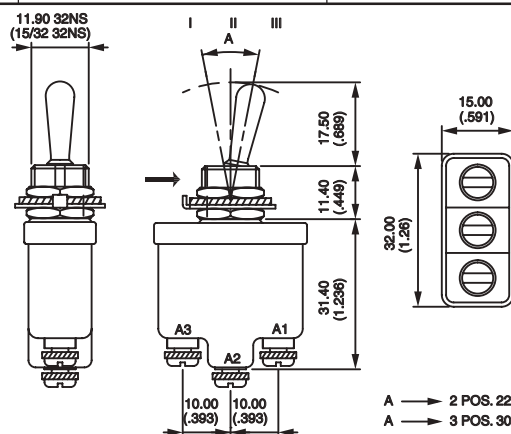
### Single pole

→ Keyway



| Solder lug/<br>quick-connect | Screw<br>terminals | III<br>A2-A3 | II  | I<br>A1-A2 |
|------------------------------|--------------------|--------------|-----|------------|
| 3531021N000                  | 3531001N000        | ON           | -   | OFF        |
| 3536021N000                  | 3536001N000        | ON           | -   | ON         |
| 3537021N000                  | 3537001N000        | MOM          | OFF | MOM        |
| 3538021N000                  | 3538001N000        | ON           | OFF | MOM        |
| 3539021N000                  | 3539001N000        | ON           | OFF | ON         |

Above listed models have standard bat lever (1) with bright nickel finish (N).  
Model shown in photo has flattened lever (3) with satin chrome finish (B).



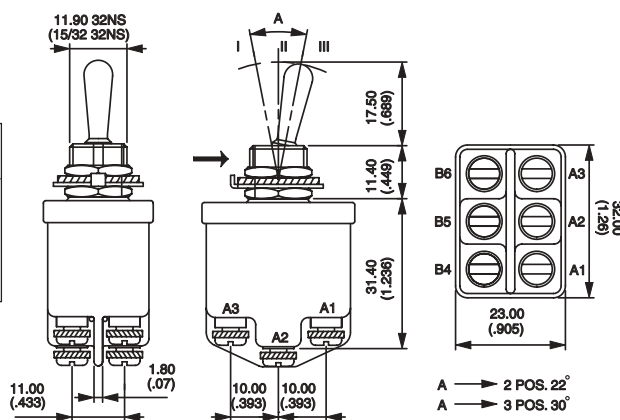
### Double pole

→ Keyway



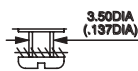
| Solder lug/<br>quick-connect | Screw<br>terminals | III<br>A2-A3 | II  | I<br>A1-A2 |
|------------------------------|--------------------|--------------|-----|------------|
| 3541021N000                  | 3541001N000        | ON           | -   | OFF        |
| 3546021N000                  | 3546001N000        | ON           | -   | ON         |
| 3547021N000                  | 3547001N000        | MOM          | OFF | MOM        |
| 3548021N000                  | 3548001N000        | ON           | OFF | MOM        |
| 3549021N000                  | 3549001N000        | ON           | OFF | ON         |

Above listed models have standard bat lever (1) with bright nickel finish (N) and screw terminals (O).  
Model shown in photo has standard bat lever (1) with matte black finish (G) on lever and bushing, and standard quick-connect terminals.

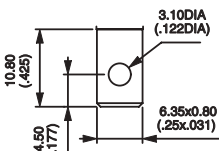


## TERMINALS

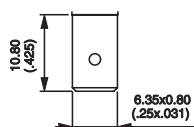
## PANEL CUT-OUTS (see mounting accessories at end of section)



Screw



Sold.lug/Quick-conn.



Quick-connect

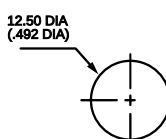


Fig. 1

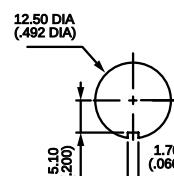


Fig. 2

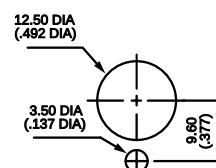


Fig. 3

**Additional ordering information:** Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

### 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

#### Model Structure:

| Series                                                        | Number of poles                | Electrical functions                                                                                                                                                                                                                                                           | Terminals                                                         |
|---------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| <input type="text" value="3"/> <input type="text" value="5"/> | <input type="text"/>           | <input type="text"/> <input type="text"/>                                                                                                                                                                                                                                      | <input type="text"/>                                              |
|                                                               | 3 Single pole<br>4 Double pole | 1 0 ON - OFF<br>2 0 ON - m.OFF<br>3 0 OFF - MOM<br>4 1 ON ON(3-4) ON*<br>4 2 ON ON(3-4) MOM*<br>4 3 MOM ON(3-4) MOM*<br>4 4 ON ON(1-6) ON*<br>4 5 ON ON(1-6) MOM*<br>4 6 MOM ON(1-6) MOM*<br>5 0 ON - MOM<br>6 0 ON - ON<br>7 0 MOM OFF MOM<br>8 0 ON OFF MOM<br>9 0 ON OFF ON | 0 Screw<br>2 Solder lug/quick-connect<br>3 Standard quick-connect |

\* - Function 4 is for double pole only - terminals connected indicated (see drawings)

#### Options:

| Lever styles                                                                                                                                                                   | Lever finish                                                                                                                                                  | Locking lever styles                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Agency recognition   | Mounting Accessories                                                           | Locking lever special finish                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <input type="text"/>                                                                                                                                                           | <input type="text"/>                                                                                                                                          | <input type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <input type="text"/> | <input type="text"/>                                                           | <input type="text"/> <input type="text"/>                                                                                    |
| 1 Std'd. length 17.5mm (.688") or locking, length 20mm (.787")<br>2 Length 30mm (1.181")<br>3 Flatted, length 24mm (.944")<br>4 Length 40mm (1.574")<br>5 Length 50mm (1.968") |                                                                                                                                                               | 0 No locking<br>A Locked in 3 positions<br>B Locked in ctr. & keyway side<br>D Locked out of ctr. position<br>E Locked in ctr. position<br>F Locked in side opposite keyway<br>G Locked in keyway side<br>H Locked out of ctr. & keyway side<br>J Locked out of ctr. & side opposite keyway<br>K Locked in ctr. & side opp. keyway<br>L Locked out of keyway side<br>M Locked out of & into side opposite keyway<br>N Locked out of side opp. keyway<br>P Locked out of & into keyway side | 0 None<br>1 CECC     |                                                                                | (NONE)<br>P 5 Painted yellow<br>A 6 Anodized red<br>This option is for lever finish C only.<br>(consult factory for others). |
|                                                                                                                                                                                | N Bright nickel<br>B Satin chrome<br>G** Matte black<br>F** Matte black w/ fluorescent tip (lever style 1 only)<br>C Painted or anodized<br>T Sulphamate gray |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                      | 0 2 hex nuts, 1 locking ring & 1 lockwasher<br>2 2 hex nuts & 1 sealing washer |                                                                                                                              |

\*\* - includes matte black on bushing

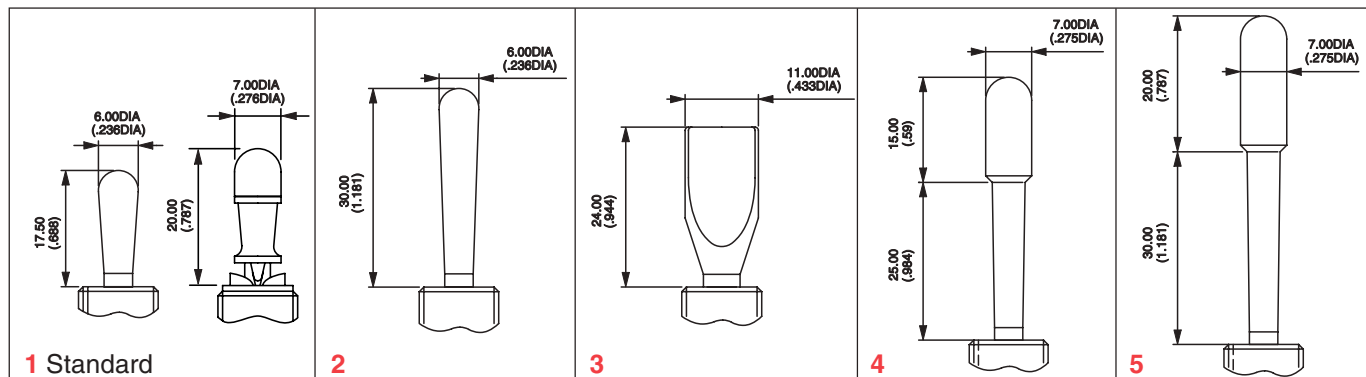
Example of completely specified model number:

**3531001NA00**

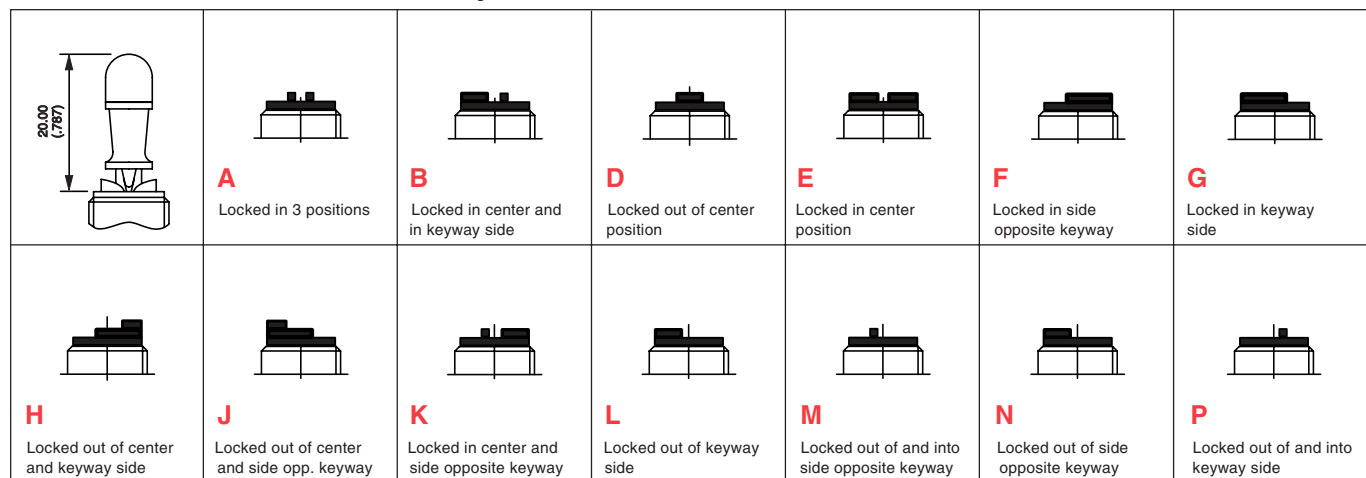
Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

**New!****3500 SERIES - MILITARY STYLE SEALED TOGGLE SWITCHES****A****OPTIONS & MISCELLANEOUS****LEVER STYLES**

Security Guards available - see Miscellaneous &amp; Accessories section D.

**LEVER FINISH**

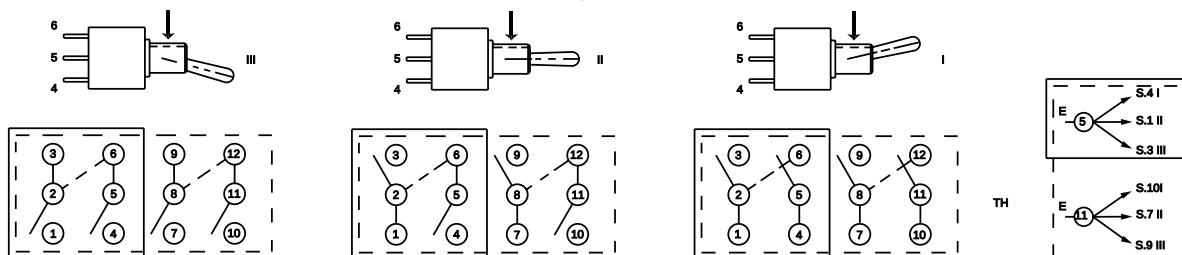
**N** Standard    **B** Satin chrome    **G\*** Matte black    **F\*** Matte black with fluorescent tip (lever style 1 only)  
**C** Painted or anodized    **T** Sulphamate gray    \* - Includes matte black finish on bushing

**LOCKING LEVER STYLES**    0 - No locking**AGENCY RECOGNITION**    0 NONE    1 CECC**MOUNTING ACCESSORIES**

- 0** For non-sealed mounting (see panel cut-outs Fig. 1, 2 or 3): 2 hex nuts 14mm (.551") across flats, 1 locking ring U121 or U12, 1 lockwasher U13. (See hardware section of catalog). Panel thickness: 5mm (.196") max.  
**2** For sealed mounting (see panel cut-out Fig. 2): 2 hex nuts 14mm (.551") across flats and 1 sealing washer U60. (See hardware section of catalog).

**LOCKING LEVER SPECIAL FINISH** (for lever finish C above only)

**(Blank)** None    **P5** Painted yellow    **A6** Anodized red    Other colors on request

**SCHEMATICS FOR FUNCTION 4 MODELS** Below diagrams are viewed from bottom of switch.

Equivalent to single pole 3 throw switch. Dotted lines between terminals 2 &amp; 6 and 8 &amp; 12 indicate external jumpers to be added by customer.

## FEATURES

## MATERIALS

|                  |                                                                                                                                                                                              |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contacts:</b> | Silver/nickel alloy                                                                                                                                                                          |
| <b>Actuator:</b> | 600H: nickel plated brass 600NH: black polyamide                                                                                                                                             |
| <b>Bushing:</b>  | Nickel plated brass                                                                                                                                                                          |
| <b>Housing:</b>  | Stainless steel or tin plated steel                                                                                                                                                          |
| <b>Case:</b>     | Melamine/polyester                                                                                                                                                                           |
| <b>Hardware:</b> | 600H models are supplied with 1 Hex Nut p/n U166 & 1 Knurled Nut p/n U411.<br>600NH models are supplied with 1 Hex Nut U166 & 1 black Knurled Nut p/n U522. See hardware section of catalog. |



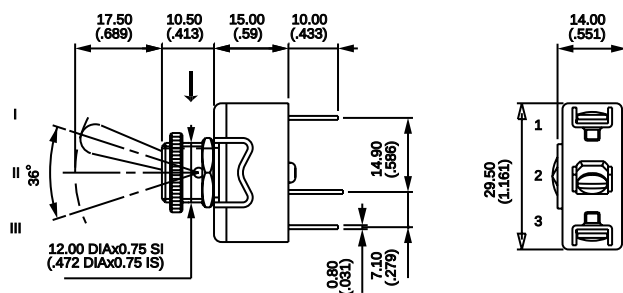
# 600H & 600NH SERIES - POWER TOGGLE SWITCHES

A

## Single pole - nickel plated brass actuator



| SOLDER LUG                   | SCREW TERMS. | CIRCUIT |     |     |
|------------------------------|--------------|---------|-----|-----|
| 631H/2                       | 631H         | ON      | -   | OFF |
| 635H/2                       | 635H         | MOM     | -   | ON  |
| 636H/2                       | 636H         | ON      | -   | ON  |
| 637H/2                       | 637H         | MOM     | OFF | MOM |
| 638H/2                       | 638H         | ON      | OFF | MOM |
| 639H/2                       | 639H         | ON      | OFF | ON  |
| Handle position (see dwg.) : |              | III     | II  | I   |
| Terminals connected:         |              | 2-1     |     | 2-3 |



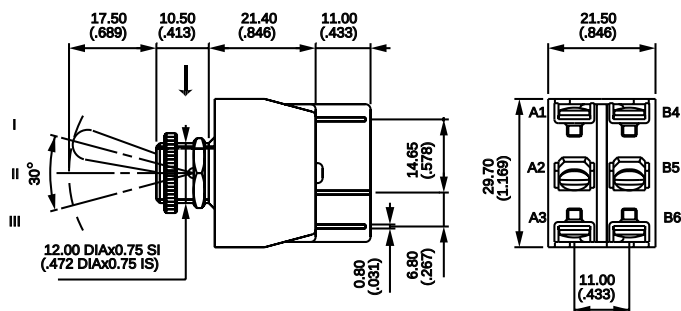
→ Keyway

## Double pole - nickel plated brass actuator



| SOLDER LUG           | SCREW TERMS. | CIRCUIT |     |     |
|----------------------|--------------|---------|-----|-----|
| 641H/2               | 641H         | ON      | -   | OFF |
| 644H/2*              | 644H*        | ON      | ON  | ON  |
| 644H/21R*            | 644H1R*      | ON      | ON  | MOM |
| 644H/22R*            | 644H2R*      | MOM     | ON  | MOM |
| 645H/2               | 645H         | MOM     | -   | ON  |
| 646H/2               | 646H         | ON      | -   | ON  |
| 647H/2               | 647H         | MOM     | OFF | MOM |
| 648H/2               | 648H         | ON      | OFF | MOM |
| 649H/2               | 649H         | ON      | OFF | ON  |
| Handle position:     |              | III     | II  | I   |
| Terminals connected: |              | 2-1     |     | 2-3 |
|                      |              | 5-4     |     | 5-6 |

\* Function 4: SP in DP case. See info. at end of section.

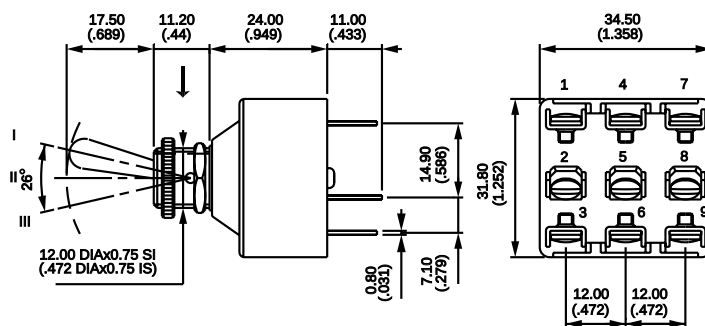


→ Keyway

## Three pole - nickel plated brass actuator



| SOLDER LUG           | SCREW TERMS. | CIRCUIT |     |     |
|----------------------|--------------|---------|-----|-----|
| 651H/2               | 651H         | ON      | -   | OFF |
| 655H/2               | 655H         | MOM     | -   | ON  |
| 656H/2               | 656H         | ON      | -   | ON  |
| 657H/2               | 657H         | MOM     | OFF | MOM |
| 658H/2               | 658H         | ON      | OFF | MOM |
| 659H/2               | 659H         | ON      | OFF | ON  |
| Handle position:     |              | III     | II  | I   |
| Terminals connected: |              | 2-1     |     | 2-3 |
|                      |              | 5-4     |     | 5-6 |
|                      |              | 8-7     |     | 8-9 |

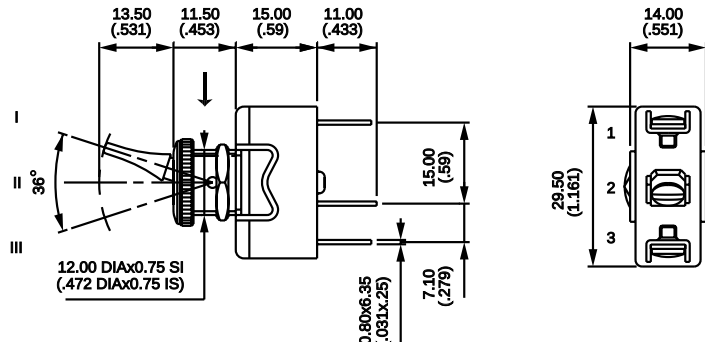


→ Keyway

## Single pole - insulated actuator



| SOLDER LUG                   | SCREW TERMS. | CIRCUIT |     |     |
|------------------------------|--------------|---------|-----|-----|
| 631NH/2                      | 631NH        | ON      | -   | OFF |
| 635NH/2                      | 635NH        | MOM     | -   | ON  |
| 636NH/2                      | 636NH        | ON      | -   | ON  |
| 637NH/2                      | 637NH        | MOM     | OFF | MOM |
| 638NH/2                      | 638NH        | ON      | OFF | MOM |
| 639NH/2                      | 639NH        | ON      | OFF | ON  |
| Handle position (see dwg.) : |              | III     | II  | I   |
| Terminals connected:         |              | 2-1     |     | 2-3 |



→ Keyway

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

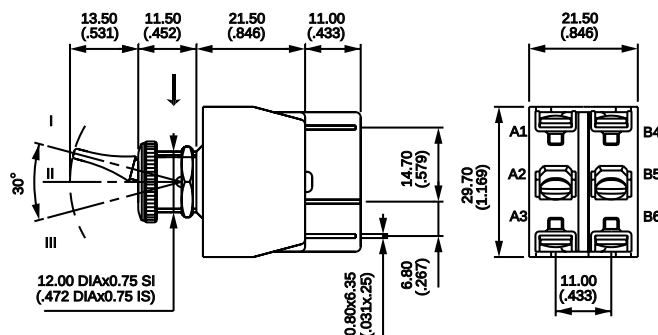
# 600H & 600NH SERIES - POWER TOGGLE SWITCHES

## Double pole - insulated actuator



| SOLDER LUG           | SCREW TERMS. | CIRCUIT |     |     |
|----------------------|--------------|---------|-----|-----|
| 641NH/2              | 641NH        | ON      | -   | OFF |
| 644NH/2*             | 644NH*       | ON      | ON  | ON  |
| 644NH/21R*           | 644NH1R*     | ON      | ON  | MOM |
| 644NH/22R*           | 644NH2R*     | MOM     | ON  | MOM |
| 645NH/2              | 645NH        | MOM     | -   | ON  |
| 646NH/2              | 646NH        | ON      | -   | ON  |
| 647NH/2              | 647NH        | MOM     | OFF | MOM |
| 648NH/2              | 648NH        | ON      | OFF | MOM |
| 649NH/2              | 649NH        | ON      | OFF | ON  |
| Handle position:     |              | III     | II  | I   |
| Terminals connected: |              | 2-1     | 2-3 |     |
|                      |              | 5-4     | 5-6 |     |

\* Function 4: SP in DP case. See info. at end of section.

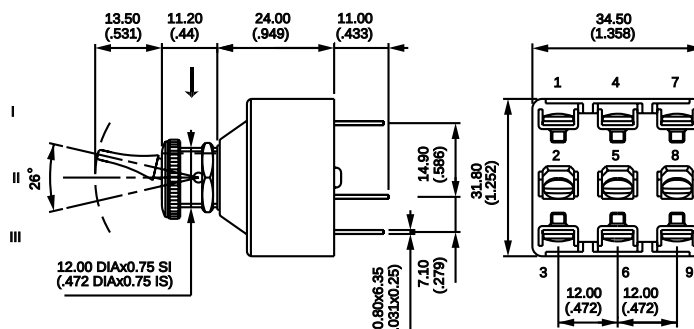


→ Keyway

## Three pole - insulated actuator



| SOLDER LUG           | SCREW TERMS. | CIRCUIT |     |     |
|----------------------|--------------|---------|-----|-----|
| 651NH/2              | 651NH        | ON      | -   | OFF |
| 655NH/2              | 655NH        | MOM     | -   | ON  |
| 656NH/2              | 656NH        | ON      | -   | ON  |
| 657NH/2              | 657NH        | MOM     | OFF | MOM |
| 658NH/2              | 658NH        | ON      | OFF | MOM |
| 659NH/2              | 659NH        | ON      | OFF | ON  |
| Handle position:     |              | III     | II  | I   |
| Terminals connected: |              | 2-1     | 2-3 |     |
|                      |              | 5-4     | 5-6 |     |
|                      |              | 8-7     | 8-9 |     |



→ Keyway

## 600SH & 600SNH - switches for peak currents - up to 150 Amps at 250 VAC

**Contacts:** Silver cadmium oxide

**Capacitive load ratings:** 15/150A 125VAC & 250VAC - 5,000 cycles  
10/150A 125VAC & 250VAC - 10,000 cycles  
4/90A (10ms) 60VDC - 10,000 cycles

**Motor load ratings:** 15(6)A 250VAC - 10,000 cycles 10(4)A 380VAC - 10,000 cycles  
(note: 15(6)A 250VAC= 17(6)A 125VAC - 6,000 cycles 1 HP 250VAC - 10,000 cycles  
15A resistive and 6A motor) 2 HP 250VAC - 6,000 cycles 1/2 HP 125VAC - 6,000 cycles

**Lamp load ratings:** 10A 125VAC & 250VAC - 10,000 cycles

**Other specs. & dimensions:** Same as 600H & 600NH models previously described.  
Compatible with options T, G, K, 1V, 2V & 3V.



Single and double pole models are UL approved (3/4 HP 125VAC)

Also see 'Switches for Peak Currents' technical page in rear of catalog.

| SCREW TERMINALS WITH CLAMP | SOLDER LUG QUICK-CONNECT TERMINALS | CIRCUIT |   |     |
|----------------------------|------------------------------------|---------|---|-----|
| <b>SINGLE POLE</b>         |                                    |         |   |     |
| 631SH                      | 631SH/2                            | ON      | - | OFF |
| 636SH                      | 636SH/2                            | ON      | - | ON  |
| <b>DOUBLE POLE</b>         |                                    |         |   |     |
| 641SH                      | 641SH/2                            | ON      | - | OFF |
| 646SH                      | 646SH/2                            | ON      | - | ON  |
| <b>THREE POLE</b>          |                                    |         |   |     |
| 651SH                      | 651SH/2                            | ON      | - | OFF |
| 656SH                      | 656SH/2                            | ON      | - | ON  |

Above models have nickel plated brass actuator. For insulated actuator, replace 'SH' in above model numbers with 'SNH'.

# 600H & 600NH SERIES - POWER TOGGLE SWITCHES

A

**Additional ordering information:** Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

## 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

### Model Structure:

| Series | Number of poles | Electrical functions                                       | Actuator and terminals                                               | Momentary for function 4 |
|--------|-----------------|------------------------------------------------------------|----------------------------------------------------------------------|--------------------------|
| 6      |                 |                                                            |                                                                      |                          |
|        | 3 Single pole   | 1 ON - OFF                                                 | H Metal actuator, screw terminals                                    | (NONE)                   |
|        | 4 Double pole   | 5 MOM - ON                                                 | H / 2 Metal actuator, solder lug/quick connect style terminals       | 1 R ON ON MOM            |
|        | 5 Three pole    | 6 ON - ON                                                  |                                                                      | 2 R MOM ON MOM           |
|        |                 | 7 MOM OFF MOM                                              |                                                                      |                          |
|        |                 | 8 ON OFF MOM                                               |                                                                      |                          |
|        |                 | 9 ON OFF ON                                                | N H Insulated actuator, screw terminals                              |                          |
|        |                 | 4 ON ON ON                                                 |                                                                      |                          |
|        |                 | 4* ON ON MOM                                               |                                                                      |                          |
|        |                 | 4* MOM ON MOM                                              | N H / 2 Insulated actuator, solder lug/quick-connect style terminals |                          |
|        |                 | * specify selection from 'connections/functions' box also. |                                                                      |                          |

### Options:

#### Misc. options

(NONE)

- T** High temperature DAP case: -40°C to +85°
- G** Matte black finish on actuator, bushing & nuts. Includes option 'T' above.
- K** Front panel sealing with 'O'-ring and sealing washer

#### Locking actuators

(NONE)

- 1 V Locking (1 position)
- 2 V Locking (2 positions)
- 3 V Locking (3 positions)
- (see actuator drawings).

Example of completely specified model number:

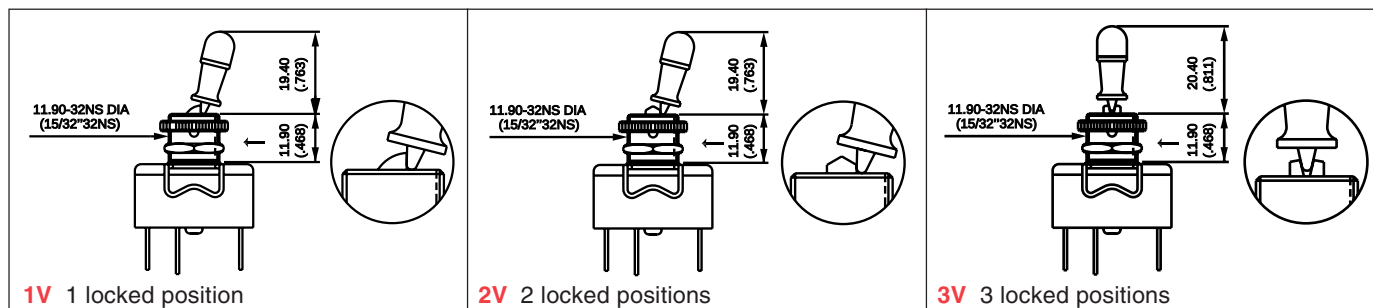
**644H/21RGK**

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

## OPTIONS & SPECIAL OPTIONS

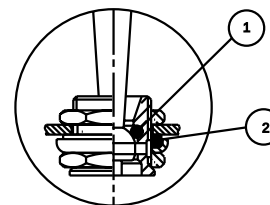
### LOCKING ACTUATORS for 1 & 2 pole models

Arrow indicates keyway



### SPECIAL OPTIONS

- T** High temperature diallyl phthalate case (-40°C to +85°C).
- G** Matte black finish on actuator, bushing and nuts. Includes option **T** above.
- K** Front panel sealing with 'O'-ring and sealing washer.



**K**

Security Guards available - see Miscellaneous & Accessories section D.

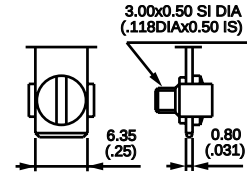
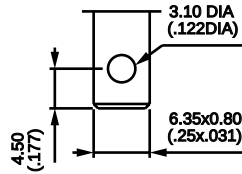
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 600H & 600NH SERIES - POWER TOGGLE SWITCHES

## OPTIONS & MISCELLANEOUS

### GROUNDING LUG RING

### TERMINALS



**U187** (required for switches used at 380VAC - order separately)

**600H/2** Solder lug terminals

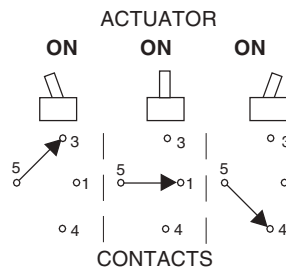
**600H** Screw terminals

### POSITIONS & CONNECTIONS for function 4 switches

| FUNCTION 4 |     |     | FUNCTION 41R |     |     | FUNCTION 42R |     |     |
|------------|-----|-----|--------------|-----|-----|--------------|-----|-----|
| ACTUATOR   |     |     | ACTUATOR     |     |     | ACTUATOR     |     |     |
| ON         | ON  | ON  | MOM          | ON  | ON  | MOM          | ON  | MOM |
|            |     |     |              |     |     |              |     |     |
| CONTACTS   |     |     | CONTACTS     |     |     | CONTACTS     |     |     |
| ON         | ON  | ON  | MOM          | ON  | ON  | MOM          | ON  | MOM |
| 5-6        | 5-6 | 5-4 | 5-6          | 5-6 | 5-4 | 5-6          | 5-6 | 5-4 |
| ON         | ON  | ON  | MOM          | ON  | ON  | MOM          | ON  | MOM |
| 2-3        | 2-1 | 2-1 | 2-3          | 2-1 | 2-1 | 2-3          | 2-1 | 2-1 |

### WIRING FOR 3 WAY SWITCH for function 4 switches

Equivalent to single pole 3 throw switch. External jumper must be connected between terminals 2 & 6 by customer.



### PANEL CUT-OUTS

### SWITCH ACTION

(arrow indicates keyway)

