



# PUSHBUTTON SWITCHES

PUSHBUTTON SWITCH SELECTION GUIDE: This catalog contains an extensive variety of pushbutton 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.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

SERIES	SIZE	RATINGS (Max. in bold)	POLES	ILLUMINATED	SMT MOUNT	PANEL MOUNT	P. C. MOUNT	UL	CSA	VDE	WASHABLE	ESD PROTECTION	PAGE(S)
TP	TINY	<b>0.4VA 20V</b>	SP		X						X	X	C2-C5
TP	TINY	<b>500mA 48V</b> 0.4VA 20V	SP,DP				X				X		C6-C9
9000	SUB-MINI.	<b>100mA 30VDC</b>	SP			X	X						C10-C14
9000	MINIATURE	<b>.6-1A 125VAC</b> 1A 30VDC .3-.5A 250VAC	SP				X						C15-C18
10400	MINIATURE	<b>3 A 110VAC</b> or 24VDC 2A 220VAC	SP,DP			X							C19-C20
300 & 400	MINIATURE	<b>3A 125VAC</b> or 28VDC 1.5A 250VAC 0.4VA 20V	SP	X		X	X	X					C21-C27
MPB	MINIATURE	<b>300mA 125VAC</b>	SP			X							C28
IP	MINIATURE	<b>500mA 48VAC</b> 200mA 50VDC or 250VAC	SP			X					X		C29-C31
SP	MINIATURE	<b>1A 120VAC</b> or 30VDC	SP			X	X					X	C32-C35
18000	MINIATURE	<b>1A 120VAC</b> or 30VDC	SP,DP			X	X						C36-C42
8000	MINIATURE	<b>6A 125VAC</b> 3A 250VAC 4A 30VDC 0.4VA 20V	SP,DP			X	X	X					C43-C46
800	MINIATURE	<b>6A 125VAC</b> 3A 250VAC 7A 30VDC 0.4VA 20V	SP,DP	X		X	X	X	X				C47-C56
PB	MINIATURE	<b>6A 125VAC</b> 3A 250VAC 7A 30VDC 0.4VA 20V	SP	X		X	X	X	X				C57-C65
13000	MINIATURE	<b>4A 125VAC</b> 2A 250VAC 4A 30VDC 100mA 30V	SP,DP			X	X						C66-C69
13000X778	MINIATURE	<b>4A 125VAC</b> 2A 250VAC 4A 28VDC 300mA 30VDC	DP			X	X						C70-C72
1200	STANDARD	<b>8A 125VAC</b> 4A 250VAC 4A 24VDC	SP			X		X	X	X			C73-C75
1200M&MR	STANDARD	<b>8A 125VAC</b> 4A 250VAC 4A 24VDC	SP			X		X	X				C76-C77
4700&4800	STANDARD	<b>6A 125VAC</b> 3A 250VAC	SP,DP			X		X	X	X			C78-C79
MD	STANDARD	<b>200mA 30VDC</b>	SP,DP,4P			X	X						C80-C82
MD1	STANDARD	<b>7.5A 125/250VAC</b> TV5&8 <b>10A 125/250VAC</b> TV5&8 8A/128A 250VAC $\mu$ T85	DP			X							C83
MD2	STANDARD	<b>15A 125VAC</b> 10A 250VAC TV-5	SP			X							C84
AV	STANDARD	SEE TABULATION BOX ON PAGE C86 FOR AV SERIES PUSHBUTTON SWITCHES. C85-C99											



# New! TP SERIES - SMT WASHABLE TINY PUSHBUTTON SWITCHES

## DESIGNED EXCLUSIVELY FOR SURFACE MOUNTING

SMT TP Series switches incorporate many desirable features that include:

- **Tape & reel packaging**  
This type of packaging is 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 with .400" (10.16mm) pitch
  - 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 TP Series pushbutton switches, TG Series slide switches and TL Series toggle switches. See Slide & Toggle switch sections of catalog for TG & TL Series respectively.



# New! TP SERIES - SMT WASHABLE TINY PUSHBUTTON 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 10µA at 5 VD
<b>Initial contact resistance:</b>	50 milliohms maximum
<b>Insulation resistance:</b>	1000 MΩ 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>	60,000 cycles
<b>Static resistance:</b>	10 KV (Schaffner equipment)

## GENERAL SPECIFICATIONS

<b>Travel:</b>	ON-MOM .039" (1mm), OFF-MOM. .031" (0.8mm)
<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

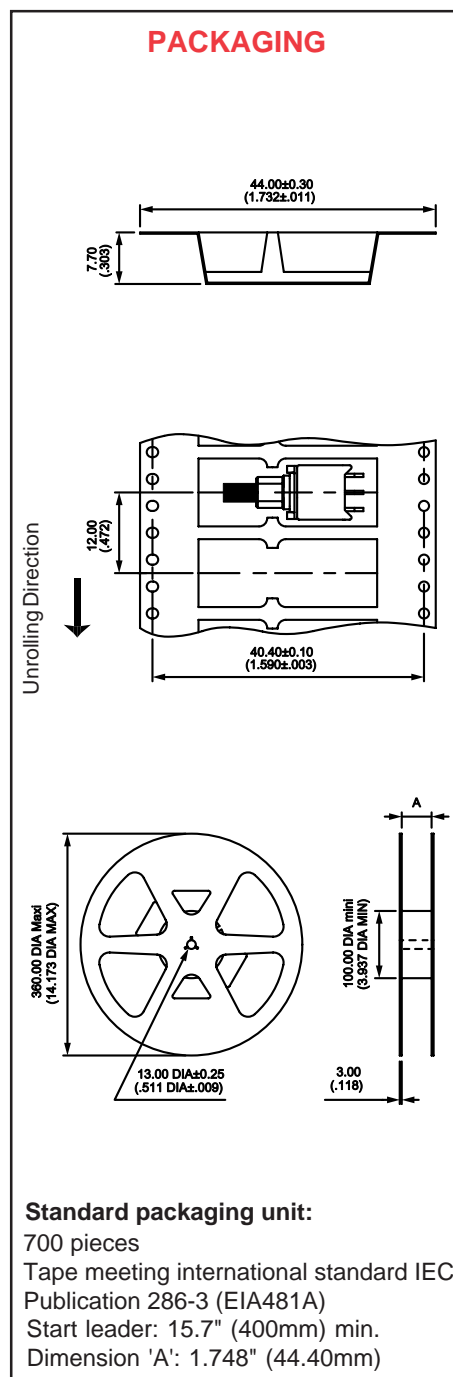
## MATERIALS

<b>Case:</b>	High temperature plastic UL94V-0
<b>Actuator:</b>	High temperature plastic UL94V-0
<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

## 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



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# New! TP SERIES - SMT WASHABLE TINY PUSHBUTTON SWITCHES

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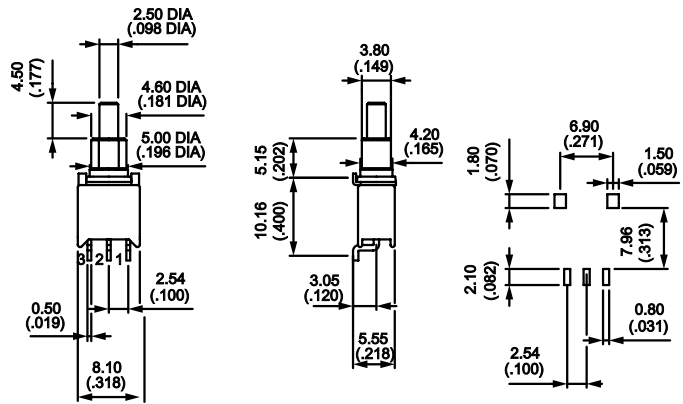
## Single pole momentary pushbutton switches



MODEL NO.	CIRCUIT	
TP32WS83500	ON	MOM
TP33WS83500	OFF	MOM

Handle position:  



Function 2 shown



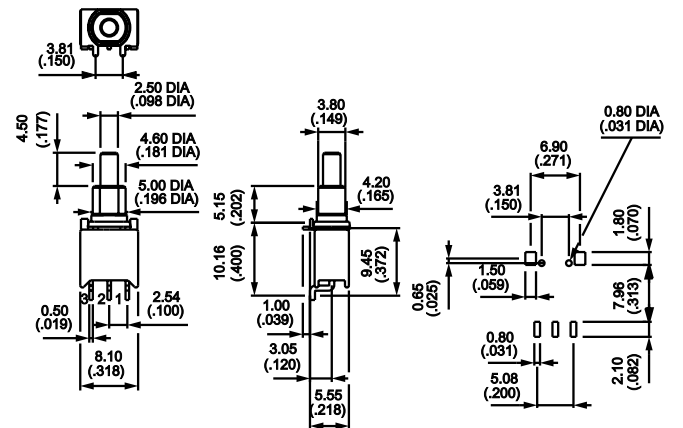
## Single pole momentary pushbutton switches with positioning pins



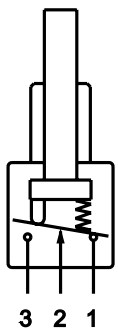
MODEL NO.	CIRCUIT	
TP32WS83565	ON	MOM
TP33WS83565	OFF	MOM

Handle position:  

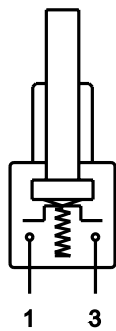
Function 2 shown



## SWITCH ACTION

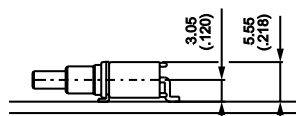


Function 2



Function 3

## P.C. BOARD DIMENSIONS



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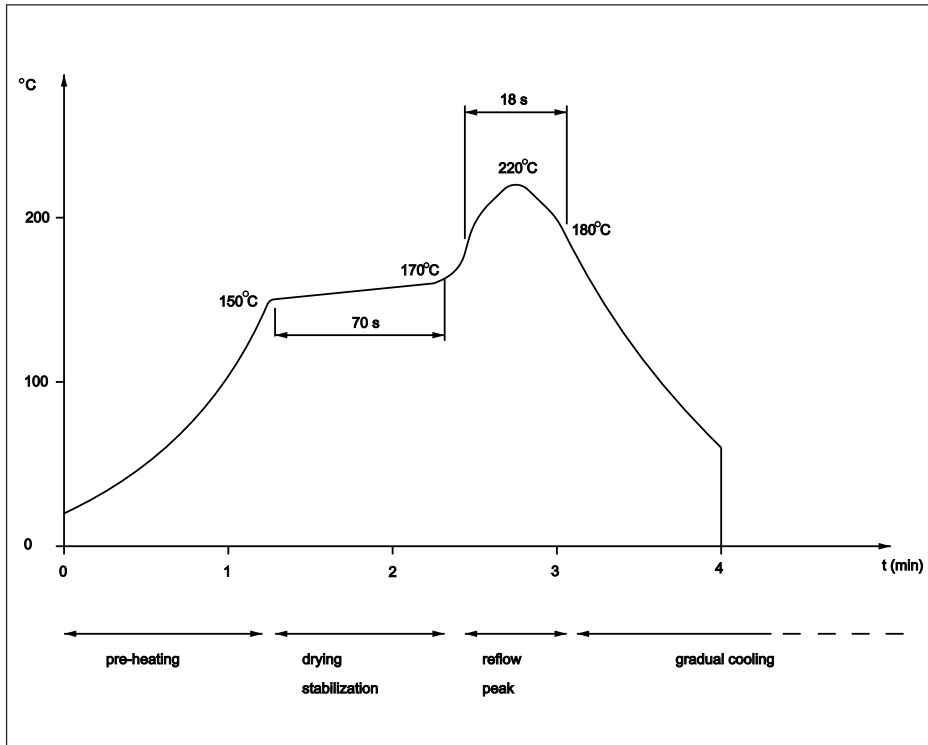
# New! TP SERIES - SMT WASHABLE TINY PUSHBUTTON SWITCHES

## REFLOW SOLDERING - STANDARD PROFILE

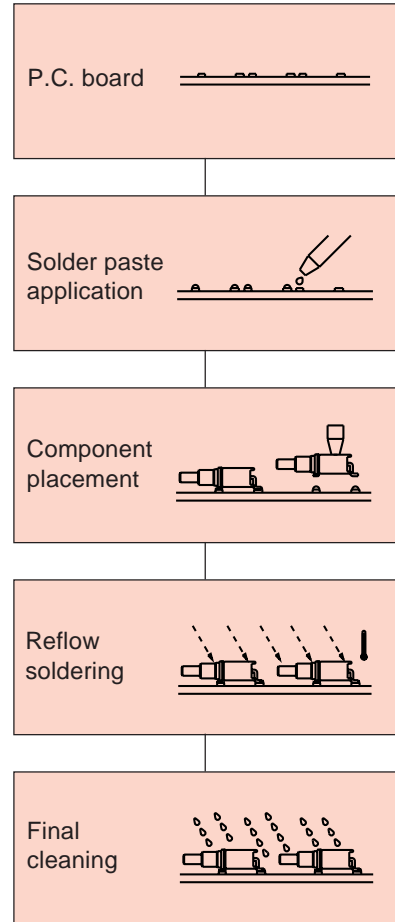
The printed circuit board, carried by a conveyor belt, travels through the reflow soldering oven and experiences the following programmed cycles:

- 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

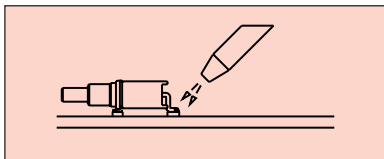


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### P.C. BOARD REWORK RECOMMENDATIONS

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.

# TP SERIES - WASHABLE SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES



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## FEATURES

- Wave solderable.
- Fully sealed for process compatibility.
- Ultra-compact case size.
- Case color options - blue or black (with black actuator).
- SPST, SPDT, DPST & DPDT p.c. mounting models.

## SPECIFICATIONS

<b>Contact ratings (resistive loads):</b>	Gold plated brass: 0.4 Volt-Amps max. at 20 V max. Silver plated brass: 0.5 Amps at 48 V max.
<b>Minimum load:</b>	10 mA at 50 mV - 10µA at 5 VDC
<b>Initial contact resistance:</b>	50 milliohms maximum
<b>Insulation resistance:</b>	1000 megohms minimum at 500 VDC
<b>Dielectric strength:</b>	1000 V rms min. between terminals and frame. 500 V rms between terminals.
<b>Electrical life:</b>	60,000 cycles minimum at full load.
<b>Operating temperature range:</b>	-30°C to +85°C
<b>Plunger travel:</b>	'ON MOM' - .039" (1mm)      'OFF MOM' - .031" (0.8mm)
<b>Washing:</b>	Permissible with water, detergents and solvents.

## MATERIALS

<b>Contacts &amp; Terminals:</b>	Gold or silver plated brass
<b>Actuator:</b>	Polyamide (UL94V-O), glass filled
<b>Bracket:</b>	Tin plated steel
<b>Case:</b>	PBT (UL94V-O)
<b>Terminal seal:</b>	Epoxy


## AGENCY LISTINGS

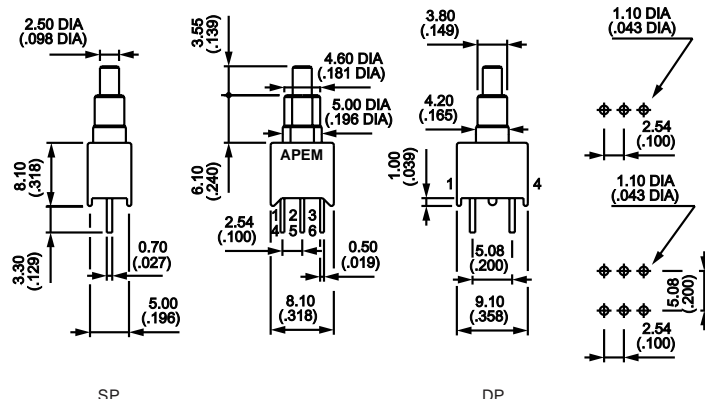
GAM T1 (military). Availability: consult factory for details of listed models.

Note: drawings show switches with 3 terminals (function 2). Function 3 switches have only 2 terminals. See switch cross-sections at end of section.

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



SINGLE POLE MODEL NO.	CIRCUIT
TP32P003000	ON MOM
TP33P003000	OFF MOM
DOUBLE POLE MODEL NO.	CIRCUIT
TP42P003000	ON MOM
TP43P003000	OFF MOM
Handle position:	





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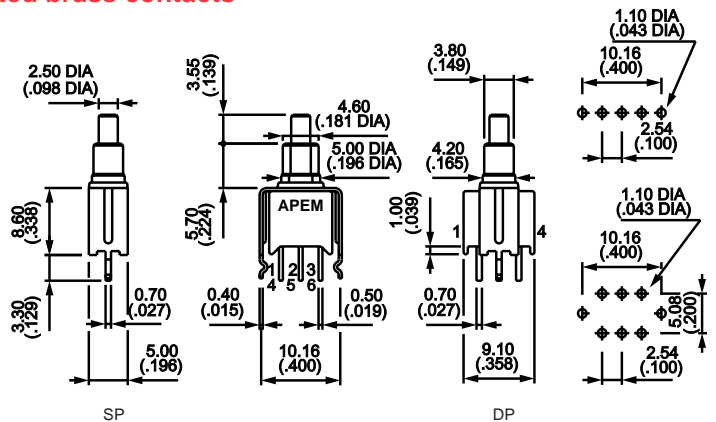


# TP SERIES - WASHABLE SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

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





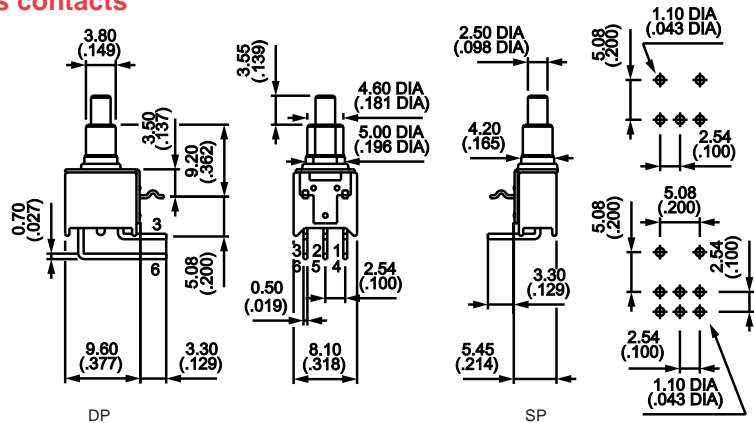
SINGLE POLE		CIRCUIT	
MODEL NO.	TP32Y003050	ON	MOM
	TP33Y003050	OFF	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.	TP42Y003050	ON	MOM
	TP43Y003050	OFF	MOM
Handle position:			



## Horizontal right angle terminals - gold plated brass contacts





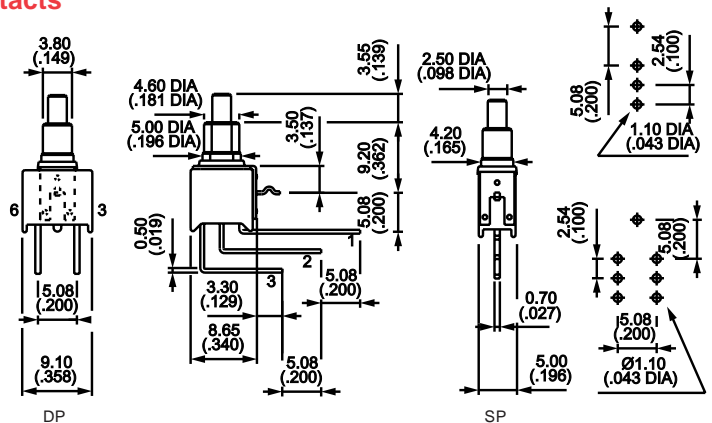
SINGLE POLE		CIRCUIT	
MODEL NO.	TP32W003050	ON	MOM
	TP33W003050	OFF	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.	TP42W003050	ON	MOM
	TP43W003050	OFF	MOM
Handle position:			



## Vertical right angle terminals - gold plated brass contacts





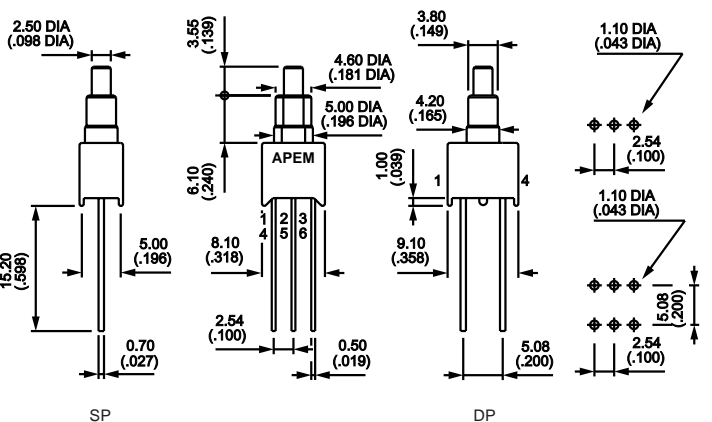
SINGLE POLE		CIRCUIT	
MODEL NO.	TP32WW03050	ON	MOM
	TP33WW03050	OFF	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.	TP42WW03050	ON	MOM
	TP43WW03050	OFF	MOM
Handle position:			



## Wire-wrap terminals - gold plated brass contacts



SINGLE POLE		CIRCUIT	
MODEL NO.	TP32MW03000	ON	MOM
	TP33MW03000	OFF	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.	TP42MW03000	ON	MOM
	TP43MW03000	OFF	MOM
Handle position:			



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# TP SERIES - WASHABLE SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

**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 under each respective box).

### Model Structure:

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

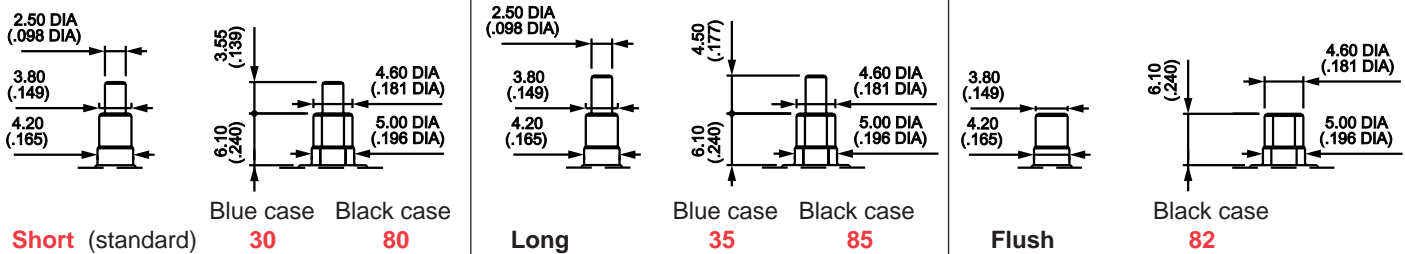
### Options:

Contact & terminal mat'ls.	Actuators & case colors	Miscellaneous	Caps
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
0 Brass, gold plated	Specify 30, 35, 80, 82, or 85	0 0 No special requirement	1 0*
1 Brass, silver plated	See drawings with specifications and dimensions.	5 0 Crimped bracket terminals - specify for models with brackets. See additional listings on following page.	2 0*
3 Brass, gold plated - (1.27 microns gold)			3 0*
8 Brass, gold plated contacts with tin plated terminals			4 0*
9 Contacts brass, gold plated (1.27 microns gold) and tin plated terminals			* - Specify color - see caps below.

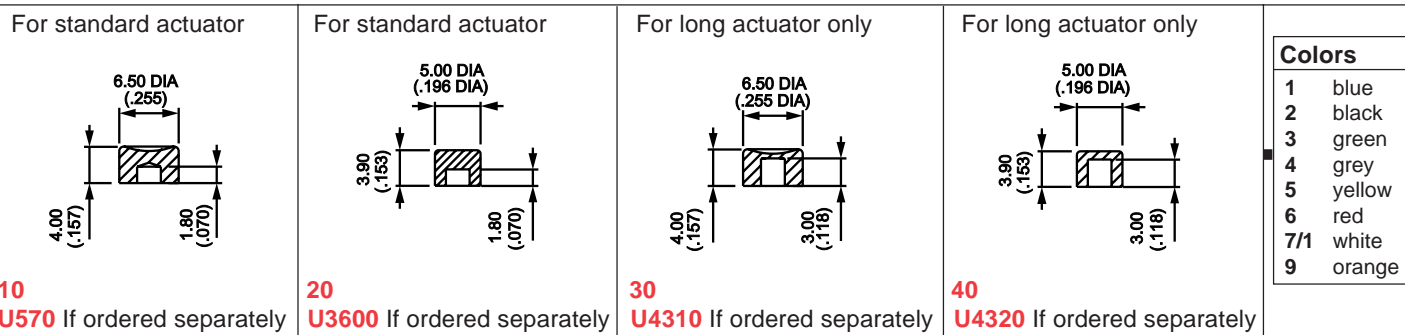
Example of completely specified model number: **TP32Y00305025**

## OPTION DRAWINGS

### Actuators & case colors



### CAPS Note: replace last '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

Note: Caps U4310 and U4320 (for long actuators) offer better resistance to vibration.

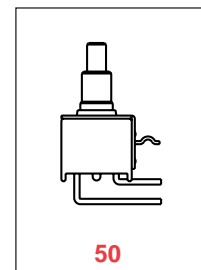
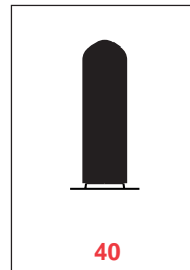
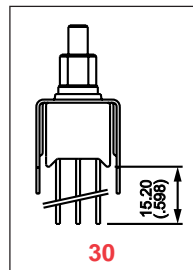
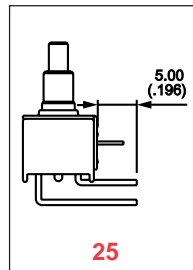
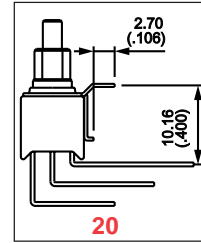
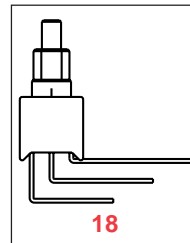
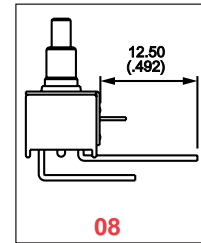
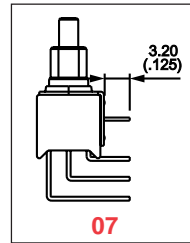
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# TP SERIES - WASHABLE SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

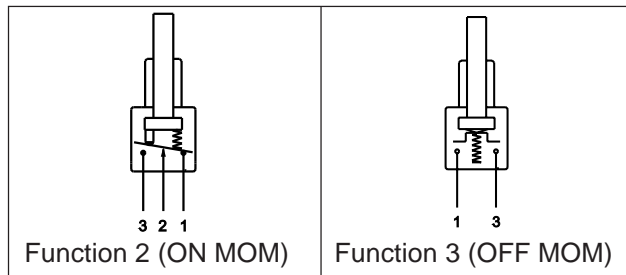
## SPECIAL OPTIONS & MISCELLANEOUS

### 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** **WW** models with mounting bracket and p.c. board spacer tab.
- 25** Trimmed terminals for all models except **WW** - .196" (5mm).
- 30** Wire-wrap terminals on models with **Y** bracket.
- 40** With cap **U3500** mounted over plunger and bushing.  
Provides additional protection during soldering & cleaning.
- 50** Crimped bracket terminals (retains switch on p.c. board during assembly and soldering). For models with **W0**, **WW** & **Y0** terminals.



### Switch cross-sections



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# 9000 SERIES - SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES



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## FEATURES

- Single pole panel and p.c. mounting models.
- Normally open (NO) & normally closed (NC) electrical functions.
- Self-cleaning or butt action contacts.
- Ultra-compact case size.

## SPECIFICATIONS

**Contact ratings (resistive loads):** 100 mA at 30 VDC  
**Initial contact resistance:** 30 milliohms maximum  
**Insulation resistance:** 1000 megohms minimum at 500 VDC  
**Dielectric strength:** 500 V rms min. between terminals. 1000 V rms between terminals & case  
**Electrical life:** 9100, 9200N & 9500N: 250,000 cycles min. 9200 & 9500: 100,000 cycles min.  
**Operating temperature range:** -30°C to +65°C



Travel	9533 & 9233	9532 & 9232	9533N, 9233N & 9133
Total	.062" (1.60mm)	.070" (1.80mm)	.035" (0.9mm)
Pre-	.029" (0.75mm)	.039" (1.00mm)	-
Over-	.027" (0.70mm)	.029" (0.75mm)	-

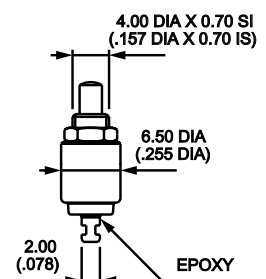
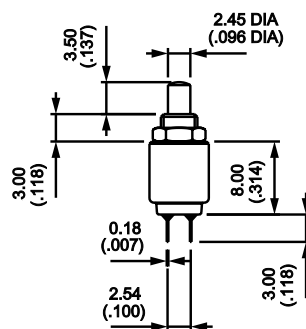
## MATERIALS

**Contacts & Terminals:** Gold plated brass  
**Actuator:** Polyamide, glass filled  
**Bracket:** Tin plated steel  
**Case:** PPS  
**Bushing:** Nickel plated brass  
**Terminal seal:** Epoxy  
**Hardware:** Threaded bushing models supplied with 1 Hex Nut p/n U544. See drawing - end of section.

## Solder lug terminals - threaded bushing - self-cleaning contacts



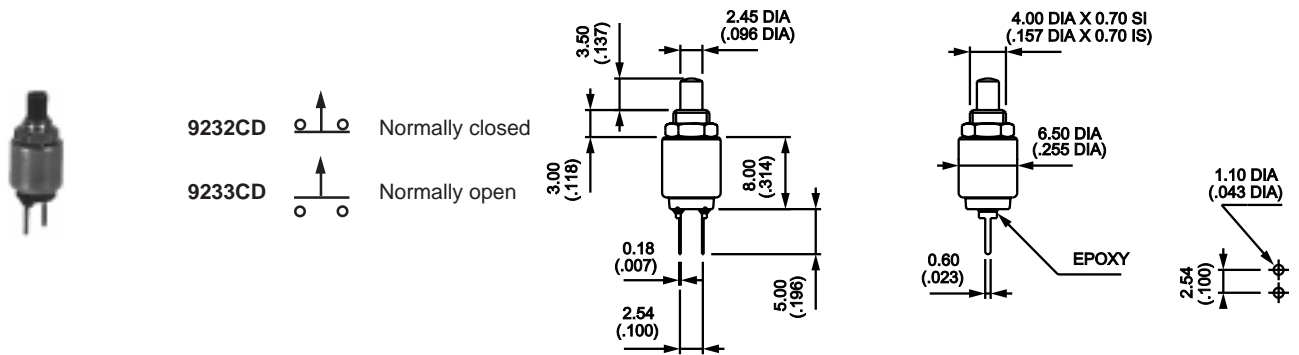
9532CD  Normally closed  
 9533CD  Normally open



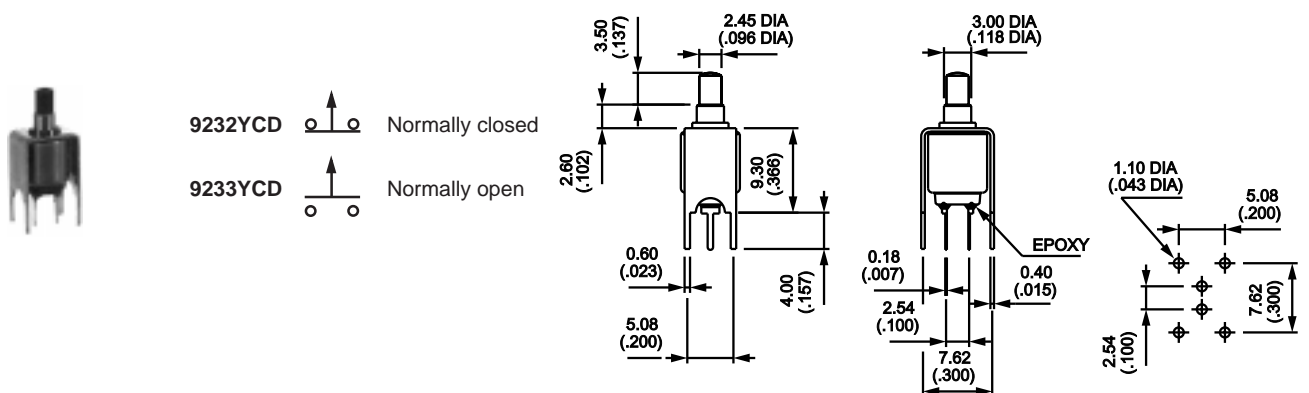
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 9000 SERIES - SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

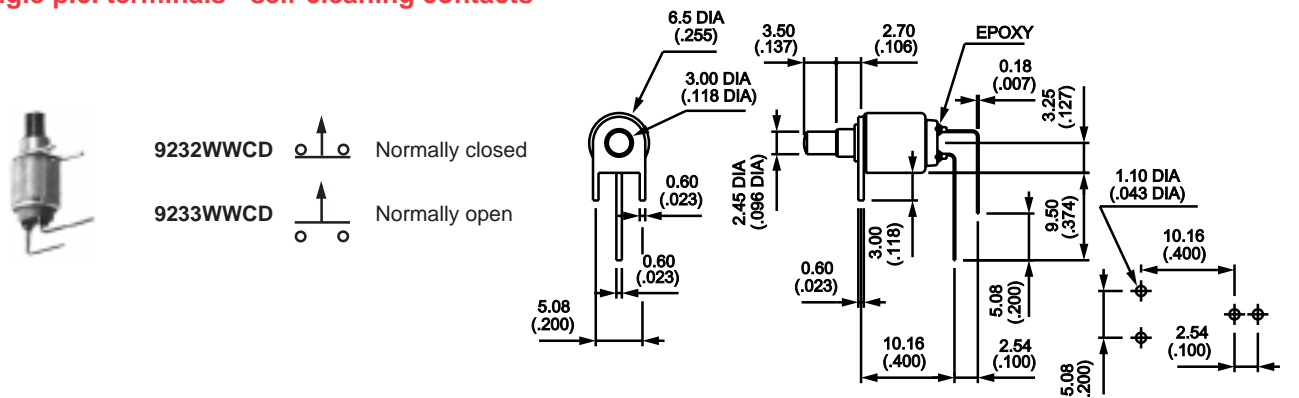
## Straight p.c. terminals - threaded bushing - self-cleaning contacts



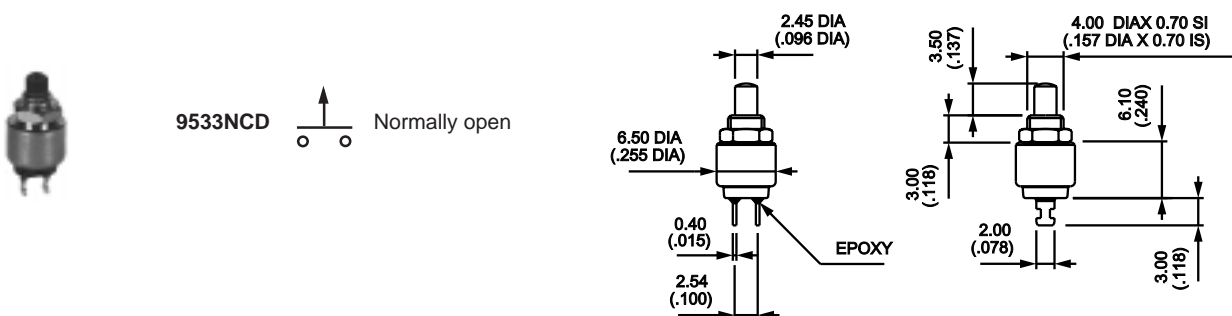
## Straight p.c. terminals - bracket mounting - self-cleaning contacts



## Right angle p.c. terminals - self-cleaning contacts



## Solder lug terminals - threaded bushing - butt action contacts



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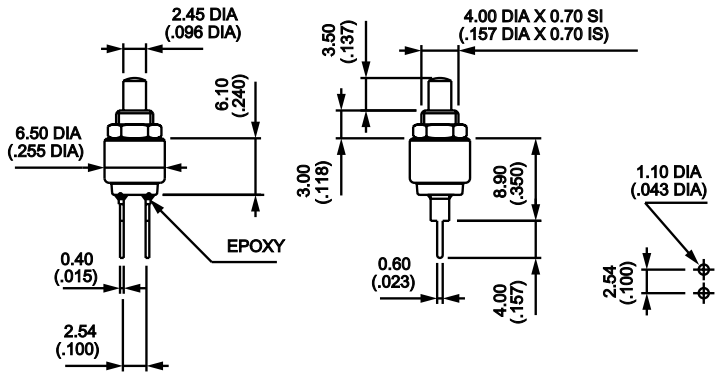
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# 9000 SERIES - SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

## Straight p.c. terminals - threaded bushing - .350" (8.9mm) p.c. to panel - butt action contacts



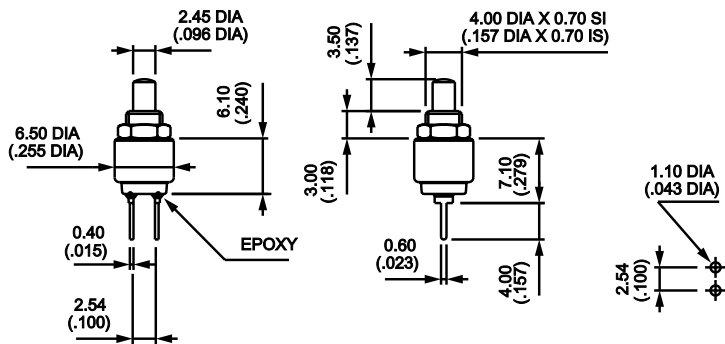
9233NCD  Normally open



## Straight p.c. terminals - threaded bushing - .279" (7.1mm) p.c. to panel - butt action contacts




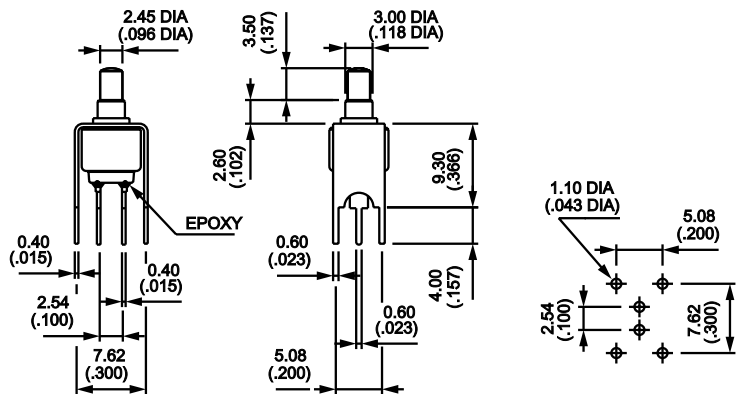
9133CD  Normally open



## Straight p.c. terminals - tall bracket mounting - butt action contacts



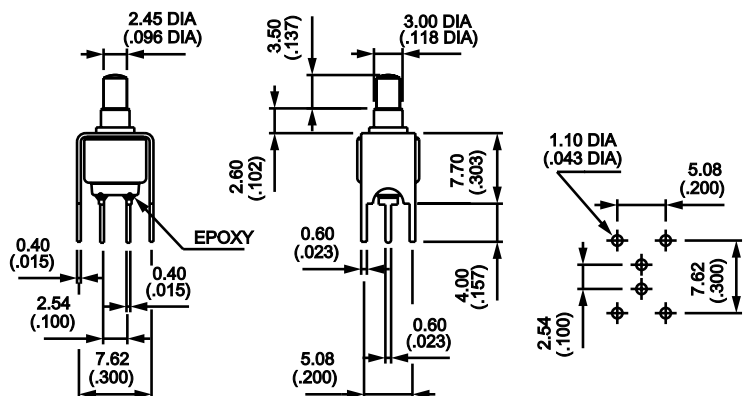
9233NYCD  Normally open



## Straight p.c. terminals - short bracket mounting - butt action contacts



9133YCD  Normally open



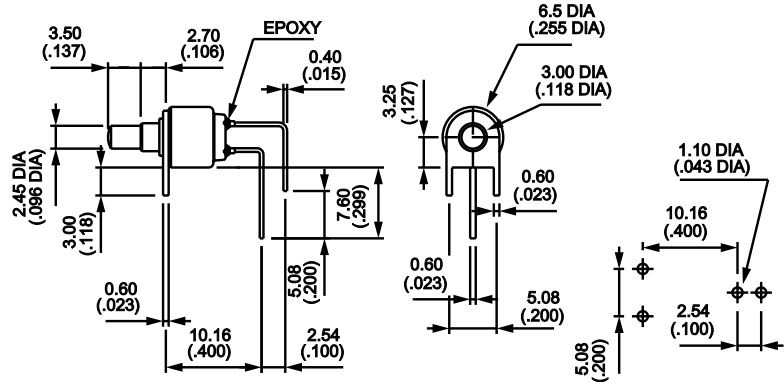
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 9000 SERIES - SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

## Right angle p.c. terminals - butt action contacts



9133WWCD  
Normally open



**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 under each respective box).  
Note: 'NONE' indicates box may be left empty.

#### Model Structure:

Series	Terminals case height	Number of poles	Electrical function	Bracket/terminals
9		3		
		Single pole		
			2 Normally closed (NC) 3 Normally open (NO)	
				<div style="border: 1px solid black; width: 20px; height: 15px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 15px; margin-bottom: 2px;"></div>
				<p><b>Case height: .314" (8mm)</b></p> <p>2.....Straight p.c. terminals, threaded bushing.....(NONE)</p> <p>2.....Straight p.c. terminals, tall bracket, smooth bushing.....Y</p> <p>2.....Right angle p.c. terminals, bracket, smooth bushing.....W W</p> <p>5.....Solder lug terminals, threaded bushing.....(NONE)</p> <p><b>Case height .240" (6.1mm)</b></p> <p>1.....Straight p.c. terminals, threaded bushing .279" (7.1mm) to panel....(NONE)</p> <p>1.....Straight p.c. terminals, short bracket, smooth bushing.....Y</p> <p>1.....Right angle p.c. terminals, bracket, smooth bushing.....W W</p> <p>2.....Straight p.c. terminals, threaded bushing, .350" (8.9mm) to panel...N</p> <p>2.....Straight p.c. terminals, tall bracket, smooth bushing.....N Y</p> <p>5.....Solder lug terminals, threaded bushing.....N</p>

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

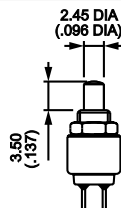
#### Options:

Contact materials	Sealing	Actuator
C D		
Gold plated brass (standard)	(NONE) Epoxy sealed terminals (standard) K Front panel sealing with two 'o'-rings	(NONE) Standard 0 Flush 4 Long

Caps available separately - see option drawings

Example of completely specified model number: **9233YCD**

### ACTUATOR OPTIONS



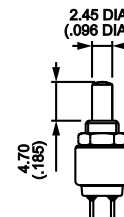
(NONE) Standard



0 Flush



4 Long



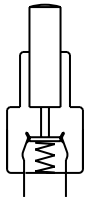
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

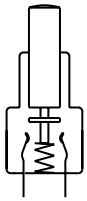
# 9000 SERIES - SUBMINIATURE MOMENTARY PUSHBUTTON SWITCHES

## MISCELLANEOUS

### SWITCH ACTION

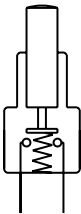


Function 2  
(NC)



Function 3  
(NO)

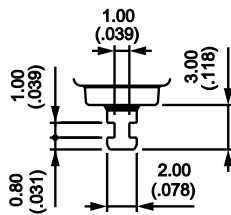
**Self-cleaning contacts**



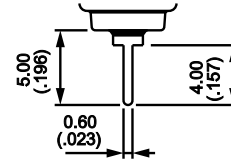
Function 3  
(NO)

**butt action contacts**

### TERMINAL OUTLINES

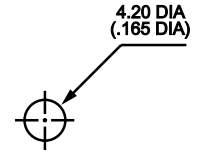


Solder lug



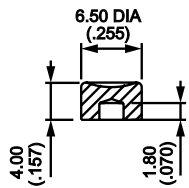
Straight p.c.

### PANEL CUT-OUT

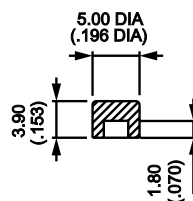


## OPTION DRAWINGS

**CAPS** Note: replace last '0' in p/n with color code. (order separately)

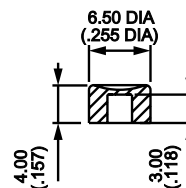


**U570** Standard  
For standard actuator

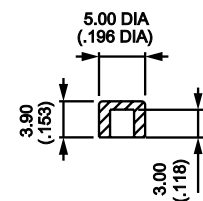


**U3600**  
For standard actuator

Below caps have deeper engagement and provide better retention



**U4310**  
For 4 actuator only



**U4320**  
For 4 actuator only

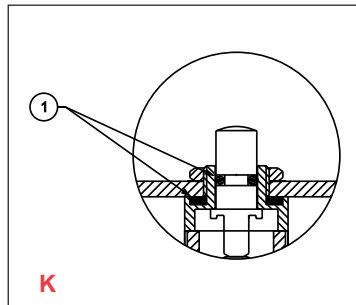
### Colors

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

## SEALING OPTIONS

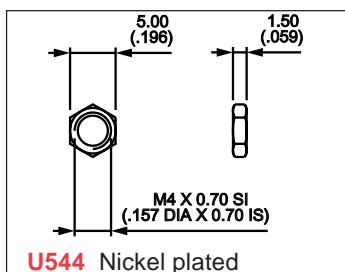
**(NONE)** Epoxy sealed terminals standard.

**K** Front panel sealing with 2 'O'-rings (1) provides protection against water and dust. Panel seal withstands 0.1bar pressure



**K**

**HEX NUT** Supplied with threaded bushing models



**U544** Nickel plated

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



# 9000 SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES



## FEATURES

- Single pole panel mounting models.
- NO, NC & NC/NO combined electrical functions.
- Solder lug & straight p.c. terminals.
- Compact case size.
- Supplied with 2 Hex Nuts & Lockwasher.

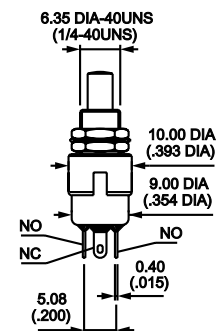
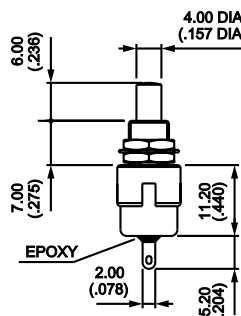
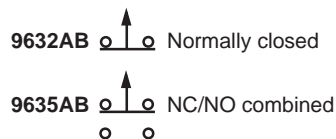
## SPECIFICATIONS

<b>Contact ratings (resistive loads):</b>	Gold plated brass: 100 mA at 30 VDC Silver: 0.3 Amps at 250 VAC, 0.6 Amps at 125 VAC or 1 Amp at 30 VDC
<b>Initial contact resistance:</b>	50 milliohms maximum
<b>Insulation resistance:</b>	1000 megohms minimum at 500 VDC
<b>Dielectric strength:</b>	1000 V rms min. between terminals. 1500 V rms between terminals & case
<b>Electrical life:</b>	250,000 cycles minimum
<b>Operating temperature range:</b>	-30°C to +65°C
<b>Travel:</b>	9600, 9400 & 9400Y models - .051" (1.3mm) 9600N & 9400N models - .035" (0.9mm)

## MATERIALS

<b>Contacts &amp; Terminals:</b>	Gold plated brass or silver
<b>Actuator:</b>	Polyamide, glass filled or nickel plated brass (with K option)
<b>Bracket:</b>	Tin plated steel
<b>Case:</b>	Diallyl phthalate
<b>Bushing:</b>	Nickel plated brass
<b>Terminal seal:</b>	Epoxy
<b>Hardware:</b>	Supplied with 2 Hex Nuts .314" (8mm) across flats & 1 Lockwasher See hardware section of catalog.

## Solder lug terminals - case length .440" (11.2mm) - silver contacts






SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

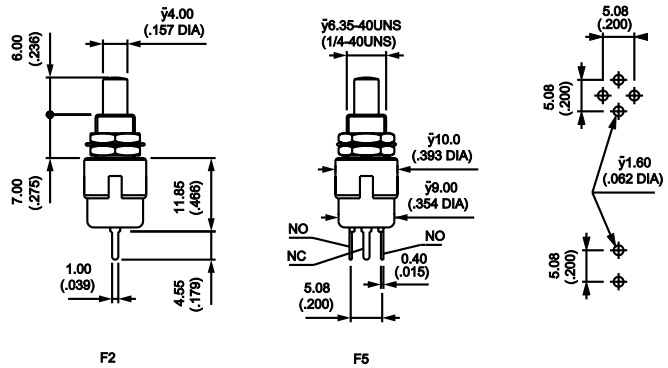
C

# 9000 SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

## Straight p.c. terminals - case length .440" (11.2mm) - gold plated brass contacts






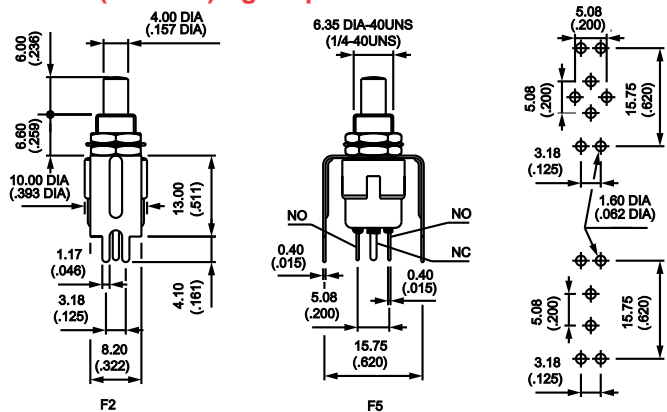
- 9432CDB  Normally closed
- 9433CDB  Normally open
- 9435CDB  NC/NO combined



## Bracket mounting w/straight p.c. terminals - case length .440" (11.2mm) - gold plated brass contacts




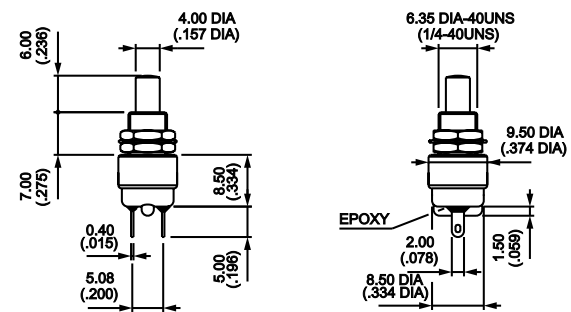
- 9432YCDB  Normally closed
- 9433YCDB  Normally open
- 9435YCDB  NC/NO combined



## Solder lug terminals - case length .334" (8.5mm) - silver contacts



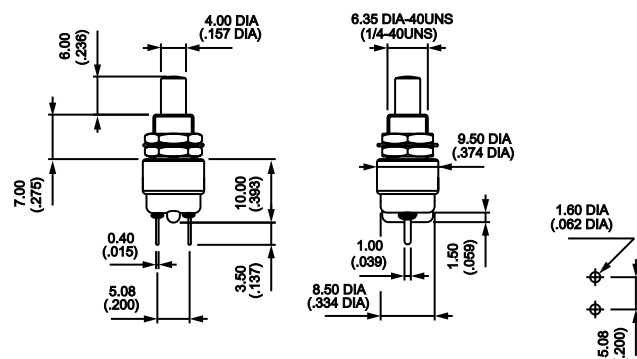
- 9633NAB  Normally open



## Straight p.c. terminals - case length .334" (8.5mm) - gold plated brass contacts



- 9433NCDB  Normally open



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 9000 SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

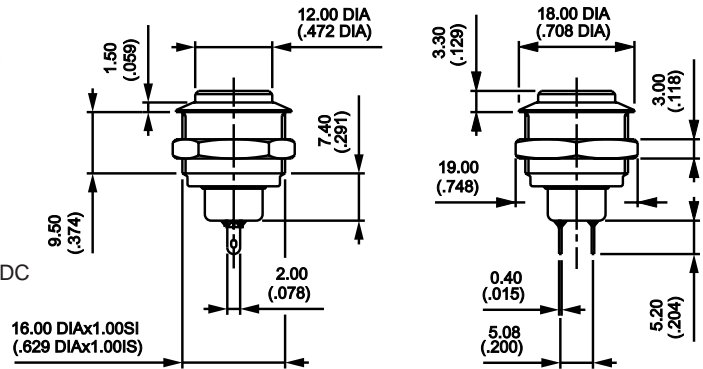
## Solder lug terminals - .630" dia. (16mm) bushing - metal button - silver contacts



Silver contacts  
**9633AX1146**  Normally open

Gold plated silver contacts  
**9633ADX1146**  Normally open

Panel cut-out: .637" dia. (16.2mm)  
 Maximum rating: 0.3A 250VAC or 1A 30VDC  
 Epoxy sealed terminals.  
 Other options not applicable for this configuration



**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 under each respective box).  
 Note: 'NONE' indicates box may be left empty.

#### Model Structure:

Series	Terminals/case length	Number of poles	Electrical function	Bracket/case length
<input type="text" value="9"/>	<input type="text"/>	<input type="text" value="3"/>	<input type="text"/>	<input type="text"/>
	4 Straight pc terms., case length .440" (11.2mm) 6 Solder lug terms., case length .440" (11.2mm) 4 Straight pc terms. with optional case length/brkt. - select <b>N</b> or <b>Y</b> from 'brkt/case length' box 6 Solder lug terms. with optional case length - indicate <b>N</b> in 'brkt/case length' box	Single pole	2 Normally closed (NC) 3 Normally open (NO) 5 NC/NO combined	<b>(NONE)</b> <b>N</b> Case length - .334" (8.5mm) <b>Y</b> Brkt. mounting, case length - .456" (11.6mm)

#### Options:

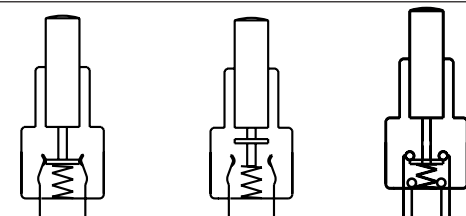
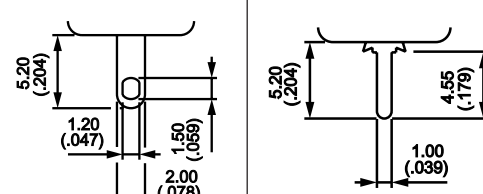
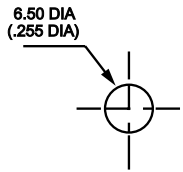
Contact materials	Sealing	Special options
<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>A</b> Silver <b>C D</b> Brass, gold plated	<b>(NONE)</b> No sealing <b>B</b> Epoxy sealed terminals <b>K</b> Front panel sealing with two 'o'-rings & metal actuator	<b>(NONE)</b> <b>F</b> Tin plated terminals (for p.c. terms. only) <b>X 6 0 1</b> Special contact w/lower rating

Example of completely specified model number: **9432YCDBF**

Caps available separately - see option drawings.

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

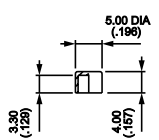
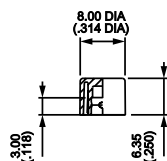
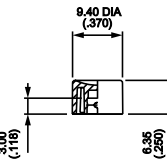
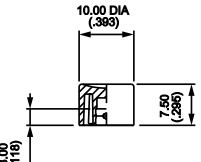
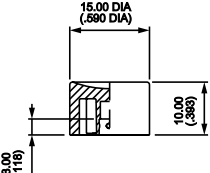
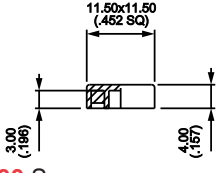
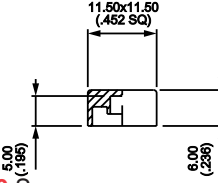
### MISCELLANEOUS

SWITCH ACTION	TERMINAL OUTLINES	PANEL CUT-OUT
 <p>Function 2 (NC)                      Function 3 (NO)                      Function 5 (combined)</p>	 <p>Solder lug                      Straight p.c.</p>	 <p>6.50 DIA (.255 DIA)</p>

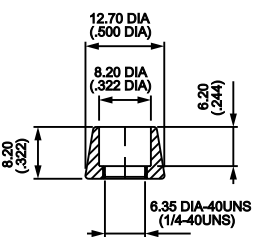
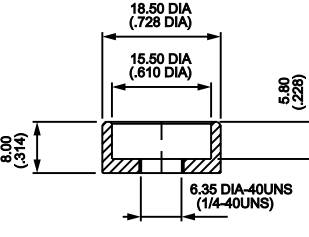
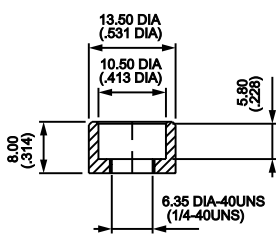
# 9000 SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

## OPTION DRAWINGS & SPECIAL OPTIONS

**CAPS** Note: replace last '0' in p/n with color code. (order separately)

 <p><b>U900</b></p>	 <p><b>U1140</b></p>	 <p><b>U1720</b></p>	 <p><b>U480</b> Standard</p>																		
 <p><b>U630</b></p>	 <p><b>U2430</b> Square</p>	 <p><b>U2020</b> Square</p>	<table border="1"> <thead> <tr> <th colspan="2">Colors</th> </tr> </thead> <tbody> <tr><td>1</td><td>blue</td></tr> <tr><td>2</td><td>black</td></tr> <tr><td>3</td><td>green</td></tr> <tr><td>4</td><td>grey</td></tr> <tr><td>5</td><td>yellow</td></tr> <tr><td>6</td><td>red</td></tr> <tr><td>7/1</td><td>white</td></tr> <tr><td>9</td><td>orange</td></tr> </tbody> </table>	Colors		1	blue	2	black	3	green	4	grey	5	yellow	6	red	7/1	white	9	orange
Colors																					
1	blue																				
2	black																				
3	green																				
4	grey																				
5	yellow																				
6	red																				
7/1	white																				
9	orange																				

**DRESS NUTS** Chrome plated. Order separately.

 <p><b>U1636</b> (for cap U1140)</p>	 <p><b>U825</b> (for cap U630)</p>	 <p><b>U840</b> (for cap U480)</p>	
--	--	---	--

### SPECIAL OPTIONS

**F** Tin plated terminals (for p.c. terminals only).

**X601** Silver plated brass contacts  
 Contact ratings: 0.2A 250VAC, 0.4A 125VAC or 0.5A 30VDC  
 Electric life: 20,000 cycles minimum.  
 Minimum quantity: 5,000 pieces.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 10400 SERIES - PROFESSIONAL MINIATURE MOMENTARY PUSHBUTTON SWITCHES



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

## FEATURES

- Single and double pole panel mounting models with optional matte black finish.
- ON - MOM electrical functions.
- Solder lug terminals.
- Compact case size with 10mm (.393") diameter threaded bushing.
- Epoxy terminal sealing standard.

## SPECIFICATIONS

<b>Contact ratings &amp; life:</b> (resistive loads)	Silver or gold plated silver: 3 Amps at 110 VAC, 2 Amps at 220 VAC or 3 Amps at 24 VDC.
<b>Initial contact resistance:</b>	10 mΩ max.
<b>Insulation resistance:</b>	1000 megohms min. at 500 VDC
<b>Dielectric strength:</b>	1000 V rms min. between terminals of the same pole 2000 V rms min. between terminals and frame 2000 V rms min. between terminals of adjacent poles
<b>Electric life:</b>	50,000 cycles min.
<b>Torque:</b>	1.106 Ft-lbs. (1.50 Nm) max. applied to nut
<b>Operating temp. range:</b>	-40°C to +85°C

## MATERIALS

<b>Contacts &amp; Terminals:</b>	Silver or gold plated silver
<b>Actuator:</b>	Chrome plated brass
<b>Case:</b>	Diallyl phthalate
<b>Housing:</b>	Nickel plated brass
<b>Bushing:</b>	Nickel plated brass
<b>Terminal seal:</b>	Epoxy

## AGENCY LISTINGS

CECC 96401-001	Availability: Consult factory for details of approved models. Marking: To order switches marked CECC, add 'CECC' to model number.
----------------	--

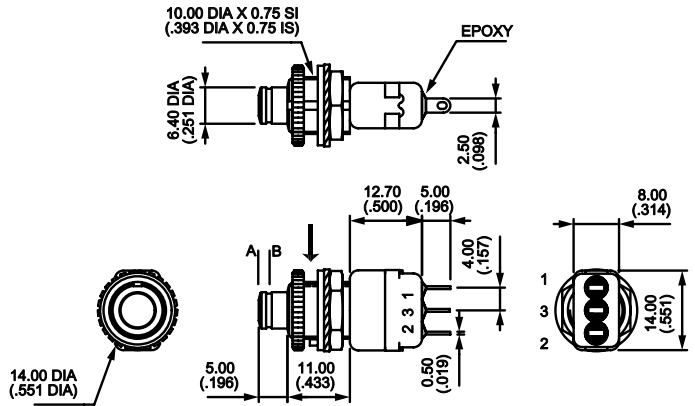
# 10400 SERIES - PROFESSIONAL MINIATURE MOMENTARY PUSHBUTTON SWITCHES

## Single pole - solder lug terminals



	A	B
Silver contacts	1-2	1-3
<b>104350003</b>	ON -	MOM
Gold plated silver contacts	1-2	1-3
<b>104350108</b>	ON -	MOM

Standard hardware supplied:  
1 Knurled nut, 1 hex nut,  
1 locking ring and 1 lockwasher

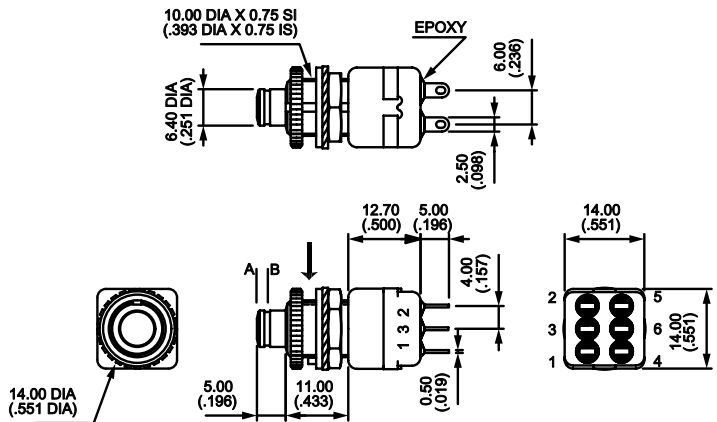


## Double pole - solder lug terminals



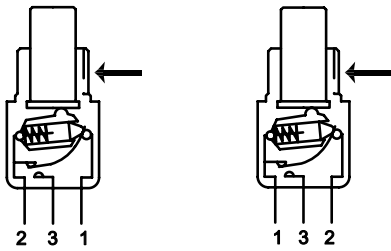
	A	B
Silver contacts	2-1	2-3
5-4	5-6	
<b>104450003</b>	ON -	MOM
Gold plated silver contacts	2-1	2-3
<b>104450108</b>	ON -	MOM

Standard hardware supplied:  
1 Knurled nut, 1 hex nut,  
1 locking ring and 1 lockwasher



## MISCELLANEOUS

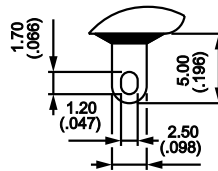
### SWITCH ACTION



Single pole

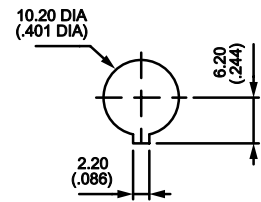
Double pole

### TERMINAL OUTLINE



Solder lug

### PANEL CUT-OUT



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

## 300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES



### FEATURES

- Dry circuit through power ratings .
- Compact size SPST momentary and alternate action models with numerous options.
- Panel, panel & p.c. and p.c. mounting models, lighted and unlighted.

### SPECIFICATIONS

#### Contact ratings & life:

(Q) power models - coin silver: 1 Amp at 125 VAC or 28 VDC or 0.5 Amps at 250 VAC - electric life 250,000 cycles min. 3 Amps at 125 VAC or 28 VDC, or 1.5 Amps at 250 VAC - electric life 10,000 cycles min. (All previous loads are resistive).

(B) dry circuit models - gold over nickel over brass: 0.4 VA max. at 20 V max.- electric life 250,000 cycles min.

UL models - coin silver: 1 Amp at 125 VAC or 0.5 Amps at 250 VAC (75% power factor). UL file no. E66367.

#### Initial contact resistance:

10 milliohms max. at 3 VDC, 0.1 Amp.

#### Insulation resistance:

Greater than 10,000 megohms.

#### Dielectric strength:

1000 Volts RMS min. at sea level.

#### Operating temperature range:

-30°C to +85°C

### MATERIALS

#### Contacts:

Coin silver for power & UL models. Gold over nickel over brass for dry circuit models.

#### Actuator:

Nylon. Black color is standard for 300 Series. White is standard for 400 Series.

#### Bushing:

Nickel plated brass

#### Base:

Melamine phenolic, color red.

#### Terminal seal:

Epoxy (standard)

#### Support bracket:

Brass or steel, tin plated

#### Spring mounting bracket:

Stainless steel

#### Bezel & cap:

Nylon. Available in black, red or white. Consult factory for other colors.

#### Hardware:

See Miscellaneous section.

#### LED:

Intensity: 2.0 mcd at 10 mA. Forward voltage: 2.0V (3.0V max.). Max. continuous forward current: 30 mA at 25°C. Red standard - yellow & green are optional. Specifications are subject to change without notice - consult factory.

### AGENCY RECOGNITION



UL Marking: Switches ordered with '/UL' added at end of model no. are supplied with recognized mark.

### ABOUT THIS SERIES

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

- Completely specified switch models & options
- 'build your own switch' order format
- Additional options & panel cut-outs



# 300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES

## 300 SERIES SPST Momentary (Normally open or normally closed)

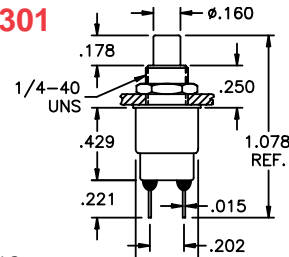


White actuator optional - black is standard

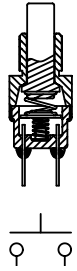
(Q) Power Model No.	(B) Dry ckt. Model No.	UL Model No.
301ZQE	301ZBE	301ZQE/UL
302ZQE	302ZBE	302ZQE/UL
303ZQE	303ZBE	303ZQE/UL
304ZQE	304ZBE	304ZQE/UL
305ZQE	305ZBE	305ZQE/UL
306ZQE	306ZBE	306ZQE/UL

Switch caps optional - see Hardware section of catalog.

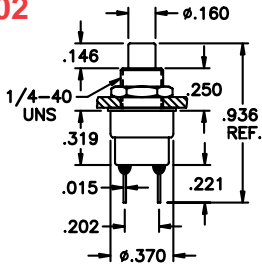
### 301



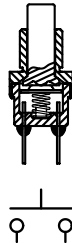
N.O. with overtravel  
Total travel: .110  
Overtravel: .020 min.  
Actuation force: 8.5 oz. ± 4 oz.



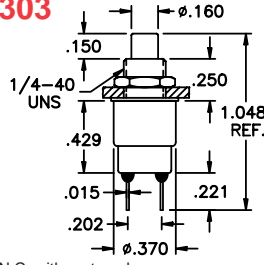
### 302



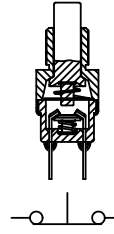
N.O. without overtravel  
Total travel: .060  
Actuation force: 10 oz. ± 4 oz.



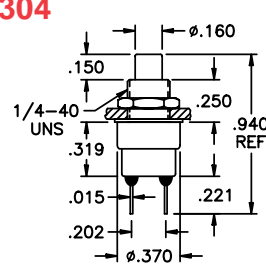
### 303



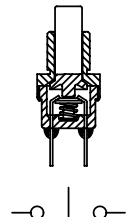
N.C. with pretravel  
Total travel: .055  
Pretravel: .020 min.  
Actuation force: 8 oz. ± 4 oz.



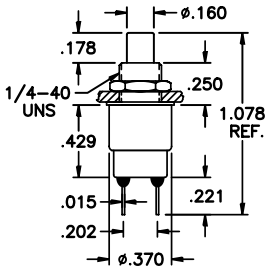
### 304



N.C. without pretravel  
Total travel: .040  
Actuation force: 8.5 oz. ± 4 oz.



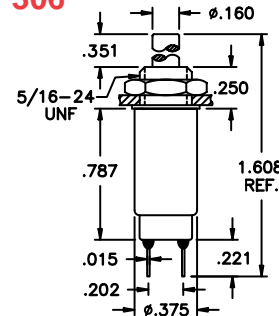
### 305



N.O. with more overtravel than 301  
Total travel: .110  
Pretravel to contact closure: .030  
Actuation force to contact closure: 3 oz.  
Overtravel: .075  
Actuation force at full travel: 8 oz.



### 306



N.O. with sealed contact area and maximum overtravel.  
Total travel: .310  
Pretravel to contact closure: .025  
Actuator force to contact closure: 1.5 oz.  
Overtravel: .250 minimum  
Actuation force at full travel: 9 oz.  
Note: Electrical or mechanical life for this model is 50,000 cycles.



## 400 SERIES (401 Push on/ push off, 402 N.O. momentary)

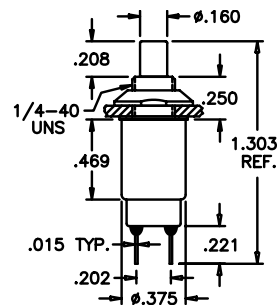


Black actuator optional - white is standard

(Q) Power Model No.	(B) Dry ckt. Model No.	UL Model No.
401ZQE	401ZBE	401ZQE/UL
402ZQE	402ZBE	402ZQE/UL

### SNAP-ACTION MECHANISM

Pretravel to contact closure: .026  
Travel to actuate switch: .106  
Total travel: .137  
Force to actuate switch: 22 oz.  
Force at maximum travel: 35 oz.  
Mechanical life: 1,000,000 cycles minimum



United States Patent 4,319,106

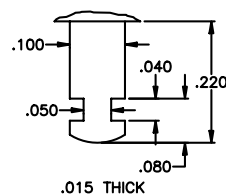
Switchcaps optional - see Hardware section of catalog.

## OPTIONS

### Colored operating actuator

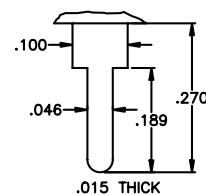
Available in dyed nylon. To specify, add digit at end of model number - 1 blue, 2 black, 3 green, 5 yellow, 6 red, 7/1 white or 9 orange. Black is standard for 300 Series. White is standard for 400 Series.

### Z



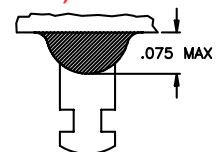
Solder lug terminal

### C



Printed circuit terminal

### E (standard)



Epoxy seal

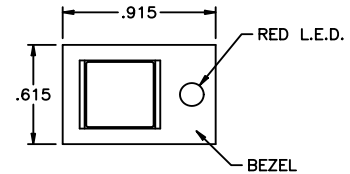
# 300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES

## Solder lug terminals - snap-in bezel with outboard LED



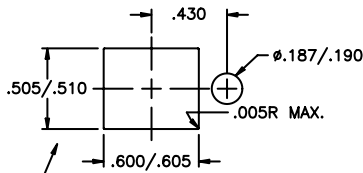
**401SZQEJ6168**

POWER CKT. MODEL NO.	DRY CKT. MODEL NO.	UL MODEL NO.	ELECTRICAL FUNCTION
301SZQEJ6168	301SZBEJ6168	301SZQEJ6168/UL	MOM. S.P.N.O. w/overtravel
302SZQEJ6168	302SZBEJ6168	302SZQEJ6168/UL	MOM. S.P.N.O. no overtravel
303SZQEJ6168	303SZBEJ6168	303SZQEJ6168/UL	MOM. S.P.N.C. w/pretravel
304SZQEJ6168	304SZBEJ6168	304SZQEJ6168/UL	MOM. S.P.N.C. no pretravel
305SZQEJ6168	305SZBEJ6168	305SZQEJ6168/UL	MOM. S.P.N.O. w/overtravel
401SZQEJ6168	401SZBEJ6168	401SZQEJ6168/UL	S.P Alternate snap-action
402SZQEJ6168	402SZBEJ6168	402SZQEJ6168/UL	MOM. S.P.N.O. (snap-action)

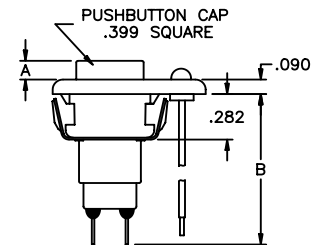


RECOMMENDED PANEL CUTOUT  
Panel thickness range - .047-.125

MODEL NO.	DIM. A	DIM. B
301	.108	.929
302	.085	.817
303	.085	.929
304	.085	.817
305	.108	.929
401	.145	1.142
402	.145	1.142



FOR MULTIPLE SWITCH ASSEMBLIES  
THIS DIMENSION = (NO. OF SWITCHES X .615) - .120



LED leads - 31/32" min. long  
Anode (front) - white  
Cathode (back) - black

## Solder lug terminals - snap-in bezel

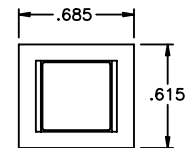


**302SZQEJ8168**



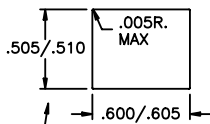
**401SZQEJ8188**

POWER CKT. MODEL NO.	DRY CKT. MODEL NO.	UL MODEL NO.	ELECTRICAL FUNCTION
301SZQEJ8168	301SZBEJ8168	301SZQEJ8168/UL	MOM. S.P.N.O. w/overtravel
302SZQEJ8168	302SZBEJ8168	302SZQEJ8168/UL	MOM. S.P.N.O. no overtravel
303SZQEJ8168	303SZBEJ8168	303SZQEJ8168/UL	MOM. S.P.N.C. w/pretravel
304SZQEJ8168	304SZBEJ8168	304SZQEJ8168/UL	MOM. S.P.N.C. no pretravel
305SZQEJ8168	305SZBEJ8168	305SZQEJ8168/UL	MOM. S.P.N.O. w/overtravel
401SZQEJ8168	401SZBEJ8168	401SZQEJ8168/UL	S.P Alternate snap-action
402SZQEJ8168	402SZBEJ8168	402SZQEJ8168/UL	MOM. S.P.N.O. (snap-action)

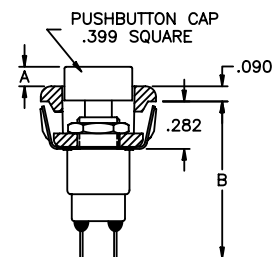


RECOMMENDED PANEL CUTOUT  
Panel thickness range - .047-.125

MODEL NO.	DIM. A	DIM. B
301	.108	.929
302	.085	.817
303	.085	.929
304	.085	.817
305	.108	.929
401	.145	1.142
402	.145	1.142



FOR MULTIPLE SWITCH ASSEMBLIES  
DIMENSION = (NO. OF SWITCHES X .615) - .120



# 300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES

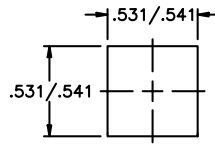
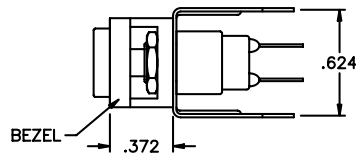
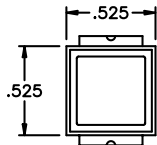
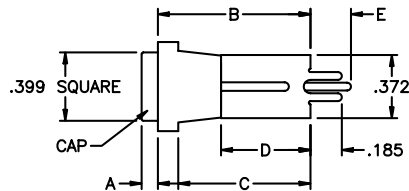
## Straight p.c. terminals - p.c. mounting bezel



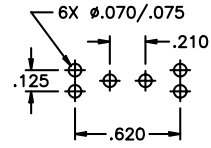
**302SV30BEJ8488**

DRY CKT. MODEL NO.	ELECTRICAL FUNCTION
<b>301SV30BEJ8488</b>	MOM. S.P.N.O. w/overtravel
<b>302SV30BEJ8488</b>	MOM. S.P.N.O. no overtravel
<b>305SV30BEJ8488</b>	MOM. S.P.N.O. w/added overtravel

MODEL NO.	OPTION	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E
301S	V30	.100	.900	.780	.527	.237
301S	V40	.100	1.020	.900	.647	.118
302S	V30	.070	.900	.780	.527	.125
302S	V40	.070	1.020	.900	.647	.357
305S	V30	.100	.900	.780	.527	.237
305S	V40	.100	1.020	.900	.647	.118



PANEL CUTOUT



P.C. LAYOUT

## Right angle p.c. terminals - p.c. mounting bezel

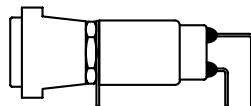
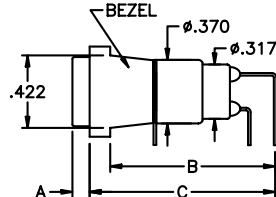
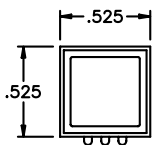
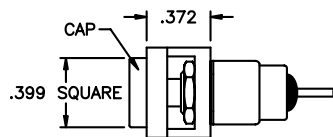


**302SV-1BEJ8488**

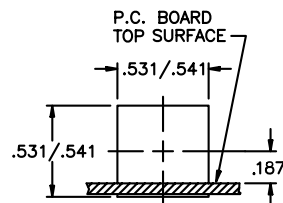
DRY CKT. MODEL NO.	ELECTRICAL FUNCTION
<b>301SV-1BEJ8488</b>	MOM. S.P.N.O. w/overtravel
<b>302SV-1BEJ8488</b>	MOM. S.P.N.O. no overtravel
<b>305SV-1BEJ8488</b>	MOM. S.P.N.O. w/added overtravel
<b>401SV-1BEJ8488</b>	S.P Alternate action w/ tactile response
<b>402SV-1BEJ8488</b>	MOM. S.P.N.O. w/ tactile response

MODEL NO.	OPTION	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E	DIM. F
301S	V	.100	.960	1.080	.550	.150	.250
301S	V-1	.100	.910	1.030	.550	.100	.250
302S	V	.070	.860	.980	.450	.150	.250
302S	V-1	.070	.810	.930	.450	.100	.250
305S	V	.100	.960	1.080	.550	.150	.250
305S	V-1	.100	.910	1.030	.550	.100	.250
401S & 402S	V	.130	1.222	1.342	.750	.150	.310
401S & 402S	V-1	.130	1.172	1.292	.750	.100	.310

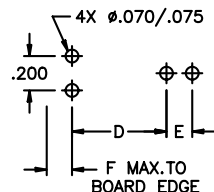
Notes: Terminals are not fully bent, to facilitate spring retention in p.c. board.



401 & 402 ONLY



PANEL CUTOUT



P.C. LAYOUT

# 300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES

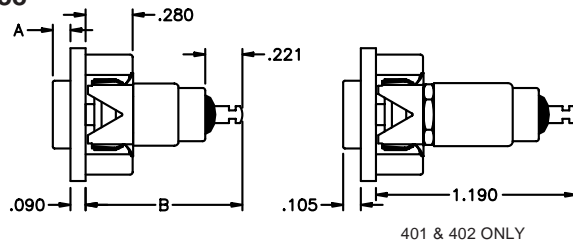
**Snap-in bezel for round hole mounting**  
Self-keying against rotation



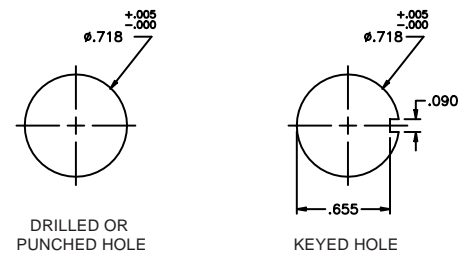
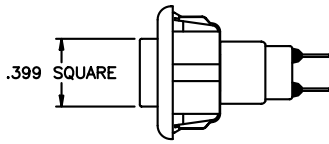
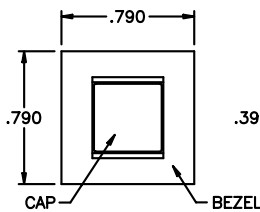
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.	UL MODEL NO.	ELECTRICAL FUNCTION
301SZQEJ9688	301SZBEJ9688	301SZQEJ9688/UL	MOM. S.P.N.O. w/overtravel
302SZQEJ9688	302SZBEJ9688	302SZQEJ9688/UL	MOM. S.P.N.O. no overtravel
303SZQEJ9688	303SZBEJ9688	303SZQEJ9688/UL	MOM. S.P.N.C. w/pretravel
304SZQEJ9688	304SZBEJ9688	304SZQEJ9688/UL	MOM. S.P.N.C. no pretravel
305SZQEJ9688	305SZBEJ9688	305SZQEJ9688/UL	MOM. S.P.N.O. w/overtravel
401SZQEJ9688	401SZBEJ9688	401SZQEJ9688/UL	S.P Alternate snap-action
402SZQEJ9688	402SZBEJ9688	402SZQEJ9688/UL	MOM. S.P.N.O. (snap-action)

## 302SZQEJ9688

MODEL NO.	DIM. A	DIM. B
301	.108	.929
302	.085	.817
303	.085	.929
304	.085	.817
305	.108	.929
401 & 402	AS SHOWN	

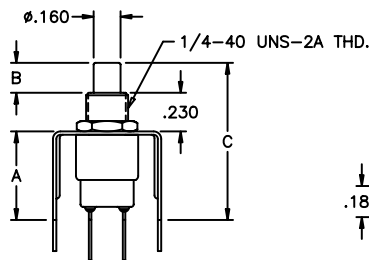
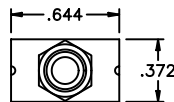


**RECOMMENDED PANEL CUTOUTS**  
Panel thickness range - .047 - .125



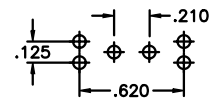
## OPTIONS FOR SELECTIVE MODELS ONLY

**Options V30 & V40** Straight p.c. terminals w/bracket  
For models 301, 302 & 305 only



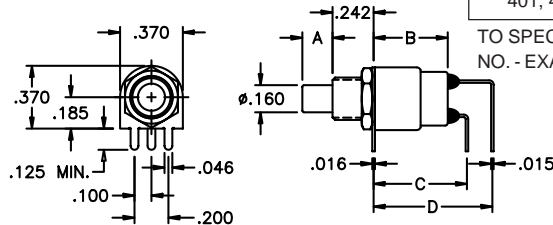
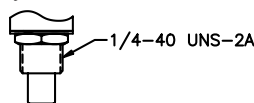
MODEL NO.	OPTION	DIM. A	DIM. B	DIM. C	DIM. D
301,305	V30	.527	.173	.933	.237
301,305	V40	.647	.173	1.053	.118
302	V30	.527	.150	.910	.125
302	V40	.647	.150	1.030	.357

TO SPECIFY, ADD OPTION FROM BOX TO SWITCH MODEL NO. - EXAMPLE: 302V30BE



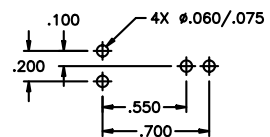
**P.C. BOARD LAYOUT**

**Options V & V-1** Right angle terminals w/bracket  
For models 301, 302, 305, 401 & 402 only



MODEL NO.	OPTION	DIM. A	DIM. B	DIM. C	DIM. D
301, 305	V	.173	.439	.550	.700
301, 305	V-1	.173	.439	.550	.650
302	V	.150	.327	.450	.600
302	V-1	.150	.327	.450	.550
401, 402	V	.210	.653	.750	.900
401, 402	V-1	.210	.653	.750	.850

TO SPECIFY, ADD OPTION FROM BOX TO SWITCH MODEL NO. - EXAMPLE: 301V-1BE



**P.C. BOARD LAYOUT**

Support Bracket is Brass, Solder Coated.  
Available with B, N, or T Contact Materials.  
(See pg. C27)  
Supplied with Epoxy Sealed Terminals.

Note: Terminals are not fully bent, to facilitate spring retention in p.c. board.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

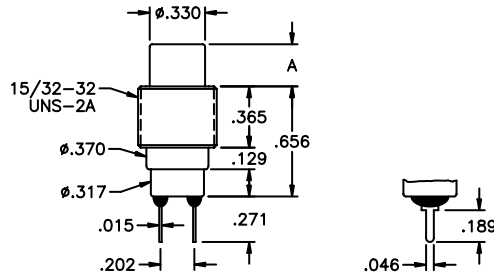
C

# 300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES

## OPTIONS FOR SELECTIVE MODELS ONLY

**Option T1** 15/32" bushing mounts from front or rear of panel  
For models 301, 303 & 305 only

MODEL NO.	A
301,305	.250
303	.225



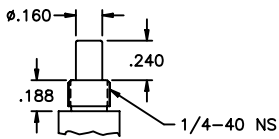
TO SPECIFY, ADD 'T1' TO SWITCH MODEL NO. - EXAMPLE: 301T1CQE6

Threaded bushing: Brass, nickel plated  
Actuator button: Nylon. Specify color - see order format.

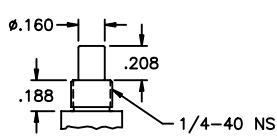
Supplied with 2 Hex Nuts, p/n A465 & 1 Lockwasher, p/n A466 (see Hardware section of catalog).

Printed circuit or solder lug terminals available.

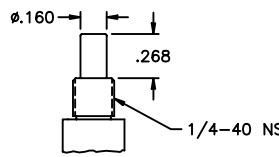
**Option S** Long actuator  
For models 301, 302, 303, 304, 305, 401 & 402 only



301 & 305



302, 303 & 304



401 & 402

TO SPECIFY, ADD 'S' TO SWITCH MODEL NO. - EXAMPLE: 301SCQE

Actuator: Nylon  
Color: Black standard for 300 Series  
White standard for 400 Series.  
Other colors available - see options.

**Additional ordering information:** Commonly ordered models are shown above and 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 with brief description - see option dwgs. & info. following.

Notes: 'NONE' indicates box may be left empty. Not all combinations can be made - see other pages of Series.

### Model Structure:

Series	Actuators	Bushings	Terminations	Contact materials	Sealing
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="E"/>
3 0 1	(NONE)	(NONE)	Z Solder lug	B Gold	Epoxy
3 0 2	S Long	T 1 15/32" thd'd.	C Printed circuit	Q Coin silver	terminal
3 0 3	(see dwg. -	(see dwg. -	V Right angle p.c. term-	N Economy	gold
3 0 4	specify for all	for 301,	V - 1 inals for 301, 302, 305,	T Economy	silver
3 0 5	models with	303 & 305	only).		
3 0 6	bezels- not	only).			
4 0 1	available		V 3 0 Straight p.c. terminals with		
4 0 2	for 306).		V 4 0 bracket for 301, 302 & 305		
			only (see dwg.).		

### Options:

Bezel & cap	Bezel color	Cap color	Recognitions
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(NONE)	(NONE)	(NONE)	(NONE)
J 6 1 Snap-in w/LED	2 Black	2 Black	/U L
J 8 1 Snap-in no LED	6 Red	6 Red	
J 8 4 P.C. style	8 White	8 White	
J 9 6 Snap-in (round hole)	Other Colors Available	Other Colors Available	

Switch caps for switches without bezels also available - see Hardware section of catalog.

Example of completely specified model number:  
**301SZQEJ8122/UL**

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

# 300 & 400 SERIES - MINIATURE PUSHBUTTON SWITCHES

## CONTACT MATERIAL OPTIONS

- B** Dry circuit - gold over nickel over brass.  
 RATING: 0.4 Volt-Amps (VA) max. at 20 V max.  
 ELECTRIC LIFE: 250,000 cycles minimum.
- Q** Power circuit - coin silver.  
 RATING: 1 Amp at 120 VAC or 28 VDC or 0.5 Amps at 250 VAC. ELECTRIC LIFE: 250,000 cycles minimum at full load.  
 Also - 3 Amps at 120 VAC or 28 VDC or 1.5 Amps at 250 VAC. ELECTRIC LIFE: 10,000 cycles minimum at full load.  
 Dry circuit or power circuit - gold over nickel over coin silver.
- G** Dry circuit - gold over nickel over coin silver.  
 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 permits customers to inventory one switch to satisfy either application,
- N** RATING: 0.4 Volt-Amps (VA) max. at 20 V max. Note- less gold than B option.  
 ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.
- T** Power circuit - Silver plate over brass.  
 RATING: 0.5 Amps at 120 VAC or 0.25 Amps at 250 VAC (resistive loads).  
 ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.

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

## UL OPTION

- /UL** For power circuits - coin silver  
 RATING: 1 Amp at 125 VAC or 0.25 Amps at 250 VAC (75% power factor).  
 Underwriter Laboratories file no. E66367. Note - applicable only to terminations with coin silver contacts (Q or G options).

## HARDWARE

### HARDWARE SUPPLIED

(See Hardware section of catalog)

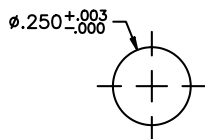
Panel mounted 300 Series switches with threaded 1/4" bushing are supplied with 1 Hex Nut A112 and 1 Lockwasher A115.

Panel mounted 300 Series switches with threaded 15/32" bushing are supplied with 2 Hex Nuts A465 and 1 Lockwasher A466.

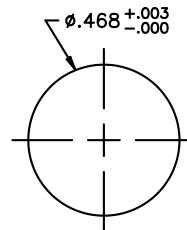
Panel mounted 306 Series switches with threaded 5/16" bushing are supplied with 1 Hex Nut A713 and 1 Lockwasher A734.

Panel mounted 400 Series switches with threaded bushing are supplied with 1 Panel Dress Nut A274 and 1 Lockwasher A115.

## PANEL CUT-OUTS



Accepts all 1/4" threaded bushings



Accepts all 15/32" threaded bushings

# MPB SERIES PUSHBUTTON SWITCHES

## FEATURES

- Single pole single throw momentary action.
- Normally open and normally closed models.
- Permanent cap is standard.
- Single hole mounting w/mtg. nut & lk'wshr supplied.

## MATERIALS

Base: PBT thermoplastic, color black  
 Bushing: Brass, nickel plated  
 Actuator: ABS thermoplastic  
 Terminals: Brass, silver plated  
 Shorting Contact: Brass or phos. brz., silver plated

## GENERAL SPECIFICATIONS

### ELECTRICALS

Contact rating: 300 mA @ 125 VDC  
 Insulation resistance: 100 megohms min. (500 VDC)  
 Dielectric withstanding voltage: 500 VAC for 1 minute  
 Contact resistance: 25 milliohms max. at 1 amp, 5 VDC  
 Electrical/Mechanical life: 10,000 cycles min.  
 Contact bounce: less than 10 milliseconds

### MECHANICALS, THERMALS

Plunger travel: MPB1110: .063" (1.6mm) MPB1140: .078" (2mm)  
 Actuation force: 300 grams ±150 grams  
 Operating temperature range: -20 °C to +60 °C

### SOLDERING

Wave or hand soldering: 235°C max. for 5 seconds max.  
 Solvent washing: Non-washable. Do not apply flux to terminals or switch mtg. surface

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

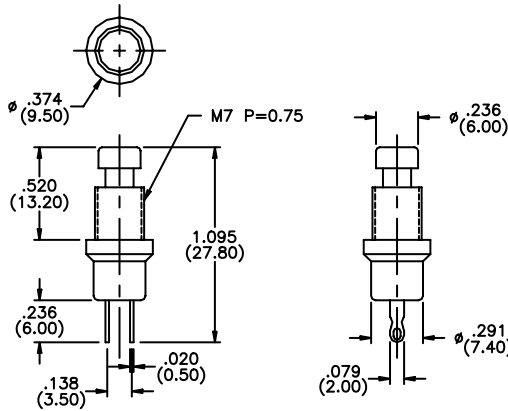
### MPB1110



NORMALLY OPEN

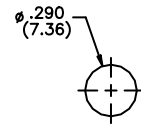


SCHEMATIC



MECHANICAL OUTLINE

Model No.	Cap Color
MPB11102	Black
MPB11106	Red



TOLERANCE FOR PANEL  
 MTG. HOLE:  $\begin{matrix} +.005 & (0.13) \\ -.000 & (0.00) \end{matrix}$

PANEL MTG. HOLE

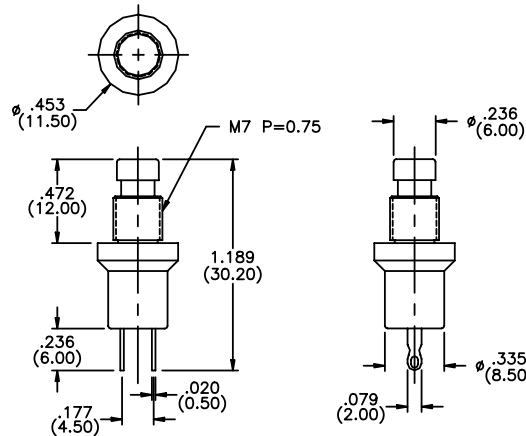
### MPB1140



NORMALLY CLOSED

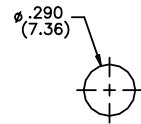


SCHEMATIC



MECHANICAL OUTLINE

Model No.	Cap Color
MPB11402	Black
MPB11406	Red



TOLERANCE FOR PANEL  
 MTG. HOLE:  $\begin{matrix} +.005 & (0.13) \\ -.000 & (0.00) \end{matrix}$

PANEL MTG. HOLE



# New! IP SERIES - PUSHBUTTON SWITCHES FOR HARSH ENVIRONMENTS



## FEATURES

- Single pole NO momentary action with double break.
- Totally sealed compact construction.
- Ergonomically sculptured bezels with colorful actuator selections.
- Excellent tactile feedback with precise actuation

## ELECTRICAL AND GENERAL SPECIFICATIONS

<b>Contact ratings (resistive loads):</b>	500 mA at 48 VAC, 200 mA at 50 VDC or 200 mA at 250 VAC
<b>Initial contact resistance:</b>	50 milliohms maximum
<b>Insulation resistance:</b>	1 gigohm min. at 500 VDC
<b>Dielectric strength:</b>	1500 V rms min.
<b>Electrical life:</b>	500,000 cycles min. at full load
<b>Mechanical life:</b>	1,000,000 cycles min.
<b>Total Travel:</b>	.059" (1.5mm)
<b>Operating force:</b>	14 ±4 oz. (4±1 N)
<b>Contact bounce:</b>	1 millisecond

## ENVIRONMENTAL SPECIFICATIONS

<b>Degree of protection:</b>	IP 67
<b>Shock resistance:</b>	100g per IEC 512-4, test 6c
<b>Vibration resistance:</b>	10-500 Hz, 10g per IEC 512-4, test 6d
<b>Salt spray:</b>	Per IEC 512-6, test 11f
<b>Strength of mechanism:</b>	IK06 per EN 50101, 1 joule (1 Nm)
<b>Operating temperature range:</b>	-40°C to +125°C

## MATERIALS

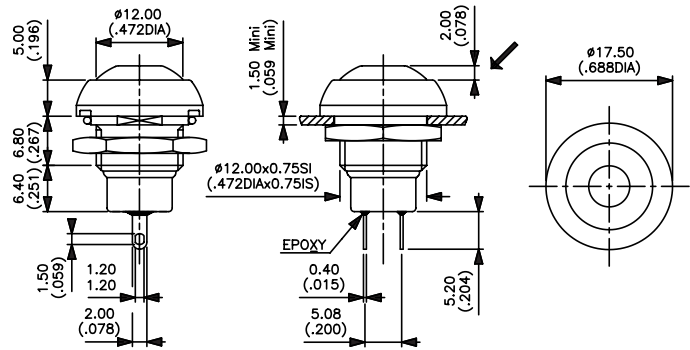
<b>Contacts :</b>	Gold plated silver
<b>Actuator:</b>	Polyamide 6/6
<b>Bushing/bezel:</b>	Zamac (with black finish on bezel)
<b>Case:</b>	PBT UL94V-0
<b>Wire leads (F models):</b>	Stranded, 20 AWG, UL approved
<b>Hardware:</b>	Supplied with 1 Hex Nut .629" (16mm) across flats and 1 'o'ring

# New! IP SERIES - PUSHBUTTON SWITCHES FOR HARSH ENVIRONMENTS

## Round - solder lug terminals



MODEL NO.	ACT. COLOR
IPR3SAD1	BLUE
IPR3SAD2	BLACK
IPR3SAD3	GREEN
IPR3SAD5	YELLOW
IPR3SAD6	RED
IPR3SAD7/1	WHITE
IPR3SAD9	ORANGE

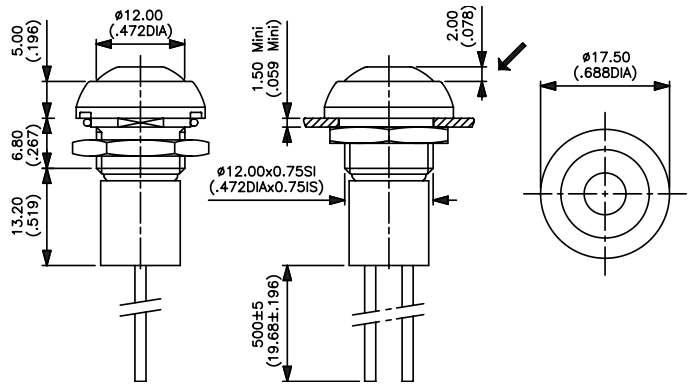


→ Flat

## Round - stranded 20 AWG wire leads



MODEL NO.	ACT. COLOR
IPR3FAD1	BLUE
IPR3FAD2	BLACK
IPR3FAD3	GREEN
IPR3FAD5	YELLOW
IPR3FAD6	RED
IPR3FAD7/1	WHITE
IPR3FAD9	ORANGE

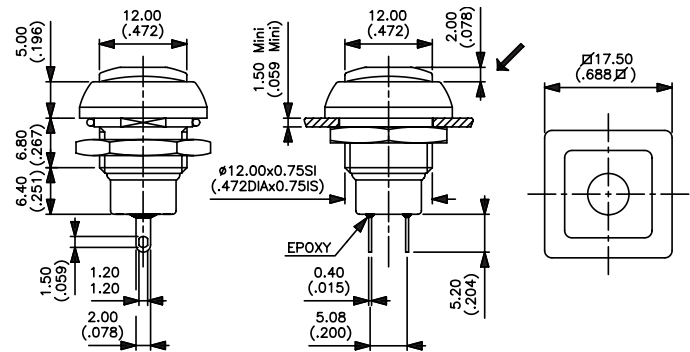


→ Flat

## Square - solder lug terminals



MODEL NO.	ACT. COLOR
IPC3SAD1	BLUE
IPC3SAD2	BLACK
IPC3SAD3	GREEN
IPC3SAD5	YELLOW
IPC3SAD6	RED
IPC3SAD7/1	WHITE
IPC3SAD9	ORANGE

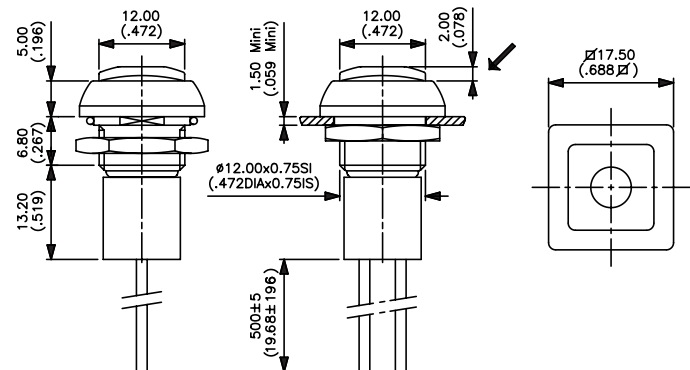


→ Flat

## Square - stranded 20 AWG wire leads



MODEL NO.	ACT. COLOR
IPC3FAD1	BLUE
IPC3FAD2	BLACK
IPC3FAD3	GREEN
IPC3FAD5	YELLOW
IPC3FAD6	RED
IPC3FAD7/1	WHITE
IPC3FAD9	ORANGE



→ Flat

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# New! IP SERIES - PUSHBUTTON SWITCHES FOR HARSH ENVIRONMENTS

**Additional ordering information:** Commonly ordered models are shown on prior page 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.

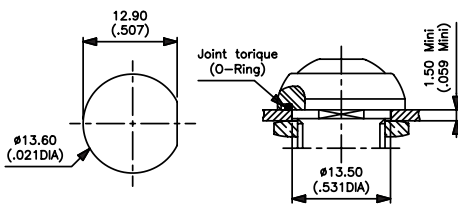
## 'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with allowable options shown below each respective box.

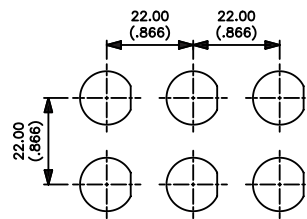
Series	Bezel shape	Electrical function	Terminals	Contacts	Actuator color
I P	<input type="checkbox"/>	3	<input type="checkbox"/>	A D	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	R Round C Square	Normally open (NO)	S Solder lugs F Stranded wire leads	Gold plated silver	1 Blue 2 Black 3 Green 5 Yellow 6 Red 7 / 1 White 9 Orange

## MOUNTING

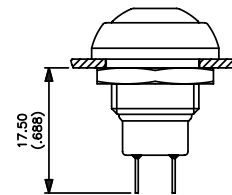
### Panel cut-out



### Matrix mounting

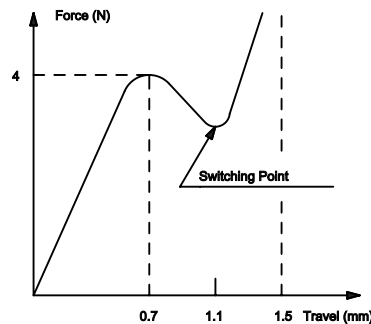


### Back of panel space requirement

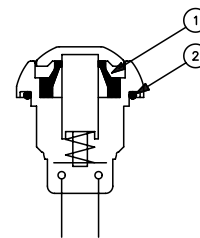


## TACTILE FEEDBACK

### Operating force vs. travel diagram



### Switch cross section



## SEALING

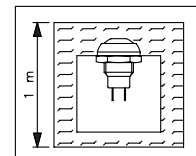
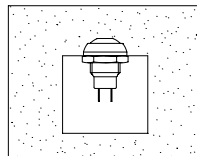
Per IP 67. Degree of protection provided by the enclosures of electric appliances according to IEC 529, DIN 40050 & NFC 20-010 shown below:

**IP**  
(ingress protection)

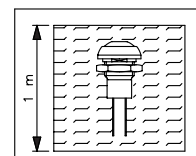
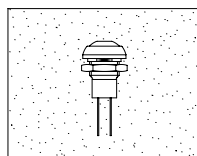
**6**  
Totally protected against dust

**7**  
Protected against the effects of immersion up to 1 meter of water (30 mins.)

**SOLDER LUG VERSION**



**WIRE LEADS VERSION**



# SP SERIES - WASHABLE MINIATURE SNAP-ACTION PUSHBUTTON SWITCHES



C

## FEATURES

- Wave solderable.
- Compact case size & fully sealed for process compatibility.
- SPDT & DPDT momentary p.c. & panel mounting models.
- Models available with ESD protection up to 12 KV.

## SPECIFICATIONS

<b>Contact ratings (resistive loads):</b>	Gold plated brass: 100 mA at 30 VDC Silver or gold plated silver: 1 Amp at 120 VAC or 30 VDC
<b>Initial contact resistance:</b>	50 milliohms maximum
<b>Insulation resistance:</b>	1000 megohms minimum
<b>Dielectric strength:</b>	1000 V rms minimum
<b>Electrical life:</b>	60,000 cycles minimum
<b>Operating temperature range:</b>	-20°C to +85°C
<b>Washing:</b>	Permissible with water, detergents and solvents.

## MATERIALS

<b>Contacts &amp; Terminals:</b>	Gold plated brass, silver or gold plated silver
<b>Actuator:</b>	UL94V-0 polyamide, glass filled
<b>Bracket:</b>	Tin plated steel
<b>Case:</b>	UL94V-0 polyamide, glass filled or PES
<b>Terminal seal:</b>	Epoxy
<b>Hardware:</b>	1/4" threaded bushing models supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog.

## AGENCY RECOGNITION





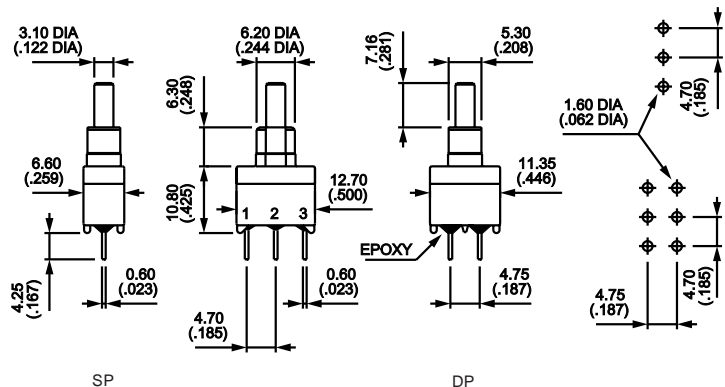
Available with all models with silver or gold plated silver contacts and terminals, standard actuator and smooth bushing. UL marking supplied when specified - see Order Format.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

## Plain bushing - straight p.c. terminals - gold plated brass contacts



<b>SINGLE POLE</b>	<b>CIRCUIT</b>
MODEL NO. SP35P000000	ON MOM
<b>DOUBLE POLE</b>	<b>CIRCUIT</b>
MODEL NO. SP45P000000	ON MOM
Button position:	 
Terminals connected:	1-3    1-2

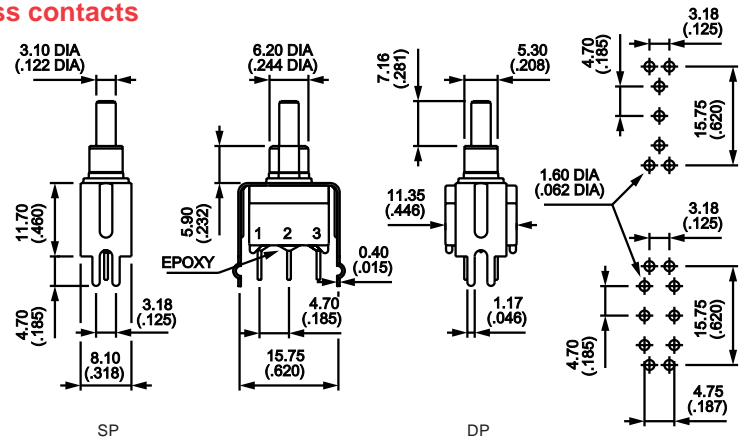


# SP SERIES - WASHABLE MINIATURE SNAP-ACTION PUSHBUTTON SWITCHES

## Plain bushing - bracket mounting - gold plated brass contacts



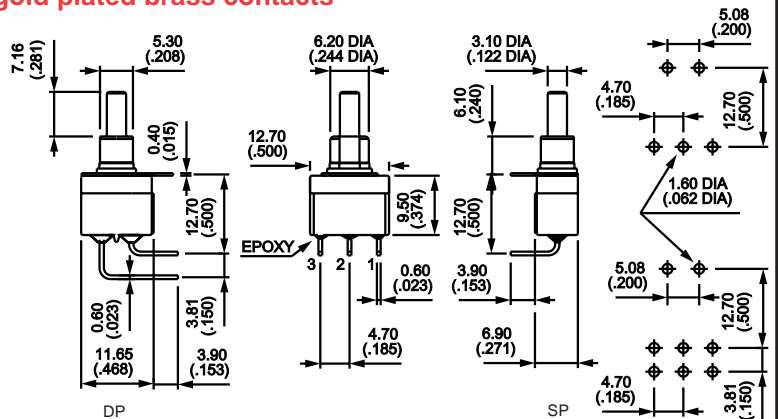
<b>SINGLE POLE</b>	<b>CIRCUIT</b>
MODEL NO. SP35Y000000	ON MOM
<b>DOUBLE POLE</b>	<b>CIRCUIT</b>
MODEL NO. SP45Y000000	ON MOM
Button position:	
Terminals connected: 1-3    1-2	



## Plain bushing - horizontal right angle terminals - gold plated brass contacts



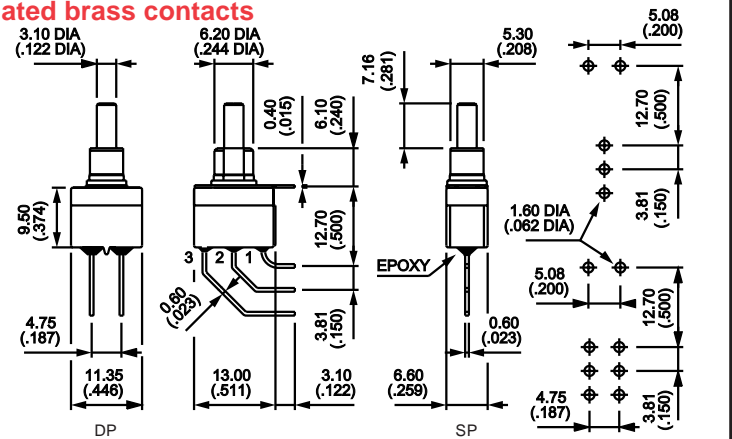
<b>SINGLE POLE</b>	<b>CIRCUIT</b>
MODEL NO. SP35W000000	ON MOM
<b>DOUBLE POLE</b>	<b>CIRCUIT</b>
MODEL NO. SP45W000000	ON MOM
Button position:	
Terminals connected: 1-3    1-2	



## Plain bushing - vertical right angle terminals - gold plated brass contacts



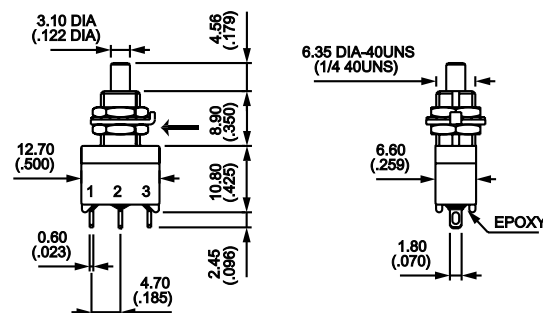
<b>SINGLE POLE</b>	<b>CIRCUIT</b>
MODEL NO. SP35WW000000	ON MOM
<b>DOUBLE POLE</b>	<b>CIRCUIT</b>
MODEL NO. SP45WW000000	ON MOM
Button position:	
Terminals connected: 1-3    1-2	



## Threaded bushing - solder lug terminals - gold plated brass contacts



<b>SINGLE POLE</b>	<b>CIRCUIT</b>
MODEL NO. SP35S000077	ON MOM
Button position:	
Terminals connected: 1-3    1-2	



→ Keyway

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

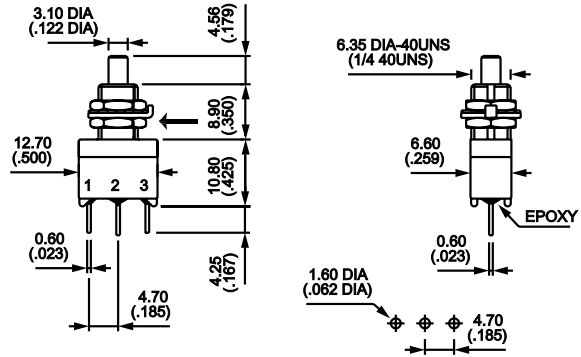
C

# SP SERIES - WASHABLE MINIATURE SNAP-ACTION PUSHBUTTON SWITCHES

Threaded bushing - straight p.c. terminals - gold plated brass contacts



<b>SINGLE POLE</b>	<b>CIRCUIT</b>	
<b>MODEL NO.</b>	<b>ON</b>	<b>MOM</b>
<b>SP35P000077</b>		
<b>Button position:</b>		
<b>Terminals connected:</b>	1-3	1-2



→ Keyway

**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 under each respective box).

### Model Structure:

<b>Series</b>	<b>Number of poles</b>	<b>Electrical function</b>	<b>Terminals</b>
<input type="checkbox"/> S <input type="checkbox"/> P	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3 Single pole 4 Double pole	5 ON MOM	<b>P 0</b> Straight pc <b>S 0</b> Solder lug <b>Y 0</b> Straight pc with mounting bracket <b>W 0</b> Horizontal right angle mounting <b>W W</b> Vertical right angle mounting

### Options:

<b>Contact &amp; terminal materials</b>	<b>Actuators and bushings</b>
<input type="checkbox"/>	<input type="checkbox"/>
<b>0</b> Brass, gold plated <b>1</b> Silver <b>2</b> Silver, gold plated <b>8</b> Brass, gold plated, with, tin plated terminals	<b>0 0 0 0</b> Standard actuator w/smooth bushing <b>0 0 0 1</b> Standard actuator w/smooth bushing & UL marking (UL available with silver or gold plated silver contacts & terminals only) <b>0 0 7 7</b> Standard actuator w/threaded bushing <b>0 2 7 6</b> Short actuator w/short smooth bushing (See actuator/ bushing drawings at bottom of this page)

Example of completely specified model number: **SP35Y080000**

Caps available separately - see option drawings on next page.

## OPTION DRAWINGS

### ACTUATOR/BUSHING DRAWINGS

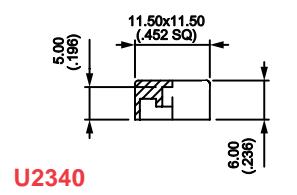
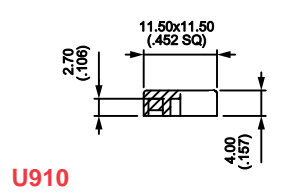
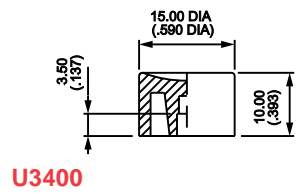
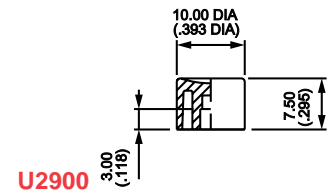
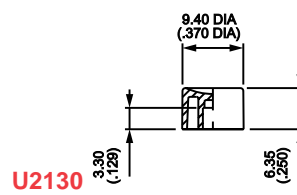
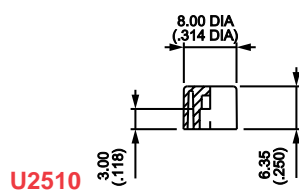
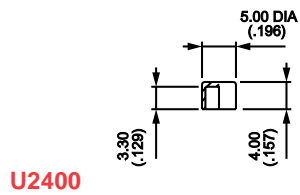
### TERMINAL OUTLINES

<p><b>0000</b> Standard actuator w/smooth bushing</p>	<p><b>0077</b> Standard actuator w/threaded bushing</p>	<p><b>0276</b> Short actuator with short smooth bushing</p>	<p><b>S0</b> Solder lug</p>	<p><b>P0</b> Straight printed circuit</p>
---	---	---	-----------------------------	---

# SP SERIES - WASHABLE MINIATURE SNAP-ACTION PUSHBUTTON SWITCHES

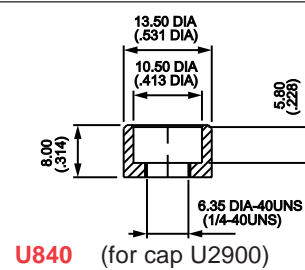
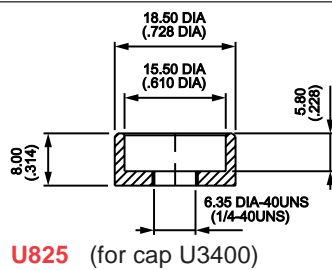
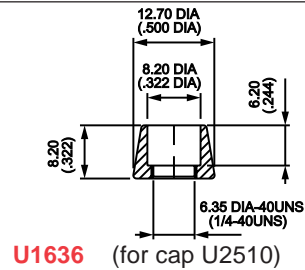
## OPTION DRAWINGS & MISCELLANEOUS

**CAPS** Note: replace last '0' in p/n with color code.

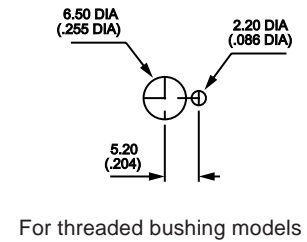


Colors	
1	blue
2	black
3	green
4	grey
5	yellow
6	red
7/1	white
9	orange

**DRESS NUTS** Chrome plated For threaded bushing models only.



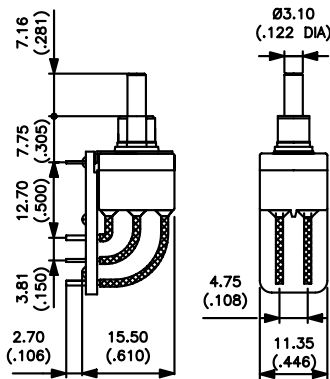
**PANEL CUT-OUT**



## ELECTROSTATIC PUSHBUTTON SWITCHES

### INSULATED

Protects against electrostatic discharges (ESD) up to 12 KV.



**X978** - Consult factory

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C



# 18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES



C

## FEATURES

- Single pole-double throw & double pole-double throw models with ON-MOM ON action.
- Epoxy terminal sealing standard.
- Panel and p.c. mounting models with compact miniature case size.

## SPECIFICATIONS

<b>Contact ratings (resistive loads):</b>	Gold plated brass: 100 mA at 30 VDC Gold plated silver: 1A at 120VAC or 30VDC
<b>Initial contact resistance:</b>	50 milliohms maximum
<b>Insulation resistance:</b>	1000 megohms minimum
<b>Dielectric strength:</b>	1000 V rms minimum
<b>Electrical life:</b>	60,000 cycles minimum at full load.
<b>Operating temperature range:</b>	-30°C to +65°C
<b>Total travel:</b>	.019" (0.5mm)

## MATERIALS

<b>Contacts &amp; Terminals:</b>	Gold plated brass or gold plated silver
<b>Actuator:</b>	Polyamide, glass filled
<b>Bushing:</b>	Nickel plated brass
<b>Housing:</b>	Stainless steel
<b>Case:</b>	Diallyl phthalate
<b>Bracket:</b>	Tin plated steel
<b>Terminal seal:</b>	Epoxy
<b>Hardware:</b>	1/4" threaded bushing models supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog.

## ABOUT THIS SERIES

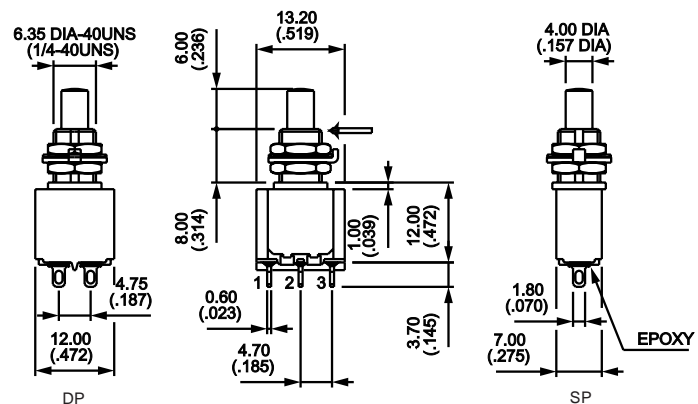
- The material is organized in the following sequence:
- completely specified switch models.
  - 'Build your own switch' order format.
  - Options & miscellaneous

## Solder lug terminals - 1/4" (6.35mm) bushing - gold plated silver contacts



<b>SINGLE POLE</b>	<b>CIRCUIT</b>	
<b>MODEL NO.</b>	<b>ON</b>	<b>MOM</b>
18535AD	ON	MOM
<b>DOUBLE POLE</b>	<b>CIRCUIT</b>	
<b>MODEL NO.</b>	<b>ON</b>	<b>MOM</b>
18545AD	ON	MOM
<b>Handle position:</b>		
<b>Terms. connected:</b>	1-3 4-6	1-2 4-5

→ Keyway



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

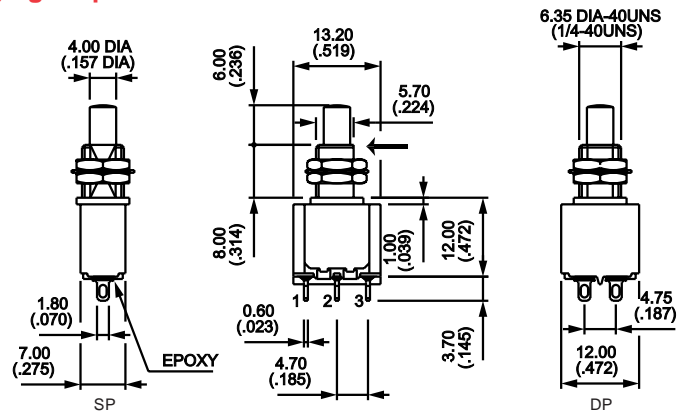
# 18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

## Solder lug terminals - 1/4" (6.35mm) flatted bushing - gold plated silver contacts



SINGLE POLE MODEL NO.	CIRCUIT	
18735AD	ON	MOM
DOUBLE POLE MODEL NO.	CIRCUIT	
18745AD	ON	MOM
Handle position:		
Terms. connected:	1-3 4-6	1-2 4-5

→ 'D' flat

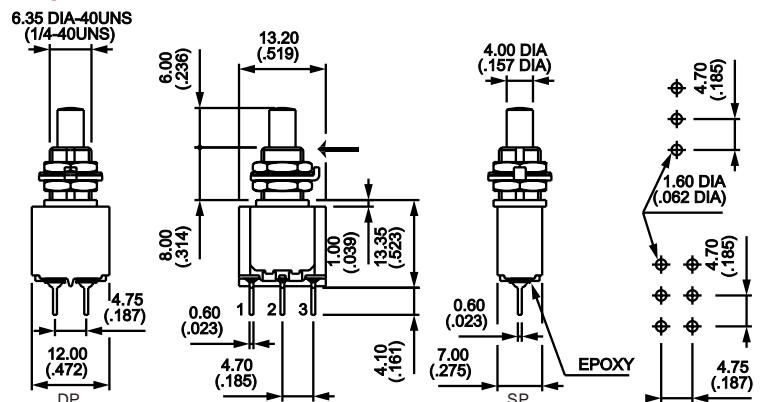


## Straight p.c. terminals - 1/4" (6.35mm) bushing - gold plated silver contacts



SINGLE POLE MODEL NO.	CIRCUIT	
18235AD	ON	MOM
DOUBLE POLE MODEL NO.	CIRCUIT	
18245AD	ON	MOM
Handle position:		
Terms. connected:	1-3 4-6	1-2 4-5

→ Keyway

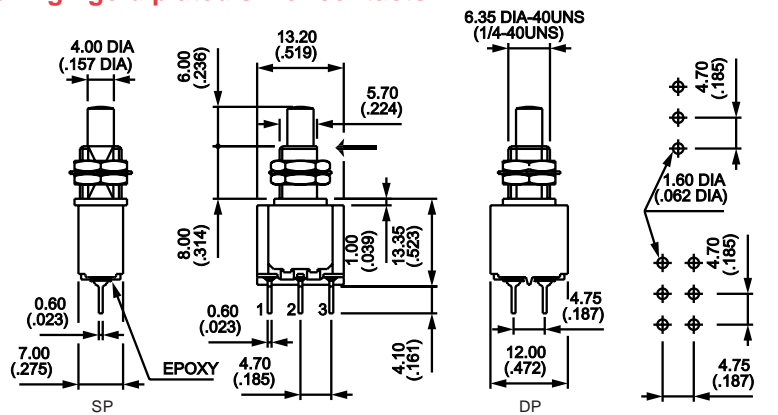


## Straight p.c. terminals - 1/4" (6.35mm) flatted bushing - gold plated silver contacts



SINGLE POLE MODEL NO.	CIRCUIT	
18935AD	ON	MOM
DOUBLE POLE MODEL NO.	CIRCUIT	
18945AD	ON	MOM
Handle position:		
Terms. connected:	1-3 4-6	1-2 4-5

→ 'D' flat

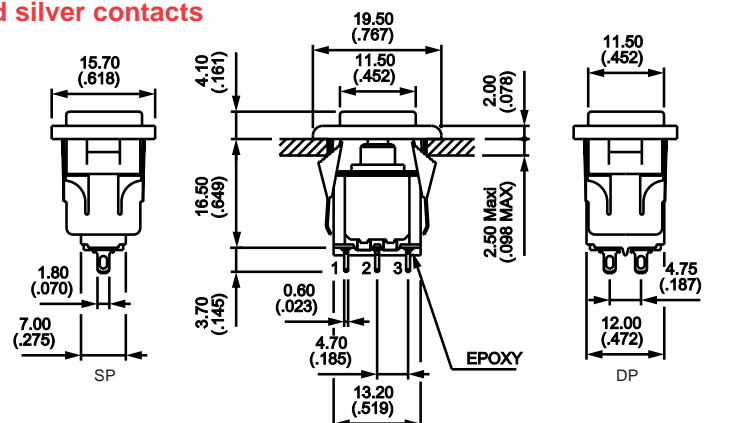


## Solder lug terminals - snap-in mounting - gold plated silver contacts



SINGLE POLE MODEL NO.	CIRCUIT	
18835AD+U912+U1202	ON	MOM
DOUBLE POLE MODEL NO.	CIRCUIT	
18845AD+U912+U1202	ON	MOM
Handle position:		
Terms. connected:	1-3 4-6	1-2 4-5

Above models have back bezel & cap

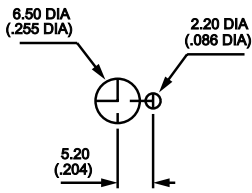


SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

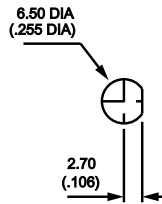
C

# 18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

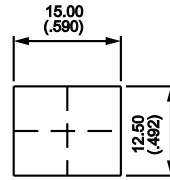
## PANEL CUT-OUTS for models shown above



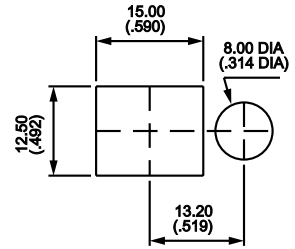
1/4" (6.35mm) bushing



1/4" (6.35mm) flatted bush.



Bezel U1200

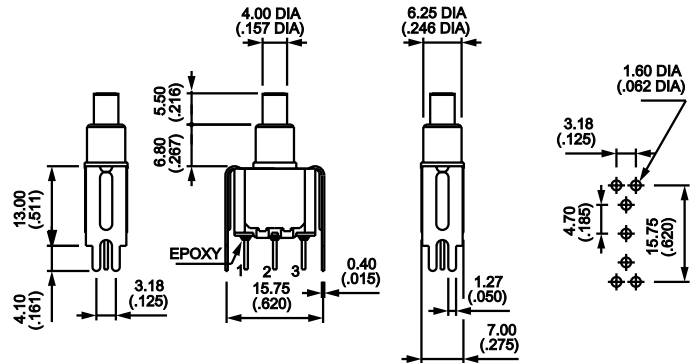


Bezel U1210 w/LED

## Single pole - straight p.c. terminals - bracket mounting - gold plated brass contacts



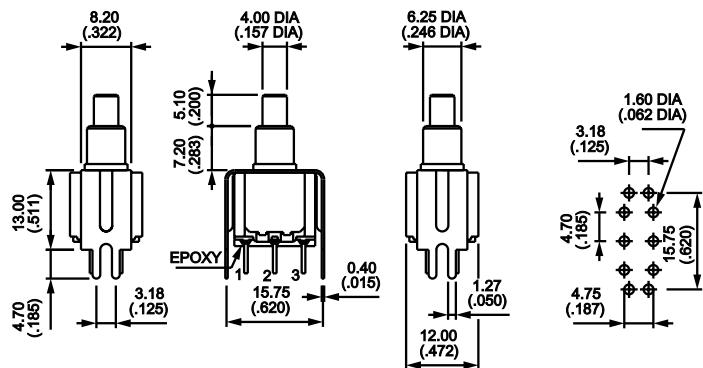
SINGLE POLE MODEL NO.	CIRCUIT	
18235YCD3	ON	MOM
Handle position:		
Terms. connected:	1-3	1-2



## Double pole - straight p.c. terminals - bracket mounting - gold plated brass contacts



DOUBLE POLE MODEL NO.	CIRCUIT	
18245YCD3	ON	MOM
Handle position:		
Terms. connected:	1-3 4-6	1-2 4-5



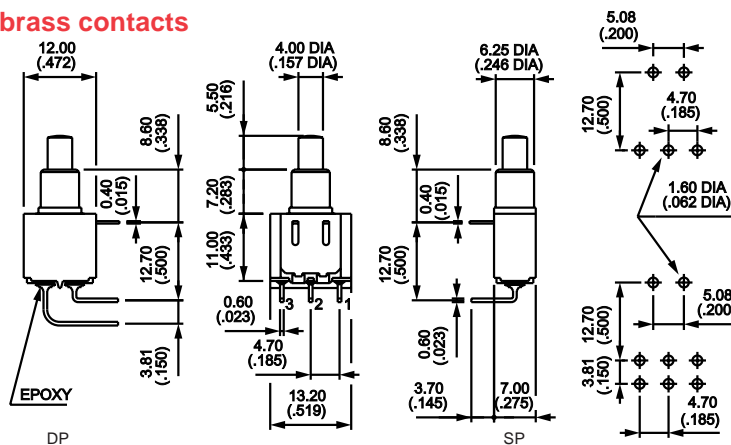
## Horizontal right angle p.c. terminals - gold plated brass contacts



SINGLE POLE MODEL NO.	CIRCUIT	
18235WCD3	ON	MOM
Handle position:		
Terms. connected:	1-3	1-2

DOUBLE POLE MODEL NO.	CIRCUIT	
18245WCD3	ON	MOM
Handle position:		
Terms. connected:	1-3 4-6	1-2 4-5



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

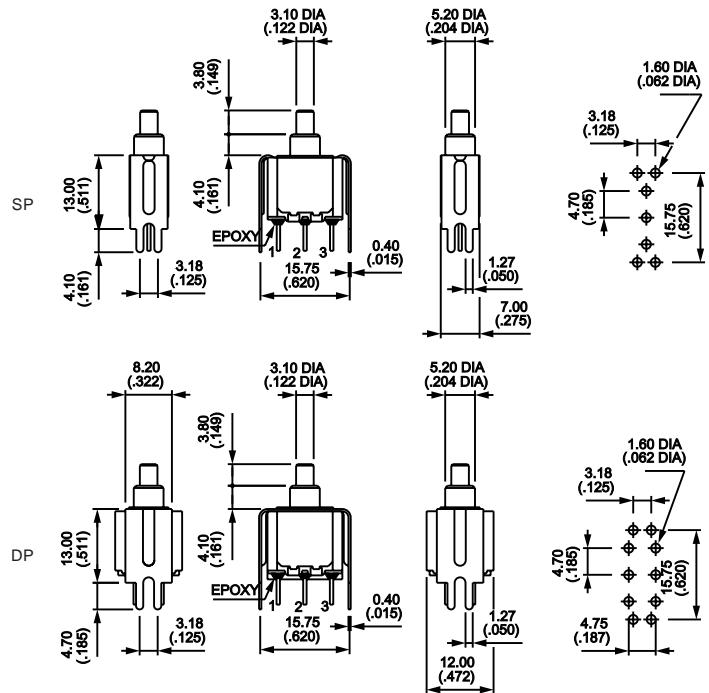
# 18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

## SPECIAL OPTIONS

### Special option X624 - straight p.c. terminals - short bushing & actuator - gold plated brass contacts



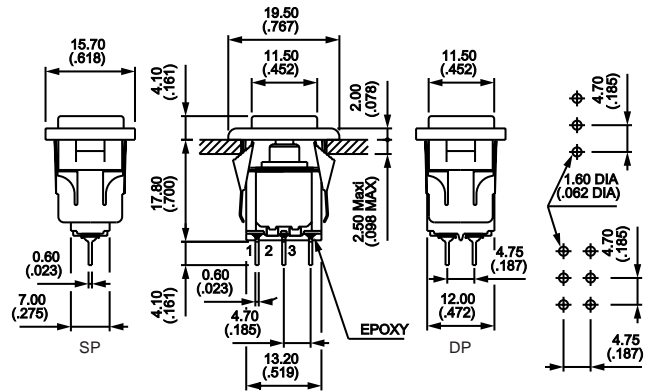
SINGLE POLE		CIRCUIT	
MODEL NO.	18235YCD2X624	ON	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.	18245YCD2X624	ON	MOM
Handle position:			
Terms. connected:	1-3	1-2	
	4-6	4-5	



### Special option X662 - straight p.c. terminals - snap-in mounting - gold plated brass contacts



SINGLE POLE		CIRCUIT	
MODEL NO.	18835CDX662+U910+U1200	ON	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.	18845CDX662+U910+U1200	ON	MOM
Handle position:			
Terms. connected:	1-3	1-2	
	4-6	4-5	



## OPTIONS

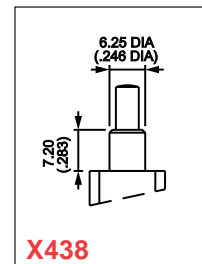
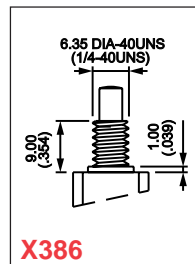
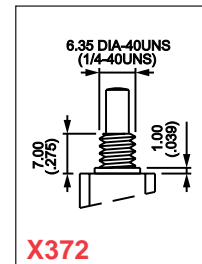
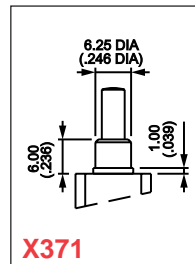
**F** Tin plated terminals (for p.c. terminals only).

**X371** .246" (6.25mm) smooth bushing in place of standard threaded bushing.

**X372** Short 1/4" (6.35mm) threaded bushing, .274" (7mm) long.

**X386** 1/4" (6.35mm) threaded bushing in place of smooth bushing on models with W, WW & Y options.

**X438** .246" (6.25mm) smooth bushing without shoulder, .283" (7.2mm) long.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

# 18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

**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 under each respective box).  
 Note: 'NONE' indicates box may be left empty.

### Model Structure:

Series	Terminals & bushings	Number of poles	Electrical function	Terminals
1	8		5	
	2 Straight p.c. terminals with 1/4" (6.35mm) threaded bushing. Straight p.c. terms. + bracket or right angle p.c. terms. with smooth bushing 5 Solder lug terminals with 1/4" (6.35mm) threaded bushing 7 Solder lug terminals with 1/4" (6.35mm) flatted bushing 8 Solder lug terminals, snap-in mounting 9 Straight p.c. terminals with 1/4" (6.35mm) flatted bushing	3 Single pole 4 Double pole	ON - MOM	(NONE) Solder lug or straight p.c. W Horizontal right angle p.c. W W Vertical right angle p.c. Y Bracket mounting

Example of completely specified model number: **18245AD**

Caps available separately - see option drawings.

### Options:

Contact materials	Actuators	Special options
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
A D Silver, gold plated C D Brass, gold plated	(NONE) .157" (4mm) dia. x .236" (6mm) long (standard) with threaded bushing 6 .122" (3.1mm) dia. x .230" (5.85mm) with threaded bushing 3 .157" (4mm) dia. x .216" (5.5mm) long (standard) with smooth bushing 5 .122" (3.1mm) dia. x .248" (6.3mm) long	(NONE) F Tin plated terminals - for p.c. terms. only X 6 2 4 Shorter bushing & actuator X 6 6 2 Snap-in mounting & straight p.c. terminals Others listed - see Special Option page

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

### ACTUATOR OPTIONS

<p>7.90 (.307) 4.00 DIA (.157 DIA) 7.20 (.283) 1.00 (.039)</p>	<p>6.00 (.236) 4.00 DIA (.157 DIA) 9.00 (.354) 1.00 (.039)</p>	<p>7.65 (.301) 3.10 DIA (.122 DIA) 7.20 (.283) 1.00 (.039)</p>	<p>5.85 (.230) 3.10 DIA (.122 DIA) 9.00 (.354) 1.00 (.039)</p>	<p>5.50 (.216) 4.00 DIA (.157 DIA) 7.20 (.283) 1.00 (.039)</p>	<p>3.70 (.145) 4.00 DIA (.157 DIA) 9.00 (.354) 1.00 (.039)</p>
(NONE) Standard with threaded bushing	6	3		3 Standard with smooth bushing	

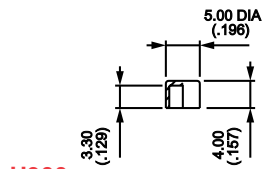
<p>6.30 (.248) 3.10 DIA (.122 DIA) 7.20 (.283) 1.00 (.039)</p>	<p>4.50 (.177) 3.10 DIA (.122 DIA) 9.00 (.354) 1.00 (.039)</p>	<h4>SWITCH ACTION</h4> <p>Arrow indicates keyway</p>	<h4>TERMINALS</h4> <p>Solder lug Straight p.c.</p>
--	--	--	--

# 18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

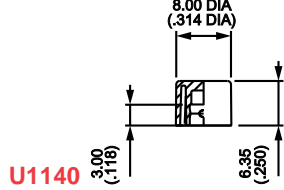
## CAPS

FOR .157" (4mm) DIA. ACTUATORS (13 & 3)

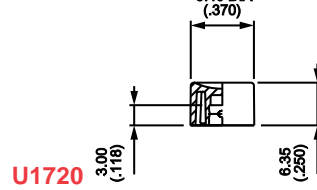
Note: replace last '0' in p/n with color code.



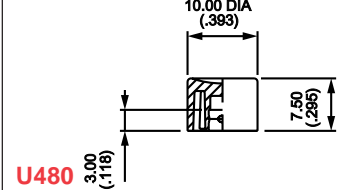
**U900**



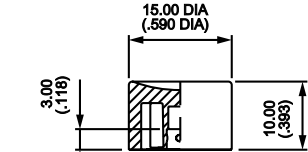
**U1140**



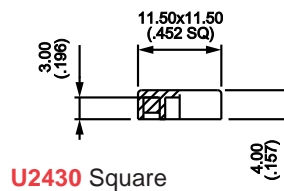
**U1720**



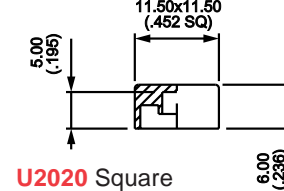
**U480**



**U630**



**U2430 Square**

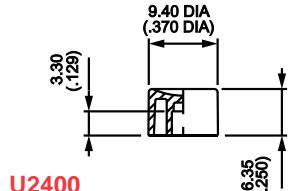


**U2020 Square**

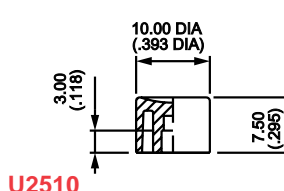
Colors	
1	blue
2	black
3	green
4	grey
5	yellow
6	red
7	ivory
7/1	white
9	orange

FOR .122" (3.1mm) DIA. ACTUATORS (5 & 6)

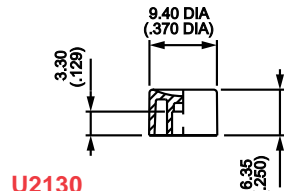
Note: replace last '0' in p/n with color code.



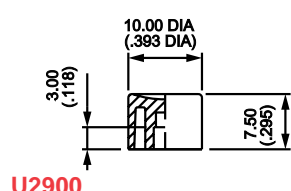
**U2400**



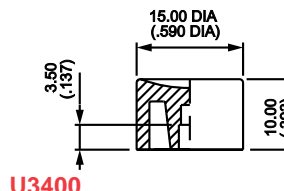
**U2510**



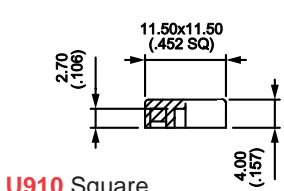
**U2130**



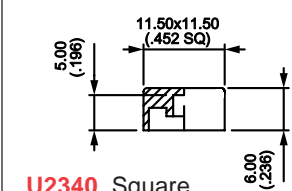
**U2900**



**U3400**



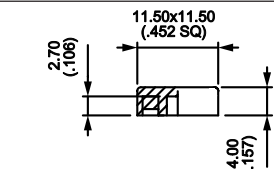
**U910 Square**



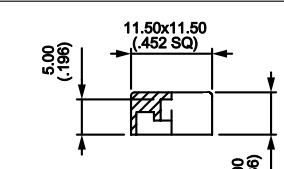
**U2340 Square**

FOR 188.. & 188..X662 MODELS

Note: replace '0' in p/n with color code.



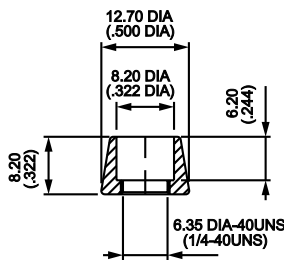
**U910 Square**



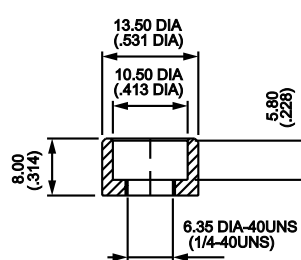
**U2340 Square**

## DRESS NUTS

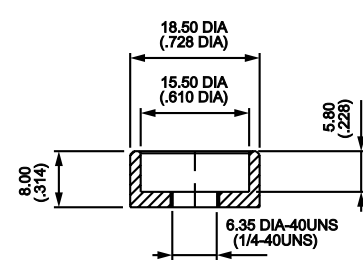
Chrome plated For models with threaded bushings (182..., 185..., 187..., & 189...) (Order separately)



**U1636** For caps U1140 & U2510



**U840** For caps U480 & U2900



**U825** For caps U630 & U3400

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

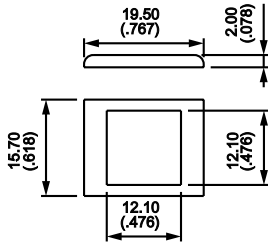
C

# 18000 SERIES - MINIATURE SNAP-ACTION MOMENTARY PUSHBUTTON SWITCHES

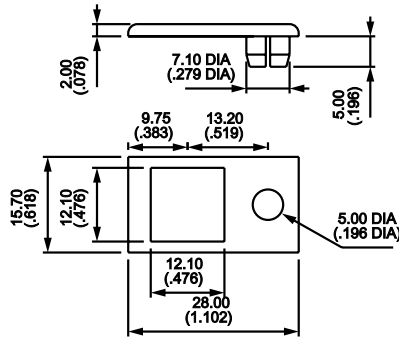
**BEZELS** Note: replace last '0' in p/n with color code

For snap-in models (188.. & 188..X662)

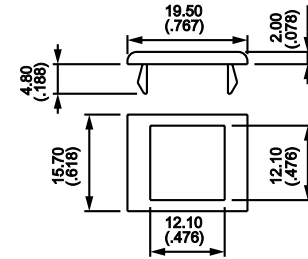
For bracket mtg. models (182..Y & 182..YX624)



**U1200**



**U1210** For LED (not supplied)



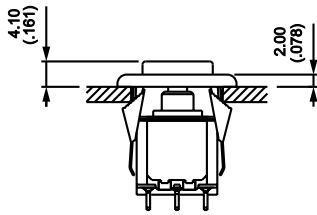
**U3200**

**Colors**

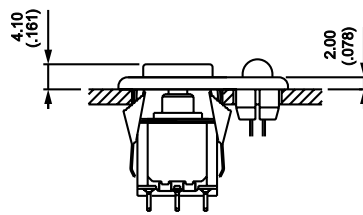
- 1 blue
- 2 black
- 3 green
- 4 grey
- 5 yellow
- 6 red
- 7 ivory
- 7/1 white
- 9 orange

**STANDARD PANEL MOUNTING FOR BEZELS**

Panel thicknesses: .039" (1mm) to .098" (2.5mm)



**188.. + U910 + U1200**



**188.. + U910 + U1210**

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



# 8000 SERIES - MINI. MOMENTARY OR ALTERNATE ACTION PUSHBUTTON SWITCHES



## FEATURES

- Single pole-double throw & double pole-double throw models.
- ON-MOM and ON-ON alternate actions .
- 1/4-40 and 15/32-32 threaded bushing options.
- Panel and p.c. mounting models with compact miniature case size.

## SPECIFICATIONS

<b>Contact ratings (resistive loads):</b>	Gold plated brass: 0.4 Volt-Amps max. at 20 V (AC or DC) Silver: 3A 250VAC, 6A 125VAC or 4A 30VDC
<b>Initial contact resistance:</b>	10 milliohms maximum
<b>Insulation resistance:</b>	1000 megohms minimum at 500 VDC
<b>Dielectric strength:</b>	2000 V rms min. between terminals and frame. 1000 V rms between terminals.
<b>Electrical life:</b>	30,000 cycles minimum at full load.
<b>Operating temperature range:</b>	-40°C to +85°C
<b>Travel:</b>	Pre-travel - .086" (2.2mm)    Over-travel - .019" (0.5mm) Total-travel - .106" (2.7mm)

## MATERIALS

<b>Contacts &amp; Terminals:</b>	Gold plated brass or gold plated silver
<b>Actuator:</b>	Nickel plated brass
<b>Bushing:</b>	Nickel plated brass
<b>Housing:</b>	Stainless steel
<b>Case:</b>	Diallyl phthalate
<b>Terminal seal:</b>	Epoxy
<b>Hardware:</b>	1/4" threaded bushing models supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog.

## AGENCY LISTINGS



To order switches marked UL, specify in approvals box of Order Format.

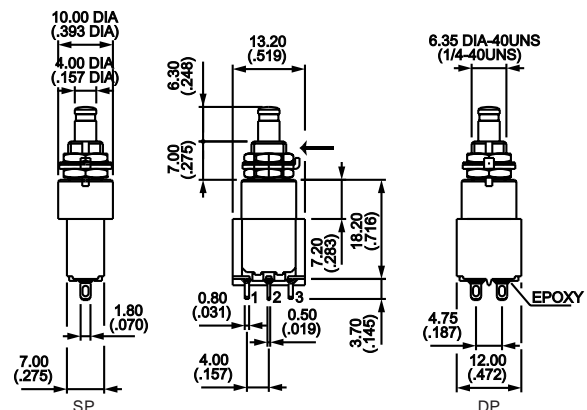
## Solder lug terminals - 1/4" (6.35mm) bushing - silver contacts



Note: Cap shown must be ordered separately.

SINGLE POLE		CIRCUIT	
MODEL NO.	8632AB	ON	MOM
	8636AB	ON	ON
DOUBLE POLE		CIRCUIT	
MODEL NO.	8642AB	ON	MOM
	8646AB	ON	ON
Actuator position:			
Terms. connected:	2-3	1-2	
	5-6	4-5	

→ Keyway



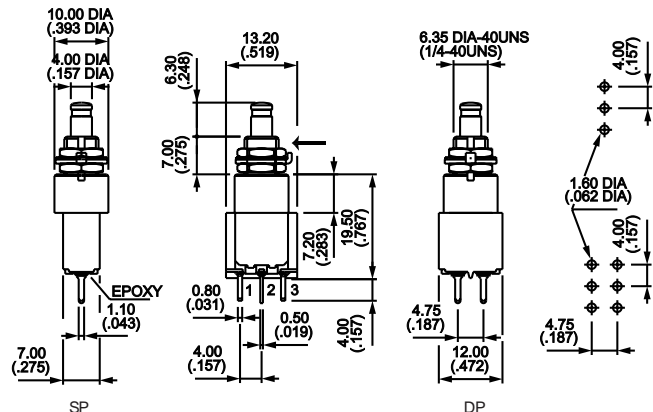
# 8000 SERIES - MINI. MOMENTARY OR ALTERNATE ACTION PUSHBUTTON SWITCHES

## Straight p.c. terminals - 1/4" (6.35mm) bushing - silver contacts



SINGLE POLE		CIRCUIT	
MODEL NO.			
8432AB	ON	MOM	
8436AB	ON	ON	
DOUBLE POLE		CIRCUIT	
MODEL NO.			
8442AB	ON	MOM	
8446AB	ON	ON	
Actuator position:			
Terms. connected:		2-3	1-2
		5-6	4-5

→ Keyway

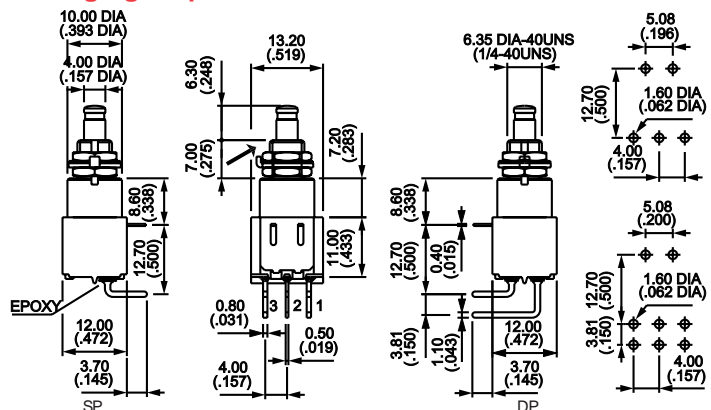


## Horizontal right angle p.c. terminals - 1/4" (6.35mm) bushing - gold plated brass contacts



SINGLE POLE		CIRCUIT	
MODEL NO.			
8432WCDB	ON	MOM	
8436WCDB	ON	ON	
DOUBLE POLE		CIRCUIT	
MODEL NO.			
8442WCDB	ON	MOM	
8446WCDB	ON	ON	
Actuator position:			
Terms. connected:		2-3	1-2
		5-6	4-5

→ Keyway



**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 under each respective box).  
Note: 'NONE' indicates box may be left empty.

#### Model Structure:

Series	Terminals	Number of poles	Electrical functions	Terminals
<input type="text" value="8"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	4 Straight p.c. or right angle terminals 6 Solder lug terminals	3 Single pole 4 Double pole	2 ON - MOM 6 ON - ON	(NONE) Solder lug or straight p.c. W Right angle p.c.

#### Options:

Contact materials	Actuators	Sealing	Special options	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
A Silver A D Silver, gold plated C D Brass, gold plated	For 1/4" (6.35mm) bushings (NONE) Height .248" (6.3mm) 9 Height .346" (8.8mm) For 15/32" (11.9mm) bushings (NONE) Height .338" (8.6mm) 6 Height .275" (7mm)	(NONE) No sealing B Epoxy sealed terminals K Front panel sealing with 'o'-ring & gasket	(NONE) X 7 1 8 15/32" (11.9mm) bushing X 9 3 4 15/32" (11.9mm) bushing & front panel sealing	(NONE) U L

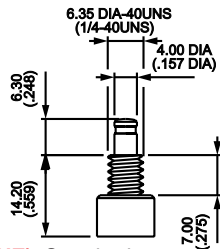
Example of completely specified model number: **8432WCDB**

Caps available separately - see option drawings.

# 8000 SERIES - MINI. MOMENTARY OR ALTERNATE ACTION PUSHBUTTON SWITCHES

## ACTUATOR OPTIONS

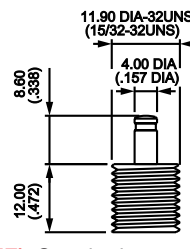
### For 1/4" (6.35mm) bushing



(NONE) Standard

9

### For 15/32" (11.9mm) bushing



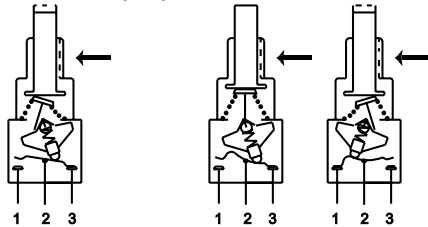
(NONE) Standard

6

## MISCELLANEOUS

### SWITCH ACTION

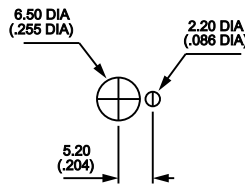
Arrow indicates keyway



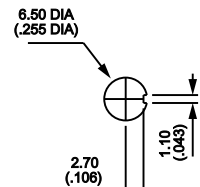
Function 6  
(ON-ON)

Function 2  
(ON-MOM)

### PANEL CUT-OUTS



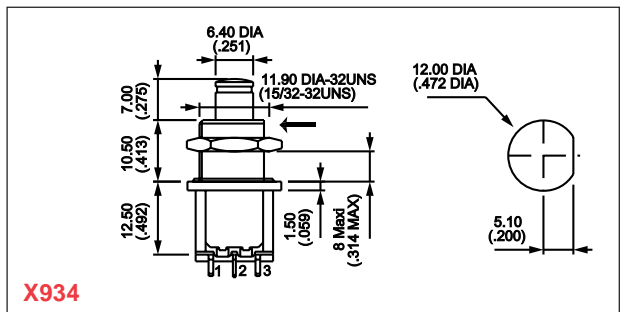
1/4" (6.35mm)  
Standard (With locking ring)



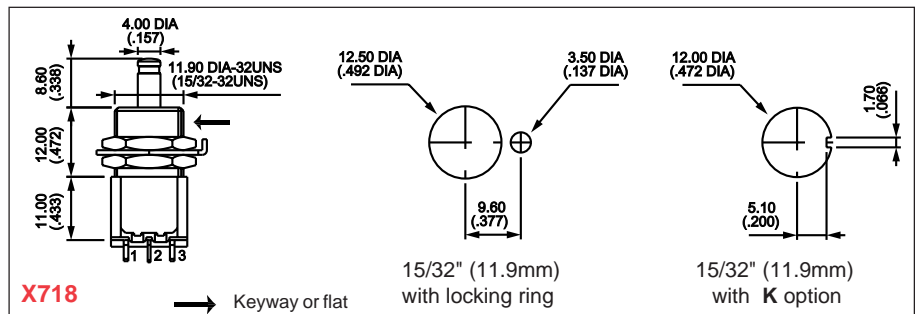
1/4" (6.35mm)  
with K option

## SPECIAL OPTIONS

- F** Tin plated terminals (for p.c. terminals only).
- X601** Silver plated brass contacts. Contact ratings: 0.2A 250VAC, 0.4A 125VAC or 0.5A 30VDC. Electric life: 20,000 cycles min. Minimum quantity: 5,000 pieces.
- X718** Bushing 15/32" (11.9mm). For all basic models (solder lug, straight p.c. or right angle p.c. terminals). Available with actuators 13 & 6. Sealing option K available.
- X934** Flatted 15/32" (11.9mm) bushing and front panel sealing with 2 'o'-rings.



**X934**



**X718**

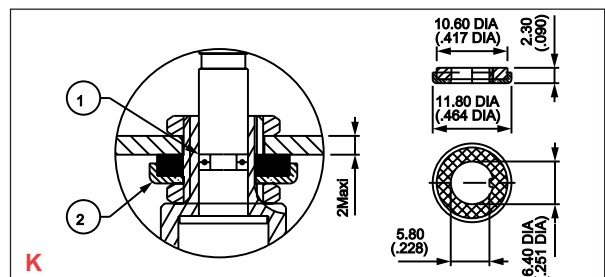
→ Keyway or flat

15/32" (11.9mm)  
with locking ring

15/32" (11.9mm)  
with K option

## SEALING OPTIONS

- (NONE)** No sealing.
- B** Epoxy sealed terminals.
- K** Front panel sealing with 'o'-ring and gasket. Protects against water and dust. Withstands 1 bar pressure when switch is operated.
- KB** Combined sealings (above).



**K**

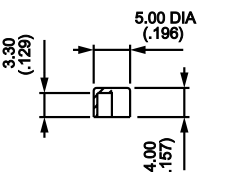
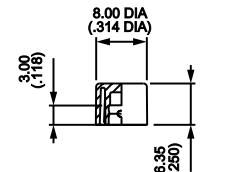
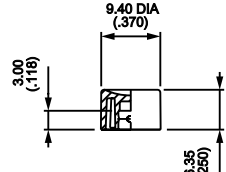
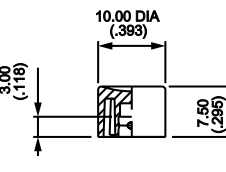
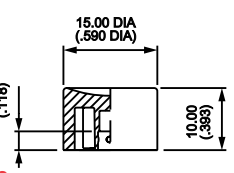
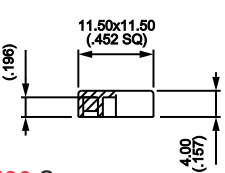
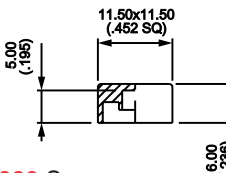
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

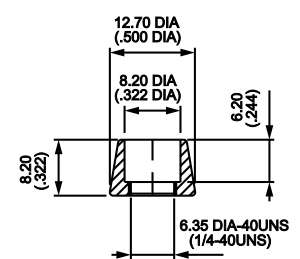
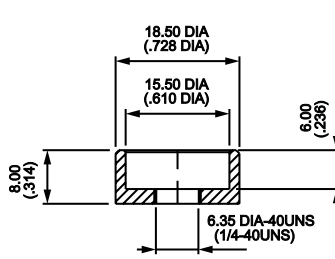
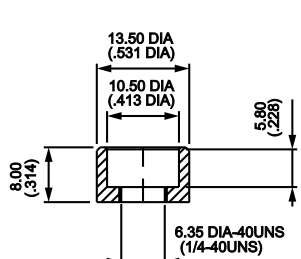
# 8000 SERIES - MINI. MOMENTARY OR ALTERNATE ACTION PUSHBUTTON SWITCHES

## CAPS

Note: replace last '0' in p/n with color code.

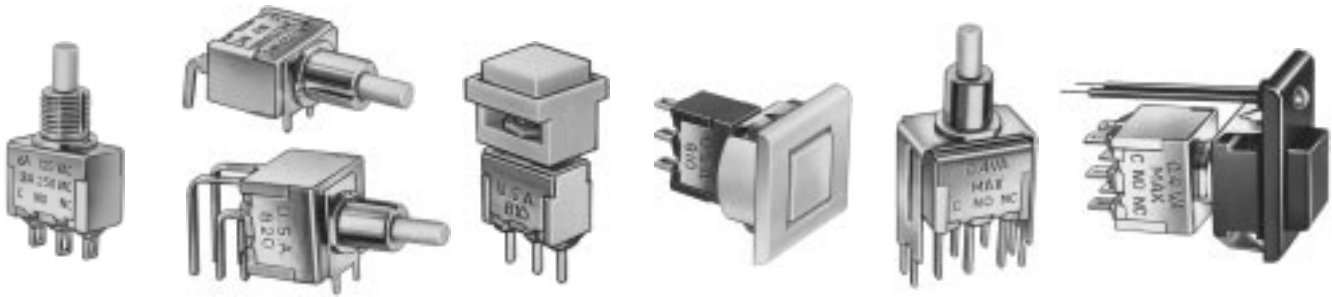
 <p><b>U900</b></p>	 <p><b>U1140</b></p>	 <p><b>U1720</b></p>	 <p><b>U480 Standard</b></p>																		
 <p><b>U630</b></p>	 <p><b>U2430 Square</b></p>	 <p><b>U2020 Square</b></p>	<table border="1"> <thead> <tr> <th colspan="2">Colors</th> </tr> </thead> <tbody> <tr><td>1</td><td>blue</td></tr> <tr><td>2</td><td>black</td></tr> <tr><td>3</td><td>green</td></tr> <tr><td>4</td><td>grey</td></tr> <tr><td>5</td><td>yellow</td></tr> <tr><td>6</td><td>red</td></tr> <tr><td>7/1</td><td>white</td></tr> <tr><td>9</td><td>orange</td></tr> </tbody> </table>	Colors		1	blue	2	black	3	green	4	grey	5	yellow	6	red	7/1	white	9	orange
Colors																					
1	blue																				
2	black																				
3	green																				
4	grey																				
5	yellow																				
6	red																				
7/1	white																				
9	orange																				

## DRESS NUTS (chrome plated)

 <p><b>U1636</b> For cap U1140</p>	 <p><b>U825</b> For cap U630</p>	 <p><b>U840</b> For cap U480</p>
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SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES



## FEATURES

- Dry circuit through power ratings .
- Ultra-rugged construction SPDT & DPDT momentary 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. (B) dry circuit models - gold over nickel over brass: 0.4 VA max. at 20 V max. 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. 20 milliohms max. at 3 VDC, 0.1 Amp. Greater than 200,000 megohms between terminals & case ground. Greater than 1500 VAC for 1 minute between terminals & case ground. 60,000 cycles min. at full load. -30°C to +85°C .035" (0.9mm) approx. Single pole: 290 ± 75 grams    Double pole: 550 ± 75 grams
<b>Initial contact resistance:</b>	
<b>Insulation resistance:</b>	
<b>Dielectric strength:</b>	
<b>Electrical life (resistive loads):</b>	
<b>Operating temperature range:</b>	
<b>Total travel:</b>	
<b>Actuation force:</b>	

Also see economy ratings  
N & T in options section.

## MATERIALS

<b>Contacts:</b>	Coin silver for power, UL & CSA models. Gold over nickel over brass for dry circuit models.
<b>Actuator:</b>	Glass filled polyester, color white
<b>Bushing:</b>	Nickel plated brass
<b>Strap:</b>	Stainless steel
<b>Case:</b>	Melamine phenolic, color red
<b>Terminal seal:</b>	Epoxy (standard)
<b>Support bracket:</b>	Brass or steel, tin plated
<b>Spring mounting bracket:</b>	Stainless steel
<b>Bezel &amp; cap:</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 with '/UL' added at end of model no. are supplied with recognition marked. Switches ordered with '/CSA' added at end of model no. are supplied with recognition marked.



## ABOUT THIS SERIES

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

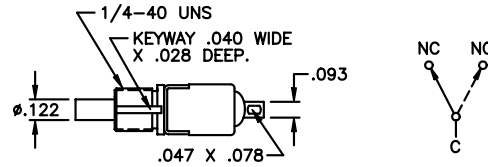
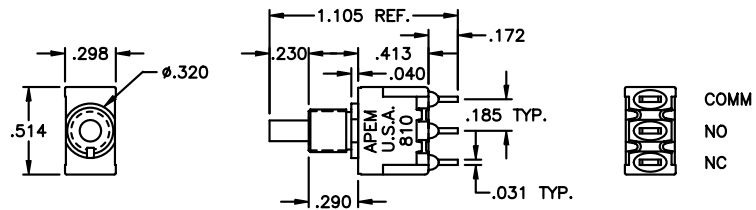
- Completely specified switch models
- 'build your own switch' order format
- Miscellaneous
- Option drawings & information
- Panel cut-outs

# 800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

## Solder lug terminals - panel mounting

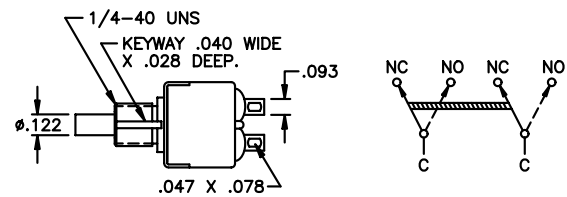
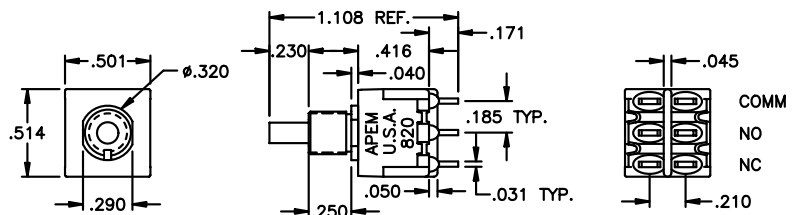
### SINGLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.
810KMZQ	810KMZQ/UL



### DOUBLE POLE

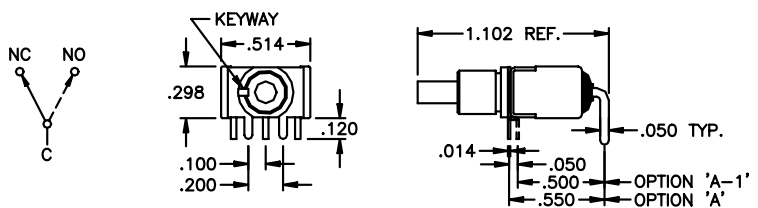
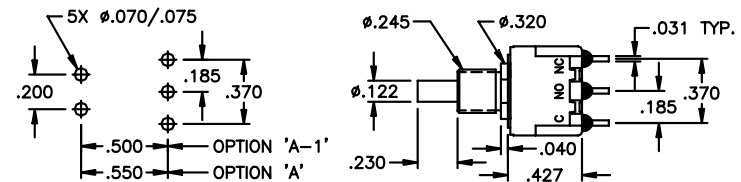
POWER CKT. MODEL NO.	UL MODEL NO.
820KMZQ	820KMZQ/UL



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

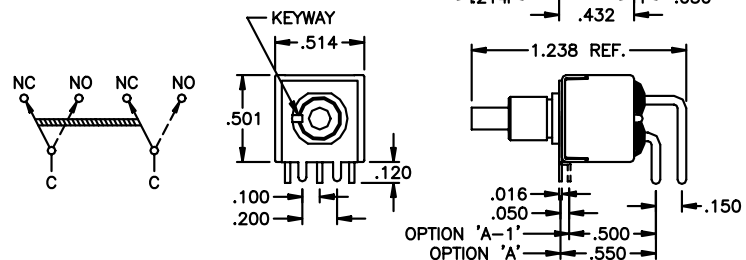
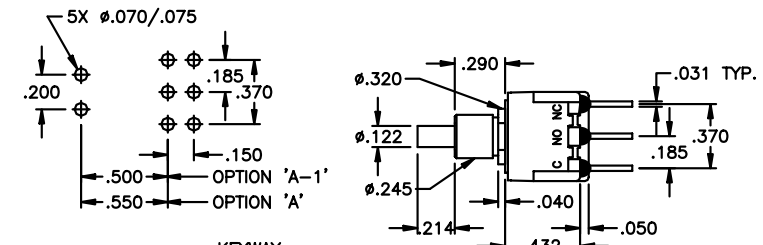
### SINGLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.
810KSAB	810KSAQ/UL
810KSA-1B	810KSA-1Q/UL



### DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.
820KSAB	820KSAQ/UL
820KSA-1B	820KSA-1Q/UL



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

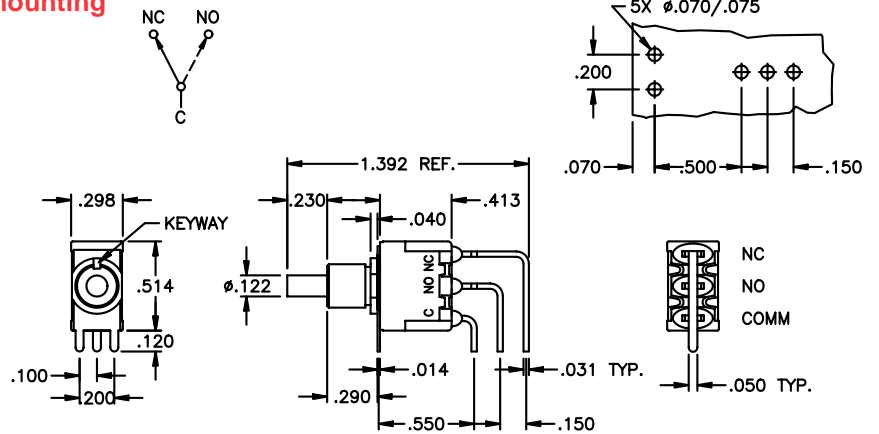
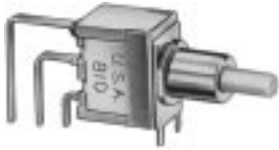


# 800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

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

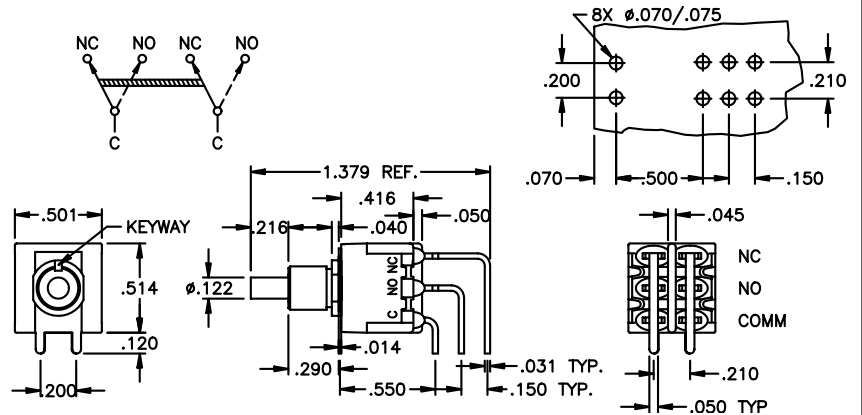
### SINGLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.
810KSVB	810KSVQ/UL
810KSV-1B	810KSV-1Q/UL
810KSV-2B	810KSV-2Q/UL



### DOUBLE POLE

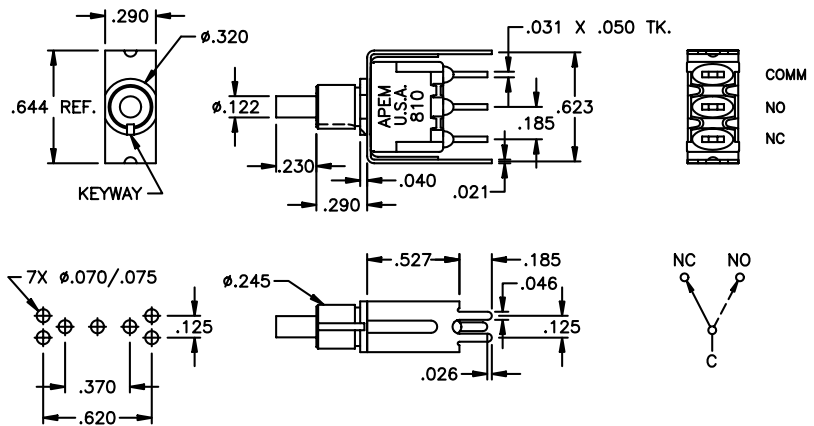
DRY CKT. MODEL NO.	UL MODEL NO.
820KSVB	820KSVQ/UL
820KSV-1B	820KSV-1Q/UL
820KSV-2B	820KSV-2 Q/UL



## Straight p.c. terminals with bracket

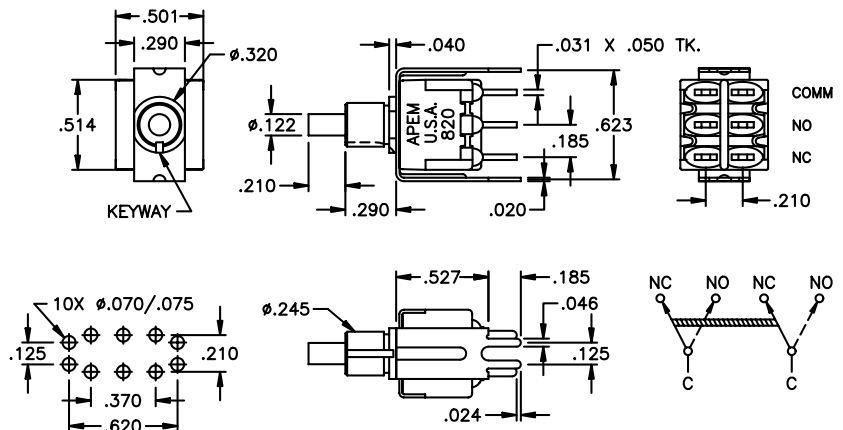
### SINGLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.
810KSV30B	810KSV30Q/UL
810KSV40B	810KSV40Q/UL



### DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.
820KSV30B	820KSV30Q/UL
820KSV40B	820KSV40Q/UL



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C



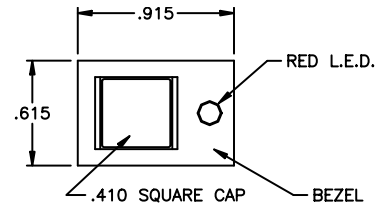
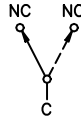
# 800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

## Solder lug terminals - snap-in bezel with outboard LED

### SINGLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1ZQJ6122	810K2M1ZQJ6122/UL	.100
810K1M1ZQJ6122	810K1M1ZQJ6122/UL	.010

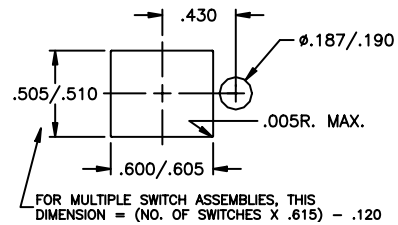
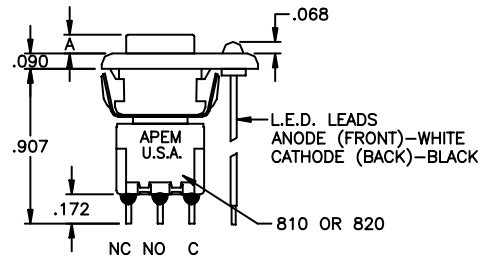
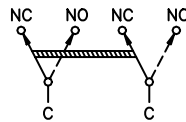
Models listed above have black bezel and cap.



### DOUBLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1ZQJ6122	820K2M1ZQJ6122/UL	.100
820K1M1ZQJ6122	820K1M1ZQJ6122/UL	.010

Models listed above have black bezel and cap.

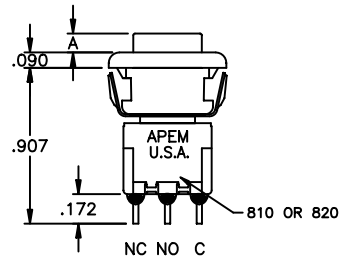
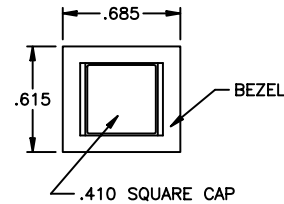
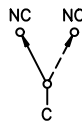


## Solder lug terminals - snap-in bezel

### SINGLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1ZQJ8122	810K2M1ZQJ8122/UL	.100
810K1M1ZQJ8122	810K1M1ZQJ8122/UL	.010

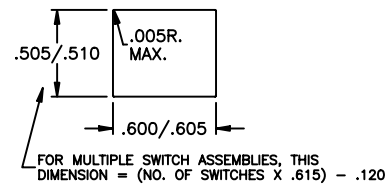
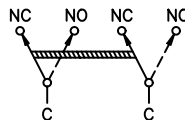
Models listed above have black bezel and cap.



### DOUBLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1ZQJ8122	820K2M1ZQJ8122/UL	.100
820K1M1ZQJ8122	820K1M1ZQJ8122/UL	.010

Models listed above have black bezel and cap.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

## Straight p.c. terminals - p.c. mounting bezel

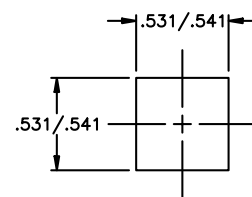
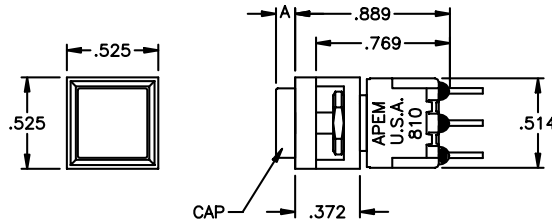
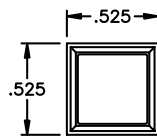
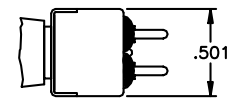
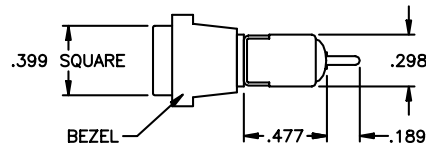
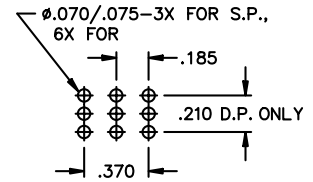
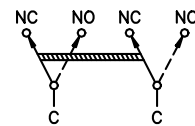
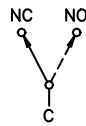
### SINGLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1CBJ8422	810K2M1CQJ8422/UL	.100
810K1M1CBJ8422	810K1M1CQJ8422/UL	.010

### DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1CBJ8422	820K2M1CQJ8422/UL	.100
820K1M1CBJ8422	820K1M1CQJ8422/UL	.010

Models listed above have black bezel and cap.



## Straight p.c. terminals w/bracket - p.c. mounting bezel

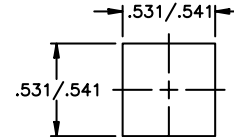
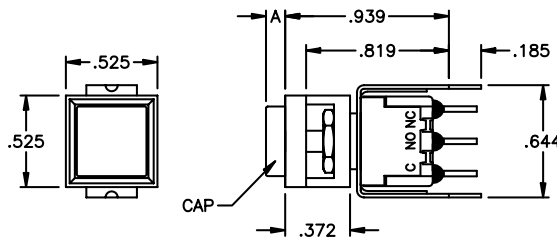
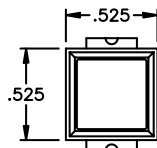
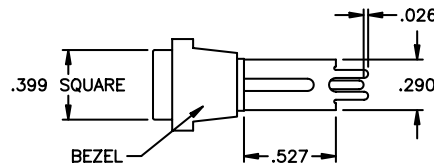
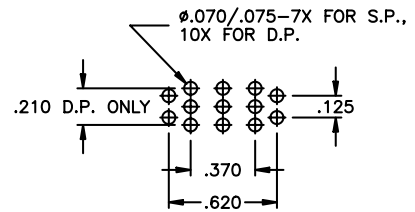
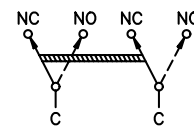
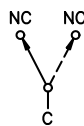
### SINGLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1V30BJ8422	810K2M1V30QJ8422/UL	.100
810K1M1V30BJ8422	810K1M1V30QJ8422/UL	.010

### DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1V30BJ8422	820K2M1V30QJ8422/UL	.100
820K1M1V30BJ8422	820K1M1V30QJ8422/UL	.010

Models listed above have black bezel and cap.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

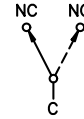
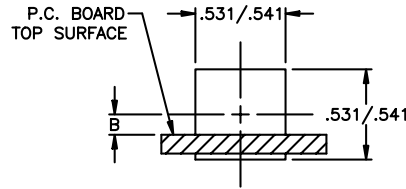
C

# 800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

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

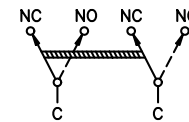
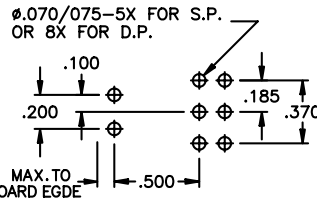
### SINGLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1ABJ8422	810K2M1AQJ8422/UL	.100
810K1M1ABJ8422	810K1M1AQJ8422/UL	.010

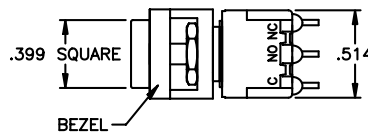


### DOUBLE POLE

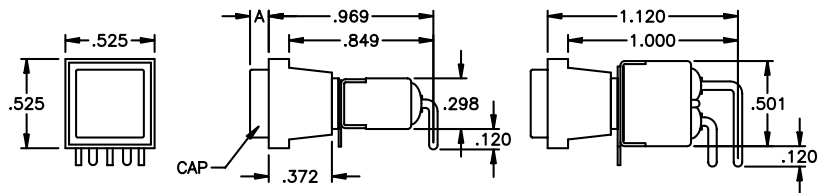
DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1ABJ8422	820K2M1AQJ8422/UL	.100
820K1M1ABJ8422	820K1M1AQJ8422/UL	.010



Models listed above have black bezel and cap.



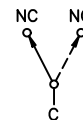
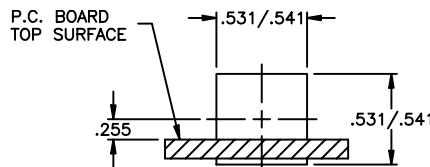
Poles	Option	Dim. B	Dim. C
SP	A	.148	.045 max.
SP	A-1	.164	.095 max.
DP	A	.250	.300 max.
DP	A-1	.266	.350 max.



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

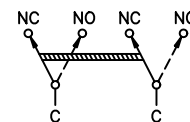
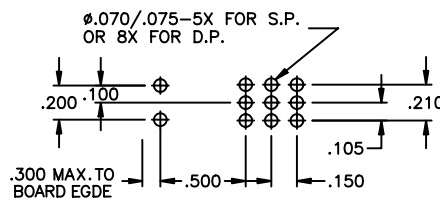
### SINGLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1V-1BJ8422	810K2M1V-1QJ8422/UL	.100
810K1M1V-1BJ8422	810K1M1V-1QJ8422/UL	.010

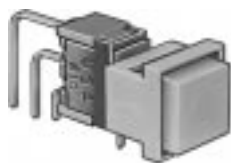
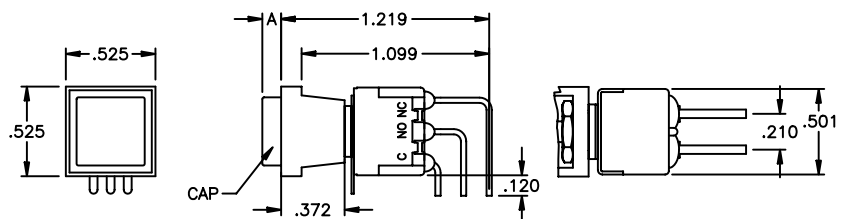
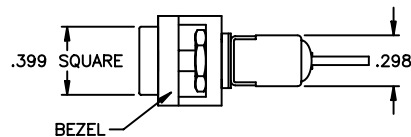


### DOUBLE POLE

DRY CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1V-1BJ8422	820K2M1V-1QJ8422/UL	.100
820K1M1V-1BJ8422	820K1M1V-1QJ8422/UL	.010



Models listed above have black bezel and cap.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

## Snap-in bezel for round hole mounting

Self-keying against rotation

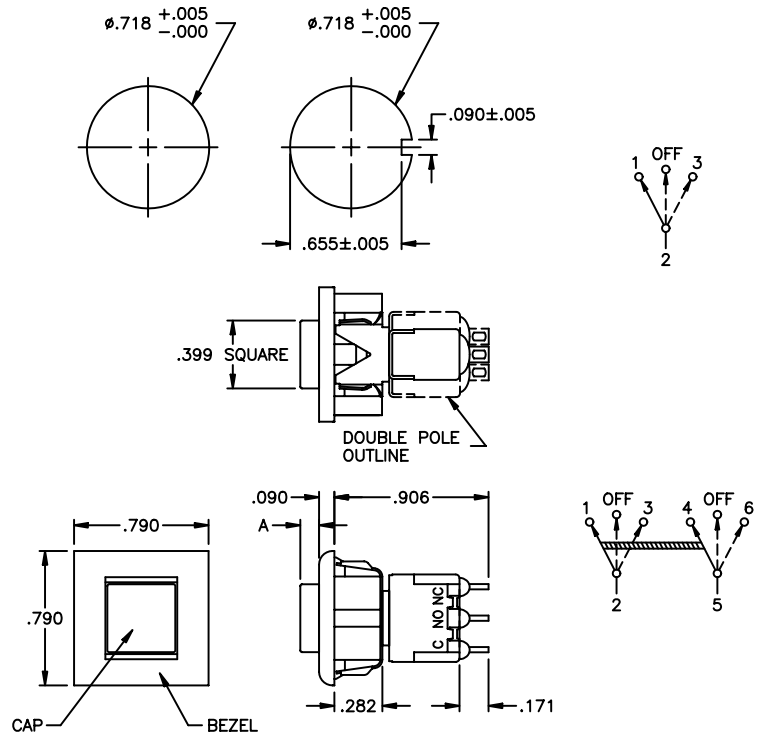
### SINGLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
810K2M1ZQJ9622	810K2M1ZQJ9622/UL	.100
810K1M1ZQJ9622	810K1M1ZQJ9622/UL	.010

### DOUBLE POLE

POWER CKT. MODEL NO.	UL MODEL NO.	DIM. A
820K2M1ZQJ9622	820K2M1ZQJ9622/UL	.100
820K1M1ZQJ9622	820K1M1ZQJ9622/UL	.010

Models listed above have black bezel and cap.



**Additional ordering information:** Commonly ordered models are shown above and 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 with brief description - see option dwgs. & info. following.

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

### Model Structure:

Series	Actuators	Bushings	Terminations	Contact materials
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Single pole: 8 1 0	K Standard K 1 Short	M Standard 1/4" thd'd. M 1 Short 1/4" thd'd.	Z Solder lug C Printed circuit W Wirewrap	B Gold Q Coin silver G Gold over coin silver
Double pole: 8 2 0	K 2 Medium	D 1/4" thd'd. w/'D' flat S Non-threaded	W 1 Lg. wirewrap W 3 Sht. wirewrap X Extra lg. wirewrap	N Economy gold T Economy silver

Notes:  
When bezel is specified and flush cap is desired, specify K1 actuator and M1 bushing.  
When bezel is specified and raised cap is desired, specify K2 actuator and M1 bushing.  
Epoxy terminal seal is standard on 800 Series.

### Options:

Bezel& cap	Bezel color	Cap color	Approvals
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(NONE) J 6 1 Snap-in w/LED J 8 1 Snap-in no LED J 8 4 P.C. style J 9 6 Snap-in (round hole)	(NONE) 2 Black 6 Red 8 White	(NONE) 2 Black 6 Red 8 White	(NONE) / U L / C S A

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

Horiz. right angle p.c. terminals:  
A  
A - 1  
Vertical right angle p.c. terminals:  
V  
V - 1  
V - 2  
Straight p.c. terminals w/brkt.:  
V 3 0 or V 3 1  
V 4 0 or V 4 1  
V 7 0  
V 8 0  
V 7 1  
V 8 1

Example of completely specified model number:  
**820K1M1ZQJ8126/UL/CSA**

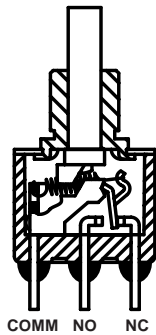
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

# 800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

## MISCELLANEOUS

**TYPICAL  
SWITCH  
CROSS  
SECTION**



### HARDWARE SUPPLIED

(See Hardware section of catalog)

Switches with M option bushings are supplied with (2) A112 Hex Nuts, (1) A115 Lockwasher and (1) A107 Anti-rotate Ring.

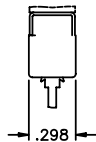
Switches with D option bushings are supplied with (2) A112 Hex Nuts and (1) A115 Lockwasher.

Switches with M1 option bushings are supplied with (1) A112 Hex Nut and (1) A115 Lockwasher.

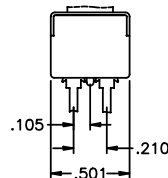
Note: Switches with non-threaded bushings or bezels supplied without hardware.

**SWITCH BODY  
SIZES WITH  
TERMINAL  
LOCATION  
DIMENSIONS**

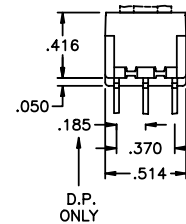
SIDE VIEW  
SINGLE POLE



SIDE VIEW  
DOUBLE POLE



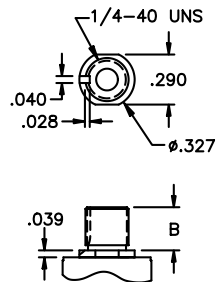
FRONT VIEW  
SINGLE AND  
DOUBLE POLE



## BUSHING OPTIONS

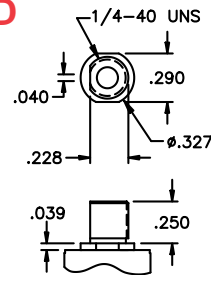
**NOTE:  
BUSHING M AND  
ACTUATOR K  
ARE STANDARD.**

### M & M1



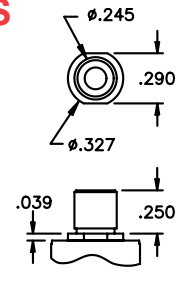
THREADED

### D



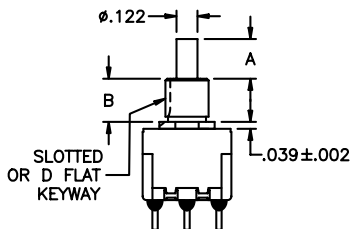
THREADED

### S



NON-THREADED

## ACTUATOR/BUSHING OPTIONS



BUSHING OPTION	DIM. B	DIMENSION A ACTUATOR OPTION		
		K	K1	K2
M or D	.250	.230	.069	.168
S	.250	.230	.069	.168
M1	.154	.322	.165	.264

All bushings have 1/4-40 UNS-2A thread except S which is non-threaded.

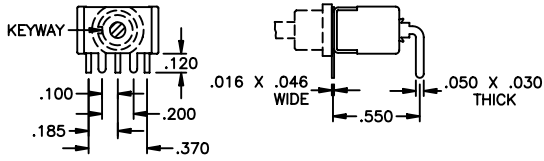
Switch caps for switches without bezels also available - see Hardware section of catalog.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

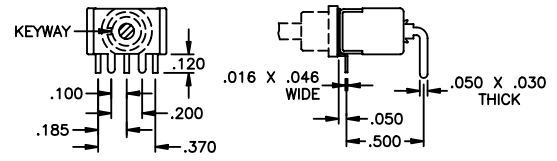
## TERMINATION OPTIONS

**A**



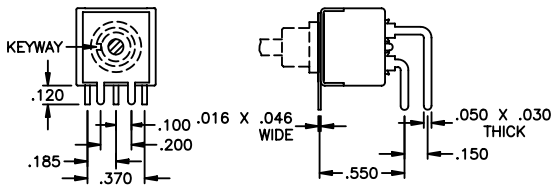
SINGLE POLE HORIZONTAL P.C. MOUNTING

**A-1**



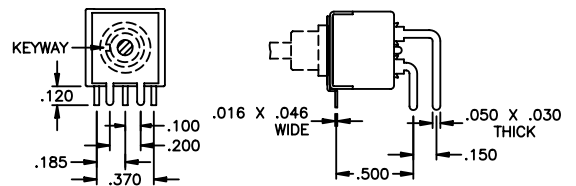
SINGLE POLE HORIZONTAL P.C. MOUNTING

**A**



DOUBLE POLE HORIZONTAL P.C. MOUNTING

**A-1**



DOUBLE POLE HORIZONTAL P.C. MOUNTING

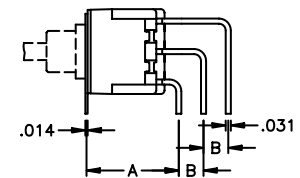
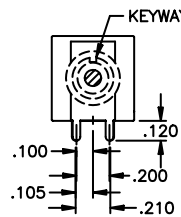
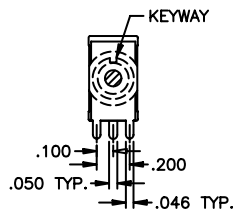
## V, V-1 & V-2

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

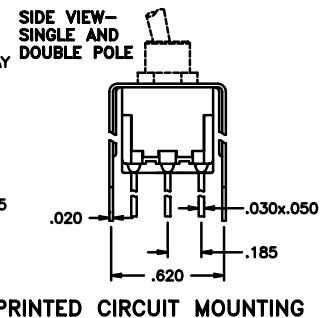
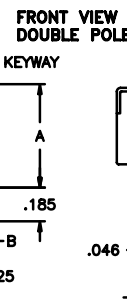
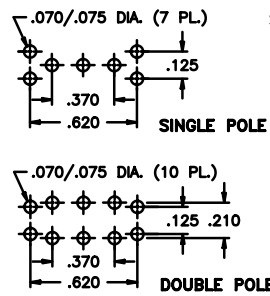


VERTICAL P.C. MOUNTING

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

PANEL LAYOUT V30, V31, V40 & V41

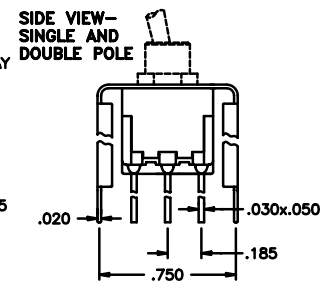
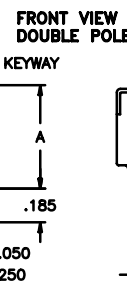
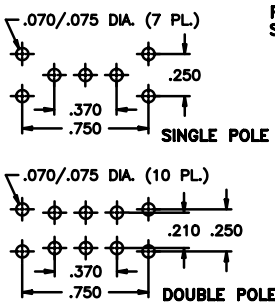
Option	Dim. A	Dim. B
V30-V31	.527	.024
V40-V41	.647	.048



PRINTED CIRCUIT MOUNTING

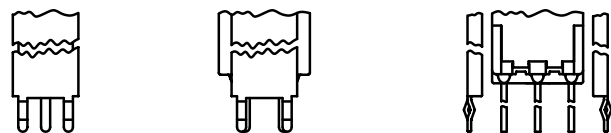
PANEL LAYOUT V70, V71, V80 & V81

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



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.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

# 800 SERIES - SNAP-ACTING MINIATURE PUSHBUTTON SWITCHES

## TERMINATION OPTIONS (CONT'D.)

Z	C	W	W1	W3	X
SOLDER LUG	PRINTED CIRCUIT	WIREWRAp	LONG WIREWRAp	SHORT WIREWRAp	EXTRA LG. WIREWRAp

## CONTACT MATERIAL OPTIONS

<b>B</b>	Dry circuit - gold over nickel over brass. RATING: 0.4 Volt-Amps (VA) max. at 20 V max. ELECTRIC LIFE: 60,000 cycles minimum. MECHANICAL LIFE: 500,000 cycles minimum.	
<b>Q</b>	Power circuit - coin silver. RATING: 6 Amps at 125 VAC, 3 Amps at 250 VAC or 7 Amps at 30 VDC (resistive loads). ELECTRIC LIFE: 60,000 cycles minimum at full load.	
<b>G</b>	Dry circuit or power circuit - gold over nickel over coin silver. 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. RATING: 0.4 Volt-Amps (VA) max. at 20 V max. ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.	
<b>T</b>	Power circuit - Silver plate over brass. RATING: 1 Amp at 125 VAC or 0.5 Amps at 250 VAC (resistive loads). 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 RATING: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor). Underwriter Laboratories file no. E66367. Note - applicable only to terminations with coin silver contacts (Q or G options).
<b>CSA</b>	For power circuits - coin silver RATING: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor). Canadian Standards Association file no. LR54592-1. Note - applicable only to terminations with coin silver contacts (Q or G options) as CSA recognizes switches for power applications only. Note- Double pole switches with solder lug terminals are not CSA recognized .

## PANEL CUT-OUTS

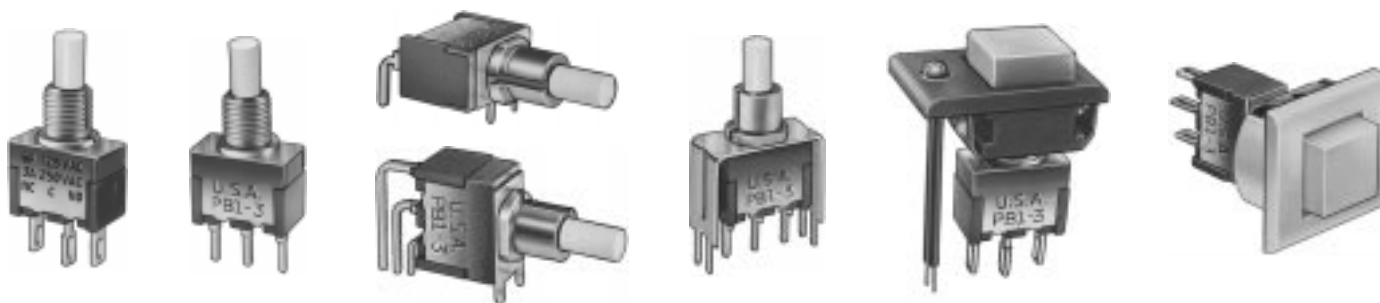
### Cut-outs that accept all 1/4-40 threaded bushings:

Without keying	With A107 anti-rotate ring	With A158 anti-rotate ring	With D bushing	With slotted keyway bushings	Accepts all 1/4" non-threaded bushings

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



# PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES



## FEATURES

- Dry circuit through power ratings .
- Rugged construction SPDT momentary 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. (B) dry circuit models - gold over nickel over brass: 0.4 VA max. at 20 V max. 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>	5 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. at full load.
<b>Operating temperature range:</b>	-30°C to +85°C
<b>Total travel &amp; operating force:</b>	.065" (1.6mm) & 19 oz. (approximate values ) .

## MATERIALS

<b>Contacts:</b>	Coin silver for power, UL & CSA models. Gold over nickel over brass for dry circuit models.
<b>Actuator:</b>	Glass filled polyester, color white
<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; cap:</b>	Nylon. Available in black, red or 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 with '/UL' added at end of model no. are supplied with recognition marked. Switches ordered with '/CSA' added at end of model no. are supplied with recognition marked.

## ABOUT THIS SERIES

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

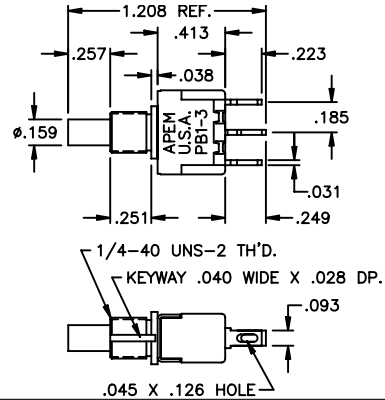
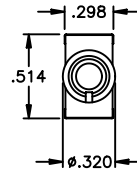
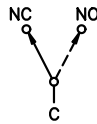
- Completely specified switch models
- 'build your own switch' order format
- Miscellaneous
- Option drawings & information
- Panel cut-outs & miscellaneous

# PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

## Solder lug terminals - panel mounting



POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1ZQ	PB1-3P2Y1ZB

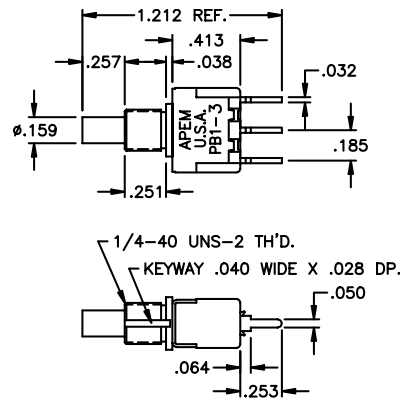
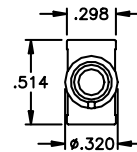
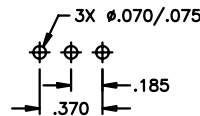
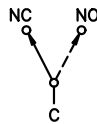


C

## P.C. or wirewrap terminals - panel or p.c. mounting



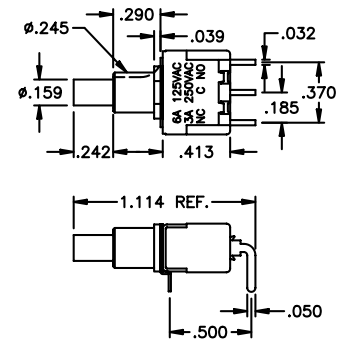
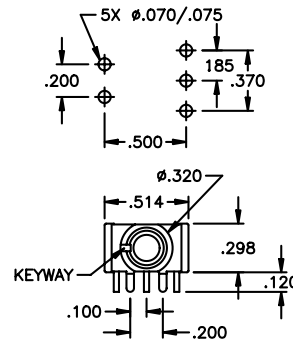
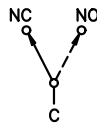
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1CQ	PB1-3P2Y1CB



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



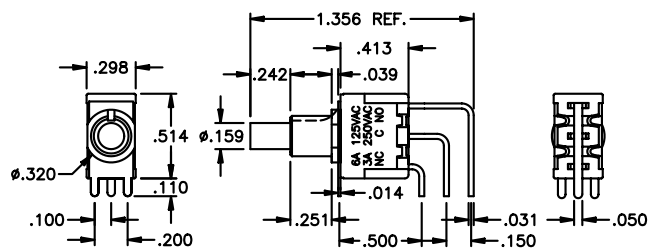
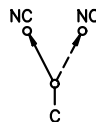
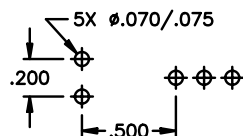
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y2A-1Q	PB1-3P2Y2A-1B



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



POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y2V-1Q	PB1-3P2Y2V-1B



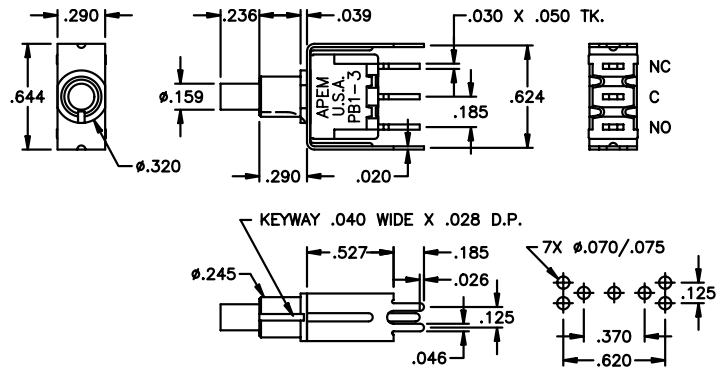
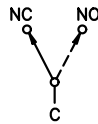
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

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



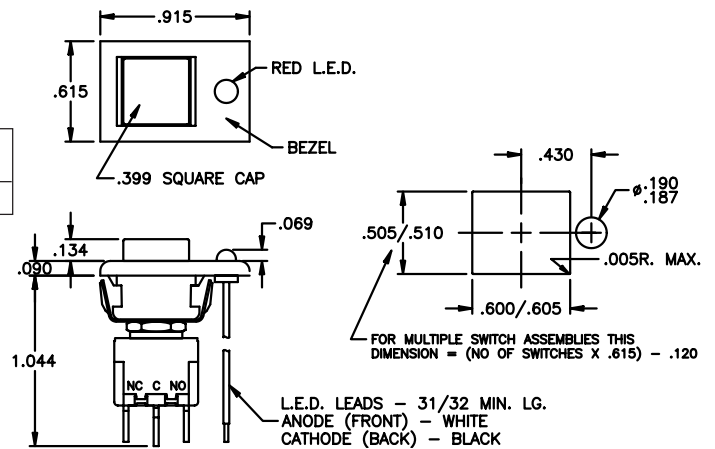
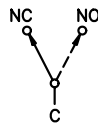
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y2V30Q	PB1-3P2Y2V30B



## Solder lug terminals - snap-in bezel with LED



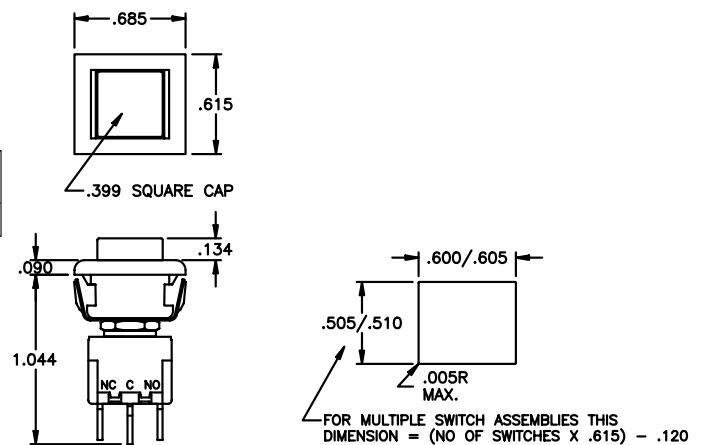
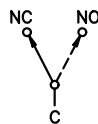
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1ZQJ6168	PB1-3P2Y1ZBJ6168



## Solder lug terminals - snap-in bezel



POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1ZQJ8182	PB1-3P2Y1ZBJ8182

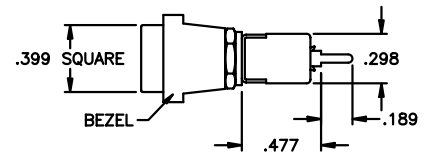
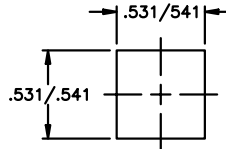
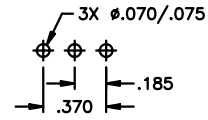
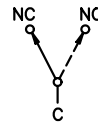


SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

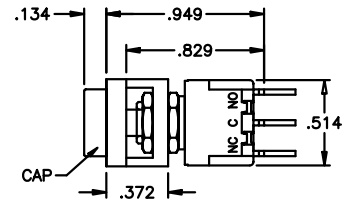
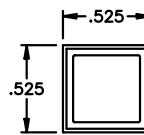
C

# PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

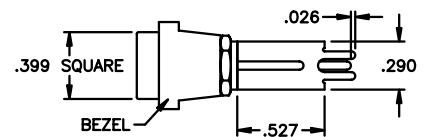
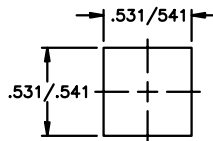
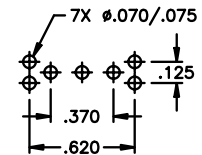
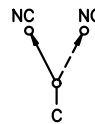
## Straight p.c. terminals - p.c. mounting bezel



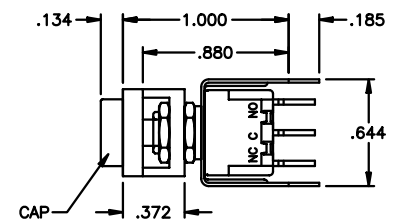
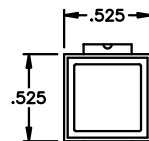
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1CQJ8488	PB1-3P2Y1CBJ8488



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



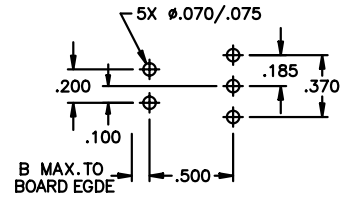
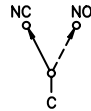
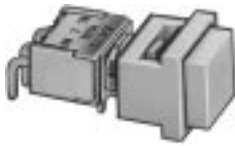
POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1V30QJ8488	PB1-3P2Y1V30BJ8488



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

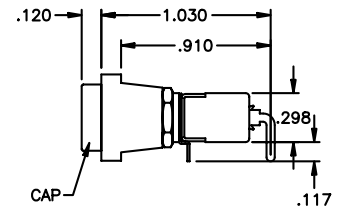
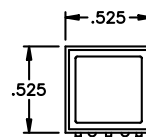
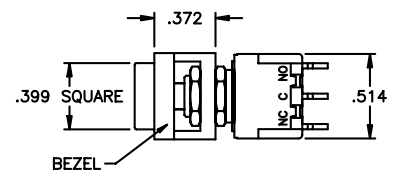
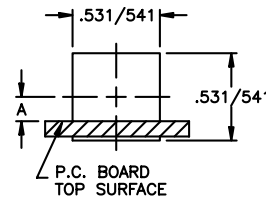
# PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

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

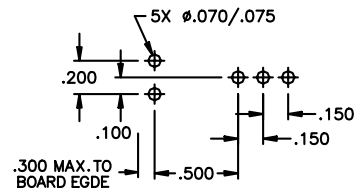
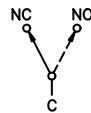
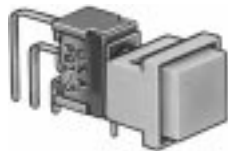


POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1A-1QJ8488	PB1-3P2Y1A-1BJ8488

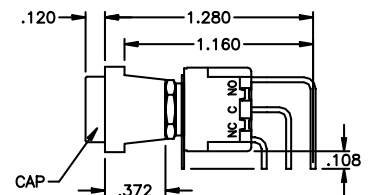
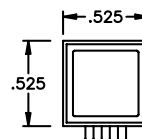
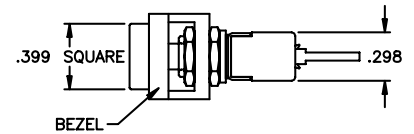
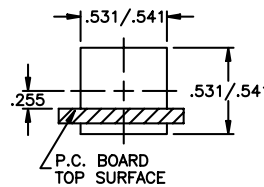
Option	Dim. A	Dim. B
A	.148	.045 max.
A-1	.164	.095 max.



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



POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1V-1QJ8488	PB1-3P2Y1V-1BJ8488



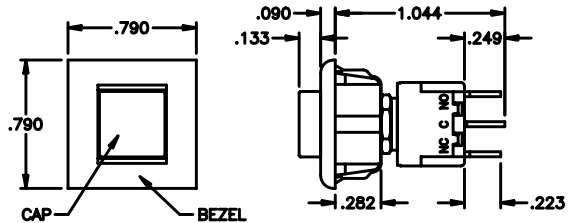
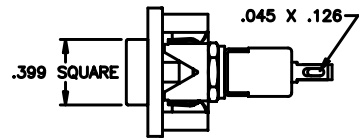
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

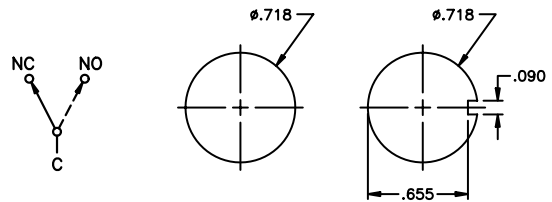
# PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

## Solder lug terminals - snap-in bezel for round hole mounting

Self-keying against rotation



POWER CKT. MODEL NO.	DRY CKT. MODEL NO.
PB1-3P2Y1ZQJ9688	PB1-3P2Y1ZBJ9688



**Additional ordering information:** Commonly ordered models are shown above and 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 with brief description - see option dwgs. & info. following.

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

### Model Structure:



Note:  
When bezel is specified, specify P2 actuator and Y1 bushing.

P Long  
P 2 Short  
(standard)

Y 1/4" thd'd.  
Y 1 Short 1/4" thd'd.  
(standard)  
D 1/4" thd'd. w/'D' flat  
Y 2 Non-threaded

Z Solder lug  
C Printed circuit  
W Wirewrap  
W 1 Lg. wirewrap  
W 3 Sht. wirewrap  
X Extra lg. wirewrap  
Horiz. right angle p.c.  
terminals:

B Gold  
Q Coin silver  
G Gold over  
coin silver  
N Economy  
gold  
T Economy  
silver

### Options:



(NONE)  
J 6 1 Snap-in w/LED  
J 8 1 Snap-in no LED  
J 8 4 P.C. style  
J 9 6 Snap-in (round  
hole)

(NONE)  
2 Black  
6 Red  
8 White

(NONE)  
2 Black  
6 Red  
8 White

(NONE)  
/ U L  
/ C S A

A  
A - 1  
Vertical right angle  
p.c. terminals:  
V  
V - 1  
V - 2  
Straight p.c. terminals w/brkt.:  
V 3 0 or V 4 1  
V 4 0 or V 4 1  
V 7 0  
V 8 0  
V 7 1  
V 8 1

Example of completely specified  
model number:  
**PB1-3P2Y1ZQJ9622/UL/CSA**

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

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

## MISCELLANEOUS

### HARDWARE SUPPLIED

(See Hardware section of catalog)

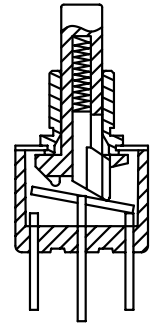
Switches with Y option bushings are supplied with (2) A112 Hex Nuts, (1) A115 Lockwasher and (1) A107 Anti-rotate Ring.

Switches with D option bushings are supplied with (2) A112 Hex Nuts and (1) A115 Lockwasher.

Switches with Y1 option bushings are supplied with (1) A112 Hex Nut and (1) A115 Lockwasher.

Note: Switches with non-threaded bushings or bezels supplied without hardware.

TYPICAL  
SWITCH  
CROSS  
SECTION

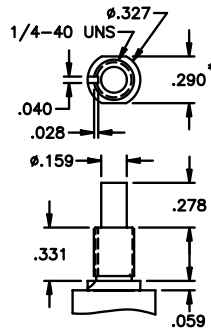


## ACTUATOR/BUSHING OPTIONS

Drawings reflect allowable actuator/bushing combinations.

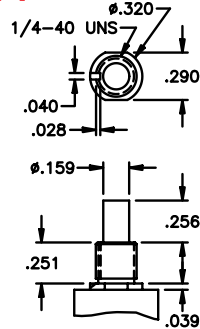
Note for drawings P2Y1 & P2Y2: Asterisk indicates .290 flats are supplied with options A, V, V30, V40, V70, V71, V80 & V81. For other options, .320 Dia. with no flats may be supplied

### PY



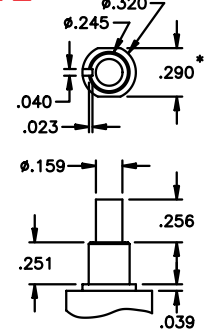
THREADED

### P2Y1



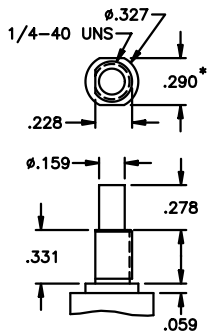
THREADED

### P2Y2



NON-THREADED

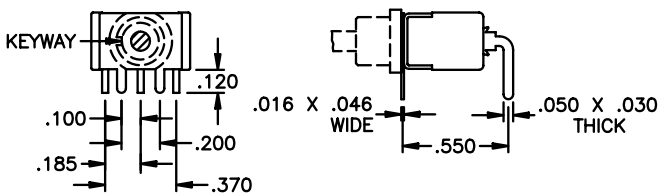
### PD



THREADED

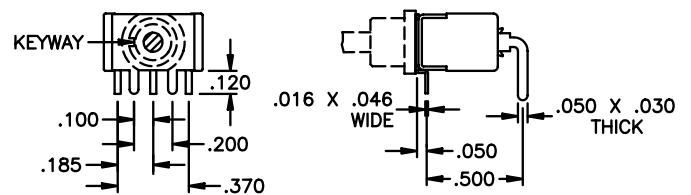
## TERMINATION OPTIONS

### A



HORIZONTAL P.C. MOUNTING

### A-1



HORIZONTAL P.C. MOUNTING

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C

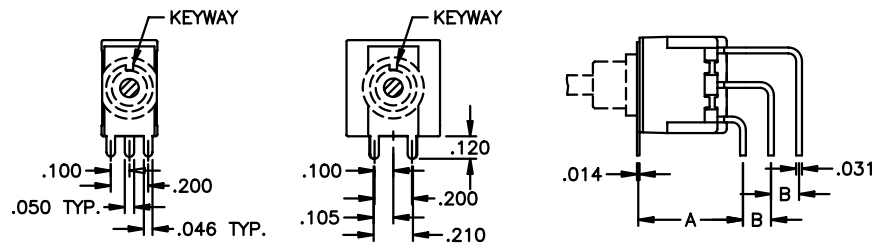


# PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

## TERMINATION OPTIONS (CONT'D.)

### V, V-1 & V-2

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

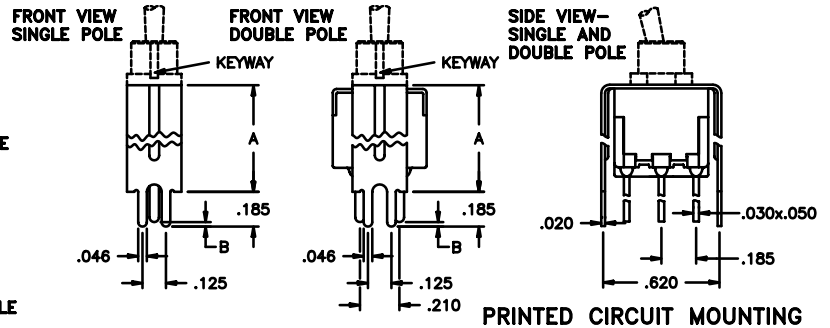
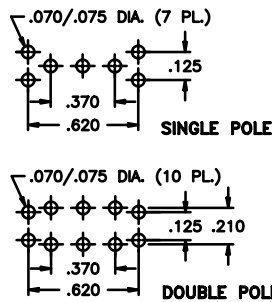


### VERTICAL P.C. MOUNTING

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

#### PANEL LAYOUT V30, V31, V40 & V41

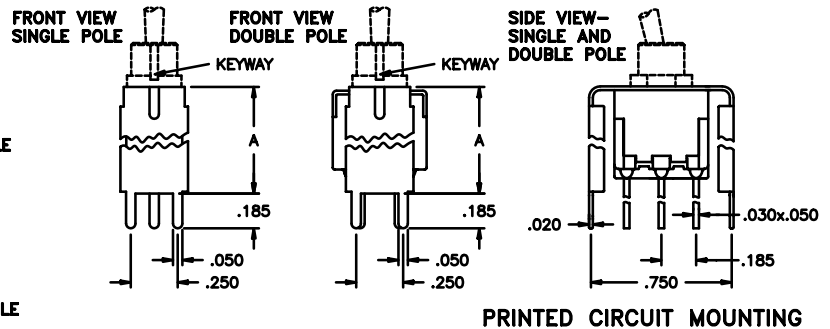
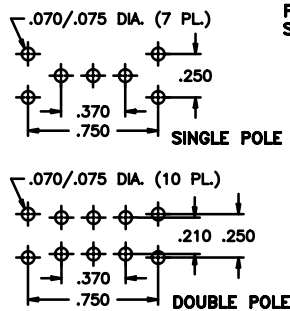
Option	Dim. A	Dim. B
V30-V31	.527	.024
V40-V41	.647	.048



### PRINTED CIRCUIT MOUNTING

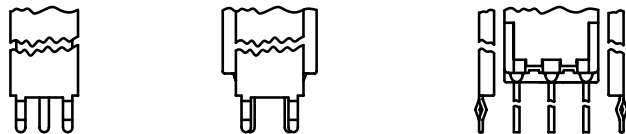
#### PANEL LAYOUT V70, V71, V80 & V81

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

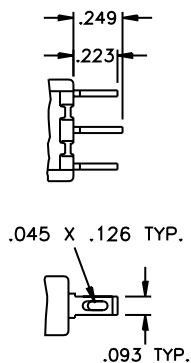


### PRINTED CIRCUIT MOUNTING

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.

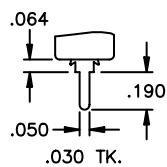


### Z



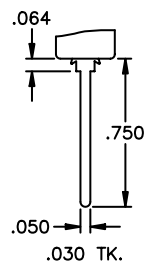
### SOLDER LUG

### C



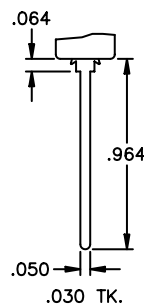
### PRINTED CIRCUIT

### W



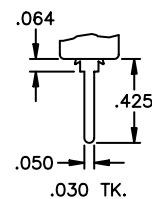
### WIREWRAP

### W1



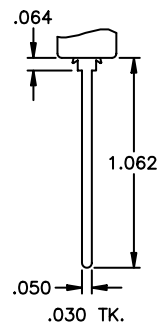
### LONG WIREWRAP

### W3



### SHORT WIREWRAP

### X



### EXTRA LG. WIREWRAP

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# PB SERIES - MINIATURE MOMENTARY PUSHBUTTON SWITCHES

## CONTACT MATERIAL OPTIONS

- B** Dry circuit - gold over nickel over brass.  
 RATING: 0.4 Volt-Amps (VA) max. at 20 V max.  
 ELECTRIC LIFE: 60,000 cycles minimum. MECHANICAL LIFE: 500,000 cycles minimum.
- Q** Power circuit - coin silver.  
 RATING: 6 Amps at 125 VAC, 3 Amps at 250 VAC or 7 Amps at 30 VDC (resistive loads).  
 ELECTRIC LIFE: 60,000 cycles minimum at full load.
- G** Dry circuit or power circuit - gold over nickel over coin silver.  
 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.
- N** Dry circuit - gold over nickel over brass. Note- less gold than B option.  
 RATING: 0.4 Volt-Amps (VA) max. at 20 V max.  
 ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.
- T** Power circuit - Silver plate over brass.  
 RATING: 1 Amp at 125 VAC or 0.5 Amps at 250 VAC (resistive loads).  
 ELECTRIC LIFE: 10,000 cycles min. at 13 cycles per minute.

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

## UL & CSA OPTIONS

- UL** For power circuits - coin silver  
 RATING: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor).  
 Underwriter Laboratories file no. E66367. Note - applicable only to terminations with coin silver contacts (Q or G options).
- CSA** For power circuits - coin silver  
 RATING: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor).  
 Canadian Standards Association file no. LR54592-1. Note - applicable only to terminations with coin silver contacts (Q or G options) as CSA recognizes switches for power applications only.

## EPOXY SEALING OPTION

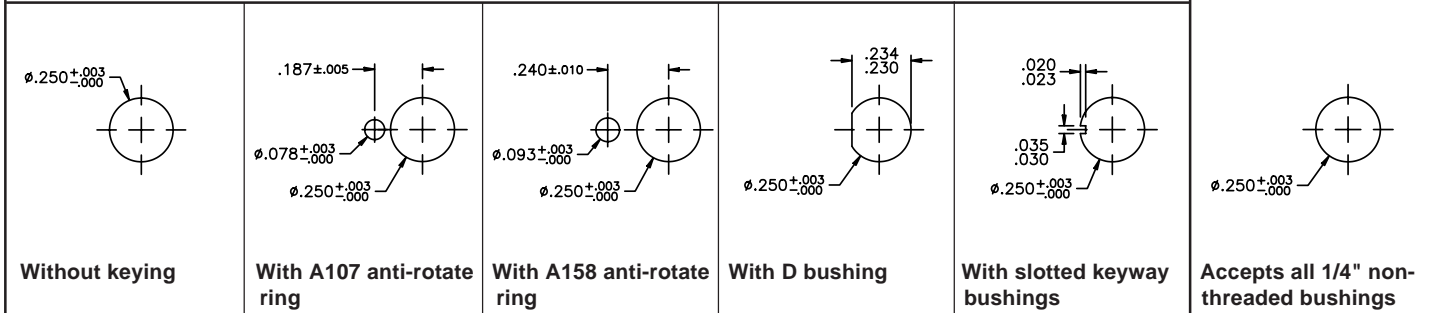
- E** Space between terminals and case hole is completely epoxy sealed to prevent flux and contaminant entry.

## REVERSE ACTION OPTION

- /R** To reverse the **NO** and **NC** terminals, add **/R** to the switch model number.

## PANEL CUT-OUTS

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



## MISCELLANEOUS

- QUICK-CONNECT RECEPTACLES** that are compatible with solder lug or p.c. terminals are commercially available. Consult factory.
- FRONT PANEL SEAL:** Silicone rubber boots for front panel sealing of the switch against high pressure water or other contaminants are available. See Waterproof Switch Sealing Boots section in catalog.
- SWITCH CAPS** for switches without bezels also available - see Hardware section of catalog

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

# 13000 SERIES - PROFESSIONAL PUSHBUTTON SWITCHES



## FEATURES

- Quick break momentary action.
- SPDT & DPDT models with 1/4" threaded bushing (also see optional 15/32" bushing).
- Models for panel and p.c. mounting.
- Bright chrome or matte black finish on bushing, actuator & 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. (300 mA 30 VDC max. to prevent damage to gold plating.) Gold plated brass; 100 mA at 30 V max.
<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 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. Gold plated brass: 50,000 cycles min.
<b>Low level or mechanical life:</b>	150,000 cycles min.
<b>Total Travel:</b>	.078" (2mm)
<b>Operating temperature range:</b>	-40°C to +85°C

## MATERIALS

<b>Contacts :</b>	Silver, gold plated silver or gold plated brass
<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>	1/4" threaded bushing models 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, 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:

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

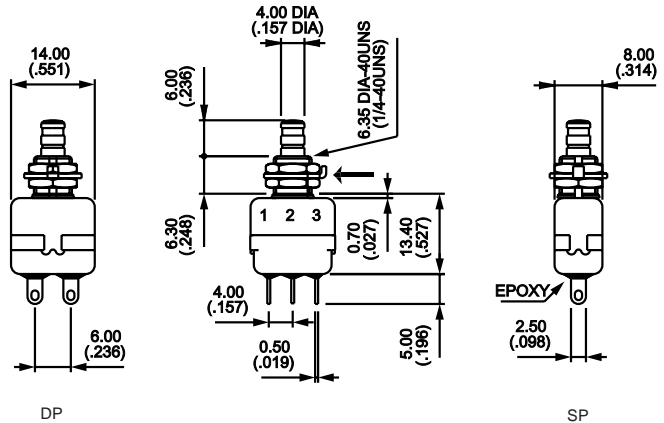
# 13000 SERIES - PROFESSIONAL PUSHBUTTON SWITCHES

## Solder lug terminals - silver contacts



SINGLE POLE		CIRCUIT	
MODEL NO.	13435A	ON	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.	13445A	ON	MOM
Handle position:			
Terms. connected:			
		1-3	1-2
		4-6	4-5

→ Keyway

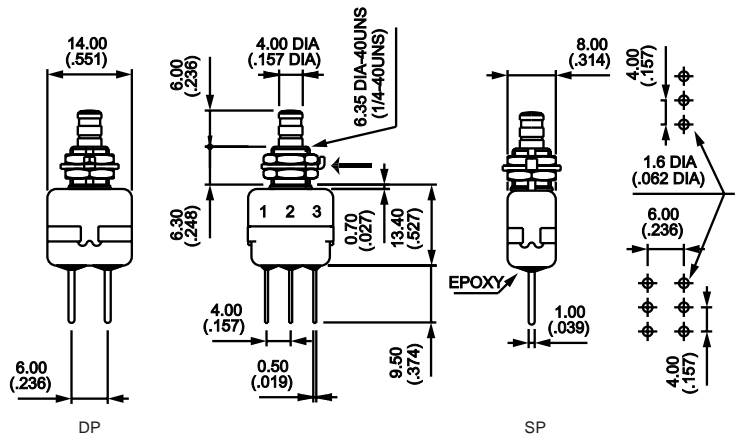


## Straight p.c. terminals - silver contacts



SINGLE POLE		CIRCUIT	
MODEL NO.	13235A	ON	MOM
DOUBLE POLE		CIRCUIT	
MODEL NO.	13245A	ON	MOM
Handle position:			
Terms. connected:			
		1-3	1-2
		4-6	4-5

→ Keyway

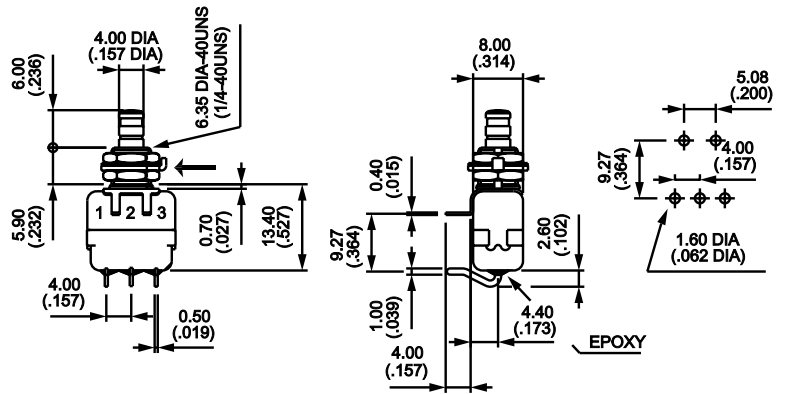


## Horizontal right angle p.c. terminals - silver contacts



SINGLE POLE		CIRCUIT	
MODEL NO.	13435WA	ON	MOM
Handle position:			
Terms. connected:			
		1-3	1-2

→ Keyway



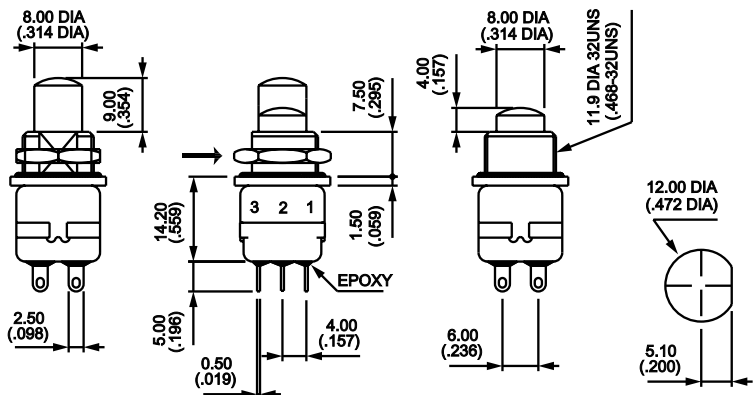
## X768 - Sealed double pole with 15/32" (11.9mm) flatted bushing



With short actuator		CIRCUIT	
MODEL NO.	13445A4X768	ON	MOM
With long actuator		CIRCUIT	
MODEL NO.	13445A9X768	ON	MOM
Handle position:			
Terms. connected:			
		1-3	1-2
		4-6	4-5

Contact and finish options available.

→ Flat



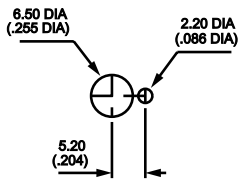
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

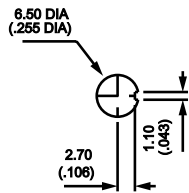
# 13000 SERIES - PROFESSIONAL PUSHBUTTON SWITCHES

## PANEL CUT-OUTS

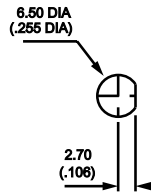
## TERMINALS



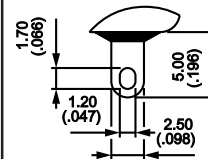
Standard



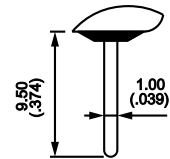
with K sealing option



with X640 sealing option  
(see Special Options)



Solder Lug



Straight p.c.

**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:

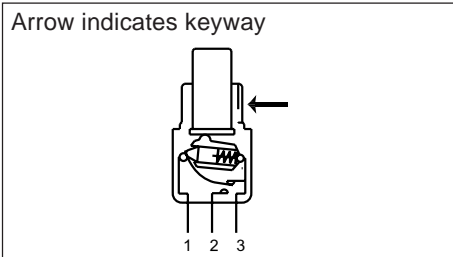
Series	Terminals & bushings	Number of poles	Electrical functions	Terminals	Contact materials
1 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2 Straight p.c. terminals, 1/4" (6.35mm) bushing 4 Solder lugs, 1/4" (6.35mm) or 15/32" (11.9mm) bushing. Right angle terminals, 1/4" (6.35mm) bushing	3 Single pole 4 Double pole	5 ON - MOM	(NONE) Solder lugs or straight p.c. W Horizontal right angle p.c.	A Silver A D 2 Gold plated silver (2 microns) C D Gold plated brass

### Options:

Actuators	Finish	Sealing	Special options	Approvals/listings
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(NONE) Standard for 1/4" bushing 4 .157" (4mm) long for 15/32" (11.9mm) bushing (X768) 9 .354" (9mm) long for 15/32" (11.9mm) bushing (X758)	(NONE) Bright chrome finish G Matte black finish on bushing, actuator & hardware.	(NONE) Epoxy sealed terminals std'd. K Front panel sealing with o-ring & gasket.	(NONE) F Tin plated terminals (p.c. only) X 7 6 8 15/32" (11.9mm) bushing + front panel sealing (Double pole only).	(NONE) C E C C (consult factory for details of approved models).  Caps available separately - see option drawings.

Example of completely specified model number:  
**13235AGKFCECC**

### SWITCH ACTION

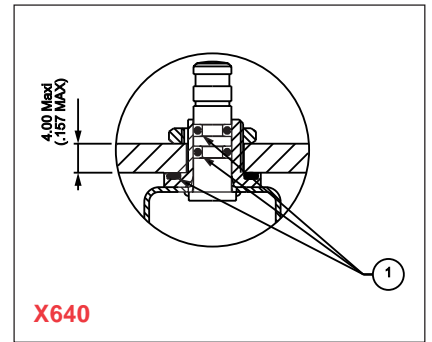
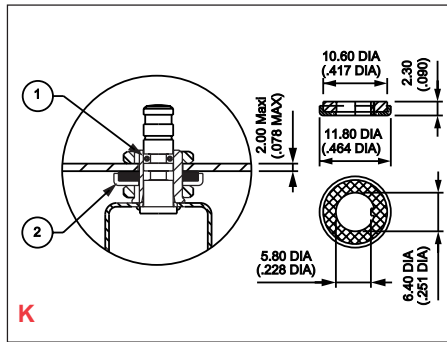


SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 13000 SERIES - PROFESSIONAL PUSHBUTTON SWITCHES

## SPECIAL & SEALING OPTIONS

- F** Tin plated terminals (for p.c. terminals only).
- K** Front panel sealing with 'o'-ring (1) & sealing gasket (2). Protects switch against water & dust. Panel seal withstands 1 bar pressure even when switch is operated.
- X640** Front panel sealing with 3 'o'-rings (1) & flatted bushing. Protects switch against water & dust. Panel seal withstands 1 bar pressure even when switch is operated. (Available with 1/4" (6.35mm) bushing only).



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

## CAPS

Note: replace last '0' in p/n with color code.

<p><b>U900</b></p>	<p><b>U1140</b></p>	<p><b>U1720</b></p>	<p><b>U480 Standard</b></p>																				
<p><b>U630</b></p>	<p><b>U2020 Square</b></p>	<p><b>U2430 Square</b></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Colors</th> </tr> </thead> <tbody> <tr><td>1</td><td>blue</td></tr> <tr><td>2</td><td>black</td></tr> <tr><td>3</td><td>green</td></tr> <tr><td>4</td><td>grey</td></tr> <tr><td>5</td><td>yellow</td></tr> <tr><td>6</td><td>red</td></tr> <tr><td>7</td><td>ivory</td></tr> <tr><td>7/1</td><td>white</td></tr> <tr><td>9</td><td>orange</td></tr> </tbody> </table>	Colors		1	blue	2	black	3	green	4	grey	5	yellow	6	red	7	ivory	7/1	white	9	orange
Colors																							
1	blue																						
2	black																						
3	green																						
4	grey																						
5	yellow																						
6	red																						
7	ivory																						
7/1	white																						
9	orange																						

## DRESS NUTS

Chrome plated For models with 1/4" (6.35mm) threaded bushings only.

<p><b>U1636</b> For cap U1140</p>	<p><b>U840</b> For cap U480</p>	<p><b>U825</b> For cap U630</p>
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# 13000X778 SERIES - HIGH PERFORMANCE PUSHBUTTON SWITCHES



## FEATURES

- Designed for high reliability environments.
- Double shell case for high mechanical strength & high electrical insulation.
- Quick break momentary action DPDT models with 15/32" (11.9mm) threaded bushing.
- Panel sealed to IP67 and fully sealed switch body.
- Highly reliable for low level or power applications.
- Matte black finish on body, 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 28 VDC. (300 mA 30 VDC max. to prevent damage to gold plating.) Minimum load - 10 mA at 50 mV, 10µA 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 2000 V rms min. - between poles and between terminals and frame
<b>Electrical life:</b>	At 2A 250VAC or 4A 28VDC - 10,000 cycles. At low level (50mV at 10mA) - 20,000 cycles
<b>Total Travel:</b>	.078" (2mm)
<b>Operating temperature range:</b>	-40°C to +85°C
<b>Environmental:</b>	Shock: 50g - 11ms (IEC 68-2-27). Vibration: 10-500 Hz - 10g (IEC68-2-6) Salt spray: 96 hrs. (IEC68-2-11). Humidity: 56 days, 93% R.H., 40°C (IEC68-2-3)

## MATERIALS

<b>Contacts :</b>	Silver inlay - gold plated over nickel barrier
<b>Actuator:</b>	Black chrome plated brass
<b>Bushing:</b>	Black chrome plated brass
<b>Case:</b>	Diallyl phthalate (DAP) with PBT external shell, epoxy sealed
<b>Hardware:</b>	Supplied with 1 Hex Nut with black finish p/n U41. 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:

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

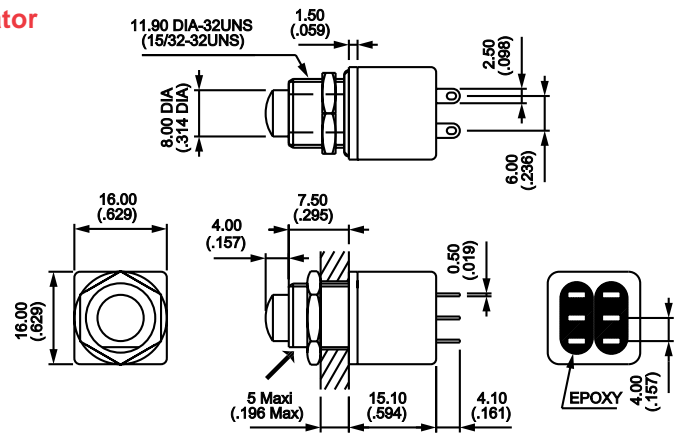


# 13000X778 SERIES - HIGH PERFORMANCE PUSHBUTTON SWITCHES

## Double pole - solder lug terminals - .157" (4mm) actuator



MODEL NO.	CIRCUIT	
134454X778	ON	MOM
Handle position:		

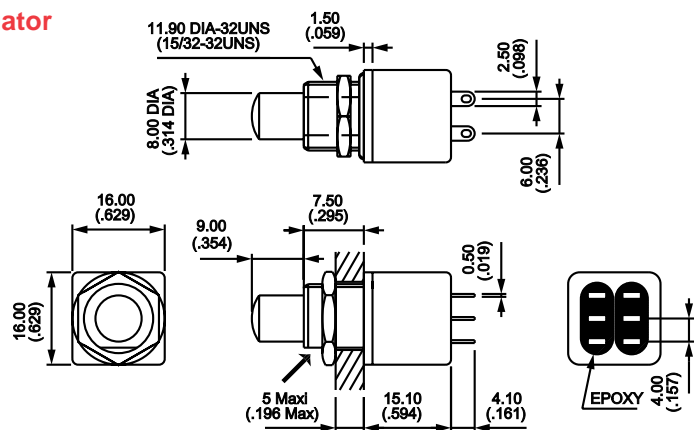


→ Flat

## Double pole - solder lug terminals - .354" (9mm) actuator



MODEL NO.	CIRCUIT	
134459X778	ON	MOM
Handle position:		

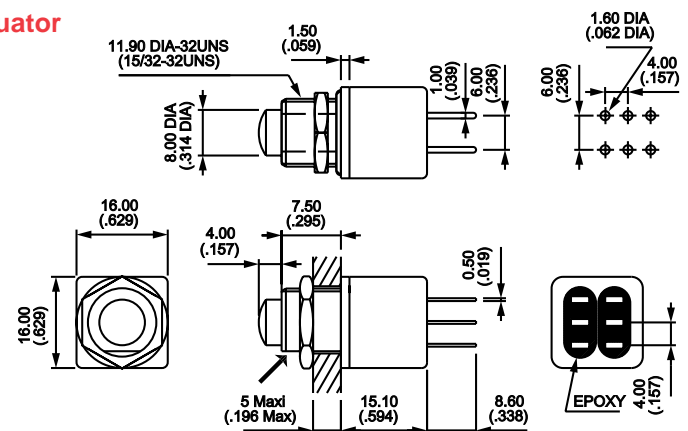


→ Flat

## Double pole - straight p.c. terminals - .157" (4mm) actuator



MODEL NO.	CIRCUIT	
132454X778	ON	MOM
Handle position:		

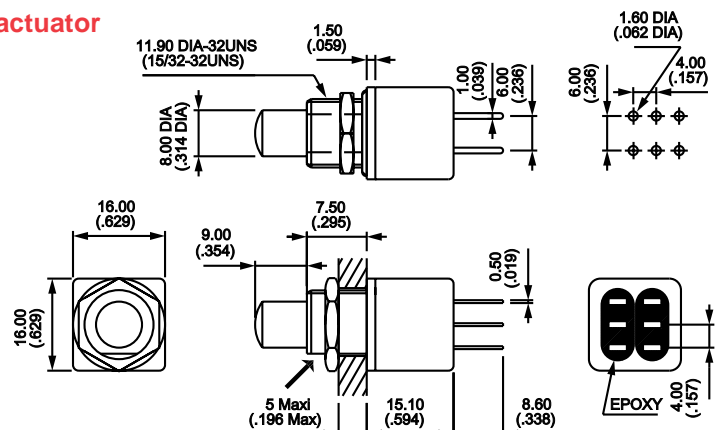


→ Flat

## Double pole - straight p.c. terminals - .354" (9mm) actuator



MODEL NO.	CIRCUIT	
132459X778	ON	MOM
Handle position:		



→ Flat

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

# 13000X778 SERIES - HIGH PERFORMANCE PUSHBUTTON 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 & bushing	Number of poles	Electrical function	Actuator	Special options
1 3					X 7 7 8
	2 Straight p.c. terminals, 15/32" (11.9mm) threaded bushing 4 Solder lug terminals, 15/32" (11.9mm) threaded bushing.	4 Double pole	5 ON - MOM	4 .157" (4mm) long 9 .354" (9mm) long	High performance fully sealed matte black switch

### Options:

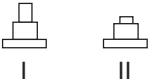
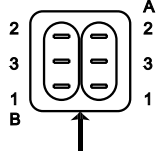
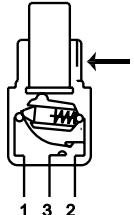
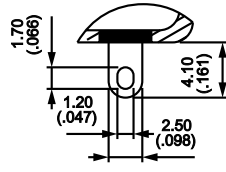
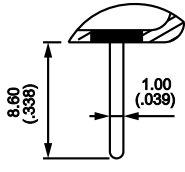
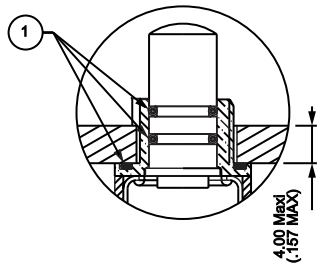
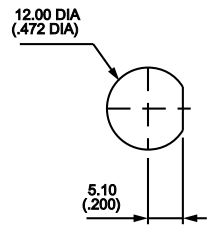
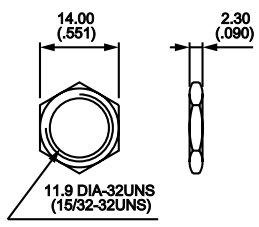
Approvals/listings

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(NONE)

C E C C (consult factory for details of approved models).

Example of completely specified model number:  
**132454X778CECC**

POSITIONS AND CONNECTIONS		SWITCH ACTION	TERMINALS							
<p>Button position</p>  <p>I      II</p> <p>Connections</p> <table border="0"> <tr> <td>ON</td> <td>MOM</td> </tr> <tr> <td>A 1-2</td> <td>A 1-3</td> </tr> <tr> <td>B 1-2</td> <td>B 1-3</td> </tr> </table>	ON	MOM	A 1-2	A 1-3	B 1-2	B 1-3	<p>Terminal identification</p> <p>Arrow indicates flat</p> 	<p>Arrow indicates flat</p>  <p>1 3 2</p>	 <p>Solder lug</p>	 <p>Straight p.c.</p>
ON	MOM									
A 1-2	A 1-3									
B 1-2	B 1-3									
SEALING		PANEL CUT-OUT	HARDWARE							
<p>Standard on all models:</p> <p>3 'o'-rings (1) seal front panel and withstand 1 bar pressure, even when switch is operated.</p> <p>Epoxy sealed terminals.</p> <p>Splash-proof case.</p>  <p>4.00 Max (.157 MAX)</p>		 <p>Panel thickness: .196" (5mm) max.</p>	 <p><b>U41</b> matte black Hex Nut</p>							

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 1200 SERIES - MOMENTARY PUSHBUTTON SWITCHES



## FEATURES

- Single pole panel mounting models.
- NC & NO electrical functions with double break.
- Solder lug, screw, screw with clamp and right angle screw with clamp terminals.
- 4 optional actuator colors.

## SPECIFICATIONS

<b>Contact ratings (resistive loads):</b>	4 Amps at 250 VAC, 8 Amps at 125 VAC or 4 Amps at 24 VDC	
<b>Initial contact resistance:</b>	10 milliohms max. at 1A 2VDC	
<b>Insulation resistance:</b>	1000 megohms minimum at 500 VDC	
<b>Dielectric strength:</b>	2000 V rms min. between terminals. 3000 V rms between terminals & frame	
<b>Electrical life:</b>	10,000 cycles at full load	
<b>Operating temperature range:</b>	-20°C to +55°C	
<b>Total travel:</b>	NO: .177" (4.5mm) ± .011" (0.3mm)	NC: .137" (3.5mm) ± .011" (0.3mm)

## MATERIALS

<b>Contacts:</b>	Silver
<b>Actuator:</b>	Polyamide
<b>Case:</b>	Polyamide
<b>Bushing:</b>	Nickel plated brass
<b>Hardware:</b>	Supplied with 1 Hex Nut p/n U166 & 1 Knurled Nut p/n U411. See hardware section of catalog.

## AGENCY RECOGNITION



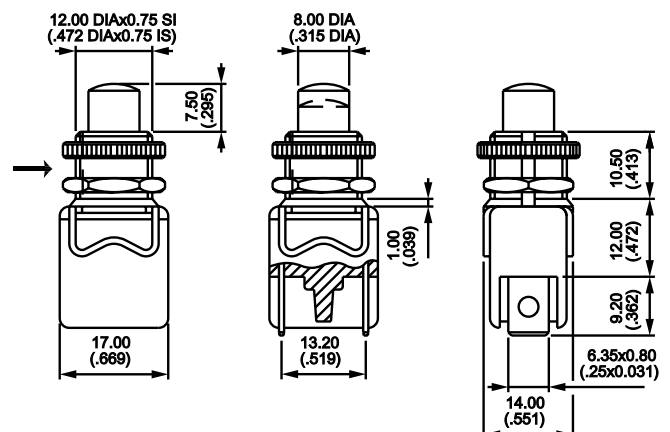
Model no.'s. with 'UU' are UL & CSA recognized.  
 Models 1233X209 & 1233X209L are VDE recognized.  
 Marking: Switches are supplied with recognitions marked.

## Solder lug/quick-connect terminals



1212A2		Normally Closed
1213A2UU		Normally Open

The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

# 1200 SERIES - MOMENTARY PUSHBUTTON SWITCHES

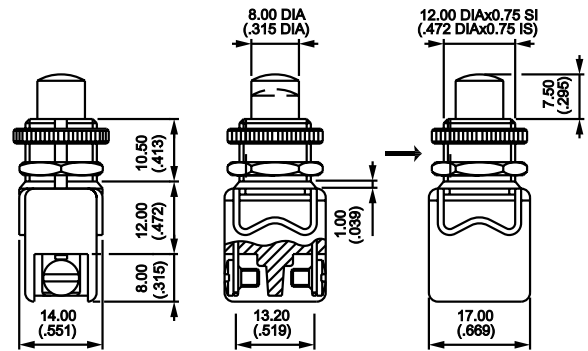
## Screw terminals



1222A2  Normally Closed

1223A2UU  Normally Open

The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.



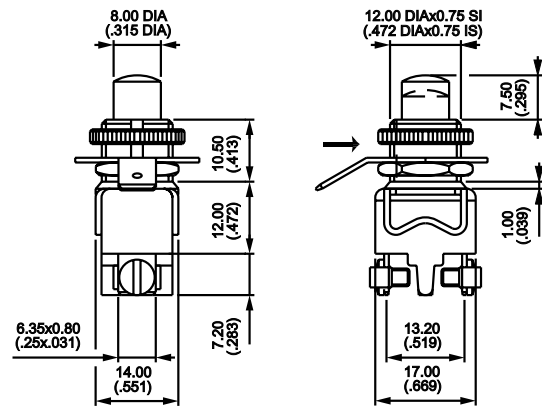
## Straight screw terminals and clamp



1202A2  Normally Closed

1203A2UU  Normally Open

The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.

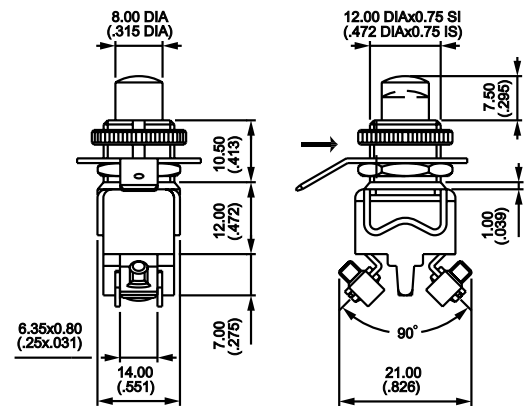


## Right angle screw terminals and clamp



12037A2UU  Normally Open

The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.



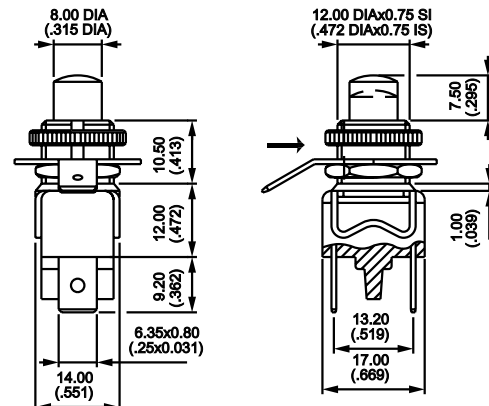
## X209 - UL, CSA, VDE, SEMCO & NF-USE approved - solder lug/quick connect terminals

( Note- U187 ground connector ring required if panel is not metallic or not connected to ground. Order separately).



1233A2X209UU  Normally Open

The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# 1200 SERIES - MOMENTARY PUSHBUTTON SWITCHES

## X209 - UL, CSA, VDE, SEMCO & NF-USE approved - solder lug/quick connect terminals

( Note- U187 ground connector ring required if panel is not metallic or not connected to ground. Order separately).

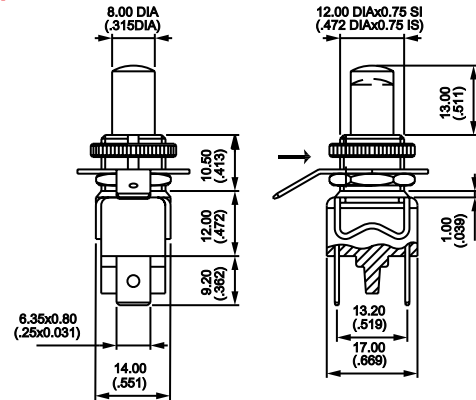


1233A2X209LUU

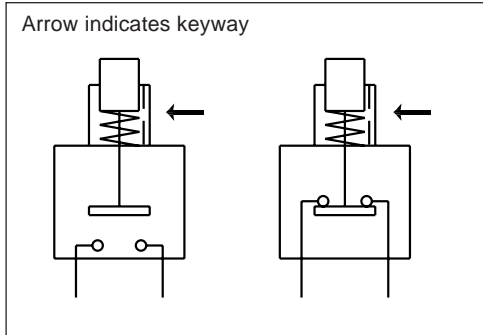


Normally Open

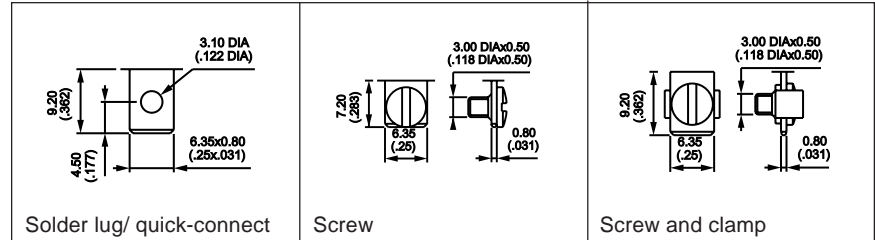
The '2' following the 'A' in model no. indicates black actuator. Substitute '6' for red or '7/1' for white, if desired.



### SWITCH ACTION

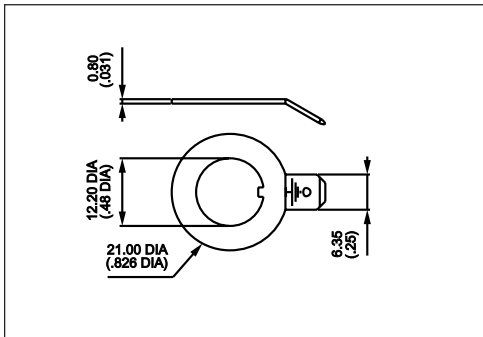


### TERMINALS



**PANEL CUT-OUT: .480" (12.2mm) dia.**

### GROUND CONNECTOR RING U187



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

# 1200M & 1200MR SERIES - MOMENTARY PUSHBUTTON SWITCHES



C

## FEATURES

- Single pole panel mounting models.
- NC & NO electrical functions with double break.
- Solder lug, screw and screw with clamp terminals.
- Chrome plated domed or flat metal actuators .

## SPECIFICATIONS

<b>Contact ratings (resistive loads):</b>	4 Amps at 250 VAC, 8 Amps at 125 VAC or 4 Amps at 24 VDC	
<b>Initial contact resistance:</b>	10 milliohms max. at 1A 2VDC	
<b>Insulation resistance:</b>	1000 megohms minimum at 500 VDC	
<b>Dielectric strength:</b>	2000 V rms min. between terminals. 3000 V rms between terminals & frame	
<b>Electrical life:</b>	10,000 cycles at full load	
<b>Operating temperature range:</b>	-20°C to +55°C	
<b>Total travel:</b>	NO: .177" (4.5mm) ± .011" (0.3mm)	NC: .137" (3.5mm) ± .011" (0.3mm)

## MATERIALS

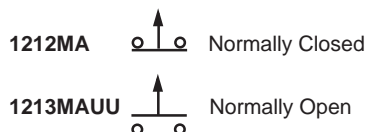
<b>Contacts:</b>	Silver
<b>Actuator:</b>	Chrome plated brass on polyamide base
<b>Case:</b>	Polyamide
<b>Bushing:</b>	Nickel plated brass
<b>Hardware:</b>	Supplied with 1 Hex Nut p/n U166 & 1 Panel Dress Nut U1868. See hardware section of catalog.

## AGENCY RECOGNITION



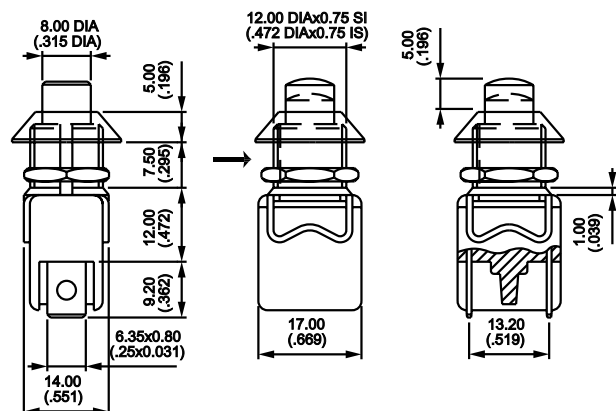
Model no's. with 'UU' are UL & CSA recognized.  
Marking: Switches are supplied with recognized marks.

## Solder lug/quick-connect terminals



The 'M' in model no. indicates flat actuator.  
Substitute 'MR' for domed actuator, if desired.

→ Keyway





SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

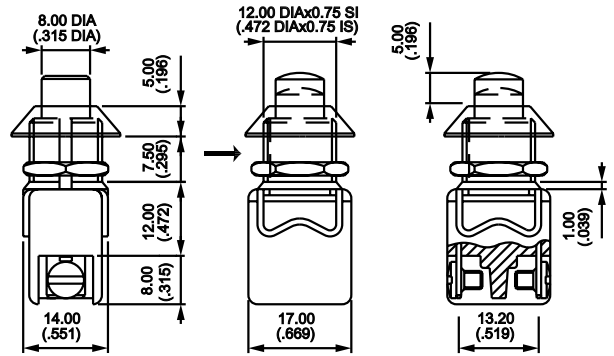
# 1200M & 1200MR SERIES - MOMENTARY PUSHBUTTON SWITCHES

## Screw terminals



- 1222MA  Normally Closed
- 1223MAUU  Normally Open



The 'M' in model no. indicates flat actuator.  
Substitute 'MR' for domed actuator, if desired.



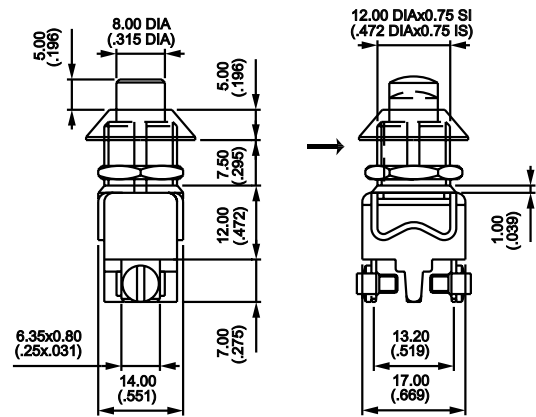
→ Keyway

## Straight screw terminals and clamp



- 1202MA  Normally Closed
- 1203MAUU  Normally Open

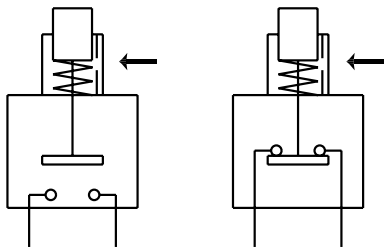
The 'M' in model no. indicates flat actuator.  
Substitute 'MR' for domed actuator, if desired.



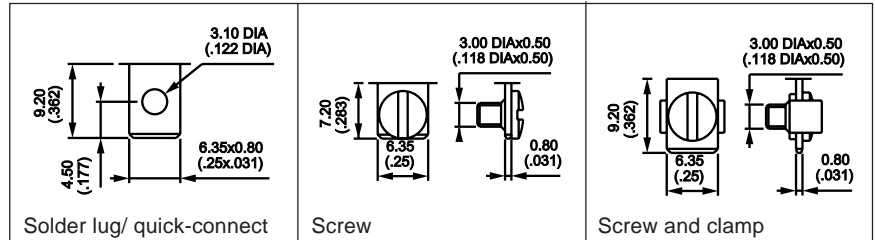
→ Keyway

## SWITCH ACTION

Arrow indicates keyway

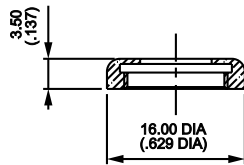


## TERMINALS



**PANEL CUT-OUT: .480" (12.2mm) dia.**

## SPECIAL CAP NUT



**U1874** Chrome plated cap nut, flat & plain  
May be ordered in place of panel dress nut.  
Order separately.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C



# 4700 & 4800 SERIES - ALTERNATE ACTION PUSHBUTTON SWITCHES



## FEATURES

- Single and double pole panel mounting models.
- ON-OFF and ON-ON electrical functions.
- Solder lug, straight p.c. and quick-connect terminals.
- 7 optional actuator colors with matching knurled mounting nut.

## SPECIFICATIONS

<b>Contact ratings (resistive loads):</b>	3 Amps at 250 VAC or 6 Amps at 125 VAC
<b>Initial contact resistance:</b>	10 milliohms max. at 1A 2VDC
<b>Insulation resistance:</b>	1000 megohms minimum at 500 VDC
<b>Dielectric strength:</b>	2000 V rms min. between terminals. 3000 V rms between terminals & frame
<b>Electrical life:</b>	10,000 cycles at full load
<b>Operating temperature range:</b>	-20°C to +65°C
<b>Total travel:</b>	.177" (4.5mm) ± .019" (0.5mm)

## MATERIALS

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

## AGENCY RECOGNITION



Models 4731AUU, 4736AUU, 4741AUU & 4746AUU are UL, CSA and VDE recognized.  
Models 4831A, 4836A, 4841A & 4846A are VDE recognized.  
Marking: Switches are supplied with recognitions marked.

## ORDER FORMAT

Fill in boxes below, for complete model number. Note: 'NONE' indicates box may be left empty.

**Model Number**                      **Actuator & knurled nut color**

--	--	--	--	--	--

Select model number from those shown on next page.

<b>0 1</b>	blue
<b>0 2</b>	black
<b>0 3</b>	green
<b>0 5</b>	yellow
<b>0 6</b>	red
<b>0 7 / 1</b>	white
<b>0 9</b>	orange

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

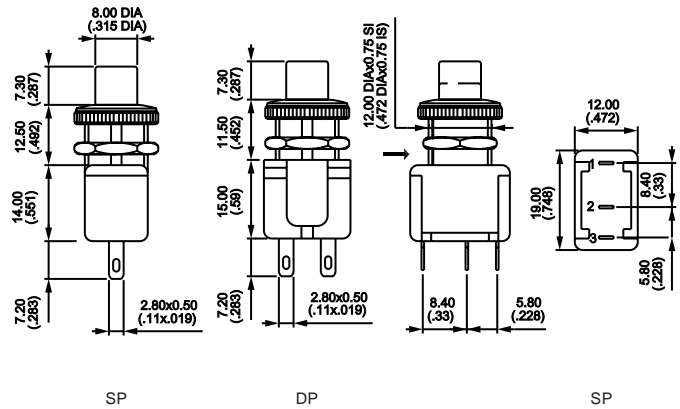
# 4700 & 4800 SERIES - ALTERNATE ACTION PUSHBUTTON SWITCHES

## Solder lug/quick-connect terminals



SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT
4731AUU	4741AUU	ON - OFF
4736AUU	4746AUU	ON - ON

Note: add color to model number - see Order Format, prior page.



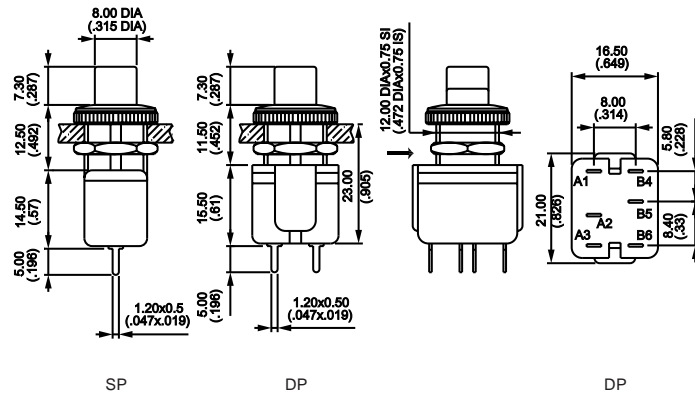
→ Keyway

## Straight p.c. terminals



SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT
4831A	4841A	ON - OFF
4836A	4846A	ON - ON

Note: add color to model number - see Order Format, prior page.



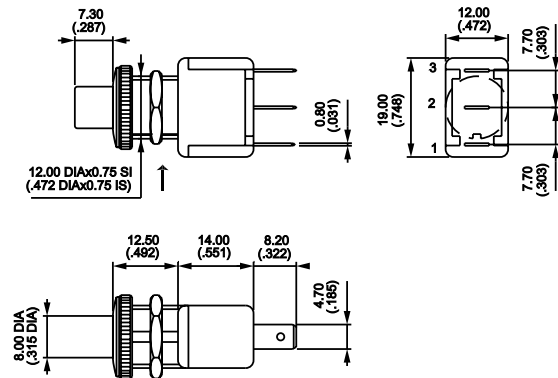
→ Keyway

## Quick-connect terminals - .185" x .031" (4.7mm x 0.8mm)



SINGLE POLE MODEL NO.	CIRCUIT
47318A	ON - OFF
47368A	ON - ON

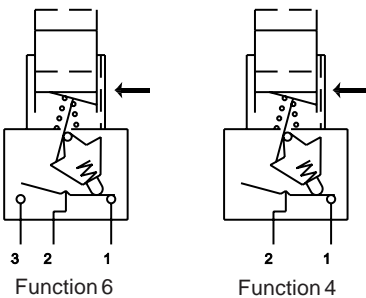
Note: add color to model number - see Order Format, prior page.



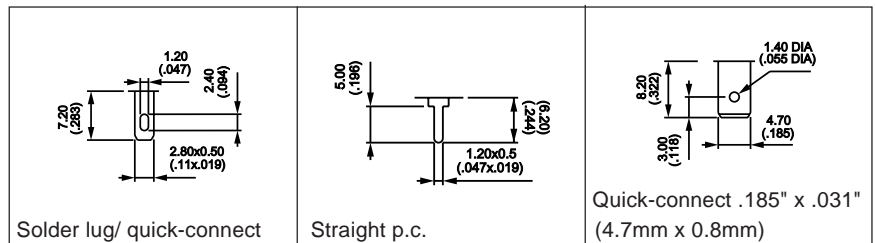
→ Keyway

## SWITCH ACTION

Arrow indicates keyway



## TERMINALS



PANEL CUT-OUT: .480" (12.2mm) dia.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

C

# New! MD SERIES PUSHBUTTON SWITCHES

## FEATURES

- Momentary or maintained actions.
- 1, 2 & 4 pole 2 throw models.
- Printed circuit & panel mounting models.
- Self-cleaning bifurcated contacts.

## SPECIFICATIONS

<b>Contact ratings (resistive loads):</b>	200 mA at 30 VDC
<b>Initial contact resistance:</b>	20 milliohms maximum
<b>Insulation resistance:</b>	100 megohms minimum at 500 VDC
<b>Dielectric strength:</b>	Type 5: 500 VAC for 1 minute. Type 8: 250 VAC for 1 minute.
<b>Electrical life:</b>	10,000 cycles minimum
<b>Operating temperature range:</b>	-20°C to +85°C
<b>Operating force:</b>	Type 5: 300g ± 150g Type 8: 330g ± 150g

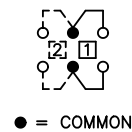
## MATERIALS

<b>Terminals:</b>	Silver plated brass
<b>Actuator:</b>	Polyacetal
<b>Frame:</b>	Steel with tin plating
<b>Base:</b>	Phenolic laminated sheet
<b>Sliding contact:</b>	Silver plated phosphor bronze

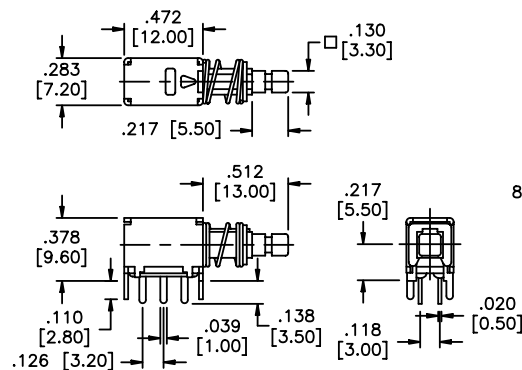
**MDPS522PN (MOMENTARY)**  
**MDPA522PN (MAINTAINED)**



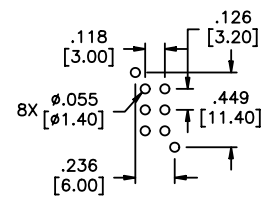
2P2T P.C. MOUNTING



SCHEMATIC



MECHANICAL OUTLINE



P.C. BOARD LAYOUT

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# New! MD SERIES PUSHBUTTON SWITCHES

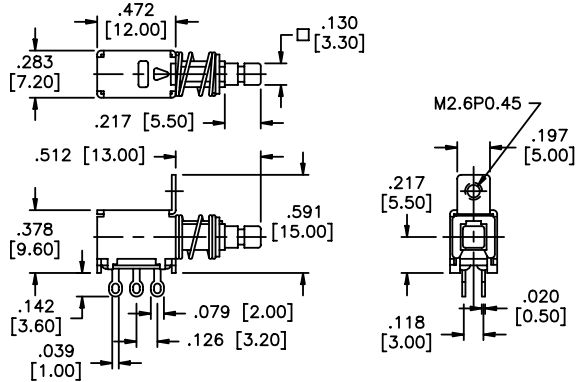
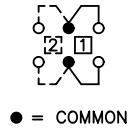
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



**MDPS522WN** (MOMENTARY)  
**MDPA522WN** (MAINTAINED)



2P2T PANEL MOUNTING



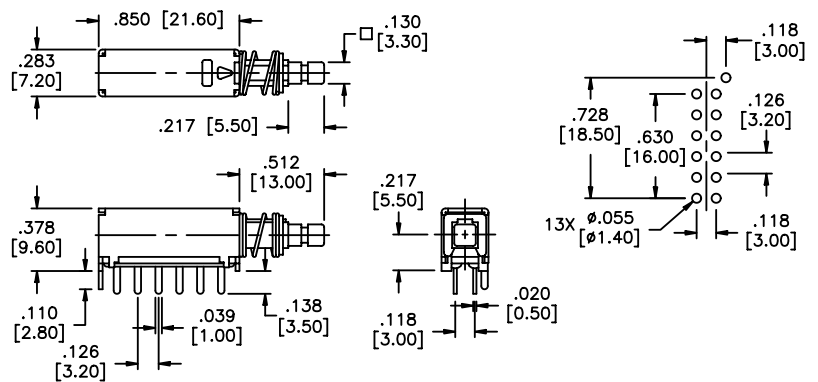
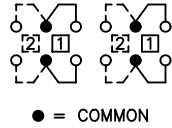
SCHEMATIC

MECHANICAL OUTLINE

**MDPS542PN** (MOMENTARY)  
**MDPA542PN** (MAINTAINED)



4P2T P.C. MOUNTING

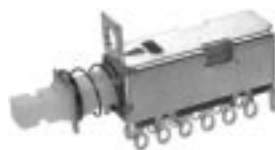


SCHEMATIC

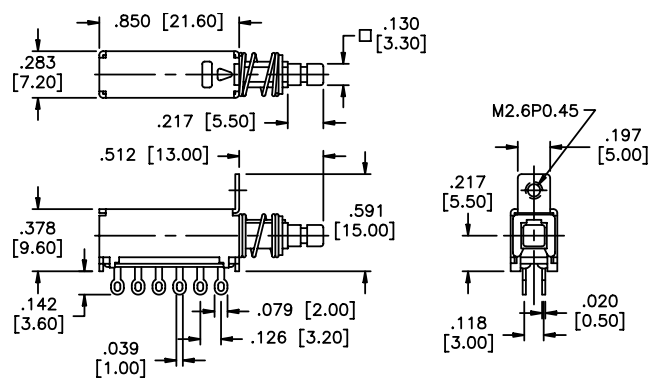
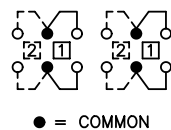
MECHANICAL OUTLINE

P.C. BOARD LAYOUT

**MDPS542WN** (MOMENTARY)  
**MDPA542WN** (MAINTAINED)



4P2T PANEL MOUNTING



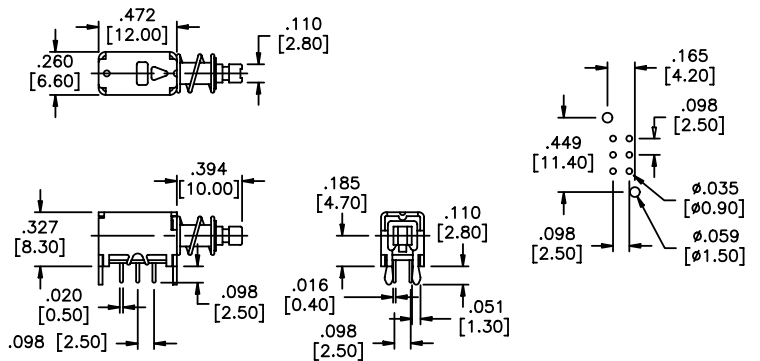
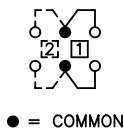
SCHEMATIC

MECHANICAL OUTLINE

**MDPS822PN** (MOMENTARY)  
**MDPA822PN** (MAINTAINED)



2P2T P.C. MOUNTING



SCHEMATIC

MECHANICAL OUTLINE

P.C. BOARD LAYOUT

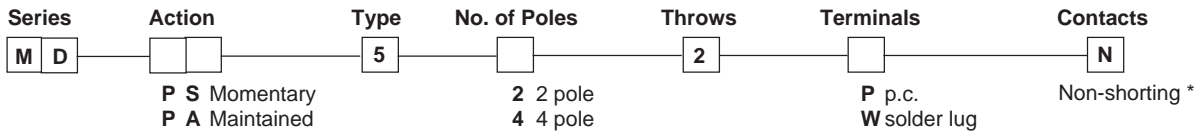
# New! MD SERIES PUSHBUTTON SWITCHES

**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

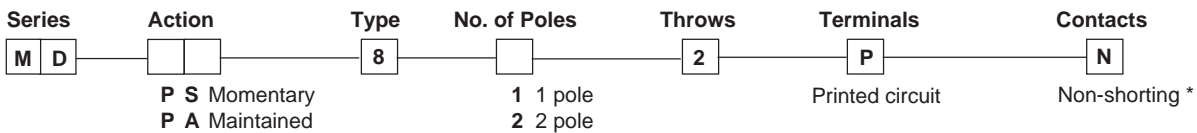
Fill in boxes with selections shown for complete model number.  
(Allowable options are shown under each respective box).

### TYPE 5:



\*Shorting available-consult factory.

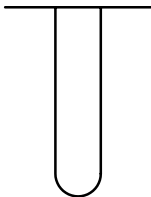
### TYPE 8:



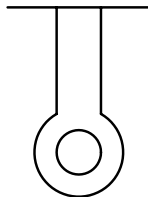
Example of completely specified model number: **MDPS542WN**

### TERMINAL CONFIGURATIONS

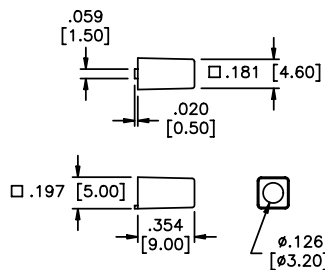
### COLOR KNOBS FOR TYPE 8 MODELS



PRINTED CIRCUIT



SOLDER LUG



MODEL NO.	COLOR
C152	Black
C154	Gray
C156	Red

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

# MD1 SERIES PUSHBUTTON SWITCHES

C

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

## FEATURES

- Power ratings include TV-5 & TV-8 (TV-5 rating shown)
- Double pole single throw alternate action.
- TV-5 & TV-8 ratings are UL, CSA, VDE & SEMKO recognized. TV-8 ratings are also NEMKO, DEMCO, SETI and SEV recognized.
- Panel mounting with threaded mounting holes.

## MATERIALS

Base: Phenolic, UL94V-O  
 Frame: Zinc plated steel  
 Actuator: 30% glass fiber PBT, color gray  
 Terminals: Silver plated copper alloy  
 Contacts: Silver copper alloy

## GENERAL SPECIFICATIONS

### ELECTRICALS

Contact ratings:	UL: 7.5 amps @ 125/250 VAC, TV5&8 CSA:10 amps @ 125/250 VAC, TV5&8 VDE, SEMCO, NEMCO, SETI, DEMCO & SEV: 8A/128A @ 250 VAC $\mu$ T85
Insulation resistance:	100 megohms min. (500 VDC)
Dielectric withstanding voltage:	1000 VAC for 1 minute
Contact resistance:	20 milliohms max.
Electrical life:	25,000 cycles min.
Mechanical life:	30,000 cycles min.

### MECHANICALS, THERMALS

Actuation force:	500 grams $\pm$ 200 grams	Travel:	.098" (2.5mm)
Operating temperature range:	-10 °C to +85 °C		

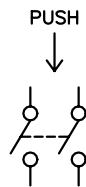
### SOLDERING

Solder heat resistance:	230°C max. for 3 $\pm$ 0.5 seconds
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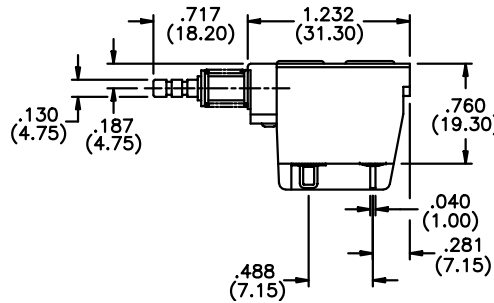
### MD12T5



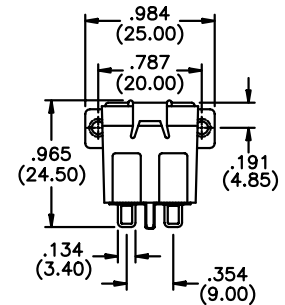
SOLDER LUG TERMS.



SCHEMATIC



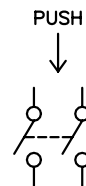
MECHANICAL OUTLINE



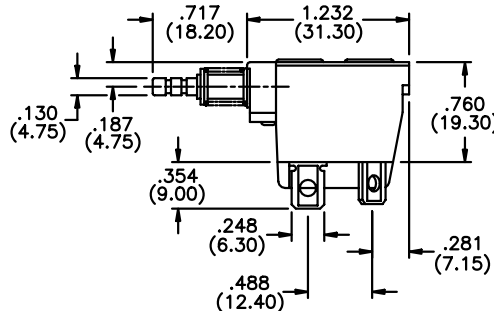
### MD12L5



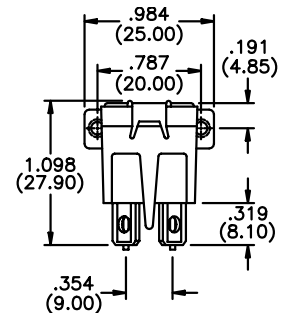
QUICK CONNECT TERMS.



SCHEMATIC



MECHANICAL OUTLINE



# MD2 SERIES PUSHBUTTON SWITCHES

## FEATURES

- Power ratings include TV-5
- Single pole single throw alternate action.
- UL, CSA, VDE and SEMKO recognized.
- Panel mounting with threaded mounting holes and p.c. mounting with restraining bracket.

## MATERIALS

Base: Phenolic, UL94V-O  
 Frame: Zinc plated steel (panel mtg. models)  
           Tin plated steel (p.c. mtg. models)  
 Actuator: PBT, nylon 66, UL94V-2 min.  
 Terminals: Silver plated copper alloy  
 Contacts: Silver copper alloy

## GENERAL SPECIFICATIONS

### ELECTRICALS

Contact ratings:	UL & CSA: 15 amps @ 125 VAC, 10 amps @ 250 VAC, TV-5 VDE & SEMCO: 5A/80A @ 250 VAC $\mu$ T85
Insulation resistance:	100 megohms min. (500 VDC)
Dielectric withstanding voltage:	1000 VAC for 1 minute
Contact resistance:	20 milliohms max.
Electrical life:	10,000 cycles min.
Mechanical life:	30,000 cycles min.

### MECHANICALS, THERMALS

Actuation force:	400 grams $\pm$ 200 grams
Operating temperature range:	-10 °C to +85 °C

### SOLDERING

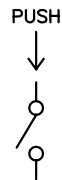
Solder heat resistance:	230°C max. for 3 $\pm$ 0.5 seconds
-------------------------	------------------------------------

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

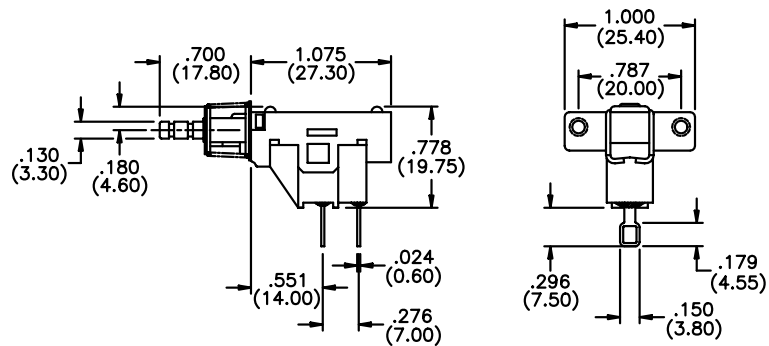
### MD2BM4T1



PANEL MOUNTING WITH  
SOLDER LUG TERMS.



SCHEMATIC

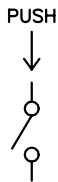


MECHANICAL OUTLINE

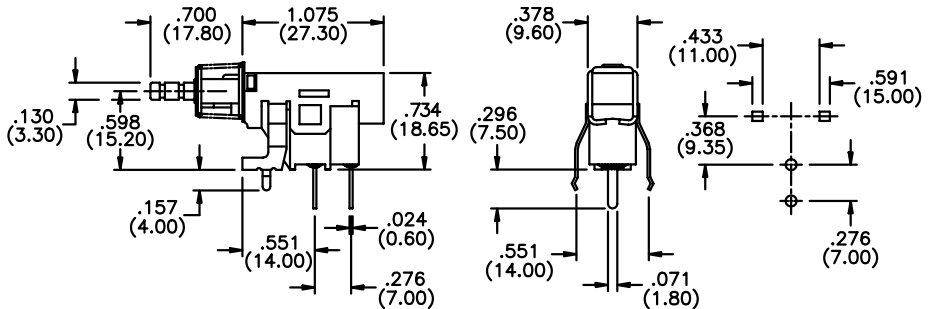
### MD2CP4T3



P.C. MOUNTING



SCHEMATIC



MECHANICAL OUTLINE

P.C. BOARD LAYOUT



# AV SERIES PUSHBUTTON SWITCHES

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Designed to meet stringent security requirements, all AV Series models are rugged, durable and cosmetically attractive.

All models feature:

- Long life.
- Anti-jamming construction.
- Minimum clearance between actuator and bushing, to prevent willful damage by means of insertion of foreign parts or matter.
- Protection against crushing of contacts and switch mechanism.



In addition, all standard models are sealed to Specification IP54. IP54 specifies that the switch enclosure must be dust-protected (no harmful penetration) as well as resistant to splashing water. Optional sealing to IP65 is also available on all models, and is provided with a front panel sealing gasket as well. IP65 specifies that the switch enclosure must be dust-tight (no penetration) as well as resistant to jets of water from any direction.

The AV Series consists of 3 categories of pushbutton switches designated **Anti-Vandal**, **Security** and **Snap-Action Security**. The distinctive features are:

**Anti-Vandal** - Highest impact resistance provided by a mechanical stop and added ruggedness provided by a stainless steel actuator and bushing. The 19mm models meet IP..7 which specifies the switch must withstand a hammer blow to the actuator with a striking energy of 6 joules, while the 22mm models meet IP..9 which specifies the switch must similarly withstand 20 joules of energy. In both of these cases, no resulting damage is permissible per the specification. (Continued).

# AV SERIES PUSHBUTTON SWITCHES

**Security** - High impact resistance and ruggedness with a large variety of options, including actuator shapes, electrical functions, connections, finish and marking options.

**Snap-Action Security** - High impact resistance and ruggedness. All of these models feature tactile response and optional illumination and marking.

AV Series switches are shown on the following pages in order of the above categories. For ease in selecting the correct model for your application, the following table lists key parameters by switch category in order of ascending ratings.

CATEGORY	RATING(S) (RESISTIVE)	ELECTRICAL . CONFIGURATION	SIZE (mm)	ADD'L. SPECS. SEE ALSO	PAGE
<b>ANTI-VANDAL</b>	2 A 48 VDC	SPST NO Momentary	19	-	C87
	2 A 48 VDC	SPST NO Momentary	22	-	C88
<b>SECURITY</b>	1 A 30 V	SPST NO & NC Mom	19	9000 Series	C89
	2 A 48 VDC	SPST NO Momentary	19	-	C90
	2 A 48 VDC	SPST NO Momentary	22	-	C91
	<b>New!</b> 3 A 120 VAC or 28 VDC, 1.5 A 250 VAC & Dry Circuit	SPST NO Momentary	19	300 Series	C92
	3 A 125 VAC, 2 A 250 VAC, 2.5 A 24 VDC	SPST NC Momentary	22	1200 Series	C93
	6 A 125 VAC, 3 A 250 VAC, 3 A 24 VDC	DPDT ON-ON Alternate	22	4700 Series	C94
<b>New!</b> 6 A 125 VAC, 3 A 250 VAC, 7 A 30 VDC & Dry Circuit	SPDT NO & NC Mom.	19	PB Series	C95	
<b>SNAP-ACTION SECURITY</b>	50 mA 24 VDC	SPST NO Momentary	19	-	C96
	50 mA 24 VDC	SPST NO Mom. (lighted)	19	-	C97
	<b>New!</b> 3A 120 VAC or 28 VDC. 1.5 A 250 VAC & Dry Circuit	SPST ON-OFF Alternate	19	400 Series	C98
	<b>New!</b> 6 A 125 VAC, 3 A 250 VAC, 7 A 30 VDC & Dry Circuit	SPDT & DPDT, NO & NC Mom.	19	800 Series	C99

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

# AV SERIES ANTI-VANDAL PUSHBUTTON SWITCHES

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

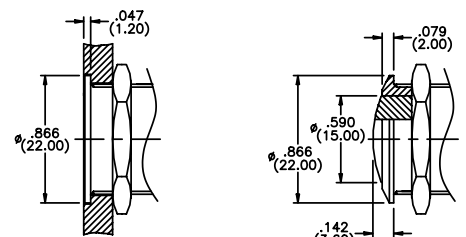


SPECIFICATIONS	FEATURES
<p><b>Contact ratings:</b> 2 A at 48 VDC max. (resistive load)</p> <p><b>Initial contact resistance:</b> 10 milliohms max. at 1 A, 2 V</p> <p><b>Insulation resistance:</b> 1000 megohms min. at 500 VDC</p> <p><b>Dielectric strength:</b> 3000 V rms min. between terminals and frame and between terminals</p> <p><b>Electrical life:</b> 10,000 cycles min. at full load</p> <p><b>Mechanical life:</b> 1,000,000 cycles min.</p> <p><b>Operating temperature range:</b> -20°C to +55°C</p> <p><b>Solder heat resistance:</b> 300°C max. for 5 seconds</p> <p><b>Washing not recommended</b></p>	<ul style="list-style-type: none"> <li>● .755" (19 mm) dia. and .866" (22 mm) dia. models.</li> <li>● Single pole NO momentary action.</li> <li>● Standard - sealing protection per IP547 or IP549.</li> <li>● Optional - sealing protection per IP657 or IP659.</li> <li>● Extremely rugged and durable.</li> </ul>
	<p><b>MATERIALS</b></p> <p><b>Contacts &amp; terminals:</b> Silver plated brass</p> <p><b>Bushing &amp; Actuator:</b> Stainless steel</p> <p><b>Case:</b> PBT    <b>Hex. Mounting Nut:</b> Nickel plated brass</p>

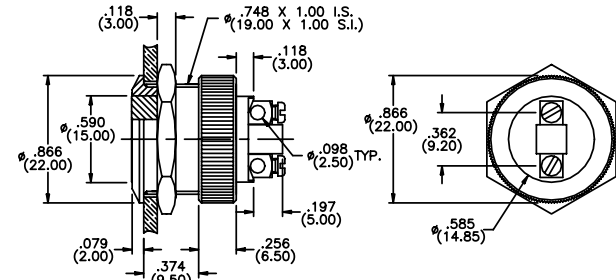
<p><b>ORDER FORMAT:</b> For complete model no., fill in 2 empty boxes with selected options shown below. Example of complete model no. - <b>AV191003C940N</b></p>	<table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">Series</td> <td style="border: 1px solid black; padding: 2px;">Bush./Act. Config.</td> <td style="border: 1px solid black; padding: 2px;">Body Style</td> <td style="border: 1px solid black; padding: 2px;">Function</td> <td style="border: 1px solid black; padding: 2px;">Cont.Matl.</td> <td style="border: 1px solid black; padding: 2px;">Term.Type</td> <td style="border: 1px solid black; padding: 2px;">Bush./Act. Matl.</td> <td style="border: 1px solid black; padding: 2px;">Sealing</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">AV</td> <td style="border: 1px solid black; padding: 2px; width: 40px;"> </td> <td style="border: 1px solid black; padding: 2px;">100</td> <td style="border: 1px solid black; padding: 2px;">3</td> <td style="border: 1px solid black; padding: 2px;">C</td> <td style="border: 1px solid black; padding: 2px;">9</td> <td style="border: 1px solid black; padding: 2px;">40</td> <td style="border: 1px solid black; padding: 2px; width: 40px;"> </td> </tr> <tr> <td></td> <td style="padding: 2px;">09 19 9D</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="padding: 2px;">N R T</td> </tr> </table>	Series	Bush./Act. Config.	Body Style	Function	Cont.Matl.	Term.Type	Bush./Act. Matl.	Sealing	AV		100	3	C	9	40			09 19 9D						N R T
Series	Bush./Act. Config.	Body Style	Function	Cont.Matl.	Term.Type	Bush./Act. Matl.	Sealing																		
AV		100	3	C	9	40																			
	09 19 9D						N R T																		

19mm

Bushing/Actuator configurations



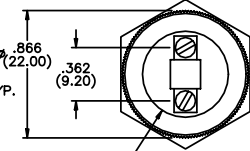
Screw terminals


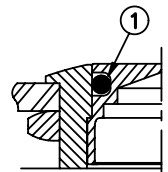
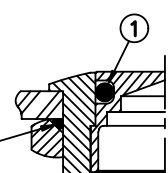
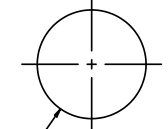
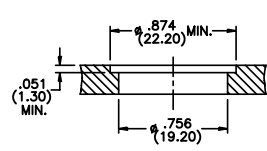
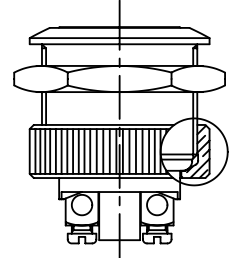



9D flat Act. w/flush mount Bush.    19 curved Act. & Bush.

09 flat Act. & curved Bush.

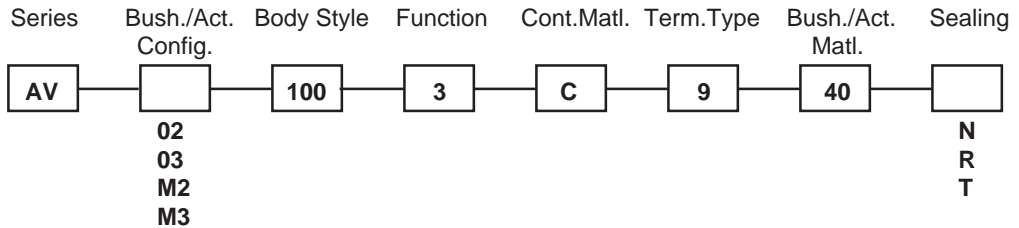
Rear view all models



 <p style="font-weight: bold; margin-top: 10px;">AV091003C940N (Model shown)</p>	<p style="color: red; font-weight: bold;">N - no sealing (std'd)</p>  <p style="color: red; font-weight: bold;">R ① Internal seal meets IP65</p>  <p style="color: red; font-weight: bold;">T ① Internal seal &amp; ② front panel seals meet IP65</p>	<p style="color: red; font-weight: bold;">For 09 &amp; 19 Bush/Act</p>  <p style="color: red; font-weight: bold;">For 9D Bush/Act</p>  <p style="color: red; font-weight: bold;">Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).</p>	<p style="color: red; font-weight: bold;">R and T sealing options also feature increased impact resistance provided by knurled nut as shown below.</p> 
 <p style="color: red; font-weight: bold;">Schematic</p>	<p style="color: red; font-weight: bold;">Sealing</p>	<p style="color: red; font-weight: bold;">Mounting Holes</p>	

# AV SERIES ANTI-VANDAL PUSHBUTTON SWITCHES

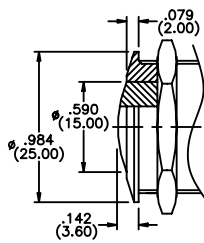
**ORDER FORMAT:** For complete model no., fill in 2 empty boxes with selected options shown below.  
Example of complete model no. -  
**AV021003C940N**



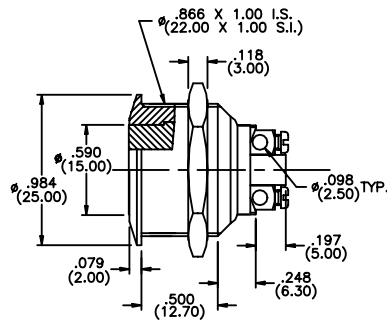
**22mm**

**Bushing/Actuator configurations**

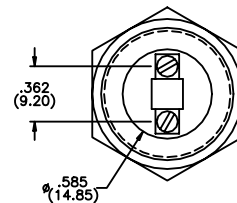
**Screw terminals**



**02** curved Act. & Bush.



**03** flat Act. & curved Bush.

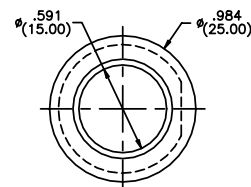


Rear view all models

**M2** curved Actuator & curved Bushing with 'D' flat on Bushing

or

**M3** flat Actuator & curved Bushing with 'D' flat on Bushing

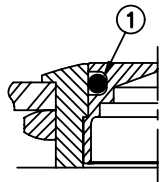


**AV021003C940N**  
(Model shown)

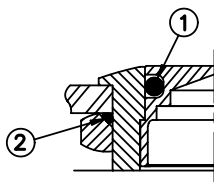


**Schematic**

**N** - no sealing (std'd)



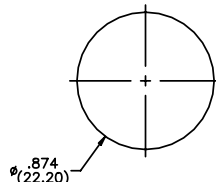
**R** ① Internal seal meets IP65



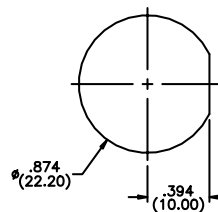
**T** ① Internal seal & ② front panel seals meet IP65

**Sealing**

For **02** & **03** Bush/Act



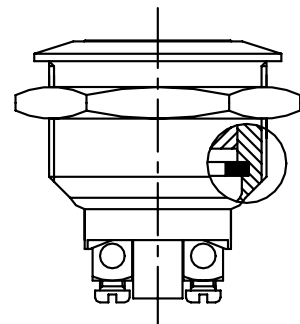
For **M2** & **M3** Bush/Act



Min. dimensions for matrix mounting: 1.181" (30mm) x 1.181" (30mm).

**Mounting Holes**

**R** and **T** sealing options also feature increased impact resistance provided by an internal ring as shown below.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

# AV SERIES SECURITY PUSHBUTTON SWITCHES

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.



SPECIFICATIONS	FEATURES
<p><b>Contact ratings:</b> 1 A at 30 V max. (resistive load) 10 <math>\mu</math>A at 5 V min.</p> <p>Note: current above 100 mA damages the gold plating.</p> <p><b>Initial contact resistance:</b> 10 milliohms max. at 1 A, 2 V</p> <p><b>Insulation resistance:</b> 1000 megohms min. at 500 VDC</p> <p><b>Dielectric strength:</b> 2000 V rms min. between terms. &amp; frame. 1000 V rms min. between terminals</p> <p><b>Electrical life:</b> 250,000 cycles min. at full load</p> <p><b>Mechanical life:</b> 1,000,000 cycles min.</p> <p><b>Operating temperature range:</b> -20°C to +55°C</p> <p><b>Solder heat resistance:</b> 300°C max. for 5 seconds</p> <p><b>Washing not recommended</b></p>	<ul style="list-style-type: none"> <li>● <b>.755" (19 mm) dia. models.</b></li> <li>● <b>Combined single pole NO &amp; NC momentary action.</b></li> <li>● <b>Standard - sealing protection per IP547 or IP549.</b></li> <li>● <b>Optional - sealing protection per IP657 or IP659.</b></li> <li>● <b>Extremely rugged and durable.</b></li> </ul>
<b>MATERIALS</b>	
<p><b>Contacts:</b> Gold plated silver</p> <p><b>Bushing &amp; Actuator:</b> Nickel plated brass (std'd)</p> <p><b>Case:</b> PBT    <b>Hex. Mounting Nut:</b> Nickel plated brass</p>	

**ORDER FORMAT:** For complete model no., fill in 2 empty boxes with selected options shown below. Example of complete model no. - **AV199035D200**

Series	Bush./Act. Config.	Body Style	Function	Cont.Matl.	Term.Type	Bush./Act. Matl.	Sealing
AV	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px;"> </div> <div style="border: 1px solid black; padding: 2px;"> </div> </div>	903	5	D	2	00	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px;"> </div> <div style="border: 1px solid black; padding: 2px;"> </div> </div>
	<div style="display: flex; justify-content: space-around;"> <span>09</span> <span>19</span> </div>						<div style="display: flex; justify-content: space-around;"> <span>Blank</span> <span>E</span> <span>K</span> </div>

Other Bushing/Actuator materials available - flat thermoplastic Actuators available - Actuator marking available - consult factory.

<b>19mm</b>	<b>Bushing/Actuator configurations</b>	<b>Solder lug terminals</b>
	<p><b>09</b> flat Act. &amp; curved Bush.</p>	<p><b>19</b> curved Act. &amp; Bush.</p>
		<p>Rear view all models</p>

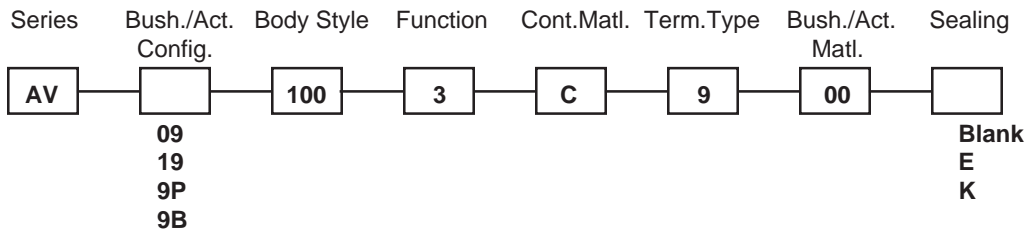
<p><b>AV199035D200 (Model shown)</b></p>	<p><b>Blank</b> - no sealing (std'd)</p> <p><b>E</b> ① Internal seal meets IP65</p> <p><b>K</b> ① Internal seal &amp; ② front panel seals meet IP65</p>	<p>Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).</p>	
<p><b>Schematic</b></p>	<p><b>Sealing</b></p>	<p><b>Mounting Hole</b></p>	

# AV SERIES SECURITY PUSHBUTTON SWITCHES

C

SPECIFICATIONS	FEATURES
<p><b>Contact ratings:</b> 2 A at 48 VDC max. (resistive load)  <b>Initial contact resistance:</b> 10 milliohms max. at 1 A, 2 V  <b>Insulation resistance:</b> 1000 megohms min. at 500 VDC  <b>Dielectric strength:</b> 3000 V rms min. between terms. &amp; frame and between terminals  <b>Electrical life:</b> 10,000 cycles min. at full load  <b>Mechanical life:</b> 1,000,000 cycles min.  <b>Operating temperature range:</b> -20°C to +55°C  <b>Solder heat resistance:</b> 300°C max. for 5 seconds  <b>Washing not recommended</b></p>	<ul style="list-style-type: none"> <li>● <b>.755" (19 mm) dia. and .866" (22 mm) dia. models.</b></li> <li>● <b>Single pole NO momentary action.</b></li> <li>● <b>Standard - sealing protection per IP547 or IP549.</b></li> <li>● <b>Optional - sealing protection per IP657 or IP659.</b></li> <li>● <b>Extremely rugged and durable.</b></li> </ul>
	MATERIALS
	<p><b>Contacts &amp; terminals:</b> Silver plated brass  <b>Bushing &amp; Actuator:</b> Nickel plated brass (std'd)  <b>Case:</b> PBT    <b>Hex. Mounting Nut:</b> Nickel plated brass</p>

**ORDER FORMAT:** For complete model no., fill in 2 empty boxes with selected options shown below. Example of complete model no. - **AV191003C900**

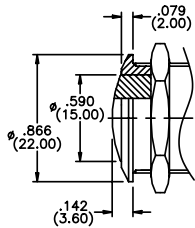


Other Bushing/Actuator materials available - flat thermoplastic Actuators available - Actuator marking available - consult factory.

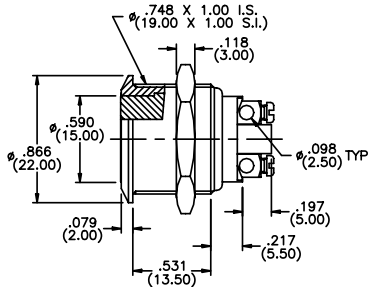
## 19mm

### Bushings/Actuator configurations

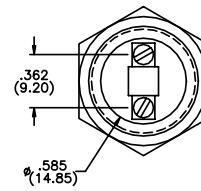
### Screw terminals



**19** curved Act. & Bush.



**09** flat Act. & curved Bush.



Rear view all models

**9B** curved Act. & Bush. with knurled nut for closer matrix mtg.

**9P** flat Act. & curved Bush. with knurled nut for closer matrix mtg.

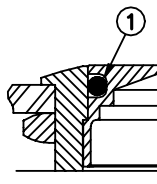
Min. dimensions for matrix mtg. for options **9B** & **9P**: .984" (25mm) x .984" (25mm). Order wrench p/n U1929 for knurled nut.



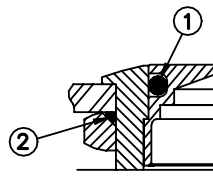
**AV191003C900**  
(Model shown)

### Blank - no sealing (std'd)

**E** ① Internal seal meets IP65



**K** ① Internal seal & ② front panel seals meet IP65

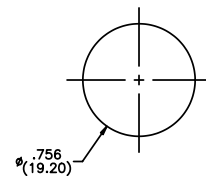


### Sealing



### Schematic

Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).



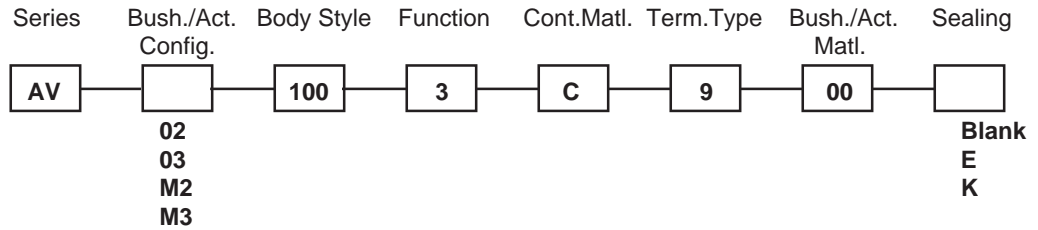
### Mounting Hole

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.



# AV SERIES SECURITY PUSHBUTTON SWITCHES

**ORDER FORMAT:** For complete model no., fill in 2 empty boxes with selected options shown below.  
Example of complete model no. -  
**AV021003C900**



Other Bushing/Actuator materials available - flat thermoplastic Actuators available - Actuator marking available - consult factory.

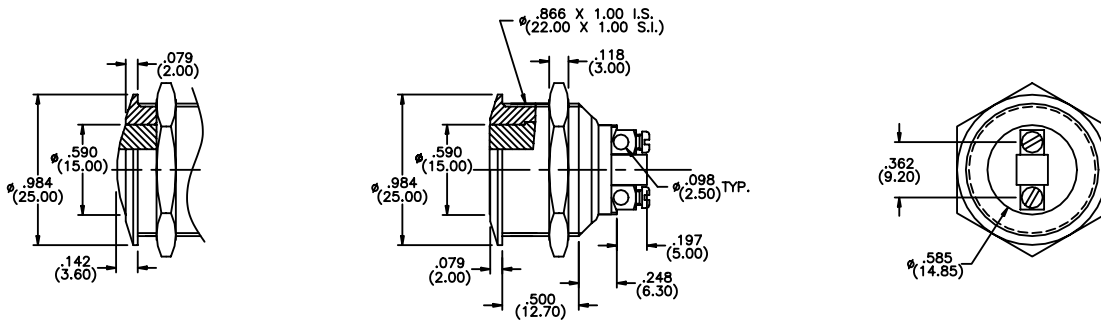
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.



## 22mm

### Bushing/Actuator configurations

### Screw terminals

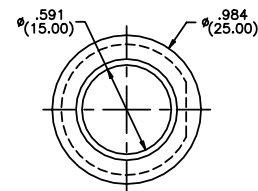


**02** curved Act. & Bush.

**03** flat Act. & curved Bush.

Rear view all models

**M2** curved Actuator & curved Bushing with 'D' flat on Bushing  
or  
**M3** flat Actuator & curved Bushing with 'D' flat on Bushing

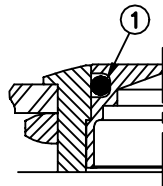


**AV021003C900**  
(Model shown)

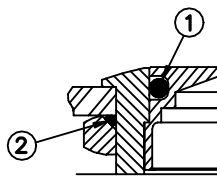


Schematic

**Blank** - no sealing (std'd)



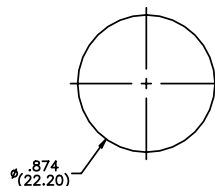
**E** ① Internal seal meets IP65



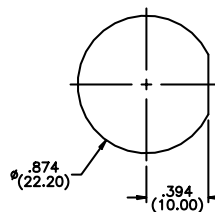
**K** ① Internal seal & ② front panel seals meet IP65

Sealing

For **02** & **03** Bush/Act



For **M2** & **M3** Bush/Act



Min. dimensions for matrix mounting: 1.181" (30mm) x 1.181" (30mm).

Mounting Holes



**New!**

# AV SERIES SECURITY PUSHBUTTON SWITCHES

## SPECIFICATIONS

**Contact ratings:** Max. resistive loads: **Q** - 3 A 120 VAC (and life) or 28 VDC, 1.5 A 250 VAC - 10,000 cycles min. Also 1 A 120 VAC or 28 VDC, 0.5 A 250 VAC - 250,000 cycles min. **B** - 0.4 Volt-Amps max at 20 V max. - 250,000 cycles min.

**Initial contact resistance:** 10 mΩ max. at 3 V, 0.1 A

**Insulation resistance:** 10,000 megohms min.

**Dielectric strength:** 1000 V rms min.

**Operating temperature range:** -30°C to +85°C

**For additional specifications:** See 300 Series switches

## FEATURES

- **.755" (19 mm) dia. models.**
- **Single pole NO momentary action.**
- **Standard - sealing protection per IP547 or IP549.**
- **Optional - sealing protection per IP657 or IP659.**
- **Extremely rugged and durable.**

## MATERIALS

**Contacts:** **Q** - Coin silver for power & UL models. **B** - Gold over nickel over brass for dry circuit models.

**Bushing & Actuator:** Nickel plated brass (std'd)

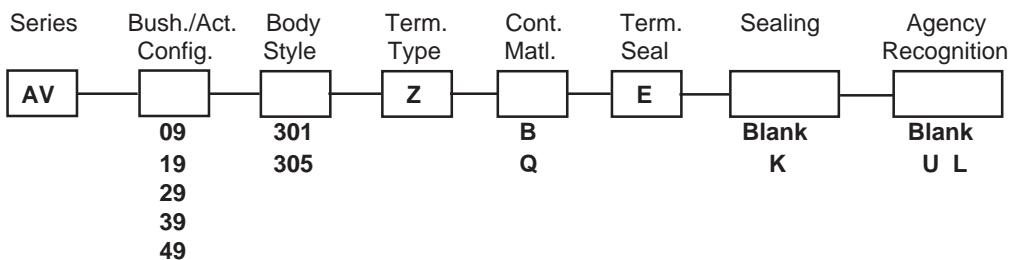
**Case:** Diallyl Phthalate **Hex. Mounting Nut:** Nickel plated brass

C

**ORDER FORMAT:** For complete model no., fill in boxes with selected options shown below.

Example of complete model no. -

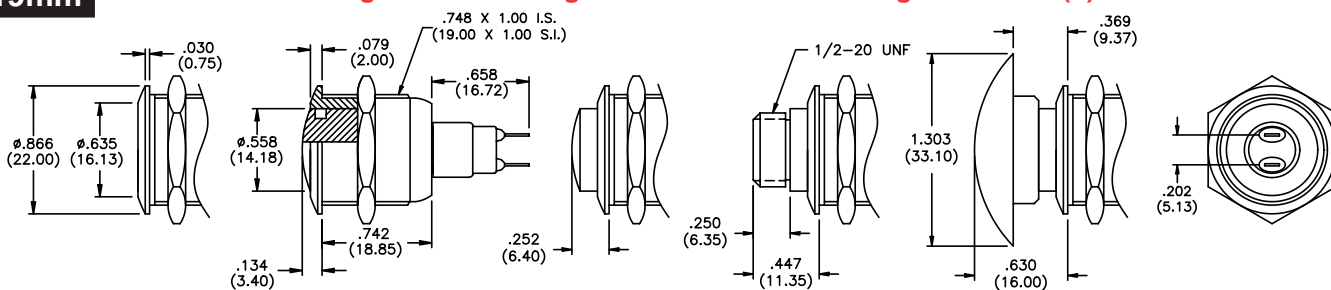
**AV19301ZQEK/UL**



## 19mm

### Bushing/Actuator configuration

### Solder lug terminals - (Z)



**09** flat Act. & curved Bushing

**19** curved Act. & Bushing (standard)

**29** extended Act. & curved bushing

**39** threaded Act. & curved bushing

**49** thd'd Act. with mushroom cap & curved bushing

Rear view all models

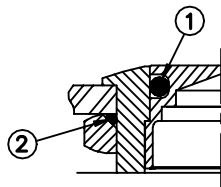


**AV19301ZQE/UL**  
(Model shown)



**Schematic**

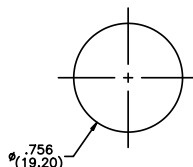
**Blank** - no sealing (std'd)



**K** ① Internal seal & ② front panel seals meet IP65

**Sealing**

Min. dimensions for matrix mounting:  $.984$ " (25mm) x  $.984$ " (25mm).



**Mounting Hole**

Notes to Order Format:

**301** models have  $.020$ " (0.5mm) overtravel and  $.110$ " (2.79mm) total travel.

**305** models have  $.080$ " (2.03mm) overtravel and  $.110$ " (2.79mm) total travel.

**UL** option available only with Q option. UL rating: 1 A 125 VAC or 0.5 A 250 VAC (75% power factor). UL file E66367.

**E** option is epoxy terminal seal - standard.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

# AV SERIES SECURITY PUSHBUTTON SWITCHES

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

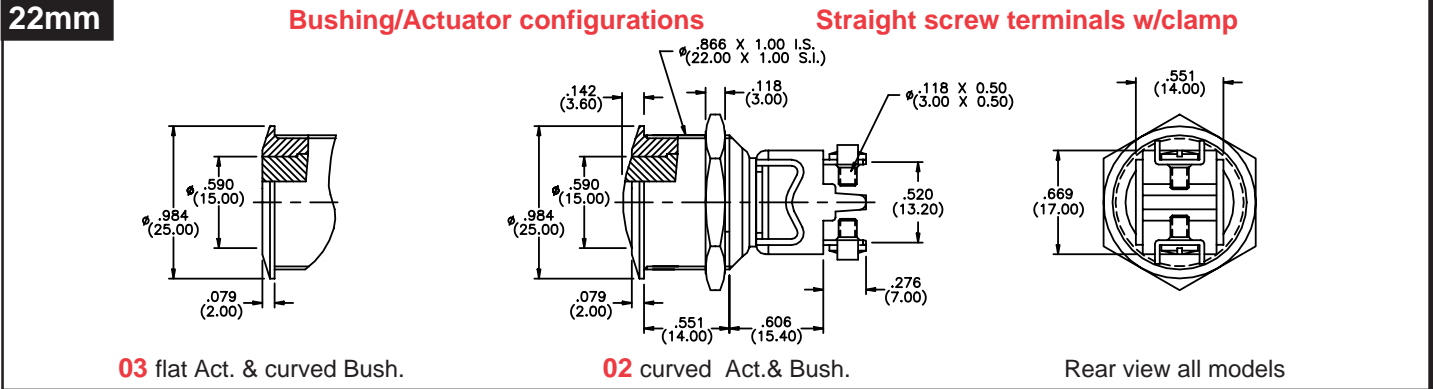


SPECIFICATIONS	FEATURES
<p><b>Contact ratings:</b> Max. resistive loads: , 3 A 125 VAC, 2 A 250 VAC &amp; 2.5 A 24 VDC</p> <p><b>Initial contact resistance:</b> 10 milliohms max. at 1 A, 2 V</p> <p><b>Insulation resistance:</b> 1000 megohms min. at 500 VDC</p> <p><b>Dielectric strength:</b> 2000 V rms min. between terms. &amp; frame. 2000 V rms min. between terminals</p> <p><b>Electrical life:</b> 10,000 cycles at 0.3 A 24 V</p> <p><b>Mechanical life:</b> 1,000,000 cycles min.</p> <p><b>Operating temperature range:</b> -20°C to +55°C</p> <p><b>Solder heat resistance:</b> 300°C max. for 5 seconds</p> <p><b>Washing not recommended</b></p>	<ul style="list-style-type: none"> <li>● .866" (22 mm) dia. models.</li> <li>● Single pole NC momentary action.</li> <li>● Standard - sealing protection per IP547 or IP549.</li> <li>● Optional - sealing protection per IP657 or IP659.</li> <li>● Extremely rugged and durable.</li> </ul> <p><b>MATERIALS</b></p> <p><b>Contacts &amp; terminals:</b> Silver plated brass</p> <p><b>Bushing &amp; Actuator:</b> Nickel plated brass (std'd)</p> <p><b>Case:</b> PBT    <b>Hex. Mounting Nut:</b> Nickel plated brass</p>

**ORDER FORMAT:** For complete model no., fill in 2 empty boxes with selected options shown below. Example of complete model no. - **AV021202C000**

Series	Bush./Act. Config.	Body Style	Function	Cont. Matl.	Term. Type	Bush./Act. Matl.	Sealing
AV	<div style="display: flex; justify-content: space-around; width: 100%;"> <span style="border: 1px solid black; padding: 2px;"> </span> <span style="border: 1px solid black; padding: 2px;"> </span> </div>	120	2	C	0	00	<div style="display: flex; justify-content: space-around; width: 100%;"> <span style="border: 1px solid black; padding: 2px;">Blank</span> <span style="border: 1px solid black; padding: 2px;">E</span> <span style="border: 1px solid black; padding: 2px;">K</span> </div>

Other Bushing/Actuator materials available - flat thermoplastic Actuators available - Actuator marking available - consult factory.



<p><b>AV021202C000 (Model shown)</b></p>	<p><b>Blank</b> - no sealing (std'd)</p> <p><b>E</b> ① Internal seal meets IP65</p> <p><b>K</b> ① Internal seal &amp; ② front panel seals meet IP65</p>	<p>Min. dimensions for matrix mounting: 1.181" (30mm) x 1.181" (30mm).</p> <p style="text-align: center;"><b>Mounting Hole</b></p>	<p>Note: Models on this page are VDE recognized and marked.</p>
<p><b>Schematic</b></p>	<p><b>Sealing</b></p>		

# AV SERIES SECURITY PUSHBUTTON SWITCHES

## SPECIFICATIONS

**Contact ratings:** Max.resistive loads: 6 A 125 VAC, 3 A 250 VAC, & 3 A 24 VAC or VDC  
**Initial contact resistance:** 10 milliohms max. at 1 A, 2 V  
**Insulation resistance:** 1000 megohms min. at 500 VDC  
**Dielectric strength:** 3000 V rms min. between terms. & frame  
**Electrical life:** 10,000 cycles at full load, 50,000 cycles min. at 1 A 24 VAC of VDC  
**Mechanical life:** 50,000 cycles min.  
**Operating temperature range:** -20°C to +55°C  
**Solder heat resistance:** 300°C max. for 5 seconds

## FEATURES

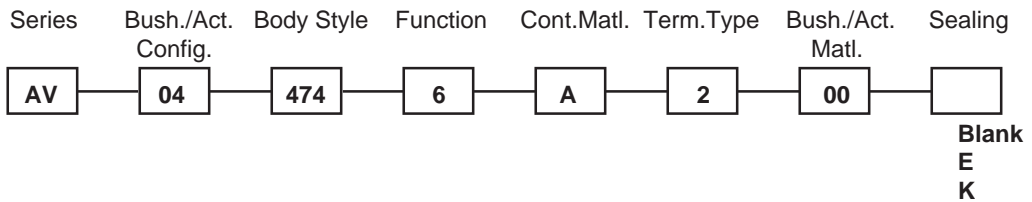
- .866" (22 mm) dia. models.
- Double pole alternate action (ON - ON).
- Standard - sealing protection per IP547 or IP549.
- Optional - sealing protection per IP657 or IP659.
- Extremely rugged and durable.

## MATERIALS

**Contacts:** Silver  
**Bushing & Actuator:** Nickel plated brass (std'd)  
**Case:** PBT    **Hex. Mounting Nut:** Nickel plated brass

C

**ORDER FORMAT:** For complete model no., fill in empty box with selected options shown below. Example of complete model no. - **AV044746A200**

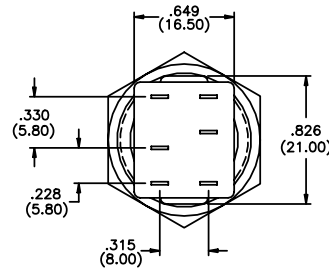
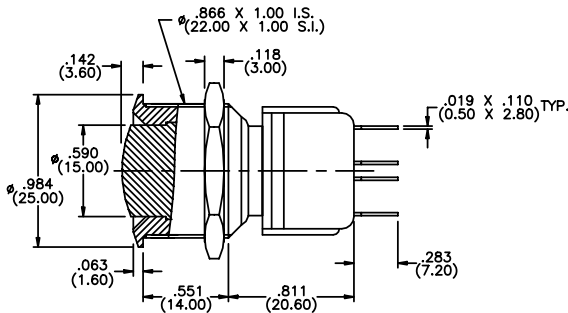


Other Bushing/Actuator materials available - flat thermoplastic Actuators available - Actuator marking available - consult factory.

## 22mm

### Bushing/Actuator configurations

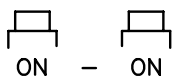
### Solder lug/quick connect terminals



**04** curved Act.& Bush.

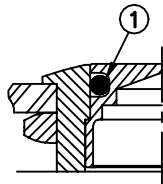


**AV044746A200  
(Model shown)**

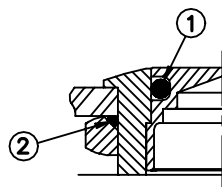


**Schematic**

**Blank** - no sealing (std'd)



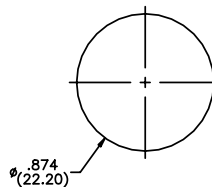
**E** ① Internal seal meets IP65



**K** ① Internal seal & ② front panel seals meet IP65

**Sealing**

Min. dimensions for matrix mounting: 1.181" (30mm) x 1.181" (30mm).



**Mounting Hole**

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

**New!**

# AV SERIES SECURITY PUSHBUTTON SWITCHES

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

C

SPECIFICATIONS	FEATURES
<p><b>Contact ratings:</b> Max. resistive loads: <b>Q</b> - 6 A 125 VAC, 3 A 250 VAC or 7 A 30 VDC. <b>B</b> - 0.4 Volt-Amps max at 20 V max.</p> <p><b>Initial contact resistance:</b> 5 mΩ max. at 3 VDC, 0.1 A</p> <p><b>Insulation resistance:</b> 200,000 megohms minimum between terminals &amp; case ground.</p> <p><b>Dielectric strength:</b> 2000 VAC min. between terminals and case ground.</p> <p><b>Electrical life:</b> 100,000 cycles min.</p> <p><b>Operating temperature range:</b> -30°C to +85°C</p> <p><b>For additional specifications:</b> See PB Series switches</p>	<ul style="list-style-type: none"> <li>● <b>.755" (19 mm) dia. models.</b></li> <li>● <b>Single pole double throw NO &amp; NC momentary action.</b></li> <li>● <b>Standard - sealing protection per IP547 or IP549.</b></li> <li>● <b>Optional - sealing protection per IP657 or IP659.</b></li> <li>● <b>Extremely rugged and durable.</b></li> </ul>
	MATERIALS
	<p><b>Contacts:</b> <b>Q</b> - Coin silver for power &amp; UL models. <b>B</b> - Gold over nickel over brass for dry circuit models.</p> <p><b>Bushing &amp; Actuator:</b> Nickel plated brass (std'd)</p> <p><b>Case:</b> Diallyl Phthalate    <b>Hex. Mounting Nut:</b> Nickel plated brass</p>

<p><b>ORDER FORMAT:</b> For complete model no., fill in boxes with selected options shown below. Example of complete model no. - <b>AV19PB1-3P2Y1ZQEK/UL</b></p>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">Series</td> <td style="border: 1px solid black; padding: 2px;">Bush./Act. Config.</td> <td style="border: 1px solid black; padding: 2px;">Body Style</td> <td style="border: 1px solid black; padding: 2px;">Term. Type</td> <td style="border: 1px solid black; padding: 2px;">Cont. Matl.</td> <td style="border: 1px solid black; padding: 2px;">Term. Seal</td> <td style="border: 1px solid black; padding: 2px;">Sealing</td> <td style="border: 1px solid black; padding: 2px;">Agency Recognition</td> </tr> <tr> <td style="border: 1px solid black; text-align: center;">AV</td> <td style="border: 1px solid black; text-align: center;">19 09 19 29 39 49</td> <td style="border: 1px solid black; text-align: center;">PB1-3P2Y1</td> <td style="border: 1px solid black; text-align: center;">Z</td> <td style="border: 1px solid black; text-align: center;">B Q</td> <td style="border: 1px solid black; text-align: center;">E</td> <td style="border: 1px solid black; text-align: center;">Blank K</td> <td style="border: 1px solid black; text-align: center;">Blank UL</td> </tr> </table>	Series	Bush./Act. Config.	Body Style	Term. Type	Cont. Matl.	Term. Seal	Sealing	Agency Recognition	AV	19 09 19 29 39 49	PB1-3P2Y1	Z	B Q	E	Blank K	Blank UL
Series	Bush./Act. Config.	Body Style	Term. Type	Cont. Matl.	Term. Seal	Sealing	Agency Recognition										
AV	19 09 19 29 39 49	PB1-3P2Y1	Z	B Q	E	Blank K	Blank UL										

19mm	Bushing/Actuator configuration	Solder lug terminals - (Z)	
<p><b>09</b> flat Act. &amp; curved Bushing</p>	<p><b>19</b> curved Act. &amp; Bushing (standard)</p>	<p><b>39</b> threaded Act. &amp; curved bushing</p>	<p><b>49</b> thd'd Act. with mushroom cap &amp; curved bushing</p>
			<p>Rear view all models</p>

<p><b>AV19PB1-3P2Y1ZQE</b> (Model shown)</p>	<p><b>Blank</b> - no sealing (std'd)</p> <p><b>K</b> ① Internal seal &amp; ② front panel seals meet IP65</p>	<p>Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).</p> <p style="text-align: center;"><b>Mounting Hole</b></p>	<p>Notes to Order Format:</p> <p><b>UL</b> option available only with Q option. UL rating: 6 A 125 VAC or 3 A 250 VAC (75% power factor). UL file E66367.</p> <p><b>E</b> option is epoxy terminal seal - standard.</p>
<p><b>Schematic</b></p>	<p><b>Sealing</b></p>		



# AV SERIES SNAP-ACTION SECURITY PB SWITCHES (LIGHTED)

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

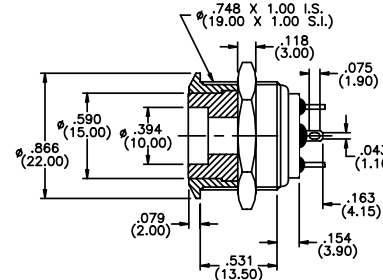
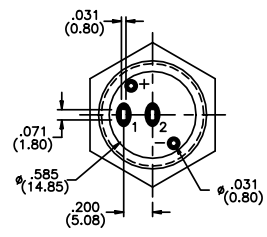
C


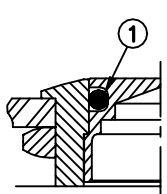
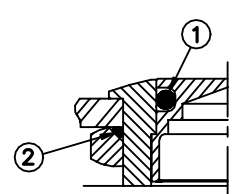
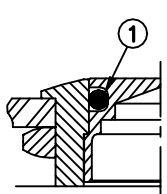
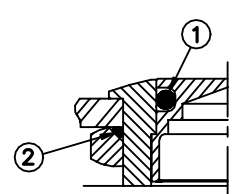
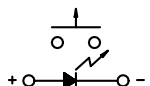
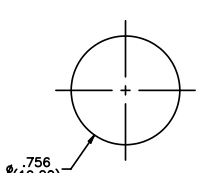
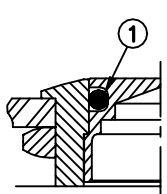
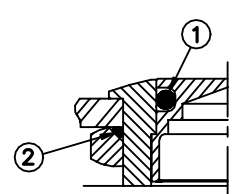
SPECIFICATIONS	FEATURES
<p><b>Contact ratings:</b> Max.resistive load: 50mA at 24 VDC  <b>Initial contact resistance:</b> 100 milliohms max.  <b>Insulation resistance:</b> 1000 megohms min. at 500 VDC  <b>Dielectric strength:</b> 500 V rms min. between terms.                      2000 V rms between terms &amp; bushing  <b>Electrical life:</b> 1,000,000 cycles at full load  <b>Operating force:</b> 25 oz. ± 7 oz.  <b>Travel:</b> .027" (0.7mm) ± .003" (0.1mm)  <b>Panel thickness:</b> .039" (1mm) to .433" (11mm)  <b>Operating temperature range:</b> -30°C to +70°C  <b>Solder heat resistance:</b> 270 °C max. for 3 seconds  <b>LED:</b> Consult factory for options &amp; specifications</p>	<ul style="list-style-type: none"> <li>● .755" (19 mm) dia. models.</li> <li>● Single pole NO momentary action.</li> <li>● Illuminated models.</li> <li>● Standard - sealing protection per IP547 or IP549.</li> <li>● Optional - sealing protection per IP657 or IP659.</li> <li>● Extremely rugged and durable.</li> </ul>
<b>MATERIALS</b>	
<p><b>Contacts:</b> Gold plated dome    <b>Terminals:</b> Gold plated brass  <b>Bushing &amp; Actuator:</b> Nickel plated brass (std'd)  <b>Case:</b> PBT    <b>Hex. Mounting Nut:</b> Nickel plated brass</p>	

**ORDER FORMAT:** For complete model no., fill in empty boxes with selected options shown below. Example of complete model no. - **AV09C7L3D2006**

Series	Bush./Act. Config.	Body Style	Function	Cont.Matl.	Term.Type	Bush./Act. Matl.	LED color	Sealing
AV	09	C7L	3	D	2	00		
							6 (red) 3 (green) 5 (yellow) 2 (red/green)	<b>Blank</b> E K

Other Bushing/Actuator materials available - consult factory.

19mm	Bushing/Actuator configurations	Solder lug terminals
	 <p style="text-align: center; margin-top: 5px;"><b>09 flat Act.&amp; curved Bush.</b></p>	 <p style="text-align: center; margin-top: 5px;">Rear view</p>

 <p style="text-align: center; margin-top: 10px;"><b>AV09C7L3D2006</b> (Model shown)</p>	<p style="text-align: center; color: red; font-weight: bold;">Blank - no sealing (std'd)</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <p style="color: red; font-weight: bold;">E</p> <p>① Internal seal meets IP65</p>  </td> <td style="width: 50%; padding: 5px;"> <p style="color: red; font-weight: bold;">K</p> <p>① Internal seal &amp; ② front panel seals meet IP65</p>  </td> </tr> </table> <p style="text-align: center; color: red; font-weight: bold; margin-top: 10px;">Sealing</p>	<p style="color: red; font-weight: bold;">E</p> <p>① Internal seal meets IP65</p> 	<p style="color: red; font-weight: bold;">K</p> <p>① Internal seal &amp; ② front panel seals meet IP65</p> 	 <p style="text-align: center; color: red; font-weight: bold;">Schematic</p> <p style="text-align: center; font-size: 0.8em;">Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).</p>  <p style="text-align: center; color: red; font-weight: bold; margin-top: 10px;">Mounting Hole</p>
<p style="color: red; font-weight: bold;">E</p> <p>① Internal seal meets IP65</p> 	<p style="color: red; font-weight: bold;">K</p> <p>① Internal seal &amp; ② front panel seals meet IP65</p> 			



**New!**

# AV SERIES SNAP-ACTION SECURITY PUSHBUTTON SWITCHES

## SPECIFICATIONS

**Contact ratings:** Max. resistive loads: **Q** - 3 A 120 VAC (and life) or 28 VDC, 1.5 A 250 VAC - 10,000 cycles min. Also 1 A 120 VAC or 28 VDC, 0.5 A 250 VAC - 250,000 cycles min. **B** - 0.4 Volt-Amps max at 20 V max. - 250,000 cycles min.

**Initial contact resistance:** 10 mΩ max. at 3 V, 0.1 A

**Insulation resistance:** 10,000 megohms min.

**Dielectric strength:** 1000 V rms min.

**Operating temperature range:** -30°C to +85°C

**For additional specifications:** See 400 Series switches

## FEATURES

- **.755" (19 mm) dia. models.**
- **Single pole ON-OFF alternate & momentary actions.**
- **Standard - sealing protection per IP547 or IP549.**
- **Optional - sealing protection per IP657 or IP659.**
- **Extremely rugged and durable.**

## MATERIALS

**Contacts:** **Q** - Coin silver for power & UL models. **B** - Gold over nickel over brass for dry circuit models.

**Bushing & Actuator:** Nickel plated brass (std'd)

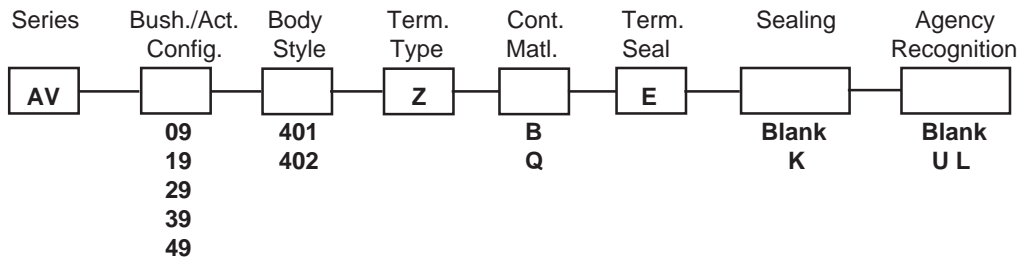
**Case:** Diallyl Phthalate **Hex. Mounting Nut:** Nickel plated brass

C

**ORDER FORMAT:** For complete model no., fill in boxes with selected options shown below.

Example of complete model no. -

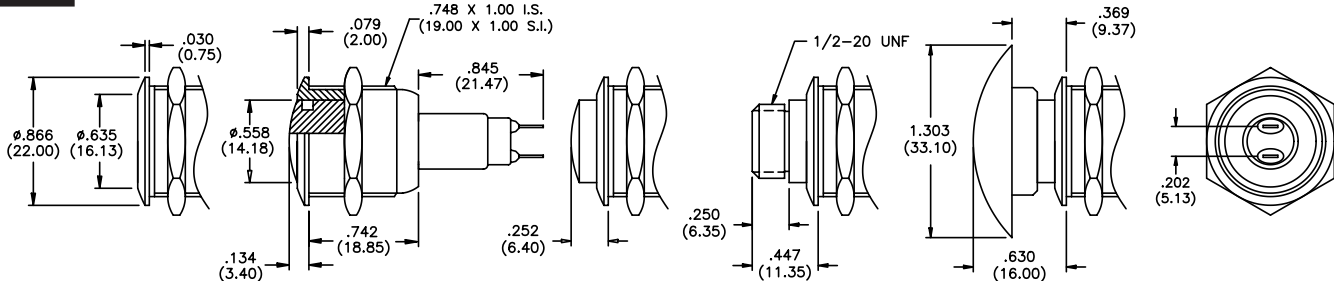
**AV19401ZQE/UL**



## 19mm

### Bushing/Actuator configuration

### Solder lug terminals - (Z)



**09** flat Act. & curved Bushing

**19** curved Act. & Bushing (standard)

**29** extended Act. & curved bushing

**39** threaded Act. & curved bushing

**49** th'd Act. with mushroom cap & curved bushing

Rear view all models

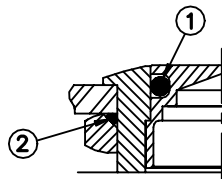


**AV19401ZQE/UL**  
(Model shown)



**Schematic**

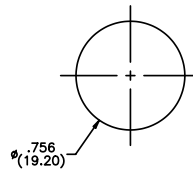
**Blank** - no sealing (std'd)



**K** ① Internal seal & ② front panel seals meet IP65

**Sealing**

Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).



**Mounting Hole**

**Notes to Order Format:**

**401** is alternate action.  
**402** is momentary action.

**401** models have .026" (0.7mm) to contact closure, .106" (2.7mm) travel to activate switch and .137" (3.5mm) total travel.

**UL** option available only with Q option. UL rating: 1 A 125 VAC or 0.5 A 250 VAC (75% power factor). UL file E66367.

**E** option is epoxy terminal seal - standard.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.



**New!**

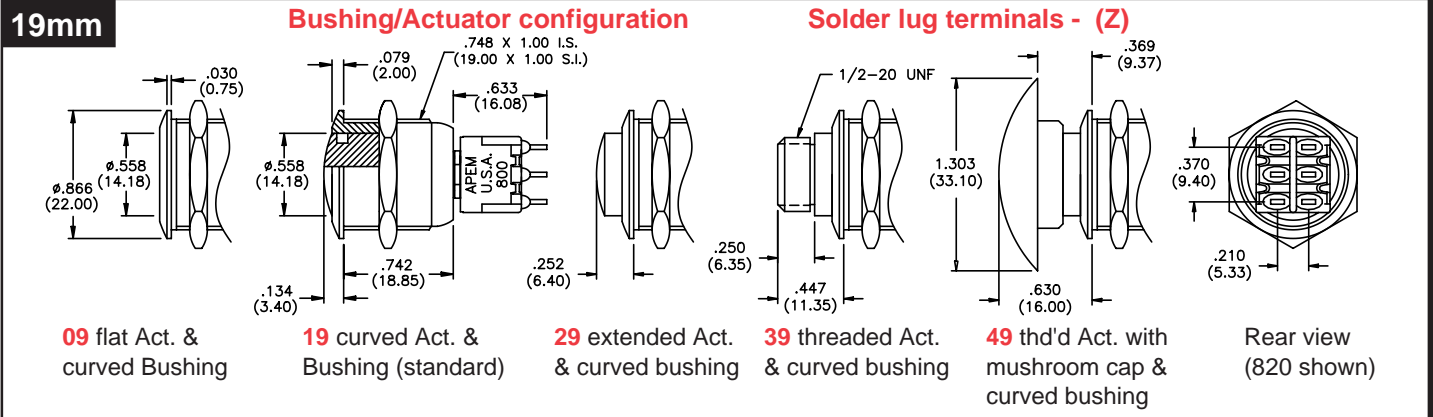
# AV SERIES SNAP-ACTION SECURITY PUSHBUTTON SWITCHES

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

C

SPECIFICATIONS	FEATURES
<p><b>Contact ratings:</b> Max. resistive loads: <b>Q</b> - 6 A 125 VAC, 3 A 250 VAC or 7 A 30 VDC. <b>B</b> - 0.4 Volt-Amps max at 20 V max.</p> <p><b>Initial contact resistance:</b> 20 mΩ max. at 3 VDC, 0.1 A</p> <p><b>Insulation resistance:</b> 200,000 megohms minimum between terminals &amp; case ground.</p> <p><b>Dielectric strength:</b> 1500 VAC min. between terminals and case ground.</p> <p><b>Electrical life:</b> 60,000 cycles min.</p> <p><b>Operating temperature range:</b> -30°C to +85°C</p> <p><b>For additional specifications:</b> See 800 Series switches</p>	<ul style="list-style-type: none"> <li>● <b>.755" (19 mm) dia. models.</b></li> <li>● <b>SPDT and DPDT with NO &amp; NC momentary action.</b></li> <li>● <b>Standard - sealing protection per IP547 or IP549.</b></li> <li>● <b>Optional - sealing protection per IP657 or IP659.</b></li> <li>● <b>Extremely rugged and durable.</b></li> </ul>
<b>MATERIALS</b>	
<p><b>Contacts:</b> <b>Q</b> - Coin silver for power &amp; UL models. <b>B</b> - Gold over nickel over brass for dry circuit models.</p> <p><b>Bushing &amp; Actuator:</b> Nickel plated brass (std'd)</p> <p><b>Case:</b> Diallyl Phthalate    <b>Hex. Mounting Nut:</b> Nickel plated brass</p>	

<p><b>ORDER FORMAT:</b> For complete model no., fill in boxes with selected options shown below.</p> <p>Example of complete model no. - <b>AV19810KMZQK/UL</b></p>	<table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px;">Series</td> <td style="border: 1px solid black; padding: 5px;">Bush./Act. Config.</td> <td style="border: 1px solid black; padding: 5px;">Body Style</td> <td style="border: 1px solid black; padding: 5px;">Term. Type</td> <td style="border: 1px solid black; padding: 5px;">Cont. Matl.</td> <td style="border: 1px solid black; padding: 5px;">Sealing</td> <td style="border: 1px solid black; padding: 5px;">Agency Recognition</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;"><b>AV</b></td> <td style="border: 1px solid black; padding: 5px;"> <div style="border: 1px solid black; width: 30px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; margin: 2px auto;"></div> </td> <td style="border: 1px solid black; padding: 5px;"> <div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div> </td> <td style="border: 1px solid black; padding: 5px;"><b>Z</b></td> <td style="border: 1px solid black; padding: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px auto;"></div> </td> <td style="border: 1px solid black; padding: 5px;"> <div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div> </td> <td style="border: 1px solid black; padding: 5px;"> <div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div> </td> </tr> <tr> <td></td> <td style="padding: 5px;"><b>09</b> <b>19</b> <b>29</b> <b>39</b> <b>49</b></td> <td style="padding: 5px;"><b>810KM</b> <b>820KM</b></td> <td></td> <td style="padding: 5px;"><b>B</b> <b>Q</b></td> <td style="padding: 5px;"><b>Blank</b> <b>K</b></td> <td style="padding: 5px;"><b>Blank</b> <b>U L</b></td> </tr> </table>	Series	Bush./Act. Config.	Body Style	Term. Type	Cont. Matl.	Sealing	Agency Recognition	<b>AV</b>	<div style="border: 1px solid black; width: 30px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; margin: 2px auto;"></div>	<div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div>	<b>Z</b>	<div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px auto;"></div>	<div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div>	<div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div> <div style="border: 1px solid black; width: 60px; height: 20px; margin: 2px auto;"></div>		<b>09</b> <b>19</b> <b>29</b> <b>39</b> <b>49</b>	<b>810KM</b> <b>820KM</b>		<b>B</b> <b>Q</b>	<b>Blank</b> <b>K</b>	<b>Blank</b> <b>U L</b>
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<p><b>AV19820KMZQ/UL (Model shown)</b></p>	<p><b>Blank</b> - no sealing (std'd)</p>	<p>Min. dimensions for matrix mounting: .984" (25mm) x .984" (25mm).</p>	<p><b>Notes to Order Format:</b></p> <p>810KM is SPDT</p> <p>820KM is DPDT</p> <p><b>UL</b> option available only with Q option. UL rating: 6 A 125 VAC or 3 A 250 VAC (75% power factor). UL file E66367.</p> <p>Epoxy terminal seal is standard on all models.</p>
<p><b>Schematic</b></p>	<p><b>K</b> ① Internal seal &amp; ② front panel seals meet IP65</p> <p><b>Sealing</b></p>	<p><b>Mounting Hole</b></p>	