



# Pushbuttons

## Product Selection Guide

<b>Pushbutton</b>									
<b>Series</b>	<b>ELUM</b>	<b>EP</b>	<b>TP</b>	<b>E020</b>	<b>8020</b>	<b>E010</b>	<b>8060</b>	<b>8500</b>	<b>KM</b>
<b>Switch Type</b>	Mom./Latching	Tiny	Tiny	Snap-acting Mom.	Snap-acting Mom.	Miniature	Alternate Action	Sub-miniature	Sub-miniature
<b>Poles/Throws</b>	SPDT	SPST, SPDT, DPST	SPST, SPDT, DPST	SPDT, DPDT	SPDT, DPDT, 3PDT, 4PDT	SPDT	SPDT, DPDT	SPST	SPST, SPDT
<b>Max. Current</b>	3.5 VA	1 Amp	1 Amp	1 Amp	1 Amp	4 Amps	6 Amps	3 Amps	1 Amp
<b>Process Sealed</b>		•		•		•			
<b>Illuminated</b>	•				•		•	•	
<b>PCB Mount Options</b>									
Thru-hole	•	•	•	•	•	•	•	•	•
Vertical		•	•	•	•	•	•	•	•
Right Angle	•	•	•	•	•	•	•	•	•
Surface Mount	•	•							
<b>Panel Mount</b>			•		•	•	•	•	•
<b>Page No.</b>	A-3	A-9	A-15	A-21	A-29	A-46	A-52	A-62	A-67

<b>Pushbutton</b>							
<b>Series</b>	<b>8600</b>	<b>8700</b>	<b>GP</b>	<b>PN</b>	<b>PHA</b>	<b>F</b>	<b>NE-18</b>
<b>Switch Type</b>	Micro-miniature	Over Travel	Ultra-miniature	Alternate & Mom. Action	Short Stroke	Alternate & Mom. Action	Mains / Power
<b>Poles/Throws</b>	SPST	SPST	SPST, SPDT	SPDT, DPDT, 4PDT	DPDT, 4PDT, 6PDT	DPDT, 4PDT, 6PDT, 8PDT, 10PDT	DPST, DPDT, Varied
<b>Max. Current</b>	500 mA	1 Amp	0A V	200 mA	100 mA	500 mA	6 A
<b>Process Sealed</b>			•				
<b>PCB Mount Options</b>							
Thru-hole	•	•	•	•	•	•	•
Vertical	•	•	•				
Right Angle			•	•	•	•	•
Surface Mount			•				
<b>Panel Mount</b>	•	•				•	•
<b>Page No.</b>	A-71	A-74	A-77	A-81	A-84	A-88	A-98



**A**  
Pushbutton

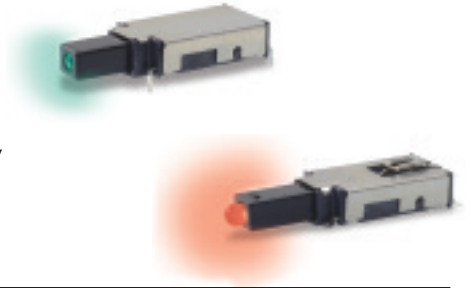
Patent Numbers  
6,974,924 B2 US  
EP1583118B1 Europe

**Features/Benefits**

- SPDT (N.O. & N.C.)
- Low height above PCB
- Reliable self-cleaning contact
- Surface-mount or thru-hole PCB
- Standard or custom actuator
- Central LED illumination
- Latching or Momentary
- Long travel. Smooth feel
- RoHS compliant and compatible

**Typical Applications**

- Telecom network equipment
- Automotive electronics
- Consumer electronics
- Computer, server, modem, data storage
- Professional instrumentation, medical



**Materials**

FIXED CONTACTS AND TERMINALS: Stainless steel, silver plated with gold flash (STD.)  
MOVABLE CONTACTS: Copper alloy, silver plated with gold flash (STD.)  
BASE: Glass filled LCP (UL94V-0)  
ACTUATOR: Glass filled nylon 4/6 (UL94V-0)  
COVER: Stainless steel

**Electrical**

MAXIMUM POWER: 3.5 VA  
MIN./MAX. VOLTAGE: 20 mV – 50 VDC  
MIN./MAX. CURRENT: 0.01 mA – 250 mA  
DIELECTRIC STRENGTH: ≥ 250 Vrms  
CONTACT RESISTANCE: ≤ 50 mΩ  
INSULATION RESISTANCE: ≥ 10<sup>9</sup> Ω  
BOUNCE TIME: ≤1 ms  
LED SPECIFICATIONS: See page A-5

**Mechanical**

OPERATING FORCE: 2.5 N at Full Travel  
SWITCHING TRAVEL: .067" (1.7 mm)  
LATCH TRAVEL: .131" (3.6 mm)  
FULL TRAVEL: .200" (5.1 mm)

**Operating Environment**

OPERATING TEMPERATURE: -40°C TO 80°C.  
STORAGE TEMPERATURE: -40°C TO 80°C.  
RELATIVE HUMIDITY: 90% R.H. @ 80°C.  
OPERATING LIFE: 30,000 Cycles.  
VIBRATION: Per EIA 186-E Methods 7 & 8  
MECHANICAL SHOCK: Per EIA 186-E Method 12.  
OVERLOAD: Withstands 40 N for 1 minute without damage

**Process Environment**

SOLDERABILITY: According to Mil STD 202F Method 208D or EIA RS-186E Method 9.  
LEAD FREE PROCESS COMPATIBLE: 260°C peak, 10 seconds Max. above 250° C.  
WASHING PROCESS: No clean process compatible (SMT)  
Bottom wash compatible (Thru-hole)  
SHEAR TEST (SWITCH/PCB): > 40 N

**Packaging**

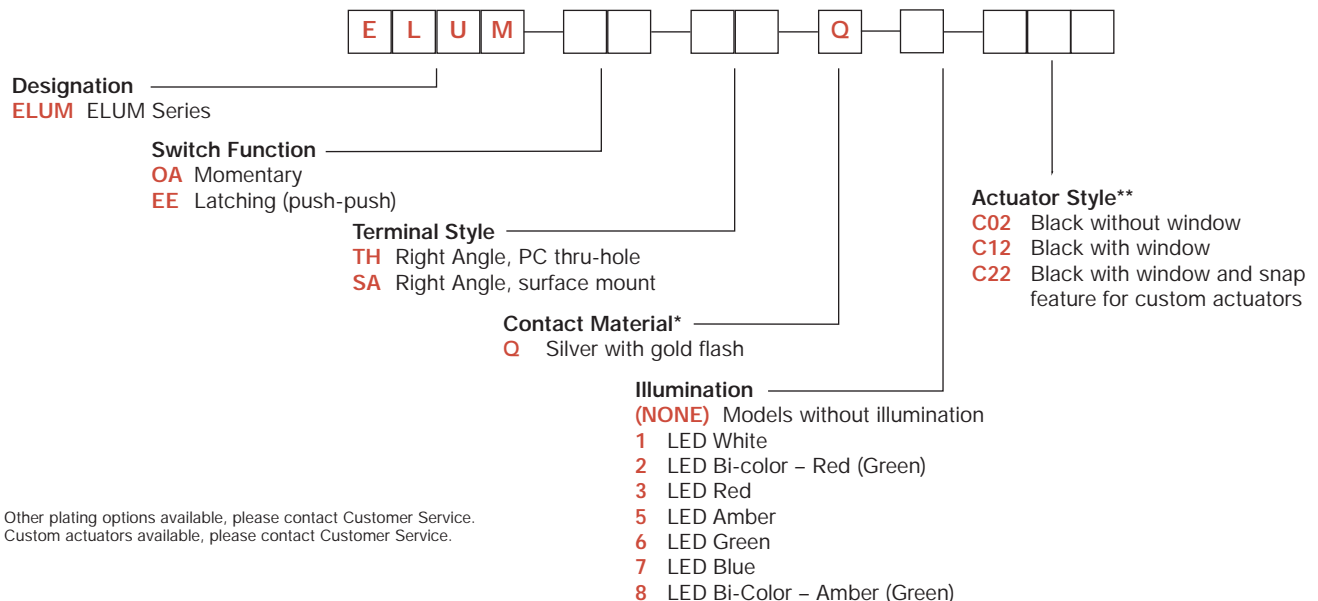
"SA" Terminal Style SMT: Tape and reel per EIA 481-2 (450/reel)  
"TH" Terminal Style PC: Tray (60/tray)

**NOTE:** Any models supplied with Q, contact material are RoHS compliant.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, please contact Customer Service.

**Build-A-Switch**

To order, simply select desired option from each category and place in the appropriate box.



\* Other plating options available, please contact Customer Service.  
\*\* Custom actuators available, please contact Customer Service.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

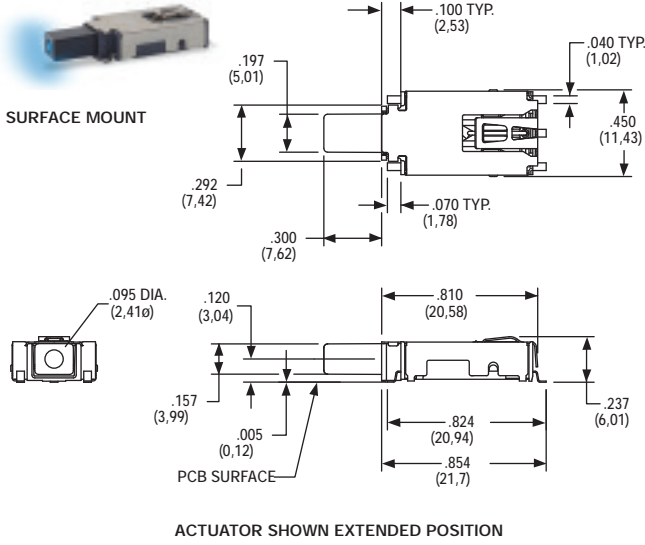


# ELUM™ Series Right Angle Illuminated Latching Pushbutton

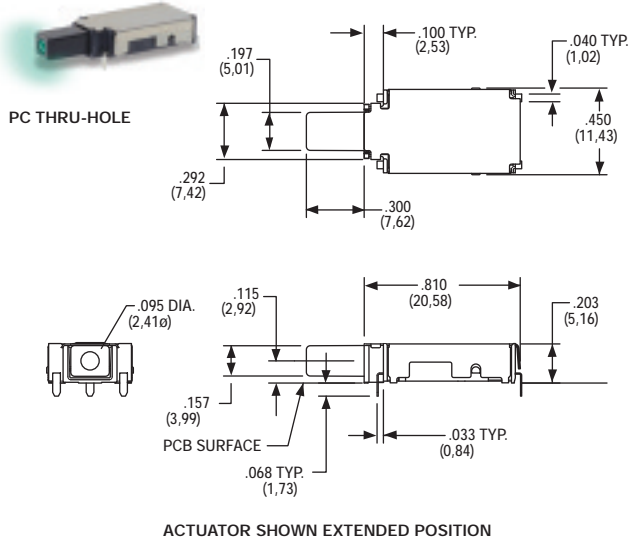
## STANDARD OPTIONS

Pushbutton  
A

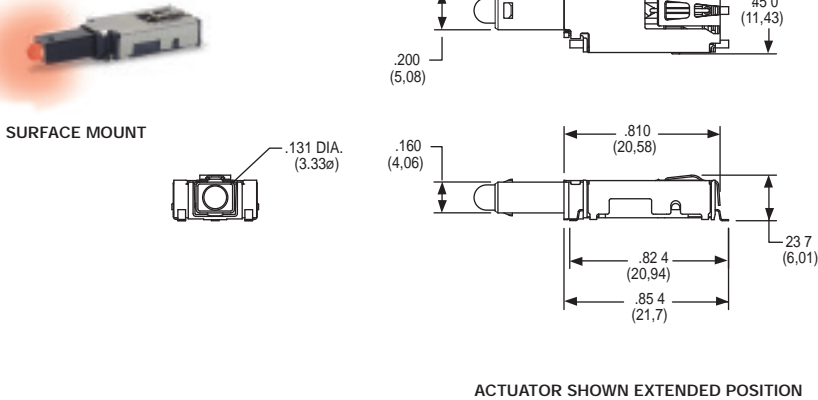
### ELUMEESAQ7C12



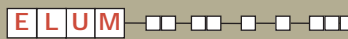
### ELUMOATHQ6C12



### ELUMEESAQ3C22



## DESIGNATION



**ELUM** ELUM SERIES, Illuminated Latching Pushbutton

## SWITCH FUNCTION

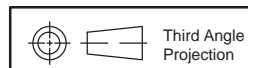
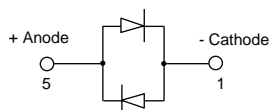


OPTION CODE	NO. OF POLES	SWITCH FUNCTION	CONNECTED TERMINALS	POSITION 1	POSITION 2	CONNECTED TERMINALS	SCHMATIC
<b>OA</b>	SP Momentary	ON	3 - 4			3 - 2	
<b>EE</b>	SP Latching (Push-Push)	ON	3 - 4			3 - 2	

For SPST N.O. function, only terminals 3 & 2 are used.  
For SPST N.C. function, only terminals 3 & 4 are used.  
Circuit: Make before break

LED pins 1 & 5 are independent of switch function.

NOTE:  
For bi-color LED's the polarity must be reversed to alternate the color



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



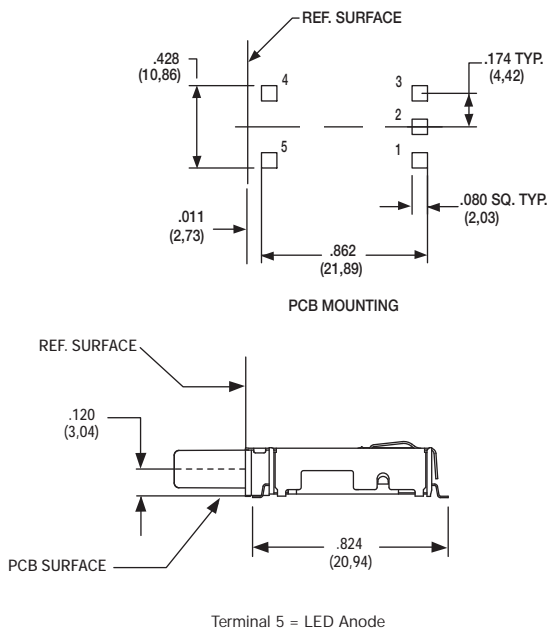
# ELUM™ Series Right Angle Illuminated Latching Pushbutton



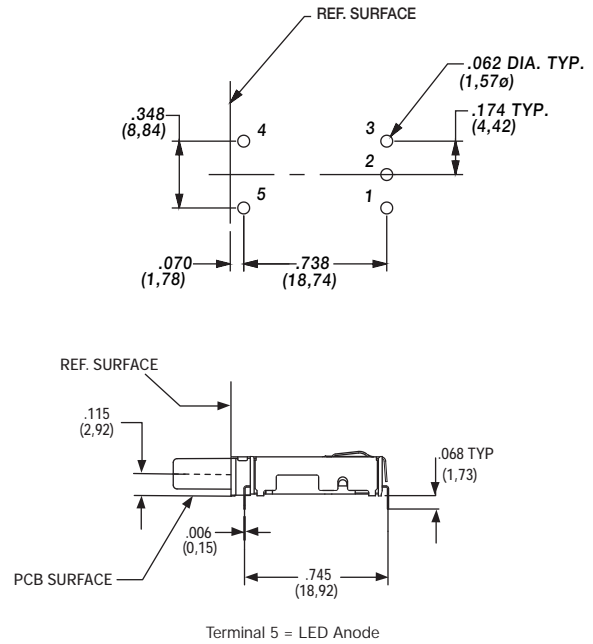
A

Pushbutton

## SA RIGHT ANGLE, SURFACE MOUNT



## TH RIGHT ANGLE, PC THRU-HOLE



## CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS
Q	SILVER WITH GOLD FLASH	SILVER WITH GOLD FLASH	250 mA

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

FIXED CONTACTS AND TERMINALS: Stainless steel, silver plated with gold flash

MOVABLE CONTACTS: Copper alloy, silver plated with gold flash

**NOTE:** Any models supplied with Q, contact material are RoHS compliant.

## ILLUMINATION

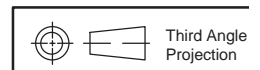
OPTION CODE	ILLUMINATION TYPE	TYPICAL INTENSITY*		PEAK WAVELENGTH	VIEWING ANGLE
		MIN	MAX		
		(mcd)		(nm)	
(NONE)	Model without illumination	N/A		N/A	N/A
1	LED Super White	4,000	5,000	N/A	30°
2	LED Bi-Color – Red (Green)	10	20	635/565	60°
3	LED Red	4	8	700	60°
5	LED Amber	35	50	610	60°
6	LED Green	35	50	565	60°
7	LED Super Blue	800	1,500	470	22°
8	LED Bi-Color – Amber (Green)	10	10	585/565	60°

\*LED FORWARD CURRENT: 20 mA

LED FORWARD VOLTAGE: 2.0 V TYP.

LED REVERSE VOLTAGE: 5.0 V MAX

\* For information on specific and custom LED, please contact Customer Service.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



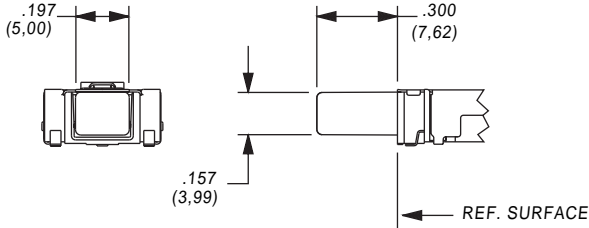
# ELUM™ Series Right Angle Illuminated Latching Pushbutton

## ACTUATOR STYLE\*

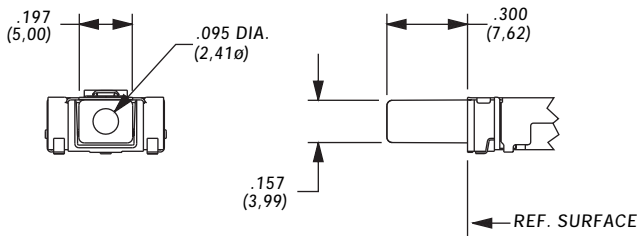


Pushbutton  
A

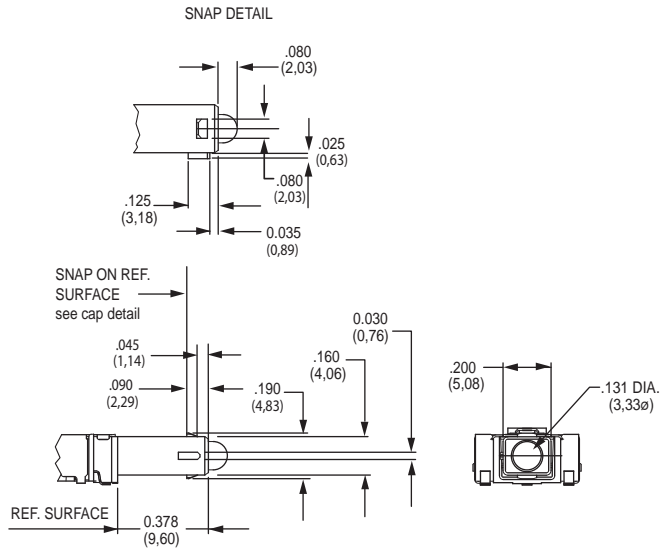
### C02 BLACK WITHOUT WINDOW



### C12 BLACK WITH WINDOW

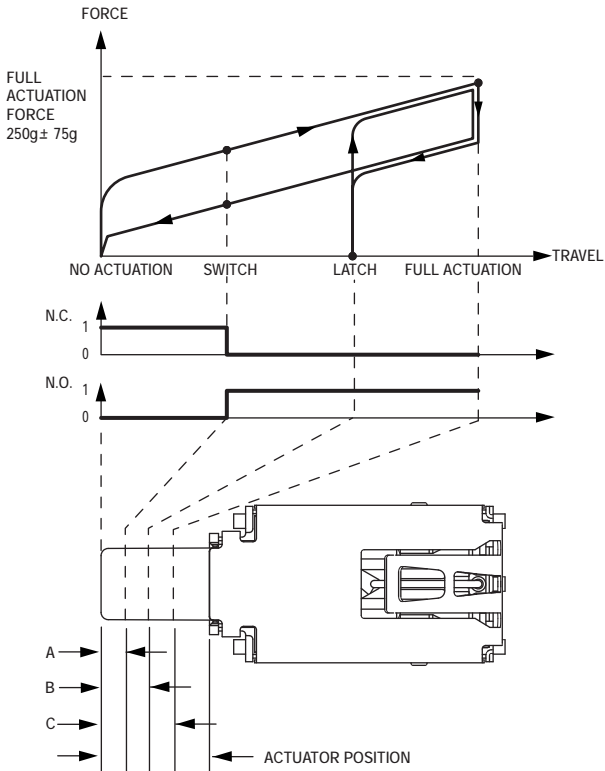


### C22 BLACK WITH WINDOW AND SNAP FEATURE TO ACCEPT CUSTOM CAP



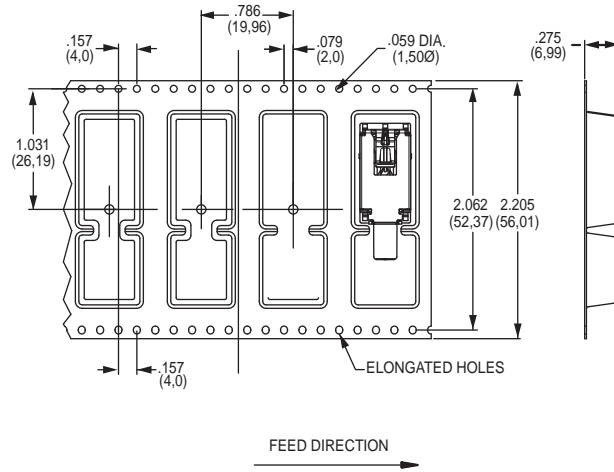
\* Custom actuators available, please contact Customer Service.

## FORCE TRAVEL DIAGRAM



ACTUATOR POSITION			
A	SWITCH	.067 ± .020	1,7 ± 0.5mm
B	LATCH	.131 ± .020	3,3 ± 0.5mm
C	FULL ACTUATION	.200 ± .020	5,1 ± 0.5mm

## TAPE & REEL



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

www.ck-components.com

# ELUM™ Series Right Angle Illuminated Latching Pushbutton



A

Pushbutton

## AVAILABLE HARDWARE

Cap



**PART NO.**

**957C00000** High temperature black cap with universal standby symbol

**956C02000** High temperature black cap with no symbol

Material: 4/6 Nylon SMT compatible

Cap



**PART NO.**

**181D01000** Paint and Laser Etched with black paint and universal standby symbol

Material: Clear polycarbonate

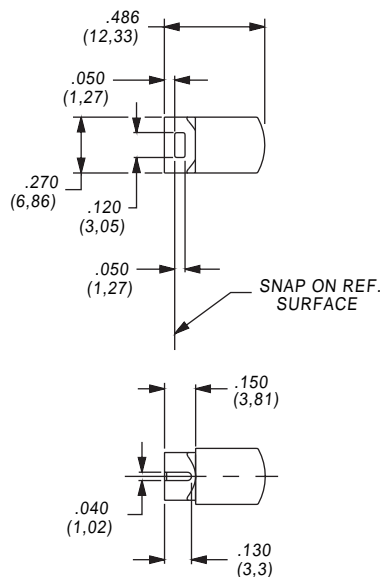
Cap



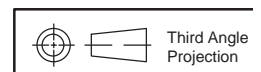
**PART NO.**

**181D00000** Paint and laser etched with white paint underlay and black paint with universal standby symbol.

Material: Clear polycarbonate



**NOTE:** Caps are for use with the C22 actuator style. Other colors and symbols available, consult Customer Service Center.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

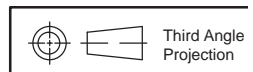
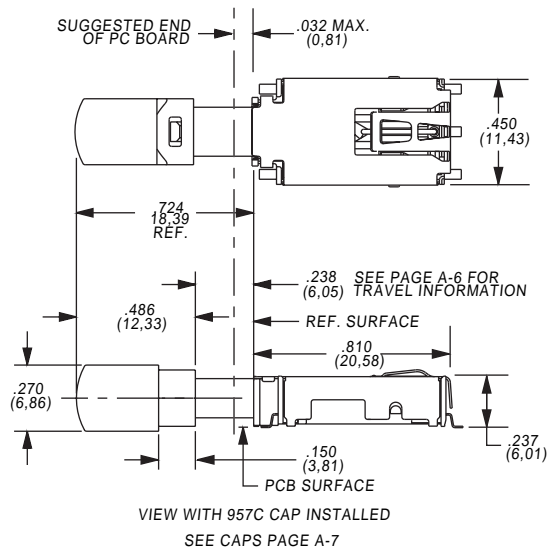




# ELUM™ Series Right Angle Illuminated Latching Pushbutton

## CAP INSTALLATION

Pushbutton  
A



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# EP Series Sealed Tiny Pushbutton Switches



## Features/Benefits

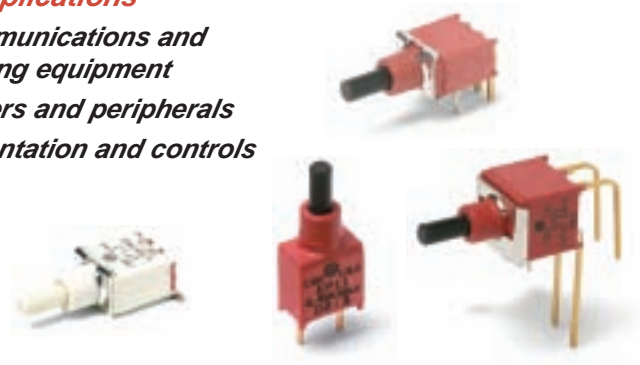
- Sealed against solder & cleaning processes
- Thru-hole and surface mount models
- Snap-fitting actuator accepts standard caps
- Tape & reel packaging available
- RoHS compliant models available



Models Available

## Typical Applications

- Telecommunications and networking equipment
- Computers and peripherals
- Instrumentation and controls



## Specifications

**CONTACT RATING:** B contact material: 0.4 VA max. @ 20 V AC or DC max. See page A-13 for additional ratings.

**ELECTRICAL LIFE:** EP11, EP21 models: 60,000 make-and-break cycles at full load. EP12 models: 30,000 cycles.

**CONTACT RESISTANCE:** Below 20 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

**INSULATION RESISTANCE:** 10<sup>9</sup> Ω min.

**DIELECTRIC STRENGTH:** 1000 Vrms min. @ sea level.

**OPERATING TEMPERATURE:** -30°C to 85°C.

**SOLDERABILITY:** Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

**DEGREE OF PROTECTION:** IP57; Protection against harmful dust deposit, full-scale voltage protection, temporary immersion.

**PACKAGING:** Surface mount switches standard in anti-static tape and reel packaging per EIA 481-3, see page A-14 for drawings and reel information. Tape and cover strip are conductive for use near statically sensitive components, consult Customer Service Center.

## Materials

**CASE & BUSHING:** High temperature material, glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0) on SMT models; glass filled nylon 6/6 on PC Through Hole models.

**PLUNGER:** Thermoplastic polyester or glass filled nylon (UL 94V-0), with internal o-ring seal. SA surface mount: High temperature material, glass filled LCP (UL 94V-0).

**SWITCH SUPPORT:** Brass, matte-tin plated.

**CONTACTS & TERMINALS:** B contact material: Copper alloy, with gold plate over nickel plate. See page A-13 for additional contact materials.

**TERMINAL SEAL:** Epoxy.

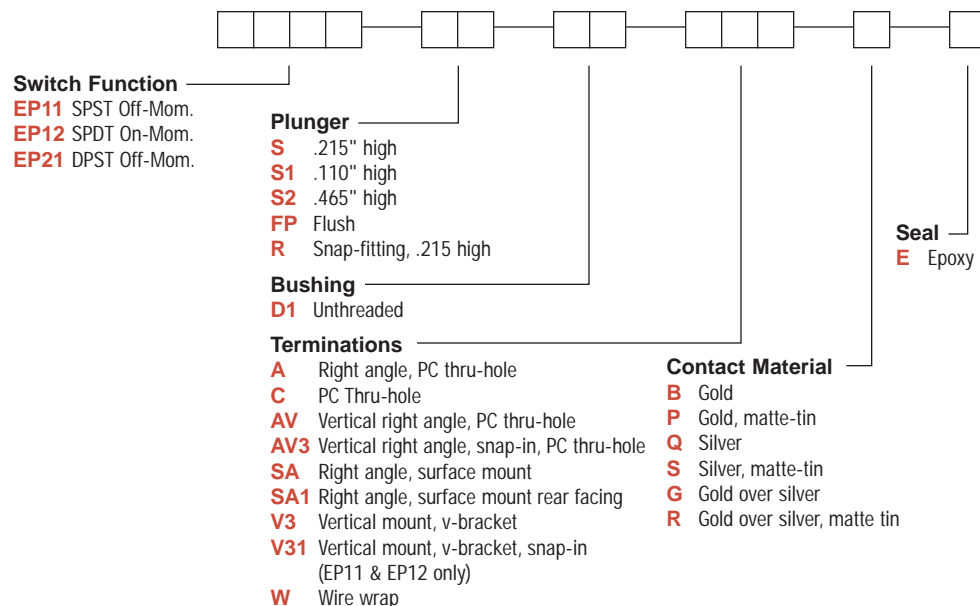
**NOTE:** Any models supplied with Q, B, P, S, R or G contact material are RoHS compliant.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

**CAUTION:** PC mounting layouts and pads as shown are designed to be compatible with the latest equipment and reflow techniques. Care should be taken in the design and location of PC lands to suit individual needs. Orientation relative to reflow direction may significantly impact solder joint integrity.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-10 thru A-14. For additional options not shown in catalog, consult Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





# EP Series Sealed Tiny Pushbutton Switches

Pushbutton  
A

## SWITCH FUNCTION

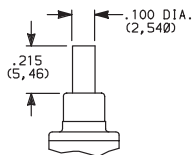
NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
		C&K marking on opposite side		C&K marking on opposite side		
SP	EP11	OFF	MOM.	OPEN	1-3	
	EP12	ON	MOM.	2-1	2-3	
<b>SPDT</b> <p>Part number shown: EP12SD1CBE</p> <p>Terminal Nos. For Reference Only</p>						
DP	EP21	OFF	MOM.	OPEN	1-3,4-6	
<b>DPST</b> <p>Part number shown: EP21SD1CBE</p> <p>Terminal Nos. For Reference Only</p>						

MOM. = Momentary

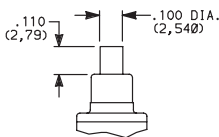
All models with all options when ordered with G, L, M Q, R or S contact material.

## PLUNGER

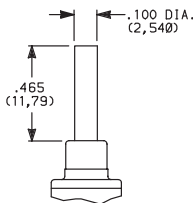
**S** .215" HIGH



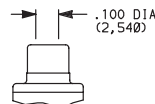
**S1** .110" HIGH



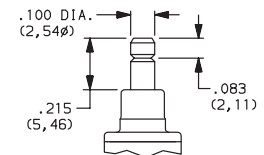
**S2** .465" HIGH



**FP** FLUSH PLUNGER



**R** SNAP-FITTING



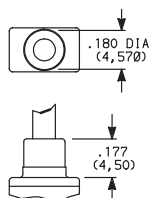
S1 & S2 actuators are not available with EP12 & EP21 models or SA1 termination style.

FP & R actuators are not available with EP21 model or SA1 termination style.

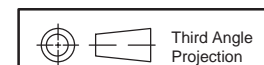
**NOTE:** Caps available for plunger options, see page A-14.

## BUSHING

**D1** UNTHREADED



**NOTE:** Internal actuator o-ring standard.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# EP Series Sealed Tiny Pushbutton Switches



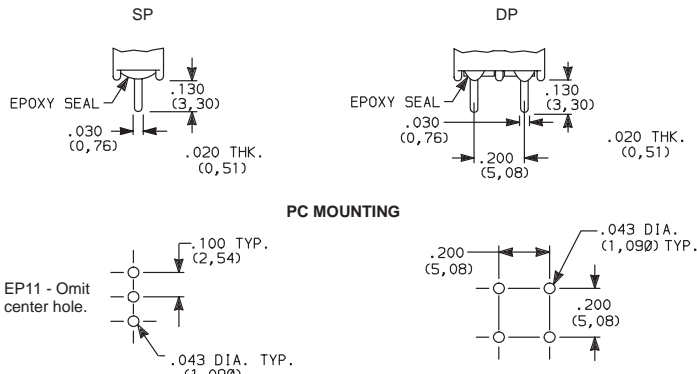
A

Pushbutton

## TERMINATIONS

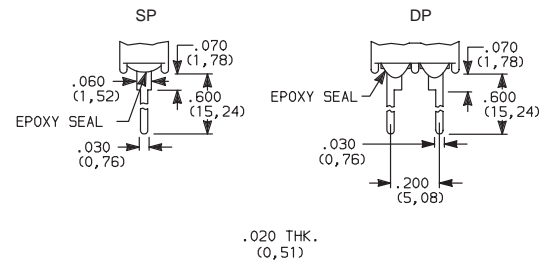


### C PC THRU-HOLE



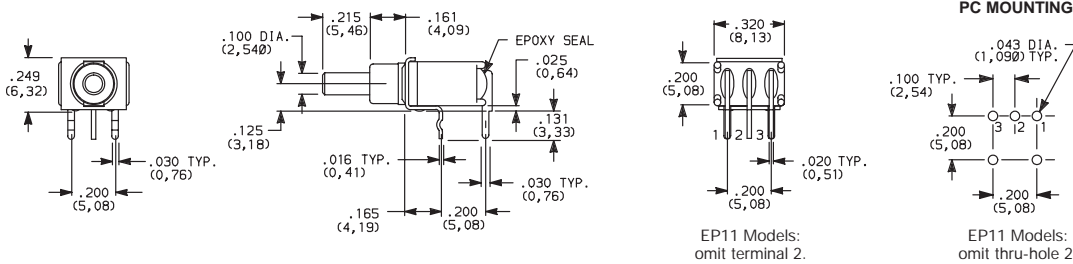
### SP and DP

### W WIRE WRAP



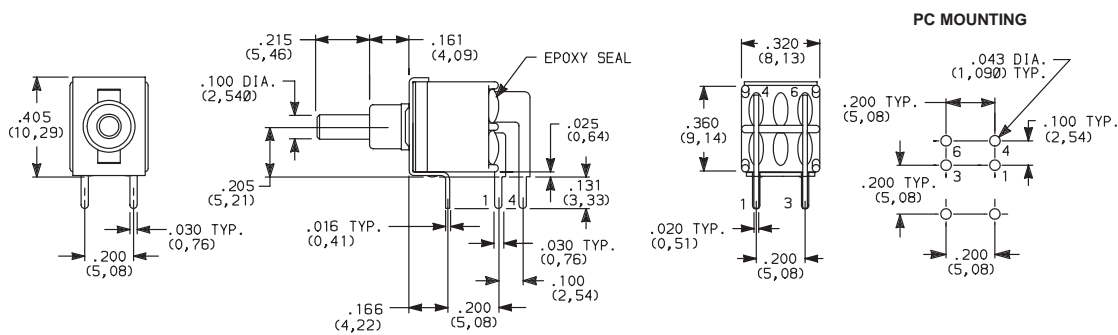
### SP and DP

### A RIGHT ANGLE, PC THRU-HOLE



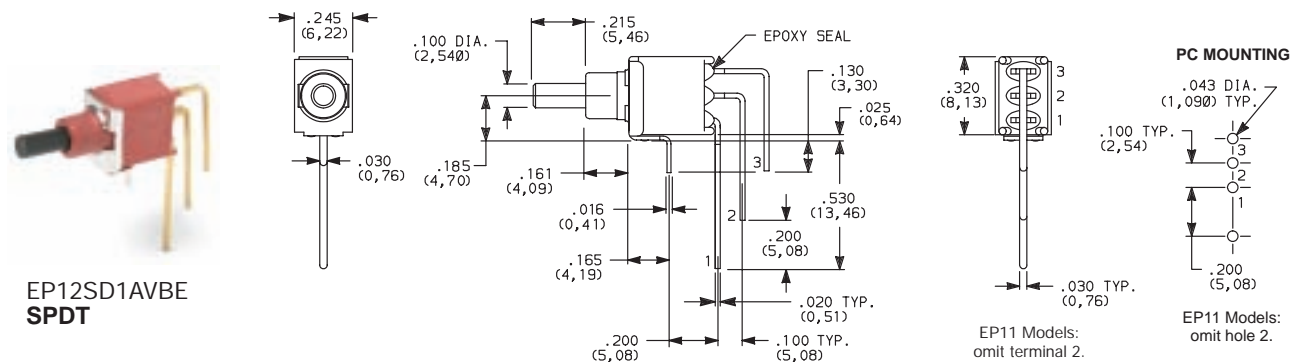
EP12SD1ABE  
SPDT

### A RIGHT ANGLE, PC THRU-HOLE



EP21SD1ABE  
DPST

### AV VERTICAL RIGHT ANGLE, PC THRU-HOLE



EP12SD1AVBE  
SPDT

NOTE: Terminal bend radii and lead-in manufacturing option.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





# EP Series Sealed Tiny Pushbutton Switches

## TERMINATIONS



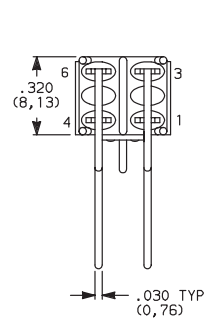
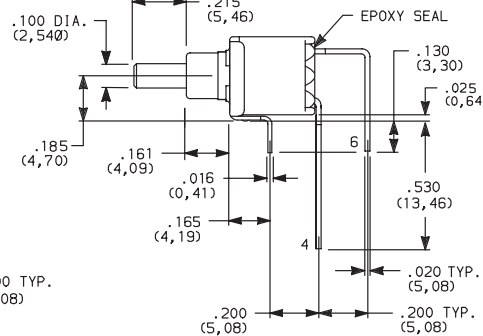
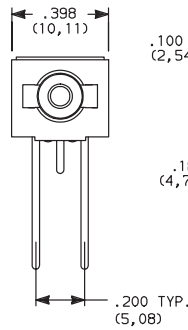
Pushbutton

A

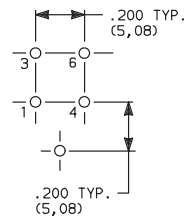
### AV VERTICAL RIGHT ANGLE, THRU-HOLE



EP21SD1AVBE  
DPST



#### PC MOUNTING

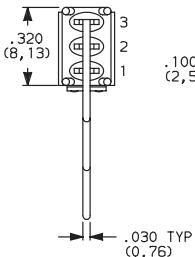
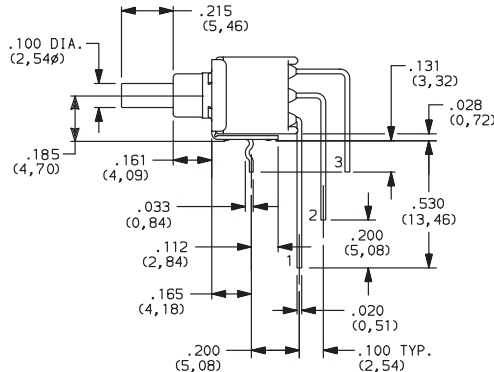
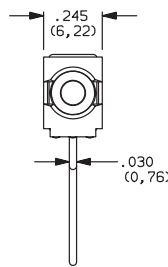


NOTE: Terminal bend radii and lead-in manufacturing option.

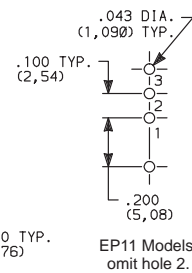
### AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



EP12SD1AV3BE  
SPST



#### PC MOUNTING

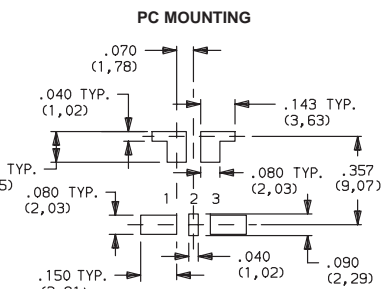
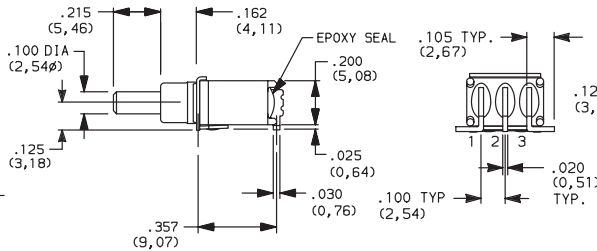
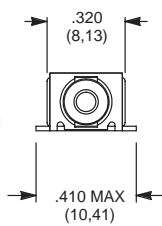


### SA RIGHT ANGLE, SURFACE MOUNT

#### SMT



EP12SD1SAPE  
SPDT



#### PC MOUNTING

EP11 Models:  
omit pad 2.

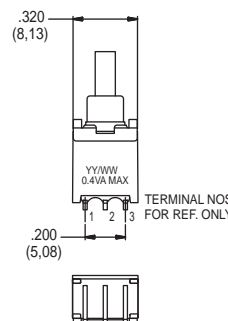
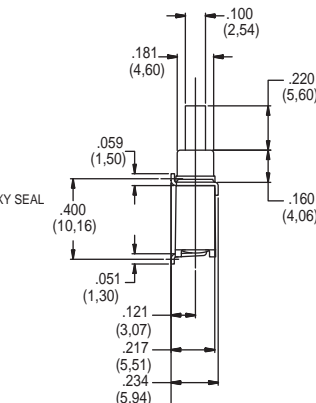
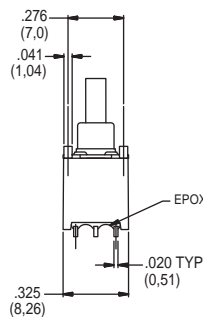
Available with P contact material only.  
Not Available on DPST models.

EP11 Models:  
omit terminal 2.

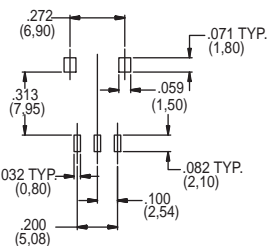
### SA1 RIGHT ANGLE, SURFACE MOUNT



EP12SD1SA1BE  
SPDT



#### PC MOUNTING



SA1 is only available with B contact materials option + S plunger.  
Not Available on DPST models.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# EP Series Sealed Tiny Pushbutton Switches



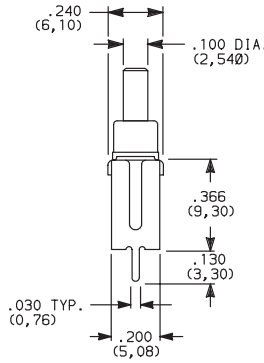
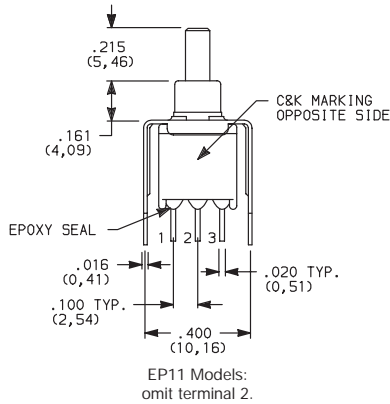
A

Pushbutton

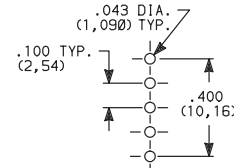
## TERMINATIONS

**V3** VERTICAL MOUNT, V-BRACKET

**V31** VERTICAL MOUNT, V-BRACKET, SNAP-IN



PC MOUNTING

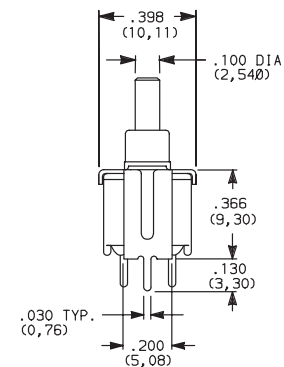
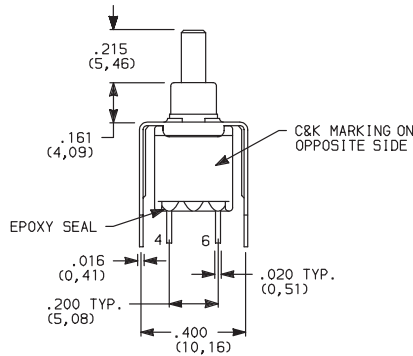


EP11 Models:  
omit centerhole.

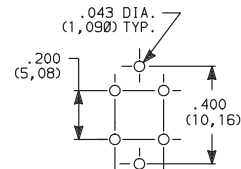


EP12SD1V3BE  
SPDT

**V3** VERTICAL MOUNT, V-BRACKET



PC MOUNTING



EP21SD1V3BE  
DPST

## CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
<b>B</b>	GOLD <sup>1</sup>	GOLD <sup>1</sup>	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
<b>P</b>		MATTE-TIN <sup>6</sup>		
<b>Q</b>	SILVER <sup>4,5</sup>	SILVER <sup>5</sup>	POWER	1 AMP @ 120 V AC OR 28 V DC.
<b>S</b>		MATTE-TIN <sup>6</sup>		
<b>G</b>	GOLD OVER SILVER <sup>2,3</sup>	GOLD <sup>3</sup>	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC.
<b>R</b>		MATTE-TIN <sup>6</sup>		

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

<sup>1</sup> CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

<sup>2</sup> END CONTACTS: Coin silver, with gold plate over nickel plate.

<sup>3</sup> CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

<sup>4</sup> END CONTACTS: Coin silver, silver plated.

<sup>5</sup> CENTER CONTACT & ALL TERMINALS: Copper alloy, silver plated.

<sup>6</sup> TERMINALS: Copper alloy, with matte tin over nickel plate.

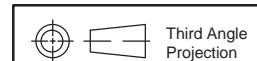
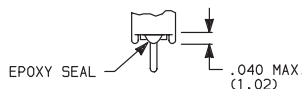
**NOTE:** Any models supplied with Q, B, P, S, R or G contact material are RoHS compliant.

All models with all options when ordered with G, L, M, S, R or Q contact material.

K, L and M options represent Non RoHS tin lead product and are not recommended for new designs. For additional information please contact Customer Service.

## SEAL

**E** EPOXY SEAL



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



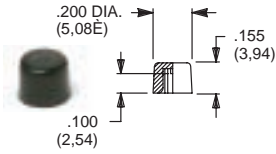


# EP Series Sealed Tiny Pushbutton Switches

## AVAILABLE HARDWARE

Pushbutton  
A

Cap



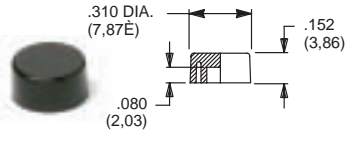
**PART NO.**

- 508101000** WHITE
- 508102000** BLACK
- 508103000** RED

Material: Nylon  
Finish: Gloss

Not for use on S1 plunger

Cap



**PART NO.**

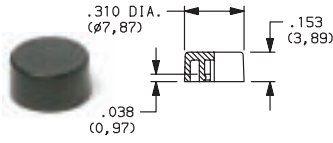
- 465801000** WHITE
- 465802000** BLACK
- 465803000** RED

Material: Nylon  
Finish: Gloss

Not for use on S1 plunger

Cap

Compatible with snap-fitting plungers  
EP11 & EP12 Models. R option only.



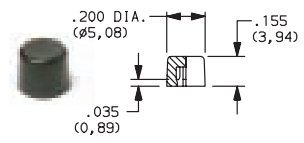
**PART NO.**

- 585A01000** WHITE
- 585A02000** BLACK
- 585A03000** RED

Material: Nylon  
Finish: Gloss

Cap

Compatible with snap-fitting plungers  
EP11 & EP12 Models. R option only.



**PART NO.**

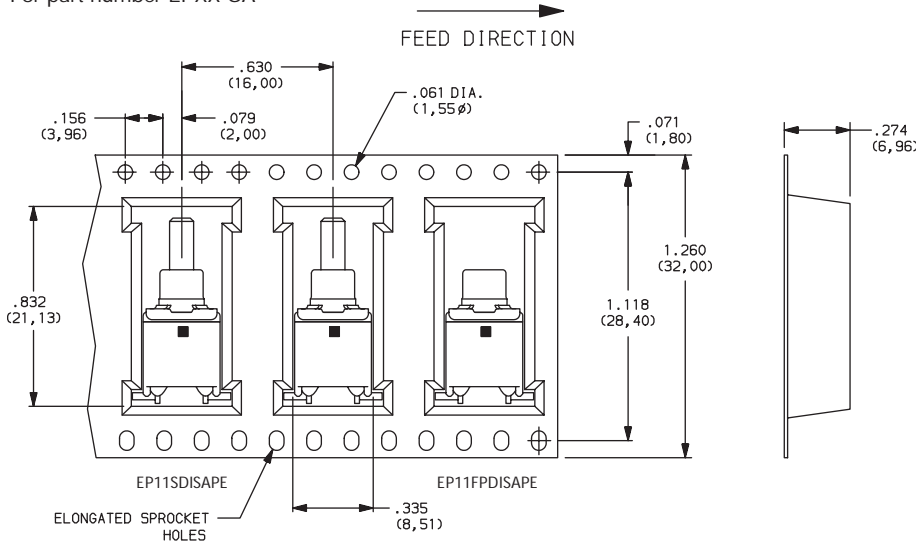
- 785A01000** WHITE
- 785A02000** BLACK
- 785A03000** RED

Material: Nylon  
Finish: Gloss

**NOTE:** Other colors available, consult Customer Service Center.

## TAPE & REEL

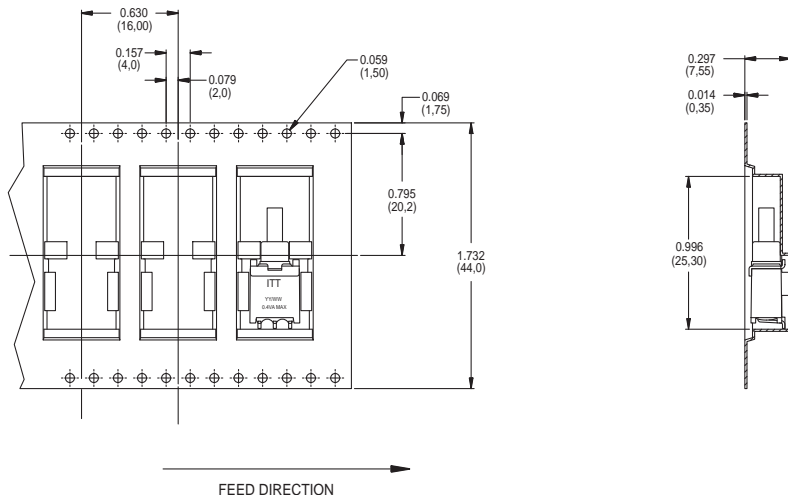
For part number EPXX-SA



### REEL INFORMATION

<b>OUTSIDE DIAMETER</b>	13.00 (330,0)
<b>PILOT HOLE</b>	.512 (13,0)
<b>QUANTITY PER REEL</b>	600

For part number EPXX-SA1



### REEL INFORMATION

<b>OUTSIDE DIAMETER</b>	13.00 (330,0)
<b>PILOT HOLE</b>	.795 (20,20)
<b>QUANTITY PER REEL</b>	500



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# TP Series Tiny Pushbutton Switches



A

Pushbutton

## Features/Benefits

- **Subminiature size**—capable of switching 1 AMP
- **Vertical & right angle terminations**
- **PC & panel mount models**
- **Snap-in front panel mounting available**
- **Epoxy terminal seal-compatible with bottom wash cleaning**
- **RoHS compliant models available**



Models Available

## Typical Applications

- **Telecommunications and networking equipment**
- **Computers and peripherals**
- **Instrumentation and controls**



## Specifications

**CONTACT RATING:** B contact material: 0.4 VA max. @ 20 V AC or DC max. Q contact material: 1 AMP @ 120 V AC or 28 V DC. See page A-19 for additional ratings.

**ELECTRICAL LIFE:** TP11, TP21 MODELS: 60,000 make-and-break cycles at full load. TP12 MODELS: 30,000 cycles.

**CONTACT RESISTANCE:** Below 20 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

**INSULATION RESISTANCE:** 10<sup>9</sup>Ω min.

**DIELECTRIC STRENGTH:** 1000 Vrms min. @ sea level.

**OPERATING TEMPERATURE:** -30°C to 85°C.

**SOLDERABILITY:** Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

**NOTE:** Any models supplied with Q, B, P, R or G contact material are RoHS compliant.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Materials

**CASE:** Glass filled nylon 6/6, flame retardant, heat stabilized or diallyl phthalate (DAP), (UL 94V-0).

**PLUNGER:** Thermoplastic polyester (UL 94V-0).

**CAP & FRAME:** Nylon, black standard.

**BUSHING:** Brass, nickel plated.

**HOUSING:** Stainless steel.

**SWITCH SUPPORT:** Brass, matte-tin plated.

**END CONTACTS:** B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Coin silver, silver plated. See page A-19 for additional contact materials.

**CENTER CONTACT & ALL TERMINALS:** B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Copper alloy, silver plated. See page A-19 for additional contact materials.

**TERMINAL SEAL:** Epoxy. Refer to soldering and cleaning in Technical Data Chapter

**HARDWARE:** Nut & Locking Ring: Brass nickel plated. Lockwasher: Steel, nickel plated.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-16 thru A-20. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all "bottom-wash" PCB cleaning methods.

<p><b>Switch Function</b></p> <p><b>TP11</b> SPST Off-Mom.</p> <p><b>TP12</b> SPDT On-Mom.</p> <p><b>TP21</b> DPST Off-Mom.</p>	<p><b>Actuator or Bushing</b></p> <p><b>SH</b> .155" high plunger, threaded, .220" high bushing, flat</p> <p><b>SH8</b> .155" high plunger, unthreaded, .220" high bushing, round</p> <p><b>SH9</b> .155" high plunger, unthreaded, .220" high bushing, flat</p> <p><b>J81</b> Snap-in with frame</p> <p><b>LT</b> .215" high plunger, threaded, .310" high bushing, flat</p> <p><b>LT9</b> .215" high plunger, unthreaded, .310" high bushing, flat</p> <p><b>MS9</b> .130" high plunger, .020" high bushing, round</p>	<p><b>Terminations</b></p> <p><b>A</b> Right angle, PC thru-hole</p> <p><b>C</b> PC Thru-hole</p> <p><b>Z</b> Solder lug</p> <p><b>AV</b> Vertical right angle, PC thru-hole</p> <p><b>V3</b> Vertical mount, v-bracket</p> <p><b>W</b> Wire wrap</p>	<p><b>Seal</b></p> <p><b>E</b> Epoxy</p>	<p><b>Cap Color</b></p> <p><b>2</b> Black</p> <p><b>NONE</b> Models with no cap</p> <p><b>1</b> White</p>	<p><b>Frame Color</b></p> <p><b>2</b> Black</p> <p><b>NONE</b> Models with no frame</p>	<p><b>Contact Material</b></p> <p><b>B</b> Gold</p> <p><b>P</b> Gold, matte-tin</p> <p><b>Q</b> Silver</p> <p><b>G</b> Gold over silver</p> <p><b>R</b> Gold over silver, matte-tin</p>
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Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# TP Series Tiny Pushbutton Switches

## SWITCH FUNCTION



A

Pushbutton

NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
		C&K marking on opposite side		C&K marking on opposite side		
SP	<b>TP11</b>	OFF	MOM.	OPEN	1-3	
	<b>TP12</b>	ON	MOM.	2-1	2-3	
<b>SPDT</b> <p>Part number shown: TP12SHZQE</p>						
DP	<b>TP21</b>	OFF	MOM.	OPEN	1-3,4-6	
<b>DPST</b> <p>Part number shown: TP21SHZQE</p>						

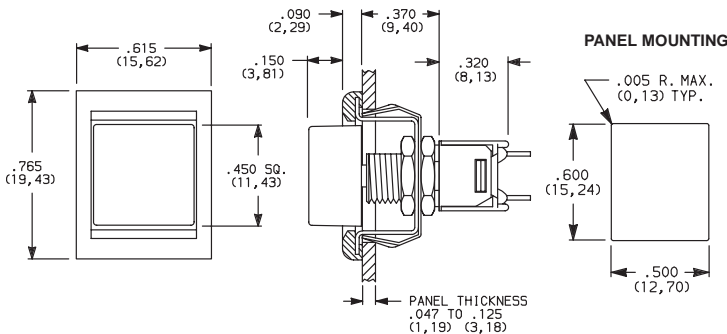
MOM. = Momentary

All models with all options when ordered with G, L, Q or R contact material.

## ACTUATOR—SNAP-IN FRONT MOUNT



### J81 SNAP-IN WITH FRAME



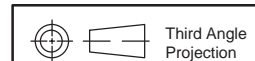
OPTION CODE	CAP COLOR
<b>2</b>	BLACK
<b>1</b>	WHITE

OPTION CODE	FRAME COLOR
<b>2</b>	BLACK
<b>NONE</b>	No Frame Color (J80 option)

Cap and Frame Finish: matte. Other colors available, consult Customer Service Center.

**NOTE:** Available with Z, C, or W terminations.

**NOTE:** Caps & frames available separately, see page A-18.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# TP Series Tiny Pushbutton Switches



A

Pushbutton

**SH** .155" HIGH PLUNGER,  
.220" HIGH BUSHING,  
THREADED, FLAT

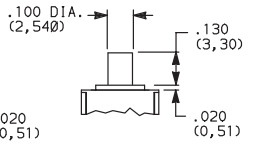
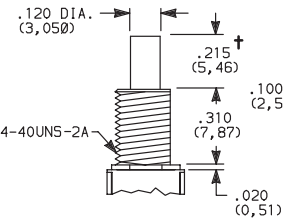
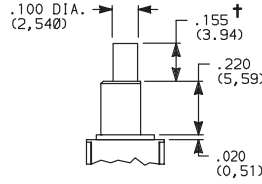
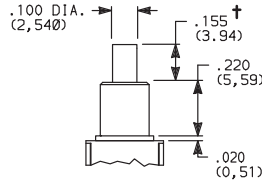
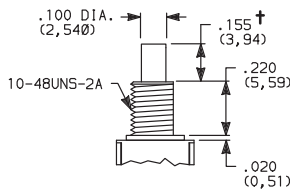
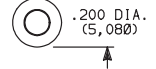
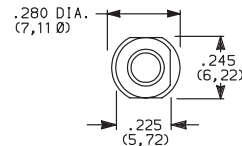
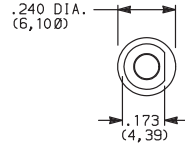
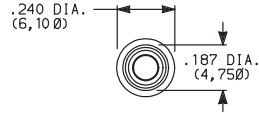
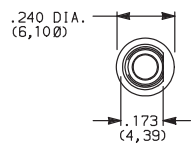
**SH8** .155" HIGH PLUNGER,  
.220" HIGH BUSHING,  
UNTHREADED

**SH9** .155" HIGH PLUNGER,  
.220" HIGH BUSHING,  
UNTHREADED, FLAT

**LT** .215" HIGH PLUNGER,  
.310" HIGH BUSHING,  
THREADED

**MS9** .130" HIGH  
PLUNGER

**LT9** .215" HIGH PLUNGER,  
.310" HIGH BUSHING,  
UNTHREADED



Standard with Z, C, W terminations.

Standard with A, AV, V3 terminations.

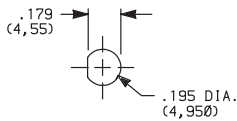
Not available with  
Z terminations.

† Subtract .016 (0,41) for models with A, AV or V3 terminations.

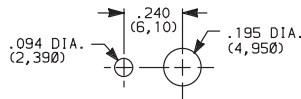
**NOTE:** Caps available for plunger options, see page A-20.

## PANEL MOUNTING

### 10-48 BUSHING

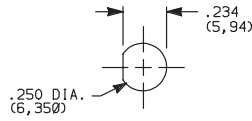


Without locking ring

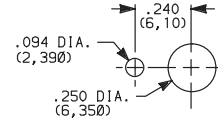


With standard locking ring

### 1/4 IN. BUSHING



Without locking ring



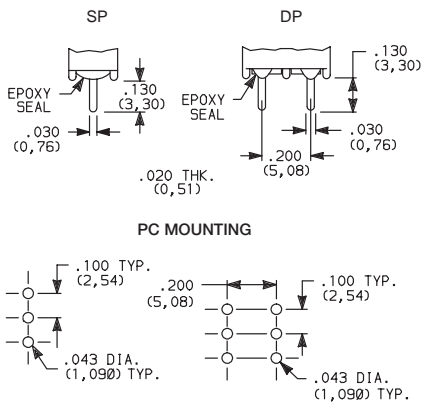
With standard locking ring

**NOTE:** One mounting nut, locking ring and lockwasher supplied standard with 10-48 threaded bushings (two nuts with 1/4-40 bushings).  
Optional mounting nut and locking ring styles and finishes available separately, see section "Technical Data and Additional Hardware".

## TERMINATIONS

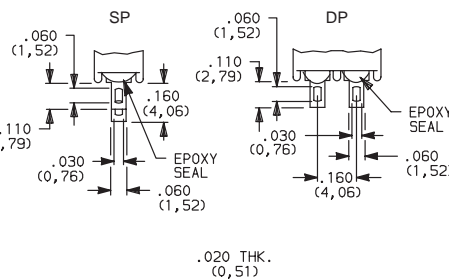


### C PC THRU-HOLE



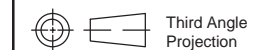
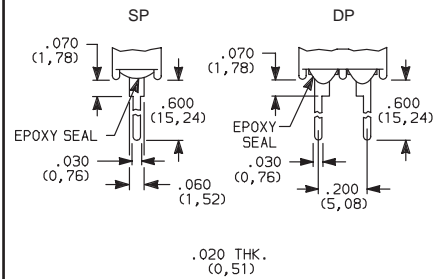
Omit center holes  
for TP11 models

### Z SOLDER LUG



Not available with MS9 bushing or P  
or R contact material.

### W WIRE WRAP



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change







# TP Series Tiny Pushbutton Switches

## TERMINATIONS



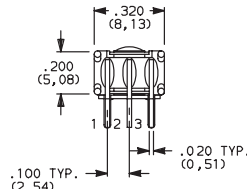
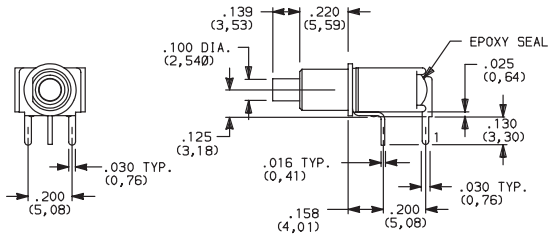
Pushbutton

A

### A RIGHT ANGLE, PC THRU-HOLE

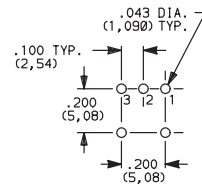


**TP12SH9ABE  
SPDT**



**TP11 Models:  
omit terminal 2.**

### PC MOUNTING

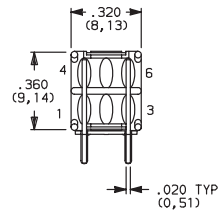
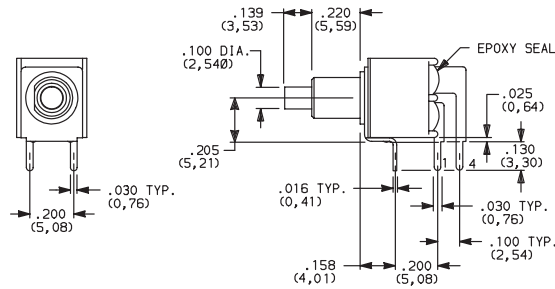


**TP11 Models:  
omit hole 2.**

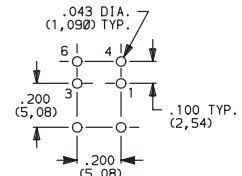
### A RIGHT ANGLE, PC THRU-HOLE



**TP21SH9ABE  
DPST**



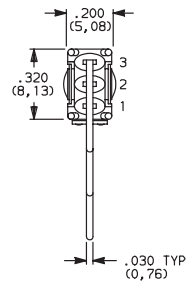
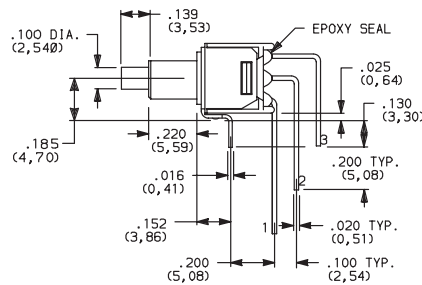
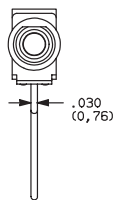
### PC MOUNTING



### AV VERTICAL RIGHT ANGLE, PC THRU-HOLE

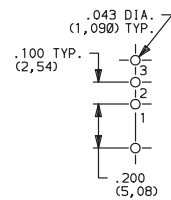


**TP12SH9AVBE  
SPDT**



**TP11 Models:  
omit terminal 2.**

### PC MOUNTING



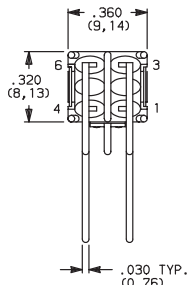
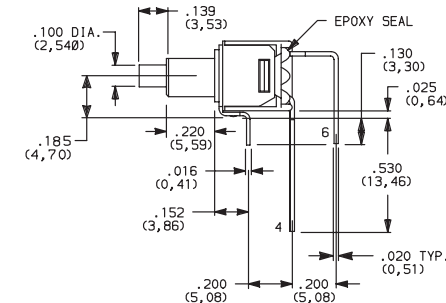
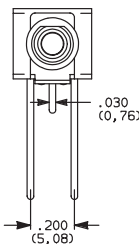
**TP11 Models:  
omit hole 2.**

**NOTE:** Terminal bend radii and lead-in manufacturing option.

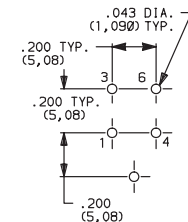
### AV VERTICAL RIGHT ANGLE, PC THRU-HOLE



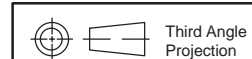
**TP21SH9AVBE  
DPST**



### PC MOUNTING



**NOTE:** Terminal bend radii and lead-in manufacturing option.



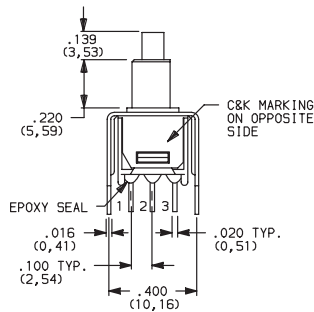
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



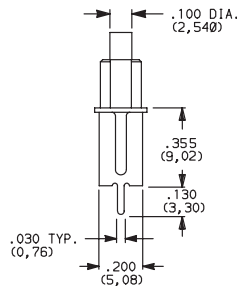
# TP Series Tiny Pushbutton Switches

## TERMINATIONS

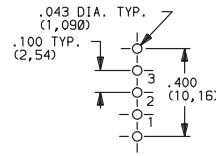
### V3 VERTICAL MOUNT, V-BRACKET



TP11 Models:  
omit terminal 2.



#### PC MOUNTING

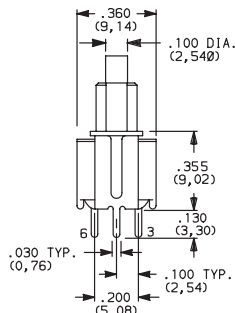
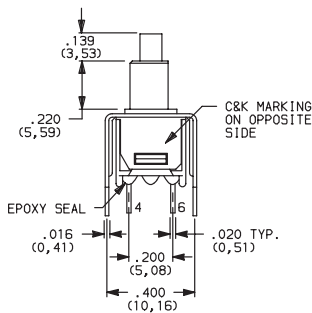


TP11 Models:  
omit hole 2.

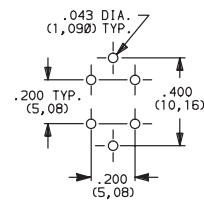


TP12SH9V3BE  
SPDT

### V3 VERTICAL MOUNT, V-BRACKET



#### PC MOUNTING



TP21SH9V3BE  
DPST

## CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	GOLD <sup>1</sup>	GOLD <sup>1</sup>	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
P		MATTE-TIN <sup>6</sup>		
Q	SILVER <sup>4,5</sup>	SILVER <sup>5</sup>	POWER	1 AMP @ 120 V AC OR 28 V DC.
G	GOLD OVER SILVER <sup>2,3</sup>	GOLD <sup>3</sup>	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC.
R		MATTE-TIN <sup>6</sup>		

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

<sup>1</sup> CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

<sup>2</sup> END CONTACTS: Coin silver, with gold plate over nickel plate.

<sup>3</sup> CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

<sup>4</sup> END CONTACTS: Coin silver, silver plated.

<sup>5</sup> CENTER CONTACT & ALL TERMINALS: Copper alloy, silver plated.

<sup>6</sup> TERMINALS: Copper alloy, with matte-tin over nickel plate.

**NOTE:** Any models supplied with P, R, Q, B or G contact material are RoHS compliant.

All models with all options when ordered with R, G, L or Q contact material.

B contact material standard with A, AV, V3 & W terminations.

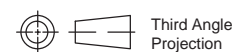
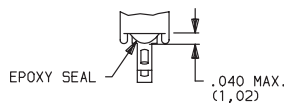
Q contact material standard with C & Z terminations

P, R contact materials not available with Z terminations.

K, L and M options represent Non RoHS tin lead product and are not recommended for new designs. For additional information please contact Customer Service.

## SEAL

### E EPOXY SEAL



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



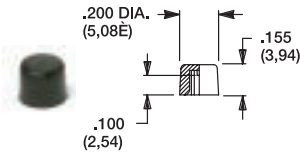


# TP Series Tiny Pushbutton Switches

## AVAILABLE HARDWARE

Pushbutton  
A

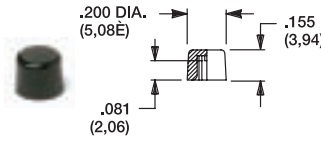
### Cap, .100" DIA. Plungers



**PART NO.**  
**508101000** WHITE  
**508102000** BLACK

Material: Nylon  
 Finish: Gloss

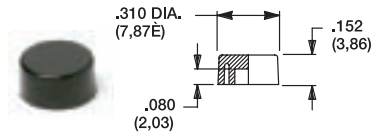
### Cap, .100" DIA. Plungers (Recommended for S9 plunger)



**PART NO.**  
**538701000** WHITE  
**538702000** BLACK

Material: Nylon  
 Finish: Gloss

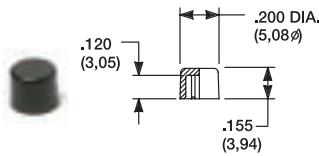
### Cap, .100" DIA. Plungers



**PART NO.**  
**465801000** WHITE  
**465802000** BLACK

Material: Nylon  
 Finish: Gloss

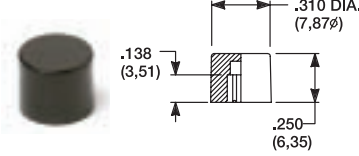
### Cap, .120" DIA. Plungers



**PART NO.**  
**708901000** WHITE  
**708902000** BLACK

Material: Nylon  
 Finish: Gloss

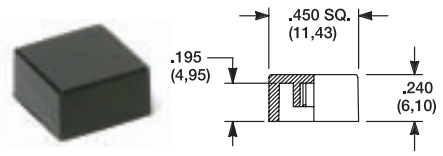
### Cap, .120" DIA. Plungers



**PART NO.**  
**801801000** WHITE  
**801802000** BLACK

Material: Nylon  
 Finish: Gloss

### Cap, J81 option only



**PART NO.**  
**484601000** WHITE  
**484602000** BLACK

Material: Nylon  
 Finish: Gloss

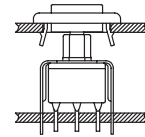
**PART NO.**  
**798201000** WHITE  
**798202263** BLACK

Material: Nylon  
 Finish: Matte

**NOTE:** Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".  
 Other cap colors available, consult Customer Service Center.

Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

### TYPICAL APPLICATION

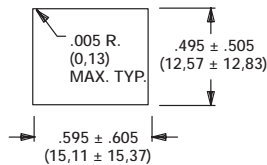


.047" (1,19) PANEL THK.    .062" (1,57) PANEL THK.    .090" (2,29) PANEL THK.    .125" (3,18) PANEL THK.

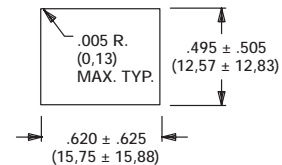
**PART NO.**                      **PART NO.**                      **PART NO.**                      **PART NO.**  
**432502263**                      **432602263**                      **432702263**                      **432802263** BLACK

### PANEL MOUNTING

For part numbers  
 432502263, 432602263

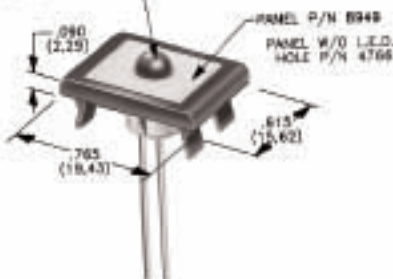


For part numbers  
 432702263, 432802263



### Panel Inserts

LED (.200 DIA. (5,08E)) SNAPS  
 SECURELY INTO INSERT (P/N 8949).  
 HEIGHT DEPENDS ON LED USED.



Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**

PANEL INSERT  
 WITH HOLE FOR LED

**PART NO.**  
**894902000**

BLANK PANEL INSERT  
 WITHOUT HOLE FOR LED

**PART NO.**  
**476602000** BLACK



Dimensions are shown: Inches (mm)  
 Specifications and dimensions subject to change

# E020 Series Sealed Snap-acting Momentary Pushbutton Switches



## Features/Benefits

- **Process sealed with disposable splashproof boot**
- **Long life contact design**
- **Snap-fitting plunger available**
- **RoHS compliant models available**

## Typical Applications

- **Instrumentation**
- **Telecommunications and networking equipment**
- **Computers and peripherals**



## Specifications

**CONTACT RATING:** B contact material (EX25 Models): 0.4 VA max. @ 20 V AC or DC max. G contact material (EX21 Models): 1 AMP @120 V AC or 28 V DC or 0.4 VA max. @ 20 V AC or DC max.  
**Note:** Break-before-make contacts. Multi-pole contacts do not make and break simultaneously. See page A-26 for additional ratings.

**ELECTRICAL LIFE:** 60,000 make-and-break cycles at full load.

**CONTACT RESISTANCE:** Below 50 mΩ typ. initial @ 2–4 V DC, 100 mA, for both silver and gold plated contacts.

**INSULATION RESISTANCE:** 10<sup>9</sup>Ω min.

**DIELECTRIC STRENGTH:** 1000 Vrms min. @ sea level.

**OPERATING TEMPERATURE:** –30°C to 75°C.

**CAP INSTALLATION FORCE:** 10 lbs. max. permissible.

**SOLDERABILITY:** Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

**NOTE:** Any models supplied with P, R, B or G contact material are RoHS compliant.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Materials

**CASE & BUSHING:** Glass filled nylon 6/6, flame retardant (UL 94V-0).

**PLUNGER:** Glass filled nylon or glass filled polyester (PBT) (UL 94V-0).

**SWITCH SUPPORT:** Brass or steel, matte-tin.

**SWITCH SUPPORT RETAINER:** Stainless steel.

**N.O. & N.C. CONTACTS:** EX25 MODELS: B contact material: Copper alloy, with gold plate over nickel plate. EX21 MODELS: G contact material: Coin silver, with gold plate over nickel plate. See page A-26 for additional contact materials.

**COMMON CONTACTS & ALL TERMINALS:** Copper alloy, with gold plate over nickel plate. See page A-26 for additional contact materials.

**TERMINAL SEAL:** Epoxy.

**DISPOSABLE BOOT:** Vinyl splashproof boot supplied standard. Remove and discard only after soldering and cleaning processes are complete.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-22 thru A-28. For additional options not shown in catalog, consult our Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.

<p><b>Switch Function</b></p> <p><b>E121</b> SPDT On-Mom. 1 Amp  <b>E221</b> DPDT On-Mom. 1 Amp  <b>E125</b> SPDT On-Mom. 0.4VA  <b>E225</b> DPDT On-Mom. 0.4VA</p> <p><b>Plunger</b></p> <p><b>S</b> .282" high  <b>M</b> .331" high, snap-fitting  <b>S1</b> .332" high</p>	<p><b>Bushing</b></p> <p><b>D1</b> Unthreaded  <b>D3</b> .180" high, unthreaded</p> <p><b>Terminations</b></p> <p><b>A</b> Right angle, PC thru-hole  <b>AV2</b> Vertical right angle, PC thru-hole  <b>C</b> PC Thru-hole  <b>A3</b> Right angle, snap-in, PC thru-hole  <b>AV3</b> Vertical right angle, snap-in, PC thru-hole  <b>V3</b> .460" high, V-bracket  <b>V4</b> .630" high, V-bracket  <b>V6</b> .460" high, V-bracket  <b>V8</b> .953" high, V-bracket  <b>V31</b> .460" high, snap-in V-bracket  <b>V41</b> .630" high, snap-in V-bracket  <b>V61</b> .460" high, snap-in V-bracket</p>	<p><b>Contact Material</b></p> <p><b>B</b> Gold  <b>G</b> Gold over silver  <b>P</b> Gold, matte-tin  <b>R</b> Gold over silver, matte-tin</p> <p><b>Seal</b></p> <p><b>E</b> Epoxy and disposable splashproof boot</p>
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Dimensions are shown: Inches (mm)  
 Specifications and dimensions subject to change



# E020 Series Sealed Snap-acting Momentary Pushbutton Switches

## SWITCH FUNCTION

Pushbutton

NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
SP	<b>E121</b>	ON	MOM.	1-3	1-2	
	<b>E125</b>	ON	MOM.			
<p><b>SPDT</b></p> <p>Part number shown: E121SD1CGE</p>						
DP	<b>E221</b>	ON	MOM.	1-3,4-6	1-2,4-5	
	<b>E225</b>	ON	MOM.			
<p><b>DPDT</b></p> <p>Part number shown: E221SD1CBE</p>						

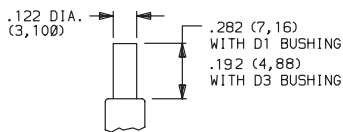
MOM. = Momentary

E121, E221 models with all options when ordered with G, L or R contact material.

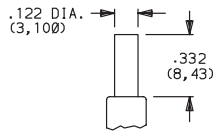
EX25 models must be ordered with B or P contact material.  
EX21 models must be ordered with G or R contact material.

## PLUNGER

**S** .282" HIGH

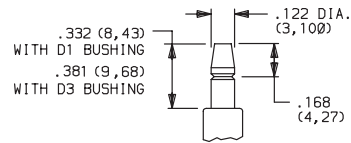


**S1** .332" HIGH



Not Available with D1 bushing.

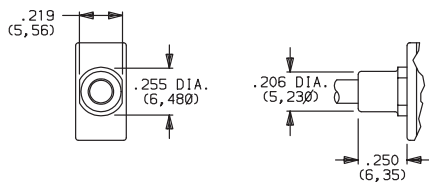
**M** .332" HIGH SNAP-FITTING



NOTE: Caps available for all plunger options, see page A-27.

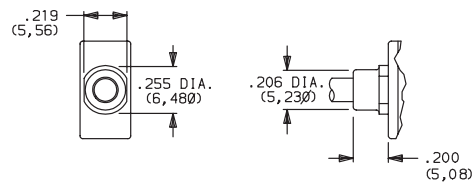
## BUSHING

**D1** UNTHREADED

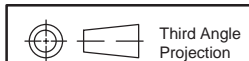


Not available with S1 actuator.

**D3** .180" HIGH UNTHREADED



NOTE: Disposable splashproof vinyl over actuator and bushing supplied std., see page A-26.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# E020 Series Sealed Snap-acting Momentary Pushbutton Switches



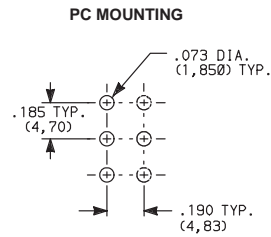
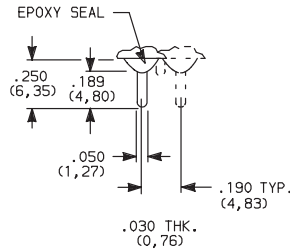
A

Pushbutton

## TERMINATIONS

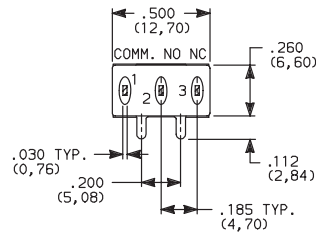
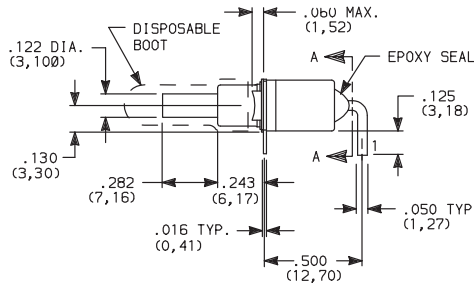
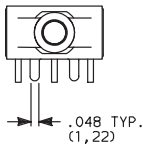


### C PC THRU-HOLE



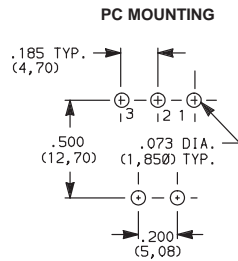
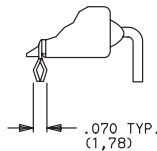
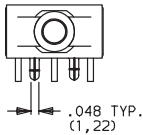
## SPDT and DPDT

### A RIGHT ANGLE, PC THRU-HOLE



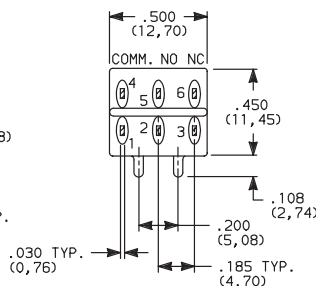
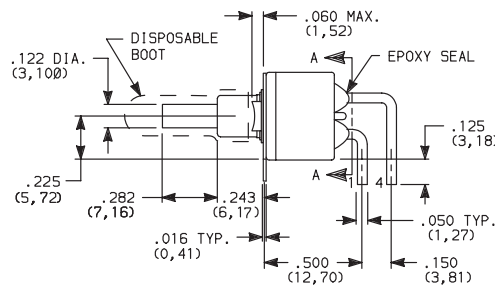
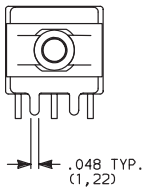
E121SD1AGE SPDT

### A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



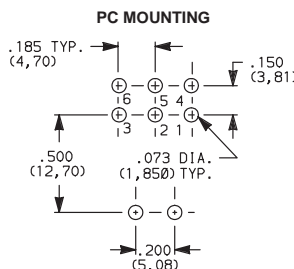
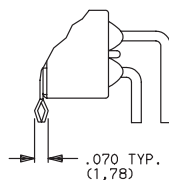
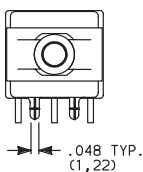
NOTE: Terminal bend radii and lead-in manufacturing option.

### A RIGHT ANGLE, PC THRU-HOLE

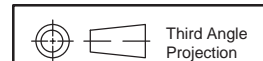


E221SD1AGE DPDT

### A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



NOTE: Terminal bend radii and lead-in manufacturing option.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





# E020 Series Sealed Snap-acting Momentary Pushbutton Switches

## TERMINATIONS

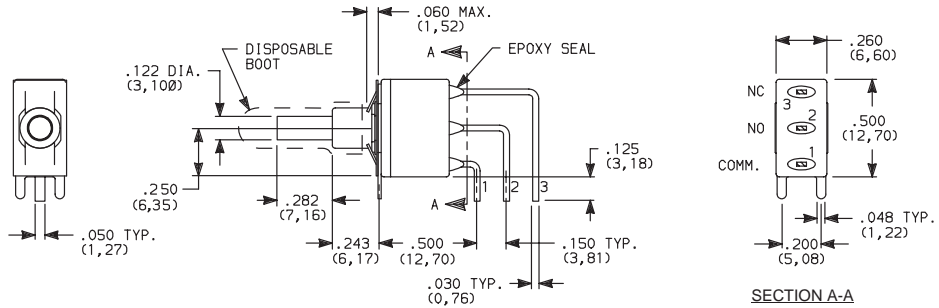
Pushbutton

A

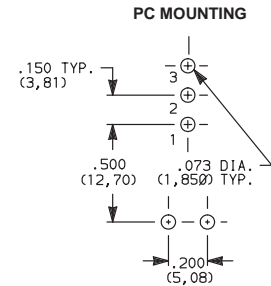
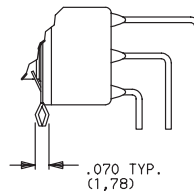
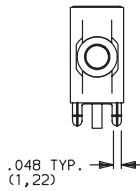
**AV2** VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH



**E121SD1AV2GE SPDT**



**AV3** VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH

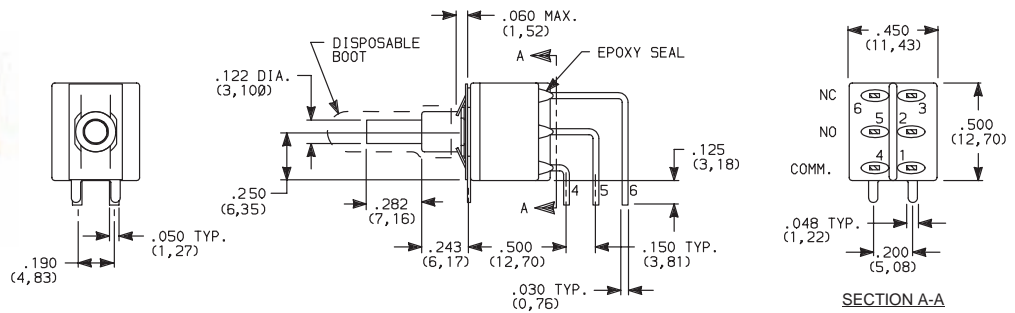


**NOTE:** Terminal bend radii and lead-in manufacturing option.

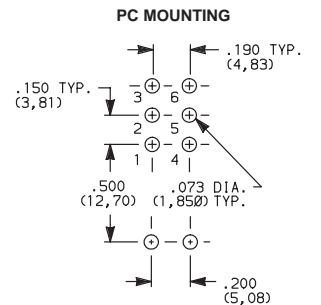
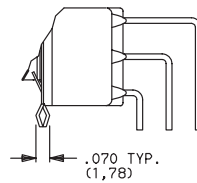
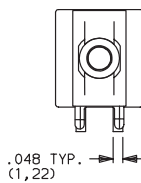
**AV2** VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH



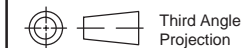
**E221SD1AV2GE DPDT**



**AV3** VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



**NOTE:** Terminal bend radii and lead-in manufacturing option.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# E020 Series Sealed Snap-acting Momentary Pushbutton Switches



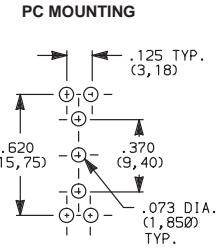
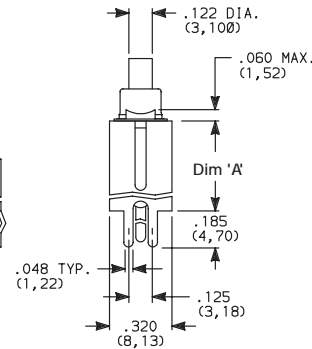
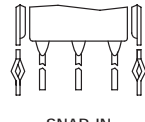
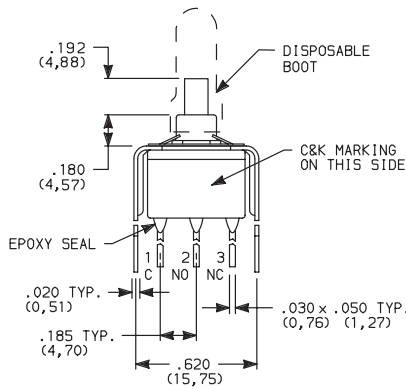
A

Pushbutton

## TERMINATIONS

**V3, V4** VERTICAL MOUNT, V-BRACKET

**V31, V41** VERTICAL MOUNT, V-BRACKET, SNAP-IN

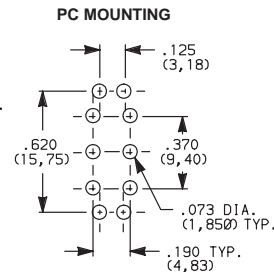
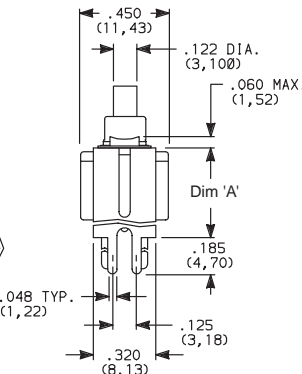
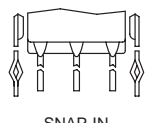
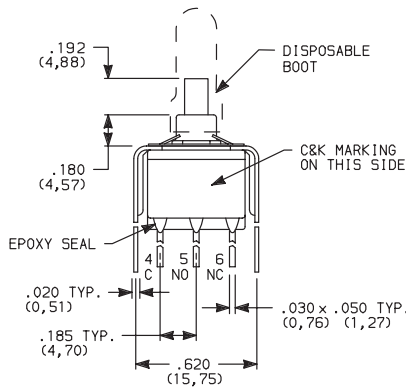


E121SD3\_GE SPDT

OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4, V41	.630 (16,00)

**V3, V4** VERTICAL MOUNT, V-BRACKET

**V31, V41** VERTICAL MOUNT, V-BRACKET, SNAP-IN

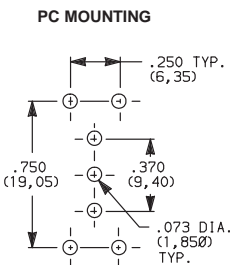
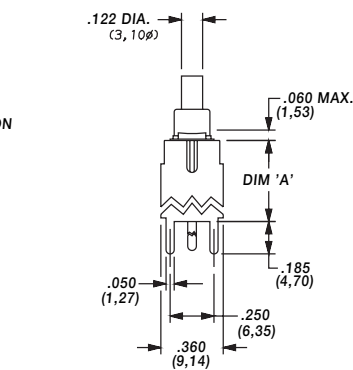
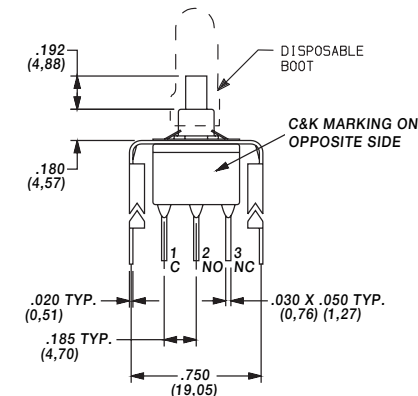


E221SD3\_GE DPDT

OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4, V41	.630 (16,00)

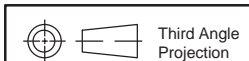
**V6, V8** VERTICAL MOUNT, V-BRACKET

**V61, V81** VERTICAL MOUNT, V-BRACKET, SNAP-IN



E121SD3\_GE SPDT

OPTION CODE	DIM 'A'
V6, V61	.460 (11,68)
V8, V81	.953 (24,21)



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change







# E020 Series Sealed Snap-acting Momentary Pushbutton Switches

## TERMINATIONS

Pushbutton

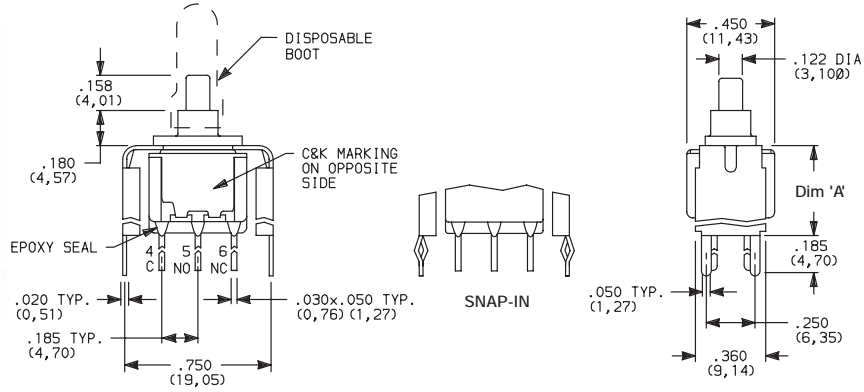
A

**V6, V8** VERTICAL MOUNT, V-BRACKET

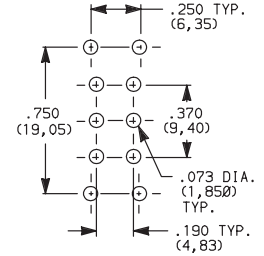
**V61, V81** VERTICAL MOUNT, V-BRACKET, SNAP-IN



E221SD3V6GE  
DPDT



## PC MOUNTING



OPTION CODE	DIM 'A'
<b>V6, V61</b>	.460 (11,68)
<b>V8, V81</b>	.953 (24,21)

## CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
<b>B</b>	GOLD <sup>1</sup>	GOLD <sup>1</sup>	LOW LEVEL/DRY CIRCUIT	EX25 MODELS ONLY: 0.4 VA MAX. @ 20 V AC OR DC MAX.
<b>P</b>		MATTE-TIN <sup>4</sup>		
<b>G</b>	GOLD OVER SILVER 2,3	GOLD <sup>3</sup>	LOW LEVEL/DRY CIRCUIT OR POWER	EX21 MODELS ONLY: 0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC.
<b>R</b>		MATTE-TIN <sup>4</sup>		

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

- <sup>1</sup> CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.
- <sup>2</sup> N.O. AND N.C. CONTACTS: Coin silver, with gold plate over nickel plate.
- <sup>3</sup> COMMON CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.
- <sup>4</sup> TERMINALS: Copper alloy, with matte-tin alloy over nickel plate.

**NOTE:** Any models supplied with P, R, B or G contact material are RoHS compliant.

E121, E221 models with all options when ordered with mandatory G, R or L contact material.

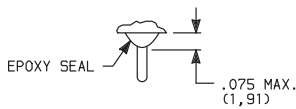
P or B contact material must be ordered with EX25 models.

R or G contact material must be ordered with EX21 models.

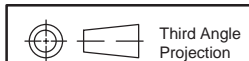
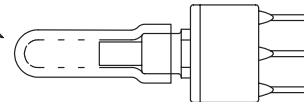
K, L and M options represent Non RoHS tin lead product and are not recommended for new designs. For additional information please contact Customer Service.

## SEAL

**E** EPOXY SEAL AND DISPOSABLE SPLASHPROOF BOOT



Disposable splashproof boot supplied standard. Remove and discard boot *only after* soldering and cleaning processes are complete.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# E020 Series Sealed Snap-acting Momentary Pushbutton Switches

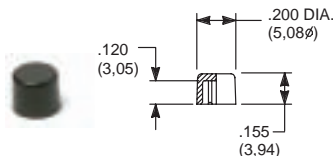


A

Pushbutton

## AVAILABLE HARDWARE

Cap

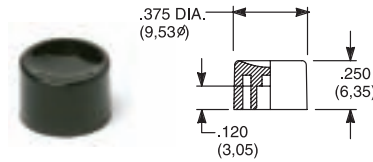


**PART NO.**

- 708901000** WHITE
- 708902000** BLACK
- 708903000** RED

Material: Nylon  
Finish: Gloss

Cap

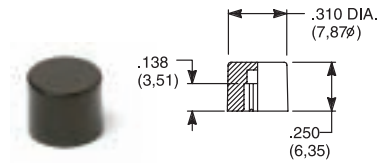


**PART NO.**

- 752701000** WHITE
- 752702000** BLACK
- 752703000** RED

Material: Nylon  
Finish: Gloss

Cap

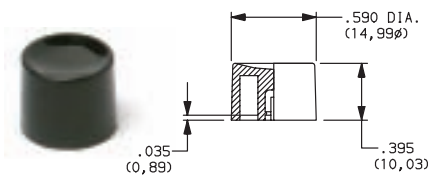


**PART NO.**

- 801801000** WHITE
- 801802000** BLACK
- 801803000** RED

Material: Nylon  
Finish: Gloss

Cap, Snap-fitting plunger

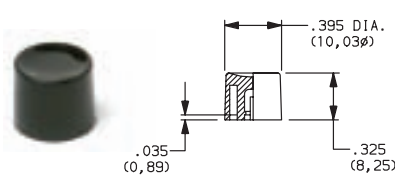


**PART NO.**

- 894001000** WHITE
- 894002000** BLACK
- 894003000** RED

Material: Nylon  
Finish: Gloss

Cap, Snap-fitting plunger

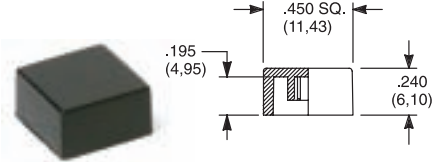


**PART NO.**

- 894101000** WHITE
- 894102000** BLACK
- 894103000** RED

Material: Nylon  
Finish: Gloss

Cap



**PART NO.**

- 484601000** WHITE
- 484602000** BLACK
- 484603000** RED

Material: Nylon  
Finish: Gloss

**PART NO.**

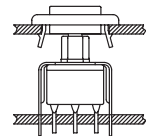
- 798201000** WHITE
- 798202263** BLACK
- 798203000** RED

Material: Nylon  
Finish: Matte

**NOTE:** Other cap colors available, consult Customer Service Center.

Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

**TYPICAL APPLICATION**



.047" (1,19) PANEL THK.    .062" (1,57) PANEL THK.    .090" (2,29) PANEL THK.    .125" (3,18) PANEL THK.

**PART NO.**

- 432501000**
- 432502263**
- 432503000**

**PART NO.**

- 432601000**
- 432602263**
- 432603000**

**PART NO.**

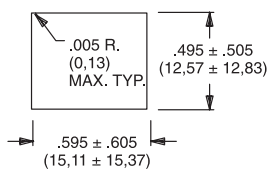
- 432701000**
- 432702263**
- 432703000**

**PART NO.**

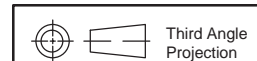
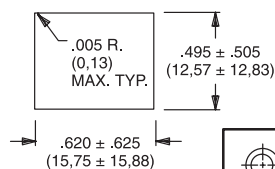
- 432801000** WHITE
- 432802263** BLACK
- 432803000** RED

**PANEL MOUNTING**

For part numbers  
4325xxxxx, 4326xxxxx



For part numbers  
4327xxxxx, 4328xxxxx



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





# E020 Series Sealed Snap-acting Momentary Pushbutton Switches

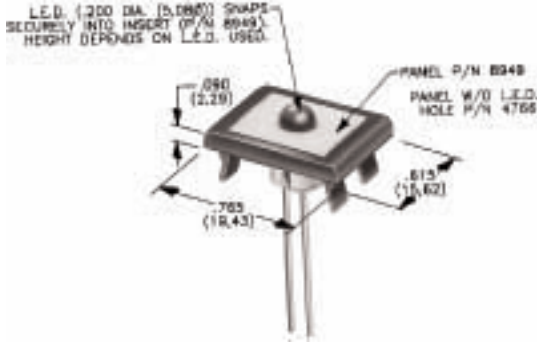
## AVAILABLE HARDWARE

A

Pushbutton

### PANEL INSERTS

Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**



PANEL INSERT  
WITH HOLE FOR LED

BLANK PANEL INSERT  
WITHOUT HOLE FOR LED

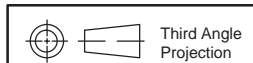
**PART NO.**

**894901000**  
**894902000**  
**894903000**

**PART NO.**

**476601000** WHITE  
**476602000** BLACK  
**476603000** RED

Special colors, custom markings available, consult Customer Service Center.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# 8020 Series Snap-acting Momentary Pushbutton Switches



A

Pushbutton

## Features/Benefits

- **Positive tactile feel**
- **Multi-positions available**
- **Wide variety of termination options**
- **Epoxy terminal seal compatible with bottom wash cleaning**
- **RoHS compliant models available**

## Typical Applications

- **Instrumentation**
- **Computer peripherals**
- **Telecommunications equipment**



Models Available

## Specifications

**CONTACT RATING:** B contact material (8X25 Models): 0.4 VA max. @ 20 V AC or DC maximum. G contact material (8X21, U8X1 Models): 1 AMP @ 120 V AC or 28 V DC or 0.4 VA max. @ 20 V AC or DC max. Note: Break-before-make contacts. Multi-pole contacts do not make and break simultaneously. See page A-43 for additional ratings.

**ELECTRICAL LIFE:** 60,000 make-and-break cycles at full load.

**CONTACT RESISTANCE:** Below 50 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

**INSULATION RESISTANCE:** 10<sup>9</sup>Ω min.

**DIELECTRIC STRENGTH:** 1,000 Vrms min. @ sea level.

**OPERATING TEMPERATURE:** 8X2X MODELS: -30°C to 75°C. U8X1 MODELS: -30°C to 65°C.

**CAP INSTALLATION FORCE:** 10 lbs. max. permissible.

**SOLDERABILITY:** Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

**NOTE:** Any models supplied with B, P, R, or G contact material are RoHS compliant.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Materials

**CASE:** Glass filled nylon 6/6 or diallyl phthalate (DAP), flame retardant (UL 94V-0).

**PLUNGER:** Glass filled nylon or glass filled polyester (PBT) (UL 94V-0).

**CAP & FRAME:** Nylon, black, standard.

**BUSHING:** Brass or zinc, nickel plated.

**HOUSING:** Stainless steel.

**SWITCH SUPPORT:** Brass or steel, matte-tin plated.

**N.O. & N.C. CONTACTS:** 8X21, U8X1 MODELS: G contact material: Coin silver, with gold plate over nickel plate. See page A-43 for additional contact materials.

8X25 MODELS: B contact material: Copper alloy, with gold plate over nickel plate. See page A-43 for additional contact materials.

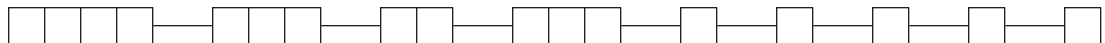
**COMMON CONTACT & ALL TERMINALS:** Copper alloy, with gold plate over nickel plate.

**TERMINAL SEAL:** Epoxy. Refer to soldering and cleaning Technical Data Chapter.

**HARDWARE:** Nut & Locking Ring: Brass, nickel plated; Lockwasher: Steel, nickel plated.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-30 thru A-45. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all "bottom-wash" PCB cleaning methods.



### Switch Function

- 8121** SPDT On-Mom. 1 Amp
- 8125** SPDT On-Mom. 0.4VA
- 8221** DPDT On-Mom. 1 Amp
- 8225** DPDT On-Mom. 0.4VA
- 8321** 3PDT On-Mom. 1 Amp
- 8325** 3PDT On-Mom. 0.4VA
- 8421** 4PDT On-Mom. 1 Amp
- 8425** 4PDT On-Mom. 0.4VA

**Note:** UL/CSA models available, see page A-30 and A-31.

### Actuator or Plunger

- S** Plunger
- NONE** Snap-in
- J80** Snap-in
- J81** Snap-in w/frame
- J82** Snap-in w/frame for LED
- J83** Snap-in w/frame & flush cap
- J84** Snap-in w/frame for LED, flush cap
- J85** Snap-in w/frame & LED
- J95** PC w/V-bracket & LED
- L** Plunger
- M** Snap-fitting plunger

### Bushing

- D9** .280" high, keyway
- H** .250" high, flat
- NONE** No bushing choice required
- D** .280" high, keyway
- D2** .288" high, flat
- D3** .180" high
- D8** .288" high, flat
- H9** .250" high, flat, hi torque
- Y** .350" high, keyway
- Y3** 6.35mm high, keyway, hi torque
- Y4** .378" high, flat, hi torque
- Y9** .350" high, keyway

### Contact Material

- B** Gold
- P** Gold, matte-tin
- G** Gold over silver
- R** Gold over silver, matte-tin

### Seal

- E** Epoxy
- I** Epoxy potted base

### Cap Color

- 2** Black
- NONE** Models without caps
- 1** White
- 3** Red
- 4** Orange
- 5** Yellow
- 6** Green
- 7** Blue
- 9** Gray

### Frame Color

- 2** Black
- NONE** Models without frame
- 1** White
- 3** Red
- 5** Yellow
- 6** Green
- 9** Gray

### LED Color

- 3** Red
- NONE** Models without LED
- 5** Yellow
- 6** Green

### Terminations

- A** Right angle, PC thru-hole
- AV2** Vertical right angle, PC thru-hole
- C** PC Thru-hole
- Z** Solder lug
- A2** Right angle, PC thru-hole
- A3** Right angle, snap-in, PC thru-hole
- A4** Right angle, PC thru-hole, reversed terminals
- A6** Right angle, PC thru-hole
- AV** Vertical right angle, PC thru-hole
- AV1** Vertical right angle, PC thru-hole
- AV3** Vertical right angle, snap-in, PC thru-hole
- R** Right angle with PCB
- R2** Right angle with PCB, reversed terminals
- V2** .555" high, V-bracket
- V3** .460" high, V-bracket
- V4** .630" high, V-bracket
- V6** .460" high, V-bracket
- V7** .630" high, V-bracket
- V8** .953" high, V-bracket
- V9** 1.150" high, V-bracket
- V31** .460" high, snap-in V-bracket
- V61** .460" high, snap-in V-bracket
- W** .750" long, wire wrap
- W1** .964" long, wire wrap
- W3** .425" long, wire wrap
- W4** 1.062" long, wire wrap
- Z3** Quick connect

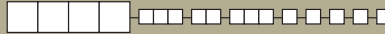


Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# 8020 Series Snap-acting Momentary Pushbutton Switches

## SWITCH FUNCTION



Pushbutton

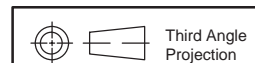
NO. POLES	MODEL NO.	UL/CSA* MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
			POS. 1	POS. 2	POS. 1	POS. 2	
SP	<b>8121</b>	<b>U811</b>	ON	MOM.	1-3	1-2	
	<b>8125</b>		ON	MOM.			
<p><b>SPDT</b></p> <p>Part number shown: 8121SHZGE</p>							
DP	<b>8221</b>	<b>U821</b>	ON	MOM.	1-3,4-6	1-2,4-5	
	<b>8225</b>		ON	MOM.			
<p><b>DPDT</b></p> <p>Part number shown: 8221SHZGE</p>							
3P	<b>8321</b>	<b>U831</b>	ON	MOM.	1-3,4-6,7-9	1-2,4-5,7-8	
	<b>8325</b>		ON	MOM.			
<p><b>3PDT</b></p> <p>Part number shown: 8321SHZGE</p>							

MOM. = Momentary

\*U811 thru U841 model numbers with all options (except R, R2 terminations) when ordered with G, L or R contact material.

8X25 models must be ordered with B or P contact material.

8X21 and U8X1 models must be ordered with G or R contact material.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# 8020 Series Snap-acting Momentary Pushbutton Switches



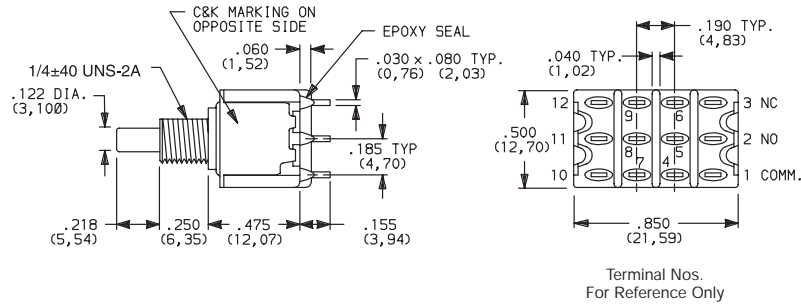
A

Pushbutton

## SWITCH FUNCTION

NO. POLES	MODEL NO.	UL/CSA* MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
			POS. 1	POS. 2	POS. 1	POS. 2	
4P	8421	U841	ON	MOM.	1-3,4-6,7-9,10-12	1-2,4-5,7-8,10-11	
	8425		ON	MOM.			

### 4PDT



Part number shown: 8421SHZGE

Terminal Nos. For Reference Only

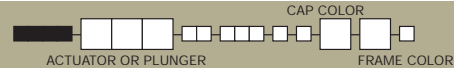
MOM. = Momentary

\* U811 thru U841 model numbers with all options (except R, R2 terminations) when ordered with G, L or R contact material.

8X25 models must be ordered with B or P contact material.

8X21 and U8X1 models must be ordered with G or R contact material.

## ACTUATOR—SNAP-IN FRONT MOUNT

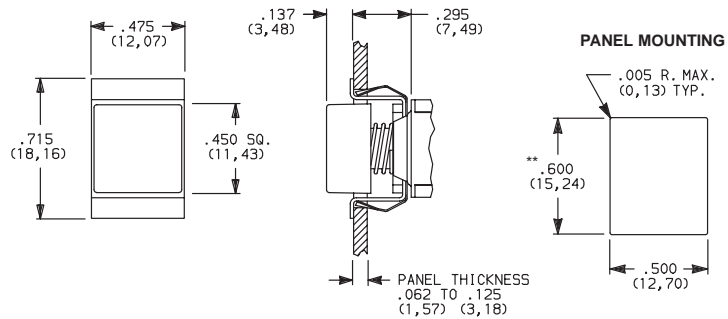


OPTION CODE	CAP AND FRAME COLOR
2	BLACK
NONE	No Frame Color (J80 option)
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

Other colors available, consult Customer Service Center. Cap and Frame Finish: matte.

**NOTE:** Caps and frames available separately, see pages A-44 and A-45.

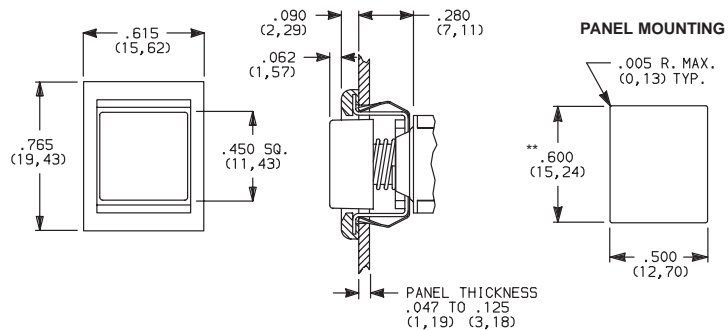
### J80 SNAP-IN



**NOTE:** No frame color choice required.

\*\* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

### J81 SNAP-IN WITH FRAME



**NOTE:** Available with C, W-W4, Z or Z3 terminations and SPDT and DPDT models only.

\*\* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.



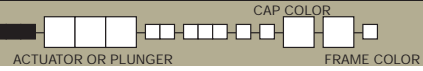
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





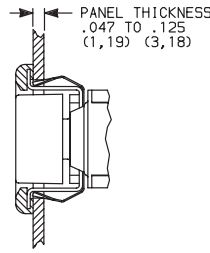
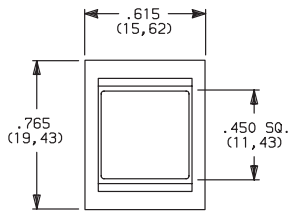
# 8020 Series Snap-acting Momentary Pushbutton Switches

## ACTUATOR—SNAP-IN FRONT MOUNT

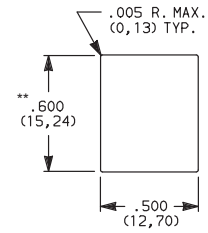


Pushbutton  
A

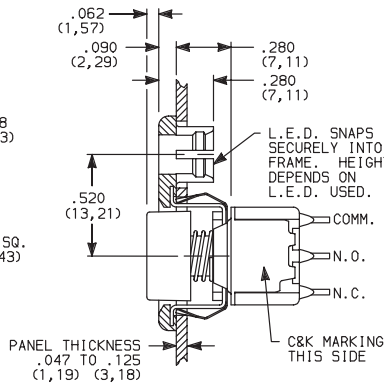
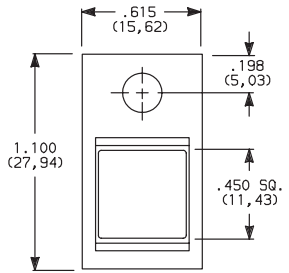
### J83 SNAP-IN WITH FRAME AND FLUSH CAP



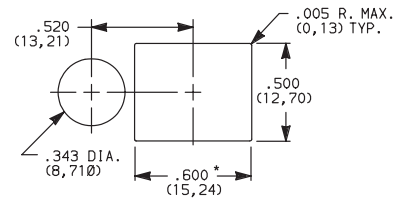
#### PANEL MOUNTING



### J82 SNAP-IN WITH FRAME FOR LED



#### PANEL MOUNTING

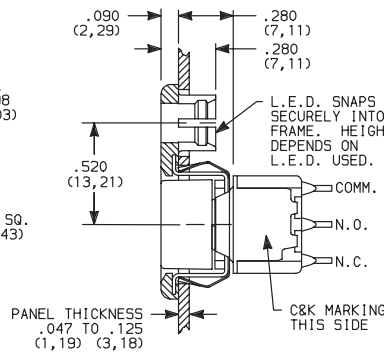
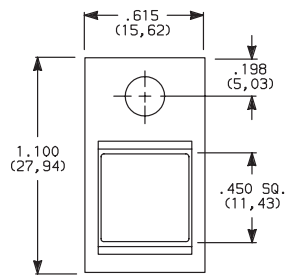


\* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

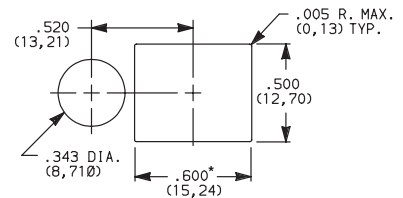
**LED not included.**

For LED information, see page A-45.

### J84 SNAP-IN WITH FRAME FOR LED, FLUSH CAP



#### PANEL MOUNTING



\* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

**LED not included.**

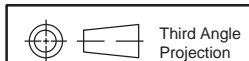
For LED information, see page A-45.

OPTION CODE	CAP AND FRAME COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

Other colors available, consult Customer Service Center.  
Cap and Frame Finish: matte.

Available with C, W-W4, Z or Z3 terminations and SPDT and DPDT models only.

**NOTE:** Caps and frames available separately, see pages A-44 and A-45.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

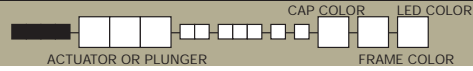


# 8020 Series Snap-acting Momentary Pushbutton Switches

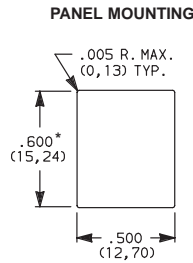
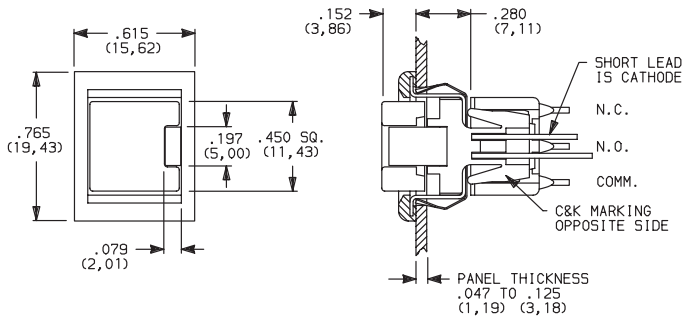


Pushbutton

## ACTUATOR—SNAP-IN FRONT MOUNT



### J85 SNAP-IN WITH FRAME AND LED



\* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.



8121J85ZGE23  
SPST

Available with C, W-W4, Z or Z3 terminations and SPDT models only. For LED information see page A-45.

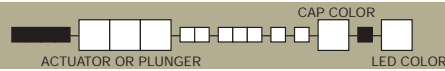
**NOTE:** Caps & frames available separately, see pages A-44 and A-45.

OPTION CODE	CAP AND FRAME COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

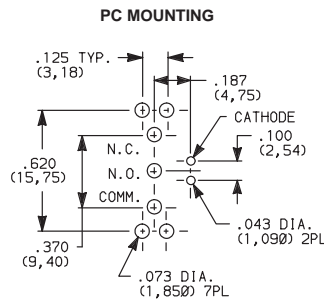
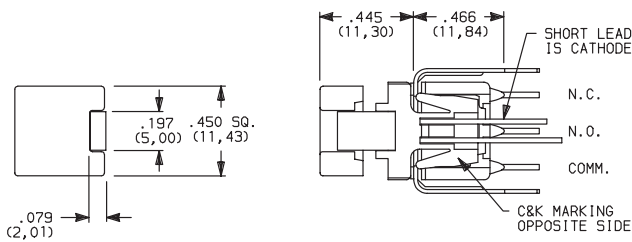
OPTION CODE	LED COLOR
3	RED
5	YELLOW
6	GREEN

For LED information see page A-43.

## ACTUATOR—PC MOUNT



### J95 PC WITH V-BRACKET AND LED



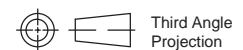
8121J95V3GE23  
SPST

OPTION CODE	CAP AND FRAME COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

OPTION CODE	LED COLOR
3	RED
5	YELLOW
6	GREEN

For LED information see page A-45.

**NOTE:** Caps available separately, see page A-44. Available with V3 terminations and SPDT models only.



Third Angle Projection  
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





# 8020 Series Snap-acting Momentary Pushbutton Switches

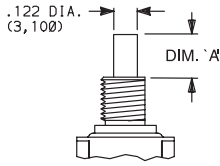
## PLUNGER

ACTUATOR OR PLUNGER

Pushbutton

A

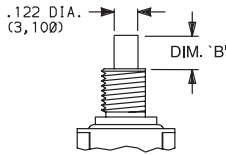
### S PLUNGER



**NONE** NO PLUNGER CHOICE REQUIRED (JXX ACTUATORS)

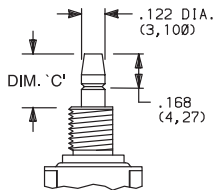
AVAILABLE BUSHINGS	DIM. 'A' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'A' FOR A, A2, A3, A4, A6, AV-A3, R & R2 TERMINATIONS	DIM. 'A' FOR V3-V61 TERMINATIONS
D, D9	.244 (6,20)	.228 (5,79)	.224 (5,69)
H, H9	.218 (5,54)	.202 (5,13)	.198 (5,03)
Y, Y9	.203 (5,16)	.187 (4,75)	.183 (4,65)
Y3	(5,54)	(5,13)	(5,03)
Y4	.185 (4,70)	.169 (4,29)	.165 (4,19)
D2, D8	N/A	.232 (5,89)	.228 (5,79)
D3	N/A	.162 (4,11)	.158 (4,01)

### L PLUNGER



AVAILABLE BUSHINGS	DIM. 'B' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'B' FOR A, A2, A3, A4, A6, AV-A3, R & R2 TERMINATIONS	DIM. 'B' FOR V3-V61 TERMINATIONS
Y, Y9	.178 (4,52)	.162 (4,11)	.158 (4,01)
Y4	.090 (2,29)	.074 (1,88)	.070 (1,78)

### M SNAP-FITTING PLUNGER



AVAILABLE BUSHINGS	DIM. 'C' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'C' FOR A, A2, A3, A4, A6, AV-A3, R & R2 TERMINATIONS	DIM. 'C' FOR V3-V61 TERMINATIONS
D, D9	.297 (7,54)	.281 (7,14)	.277 (7,04)
H, H9	.267 (6,78)	.251 (6,38)	.247 (6,27)
Y, Y9	.259 (6,58)	.243 (6,17)	.239 (6,07)
Y3	(6,78)	(6,37)	(6,27)
Y4	.259 (6,58)	.243 (6,17)	.239 (6,07)
D2, D8	N/A	.273 (6,93)	.269 (6,83)
D3	N/A	.361 (9,17)	.357 (9,07)

N/A = NOT AVAILABLE

**NOTE:** When selecting plunger option, bushing selection must also be made, see next page. No plunger option is required when any JXX actuator option is selected. Additional plunger lengths are available on SPDT and DPDT models, consult Customer Service Center. Not all plunger lengths sufficient for use with caps, see page A-44.

## BUSHING

**NONE** NO BUSHING CHOICE REQUIRED (JXX ACTUATORS)

**D** .280" HIGH THREADED, KEYWAY

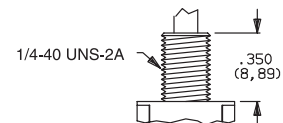
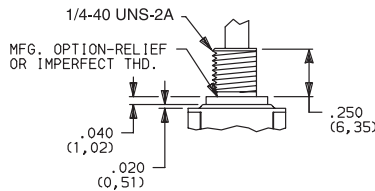
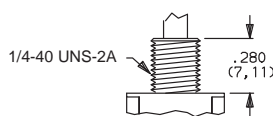
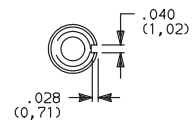
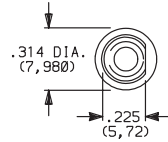
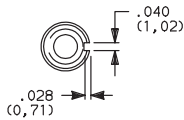
**D9** .280" HIGH UNTHREADED, KEYWAY

**H** .250" HIGH THREADED, FLAT

**H9** .250" HIGH UNTHREADED, FLAT

**Y** .350" HIGH THREADED, KEYWAY

**Y9** .350" HIGH UNTHREADED, KEYWAY



D9 bushing standard with A-A6, R, R2 AV-AV3 terminations.

H bushing standard with C, W-W4, Z or Z3 terminations. H, H9 bushings not available on single pole models with A3-A6, R, R2 terminations.

**Will withstand 12 in./lbs. of torque with no distortion.**



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# 8020 Series Snap-acting Momentary Pushbutton Switches

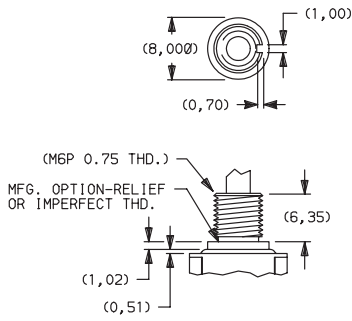


A

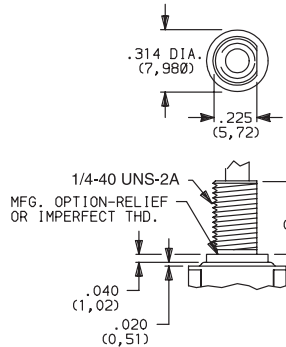
Pushbutton

## BUSHING

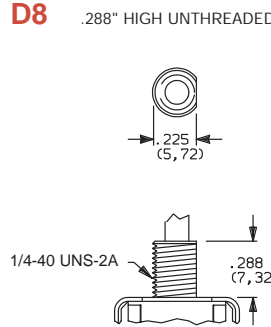
**Y3** 6.35mm THREADED, KEYWAY



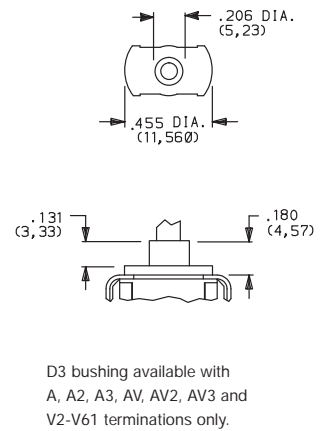
**Y4** .378" HIGH THREADED, FLAT



**D2** .288" HIGH THREADED, FLAT



**D3** .180" HIGH UNTHREADED

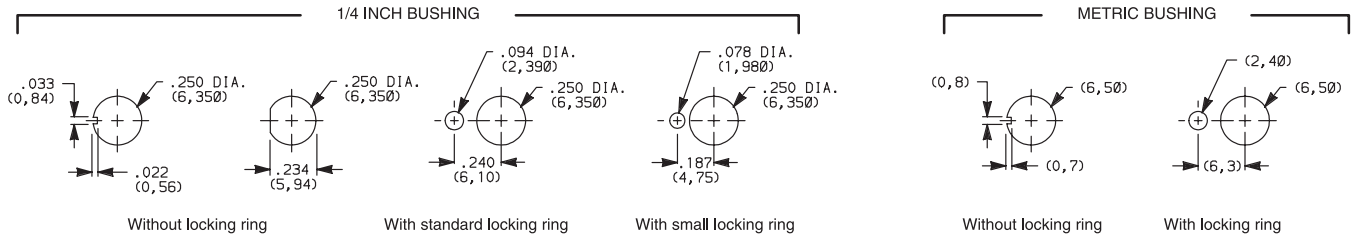


Y3 & Y4 bushings not available on single pole models with A3-A6, R, R2 terminations. Will withstand 12 in./lbs. of torque with no distortion.

D2, D8 bushings not available with C, W-W4, Z, Z3 terminations.

**NOTE:** No bushing option choice required when JXX actuator option is selected. When selecting bushing option, plunger selection must also be made, see previous page. Plunger lengths vary with bushing and termination options selected.

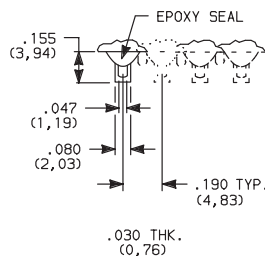
## PANEL MOUNTING



**NOTE:** Two mounting nuts, locking ring and lockwasher supplied standard with threaded bushings. Optional mounting nut and locking ring styles available, see section "Technical Data and Additional Hardware".

## TERMINATIONS

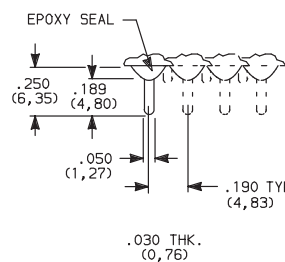
**Z** SOLDER LUG



SPDT thru 4PDT

Not available with J95 actuator, P or R contact material.

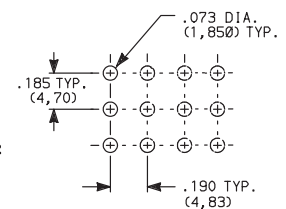
**C** PC THRU-HOLE



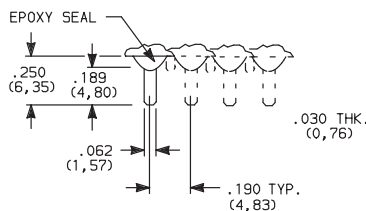
SPDT thru 4PDT

Not available with J95 actuator option.

PC MOUNTING



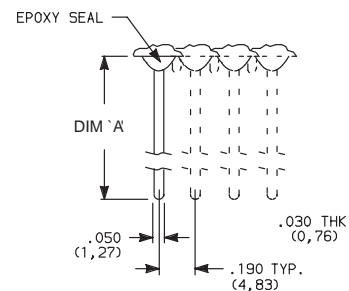
**Z3** QUICK CONNECT



SPDT thru 4PDT

Not available with J95 actuator, P or R contact material. Mating quick connector available, order part number 530100000, page A-44.

**W W1, W3, W4** WIRE WRAP



SPDT thru 4PDT

OPTION CODE	DIM 'A'
<b>W</b>	.750 (19,05)
<b>W1</b>	.964 (24,49)
<b>W3</b>	.425 (10,80)
<b>W4</b>	1.062 (26,97)

Not available with J95 actuator option.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





# 8020 Series Snap-acting Momentary Pushbutton Switches

## TERMINATIONS



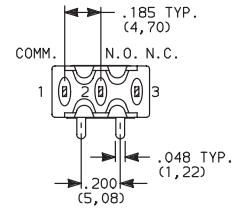
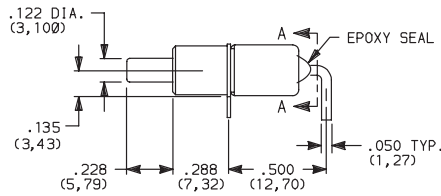
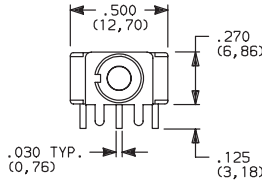
Pushbutton

A

### A RIGHT ANGLE, PC THRU-HOLE

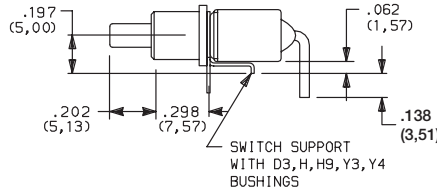


8121SD9AGE  
SPDT



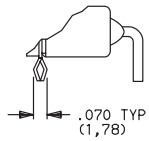
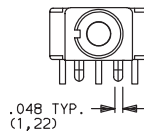
#### SECTION A-A

Terminal Nos.  
For Reference Only.

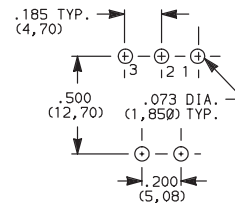


Part Number 8121SH9AGE

### A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



#### PC MOUNTING

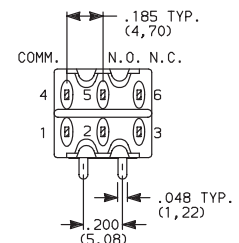
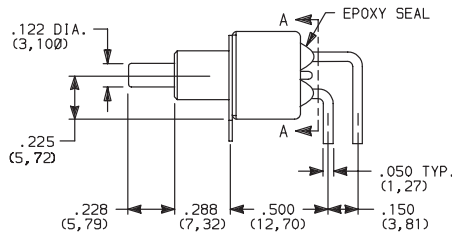
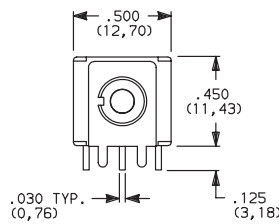


Not available with JXX actuators and I seal.  
Terminal bend radii and lead-in manufacturing option.

### A RIGHT ANGLE, PC THRU-HOLE

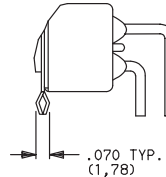
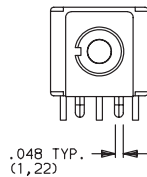


8221SD9AGE  
DPDT

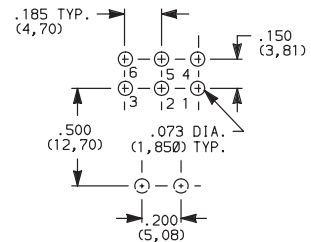


#### SECTION A-A

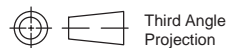
### A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



#### PC MOUNTING



Not available with JXX actuators and I seal option.  
Terminal bend radii and lead-in manufacturing option.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# 8020 Series Snap-acting Momentary Pushbutton Switches

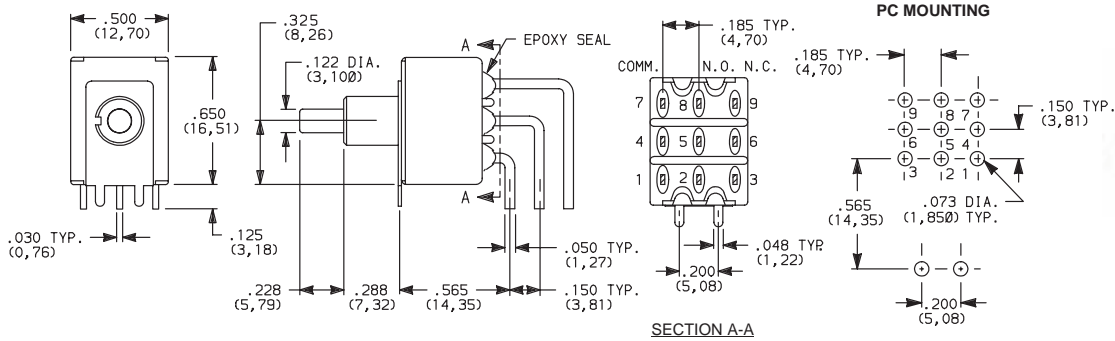


A

Pushbutton

## TERMINATIONS

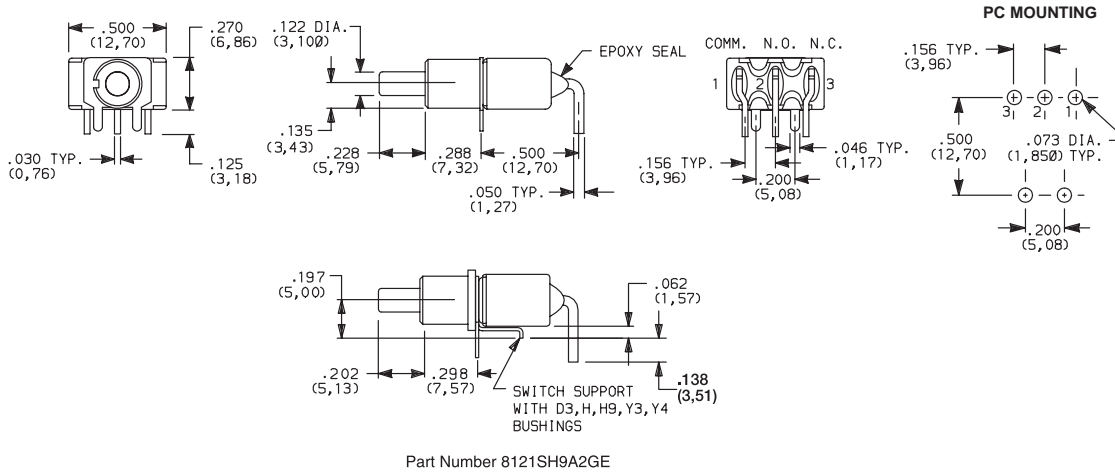
### A RIGHT ANGLE, PC THRU-HOLE



8321SD9AGE  
3PDT

Not available with JXX actuators and I seal option.  
Terminal bend radii and lead-in manufacturing option.

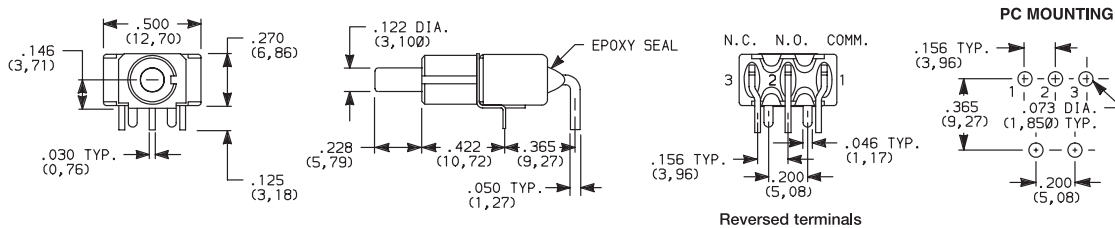
### A2 RIGHT ANGLE, PC THRU-HOLE



8121SD9A2GE  
SPDT

Not available with JXX actuators, I seal option.  
Terminal bend radii and lead-in manufacturing option.

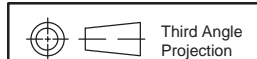
### A4 RIGHT ANGLE, PC THRU-HOLE, REVERSED TERMINALS



8121SD9A4GE  
SPDT

Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings and I seal.  
Terminal bend radii and lead-in manufacturing option.

The A4 and R2 termination options are functionally identical and fit the same PC mounting pattern. The switches, however, are shifted relative to the mounting holes. The PC pattern must clear the switch support legs. Unlike the R2, the A4 option is available with UL/CSA.



Third Angle Projection  
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





# 8020 Series Snap-acting Momentary Pushbutton Switches

## TERMINATIONS



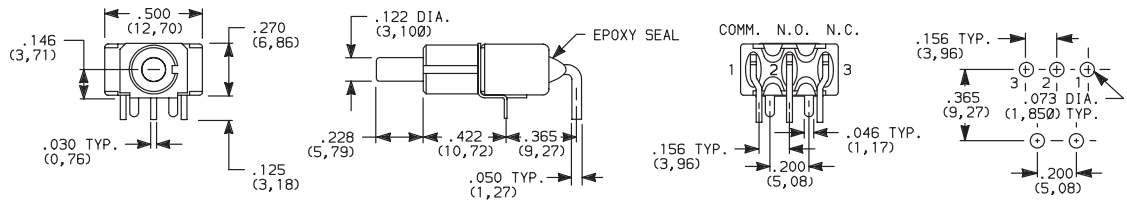
Pushbutton

A

### A6 RIGHT ANGLE, PC THRU-HOLE



8121SD9A6GE  
SPDT



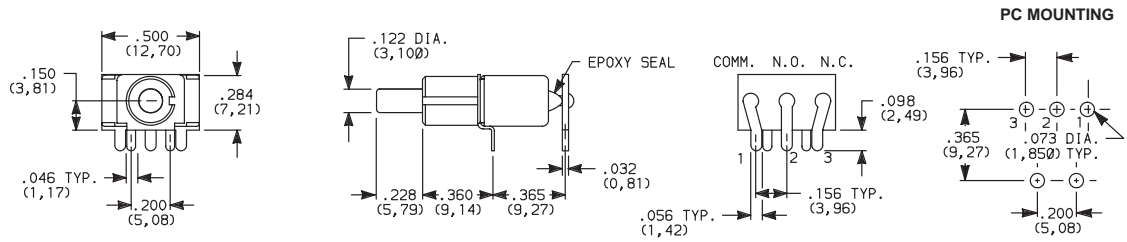
The A6 and R termination options are functionally identical and fit the same PC mounting pattern. The switches, however, are shifted relative to the mounting holes. The PC pattern must clear the switch support legs. Unlike the R, the A6 option is available with UL/CSA.

Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings and I seal. Terminal bend radii and lead-in manufacturing option.

### R RIGHT ANGLE WITH PCB



8121SD9RGE  
SPDT

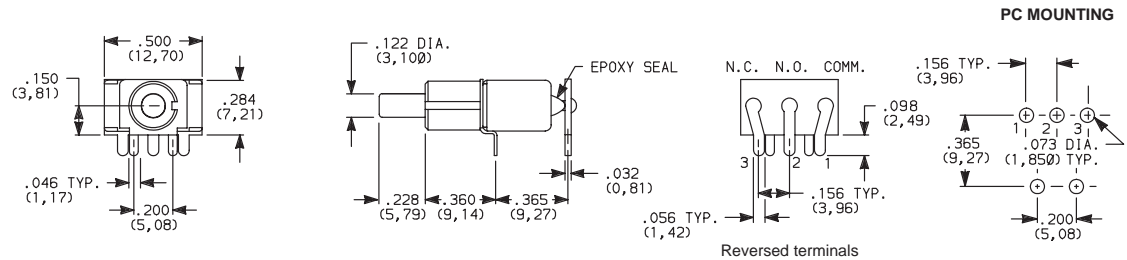


Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings, I seal option. R termination not UL/CSA approved.

### R2 RIGHT ANGLE WITH PCB, REVERSED TERMINALS



8121SD9R2GE  
SPDT

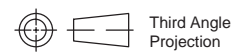
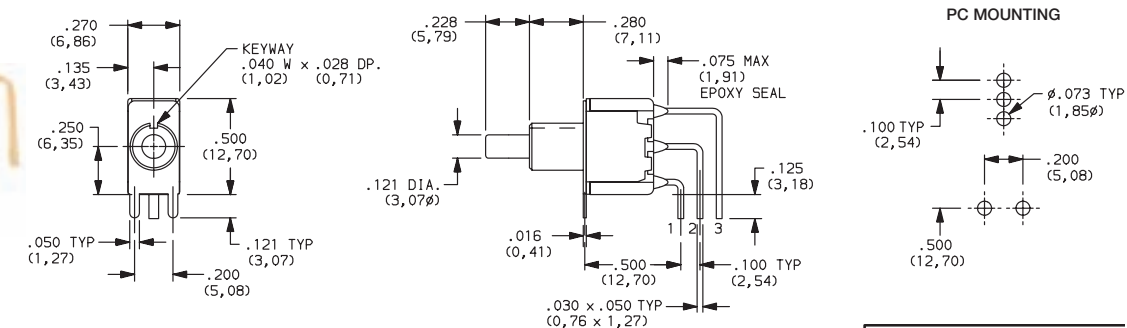


Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings, I seal option. R2 termination not UL/CSA approved.

### AV VERTICAL RIGHT ANGLE, PC THRU-HOLE, .100" PITCH



8121SD9AVGE  
SPDT



Third Angle Projection  
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# 8020 Series Snap-acting Momentary Pushbutton Switches

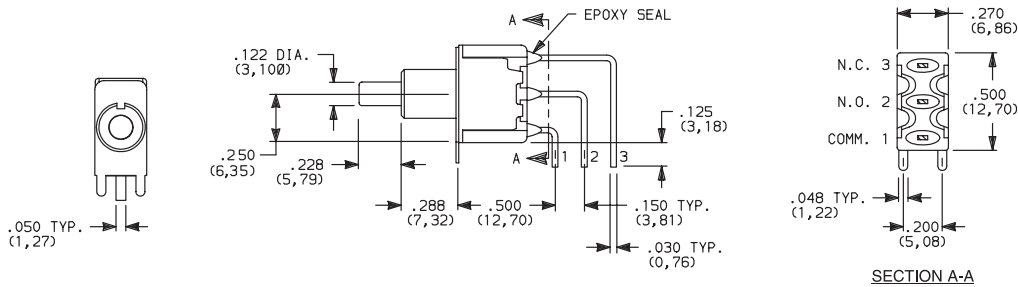


Pushbutton

## TERMINATIONS

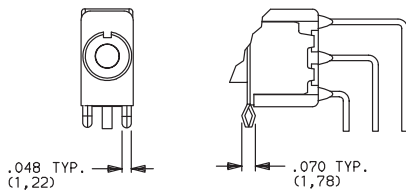


**AV2** VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

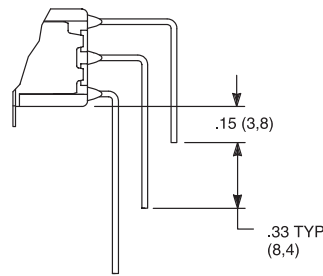


8121SD9AV2GE  
SPDT

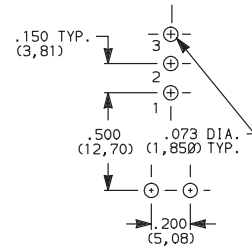
**AV3** VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



**AV1** VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH

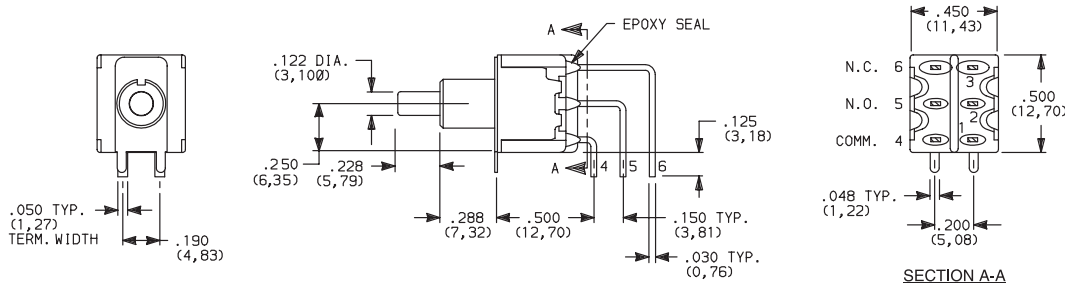


### PC MOUNTING



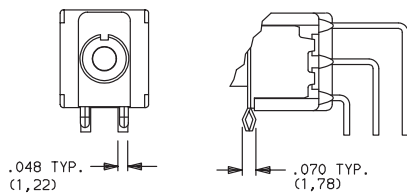
Not available with JXX actuators and I seal.  
Terminal bend radii and lead-in manufacturing option.

**AV2** VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

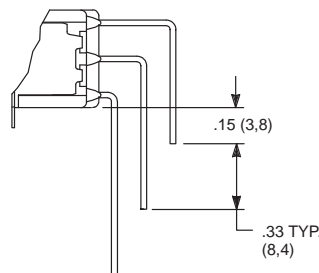


8221SD9AV2GE  
DPDT

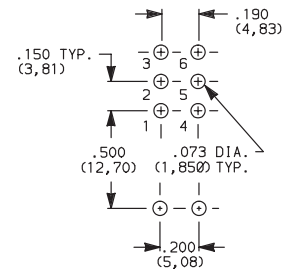
**AV3** VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



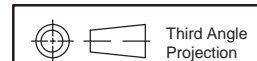
**AV1** VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH



### PC MOUNTING



Not available with JXX actuators and I seal.  
Terminal bend radii and lead-in manufacturing option.



Third Angle Projection  
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





# 8020 Series Snap-acting Momentary Pushbutton Switches

## TERMINATIONS

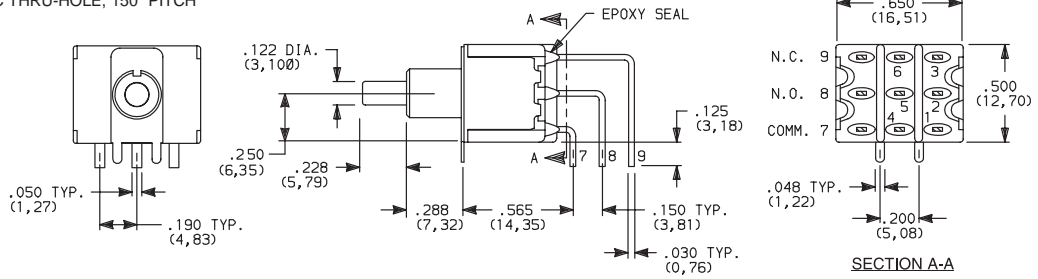


Pushbutton  
A

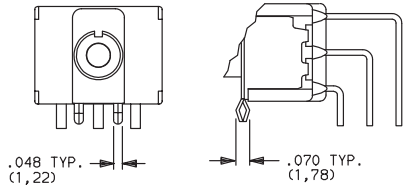
**AV2** VERTICAL RIGHT ANGLE, PC THRU-HOLE, 150° PITCH



**8321SD9AV2GE**  
**3PDT**

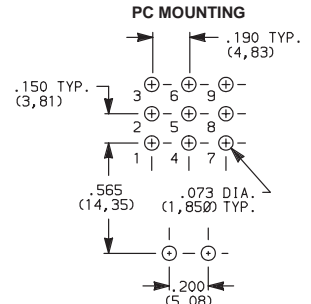
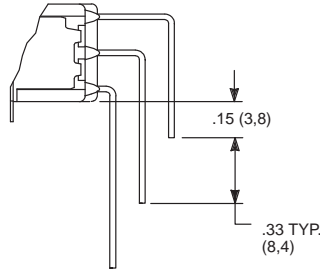


**AV3** VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



Not available with JXX actuators and I seal.  
Terminal bend radii and lead-in manufacturing option.

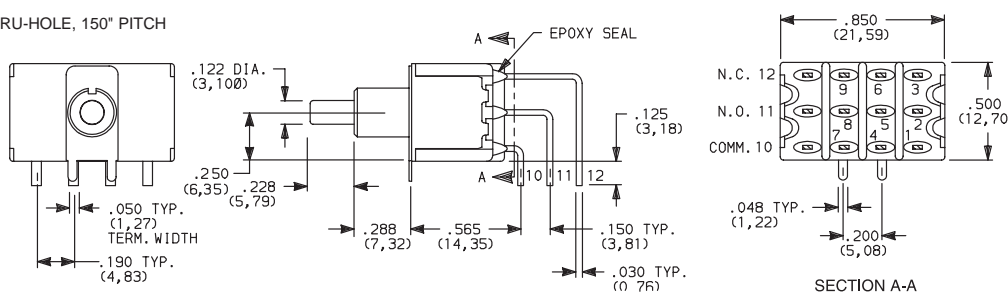
**AV1** VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH



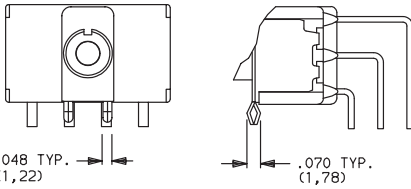
**AV2** VERTICAL RIGHT ANGLE, PC THRU-HOLE, 150° PITCH



**8421SD9AV2GE**  
**4PDT**

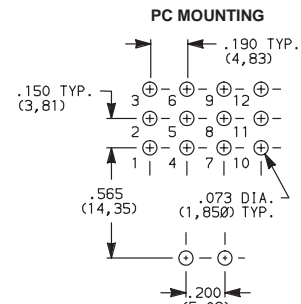
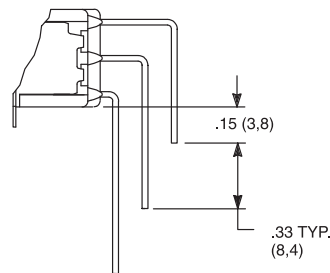


**AV3** VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



Not available with JXX actuators and I seal.  
Terminal bend radii and lead-in manufacturing option.

**AV1** VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH



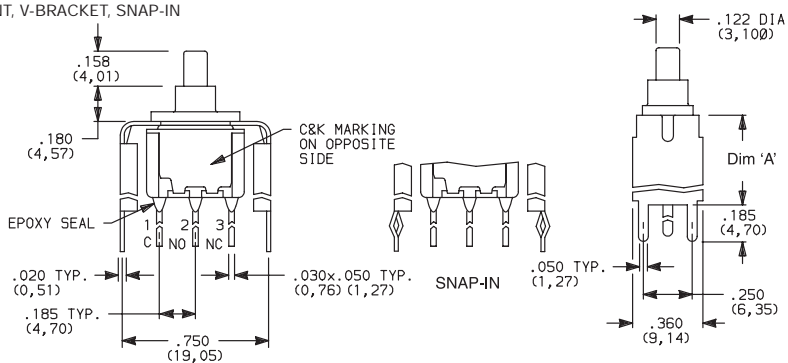
**V2, V6, V7, V8**

VERTICAL MOUNT, V-BRACKET

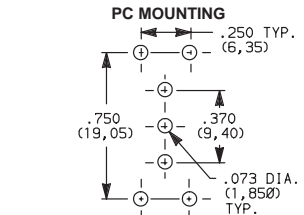
**V61** VERTICAL MOUNT, V-BRACKET, SNAP-IN



**8121SD3\_GE**  
**SPDT**



Not available with JXX actuators and I seal.



OPTION CODE	DIM 'A'
V2	.555 (14,10)
V6, V61	.460 (11,68)
V7	.630 (16,00)
V8	.953 (24,21)



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# 8020 Series Snap-acting Momentary Pushbutton Switches

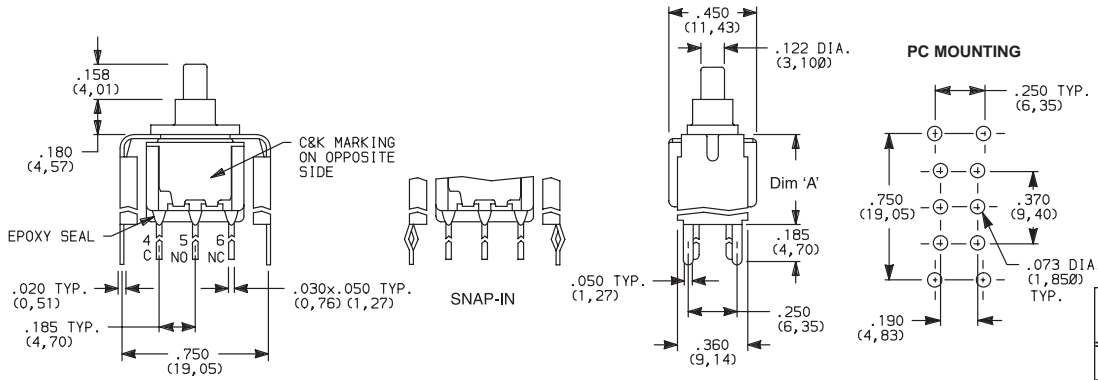


Pushbutton

## TERMINATIONS

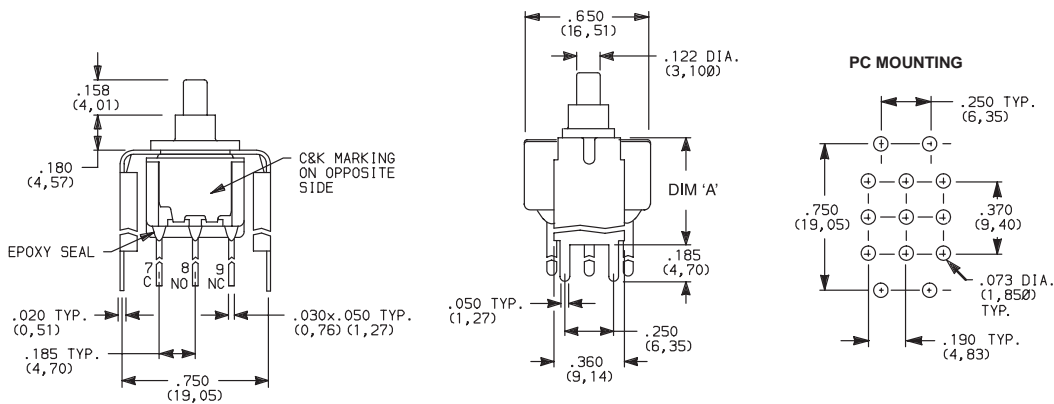
**V2, V6, V7, V8** VERTICAL MOUNT, V-BRACKET

**V61** VERTICAL MOUNT, V-BRACKET, SNAP-IN



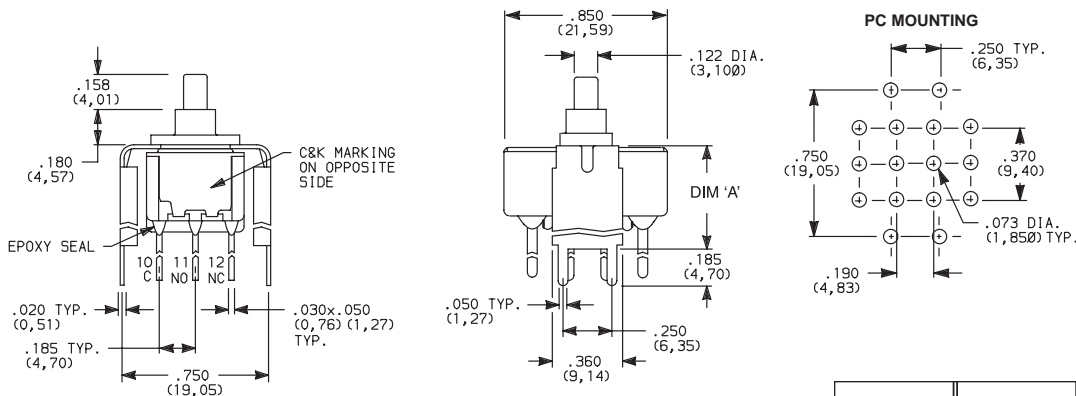
Not available with JXX actuators and I seal.

**V2, V7, V8** VERTICAL MOUNT, V-BRACKET

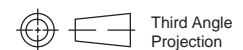


Not available with JXX actuators and I seal.

**V2, V7, V8** VERTICAL MOUNT, V-BRACKET



Not available with JXX actuators and I seal.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





# 8020 Series Snap-acting Momentary Pushbutton Switches

## TERMINATIONS



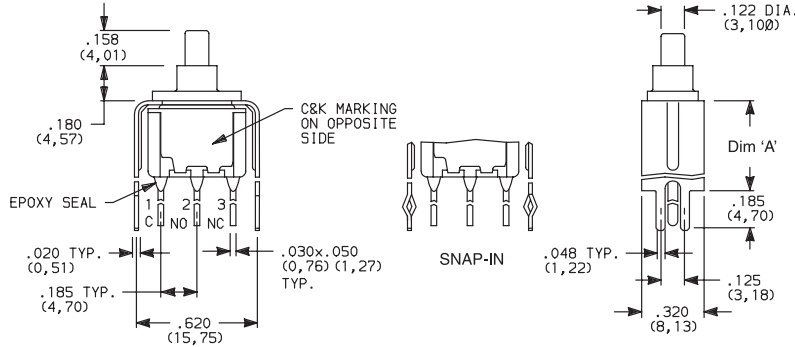
Pushbutton  
A

**V3, V4, V9** VERTICAL MOUNT, V-BRACKET

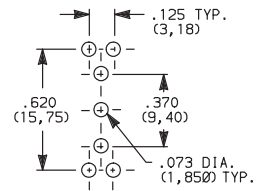
**V31** VERTICAL MOUNT, V-BRACKET, SNAP-IN



8121SD3\_GE  
SPDT



### PC MOUNTING



OPTION CODE	DIM 'A'
<b>V3, V31</b>	.460 (11,68)
<b>V4</b>	.630 (16,00)
<b>V9</b>	1.150 (29,21)

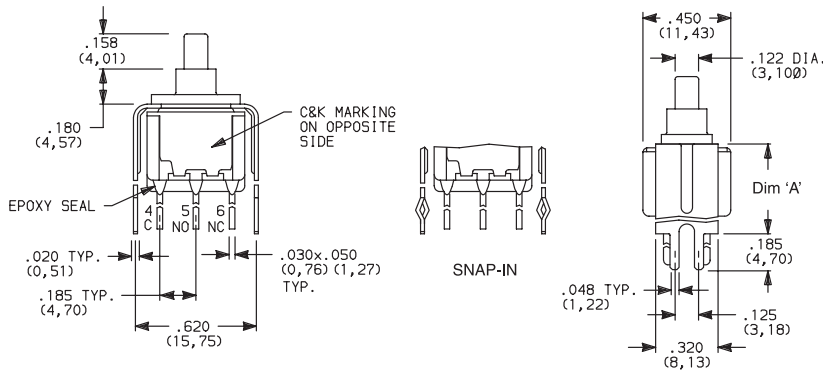
Not available with J8X actuators and I seal.

**V3, V4, V9** VERTICAL MOUNT, V-BRACKET

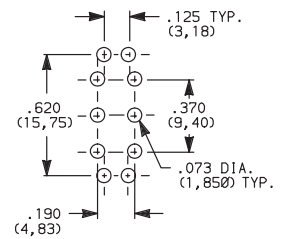
**V31** VERTICAL MOUNT, V-BRACKET, SNAP-IN



8221SD3\_GE  
DPDT



### PC MOUNTING



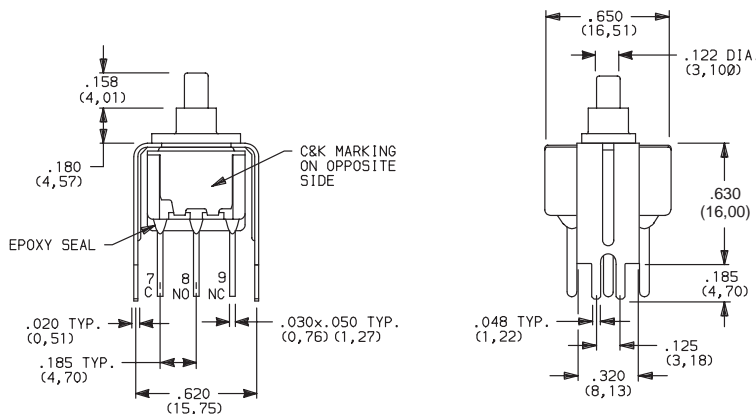
OPTION CODE	DIM 'A'
<b>V3, V31</b>	.460 (11,68)
<b>V4</b>	.630 (16,00)
<b>V9</b>	1.150 (29,21)

Not available with J8X actuators and I seal.

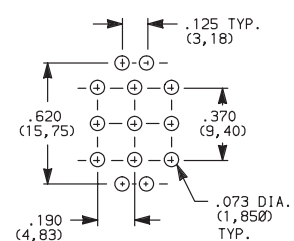
**V4, V9** VERTICAL MOUNT, V-BRACKET



8321SD3V4GE  
3PDT

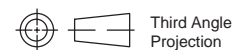


### PC MOUNTING



OPTION CODE	DIM 'A'
<b>V4</b>	.630 (16,00)
<b>V9</b>	1.150 (29,21)

Not available with JXX actuators and I seal.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# 8020 Series Snap-acting Momentary Pushbutton Switches



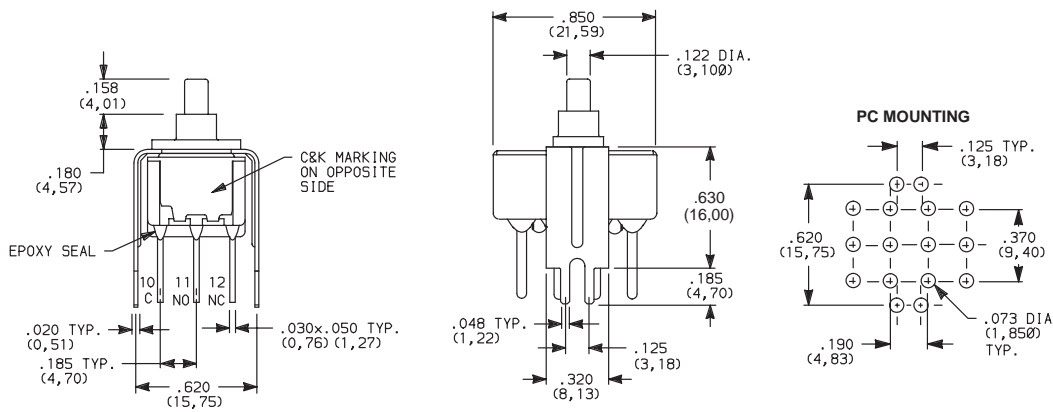
A

Pushbutton

## TERMINATIONS



**V4, V9** VERTICAL MOUNT, V-BRACKET



8421SD3V4GE  
4PDT

OPTION CODE	DIM 'A'
V4	.630 (16,00)
V9	1.150 (29,21)

Not available with JXX actuators and I seal.

## CONTACT MATERIAL



OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	GOLD <sup>1</sup>	GOLD <sup>1</sup>	LOW LEVEL/DRY CIRCUIT	8x25 MODELS ONLY: 0.4 MAX. @ 20 V AC OR DC MAX.
P		MATTE-TIN <sup>4</sup>		
G	GOLD OVER SILVER <sup>2,3</sup>	GOLD <sup>3</sup>	LOW LEVEL/DRY CIRCUIT OR POWER	8X21, U8X1 MODELS ONLY: 0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC.
R		MATTE-TIN <sup>4</sup>		

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

- <sup>1</sup> ALL CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.
- <sup>2</sup> N.O. AND N.C. CONTACTS: Coin silver, with gold plate over nickel plate.
- <sup>3</sup> COMMON CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.
- <sup>4</sup> TERMINALS: Copper alloy, with matte-tin over nickel plate.

**NOTE:** Any models supplied with B, P, R or G contact material are RoHS compliant.

U811-U841 models with all options (except R, R2 terminations) when ordered with mandatory G, R or L contact material.

B or P contact material must be ordered with 8X25 models.

G or R contact material must be ordered with 8X21, U8X1 models.

P or R contact material not available with Z, Z3 terminations.

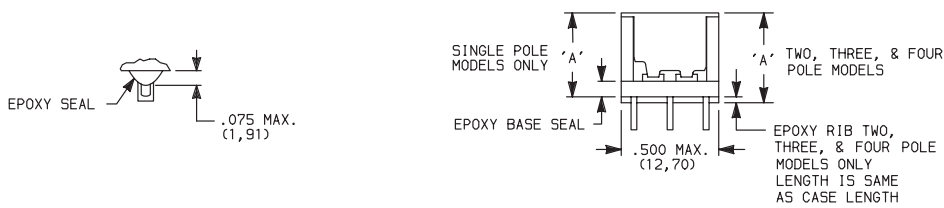
K, L and M options represent Non RoHS tin lead product and are not recommended for new designs. For additional information please contact Customer Service.

## SEAL



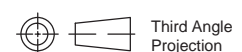
**E** EPOXY SEAL

**I** EPOXY POTTED BASE



NO. POLES	DIM 'A'
SP	.410 (10,41)
DP	.440 (11,18)
3P	.505 (12,83)
4P	.505 (12,83)

**NOTE:** Available with C, W-W4, Z, Z3 terminations only.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



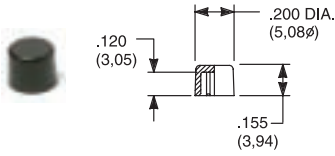


# 8020 Series Snap-acting Momentary Pushbutton Switches

## AVAILABLE HARDWARE

Pushbutton  
A

### Cap

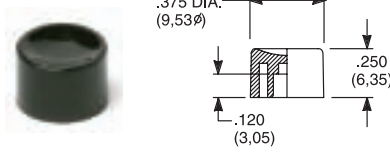


#### PART NO.

- 708901000** WHITE
- 708902000** BLACK
- 708903000** RED
- 708904000** ORANGE
- 708905000** YELLOW
- 708906000** GREEN
- 708907000** BLUE
- 708909000** GRAY

Material: Nylon  
Finish: Gloss

### Cap

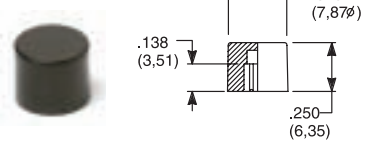


#### PART NO.

- 752701000** WHITE
- 752702000** BLACK
- 752703000** RED
- 752704000** ORANGE
- 752705000** YELLOW
- 752706000** GREEN
- 752707000** BLUE
- 752709000** GRAY

Material: Nylon  
Finish: Gloss

### Cap

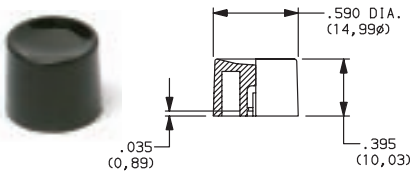


#### PART NO.

- 801801000** WHITE
- 801802000** BLACK
- 801803000** RED
- 801804000** ORANGE
- 801805000** YELLOW
- 801806000** GREEN
- 801807000** BLUE
- 801809000** GRAY

Material: Nylon  
Finish: Gloss

### Cap, Snap-fitting plunger

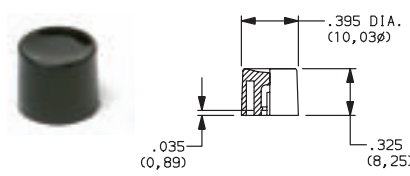


#### PART NO.

- 894001000** WHITE
- 894002000** BLACK
- 894003000** RED
- 894004000** ORANGE
- 894005000** YELLOW
- 894006000** GREEN
- 894007000** BLUE
- 894009000** GRAY

Material: Nylon  
Finish: Gloss

### Cap, Snap-fitting plunger

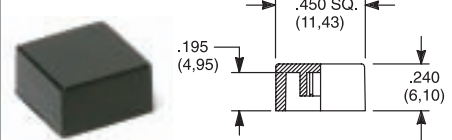


#### PART NO.

- 894101000** WHITE
- 894102000** BLACK
- 894103000** RED
- 894104000** ORANGE
- 894105000** YELLOW
- 894106000** GREEN
- 894107000** BLUE
- 894109000** GRAY

Material: Nylon  
Finish: Gloss

### Cap, J80, J81, J82, J83 & J84 options only



#### PART NO.

- 484601000** WHITE
- 484602000** BLACK
- 484603000** RED
- 484604000** ORANGE
- 484605000** YELLOW
- 484606000** GREEN
- 484607000** BLUE
- 484609000** GRAY

Material: Nylon  
Finish: Gloss

#### PART NO.

- 798201000** WHITE
- 798202263** BLACK
- 798203000** RED
- 798204000** ORANGE
- 798205000** YELLOW
- 798206000** GREEN
- 798207000** BLUE
- 798209000** GRAY

Material: Nylon  
Finish: Matte

### Frame



#### PART NO.

- 615601000** WHITE
- 615602263** BLACK
- 615603000** RED
- 615605000** YELLOW
- 615606000** GREEN
- 615609000** GRAY

Material: Nylon  
Finish: Matte

### Frame

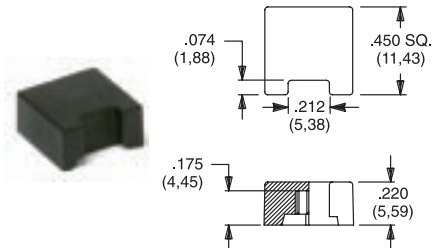


#### PART NO.

- 613301000** WHITE
- 613302263** BLACK
- 613303000** RED
- 613305000** YELLOW
- 613306000** GREEN
- 613309000** GRAY

Material: Nylon  
Finish: Matte

### Cap, J85 & J95 options only



#### PART NO.

- 459701000** WHITE
- 459702000** BLACK
- 459703000** RED
- 459704000** ORANGE
- 459705000** YELLOW
- 459706000** GREEN
- 459707000** BLUE
- 459709000** GRAY

Material: Nylon  
Finish: Gloss

#### PART NO.

- 459701000** WHITE
- 459702000** BLACK
- 459703000** RED
- 459704000** ORANGE
- 459705000** YELLOW
- 459706000** GREEN
- 459707000** BLUE
- 459709000** GRAY

Material: Nylon  
Finish: Matte

### Fits Z3 Termination female connector



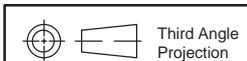
#### PART NO.

**530100000**

Available in loose pieces.

NOTE: Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".

Other cap & frame colors available, consult Customer Service Center.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



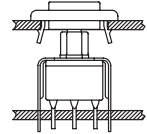
# 8020 Series Snap-acting Momentary Pushbutton Switches



## AVAILABLE HARDWARE

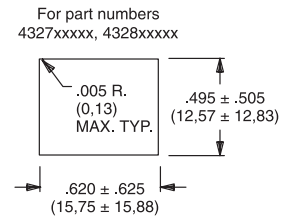
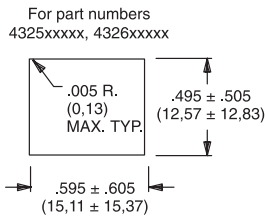
Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

### TYPICAL APPLICATION



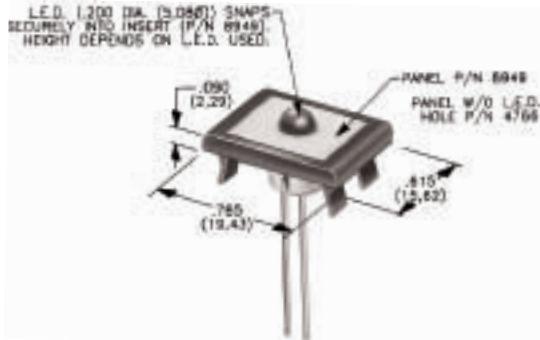
.047" (1,19) PANEL THK.	.062" (1,57) PANEL THK.	.090" (2,29) PANEL THK.	.125" (3,18) PANEL THK.
<b>PART NO.</b>	<b>PART NO.</b>	<b>PART NO.</b>	<b>PART NO.</b>
432501000	432601000	432701000	432801000
432502263	432602263	432702263	432802263
432503000	432603000	432703000	432803000
432505000	432605000	432705000	432805000
432506000	432606000	432706000	432806000
432509000	432609000	432709000	432809000
			WHITE
			BLACK
			RED
			YELLOW
			GREEN
			GRAY

### PANEL MOUNTING



### Panel Inserts

Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**



PANEL INSERT WITH HOLE FOR LED

BLANK PANEL INSERT WITHOUT HOLE FOR LED

**PART NO.**

894901000  
894902000  
894903000  
894905000  
894906000  
894909000

**PART NO.**

476601000  
476602000  
476603000  
476605000  
476606000  
476609000

WHITE  
BLACK  
RED  
YELLOW  
GREEN  
GRAY

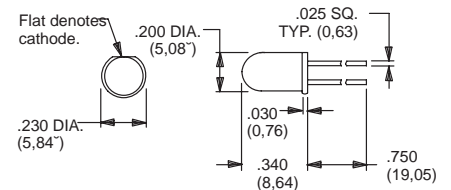
Special colors, custom markings available, consult Customer Service Center.

### LED INFORMATION

SWITCHES WITH LED SUPPLIED: J85, J95 OPTIONS:

Rectangular LEDs are supplied on 8020 Series pushbutton switches with J85 and J95 options. These LEDs are factory installed and are not replaceable. The following specifications apply:

OPTION CODE	COLOR	TYP. INTENSITY	TYP. FORWARD VOLTAGE	TYP. FORWARD CURRENT	MAX RATINGS AT 25°C AMBIENT TEMPERATURE		
					FORWARD VOLTAGE	CONTINUOUS FORWARD CURRENT	POWER DISSIPATION
6	Green	1.0 mcd	2.1 V	20 mA	2.5 V	50 mA	125 mW
3	Red*	0.5 mcd		10 mA		30 mA	75 mW
5	Yellow	4.0 mcd		20 mA		50 mA	125 mW

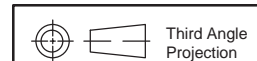


Suggested LED for J82 & J84 options. Dimensions for reference only.

**Process Information:** Soldering to LED leads must be completed within 5 seconds at 500°F (260°C) maximum.

**Caution:** Circuit elements must limit forward current of LED to 50mA max. continuous.

\* Extra-bright red LED available (typ. intensity 4.5 mcd), consult Customer Service Center. LEDs are not supplied with J82, J84 options. LED snaps into switch frame surrounding actuator and is wired externally.



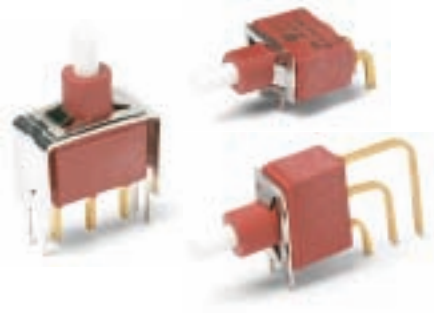
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





Pushbutton  
A

# E010 Series Sealed Momentary Pushbutton Switches



## Features/Benefits

- *Process sealed, withstands soldering and cleaning*
- *Long life contact design*
- *Snap-fitting plunger available, accepts a variety of caps*
- *RoHS compliant models available*

## Typical Applications

- *Instrumentation*
- *Telecommunications and networking equipment*
- *Computers and peripherals*



## Specifications

CONTACT RATING: Q contact material: 4 AMPS @ 125 V AC or 28 V DC. See page A-50 for additional ratings.  
 ELECTRICAL LIFE: 40,000 make-and-break cycles at full load.  
 CONTACT RESISTANCE: Below 20 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.  
 INSULATION RESISTANCE: 10<sup>9</sup>Ω min.  
 DIELECTRIC STRENGTH: 1000 Vrms min. @ sea level.  
 OPERATING TEMPERATURE: -30°C to 75°C.  
 CAP INSTALLATION FORCE: 10 lbs. max. permissible.  
 SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

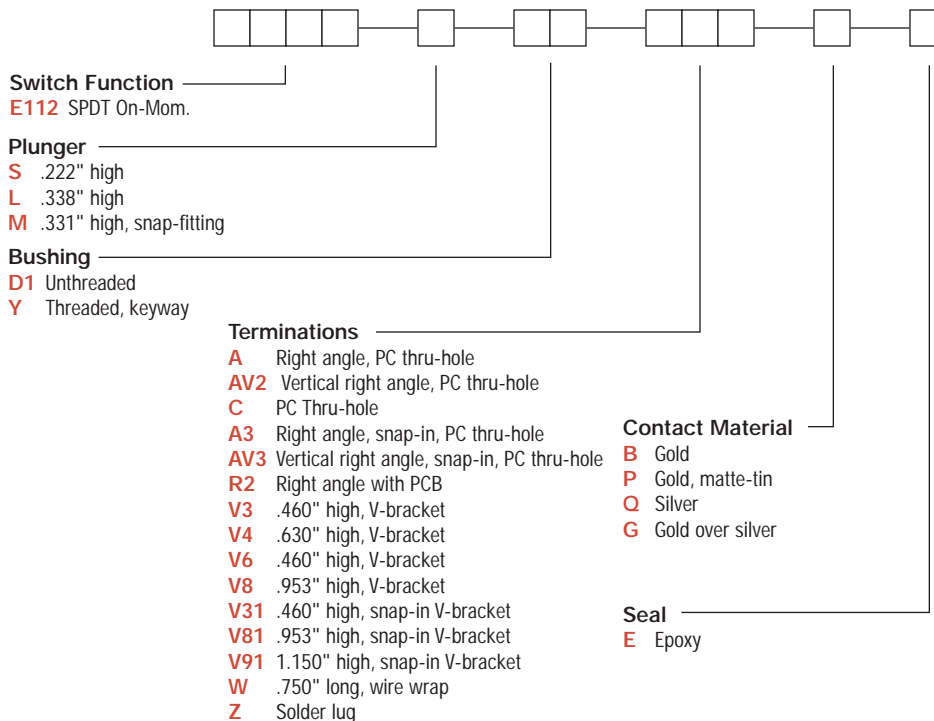
**NOTE:** Any models supplied with P, Q, B or G contact material are RoHS compliant.  
**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Materials

CASE & BUSHING: Glass filled nylon 6/6, flame retardant (UL 94V-0).  
 PLUNGER: Glass filled nylon or glass filled polyester (PBT) (UL 94V-0), with internal o-ring seal standard.  
 SWITCH SUPPORT: Brass or steel, matte-tin plated.  
 SWITCH SUPPORT RETAINER: Stainless steel.  
 END CONTACTS: Q contact material: Coin silver, silver plated. See A-50 for additional ratings.  
 CENTER CONTACTS & ALL TERMINALS: Q contact material: Copper alloy, silver plated. See page A-50 for additional ratings.  
 TERMINAL SEAL: Epoxy.  
 HARDWARE: Nut & locking ring-Brass, nickel plated. Lockwasher-Steel, nickel plated.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-47 thru A-51. For additional options not shown in catalog, consult Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.



Dimensions are shown: Inches (mm)  
 Specifications and dimensions subject to change

# E010 Series Sealed Momentary Pushbutton Switches



A

Pushbutton

## SWITCH FUNCTION

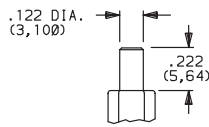
NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
		C&K marking this side		C&K marking this side		
SP	<b>E112</b>	ON	MOM.	2-1	2-3	<p>SPDT NC 1 2 (COMM) 3 NO</p>
<p><b>SPDT</b></p> <p>Part number shown: E112SD1CQE</p>						

MOM. = Momentary

All models with all options when ordered with G or Q contact material.

## PLUNGER

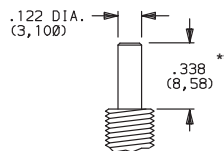
**S** .218" HIGH



Standard with D1 bushing (as shown).

† Subtract .100 (2,54) from plunger length when ordered with Y bushing.

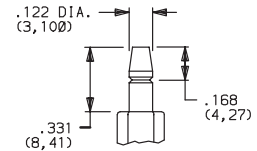
**L** .338" HIGH



Standard with Y bushing (as shown).

\*\* Add .100 (2,54) from plunger length when ordered with D1 bushing.

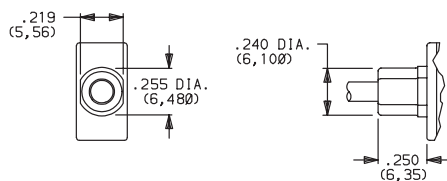
**M** .331" HIGH, SNAP-FITTING



NOTE: Caps available for all plunger options, see pages A-50 and A-51.

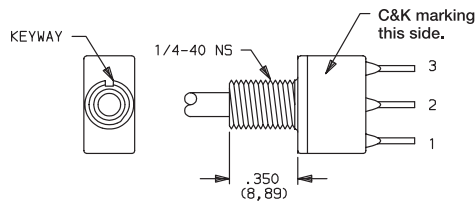
## BUSHING

**D1** UNTHREADED



S plunger standard with D1 bushing.

**Y** THREADED, KEYWAY

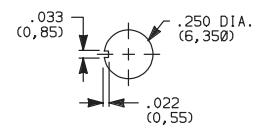


L plunger standard with Y bushing. Available only with C, Z terminations.

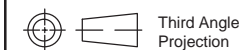
Hardware: One dress nut part number 780701201, one hex nut and lockwasher supplied standard.

Withstands 4 in./lbs. without distortion.

**PANEL MOUNTING**



NOTE: Internal o-ring actuator seal standard for all bushing options.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

**C&K**



# E010 Series Sealed Momentary Pushbutton Switches

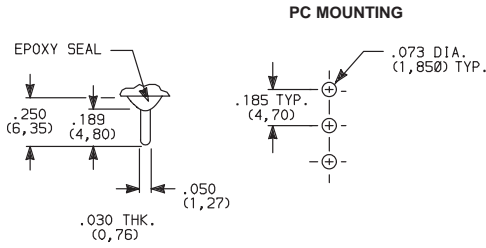
## TERMINATIONS



Pushbutton

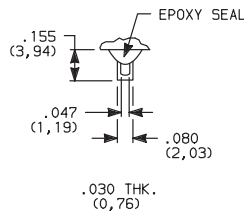
A

### C PC THRU-HOLE



SPDT

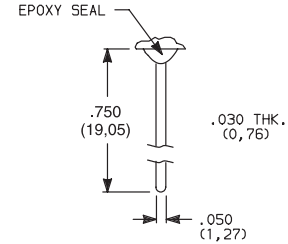
### Z SOLDER LUG



SPDT

Not available with P contact materials.

### W WIRE WRAP

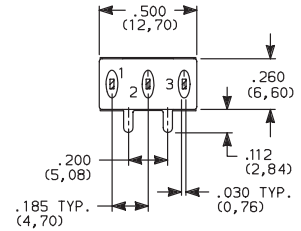
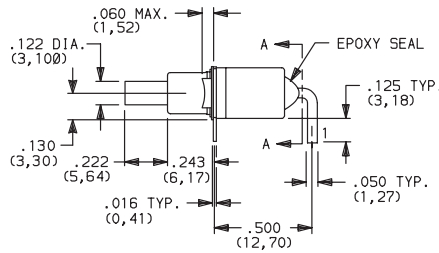
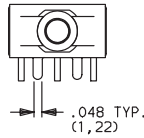


SPDT

### A RIGHT ANGLE, PC THRU-HOLE

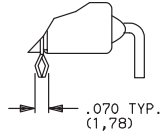
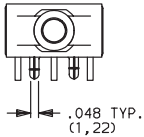


**E112SD1ABE  
SPDT**

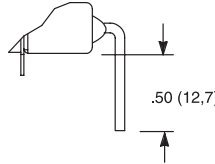


SECTION A-A

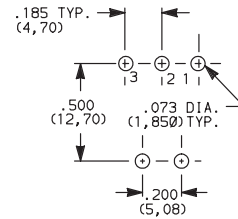
### A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



### AW RIGHT ANGLE, EXTENDED, PC THRU-HOLE



### PC MOUNTING

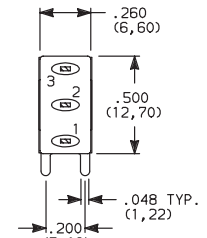
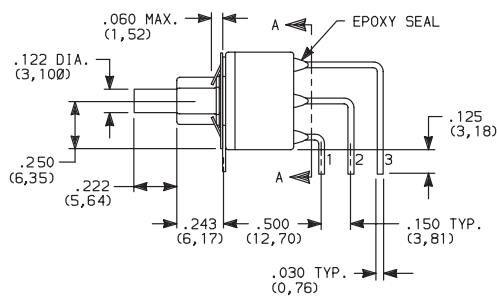
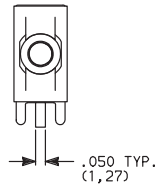


NOTE: Terminal bend radii and lead-in manufacturing option. Available with D1 bushing only.

### AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150° PITCH

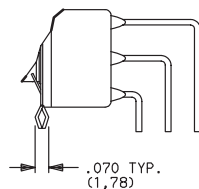
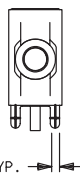


**E112SD1AV2BE  
SPDT**

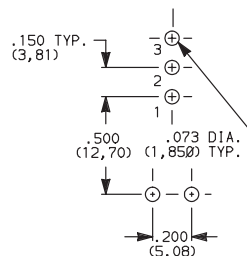


SECTION A-A

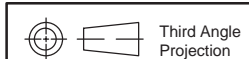
### AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150° PITCH



### PC MOUNTING



NOTE: Terminal bend radii and lead-in manufacturing option. Available with D1 bushing only.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# E010 Series Sealed Momentary Pushbutton Switches

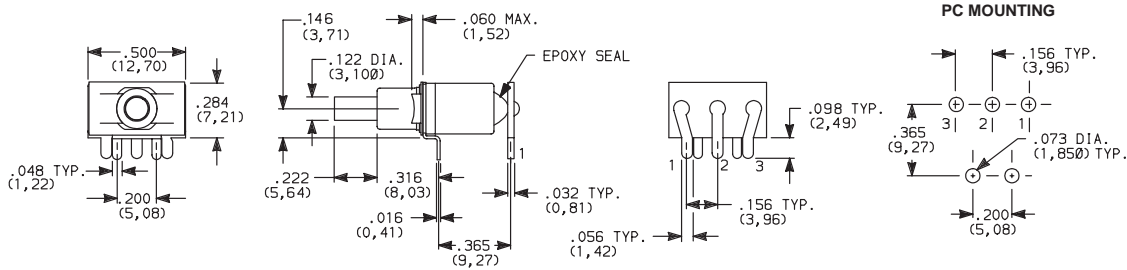


A

Pushbutton

## TERMINATIONS

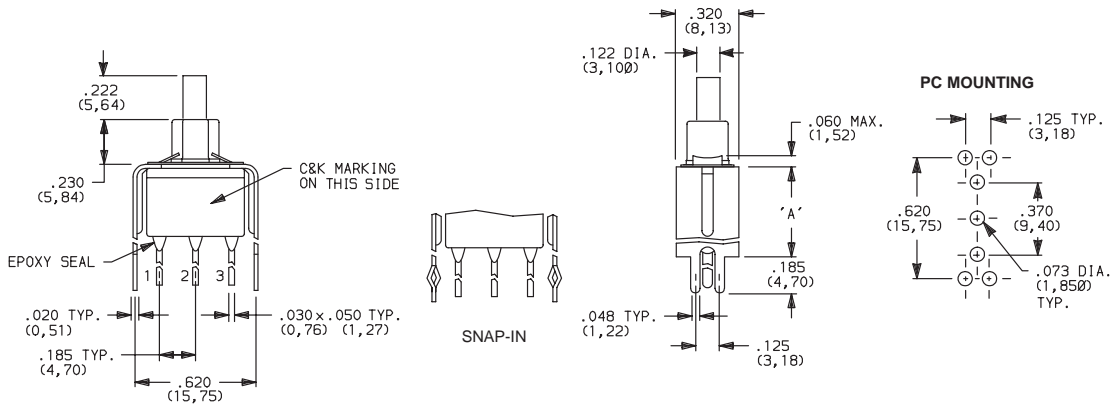
### R2 RIGHT ANGLE WITH PCB



NOTE: Available with D1 bushing and B contact material only.

### V3, V4 VERTICAL MOUNT, V-BRACKET

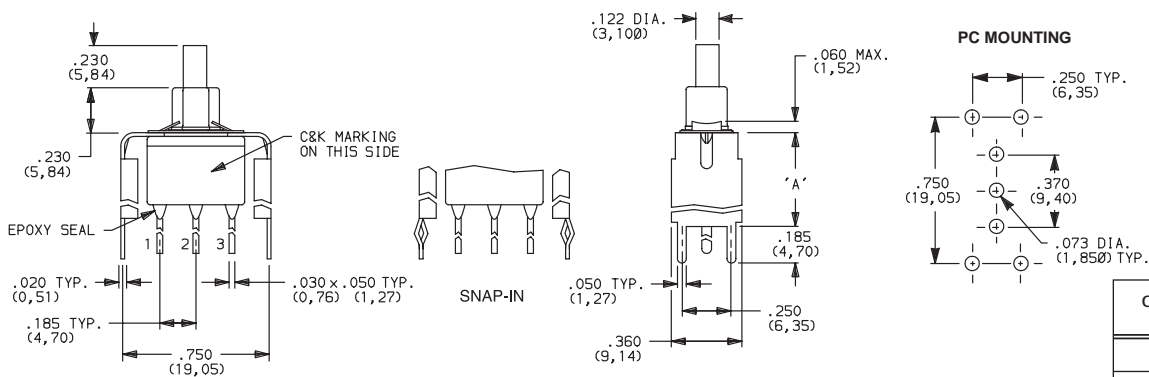
### V31, V91 VERTICAL MOUNT, V-BRACKET, SNAP-IN



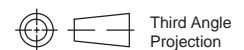
NOTE: Available with D1 bushing only.

### V6, V8 VERTICAL MOUNT, V-BRACKET

### V81 VERTICAL MOUNT, V-BRACKET, SNAP-IN



NOTE: Available with D1 bushing only.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change







# E010 Series Sealed Momentary Pushbutton Switches

## CONTACT MATERIAL



Pushbutton  
A

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
<b>B</b>	GOLD <sup>1</sup>	GOLD <sup>1</sup>	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
<b>P</b>		MATTE-TIN <sup>6</sup>		
<b>Q</b>	SILVER <sup>4,5</sup>	SILVER <sup>5</sup>	POWER	4 AMPS @ 125 V AC OR 28 V DC.
<b>G</b>	GOLD OVER SILVER <sup>2,3</sup>	GOLD <sup>3</sup>	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX. @ 20 V AC OR DC MAX. OR 4 AMPS @ 125 V AC OR 28 V DC.

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

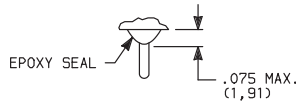
- <sup>1</sup> CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.
- <sup>2</sup> END CONTACTS: Coin silver, with gold plate over nickel plate.
- <sup>3</sup> CENTER CONTACTS & ALL TERMINALS: Coin silver, with gold plate over nickel plate.
- <sup>4</sup> END CONTACTS: Coin silver, silver plated.
- <sup>5</sup> CENTER CONTACTS & ALL TERMINALS: Copper alloy, silver plated.
- <sup>6</sup> TERMINALS: Copper alloy, with matte-tin over nickel plate.

**NOTE:** Any models supplied with P, Q, B or G contact material are RoHS compliant.  
 All models with all options when ordered with G or Q contact material.  
 B contact material standard with all terminations except C, Z.  
 B contact material must be ordered with R2 terminations.  
 Q contact material standard with C, Z terminations.  
 P contact materials not available with Z terminations.  
 K, L and M options represent Non RoHS tin lead product and are not recommended for new designs. For additional information please contact Customer Service.

## SEAL

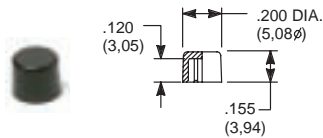


**E** EPOXY SEAL



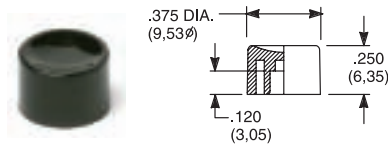
## AVAILABLE HARDWARE

Cap



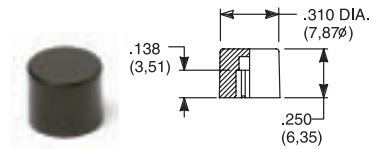
**PART NO.**  
**708901000** WHITE  
**708902000** BLACK  
**708903000** RED  
 Material: Nylon  
 Finish: Gloss

Cap



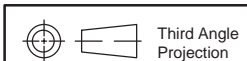
**PART NO.**  
**752701000** WHITE  
**752702000** BLACK  
**752703000** RED  
 Material: Nylon  
 Finish: Gloss

Cap



**PART NO.**  
**801801000** WHITE  
**801802000** BLACK  
**801803000** RED  
 Material: Nylon  
 Finish: Gloss

**NOTE:** Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".  
 Other cap colors available, consult Customer Service Center.



Dimensions are shown: Inches (mm)  
 Specifications and dimensions subject to change

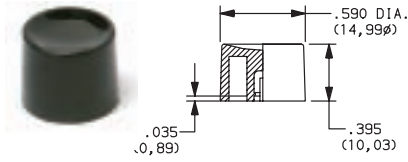


# E010 Series Sealed Momentary Pushbutton Switches



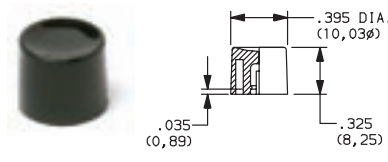
## AVAILABLE HARDWARE

Cap, Snap-fitting plunger



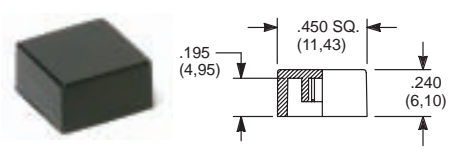
**PART NO.**  
**894001000** WHITE  
**894002000** BLACK  
**894003000** RED  
 Material: Nylon  
 Finish: Gloss

Cap, Snap-fitting plunger



**PART NO.**  
**894101000** WHITE  
**894102000** BLACK  
**894103000** RED  
 Material: Nylon  
 Finish: Gloss

Cap



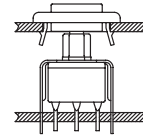
**PART NO.**  
**484601000** WHITE  
**484602000** BLACK  
**484603000** RED  
 Material: Nylon  
 Finish: Gloss

**PART NO.**  
**798201000** WHITE  
**798202263** BLACK  
**798203000** RED  
 Material: Nylon  
 Finish: Matte

**NOTE:** Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware". Other cap colors available, consult Customer Service Center.

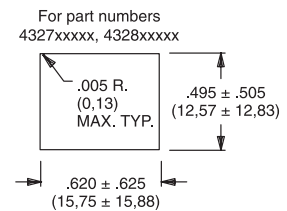
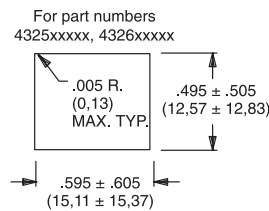
Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

TYPICAL APPLICATION



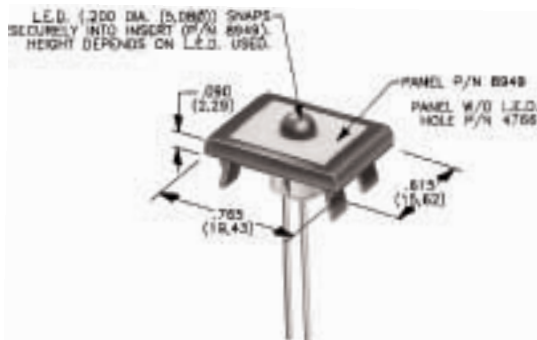
.047" (1,19) PANEL THK.	.062" (1,57) PANEL THK.	.090" (2,29) PANEL THK.	.125" (3,18) PANEL THK.
<b>PART NO.</b> <b>432501000</b> <b>432502263</b> <b>432503000</b>	<b>PART NO.</b> <b>432601000</b> <b>432602263</b> <b>432603000</b>	<b>PART NO.</b> <b>432701000</b> <b>432702263</b> <b>432703000</b>	<b>PART NO.</b> <b>432801000</b> WHITE <b>432802263</b> BLACK <b>432803000</b> RED

PANEL MOUNTING



Panel Inserts

Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**



PANEL INSERT WITH HOLE FOR LED

**PART NO.**  
**894901000**  
**894902000**  
**894903000**

BLANK PANEL INSERT WITHOUT HOLE FOR LED

**PART NO.**  
**476601000** WHITE  
**476602000** BLACK  
**476603000** RED

Special colors, custom markings available, consult Customer Service Center.



Dimensions are shown: Inches (mm)  
 Specifications and dimensions subject to change





A  
Pushbutton

# 8060 Series Alternate Action and Momentary Pushbutton Switches



## Features/Benefits

- Long travel
- Available with LED
- Long life contact design
- Epoxy terminal seal compatible with bottom wash cleaning
- RoHS compliant models available

## Typical Applications

- Instrumentation
- Computers and peripherals
- Telecommunications and networking equipment



Models Available

## Specifications

CONTACT RATING: Q contact material: 6 AMPS @ 120 V AC or 28 V DC; 3 AMPS @ 250 V AC. See page A-59 for additional ratings.

ELECTRICAL LIFE: 50,000 make-and-break cycles at full load.

CONTACT RESISTANCE: Below 20 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 10<sup>9</sup>Ω min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: -30°C to 65°C

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

CAP INSTALLATION FORCE: 10 lbs. maximum permissible.

**NOTE:** Any models supplied with P, R, S, Q, B or G contact material are RoHS compliant.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Materials

CASE: Glass filled nylon 6/6 or diallyl phthalate (DAP), flame retardant (UL 94V-0).

PLUNGER: S, S1, S2 Options: Glass filled nylon or glass filled polyester (PBT) (UL 94V-0). L, L1 Options: Brass, nickel plated.

CAP & FRAME: Nylon, black standard.

BUSHING: Brass or zinc, nickel plated.

HOUSING: Stainless steel.

SWITCH SUPPORT: Brass or steel, matte-tin plated.

END CONTACTS: Q contact material: Coin silver, silver plated. See page A-59 for additional contact materials.

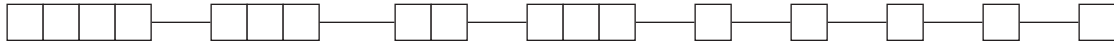
CENTER CONTACT & ALL TERMINALS: Q contact material: Copper alloy, silver plated. See page A-59 for additional contact materials.

TERMINAL SEAL: Epoxy. Refer to soldering and cleaning in Technical Data Chapter.

HARDWARE: Nut & Locking Ring: Brass, nickel plated; Lockwasher: Steel, nickel plated.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-53 thru A-61. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all "bottom-wash" PCB cleaning methods.



### Switch Function

- 8161** SPDT On-On
- 8168** SPDT On-Mom.
- 8261** DPDT On-On

### Actuator or Plunger

- S** .710" high plunger with .375" dia. cap
- J80** Snap-in
- J81** Snap-in with frame
- J82** Snap-in with frame for LED
- J86** Snap-in with frame & LED
- L** .740" high plunger with .395" dia. cap
- L1** .740" high plunger with .590" dia. cap
- S1** .615" high plunger with .200" dia. cap
- S2** .710" high plunger with .310" dia. cap

### Bushing

- H** .300" high, flat, hi torque
- H9** .300" high, flat, hi torque
- NONE** No bushing choice required
- Y3** 7.6mm, keyway

### Terminations

- A** Right angle, PC thru-hole
- AV2** Vertical right angle, PC thru-hole
- C** PC Thru-hole
- Z** Solder lug
- A3** Right angle, snap-in, PC thru-hole
- AV3** Vertical right angle, snap-in, PC thru-hole
- V3** .460" high, V-bracket
- V4** .630" high, V-bracket
- V6** .460" high, V-bracket
- V21** .555" high, snap-in V-bracket
- V31** .460" high, snap-in V-bracket
- W** .750" long, wire wrap
- Z3** Quick connect

### Contact Material

- B** Gold
- P** Gold, matte-tin
- Q** Silver
- S** Silver, matte-tin
- G** Gold over silver
- R** Gold over silver, matte-tin

### Seal

- E** Epoxy
- I** Epoxy potted base

### Cap Color

- 2** Black
- 1** White
- 3** Red
- 4** Orange
- 5** Yellow
- 9** Gray

### Frame Color

- 2** Black

### LED Color

- 3** Red
- NONE** Models without LED



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# 8060 Series Alternate Action and Momentary Pushbutton Switches



A

Pushbutton

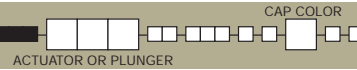
## SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
SP	<b>8161</b> <b>8168</b>	ON	ON	2-3	2-1	
		ON	MOM.	2-3	2-1	
<p><b>SPDT</b></p>						
DP	<b>8261</b>	ON	ON	2-3-5-6	2-1-5-4	
<p><b>DPDT</b></p>						

MOM. = Momentary

All models with all options when ordered with G, L, M or Q contact material.

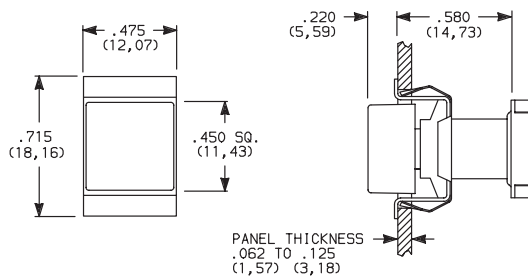
## ACTUATOR—SNAP-IN FRONT MOUNT



OPTION CODE	CAP COLOR
<b>2</b>	BLACK
<b>1</b>	WHITE
<b>3</b>	RED
<b>4</b>	ORANGE
<b>5</b>	YELLOW
<b>9</b>	GRAY

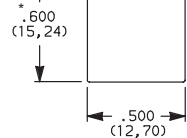
Cap Finish: matte.  
Other colors available, consult Customer Service Center.  
Available with C, W, Z or Z3 terminations.  
**NOTE:** Caps & frames available separately, see pages A-60 and A-61.

### J80 SNAP-IN



### PANEL MOUNTING

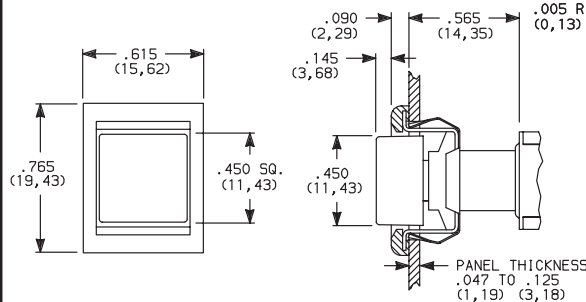
.005 R. MAX. (0, 13) TYP.



\*Increase this dimension to .620/.625 (15.75/15.88) for .091/.125 (2.41/2.18) thick panels.

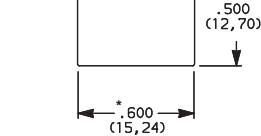


### J81 SNAP-IN WITH BLACK FRAME

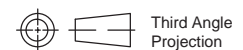


### PANEL MOUNTING

.005 R. MAX. (0, 13) TYP.



\*Increase this dimension to .620/.625 (15.75/15.88) for .091/.125 (2.41/2.18) thick panels.



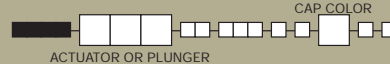
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





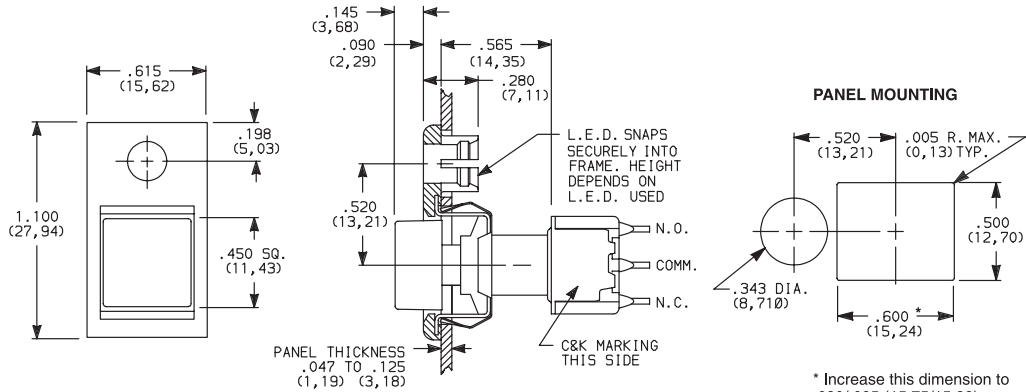
# 8060 Series Alternate Action and Momentary Pushbutton Switches

## ACTUATOR—SNAP-IN FRONT MOUNT



Pushbutton  
A

### J82 SNAP-IN WITH BLACK FRAME FOR LED



Available with C, W, Z or Z3 terminations.

#### LED not included.

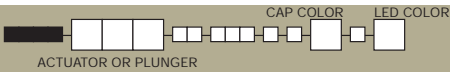
For LED information, see page A-61.

**NOTE:** Caps & frames available separately, see pages A-60 and A-61.

Other colors available, consult Customer Service Center.

OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
9	GRAY

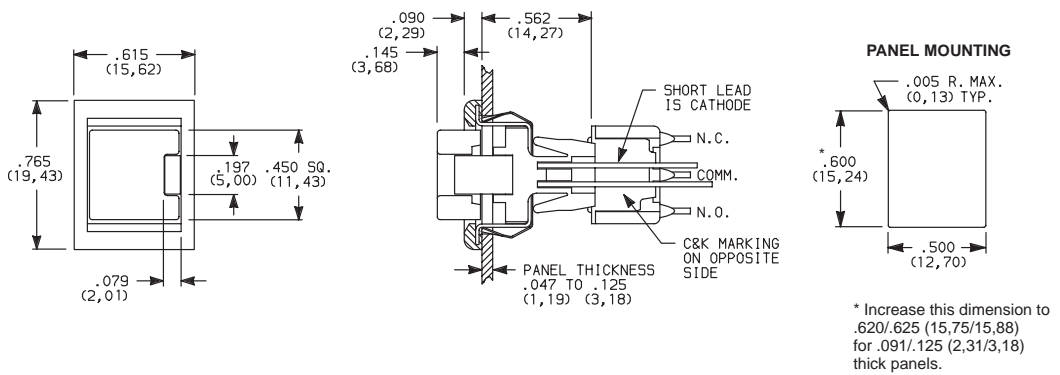
## ACTUATOR—SNAP-IN FRONT MOUNT



### J86 SNAP-IN WITH BLACK FRAME AND LED



8161J86ZQE223  
SPDT



Available with C, W, Z or Z3 terminations and SPDT models only.

**NOTE:** Caps & frames available separately, see pages A-60 and A-61.

Other colors available, consult Customer Service Center.

OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
9	GRAY

OPTION CODE	LED COLOR
3	RED

For LED information, see page A-59.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

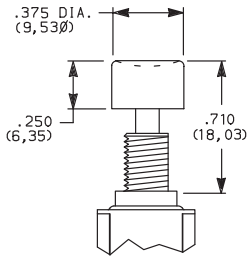
# 8060 Series Alternate Action and Momentary Pushbutton Switches



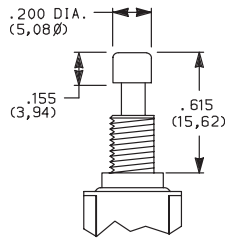
Pushbutton

## PLUNGER CAP COLOR

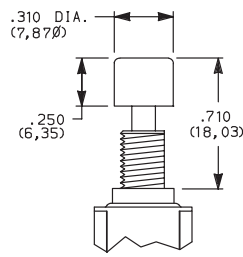
**S** PLUNGER WITH CAP P/N 7527



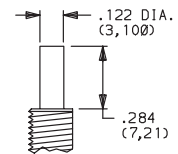
**S1** PLUNGER WITH CAP P/N 7089



**S2** PLUNGER WITH CAP P/N 8018

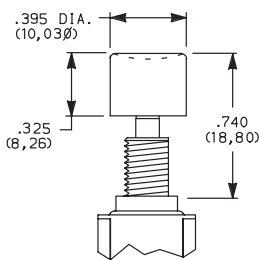


**S, S1, S2 plunger dimensions.**

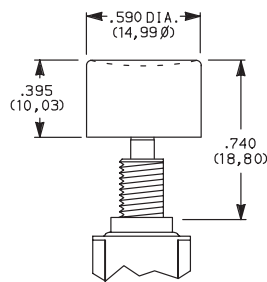


Plunger material: Glass filled nylon or glass filled polyester (UL 94V-0).

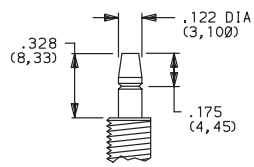
**L** PLUNGER WITH CAP P/N 8941



**L1** PLUNGER WITH CAP P/N 8940



**L, L1 plunger dimensions.**



Plunger Material: Brass, chrome plated.

OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
9	GRAY

Cap Finish: gloss. Cap supplied not installed. Other colors available, consult Customer Service Center.

**NOTE:** When selecting plunger and cap option, bushing selection must also be made, see below.

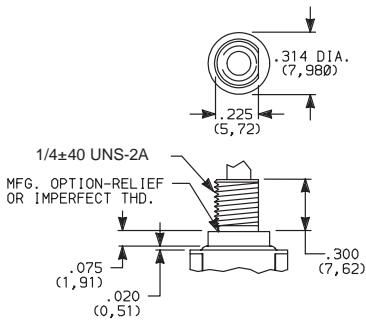
## BUSHING

**H** .300" HIGH THREADED, FLAT

**NONE** NO BUSHING CHOICE REQUIRED (JXX ACTUATORS)

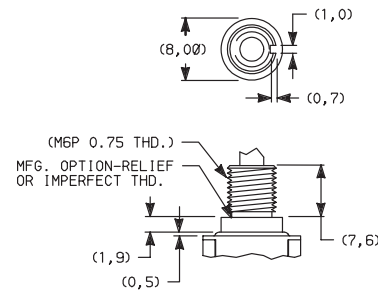
**Y3** 7.6mm THREADED, KEYWAY

**H9** .300" HIGH UNTHREADED, FLAT



H bushing standard with C, W, Z or Z3 terminations. H9 bushing standard with A, A3, AV2, AV3, or V3-V31 terminations.

Withstands 12 in./lbs. of torque with no distortion.

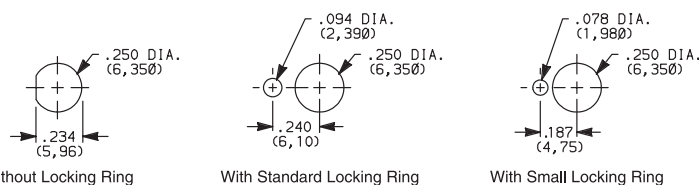


Withstands 12 in./lbs. of torque with no distortion.

**NOTE:** When selecting bushing option, plunger selection must also be made, see above. No bushing option choice required when any JXX actuator option is selected.

### PANEL MOUNTING

#### 1/4 IN. BUSHING

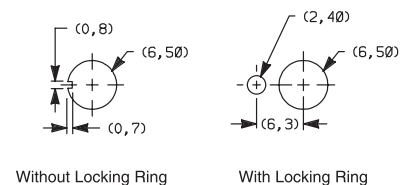


Without Locking Ring

With Standard Locking Ring

With Small Locking Ring

#### METRIC BUSHING



Without Locking Ring

With Locking Ring

**NOTE.** Two mounting nuts, locking ring and lockwasher supplied standard with threaded bushings. Optional mounting nut and locking ring styles and finishes available, see section "Technical Data and Additional Hardware".



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

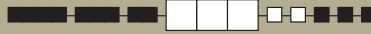




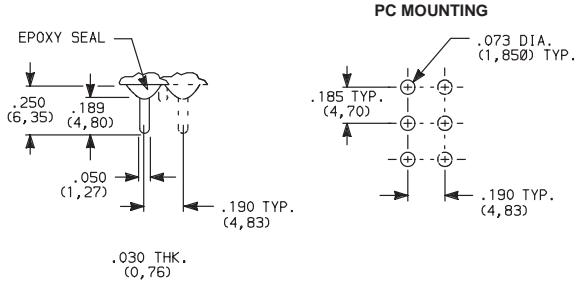
Pushbutton  
A

# 8060 Series Alternate Action and Momentary Pushbutton Switches

## TERMINATIONS

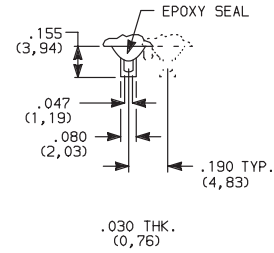


### C PC THRU-HOLE



### SPDT and DPDT

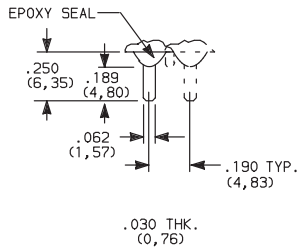
### Z SOLDER LUG



### SPDT and DPDT

Not available with P, S or R contact material.

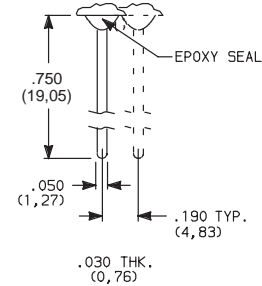
### Z3 QUICK CONNECT



### SPDT and DPDT

Not available with P, S or R contact material.  
Mating quick connector available;  
order part number 530100000, page A-61.

### W WIRE WRAP

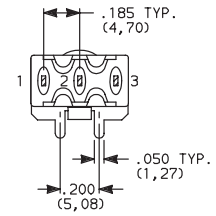
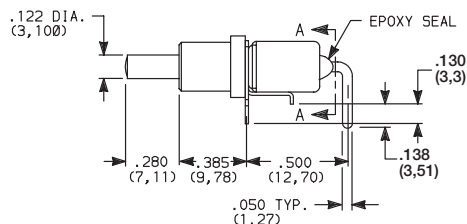
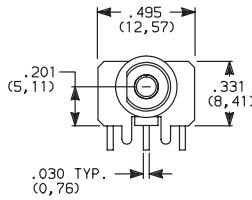


### SPDT and DPDT

### A RIGHT ANGLE, PC THRU-HOLE

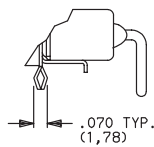
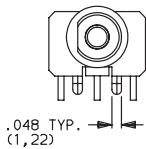


8161SH9ABE2  
SPDT

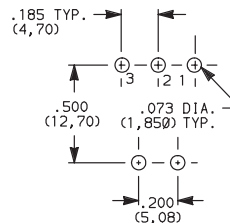


SECTION A-A

### A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



### PC MOUNTING



Not available with I seal.  
Terminal bend radii and lead-in manufacturing option.

NOTE: PC pattern must clear switch support leg.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# 8060 Series Alternate Action and Momentary Pushbutton Switches

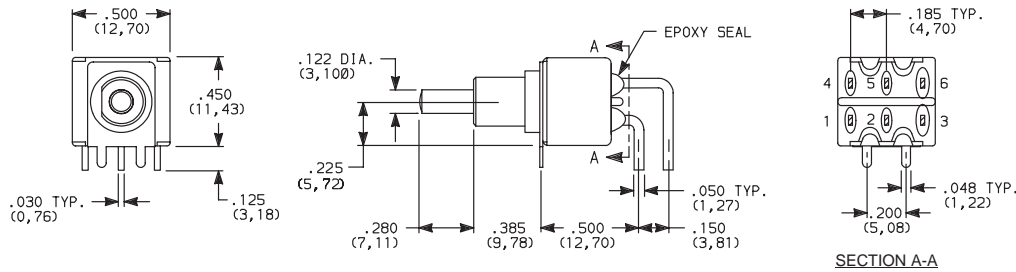


A

Pushbutton

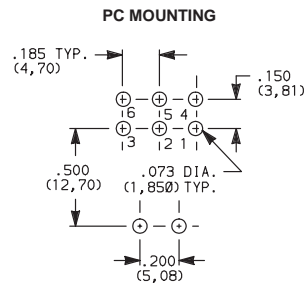
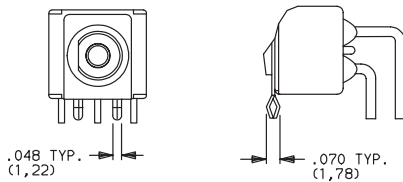
## TERMINATIONS

### A RIGHT ANGLE, PC THRU-HOLE



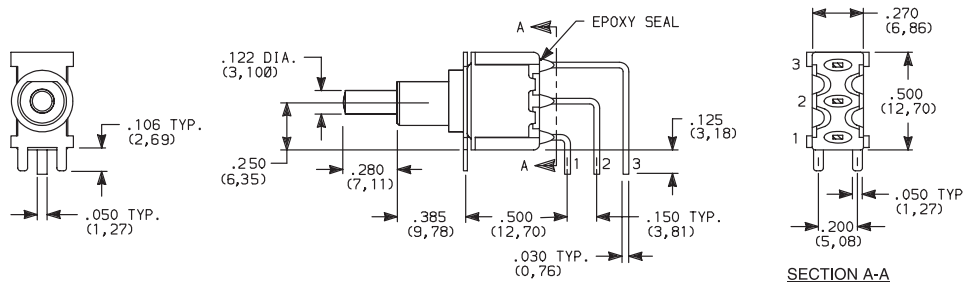
8261SH9ABE2  
DPDT

### A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



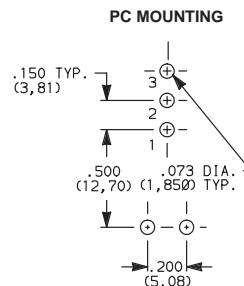
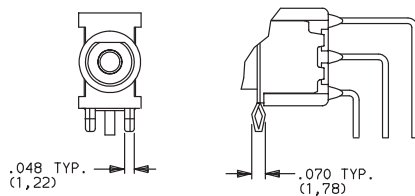
Not available with I seal.  
Terminal bend radii and lead-in manufacturing option.

### AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

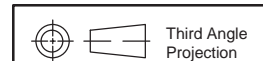


8161SH9AV2BE2  
SPDT

### AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



Not available with I seal.  
Terminal bend radii and lead-in manufacturing option.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

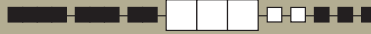






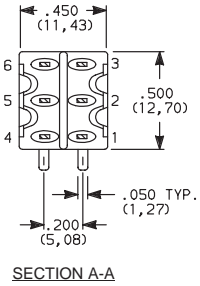
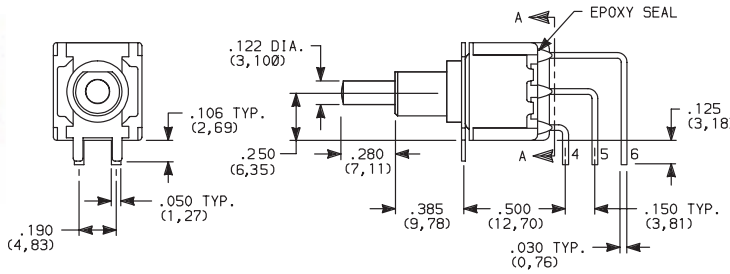
# 8060 Series Alternate Action and Momentary Pushbutton Switches

## TERMINATIONS

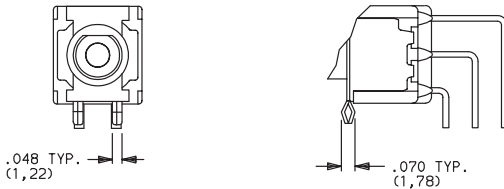


Pushbutton  
A

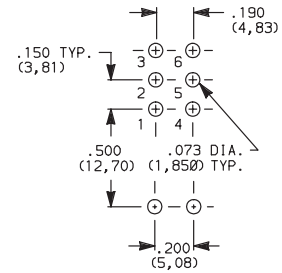
**AV2** VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH



**AV3** VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



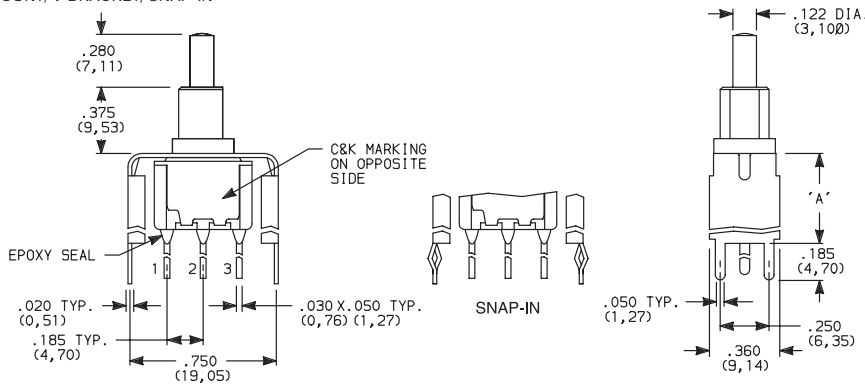
PC MOUNTING



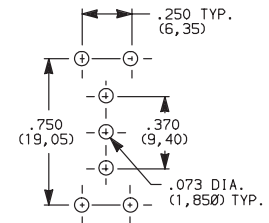
Not available with I seal.  
Terminal bend radii and lead-in manufacturing option.

**V6** VERTICAL MOUNT, V-BRACKET

**V21** VERTICAL MOUNT, V-BRACKET, SNAP-IN



PC MOUNTING

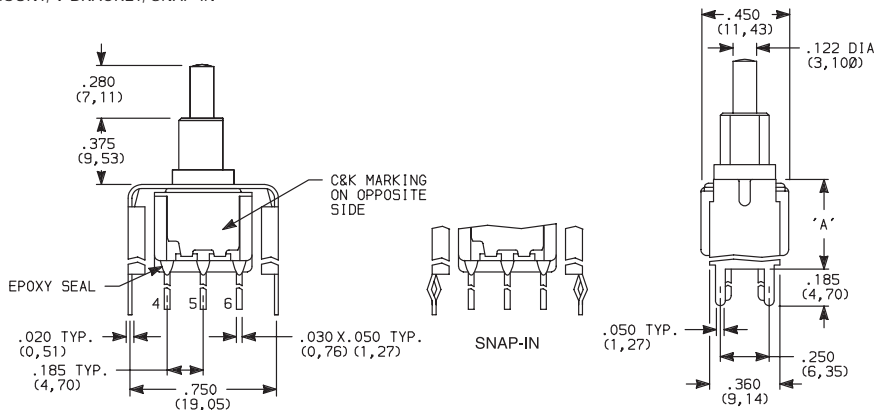


OPTION CODE	DIM 'A'
V21	.555 (14,10)
V6	.460 (11,68)

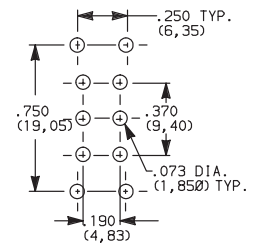
Not available with I seal.

**V6** VERTICAL MOUNT, V-BRACKET

**V21** VERTICAL MOUNT, V-BRACKET, SNAP-IN



PC MOUNTING



OPTION CODE	DIM 'A'
V21	.555 (14,10)
V6	.460 (11,68)

Not available with I seal.



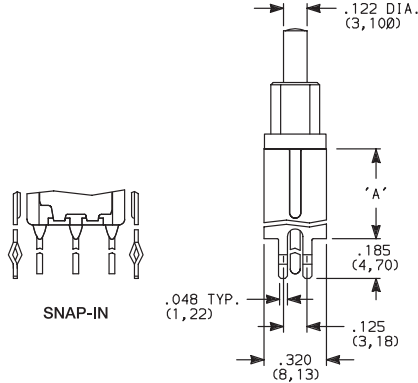
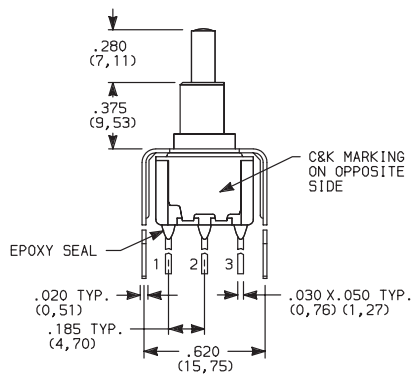
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# 8060 Series Alternate Action and Momentary Pushbutton Switches

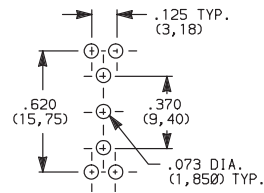
## TERMINATIONS

**V3, V4** VERTICAL MOUNT, V-BRACKET

**V31** VERTICAL MOUNT, V-BRACKET, SNAP-IN



PC MOUNTING



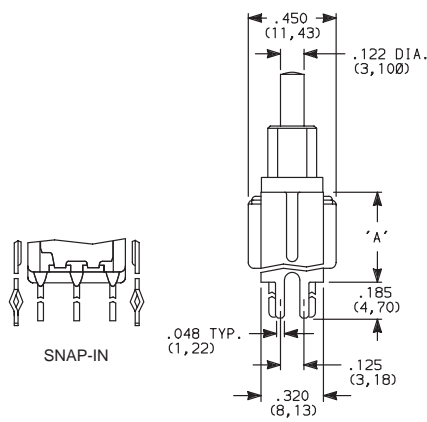
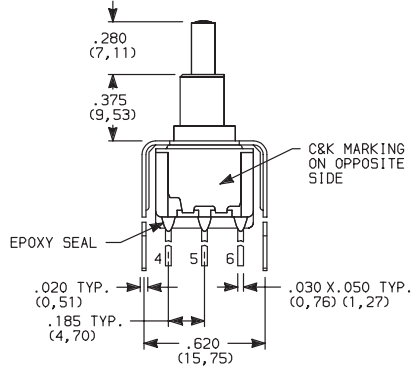
8161SH9\_BE2  
SPDT

OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)

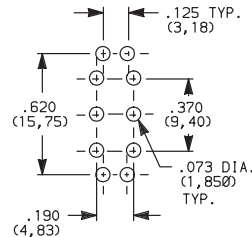
Not available with I seal.

**V3, V4** VERTICAL MOUNT, V-BRACKET

**V31** VERTICAL MOUNT, V-BRACKET, SNAP-IN



PC MOUNTING



8261SH9\_BE2  
DPDT

OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)

Not available with I seal.

## CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
<b>B</b>	GOLD <sup>1</sup>	GOLD <sup>1</sup>	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
<b>P</b>		MATTE-TIN <sup>6</sup>		
<b>Q</b>	SILVER <sup>4,5</sup>	SILVER <sup>5</sup>	POWER	6 AMPS @ 120 V AC OR 28 V DC; 3 AMPS @ 250 V AC.
<b>S</b>		MATTE-TIN <sup>6</sup>		
<b>G</b>	GOLD OVER SILVER <sup>2,3</sup>	GOLD <sup>3</sup>	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX @ 20 V AC OR DC MAX. OR 6 AMPS @ 120 V AC OR 28 V DC; 3 AMPS @ 250 V AC.
<b>R</b>		MATTE-TIN <sup>6</sup>		

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

<sup>1</sup> CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

<sup>2</sup> END CONTACTS: Coin silver, with gold plate over nickel plate.

<sup>3</sup> CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

<sup>4</sup> END CONTACTS: Coin silver, silver plated.

<sup>5</sup> CENTER CONTACT & ALL TERMINALS: Copper alloy, silver plated.

<sup>6</sup> TERMINALS: Copper alloy, with matte-tin over nickel plate.

**NOTE:** Any models supplied with P, S, R, Q, B or G contact material are RoHS compliant.

All models with all options when ordered with S, R, G, L, M or Q contact material.

B contact material standard with all terminations except C, Z & Z3.

Q contact material standard with C, Z & Z3 terminations.

P, S & R contact materials not available with Z & Z3 terminations.

K, L and M options represent Non RoHS tin lead product and are not recommended for new designs. For additional information please contact Customer Service.



Third Angle Projection  
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



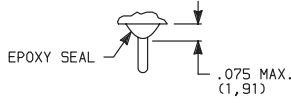


# 8060 Series Alternate Action and Momentary Pushbutton Switches

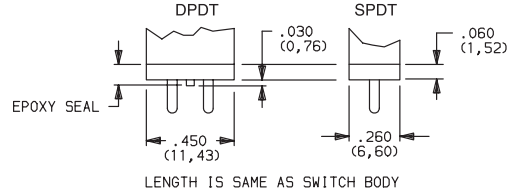
## SEAL

Pushbutton  
A

**E** EPOXY SEAL



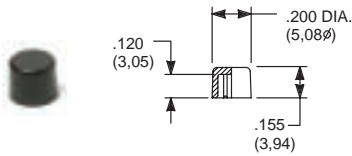
**I** EPOXY POTTED BASE



LENGTH IS SAME AS SWITCH BODY  
**NOTE:** Available with C, W, Z, Z3 terminations only.

## AVAILABLE HARDWARE

Cap

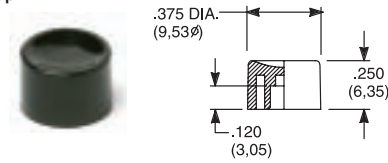


**PART NO.**

- 708901000** WHITE
- 708902000** BLACK
- 708903000** RED
- 708904000** ORANGE
- 708905000** YELLOW
- 708909000** GRAY

Material: Nylon  
Finish: Gloss

Cap

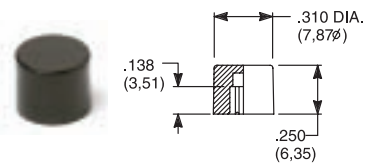


**PART NO.**

- 752701000** WHITE
- 752702000** BLACK
- 752703000** RED
- 752704000** ORANGE
- 752705000** YELLOW
- 752709000** GRAY

Material: Nylon  
Finish: Gloss

Cap

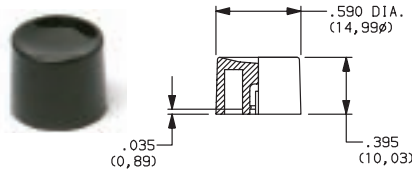


**PART NO.**

- 801801000** WHITE
- 801802000** BLACK
- 801803000** RED
- 801804000** ORANGE
- 801805000** YELLOW
- 801809000** GRAY

Material: Nylon  
Finish: Gloss

Cap, Snap-fitting plunger

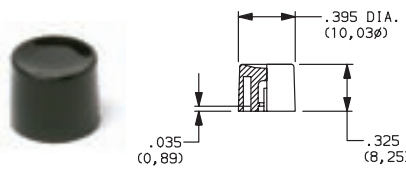


**PART NO.**

- 894001000** WHITE
- 894002000** BLACK
- 894003000** RED
- 894004000** ORANGE
- 894005000** YELLOW
- 894009000** GRAY

Material: Nylon  
Finish: Gloss

Cap, Snap-fitting plunger

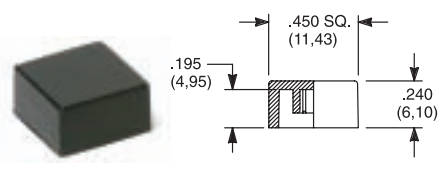


**PART NO.**

- 894101000** WHITE
- 894102000** BLACK
- 894103000** RED
- 894104000** ORANGE
- 894105000** YELLOW
- 894109000** GRAY

Material: Nylon  
Finish: Gloss

Cap, J80, J81 & J82 options only



**PART NO.**

- 484601000** WHITE
- 484602000** BLACK
- 484603000** RED
- 484604000** ORANGE
- 484605000** YELLOW
- 484609000** GRAY

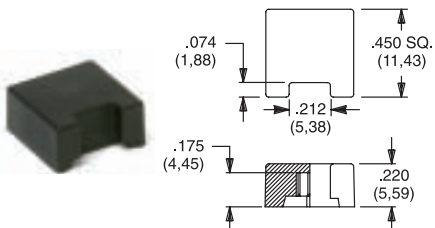
Material: Nylon  
Finish: Gloss

**PART NO.**

- 798201000** WHITE
- 798202263** BLACK
- 798203000** RED
- 798204000** ORANGE
- 798205000** YELLOW
- 798209000** GRAY

Material: Nylon  
Finish: Matte

Cap, J86 & J96 options only



**PART NO.**

- 459701000**
- 459702000**
- 459703000**
- 459704000**
- 459705000**
- 459709000**

Material: Nylon  
Finish: Gloss

**PART NO.**

- 476801000** WHITE
- 476802000** BLACK
- 476803000** RED
- 476804000** ORANGE
- 476805000** YELLOW
- 476809000** GRAY

Material: Nylon  
Finish: Matte

Frame



**PART NO.**

- 615602263** BLACK

Material: Nylon  
Finish: Matte

Frame



**PART NO.**

- 613302263** BLACK

Material: Nylon  
Finish: Matte

**NOTE:** Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware". Other cap & frame colors available, consult Customer Service Center.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# 8060 Series Alternate Action and Momentary Pushbutton Switches



A

Pushbutton

## AVAILABLE HARDWARE

Fits Z3 Termination female connector

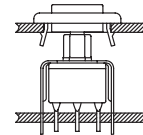
PART NO.  
**530100000**

Available in loose pieces.



Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

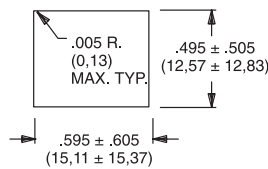
### TYPICAL APPLICATION



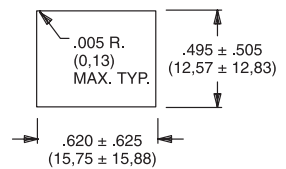
.047" (1,19) PANEL THK.	.062" (1,57) PANEL THK.	.090" (2,29) PANEL THK.	.125" (3,18) PANEL THK.
PART NO. <b>432502263</b>	PART NO. <b>432602263</b>	PART NO. <b>432702263</b>	PART NO. <b>432802263</b> BLACK

### PANEL MOUNTING

For part numbers 4325xxxxx, 4326xxxxx

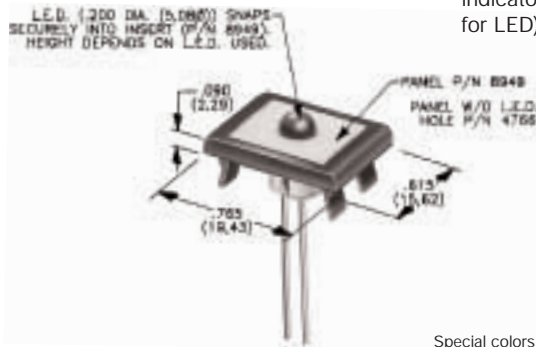


For part numbers 4327xxxxx, 4328xxxxx



### Panel Inserts

Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**



PANEL INSERT WITH HOLE FOR LED

PART NO.  
**894902000**

BLANK PANEL INSERT WITHOUT HOLE FOR LED

PART NO.  
**476602000** BLACK

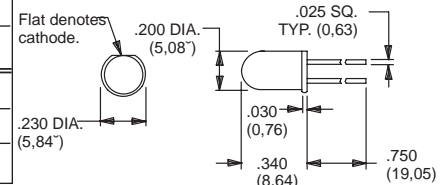
Special colors, custom markings available, consult Customer Service Center.

### LED INFORMATION

SWITCHES WITH LED SUPPLIED: J86 OPTION:

Rectangular LEDs are supplied on 8060 Series pushbutton switches with J86 option. These LEDs are factory installed and are not replaceable. The following specifications apply:

OPTION CODE	COLOR	TYP. INTENSITY	TYP. FORWARD VOLTAGE	TYP. FORWARD CURRENT	MAX RATINGS AT 25°C AMBIENT TEMPERATURE		
					FORWARD VOLTAGE	CONTINUOUS FORWARD CURRENT	POWER DISSIPATION
6	Green	1.0 mcd	2.1 V	20 mA	2.5 V	50 mA	125 mW
3	Red*	0.5 mcd		10 mA		30 mA	75 mW
5	Yellow	4.0 mcd		20 mA		50 mA	125 mW



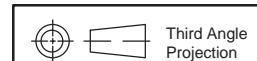
Suggested LED for J82 & J84 options. Dimensions for reference only.

**Process Information:** Soldering to LED leads must be completed within 5 seconds at 500°F (260°C) maximum.

**Caution:** Circuit elements must limit forward current of LED to 50mA max. continuous.

\* Extra-bright red LED available (typ. intensity 4.5 mcd), consult Customer Service Center.

LEDs are not supplied with J82 & J84 options. LED snaps into switch frame surrounding actuator and is wired externally.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change





# 8500 Series Subminiature Pushbutton Switches



### Features/Benefits

- *Pre-travel or over-travel models available*
- *Ratings up to 3 AMPS*
- *Reliable contact design*
- *RoHS compliant*

### Typical Applications

- *Detection*
- *Telecommunications and networking equipment*
- *Computers and peripherals*



Models Available

### Specifications

CONTACT RATING: Q contact material (853X Models): 1 AMP @ 120 V AC or 28 V DC; (855X Models): 3 AMPS @ 120 V AC or 28 V DC. See page A-65 for additional ratings.

ELECTRICAL LIFE:  
853X MODELS: 250,000 actuations at full load.  
855X MODELS: 10,000 actuations at full load.

CONTACT RESISTANCE: Below 30 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 10<sup>9</sup>Ω min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: -30°C to 65°C.

**NOTE:** Any models supplied with Q, B or G contact material are RoHS compliant.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

### Materials

CASE: Glass filled phenolic or diallyl phthalate (DAP) (UL 94V-0).

PLUNGER: Phenolic or glass filled polyester, black standard(UL94V-0).

CAP & FRAME: Nylon, black, standard.

BUSHING: Brass, nickel plated.

CONTACTS: Q contact material: Coin silver, silver plated. See page A-65 for additional contact materials.

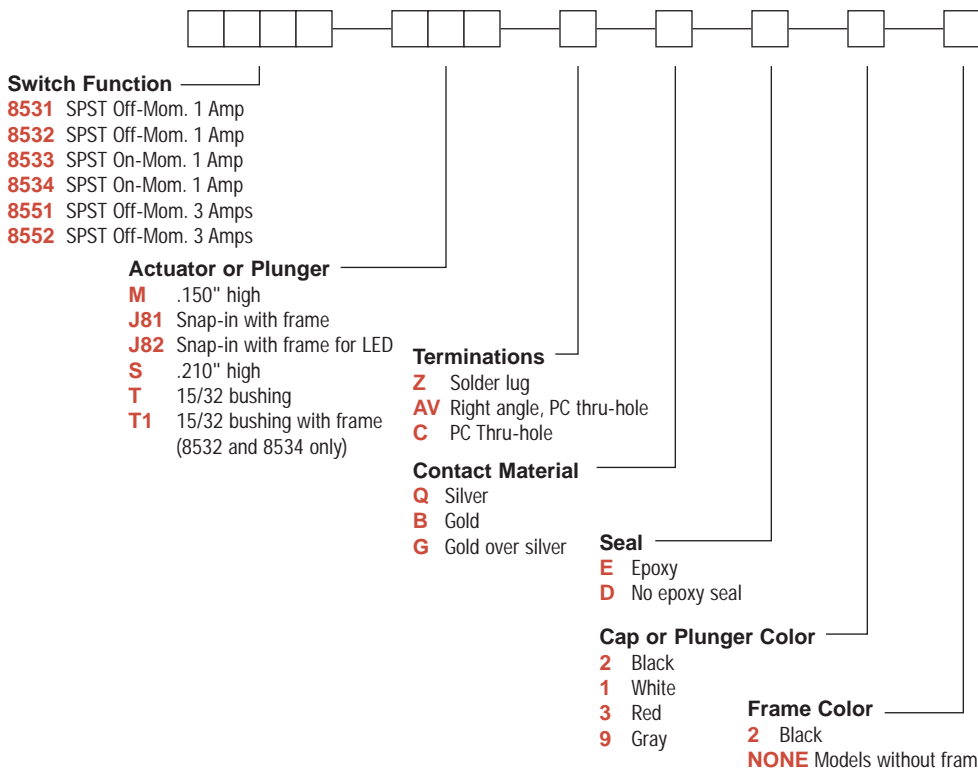
TERMINALS: Q contact material: Copper alloy, silver plated. See page A-65 for additional contact materials.

TERMINAL SEAL: Epoxy.

HARDWARE: Nut: Brass, nickel plated; Lockwasher: Steel, bright nickel plated.

### Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-63 thru A-66. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all "bottom-wash" PCB cleaning methods.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# 8500 Series Subminiature Pushbutton Switches



A

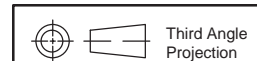
Pushbutton

## SWITCH FUNCTION

NO. POLES	MODEL NO.	RATING	SWITCH FUNCTION		TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
			POS. 1	POS. 2			
SP	<b>8531</b>	1 AMP	OFF	MOM.	.095 (2,41) TYP. with overtravel .042 (1,07) TYP.	7.7 oz (220g) TYP.	N.O. with overtravel
	<b>8551</b>	3 AMPS					
<b>SPST</b> <p>Part number shown: 8531MZQE2</p>							
SP	<b>8532</b>	1 AMP	OFF	MOM.	.050 (1,27) TYP.	6 oz (170g) TYP.	N.O.
	<b>8552</b>	3 AMPS					
<b>SPST</b> <p>Part number shown: 8532MZQE2</p>							
SP	<b>8533</b>	1 AMP	ON	MOM.	.080 (2,03) TYP. with pretravel .057 (1,45) TYP.	11.5 oz (456 g) TYP.	N.C. with pretravel
	<b>8534</b>	1 AMP	ON	MOM.			
<b>SPST</b> <p>Part number shown: 8533MZQE2</p>							

MOM. = Momentary

All models with all options when ordered with G or Q contact material.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

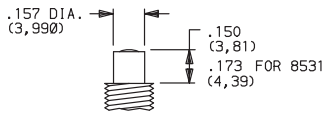


# 8500 Series Subminiature Pushbutton Switches

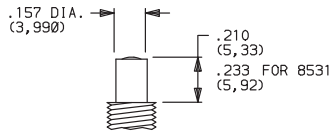
Pushbutton  
A

## PLUNGER

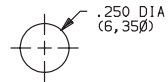
### M .150" HIGH PLUNGER



### S .210" HIGH PLUNGER



### PANEL MOUNTING

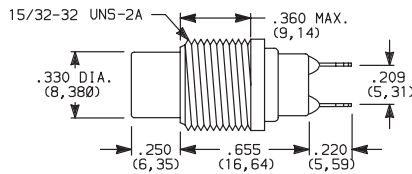


OPTION CODE	PLUNGER COLOR
2	BLACK
3	RED

**NOTE:** One mounting nut and lockwasher supplied with all actuators (except T actuator: two nuts supplied).

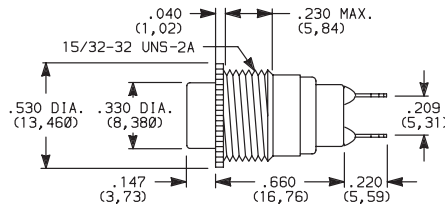
## ACTUATOR

### T 15/32 BUSHING



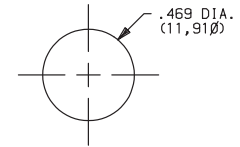
**NOTE:** No frame color choice required.

### T1 15/32 BUSHING WITH FRAME



**NOTE:** No frame color choice required.  
Available with 8532 and 8534 models only.

### PANEL MOUNTING



OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
9	GRAY

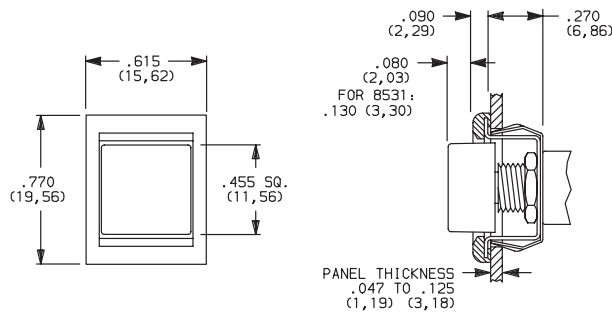
Cap Finish: gloss. Other colors available, consult Customer Service Center.

One mounting nut and lockwasher supplied with all actuators (except T actuator: two nuts supplied).

**NOTE:** Caps available for plunger options, see page A-65.

## ACTUATOR—SNAP-IN FRONT MOUNT

### J81 SNAP-IN WITH FRAME



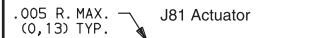
OPTION CODE	CAP AND FRAME COLOR
2	BLACK

Cap and Frame Finish: matte. Other colors available, consult Customer Service Center.

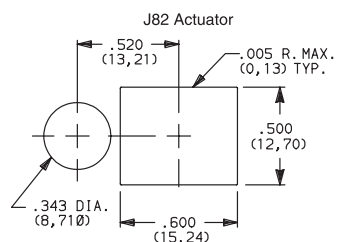
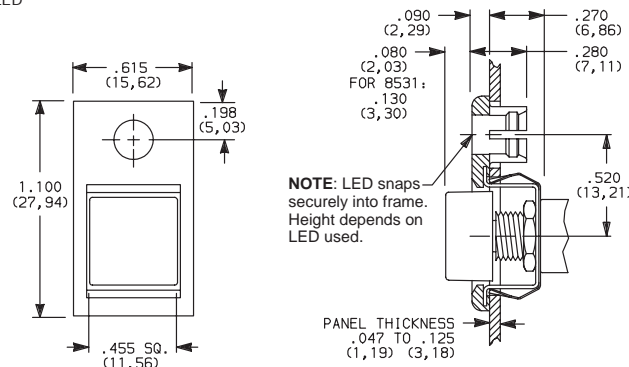
One mounting nut and lockwasher supplied with all actuators.

**NOTE:** Caps & frames available separately, see pages A-65 and A-66.

### PANEL MOUNTING



### J82 SNAP-IN WITH FRAME FOR LED



**LED not included.**  
For LED information, see page A-66.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# 8500 Series Subminiature Pushbutton Switches

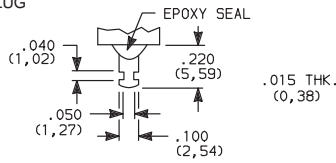


A

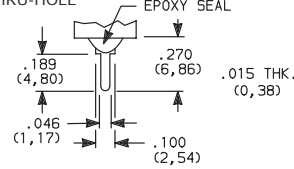
Pushbutton

## TERMINATIONS

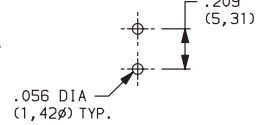
### Z SOLDER LUG



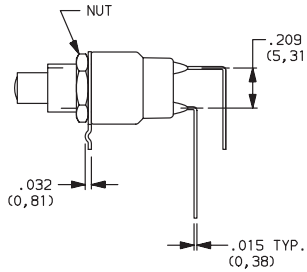
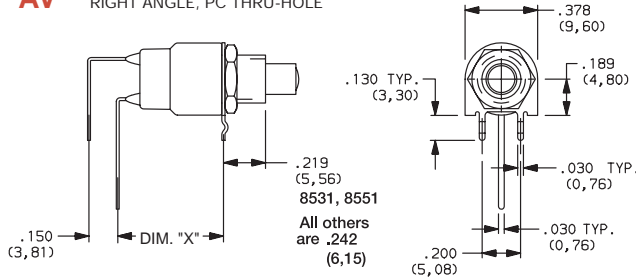
### C PC THRU-HOLE



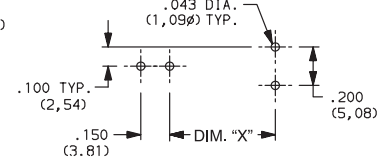
### PC MOUNTING



### AV RIGHT ANGLE, PC THRU-HOLE



### PC MOUNTING



MODEL NO.	DIM "X"
8531, 8533, 8551	0.550
8532, 8534, 8552	0.438

NOTE: Available with M or S plunger models only

## CONTACT MATERIAL

OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	TERMINAL PLATING	CONTACT MATERIAL	RATINGS	
B	YES	YES	GOLD <sup>1</sup>	GOLD	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
Q	YES	YES	SILVER <sup>4</sup>	SILVER <sup>5</sup>	POWER	853X MODELS: 1 AMP @ 120 V AC OR 28 V DC. 855X MODELS: 3 AMPS @ 120 V AC OR 28 V DC.
G	YES	YES	GOLD OVER SILVER <sup>2</sup>	GOLD <sup>3</sup>	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 V MAX @20 V AC OR DC MAX. OR 853X MODELS: 1 AMP @ 120 V AC OR 28 V DC. 855X MODELS: 3 AMPS @120 V AC OR 28 V DC.

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

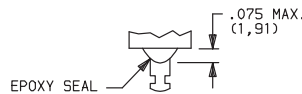
- CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.
- CONTACTS: Coin silver, with gold plate over nickel plate.
- TERMINALS: Copper alloy, with gold plate over nickel plate.
- CONTACTS: Coin silver, silver plated.
- TERMINALS: Copper alloy, silver plated.

NOTE: Any models supplied with Q, B or G contact material are RoHS compliant.

All models with all options when ordered with G or Q contact material.  
Q contact material standard with C, Z terminations.  
8551 & 8552 available with Q contact material only.

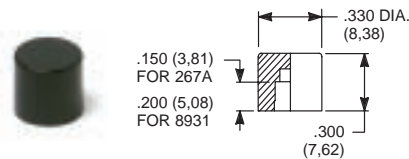
## SEAL

### E EPOXY SEAL



## REPLACEMENT HARDWARE

### Cap for 0.157" dia. plungers

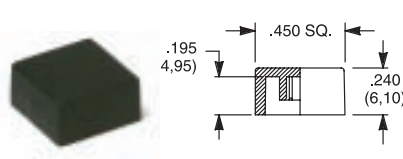


PART NO.	COLOR	PART NO.	COLOR
267A01000	WHITE	893101000	WHITE
267A02000	BLACK	893102000	BLACK
267A03000	RED	893103000	RED
267A09000	GRAY	893109000	GRAY

85X2T, 8534T models only  
Material: Nylon  
Finish: Gloss

85X1T, 8532T1, 8533T, 8534T1 models only  
Material: Nylon  
Finish: Gloss

### Cap, J80, J81 & J 82 options only



PART NO.	COLOR
448901000	WHITE
448902000	BLACK
448903000	RED
448909000	GRAY

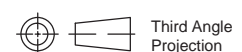
Material: Nylon  
Finish: Gloss or matte

### Frame



PART NO.	COLOR
613302263	BLACK

Material: Nylon  
Finish: Matte



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



Other colors available, consult Customer Service Center.





# 8500 Series Subminiature Pushbutton Switches

## AVAILABLE HARDWARE

Pushbutton  
A

### Frame



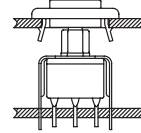
**PART NO.**  
**615602263** BLACK

Material: Nylon  
Finish: Matte

**NOTE:** Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".  
Other colors available, consult Customer Service Center.

Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

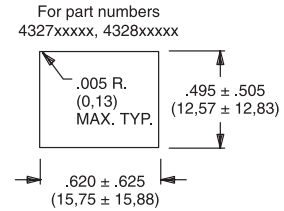
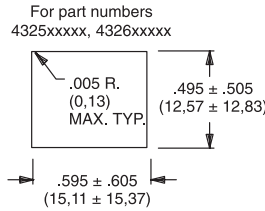
### TYPICAL APPLICATION



.047" (1,19) PANEL THK.    .062" (1,57) PANEL THK.    .090" (2,29) PANEL THK.    .125" (3,18) PANEL THK.

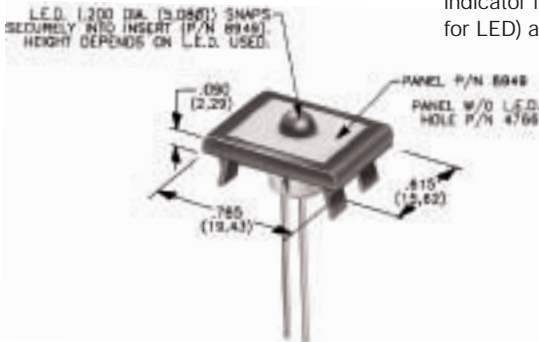
<b>PART NO.</b> <b>432502263</b>	<b>PART NO.</b> <b>432602263</b>	<b>PART NO.</b> <b>432702263</b>	<b>PART NO.</b> <b>432802263</b> BLACK
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### PANEL MOUNTING



### Panel Inserts

Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**



PANEL INSERT  
WITH HOLE FOR LED

**PART NO.**  
**894902000**

BLANK PANEL INSERT  
WITHOUT HOLE FOR LED

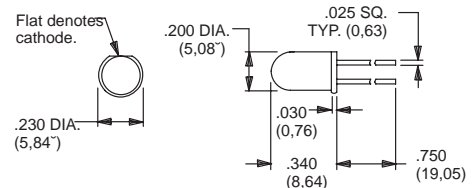
**PART NO.**  
**476602000** BLACK

Special colors, custom markings available, consult Customer Service Center.

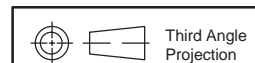
### LED INFORMATION

**Process Information:** Soldering to LED leads must be completed within 5 seconds at 500°F (260°C) maximum.

LEDs are not supplied with J82 option. LED snaps into switch frame surrounding actuator and is wired externally.



Suggested LED for J82 option.  
Dimensions for reference only.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# KM Series Subminiature Pushbutton Switches



## Features/Benefits

- **Reliable contact design**
- **Available with pretravel and overtravel**
- **Extended overtravel option**
- **RoHS compliant**

## Typical Applications

- **Alarm systems**
- **Computers**
- **Detector switch application**



Models Available

## Specifications

**CONTACT RATING:** Q contact material (KM11, KM12 Models): 0.25 AMPS @ 125 V AC or DC (UL); (KM33 Model): 1 AMP @ 125 V AC or 28 V DC. See page A-69 for additional ratings.

**ELECTRICAL LIFE:** 10,000 actuations min. at full load.

**CONTACT RESISTANCE:** Below 30 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

**INSULATION RESISTANCE:** 10<sup>9</sup>Ω min.

**DIELECTRIC STRENGTH:** 1,000 Vrms min. @ sea level.

**OPERATING TEMPERATURE:** -30°C to 85°C.

**CAP INSTALLATION FORCE:** 10 lbs. max. permissible.

**NOTE:** Any models supplied with Q or B contact material are RoHS compliant.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Materials

**HOUSING & BUSHING:** 6/6 nylon (UL94V-2), black.

**ACTUATOR:** 6/6 nylon (UL 94V-2), natural. Internal o-ring seal, available on KM11 & KM33 models.

**MOVABLE CONTACT:** B contact material: Bronze or copper, with gold plate over nickel plate. See page A-69 for additional contact materials.

**STATIONARY CONTACTS & TERMINALS:** B contact material: Copper, with gold plate over nickel plate. See page A-69 for additional contact materials.

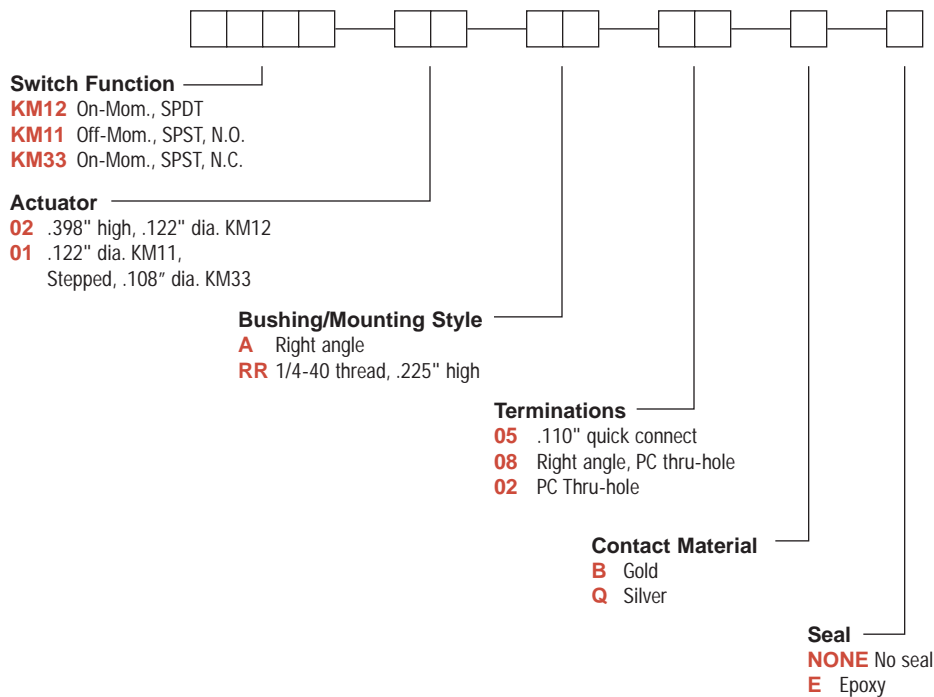
**RETURN SPRING:** Music wire, phosphor coated.

**MOUNTING NUT:** Brass, nickel plated.

**TERMINAL SEAL:** Epoxy.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-68 and A-70. For additional options not shown in catalog, consult Customer Service Center.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# KM Series Subminiature Pushbutton Switches

## SWITCH FUNCTION



A

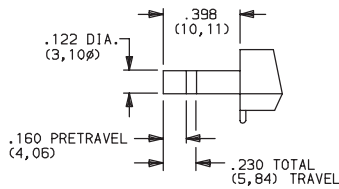
Pushbutton

NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
SP	<b>KM11</b>	OFF	MOM.	OPEN	2-1	SPST N.O.
	<b>KM33</b>	ON	MOM.	2-1	OPEN	SPST N.C.
<b>SPST</b>						
SP	<b>KM12</b>	ON	MOM.	2-1	4-3	SPDT
<b>SPDT</b>						

## ACTUATOR

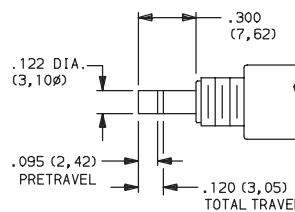


**02** .398" HIGH, .122" DIA.

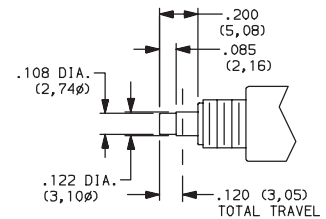


KM12 models only.

**01** .122" DIA.



KM11 models only.



KM33 models only.

**NOTE:** Caps available for plunger options, see page A-70.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

**C&K**

# KM Series Subminiature Pushbutton Switches



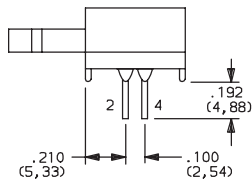
A

Pushbutton

## BUSHING/ MOUNTING STYLE

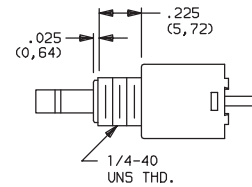


**A** RIGHT ANGLE



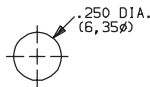
KM12 models only.

**RR** 1/4-40 THREAD, .225" HIGH



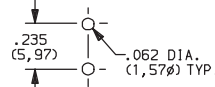
KM11 & KM33 models only.

### PANEL MOUNTING

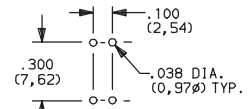


KM11 & KM33 models.

### PC MOUNTING



KM11 models only.

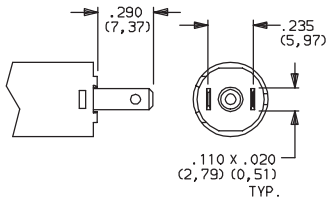


KM12 models only.

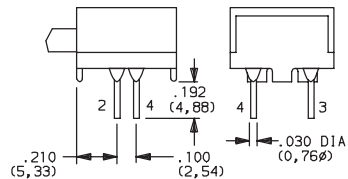
## TERMINATIONS



**05** .110" QUICK CONNECT

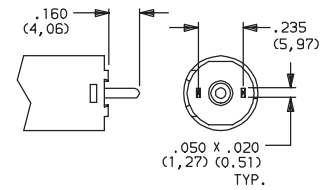


**08** RIGHT ANGLE, PC THRU-HOLE



KM12 models only.

**02** PC THRU-HOLE



KM11 models only.

## CONTACT MATERIAL



OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	CONTACT AND TERMINAL MATERIAL	RATINGS	
<b>B</b>	YES	YES	GOLD <sup>1</sup>	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
<b>Q</b>	YES	YES	SILVER <sup>2</sup>	POWER	0.25 AMPS @ 125 V AC OR DC (KM11, KM12) (UL) 1 AMP @ 125 V AC OR 28 V DC (KM33).


\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

<sup>1</sup> STATIONARY CONTACTS & TERMINALS: Copper, with gold plate over nickel plate. MOVABLE CONTACT: Phosphor bronze or beryllium copper, with gold plate over nickel plate.

<sup>2</sup> STATIONARY CONTACTS & TERMINALS: Copper, silver plated (standard with all termination options). MOVABLE CONTACT: Phosphor bronze or beryllium copper, silver plated.

<sup>3</sup> STATIONARY CONTACTS & TERMINALS: Copper, with gold plate over nickel plate over silver plate. MOVABLE CONTACT: Phosphor bronze or beryllium copper, with gold plate over nickel plate over silver plate.

**NOTE:** Any models supplied with Q or B contact material are RoHS compliant.

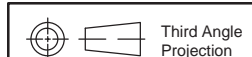
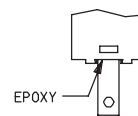
KM11, KM12 models  when ordered with 'Q' contact material.

## SEAL



**NONE** NO SEAL

**E** EPOXY SEAL



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

**C&K**

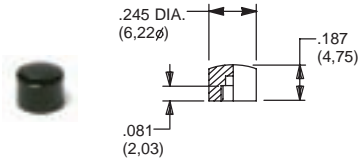


# KM Series Subminiature Pushbutton Switches

## AVAILABLE HARDWARE

Pushbutton  
A

Cap, KM33 models

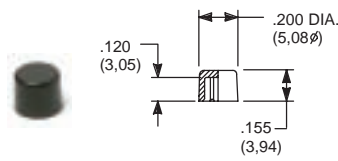


**PART NO.**

- 785101000** WHITE
- 785102000** BLACK
- 785103000** RED

Material: Nylon  
Finish: Gloss

Cap, KM11 models

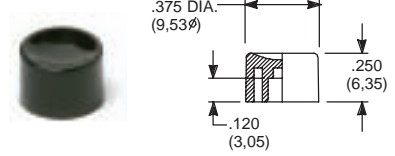


**PART NO.**

- 708901000** WHITE
- 708902000** BLACK
- 708903000** RED

Material: Nylon  
Finish: Gloss

Cap, KM11 models

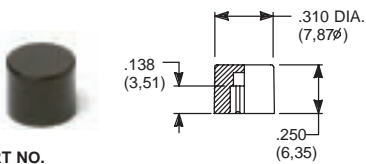


**PART NO.**

- 752701000** WHITE
- 752702000** BLACK
- 752703000** RED

Material: Nylon  
Finish: Gloss

Cap, KM11 models

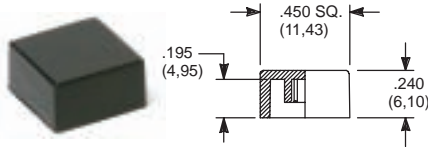


**PART NO.**

- 801801000** WHITE
- 801802000** BLACK
- 801803000** RED

Material: Nylon  
Finish: Gloss

Cap, KM11 models



**PART NO.**

- 484601000** WHITE
- 484602000** BLACK
- 484603000** RED

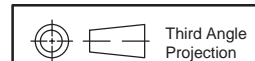
Material: Nylon  
Finish: Gloss

**PART NO.**

- 798201000** WHITE
- 798202263** BLACK
- 798203000** RED

Material: Nylon  
Finish: Matte

**NOTE:** Other cap colors available, consult Customer Service Center.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# 8600 Series Microminiature Pushbutton Switches



## Features/Benefits

- Available with overtravel
- Normally closed models available
- Microminiature size ideal for applications where space is limited
- RoHS compliant

## Typical Applications

- Detection
- Telecommunications and networking equipment
- Computers and peripherals



Models Available

## Specifications

**CONTACT RATING:** Q contact material (8631, 8632 Models): 500 mA @ 120 V AC or 28 V DC; 250 mA @ 250 V AC; (8633 Model): 250 mA @ 120 V AC or 28 V DC; 125 mA @ 250 V AC. See page A-73 for additional ratings.

**ELECTRICAL LIFE:**  
8631 and 8633 MODELS: 250,000 actuations at full load.  
8632 MODEL: 100,000 actuations at full load.

**CONTACT RESISTANCE:** Below 30 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

**INSULATION RESISTANCE:** 109 Ω min.

**DIELECTRIC STRENGTH:** 500 Vrms min. @ sea level.

**OPERATING TEMPERATURE:** -30°C to 65°C.

**SOLDERABILITY:** Per MIL-STD-202F method 208D, or EIA RS-186E method 9.

## Materials

**CASE:** Glass filled phenolic or diallyl phthalate (DAP), (UL94V-0).

**PLUNGER:** Glass filled nylon (UL94V-0), black standard.

**BUSHING:** Brass, nickel plated.

**CONTACTS:** Q contact material: Coin silver, silver plated.  
See page A-73 for additional contact materials.

**TERMINALS:**  
8631, 8632 MODELS: Copper alloy, silver plated.  
8633 MODEL: Q contact material: Coin silver.  
See page A-73 for additional contact materials.

**TERMINAL SEAL:**  
8633 MODEL: Epoxy.  
8631, 8632 MODELS: Terminals insert molded.

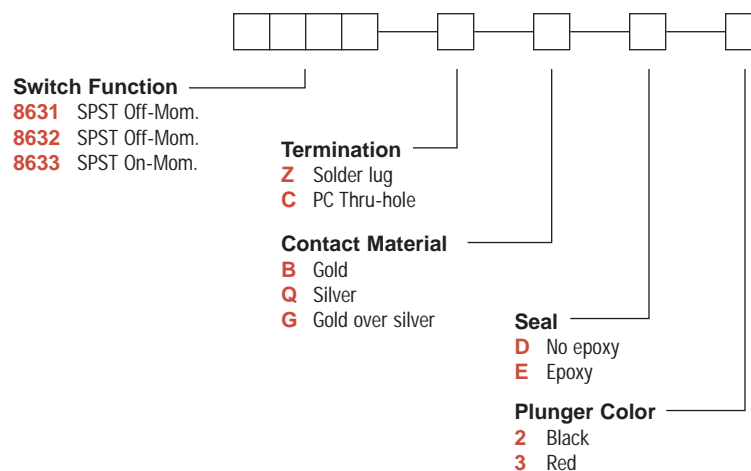
**HARDWARE:** Nut: Brass, nickel plated.

**NOTE:** Any models supplied with Q, B or G contact material are RoHS compliant.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-72 and A-73. For additional options not shown in catalog, consult Customer Service Center.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# 8600 Series Microminiature Pushbutton Switches

## SWITCH FUNCTION



A

Pushbutton

NO. POLES	MODEL NO.	SWITCH FUNCTION		TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
		POS. 1	POS. 2			
SP	<b>8631</b>	OFF	MOM.	.040 (1,02) TYP.	5 oz (140g) TYP.	N.O.
<b>SPST</b> <p>Part number shown: 8631ZQD2</p>						
SP	<b>8632</b>	OFF	MOM.	.106 (2,69) TYP. with overtravel .024 (0,61) TYP.	6.25 oz (177g) TYP.	N.O. with overtravel
<b>SPST</b> <p>Part number shown: 8632ZQD2</p>						
SP	<b>8633</b>	ON	MOM.	.048 (1,22) TYP.	5 oz (140g) TYP.	N.C.
<b>SPST</b> <p>Part number shown: 8633ZQE2</p>						

MOM. = Momentary

**NOTE:** Caps available for plunger options, see page A-73.

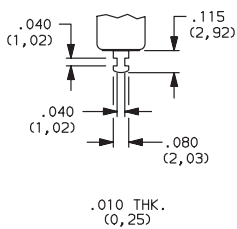
## TERMINATIONS



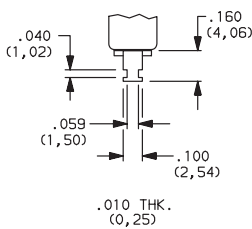
**Z** SOLDER LUG

**C** PC THRU-HOLE

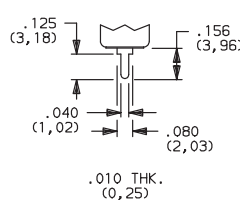
8631, 8632 models only.



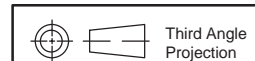
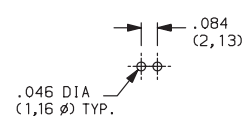
8633 models only.



8631, 8632 models only.



**PC MOUNTING**



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# 8600 Series Microminiature Pushbutton Switches



A

Pushbutton

## CONTACT MATERIAL

OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
<b>B</b>	YES	YES	GOLD <sup>1</sup>	GOLD <sup>1</sup>	LOW LEVEL/ DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
<b>Q</b>	YES	YES	SILVER <sup>4</sup>	SILVER <sup>5</sup>	POWER	8631, 8632 MODELS: 500 mA @ 120 V AC OR 28 V DC; 250 mA @ 250 V AC. 8633 MODELS: 250 mA @ 120 V AC OR 28 V DC; 125 mA @ 250 V AC.
<b>G</b>	YES	YES	GOLD OVER SILVER <sup>4</sup>	GOLD <sup>3</sup>	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX @ 20 V AC OR DC MAX. OR 8631, 8632 MODELS: 500 mA @ 120 V AC OR 28 V DC; 250 mA @ 250 V AC. 8633 MODELS: 250 mA @ 120 V AC OR 28 V DC; 125 mA @ 250 V AC.

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

<sup>1</sup> CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

<sup>2</sup> CONTACTS: Coin silver, with gold plate over nickel plate.

<sup>3</sup> TERMINALS: Copper alloy, with gold plate over nickel plate.  
8633 model only: Coin silver, with gold plate over nickel plate.

<sup>4</sup> CONTACTS: Coin silver, silver plated.

<sup>5</sup> TERMINALS: Copper alloy, silver plated. 8633 model only: coin silver.

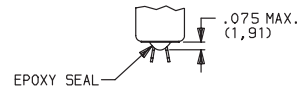
**NOTE:** Any models supplied with Q, B or G contact material are RoHS compliant.

8631, 8632 models with all options when ordered with G or Q contact material.  
Q contact material standard with C, Z terminations.

## SEAL

**D** NO EPOXY SEAL

**E** EPOXY SEAL



Not available on 8633 model.  
Standard on 8631, 8632 models.

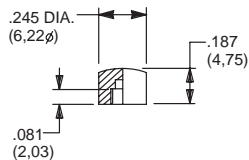
Not available on 8631, 8632 models.  
Standard on 8633 model only.

## PLUNGER COLOR

OPTION CODE	COLOR
<b>2</b>	BLACK
<b>3</b>	RED

## AVAILABLE HARDWARE

Cap



**PART NO.**  
**785101000** WHITE  
**785102000** BLACK  
**785103000** RED

Material: Nylon  
Finish: Gloss

**NOTE:** Other cap colors available, consult Customer Service Center.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change







# 8700 Series Overtravel Pushbutton Switches

A

Pushbutton



## Features/Benefits

- *Extended pre-travel or over-travel*
- *Heavy-duty brass plunger*
- *Long electrical life — 100K cycles*
- *RoHS compliant*

## Typical Applications

- *Telecommunications*
- *High end Instrumentation*
- *Medical & test equipment*
- *Detection*

## Specifications

CONTACT RATING: Q contact material: 1 AMP @ 120 V AC or 28 V DC. See page A-76 for additional ratings.

ELECTRICAL LIFE: 100,000 actuations at full load.

CONTACT RESISTANCE: Below 30 mΩ typ. Initial @ 2-4 V DC, 100 mA.

INSULATION RESISTANCE: 10<sup>3</sup>Ω min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: -30°C to 65°C.

**NOTE:** Any models supplied with Q, or B contact material are RoHS compliant.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Materials

CASE: Diallyl phthalate (DAP) (UL 94V-0).

PLUNGER:

8731 – .390" brass, nickel plated.

8732 – .390" PBT polyester, black.

BUSHING: brass, nickel plated.

CONTACTS: Q contact material: Coin silver, silver plated. See page A-76 for additional contact materials.

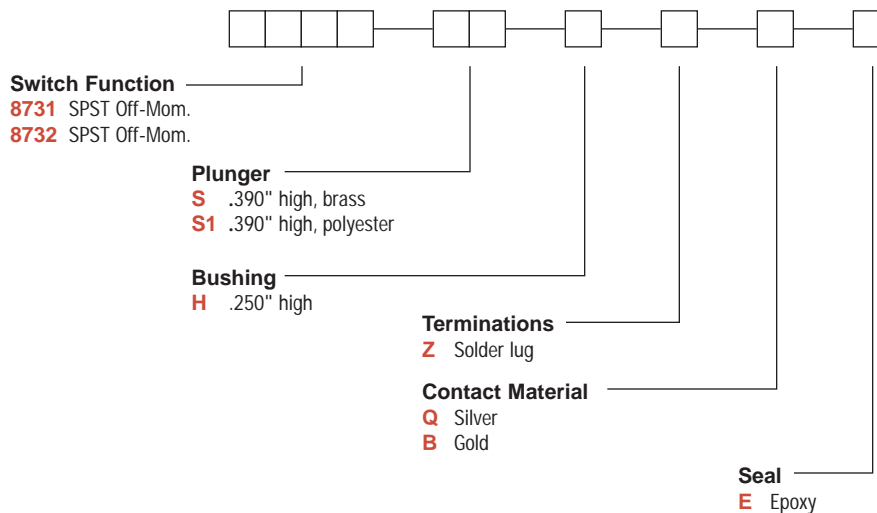
TERMINALS: Q contact material: Copper alloy, silver plated. See page A-76 for additional contact materials.

TERMINAL SEAL: Epoxy.

HARDWARE: Nut: Brass, nickel plated; lockwasher: Steel, bright nickel plate. One mounting nut & lockwasher supplied with all switches.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-75 and A-76. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all "bottom-wash" PCB cleaning methods.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# 8700 Series Overtravel Pushbutton Switches



## SWITCH FUNCTION

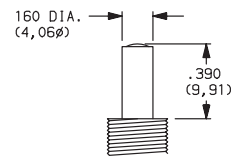
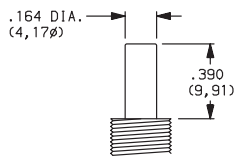
NO. POLES	MODEL NO.	SWITCH FUNCTION		TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
		POS. 1	POS. 2			
SP	<b>8731</b>	OFF	MOM.	.390 (9,91) TYP. with overtravel .311 TYP.	4.7 oz TYP.	N.O. with overtravel SPST
<b>SPST</b> <p>Part number shown: 8731SHZQE</p>						
SP	<b>8732</b>	OFF	MOM.	.390 (9,91) TYP. with overtravel .350 TYP.	2.2 oz TYP.	N.O. with overtravel SPST
<b>SPST</b> <p>Part number shown: 8732S1HZQE</p>						

MOM. = Momentary

## PLUNGER

**S** .390" HIGH, BRASS

**S1** .390" HIGH, PBT POLYESTER

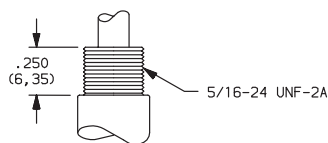


Available with 8731 model only.

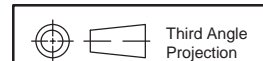
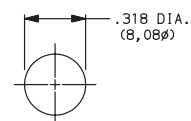
Available with 8732 model only.

## BUSHING

**H** .250" HIGH



PANEL MOUNTING



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



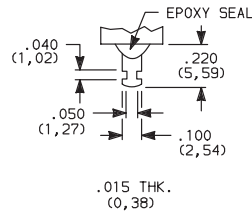


# 8700 Series Overtravel Pushbutton Switches

Pushbutton  
A

## TERMINATIONS

**Z** SOLDER LUG



## CONTACT MATERIAL

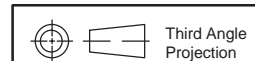
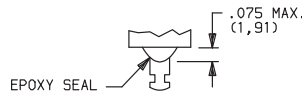
OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
					POWER	
<b>Q</b>	YES	YES	SILVER	SILVER		1 AMP @ 125 V AC OR 28 V DC.
<b>B</b>	YES	YES	GOLD	GOLD	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definition and specifications.

**NOTE:** Any models supplied with Q, or B contact material are RoHS compliant.

## SEAL

**E** EPOXY SEAL



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# GP Series Sealed Ultraminiature Pushbutton Switches

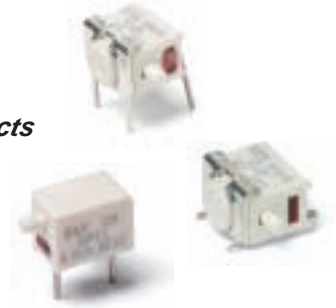


## Features/Benefits

- **Ultraminiature design saves space**
- **Process compatible, withstands most soldering and washing processes**
- **Thru-hole and surface mount models available**
- **Sealed construction—internal o-ring and epoxy base**
- **RoHS compliant**

## Typical Applications

- **Telecommunications and network equipment**
- **Computers and peripheral products**
- **Instrumentation**
- **Medical Applications**



## Specifications

CONTACT RATING: 0.4 VA max. @ 20 V AC or DC max.  
 MECHANICAL & ELECTRICAL LIFE: 40,000 make-and-break cycles at full load.  
 CONTACT RESISTANCE: Below 50 mΩ typ. initial @ 2-4 V DC, 100 mA.  
 INSULATION RESISTANCE: 10<sup>9</sup>Ω min.  
 DIELECTRIC STRENGTH: 500 Vrms min. @ sea level.  
 OPERATING TEMPERATURE: -30°C to 85°C.  
 SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).  
 DEGREE OF PROTECTION: IP57; Protection against harmful dust deposit, full-scale voltage protection, temporary immersion.  
 PACKAGING: Surface mount switches standard in anti-static tape and reel packaging per EIA 481-3, see page A-80 for drawings and reel information. Thru-Hole parts are shipped in trays.  
 All models are RoHS compliant and compliant.

## Materials

HOUSING & BASE: Glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0).  
 ACTUATOR: Glass filled nylon 4/6, flame retardant (UL 94V-0) with standard internal o-ring seal.  
 SWITCH SUPPORT: Brass, tin plated.  
 MOVABLE CONTACT: Copper alloy, with gold plate over nickel plate.  
 STATIONARY CONTACTS Copper alloy, with gold plate over nickel plate.  
 TERMINALS: Copper alloy, with gold flash over nickel plate.  
 TERMINAL SEAL: Epoxy/Urethane. All terminals insert molded.

**NOTE:** Any models supplied with B contact material are RoHS compliant and compatible.

**NOTE:** Materials listed above are general specifications. Specifications available for specific and custom switches, consult Customer Service Center.

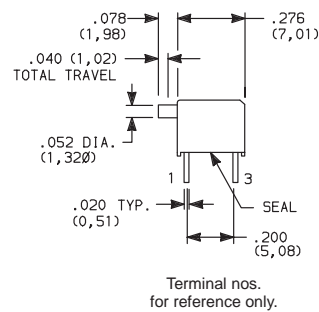
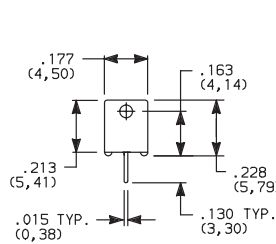
**CAUTION:** PC mounting layouts and pads as shown are designed to be compatible with the latest equipment and reflow techniques. Care should be taken in the design and location of PC lands to suit individual needs. Orientation relative to reflow direction may significantly impact solder joint integrity.

## How To Order

Complete part numbers for GP Series Sealed Ultraminiature Pushbutton Switches are shown on pages A-78 thru A-80.

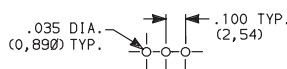
PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS. 1	POS. 2	
<b>GP11MCBE</b>	OFF	MOM.	
Conn. Terms.	OPEN	1-3	SPST
<b>GP12MCBE</b>	ON	MOM.	
Conn. Terms.	2-1	2-3	SPDT

MOM. = Momentary

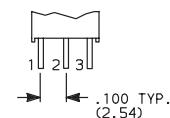


GP11MCBE SPST

### PC MOUNTING



GP11—omit center hole.



GP12 Model



Dimensions are shown: Inches (mm)  
 Specifications and dimensions subject to change



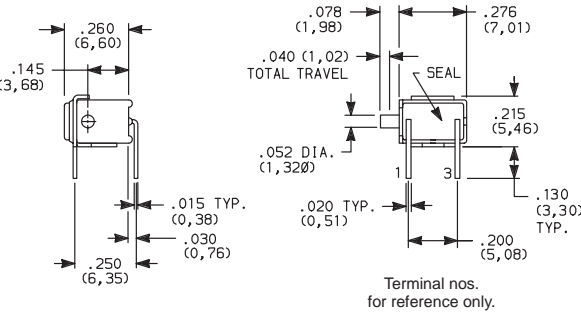
# GP Series Sealed Ultraminiature Pushbutton Switches

A

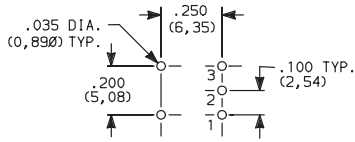
Pushbutton



GP11MABE  
SPST



PC MOUNTING



GP11- omit hole 2.

GP12 Model

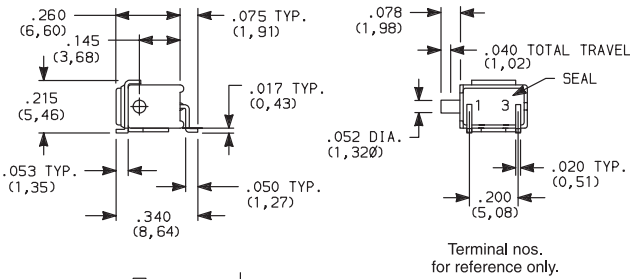
PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS.1	POS. 2	
<b>GP11MABE</b>	OFF	MOM.	
Conn. Terms.	OPEN	1-3	
<b>GP12MABE</b>	ON	MOM.	
Conn. Terms.	2-1	2-3	

MOM. = Momentary

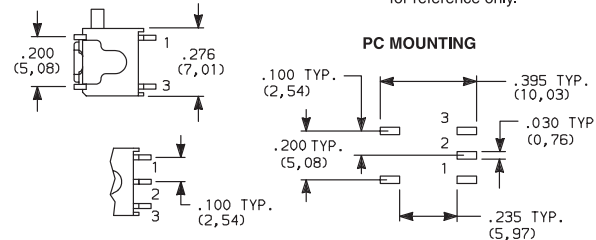
SMT



GP11MSABE  
SPST



PC MOUNTING



GP12 Model

GP11- omit pad 2.

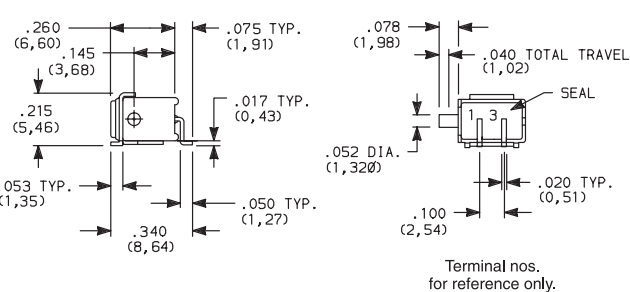
PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS.1	POS. 2	
<b>GP11MSABE</b>	OFF	MOM.	
Conn. Terms.	OPEN	1-3	
<b>GP12MSABE</b>	ON	MOM.	
Conn. Terms.	2-1	2-3	

MOM. = Momentary

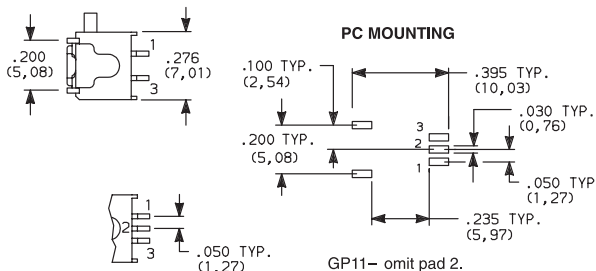
SMT



GP11MSA1BE  
SPST



PC MOUNTING

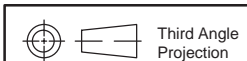


GP12 Model

GP11- omit pad 2.

PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS.1	POS. 2	
<b>GP11MSA1BE</b>	OFF	MOM.	
Conn. Terms.	OPEN	1-3	
<b>GP12MSA1BE</b>	ON	MOM.	
Conn. Terms.	2-1	2-3	

MOM. = Momentary



Third Angle Projection  
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

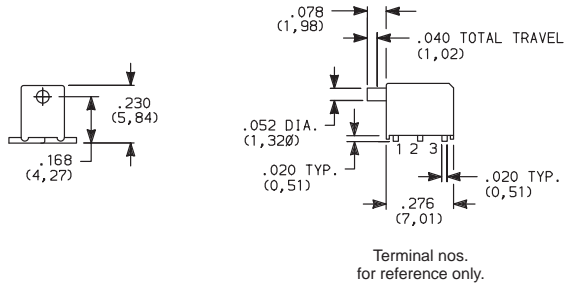


# GP Series Sealed Ultraminiature Pushbutton Switches



PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS. 1	POS. 2	
<b>GP12MSCBE</b>	ON	MOM.	 NC 1    2 (COMM)    3 NO SPDT
Conn. Terms.	2-1	2-3	

MOM. = Momentary



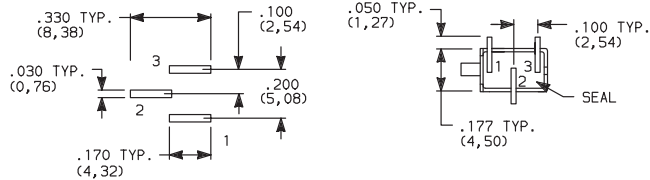
SMT



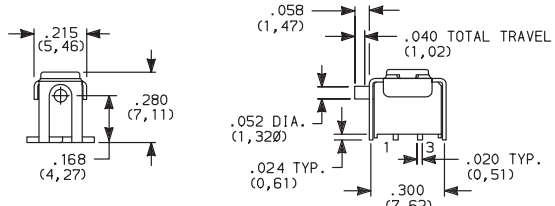
**GP12MSCBE SPDT**

Terminal nos. for reference only.

### PC MOUNTING



**NOTE:** Recommended for infrequent use applications only  
For increased switch mounting strength, order, SV1 termination style with support bracket (see below).



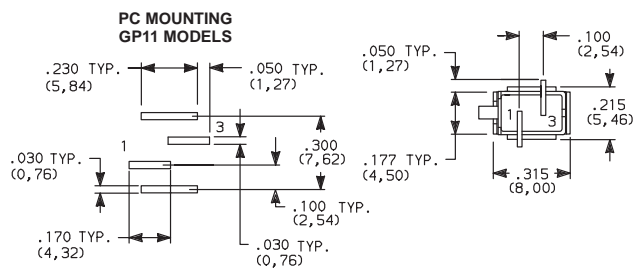
SMT



**GP11MSV1BE SPST**

PART NUMBER	SWITCH FUNCTION		SCHEMATIC
	POS. 1	POS. 2	
<b>GP11MSV1BE</b>	OFF	MOM.	 1    3 SPST
Conn. Terms.	OPEN	1-3	
<b>GP12MSV1BE</b>	ON	MOM.	 NC 1    2 (COMM)    3 NO SPDT
Conn. Terms.	2-1	2-3	

MOM. = Momentary



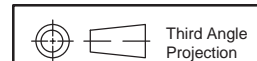
### PC MOUNTING GP11 MODELS



### PC MOUNTING GP12 Models

GP12 Model

Terminal nos. for reference only.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



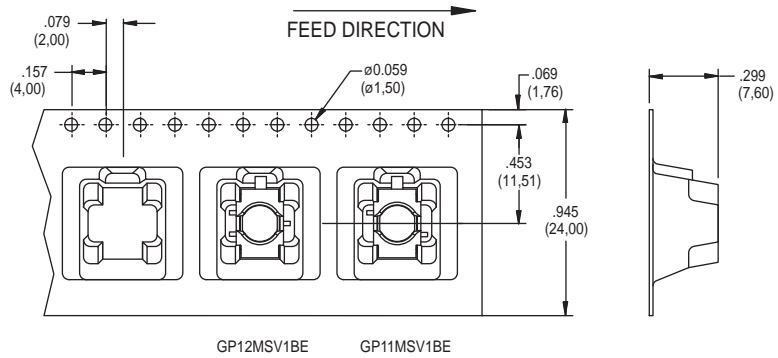
# GP Series Sealed Ultraminiature Pushbutton Switches

## TAPE & REEL

Pushbutton  
A

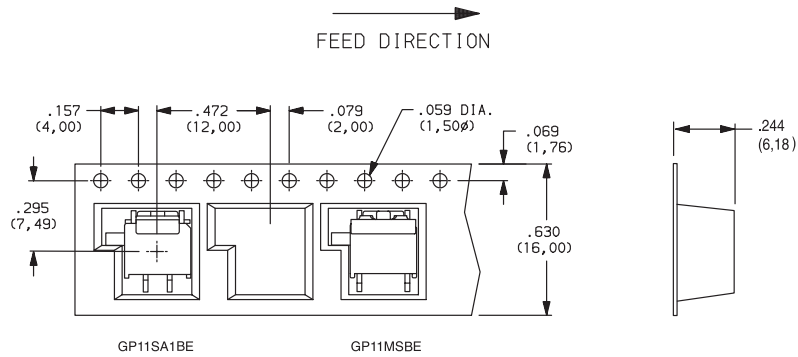
For part numbers GP11MSV1BE, GP12MSV1BE

REEL INFORMATION	
OUTSIDE DIAMETER	13.00 (330,0)
PILOT HOLE	.512 (13,0)
QUANTITY PER REEL	600



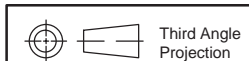
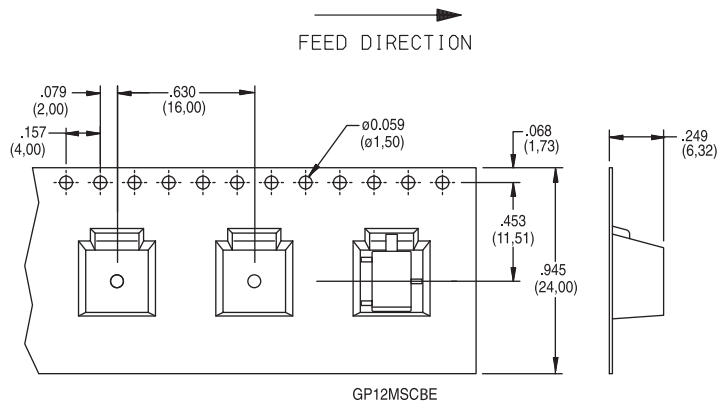
For part numbers GPXXSA1BE, GPXXMSABE

REEL INFORMATION	
OUTSIDE DIAMETER	13.00 (330,0)
PILOT HOLE	.512 (13,0)
QUANTITY PER REEL	600



For part numbers GP12MSCBE

REEL INFORMATION	
OUTSIDE DIAMETER	13.00 (330,0)
PILOT HOLE	.512 (13,0)
QUANTITY PER REEL	600



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# PN Series Alternate & Momentary Action Pushbutton Switches

## Features/Benefits

- Momentary or locking action
- 3 actuation forces for customized feel
- Low cost, reliable contact design
- 1-4 poles available
- RoHS compliant

## Typical Applications

- Computers and peripherals
- Instrumentation and measurement equipment
- Non-power, on-off switch applications



## Specifications

CONTACT RATING: 0.2 AMP @ 30 V DC max.  
 ELECTRICAL LIFE: 10,000 make-and-break cycles at full load.  
 MECHANICAL LIFE: 10,000 on/off cycles.  
 CONTACT RESISTANCE: 50 mΩ max. initial,  
 100 milliohms max. at end of life.  
 INSULATION RESISTANCE: 100 MΩ min. at 500 V DC.  
 DIELECTRIC STRENGTH: 500 V AC min.  
 OPERATING/STORAGE TEMPERATURES: -10°C to 60°C.  
 PACKAGING: Switches are supplied in anti-static bags  
 or anti-static trays.

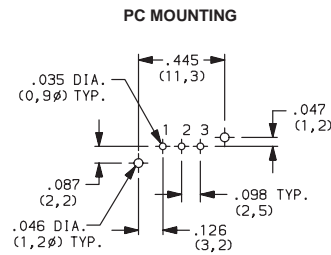
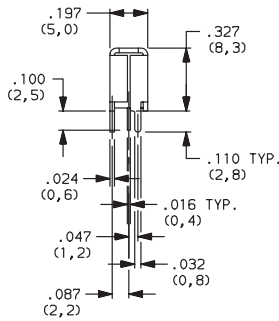
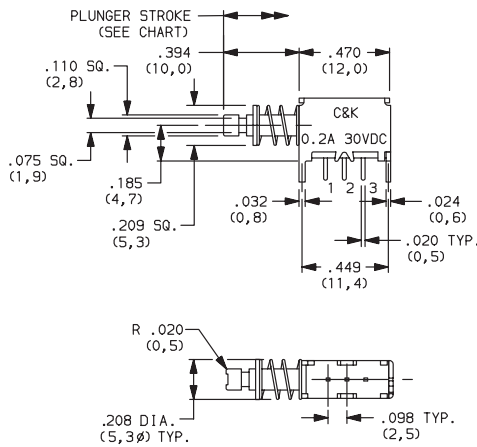
**NOTE:** All models are RoHS compliant and compatible.

## Materials

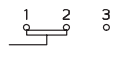
FRAME: Tin plated steel.  
 ACTUATOR: Polyacetal. Color: Manufacturing option.  
 BASE: Laminated phenolic.  
 TERMINALS: Silver plated brass.  
 MOVABLE CONTACTS: Silver plated (or clad) phosphor bronze.  
 RETURN SPRING: Music wire.  
 DETENT SPRING: Phosphor bronze.  
 DETENT SPRING PLATE: Phosphor bronze.  
 RETURN SPRING RETAINER RING: Nickel (or tin) plated steel.  
 TERMINAL SEAL: Epoxy.

## How To Order

Complete part numbers for PN Series Alternate & Momentary Action Pushbutton Switches are shown on pages A-82 thru A-83.



PN11SBSA03QE  
SPDT

PART NUMBER	SWITCH FUNCTION	OPERATING FORCE (typ.)	STROKE		SHORTING/ NON-SHORTING	SCHEMATIC
			LOCK STROKE	FULL STROKE		
PN11SBNA03QE	SPDT Momentary	120g max.	—	.140 (3,5)	Non-Shorting	
PN11SCNA03QE	SPDT Momentary	150g	—			
PN11SHNA03QE	SPDT Momentary	230g	—			
PN11SJNA03QE	SPDT Momentary	330g	—			
PN12SHNA03QE	SPDT Locking	230g	.100g (2,5)	.100g (2,5)	Non-Shorting	
PN12SJNA03QE	SPDT Locking	330g	.100g (2,5)			
PN11SBSA03QE	SPDT Momentary	120g max.	—	.140 (3,5)	Shorting	
PN11SCSA03QE	SPDT Momentary	150g	—			
PN11SHSA03QE	SPDT Momentary	230g	—			
PN11SJSA03QE	SPDT Momentary	330g	—			
PN12SHSA03QE	SPDT Locking	230g	.100g (2,5)	.100 (2,5)	Shorting	
PN12SJSA03QE	SPDT Locking	330g	.100 (2,5)			



Dimensions are shown: Inches (mm)  
 Specifications and dimensions subject to change





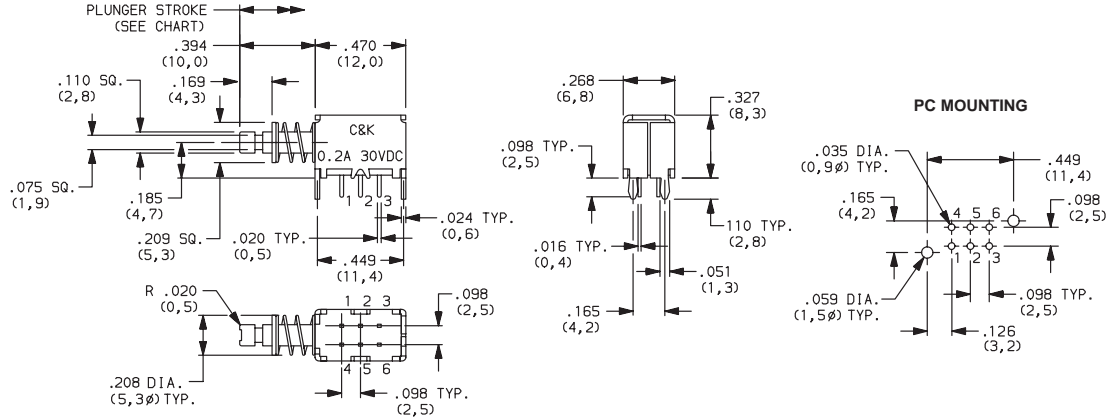
# PN Series Alternate & Momentary Action Pushbutton Switches

A

Pushbutton



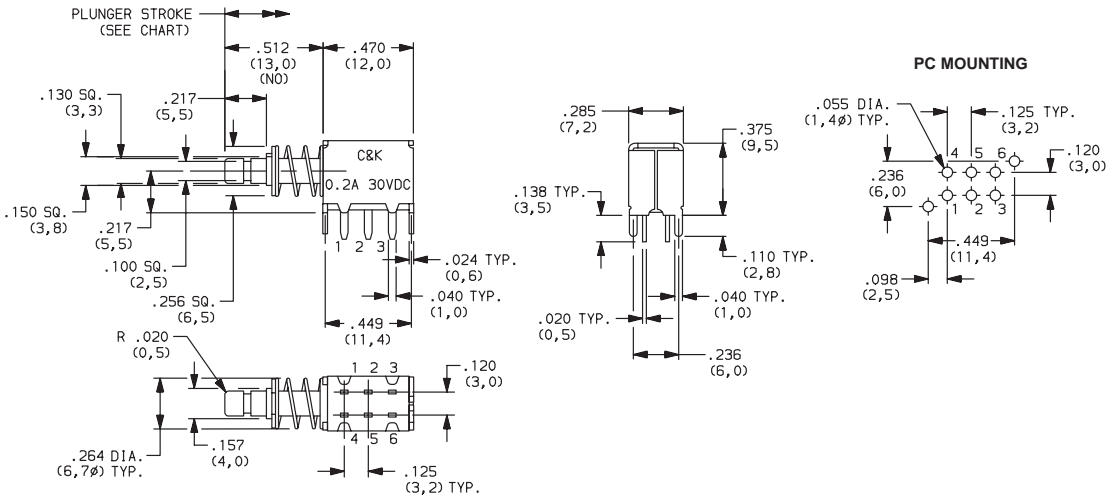
PN21SBSA03QE  
DPDT



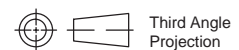
PART NUMBER	SWITCH FUNCTION	OPERATING FORCE (typ.)	STROKE		SHORTING/ NON-SHORTING	SCHEMATIC
			LOCK STROKE	FULL STROKE		
PN21SBNA03QE	DPDT Momentary	120g max.	—	.140 (3,5)	Non-Shorting	
PN21SDNA03QE	DPDT Momentary	175g	—			
PN21SJNA03QE	DPDT Momentary	330g	—			
PN22SJNA03QE	DPDT Locking	330g	.100 (2,5)	.140 (3,5)	Shorting	
PN21SBSA03QE	DPDT Momentary	120g max.	—			
PN21SDSA03QE	DPDT Momentary	175g	—			
PN21SJSA03QE	DPDT Momentary	330g	—	.100 (2,5)	Shorting	
PN22SJSA03QE	DPDT Locking	330g	.100 (2,5)			



PN21LASA03QE  
DPDT



PART NUMBER	SWITCH FUNCTION	OPERATING FORCE (typ.)	STROKE		SHORTING/ NON-SHORTING	SCHEMATIC
			LOCK STROKE	FULL STROKE		
PN21LANA03QE	DPDT Momentary	100g max.	—	.140 (3,5)	Non-Shorting	
PN21LFNA03QE	DPDT Momentary	120g	—			
PN21LDNA03QE	DPDT Momentary	175g	—			
PN21LENA03QE	DPDT Momentary	300g	—	.140 (3,5)	Shorting	
PN22LENA03QE	DPDT Locking	300g	.100 (2,5)			
PN21LASA03QE	DPDT Momentary	100g max.	—			
PN21LFSA03QE	DPDT Momentary	120g	—	.100 (2,5)	Shorting	
PN21LDSA03QE	DPDT Momentary	175g	—			
PN21LESA03QE	DPDT Momentary	300g	—	.100 (2,5)	Shorting	
PN22LESA03QE	DPDT Locking	300g	.100 (2,5)			



Third Angle  
Projection



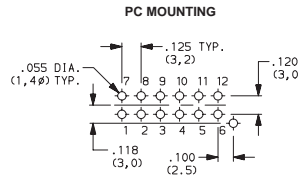
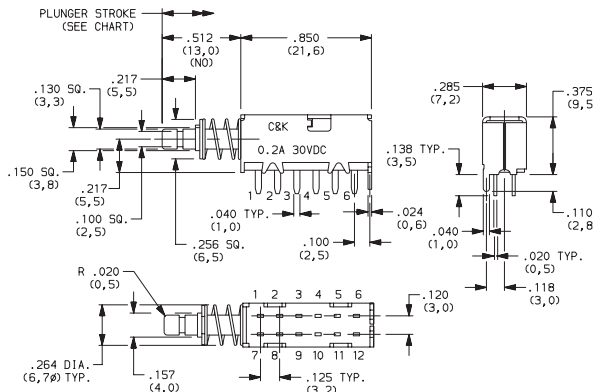
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# PN Series Alternate & Momentary Action Pushbutton Switches



A

Pushbutton

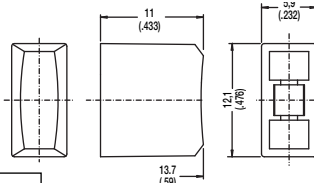


PN41LGS A02QE  
4PDT

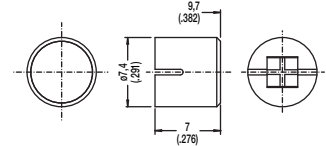
PART NUMBER	SWITCH FUNCTION	OPERATING FORCE (typ.)	STROKE		SHORTING/ NON-SHORTING	SCHEMATIC
			LOCK STROKE	FULL STROKE		
PN41LGNA02QE	4PDT Momentary	175g	—	.140 (3,5)	Non-Shorting	
PN41LENA02QE	4PDT Momentary	300g	—			
PN42LENA02QE	4PDT Locking	300g	.100 (2,5)	.140 (3,5)	Shorting	
PN41LGS A02QE	4PDT Momentary	175g	—			
PN41LESA02QE	4PDT Momentary	300g	—	.140 (3,5)	Shorting	
PN42LESA02QE	4PDT Locking	300g	.100 (2,5)			

BUTTONS MUST BE ORDERED SEPARATELY. SHIPPED IN BULK.

PE



PV

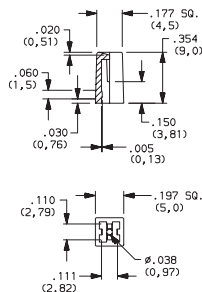


OPTION CODE	COLOR
RD	Red
GY	Gray
BK	Black
WH	White

PE and PV buttons fit .130" square plungers

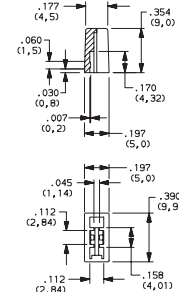
## Indexed

- G001A Black
- G001G Gray
- G001I Ivory
- G001R Red



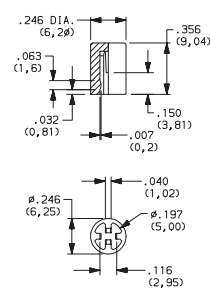
## Rectangular

- G002A Black
- G002G Gray
- G002I Ivory
- G002R Red



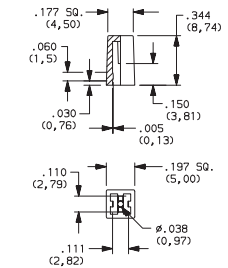
## Round

- G003A Black
- G003G Gray
- G003I Ivory
- G003R Red

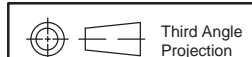


## Square

- G004A Black
- G004G Gray
- G004I Ivory
- G004R Red



G001, G002, G003 and G004 buttons fit .110" square plungers.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# PHA Series Short Stroke Pushbutton Switches



### Features/Benefits

- **Momentary or latching action**
- **Low cost, reliable contact design**
- **2, 4 & 6 pole configurations**
- **Sealed contacts**
- **Optional buttons**
- **RoHS compliant**

### Typical Applications

- **Computers and peripherals**
- **Instrumentation and measurement equipment**
- **Non-power, on-off switch applications**

### Specifications

SWITCHING POWER MAX.: 3 W DC  
 SWITCHING VOLTAGE MAX.: 30 V DC  
 SWITCHING CURRENT MAX.: 100 mA DC  
 DIELECTRIC STRENGTH (50 Hz/1 min.): 500 V between open contacts. 1500 V between chassis and contacts.  
 OPERATING LIFE: Impulse/momentary (OA):  $\wedge 10^4$  operations.  
 Latching (EE):  $\wedge 10^4$  operations  
 CONTACT RESISTANCE: New:  $\%20\ m\Omega$   
 After 105 operations:  $\%40\ m\Omega$   
 INSULATION RESISTANCE:  $\wedge 10^{10}\ \Omega$   
 CAPACITANCE:  $\%1.5\ pF$   
 CONTACT BOUNCE:  $\%2\ ms$   
 Operating speed 200 mm/s (7.87 inch/s)  
 TOTAL TRAVEL/LATCHING TRAVEL: 2.5mm/1.5mm  
 (.0984 inch/.0591 inch)  
 OPERATING FORCE:  
 2U: 170cN $\pm$ 50cN (170 grams $\pm$ 50 grams)  
 4U: 230cN $\pm$ 70cN (230 grams $\pm$ 70 grams)  
 6U: 300cN $\pm$ 100cN (300 grams $\pm$ 100 grams)  
 SEALING: Sealed contacts.

### Materials

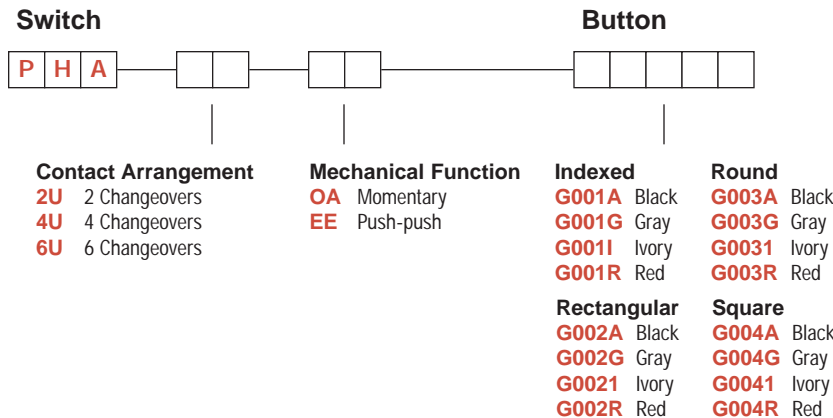
FIXED TERMINAL: Brass, silver plated.  
 MOVABLE CONTACT: Phosphor bronze, silver plated.  
 SWITCH BODY: PPE  
 ACTUATOR: POM  
 STANDOFF CLIP: POM  
 RETURN SPRING: Music wire.  
 RETURN SPRING RETAINER: Carbon steel, tin plated.  
 DETENT SPRING PLATE: Phosphor bronze.  
 DETENT SPRING: Stainless steel.  
 BASE: Laminated phenolic.  
 TERMINAL SEAL: Epoxy.

**NOTE:** All models are RoHS compliant and compatible.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

### Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-85 thru A-87. For additional options not shown in catalog, consult Customer Service Center.



#### BUTTON REMOVAL

A button of a push-push switch should only be removed in the "OFF" non-latching position.

# PHA Series Short Stroke Pushbutton Switches

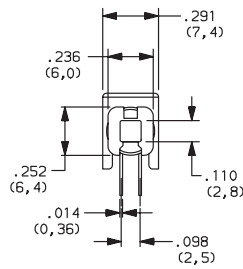
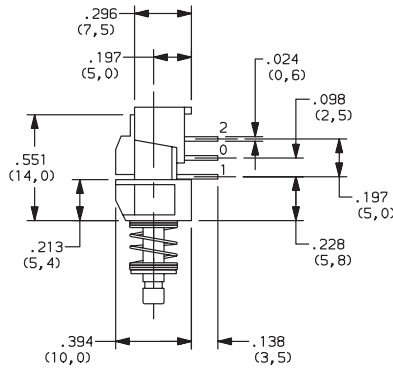
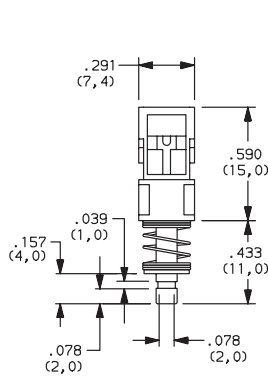


A

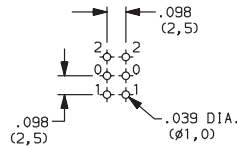
Pushbutton

DESIGNATION

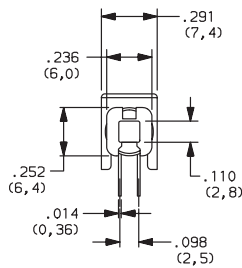
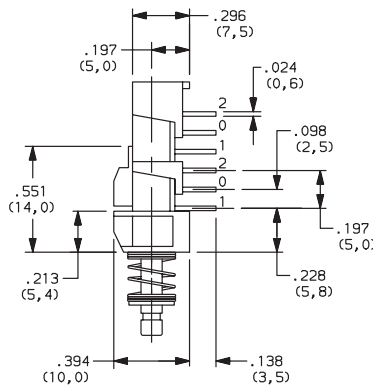
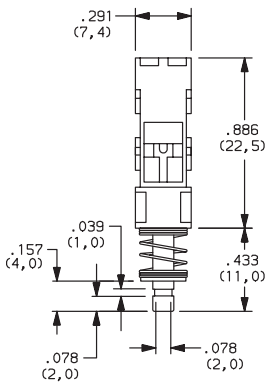
**2U** 2 CHANGEOVERS



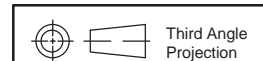
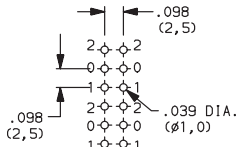
**PC MOUNTING**



**4U** 4 CHANGEOVERS



**PC MOUNTING**



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

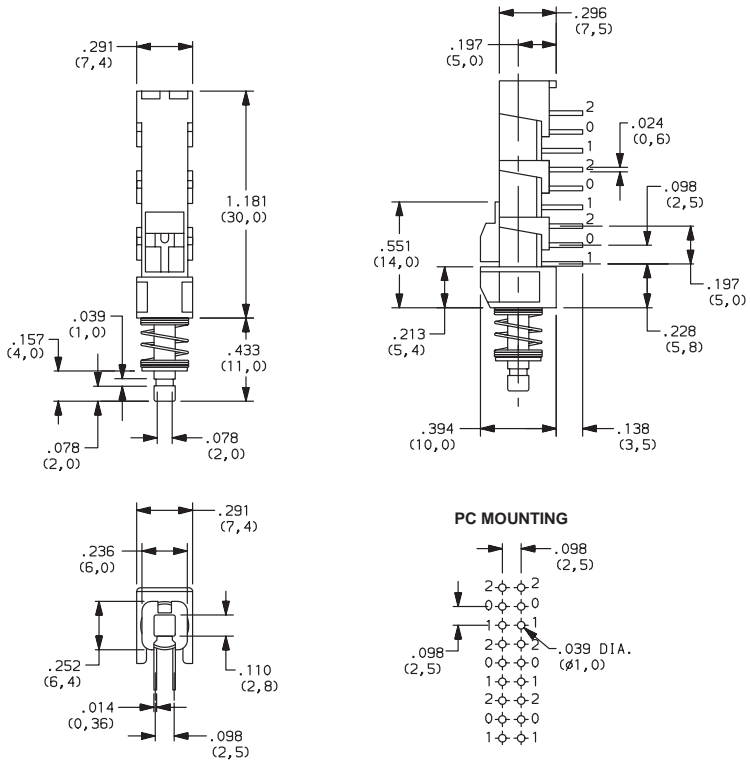


# PHA Series Short Stroke Pushbutton Switches

## DESIGNATION

Pushbutton  
A

**6U** 6 CHANGEOVERS



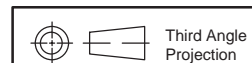
## CONTACT ARRANGEMENT

OPTION CODE	NO. OF POLES *	SCHEMATIC
<b>2U</b>	2PDT	
<b>4U</b>	4PDT	2X
<b>6U</b>	6PDT	3X

\*Non-shorting contacts.

## MECHANICAL FUNCTION

OPTION CODE	FUNCTION
<b>OA</b>	Momentary
<b>EE</b>	Push-push



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# PHA Series Short Stroke Pushbutton Switches



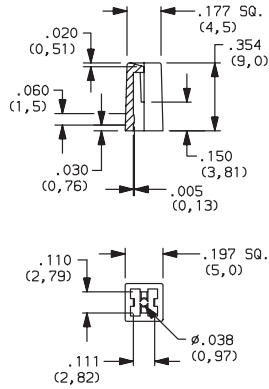
A

Pushbutton

## BUTTONS

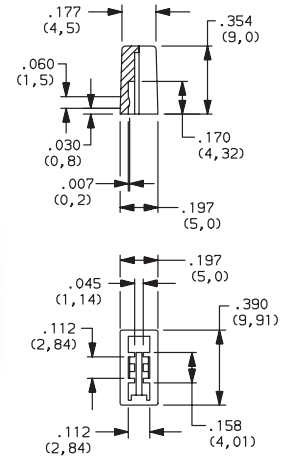
### Indexed

- G001A** Black
- G001G** Gray
- G001I** Ivory
- G001R** Red



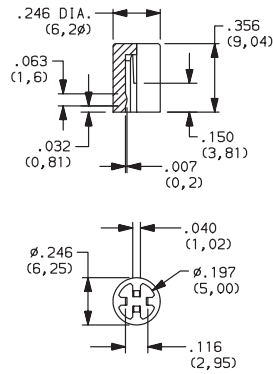
### Rectangular

- G002A** Black
- G002G** Gray
- G002I** Ivory
- G002R** Red



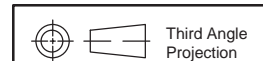
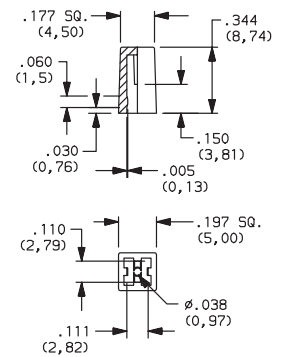
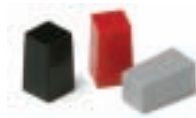
### Round

- G003A** Black
- G003G** Gray
- G003I** Ivory
- G003R** Red



### Square

- G004A** Black
- G004G** Gray
- G004I** Ivory
- G004R** Red



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# F Series Pushbutton Switches

## Features/Benefits

- Up to 10 poles per module
- Various contact terminals
- Various mounting & switch ganging configurations
- Mechanical indicator buttons
- Illumination options
- RoHS compliant

## Typical Applications

- Audio selection
- Digital equipment interface
- Medical equipment interface



## Specifications

SWITCHING POWER: F module max. AC/DC: Silver: 50 VA/15W, Gold: 1 VA/300 mW.

SWITCHING VOLTAGE: F module max. AC/DC: Silver: 125/30V, Gold: 50/30 V.

SWITCHING CURRENT: F module max. AC/DC: Silver: 0.5A/0.5A, Gold: 0.04A/0.01A.

CARRYING CURRENT: Max at  $\Delta u = 20^{\circ}\text{C}$ : Silver: < 2A, Gold: <0.5A.

DIELECTRIC STRENGTH (50 Hz, 1 min.): Chassis/contact:  $\wedge 1500\text{V}$  Between contacts:  $\wedge 1500\text{V}$ .

OPERATING LIFE "OA/EE" (24V/200mA):  $>10^5$  operations "GR":  $>3.5 \times 10^4$  operations.

CONTACT RESISTANCE: Initial: Typical %10 m $\Omega$ , max. 20 m $\Omega$  After operating life: %100 m $\Omega$

INSULATION RESISTANCE:  $\wedge 10^9 \Omega$  between open contacts,  $\wedge 10^9 \Omega$  between chassis and contacts.

CAPACITANCE (at f = 10 kHz): %0.7 pF between 2 contacts.

TOTAL TRAVEL/LATCHING TRAVEL: 4.7mm/3.3mm (.185 inch/.130 inch).

All models and options are RoHS compliant and compatible.

**NOTE:** All models and options are RoHS compliant and compatible.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

TYPICAL F OPERATING FORCE: 2U: 6.5N (650 grams); 4U: 6.5N (650 grams); 6U: 7.5N (750 grams); 8U: 9.0N (900 grams); 10U: 9.0N (900 grams).

EUROPEAN TYPICAL SF OPERATING FORCE:  
2U: 3.5N $\pm 0.5\text{N}$  (350 grams $\pm 100$  grams); 4U: 5N $\pm 1\text{N}$  (500 grams $\pm 100$  grams); 6U: 6.5N $\pm 1\text{N}$  (650 grams $\pm 100$  grams); 8U: 9.0N $\pm 1\text{N}$  (900 grams $\pm 100$  grams).

OPERATING TEMPERATURE RANGE: -40 $^{\circ}\text{C}$  to 70 $^{\circ}\text{C}$ .

## Materials

HOUSING: Polycarbonate UL 94V-0 or polyester UL 94V-0.

ACTUATOR: Polyester UL 94V-0.

MOVABLE CONTACTS: Bimetal brass, silver plated, gold plate over nickel.

STATIONARY CONTACTS & TERMINALS: Brass, silver plated, gold plated.

TERMINAL BOARD: Polyester UL 94V-0.

RETURN SPRING: Music wire.

TERMINAL SEAL: RTV adhesive sealant.

CHASSIS: Steel.

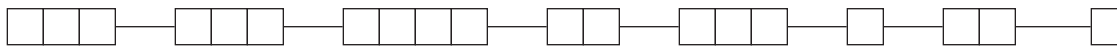
LOCKOUT PIN: Steel.

BLOCKERS: Steel.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-92 thru A-100. For additional options not shown in catalog, consult Customer Service Center. If requesting only a switch, select either a North American or European switch as noted below. Chassis and buttons are sold separately. If multiple stations are selected, we will assume all switches are the same unless noted otherwise.

### North American Order Code - Switch Only



#### Designation

- F** F Series
- FLT** Light touch F series
- ZF** Central mounted F series

#### Contact Arrangement

- 2U** 2PDT
- 4U** 4PDT
- 6U** 6PDT
- 8U** SPDT
- 10U** 10PDT

#### Mechanical Function

- OA** Momentary
- EE** Alternate (push-push)
- GR** Interlock
- AOR** Central release
- OASP** Momentary with lockout
- GRSP** Interlock with lockout

#### Terminal Sealing

- (NONE)** None
- TB** Top/bottom

#### Terminal Style

- (NONE)** Solder lugs & PC pins
- 01A** Cut solder lugs
- 01B** Cut PC pins, for other configurations, consult factory

#### Electrical Function

- (NONE)** BBM
- M** MBB (special)

#### Contact Material

- (NONE)** Silver, AG
- AU** Gold

#### Dress nut\*

\*Central mounted F series only

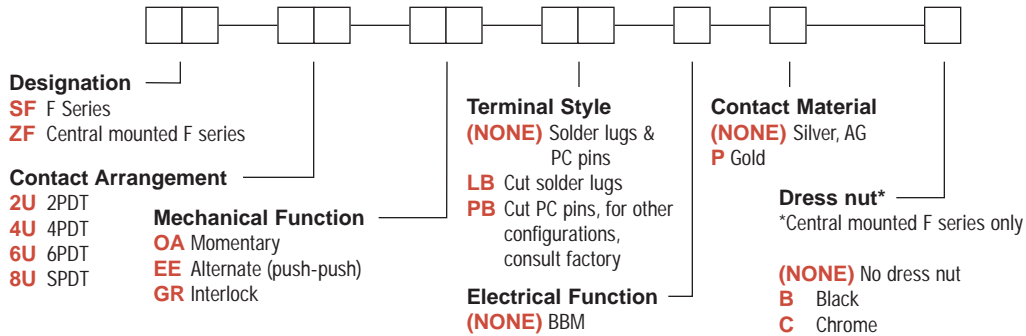
- (NONE)** No dress nut
- B** Black
- C** Chrome



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



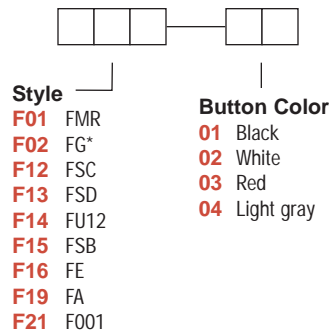
## European Order Code - Switch Only



\*Minimum order quantities apply.

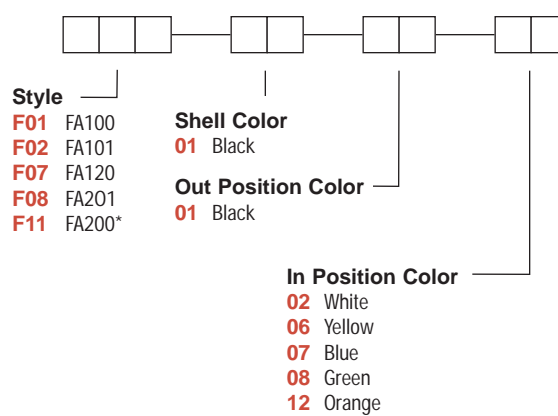
## Order Code - Buttons

### Solid Buttons



\*Button options for central mounting configurations, use 'FG' for central mount with chrome dress nut, use 'FA200' for central mount with black dress nut.

### Mechanical Indicator Buttons



## BUTTON REMOVAL

A button of a push-push switch should only be removed in the "OFF" non-latching position.





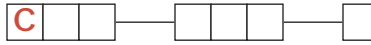
# F Series Pushbutton Switches

Pushbutton  
A

## Order Code - Chassis

To order a switch with chassis, create the switch part number listed above and add the Chassis part number configurator information at the end of the part number.

Note: We do not guarantee or recommend interlocking beyond 10 stations.



### No. of Stations

**01 thru 23** Comes with standard .094 (2,4mm) mounting holes  
Note: Single station chassis available with special mounting configurations, consult factory.

### Spacing between Stations

**00** Single station  
**10** 10mm  
**12.5** 12.5mm  
**15** 15mm  
**17.5** 17.5mm  
**20** 20mm

### Special Acknowledgements

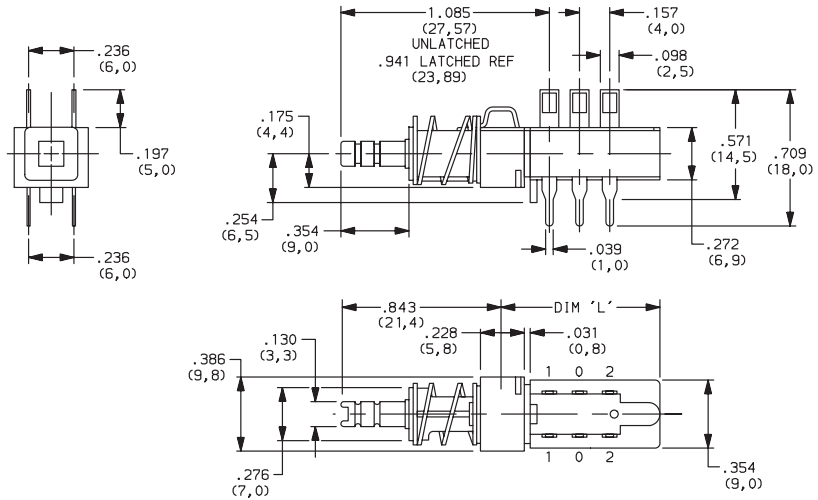
See note

\*Minimum order quantities apply.

## SWITCHES WITH STANDARD OPTIONS

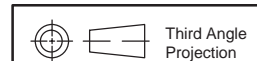
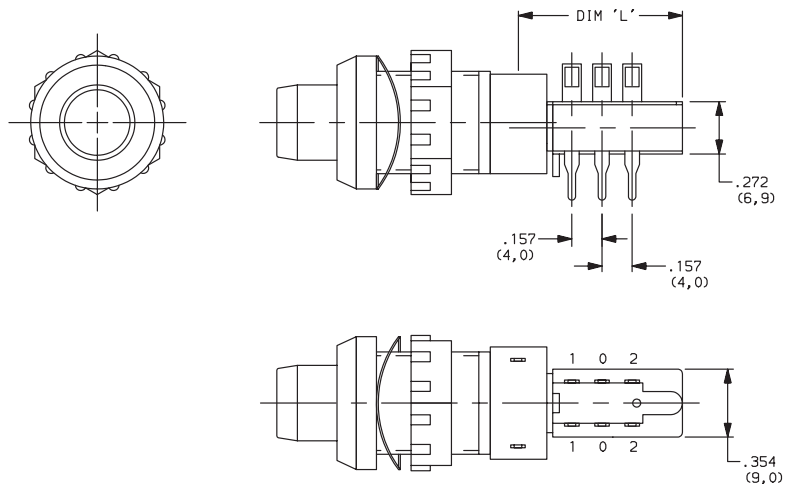
### F2UEE

CONTACT ARRANGEMENT	LENGTH DIM 'L'
2U	0.827 (21,00)
4U	1.300 (33,00)
6U	1.770 (45,00)
8U	2.240 (57,00)
10U	2.720 (69,00)



### ZF2UEEBF11010108

CONTACT ARRANGEMENT	LENGTH DIM 'L'
2U	0.827 (21,00)
4U	1.300 (33,00)
6U	1.770 (45,00)
8U	2.240 (57,00)
10U	2.720 (69,00)



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# F Series Pushbutton Switches



A

Pushbutton

## DESIGNATION

### Designation, North America

- F** F Series
- FLT** Light touch F series
- ZF** Central mounted F series

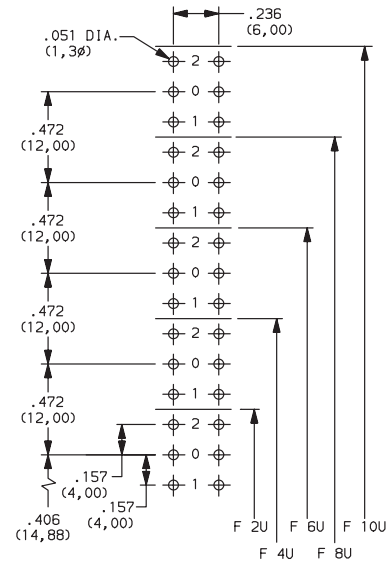
### Designation, Europe

- SF** F Series
- ZF** Central mounted F series

## CONTACT ARRANGEMENT

OPTION CODE	NO. OF POLES	SCHEMATIC
<b>2U</b>	2PDT	
<b>4U</b>	4PDT	2X
<b>6U</b>	6PDT	3X
<b>8U</b>	8PDT	4X
<b>10U</b>	10PDT	5X

### PC MOUNTING



## MECHANICAL FUNCTION

### North America

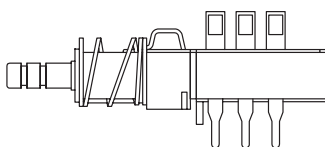
OPTION CODE	FUNCTION
<b>OA</b>	Momentary
<b>EE</b>	Alternate (push-push)
<b>GR</b>	Interlock
<b>AOR</b>	Central release
<b>OASP</b>	Momentary with lockout
<b>GRSP</b>	Interlock with lockout

### Europe

OPTION CODE	FUNCTION
<b>OA</b>	Momentary
<b>EE</b>	Alternate (push-push)
<b>GR</b>	Interlock

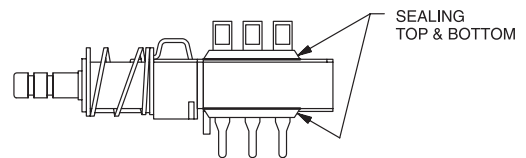
## TERMINAL SEALING

**(NONE)** NO SEAL



F2UEE shown in example above.

**TB** TOP & BOTTOM



**NOTE:** Available for North America only



Dimensions are shown: Inches (mm)

Specifications and dimensions subject to change





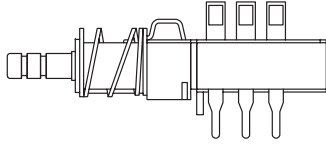
# F Series Pushbutton Switches

Pushbutton  
A

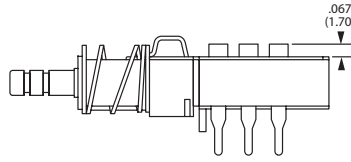
## TERMINAL STYLE



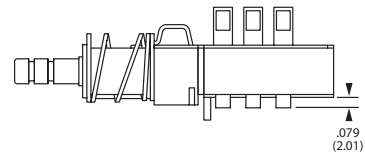
**(NONE)** SOLDER LUGS & PC PINS



**01A** CUT SOLDER LUGS (North America)  
**LB** CUT SOLDER LUGS (Europe)



**01B** CUT PC PINS (North America)  
**PB** CUT PC PINS (Europe)



## ELECTRICAL FUNCTION



OPTION CODE	FUNCTION
<b>(NONE)</b>	BBM Non-shorting
<b>M</b>	MBB Shorting (North America only)

## CONTACT MATERIAL



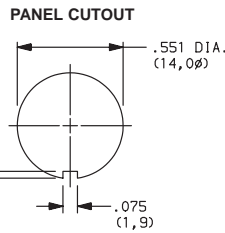
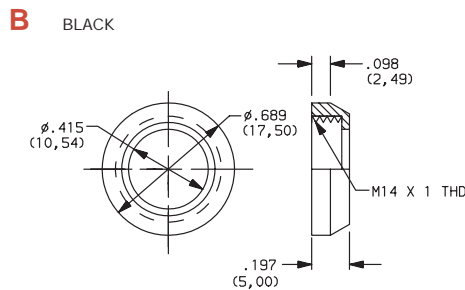
NORTH AMERICA OPTION CODE	EUROPE OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	MATERIAL	RATING
<b>(NONE)</b>	<b>(NONE)</b>	YES	YES	SILVER, AG	50 VA/15 W; 125/30 V; 0.5/0.5 A
<b>AU</b>	<b>P</b>	YES	YES	GOLD	1 VA/300mW; 50/30 V; 0.04 A/0.01 A

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

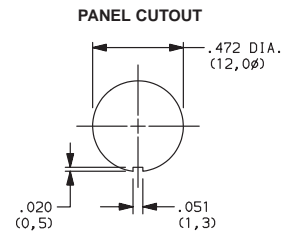
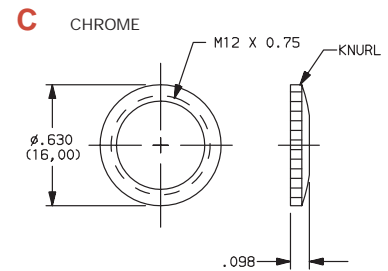
## DRESS NUT



**(NONE)** NO DRESS NUT FOR F & F/LT DESIGNATIONS



**NOTE:** Available with ZF designation and FA200 buttons.



**NOTE:** Available with ZF designation and FG button.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change







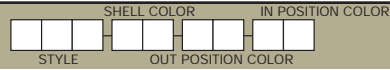
# F Series Pushbutton Switches



A

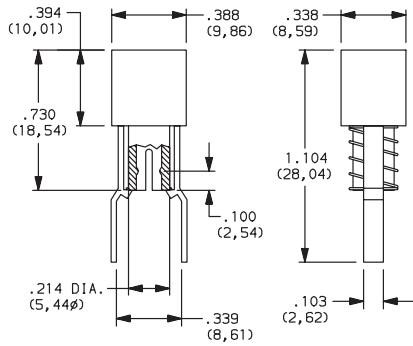
Pushbutton

## MECHANICAL BUTTON

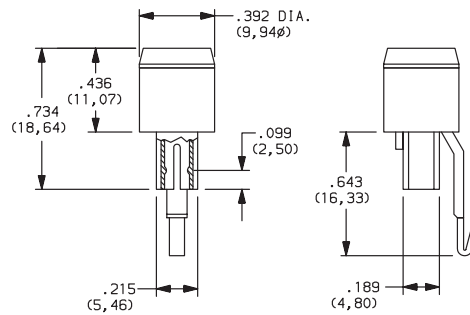


### STYLE

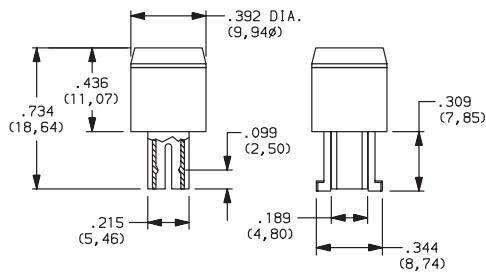
**F07** FA120



**F08** FA201



**F11** FA200



### SHELL COLOR

**01** BLACK

### OUT POSITION COLOR

**01** BLACK

### IN POSITION COLOR

OPTION CODE	COLOR
<b>02</b>	WHITE
<b>06</b>	YELLOW
<b>07</b>	BLUE
<b>08</b>	GREEN
<b>12</b>	ORANGE



Third Angle Projection

Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# F Series Pushbutton Switches



Pushbutton  
A

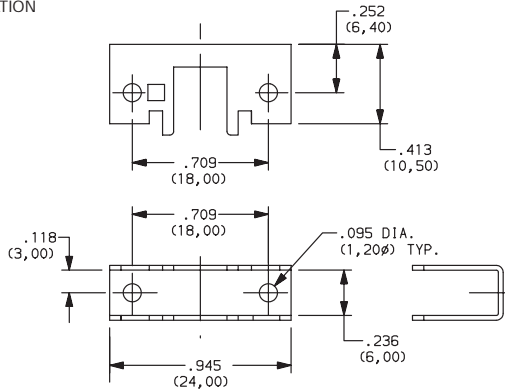
## NUMBER OF STATIONS

**C00 Thru C10** Comes with standard 0.094 (2,44mm) mounting holes

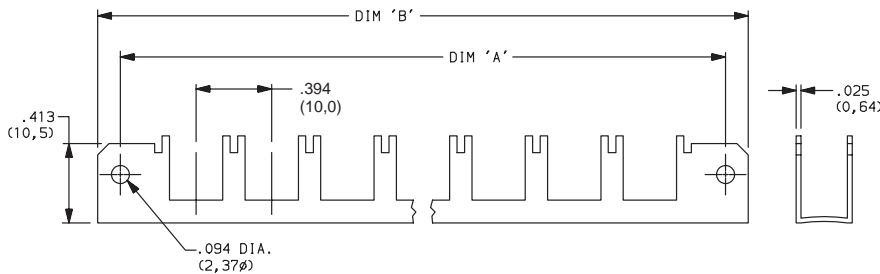
**NOTE:** Single station chassis available with mounting configurations, consult factory.

## SPACING

**00** SINGLE STATION

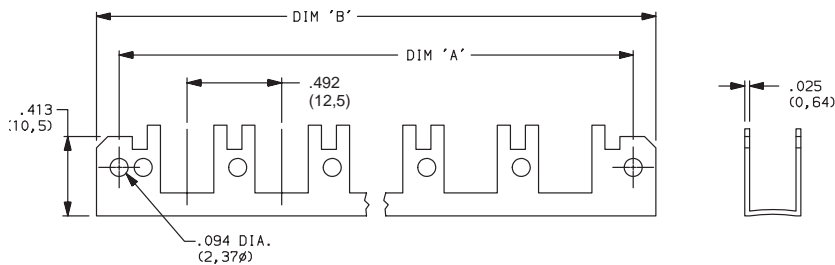


**10** 10mm



No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.182 (30,02)	1.418 (36,02)	0.005
3	1.575 (40,01)	1.811 (46,00)	0.010
4	1.969 (50,01)	2.205 (56,01)	0.010
5	2.363 (60,02)	2.599 (66,01)	0.010
6	2.757 (70,03)	2.993 (76,02)	0.015
7	3.150 (80,01)	3.386 (86,00)	0.015
8	3.544 (90,02)	3.780 (96,01)	0.015
9	3.938 (100,03)	4.174 (106,02)	0.015
10	4.331 (110,01)	4.567 (116,00)	0.015

**12.5** 12.5mm



No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.200 (30,48)	1.436 (36,47)	0.005
3	1.692 (42,98)	1.928 (48,97)	0.010
4	2.184 (55,47)	2.420 (61,47)	0.010
5	2.676 (67,97)	2.912 (73,96)	0.010
6	3.169 (80,49)	3.405 (86,49)	0.015
7	3.661 (92,99)	3.897 (98,98)	0.015
8	4.153 (105,49)	4.389 (111,48)	0.015
9	4.645 (117,98)	4.881 (123,98)	0.015
10	5.137 (130,48)	5.373 (136,47)	0.015



Dimensions are shown: Inches (mm)

Specifications and dimensions subject to change



# F Series Pushbutton Switches



A

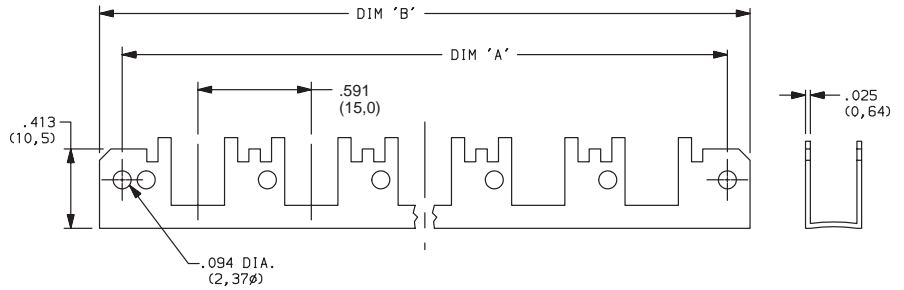
Pushbutton



## SPACING

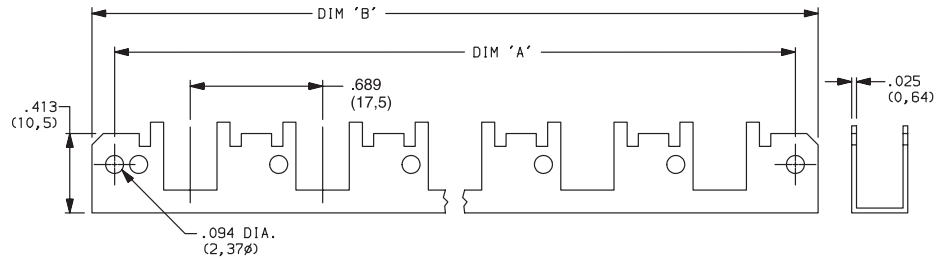
**15** 15mm

No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.374 (34,90)	1.615 (41,02)	0.005
3	1.969 (50,01)	2.205 (56,01)	0.010
4	2.560 (65,02)	2.796 (71,02)	0.010
5	3.150 (80,01)	3.386 (86,00)	0.010
6	3.741 (95,02)	3.977 (101,02)	0.015
7	4.332 (110,03)	4.568 (116,03)	0.015
8	4.922 (125,02)	5.158 (131,01)	0.015
9	5.513 (140,03)	5.749 (146,02)	0.015
10	6.103 (155,02)	6.339 (161,01)	0.015



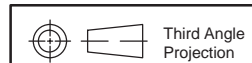
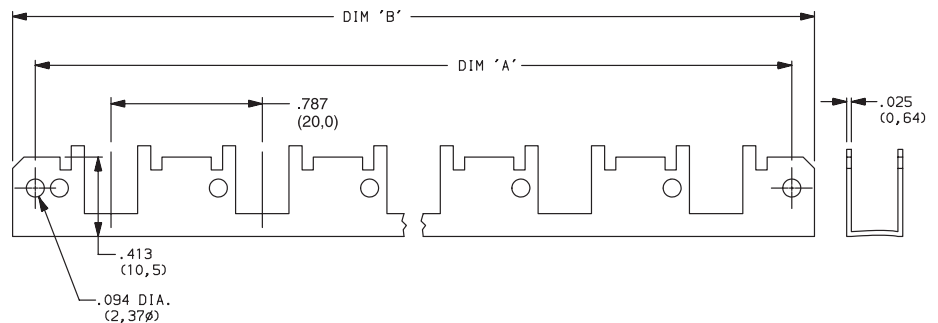
**17.5** 17.5mm

No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.477 (37,52)	1.713 (43,51)	0.005
3	2.166 (55,02)	2.402 (61,01)	0.010
4	2.855 (75,52)	3.091 (78,51)	0.010
5	3.544 (90,02)	3.780 (96,01)	0.010
6	4.233 (107,52)	4.469 (113,51)	0.015
7	4.922 (125,02)	5.158 (131,01)	0.015
8	5.611 (142,52)	5.847 (148,51)	0.015
9	6.300 (160,02)	6.536 (166,01)	0.015
10	6.989 (177,52)	7.225 (183,52)	0.015



**20** 20mm

No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.575 (40,01)	1.811 (46,00)	0.005
3	2.363 (60,02)	2.599 (66,01)	0.010
4	3.150 (80,01)	3.386 (86,00)	0.010
5	3.938 (100,03)	4.174 (106,02)	0.010
6	4.725 (120,02)	4.961 (126,01)	0.015
7	5.512 (140,00)	5.748 (146,00)	0.015
8	6.300 (160,02)	6.536 (166,01)	0.015
9	7.087 (180,01)	7.323 (186,00)	0.015
10	7.875 (200,03)	8.111 (206,02)	0.015



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change







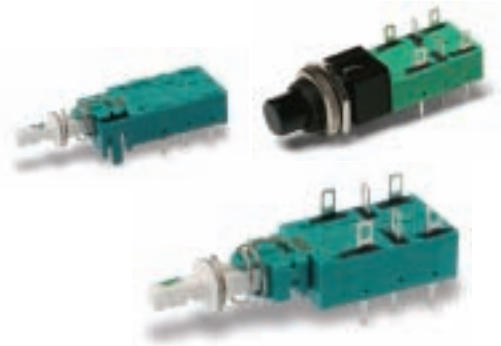
# NE-18 Series Mains / Power Switches

## Features/Benefits

- Chassis or panel mount
- Various buttons
- Various contact configurations
- RoHS compliant

## Typical Applications

- Mains/power switching
- Consumer electronics
- Audio equipment
- Digital products



## Specifications

### POWER CONTACT:

SWITCHING POWER MAX. AC/DC: NE18: 1500/100 W,  
NE18CTII: 1000/100 W; AC (Inductive  $\cos \phi = 0.6$ ): NE18: 900W,  
NE18CTII: 600W.

SWITCHING VOLTAGE MAX. AC/DC: 250/100V

### SWITCHING CURRENT MAX. AC/DC

AC (Inductive  $\cos \phi = 0.6$ ): NE18:  $6 A^2$ /1 A, NE18CTII:  $4 A^2$ /1 A

INRUSH CURRENT MAX. AC<sup>1</sup>): NE18: 36 A, NE18CTII: 64 A

DIELECTRIC STRENGTH (50 Hz, 1 min.): 2000 V

OPERATING LIFE AT MAX. LOAD AND AT MAX. INRUSH  
CURRENT:  $10^4$  operations<sup>5</sup>)

CONTACT RESISTANCE: Initial: 50m $\Omega$ ; After  $10^4$  operations: 70m $\Omega$ .

INSULATION RESISTANCE:  $10^{12}$   $\Omega$ chassis – nearest contact;  
 $10^{12}$   $\Omega$ mains contact – mains contact;  $10^{12}$   $\Omega$ mains contact –  
mains contact after  $10^4$  operations.

### LOW VOLTAGE CONTACT:

SWITCHING POWER MAX.: 12W

SWITCHING VOLTAGE MAX.: 24V

SWITCHING CURRENT MAX.: 0.5A

TOTAL TRAVEL: 4.7mm (.185 inch)

LATCHING TRAVEL: 3.3mm (.130 inch)

OPERATING FORCE: Without auxiliary low voltage contacts:

NE18: 7N (700 grams); NE18CTII: 9.5N (950 grams).

With auxiliary low voltage contacts: NE18: 8N (800 grams);

NE18CTII: 11N (1100 grams).

SEALING: Dust proof.

## Materials

HOUSING, ACTUATOR & TERMINAL BOARD: Thermoplastic polyester (UL 94V-0).

MOVABLE CONTACT: Silver nickel alloy, silver plated.

FIXED CONTACTS: Silver nickel alloy, silver plated.

COMMON CONTACTS & TERMINALS: Copper alloy, silver plated.

RETURN SPRING: Music wire.

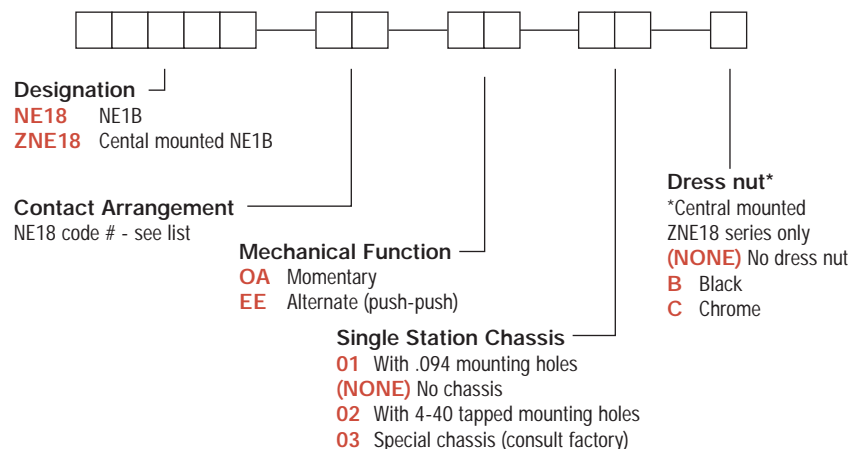
**NOTE:** All models are RoHS compliant and compatible.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-102 thru A-109. For additional options not shown in catalog, consult Customer Service Center.

If requesting only a switch, select the switch as noted below. Buttons are sold separately.



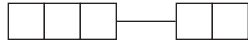
# NE-18 Series Mains / Power Switches



A  
Pushbutton

## Order Code - Buttons

### Solid Buttons



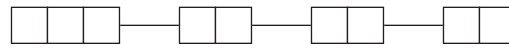
#### Style

- F01 FMR
- F02 FG\*
- F12 FSC
- F13 FSD
- F14 FU12
- F15 FSB
- F16 FE
- F19 FA
- F21 F001

#### Button Color

- 01 Black
- 02 White
- 03 Red
- 04 Light gray

### Mechanical Indicator Buttons



#### Style

- F01 FA100
- F02 FA101
- F07 FA120
- F08 FA201
- F11 FA200\*

#### Shell Color

- 01 Black

#### Out Position Color

- 01 Black

#### In Position Color

- 02 White
- 06 Yellow
- 07 Blue
- 08 Green
- 12 Orange

\*Button options for central mounting configurations, use 'FG' for central mount with chrome dress nut, use 'FA200' for central mount with black dress nut.

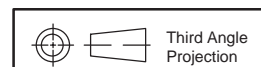
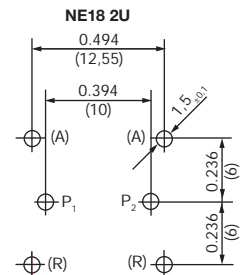
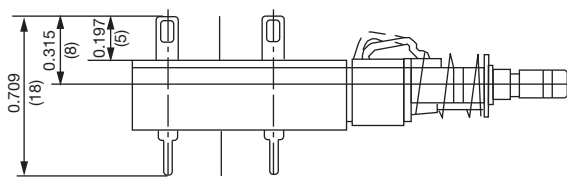
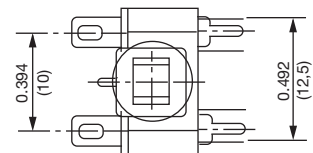
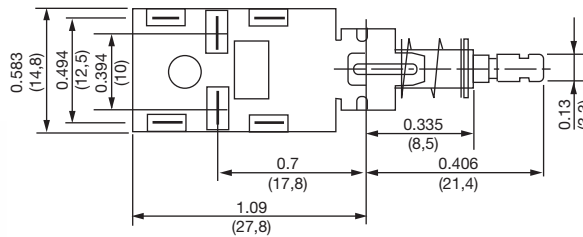
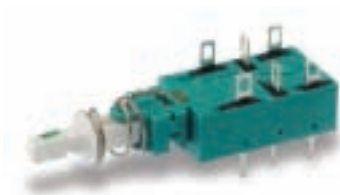
## BUTTON REMOVAL

A button of a push-push switch should only be removed in the "OFF" non-latching position.

## DESIGNATION & SWITCHES WITH STANDARD OPTIONS



### NE1838EE



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



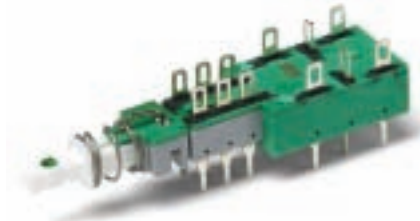
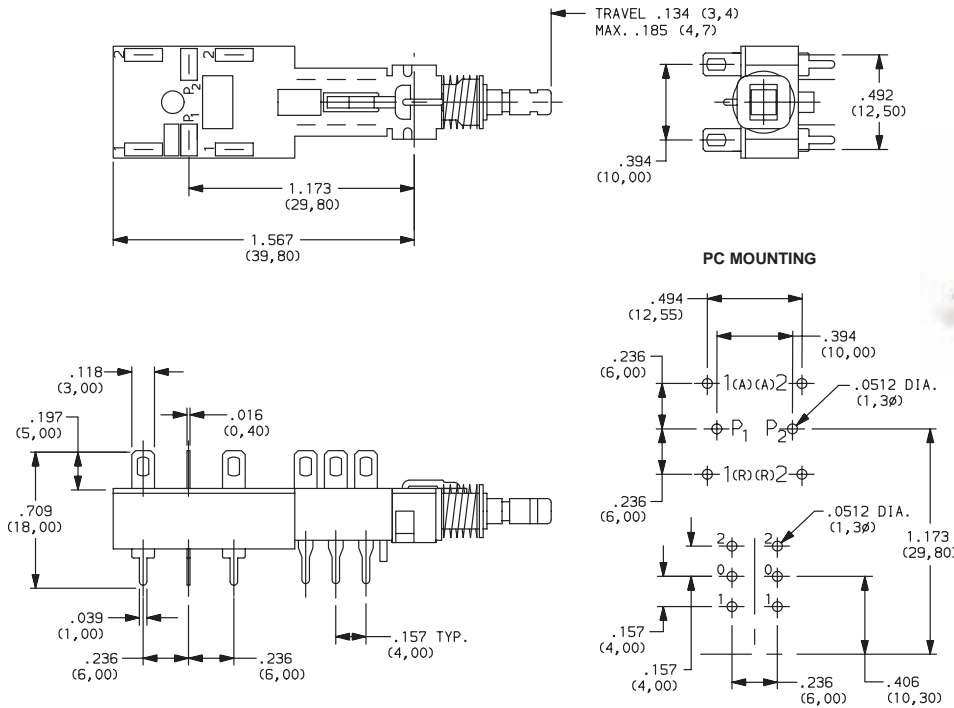
Pushbutton  
A

# NE-18 Series Mains / Power Switches

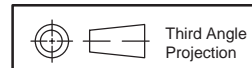
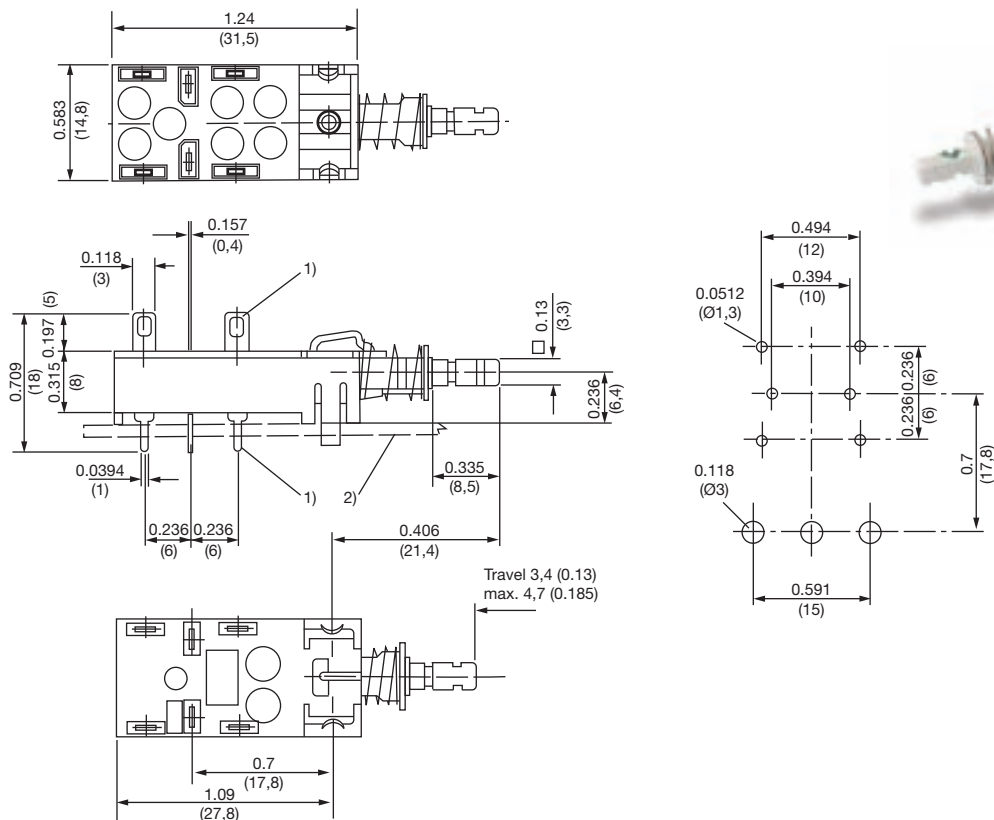
## DESIGNATION & SWITCHES WITH STANDARD OPTIONS



### NE1839EE



### NE1848EE



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# NE-18 Series Mains / Power Switches

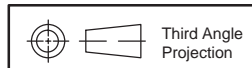
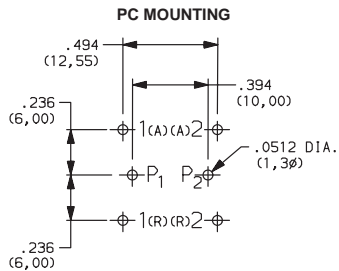
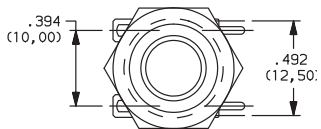
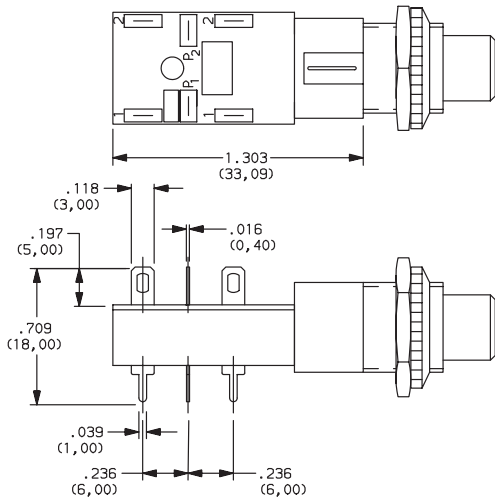


Pushbutton

DESIGNATION & SWITCHES WITH STANDARD OPTIONS



ZNE1838EECF0201



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# NE-18 Series Mains / Power Switches

Pushbutton  
A

## CONTACT ARRANGEMENT



OPTION CODE Contact capacity and availability	STYLE	ELECTRICAL CIRCUIT
<b>37</b>	NE18 — 2AX	DPST
<b>38</b>	NE18 — 2UX	DPDT
<b>51</b>	2U + NE18 — 2AX	DPST*
<b>52 (4A/64)</b>	NE18CTII — 2AX	DPST
<b>39</b>	2U + NE18 — 2UX	DPDT*
<b>41</b>	NE18 — 2AP	DPST
<b>42</b>	NE18 — 2UP	DPDT
<b>43</b>	NE18 — 2AW	DPST
<b>44</b>	NE18 — 2UW	DPDT
<b>45</b>	NE18 — 2ASX	DPST

OPTION CODE Contact capacity and availability	STYLE	ELECTRICAL CIRCUIT
<b>46</b>	NE18 — 2USX	DPDT
<b>47</b>	NE18 — 2ASP	DPST
<b>48</b>	NE18 — 2USP	DPDT
<b>49</b>	NE18 — 2ASW	DPST
<b>50</b>	NE18 — 2USW	DPDT
<b>53 (4A/64)</b>	2U + NE18CTII — 2AX	DPST
<b>54</b>	2U + NE18 — 2AW	DPST
<b>55</b>	2U + NE18 — 2AP	DPST
<b>56</b>	2U + NE18 — 2UW	DPDT
<b>57</b>	2U + NE18 — 2UP	DPDT

- \* 2U + Denotes auxiliary set of low current contacts DPDT  
 2A = DPST  
 2U = DPDT  
 S = Snap-in mounting  
 X = Solder lug/PC pins  
 W = Solder lugs only  
 P = PC pins only

### NOTES

- Contact plating is silver on all Power Switches.
- The electrical function is Break Before Make (BBM) on all Power Switches.
- The terminals will be epoxy sealed.

TYPE	POSSIBLE CONTACT ARRANGEMENT		CONTACT SPACING	PROTECTION CLASS (CEE 24)	APPROVALS
	POWER CONTACTS <sup>1</sup>	AUXILIARY CONTACTS			
NE18	2A <sup>2</sup>	2U	> 3mm (.118 inch)	II	VDE, BSI, DEMKO, NEMKO, SEMKO, SEV, CSA, UL
NE18	2A <sup>2</sup> 2U	2U	> 3mm (m) (.118 inch)	I	VDE, MEEI, BSI <sup>3</sup> , DEMKO, NEMKO, SEMKO, SEV, CSA, UL
NE18CTII	2A <sup>2</sup>	2U	> 3mm (.118 inch)	II	VDE, BSI, DEMKO, CSA, SEMKO, SEV, UL, NEMKO

- 1) A = make contact, R = break contact, U = changeover contact, m = VDE sign for switches with a contact spacing (air gap) < 3mm (.118 inch) according to VDE 0630/CEE 24.
- 2) With 2A mains contacts: Mounting only by PC pins is not sufficient.
- 3) BSI only for 2U mains contacts.

## MECHANICAL FUNCTION



OPTION CODE	FUNCTION
<b>OA</b>	Momentary
<b>EE</b>	Alternate (push-push)



Dimensions are shown: Inches (mm)

Specifications and dimensions subject to change

# NE-18 Series Mains / Power Switches



A

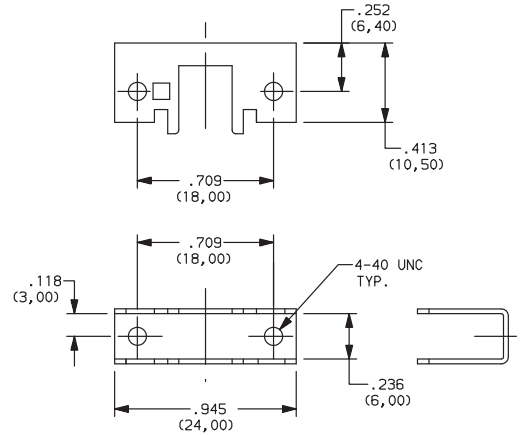
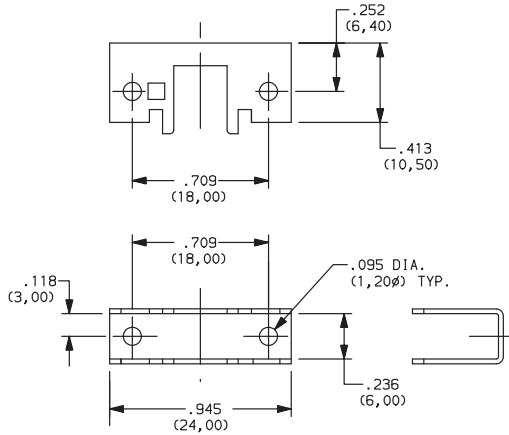
Pushbutton

## SINGLE STATION CHASSIS

01 WITH .094 MOUNTING HOLES

(NONE) NO CHASSIS

02 WITH 4-40 TAPPED MOUNTING HOLES



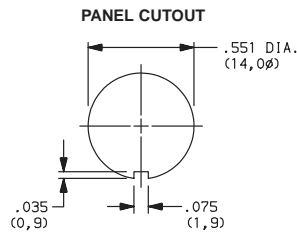
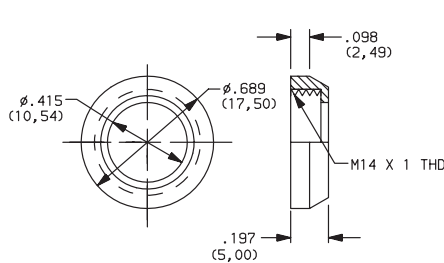
03 SPECIAL CHASSIS (CONSULT FACTORY)

## DRESS NUT

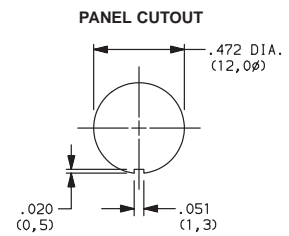
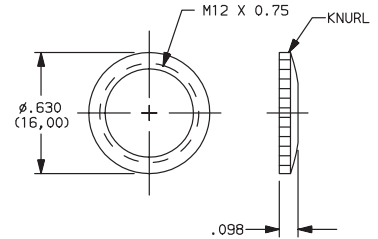
(NONE) NO DRESS NUT

B BLACK

C CHROME



NOTE: Available with ZNE18 designation and FA200 buttons.



NOTE: Available with ZNE18 designation and FG button.



Third Angle Projection  
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# NE-18 Series Mains / Power Switches

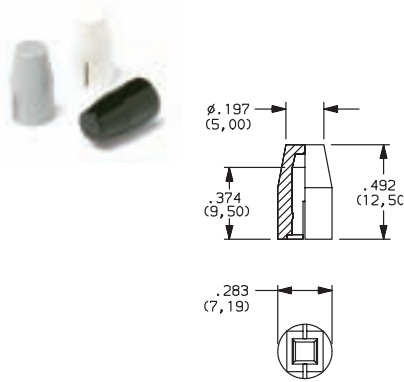
## SOLID BUTTON

Pushbutton

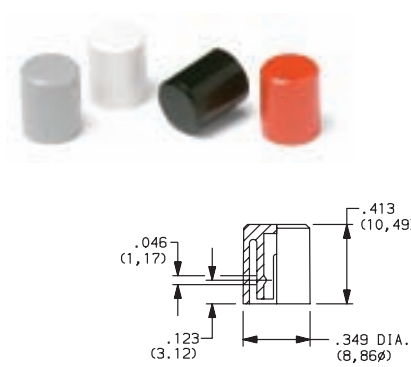
A

### STYLE

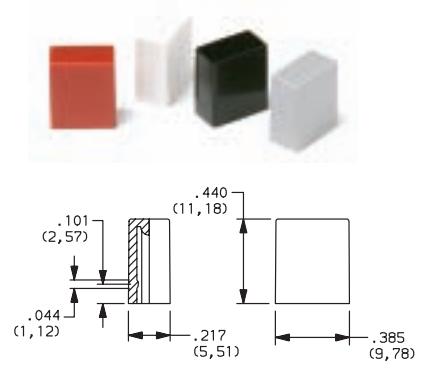
**F01** FMR



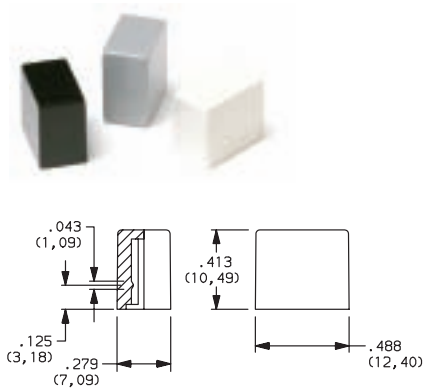
**F02** FG



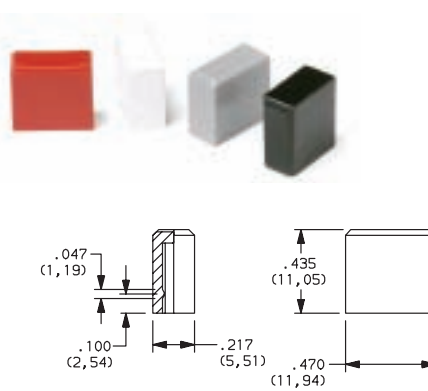
**F12** FSC



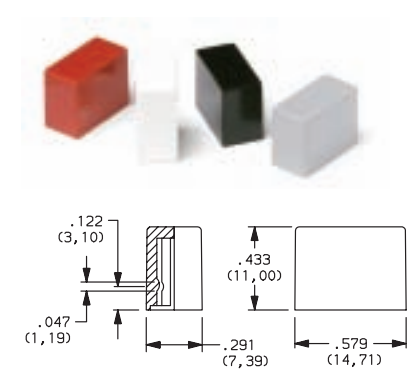
**F13** FSD



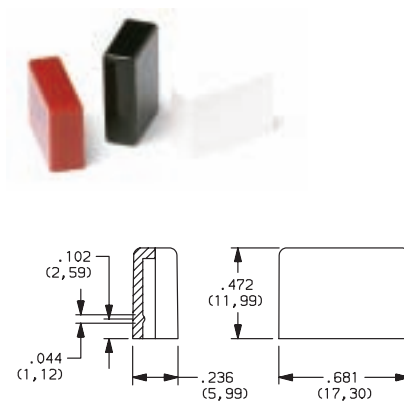
**F14** FU12



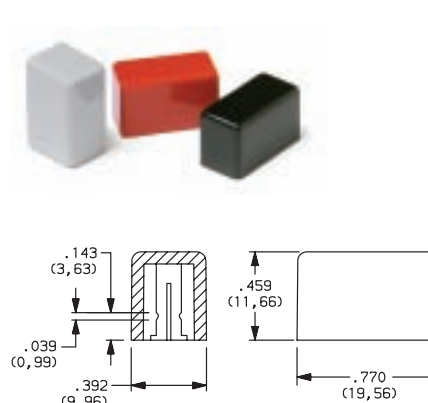
**F15** FSB



**F16** FE



**F19** FA



OPTION CODE	COLOR
01	BLACK
02	WHITE
03	RED
04	LT. GRAY



Third Angle Projection  
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

**C&K**

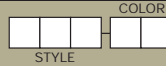
# NE-18 Series Mains / Power Switches



A

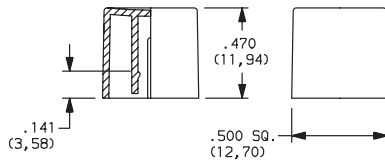
Pushbutton

## SOLID BUTTON



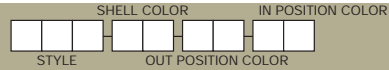
### STYLE

**F21** F001



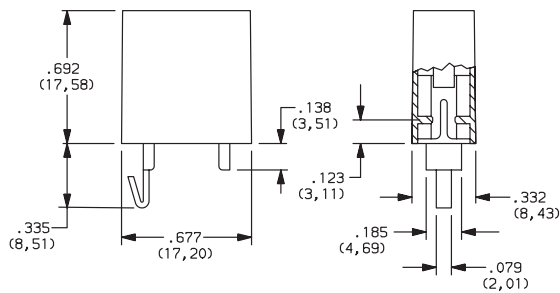
OPTION CODE	COLOR
<b>01</b>	BLACK
<b>02</b>	WHITE
<b>03</b>	RED
<b>04</b>	LT. GRAY
<b>09</b>	BLACK/CHROME (F03, F06 & F07 buttons only)

## MECHANICAL BUTTON

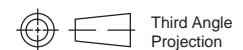
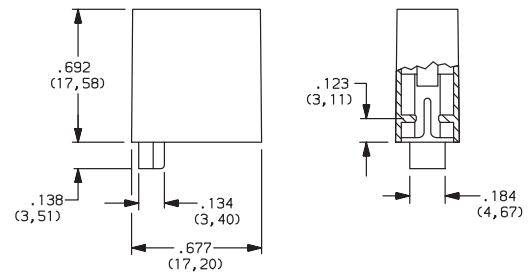


### STYLE

**F01** FA100



**F02** FA101



Third Angle Projection  
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

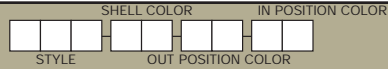




# NE-18 Series Mains / Power Switches

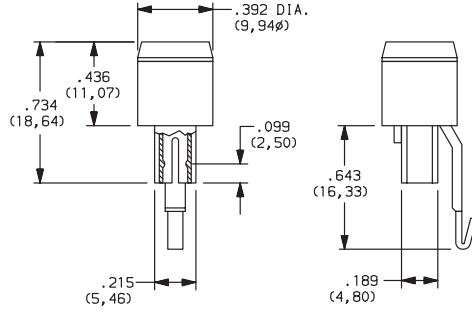
Pushbutton  
A

## MECHANICAL BUTTON

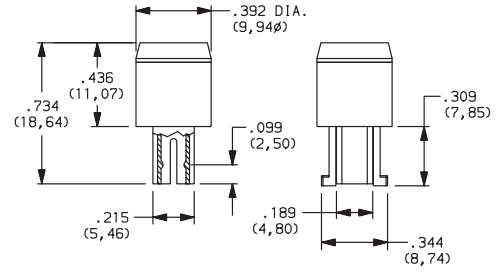


### STYLE

**F08** FA201



**F11** FA200



### SHELL COLOR

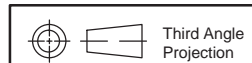
**01** BLACK

### OUT POSITION COLOR

**01** BLACK

### IN POSITION COLOR

OPTION CODE	COLOR
<b>02</b>	WHITE
<b>06</b>	YELLOW
<b>07</b>	BLUE
<b>08</b>	GREEN
<b>12</b>	ORANGE



Dimensions are shown: Inches (mm)  
 Specifications and dimensions subject to change