Pushbuttons
Product Selection Guide

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

Pushbutton							
Series	**8600**	**8700**	**GP**	**PN**	**PHA**	**F**	**NE-18**
Switch Type	Micro-miniature	Over Travel	Ultra-miniature	Alternate & Mom. Action	Short Stroke	Alternate & Mom. Action	Mains / Power
Poles/Throws	SPST	SPST	SPST, SPDT	SPDT, DPDT, 4PDT	DPDT, 4PDT, 6PDT	DPDT, 4PDT, 6PDT, 8PDT, 10PDT	DPST, DPDT Varied
Max. Current	500 mA	1 Amp	0.4 V	200 mA	100 mA	500 mA	6 A
Process Sealed			•				
PCB Mount Options							
Thru-hole	•	•	•	•	•	•	•
Vertical	•	•	•				
Right Angle			•	•	•	•	•
Surface Mount			•				
Panel Mount	•	•				•	•
Page No.	A-71	A-74	A-77	A-81	A-84	A-88	A-98

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: 10^9 Ω min.

DIELECTRIC STRENGTH: 1000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30ºC to 85ºC.

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.

Switch Function
- **EP11** SPST Off-Mom.
- **EP12** SPDT On-Mom.
- **EP21** DPST Off-Mom.

Plunger
- **S** .215" high
- **S1** .110" high
- **S2** .465" high
- **FP** Flush
- **R** Snap-fitting, .215 high

Bushing
- **D1** Unthreaded

Terminations
- **A** Right angle, PC thru-hole
- **C** PC Thru-hole
- **AV** Vertical right angle, PC thru-hole
- **AV3** Vertical right angle, snap-in, PC thru-hole
- **SA** Right angle, surface mount
- **SA1** Right angle, surface mount rear facing
- **V3** Vertical mount, v-bracket
- **V31** Vertical mount, v-bracket, snap-in (EP11 & EP12 only)
- **W** Wire wrap

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

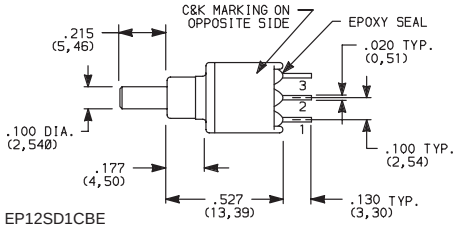
Seal
- **E** Epoxy

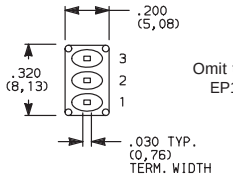
EP Series
Sealed Tiny Pushbutton Switches

SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking on opposite side)	SWITCH FUNCTION POS. 2 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 1 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 2 (C&K marking on opposite side)	SCHEMATIC
SP	EP11	OFF	MOM.	OPEN	1-3	SPST: 1, 3
	EP12	ON	MOM.	2-1	2-3	SPDT: 2 (COMM), NC 1, 3 NO

SPDT





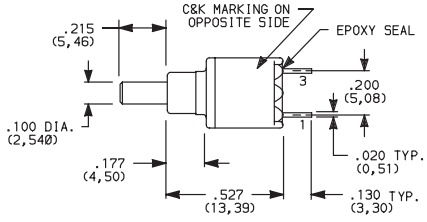
Omit terminal 2 for EP11 models.

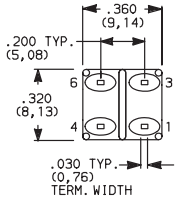
Terminal Nos. For Reference Only

Part number shown: EP12SD1CBE

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking on opposite side)	SWITCH FUNCTION POS. 2 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 1 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 2 (C&K marking on opposite side)	SCHEMATIC
DP	EP21	OFF	MOM.	OPEN	1-3,4-6	DPST: 1, 3, 4, 6

DPST





Terminal Nos. For Reference Only

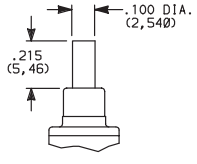
Part number shown: EP21SD1CBE

MOM. = Momentary

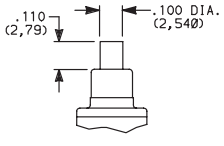
All models with all options when ordered with G, L, M Q, R or S contact material.

PLUNGER

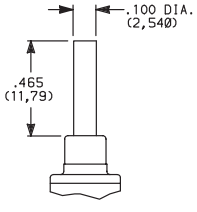
S .215" HIGH



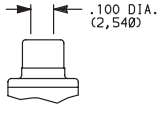
S1 .110" HIGH



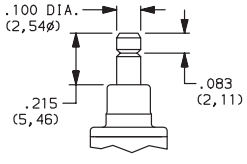
S2 .465" HIGH



FP FLUSH PLUNGER



R SNAP-FITTING



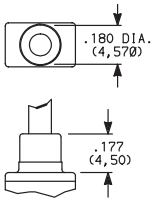
S1& S2 actuators are not available with EP12 & EP21 models or SA1 termination style.

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.

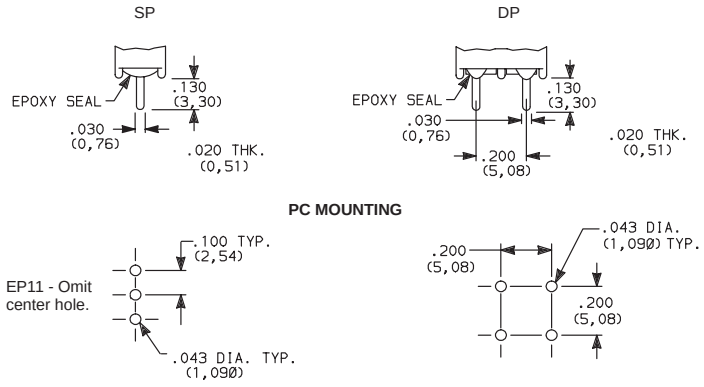
Third Angle Projection

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

EP Series
Sealed Tiny Pushbutton Switches

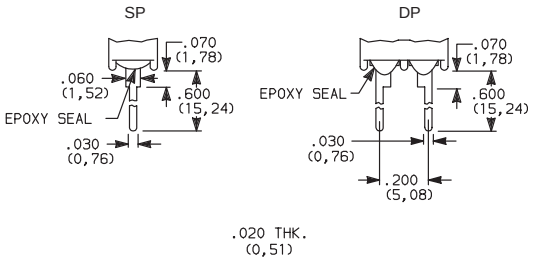
TERMINATIONS

C PC THRU-HOLE



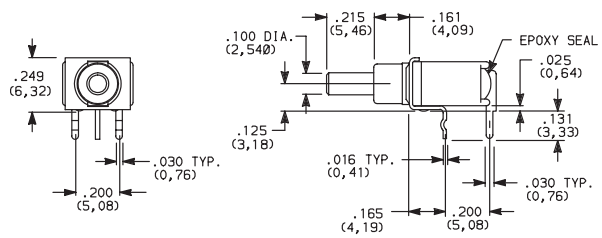
SP and DP

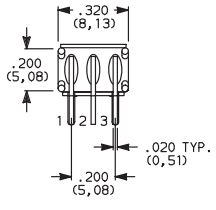
W WIRE WRAP



SP and DP

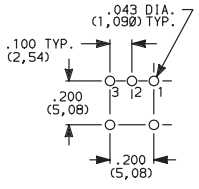
A RIGHT ANGLE, PC THRU-HOLE





EP11 Models:
omit terminal 2.

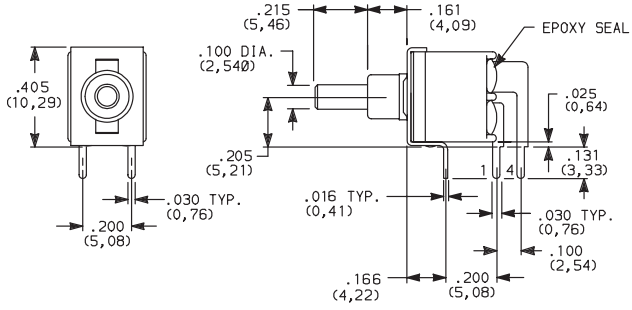
PC MOUNTING

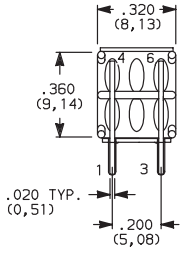


EP11 Models:
omit thru-hole 2.

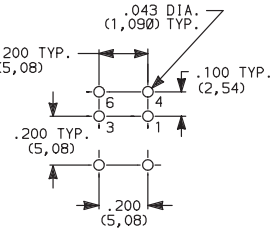
EP12SD1ABE
SPDT

A RIGHT ANGLE, PC THRU-HOLE





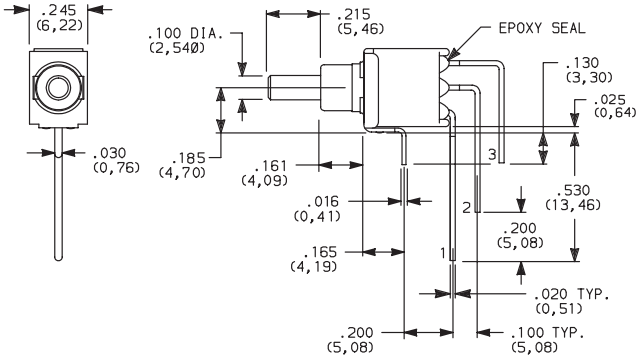
PC MOUNTING

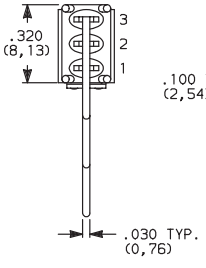


EP21SD1ABE
DPST

AV VERTICAL RIGHT ANGLE, PC THRU-HOLE

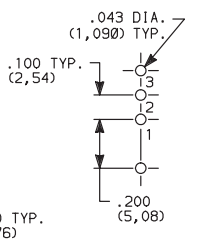
EP12SD1AVBE
SPDT





EP11 Models:
omit terminal 2.

PC MOUNTING



EP11 Models:
omit hole 2.

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

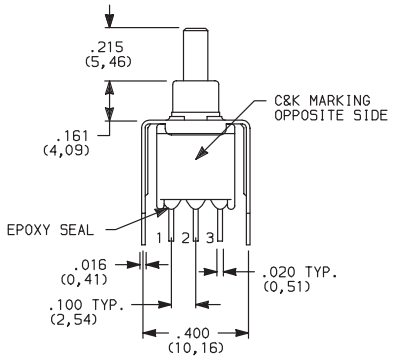
Third Angle Projection

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

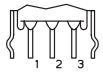
TERMINATIONS

V3 VERTICAL MOUNT, V-BRACKET

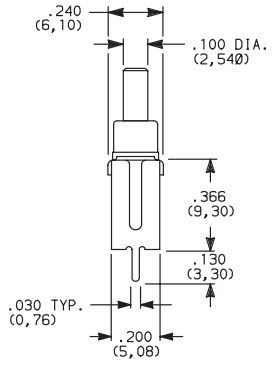
V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN

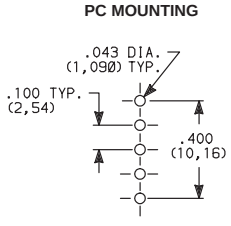


EP11 Models:
omit terminal 2.



V31 SNAP-IN

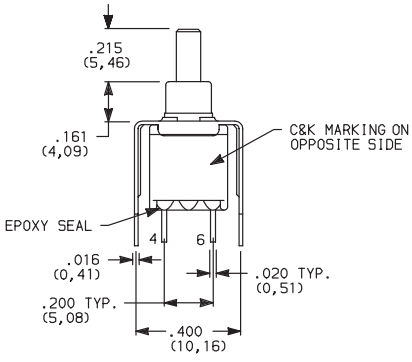


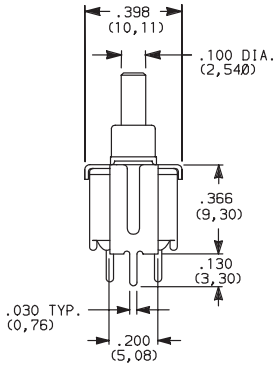


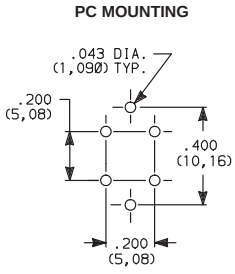
EP11 Models:
omit centerhole.

EP12SD1V3BE
SPDT

V3 VERTICAL MOUNT, V-BRACKET







EP21SD1V3BE
DPST

CONTACT MATERIAL

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

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

[1] CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

[2] END CONTACTS: Coin silver, with gold plate over nickel plate.

[3] CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

[4] END CONTACTS: Coin silver, silver plated.

[5] CENTER CONTACT & ALL TERMINALS: Copper alloy, silver plated.

[6] TERMINALS: Copper alloy, with matte tin over nickel plate.

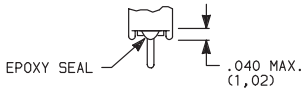
NOTE: Any models supplied with Q, B P, S ,R or G contact material are RoHS compliant.

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



Third Angle Projection

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