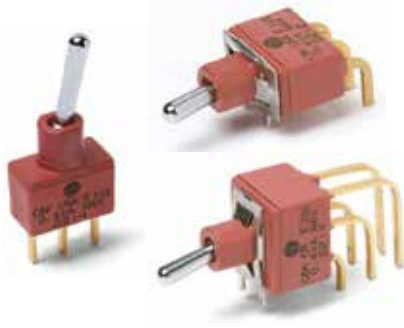


# E Series Sealed Miniature Toggle Switches



## Features/Benefits

- Sealed against solder and cleaning process contaminants
- UL 94V-0 Nylon case and bushing
- Multi-positions
- ESD protection available
- RoHS compliant models available

## Typical Applications

- Telecommunications
- Instrumentation
- Medical equipment



## Specifications

**CONTACT RATING:** B contact material: 0.4 VA max. @ 20 V AC or DC max. Q contact material: E1XX & E2XX MODELS: 7.5 AMPS @ 125 V AC or 28 V DC; 3 AMPS @ 250 V AC. E3XX MODELS: 5 AMPS @ 125 V AC or 28 V DC; 2 AMPS @ 250 V AC. See page F-29 for additional ratings.

**ELECTRICAL LIFE:** E1XX and E2XX models: 40,000 make-and-break cycles at full load. E3XX models: 30,000 cycles.

**CONTACT RESISTANCE:** Below 10 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

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

**ELECTROSTATIC DISCHARGE (ESD) OPTION:** F1 conductive bushing only. Dissipates up to 20,000 V DC from actuator to ground.

**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.

## Materials

**CASE & BUSHING:** Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0). F1 conductive bushing option is impregnated with carbon fibers.

**ACTUATOR:** Brass, chrome plated with internal o-ring seal standard.

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

**SWITCH SUPPORT RETAINER:** Stainless steel.

**CONTACTS & TERMINALS:** B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Copper alloy, silver plated. See page F-29 for additional contact materials.

**TERMINAL SEAL:** Epoxy.

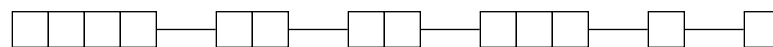
**HARDWARE:** Nut & Locking ring: Brass, nickel plated.  
Lockwasher: Steel, nickel plated.

**NOTE:** Any models supplied with P, S, R, Q, B or G contact material 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 F-23 thru F-29. 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.



### Switch Function

- E101** SP, On-None-On
- E103** SP, On-Off-On
- E105** SP, Mom.-Off-Mom.
- E107** SP, On-Off-Mom.
- E108** SP, On-None-Mom.
- E201** DP, On-None-On
- E203** DP, On-Off-On
- E205** DP, Mom.-Off-Mom.
- E207** DP, On-Off-Mom.
- E208** DP, On-None-Mom.
- E211** DP, On-On-On
- E213** DP, On-On-Mom.
- E215** DP, Mom.-On-Mom.
- \*\*E301** 3P, On-None-On

### Actuator

- M** .300" high
- S** .500" high
- L3** Plastic, .940" high

### Bushing

- D1** .250" high
- \*F1** Conductive, .250" high
- D9** .280" high
- \*\*Y** Threaded, .350" high

### Terminations

- A** Right angle, PC thru-hole
- AV2** Vertical right angle, PC thru-hole
- C** PC Thru-hole
- V3** .460" high, V-bracket
- Z** Solder lug
- A3** Right angle, PC thru-hole
- AV3** Vertical right angle, PC thru-hole
- V6** .460" 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
- 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

\* F1 available with SP and DP versions only, please see page F-19

\*\* Y threaded bushing available for 1 & 2 pole only

Toggle F



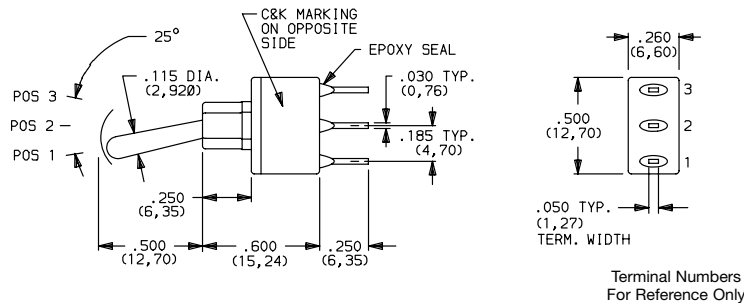
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# E Series Sealed Miniature Toggle Switches

## SWITCH FUNCTION

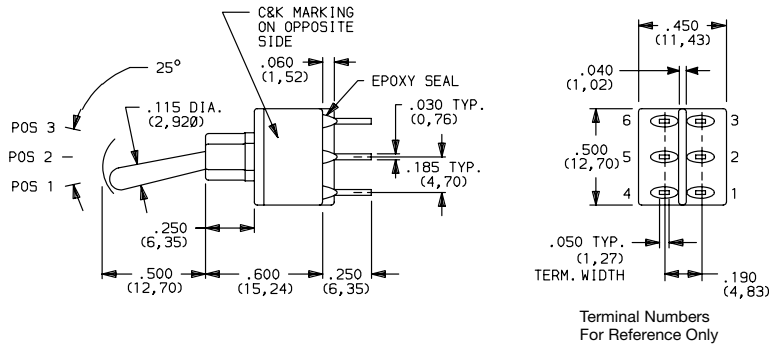
NO. POLES	MODEL NO.	SWITCH FUNCTION			CONNECTED TERMINALS			SCHEMATIC
		POS. 1	POS. 2	POS. 3	POS. 1	POS. 2	POS. 3	
SP	<b>E101</b>	ON	NONE	ON	2-3	N/A	2-1	
	<b>E103</b>	ON	OFF	ON	2-3	OPEN	2-1	
	<b>E105</b>	MOM.	OFF	MOM.				
	<b>E107</b>	ON	OFF	MOM.				
	<b>E108</b>	ON	NONE	MOM.				

### SPDT



DP	<b>E201</b>	ON	NONE	ON	2-3,5-6	N/A	2-1,5-4	
	<b>E203</b>	ON	OFF	ON	2-3,5-6	OPEN	2-1,5-4	
	<b>E205</b>	MOM.	OFF	MOM.				
	<b>E207</b>	ON	OFF	MOM.				
	<b>E208</b>	ON	NONE	MOM.				
	<b>E211**</b>	ON	ON	ON	2-3,5-6	N/A	2-1,5-4	
	<b>E213**</b>	ON	ON	MOM.	2-3,5-6	2-3,5-4	2-1,5-4	
<b>E215**</b>	MOM.	ON	MOM.				DPDT	

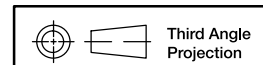
### DPDT



MOM. = Momentary

\*\* Wiring for 3-way switch, see Section N.

All models with all options when ordered with G,R, Q or S contact material except with F1 conductive bushing.



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



F

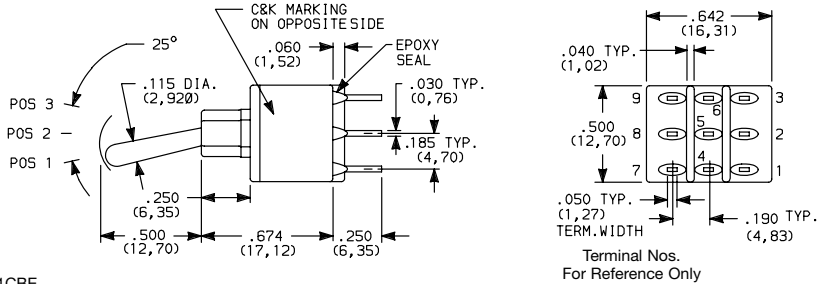
Toggle

# E Series Sealed Miniature Toggle Switches

## SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION			CONNECTED TERMINALS			SCHEMATIC
		POS. 1	POS. 2	POS. 3	POS. 1	POS. 2	POS. 3	
3P	<b>E301</b>	ON	NONE	ON	2-3,5-6,8-9	N/A	2-1,5-4,8-7	

### 3PDT



Part number shown: E301SD1CBE

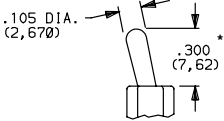
MOM. = Momentary

\*\* Wiring for 3-way switch, see Section N.

All models with all options when ordered with G, R, Q or S contact material except with F1 conductive bushing.

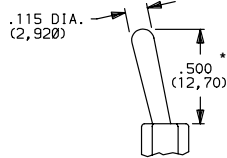
## ACTUATOR

### M .300" HIGH



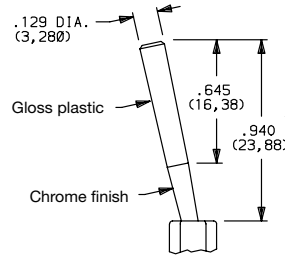
Standard when ordered with A, A3, AV2, AV3, V2-V61 terminations. Finish: Chrome.

### S .500" HIGH



Standard when ordered with C, Z, Z3, W & W4 terminations. Finish: Chrome

### L3 PLASTIC, .940" HIGH



OPTION CODE	L3 ACTUATOR COLOR
<b>2</b>	BLACK

Other colors available, consult Customer Service Center. No color choice required for S & M actuators.

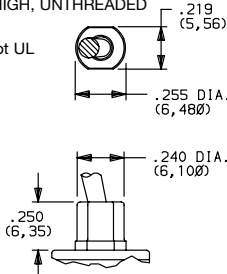
\* Actuators shown with standard D1 bushing. Subtract .030 (0,76) for D9 bushing. Subtract .100 (2,54) for Y bushing.

## BUSHING

### D1 .250" HIGH, UNTHREADED

### F1 ESD CONDUCTIVE BUSHING, .250" HIGH, UNTHREADED

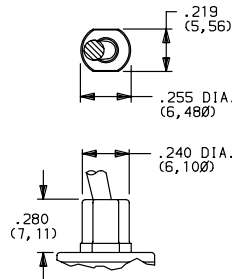
F1 bushing is not UL approved



ESD protection depends on proper grounding of switch support bracket. F1 conductive bushing option is impregnated with carbon fibers; dissipates electrostatic discharge (ESD) up to 20,000 V from actuator to ground.

Available with M & S actuator options and A, A3, AV2, AV3, V3-V61 termination options.

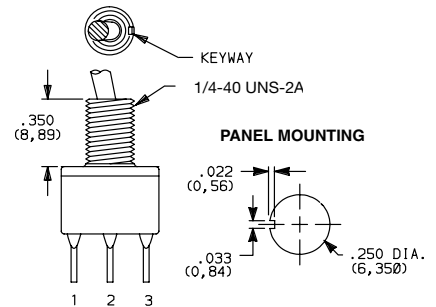
### D9 .280" HIGH, UNTHREADED



E3XX models not available with D9 bushing.

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

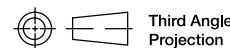
### Y THREADED, INSULATED, .350" HIGH WITH KEYWAY



Available only with C, Z, Z3, & W terminations. Available for 1&2 pole only.

Hardware: One dress nut part number 299D01201, one hex nut part number 540400201 and lockwasher part number 700303202 supplied standard.

Will withstand 4 in.-lbs. of torque with no distortion.



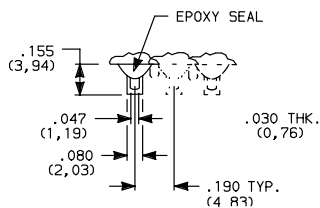
Third Angle Projection

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

# E Series Sealed Miniature Toggle Switches

## TERMINATIONS

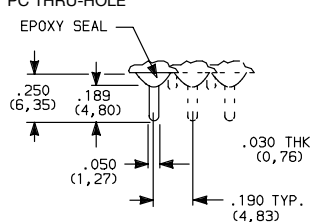
### Z SOLDER LUG



Not available with F1 conductive bushing or P, R or S contact material.

SPDT thru 3PDT

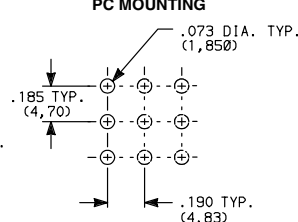
### C PC THRU-HOLE



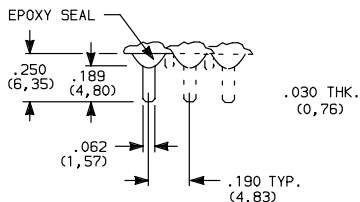
SPDT thru 3PDT

Not available with F1 conductive bushing.

### PC MOUNTING



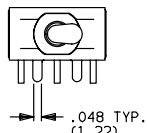
### Z3 QUICK CONNECT



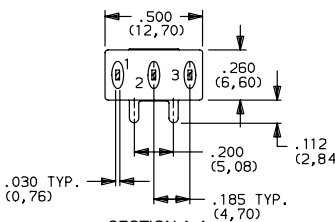
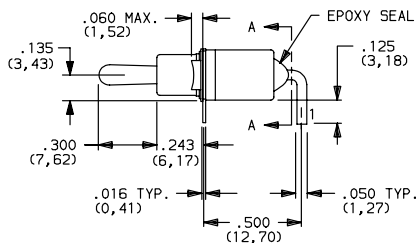
Not available with F1 conductive bushing or P, R or S contact material. Mating quick connector available; order part number 530100000, page F-16.

SPDT thru 3PDT

### A RIGHT ANGLE, PC THRU-HOLE



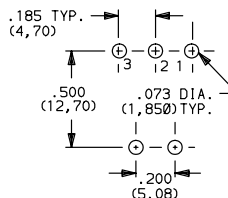
Actuator Shown In Pos. 1



SECTION A-A

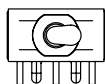
Terminal Nos. For Reference Only

### PC MOUNTING

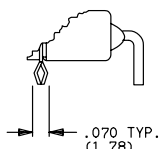


E101MD1ABE  
Horizontal Actuation  
SPDT

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



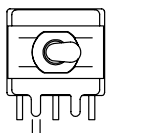
.048 TYP. (1,22)



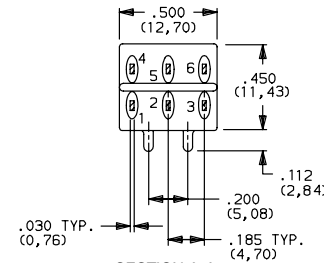
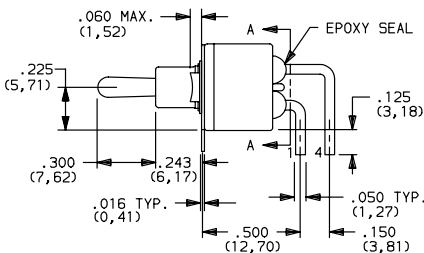
Not available with Y bushing.

Terminal bend radii and lead-in manufacturing option.

### A RIGHT ANGLE, PC THRU-HOLE



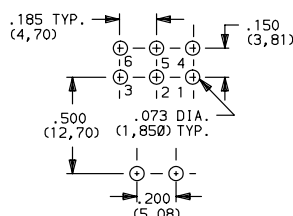
Actuator Shown In Pos. 1



SECTION A-A

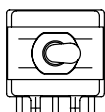
Terminal Nos. For Reference Only

### PC MOUNTING

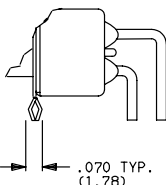


E201MD1ABE  
Horizontal Actuation  
DPDT

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

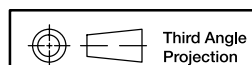


.048 TYP. (1,22)



Not available with Y bushing.

Terminal bend radii and lead-in manufacturing option.

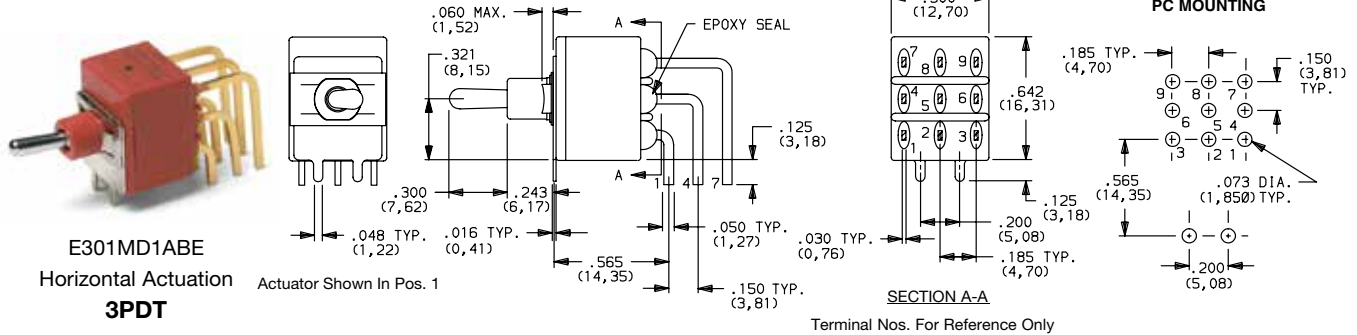


Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

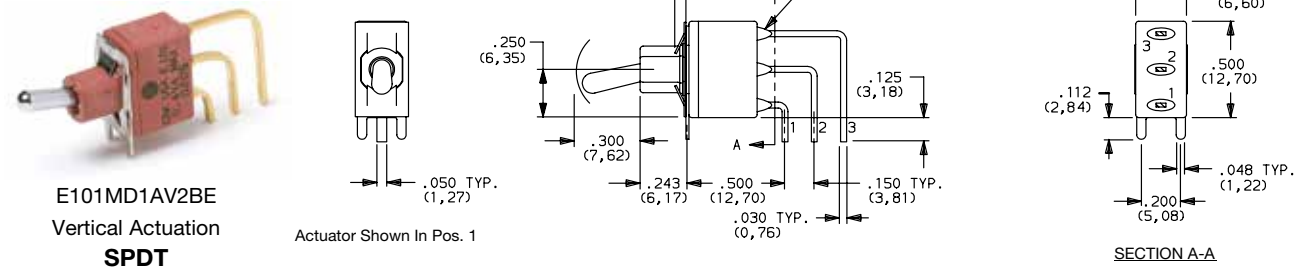
# E Series Sealed Miniature Toggle Switches

## TERMINATIONS

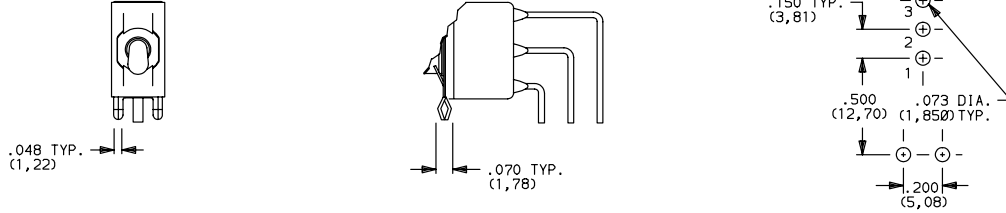
### A RIGHT ANGLE, PC THRU-HOLE



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

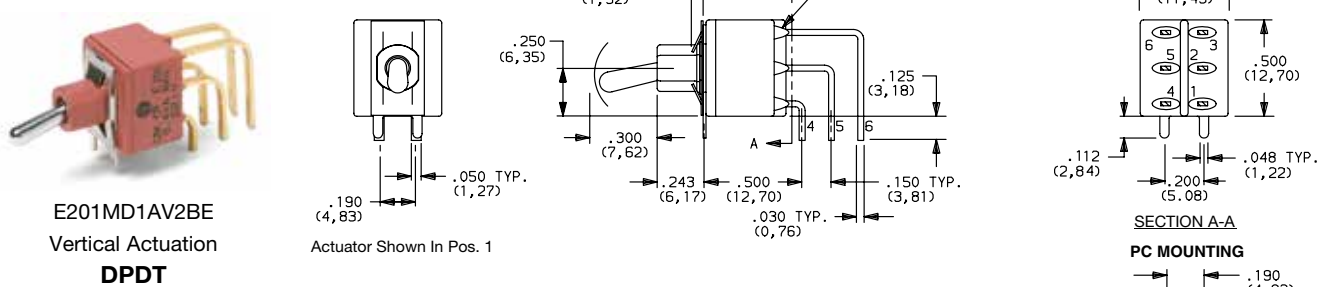


### AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH

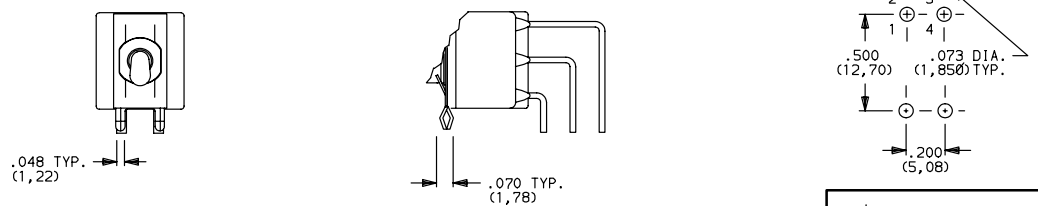


Not available with Y bushing.  
Terminal bend radii and lead-in manufacturing option.

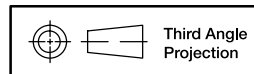
### AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH



### A3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



Not available with Y bushing.  
Terminal bend radii and lead-in manufacturing option.



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

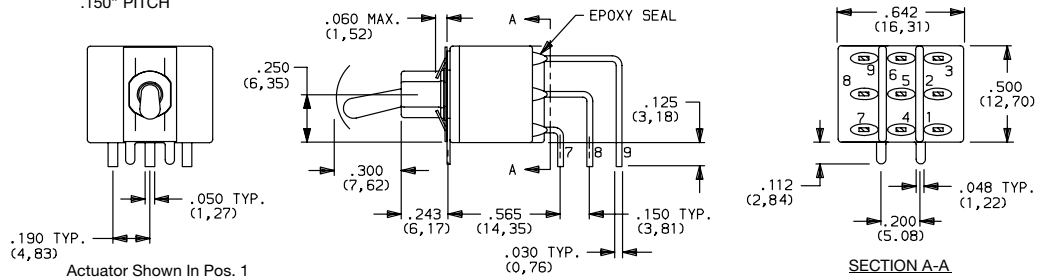
Toggle



# E Series Sealed Miniature Toggle Switches

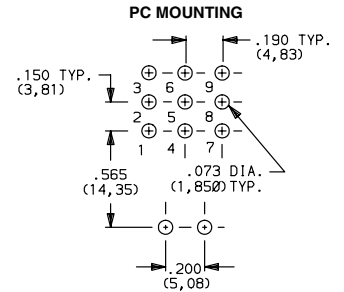
## TERMINATIONS

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



**E301MD1AV2BE**  
Vertical Actuation  
**3PDT**

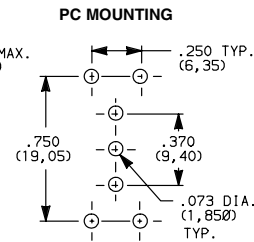
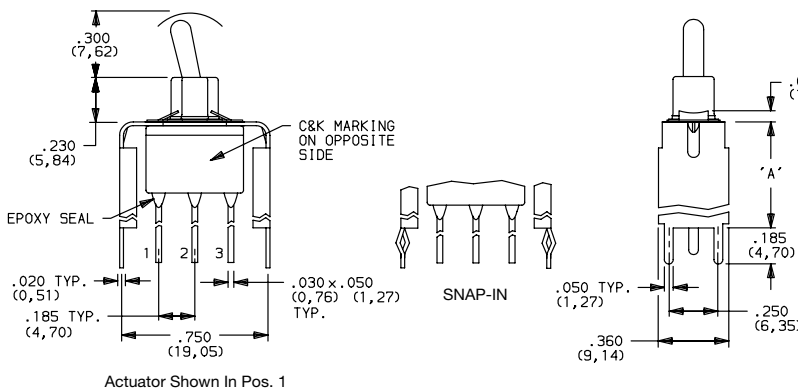
**AV3** VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



Not available with D9 & Y bushings.  
Terminal bend radii and lead-in manufacturing option.

**V6** VERTICAL MOUNT, V-BRACKET

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



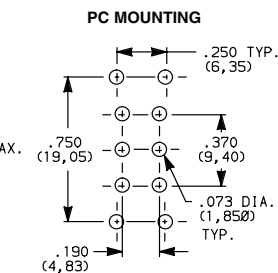
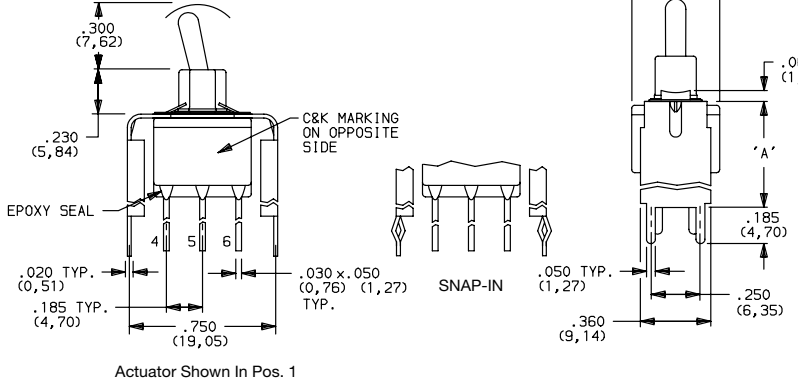
**E101MD1\_BE**  
**SPDT**

OPTION CODE	DIM 'A'
<b>V6, V61</b>	.460 (11,68)

Not available with Y bushing.

**V6** VERTICAL MOUNT, V-BRACKET

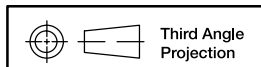
**V61** VERTICAL MOUNT, V-BRACKET, SNAP-IN



**E201MD1\_BE**  
**DPDT**

OPTION CODE	DIM 'A'
<b>V6, V61</b>	.460 (11,68)

Not available with Y bushing.



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

# E Series Sealed Miniature Toggle Switches

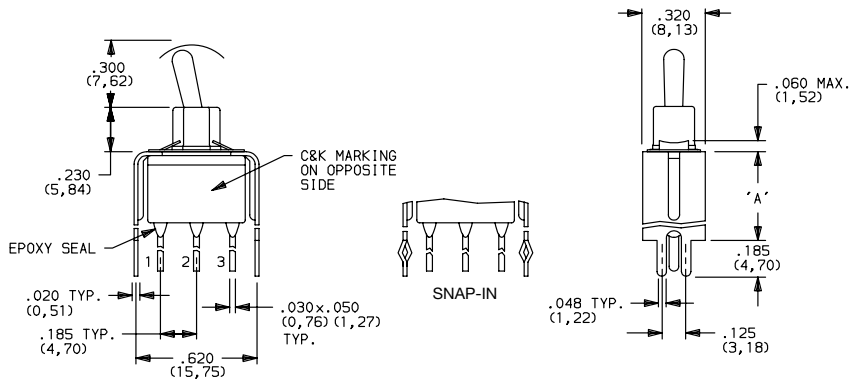
## TERMINATIONS

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

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

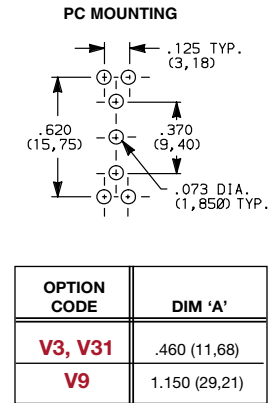


**E101MD1\_BE**  
**SPDT**



Actuator Shown In Pos. 1

Not available with Y bushing.

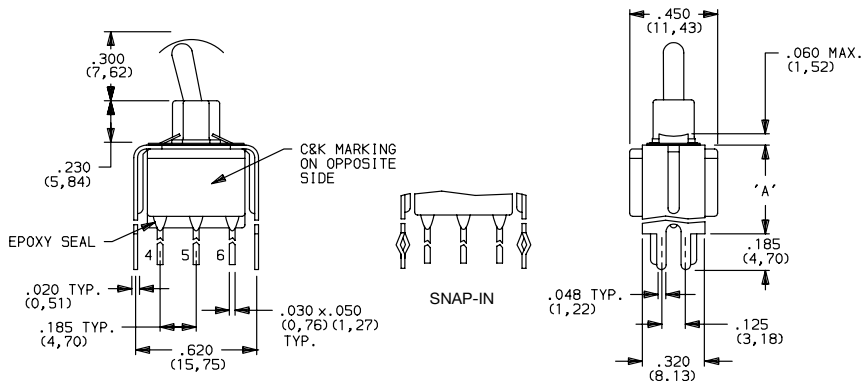


**V3, V9** VERTICAL MOUNT, V-BRACKET

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

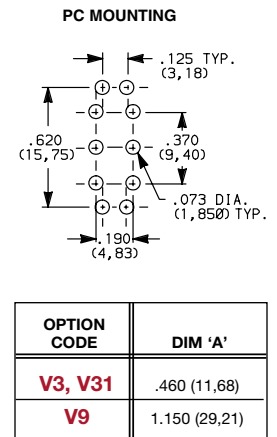


**E201MD1\_BE**  
**DPDT**



Actuator Shown In Pos. 1

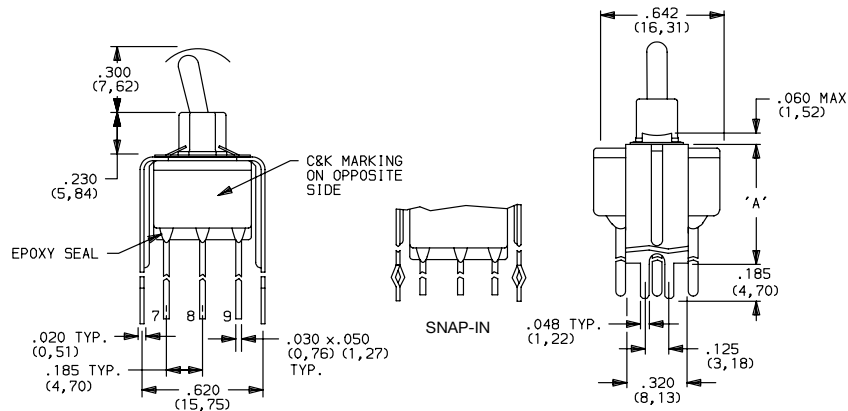
Not available with Y bushing.



**V9** VERTICAL MOUNT, V-BRACKET

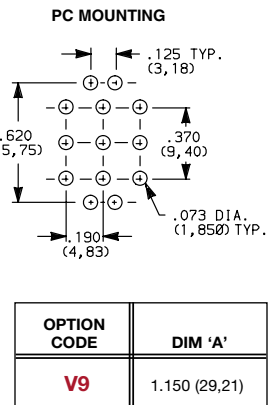


**E301MD1\_BE**  
**3PDT**

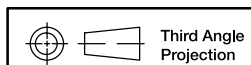


Actuator Shown In Pos. 1

Not available with D9 & Y bushings.



Toggle



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



# E Series Sealed Miniature Toggle Switches

## 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	E1XX & E2XX MODELS: 7.5 AMPS @ 125 V AC OR 28 V DC; 3 AMPS @ 250 V AC. E3XX MODELS: 5 AMPS @ 125 V AC OR 28 V DC; 2 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	E1XX AND E2XX MODELS: 0.4 VA MAX @20 V AC OR DC MAX. OR 7.5 AMPS @125 V AC OR 28 V DC; 3 AMPS @ 250 V AC. DC E3XX MODELS: 0.4 VA MAX. @ 20 V AC OR DC MAX. OR 5 AMPS @ 125 V AC OR 28 V DC; 2 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, with gold flash over silver plate. Or 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, or Q contact material except with F1 conductive bushing.

B contact material standard with all terminations.

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