

C&K ET Series Sealed Subminiature Toggle Switches

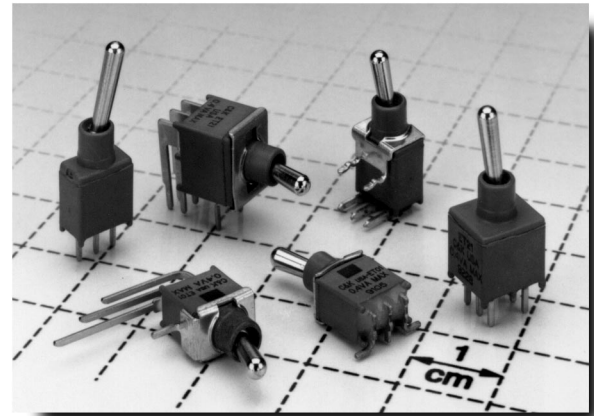


Features/Benefits

- Sealed against solder and cleaning process contaminants
- ESD protection available
- Thru-hole and surface mount models
- Compact size and small footprint save PCB space

Typical Applications

- Hand-held telecommunications
- Instrumentation
- Medical equipment



Toggle
A

Build-A-Switch

Our easy Build-A-Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box. Switches with standard options are shown on pages A-32 and A-33. Available options are shown and described on pages A-34 thru A-38. 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.

Typical Example:

E	T	0	1
---	---	---	---

 —

S

 —

D	1
---	---

 —

C

 —

B

 —

E

 —

--

Switch Function

ET01 (STD.) SP, On-None-On
ET03 (STD.) SP, On-Off-On
ET05 (STD.) SP, Mom.-Off-Mom.
ET21 (STD.) DP, On-None-On
ET02 SPST, Off-None-On
ET07 SP, On-Off-Mom.
ET08 SP, On-None-Mom.
ET23 DP, On-Off-On
ET24 DP, On-On-On
ET25 DP, Mom.-Off-Mom.
ET27 DP, On-Off-Mom.
ET28 DP, On-None-Mom.

Actuator

M (STD.) .240" high
M3 (STD.) Plastic, anti-static, .240" high
S (STD.) .400" high
L .320" high
S1 .540" high
S3 Plastic, anti-static, .410" high

Bushing

D1 (STD.) .177" High, Unthreaded
F1 .177" high, unthreaded, conductive

Terminations

A (STD.) Right angle, PC thru-hole
AV (STD.) Vertical right angle, PC thru-hole
C (STD.) PC Thru-hole
SA (STD.) Right angle, surface mount
V3 (STD.) Vertical mount, V-bracket
AV2 Vertical right angle, PC thru-hole
AV3 Vertical right angle, snap-in, PC thru-hole
V31 Vertical mount, V-bracket, snap-in
W Wire wrap

Contact Material

B (STD.) Gold
K Gold
Q Silver
M Silver
G Gold over silver
L Gold over silver

Seal

E (STD.) Epoxy
Plastic Actuator color
NONE (STD.) No actuator color
2 (STD.) Black
1 White

Specifications

CONTACT RATING: B contact material: 0.4 VA max. @ 20 V AC or DC max. See page A-38 for additional ratings.
ELECTRICAL LIFE: ETXX and ETX1 models: 60,000 make-and-break cycles at full load. All other models: 30,000 cycles.
CONTACT RESISTANCE: Below 20 milliohms typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.
INSULATION RESISTANCE: 10⁹ ohms min.
ELECTROSTATIC DISCHARGE (ESD) RESISTANT OPTION:
M3 & S3 insulating actuator only: 9,000 V DC min. @ sea level, actuator to terminals. F1 conductive bushing only: Dissipates up to 20,000 V DC from actuator to ground. M3 & S3 actuator and F1 bushing options are not recommended for use together.
DIELECTRIC STRENGTH: 1000 V RMS 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 are available in tape and reel packaging, see page L-34 for drawings and reel information.

Materials

CASE & BUSHING: Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0). SA surface mount: High temperature material, glass filled 4/6 nylon, flame retardant, heat stabilized (UL 94V-0). F1 conductive bushing option is impregnated with carbon fibers.
ACTUATOR: M3 & S3 anti-static actuator: Nylon 4/6, black standard (UL 94V-0). All other actuators: Brass, chrome plated. Internal o-ring seal standard with all actuators.
SWITCH SUPPORT: Brass, tin plated.
CONTACTS & TERMINALS: B contact material: Copper alloy, with gold plate over nickel plate. See page A-38 for additional contact materials.
TERMINAL SEAL: Epoxy.

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

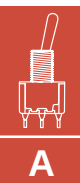


ITT Industries

Cannon

C&K ET Series Sealed Subminiature Toggle Switches

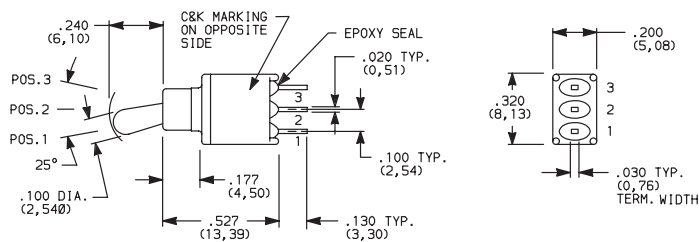
SWITCHES WITH STANDARD OPTIONS



Toggle



ET01MD1CBE
SPDT



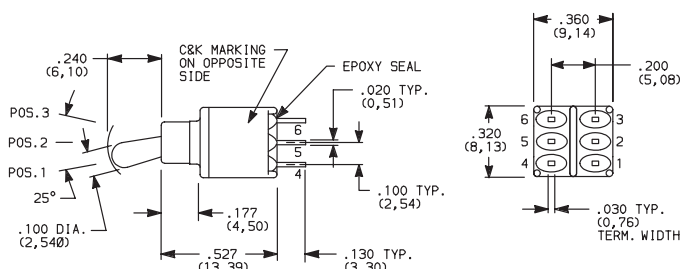
ET02 Models:
Omit terminal 2.

PART NUMBER	NO. POLES	POS. 1	POS. 2	POS. 3
ET01MD1CBE	SPDT	ON	NONE	ON
ET02MD1CBE	SPDT	OFF	NONE	ON
ET03MD1CBE	SPDT	ON	OFF	ON

NOTE: For PC mounting information, see page A-35.



ET21SD1CBE
DPDT

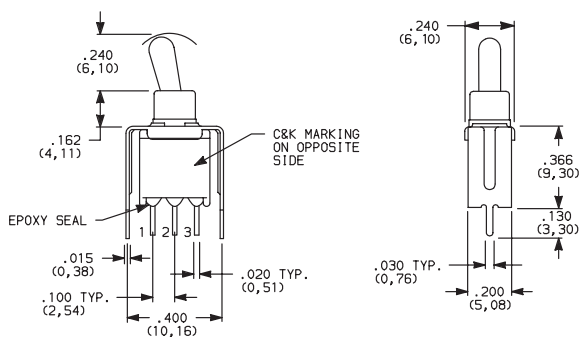


PART NUMBER	NO. POLES	POS. 1	POS. 2	POS. 3
ET21MD1CBE	DPDT	ON	NONE	ON

NOTE: For PC mounting information, see page A-35.

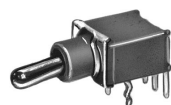


ET01MD1V3BE
SPDT

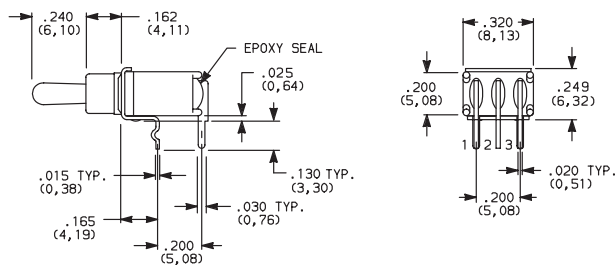


PART NUMBER	NO. POLES	POS. 1	POS. 2	POS. 3
ET01MD1V3BE	SPDT	ON	NONE	ON

NOTE: For PC mounting information, see page A-37.



ET01MD1ABE
Horizontal Actuation
SPDT



PART NUMBER	NO. POLES	POS. 1	POS. 2	POS. 3
ET01MD1ABE	SPDT	ON	NONE	ON
ET03MD1ABE		ON	OFF	ON
ET05MD1ABE		MOM.	OFF	MOM.
ET07MD1ABE		ON	OFF	MOM.
ET08MD1ABE		ON	NONE	MOM.

MOM. = Momentary

NOTE: For PC mounting information, see page A-35.

C&K ET Series Sealed Subminiature Toggle Switches

SWITCHES WITH STANDARD OPTIONS

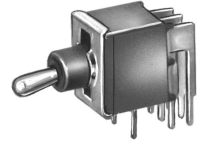
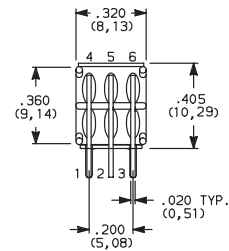
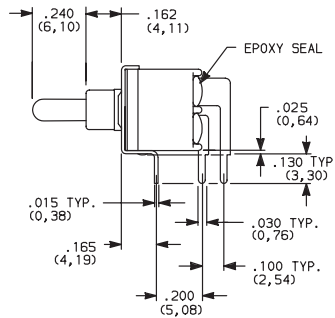


A

Toggle

PART NUMBER	NO. POLES	POS. 1	POS. 2	POS. 3
ET21MD1ABE	DPDT	ON	NONE	ON

NOTE: For PC mounting information, see page A-36.

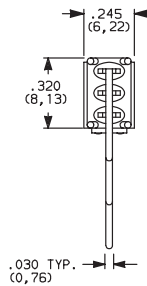
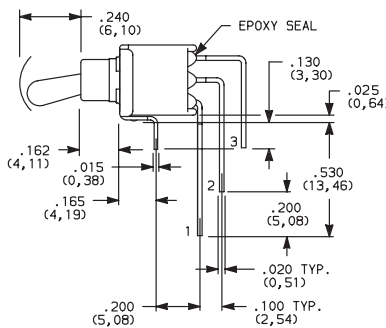


ET21MD1ABE
Horizontal Actuation
DPDT

PART NUMBER	NO. POLES	POS. 1	POS. 2	POS. 3
ET01MD1AVBE	SPDT	ON	NONE	ON
ET03MD1AVBE		ON	OFF	ON
ET05MD1AVBE		MOM.	ON	MOM.

MOM. = Momentary

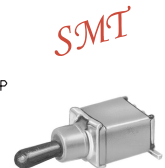
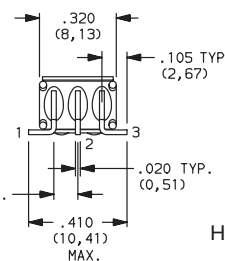
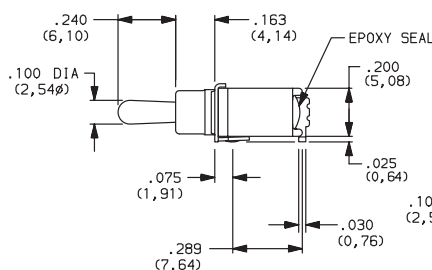
NOTE: For PC mounting information, see page A-36.



ET01MD1AVBE
Vertical Actuation
SPDT

PART NUMBER	NO. POLES	POS. 1	POS. 2	POS. 3
ET01MD1SAKE	SPDT	ON	NONE	ON

NOTE: For PC mounting information, see page A-37.



ET01MD1SAKE
Horizontal Actuation
SPDT

C&K ET Series

Sealed Subminiature Toggle Switches



Toggle

SWITCH FUNCTION

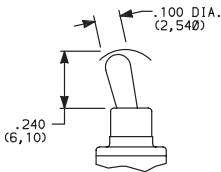
NO. POLES	MODEL NO.	SWITCH FUNCTION			CONNECTED TERMINALS			SCHEMATIC
		POS. 1	POS. 2	POS. 3	POS. 1	POS. 2	POS. 3	
SP	ET01 (STD.)	ON	NONE	ON	2-3	OPEN	2-1	 SPDT
	ET03 (STD.)	ON	OFF	ON				
	ET05 (STD.)	MOM.	OFF	MOM.				
	ET07	ON	OFF	MOM.				
	ET08	ON	NONE	MOM.				
	ET02	OFF	NONE	ON	OPEN	N/A	3-1	 SPST
DP	ET21 (STD.)	ON	NONE	ON	2-3,5-6	OPEN	2-1,5-4	 DPDT
	ET23	ON	OFF	ON				
	ET25	MOM.	OFF	MOM.				
	ET27	ON	OFF	MOM.				
	ET28	ON	NONE	MOM.				
	ET24**	ON	ON	ON	2-3,5-6	2-3,5-4	2-1,5-4	

MOM. = Momentary ** Wiring for 3-way switch, see page L-29.

All models with all options (except M3 & S3 actuator) when ordered with G, L, M or Q contact material.

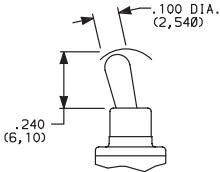
ACTUATOR

M (STD.) .240" HIGH



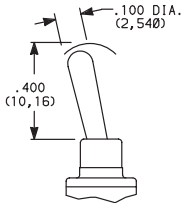
Standard with A, AV, V3 & V31 terminations.

M3 (STD.) PLASTIC, ANTISTATIC, .240" HIGH



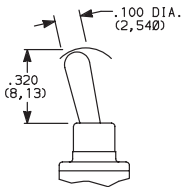
Material: Nylon 4/6 (UL 94V-0), black standard. Static resistance: 9,000 V DC min. @ sea level, actuator to terminals. Not available with F1 conductive bushing option. Not UL approved.

S (STD.) .400" HIGH

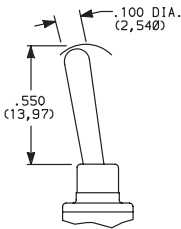


Standard with C or W terminations.

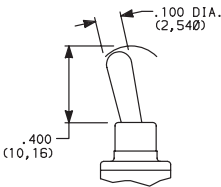
L .320" HIGH



S1 .550" HIGH



S3 PLASTIC, ANTISTATIC, .400" HIGH



Material: Nylon 4/6 (UL 94V-0), black standard. Static resistance: 9,000 V DC min. @ sea level, actuator to terminals. Not available with F1 conductive bushing option. Not UL approved.

OPTION CODE	ACTUATOR COLOR
(NONE)	(STD.) No actuator color
2	(STD.) BLACK (M3 & S3 only)
1	WHITE (M3 & S3 only)

NOTE: All actuators have chrome finish (except M3 & S3).

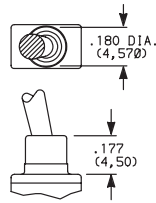
C&K ET Series Sealed Subminiature Toggle Switches

BUSHING



D1 (STD.) .177" HIGH, UNTHREADED

F1 ESD, CONDUCTIVE BUSHING
UNTHREADED, .177" HIGH



NOTE: 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.

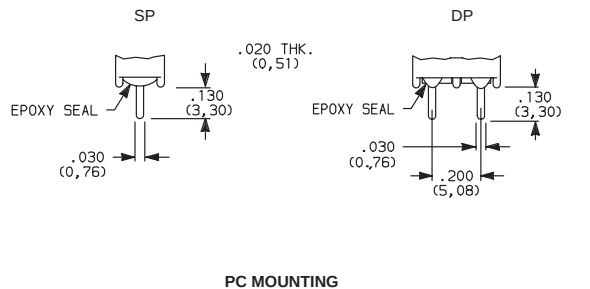
Available with all metal actuator options and A, AV, V3 and V31 termination options only.

Internal actuator o-ring seal standard.

TERMINATIONS



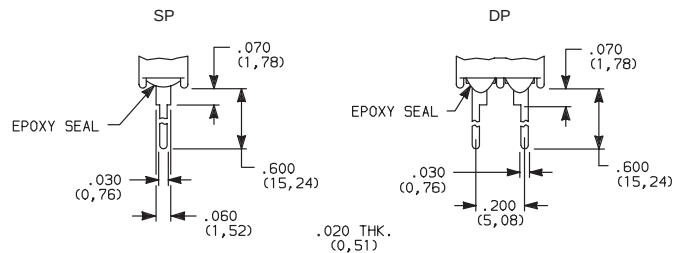
C (STD.) PC THRU-HOLE



SP and DP

Not available with F1 conductive bushing.

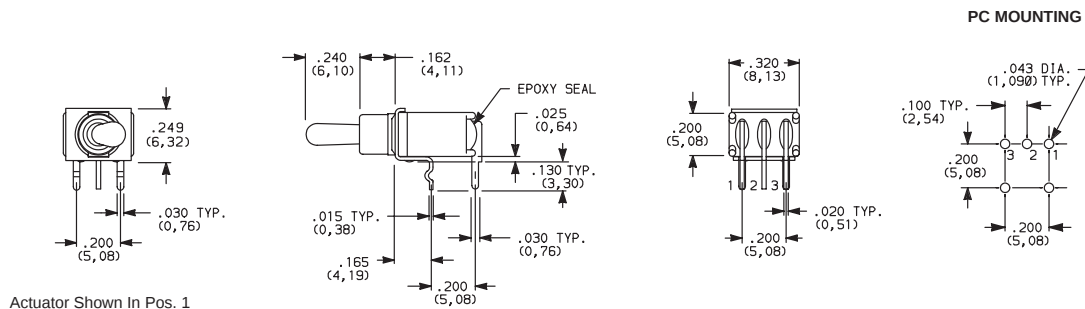
W WIRE WRAP



SP and DP

Not available with F1 conductive bushing.

A (STD.) RIGHT ANGLE, PC THRU-HOLE



ET01MD1ABE
Horizontal Actuation
SPDT

Not available with ET02 model.

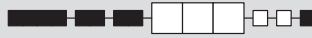


A

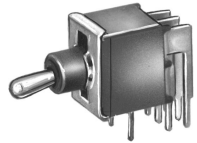
Toggle

C&K ET Series Sealed Subminiature Toggle Switches

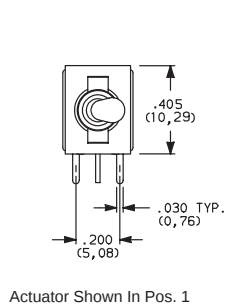
TERMINATIONS



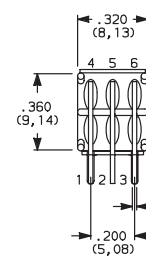
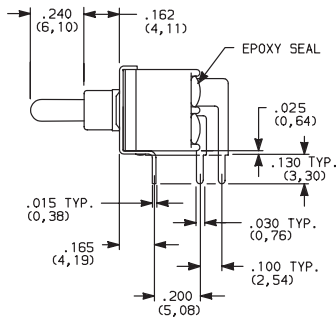
A (STD.) RIGHT ANGLE, PC THRU-HOLE



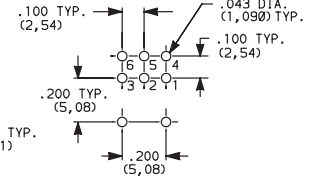
ET21MD1ABE
Horizontal Actuation
DPDT



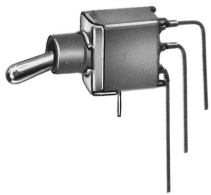
Actuator Shown In Pos. 1



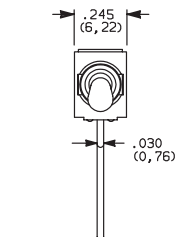
PC MOUNTING



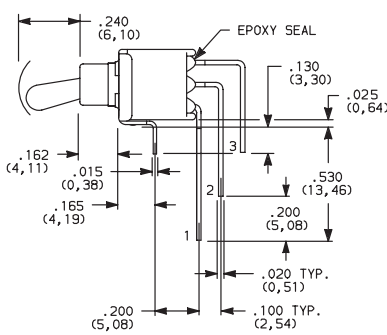
AV (STD.) VERTICAL RIGHT ANGLE, PC THRU-HOLE



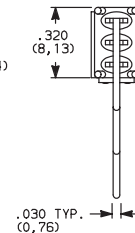
ET01MD1AVBE
Vertical Actuation
SPDT



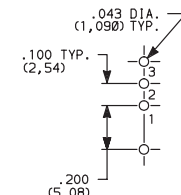
Actuator Shown In Pos. 1



ET02 - omit terminal 2.

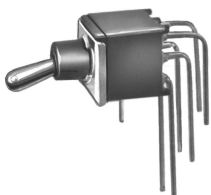


PC MOUNTING

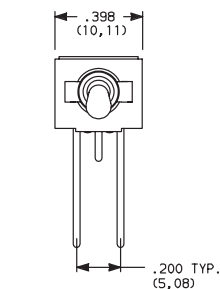


NOTE: Terminal bend radii and lead-in manufacturing option.

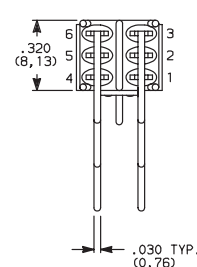
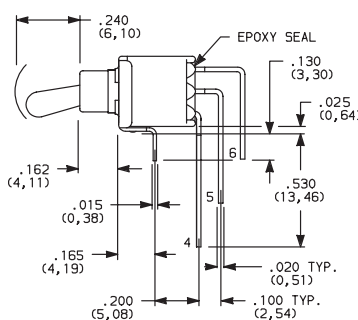
AV (STD.) VERTICAL RIGHT ANGLE, PC THRU-HOLE



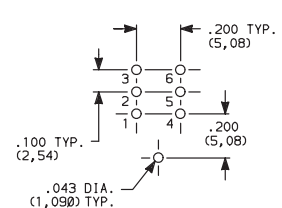
ET21MD1AVBE
Vertical Actuation
DPDT



Actuator Shown In Pos. 1



PC MOUNTING

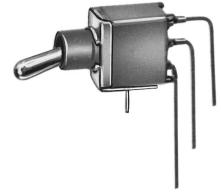
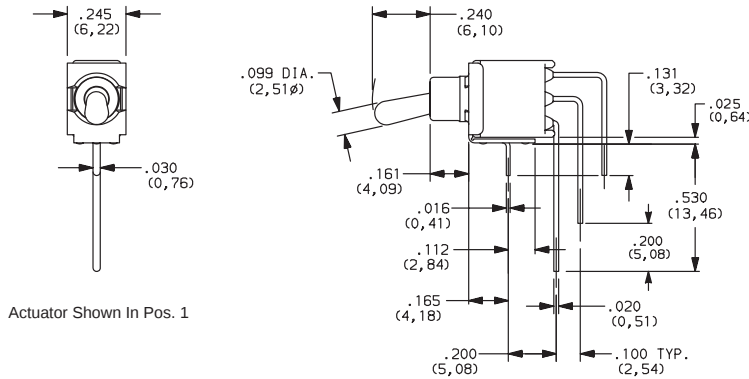


NOTE: Terminal bend radii and lead-in manufacturing option.

C&K ET Series Sealed Subminiature Toggle Switches

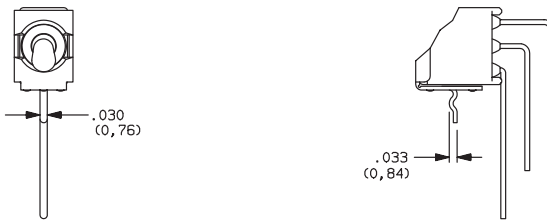
TERMINATIONS

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE

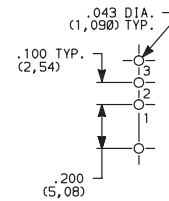


ET01SD1AV2BE
Vertical Actuation
SPDT

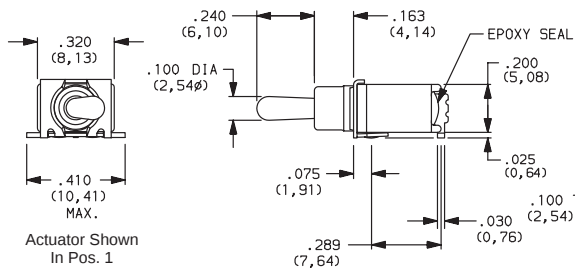
AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



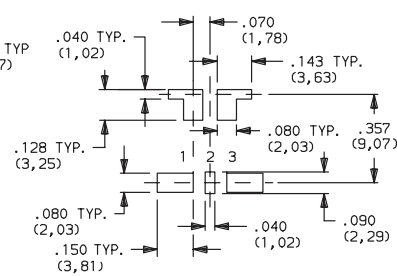
PC MOUNTING



SA (STD.) RIGHT ANGLE, SURFACE MOUNT



PC MOUNTING



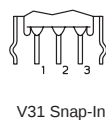
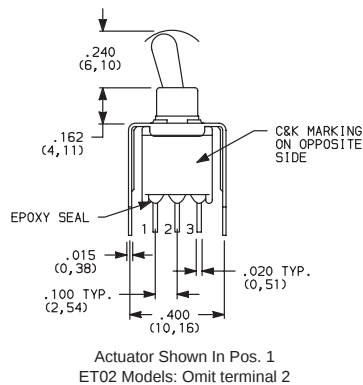
SMT



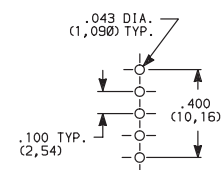
ET01M3D1SAKE
Horizontal Actuation
SPDT Only

V3 (STD.) VERTICAL MOUNT, V-BRACKET

V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN



PC MOUNTING



ET02 Models: Omit center hole.



ET01MD1V3BE
SPDT



A

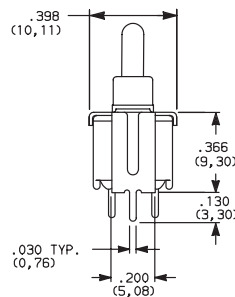
Toggle

Toggle

Technical drawing of a probe tip assembly. The drawing shows a cross-section of the assembly with various dimensions and labels. The dimensions are given in inches and millimeters (in parentheses). The labels include:

- .240 (6,10)**: Dimension for the top section.
- .162 (4,11)**: Dimension for the middle section.
- C&K MARKING ON OPPOSITE SIDE**: Label pointing to the side of the assembly.
- EPOXY SEAL**: Label pointing to the seal area.
- .015 (0,38)**: Dimension for the bottom section.
- .100 TYP. (2,54)**: Dimension for the bottom section.
- .020 TYP. (0,51)**: Dimension for the bottom section.
- .400 (10,16)**: Dimension for the bottom section.
- 4**, **5**, **6**: Dimensions for the bottom section.

Actuator Shown In Pos. 1



Technical drawing of a 3-hole punch. The drawing shows a rectangular plate with three circular holes arranged vertically. Dimensions are given in inches and millimeters (in parentheses).

- Top hole diameter: $.043 \text{ DIA.}$ ($1,090$) TYP.
- Distance between hole centers (pitch): $.100 \text{ TYP.}$ ($2,54$)
- Distance from top hole center to top edge: $.400$ ($10,16$)
- Distance between hole centers (pitch): $.200$ ($5,08$)

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B (STD.)	GOLD ¹	GOLD ¹	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
K		TIN-LEAD ⁶		
Q	SILVER ^{4,5}	SILVER ⁵	POWER	ETX1 MODELS: 3 AMPS @ 120 V AC OR 28 V DC. ALL OTHER MODELS: 2 AMPS @ 120 V AC OR 28 V DC.
M		TIN-LEAD ⁶		
G	GOLD OVER SILVER ^{2,3}	GOLD ³	LOW LEVEL/DRY CIRCUIT OR POWER	ETX1 MODELS: 0.4 VA MAX. @ 20 V AC OR DC MAX. OR 3 AMPS @ 120 V AC OR 28 V DC. ALL OTHER MODELS: 0.4 VA MAX @ 20 V AC OR DC MAX. OR 2 AMPS @ 120 V AC OR 28 V DC.
L		TIN-LEAD ⁶		

All models   with all options (except M3 & S3 actuator) when ordered with G, L, M or Q contact material.

```

graph LR
    N1[ ] --- N2[ ]
    N2 --- N3[ ]
    N3 --- N4[ ]
    N4 --- N5[ ]
    N5 --- N6[ ]
    N6 --- N1
    style N1 fill:#000,stroke:#000
    style N2 fill:#000,stroke:#000
    style N3 fill:#000,stroke:#000
    style N4 fill:#000,stroke:#000
    style N5 fill:#000,stroke:#000
    style N6 fill:#fff,stroke:#000
  
```

EPOXY SEAL

.040 MAX.
(1,02)

