

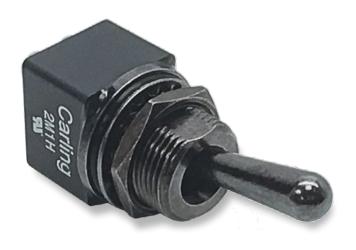
# 2M-Series

Miniature Toggles Switches

**PRODUCT WEBPAGE** 

request sample, configure part





The 2M family of miniature toggle switches is composed of three switch series; the 2M1-Series miniature toggle switch, the 2MS-Series sealed miniature toggle switch, and the 2M1H-Series premium sealed miniature toggle switch. These series all feature PC mounting and offer a variety of ratings, circuits, contact materials, terminal platings, toggle styles and lengths, and optional color caps.

Poles **Amps** 

125, 250

VDC

**Typical Applications** 

Instrumentation

- Networking
- Telecommunications
- Medical

Military



# **Tech Specs**



2M1H-Series **Premium Sealed** Miniature Toggle Switch



2MS-Series Sealed Miniature Toggle Switch



2M1-Series Miniature Toggle Switch

#### **Electrical**

Contact Rating	refer to ordering scheme
Electrical Life	50,000 make & break cycles @ full load
Contact Resistance	10 mΩ max. initial @ 2-4 VDC 100mA for both silver & gold plated contacts
Insulation Resistance	1000 MΩ min.
Dielectric Strength	1500 Volts RMS @ sea level

#### **Physical**

•	
Operating Temperature	-30°C to +85°C
Index of Protection	2M1H-Series: IP67 2MS-Series: IP67
Solder Heat Resistance	MIL-STD-202, Method 210
Actuator Travel	25°

#### **Material**

Case	2M1H-Series & 2M1-Series: Dially phthalate (DAP) (UL 94V-0) 2MS-Series: Glass filled nylon 6/6,flame retardant, heat stabilized (UL 94V-0)
Toggle	2MIH-Series: Brass, black finish with o-ring seal 2MS-Series: Brass, chrome plated, internal o-ring sealed 2MI-Series: Brass, chrome plated
Bushing	2M1H-Series: Brass, black finish with o-ring seal 2MS-Series: Glass filled nylon 6/6,flame retardant, heat stabilized (UL 94V-0) 2M1-Series: Brass, nickel plated
Housing	Stainless Steel
Bracket	2MS-Series: Nylon (UL 94V-0) 2M1-Series: Stainless Steel
Actuator Retainer	2MS-Series: Stainless Steel
Switch Support	Brass, tin plated
Terminal Seal	Ероху

## **Ordering Scheme**

Part Number

#### Selection 1. SERIES

2M1H Premium Sealed Miniature Toggle Switch

#### 2. POLES / CIRCUIT

( ) - mome	entary		
Pósition:	1 ′	2	3
	2-3, 5-6	Connected Terminals	2-1, 5-4
SP1	ON <sup>'</sup>	NONE	ON
SP2	ON	NONE	(ON)
SP3	ON	OFF	ÒN ´
SP4	(ON)	OFF	(ON)
SP5	ÒN	OFF	(ON)
DP1	ON	NONE	ÒN Í
DP2	ON	NONE	(ON)
DP3	ON .	OFF	ÓN Í
DP4	(ON)	OFF	(ON)
DP5	ON	OFF	(ON)
DP6 *	ŌΝ ͺ	ON	ÔN (
DP7 *	(ON)	ON	(ON)
DP8 *	ÓN	ON	(ON)
*Center pos	ition connects :	2-3, 5-4	

#### 3. ACTUATOR STYLE

.709" [18 mm] length ΤK .512" [13.00 mm] length

#### 4. BUSHING

**BK** .386" [9.80 mm] threaded, flat

#### 5. TERMINATION 7

M1 Solder Lug	M51	Wire Wrap, .750" [	[19.05mm]	length
M2 PCB	M52	Wire Wrap, .964"	24.48mm	length
M3 Quick Connect	M53	Wire Wrap, .425"	[10.80mm]	length
	M54	Wire Wrap, 1.062"	25.97mm	length

#### 6. CONTACTS / TERMINALS

	Contact Material	Terminal Platin	g Rating A	Approvals
G	silver <sup>1</sup>	gold over silver	5A 125VAC or 28VDC,	<b>91</b> , IP67
		•	2A 250VAC	
K P	gold <sup>2,5</sup> silver <sup>1,6</sup>	tin <sup>4,7</sup>	0.4VA max 20V max (	(AC/DC) IP67
Р	silver <sup>1,6</sup>	tin <sup>4,7</sup>	5A 125VAC or 28VDC,	<b>91</b> , IP67
		2A	250VAC	
Q	silver <sup>1</sup> silver <sup>1</sup>	5A	125VAC or 28VDC,	<b>911</b> , IP67
		2A	250VAC	
R	gold <sup>2</sup> gold <sup>3</sup>	0.4VA max	20V max (AC/DC)	IP67

#### 7. EPOXY SEAL

**Epoxy Seal** 

Notes: Switches supplied with (1) 2MI-HDW4 hex nut and (1) 3MNH-WCP-0872 O-Ring
Movable contact and terminal platings: silver over copper alloy
Movable contact and terminal platings: gold over nickel over copper alloy
Terminal platings: gold over nickel over copper alloy
Terminal platings: tin over copper alloy
Terminal contact platings: gold over nickel alloy
Terminal contact platings: silver over nickel alloy
Tin option not available with MI & M3 terminations.

## **Ordering Scheme**

Part Number

3

Selection

1. SERIES

2MS Sealed Miniature Toggle Switch

#### 2. POLES

**WSP** Single pole - uses terminals 1, 2 & 3 **WDP** Double pole - uses terminals 1, 2, 3, 4, 5 & 6 **W3P** Three pole - uses terminals 1, 2, 3, 4, 5, 6, 7, 8 & 9

#### 3. CIRCUIT

( ) - momentary			
Position:	1 ′	2	3
	2-3, 5-6	Connected Terminals	2-1, 5-4
1	ON	NONE	ON
2	ON	NONE	(ON)
3	ON	OFF	ÓN .
4	(ON)	OFF	(ON)
5	ÓN	OFF	(ON)

#### 4. ACTUATOR STYLE

**Round Bat** Plastic Anti-Static .496" length Round Short Bat P2 Plastic Anti-Static .299" length T9 Long Black Plastic .492" length

#### 5. BUSHING

Threaded, Keyway **B4** Unthreaded, Short, Keyway, Flat

BI Bushing switches supplied with (2) 2MI-HDW2 nuts, (1) 2MI-HDW1 washer and (1) 2MI-HDW15 locking ring. See page 76-77.

Movable contact & terminal platings: silver over copper alloy Movable contact & terminal platings: gold over nickel over copper alloy Terminal platings: tin over nickel over copper alloy Tin option not available with MI terminal

#### **6. TERMINATION**

M14 Solder Lug VS21 Vertical, Snap-In, .460" PCB [11.70mm] VS3 Vertical, 630" [16mm]
VS31 Vertical, Snap-In, .630" [16mm]
U2 Vertical, .551" [14mm] -М3 Quick Connect **M51** Wire Wrap, .750" [19.05mm] **M52** Wire Wrap, .964" [24.48mm] **M53** Wire Wrap, .425" [10.80mm] **M54** Wire Wrap, 1.062" [25.97mm] only 3PDT **VS4** Vertical, .461" [11.70mm] M6 Right Angle, PC Thru-Hole VS41 Vertical, Snap-In, .461" M61 Right Angle, Snap-In M7 Vertical, Right Angle, [11.70mm] Vertical, .551" [14mm] only 3PDT PC Thru-Hole M71 Vertical, Right Angle, Snap-In VS2 Vertical, .461" [11.70mm] **VS5** Vertical, .630" [16mm] **VS51** Vertical, Snap-In, .630" [16mm

#### 7. CONTACTS / TERMINALS

Co G	ntact Material silver <sup>1</sup>	Terminal Plating gold over silver 2A	Rating 5A 125VAC or 28VDC, 250VAC	Approvals c Sus, IP67
K P	gold <sup>2</sup> silver <sup>1</sup>	tin <sup>3, 4</sup> tin <sup>3, 4</sup>	0.4VA max 20V max ( 5A 125VAC or 28VDC,	
R	gold <sup>2</sup>	2A gold <sup>2</sup>	250VAC 0.4VA max 20V max (/	AC/DC) IP67

#### 8. EPOXY SEAL

**Epoxy Seal** without Epoxy Seal

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ଞ୍ଚ Configure Complete Part Number >

Browse Standard Parts >

Sample Part Number

Selection

#### 1. SERIES

2M1 Miniature Toggle Switch

#### 2. POLES

Single pole - uses terminals 1, 2 & 3 Double pole - uses terminals 1, 2, 3, 4, 5 & 6 Three pole - uses terminals 1, 2, 3, 4, 5, 6, 7, 8 & 9 Four pole - uses terminals 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12 DP

#### 5. BUSHING

Threaded Standard, keyway **B2** Non-Threaded Standard, keyway

5

**B3** Threaded Short, keyway **B4** Non-Threaded Short, keyway **B5** High Torque, 7.5mm, flat

**B7** Long threaded

B9 Splashproof B0 15/32" Threaded (Standard for T7 & T8 actuator styles)

**BA** Threaded for T6 **BA** Threaded for T6

BB Non-Threaded for `T6 BE Threaded Hi Torque for T6

**BL** Threaded, Locking

#### 3. CIRCUIT

( ) - momentary			
Position:	1 '	2	3
	2-3, 5-6, 8-9, 11-12	Connected Terminals	2-1, 5-4, 8-7, 11-10
1	ON	NONE	ON
2	ON	NONE	(ON)
3	ON	OFF	ÓN
4	(ON)	OFF	(ON)
5	ÓN	OFF	(ON)
6*	ON	ON	ÓN
7*	(ON)	ON	(ON)
8*	ÒN	ON	(ON)
*Available with DP and 4P switches only. Center position connects 2-3, 5-4, 8-9, 11-10			

#### 4 ACTUATOR STYLE

	COLONION OLLER		
Τl	Round Bat	Т7	Large Bat (B0 bushing)
T2	Round Short Bat	Т8	X-Large Bat (B0 bushing)
Т3	Paddle	Т9	Black Plastic
T4	Medium Paddle	T0	Rectangular
TA	Locking Lever	TA	Locking Lever
	Long Paddle	TI	Locking Lever
Т6	Flat (B1,B2,B5,BA,BB,BE)	TL	Locking Lever

Notes: B1 Bushing switches supplied with (2) 2M1-HDW2 nuts, (1) 2M1-HDW11 washer and (1) 2M1-HDW15 locking ring.

Movable contact & terminal platings: silver over copper alloy

Movable contact & terminal platings: gold over nickel over copper alloy

Terminal platings: tin over nickel over copper alloy

Tin option not available with M1 terminal Movable contact & terminal platings:

In option not available with MI terminal Movable contact & terminal pic silver over copper alloy Movable contact & terminal platings: gold over nickel over copper alloy Terminal platings: tin over nickel over copper alloy Tin option not available with MI terminal

B6 High Torque, 8.0mm, keyway

**B8** Metric

#### 6. TERMINATION

м14	Solder Lug	VS21	Vertical, Snap-In, .460"
М2	PCB		[11.70mm]
М3	Quick Connect	VS3	Vertical, .630" [16mm]
M51	Wire Wrap, .750" [19.05mm]	VS31	Vertical, Snap-In, .630" [16mm]
M52	Wire Wrap, .964" [24.48mm]	U2	Vertical, .551" [14mm] -
	Wire Wrap, .425" [10.80mm]		only 3PDT
M54	Wire Wrap, 1.062" [25.97mm]	VS4	Vertical, .461" [11.70mm]
М6	Right Angle, PC Thru-Hole	VS41	Vertical, Snap-In, .461"
M61	Right Angle, Snap-In		[11.70mm]
М7	Vertical, Right Angle,	U4	
	PC Thru-Hole		only 3PDT
M71	Vertical, Right Angle, Snap-In		Vertical, .630" [16mm]
VS2	Vertical. 461" [11.70mm]	VS51	Vertical, Snap-In630" [16mm]

#### 7. CONTACTS / TERMINALS

Contact M G silver 1	<b>aterial Terminal Plating</b> gold over silver	Rating Approvals 5A 125VAC or 28VDC, 125VAC or 28VDC, 125VAC
K gold <sup>2</sup> P silver <sup>1</sup>	tin <sup>3, 4</sup> tin <sup>3, 4</sup>	2A 250VAC 0.4VA max 20V max (AC/DC) N/A 5A 125VAC or 28VDC, <b>71</b> , <b>6</b> , IP67
<b>Q</b> silver <sup>1</sup>	silver 1	2A 250VAC 5A 125VAC or 28VDC, <b>%1</b> , <b>(B</b> , IP67 2A 250VAC
R gold <sup>2</sup>	gold <sup>2</sup>	0.4VA max 20V max (AC/DC) N/A

#### 8. EPOXY SEAL

without Epoxy Seal **Epoxy Seal** 

Configure Complete Part Number >

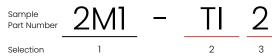
Browse Standard Parts >

## **Ordering Scheme Accessories**

#### **2M-Series Accessories**

To order accessories assembled on a switch, specify the switch number followed by the accessory part number and the word "assembled". Ex: 2MI-SPI-TI-BI-MIQE-T12 ASSEMBLED. To order accessories in bulk, specify the Series, followed by the accessory. Ex: 2MI-T12. See page 76 for dimensional specifications.

## **Optional Toggle Cap**



#### 1. SERIES

2M1 Fits 2M1H, 2MS or 2M1

## 2. TOGGLE CAP SIZE

10.6 mm 7.6 mm

#### 3. CAP COLOR

White Yellow Black 6 Green 3 Red Blue

## **Optional Dress and Knurled Nuts**

Sample Part Number	2M1	_	HDW3
Selection	1		2

#### 1. SERIES

2M1 Fits 2M1H, 2MS or 2M1

#### **2. NUT**

Dress nut for 1/4" bushing Knurled nut for 15/32" bushing (2M1-Series only) HDW3 HDW5

## **Optional Rubber Seals**



#### 1. SERIES

2M1 Fits 2M1H, 2MS or 2M1

#### 2. RUBBER BOOT SEAL

EIA 1/4 - 40" UNS bushing (Not available for B0 bushing option)
K1 Metric M6 bushing (B8 bushing only)
YEID 15/32 - 32" UNS bushing (TJ, TK and B0 bushings only)
YEIE 15/32 - 32" UNS bushing 1/2 boot (T7, T8, TJ, TK and B0

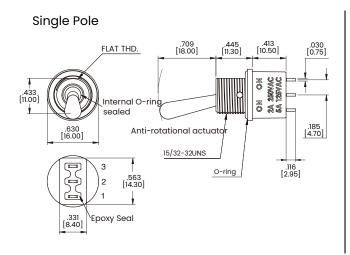


Fits 3MNH or 2M1H 3MNH

#### 2. RUBBER O-RING

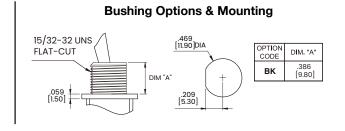
WCP-0872 For 15/32 bushing option

inches [millimeters]

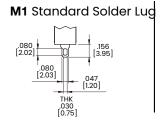


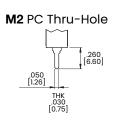
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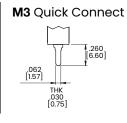
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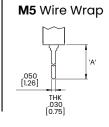


#### **Termination Options**



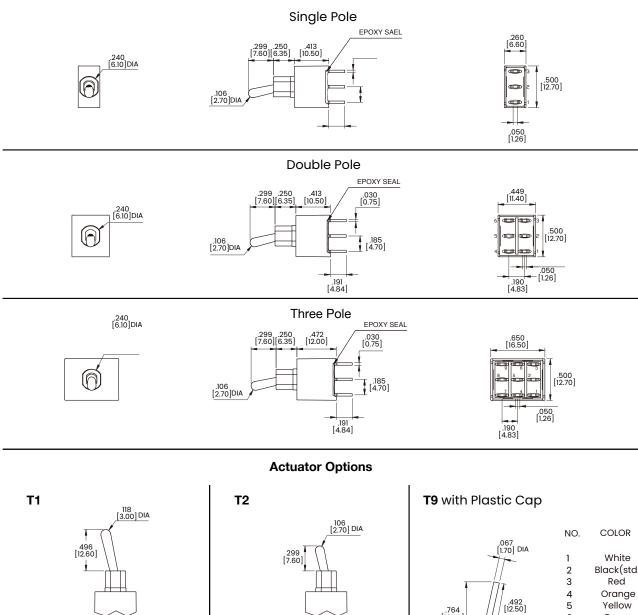






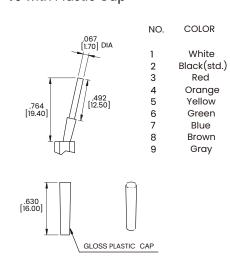
OPTION CODE	DIM.'A'
M5-1	.750 [19.05]
M5-2	.964 [24.48]
M5-3	.425 [10.80]
M5-4	1.062 [26.97]

inches [millimeters]

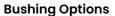


# P1 Plastic Toggle P2 Plastic Toggle | 106 | (2.70] DIA | 299 | (7.80) | (2.70] DIA | (2.70) DI

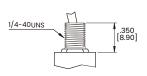
\* Shown with B4 bushing. Subtract 0.75" (1.90mm) from actuator height for B1 bushing.



inches [millimeters]



В1

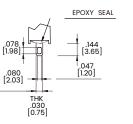


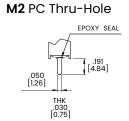




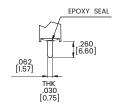
#### **Termination Options**

M1 Standard Solder Lug

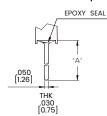




## M3 Quick Connect

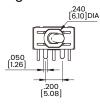


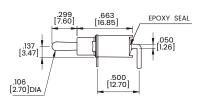
M5 Wire Wrap

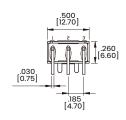


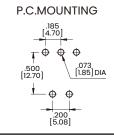
OPTION	DIM.'A'
	, ,
M5-1	.750 [19.05]
M5-2	.964 [24.48]
M5-3	.425 [10.80]
M5-4	1.062 [26.97]

#### M6 Single Pole

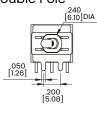


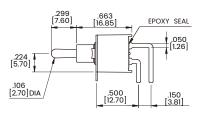


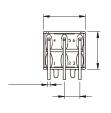


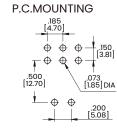


#### M6Double Pole

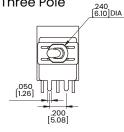


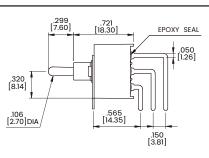


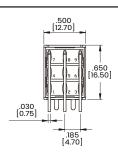


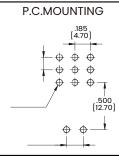


#### M6 Three Pole

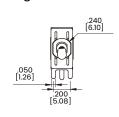


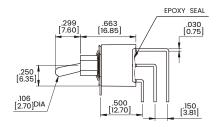


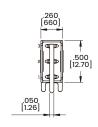


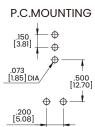


#### M7 Single Pole



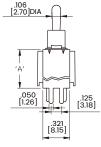


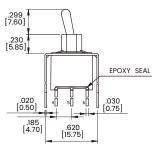




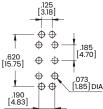
inches [millimeters]

#### **Termination Options** P.C.MOUNTING M7 Double Pole EPOXY SEAL .240 [6.10]DIA .250 [6.35] .073 [1.85] DIA .106 [2.70]DIA .500 [12.70] EPOXY SEAL P.C.MOUNTING M7 Three Pole .073 [1.85] DIA .250 [6.35] .106 [2.70]DIA VS2-VS3 Single Pole P.C.MOUNTING .106 [2.70]DIA .299 [7.60] OPTION DIM.'A' CODE EPOXY SEAL .461 [11.70] VS2 .125 [3.18] .630 VS3 [16.00] .620 [15.75] VS2-VS3 Double Pole P.C.MOUNTING .299 [7.60]

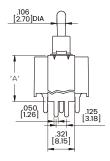


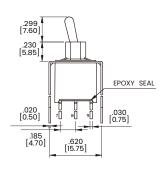


OPTION CODE	DIM.'A'
VS2	.461 [11.70]
VS3	.630 [16.00]

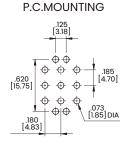


U2-VS3 Three Pole



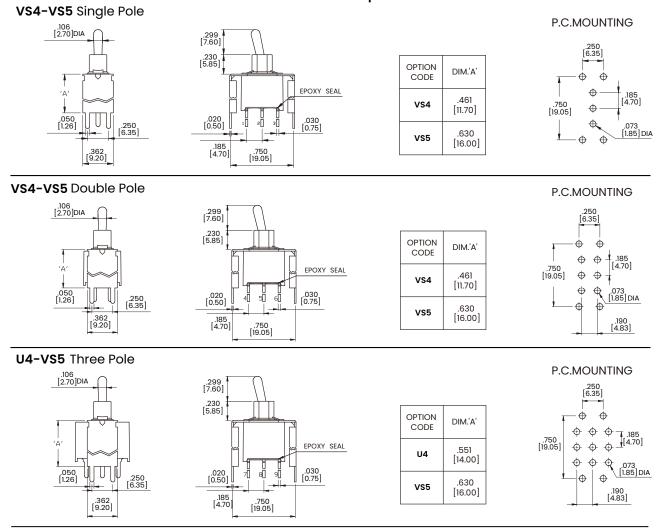


OPTION CODE	DIM.'A'
U2	.551 [14.00]
VS3	.630 [16.00]

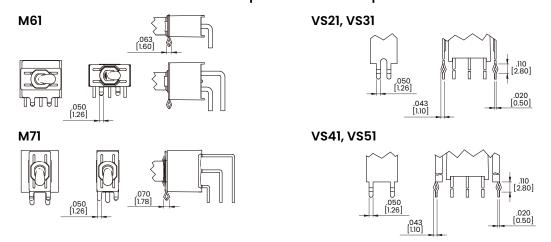


inches [millimeters]

#### **Termination Options**

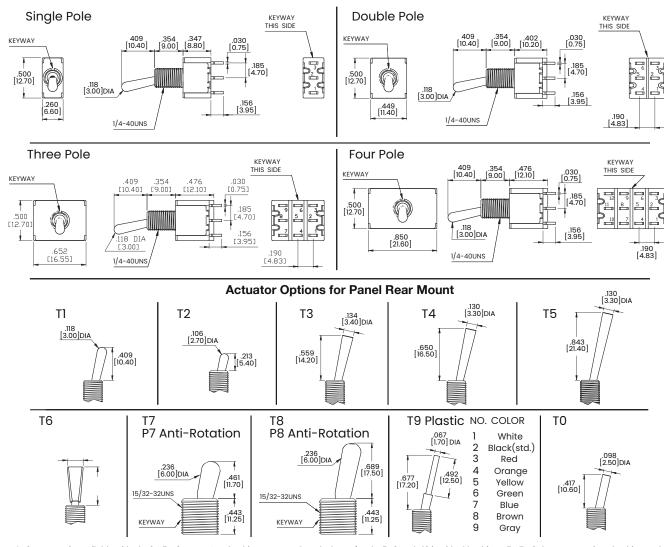


#### **Snap-In Termination Options**

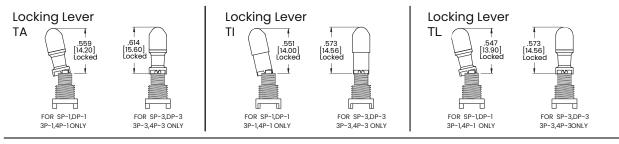


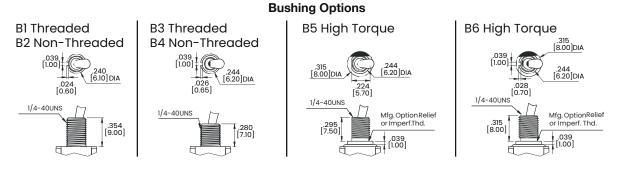
<sup>\*</sup> PC Mounting for M61, M71, VS21, VS31, VS41, VS51 refer to M6, M7, VS2, VS3, VS4, VS5 respectively.

inches [millimeters]



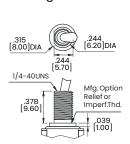
\* T6 actuator is available with B1, B2, B5, B6, BA, BB & BE bushing. Actuator length shown for T1-T5,T9 and T10 is with B1 bushing. T7, P7, P8 does not require a bushing code.

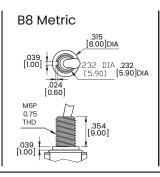


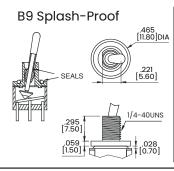


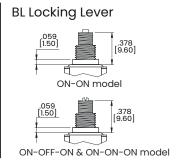
### inches [millimeters]

B7 Long

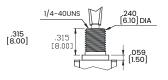


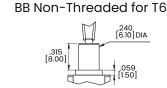


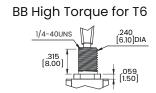




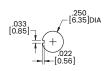
BA Threaded for T6



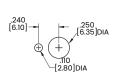




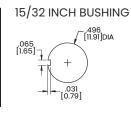
1/4 INCH BUSHING

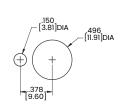






**Panel Mounting** 

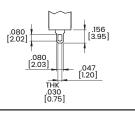


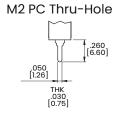


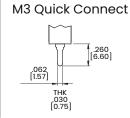
DIM.'A'

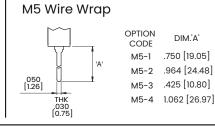
**Termination Options** 

M1 Standard Solder Lug

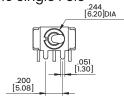


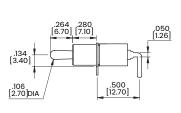


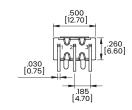


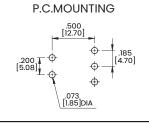


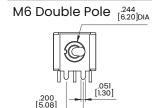


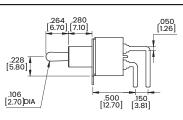


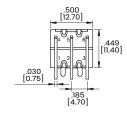


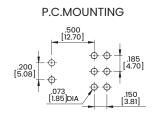


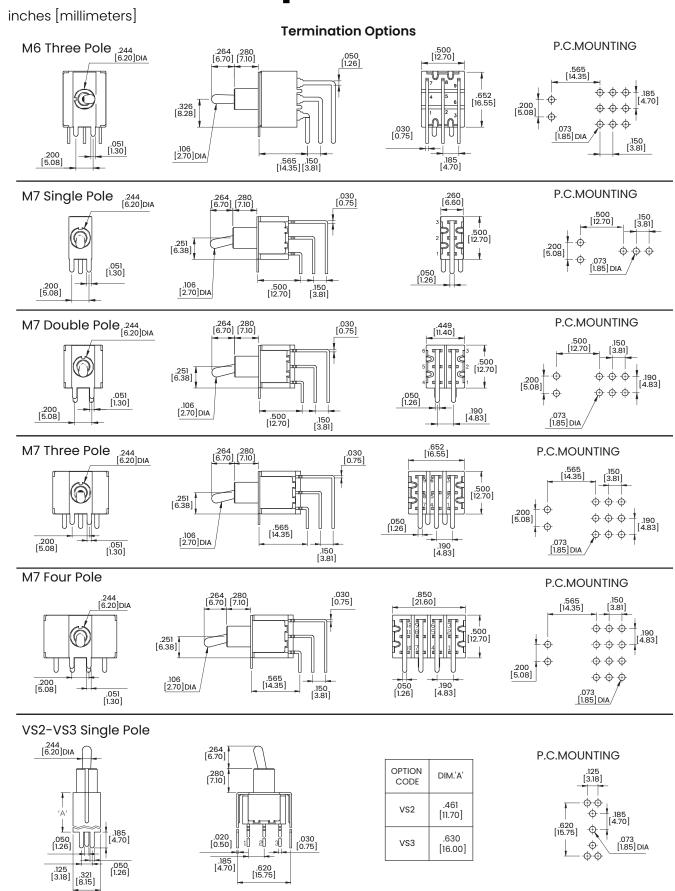








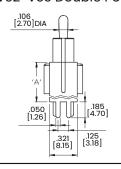


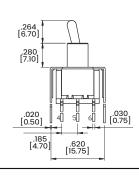


inches [millimeters]

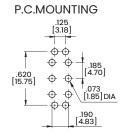
VS2-VS3 Double Pole

**Termination Options** 

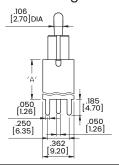


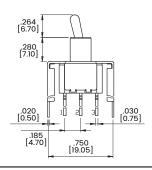


OPTION CODE	DIM.'A'
VS2	.461 [11.70]
VS3	.630 [16.00]

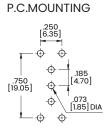


VS4-VS5 Single Pole

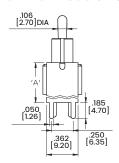


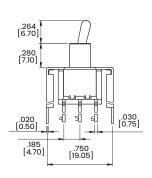


OPTION CODE	DIM.'A'
VS4	.461 [11.70]
VS5	.630 [16.00]



VS4-VS5 Double Pole





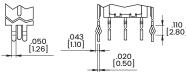
OPTION CODE	DIM.'A'
VS4	.461 [11.70]
VS5	.630 [16.00]

#### **Snap-In Termination Options**

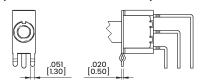
M61 (available with SP & DP)



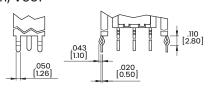
VS21, VS31



M71 (available with SP & DP)



VS41, VS51



<sup>\*</sup> PC Mounting for M61,M71,VS21,VS31,VS41,VS5 1 refer to M6,M7,VS2,VS3,VS4,VS5 respectively.

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