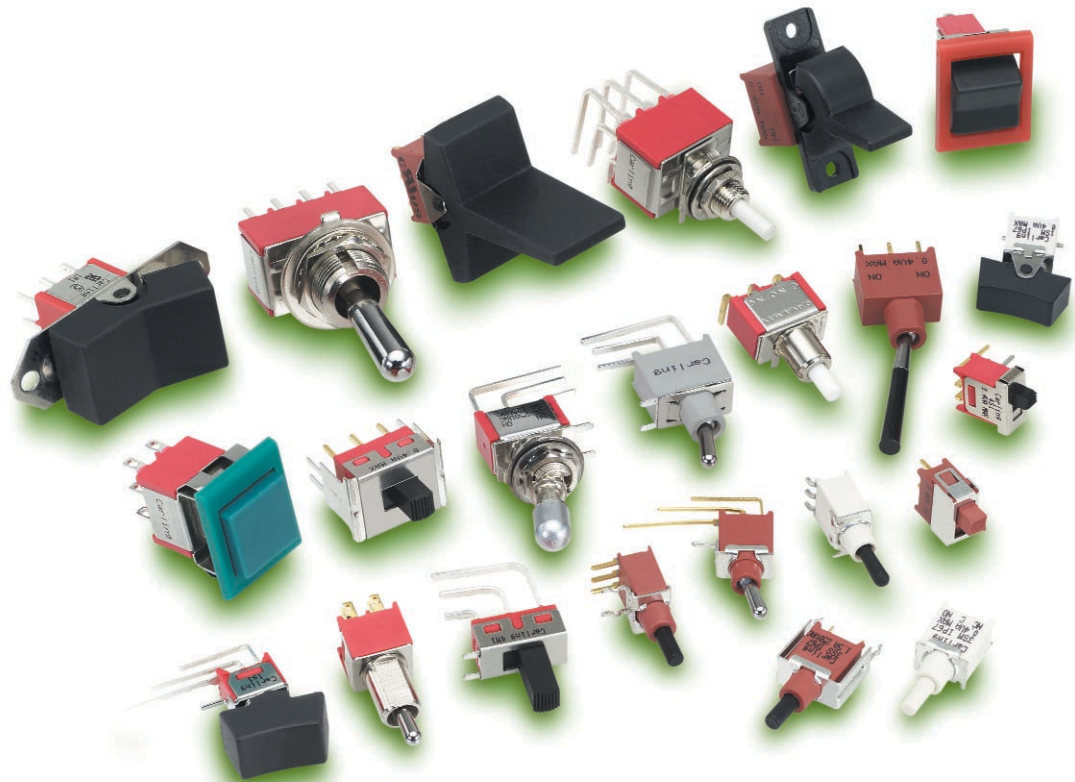


Miniature Switches

Rocker, Toggle,
Pushbutton
& Slide



Transforming Customer Needs into Customer Solutions

At Carling Technologies, we do much more than manufacture electrical components. We engineer powerful solutions. Working closely with your product team, we can tailor switching and circuit protection solutions that meet your application needs — cost effectively.

Since our founding in 1920, there are few products we haven't turned on, fewer industries that haven't turned to us. With five ISO registered manufacturing locations and technical sales offices worldwide, Carling Technologies now ranks among the world's largest privately owned manufacturers of hydraulic/magnetic circuit breakers, thermal circuit protectors, electrical switches and assemblies, power distribution centers and electronic control systems. What makes all our switches and controls especially attractive is their superior performance and reliability — both hallmarks of Carling Technologies.

We have over 2000 employees working through offices and manufacturing sites across the globe, providing engineered solutions to leading electronic and industrial OEMs in a variety of industries, including:

- Electronics (telecom, medical, computers, office automation)
- Transportation (on/off road vehicles, trucks, buses, boats)
- Commercial Facilities Control
- Industrial Controls
- Appliances
- Factory Automation

We look forward to helping you create safe, reliable products that exceed the tough demands of today's applications. You'll find our commitment to excellence consistently delivers "Quality by Design," our company's mission.



Our commitment to quality products begins with our investment in research and development. Not only does Carling have a team of highly-qualified engineers on staff, we equip them with the industry's most advanced computer-aided design tools.

Our engineering team will work closely with yours to advance your project from initial product concepts to final design and manufacturing. Using industry-leading CAD/CAM software, Carling engineers can evaluate multiple design alternatives as well as develop products, tooling and manufacturing processes concurrently. The result? Functionally superior, aesthetically pleasing products — produced faster and at a lower cost.



We can even share electronic files that can be easily incorporated into the rest of your design. Just one more reason you'll think of Carling as much more than an approved vendor, but rather as a proven partner.

Our automated call center system ensures that your calls are routed to the right Customer Care person for prompt attention. Our customer care personnel are technically trained to discuss your requirements and provide the advice and services you expect from Carling Technologies. Each member of the Carling Customer Care team is technically trained on our standard products, and Application Engineers are also available to answer your more advanced technical questions. In addition, Carling is proud to offer a global network of fully trained representatives and distributors, who are always ready to service you.

Carling Technologies' Products

Within this catalog, you'll find a comprehensive line of miniature and sub-miniature switches, including rocker, toggle, pushbutton, and slide switches, many sealed to IP67, and many certified to UL/CUL under file number E7560, and to CSA under file number LRA9280.

We also offer full size switches, hydraulic/magnetic and ground fault circuit breakers, thermal circuit protectors, digital switching systems and power distribution centers. For more information on our other products, please request one of the catalogs listed on the inside back cover of this catalog, or go to: www.carlingtech.com.

How To Use This Catalog

Please refer to the Product Selector Guide, located on this page, for the type of switch required. Each switch Series is located under an alphabetical code. Each code refers you to the specific pages covering an individual Series. Product features/specifications and dimensional drawings are provided to assist you with product selection.

Follow our easy step-by-step catalog number sequence to construct the switch, which meets your needs. An ordering format and an example for constructing a catalog number are provided for each Series.






















www.carlingtech.com

Our website also offers a fast and easy way for you to configure part numbers and check stock on-line for your switch needs. Our on-line product selector will guide you to a valid Series based on your requirements, and the on-line product configurator will help you build a valid part number. A stock check feature is also included at www.carlingtech.com. Product Selector, Configurit, Product pages & PDF files make the Carling Technologies web site your "one stop shop" for quick and thorough product information.

Customer Care Center

For additional application assistance, we urge you to consult with our experienced staff in our Customer Care Center. Our Technical and Engineering staff has extensive test, research and development capabilities, and have assisted many customers in solving unique design and application problems with standard or customized products. Please refer to our location listing on the back of this catalog, for contact information for your area.

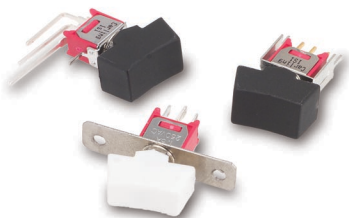
We look forward to working with you.

	Series	Sub-Miniature	Miniature	Sealed	Surface Mount	Approvals	IP67	page
ROCKER	1S1 	•				UL, CSA		2-5
	1SS 	•		•			•	2-5
	1SM 	•		•	•		•	2-6
	1M1 		•			UL, CSA		7-12
	1MS 		•	•		UL, CUL	•	7-12
TOGGLE	2S1 	•				UL, CSA		13-17
	2SM 	•		•	•		•	13-19
	2SS 	•		•			•	13-17
	2M1 		•			UL, CSA		20-26
	2M2 		•			UL, CUL		20-26
	2MS 		•	•		UL, CUL	•	20-26
PUSHBUTTON	3S1 	•						27-30
	3SS 	•		•			•	27-28, 31-32
	3SM 	•		•	•		•	27-28, 33-34
	3MN 		•			UL, CUL		35-36, 38-40
	3MS 		•	•		UL, CUL	IP68	35,37, 41-42
	3MA 		•			UL, CUL		35,37, 43-45
SLIDE	4S1 	•						46,48
	4SS 	•		•				46-49
	4M1 		•			UL, CSA		46,47, 50-51
	4PM 		•					52

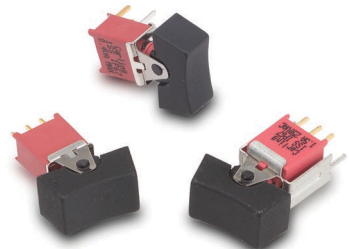
The range of temperatures that switches can perform at may be effected by various factors, including current load, voltage, foreign contaminant's, environmental conditions, frequency of operation, etc. As a result, switches should be tested for suitability under actual application conditions, before making a final product selection. Operating temperature is defined as the temperature of the switch at rated current plus ambient temperature.

The product information published in this catalog is subject to change without notice. Modification of material, finishes, technical specifications and agency approvals may occur as part of our continual pursuit of product enhancement. All statements, technical information and recommendations are based on facts and tests we believe to be reliable. The product described may be used in a variety of applications. Since the user's product information, specific use application, and conditions of use are all outside of Carling's control, IT IS THE RESPONSIBILITY OF THE PURCHASER TO DETERMINE THE SUITABILITY OF THESE PRODUCTS FOR THE PURCHASER'S SPECIFIC USE AND THE PURCHASER ASSUMES ALL ASSOCIATED RISKS. The purchaser should review applicable codes and standards such as UL, NEMA, CSA, VDE, OSHA and others for recommended practices and safety standards along with electrical ratings as marked on product to ensure compatibility of product performance to application requirements.

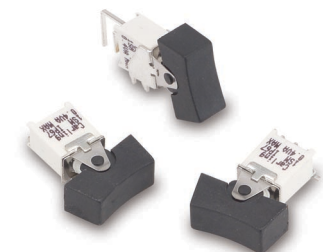
Warranty Policy Carling Technologies, Inc. (Seller) warrants that goods sold hereunder shall be free of defects in material and workmanship for one year from date of shipment. In the event of such defects, the Seller's only obligation shall be the replacement or the cost of the defective goods, themselves, excluding, without limitation, labor costs, which are or may be required in connection with the replacement or reinstallation of the goods. This warranty is the Seller's sole obligation and excludes all other remedies or warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, whether or not purposes or specifications are described herein. This Warranty expressly excludes any and all incidental, special and/or consequential damages of any nature. Seller further disclaims any responsibility for injury to person or damage to or loss of property or value caused by any product which has been subjected to misuse, negligence, or accident; or misapplied, or modified or repaired by a person or persons not authorized by the Seller or which have been improperly installed.



1S1-Series
Sub-Miniature Rocker
Switch



1SS-Series
Sealed Sub-Miniature
Rocker Switch



1SM-Series
**Sealed Surface
Mount** Sub-Miniature
Rocker Switch

Specifications

- Contact Rating refer to ordering scheme
 Electrical Life **1S1-Series:** 30,000 make & break cycles @ full load
 1SS & 1SM-Series: 50,000 make & break cycles @ full load
 Contact Resistance. 20 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
 Operating Temperature . . -30°C to +85°C
 Index of Protection **1SS & 1SM-Series:** IP67
 Solder Heat Resistance. . . MIL-STD-202, Method 210
 Actuator Travel 25°

Materials

- Case all UL94 V-0
 1S1-Series: Diallyl phthalate (DAP)
 1SS-Series: Glass filled nylon 6/6, flame retardant, heat stabilized
 1SM-Series: Glass filled nylon 4/6, flame retardant, heat stabilized
 Rocker. **1S1-Series:** Nylon (UL 94V-0)
 1SS & 1SM-Series: Nylon, black standard, internal o-ring sealed
 Bushing **1S1-Series:** Brass, nickel plated
 1SS-Series: Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0)
 1SM-Series: Glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0)
 Housing. **1S1-Series:** Stainless Steel
 Switch Support **1S1 & 1SM-Series:** Brass, tin plated
 Terminal Seal Epoxy

1S1-Series Ordering Scheme



<p>1 SERIES 1S1 Sub-Miniature Rocker Switch</p>																								
<p>2 POLES MSP single pole - uses terminals 1, 2 & 3. MDP double pole uses terminals 1,2, 3, 4, 5 & 6.</p>																								
<p>3 CIRCUIT () - momentary</p> <p style="text-align: center;">Switching Position:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">2-3, 5-6</td> <td style="text-align: center;">NONE</td> <td style="text-align: center;">2-1, 5-4</td> </tr> <tr> <td style="text-align: center;">1</td> <td>ON</td> <td>NONE</td> <td>ON</td> </tr> <tr> <td style="text-align: center;">2</td> <td>ON</td> <td>NONE</td> <td>(ON)</td> </tr> <tr> <td style="text-align: center;">3</td> <td>ON</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td style="text-align: center;">4</td> <td>(ON)</td> <td>OFF</td> <td>(ON)</td> </tr> <tr> <td style="text-align: center;">5</td> <td>ON</td> <td>OFF</td> <td>(ON)</td> </tr> </table>		2-3, 5-6	NONE	2-1, 5-4	1	ON	NONE	ON	2	ON	NONE	(ON)	3	ON	OFF	ON	4	(ON)	OFF	(ON)	5	ON	OFF	(ON)
	2-3, 5-6	NONE	2-1, 5-4																					
1	ON	NONE	ON																					
2	ON	NONE	(ON)																					
3	ON	OFF	ON																					
4	(ON)	OFF	(ON)																					
5	ON	OFF	(ON)																					
<p>4 ACTUATOR STYLE R1 Small rocker R2 Narrow black rocker</p>																								
<p>5 ACTUATOR COLOR¹</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">1 white</td> <td style="text-align: center;">4 orange</td> <td style="text-align: center;">7 blue</td> </tr> <tr> <td style="text-align: center;">2 black</td> <td style="text-align: center;">5 yellow</td> <td style="text-align: center;">8 brown</td> </tr> <tr> <td style="text-align: center;">3 red</td> <td style="text-align: center;">6 green</td> <td style="text-align: center;">9 gray</td> </tr> </table> <p><small>1 Black, white and red are standard. Other colors available, consult factory.</small></p>	1 white	4 orange	7 blue	2 black	5 yellow	8 brown	3 red	6 green	9 gray															
1 white	4 orange	7 blue																						
2 black	5 yellow	8 brown																						
3 red	6 green	9 gray																						

6 TERMINATION		VS3 PC Mount, U bracket, .620 mounting x .630 high
M1 Solder Lug	M2 PCB	M61 Snap-In, U bracket, 90° horizontal
M6 PC Mount, 90° horizontal	M7 PC Mount, 90° vertical	M71 Snap-In, U bracket, 90° vertical
M7 PC Mount, 90° vertical	VS2 PC Mount, U bracket, .620 mounting x .460 high	VS21 Snap-In, U bracket

7 CONTACT				
Material	Terminal Plating	Rating	Approvals	
G silver ¹	gold over silver ²	3A @ 125VAC or 28VDC, 1.5A @ 250VAC	UL CSA	
K gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC) –		UL CSA
P silver ¹	tin-lead ⁴	3A @ 125VAC or 28VDC, 1.5A @ 250VAC		
Q silver ¹	silver ¹	3A @ 125VAC or 28VDC, 1.5A @ 250VAC	UL CSA	
R gold ²	gold ²	0.4VA max. @20V max (AC/DC) –		
NOTE:				
Tin-lead option available with PC type terminations only.				
1 Moveable contact & terminals: copper alloy, silver plated				
2 Moveable contact & terminals: copper alloy with gold plate over nickel plate				
3 Terminals: silver plated with outer layer in gold plating				
4 Outer terminals: copper alloy with tin-lead over nickel plate				

8 EPOXY SEAL	
E	epoxy seal

1SS-Series Ordering Scheme



1 SERIES
1SS Sealed Sub-Miniature Rocker Switch

2 POLES
WMSP single pole - uses terminals 1, 2 & 3.
WMDP double pole uses terminals 1, 2, 3, 4, 5 & 6.

3 CIRCUIT
 () - momentary

Switching Position:			
	2-3, 5-6	OPEN	2-1, 5-4
1	ON	NONE	ON
2	ON	NONE	(ON)
3	ON	OFF	ON
4	(ON)	OFF	(ON)
5	ON	OFF	(ON)

4 ACTUATOR STYLE
R1 Small rocker **R2** Narrow rocker

5 ACTUATOR COLOR¹

1 white	4 orange	7 blue
2 black	5 yellow	8 brown
3 red	6 green	9 gray

1 White, black & red are standard. Other colors available for quantities of 5K or more.

6 TERMINATION
M1 Solder Lug
M2 PCB
M6 PC Mount, 90° horizontal
M7 PC Mount, 90° vertical
VS2 PC Mount, U bracket, .620 mounting x .460 high
M61 Snap-In, U bracket, 90° horizontal
M71 Snap-In, U bracket, 90° vertical
VS21 Snap-In, U bracket, .620 mounting x .460 high

7 CONTACT

	<i>Material</i>	<i>Terminal Plating</i>	<i>Rating</i>	
G	silver ¹	gold over silver ³	3A@125VAC or 28VDC, 1.5A @ 250VAC	IP67
K	gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)	IP67
P	silver ¹	tin-lead ⁴	3A@125VAC or 28VDC, 1.5A @ 250VAC	IP67
R	gold ²	gold ²	0.4VA max. @20V max (AC/DC)	IP67

NOTE:
Standard G plating for sealed product.
Tin-lead option available with PC type terminations only.
1 Moveable contact & terminals: copper alloy, silver plate
2 Moveable contact & terminals: copper alloy with gold plated over nickel plate
3 Terminals: silver plated with outer layer in gold plating
4 Outer terminals: copper alloy with tin-lead over nickel plate

8 EPOXY SEAL
E epoxy seal

1SM-Series Ordering Scheme



1 SERIES
1SM Sealed Surface Mount Sub-Miniature Rocker Switch

2 POLES
WMSP single pole - uses terminals 1, 2 & 3.

3 CIRCUIT
 () - momentary

Switching Position:			
	2-3	OPEN	2-1
1	ON	NONE	ON
2	ON	NONE	(ON)
3	ON	OFF	ON
4	(ON)	OFF	(ON)
5	ON	OFF	(ON)

4 ACTUATOR STYLE
R2 Narrow black rocker

5 TERMINATION
M6 Surface Mount, 90° flat - horizontal/side terms
S6 Surface Mount, 90° horizontal/back terms
S7 Surface Mount, 90° vertical

6 CONTACT

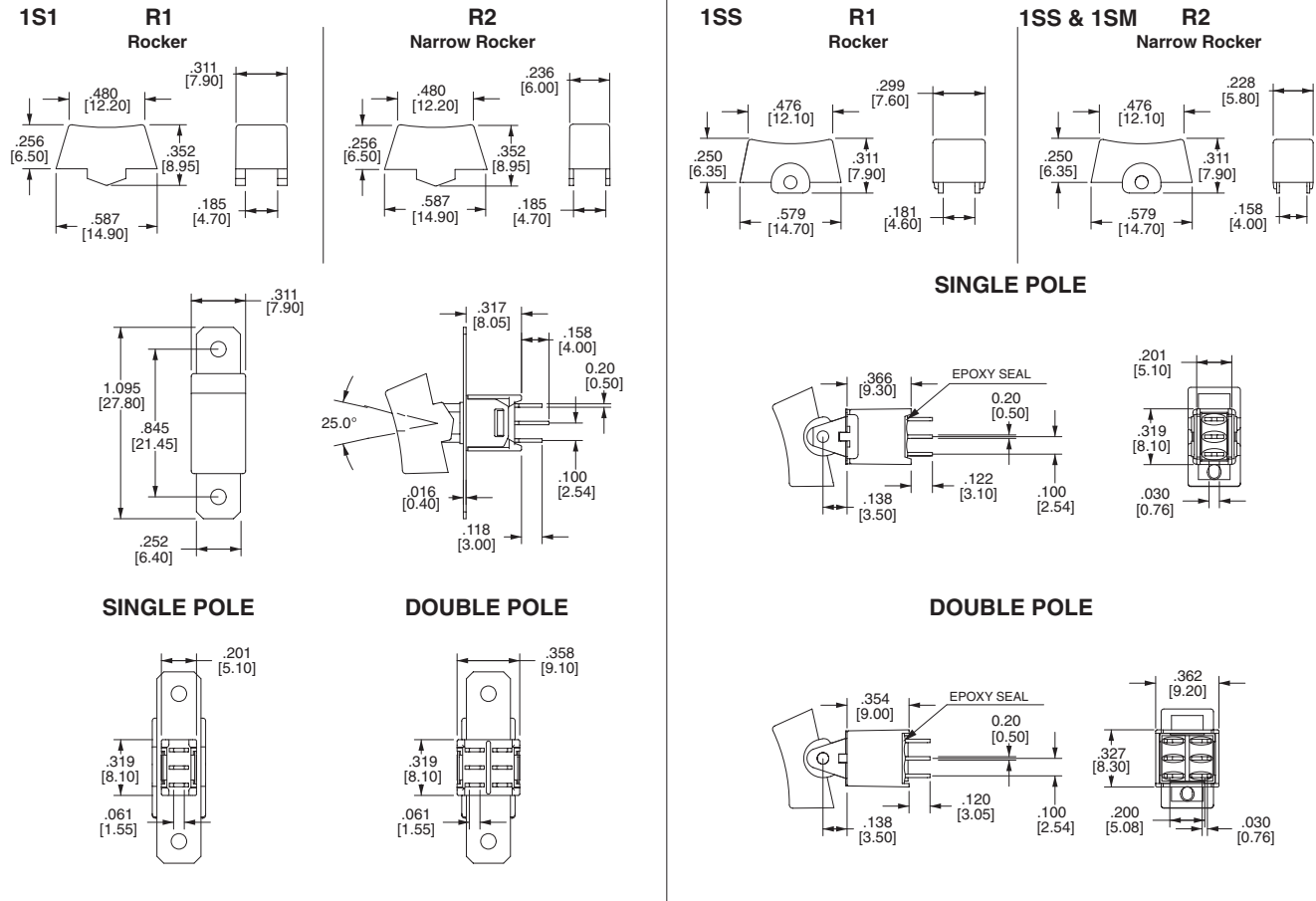
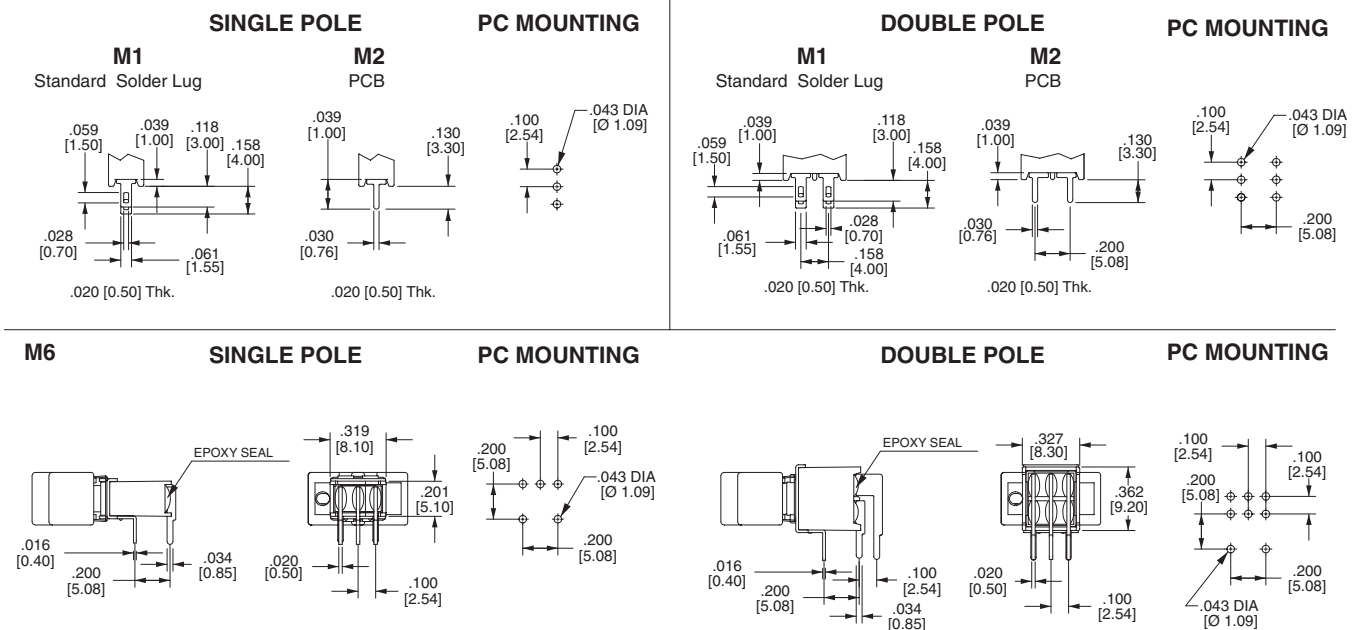
	<i>Material</i>	<i>Terminal Plating</i>	<i>Rating</i>	
G	silver ¹	gold over silver ³	3A@125VAC or 28VDC, 1.5A @ 250VAC	IP67
K	gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)	IP67
P	silver ¹	tin-lead ⁴	3A@125VAC or 28VDC, 1.5A @ 250VAC	IP67
Q	silver ¹	silver ¹	3A@125VAC or 28VDC, 1.5A @ 250VAC	IP67
R	gold ²	gold ²	0.4VA max. @20V max (AC/DC)	IP67

NOTE:
Standard G plating for sealed product. P&K for PC mount only.
Tin-lead option available with PC type terminations only.
1 Moveable contact & terminals: copper alloy, silver plate
2 Moveable contact & terminals: copper alloy with gold plate over nickel plate
3 Terminals: silver plated with outer layer in gold plating
4 Outer terminals: copper alloy with tin-lead over nickel plate

7 EPOXY SEAL
E epoxy seal

8 PACKAGING
 Switches are bulk packed, unless **T/R** is specified at the end of the part number.

T/R tape reel - 500 pieces per reel

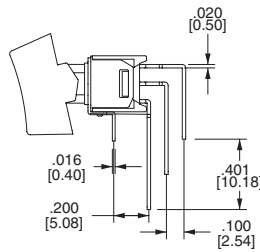
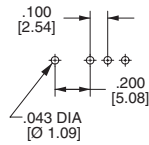
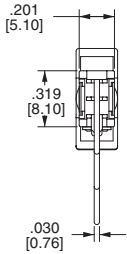
1S-Series Dimensional Specifications: in. [mm]
ACTUATOR

TERMINATION


1S-Series Dimensional Specifications: in. [mm]

TERMINATION

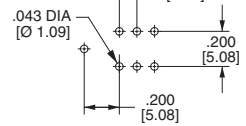
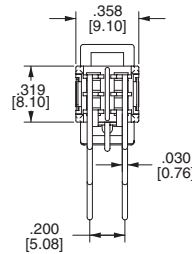
M7 SINGLE POLE

PC MOUNTING



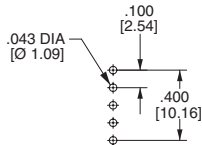
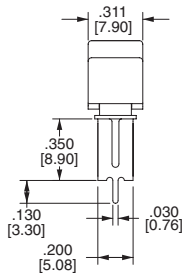
DOUBLE POLE

PC MOUNTING

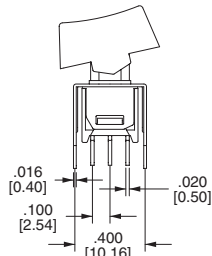


VS2

PC MOUNTING

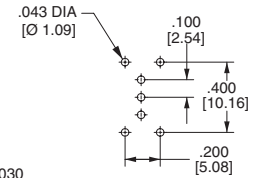
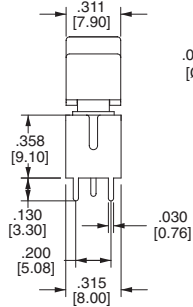


SINGLE POLE



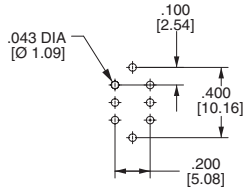
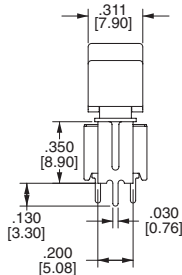
VS3

PC MOUNTING

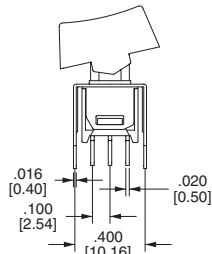


VS2

PC MOUNTING

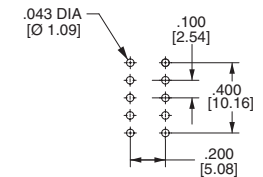
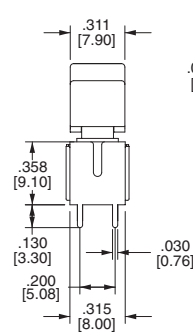


DOUBLE POLE



VS3

PC MOUNTING

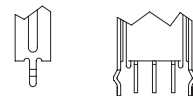
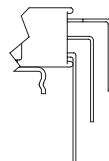
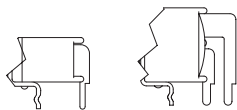


SNAP-IN TERMINATION

M61

M71

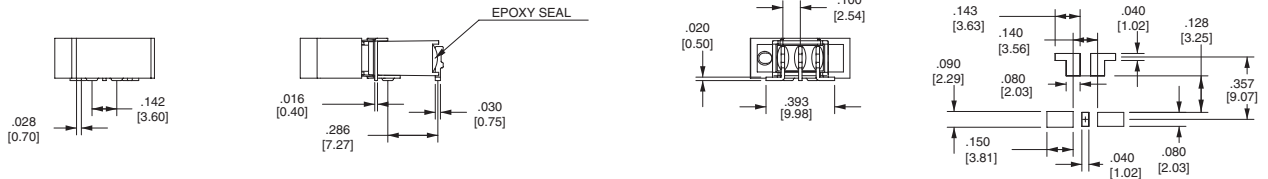
VS21



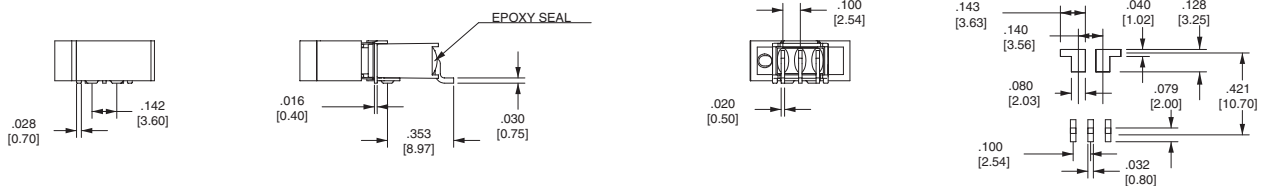
1SM-Series Dimensional Specifications: in. [mm]

TERMINATION

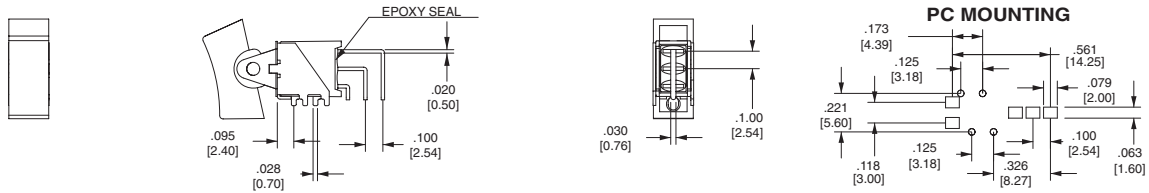
M6



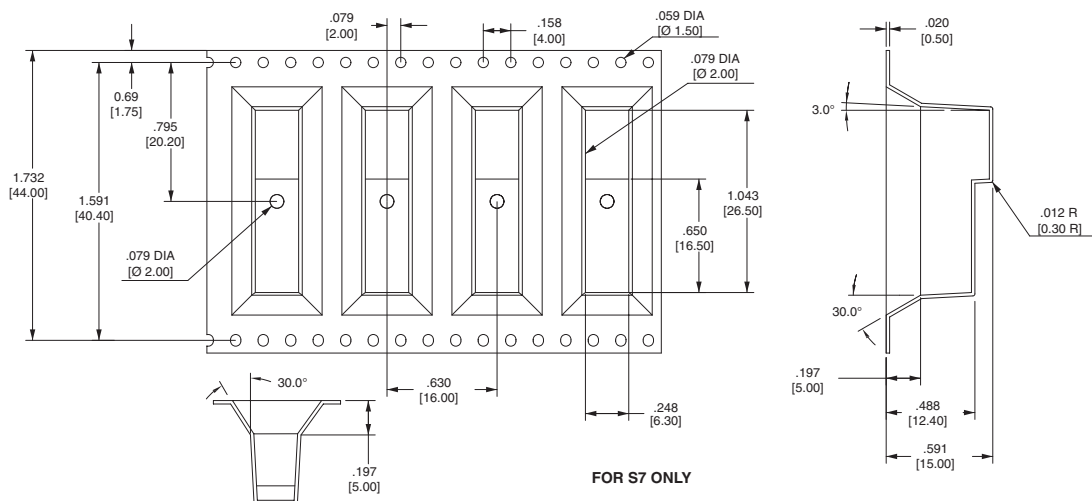
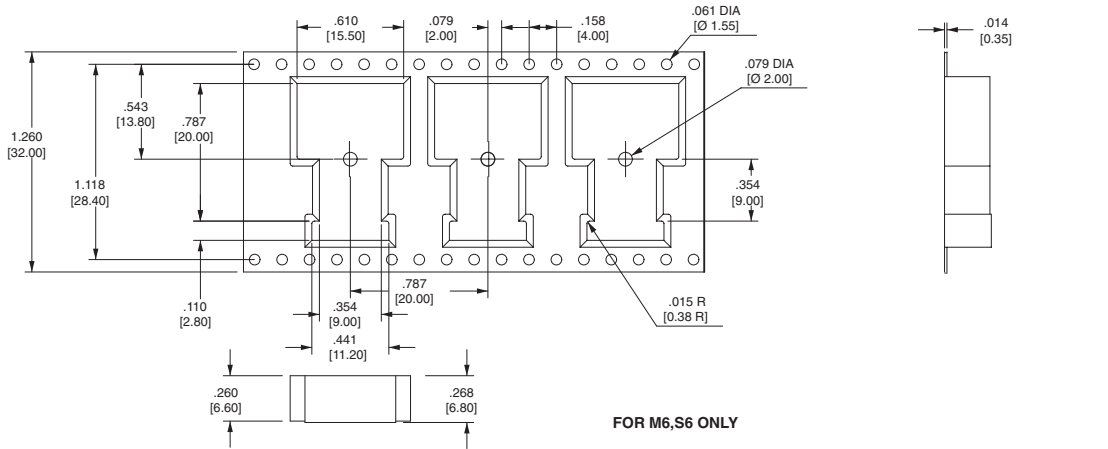
S6

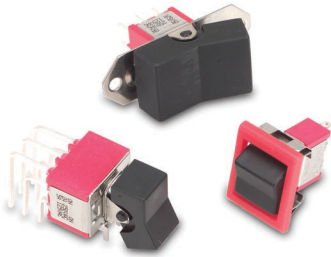


S7



REEL TAPING





1M1-Series
Miniature Rocker &
Paddle Switch



1MS-Series
Sealed Miniature
Rocker & Paddle
Switch

Specifications

Contact Rating	refer to ordering scheme.
Electrical Life	1M1-Series: 50,000 make & break cycles @ full load 1MS-Series: 30,000 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
Operating Temperature . . .	-30°C to +85°C
Index of Protection	1MS-Series: IP67
Solder Heat Resistance. . .	MIL-STD-202, Method 210
Actuator Travel	25°

Materials

Case	1M1-Series: Dially phthalate (DAP) (UL 94V-0) 1MS-Series: Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0)
Rocker/Paddle.	1M1-Series: Nylon (UL 94V-0) 1MS-Series: Nylon, black standard, internal o-ring sealed
Bushing	1M1-Series: Brass, nickel plated 1MS-Series: Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0)
Housing.	1M1-Series: Stainless Steel 1MS-Series: Spring Steel
Actuator Pivot & Mounting	
Bracket	1M1-Series: Stainless Steel 1MS-Series: Nylon (UL 94V-0)
Actuator Pivot Retainer . . .	1MS-Series: Stainless Steel
Switch Support	Brass, tin plated
Terminal Seal	Epoxy

1M1-Series Ordering Scheme



1 SERIES
1M1 Miniature Rocker Switch

2 POLES
SP single pole - uses terminals 1, 2 & 3.
DP double pole uses terminals 1,2, 3, 4, 5 & 6.
3P double pole uses terminals 1,2, 3, 4, 5, 6, 7, 8 & 9.
4P double pole uses terminals 1,2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.

3 CIRCUIT
 () - momentary

Switching Position:
 2-3, 5-6, 8-9, 11-12 OPEN 2-1, 5-4, 8-7, 11-10

1	ON	NONE	ON
2	ON	NONE	(ON)
3	ON	OFF	ON
4	(ON)	OFF	(ON)
5	ON	OFF	(ON)

4 ACTUATOR STYLE

R1	Small rocker	R5	Large rocker
R2	Small paddle	R6	Rocker & frame
R3	Medium rocker	R7	Paddle & frame
R4	Large paddle	R8	Rocker w/out frame
		R9	Paddle w/out frame

5 ACTUATOR COLOR & 6 FRAME COLOR^{1,2}

1 white	4 orange	7 blue
2 black	5 yellow	8 brown
3 red	6 green	9 gray

1 Black is standard. Other colors available, consult factory for details.
 2 Selection 6 is blank if actuator style R8 or R9 (no frame)

7 TERMINATION

M1	Solder Lug	VS4	PC Mount, U bracket, .460 high
M2	PCB	VS5	PC Mount, U bracket, .630 high
M3	Quick Connect	M61	Snap-In, U bracket, 90° horizontal
M5-1	Wire Wrap .750 [19.05]	M71	Snap-In, U bracket, 90° vertical
M5-2	Wire Wrap .964 [24.48]	VS21	Snap-In, U bracket, .620 mounting x .460 high
M5-3	Wire Wrap .425 [10.80]	VS31	Snap-In, U bracket, .620 mounting x .630 high
M5-4	Wire Wrap 1.062 [26.97]	VS41	Snap-In, U bracket
M6	PC Mount, 90° horizontal	VS51	Snap-In, U bracket
M7	PC Mount, 90° vertical		
VS2	PC Mount, U bracket, .620 mounting x .460 high		
VS3	PC Mount, U bracket, .620 mounting x .630 high		

8 CONTACT

G	Material	Terminal Plating	Rating	Approvals
	silver ¹	gold over silver ²	5A@125VAC or 28VDC, 2A @ 250VAC	UL CSA
K	gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)	-
P	silver ¹	tin-lead ⁴	5A@125VAC or 28VDC, 2A @ 250VAC	UL CSA
Q	silver ¹	silver ¹	5A@125VAC or 28VDC, 2A @ 250VAC	UL CSA
R	gold ²	gold ²	0.4VA max. @20V max (AC/DC)	-

NOTE:
 Tin-lead option available with PC type terminations only.
 1 Moveable contact & terminals: copper alloy, silver plate
 2 Moveable contact & terminals: copper alloy with gold plate over nickel plate
 3 Terminals: silver plate with outer layer in gold plating
 4 Outer terminals: copper alloy with tin-lead over nickel plate

9 EPOXY SEAL
E epoxy seal

1MS-Series Ordering Scheme



1 SERIES
1MS Sealed Miniature Rocker Switch

2 POLES
SP single pole - uses terminals 1, 2 & 3.
DP double pole uses terminals 1,2, 3, 4, 5 & 6.
3P double pole uses terminals 1,2, 3, 4, 5, 6, 7, 8 & 9.

3 CIRCUIT
 () - momentary

Switching Position:
 2-3, 5-6, 8-9 OPEN 2-1, 5-4, 8-7

1	ON	NONE	ON
2	ON	NONE	(ON)
3	ON	OFF	ON
4	(ON)	OFF	(ON)
5	ON	OFF	(ON)

4 ACTUATOR STYLE

R1	Small rocker	R5	Large rocker
R2	Small paddle	R6	Rocker & frame
R3	Medium rocker	R7	Paddle & frame
R4	Large paddle	R8	Rocker w/out frame
		R9	Paddle w/out frame

5 TERMINATION

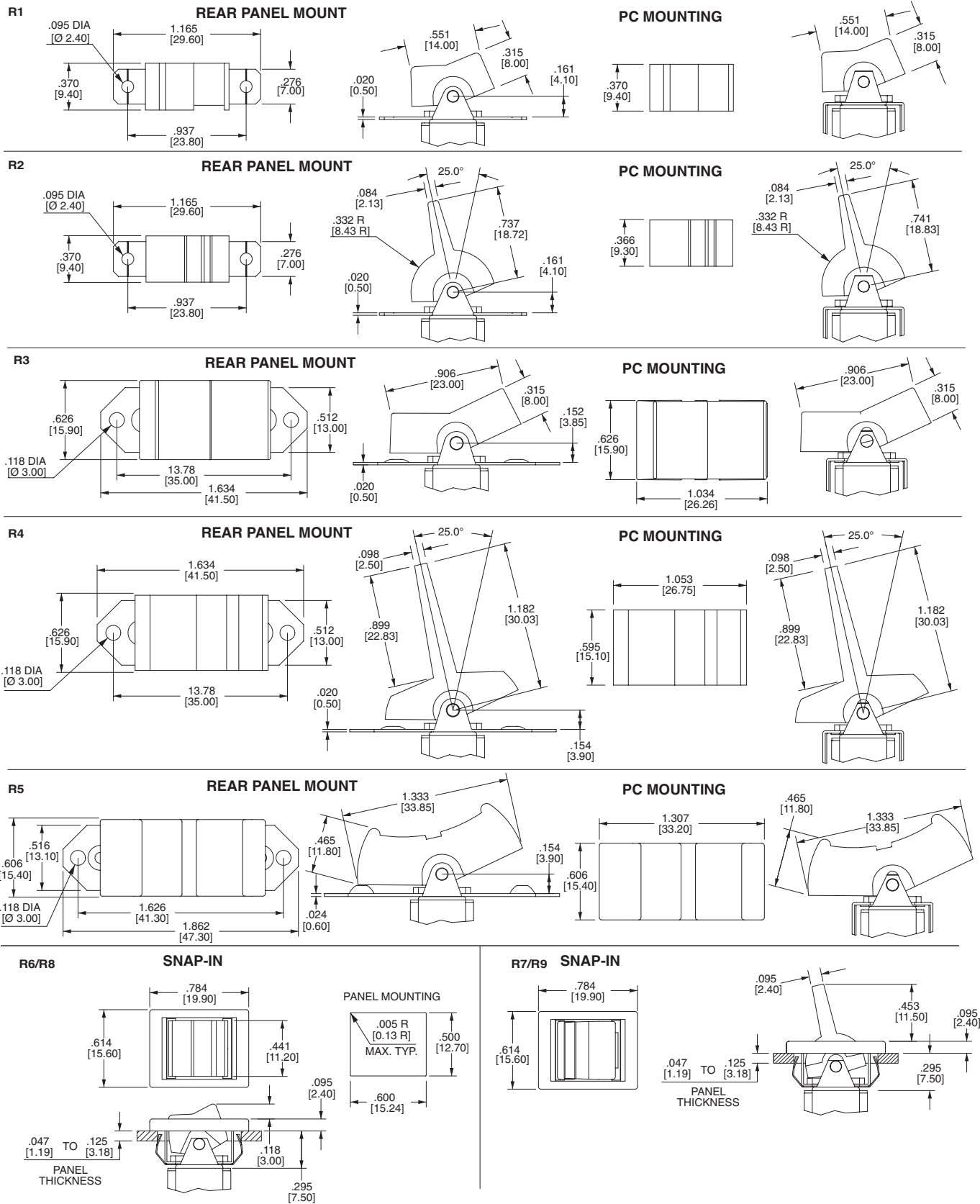
M1	Solder Lug	VS3	PC Mount, U bracket, .620 mounting x .630 high
M2	PCB	VS4	PC Mount, U bracket, .460 high
M3	Quick Connect	VS5	PC Mount, U bracket, .630 high
M5-1	Wire Wrap .750 [19.05]	VS21	Snap-In, U bracket, .620 mounting x .460 high
M5-2	Wire Wrap .964 [24.48]	VS31	Snap-In, U bracket, .620 mounting x .630 high
M5-3	Wire Wrap .425 [10.80]	VS41	Snap-In, U bracket
M5-4	Wire Wrap 1.062 [26.97]	VS51	Snap-In, U bracket
M6	PC Mount, 90° horizontal		
M7	PC Mount, 90° vertical		
VS2	PC Mount, U bracket, .620 mounting x .460 high		

6 CONTACT

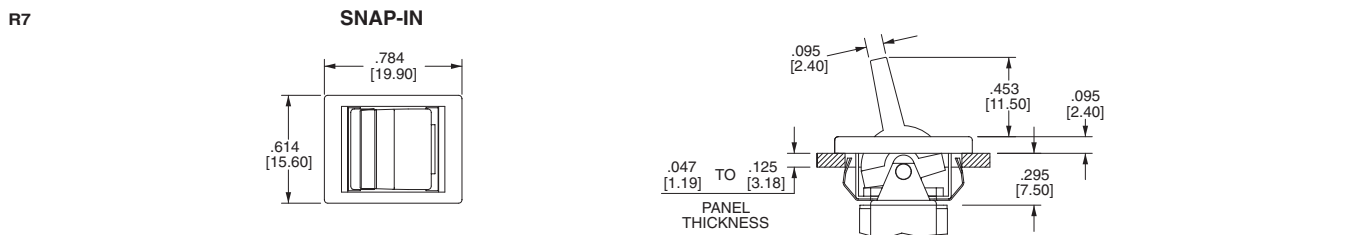
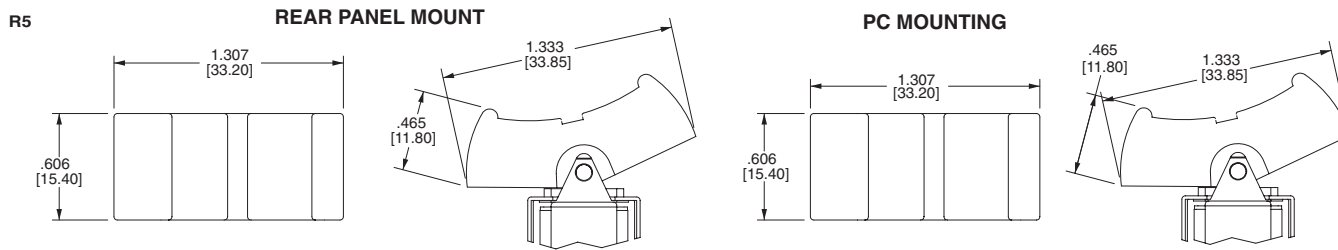
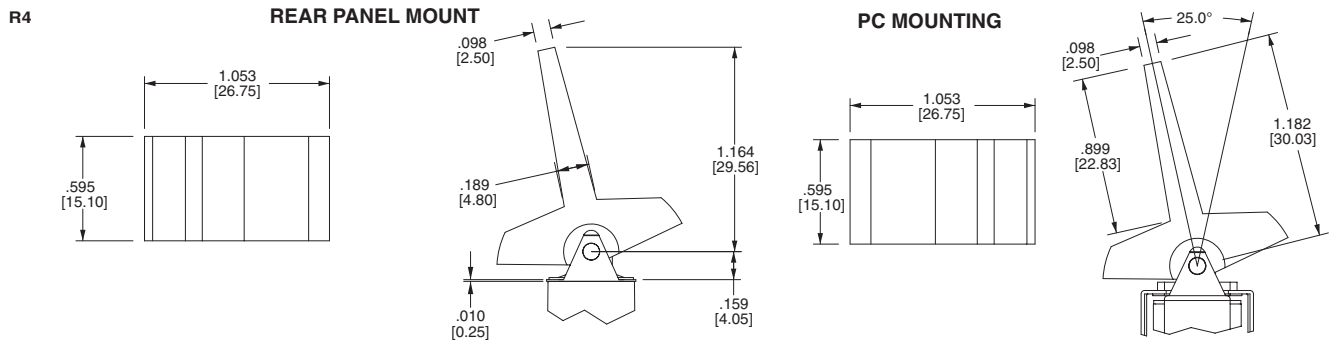
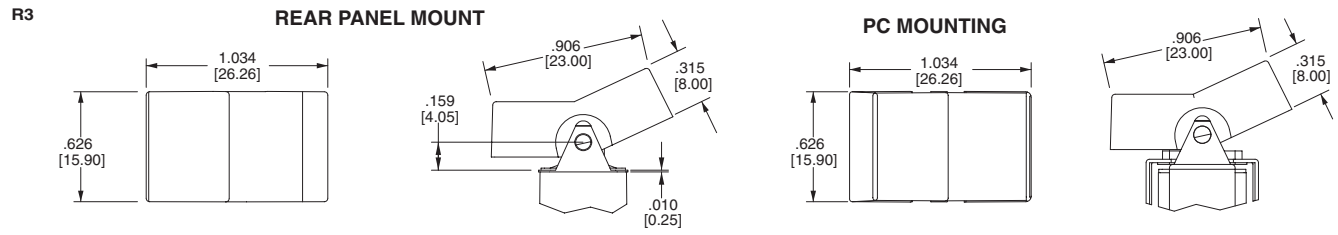
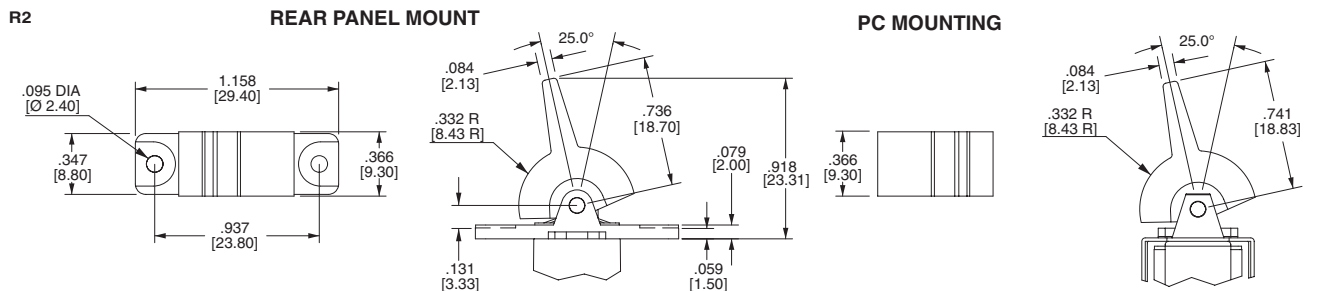
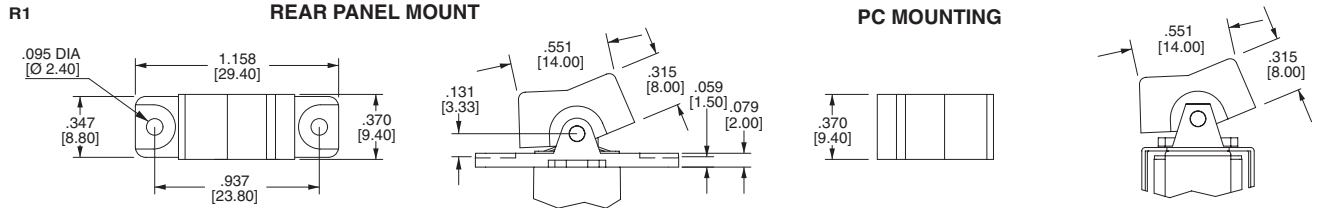
G	Material	Terminal Plating	Rating	Approvals
	silver ¹	gold over silver ²	5A@125VAC or 28VDC, 2A @ 250VAC	UL CUL
K	gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)	-
P	silver ¹	tin-lead ⁴	5A@125VAC or 28VDC, 2A @ 250VAC	UL CUL
R	gold ²	gold ²	0.4VA max. @20V max (AC/DC)	-

NOTE:
 Tin-lead option available with PC type terminations only.
 1 Moveable contact & terminals: copper alloy, silver plate
 2 Moveable contact & terminals: copper alloy with gold plate over nickel plate
 3 Terminals: silver plate with outer layer in gold plating
 4 Outer terminals: copper alloy with tin-lead over nickel plate

7 EPOXY SEAL
E epoxy seal

1M1-Series Dimensional Specifications: in.[mm]
ACTUATOR


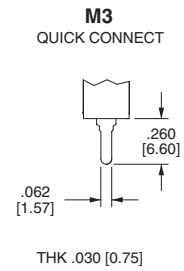
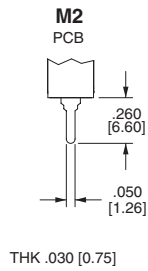
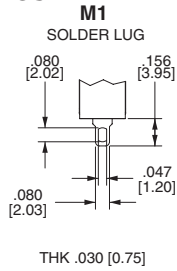
R8 and R9 are without frame. Actuators are as shown.

1MS-Series Dimensional Specifications: in.[mm]
ACTUATOR


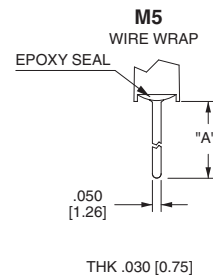
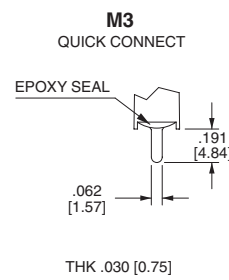
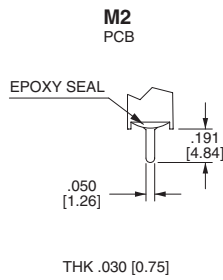
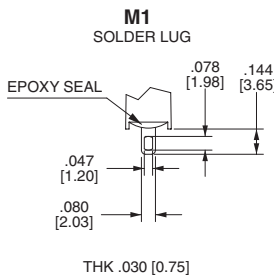
1M-Series Dimensional Specifications: in.[mm]

TERMINATION

1M1-Series



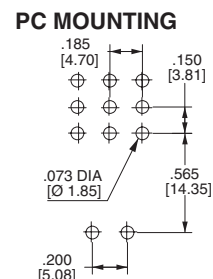
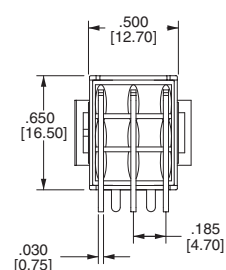
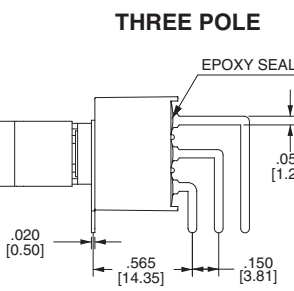
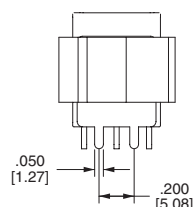
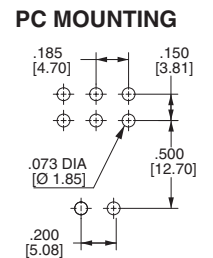
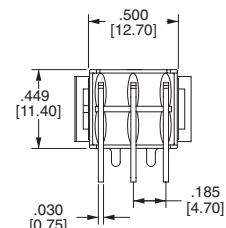
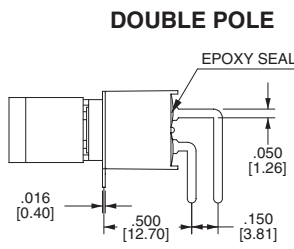
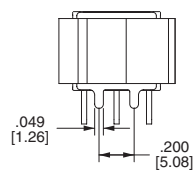
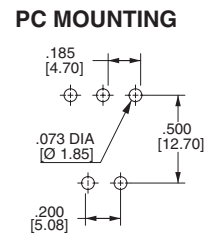
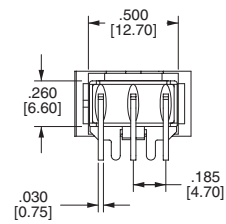
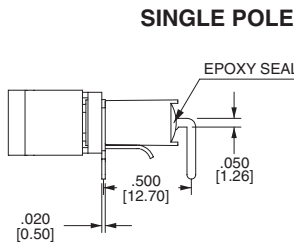
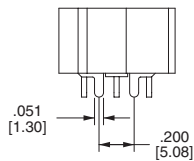
1MS-Series



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]

1M-Series

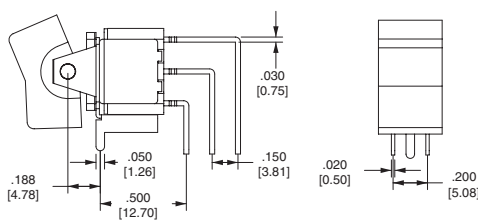
M6



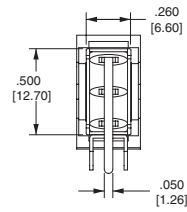
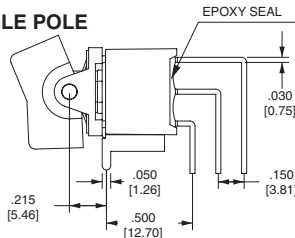
1M-Series Dimensional Specifications: in.[mm]

TERMINATION

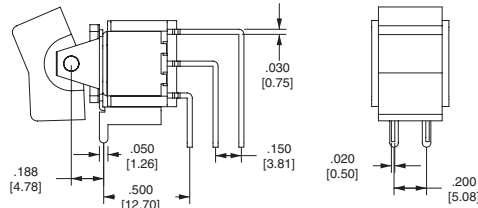
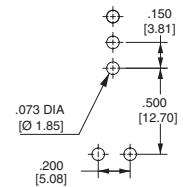
M7



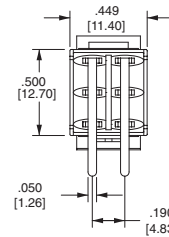
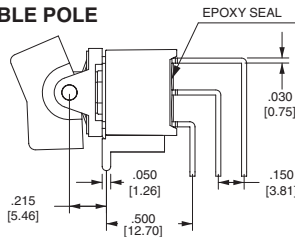
SINGLE POLE



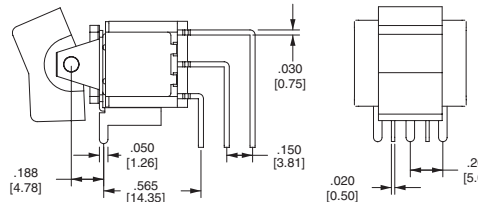
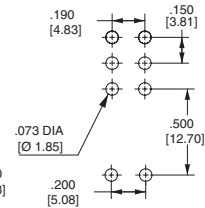
PC MOUNTING



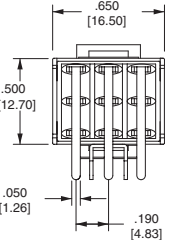
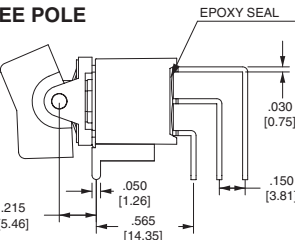
DOUBLE POLE



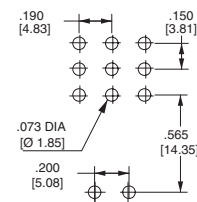
PC MOUNTING



THREE POLE

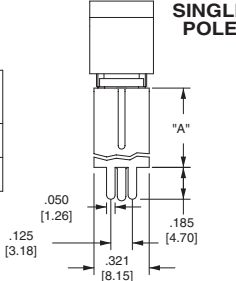


PC MOUNTING



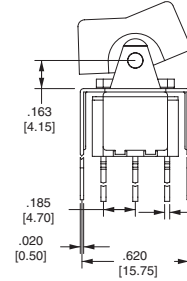
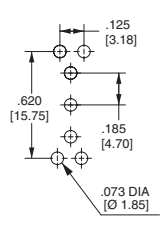
VS2 & VS3

OPTION CODE	DIM. "A"
VS2	.460 [11.68]
VS3	.630 [16.00]

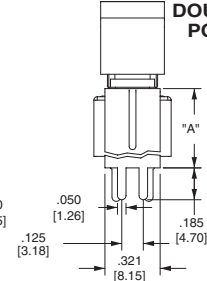


SINGLE POLE

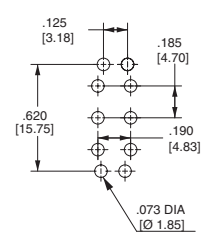
PC MOUNTING



DOUBLE POLE

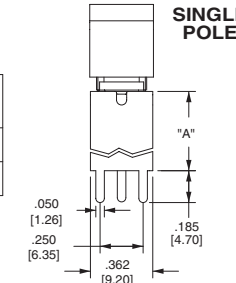


PC MOUNTING



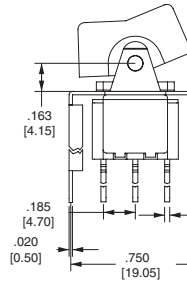
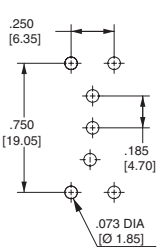
VS4 & VS5

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VS5	.630 [16.00]

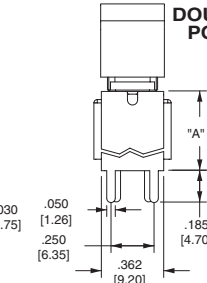


SINGLE POLE

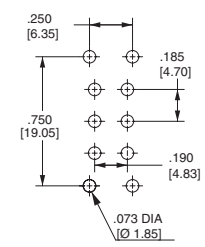
PC MOUNTING



DOUBLE POLE

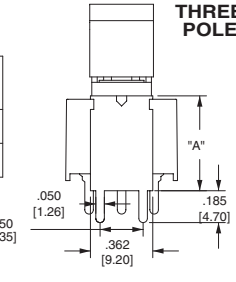


PC MOUNTING

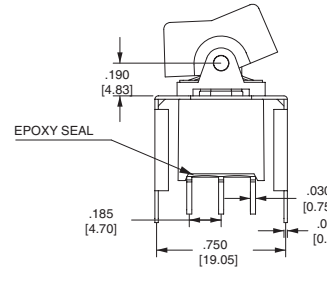


U4 & VS5

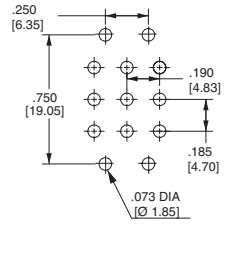
OPTION CODE	DIM. "A"
U4	.551 [14.00]
VS5	.630 [16.00]

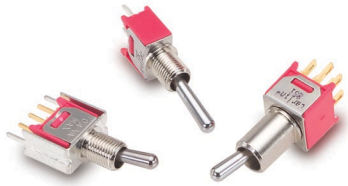


THREE POLE

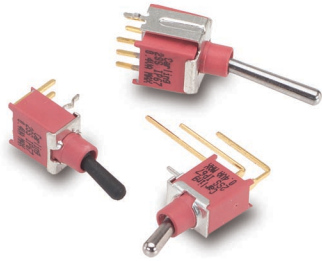


PC MOUNTING

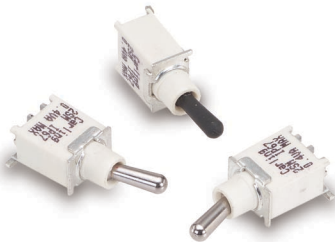




2S1-Series
Sub-Miniature Toggle Switch



2SS-Series
Sealed Sub-Miniature Toggle Switch



2SM-Series
Sealed Surface Mount Sub-Miniature Toggle Switch

2S1-Series Ordering Scheme

2S1 - MSP 1 - T1 - B4 - M6 Q E

1 Series
2 Poles
3 Circuit
4 Actuator Style
5 Bushing
6 Termination
7 Contact
8 Seal

1 SERIES
2S1 Sub-Miniature Toggle Switch

2 POLES
MSP single pole - uses terminals 1, 2 & 3.
MDP double pole uses terminals 1,2, 3, 4, 5 & 6.

3 CIRCUIT
() - momentary

	Switching Position:		
	2-3, 5-6	OPEN	2-1, 5-4
1	ON	NONE	ON
2	ON	NONE	(ON)
3	ON	OFF	ON
4	(ON)	OFF	(ON)
5	ON	OFF	(ON)

4 ACTUATOR STYLE

T1	Round toggle .358 length	T3	Round toggle .299 length
T2	Round toggle .220 length	T4	Round toggle .433 length

5 BUSHING¹

B1	Threaded Standard, keyway	Note: 1 All Switches come with standard nut, washer and locking ring shipped bulk. B5 & B7 bushing styles use small locking ring.
B2	Non-Threaded Standard, keyway	
B3	Threaded Short, keyway	
B4	Non-Threaded Short, keyway	
B5	High Torque, 7.5mm, flat	
B6	High Torque, 8.0mm, keyway	
B7	Long threaded	
B8	Metric	

Specifications

Contact Rating refer to ordering scheme
 Electrical Life 30,000 make & break cycles @ full load
 Contact Resistance. 20 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
 Operating Temperature -30°C to +85°C
 Index of Protection **2SS & 2SM-Series:** IP67
 Solder Heat Resistance. MIL-STD-202, Method 210
 Actuator Travel 25°

Materials

Case all UL 94 V-0
2S1-Series: Diallyl phthalate (DAP)
2SS-Series: Glass filled nylon 6/6, flame retardant, heat stabilized
2SM-Series: Glass filled nylon 4/6, flame retardant, heat stabilized
 Toggle. 2S1-Series: Brass, chrome plated.
2SS & 2SM-Series: Brass, chrome plated or nylon, internal o-ring sealed
 Bushing 2S1-Series: Brass, nickel plated
2SS-Series: Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0)
2SM-Series: Glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0)
 Housing. Stainless Steel
 Switch Support Brass, tin plated
 Terminal Seal Epoxy

6 TERMINATION

M1	Solder Lug
M2	PCB
M6	PC Mount, 90° horizontal
M7	PC Mount, 90° vertical
VS2	PC Mount, U bracket, .620 mounting x .460 high
VS3	PC Mount, U bracket, .620 mounting x .630 high
VS21	Snap-In, U bracket

7 CONTACT

	Material	Terminal Plating	Rating	Approvals
G	silver ¹	gold over silver ³	3A@125VAC or 28VDC, 1.5A @ 250VAC	UL CSA
K	gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)	-
P	silver ¹	tin-lead ⁴	3A@125VAC or 28VDC, 1.5A @ 250VAC	UL CSA
Q	silver ¹	silver ¹	3A@125VAC or 28VDC, 1.5A @ 250VAC	UL CSA
R	gold ²	gold ²	0.4VA max. @20V max (AC/DC)	-

NOTE:
 Tin-lead option available with PC type terminations only.
 1 Moveable contact & terminals: copper alloy, silver plate
 2 Moveable contact & terminals: copper alloy with gold plated over nickel plate
 3 Terminals: silver plate with outer layer in gold plating
 4 Outer terminals: copper alloy with tin-lead over nickel plate

8 EPOXY SEAL
E epoxy seal

2SS-Series Ordering Scheme



1 SERIES
2SS Sealed Sub-Miniature Toggle Switch

2 POLES
MSP single pole - uses terminals 1, 2 & 3.
MDP double pole uses terminals 1,2, 3, 4, 5 & 6.

3 CIRCUIT
 () - momentary

Switching Position:			
2-3, 5-6			
1	ON	OPEN	2-1, 5-4
2	ON	NONE	ON
3	ON	NONE	(ON)
4	(ON)	OFF	ON
5	ON	OFF	(ON)

4 ACTUATOR STYLE

T1 Round toggle .358 length	P1 ESD resistant plastic toggle .421 length
T2 Round toggle .220 length	P2 ESD resistant plastic toggle .272 length
T3 Round toggle .299 length	
T4 Round toggle .433 length	

5 BUSHING
B4 Unthreaded bushing

6 TERMINATION

M2	PCB
M6	PC Mount, 90° horizontal
M61	Snap-In PC Mount, 90° horizontal
M7	PC Mount, 90° vertical
M71	Snap-In PC Mount, 90° vertical
VS2	PC Mount, U bracket, .620 mounting x .460 high
VS21	Snap-In, U bracket

7 CONTACT

	Material	Terminal Plating	Rating	
G	silver ¹	gold over silver ³	3A@125VAC or 28VDC, 1.5A @ 250VAC	IP67
K	gold ²	tin-lead plated ⁴	0.4VA max. @20V max (AC/DC)	IP67
P	silver ¹	tin-lead plated ⁴	3A@125VAC or 28VDC, 1.5A @ 250VAC	IP67
R	gold ²	gold plated ²	0.4VA max. @20V max (AC/DC)	IP67

NOTE:
 Tin-lead option available with PC type terminations only.
 1 Moveable contact & terminals: copper alloy, silver plate
 2 Moveable contact & terminals: copper alloy with gold plate over nickel plate
 3 Terminals: silver plate with outer layer in gold plating
 4 Outer terminals: copper alloy with tin-lead over nickel plate

8 EPOXY SEAL
E epoxy seal

2SM-Series Ordering Scheme



1 SERIES
2SM Sealed Surface Mount Sub-Miniature Toggle Switch

2 POLES
MSP single pole - uses terminals 1, 2 & 3.

3 CIRCUIT
 () - momentary

Switching Position:			
2-3			
1	ON	OPEN	2-1
2	ON	NONE	ON
3	ON	NONE	(ON)
4	(ON)	OFF	ON
5	ON	OFF	(ON)

4 ACTUATOR STYLE

T1 Round toggle .358 length	P1 ESD resistant plastic toggle .421 length
T2 Round toggle .220 length	P2 ESD resistant plastic toggle .272 length

5 TERMINATION

M6	Surface Mount, 90° flat
M7	Surface Mount, 90° vertical
S6	Surface Mount, 90° horizontal

6 CONTACT

	Material	Terminal Plating	Rating	
G	silver ¹	gold over silver ³	3A@125VAC or 28VDC, 1.5A @ 250VAC	IP67
K	gold ²	tin-lead plated ⁴	0.4VA max. @20V max (AC/DC)	IP67
P	silver ¹	tin-lead plated ⁴	3A@125VAC or 28VDC, 1.5A @ 250VAC	IP67
R	gold ²	gold plated ²	0.4VA max. @20V max (AC/DC)	IP67

NOTE:
 Tin-lead option available with PC type terminations only.
 1 Moveable contact & terminals: copper alloy, silver plate
 2 Moveable contact & terminals: copper alloy with gold plate over nickel plate
 3 Terminals: silver plate with outer layer in gold plating
 4 Outer terminals: copper alloy with tin-lead over nickel plate

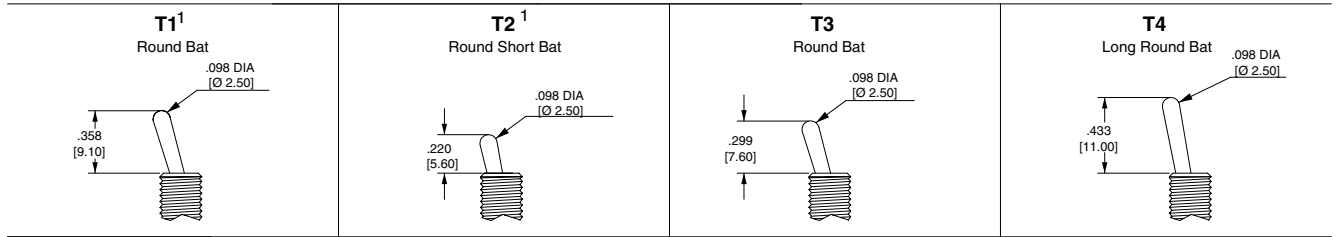
7 EPOXY SEAL
E epoxy seal

8 PACKAGING
 Switches are bulk packed, unless **T/R** is specified at the end of the part number.
T/R tape reel - 500 pieces per reel

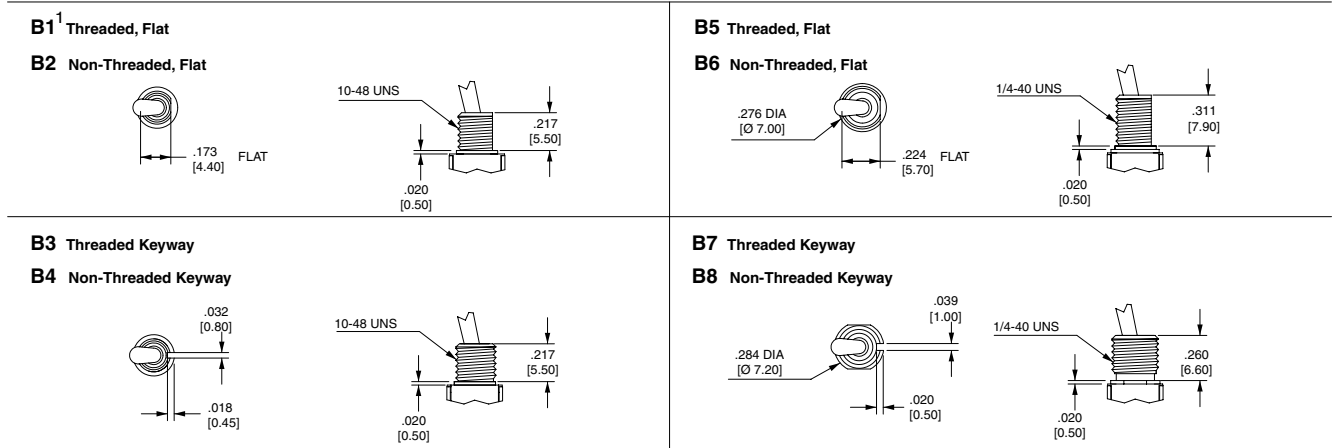
2S-Series Dimensional Specifications: in. [mm]

2S1-Series

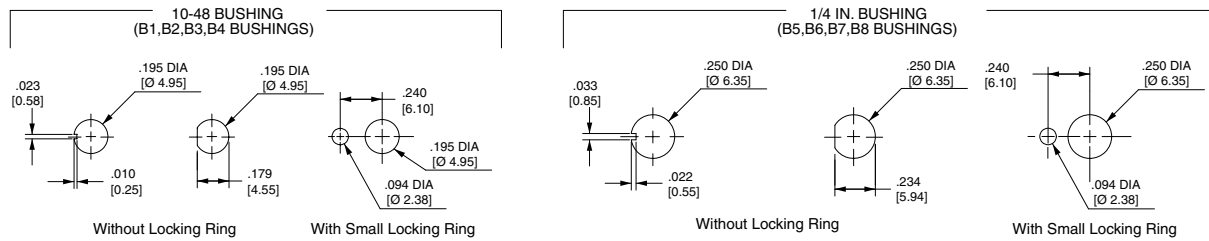
ACTUATOR



BUSHING

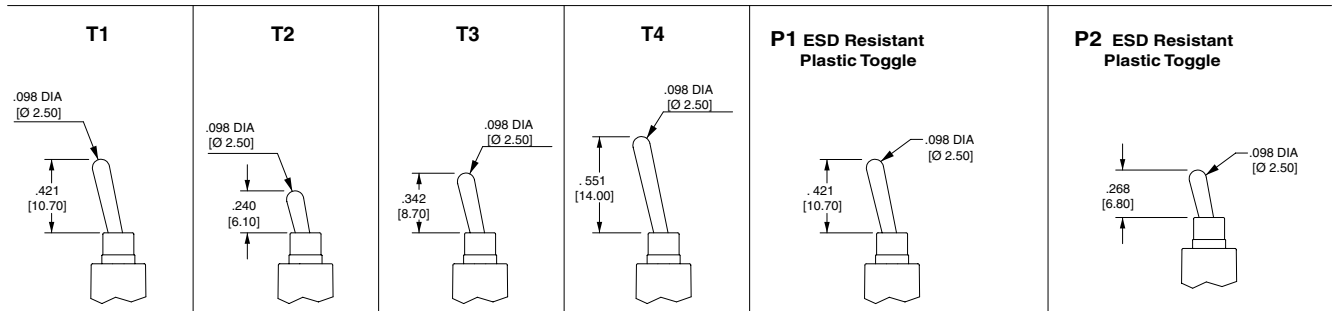


PANEL MOUNTING



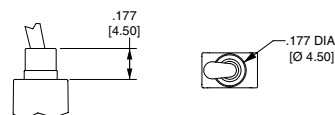
2SS-Series

ACTUATOR



BUSHING

B4

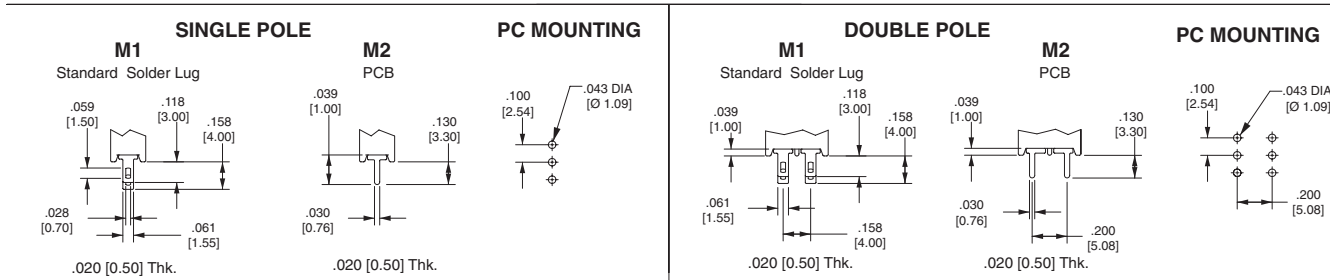


NOTE:
1 Subtract 2.55mm from toggle length for B1 bushing.

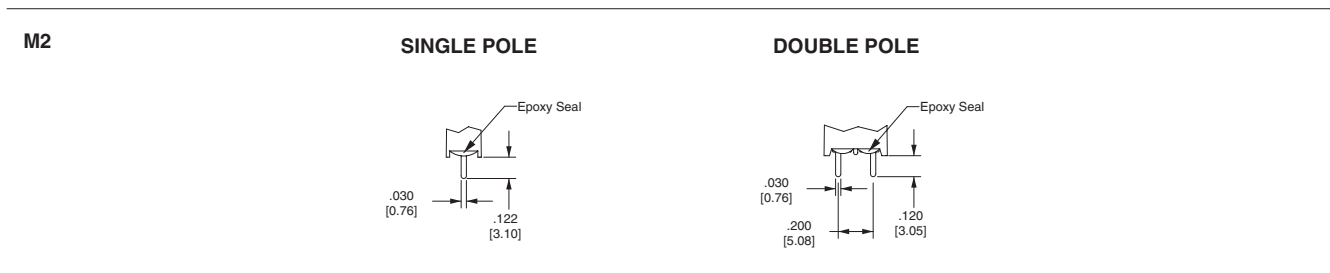
2S-Series Dimensional Specifications: in. [mm]

TERMINATION

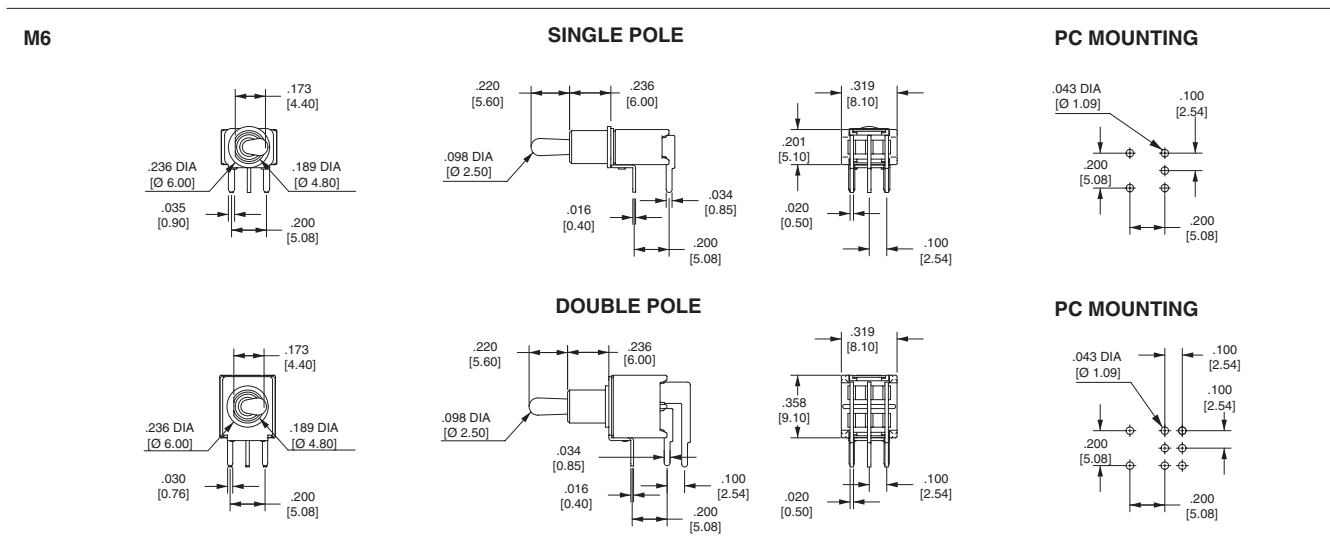
2S1-Series



2SS-Series



2S-Series



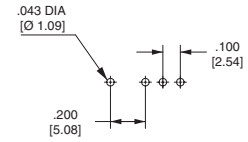
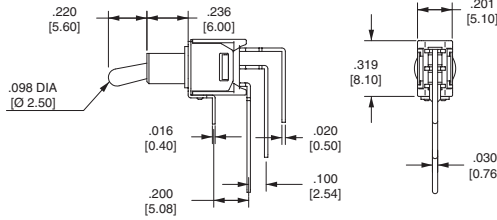
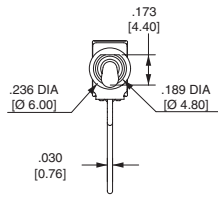
2S-Series Dimensional Specifications: in. [mm]

TERMINATION

M7

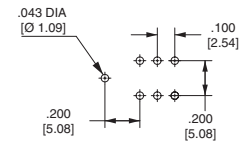
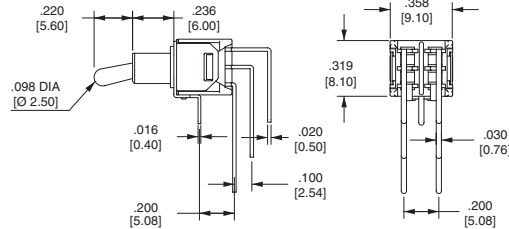
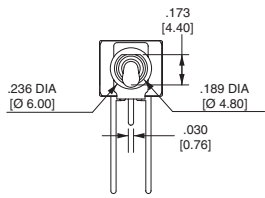
SINGLE POLE

PC MOUNTING



DOUBLE POLE

PC MOUNTING



VS2-VS3

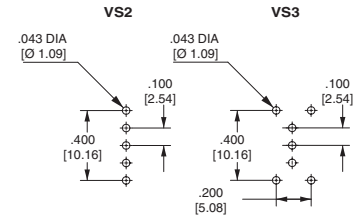
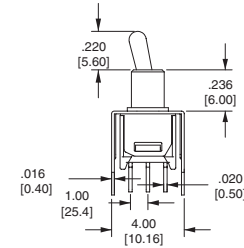
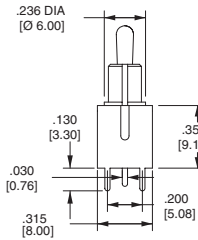
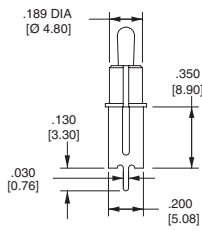
U Bracket Snap-in

VS2

VS3

SINGLE POLE

PC MOUNTING

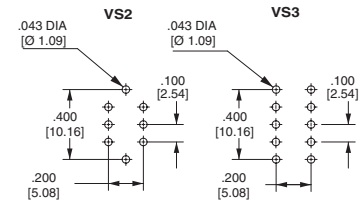
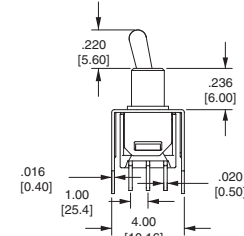
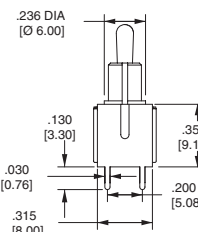
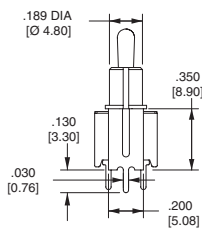


VS2

VS3

DOUBLE POLE

PC MOUNTING

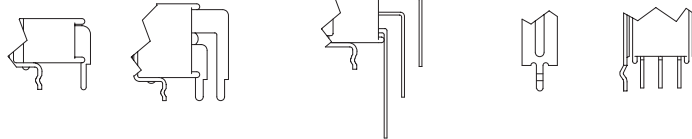


SNAP-IN TERMINATION

M61

M71

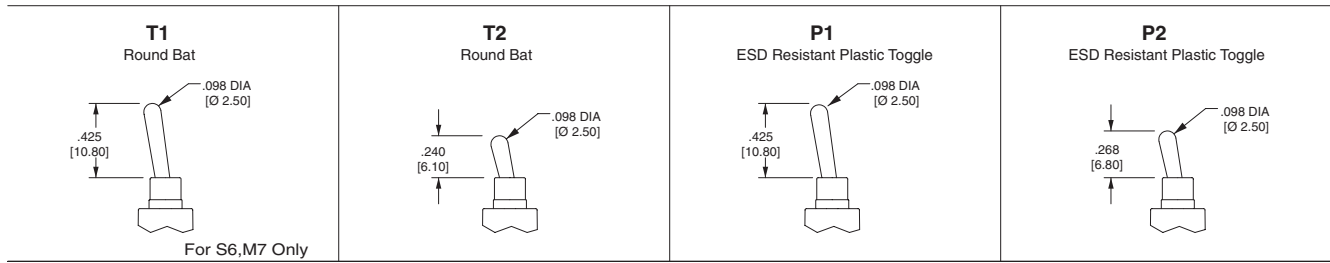
VS21



M61, M71, VS21 have the same P.C. mounting but with snap-in bracket.

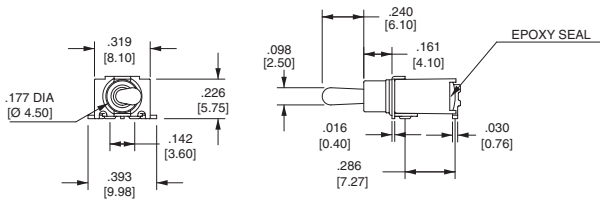
2SM-Series Dimensional Specifications: in. [mm]

ACTUATOR

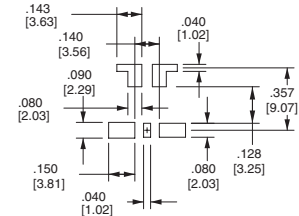


TERMINATION

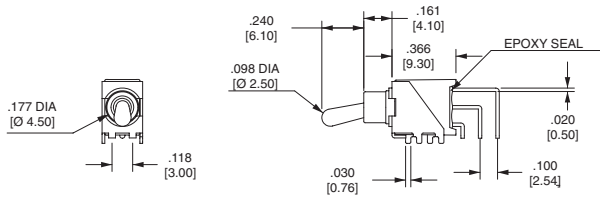
M6
90° Horizontal



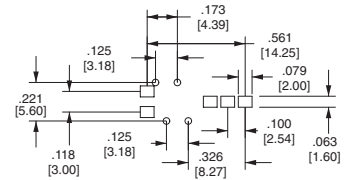
PC MOUNTING



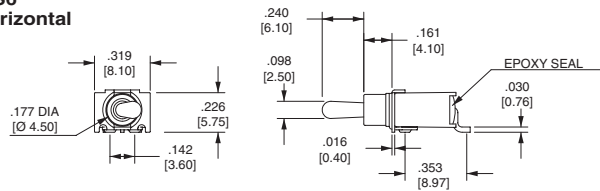
M7
90° Vertical



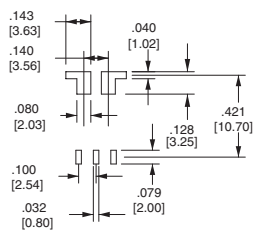
PC MOUNTING



S6
90° Horizontal

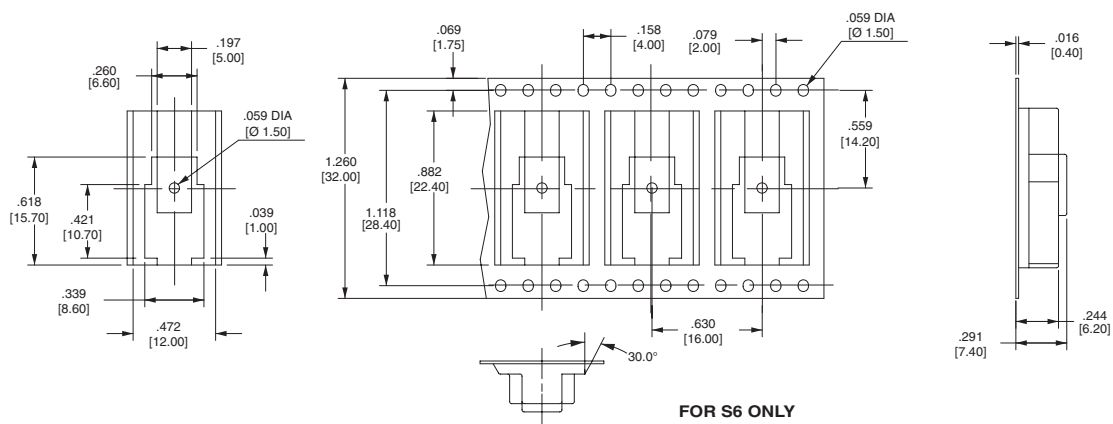
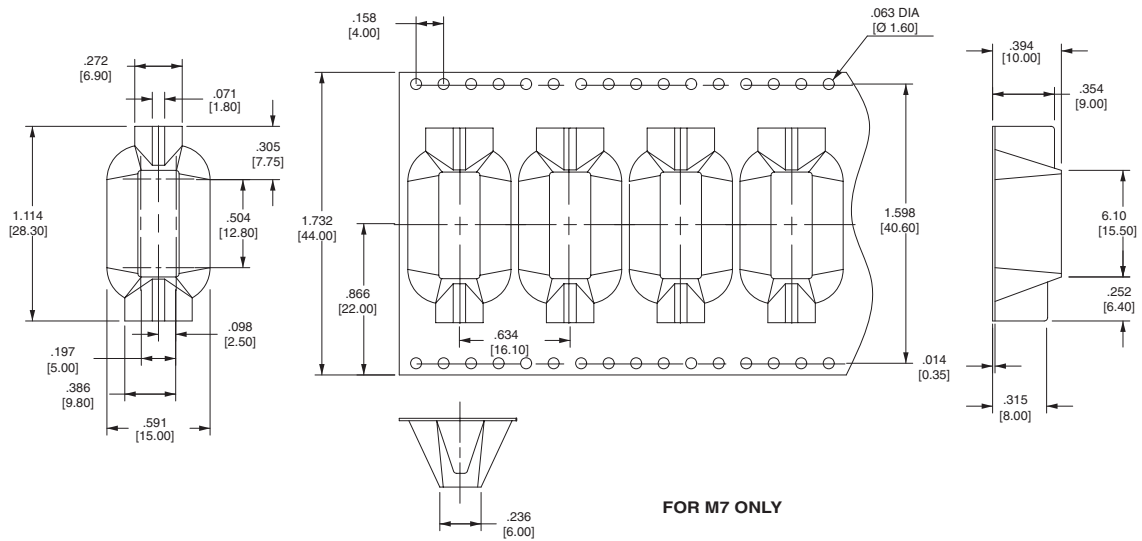
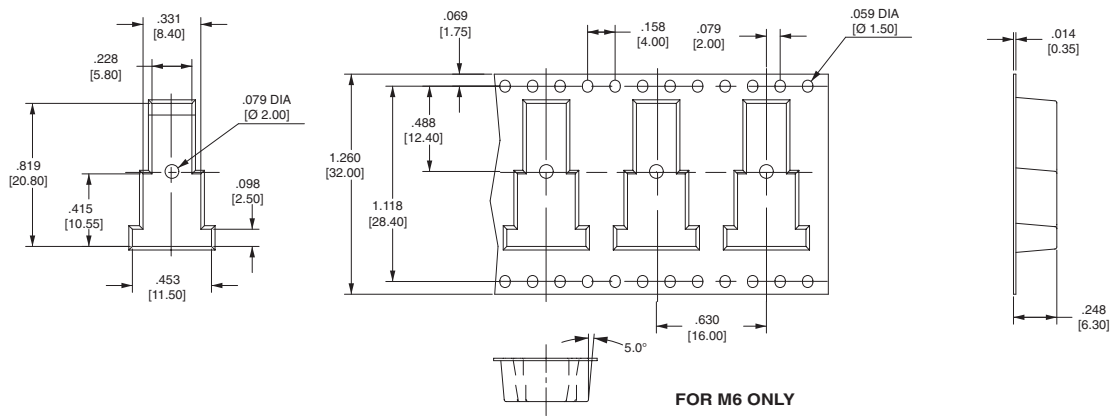


PC MOUNTING



2SM-Series Dimensional Specifications: in. [mm]

REEL TAPING





2M1-Series
Miniature Toggle Switch

2MS-Series
Sealed Nylon
Miniature Toggle Switch

2M2-Series
Nylon Miniature Toggle Switch

Specifications

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

Materials
 Case **2M1-Series:** Diallyl phthalate (DAP) (UL 94V-0)
2MS & 2M2-Series: Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0)
 Toggle. **2M1-Series:** Brass, chrome plated.
2MS & 2M2-Series: Brass, chrome plated, internal o-ring sealed
 Bushing **2M1-Series:** Brass, nickel plated
2MS & 2M2-Series: Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0)
 Housing. Stainless Steel
 Switch Support Brass, tin plated
 Terminal Seal Epoxy

2M1-Series Accessories

To order accessories assembled on a switch, specify the switch number followed by the accessory part number and the word "assembled".
 Ex: 2M1-SP1-T1-B1-M1QE-T12ASSEMBLED
 To order accessories in bulk, specify the Series, followed by the accessory. Ex.) 2M1-T12.

Optional Toggle Cap

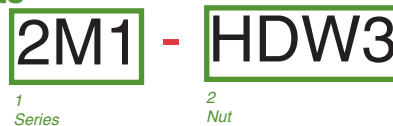


1 SERIES OR SWITCH CATALOG NUMBER 2M1, 2MS or 2M2	
2 TOGGLE CAP SIZE	
T1 10.6mm	T2 7.6mm

3 CAP COLOR¹					
1	white	3	red	6	green
2	black	5	yellow	7	blue

NOTE
 1 Black, white & red are standard. Additional colors available. Consult factory.

Optional Dress and Knurled Nuts



1 SERIES OR SWITCH CATALOG NUMBER 2M1, 2MS or 2M2

2 NUT	
HDW3	dress nut for 1/4" bushing
HDW5	knurled nut for 15/32" bushing (2M1-Series only)

Optional Rubber Hood



1 SERIES OR SWITCH CATALOG NUMBER 2M1, 2MS or 2M2

2 RUBBER HOOD	
E1A	rubber hood sealing (for all bushings except B0).

2M1-Series Ordering Scheme

1 SERIES
2M1 Miniature Toggle Switch

2 POLES

SP single pole - uses terminals 1, 2 & 3.
DP double pole uses terminals 1,2, 3, 4, 5 & 6.
3P three pole uses terminals 1, 2, 3, 4, 5, 6, 7, 8 & 9.
4P four pole uses terminals 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 & 11.

3 CIRCUIT

() - momentary

Switching Position:

	2-3, 5-6, 8-9, 11-12	OPEN NONE OFF OFF	2-1, 5-4, 8-7, 11-10 ON (ON) ON (ON)
1	ON	NONE	ON
2	ON	NONE	(ON)
3	ON	OFF	ON
4	(ON)	OFF	(ON)
5	ON	OFF	(ON)
6'	ON	ON	ON

NOTE:

1 ON-ON-ON available with DP and 4P switches only.

4 ACTUATOR

T1 round bat	T8 extra-large bat (with B0 bushing)
T2 round short bat	T9 black plastic
T3 paddle	T0 rectangular
T4 medium paddle	TA locking lever
T5 long paddle	TI locking lever
T6 flat (with B1, B2 or B5 bushing)	TL locking lever
T7 large bat (with B0 bushing)	

5 BUSHING

B1	Threaded Standard, keyway
B2	Non-Threaded Standard, keyway
B3	Threaded Short, keyway
B4	Non-Threaded Short, keyway
B5	High Torque, 7.5mm, flat
B6	High Torque, 8.0mm, keyway
B7	Long threaded
B8²	Metric
B9	Splashproof
B0	15/32" Threaded (Standard for T7 and T8 actuator styles)

6 TERMINATION

M1	Solder Lug
M2	PCB
M3	Quick Connect
M5-1	Wire Wrap .750 [19.05]
M5-2	Wire Wrap [24.48]
M5-3	Wire Wrap [10.80]
M5-4	Wire Wrap [26.97]
M6	PC Mount, 90° horizontal
M7	PC Mount, 90° vertical
VS2	PC Mount, U bracket, .620 mounting x .460 high
VS3	PC Mount, U bracket, .620 mounting x .630 high
VS4	PC Mount, U bracket, .750 mounting x .460 high
VS5	PC Mount, U bracket, .750 mounting x .630 high
VS21	Snap-In, U bracket

7 CONTACT

	Material	Terminal Plating	Rating	Approvals
G	silver ¹	gold over silver ²	5A @ 125VAC or 28VDC, 2A @ 250VAC	UL CSA
K	gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)	-
P	silver ¹	tin-lead ⁴	5A @ 125VAC or 28VDC, 2A @ 250VAC	UL CSA
Q	silver ¹	silver ¹	5A @ 125VAC or 28VDC, 2A @ 250VAC	UL CSA
R	gold ²	gold ²	0.4VA max. @20V max (AC/DC)	-

NOTE:

Tin-lead option available with PC type terminations only.

- 1 Moveable contact & terminals: copper alloy, silver plate
- 2 Moveable contact & terminals: copper alloy with gold plate over nickel plate
- 3 Terminals: silver plate with outer layer in gold plating
- 4 Outer terminals: copper alloy with tin-lead over nickel plate

8 EPOXY SEAL
E epoxy seal

NOTES:

All switches come with standard nut, washer and locking ring shipped bulk.
 T7 and T8 actuator styles come with a larger nut, washer and locking ring, to accommodate the switch.
 Additional nut styles available. See page 26.
 Custom colors available, consult factory.
 Rubber seal available. Order part number E1A separately.

2MS & 2M2-Series Ordering Scheme



1 SERIES
2MS Sealed Nylon Miniature Toggle Switch
2M2 Nylon 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

	Switching Position:		
	2-3, 5-6, 8-9	OPEN	2-1, 5-4, 8-7
1	ON	NONE	ON
2	ON	NONE	(ON)
3	ON	OFF	ON
4	(ON)	OFF	(ON)
5	ON	OFF	(ON)

4 ACTUATOR STYLE
T1 round bat
T2 round short bat
T9 long black plastic

5 BUSHING
B1 Threaded Standard, keyway for ST, PC termination
B4 Non-Threaded Short, keyway for H9, V9 termination

6 TERMINATION

M1	Solder Lug
M2	PCB
M3	Quick Connect
M6	PC Mount, 90° horizontal
M7	PC Mount, 90° vertical
VS2	PC Mount, U bracket, .620 mounting x .460 high
VS3	PC Mount, U bracket, .620 mounting x .630 high
VS4	PC Mount, U bracket, .750 mounting x .460 high
VS5	PC Mount, U bracket, .750 mounting x .630 high
VS21	Snap-In, U bracket
VS41	Snap-In, U bracket

7 CONTACT

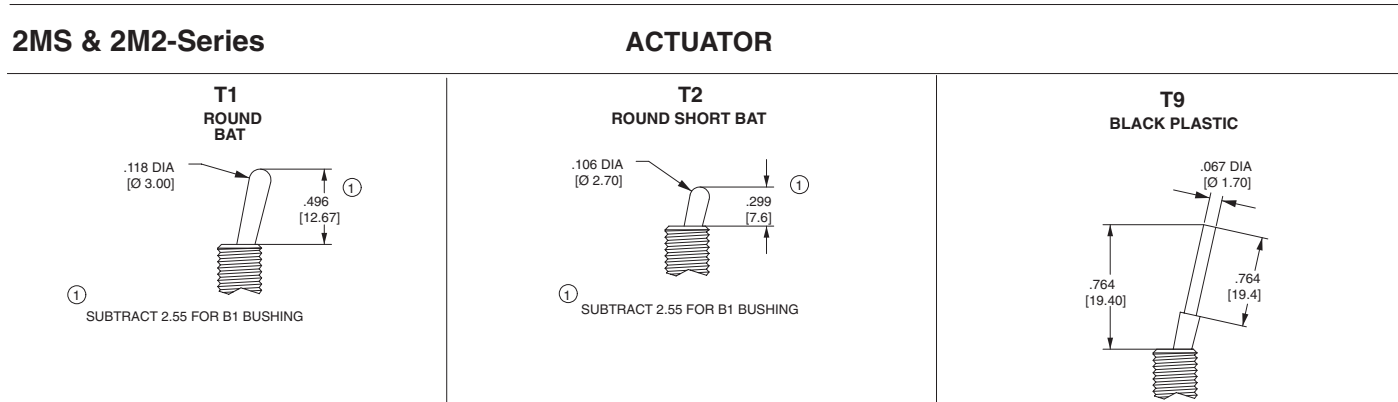
	Material	Terminal Plating	Rating	2MS-Series Approvals
G	silver ¹	gold over silver ³	5A @ 125VAC or 28VDC, 2A @ 250VAC	UL CUL IP67
K	gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)	-
P	silver ¹	tin-lead ⁴	5A @ 125VAC or 28VDC, 2A @ 250VAC	UL CUL IP67
R	gold ²	gold ²	0.4VA max. @20V max (AC/DC)	-

1 Moveable contact & terminals: copper alloy, silver plated
 2 Moveable contact & terminals: copper alloy with gold plate over nickel plated
 3 Terminals: silver plated with outer layer in gold plating
 4 Outer terminals: copper alloy with tin-lead over nickel plated

8 EPOXY SEAL
E epoxy seal

NOTE:
 All switches come with standard nut, washer and locking ring. T7 and T8 actuator styles come with a larger nut, washer and locking ring, to accommodate the switch.

2M-Series Dimensional Specifications: in. [mm]



2M-Series Dimensional Specifications: in. [mm]

2M1-Series

ACTUATOR

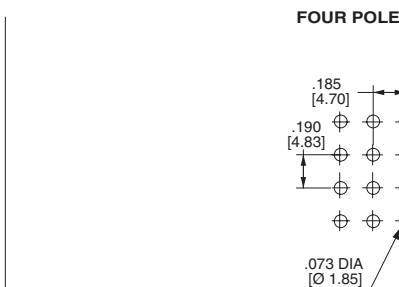
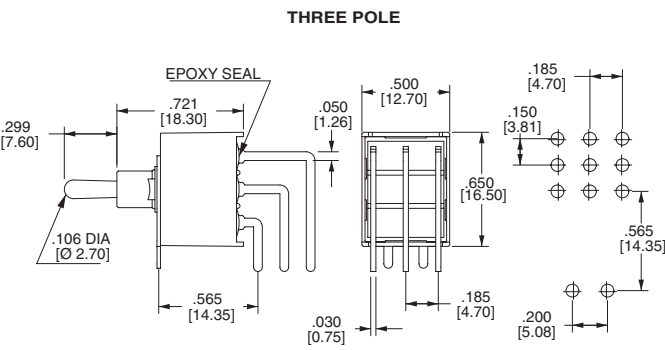
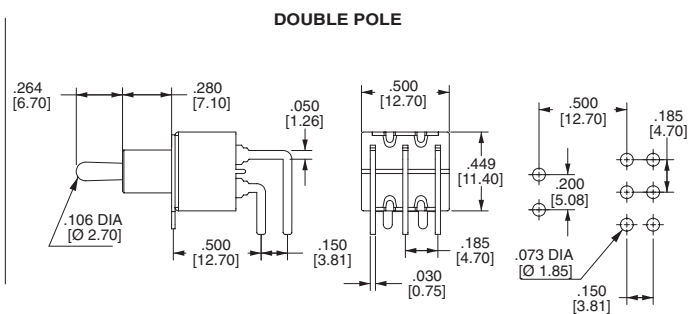
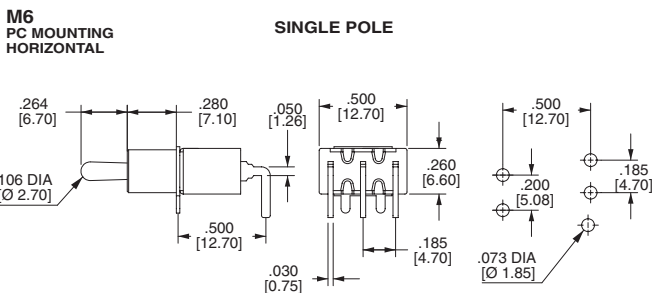
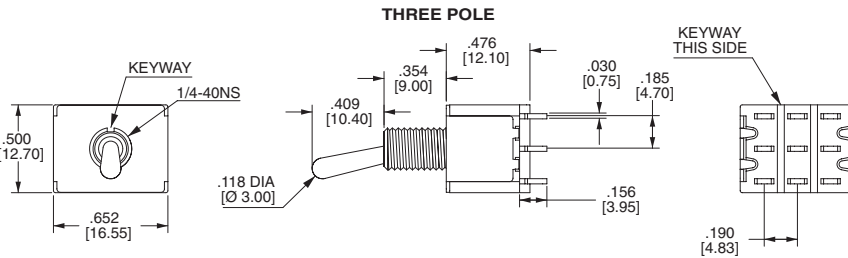
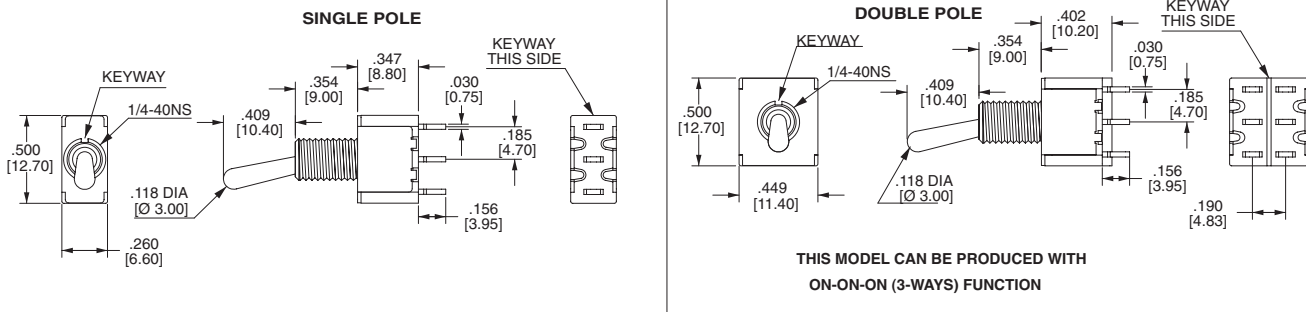
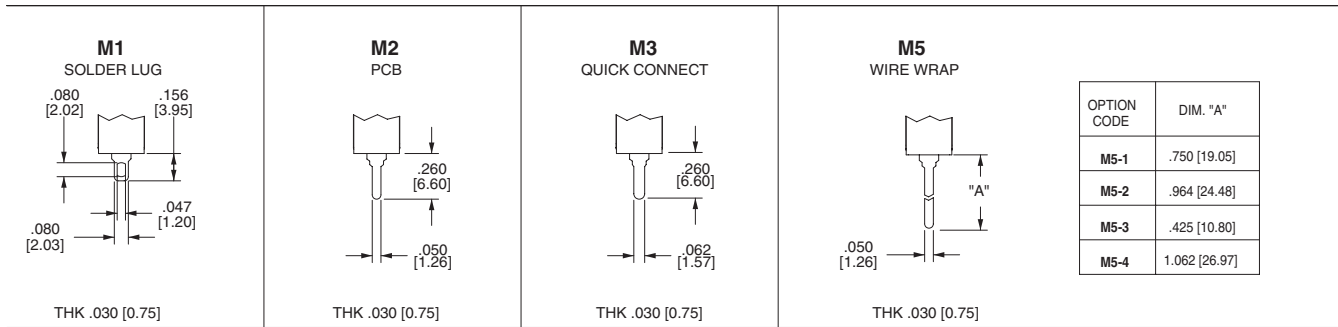
<p>T1 ROUND BAT</p> <p>DIMENSION = .461 [11.70] WITH NON THREADED BUSHING B4</p>	<p>T2 ROUND SHORT BAT</p> <p>DIMENSION = .264 [6.70] WITH NON THREADED BUSHING B4</p>	<p>T3 PADDLE</p> <p>DIMENSION = .134 [3.40] WITH NON THREADED BUSHING B4</p>	<p>T4 MEDIUM PADDLE</p> <p>DIMENSION = .105 [7.90] WITH NON THREADED BUSHING B4</p>	<p>T5 LONG PADDLE</p> <p>DIMENSION = .105 [7.90] WITH NON THREADED BUSHING B4</p>	
<p>T6 FLAT</p> <p>WITH BUSHING OPTIONS B1, B2, B5 ONLY</p>	<p>T7 LARGE BAT</p> <p>FOR T7, T8, ACTUATOR, BUSHING OPTION CODE IS NOT REQUIRED. ALL OTHER ACTUATOR LENGTHS SHOWN WITH BUSHING B1.</p>	<p>T8 EXTRA LARGE BAT</p> <p>FOR T7, T8, ACTUATOR, BUSHING OPTION CODE IS NOT REQUIRED. ALL OTHER ACTUATOR LENGTHS SHOWN WITH BUSHING B1.</p>	<p>T9 BLACK PLASTIC</p>	<p>T0 RECTANGULAR</p>	
<p>TA LOCKING LEVER CURVED WITH TAPERED STEM</p> <p>CIRCUIT 1 FOR SP-1, DP-1 3P-1, 4P-1 ONLY</p> <p>CIRCUIT 3 FOR SP-3, DP-3 3P-3, 4P-3 ONLY</p>		<p>TI LOCKING LEVER CURVED WITH STRAIGHT STEM</p> <p>CIRCUIT 1 FOR SP-1, DP-1 3P-1, 4P-1 ONLY</p> <p>CIRCUIT 3 FOR SP-3, DP-3 3P-3, 4P-3 ONLY</p>		<p>TL LOCKING LEVER ROUNDED WITH TAPERED STEM</p> <p>FOR SP-1, DP-1 3P-1, 4P-1 ONLY</p> <p>FOR SP-3, DP-3 3P-3, 4P-3 ONLY</p>	

BUSHING

<p>B1 STANDARD KEYWAY THREADED SHOWN</p> <p>B2 STANDARD KEYWAY NON-THREADED</p>	<p>B3 SHORT KEYWAY THREADED SHOWN</p> <p>B4 SHORT KEYWAY NON-THREADED</p>	<p>B5 7.5mm FLAT HIGH TORQUE</p>	<p>B6 8.0mm FLAT HIGH TORQUE</p>	
<p>B7 LONG THREADED</p>	<p>B8 METRIC</p>	<p>K1 METRIC BOOT</p>	<p>B9 SPLASH-PROOF</p>	<p>B0 15/32" THREADED BUSHING</p> <p>FOR T7, T8, ACTUATOR, BUSHING OPTION CODE IS NOT REQUIRED. ALL OTHER ACTUATOR LENGTHS SHOWN WITH BUSHING B1.</p>

2M-Series Dimensional Specifications: in. [mm]

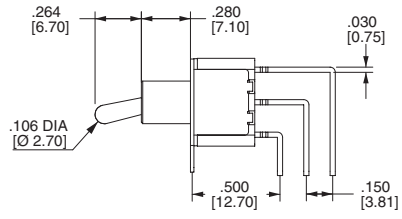
TERMINATION



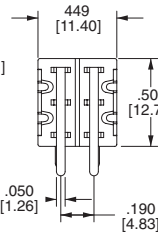
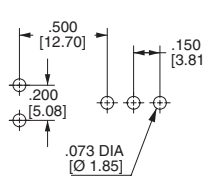
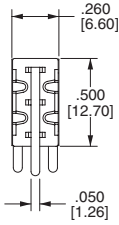
2M-Series Dimensional Specifications: in. [mm]

TERMINATION

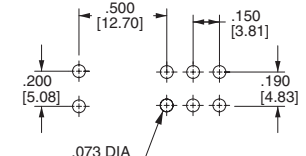
M7
SINGLE POLE & DOUBLE POLE
PC MOUNT VERTICAL



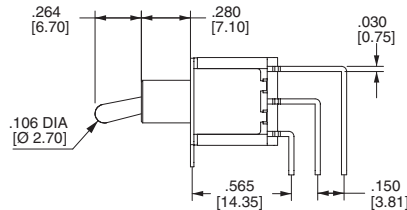
SINGLE POLE



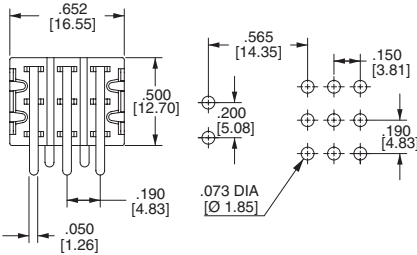
DOUBLE POLE



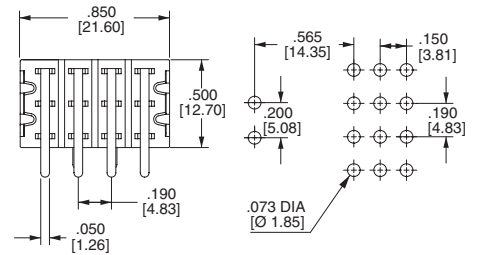
PC MOUNT VERTICAL



THREE POLE

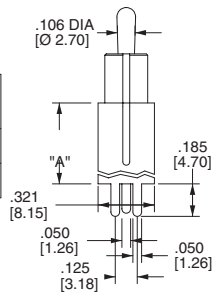


FOUR POLE

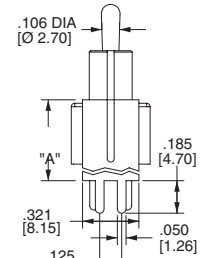
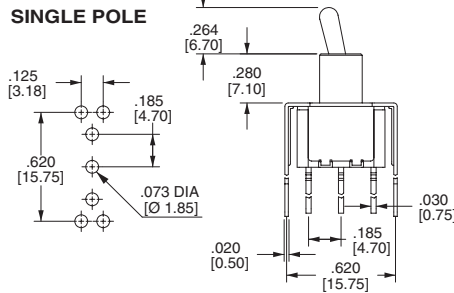


VS2 & VS3
"U" BRACKET
PC MOUNT

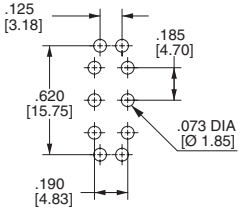
OPTION CODE	DIM. "A"
VS2	.460 [11.68]
VS3	.630 [16.00]



SINGLE POLE

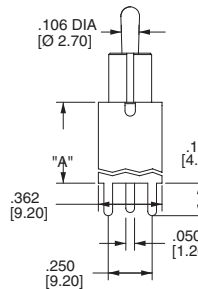


DOUBLE POLE

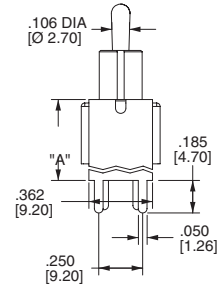
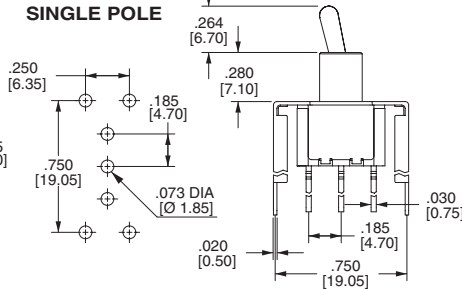


VS4 & VS5
"U" BRACKET
PC MOUNT

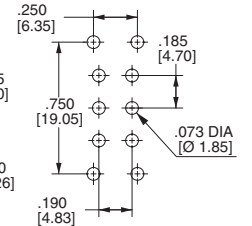
OPTION CODE	DIM. "A"
VS4	.460 [11.68]
VS5	.630 [16.00]



SINGLE POLE

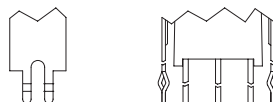


DOUBLE POLE



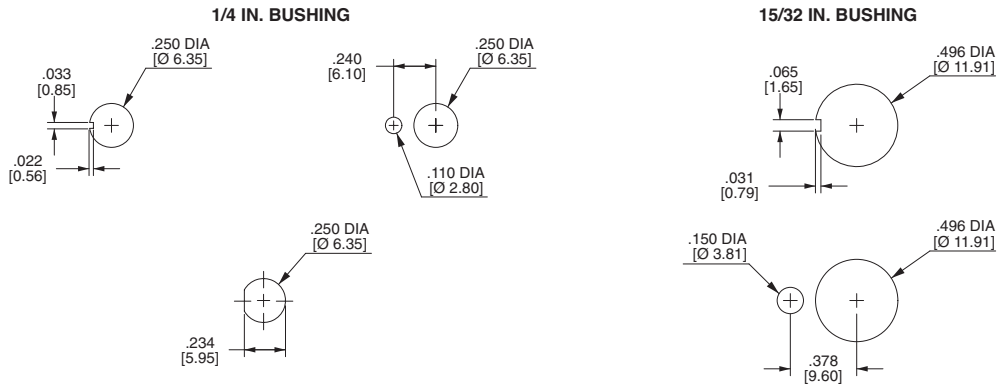
SNAP-IN TERMINATION OPTIONS

VS21
SNAP-IN, WITH BRACKET
(Same Mounting Pattern as VS2)

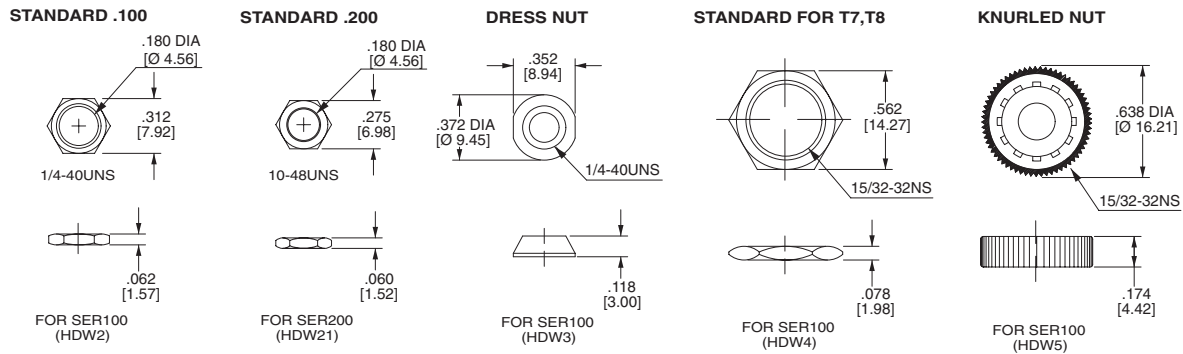


2M-Series Dimensional Specifications: in. [mm]

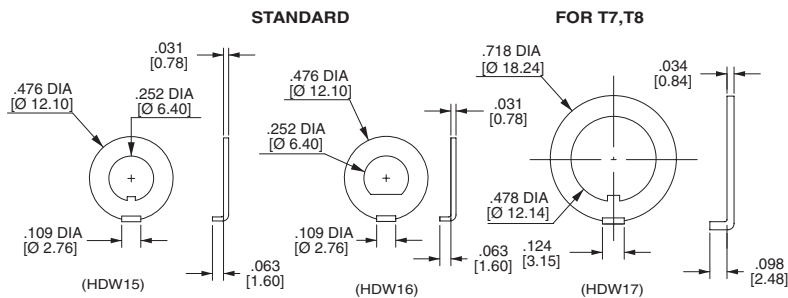
PANEL MOUNTING



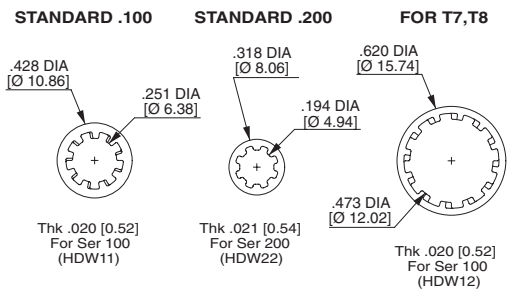
NUT



LOCKING RING

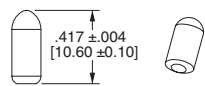


LOCK WASHER

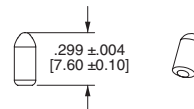


TOGGLE CAPS

T1

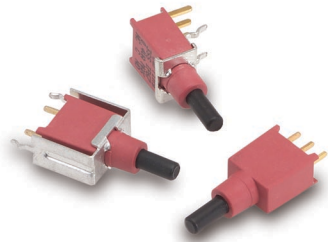


T2

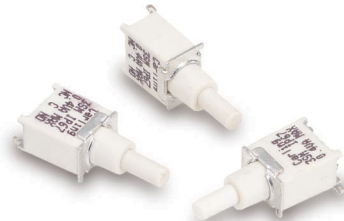




3S1-Series
Sub-Miniature
Pushbutton Switch



3SS-Series
Sealed Sub-Miniature
Pushbutton Switch



3SM-Series
Sealed Surface
Mount Sub-Miniature
Pushbutton Switch

Specifications

Contact Rating	refer to ordering scheme
Electrical Life	50,000 make & break cycles @ full load
Contact Resistance.	20 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
Operating Temperature	-30°C to +85°C
Index of Protection	3SS & 3SM-Series: IP67
Solder Heat Resistance.	MIL-STD-202, Method 210
Actuator Travel25°

Materials

Case	UL 94-0 <i>3S1-Series:</i> Dially phthalate (DAP) <i>3SS-Series:</i> Glass filled nylon 6/6, flame retardant, heat stabilized <i>3SM-Series:</i> Glass filled nylon 4/6, flame retardant, heat stabilized
Plunger.	<i>3S1-Series:</i> Thermoplastic polyester, black <i>3SS-Series:</i> Thermoplastic polyester (UL 94V-0), with internal o-ring seal <i>3SM-Series:</i> Glass filled nylon 4/6, flame retardant, heat stabilized
Bushing	<i>3S1-Series:</i> Brass, nickel plated <i>3SS-Series:</i> Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0) <i>3SM-Series:</i> Glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0)
Housing.	Stainless Steel
Switch Support	Brass, tin plated
Terminal Seal	Epoxy

3S1-Series Ordering Scheme



1 SERIES 3S1 Sub-Miniature Pushbutton Switch												
2 POLES SP single pole												
3 CIRCUIT () - momentary <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;">8</td> <td style="width: 40%;">ON</td> <td style="width: 50%;">(ON)</td> </tr> <tr> <td>9</td> <td>OFF</td> <td>(ON)</td> </tr> </table>	8	ON	(ON)	9	OFF	(ON)						
8	ON	(ON)										
9	OFF	(ON)										
4 BUSHING <table style="width: 100%; border: none;"> <tr><td>B5</td><td>10-48 Threaded</td></tr> <tr><td>B6</td><td>Unthreaded "D"</td></tr> <tr><td>B7</td><td>Unthreaded</td></tr> <tr><td>B8</td><td>1/4-40 Threaded "D"</td></tr> <tr><td>B9</td><td>Flush Bushing</td></tr> <tr><td>B0</td><td>1/4" Unthreaded "D"</td></tr> </table>	B5	10-48 Threaded	B6	Unthreaded "D"	B7	Unthreaded	B8	1/4-40 Threaded "D"	B9	Flush Bushing	B0	1/4" Unthreaded "D"
B5	10-48 Threaded											
B6	Unthreaded "D"											
B7	Unthreaded											
B8	1/4-40 Threaded "D"											
B9	Flush Bushing											
B0	1/4" Unthreaded "D"											

5 TERMINATION		
M1	Solder Lug	
M2	PCB	
M6	PC Mount, 90° horizontal	
M61	Snap-In, 90° horizontal	
M7	PC Mount, 90° vertical	
M71	Snap-In, 90° vertical	
VS2	PC Mount, U bracket, .620 mounting x .460 high	
VS21	Snap-In, U bracket	

6 CONTACT		
	<i>Material</i>	<i>Terminal Plating</i>
G	silver ¹	gold over silver ³
K	gold ²	tin-lead ⁴
P	silver ¹	tin-lead ⁴
Q	silver ¹	silver ¹
R	gold ²	gold ²
		<i>Rating</i>
		1A @ 125VAC or 28VDC
		0.4VA max. @ 20V max (AC/DC)
		1A @ 125VAC or 28VDC
		1A @ 125VAC or 28VDC
		0.4VA max. @ 20V max (AC/DC)

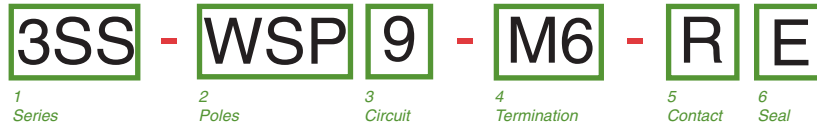
NOTE:

Tin-lead option available with PC type terminations only.

- 1 Moveable contact & terminals: copper alloy, silver plate
- 2 Moveable contact & terminals: copper alloy with gold plate over nickel plate
- 3 Terminals: silver plated with outer layer in gold plating
- 4 Outer terminals: copper alloy with tin-lead over nickel plate

7 EPOXY SEAL	
E	epoxy seal

3SS-Series Ordering Scheme



1 SERIES 3SS Sealed Sub-Miniature Pushbutton Switch														
2 POLES WSP single pole WDP double pole														
3 CIRCUIT () - momentary <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">8</td> <td style="width: 40%;">ON</td> <td style="width: 10%;"></td> <td style="width: 30%;">(ON)</td> </tr> <tr> <td>9</td> <td>OFF</td> <td></td> <td>(ON)</td> </tr> </table>	8	ON		(ON)	9	OFF		(ON)						
8	ON		(ON)											
9	OFF		(ON)											
4 TERMINATION <table style="width: 100%; border-collapse: collapse;"> <tr><td>M2</td><td>PCB</td></tr> <tr><td>M6</td><td>PC Mount, 90° horizontal</td></tr> <tr><td>M61</td><td>Snap-In, 90° horizontal</td></tr> <tr><td>M7</td><td>PC Mount, 90° vertical</td></tr> <tr><td>M71</td><td>Snap-In, 90° vertical</td></tr> <tr><td>VS2</td><td>PC Mount, U bracket</td></tr> <tr><td>VS21</td><td>Snap-In, U bracket</td></tr> </table>	M2	PCB	M6	PC Mount, 90° horizontal	M61	Snap-In, 90° horizontal	M7	PC Mount, 90° vertical	M71	Snap-In, 90° vertical	VS2	PC Mount, U bracket	VS21	Snap-In, U bracket
M2	PCB													
M6	PC Mount, 90° horizontal													
M61	Snap-In, 90° horizontal													
M7	PC Mount, 90° vertical													
M71	Snap-In, 90° vertical													
VS2	PC Mount, U bracket													
VS21	Snap-In, U bracket													

5 CONTACT <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="font-size: small;">Material</th> <th style="font-size: small;">Terminal Plating</th> <th style="font-size: small;">Rating</th> <th style="font-size: small;"></th> </tr> </thead> <tbody> <tr> <td>G silver¹</td> <td>gold over silver³</td> <td>1A@125VAC or 28VDC</td> <td>IP67</td> </tr> <tr> <td>K gold²</td> <td>tin-lead⁴</td> <td>0.4VA max. @20V max (AC/DC)</td> <td>IP67</td> </tr> <tr> <td>P silver¹</td> <td>tin-lead⁴</td> <td>1A@125VAC or 28VDC</td> <td>IP67</td> </tr> <tr> <td>R gold²</td> <td>gold²</td> <td>0.4VA max. @20V max (AC/DC)</td> <td>IP67</td> </tr> </tbody> </table> <p style="font-size: x-small; margin-top: 5px;">NOTE: Tin-lead option available with PC type terminations only.</p> <ol style="list-style-type: none"> Moveable contact & terminals: copper alloy, silver plate Moveable contact & terminals: copper alloy with gold plate over nickel plate Terminals: silver plate with outer layer in gold plating Outer terminals: copper alloy with tin-lead over nickel plate 	Material	Terminal Plating	Rating		G silver ¹	gold over silver ³	1A@125VAC or 28VDC	IP67	K gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)	IP67	P silver ¹	tin-lead ⁴	1A@125VAC or 28VDC	IP67	R gold ²	gold ²	0.4VA max. @20V max (AC/DC)	IP67
Material	Terminal Plating	Rating																		
G silver ¹	gold over silver ³	1A@125VAC or 28VDC	IP67																	
K gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)	IP67																	
P silver ¹	tin-lead ⁴	1A@125VAC or 28VDC	IP67																	
R gold ²	gold ²	0.4VA max. @20V max (AC/DC)	IP67																	
6 EPOXY SEAL E epoxy seal																				

3SM-Series Ordering Scheme



1 SERIES 3SM Sealed Surface Mount Pushbutton Switch								
2 POLES SP single pole DP double pole								
3 CIRCUIT () - momentary <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">8</td> <td style="width: 40%;">ON</td> <td style="width: 10%;"></td> <td style="width: 30%;">(ON)</td> </tr> <tr> <td>9</td> <td>OFF</td> <td></td> <td>(ON)</td> </tr> </table>	8	ON		(ON)	9	OFF		(ON)
8	ON		(ON)					
9	OFF		(ON)					
4 TERMINATION <table style="width: 100%; border-collapse: collapse;"> <tr><td>M6</td><td>Surface Mount, 90° flat</td></tr> <tr><td>M7</td><td>Surface Mount, 90° vertical</td></tr> <tr><td>S6</td><td>Surface Mount, 90° horizontal</td></tr> </table>	M6	Surface Mount, 90° flat	M7	Surface Mount, 90° vertical	S6	Surface Mount, 90° horizontal		
M6	Surface Mount, 90° flat							
M7	Surface Mount, 90° vertical							
S6	Surface Mount, 90° horizontal							

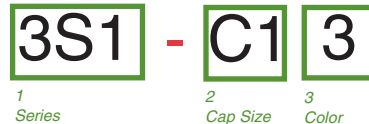
5 CONTACT <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="font-size: small;">Material</th> <th style="font-size: small;">Terminal Plating</th> <th style="font-size: small;">Rating</th> <th style="font-size: small;"></th> </tr> </thead> <tbody> <tr> <td>G silver¹</td> <td>gold over silver³</td> <td>1A@125VAC or 28VDC</td> <td>IP67</td> </tr> <tr> <td>K gold²</td> <td>tin-lead plated⁴</td> <td>0.4VA max. @20V max (AC/DC)</td> <td>IP67</td> </tr> <tr> <td>P silver¹</td> <td>tin-lead plated⁴</td> <td>1A@125VAC or 28VDC</td> <td>IP67</td> </tr> <tr> <td>R gold²</td> <td>gold plated²</td> <td>0.4VA max. @20V max (AC/DC)</td> <td>IP67</td> </tr> </tbody> </table> <p style="font-size: x-small; margin-top: 5px;">NOTE: Tin-lead option available with PC type terminations only.</p> <ol style="list-style-type: none"> Moveable contact & terminals: copper alloy, silver plate Moveable contact & terminals: copper alloy with gold plate over nickel plate Terminals: silver plate with outer layer in gold plating Outer terminals: copper alloy with tin-lead over nickel plate 	Material	Terminal Plating	Rating		G silver ¹	gold over silver ³	1A@125VAC or 28VDC	IP67	K gold ²	tin-lead plated ⁴	0.4VA max. @20V max (AC/DC)	IP67	P silver ¹	tin-lead plated ⁴	1A@125VAC or 28VDC	IP67	R gold ²	gold plated ²	0.4VA max. @20V max (AC/DC)	IP67
Material	Terminal Plating	Rating																		
G silver ¹	gold over silver ³	1A@125VAC or 28VDC	IP67																	
K gold ²	tin-lead plated ⁴	0.4VA max. @20V max (AC/DC)	IP67																	
P silver ¹	tin-lead plated ⁴	1A@125VAC or 28VDC	IP67																	
R gold ²	gold plated ²	0.4VA max. @20V max (AC/DC)	IP67																	
6 EPOXY SEAL E epoxy seal																				
7 PACKAGING Switches are bulk packed, unless T/R is specified at the end of the part number. T/R tape reel - 500 pieces per reel																				

3S-Series Optional Cap

To order accessories assembled on a switch, specify the switch number followed by the accessory part number and the word "assembled".

Ex: 3S1-SP9-B6-M7-RE-C23ASSEMBLED

To order accessories in bulk, specify the Series, followed by the accessory. Ex.) 3S1-C13



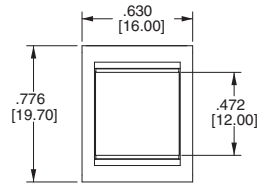
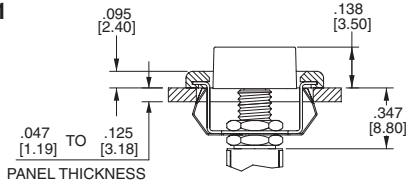
1 SERIES OR SWITCH CATALOG NUMBER 3S1, 3SS or 3SM		
2 CAP SIZE <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">C1 10.6mm</td> <td style="width: 50%;">C2 7.6mm</td> </tr> </table>	C1 10.6mm	C2 7.6mm
C1 10.6mm	C2 7.6mm	

3 CAP COLOR¹ <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">1 white</td> <td style="width: 50%;">5 yellow</td> </tr> <tr> <td>2 black</td> <td>6 green</td> </tr> <tr> <td>3 red</td> <td>7 blue</td> </tr> <tr> <td>4 orange</td> <td></td> </tr> </table>	1 white	5 yellow	2 black	6 green	3 red	7 blue	4 orange	
1 white	5 yellow							
2 black	6 green							
3 red	7 blue							
4 orange								
¹ Black, white & red standard. Other colors available. Consult factory.								

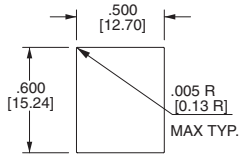
3S1-Series Dimensional Specifications: in. [mm]

ACTUATOR

OP1

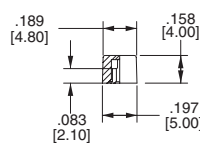


PANEL MOUNTING

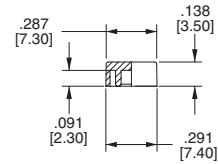


CAP

C1

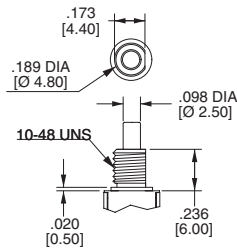


C2

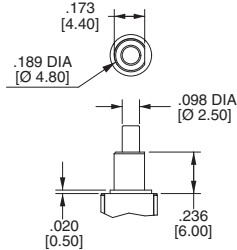


BUSHING

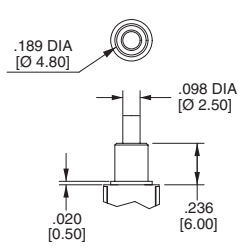
B5



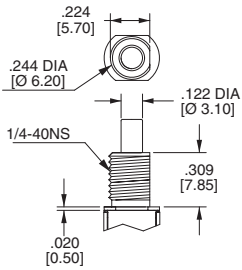
B6



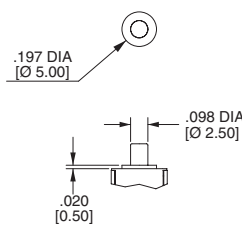
B7



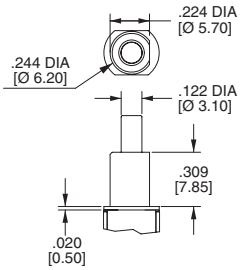
B8



B9



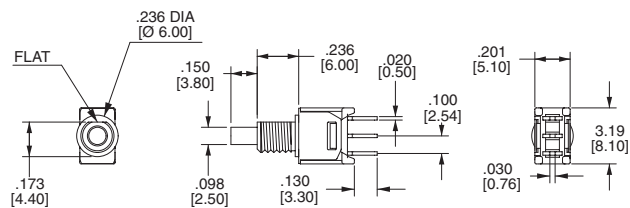
B0



TERMINATION

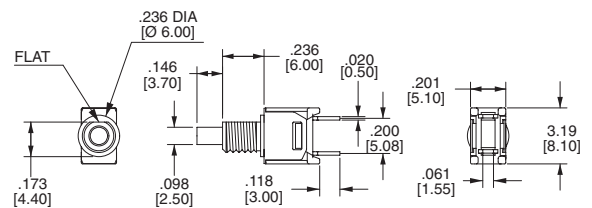
SP8

SINGLE POLE DOUBLE THROW



SP9

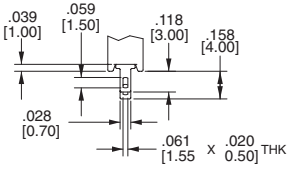
SINGLE POLE SINGLE THROW



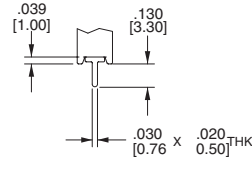
3S1-Series Dimensional Specifications: in. [mm]

TERMINATION

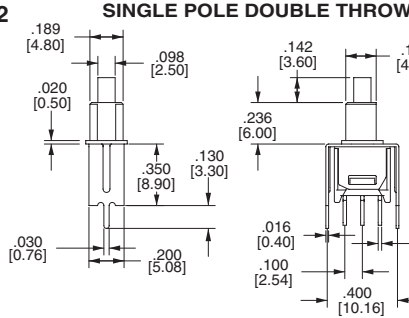
M1



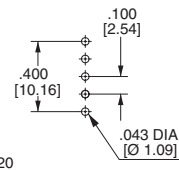
M2



VS2

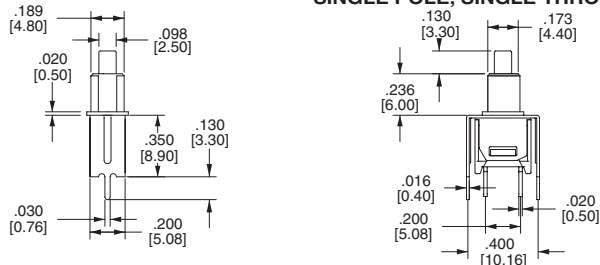


PC MOUNTING

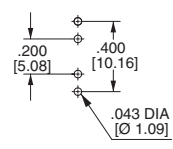


VS2

SINGLE POLE, SINGLE THROW

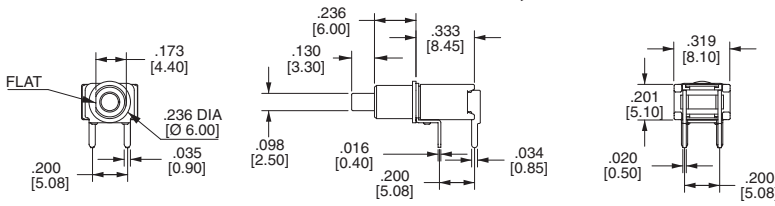


PC MOUNTING

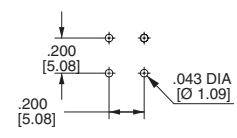


M6

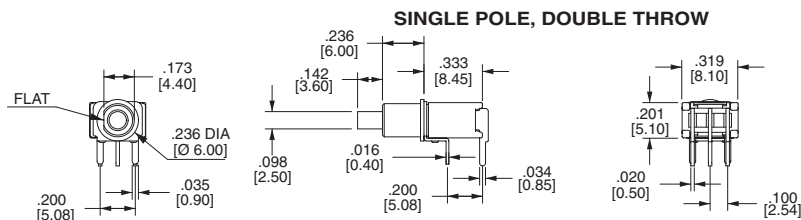
SINGLE POLE, SINGLE THROW



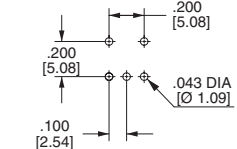
PC MOUNTING



SINGLE POLE, DOUBLE THROW

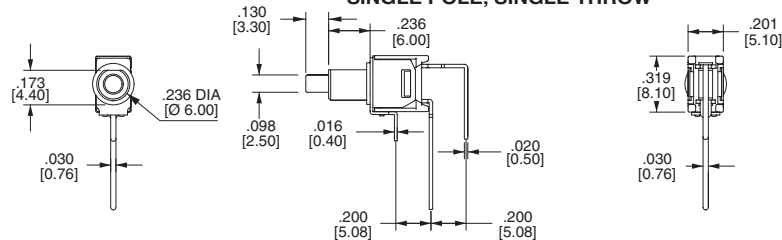


PC MOUNTING

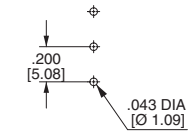


M7

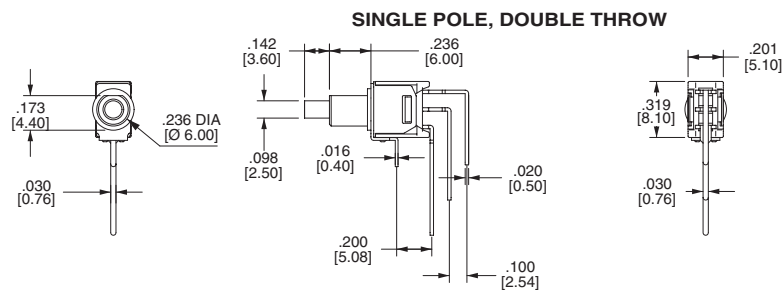
SINGLE POLE, SINGLE THROW



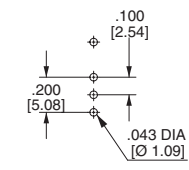
PC MOUNTING



SINGLE POLE, DOUBLE THROW



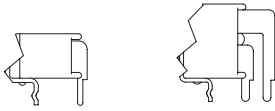
PC MOUNTING



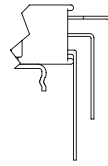
3SS-Series Dimensional Specifications: in. [mm]

SNAP-IN TERMINATION

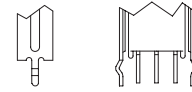
M61



M71



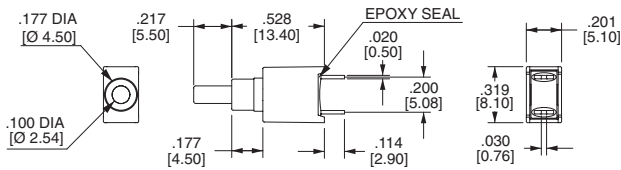
VS21



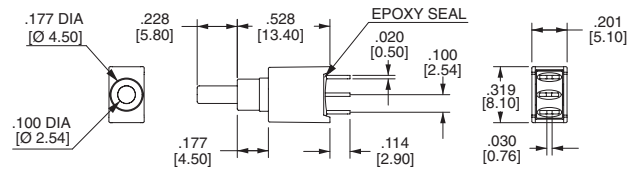
M61, M71, VS21 have the same P.C. mounting but with snap-in bracket.

TERMINATION

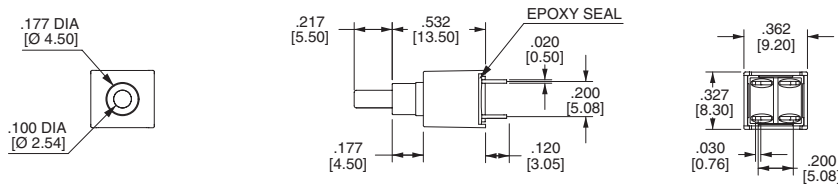
SINGLE POLE, SINGLE THROW



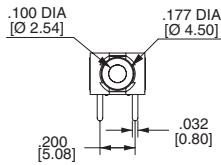
SINGLE POLE, DOUBLE THROW



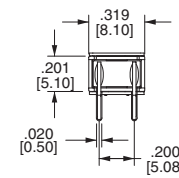
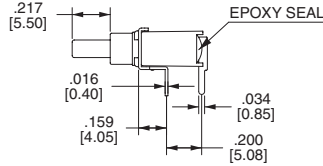
DOUBLE POLE, SINGLE THROW



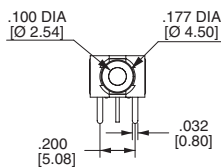
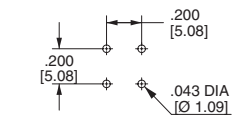
M6



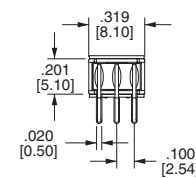
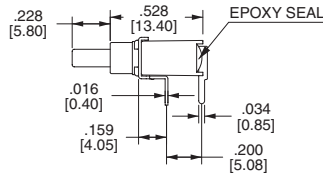
SINGLE POLE, SINGLE THROW



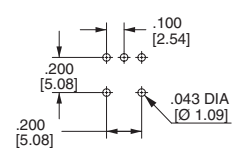
PC MOUNTING



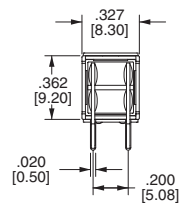
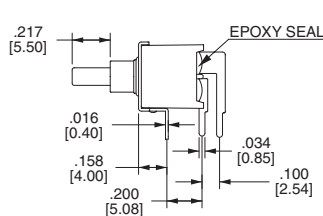
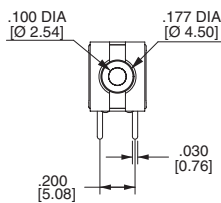
SINGLE POLE, DOUBLE THROW



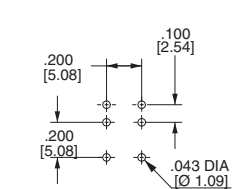
PC MOUNTING



DOUBLE POLE, SINGLE THROW



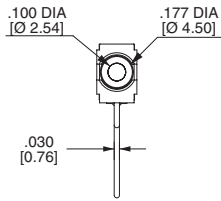
PC MOUNTING



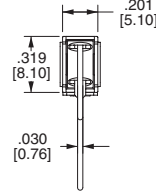
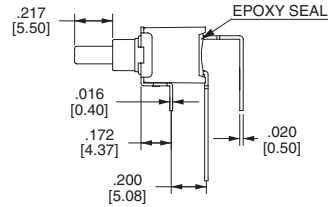
3SS-Series Dimensional Specifications: in. [mm]

TERMINATION

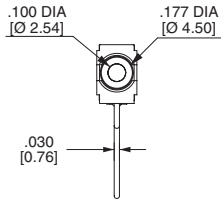
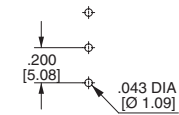
M7



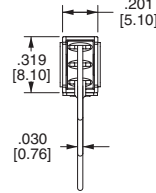
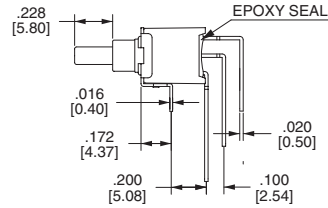
SINGLE POLE, SINGLE THROW



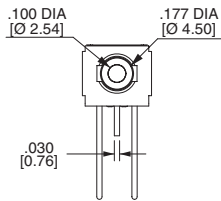
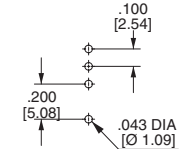
PC MOUNTING



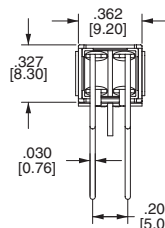
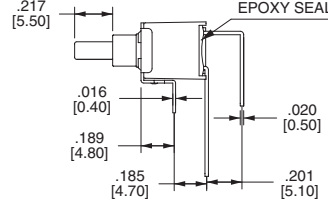
SINGLE POLE, DOUBLE THROW



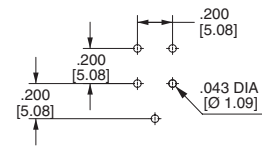
PC MOUNTING



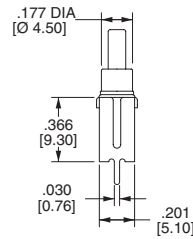
DOUBLE POLE, SINGLE THROW



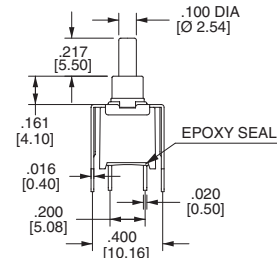
PC MOUNTING



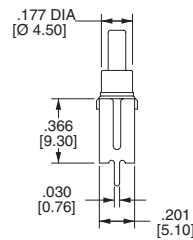
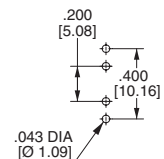
VS2



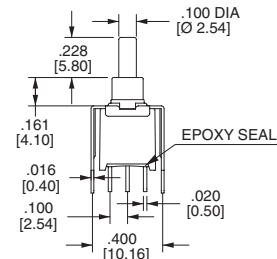
SINGLE POLE, SINGLE THROW



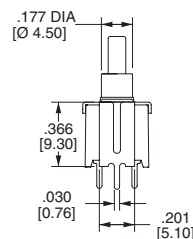
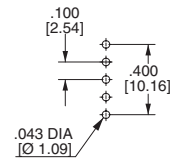
PC MOUNTING



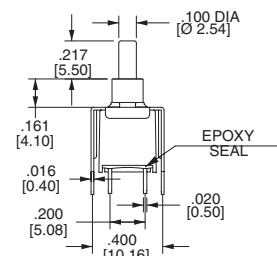
SINGLE POLE, DOUBLE THROW



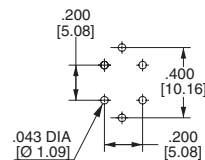
PC MOUNTING



DOUBLE POLE, SINGLE THROW



PC MOUNTING

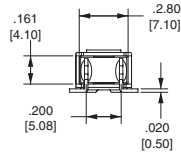
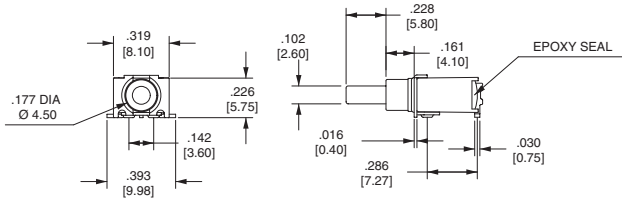


3SM-Series Dimensional Specifications: in. [mm]

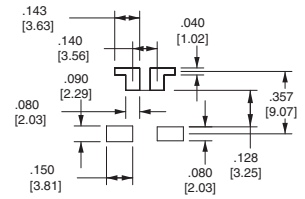
TERMINATION

M6

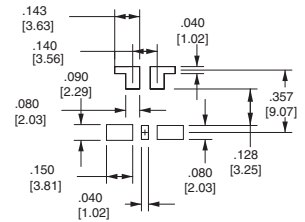
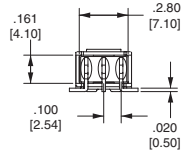
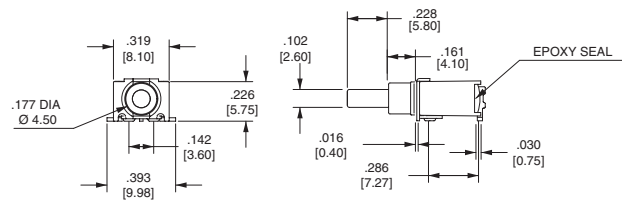
SINGLE THROW



PC MOUNTING

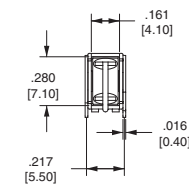
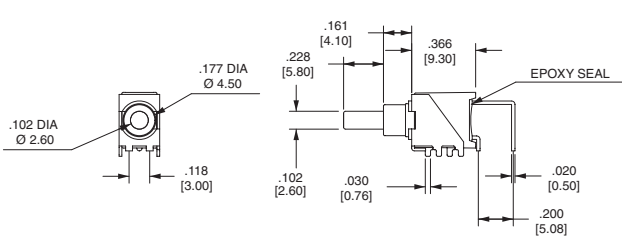


DOUBLE THROW

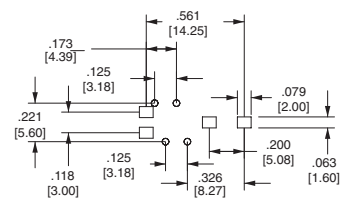


M7

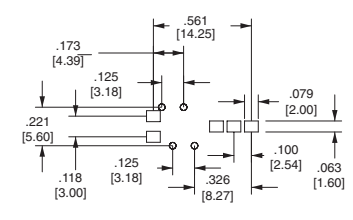
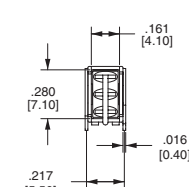
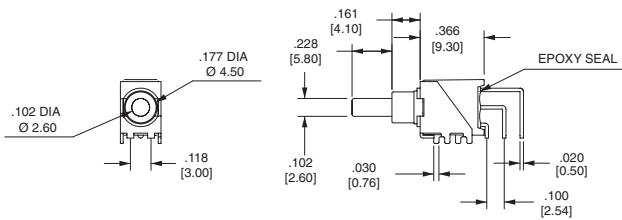
SINGLE THROW



PC MOUNTING

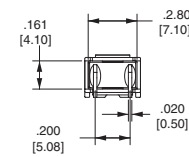
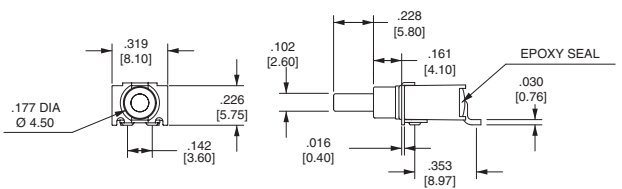


DOUBLE THROW

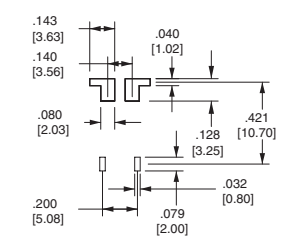


S6

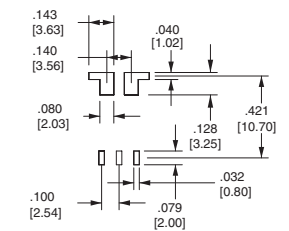
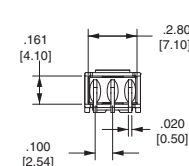
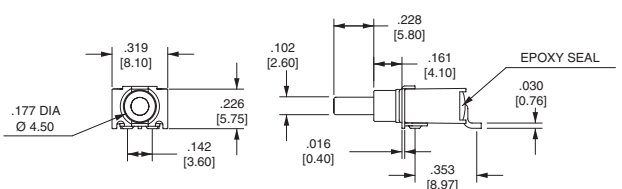
SINGLE THROW



PC MOUNTING



DOUBLE THROW



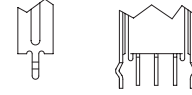
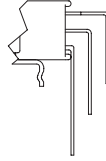
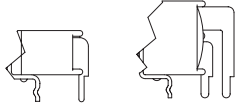
3SM-Series Dimensional Specifications: in. [mm]

SNAP-IN TERMINATION

M61

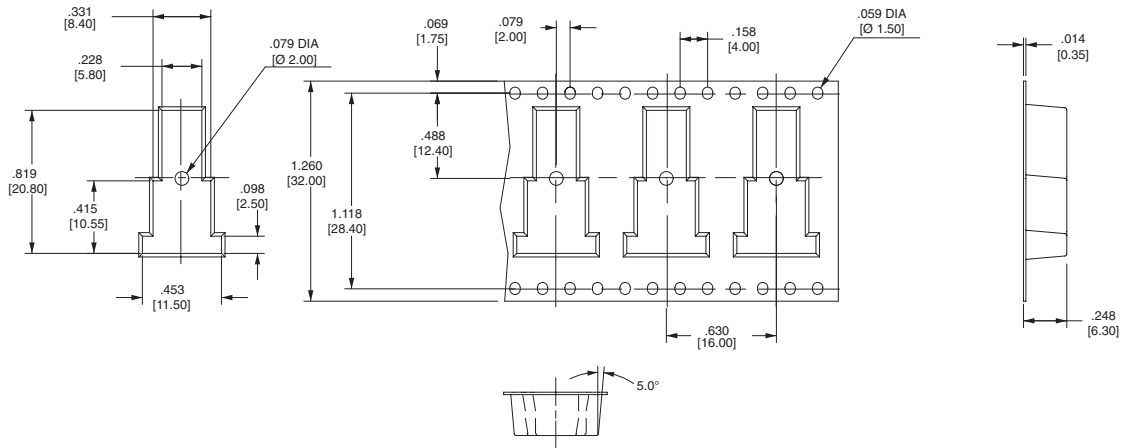
M71

VS21



M61, M71, VS21 have the same P.C. mounting but with snap-in bracket.

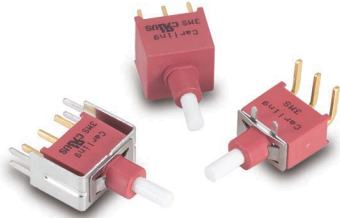
REEL TAPING



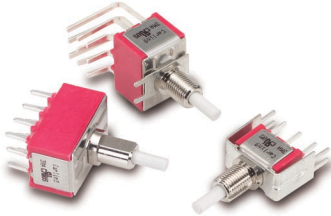
FOR M6 ONLY



3MN-Series
Snap-Acting Miniature Pushbutton Switch



3MS-Series
Sealed Snap-Acting Miniature Pushbutton Switch



3MA-Series
Alternate Acting Miniature Pushbutton Switch

Specifications

Contact Rating	refer to ordering scheme
Electrical Life	50,000 make & break cycles @ full load
Contact Resistance.	<i>3MN & 3MA-Series:</i> 10 mΩ max. initial @ 2-4 VDC 100mA for both silver & gold plated contacts. <i>3MS-Series:</i> 50 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
Operating Temperature . . .	-30°C to +85°C
Index of Protection	<i>3MS -Series:</i> IP68
Cap Installation Support . . .	<i>3MS-Series:</i> 10 lbs. max.
Solder Heat Resistance. . .	MIL-STD-202, Method 210
Actuator Travel25°

Materials

Case	<i>3MN & 3MA-Series:</i> Diallyl phthalate (DAP) (UL 94V-0) <i>3MS-Series:</i> Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0)
Plunger.	<i>3MN-Series:</i> Thermoplastic polyester, black <i>3MS & 3MA-Series:</i> Glass filled nylon or glass filled polyester (UL 94V-0)
Bushing	<i>3MN-Series:</i> Brass, nickel plated <i>3MA-Series:</i> Zinc, nickel plated
Housing.	<i>3MN & 3MA-Series:</i> Stainless Steel
Switch Support Retainer . . .	<i>3MS-Series:</i> Stainless Steel
Terminal Seal	Epoxy

3M-Series Optional Cap

To order a cap assembled on a switch, specify the switch number followed by the cap part number and the word "assembled".

Ex: 3MN-SP-7-P2-B6-M6QE-C13ASSEMBLED

To order caps in bulk, specify the Series, followed by the cap. Ex.) 3MN-C13



1 SERIES OR SWITCH CATALOG NUMBER 3MN, 3MS or 3MA		3 CAP COLOR	
2 CAP SIZE		1 white 2 black 3 red 4 orange	5 yellow 6 green 7 blue
C1 round 7.6mm dia. C2 round 9.35 mm dia. C3 square 11.7 x 11.7mm C4 round 5mm dia.	C5 round 14.5mm dia. (for 3MA w/ PL bushing) C6 brass chrome plated (for 3MA w/ PD bushing)	1 Black, white & red standard. Other colors available. Consult factory.	

3MN-Series Ordering Scheme

with Square Actuator



with Plunger Actuator



1 SERIES

3MN Snap-Acting Miniature Pushbutton Switch

2 POLES

SP single pole **DP** double pole

3 CIRCUIT

() - momentary

7 **ON** **(ON)**

4 ACTUATOR¹

SQUARE ACTUATOR (use with Color Options in Selection 5A & 5B.)

AP1 square with no frame
AP2 square raised above frame
AP3 square flush with frame

PLUNGER ACTUATOR (use with Bushing Options in Selection 5)

P0 2.5mm short plunger(for B6 bushing only)
P1 5.2mm plunger(for bushing B10,B11,B20,B21; 7.5mm for B6)
P2 2.0mm plunger(for bushing B10,B11,B20,B21; 4.2mm for B6)

5A ACTUATOR COLOR & 5B FRAME COLOR^{1,2}

1 white	4 orange	7 blue
2 black	5 yellow	8 brown
3 red	6 green	9 gray

1 Black, white and red are standard. Other colors available, consult factory for details.
2 Selection 5B is blank if actuator style is AP1 (no frame)

OR

5 BUSHING

B6 Unthreaded (for terminations VS6-VS9 only)
B10 Threaded keyway
B11 Threaded with flat
B20 Unthreaded keyway
B21 Unthreaded with flat

NOTE:

If ordering optional CAP with bushings B10, B11, B20 or B21, specify actuator P1.
For CAP with bushing B6, specify actuator P2.
For CAP options, see ordering scheme on page 35.

6 TERMINATION

M1 Solder Lug
M2 PCB
M5-1 Wire Wrap .750 [19.05]
M5-3 Wire Wrap .425 [10.80]
M6 PC Mount, 90° horizontal
M7 PC Mount, 90° vertical
VS2 PC Mount, U bracket, .620 mounting x .460 high
VS3 PC Mount, U bracket, .620 mounting x .630 high
VS4 PC Mount, U bracket, .750 mounting x .460 high
VS5 PC Mount, U bracket, .750 mounting x .630 high
VS6 PC Mount, U bracket, .460 high (for B6 bushing only)
VS7 PC Mount, U bracket, .630 high (for B6 bushing only)
VS8 PC Mount, U bracket, .460 high (for B6 bushing only)
VS9 PC Mount, U bracket, .630 high (for B6 bushing only)

7 CONTACT

Material	Terminal Plating	Rating	Approvals
G silver ¹	gold over silver ³	1A @ 120VAC or 28VDC	UL, CUL
Q silver ¹	silver ¹	1A @ 120VAC or 28VDC	UL, CUL
R gold ²	gold ²	0.4VA max. @ 20V max (AC/DC)	

NOTE:

Tin-lead option available with PC type terminations only.
1 Moveable contact & terminals: copper alloy, silver plate
2 Moveable contact & terminals: copper alloy with gold plate over nickel plate
3 Terminals: silver plate with outer layer in gold plating

8 EPOXY SEAL

E epoxy seal

3MS-Series Ordering Scheme

3MS -
 WSP
7 -
 P1 -
 B1 -
 M6
Q
E

1 Series 2 Poles 3 Circuit 4 Actuator 5 Bushing 6 Termination 7 Contact 8 Seal

<p>1 SERIES 3MS Sealed Snap-Acting Miniature Pushbutton Switch</p> <p>2 POLES WSP single pole WDP double pole</p> <p>3 CIRCUIT () - momentary</p> <p>7 ON (ON)</p> <p>4 ACTUATOR P1 .173" plunger (for B1 bushing); .276" (for B4 bushing) P2 .220" plunger (for B1 bushing); .327" (for B4 bushing) P3 .087" plunger (for B1 bushing); .193" (for B4 bushing)</p> <p>5 BUSHING B1 Threaded B4 Unthreaded</p>	<p>6 TERMINATION</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">M1 Solder Lug</td> <td style="width: 30%;"></td> <td style="width: 30%;">VS21 Snap-In, U bracket, .620 mounting x .460 high</td> </tr> <tr> <td>M2 PCB</td> <td></td> <td>VS3 PC Mount, U bracket, .620 mounting x .630 high</td> </tr> <tr> <td>M6 PC Mount, 90° horizontal</td> <td></td> <td>VS4 PC Mount, U bracket, .750 mounting x .460 high</td> </tr> <tr> <td>M61 Snap-In, 90° horizontal</td> <td></td> <td>VS5 PC Mount, U bracket, .750 mounting x .630 high</td> </tr> <tr> <td>M7 PC Mount, 90° vertical</td> <td></td> <td></td> </tr> <tr> <td>M71 Snap-In, 90° vertical</td> <td></td> <td></td> </tr> <tr> <td>VS2 PC Mount, U bracket, .620 mounting x .460 high</td> <td></td> <td></td> </tr> </table> <p>7 CONTACT</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Material</th> <th style="width: 20%;">Terminal Plating</th> <th style="width: 30%;">Rating</th> <th style="width: 35%;">Approvals</th> </tr> </thead> <tbody> <tr> <td>G silver¹</td> <td>gold over silver³</td> <td>1A@120VAC or 28VDC</td> <td>UL, CUL IP68</td> </tr> <tr> <td>Q silver¹</td> <td>silver¹</td> <td>1A@120VAC or 28VDC</td> <td>UL, CUL IP68</td> </tr> <tr> <td>R gold²</td> <td>gold²</td> <td>0.4VA max. @20V max (AC/DC)</td> <td>IP68</td> </tr> </tbody> </table> <p>NOTE: Tin-lead option available with PC type terminations only.</p> <p>1 Moveable contact & terminals: copper alloy, silver plate 2 Moveable contact & terminals: copper alloy with gold plate over nickel plate 3 Terminals: silver plate with outer layer in gold plating</p> <p>7 EPOXY SEAL E epoxy seal</p>	M1 Solder Lug		VS21 Snap-In, U bracket, .620 mounting x .460 high	M2 PCB		VS3 PC Mount, U bracket, .620 mounting x .630 high	M6 PC Mount, 90° horizontal		VS4 PC Mount, U bracket, .750 mounting x .460 high	M61 Snap-In, 90° horizontal		VS5 PC Mount, U bracket, .750 mounting x .630 high	M7 PC Mount, 90° vertical			M71 Snap-In, 90° vertical			VS2 PC Mount, U bracket, .620 mounting x .460 high			Material	Terminal Plating	Rating	Approvals	G silver ¹	gold over silver ³	1A@120VAC or 28VDC	UL, CUL IP68	Q silver ¹	silver ¹	1A@120VAC or 28VDC	UL, CUL IP68	R gold ²	gold ²	0.4VA max. @20V max (AC/DC)	IP68
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R gold ²	gold ²	0.4VA max. @20V max (AC/DC)	IP68																																			

3MA-Series Ordering Scheme

with Square Actuator 3MA - SP - 1 - AP2 / 3 2 - M6 Q E

1 Series 2 Poles 3 Circuit 4 Actuator 5A Actuator Color 5B Frame Color 6 Termination 7 Contact 8 Seal

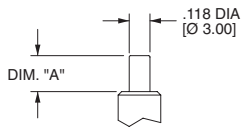
with Plunger Actuator 3MA - SP - 1 - PD - BD - M6 Q E

1 Series 2 Poles 3 Circuit 4 Actuator 5 Bushing 6 Termination 7 Contact 8 Seal

<p>1 SERIES 3MA Alternate-Acting Miniature Pushbutton Switch</p> <p>2 POLES SP single pole DP double pole 3P three pole 4P four pole</p> <p>3 CIRCUIT () - momentary</p> <p style="text-align: center;">Switching Position:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;"></td> <td style="width: 30%;">2-3, 5-6, 8-9, 11-12</td> <td style="width: 30%;">OPEN</td> <td style="width: 25%;">2-1, 5-4, 8-7, 11-10</td> </tr> <tr> <td>1</td> <td>ON</td> <td>NONE</td> <td>ON</td> </tr> <tr> <td>2</td> <td>ON</td> <td>NONE</td> <td>(ON)</td> </tr> </table> <p>4 ACTUATOR SQUARE ACTUATOR (use with Color Options in Selection 5A & 5B.) AP1 square with no frame AP2 square raised above frame</p> <p>PLUNGER ACTUATOR (use with Bushing Options in Selection 5) PA .118 dia. x .299" plunger length PI .118 dia. x .244" plunger length PL .118 dia. x .327" plunger length PC .315" dia. brass chrome plated plunger (for BD bushing only) PD .242" dia. brass chrome plated plunger (for BD bushing only)</p> <p>5A ACTUATOR COLOR & 5B FRAME COLOR^{1,2}</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">1 white</td> <td style="width: 33%;">4 orange</td> <td style="width: 33%;">7 blue</td> </tr> <tr> <td>2 black</td> <td>5 yellow</td> <td>8 brown</td> </tr> <tr> <td>3 red</td> <td>6 green</td> <td>9 gray</td> </tr> </table> <p>1 Black, red and white are standard. Other colors available, consult factory for details. 2 Selection 5B is blank if actuator style AP1 (no frame)</p> <p style="text-align: center;">OR</p> <p>5 BUSHING BD Big bushing for PC, PD actuator 15/32" B10 Threaded 1/4 - 40 B20 Unthreaded B21 Unthreaded with flat</p> <p>NOTE: For CAP options, see ordering scheme on page 35.</p>		2-3, 5-6, 8-9, 11-12	OPEN	2-1, 5-4, 8-7, 11-10	1	ON	NONE	ON	2	ON	NONE	(ON)	1 white	4 orange	7 blue	2 black	5 yellow	8 brown	3 red	6 green	9 gray	<p>6 TERMINATION</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">M1 Solder Lug</td> <td style="width: 30%;"></td> <td style="width: 30%;">VS2 PC Mount, U bracket, .620 mounting x .460 high</td> </tr> <tr> <td>M2 PCB</td> <td></td> <td>VS3 PC Mount, U bracket, .620 mounting x .630 high</td> </tr> <tr> <td>M5-1 Wire Wrap .750 [19.05]</td> <td></td> <td>VS4 PC Mount, U bracket, .750 mounting x .460 high</td> </tr> <tr> <td>M5-2 Wire Wrap .964 [24.48]</td> <td></td> <td>VS5 PC Mount, U bracket, .750 mounting x .630 high</td> </tr> <tr> <td>M5-3 Wire Wrap .425 [10.80]</td> <td></td> <td></td> </tr> <tr> <td>M5-4 Wire Wrap 1.062 [26.87]</td> <td></td> <td></td> </tr> <tr> <td>M6 PC Mount, 90° horizontal</td> <td></td> <td></td> </tr> <tr> <td>M7 PC Mount, 90° vertical</td> <td></td> <td></td> </tr> </table> <p>7 CONTACT</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Material</th> <th style="width: 20%;">Terminal Plating</th> <th style="width: 30%;">Rating</th> <th style="width: 35%;">Approvals</th> </tr> </thead> <tbody> <tr> <td>G silver¹</td> <td>gold over silver³</td> <td>6A@125VAC or 28VDC, 3A@250VAC</td> <td>UL, CUL</td> </tr> <tr> <td>K gold²</td> <td>tin-lead⁴</td> <td>6A@125VAC or 28VDC, 3A@250VAC</td> <td>UL, CUL</td> </tr> <tr> <td>P silver¹</td> <td>tin-lead⁴</td> <td>6A@125VAC or 28VDC, 3A@250VAC</td> <td>UL, CUL</td> </tr> <tr> <td>Q silver¹</td> <td>silver¹</td> <td>6A@125VAC or 28VDC, 3A@250VAC</td> <td>UL, CUL</td> </tr> <tr> <td>R gold²</td> <td>gold²</td> <td>0.4VA max. @20V max (AC/DC)</td> <td></td> </tr> </tbody> </table> <p>NOTE: Tin-lead option available with PC type terminations only.</p> <p>1 Moveable contact & terminals: copper alloy, silver plate 2 Moveable contact & terminals: copper alloy with gold plate over nickel plate 3 Terminals: silver plate with outer layer in gold plating 4 Outer terminals: copper alloy with tin-lead over nickel plate</p> <p>8 EPOXY SEAL E epoxy seal</p>	M1 Solder Lug		VS2 PC Mount, U bracket, .620 mounting x .460 high	M2 PCB		VS3 PC Mount, U bracket, .620 mounting x .630 high	M5-1 Wire Wrap .750 [19.05]		VS4 PC Mount, U bracket, .750 mounting x .460 high	M5-2 Wire Wrap .964 [24.48]		VS5 PC Mount, U bracket, .750 mounting x .630 high	M5-3 Wire Wrap .425 [10.80]			M5-4 Wire Wrap 1.062 [26.87]			M6 PC Mount, 90° horizontal			M7 PC Mount, 90° vertical			Material	Terminal Plating	Rating	Approvals	G silver ¹	gold over silver ³	6A@125VAC or 28VDC, 3A@250VAC	UL, CUL	K gold ²	tin-lead ⁴	6A@125VAC or 28VDC, 3A@250VAC	UL, CUL	P silver ¹	tin-lead ⁴	6A@125VAC or 28VDC, 3A@250VAC	UL, CUL	Q silver ¹	silver ¹	6A@125VAC or 28VDC, 3A@250VAC	UL, CUL	R gold ²	gold ²	0.4VA max. @20V max (AC/DC)	
	2-3, 5-6, 8-9, 11-12	OPEN	2-1, 5-4, 8-7, 11-10																																																																			
1	ON	NONE	ON																																																																			
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G silver ¹	gold over silver ³	6A@125VAC or 28VDC, 3A@250VAC	UL, CUL																																																																			
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P silver ¹	tin-lead ⁴	6A@125VAC or 28VDC, 3A@250VAC	UL, CUL																																																																			
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R gold ²	gold ²	0.4VA max. @20V max (AC/DC)																																																																				

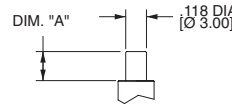
3MN-Series Dimensional Specifications: in. [mm]

PLUNGER



OPTION CODE	DIM. "A"
P0	.000 [0.00]
P1	.205 [5.20]
P2	.079 [2.00]

FOR B10,B11,B20,B21 ONLY

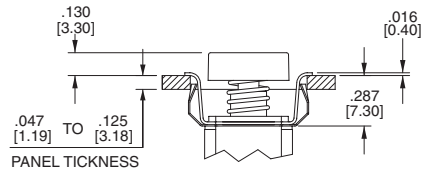
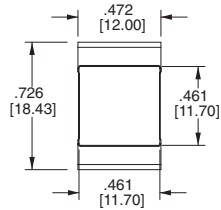


OPTION CODE	DIM. "A"
P0	.098 [2.50]
P1	.295 [7.50]
P2	.165 [4.20]

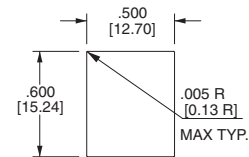
FOR B6 ONLY

ACTUATOR

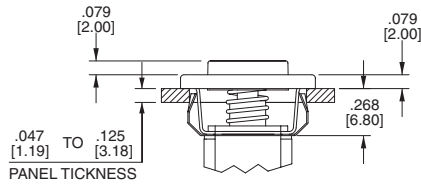
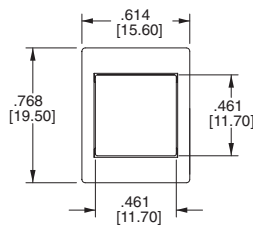
AP1



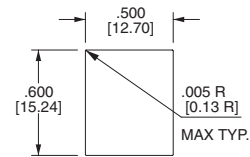
PANEL MOUNTING



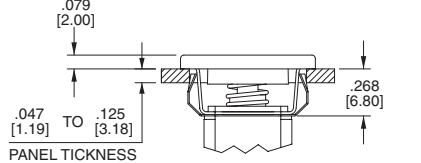
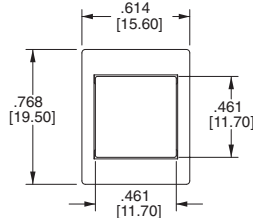
AP2



PANEL MOUNTING

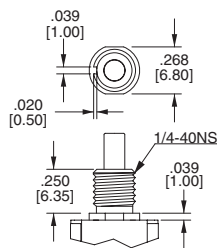


AP3

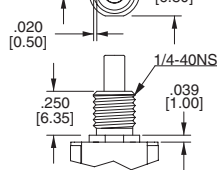


BUSHING

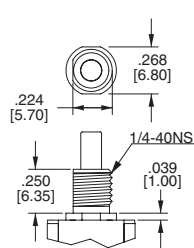
B10
STANDARD KEYWAY
THREADED SHOWN



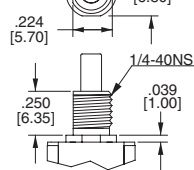
B20
STANDARD KEYWAY
NON-THREADED



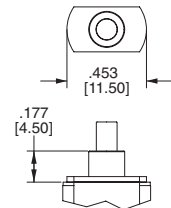
B11
THREADED SHOWN
WITH FLAT



B21
NON-THREADED
WITH FLAT

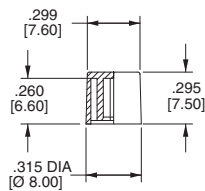


B6
NON-THREADED
(FOR TERMINATION
OPTIONS VS6-VS9 ONLY)

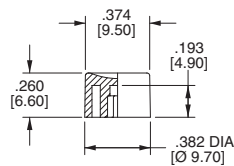


CAP

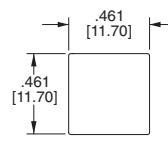
C1



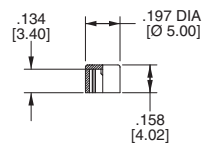
C2



C3



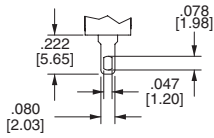
C4



3MN-Series Dimensional Specifications: in. [mm]

TERMINATION

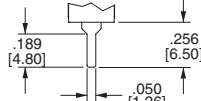
M1



THK .030 [0.75]

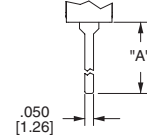
SINGLE POLE

M2



THK .030 [0.75]

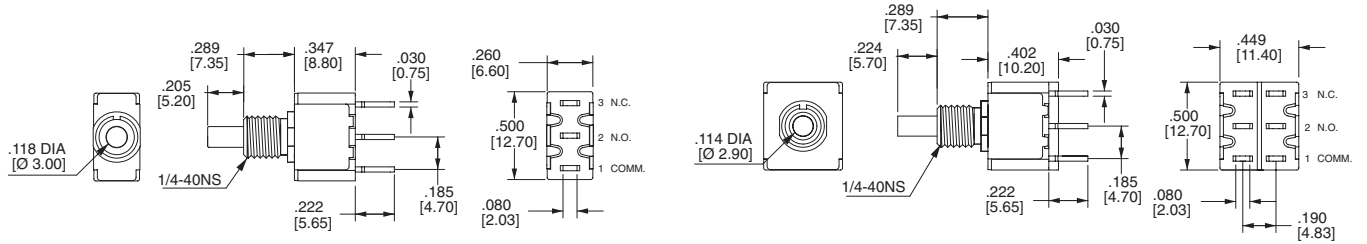
M5



THK .030 [0.75]

DOUBLE POLE

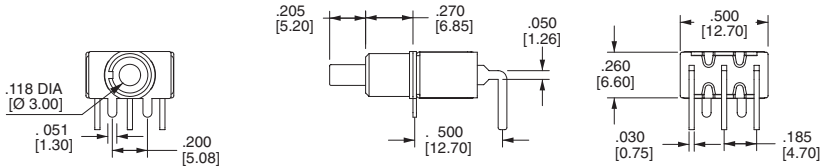
OPTION CODE	DIM. "A"
M5-1	.750 [19.05]
M5-3	.425 [10.80]



M6

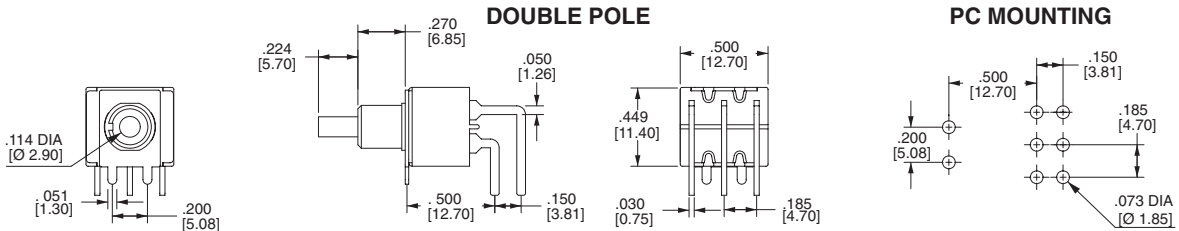
SINGLE POLE

PC MOUNTING



DOUBLE POLE

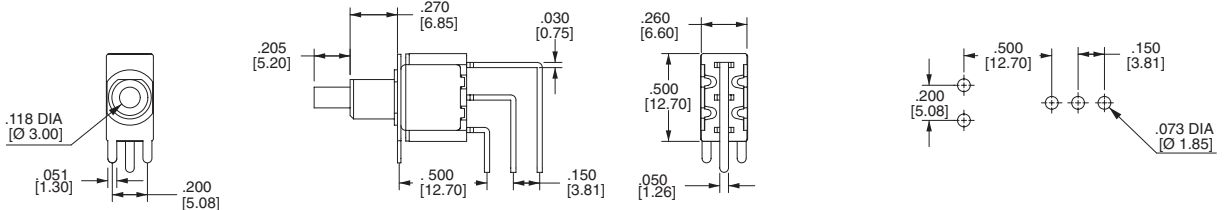
PC MOUNTING



M7

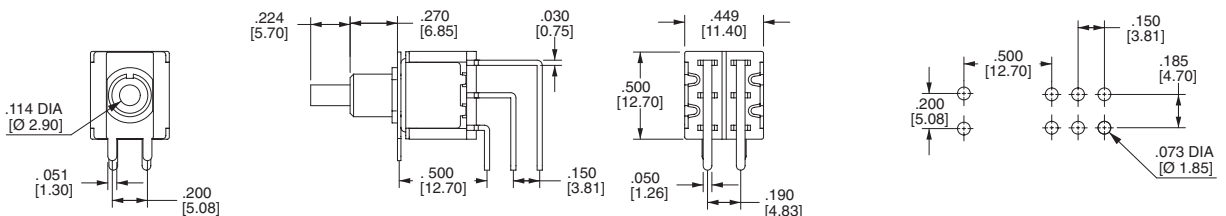
SINGLE POLE

PC MOUNTING



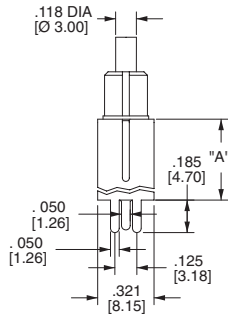
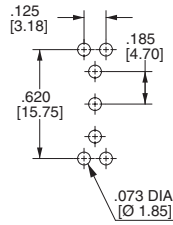
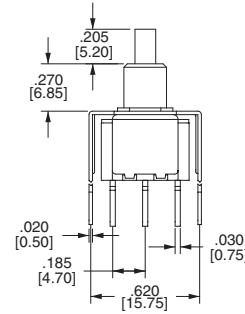
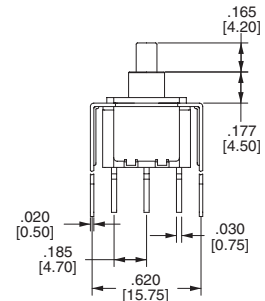
DOUBLE POLE

PC MOUNTING

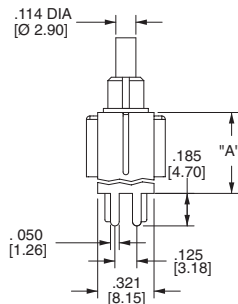
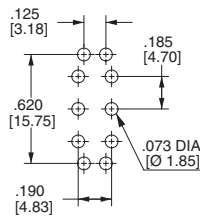
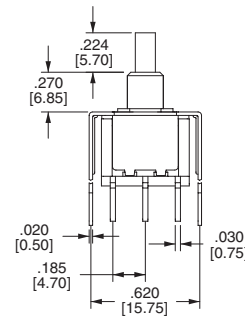
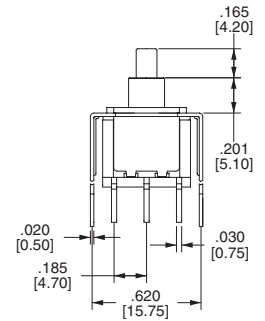


3MN-Series Dimensional Specifications: in. [mm]
TERMINATION
SINGLE POLE

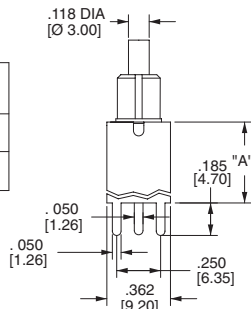
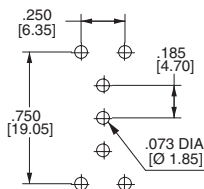
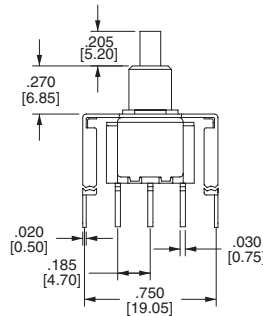
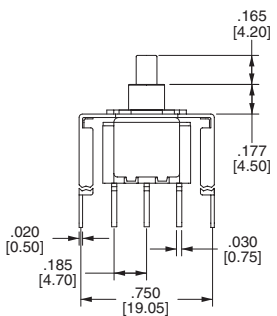
OPTION CODE	DIM. "A"
VS2	.460 [11.68]
VS3	.630 [16.00]
VS7	[16.00]


PC MOUNTING

VS2-VS3

**VS6-VS7
(For B6 Bushing Only)**

DOUBLE POLE

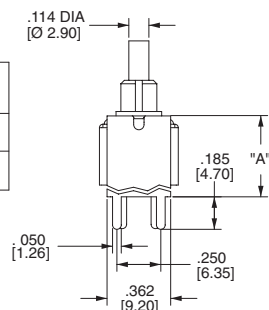
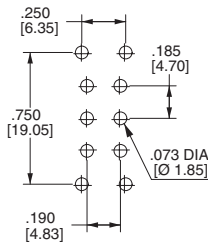
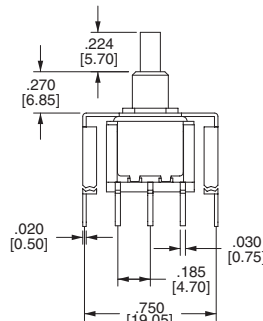
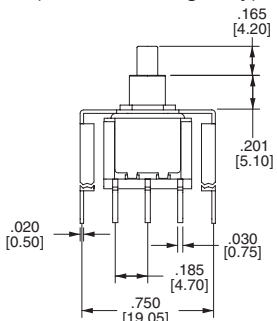
OPTION CODE	DIM. "A"
VS2	.460 [11.68]
VS6	.630 [16.00]
VS3	[16.00]
VS7	[16.00]


PC MOUNTING

VS2-VS3

**VS6-VS7
(For B6 Bushing Only)**

SINGLE POLE

OPTION CODE	DIM. "A"
VS4	.460 [11.68]
VS8	[11.68]
VS5	.630 [16.00]
VS9	[16.00]


PC MOUNTING

VS4-VS5

**VS8-VS9
(For B6 Bushing Only)**

DOUBLE POLE

OPTION CODE	DIM. "A"
VS4	.460 [11.68]
VS8	[11.68]
VS5	.630 [16.00]
VS9	[16.00]

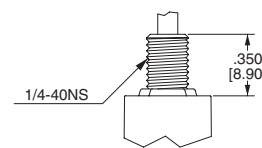
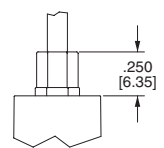

PC MOUNTING

VS4-VS5

**VS8-VS9
(For B6 Bushing Only)**


3MS-Series Dimensional Specifications: in. [mm]

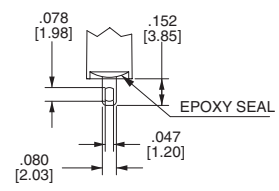
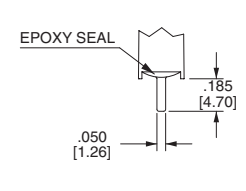
PLUNGER

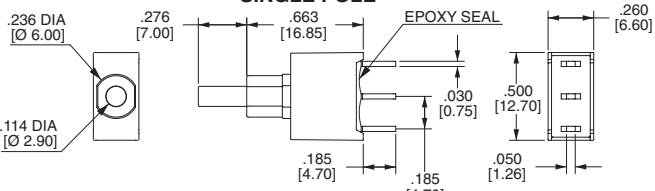
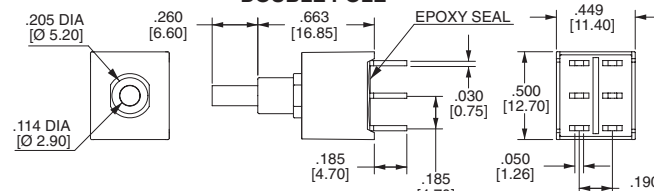
 <p>DIM. "A"</p> <p>.114 DIA [Ø 2.90]</p> <table border="1"> <thead> <tr> <th>OPTION CODE</th> <th>DIM. "A"</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>.173 [4.40]</td> </tr> <tr> <td>P2</td> <td>.220 [5.60]</td> </tr> <tr> <td>P3</td> <td>.087 [2.20]</td> </tr> </tbody> </table> <p>FOR B1 BUSHING</p>	OPTION CODE	DIM. "A"	P1	.173 [4.40]	P2	.220 [5.60]	P3	.087 [2.20]	 <p>DIM. "A"</p> <p>.114 DIA [Ø 2.90]</p> <table border="1"> <thead> <tr> <th>OPTION CODE</th> <th>DIM. "A"</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>.276 [7.00]</td> </tr> <tr> <td>P2</td> <td>.327 [8.30]</td> </tr> <tr> <td>P3</td> <td>.193 [4.90]</td> </tr> </tbody> </table> <p>FOR B4 BUSHING</p>	OPTION CODE	DIM. "A"	P1	.276 [7.00]	P2	.327 [8.30]	P3	.193 [4.90]
OPTION CODE	DIM. "A"																
P1	.173 [4.40]																
P2	.220 [5.60]																
P3	.087 [2.20]																
OPTION CODE	DIM. "A"																
P1	.276 [7.00]																
P2	.327 [8.30]																
P3	.193 [4.90]																

BUSHING

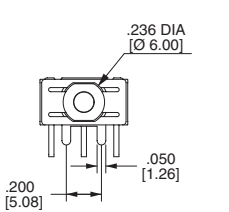
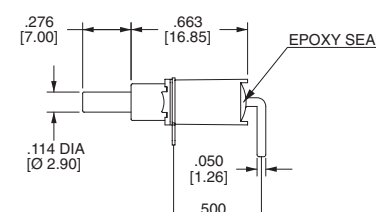
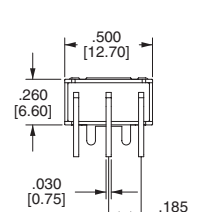
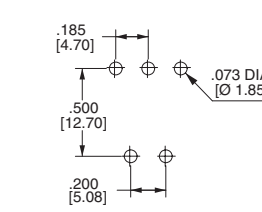
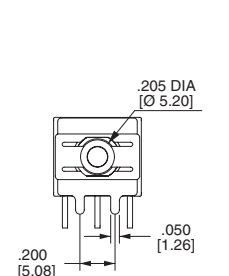
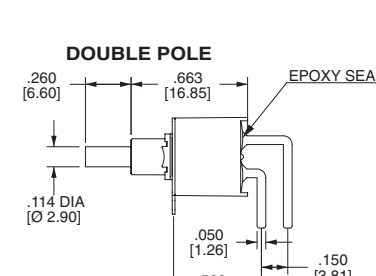
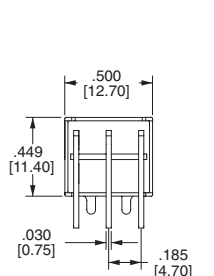
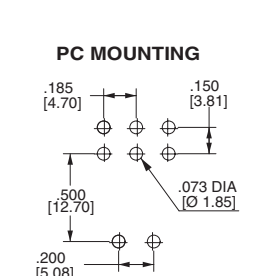
<p>B1</p>  <p>1/4-40NS</p> <p>.350 [8.90]</p>	<p>B4</p>  <p>.250 [6.35]</p>
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TERMINATION

<p>M1</p>  <p>.078 [1.98]</p> <p>.152 [3.85]</p> <p>EPOXY SEAL</p> <p>.080 [2.03]</p> <p>.047 [1.20]</p> <p>THK .030 [0.75]</p>	<p>M2</p>  <p>EPOXY SEAL</p> <p>.185 [4.70]</p> <p>.050 [1.26]</p> <p>THK .030 [0.75]</p>
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<p>SINGLE POLE</p>  <p>.236 DIA [Ø 6.00]</p> <p>.276 [7.00]</p> <p>.663 [16.85]</p> <p>EPOXY SEAL</p> <p>.260 [6.60]</p> <p>.030 [0.75]</p> <p>.500 [12.70]</p> <p>.185 [4.70]</p> <p>.185 [4.70]</p> <p>.050 [1.26]</p>	<p>DOUBLE POLE</p>  <p>.205 DIA [Ø 5.20]</p> <p>.260 [6.60]</p> <p>.663 [16.85]</p> <p>EPOXY SEAL</p> <p>.449 [11.40]</p> <p>.030 [0.75]</p> <p>.500 [12.70]</p> <p>.185 [4.70]</p> <p>.185 [4.70]</p> <p>.050 [1.26]</p> <p>.190 [4.83]</p>
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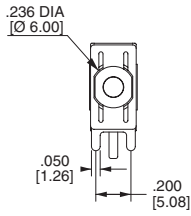
M6

 <p>.236 DIA [Ø 6.00]</p> <p>.200 [5.08]</p> <p>.050 [1.26]</p>	<p>SINGLE POLE</p>  <p>.276 [7.00]</p> <p>.663 [16.85]</p> <p>EPOXY SEAL</p> <p>.114 DIA [Ø 2.90]</p> <p>.050 [1.26]</p> <p>.500 [12.70]</p>	 <p>.500 [12.70]</p> <p>.260 [6.60]</p> <p>.030 [0.75]</p> <p>.185 [4.70]</p>	<p>PC MOUNTING</p>  <p>.185 [4.70]</p> <p>.500 [12.70]</p> <p>.200 [5.08]</p> <p>.073 DIA [Ø 1.85]</p>
 <p>.205 DIA [Ø 5.20]</p> <p>.200 [5.08]</p> <p>.050 [1.26]</p>	<p>DOUBLE POLE</p>  <p>.260 [6.60]</p> <p>.663 [16.85]</p> <p>EPOXY SEAL</p> <p>.114 DIA [Ø 2.90]</p> <p>.050 [1.26]</p> <p>.500 [12.70]</p> <p>.150 [3.81]</p>	 <p>.500 [12.70]</p> <p>.449 [11.40]</p> <p>.030 [0.75]</p> <p>.185 [4.70]</p>	<p>PC MOUNTING</p>  <p>.185 [4.70]</p> <p>.150 [3.81]</p> <p>.500 [12.70]</p> <p>.200 [5.08]</p> <p>.073 DIA [Ø 1.85]</p>

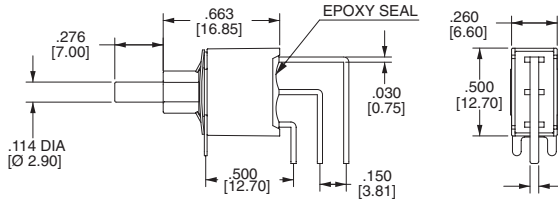
3MS-Series Dimensional Specifications: in. [mm]

TERMINATION

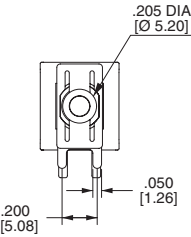
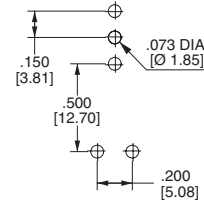
M7



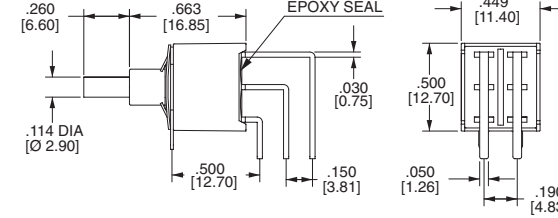
SINGLE POLE



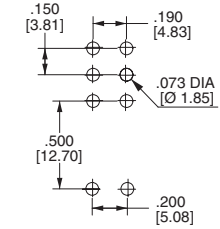
PC MOUNTING



DOUBLE POLE

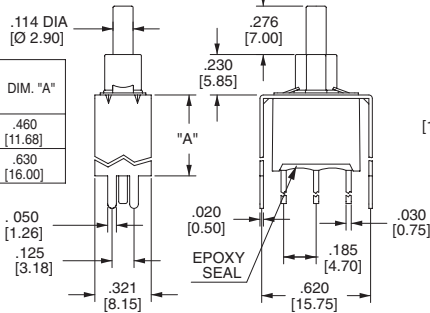


PC MOUNTING

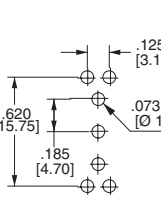


VS2-VS3

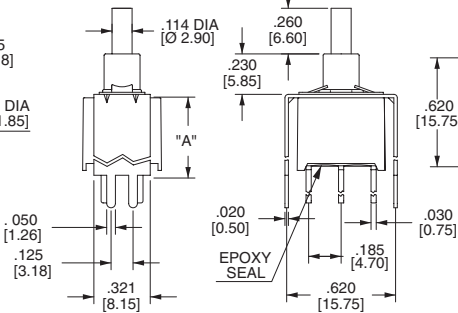
SINGLE POLE



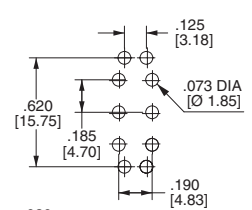
PC MOUNTING



DOUBLE POLE



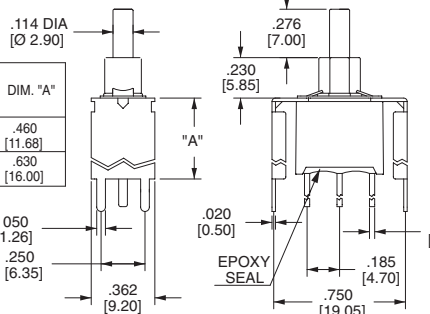
PC MOUNTING



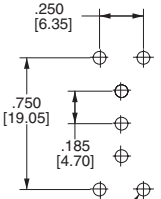
OPTION CODE	DIM. "A"
VS2	.460 [11.68]
VS3	.630 [16.00]

VS4-VS5

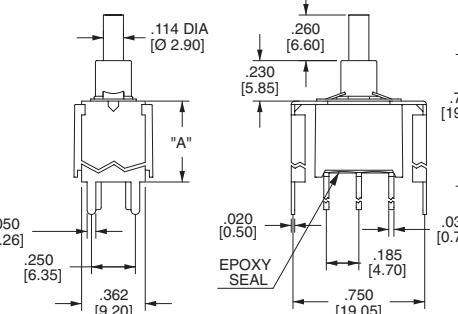
SINGLE POLE



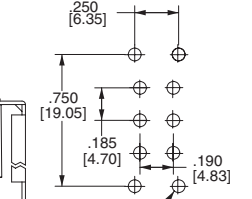
PC MOUNTING



DOUBLE POLE



PC MOUNTING



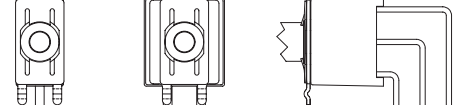
OPTION CODE	DIM. "A"
VS4	.460 [11.68]
VS5	.630 [16.00]

SNAP-IN TERMINATION OPTIONS

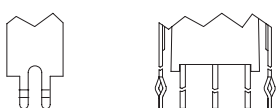
M61



M71



VS21, VS31



VS41, VS51

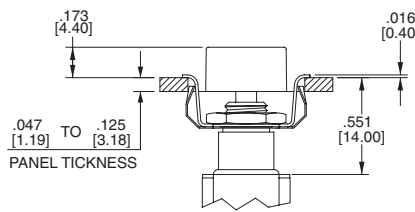
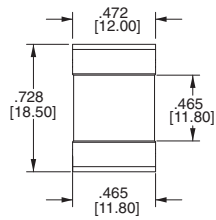


M61, M71, VS21, VS31, VS41, VS51 have the same P.C. mounting but with snap-in bracket.

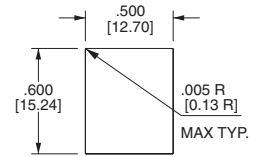
3MA-Series Dimensional Specifications: in. [mm]

ACTUATOR

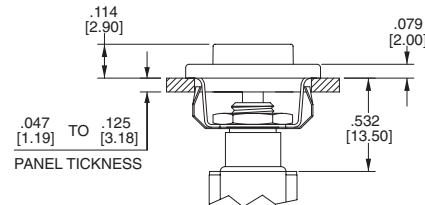
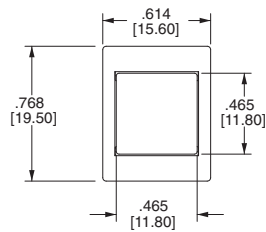
AP1



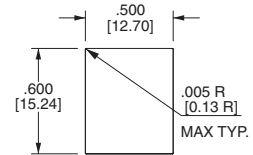
PANEL MOUNTING



AP2

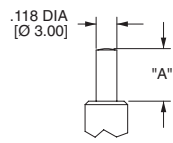


PANEL MOUNTING



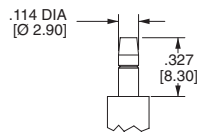
PLUNGER

PA,PI

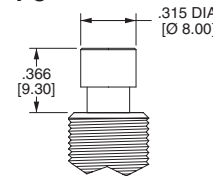


OPTION CODE	DIM. "A"
PA	.299 [7.60]
PI	.244 [6.20]

PL

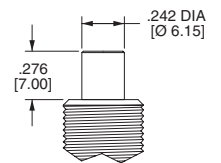


PC



Brass Chrome Plated

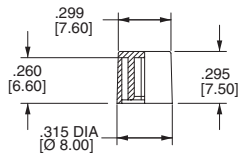
PD



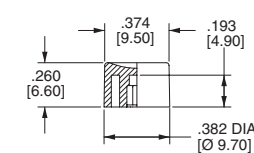
PC, PD Plunger must fit with BD bushing

CAP

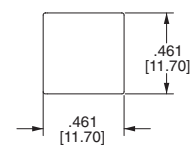
C1



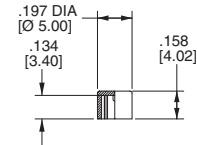
C2



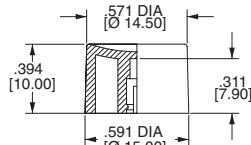
C3



C4

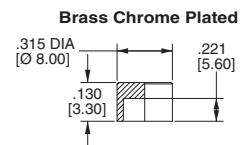


C5



For PL Bushing Only

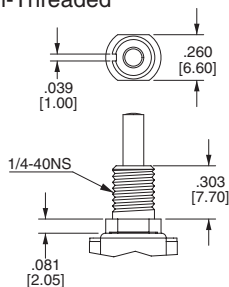
C6



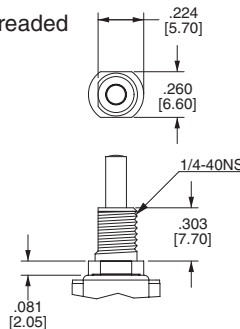
For PD Bushing Only

BUSHING

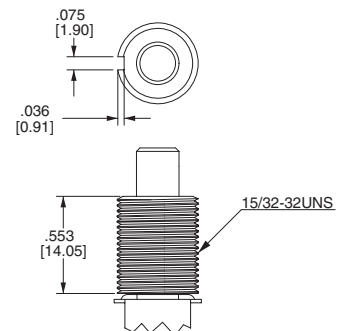
B10 Threaded
B20 Non-Threaded



B21 Non-Threaded



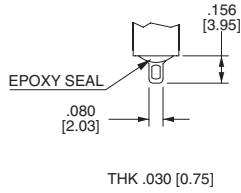
BD



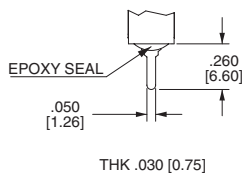
3MA-Series Dimensional Specifications: in. [mm]

TERMINATION

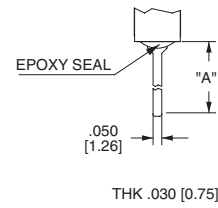
M1



M2



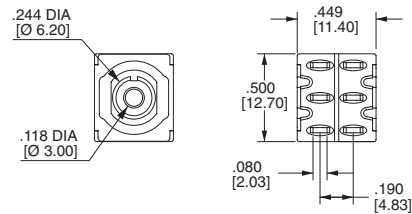
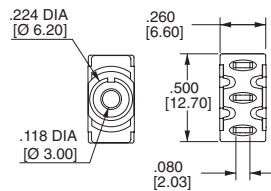
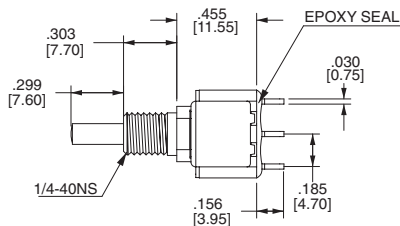
M5



OPTION CODE	DIM. "A"
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M5-2	.964 [24.48]
M5-3	.425 [10.80]
M5-4	1.062 [26.97]

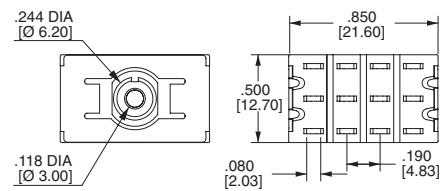
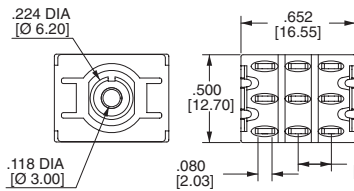
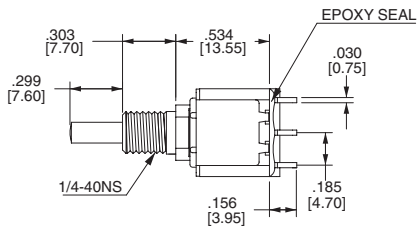
SINGLE POLE

DOUBLE POLE



3 POLE

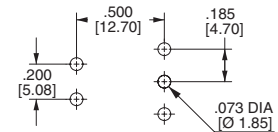
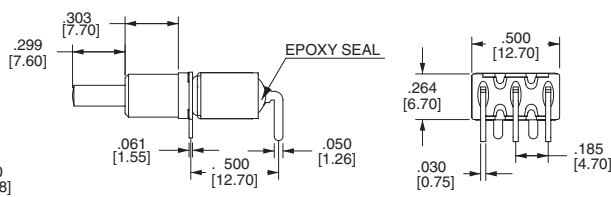
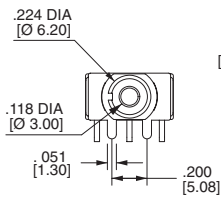
4 POLE



M6

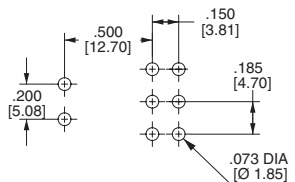
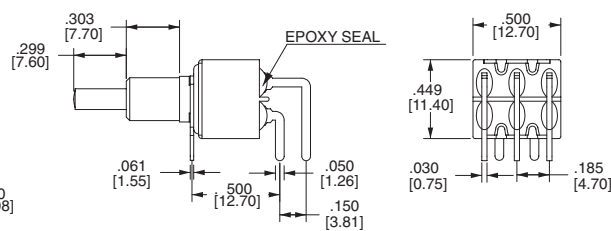
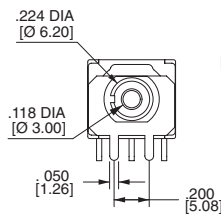
SINGLE POLE

PC MOUNTING



DOUBLE POLE

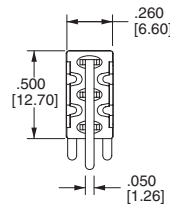
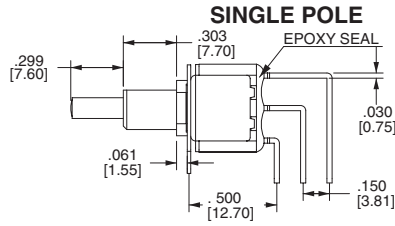
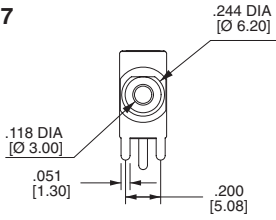
PC MOUNTING



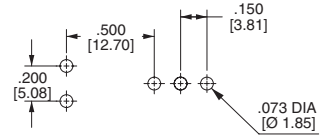
3MA-Series Dimensional Specifications: in. [mm]

TERMINATION

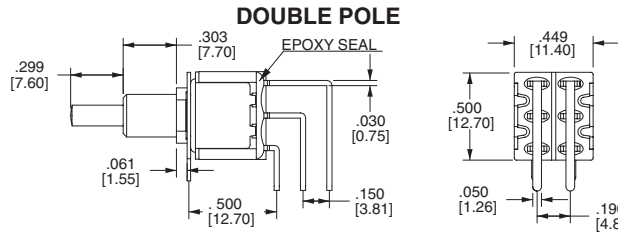
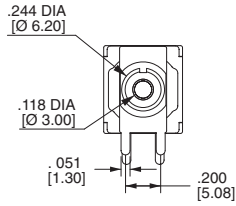
M7



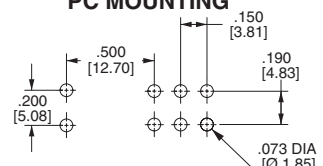
PC MOUNTING



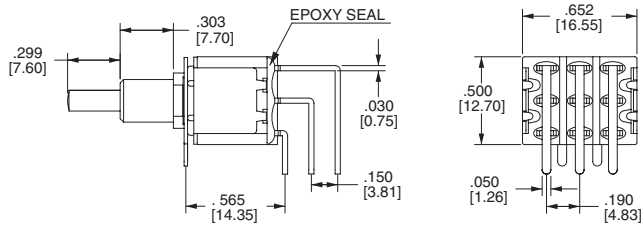
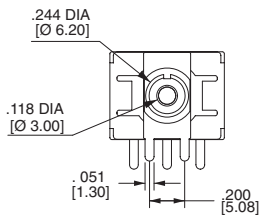
DOUBLE POLE



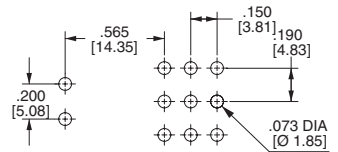
PC MOUNTING



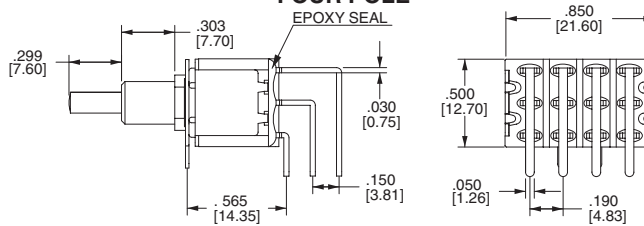
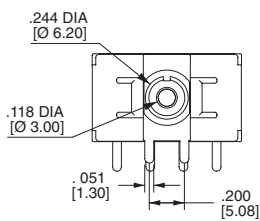
THREE POLE



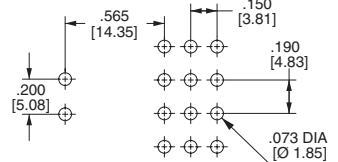
PC MOUNTING



FOUR POLE

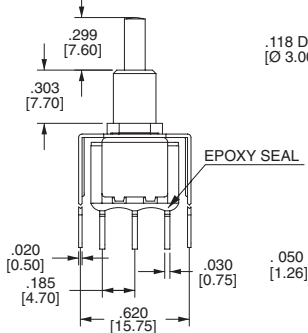


PC MOUNTING

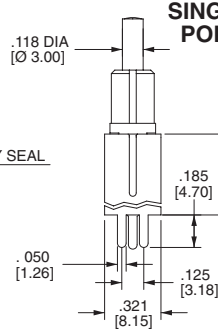


VS2-VS3

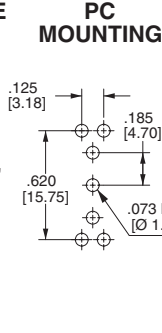
OPTION CODE	DIM. "A"
VS2	.460 [11.68]
VS3	.630 [16.00]



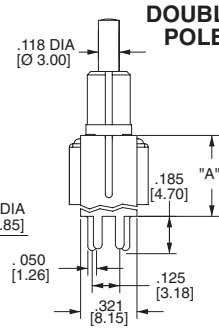
SINGLE POLE



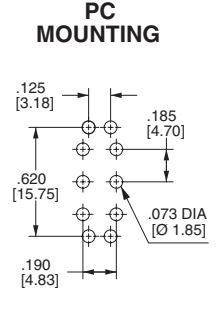
PC MOUNTING



DOUBLE POLE

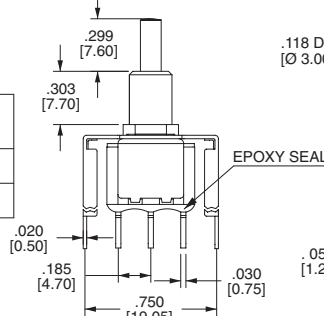


PC MOUNTING

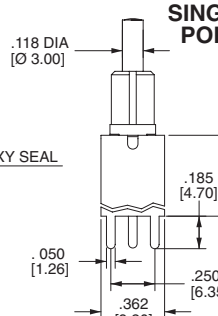


VS4-VS5

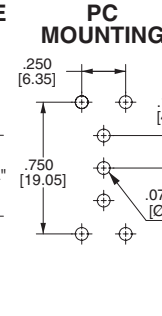
OPTION CODE	DIM. "A"
VS4	.460 [11.68]
VS5	.630 [16.00]



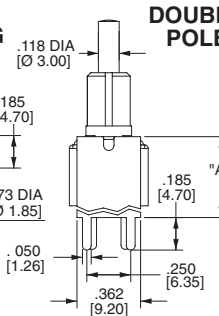
SINGLE POLE



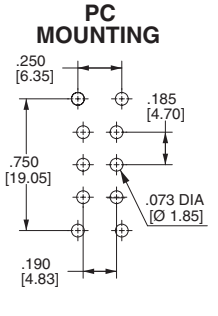
PC MOUNTING

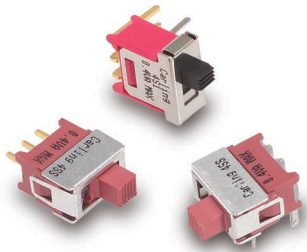


DOUBLE POLE

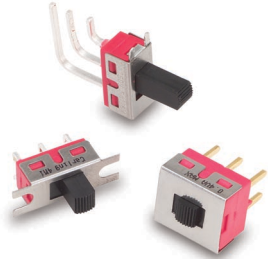


PC MOUNTING





4S1 & 4SS-Series
Sub-Miniature &
Sealed Sub-Miniature
Slide Switches



4M1-Series
Miniature Slide Switch

Specifications

Contact Rating refer to ordering scheme
 Electrical Life 30,000 make & break cycles at 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
 Operating Temperature -30°C to +85°C
 Solder Heat Resistance. MIL-STD-202, Method 210
 Actuator Travel 25°

Materials

Case Diallyl phthalate (DAP) (UL 94V-0)
 Slide Handle. Nylon
 Housing. Stainless Steel
 Terminal Seal Epoxy

4S1-Series Ordering Scheme



1 SERIES 4S1 Sub-Miniature Slide Switch																				
2 POLES FSP single pole																				
3 CIRCUIT <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="4" style="text-align: center;">Switching Position:</td> </tr> <tr> <td style="width: 10%;"></td> <td style="width: 15%;">2-1</td> <td style="width: 20%;">OPEN</td> <td style="width: 15%;">2-3</td> </tr> <tr> <td>1</td> <td>ON</td> <td>NONE</td> <td>ON</td> </tr> <tr> <td>2</td> <td>ON</td> <td>NONE</td> <td>(ON)</td> </tr> <tr> <td>3</td> <td>ON</td> <td>OFF</td> <td>ON</td> </tr> </table>	Switching Position:					2-1	OPEN	2-3	1	ON	NONE	ON	2	ON	NONE	(ON)	3	ON	OFF	ON
Switching Position:																				
	2-1	OPEN	2-3																	
1	ON	NONE	ON																	
2	ON	NONE	(ON)																	
3	ON	OFF	ON																	
4 TERMINATION M2 PCB M6 PC Mount, 90° horizontal																				

5 CONTACT		
<i>Material</i>	<i>Terminal Plating</i>	<i>Rating</i>
G silver ¹	gold over silver ³	3A@125VAC or 28VDC; 1.5A @ 250VAC
K gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)
P silver ¹	tin-lead ⁴	3A@125VAC or 28VDC; 1.5A @ 250VAC
Q silver ¹	silver ¹	3A@125VAC or 28VDC; 1.5A @ 250VAC
R gold ²	gold ²	0.4VA max. @20V max (AC/DC)
NOTE: Tin-lead option available with PC type terminations only. 1 Moveable contact & terminals: copper alloy, silver plate 2 Moveable contact & terminals: copper alloy with gold plate over nickel plate 3 Terminals: silver plate with outer layer in gold plating		

6 EPOXY SEAL E epoxy seal
--

7 PACKAGING Switches are bulk packed, unless T/R is specified at the end of the part number. T/R tape reel - 500 pieces per reel

4SS-Series Ordering Scheme



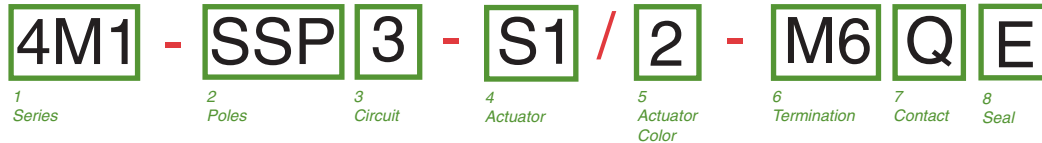
1 SERIES 4SS Sealed Sub-Miniature Slide Switch																
2 POLES FSP single pole																
3 CIRCUIT <table style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="4" style="text-align: left; padding-left: 10px;">Switching Position:</th> </tr> <tr> <td style="width: 10%;"></td> <td style="width: 15%;"></td> <td style="width: 25%; text-align: center;">OPEN</td> <td style="width: 50%; text-align: center;">2-3</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">ON</td> <td style="text-align: center;">NONE</td> <td style="text-align: center;">ON</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">ON</td> <td style="text-align: center;">OFF</td> <td style="text-align: center;">ON</td> </tr> </table>	Switching Position:						OPEN	2-3	1	ON	NONE	ON	3	ON	OFF	ON
Switching Position:																
		OPEN	2-3													
1	ON	NONE	ON													
3	ON	OFF	ON													
4 TERMINATION Termination options for switches with brick color actuators M2 PCB M6 PC Mount, 90° horizontal M7 PC Mount, 90° vertical Termination options for switches with white color actuators L6 Surface Mount, 90° flat S6 Surface Mount, 90° horizontal S7 Surface Mount, 90° vertical																

5 CONTACT		
Material	Terminal Plating	Rating
G silver ¹	gold over silver ³	1.5A @ 125VAC or 28VDC; 1.5A @ 250VAC
K gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)
P silver ¹	tin-lead ⁴	1.5A @ 125VAC or 28VDC; 1.5A @ 250VAC
R gold ²	gold ²	0.4VA max. @20V max (AC/DC)
NOTE:		
Tin-lead option available with PC type terminations only.		
1 Moveable contact & terminals: copper alloy, silver plate		
2 Moveable contact & terminals: copper alloy with gold plate over nickel plate		
3 Terminals: silver plate with outer layer in gold plating		
4 Outer terminals: copper alloy with tin-lead over nickel plate		

6 EPOXY SEAL
E epoxy seal

7 PACKAGING
Switches are bulk packed, unless T/R is specified at the end of the part number. T/R tape reel - 500 pieces per reel

4M1-Series Ordering Scheme

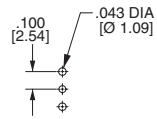
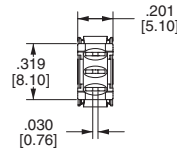
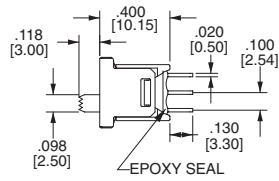
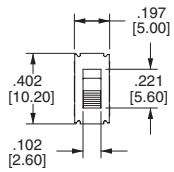
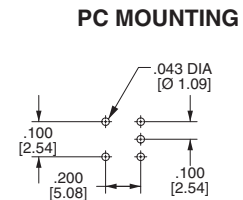
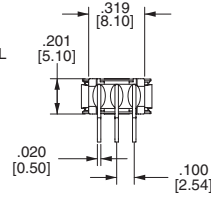
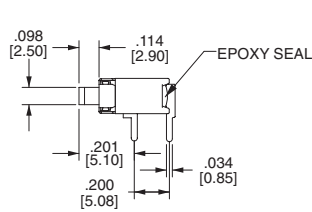
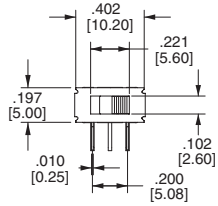
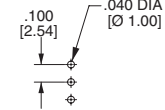
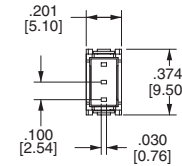
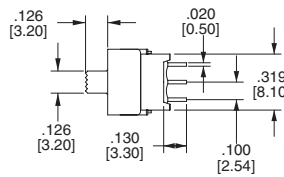
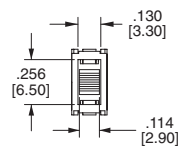
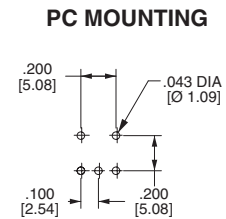
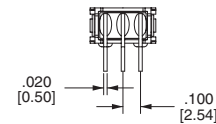
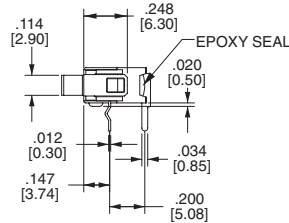
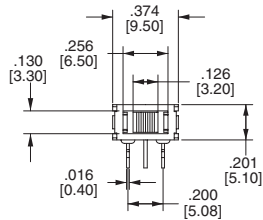
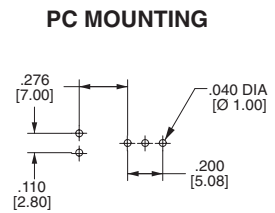
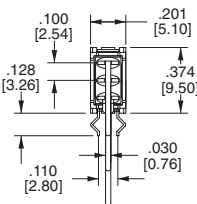
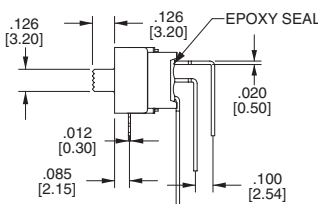
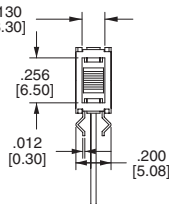
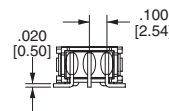
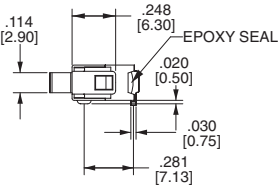
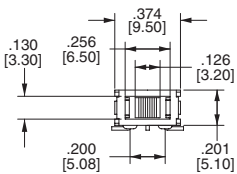
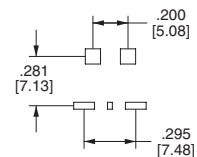


1 SERIES 4M1 Miniature Slide Switch												
2 POLES SSP single pole SDP double pole												
3 CIRCUIT Switching Position <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;"></td> <td style="width: 15%; text-align: center;">2-1, 5-4</td> <td style="width: 25%; text-align: center;">OPEN</td> <td style="width: 50%; text-align: center;">2-3, 5-6</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">ON</td> <td style="text-align: center;">NONE</td> <td style="text-align: center;">ON</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">ON</td> <td style="text-align: center;">OFF</td> <td style="text-align: center;">ON</td> </tr> </table>		2-1, 5-4	OPEN	2-3, 5-6	1	ON	NONE	ON	3	ON	OFF	ON
	2-1, 5-4	OPEN	2-3, 5-6									
1	ON	NONE	ON									
3	ON	OFF	ON									
4 ACTUATOR S1 .201 [5.10] high S2 .285 [7.25] high S3 .370 [9.40] high S4 .140 [3.55] high S5 .053 [1.35] high (for DPDT only) S6 .482 [12.25] high S7 .311 [7.90] high T1 .201 [5.10] high (for DPDT only)												
5 ACTUATOR COLOR¹ <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">1 white</td> <td style="width: 25%;">3 red</td> <td style="width: 25%;">5 yellow</td> <td style="width: 25%;">7 blue</td> </tr> <tr> <td>2 black</td> <td>4 orange</td> <td>6 green</td> <td>8 brown</td> </tr> </table> <p style="font-size: small;">1 White, black & red are standard. Other colors available for quantities of 5K or more.</p>	1 white	3 red	5 yellow	7 blue	2 black	4 orange	6 green	8 brown				
1 white	3 red	5 yellow	7 blue									
2 black	4 orange	6 green	8 brown									

6 TERMINATION	
M1 Solder Lug	M5-3 Wire Wrap [10.80]
M2 PCB	M5-4 Wire Wrap [26.97]
M3 Quick Connect	M6 PC Mount, 90° horizontal
M5-1 Wire Wrap .750 [19.05]	M7 PC Mount, 90° vertical
M5-2 Wire Wrap [24.48]	VS2 PC Mount, U bracket, .620 mounting x .460 high

7 CONTACT			
Material	Terminal Plating	Rating	Approvals
G silver ¹	gold over silver ³	5A @ 125VAC or 28VDC; 2A @ 250VAC	UL, CSA
K gold ²	tin-lead ⁴	0.4VA max. @20V max (AC/DC)	
P silver ¹	tin-lead ⁴	5A @ 125VAC or 28VDC; 2A @ 250VAC	UL, CSA
Q silver ¹	silver ¹	5A @ 125VAC or 28VDC; 2A @ 250VAC	UL, CSA
R gold ²	gold ²	0.4VA max. @20V max (AC/DC)	
NOTE:			
Tin-lead option available with PC type terminations only.			
1 Moveable contact & terminals: copper alloy, silver plate			
2 Moveable contact & terminals: copper alloy with gold plate over nickel plate			
3 Terminals: silver plate with outer layer in gold plating			
4 Outer terminals: copper alloy with tin-lead over nickel plate			

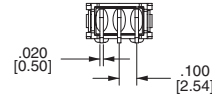
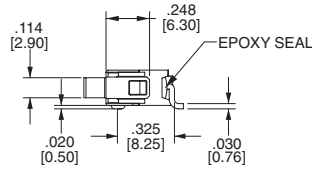
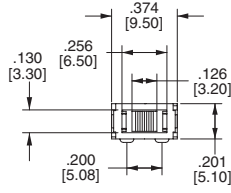
8 EPOXY SEAL
E epoxy seal

4S-Series Dimensional Specifications: in. [mm]
4S1-Series
TERMINATION
PC MOUNTING
M2

M6

4SS-Series
TERMINATION
PC MOUNTING
M2

M6

M7

L6

PC MOUNTING


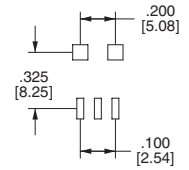
4SS-Series Dimensional Specifications: in. [mm]

TERMINATION

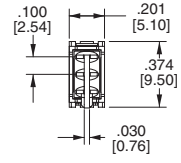
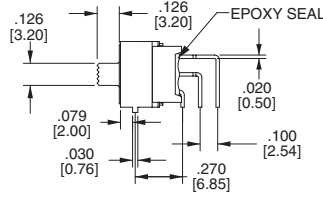
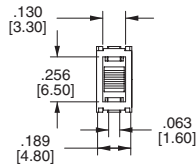
S6



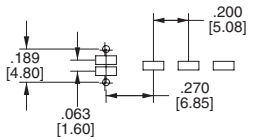
PC MOUNTING



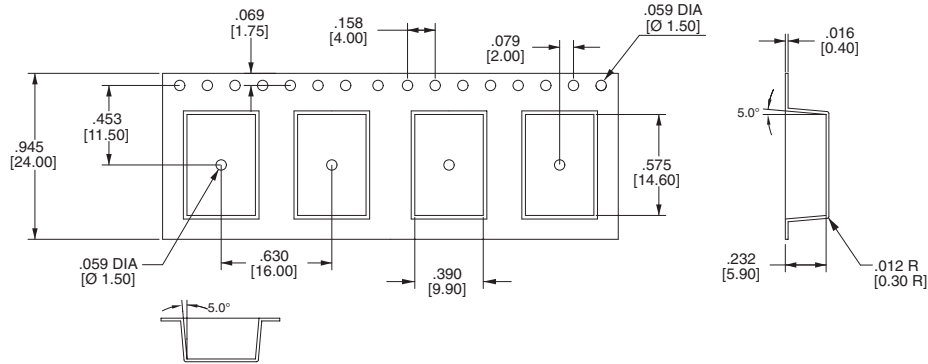
S7



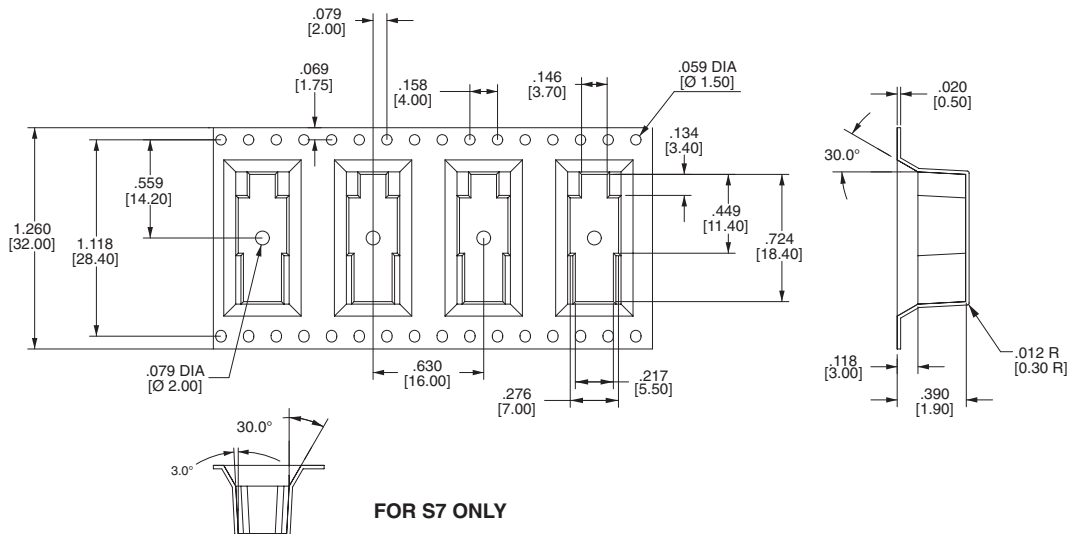
PC MOUNTING



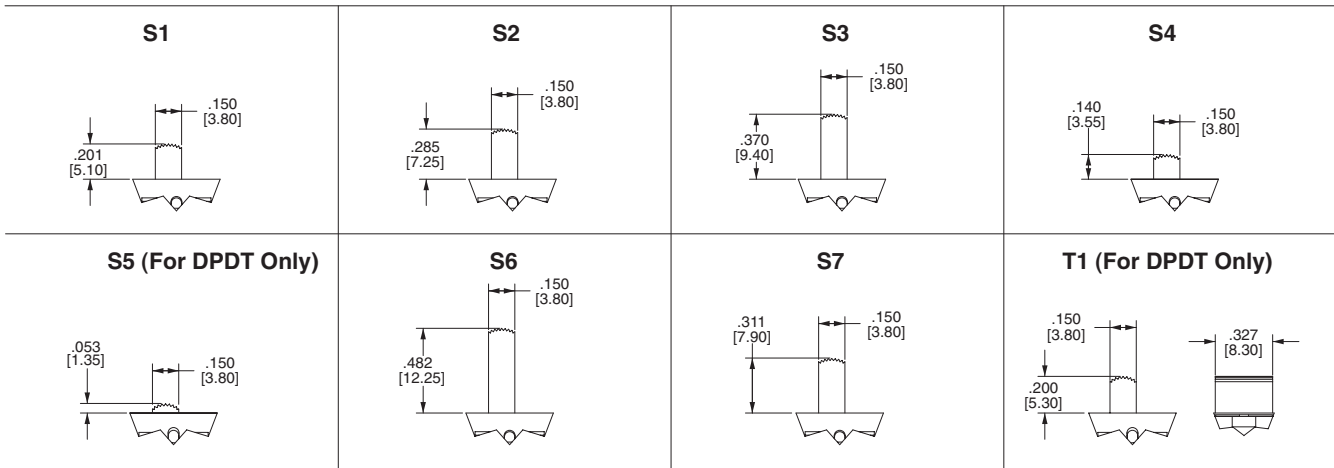
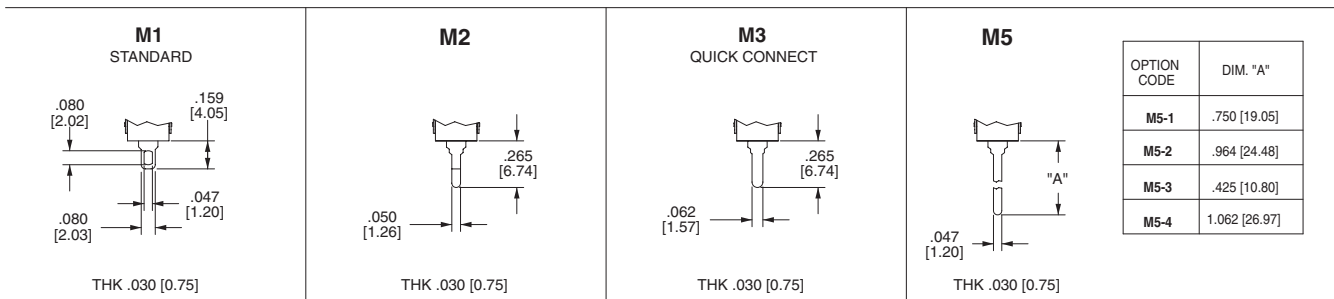
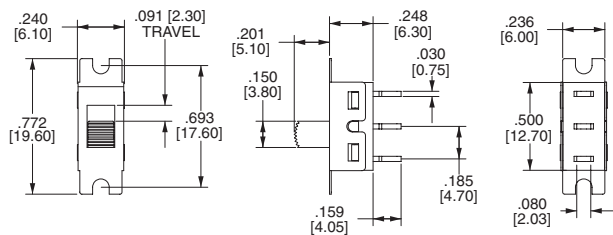
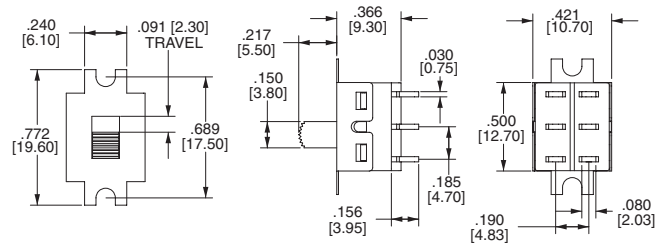
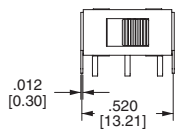
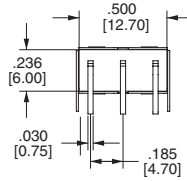
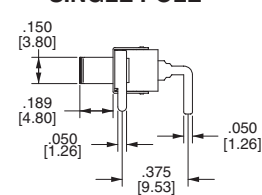
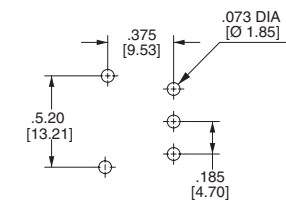
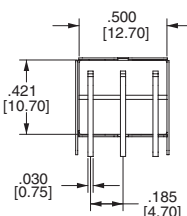
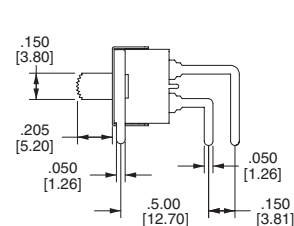
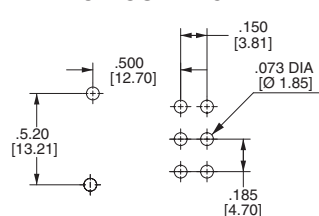
REEL TAPING



FOR S6,L6 ONLY



FOR S7 ONLY

4M1-Series Dimensional Specifications: in. [mm]
ACTUATOR

TERMINATION

SINGLE POLE

DOUBLE POLE

M6

SINGLE POLE

PC MOUNTING

DOUBLE POLE

PC MOUNTING


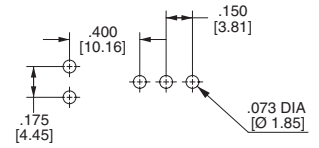
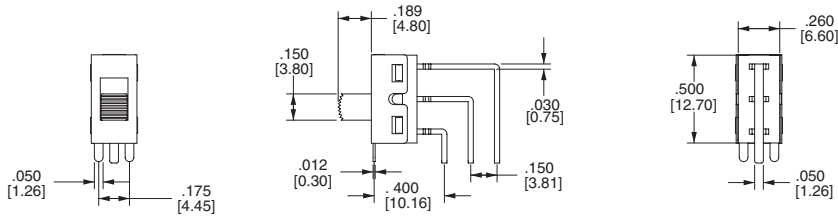
4M1-Series Dimensional Specifications: in. [mm]

TERMINATION

M7

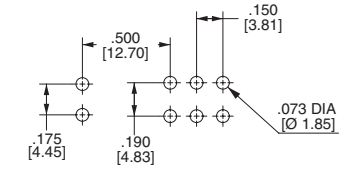
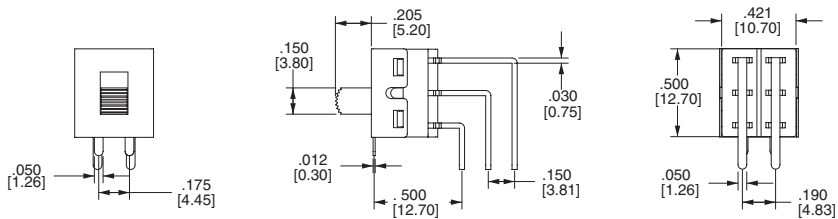
SINGLE POLE

PC MOUNTING



DOUBLE POLE

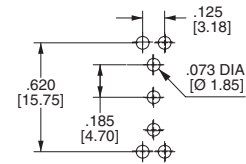
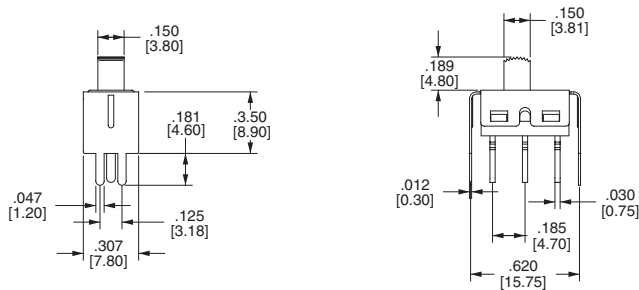
PC MOUNTING



VS2

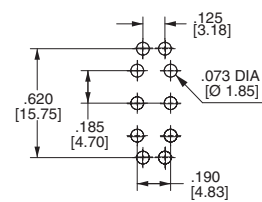
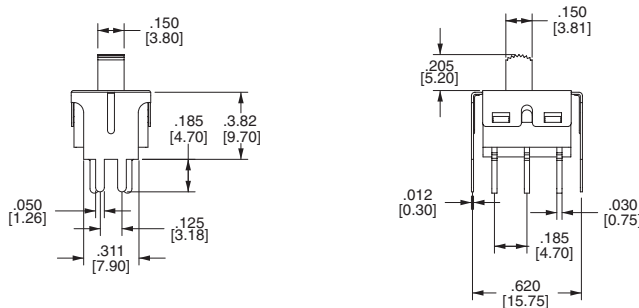
SINGLE POLE

PC MOUNTING



DOUBLE POLE

PC MOUNTING





4PM-Series Sub-Miniature Slide Switches for PC Board

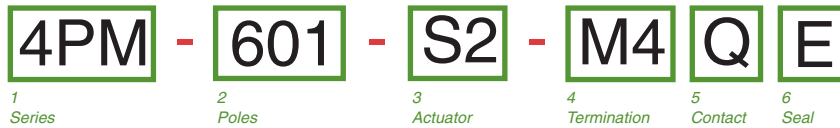
Specifications

Contact Rating refer to ordering scheme
 Electrical Life 10,000 make & break cycles @ full load
 Contact Resistance. 10 mΩ max.
 Insulation Resistance 1000 MΩ min. @500 VDC
 Mechanical Life 20,000 cycles
 Operating Temperature . . . -30°C to +85°C
 Solder Heat Resistance. . . MIL-STD-202, Method 210
 Actuator Travel 25°

Materials

Case & Slide Handle. PBT, Glass filled
 Housing. POM
 Terminal Seal Epoxy

4PM-Series Ordering Scheme



1 SERIES
 4PM Sub-Miniature Slide Switch

2 POLES

		Switching Position:		
		2-1, 5-4	OPEN	2-3, 5-6
601	single pole	ON	NONE	ON
602	double pole	ON	NONE	ON

3 ACTUATOR
 S1 flush slider S2 high slider S3 side slider

4 TERMINATION
 M1 narrow pitch single pole M3 wide pitch single pole
 M2 narrow pitch double pole M4 wide pitch double pole

5 CONTACT

	Material	Terminal Plating	Rating
Q	silver ¹	silver ¹	2A@250VAC
R	gold ²	gold ²	0.1A@30VDC

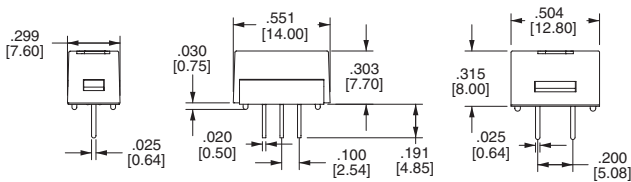
1 Moveable contact & terminals: copper alloy, silver plated
 2 Moveable contact & terminals: copper alloy with gold plate over nickel plate

6 EPOXY SEAL
 E epoxy seal

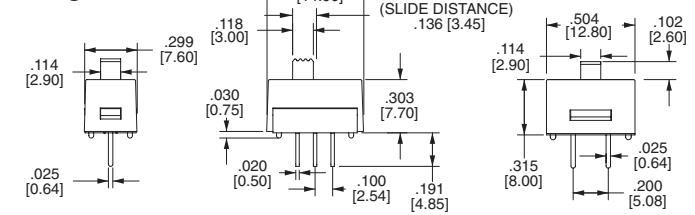
4PM-Series Dimensional Specifications: in. [mm]

ACTUATOR

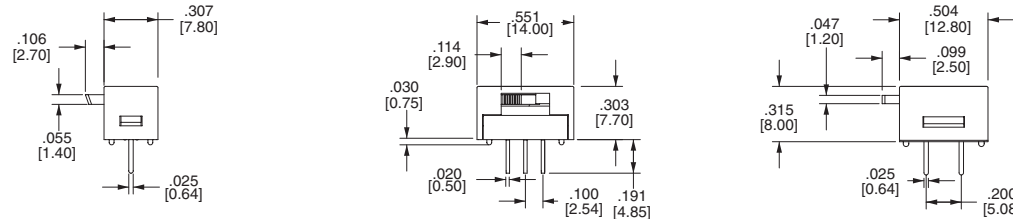
S1 Flush Slider



S2 High Slider

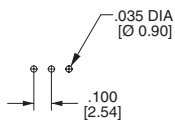


S3 Side Slider

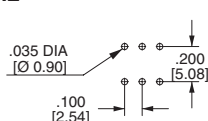


TERMINATION

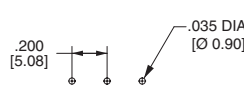
M1 SINGLE POLE



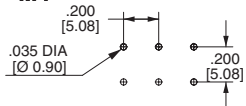
M2 DOUBLE POLE



M3 SINGLE POLE



M4 DOUBLE POLE



Other Carling Technologies Catalogs

Switches and Controls



This catalog includes the Carlingswitch brand of electrical switches for most any power switching need. Included are rocker, toggle, push-button, rotary and sealed switches with a wide variety of cir-

cuits, ratings, terminations, colors, illuminations, and legends. Worldwide certifications, UL1500, CE marked. Dimmer, Mirror Rotate & Wiper/Washer controls are also included.

Thermal Circuit Protectors



This catalog details Carling's thermal circuit protection products. Thermal protectors range from 0.1 to 40 amps. Front Panel Snap-in Mounting styles and Quick Connect

Terminals are included. Worldwide certifications, including UL1500, TUV and CE marked.

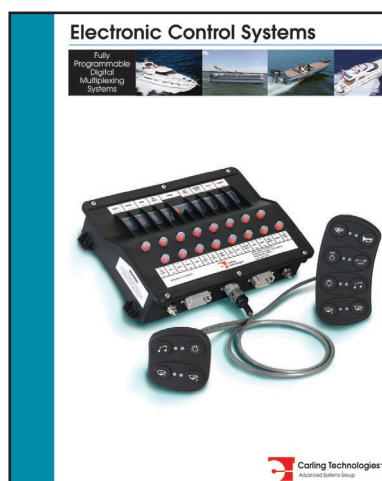
Circuit Protection



This catalog details the complete line of Carling circuit protection products including hydraulic/magnetic circuit breakers, thermal circuit protectors, and ground fault breakers. Breakers range

from 0.1 to 700 amps Hi-inrush delay curves, Front Panel Snap-in Mounting styles, Rockerguard Bezels, Dual-Coil functions, and Quick Connect Terminals are included. Worldwide certifications, including UL1500, UL489 and CE marked.

Digital Switching Systems



This catalog details Carling's Digital Switching Systems, including the Electronic Control System III, (ECS III). The ECS III features the latest in digital multiplex technology, creating a safer and

fully configurable control system for the marine environment. The ECS III eliminates complex wiring while increasing switching features and functionality, and simplifies troubleshooting.

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