

SPECIFICATIONS

CONTACT RATING: Dependent upon contact material.

MECHANICAL LIFE: 40,000 make-and-break cycles.

CONTACT RESISTANCE: 10mΩ max. initial @ 2-4VDC
100mA for both silver and gold plated contacts.

INSULATION RESISTANCE: 1,000MΩ min.

DIELECTRIC STRENGTH: 1,000 V RMS@sea level.

OPERATING TEMPERATURE: -30°C to 85°C.

MATERIALS

CASE: Diallyl phthalate (DAP) (UL94v-0).

ACTUATOR: Nylon,black std.

BUSHING: Brass,nickel plated.

HOUSING: Stainless Steel.

SWITCH SUPPORT: Brass,tin plated.

TERMINAL/CONTACT: Brass,with silver or gold plated.(See Page 58)

HOW TO ORDER

MODEL NO. ACTUATOR FRAME COLOR ACTUATOR COLOR CAP MARKING TERMINATIONS CONTACT MATERIAL SEAL ROHS SOLDERING

See below

| <p>MODEL NO.</p> <p>3MS1 SP On-None-On</p> <p>3MS2 SP On-None-Mom</p> <p>3MS3 SP On-Off-On</p> <p>3MS4 SP Mom-Off-Mom</p> <p>3MS5 SP On-Off-Mom</p> <p>3MD1 DP On-None-On</p> <p>3MD2 DP On-None-Mom</p> <p>3MD3 DP On-Off -On</p> <p>3MD4 DP Mom-Off-Mom</p> <p>3MD5 DP On-Off-Mom</p> <p>3MD6 DP On-On-On</p> <p>3MD7 DP MOm-On-Mom</p> <p>3MD8 DP On-On-Mom</p> <p>3M31 3P On-None-On</p> <p>3M32 3P On-None-Mom</p> <p>3M33 3P On-Off-On</p> <p>3M34 3P Mom-Off-Mom.</p> <p>3M35 3P On-Off-Mom</p> <p>3M41 4P On-None-On</p> <p>3M42 4P On-None-Mom</p> <p>3M43 4P On-Off-On</p> <p>3M44 4P Mom-Off-Mom</p> <p>3M45 4P On-Off-Mom</p> <p>3M46 4P On-On-On</p> <p>3M47 4P MOm-On-Mom</p> <p>3M48 4P On-On-Mom</p> | <p>ACTUATOR</p> <p>R1 13.49 long rocker - support</p> <p>R2 Lever - support</p> <p>R3 23.01 long rocker - support</p> <p>R4 Lever - support</p> <p>R5 33.48 long rocker - support</p> <p>R6 Rocker with frame</p> <p>R6K Rocker with frame,snap-in</p> <p>R7 Lever with frame</p> <p>R7K Lever with frame,snap-in</p> <p>R8 Lever with frame</p> <p>R9 Lever with frame</p> <p>R11 9.19 long rocker - support</p> <p>R12 Lever - support</p> <p>R13 Lever - support</p> <p>R16 Lever - support</p> <p>R17 Rocker with frame for LED,snap-in</p> <p>R18 Lever with frame for LED,snap-in</p> | <p>FRAME COLOR</p> <p>ACTUATOR COLOR</p> <p>See below</p> <table border="1"> <thead> <tr> <th>ITEM NO</th> <th>COLOR</th> </tr> </thead> <tbody> <tr><td>1</td><td>White</td></tr> <tr><td>2</td><td>Black (Std)</td></tr> <tr><td>3</td><td>Red</td></tr> <tr><td>4</td><td>Orange</td></tr> <tr><td>5</td><td>Yellow</td></tr> <tr><td>6</td><td>Green</td></tr> <tr><td>7</td><td>Blue</td></tr> <tr><td>8</td><td>Brown</td></tr> <tr><td>9</td><td>Gray</td></tr> </tbody> </table> | ITEM NO | COLOR | 1 | White | 2 | Black (Std) | 3 | Red | 4 | Orange | 5 | Yellow | 6 | Green | 7 | Blue | 8 | Brown | 9 | Gray | <p>CAP MARKING</p> <table border="1"> <tbody> <tr><td>1</td><td>○ —</td></tr> <tr><td>2</td><td>○ </td></tr> <tr><td>5</td><td>← →</td></tr> <tr><td>6</td><td> ○ </td></tr> <tr><td>7</td><td>— •</td></tr> <tr><td>8</td><td>⊕ </td></tr> <tr><td>9</td><td>ON/OFF</td></tr> <tr><td>F</td><td>⊕ —</td></tr> </tbody> </table> | 1 | ○ — | 2 | ○ | 5 | ← → | 6 | ○ | 7 | — • | 8 | ⊕ | 9 | ON/OFF | F | ⊕ — | <p>TERMINATIONS</p> <p>M1 Solder Lug</p> <p>M2 PC thru-hole</p> <p>M3 Quick Connect</p> <p>M5-1 18.70 high, wire wrap</p> <p>M5-2 24.20 high, wire wrap</p> <p>M5-3 10.55 high, wire wrap</p> <p>M5-4 26.97 high, wire wrap</p> <p>M6 Right angle, PC thru-hole</p> <p>M6N Right angle, snap-in, PC thru-hole</p> <p>M7 Vertical right angle, PC thru-hole</p> <p>M7N Vertical right angle, snap-in, PC thru-hole</p> <p>VS2 11.68 high, V-bracket</p> <p>V2N 11.68 high, snap-in V-bracket</p> <p>VS3 16.00 high, V-bracket</p> <p>VS4 11.68 high, V-bracket</p> <p>VS5 16.00 high, V-bracket</p> | <p>CONTACT MATERIAL</p> <p>Q Silver</p> <p>R Gold</p> <p>G Gold,pure-tin</p> <p>S Silver,pure-tin</p> <p>C Gold over silver</p> <p>K Gold over silver,pure-tin</p> | <p>SEAL</p> <p>E EPOXY (std)</p> <p>N NO EPOXY</p> | <p>ROHS SOLDERING</p> <p>□ Rohs Compliant</p> <p>S Rohs & Lead Free</p> <p>F Halogen Free+RoHS +REACH</p> |
|--|---|--|---------|-------|---|-------|---|-------------|---|-----|---|--------|---|--------|---|-------|---|------|---|-------|---|------|---|---|-----|---|---|---|-----|---|---|---|-----|---|---|---|--------|---|-----|--|--|--|---|
| ITEM NO | COLOR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | White | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Black (Std) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Orange | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Yellow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Green | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Blue | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Brown | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Gray | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ○ — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | ← → | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | — • | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | ⊕ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | ON/OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | ⊕ — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SWITCH FUNCTION

| NO. POLES | UL/CSA MODEL NO. | MODEL NO. | SWITCH FUNCTION | | | CONNECTED TERMINALS / SCHEMATIC | | |
|-----------|------------------|-----------|-----------------|-------|-------|---------------------------------|-------------------|-------------------|
| | | | POS.1 | POS.2 | POS.3 | POS.1 | POS.2 | POS.3 |
| | | | | | | | | |
| SP | Q1311 | 3MS1 | ON | NONE | ON | 2-3 | N/A | 2-1 |
| | Q1312 | 3MS2 | ON | NONE | MOM | | | |
| | Q1313 | 3MS3 | ON | OFF | ON | | OPEN | |
| | Q1314 | 3MS4 | MOM | OFF | MOM | | | |
| | Q1315 | 3MS5 | ON | OFF | MOM | | | |
| DP | Q1321 | 3MD1 | ON | NONE | ON | 2-3,5-6 | N/A | 2-1,5-4 |
| | Q1322 | 3MD2 | ON | NONE | MOM | | | |
| | Q1323 | 3MD3 | ON | OFF | ON | | OPEN | |
| | Q1324 | 3MD4 | MOM | OFF | MOM | | | |
| | Q1325 | 3MD5 | ON | OFF | MOM | | | |
| | Q1326 | 3MD6 | ON | ON | ON | 2-3,5-6 | 2-3,5-4 | 2-1,5-4 |
| | ▲ Q1327 | 3MD7 | MOM | ON | MOM | | | |
| | ▲ Q1328 | 3MD8 | ON | ON | MOM | | | |
| 3P | Q1331 | 3M31 | ON | NONE | ON | 2-3,5-6,8-9 | N/A | 2-1,5-4,8-7 |
| | Q1332 | 3M32 | ON | NONE | MOM | | | |
| | Q1333 | 3M33 | ON | OFF | ON | | OPEN | |
| | Q1334 | 3M34 | MOM | OFF | MOM | | | |
| | Q1335 | 3M35 | ON | OFF | MOM | | | |
| 4P | Q1341 | 3M41 | ON | NONE | ON | 2-3,5-6,8-9,11-12 | N/A | 2-1,5-4,8-7,11-10 |
| | Q1342 | 3M42 | ON | NONE | MOM | | | |
| | Q1343 | 3M43 | ON | OFF | ON | | OPEN | |
| | Q1344 | 3M44 | MOM | OFF | MOM | | | |
| | Q1345 | 3M45 | ON | OFF | MOM | | | |
| | Q1346 | 3M46 | ON | ON | ON | 2-3,5-6,8-9,11-12 | 2-3,5-4,8-9,11-10 | 2-1,5-4,8-7,11-10 |
| | ▲ Q1347 | 3M47 | MOM | ON | MOM | | | |
| | ▲ Q1348 | 3M48 | ON | ON | MOM | | | |

MOM=MOMENTARY

▲ Please check the availability in advance before order

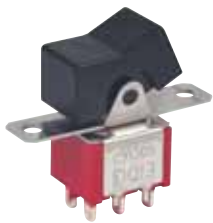
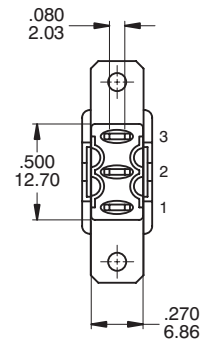
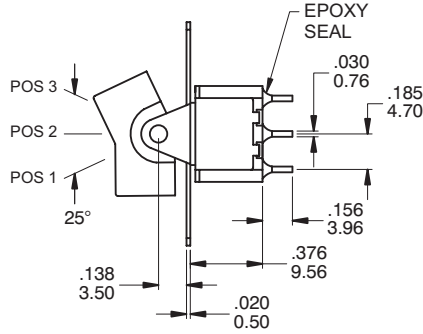
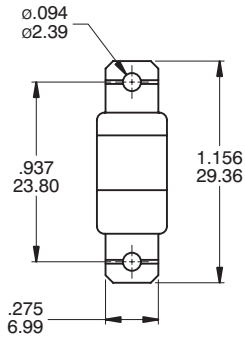
POLE OPTIONS

Rocker Switches



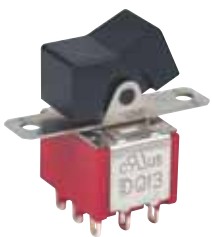
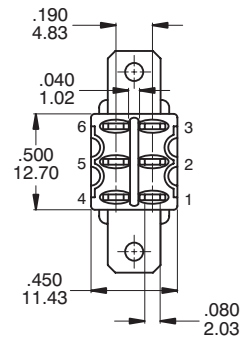
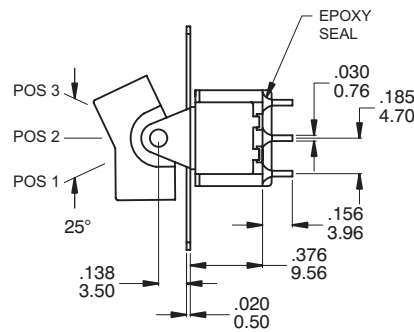
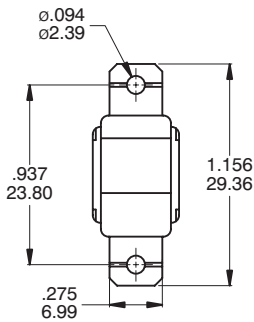
SPDT

Part No. Shown : 3MS1R102M1QE



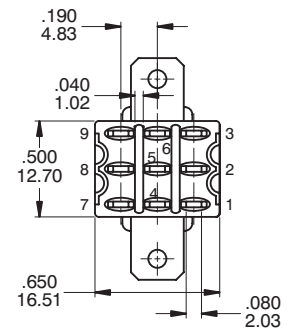
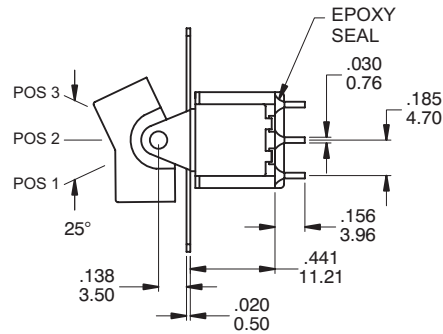
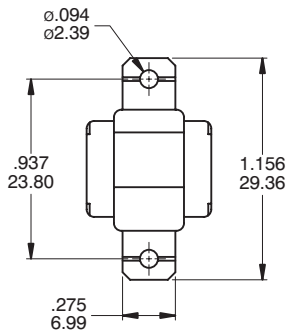
DPDT

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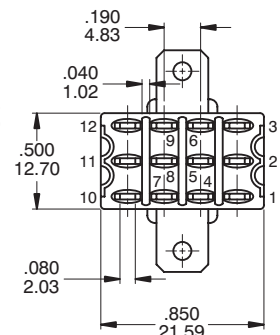
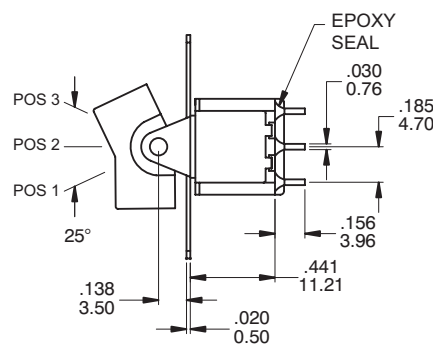
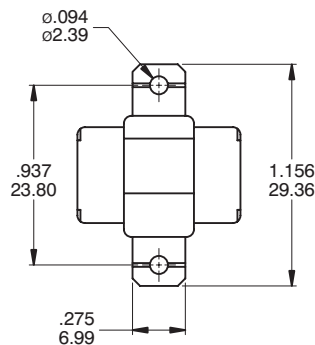
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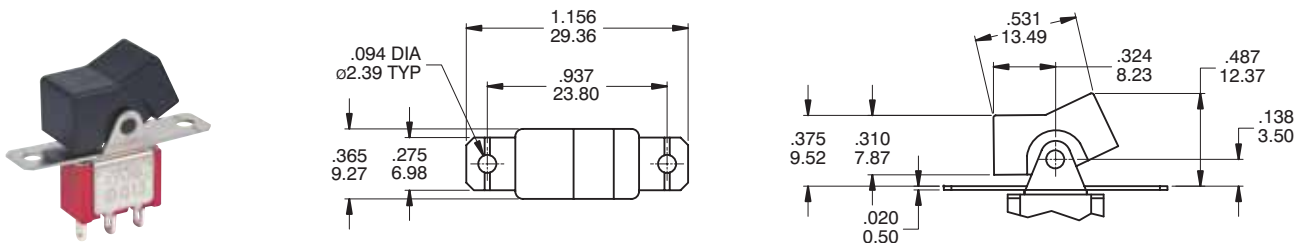
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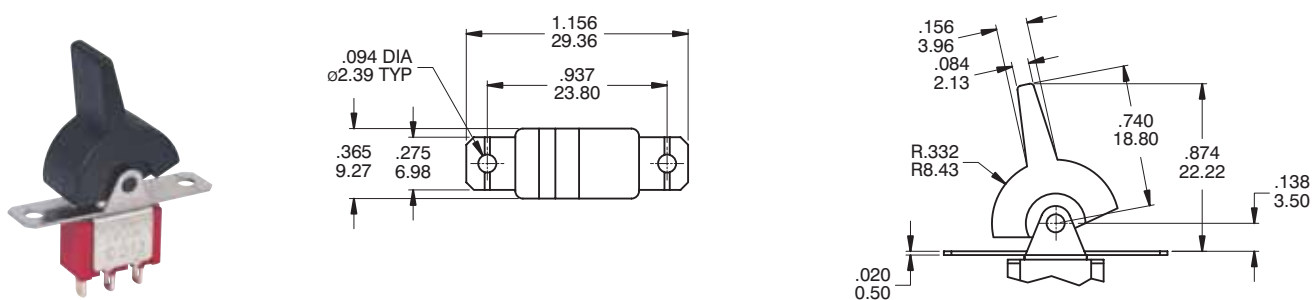


ACTUATOR OPTIONS FOR PANEL MOUNT ONLY

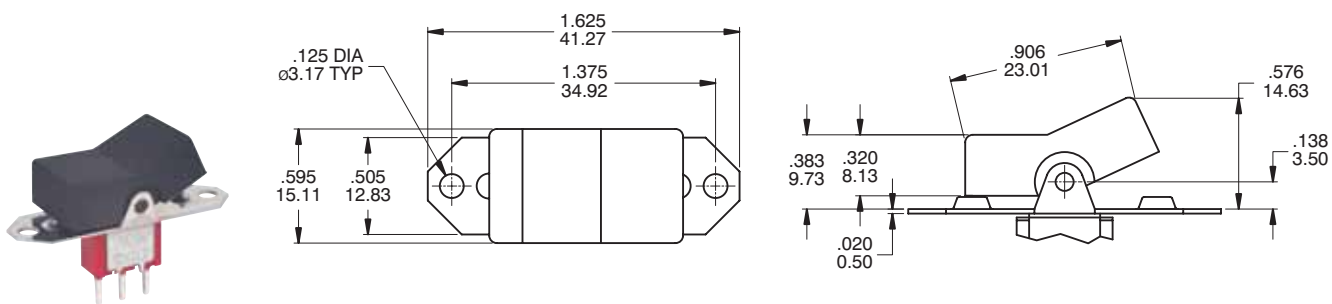
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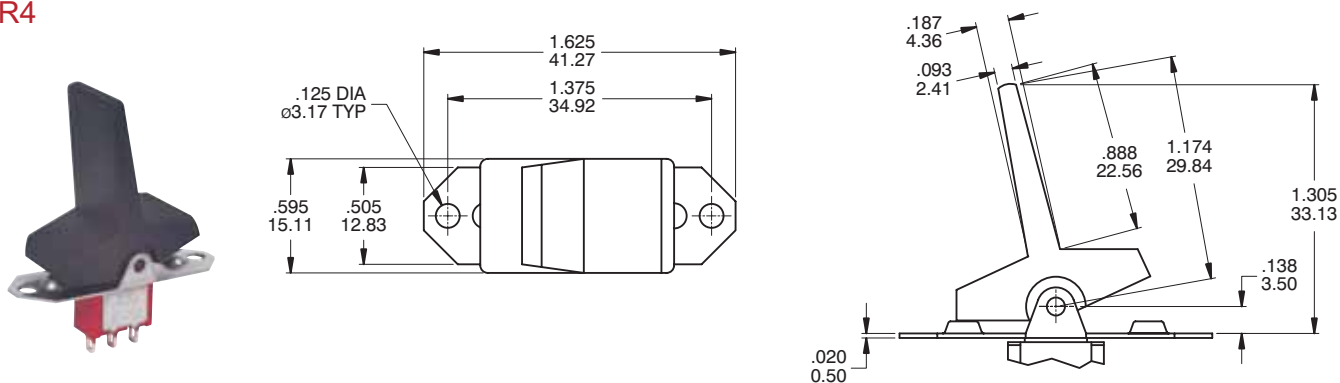
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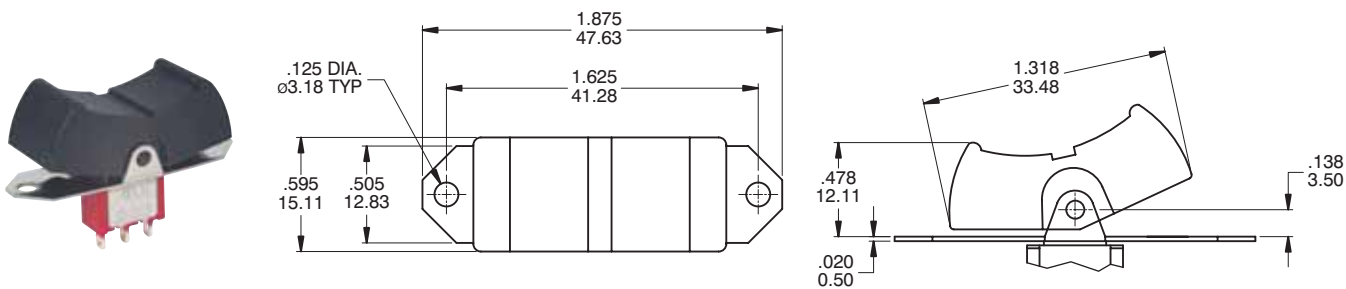


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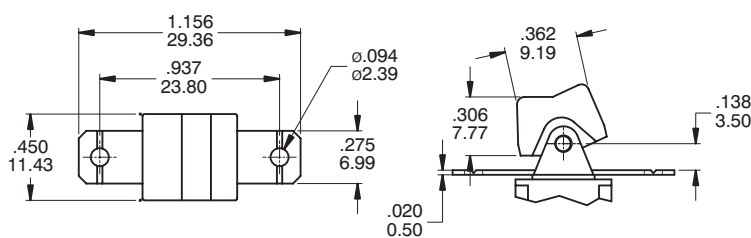


ACTUATOR OPTIONS FOR SNAP-IN FRONT MOUNT

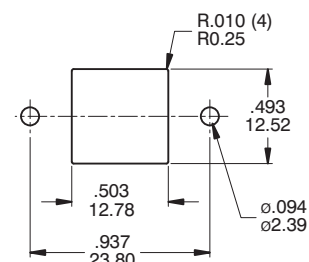
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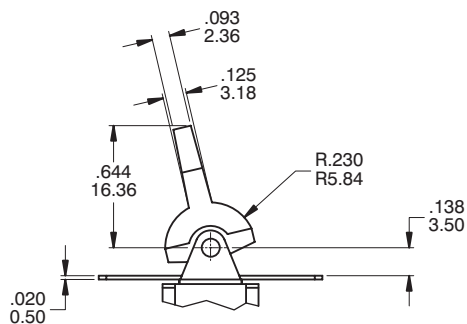
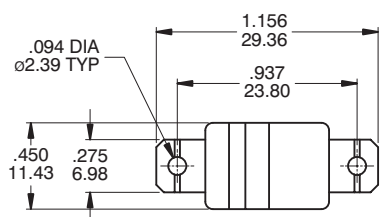
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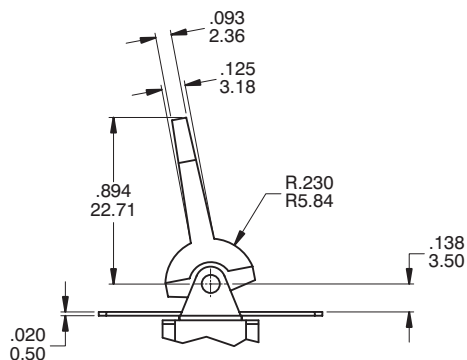
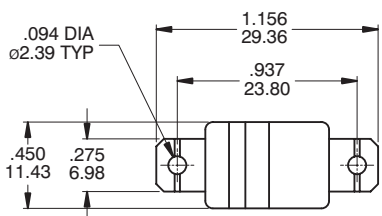
RECOMMENDED MOUNTING



R12

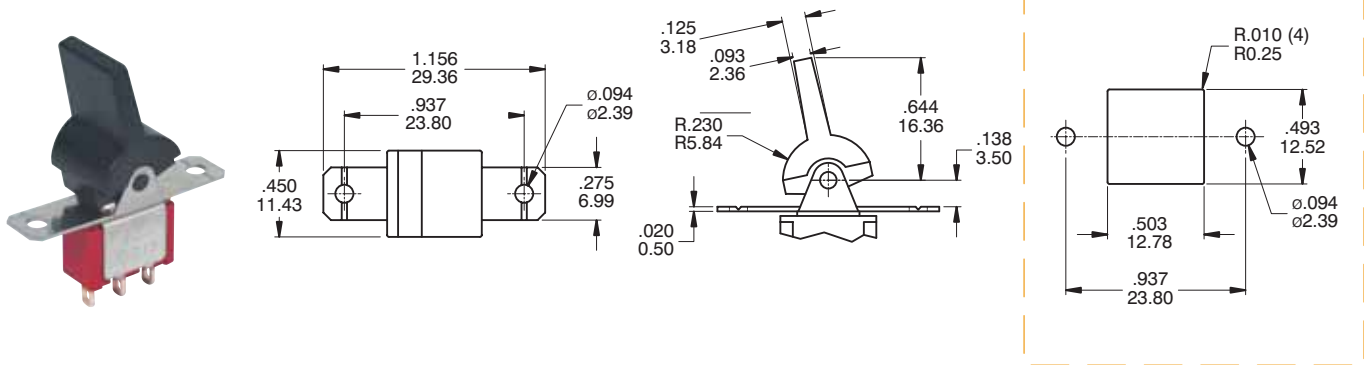


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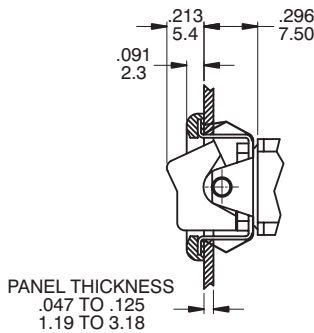
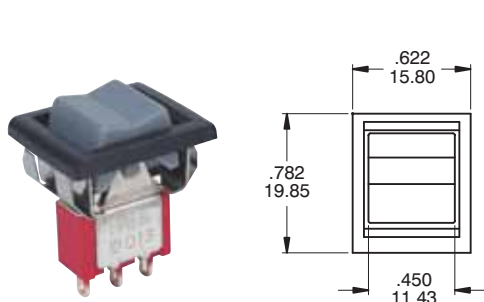


ACTUATOR OPTIONS SNAP-IN FRONT MOUNT

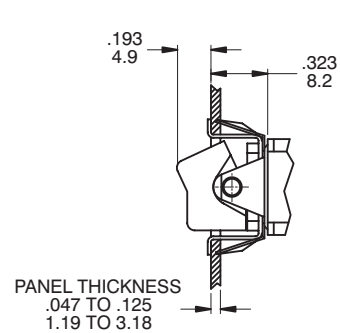
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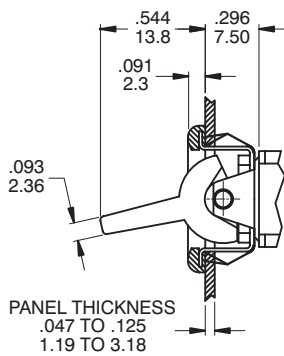
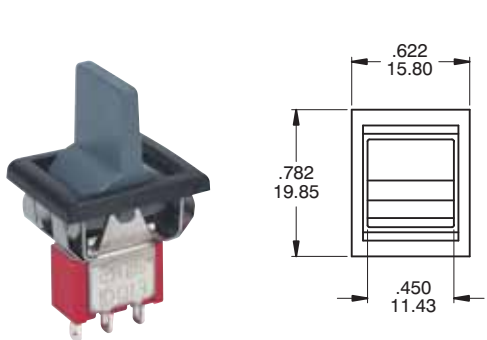
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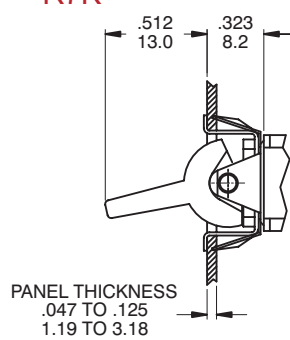
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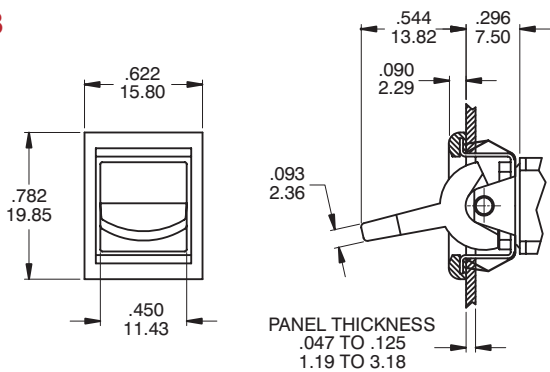
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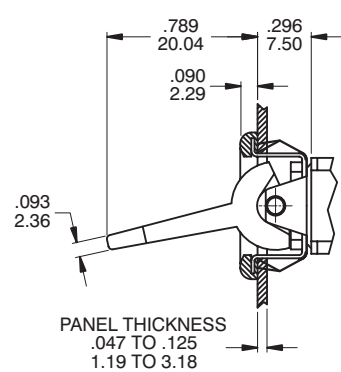
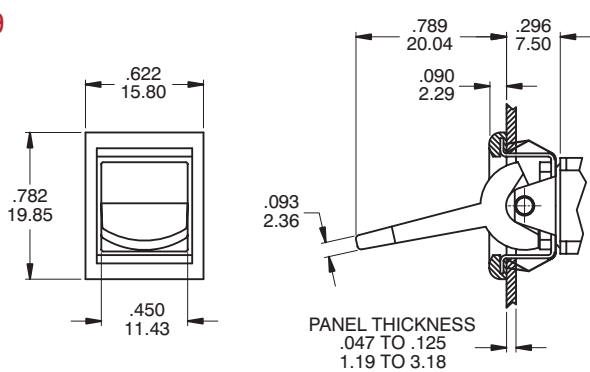
R7K



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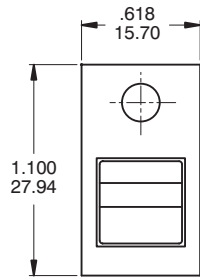


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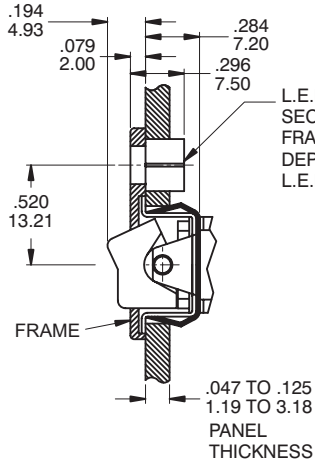


Rocker Switches

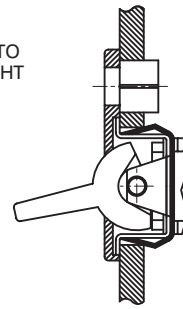
R18



▲R17



▲R18



CAP AND FRAME COLORS

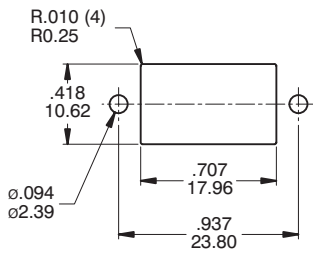
| OPTION CODE | COLOR |
|-------------|-------------|
| 1 | WHITE |
| 2 | BLACK (std) |
| 3 | RED |

LED COLORS

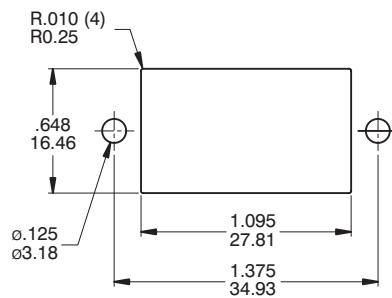
| OPTION CODE | COLOR |
|-------------|-----------|
| R | RED (std) |
| O | ORANGE |
| G | GREEN |

RECOMMENDED MOUNTING

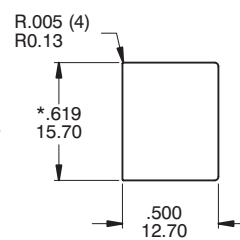
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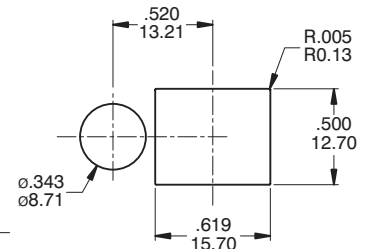
For R3-R4



For R6-R9



For R17-R18

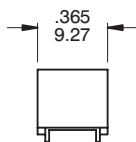
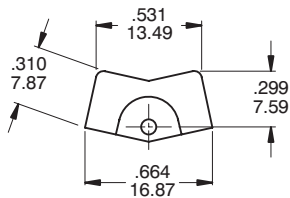


*For R8 and R9: Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

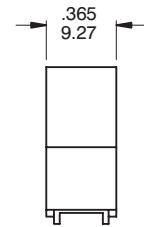
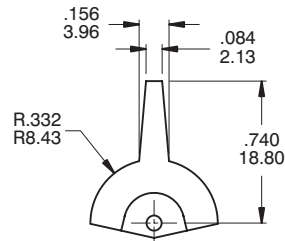
* For R6 and R7: Increase this dim. to .620/.625 (15,75/15,88) for .060/.125 (1,52/3,18) thk. panels.

ACTUATOR OPTIONS FOR P.C. MOUNT ONLY

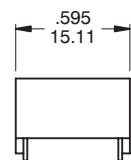
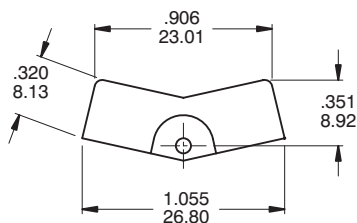
J1



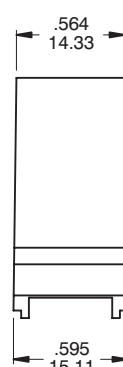
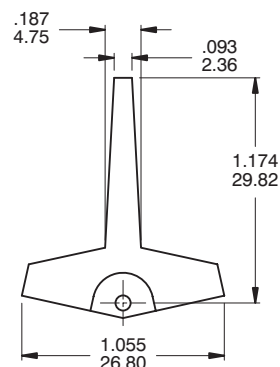
J2



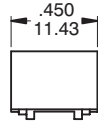
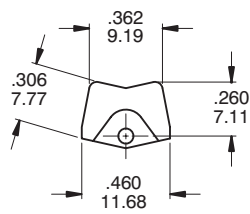
J3



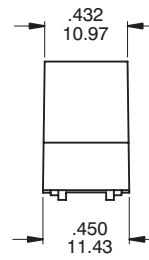
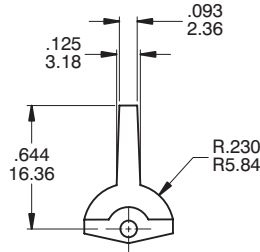
J4



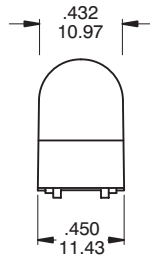
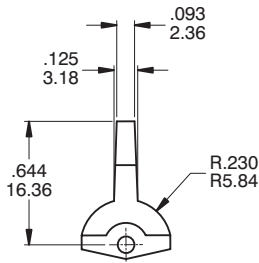
J5



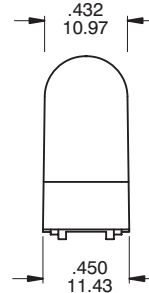
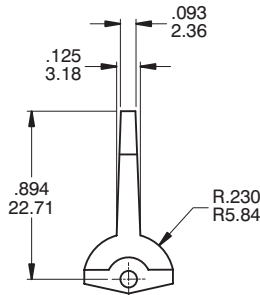
J6



J7



J8

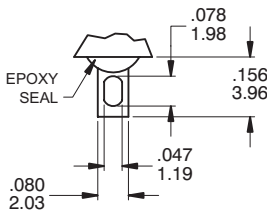


Actuator and frame colors:

| ITEM NO | COLOR |
|---------|-------------|
| 1 | White |
| 2 | Black (Std) |
| 3 | Red |
| 4 | Orange |
| 5 | Yellow |
| 6 | Green |
| 7 | Blue |
| 8 | Brown |
| 9 | Gray |

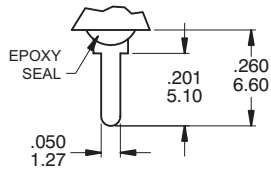
TERMINATION OPTIONS

M1 SOLDER LUG



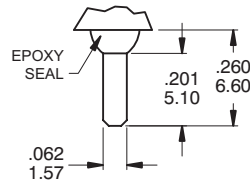
THK .030(0.76)

M2 PC THRU-HOLE



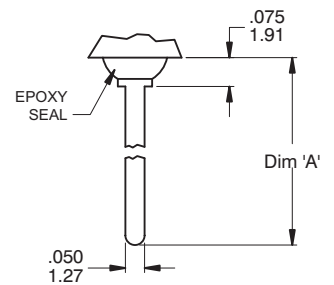
THK .030(0.76)

M3 QUICK CONNECT



THK .030(0.76)

M5 WIRE WRAP



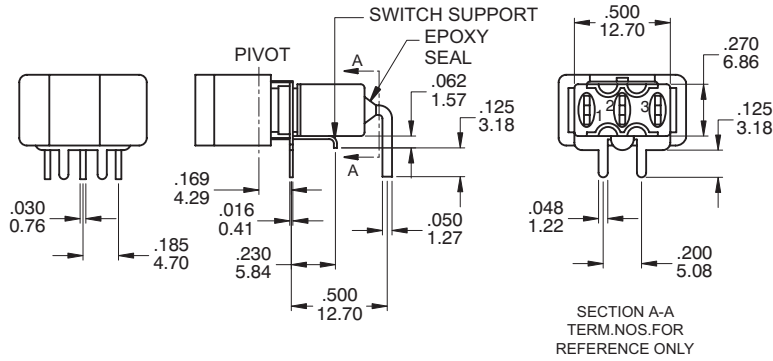
THK .030(0.76)

OTHER TERMINATION OPTIONS

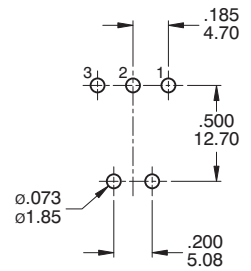
- M6 RIGHT ANGLE P.C. MOUNT
- M7 RIGHT ANGLE P.C. MOUNT
- VS2 VERTICAL BRACKET P.C. MOUNT
- VS3 VERTICAL BRACKET P.C. MOUNT
- VS4 VERTICAL BRACKET P.C. MOUNT
- VS5 VERTICAL BRACKET P.C. MOUNT

| OPTION CODE | DIM. 'A' |
|-------------|---------------|
| M5-1 | .736 (18.70) |
| M5-2 | .953 (24.20) |
| M5-3 | .415 (10.55) |
| M5-4 | 1.062 (26.97) |

M6 Shown with J1 Actuator



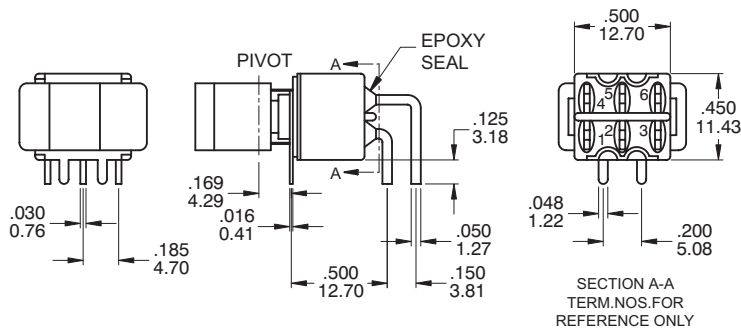
P.C. MOUNTING



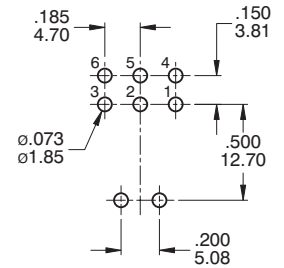
SPDT

Part No. Shown : 3MS1J102M6QE

M6



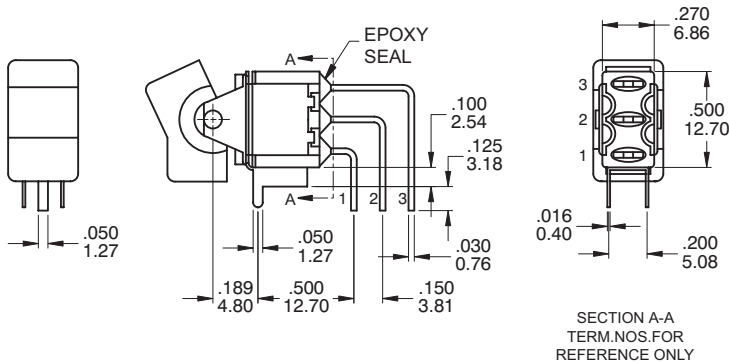
P.C. MOUNTING



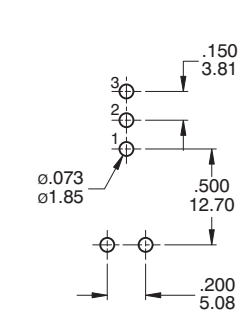
DPDT

Part No. Shown : 3MD1J102M6QE

M7



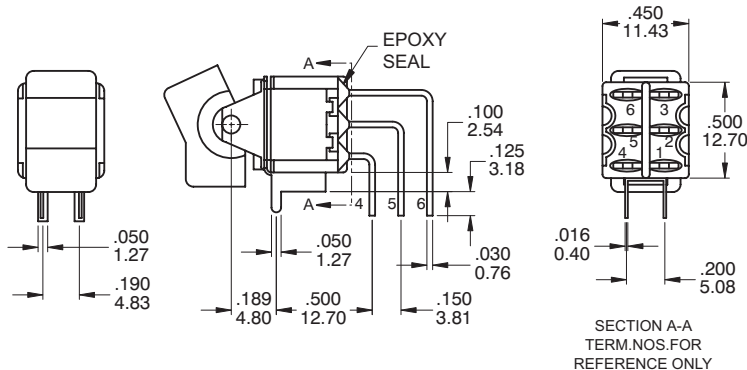
P.C. MOUNTING



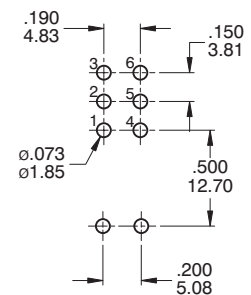
SPDT

Part No. Shown : 3MS1J102M7QE

M7



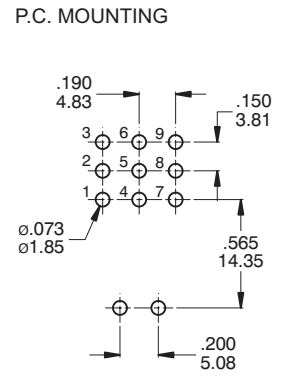
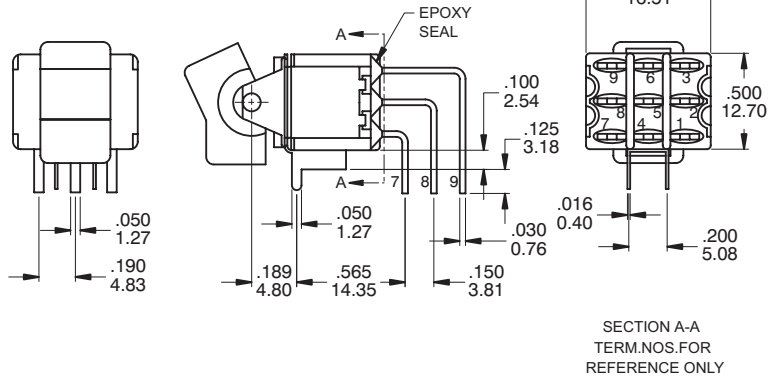
P.C. MOUNTING



DPDT

Part No. Shown : 3MD1J102M7QE

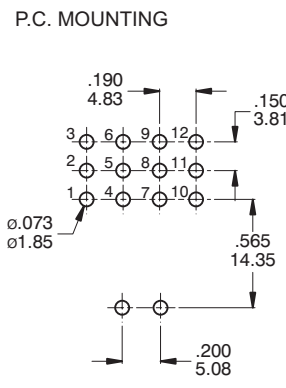
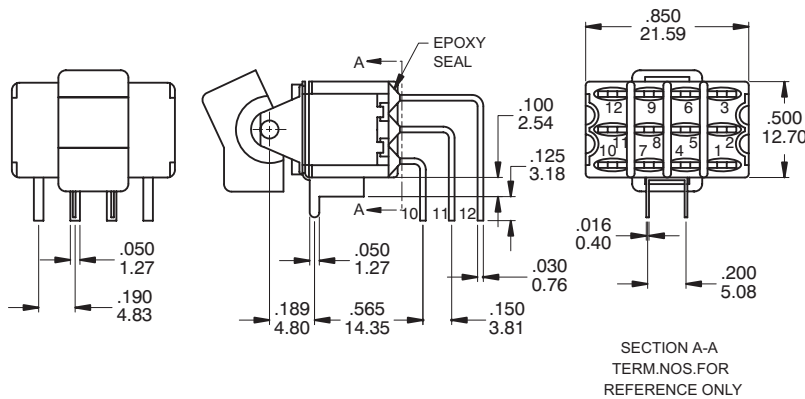
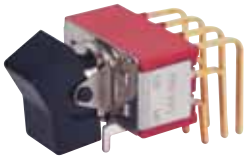
M7



SPDT

Part No. Shown : 3M31J102M7QE

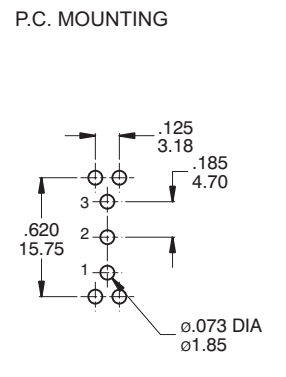
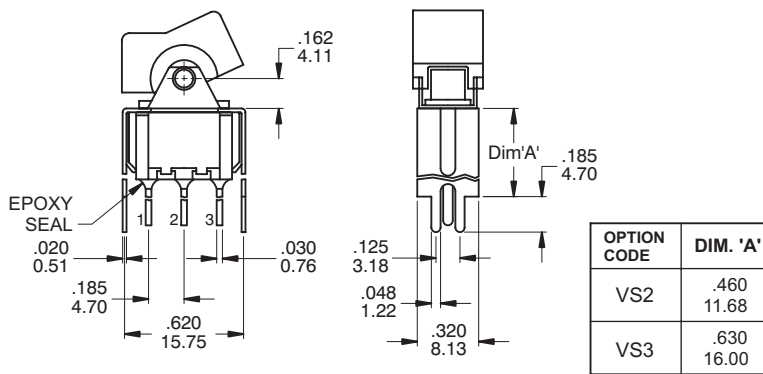
M7



DPDT

Part No. Shown : 3M41J102M7RE

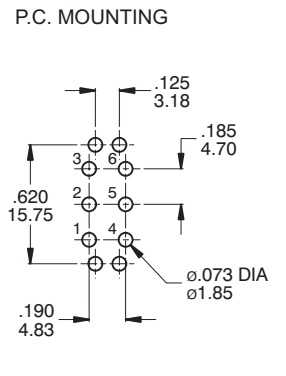
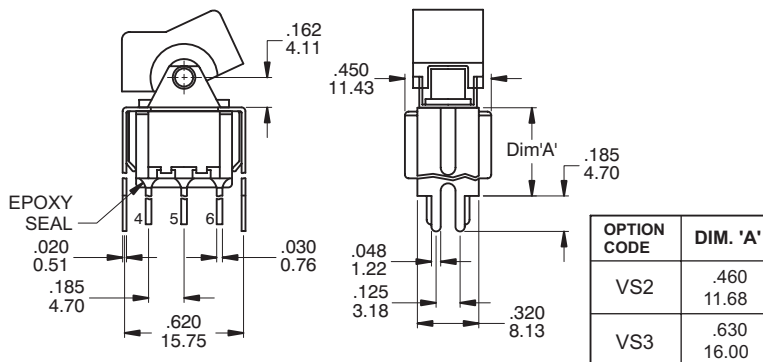
VS2 - VS3



SPDT

Part No. Shown : 3MS1V102VS2QE

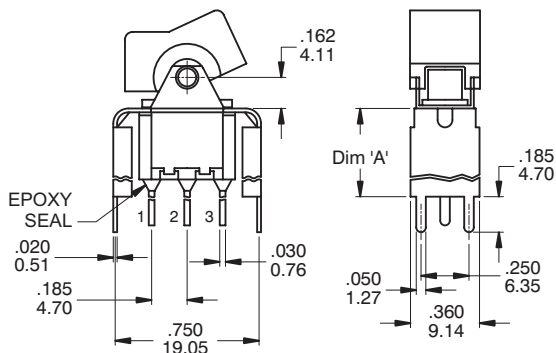
VS2 - VS3



DPDT

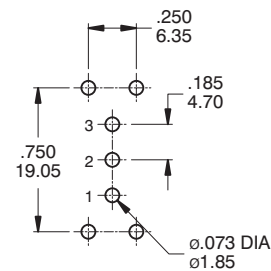
Part No. Shown : 3MD1J102VS2QE

VS4 - VS5



| OPTION CODE | DIM. 'A' |
|-------------|---------------|
| VS2 | .460 11.68 |
| VS3 | .630 16.00 |

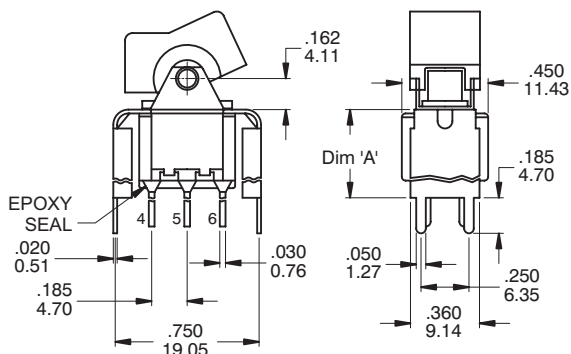
P.C. MOUNTING



SPDT

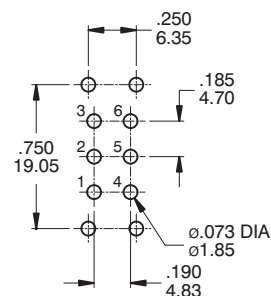
Part No. Shown : 3MS1J102VS4QE

VS4 - VS5



| OPTION CODE | DIM. 'A' |
|-------------|---------------|
| VS2 | .460 11.68 |
| VS3 | .630 16.00 |

P.C. MOUNTING



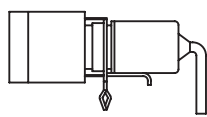
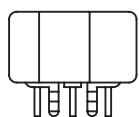
DPDT

Part No. Shown : 3MD1J102VS5QE

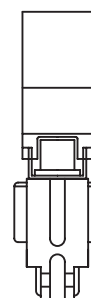
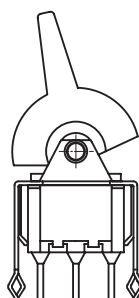
MS1R3020V20R1ES

SNAP-IM TERMINATION OPTIONS

M6N



V2N



CONTACT MATERIAL OPTIONS

| | CONTACT MATERIAL | TERMINAL PLATING | RATINGS |
|---|------------------|---------------------------------|--|
| Q | Silver | Q = Silver | 5 Amps with resistant load @ 120VAC or 28VDC 2 Amps with resistant load @ 250VA |
| S | | S = Silver,pure - tin | |
| C | Gold over Silver | C = Gold over silver | |
| K | | K = Gold over silver,pure - tin | |
| R | Gold | R = Gold | 0.4 Volt - Amps (VA) max. @ 20V max. (AC or DC) |
| G | | G = Gold,pure - tin | |



SOLDERING PROCESSES

MANUAL SOLDERING : Use soldering iron of 30 watts, controlled at 350°C approximately 5 seconds while applying solder.

WAVE SOLDERING : Recommended Soldering Temperature : 260 ± 5°C
 Duration of Solder Immersion : 5 ± 1 seconds
 (PCB is 1.6mm in thickness)

SOLDERING : Vapor phase

Temperature Profile

| Zone | Room Temperature | Time (Sec) |
|--------------|------------------|------------|
| Pre-heat (A) | 150°C | Min 120s |
| Soak (B) | 180°C ~ 200°C | Min 150s |
| Peak (C) | 200°C ~ 235°C | Min 30s |
| Peak (D) | 235°C ~ 260°C | Min 40s |
| Peak (E) | 260°C | Max 10s |

