



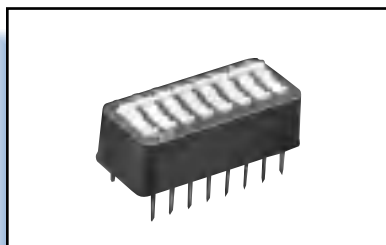
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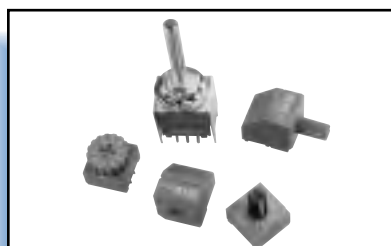
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# DIP Switches

A

DIP Switches

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| ADF05SAT  | A8 | ADP09S    | A9 | GDP04    | A4  | 436860   | A20 |
| ADF05ST   | A8 | ADP09SA   | A9 | GDP04NTS | A4  |          |     |
| ADF05STTR | A8 | ADP10     | A9 | GDP04S   | A4  |          |     |
| ADF05T    | A8 | ADP10S    | A9 | GDP06    | A4  |          |     |
| ADF06     | A8 | ADPA02    | A9 | GDP06S   | A4  |          |     |
| ADF06S    | A8 | ADPA02S   | A9 | GDP08    | A4  |          |     |
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## DIP Switches, Low Profile, Slide Actuator, Through Hole and Surface Mount

### FEATURES:

- Conventional gold wiping contact system
- Available in PC and surface mount configurations
- Traditional tape seal standard
- 95% Minimum solder coverage (90/10 tin lead)
- Withstands wave soldering temperature of 245°C for 3-5 seconds
- Heat deflection temperature of 260°C for surface mount compatibility
- End stackable (GDS version)
- Auto-insertable (GDS and GDB version)
- Vacuum pick and place compatible (GDS, GDB and GDH)
- Half pitch .050" terminal spacing (GDH version)
- Available in optional tape & reel packaging
- Shipped in the off position

### MATERIAL SPECIFICATIONS:

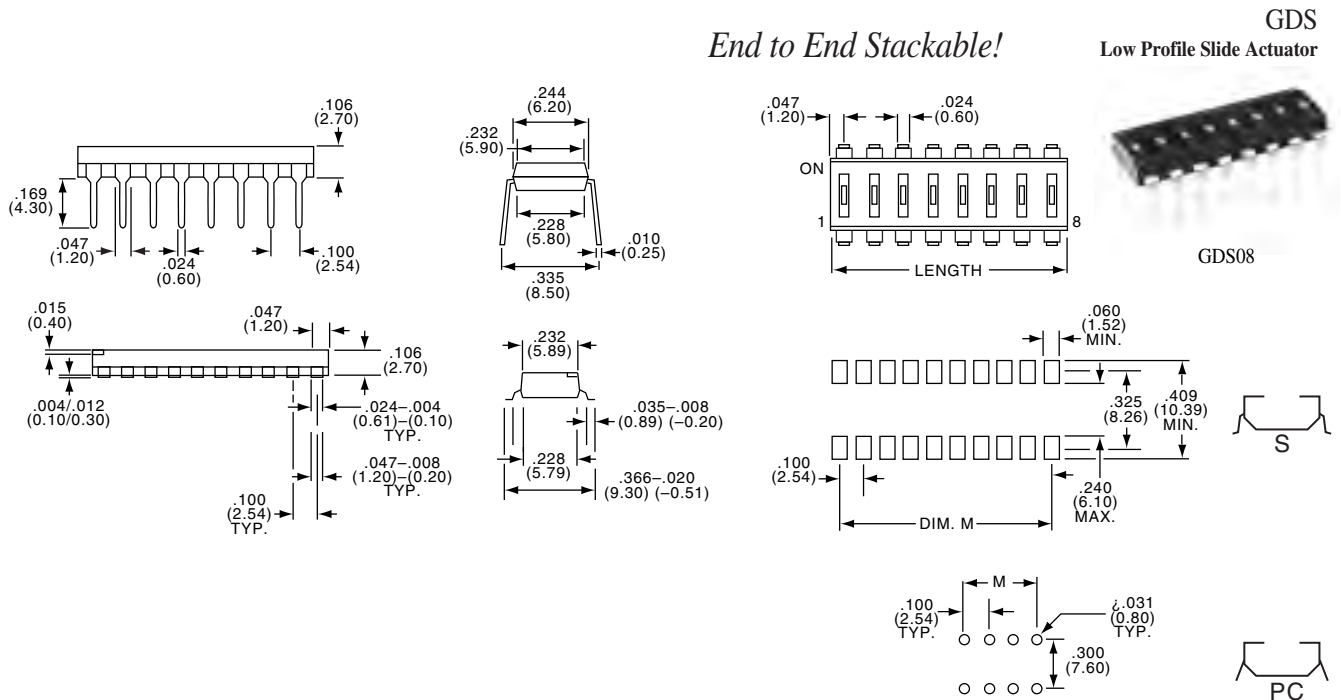
Moving Contact .....Gold over nickel over copper alloy  
 Fixed Contact .....Gold over nickel over copper alloy  
 Base Material .....PPS UL94V-0  
 Cover Material .....PPS UL94V-0  
 Actuator Material .....High temperature polyester/polyamide  
 Terminal .....Tin lead plated over nickel over copper alloy

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA @ 24 VDC  
 Initial Contact Resistance .....100 Milliohms max.  
 Insulation Resistance .....100 Megohms min. @ 250 VDC  
 Dielectric Strength .....300 VAC  
 Life Expectancy .....1,000 Cycles  
 Operating Force .....60-600 Grams

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature .....-30°C to +85°C  
 Storage Temperature .....-45°C to +100°C  
 Solder Heat Resistance .....See page M3-4



| Part Number         |            |                     |            |                     |            |                     |            | Poles | Length      | Dim.<br>M   |
|---------------------|------------|---------------------|------------|---------------------|------------|---------------------|------------|-------|-------------|-------------|
| PC Model            |            | S Model             |            | Tape & Reel         |            | S Model No Tape     |            |       |             |             |
| Tyco<br>Electronics | Alcoswitch | Tyco<br>Electronics | Alcoswitch | Tyco<br>Electronics | Alcoswitch | Tyco<br>Electronics | Alcoswitch |       |             |             |
| 5-1437590-5         | GDS02      | 5-1437590-7         | GDS02S     | 5-1437590-8         | GDS02STR   | 5-1437590-6         | GDS02NTS   | 2     | .194(4.94)  | .100(2.54)  |
| 5-1437590-9         | GDS04      | 6-1437590-1         | GDS04S     | 6-1437590-2         | GDS04STR   | 6-1437590-0         | GDS04NTS   | 4     | .394(10.02) | .300(7.62)  |
| 6-1437590-3         | GDS06      | 6-1437590-5         | GDS06S     | 6-1437590-6         | GDS06STR   | 6-1437590-4         | GDS06NTS   | 6     | .594(15.10) | .500(12.7)  |
| 6-1437590-7         | GDS08      | 6-1437590-9         | GDS08S     | 7-1437590-0         | GDS08STR   | 6-1437590-8         | GDS08NTS   | 8     | .794(20.18) | .700(17.78) |
| 7-1437590-1         | GDS10      | 7-1437590-2         | GDS10S     | 7-1437590-3         | GDS10STR   | —                   | —          | 10    | .994(25.26) | .900(22.86) |

## DIP Switches, Piano Actuator, Through Hole and Surface Mount

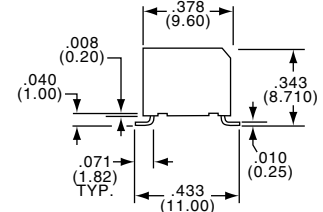
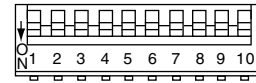
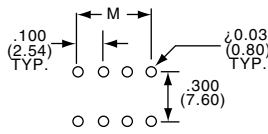
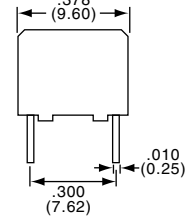
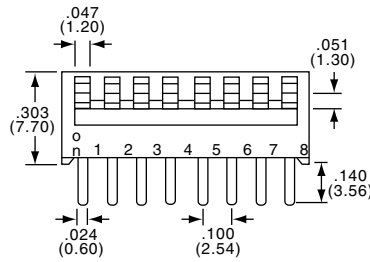
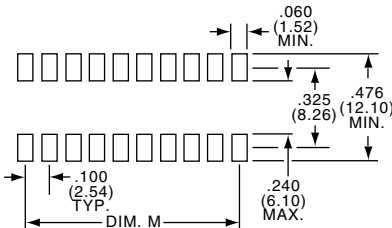
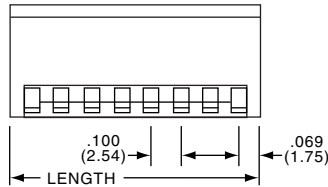
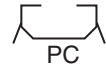
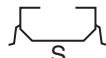
SEE PAGE A3 FOR PRODUCT SPECIFICATIONS

GDP

Classic Profile Piano Actuator



GDP08



| Part Number      |            |                  |            |                  |            |                  |            |    |              | Poles       | Length | Dim. M |
|------------------|------------|------------------|------------|------------------|------------|------------------|------------|----|--------------|-------------|--------|--------|
| PC Model         |            | S Model          |            | Tape and Reel    |            | S Model No Tape  |            |    |              |             |        |        |
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |    |              |             |        |        |
| 3-1437590-2      | GDP02      | 3-1437590-4      | GDP02S     | 1571668-1        | GDP02STR   | 3-1437590-3      | GDP02NTS   | 2  | .238(6.04)   | .100(2.54)  |        |        |
| 3-1437590-5      | GDP04      | 3-1437590-7      | GDP04S     | —                | —          | 3-1437590-6      | GDP04NTS   | 4  | .438(11.12)  | .300(7.62)  |        |        |
| 3-1437590-8      | GDP06      | 3-1437590-9      | GDP06S     | —                | —          | —                | —          | 6  | .638(16.20)  | .500(12.7)  |        |        |
| 4-1437590-0      | GDP08      | 4-1437590-1      | GDP08S     | 4-1437590-2      | GDP08STR   | —                | —          | 8  | .838(21.28)  | .700(17.78) |        |        |
| 4-1437590-3      | GDP10      | 4-1437590-4      | GDP10S     | 4-1437590-5      | GDP10STR   | —                | —          | 10 | 1.038(26.36) | .900(22.86) |        |        |

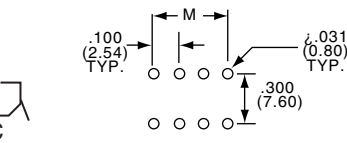
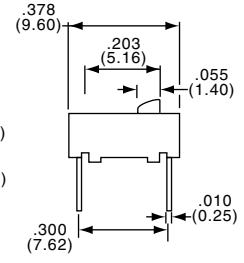
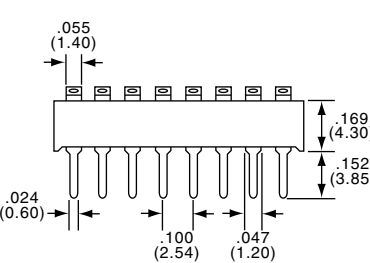
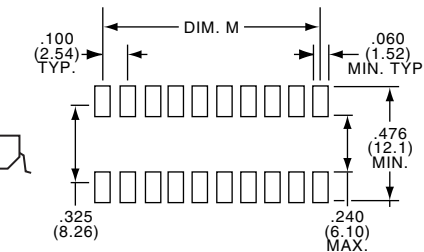
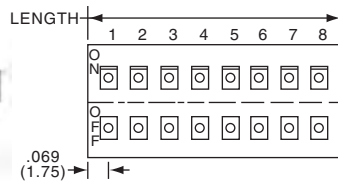
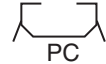
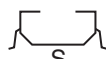
## DIP Switches, Flush Rocker Actuator, Through Hole and Surface Mount

GDB

Flush Rocker Actuator



GDB08



| Part Number      |            |                  |            | Poles | Length       | Dim. M      |
|------------------|------------|------------------|------------|-------|--------------|-------------|
| PC Model         |            | S Model          |            |       |              |             |
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |       |              |             |
| 1437590-1        | GDB02      | —                | GDB02S     | 2     | .238(6.04)   | .100(2.54)  |
| 1437590-2        | GDB04      | 1437590-3        | GDB04S     | 4     | .438(11.12)  | .300(7.62)  |
| 1437590-4        | GDB06      | 1437590-5        | GDB06S     | 6     | .638(16.20)  | .500(12.7)  |
| 1437590-6        | GDB08      | 1437590-7        | GDB08S     | 8     | .838(21.28)  | .700(17.78) |
| 1437590-8        | GDB10      | 1437590-9        | GDB10S     | 10    | 1.038(26.36) | .900(22.86) |

## DIP Switches, Recessed Rocker, Through Hole and Surface Mount

SEE PAGE A3 FOR PRODUCT SPECIFICATIONS

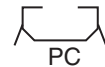
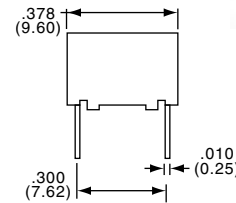
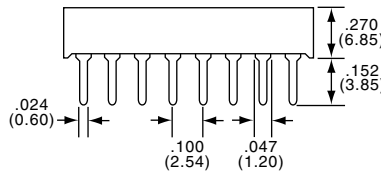
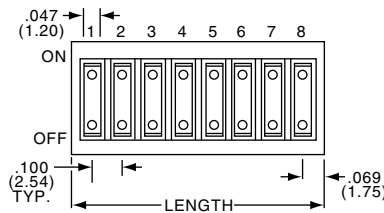
| Part Number      |            |                  |            | Poles | Length       | Dim. M      |
|------------------|------------|------------------|------------|-------|--------------|-------------|
| PC Model         |            | S Model          |            |       |              |             |
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |       |              |             |
| 4-1437590-6      | GDR02      | 4-1437590-7      | GDR02S     | 2     | .238(6.04)   | .100(2.54)  |
| 4-1437590-8      | GDR04      | 4-1437590-9      | GDR04S     | 4     | .438(11.12)  | .300(7.62)  |
| 5-1437590-0      | GDR06      | 5-1437590-1      | GDR06S     | 6     | .638(16.20)  | .500(12.7)  |
| 5-1437590-2      | GDR08      | 5-1437590-3      | GDR08S     | 8     | .838(21.28)  | .700(17.78) |
| 5-1437590-4      | GDR10      | —                | GDR10S     | 10    | 1.038(26.36) | .900(22.86) |

GDR

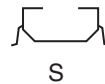
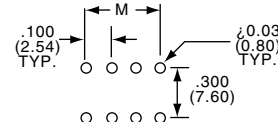
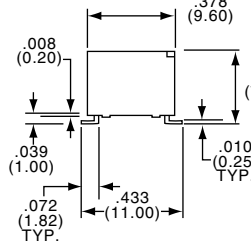
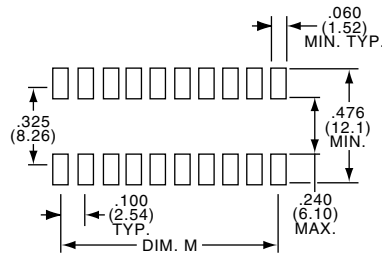
Classic Profile  
Recessed Rocker Actuator



GDR08



PC



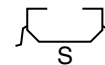
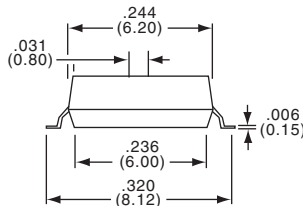
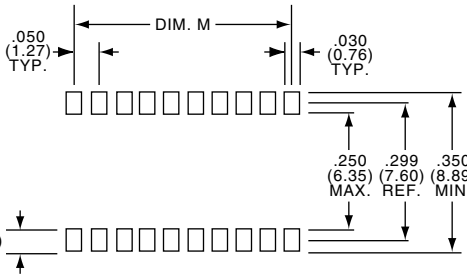
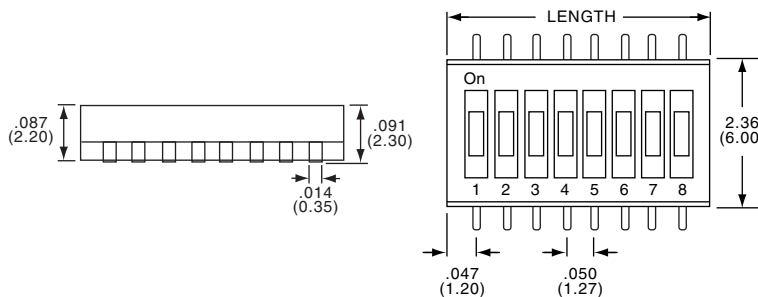
S

## DIP Switches, Half Pitch, Low Profile

GDH  
Half Pitch .050" Terminal Spacing



GDH08S



S

| Part Number      |            |                  |            | Poles | Length      | Dim. M      |
|------------------|------------|------------------|------------|-------|-------------|-------------|
| PC Model         |            | S Model          |            |       |             |             |
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |       |             |             |
| 1-1437590-0      | GDH02S     | 1-1437590-3      | GDH02STR   | 2     | .144(3.66)  | .050(1.27)  |
| 1-1437590-4      | GDH04S     | 1-1437590-6      | GDH04STR   | 4     | .244(6.20)  | .150(3.81)  |
| 1-1437590-9      | GDH06S     | 2-1437590-1      | GDH06STR   | 6     | .344(8.75)  | .250(6.35)  |
| 2-1437590-2      | GDH08S     | 2-1437590-4      | GDH08STR   | 8     | .444(11.29) | .350(8.89)  |
| 2-1437590-6      | GDH10S     | 2-1437590-8      | GDH10STR   | 10    | .544(13.82) | .450(11.43) |

## DIP Switches, Half Pitch, Ultra Low Profile, .067" High

### MATERIAL SPECIFICATIONS:

Contacts .....Copper alloy, gold plate over nickel  
Case Material .....High temperature polyamide, UL 94V-0  
Actuator Material .....High temperature polyester, 94V-0  
Moving Contact .....Copper alloy, gold plate over nickel  
Fixed Contact .....Copper alloy, gold plate over nickel  
Terminals .....Copper alloy, gold flash over nickel

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-30°C to +85°C (-22°F to +185°F)  
Storage Temperature.....-45°C to +100°C (-49°F to +212°F)

### TYPICAL PERFORMANCE CHARACTERISTICS:

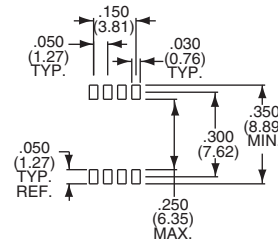
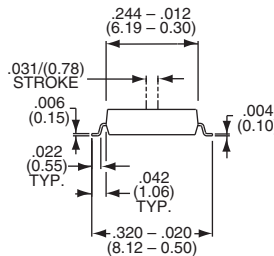
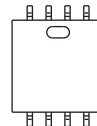
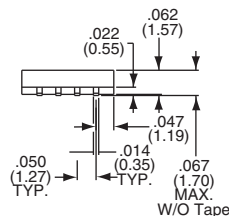
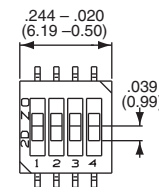
Contact Rating .....Non-switching: 100 Milliamps @ 50 VDC  
Switching: 25 Milliamps @ 24 VDC  
Initial Contact Resistance .....100 Milliohms max.  
Insulation Resistance .....100 Megohms min. @ 100 VDC  
Dielectric Strength .....300 VAC, 1 minute  
Actuation Force .....60 - 600 Grams max.  
Life Expectancy .....1,000 Cycles min.

### MGDH

Half Pitch .050" Terminal Spacing, .067" High



MGDH04



| Part Number      |            |
|------------------|------------|
| Tyco Electronics | Alcoswitch |
| 7-1437590-5      | MGDH04     |

## DIP Switches, Extended Actuator, Auto Insertable, Through Hole and Surface Mount

### FEATURES:

- Available in PC or surface mount termination.
- High pressure wiping contact allows aqueous or solvent cleaning without tape seal.
- Auto-insertable
- Tape Seal version available for vacuum pick-n-place
- Unique design can withstand vapor phase reflow or wave soldering conditions.
- Gas tight contacts
- Shipped in the off position

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature .....-30°C to + 85°C  
 Storage Temperature .....-45°C to + 100°C  
 Solder Heat Resistance.....245°C ± 5°C with switch in "off" position 30 seconds when mounted on a .060" thick PCB per MIL-STD202, Method 210  
 Cleaning.....Aqueous solution or solvent

### MATERIAL SPECIFICATIONS:

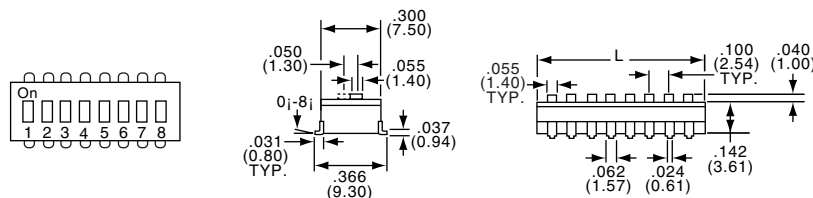
Base and Cover .....PPS-UL94V-0, (Black)  
 Actuator.....PA6T-UL94V-0, (White)  
 Fixed Contact/Terminal .....Copper alloy plate-solder/copper  
 Moving Contact .....Copper alloy plate-gold/nickel

### TYPICAL PERFORMANCE CHARACTERISTICS:

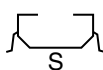
Contact Rating .....0.4 VA @ 20 VDC max.  
 Max Rating Switching-100 Milliamp @ 24VDC  
 Min Rating Switching-1 Microamp @ 1 Millivolt  
 Max Rating Non Switching-1 Amp @ 5VDC  
 Initial Contact Resistance .....50 Milliohms max.  
 Insulation Resistance .....1,000 Megohms min. @ 100 VDC  
 Dielectric Strength .....500 VAC  
 Operating Force .....Less than 800 grams  
 Actuator Travel .....AD/R Series 1.30mm/.050" piano style 25°  
 Life Expectancy .....1,000 Cycles



ADE



S Termination Shown



| PC Term.         |            | "S" Term.        |            | "SA" Term.       |            | No. of Positions | Actuator Style | Dim. L       |
|------------------|------------|------------------|------------|------------------|------------|------------------|----------------|--------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |                  |                |              |
| 1437586-2        | ADE02      | 1437586-4        | ADE02S     | 1437586-5        | ADE02SA    | 2                | Slide          | .278(7.06)   |
| 1437586-7        | ADE03      | 1437586-8        | ADE03S     | —                | ADE03SA    | 3                | Slide          | .378(9.60)   |
| 1-1437586-0      | ADE04      | 1-1437586-2      | ADE04S     | 1-1437586-3      | ADE04SA    | 4                | Slide          | .478(12.14)  |
| 1-1437586-5      | ADE05      | 1-1437586-7      | ADE05S     | —                | ADE05SA    | 5                | Slide          | .578(14.68)  |
| 1-1437586-8      | ADE06      | 2-1437586-0      | ADE06S     | 2-1437586-1      | ADE06SA    | 6                | Slide          | .678(17.22)  |
| 2-1437586-3      | ADE07      | 2-1437586-5      | ADE07S     | —                | ADE07SA    | 7                | Slide          | .778(19.76)  |
| 2-1437586-6      | ADE08      | 2-1437586-8      | ADE08S     | 2-1437586-9      | ADE08SA    | 8                | Slide          | .878(22.30)  |
| 3-1437586-0      | ADE09      | —                | ADE09S     | —                | ADE09SA    | 9                | Slide          | .978(24.84)  |
| 3-1437586-2      | ADE10      | 3-1437586-7      | ADE10S     | —                | ADE10SA    | 10               | Slide          | 1.078(27.38) |
| 3-1437586-8      | ADE12      | 1571337-1        | ADE12S     | —                | ADE12SA    | 12               | Slide          | 1.278(32.51) |

See Page A9 for PC Pad Layout.



## DIP Switches, Flush Acuator, Auto Insertable, Through Hole, and Surface Mount

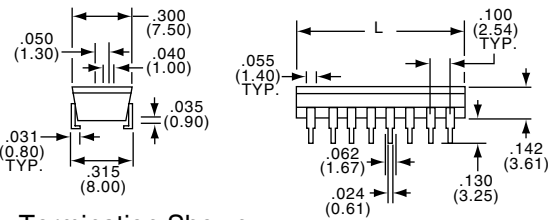
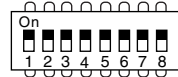
SEE PAGE A7 FOR PRODUCT SPECIFICATIONS

ADF

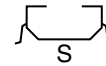


ADF08S  
Flush Actuator

See Page A9 for PC Pad Layout.



SA Termination Shown



| PC Term.         |            | PC Term. w/Tape  |            | No. of Positions | Actuator Style | Dim. L       |
|------------------|------------|------------------|------------|------------------|----------------|--------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |                  |                |              |
| 4-1437586-2      | ADF02      | 5-1437586-0      | ADF02T     | 2                | Slide          | .278(7.06)   |
| 5-1437586-1      | ADF03      | 5-1437586-6      | ADF03T     | 3                | Slide          | .378(9.60)   |
| 5-1437586-7      | ADF04      | 6-1437586-4      | ADF04T     | 4                | Slide          | .478(12.14)  |
| 6-1437586-5      | ADF05      | 7-1437586-0      | ADF05T     | 5                | Slide          | .578(14.68)  |
| 7-1437586-1      | ADF06      | 8-1437586-0      | ADF06T     | 6                | Slide          | .678(17.22)  |
| 8-1437586-1      | ADF07      | 8-1437586-5      | ADF07T     | 7                | Slide          | .778(19.76)  |
| 8-1437586-6      | ADF08      | 9-1437586-5      | ADF08T     | 8                | Slide          | .878(22.30)  |
| 9-1437586-6      | ADF09      | —                | ADF09T     | 9                | Slide          | .978(24.84)  |
| 1437587-1        | ADF10      | 1437587-7        | ADF10T     | 10               | Slide          | 1.078(27.38) |
| —                | ADF12      | 1571336-1        | ADF12T     | 12               | Slide          | 1.278(32.51) |

| "S" Term.        |            | "S" Term. w/Tape Seal |            | Tape & Reel      |            | No. of Positions | Actuator Style | Dim. L       |
|------------------|------------|-----------------------|------------|------------------|------------|------------------|----------------|--------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics      | Alcoswitch | Tyco Electronics | Alcoswitch |                  |                |              |
| 4-1437586-4      | ADF02S     | 4-1437586-8           | ADF02ST    | 4-1437586-9      | ADF02STTR  | 2                | Slide          | .278(7.06)   |
| 5-1437586-2      | ADF03S     | 5-1437586-4           | ADF03ST    | 5-1437586-5      | ADF03STTR  | 3                | Slide          | .378(9.60)   |
| 5-1437586-9      | ADF04S     | 6-1437586-3           | ADF04ST    | 1437583-6        | ADF04STTR  | 4                | Slide          | .478(12.14)  |
| 6-1437586-6      | ADF05S     | 6-1437586-8           | ADF05ST    | 6-1437586-9      | ADF05STTR  | 5                | Slide          | .578(14.68)  |
| 7-1437586-5      | ADF06S     | 7-1437586-8           | ADF06ST    | 7-1437586-9      | ADF06STTR  | 6                | Slide          | .678(17.22)  |
| 8-1437586-2      | ADF07S     | 8-1437586-3           | ADF07ST    | 8-1437586-4      | ADF07STTR  | 7                | Slide          | .778(19.76)  |
| 8-1437586-8      | ADF08S     | 9-1437586-1           | ADF08ST    | 9-1437586-2      | ADF08STTR  | 8                | Slide          | .878(22.30)  |
| 9-1437586-7      | ADF09S     | 9-1437586-8           | ADF09ST    | 9-1437586-9      | ADF09STTR  | 9                | Slide          | .978(24.84)  |
| 1437587-3        | ADF10S     | 1437587-5             | ADF10ST    | 1437587-6        | ADF10STTR  | 10               | Slide          | 1.078(27.38) |
| 1437587-8        | ADF12S     | —                     | ADF12ST    | 1437587-9        | ADF12STTR  | 12               | Slide          | 1.278(32.51) |

| "SA" Term.       |            | "SA" Term. w/Tape Seal |            | No. of Positions | Actuator Style | Dim. L       |
|------------------|------------|------------------------|------------|------------------|----------------|--------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics       | Alcoswitch |                  |                |              |
| 4-1437586-5      | ADF02SA    | 4-1437586-6            | ADF02SAT   | 2                | Slide          | .278(7.06)   |
| 5-1437586-3      | ADF03SA    | —                      | ADF03SAT   | 3                | Slide          | .378(9.60)   |
| 6-1437586-0      | ADF04SA    | 6-1437586-1            | ADF04SAT   | 4                | Slide          | .478(12.14)  |
| —                | ADF05SA    | —                      | ADF05SAT   | 5                | Slide          | .578(14.68)  |
| 7-1437586-6      | ADF06SA    | 7-1437586-7            | ADF06SAT   | 6                | Slide          | .678(17.22)  |
| —                | ADF07SA    | —                      | ADF07SAT   | 7                | Slide          | .778(19.76)  |
| 8-1437586-9      | ADF08SA    | 9-1437586-0            | ADF08SAT   | 8                | Slide          | .878(22.30)  |
| —                | ADF09SA    | —                      | ADF09SAT   | 9                | Slide          | .978(24.84)  |
| —                | ADF10SA    | 1437587-4              | ADF10SAT   | 10               | Slide          | 1.078(27.38) |
| —                | ADF12SA    | —                      | ADF12SAT   | 12               | Slide          | 1.278(32.51) |



# DIP Switches, Piano Acuator, Auto Insertable, Through Hole, and Surface Mount

ADP

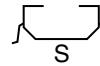
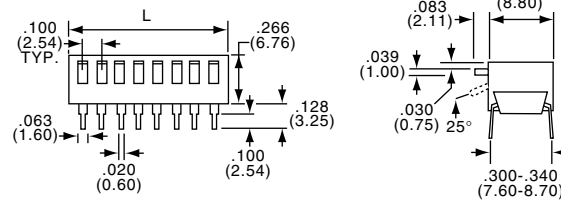


ADP04S

Piano Actuator

"PC" Termination Shown

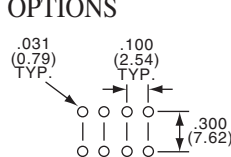
SEE PAGE A7 FOR PRODUCT SPECIFICATIONS



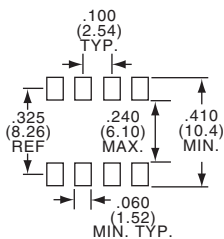
| Lever Down "On"  |            | "S" Term         |            | "SA" Term.       |            | No. of Positions | Actuator Style | Dim. L       |
|------------------|------------|------------------|------------|------------------|------------|------------------|----------------|--------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |                  |                |              |
| 1-1437587-1      | ADP02      | 1-1437587-2      | ADP02S     | 1-1437587-3      | ADP02SA    | 2                | Piano          | .278(7.06)   |
| 1-1437587-5      | ADP04      | 1-1437587-7      | ADP04S     | 1-1437587-8      | ADP04SA    | 4                | Piano          | .478(12.14)  |
| 2-1437587-0      | ADP05      | 2-1437587-1      | ADP05S     | —                | ADP05SA    | 5                | Piano          | .578(14.68)  |
| 2-1437587-2      | ADP06      | 2-1437587-3      | ADP06S     | 2-1437587-4      | ADP06SA    | 6                | Piano          | .678(17.22)  |
| 2-1437587-5      | ADP07      | —                | ADP07S     | —                | ADP07SA    | 7                | Piano          | .778(19.76)  |
| 2-1437587-6      | ADP08      | 2-1437587-8      | ADP08S     | 2-1437587-9      | ADP08SA    | 8                | Piano          | .878(22.30)  |
| 3-1437587-0      | ADP09      | —                | ADP09S     | 3-1437587-1      | ADP09SA    | 9                | Piano          | .978(24.84)  |
| 3-1437587-3      | ADP10      | 3-1437587-6      | ADP10S     | —                | ADP10SA    | 10               | Piano          | 1.078(27.38) |

| Lever Up "On"    |            | "S" Term         |            | "SA" Term.       |            | No. of Positions | Actuator Style | Dim. L       |
|------------------|------------|------------------|------------|------------------|------------|------------------|----------------|--------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |                  |                |              |
| 4-1437587-7      | ADPA02     | —                | ADPA02S    | —                | ADPA02SA   | 2                | Piano          | .278(7.06)   |
| 4-1437587-8      | ADPA04     | 5-1437587-0      | ADPA04S    | 5-1437587-1      | ADPA04SA   | 4                | Piano          | .478(12.14)  |
| 5-1437587-2      | ADPA05     | 5-1437587-3      | ADPA05S    | —                | ADPA05SA   | 5                | Piano          | .578(14.68)  |
| 5-1437587-4      | ADPA06     | 5-1437587-5      | ADPA06S    | 5-1437587-6      | ADPA06SA   | 6                | Piano          | .678(17.22)  |
| 5-1437587-7      | ADPA07     | —                | ADPA07S    | —                | ADPA07SA   | 7                | Piano          | .778(19.76)  |
| 5-1437587-8      | ADPA08     | 6-1437587-0      | ADPA08S    | —                | ADPA08SA   | 8                | Piano          | .878(22.30)  |
| —                | ADPA09     | —                | ADPA09S    | —                | ADPA09SA   | 9                | Piano          | .978(24.84)  |
| 6-1437587-1      | ADPA10     | —                | ADPA10S    | —                | ADPA10SA   | 10               | Piano          | 1.078(27.38) |

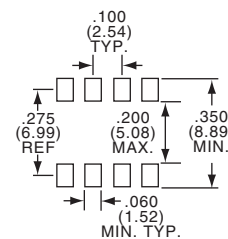
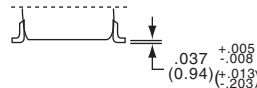
## TERMINATION OPTIONS



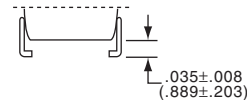
PC Termination



S Termination



SA Termination



## Hybrid DIP Switches, Through Hole and Surface Mount

### AUTO-INSERTABLE\* DIP SWITCH WITH INTEGRAL RESISTORS

\* Flush actuator versions are auto-insertable

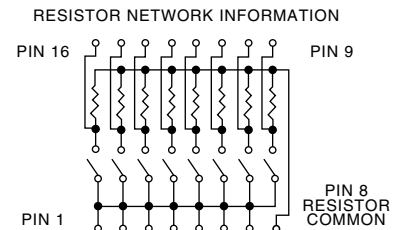
#### FEATURES:

All the features of the AD SERIES - PLUS

- Thick film pull-up resistors molded into the base of the switch.
- Replaces discrete resistor network plus DIP Switch with one component.
- Available with 3.3K ohms or 10K ohms resistors.
- Ceramic substrate allows wave soldering temperatures of 245°C for up to 30 seconds per MIL-STD 202, Method 210.
- Custom resistor values available.
- Shipped in off position.

SEE PAGE A7 FOR PRODUCT SPECIFICATIONS

| Rated Pwr. | Resistance       | Tolerance   | Max. Voltage |
|------------|------------------|-------------|--------------|
| 125 mW     | 3.3K Ohms (red)  | ±5% at 85°C | 24V          |
| 125 mW     | 10K Ohms (green) | ±5% at 85°C | 24V          |



| A                                                                                      |  | R                                                                                             |  |                               |  |  |  |                                                              |  |  |  | HOW TO ORDER |
|----------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------|--|-------------------------------|--|--|--|--------------------------------------------------------------|--|--|--|--------------|
| Series                                                                                 |  | Auto-Dip with Resistors                                                                       |  | No. of Positions              |  |  |  | Terminations                                                 |  |  |  |              |
| E = Extended<br>F = Flush Auto-Insertable<br>P = Piano (On Down)<br>PA = Piano (On Up) |  | See Pages A7-A9 for dimensional info.                                                         |  | 02, 04, 06, 08, 10            |  |  |  | Blank = PC<br>S = Outside "L" (SMT)<br>SA - Inside "L" (SMT) |  |  |  |              |
| Resistor Value                                                                         |  | 3.3K Ohms (Red case)<br>10K Ohms (Green case)<br>Custom values are available on special order |  | See Page A9 for board layout. |  |  |  |                                                              |  |  |  |              |

#### Example: ARF 06 10KST = Auto-Dip

Flush actuator  
06 positions  
10K ohms resistors  
Outside "L" terminations & tape seal



Alcoswitch 7000 Series DIP switches are available in standard single pole, single throw; side actuated, single pole, single throw and multiple series versions. Contacts are made of high strength copper alloy with .000030 [0.00076] gold over .000050 [0.00127] nickel plating in contact area and legs plated to meet Tyco Electronics Solderability Specification 109-11-3.

The multiple series switches offer the unique feature of single pole switches coupled mechanically to provide switching of various poles simultaneously. This allows flexibility in programming.

Multipole switches are available with or without lever-actuated rockers and in a variety of configurations in addition to those listed. The maximum number of poles that can be ganged is six.

## DIP Switches

### Performance Characteristics

#### Current and Voltage Rating:

Nonswitching — 1.5 amperes max. at 50 VDC  
Switching — 100 milliamperes max at 5 VDC (resistive load);  
25 milliamperes max. at 24 VDC (resistive load)

#### Contact Resistance, Dry Circuit:

100 milliohms max. (end of life) and 50 milliohms (initial) at 50 mV open circuit, 50 milliamperes

#### Insulation Resistance:

1 x 10<sup>9</sup> ohms min. at 100 VDC (initial)

#### Dielectric Withstanding Voltage:

500 VDC min. at standard atmospheric conditions

#### Capacitance:

5 picofarads max.

#### Temperature Rating:

Nonoperating — -73.3°C to +105°C  
Operating — -55°C to +105°C

#### Vibration:

Discontinuities shall not exceed 10 microseconds when subjected to 10-2000-10 Hz transversing for 20 minutes at .060 [1.52] inches total excursion

#### Shock:

No physical damage or discontinuities greater than 10 microseconds when tested with .10 ampere current applied per Tyco Electronics Specification 109-26, Condition A

#### Humidity:

Withstands an environment of +40°C and 95% RH for 96 hours

#### Durability:

No physical damage or contact resistance greater than 100 milliohms up to 7000 cycles of actuation with a resistive load of 24 VDC and 25 milliamperes max. current applied

#### Terminal Strength (Bend Test):

Two (2) 45° bend cycles per MIL-STD-202, Method 211, Condition B

### Materials

#### Housing:

Glass-filled polyester, 94V-0 rated, black

#### Rocker:

Thermoplastic, 94V-0 rated, white

#### Spring Contacts and Leads:

Copper alloy with .000030 [0.00076] gold over .000050 [0.00127] nickel in contact area and .000150 [0.00381] tin-lead over .000050 [0.00127] nickel on solder legs, plated to meet Tyco Electronics Solderability Specification 109-11-3.

### Technical Documents

#### Product Specification:

108-7519

#### Instruction Sheet:

408-07779

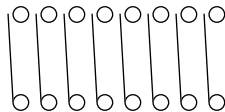
#### Application Specification:

114-1056

**Single Pole  
Single Throw  
Side Actuated  
Low Profile**

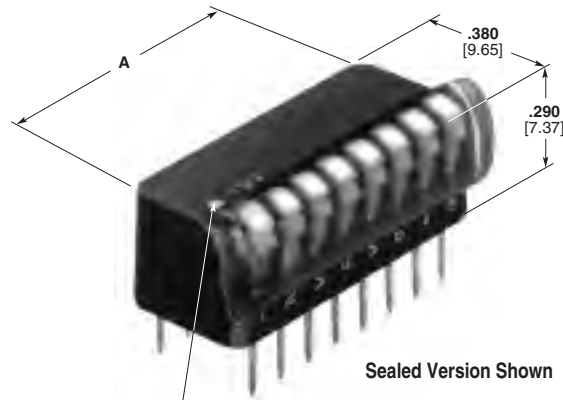
**Contact Lead Spacing —**  
.100 x .300 [2.54 x 7.62]  
**Lead Length —** .140 [3.56]  
below mounting surface

**Contact Arrangement**

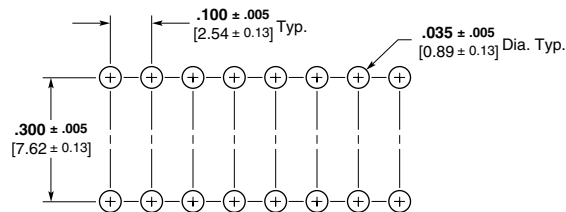
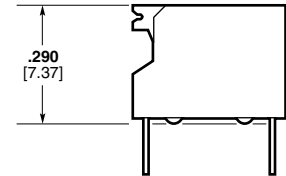


Pin 1

**Note:** Switches shown in open position



**Sealed Version Shown**



**Recommended PC Board Hole Pattern**

| No. of<br>Switches | Dim. A |       | SPST Side Actuated Part No. |            |             |
|--------------------|--------|-------|-----------------------------|------------|-------------|
|                    | inch   | mm    | Unsealed <sup>1</sup>       | Sealed     | Tape Sealed |
| 2                  | .280   | 7.11  | 1-435802-0                  | —          | —           |
| 3                  | .380   | 9.65  | 435802-2                    | —          | —           |
| 4                  | .480   | 12.19 | 435802-3                    | 1-435802-5 | —           |
| 5                  | .580   | 14.73 | 435802-4                    | 1-435802-6 | —           |
| 6                  | .680   | 17.27 | 435802-5                    | 1-435802-7 | —           |
| 7                  | .780   | 19.81 | 435802-6                    | 1-435802-8 | —           |
| 8                  | .880   | 22.35 | 435802-1                    | 435802-9   | 3-435802-8  |
| 9                  | .980   | 24.89 | 435802-7                    | 1-435802-9 | —           |
| 10                 | 1.080  | 27.43 | 435802-8                    | 2-435802-0 | —           |
| 11                 | 1.180  | 29.97 | —                           | 2-435802-1 | —           |
| 12                 | 1.280  | 32.51 | —                           | 2-435802-2 | —           |

<sup>1</sup> All switches are bottom sealed.

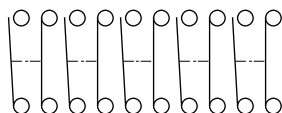
## DIP Switches, Extended Actuator, Single or Double Pole, Double Throw

### Multiple Single Pole Double Throw

**Contact Lead Spacing** —  
.100 x .300 [2.54 x 7.62]

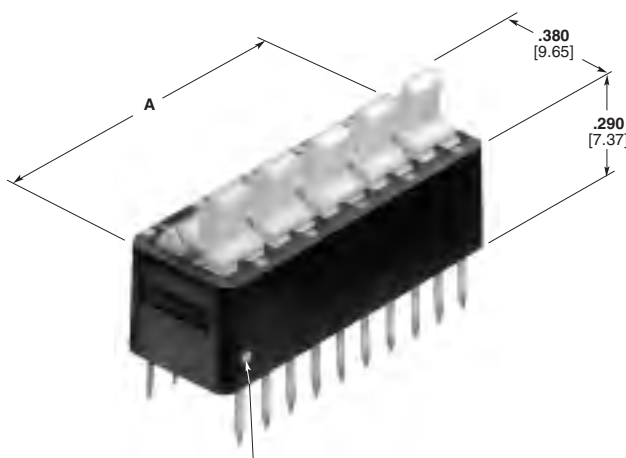
**Lead Length** — .140 [3.56]  
below mounting surface

#### Contact Arrangement

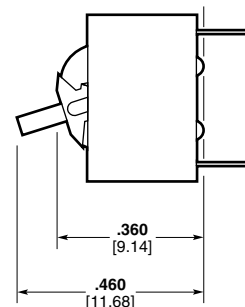


Pin 1

**Note:** Switch positions are closed when rockers are down toward white dots. Switches have make-before-break circuit design.



White Dot Identifies Pin 1



Extended Lever Actuator Shown

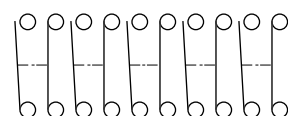
| No. of Switches | Dim. A |       | SPDT Part No.        |                         |
|-----------------|--------|-------|----------------------|-------------------------|
|                 | inch   | mm    | Low Profile Actuator | Extended Lever Actuator |
| 1               | .280   | 7.11  | 435470-7             | 2-435470-1              |
| 2               | .480   | 12.19 | 435470-1             | 2-435470-2              |
| 3               | .680   | 17.27 | 435470-2             | —                       |
| 4               | .880   | 22.35 | 435470-3             | 2-435470-4              |
| 5               | 1.080  | 27.43 | —                    | 2-435470-5              |
| 6               | 1.280  | 32.51 | —                    | 2-435470-6              |

### Double Pole Double Throw

**Contact Lead Spacing** —  
.100 x .300 [2.54 x 7.62]

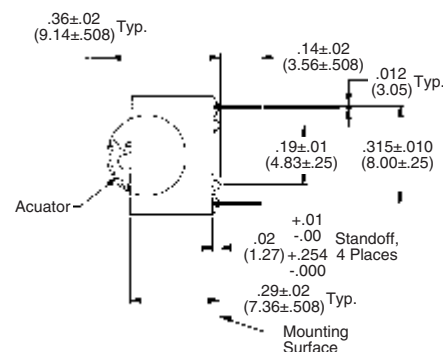
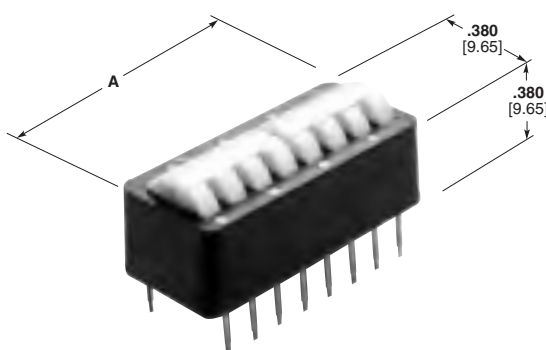
**Lead Length** — .140 [3.56]  
below mounting surface

#### Contact Arrangement



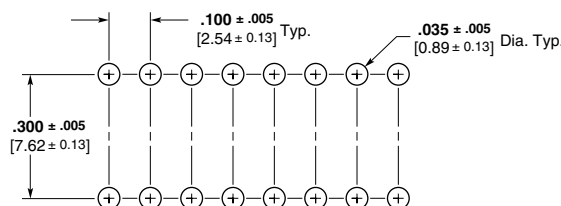
Pin 1

**Note:** Switch positions are closed when rockers are down toward white dots. Switches have make-before-break circuit design.



Low Profile Lever Actuator Shown

| No. of Switches | Dim. A |       | DPDT Part No.        |                         |
|-----------------|--------|-------|----------------------|-------------------------|
|                 | inch   | mm    | Low Profile Actuator | Extended Lever Actuator |
| 1               | .480   | 12.19 | 435470-5             | 3-435470-1              |
| 2               | .880   | 22.35 | 435470-9             | —                       |



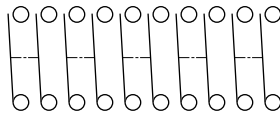
Recommended PC Board Hole Pattern

## DIP Switches, Extended Actuator, Multiple Pole, Single Throw

### Multiple Double Pole Single Throw

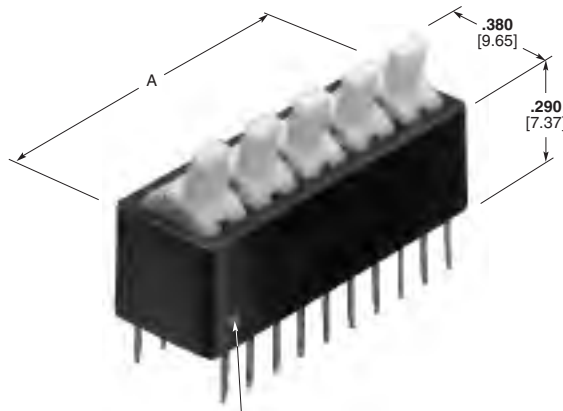
**Contact Lead Spacing —**  
 .100 x .300 [2.54 x 7.62]  
**Lead Length —** .140 [3.56]  
 below mounting surface

#### Contact Arrangement

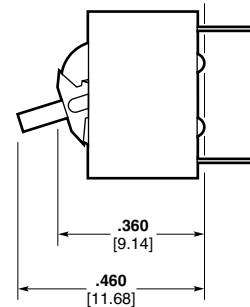


Pin 1

**Note:** Switches shown in open position.



White Dot Identifies Pin 1



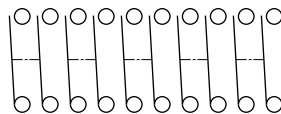
Extended Lever Actuator Shown

| No. of Switches | Dim. A |       | DPST Part No.        |                         |
|-----------------|--------|-------|----------------------|-------------------------|
|                 | inch   | mm    | Low Profile Actuator | Extended Lever Actuator |
| 1               | .280   | 7.11  | 435469-9             | 2-435469-1              |
| 2               | .480   | 12.19 | —                    | 2-435469-2              |
| 4               | .880   | 22.35 | 435469-3             | 2-435469-4              |
| 5               | 1.080  | 27.43 | —                    | 2-435469-5              |
| 6               | 1.280  | 32.51 | —                    | 2-435469-6              |

### 4-Pole Single Throw

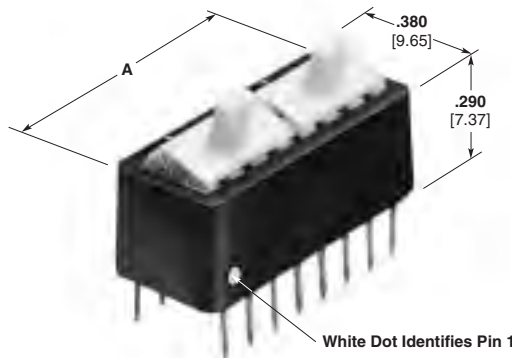
**Contact Lead Spacing —**  
 .100 x .300 [2.54 x 7.62]  
**Lead Length —** .140 [3.56]  
 below mounting surface

#### Contact Arrangement

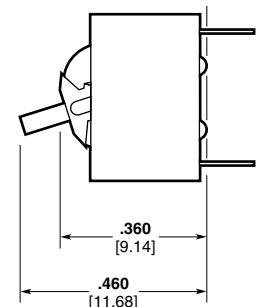


Pin 1

**Note:** Switches shown in open position.

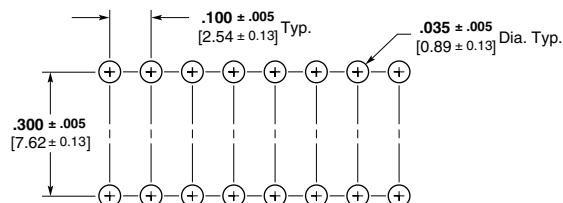


White Dot Identifies Pin 1



Extended Lever Actuator Shown

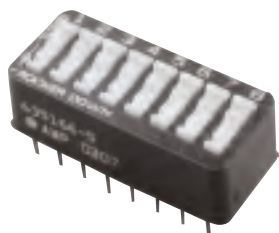
| No. of Switches | Dim. A |       | 4PST Part No.        |                         |
|-----------------|--------|-------|----------------------|-------------------------|
|                 | inch   | mm    | Low Profile Actuator | Extended Lever Actuator |
| 1               | .480   | 12.19 | 435469-7             | 3-435469-1              |



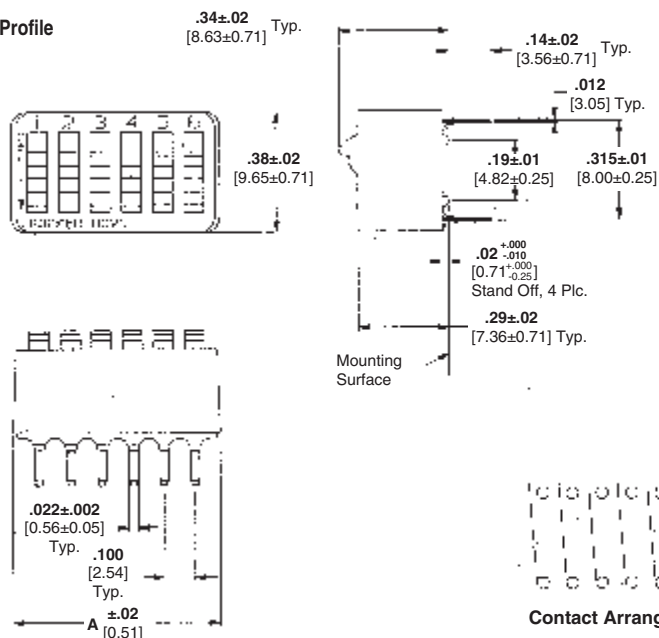
#### Recommended PC Board Hole Pattern

## DIP Switches, Rocker Style Actuator

**Contact Lead Spacing** —  
.100 x .300 [2.54 x 7.62]  
**Lead Length** — .140 [3.56]  
below mounting surface



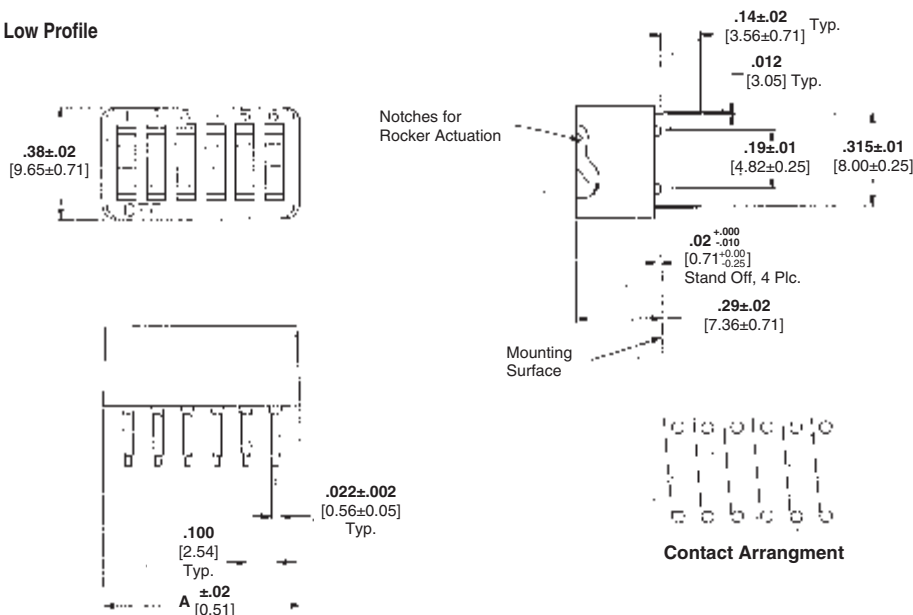
Standard Profile



**Contact Lead Spacing** —  
.100 x .300 [2.54 x 7.62]  
**Lead Length** — .140 [3.56]  
below mounting surface

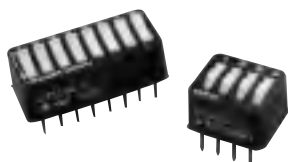


Low Profile



| Number of Switches | SPST Standard Profile |            | SPST Low Profile |             |
|--------------------|-----------------------|------------|------------------|-------------|
|                    | Unsealed              | Sealed     | Unsealed         | Tape Sealed |
| 2                  | 2-435166-9            | —          | —                | 3-435626-6  |
| 3                  | —                     | —          | —                | 3-435626-7  |
| 4                  | 435166-2              | 4-435166-9 | 435626-1         | 3-435626-8  |
| 5                  | —                     | 5-435166-0 | 435626-2         | —           |
| 6                  | 435166-4              | 5-435166-1 | —                | 4-435626-0  |
| 7                  | 435166-1              | 5-435166-2 | —                | 4-435626-1  |
| 8                  | 435166-5              | 5-435166-3 | 435626-5         | 4-435626-2  |
| 9                  | 435166-6              | —          | —                | —           |
| 10                 | 435166-7              | 5-435166-5 | —                | 4-435626-4  |





Alcoswitch 7100 Series DIP Switches are recommended for programming applications where the number of cycles per pole is limited. These single pole, single throw switches have been designed for a life of up to 2000 cycles per pole and feature contacts of copper alloy with .000030 [0.00076] gold over nickel plating in the contact area and legs plated to meet Tyco Electronics Solderability Specification 109-11-3. In addition, the SPST standard and low profile switches are also available with a top seal to provide protection during soldering and cleaning processes.

## DIP Switches

### Performance Characteristics

#### Current and Voltage Rating:

Nonswitching — 1.0 amperes max. at 40 VDC  
Switching — 60 milliamperes max at 5 VDC (resistive load);  
15 milliamperes max. at 24 VDC (resistive load)

#### Contact Resistance, Dry Circuit:

100 milliohms max. (end of life) and 50 milliohms (initial) at 50 mV open circuit, 50 milliamperes

#### Insulation Resistance:

$1 \times 10^9$  ohms min. at 100 VDC (initial)

#### Dielectric Withstanding Voltage:

500 VDC min. at standard atmospheric conditions

#### Capacitance:

5 picofarads max.

#### Temperature Rating:

Nonoperating — -73°C to +105°C  
Operating — -55°C to +105°C

#### Vibration:

Discontinuities shall not exceed 10 microseconds when subjected to 10-2000-10 Hz transversing for 20 minutes at .060 [1.52] inches total excursion

#### Shock:

No physical damage or discontinuities greater than 10 microseconds when tested with .10 ampere current applied per Tyco Electronics Specification 109-26, Condition A

#### Humidity:

Withstands an environment of +40°C and 95% RH for 96 hours

#### Durability:

No physical damage or contact resistance greater than 100 milliohms after 2000 cycles of actuation with a resistive load of 24 VDC and 25 milliamperes max. current applied

#### Terminal Strength (Bend Test):

Two (2) 45° bend cycles per MIL-STD-202, Method 211, Condition B

### Materials

#### Housing:

Glass-filled polyester, 94V-0 rated, blue

#### Rocker:

Thermoplastic, 94V-0 rated, white

#### Spring Contacts and Leads:

Copper alloy with .000030 [0.00076] gold over .000050 [0.00127] nickel in contact area and .000150 [0.00381] tin-lead over .000050 [0.00127] nickel on solder legs, plated to meet Tyco Electronics Solderability Specification 109-11-3.

### Technical Documents

#### Product Specification:

108-7532

#### Instruction Sheet:

408-07779

#### Application Specification:

114-1056

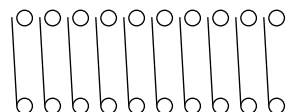
## DIP Switches, Rocker Style Actuator

### Single Pole Single Throw

**Contact Lead Spacing** —  
.100 x .300 [2.54 x 7.62]

**Lead Length** — .140 [3.56]  
below mounting surface

#### Contact Arrangement



Pin 1

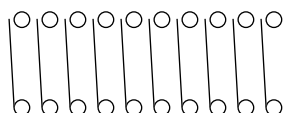
**Note:** Switches shown in open position.

### Single Pole Single Throw Low Profile

**Contact Lead Spacing** —  
.100 x .300 [2.54 x 7.62]

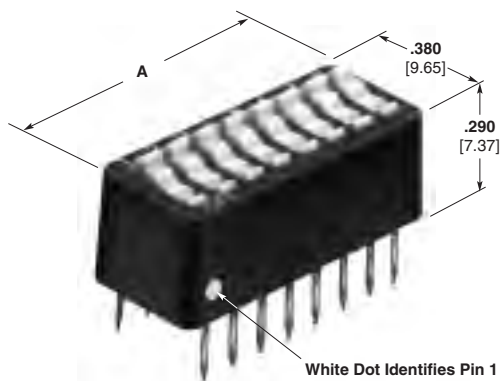
**Lead Length** — .140 [3.56]  
below mounting surface

#### Contact Arrangement

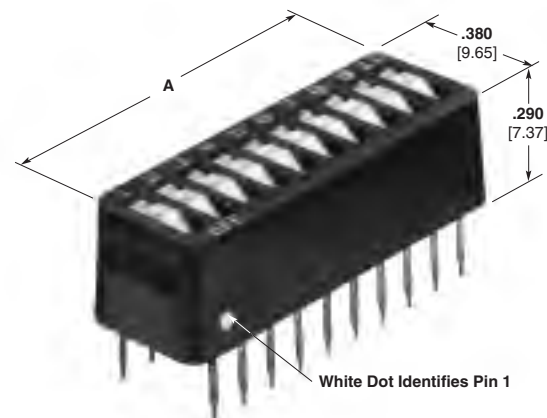
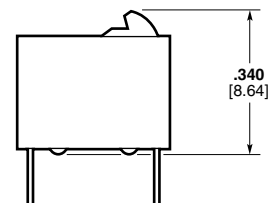


Pin 1

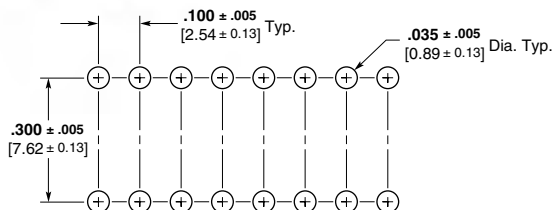
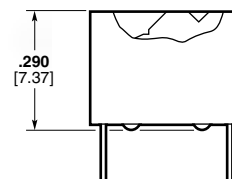
**Note:** Switches shown in open position.



White Dot Identifies Pin 1



White Dot Identifies Pin 1



Recommended PC Board Hole Pattern

| No. of<br>Switches | Dim. A |       | SPST Standard Profile             |                    | SPST Low Profile                  |                         |
|--------------------|--------|-------|-----------------------------------|--------------------|-----------------------------------|-------------------------|
|                    | inch   | mm    | Unsealed <sup>1</sup><br>Part No. | Sealed<br>Part No. | Unsealed <sup>1</sup><br>Part No. | Tape Sealed<br>Part No. |
| 2                  | .280   | 7.11  | 2-435640-9                        | —                  | 435668-1                          | 2-435668-6              |
| 3                  | .380   | 9.65  | 3-435640-0                        | —                  | —                                 | 3-435668-3              |
| 4                  | .480   | 12.19 | 435640-2                          | 3-435640-5         | 435668-3                          | 3-435668-4              |
| 5                  | .580   | 14.73 | 435640-3                          | 3-435640-6         | 435668-4                          | 3-435668-5              |
| 6                  | .680   | 17.27 | 435640-4                          | 3-435640-7         | 435668-5                          | 2-435668-5              |
| 7                  | .780   | 19.81 | 435640-1                          | 3-435640-8         | —                                 | 2-435668-7              |
| 8                  | .880   | 22.35 | 435640-5                          | 3-435640-9         | 435668-7                          | 2-435668-8              |
| 9                  | .980   | 24.89 | 435640-6                          | 4-435640-0         | —                                 | 2-435668-9              |
| 10                 | 1.080  | 27.43 | 435640-7                          | 4-435640-1         | 435668-9                          | 3-435668-0              |
| 11                 | 1.180  | 29.97 | —                                 | —                  | —                                 | 3-435668-1              |
| 12                 | 1.280  | 32.51 | 3-435640-2                        | 4-435640-3         | —                                 | 3-435668-2              |

<sup>1</sup> All switches are bottom sealed.

## Sip Switches, Low Profile, Vertical and Right Angle

### FEATURES:

- End-to-end stackable in .100" center (SSV/SLV) versions
- High pressure wiping contacts allows aqueous or solvent cleaning
- Gas tight contacts (280,000 PSI)
- Ceramic substrate allows wave soldering temperature of 245° for up to 10 seconds (SLV Version)
- 2 SIP switches take up less board space than 1 DIP switch

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature .....-30°C to +85°C  
 Storage Temperature .....-45°C to +100°C  
 Solder Heat Resistance .....Wave soldering temperatures of 245°C ± 5°C with switch in off position 30 seconds when mounting on a .060" thick PCB per MIL-STD 202, Method 210

### MATERIAL SPECIFICATIONS:

Base .....PPS 94V-0/Encapsulated Ceramic (SLV/SLH)  
 Cover .....PBT 94V-0  
 Contacts .....Gold flashed Beryllium copper  
 Actuator Material .....Polyamide  
 Terminals/Fixed Contacts .....Solder coated copper alloy  
 Terminal Seal .....Insert molded  
 Process Seal .....Gas tight contacts

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA @ 20 VDC max.  
 Initial Contact Resistance .....50 Milliohms max.  
 Insulation Resistance .....100 Megohms min. @ 100 VDC  
 Dielectric Strength .....500 VAC  
 Actuation Force .....800 Grams max.  
 Actuator Travel .....50°  
 Life Expectancy .....1,000 Cycles

### SSV

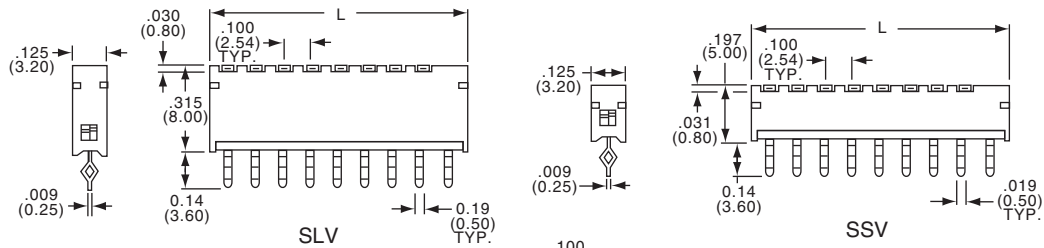


SSV08

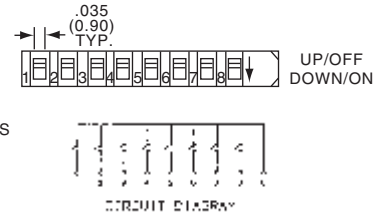
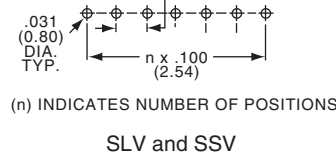
### SLV



SLV08



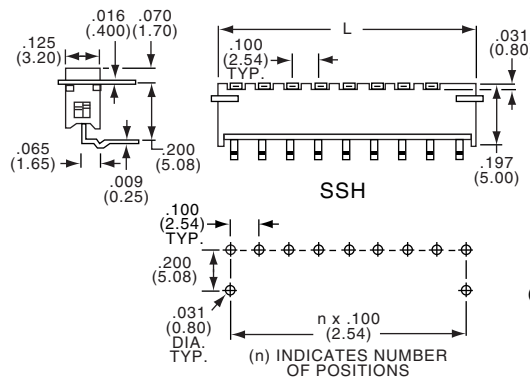
| Model            |            | No. of Positions | Dim. L |
|------------------|------------|------------------|--------|
| Tyco Electronics | Alcoswitch |                  |        |
| 2-1437589-2      | SSV02      | 2                | 0.298  |
| 2-1437589-3      | SSV04      | 4                | 0.498  |
| 2-1437589-4      | SSV06      | 6                | 0.698  |
| 2-1437589-6      | SSV08      | 8                | 0.898  |
| 2-1437589-7      | SSV10      | 10               | 1.098  |
| 1-1437589-5      | SLV04      | 4                | 0.498  |
| 1-1437589-6      | SLV08      | 8                | 0.898  |



### SSH

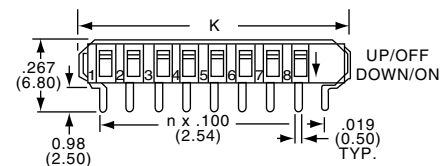


SSH06



### SSH

| Model            |            | No. of Positions | Dim. L | Dim. K |
|------------------|------------|------------------|--------|--------|
| Tyco Electronics | Alcoswitch |                  |        |        |
| 1-1437589-7      | SSH02      | 2                | 0.298  | 0.338  |
| 1-1437589-8      | SSH04      | 4                | 0.498  | 0.538  |
| 1-1437589-9      | SSH06      | 6                | 0.699  | 0.738  |
| 2-1437589-0      | SSH08      | 8                | 0.898  | 0.938  |
| 2-1437589-1      | SSH10      | 10               | 1.098  | 1.138  |



Alcoswitch DIP Shunts are a highly reliable, low cost means of manually programming various types of electrical/electronic equipment. The shunt consists of a series of conductive straps packaged in a DIP configuration. The straps can be retained intact for a closed circuit or broken with a hand tool to produce an open circuit.

DIP shunts are available in 4- through 12-position configurations. All shunts can be supplied either unprogrammed or preprogrammed.



### Performance Characteristics

#### Current Rating:

Standard Pressure — 2 amperes for +20°C rise above ambient (one conductor per shunt)  
Machine Insertable — 1 ampere for +20°C rise above ambient (one conductor per shunt)

#### Insulation Resistance:

1 x 10<sup>10</sup> ohms min. at 100 VDC

#### Dielectric Withstanding Voltage:

500 VDC min.

#### Capacitance:

2 picofarads max. between adjacent straps  
5 picofarads max. across cut straps

#### Temperature Rating:

-55°C to +105°C

#### Humidity:

Withstands an environment of +40°C and 95% RH for 96 hours

#### Terminal Strength (Bend Test):

Two 45° bend cycles per MIL-STD-202, Method 211, Condition B  
Resistance to Soldering Heat: EIA-364-56A Condition C

#### Reconnection Option

Cut straps can be reconnected by soldering bridging. Solder bridging recommendations are:

- Use low temperature solder
- Use solder tip approximately 1/32 [0.79] in diameter
- Do not let solder tip come in contact with plastic material

### Materials

#### Housing:

Glass-filled thermoplastic, 94V-0 rated

#### Metal Parts:

Copper alloy with electroplated tin finish (gold plated I/O legs are optional)

### Technical Documents

#### Product Specifications:

108-7533 Through Hole

#### Instruction Sheets:

408-07768 Through Hole

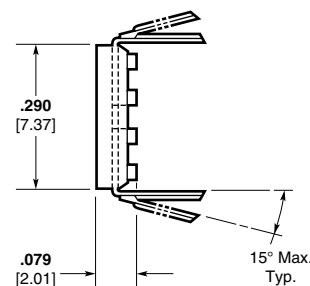
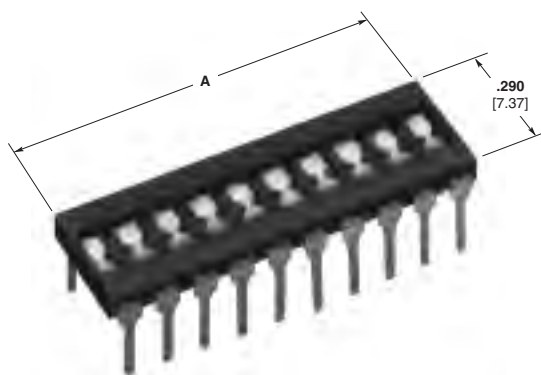
#### Application Specifications:

114-1054 Through Hole

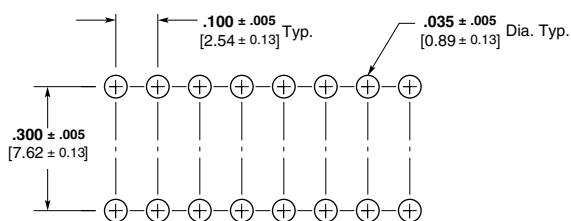
## Standard Shunt Standard Pressure

**Contact Lead Spacing** —  
.100 x .300 [2.54 x 7.62]  
**Lead Length** — .140 [3.56]  
below mounting surface  
**Housing Color** — Black  
**Programming Tool** — See below

**Programming**  
**Hand Tool**  
**Part No. 435862-1**



This tool provides a reliable means of programming DIP shunts. It is rugged, lightweight and dependable. No special skills are required to use this tool.

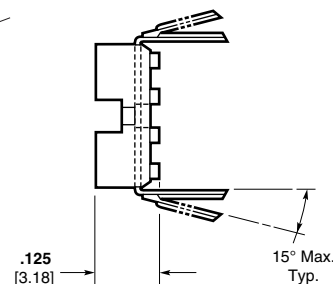
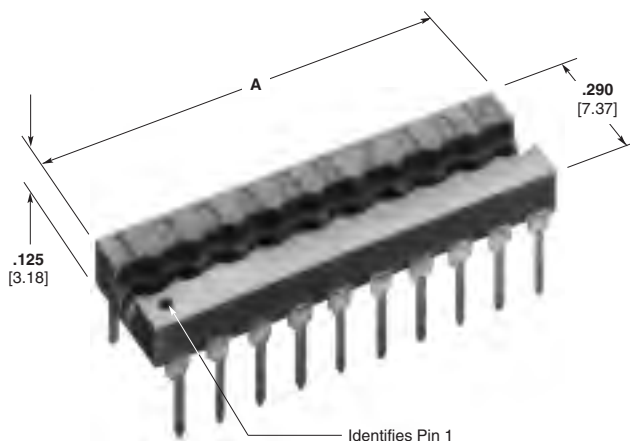


Recommended PC Board Hole Pattern

## Machine Insertable Shunt

(Compatible with commercially available IC insertion equipment)

**Contact Lead Spacing** —  
.100 x .300 [2.54 x 7.62]  
**Lead Length** — .140 [3.56]  
below mounting surface  
**Housing Color** — Gray  
**Programming Tool** — None required  
(5 to 10 lbs. [22.2 to 44.4 N] required to manually program each shunt position)



| No. of Positions | Dim. A |       | Standard Shunt<br>Standard Pressure | Machine Insertable<br>Shunt |
|------------------|--------|-------|-------------------------------------|-----------------------------|
|                  | inch   | mm    |                                     |                             |
| 4                | .400   | 10.16 | 435704-4                            | —                           |
| 6                | .600   | 15.24 | 435704-6                            | —                           |
| 7                | .700   | 17.78 | 435704-7                            | —                           |
| 8                | .800   | 20.32 | 435704-8                            | 436860-7                    |
| 9                | .900   | 22.86 | 435704-9                            | —                           |
| 10               | 1.000  | 25.40 | 1-435704-0                          | —                           |
| 12               | 1.200  | 30.48 | 1-435704-2                          | —                           |

## Rotary DIP Switches, Low Profile, Process Sealed, 7MM, Through Hole and Surface Mount

### FEATURES:

- 40% PCB area space savings over standard rotary dips
- 50% Lower in profile than standard rotary dips
- Hexadecimal or binary code, complement available
- Deflection temperature of 250°C for SMT reflow soldering
- Gold contacts, tin/lead terminals
- Sealed "O" ring design

### MATERIAL SPECIFICATIONS:

Fixed Contacts/Terminals.....Brass, gold plated / tin/lead  
 Moving Contacts.....BeCu, gold plated  
 Case Material .....PPS UL94V-0  
 Rotor .....Nylon UL94V-0  
 Cover Material .....PPS UL94V-0  
 O-Ring .....Fluoro Rubber

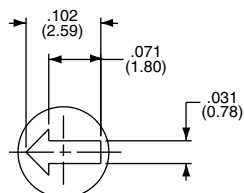
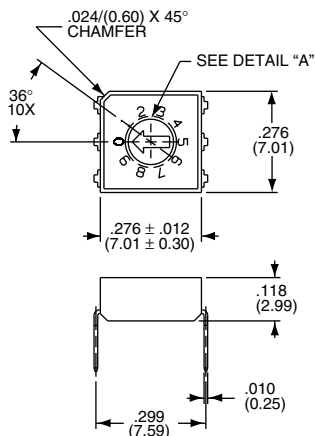
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-10°C to +85°C  
 Storage Temperature.....-45°C to +100°C  
 Solder Heat Resistance .....MIL-STD 202F, Method 210  
 IR Process Capability .....EIA-364-56 Level II (250°C peak)

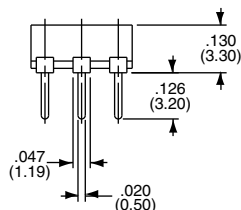
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA Max. @ 20 VDC  
 Initial Contact Resistance.....50m Max. @ 2 VDC 10mA  
 Insulation Resistance .....1,000 Megohms max.  
 Dielectric Strength .....300 VAC for 1 minute  
 Actuator Travel.....36° 10 Position, 22.5° 16 position  
 Operating Force .....200 Grams avg.  
 Life Expectancy .....20,000 Steps, mechanical

#### P.C. MOUNT



#### DETAIL "A" SCALE 8:1



MRD10



MRD10S

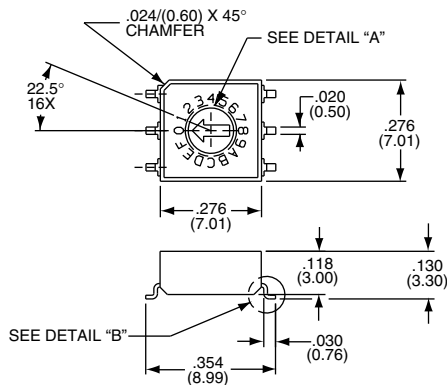


MRD16C

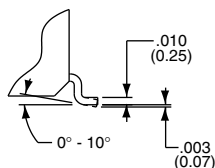


MRD16S

#### SURFACE MOUNT



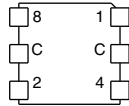
#### DETAIL "B" SCALE 8:1



## Rotary DIP Switches, Low Profile, Process Sealed, 7MM, Through Hole and Surface Mount

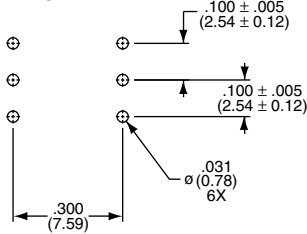
### TERMINAL IDENTIFICATION

VIEWED FROM BOTTOM SWITCH



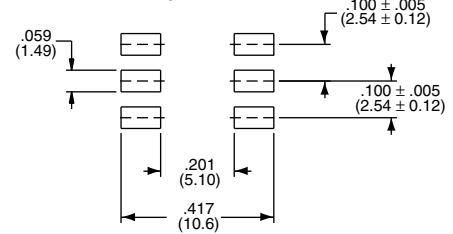
### P.C. LAYOUT (THRU HOLE)

TOP VIEW



### P.C. LAYOUT (SURFACE MOUNT)

TOP VIEW



## TRUTH TABLES

10-Position, BCD (red actuator)

| Pos. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------|---|---|---|---|---|---|---|---|---|---|
| C    | X | X | X | X | X | X | X | X | X | X |
| 1    |   | X |   | X |   | X |   | X |   | X |
| 2    |   |   | X | X |   |   | X | X |   |   |
| 4    |   |   |   |   | X | X | X | X |   |   |
| 8    |   |   |   |   |   |   |   |   | X | X |

16-Position, Hexadecimal (green actuator)

| Pos. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C    | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1    |   | X |   | X |   | X |   | X |   | X |   | X |   | X |   | X |
| 2    |   |   | X | X |   |   | X | X |   |   | X | X |   |   | X | X |
| 4    |   |   |   |   | X | X | X | X |   |   |   |   | X | X | X | X |
| 8    |   |   |   |   |   |   |   |   | X | X | X | X | X | X | X | X |

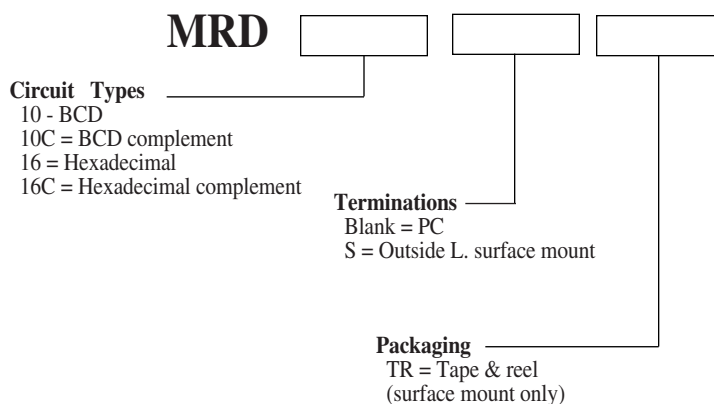
10-Position, BCD Complement (orange actuator)

| Pos. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------|---|---|---|---|---|---|---|---|---|---|
| C    | X | X | X | X | X | X | X | X | X | X |
| 1    | X |   | X |   | X |   | X |   | X |   |
| 2    | X | X |   |   | X | X |   |   | X | X |
| 4    | X | X | X | X |   |   |   |   | X | X |
| 8    | X | X | X | X | X | X | X | X |   |   |

16-Position Hexadecimal Complement (white actuator)

| Pos. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C    | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1    | X |   | X |   | X |   | X |   | X |   | X |   | X |   | X |   |
| 2    | X | X |   |   | X | X |   |   | X | X |   |   | X | X |   |   |
| 4    | X | X | X | X |   |   |   |   | X | X | X | X |   |   |   |   |
| 8    | X | X | X | X | X | X | X | X |   |   |   |   |   |   |   |   |

## HOW TO ORDER



| Color Code   |                |
|--------------|----------------|
| Circuit Type | Actuator Color |
| 10           | Red            |
| 10C          | Orange         |
| 16           | Green          |
| 16C          | White          |



## Rotary Dip Switches, Process Sealed, Through Hole and Surface Mount

### MATERIAL SPECIFICATIONS:

|                          |                                                                       |
|--------------------------|-----------------------------------------------------------------------|
| Contacts .....           | Gold flashed copper alloy                                             |
| Terminals .....          | Tin lead plated brass                                                 |
| Base, Rotor, Case .....  | PC, Glass filled PBT resin (blue case)<br>SMT, Polyimide (white case) |
| Movable Contact.....     | Gold flashed copper alloy                                             |
| Ball Support Plate ..... | Copper alloy                                                          |
| Detent Spring .....      | Stainless steel (spring)                                              |

### ENVIRONMENTAL SPECIFICATIONS:

|                              |                                                                                                                                        |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Operating Temperature.....   | -22°F to +185°F (-30°C to +85°C)                                                                                                       |
| Storage Temperature.....     | -49°F to 212°F (-45°C to +100°C)                                                                                                       |
| Vibration Resistance.....    | Subjected to vibration of 10-55hz per second with a total amplitude of .06 in. in 3 mutually perpendicular directions for 2 hours each |
| Shock Resistance .....       | Will withstand 50G acceleration in 3 different planes for a period of 11 milliseconds                                                  |
| Salt Spray Test .....        | Withstands an atmosphere of 5% salt water at temperature of 50°C                                                                       |
| Hydrogen Sulfide Test .....  | Withstands an atmosphere of 15-20 PPM hydrogen sulfide gas at temperature of 40°C for 240 hours                                        |
| Atmospheric Test .....       | Withstands an atmosphere of 30-50 PPM sulfite gas at a temperature of 40°C for 240 hours                                               |
| Solder Heat Resistance ..... | Withstands 5 sec. flow solder bath of 260°C when mounted on a .06" thick PC board per MIL-STD 202, Method 210                          |
| Bubble Test.....             | Withstands submersion in 60°C Fluorinert for 1 min. without leakage                                                                    |

### TYPICAL PERFORMANCE CHARACTERISTICS:

|                                  |                              |
|----------------------------------|------------------------------|
| Contact Rating .....             | 0.4 VA @ 20 VDC max.         |
| Initial Contact Resistance ..... | 50 Milliohms max. @ 2 VDC    |
| Insulation Resistance .....      | 1,000 Megohms min. @ 100 VDC |
| Dielectric Strength .....        | 300 VAC RMS @ sea level      |
| Operating Force .....            | .6 Oz.-in. nom.              |
| SMT Operating Force.....         | .3 Oz.-in. nom.              |
| Life Expectancy .....            | 20,000 Steps                 |



DRD10E



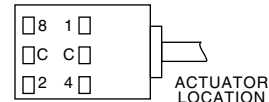
DRD16CE

### TRUTH TABLES

**Terminal Identification**  
(view from bottom of the switch)



VIEW FROM BOTTOM  
OF THE SWITCH



NOTE: COMMON TERMINALS ARE CONNECTED INTERNALLY.

#### 10-Position, BCD (red actuator)

| Pos. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------|---|---|---|---|---|---|---|---|---|---|
| C    | X | X | X | X | X | X | X | X | X | X |
| 1    |   | X |   | X |   | X |   | X |   | X |
| 2    |   |   | X | X |   |   | X | X |   |   |
| 4    |   |   |   |   | X | X | X | X |   |   |
| 8    |   |   |   |   |   |   |   |   | X | X |

#### 16-Position, Hexadecimal (black actuator)

| Pos. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C    | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1    |   | X |   | X |   | X |   | X |   | X |   | X |   | X |   | X |
| 2    |   |   | X | X |   |   | X | X |   |   | X | X |   |   | X | X |
| 4    |   |   |   |   | X | X | X | X |   |   |   |   | X | X | X | X |
| 8    |   |   |   |   |   |   |   |   | X | X | X | X | X | X | X | X |

#### 10-Position, BCD Complement (orange actuator)

| Pos. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------|---|---|---|---|---|---|---|---|---|---|
| C    | X | X | X | X | X | X | X | X | X | X |
| 1    | X |   | X |   | X |   | X |   | X |   |
| 2    | X | X |   |   | X | X |   |   | X | X |
| 4    | X | X | X | X |   |   |   |   | X | X |
| 8    | X | X | X | X | X | X | X | X |   |   |

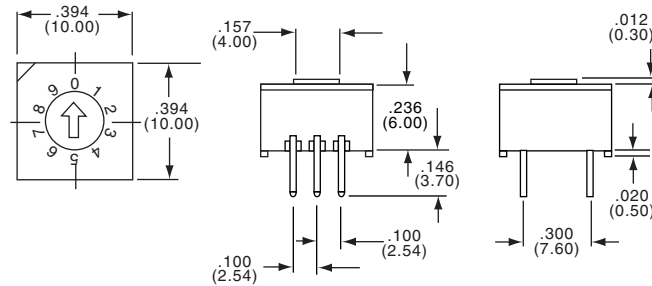
#### 16-Position Hexadecimal Complement (white actuator)

| Pos. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C    | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1    | X |   | X |   | X |   | X |   | X |   | X |   | X |   | X |   |
| 2    | X | X |   |   | X | X |   |   | X | X |   |   | X | X |   |   |
| 4    | X | X | X | X |   |   |   |   | X | X | X | X |   |   |   |   |
| 8    | X | X | X | X | X | X | X | X |   |   |   |   |   |   |   |   |

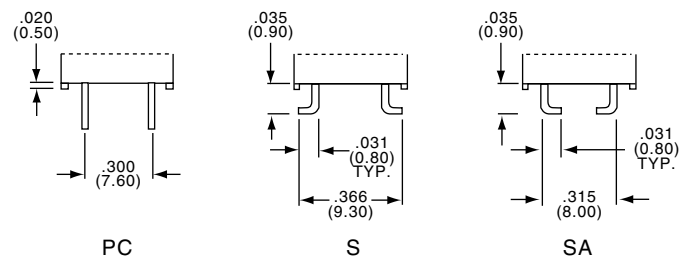


## Rotary DIP Switches, Process Sealed, Through Hole and Surface Mount

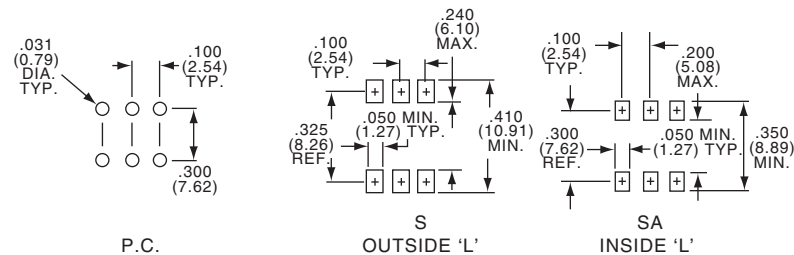
### "D" FLUSH ACTUATOR



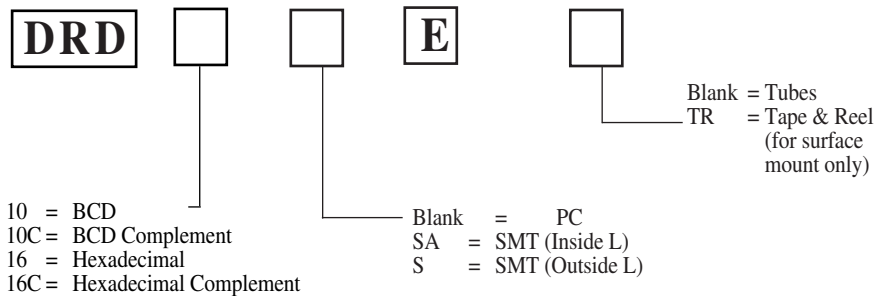
### TERMINATIONS



### LAYOUTS



### HOW TO ORDER



## Rotary DIP Switches, Unsealed, Through Hole, Straight and Right-Angle

### FEATURES:

- High pressure contacts (140K PSI) provide 20,000 Steps.
- Unique design utilizes high pressure pin-point sliding contacts to penetrate contaminants on contact surface.
- Terminals insert molded into base.

- Screwdriver, knob and shaft (plastic and steel) type actuators available in both upright and right angle versions.

- 10 And 16 position versions with both real and complement codes.

Note: Common terminals connected internally.

### MATERIAL SPECIFICATIONS:

Contacts .....Gold flashed copper alloy

Terminals .....Tin Lead Plated

Base, Rotor, Case .....Polyester

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA @ 20 VDC

Initial Contact Resistance .....50 Milliohms max. @ 2 VDC

Insulation Resistance .....1,000 Megohms min. @ 100 VDC

Dielectric Strength .....300 VAC RMS @ sea level

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-22°F to +185°F (-30°C to +85°C)

Storage Temperature.....-49°F to +212°F (-45°C to + 100°C)

Vibration Resistance.....Subjected to vibration of 10-55hz per second with a total amplitude of .06 in. in 3 mutually perpendicular directions for 2 hours each

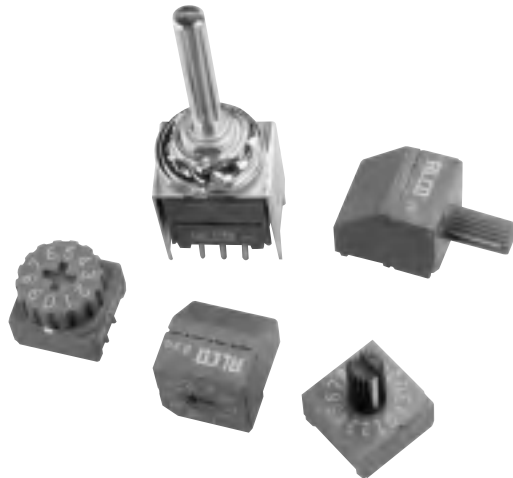
Shock Resistance .....Will withstand 50G acceleration in 3 different planes for a period of 11 milliseconds

Salt Spray Test .....Withstands an atmosphere of 5% salt water at temperature of 50°C

Hydrogen Sulfide Test .....Withstands an atmosphere of 15-20 PPM hydrogen sulfide gas at temperature of 40°C for 240 hours

Atmosphere Test.....Withstands an atmosphere of 30-50 PPM sulfide gas at a temperature of 40°C for 240 hours

Solder Heat Resistance .....Withstands 5 sec. flow solder bath of 260°C when mounted on a .06" thick PC board per MIL-STD 202, Method 210



**Example: DRW 10RA** = Rotary Dip with  
Wheel actuator  
BDC -10 position  
Right angle PC terminations

#### Series

Rotary Dips (blue case)

#### Actuator Style

- \*D = Flush
- M = Mini plastic shaft
- W = Wheel
- S = Metal shaft

#### Circuit Type

- 10 = BCD
- 10C = BCD complement
- 16 = Hexadecimal
- 16C = Hexadecimal complement

### HOW TO ORDER

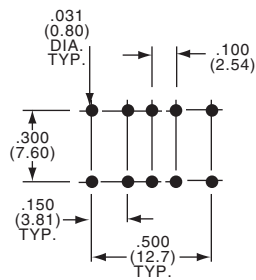
#### Terminations

- Blank = PC
- RA = Right angle for DRM, DRW, DRS only
- RAE = Right angle, Auto Assembly Compatible for DRD type only

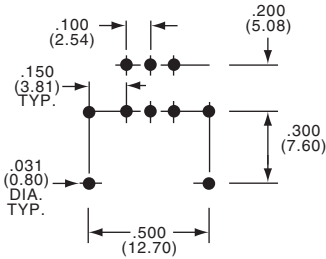
\*DRD Available in RAE version only. For PC or SMT versions, see Pg. A24 DRD "E" Process Sealed Product.

## Rotary DIP Switches, Unsealed, Through Hole, Straight and Right-Angle

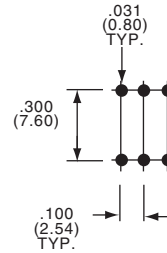
### FOOTPRINTS



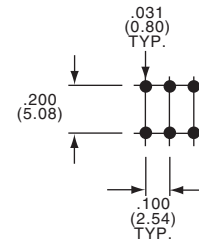
S STYLE VERTICAL  
(METAL SHAFT)



S STYLE RA  
(METAL SHAFT)



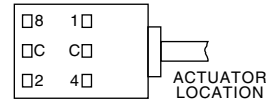
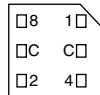
PC



PC  
RIGHT ANGLE

### TRUTH TABLES

Terminal Identification  
(view from bottom of the switch)



10-Position, BCD (red actuator)

| Pos. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------|---|---|---|---|---|---|---|---|---|---|
| C    | X | X | X | X | X | X | X | X | X | X |
| 1    |   | X |   | X |   | X |   | X |   | X |
| 2    |   |   | X | X |   |   | X | X |   |   |
| 4    |   |   |   |   | X | X | X | X |   |   |
| 8    |   |   |   |   |   |   |   |   | X | X |

16-Position, Hexadecimal (black actuator)

| Pos. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C    | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1    |   | X |   | X |   | X |   | X |   | X |   | X |   | X |   | X |
| 2    |   |   | X | X |   |   | X | X |   |   | X | X |   |   | X | X |
| 4    |   |   |   |   | X | X | X | X |   |   |   |   | X | X | X | X |
| 8    |   |   |   |   |   |   |   |   | X | X | X | X | X | X | X | X |

10-Position, BCD Complement (orange actuator)

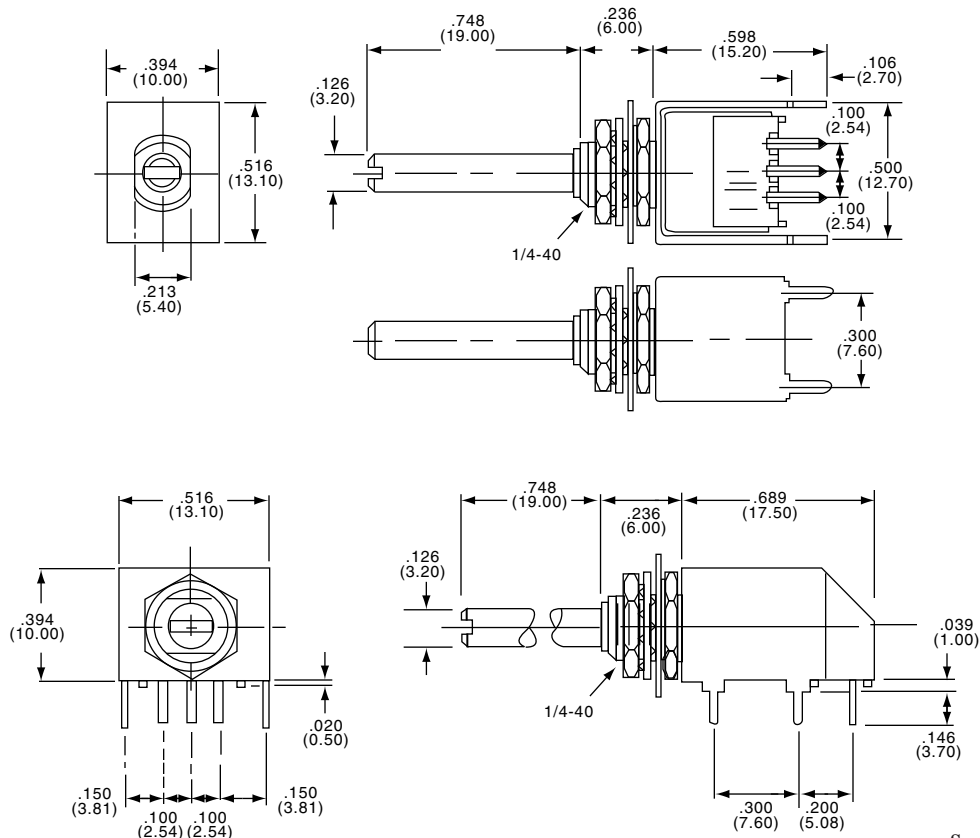
| Pos.           | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|----------------|---|---|---|---|---|---|---|---|---|---|
| $\overline{C}$ | X | X | X | X | X | X | X | X | X | X |
| $\overline{1}$ | X |   | X |   | X |   | X |   | X |   |
| $\overline{2}$ | X | X |   |   | X | X |   |   | X | X |
| $\overline{4}$ | X | X | X | X |   |   |   |   | X | X |
| $\overline{8}$ | X | X | X | X | X | X | X | X |   |   |

16-Position Hexadecimal Complement (white actuator)

| Pos.           | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $\overline{C}$ | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| $\overline{1}$ | X |   | X |   | X |   | X |   | X |   | X |   | X |   | X |   |
| $\overline{2}$ | X | X |   |   | X | X |   |   | X | X |   |   | X | X |   |   |
| $\overline{4}$ | X | X | X | X |   |   |   |   | X | X | X | X |   |   |   |   |
| $\overline{8}$ | X | X | X | X | X | X | X | X |   |   |   |   |   |   |   |   |

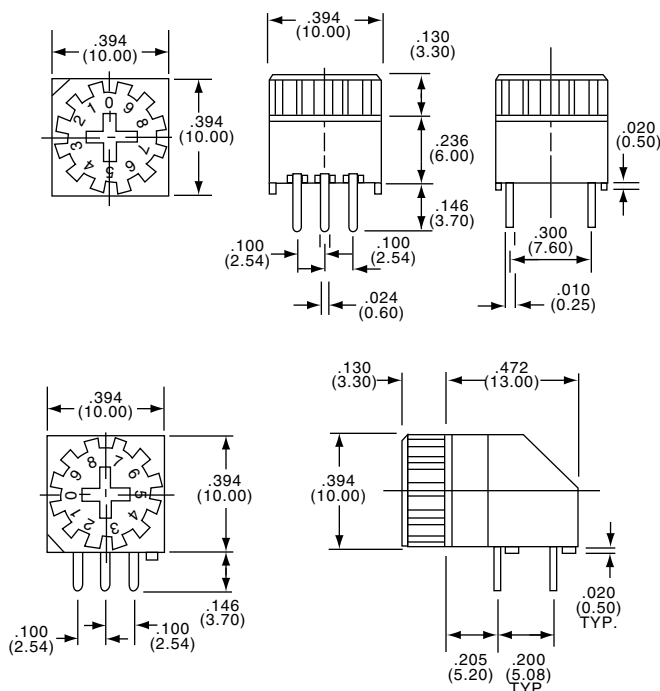
# Rotary DIP Switches, Unsealed, Through Hole, Metal Shaft or Wheel Actuator

## “S” METAL SHAFT ACTUATOR



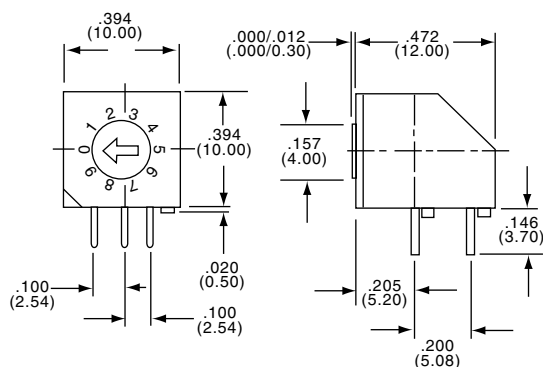
See Section K for knob selection

## “W” WHEEL ACTUATOR



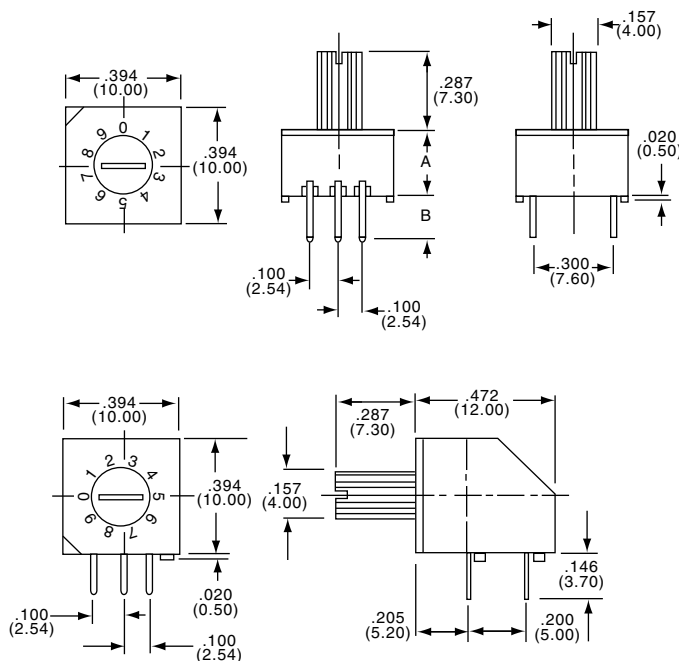
## Rotary DIP Switches, Unsealed, Through-Hole, Flush and Mini Shaft Actuator

### "D" FLUSH ACTUATOR



| DIM. | DR          | RC, *RA, RR |
|------|-------------|-------------|
| A    | .236 (6.00) | .256 (6.50) |
| B    | .146 (3.70) | .126 (3.20) |

### "M" MINI-SHAFT ACTUATOR



| DIM. | DR          | RR          |
|------|-------------|-------------|
| A    | .236 (6.00) | .256 (6.50) |
| B    | .146 (3.70) | .126 (3.20) |



*ASE/F Series - Page B5*



*SE Series - Page B9*



*STS Series - Page B11*



*TSS Series - Page B16*



*MSS Series - Page B18*



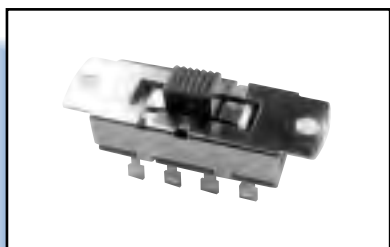
*MSSA Series - Page B24*



*MHS Series - Page B31*



*SSJ Series - Page B33*



*AC Power Slide Switches - Page B48*



**B**

Slide Switches

## Slide Switches Part Number Index

|          |       |            |     |             |     |             |     |
|----------|-------|------------|-----|-------------|-----|-------------|-----|
| ASE22    | B6    | ASF62RS    | B9  | MSSA101DG   | B31 | SLS1211     | B43 |
| ASE22G   | B6    | ASF62S     | B9  | MSSA101DGRA | B32 | SLS121PC    | B43 |
| ASE22GL  | B6    | CST022NK   | B45 | MSSA101EG   | B31 | SLS121RA    | B43 |
| ASE22GS  | B7    | CST023NK   | B45 | MSSA101EGRA | B32 | SLS131PC    | B44 |
| ASE22L   | B6    | CST042NK   | B46 | MSSA104D    | B31 | SLS131RA    | B44 |
| ASE22R   | B5,B6 | CST043NK   | B46 | MSSA104DI   | B31 | SLS141PC    | B44 |
| ASE22RG  | B6    | CST062NK   | B46 | MSSA104DRA  | B32 | SLS141RA    | B44 |
| ASE22RGL | B7    | KSS10A     | B40 | MSSA104E    | B31 | SLS151PC    | B44 |
| ASE22RGS | B7    | KSS10B     | B40 | MSSA104ERA  | B32 | SLS151RA    | B44 |
| ASE22RL  | B7    | KSS20A     | B40 | MSSA111DG   | B30 | SLS220      | B41 |
| ASE22RS  | B7    | KSS20B     | B40 | MSSA111EG   | B30 | SLS2201     | B42 |
| ASE22S   | B7    | MHS122     | B33 | MSSA114D    | B30 | SLS220PC    | B40 |
| ASE42    | B6    | MHS122G    | B33 | MSSA114E    | B30 | SLS230PC    | B40 |
| ASE42G   | B6    | MHS122GRA  | B34 | MSSA1350    | B26 | SLS240PCA   | B40 |
| ASE42GL  | B6    | MHS122K    | B33 | MSSA1350G   | B26 | SLS250PC    | B40 |
| ASE42GS  | B7    | MHS122KG   | B33 | MSSA1350R   | B26 | SLS260PC    | B40 |
| ASE42L   | B6    | MHS122RA   | B34 | MSSA1350RG  | B26 | SLSA120     | B41 |
| ASE42R   | B6    | MHS123     | B33 | MSSA1450    | B26 | SLSA1201    | B42 |
| ASE42RG  | B6    | MHS123G    | B33 | MSSA1450G   | B26 | SLSA220     | B41 |
| ASE42RGL | B7    | MHS123GRA  | B34 | MSSA1450R   | B26 | SLSA2201    | B42 |
| ASE42RGS | B7    | MHS123K    | B33 | MSSA1450RG  | B26 | SSA12       | B39 |
| ASE42RL  | B7    | MHS123KG   | B33 | MSSA201NGRA | B32 | SSA12G      | B39 |
| ASE42RS  | B7    | MHS123RA   | B34 | MSSA201PGRA | B32 | SSA22       | B39 |
| ASE42S   | B7    | MHS133     | B33 | MSSA204N    | B31 | SSA22G      | B39 |
| ASE43    | B6    | MHS133G    | B33 | MSSA204N1   | B31 | SSB12       | B38 |
| ASE43G   | B6    | MHS133GRA  | B34 | MSSA204NRA  | B32 | SSB12G      | B38 |
| ASE43GL  | B6    | MHS133K    | B33 | MSSA204P1   | B31 | SSB12R      | B38 |
| ASE43GS  | B7    | MHS133KG   | B33 | MSSA204PRA  | B32 | SSB12RG     | B38 |
| ASE43L   | B6    | MHS133RA   | B34 | MSSA211NG   | B30 | SSB22       | B38 |
| ASE43R   | B6    | MHS222     | B33 | MSSA214N    | B30 | SSB22G      | B38 |
| ASE43RG  | B6    | MHS222G    | B33 | MSSA2350    | B27 | SSB22R      | B38 |
| ASE43RGL | B7    | MHS222GRA  | B34 | MSSA2350G   | B27 | SSB22RG     | B38 |
| ASE43RGS | B7    | MHS222K    | B33 | MSSA2350R   | B27 | SSB42       | B38 |
| ASE43RL  | B7    | MHS222KG   | B33 | MSSA2350RG  | B27 | SSB42G      | B38 |
| ASE43RS  | B7    | MHS222RA   | B34 | MSSA2450    | B27 | SSJ12       | B35 |
| ASE43S   | B7    | MHS223     | B33 | MSSA2450G   | B27 | SSJ12R      | B35 |
| ASE62    | B6    | MHS223G    | B33 | MSSA2450R   | B27 | SSJ13       | B35 |
| ASE62G   | B5,B6 | MHS223GRA  | B34 | MSSA2450RG  | B27 | STS121PC    | B13 |
| ASE62GL  | B6    | MHS223K    | B33 | MSSA3350    | B28 | STS121RA    | B13 |
| ASE62GS  | B7    | MHS223KG   | B33 | MSSA3350G   | B28 | STS1300PC   | B14 |
| ASE62L   | B6    | MHS223RA   | B34 | MSSA3350R   | B28 | STS1300RA   | B14 |
| ASE62R   | B6    | MHS233     | B33 | MSSA3350RG  | B28 | STS131PC    | B13 |
| ASE62RG  | B6    | MHS233G    | B33 | MSSA3450    | B28 | STS131RA    | B13 |
| ASE62RGL | B7    | MHS233GRA  | B34 | MSSA3450G   | B28 | STS1400PC   | B14 |
| ASE62RGS | B7    | MHS233K    | B33 | MSSA3450R   | B28 | STS1400RA   | B14 |
| ASE62RL  | B7    | MHS233KG   | B33 | MSSA3450RG  | B28 | STS141PC    | B14 |
| ASE62RS  | B7    | MHS233RA   | B34 | MSSA4350    | B29 | STS141RA    | B14 |
| ASE62S   | B7    | MLL1200S   | B47 | MSSA4350G   | B29 | STS151PC    | B15 |
| ASF22    | B5,B8 | MLL1200STR | B47 | MSSA4350R   | B29 | STS151RA    | B15 |
| ASF22G   | B8    | MLL1300S   | B47 | MSSA4350RG  | B29 | STS161PC    | B15 |
| ASF22GL  | B8    | MMS12      | B36 | MSSA4450    | B29 | STS161RA    | B15 |
| ASF22GS  | B9    | MMS22      | B36 | MSSA4450G   | B29 | STS220PC    | B16 |
| ASF22L   | B8    | MMS22R     | B36 | MSSA4450R   | B29 | STS2300PC   | B15 |
| ASF22R   | B5,B8 | MMS23      | B36 | MSSA4450RG  | B29 | STS230PC    | B16 |
| ASF22RG  | B8    | MMS23R     | B36 | S1DGPC      | B12 | STS2400PC   | B15 |
| ASF22RGL | B9    | MMS42      | B37 | S1DGRA      | B12 | STS240PC    | B16 |
| ASF22RGS | B9    | MMS42R     | B37 | S1EGPC      | B12 | STS250PC    | B16 |
| ASF22RL  | B9    | MMS43      | B37 | S1EGRA      | B12 | STS260PC    | B16 |
| ASF22RS  | B9    | MMS43R     | B37 | S2DGPC      | B12 | STSA220RA   | B16 |
| ASF22S   | B9    | MSS1200    | B20 | S2DGRA      | B12 | STSA220RA1  | B16 |
| ASF42    | B8    | MSS1200G   | B20 | S2EGPC      | B12 | STSA230RA   | B16 |
| ASF42G   | B8    | MSS1200R   | B20 | S2EGRA      | B12 | STSA230RA1  | B16 |
| ASF42GL  | B8    | MSS1200RG  | B20 | SDS1240RA0  | B17 | TSD21AAGPC  | B18 |
| ASF42GS  | B9    | MSS1300    | B20 | SDS1240RA8  | B17 | TSD21DDG1PC | B18 |
| ASF42L   | B8    | MSS1300G   | B20 | SDS1340RA0  | B17 | TSD21DDG1RA | B19 |
| ASF42R   | B8    | MSS1300R   | B20 | SDS1340RA8  | B17 | TSD21DDGPC  | B18 |
| ASF42RG  | B8    | MSS1300RG  | B20 | SDS2240RA0  | B17 | TSD21DDGRA  | B19 |
| ASF42RGL | B9    | MSS1400    | B21 | SDS2240RA8  | B17 | TSD21EEG1RA | B19 |
| ASF42RGS | B9    | MSS1400G   | B21 | SDS2340RA0  | B17 | TSD21EEGRA  | B19 |
| ASF42RL  | B9    | MSS2225    | B21 | SDS2340RA8  | B17 | TSD21RG1PC  | B18 |
| ASF42RS  | B9    | MSS2225G   | B21 | SE1DGPC     | B12 | TSS11AG1PC  | B18 |
| ASF42S   | B9    | MSS2250    | B21 | SE1DGRA     | B12 | TSS11AGPC   | B18 |
| ASF43    | B8    | MSS2250G   | B21 | SE1DGMT     | B11 | TSS11DG1PC  | B18 |
| ASF43G   | B8    | MSS2250R   | B22 | SE1DGSMTR   | B11 | TSS11DG1RA  | B19 |
| ASF43GL  | B8    | MSS2250RG  | B22 | SE1EGPC     | B12 | TSS11DGPC   | B18 |
| ASF43GS  | B9    | MSS4200    | B22 | SE1EGRA     | B12 | TSS11DGRA   | B19 |
| ASF43L   | B8    | MSS4200G   | B22 | SE1EGSMT    | B11 | TSS11EG1PC  | B18 |
| ASF43R   | B8    | MSS4200R   | B23 | SE1EGSMTR   | B11 | TSS11EG1RA  | B19 |
| ASF43RG  | B8    | MSS4200RG  | B23 | SE1GSMTR    | B11 | TSS11EGPC   | B18 |
| ASF43RGL | B9    | MSS4250    | B22 | SE1GSMTR    | B11 | TSS11EGRA   | B19 |
| ASF43RGS | B9    | MSS4300    | B23 | SE2DGPC     | B12 | TSS21KG1PC  | B18 |
| ASF43RL  | B9    | MSS4300G   | B23 | SE2DGRA     | B12 | TSS21KGPC   | B18 |
| ASF43RS  | B9    | MSS4300R   | B24 | SE2EGPC     | B12 | TSS21NG1PC  | B18 |
| ASF43S   | B9    | MSS4300RG  | B24 | SE2EGRA     | B12 | TSS21NG1RA  | B19 |
| ASF62    | B8    | MSS4335    | B23 | SL1000      | B40 | TSS21NGPC   | B18 |
| ASF62G   | B8    | MSS4350R   | B24 | SL220       | B40 | TSS21NGRA   | B19 |
| ASF62GL  | B8    | MSS4350RG  | B24 | SL330       | B40 | TSS21PAGRA  | B19 |
| ASF62GS  | B9    | MSS6200    | B24 | SL550       | B40 | TSS21PG1RA  | B19 |
| ASF62L   | B8    | MSS6200G   | B24 | SL660       | B40 | TSS21PGPC   | B18 |
| ASF62R   | B8    | MSS6250    | B25 | SL770       | B40 | TSS21PGRA   | B19 |
| ASF62RG  | B8    | MSS6350    | B25 | SL880       | B40 | TSS41NGPC   | B18 |
| ASF62RGL | B9    | MSS6350G   | B25 | SLS120      | B41 | TSS41NGRA   | B19 |
| ASF62RGS | B9    | MSS6350R   | B25 | SLS1201     | B42 | 1571490     | B48 |
| ASF62RL  | B9    | MSS6350RG  | B25 | SLS121      | B43 | 1571491     | B48 |



## Slide Switch Selection Guide

### PRODUCT LINE FEATURES

- One of the broadest lines in the industry.
- One to six pole configurations.
- Current ratings from 0.4V @ 20VDC to 3A @ 115VAC.
- Miniature and sub-miniature case sizes.
- Gold or silver plating available in most series.
- Wave solderable, washable, and surface mount versions.
- Rocker (butt), shoe and bifurcated contact mechanisms.
- Vertical and RA actuator styles.

| CIRCUITRY | SERIES               | TERMINATION          | CONTACT RATING/PLATING | ACTION         | LIFE EXPECTANCY |
|-----------|----------------------|----------------------|------------------------|----------------|-----------------|
| SPST      | TSS                  | P.C.                 | .4VA/GOLD              | STANDARD/FLUSH | 80K CYCLES      |
| SPDT      | MHS                  | P.C./RIGHT ANGLE     | .4VA/GOLD:300mA/SILVER | STANDARD/BATON | 15K CYCLES      |
|           | MLL                  | SURFACE MOUNT        | 0.3A @ 4 VDC/SILVER    | RIGHT ANGLE    | 10K CYCLES      |
|           | MMS                  | P.C.                 | 100MA/SILVER           | STANDARD       | 10K CYCLES      |
|           | MSS                  | P.C./RIGHT ANGLE     | .4VA/GOLD:300MA/SILVER | STANDARD       | 15K CYCLES      |
|           | MSSA <sup>H</sup> H1 | P.C./RIGHT ANGLE     | .4VA/GOLD              | STANDARD       | 30K CYCLES      |
|           | MSSA <sup>H</sup> H4 | P.C./RIGHT ANGLE     | 3A/SILVER              | STANDARD       | 30K CYCLES      |
|           | SDS                  | P.C./RIGHT ANGLE     | 300mA @ 125VAC/SILVER  | STANDARD       | 10K CYCLES      |
|           | SE, S                | P.C./RIGHT ANGLE/SMT | .4VA/GOLD              | STANDARD       | 6K CYCLES       |
|           | SL                   | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | SLS                  | P.C./RIGHT ANGLE     | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | SLS/A                | P.C.                 | 500mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | SSA                  | P.C.                 | 100mA/SILVER:.4VA/GOLD | STANDARD       | 10K CYCLES      |
|           | SSB                  | P.C./RIGHT ANGLE     | 100MA/SILVER:.4VA/GOLD | STANDARD       | 10K CYCLES      |
|           | SSJ                  | P.C./RIGHT ANGLE     | 100mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | STS                  | P.C./RIGHT ANGLE     | 300mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | TSS                  | P.C./RIGHT ANGLE     | .4VA/GOLD              | STANDARD/FLUSH | 60-80K CYCLES   |
| SP3T      | MHS                  | P.C./RIGHT ANGLE     | 300MA/SILVER:.4VA/GOLD | STANDARD/BATON | 15K CYCLES      |
|           | MLL                  | SURFACE MOUNT        | 0.3A @ 4 VDC/SILVER    | RIGHT ANGLE    | 10K CYCLES      |
|           | MSS                  | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | MSSA                 | P.C./RIGHT ANGLE     | 300MA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | SDS                  | P.C./RIGHT ANGLE     | 300mA @ 125VAC/SILVER  | STANDARD       | 10K CYCLES      |
|           | SL                   | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | SLS                  | P.C./RIGHT ANGLE     | 250MA/SILVER           | STANDARD       | 6K CYCLES       |
|           | SSJ                  | P.C.                 | 100mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | STS                  | P.C./RIGHT ANGLE     | 300mA/SILVER           | STANDARD       | 10K CYCLES      |
| SP4T      | MSS                  | P.C.                 | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | MSSA                 | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | SLS                  | P.C./RIGHT ANGLE     | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | STS                  | P.C./RIGHT ANGLE     | 300mA/SILVER           | STANDARD       | 10K CYCLES      |
| SP5T      | SL                   | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | SLS                  | P.C./RIGHT ANGLE     | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | STS                  | P.C./RIGHT ANGLE     | 300mA/SILVER           | STANDARD       | 10K CYCLES      |
| SP6T      | SL                   | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | STS                  | P.C./RIGHT ANGLE     | 300mA/SILVER           | STANDARD       | 10K CYCLES      |
| SP7T      | SL                   | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
| SP8T      | SL                   | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
| SP10T     | SL                   | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
| DPST      | TSS                  | P.C.                 | .4VA/GOLD              | STANDARD/FLUSH | 80K CYCLES      |
| DPDT      | ASE/F                | P.C./RIGHT ANGLE/SMT | .4VA/GOLD:300mA SILVER | STANDARD/FLUSH | 10K CYCLES      |
|           | CSS                  | P.C.                 | 300mA/SILVER           | BATON          | 15K CYCLES      |
|           | CST                  | P.C.                 | 300mA/SILVER           | BATON          | 15K CYCLES      |
|           | MHS                  | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD/BATON | 15K CYCLES      |
|           | MMS                  | P.C./RIGHT ANGLE     | 100mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | MSS                  | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | MSSA21               | P.C./RIGHT ANGLE     | .4VA/GOLD              | STANDARD       | 30K CYCLES      |

## Slide Switch Selection Guide

| CIRCUITRY | SERIES   | TERMINATION          | CONTACT RATING/PLATING | ACTUATION      | LIFE EXPECTANCY |
|-----------|----------|----------------------|------------------------|----------------|-----------------|
| DPDT      | 1571491  | PANEL                | 6A/SILVER              | STANDARD       | 5K CYCLES       |
|           | MSSA2H4  | P.C./RIGHT ANGLE     | 3A/SILVER              | STANDARD/FLUSH | 30K CYCLES      |
|           | SDS      | P.C./RIGHT ANGLE     | 300mA @ 125 VAC/SILVER | STANDARD       | 10K CYCLES      |
|           | SE, S    | P.C./RIGHT ANGLE     | .4VA/GOLD              | STANDARD       | 10K CYCLES      |
|           | SLS      | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | SLS/A    | P.C.                 | 500mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | SSA      | P.C.                 | 100mA/SILVER:.4VA/GOLD | STANDARD       | 10K CYCLES      |
|           | SSB      | P.C./RIGHT ANGLE     | 100mA/SILVER:.4VA/GOLD | STANDARD       | 10K CYCLES      |
|           | STS      | P.C./RIGHT ANGLE     | 300 mA/SILVER          | STANDARD       | 10K CYCLE       |
|           | TSS      | P.C./RIGHT ANGLE     | .4VA/GOLD              | STANDARD/FLUSH | 60-80K CYCLES   |
|           | 1571490  | PANEL                | 13A/SILVER             | STANDARD       | 5K CYCLES       |
|           | CST      | P.C.                 | 300mA/SILVER           | BATON          | 10K CYCLES      |
|           | MHS      | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD/BATON | 15KCYCLES       |
|           | MMS      | P.C./RIGHT ANGLE     | 100mA/SILVER           | STANDARD       | 10K CYCLES      |
| DP3T      | MSSA     | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | SDS      | P.C./RIGHT ANGLE     | 300mA @ 125 VAC        | STANDARD       | 10K CYCLES      |
|           | SLS      | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | STS      | P.C./RIGHT ANGLE     | 300mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | MSS      | P.C.                 | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | MSSA     | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | SLS      | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | STS      | P.C./RIGHT ANGLE     | 300mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | MSS      | P.C.                 | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | MSSA     | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | SLS      | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | STS      | P.C./RIGHT ANGLE     | 300mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | SLS      | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | STS      | P.C./RIGHT ANGLE     | 300mA/SILVER           | STANDARD       | 10K CYCLES      |
| DP4T      | SLS      | P.C.                 | 250mA/SILVER           | STANDARD       | 6K CYCLES       |
|           | STS      | P.C./RIGHT ANGLE     | 300mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | MSSA     | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | SSB      | P.C.                 | 100mA/SILVER:.4VA/GOLD | STANDARD       | 10K CYCLES      |
|           | SSA      | P.C.                 | 100mA/SILVER:.4VA/GOLD | STANDARD       | 10K CYCLES      |
|           | MSS      | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | SSB      | P.C.                 | 100mA/SILVER:.4VA/GOLD | STANDARD       | 10K CYCLES      |
|           | TSS      | P.C./RIGHT ANGLE     | .4VA/GOLD              | STANDARD       | 80K CYCLES      |
|           | ASE/F    | P.C./RIGHT ANGLE/SMT | 300mA/SILVER           | STANDARD/FLUSH | 10K CYCLES      |
|           | CST      | P.C.                 | 300mA/SILVER           | BATON          | 10K CYCLES      |
|           | MMS      | P.C./RIGHT ANGLE     | 100mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | MSS      | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | SSB      | P.C.                 | 100mA/SILVER:.4VA/GOLD | STANDARD       | 10K CYCLES      |
|           | TSS      | P.C./RIGHT ANGLE     | .4VA/GOLD              | STANDARD       | 80K CYCLES      |
| DP5T      | ASE/F    | P.C./RIGHT ANGLE/SMT | 300mA/SILVER           | STANDARD/FLUSH | 10K CYCLES      |
|           | CST      | P.C.                 | 300mA/SILVER           | BATON          | 10K CYCLES      |
|           | MHS      | P.C.                 | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | MMS      | P.C./RIGHT ANGLE     | 100mA/SILVER           | STANDARD       | 10K CYCLES      |
|           | MSS/MSSA | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15L CYCLES      |
|           | MSSA     | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | ASE/F    | P.C./RIGHT ANGLE/SMT | 300mA/SILVER:.4VA/GOLD | STANDARD/FLUSH | 10K CYCLES      |
|           | CST      | P.C.                 | 300mA/SILVER:.4VA/GOLD | BATON          | 10K CYCLES      |
|           | MSS      | P.C.                 | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | MSS      | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | MSS      | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | MSS      | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | MSS      | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |
|           | MSS      | P.C./RIGHT ANGLE     | 300mA/SILVER:.4VA/GOLD | STANDARD       | 15K CYCLES      |

## Slide Switches, Auto-insertable, Through Hole and Surface Mount

### FEATURES:

- Unique design allows ASE/F to withstand aqueous or solvent cleaning processes.
- High temperature anti-static plastic construction will withstand most surface mount, vapor phase reflow or wave soldering conditions.
- Three standard types:  
ASF – DIP package with flush actuator allows auto insertion on standard IC equipment. Standard tape seal and closed case construction provide process seal.

- ASFO–Open ended flush actuator without tape seal.
- ASE–extended actuator open-ended case allows washout after process cleaning.
- 2, 4 and 6 pole versions available with top or side actuator.
- Bifurcated double wipe contacts provide dependable, telecom grade switching.
- Industry standard .100 x .300 pin spacing

### MATERIAL SPECIFICATIONS:

Contacts .....Gold over nickel or  
Silver over nickel flash  
Case Material .....PET  
Actuator Material .....Nylon  
Terminal.....Copper alloy, terminals tin lead plate  
(90/10) over nickel

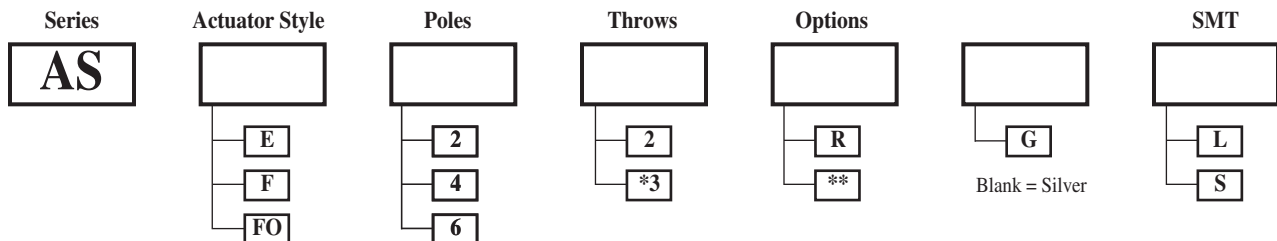
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-40°F to +176°F (-40°C to +80°C)  
Storage Temperature.....-40°F to +176°F (-40°C to +80°C)  
Solder Heat Resistance .....See page M3-M4  
Movable Contact .....Copper alloy  
Terminal Seal .....Insert molded

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....Gold: 0.4 VA @ 20 VDC or peak AC shorting type  
Silver: 300mA @ 115 VAC 28 VDC  
Initial Contact Resistance .....40 Milliohms max.  
Insulation Resistance .....1,000 Megohms @ 500 VDC min.  
Dielectric Strength .....1,000 Volts RMS @ sea level  
Contact Timing.....Shorting  
Life Expectancy .....10,000 Cycles  
Actuation Force .....850g±150grams  
Travel ......100 ±.010 [2.54±.25]

### PART NUMBERING



ASF: Tape seal, closed (sealed) case, flush top actuator.

ASE: Open ended case, extended top or side actuator.

ASFO: Open ended case, flush top or side actuator.

Standard actuator color is white.

E= Extended actuator

F= Flush actuator

FO= Open ended without tape seal

G= Gold contacts

R= Side actuator

\*3= Throw available in 4 pole only

L= SMT terminal configuration

S= SMT terminal reverse L configuration (Refer to page B10 for pad layout)

\*\*Flush side actuator "R" versions are supplied with open ended case and without tape seal.

**Note: For SPDT requirements, order DPDT version and use either set of contacts for SPDT switching.**



ASE22R



ASE62G

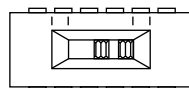


ASF22

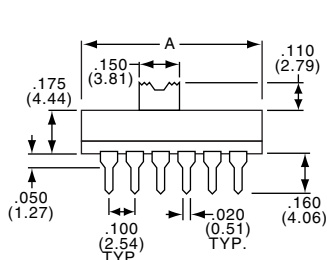


ASF22R

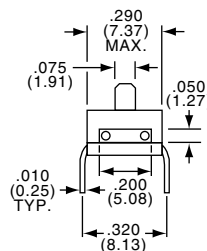
# Slide Switches, Extended Actuator, Through Hole and Surface Mount



EXTENDED TOP ACTUATOR



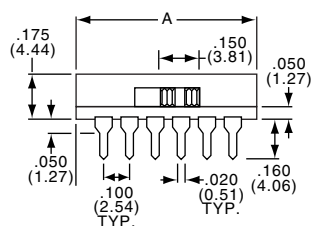
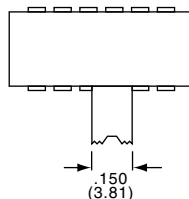
NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.



Upright, Through Hole, Extended Actuator

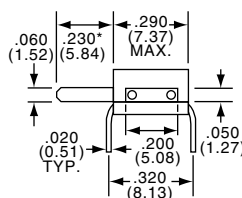
| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| 1437581-2        | ASE22      | DPDT | Silver  | .400/10.2 |
| 1437581-4        | ASE22G     | DPDT | Gold    | .400/10.2 |
| 1-1437581-4      | ASE42      | 4PDT | Silver  | .700/17.8 |
| 1-1437581-6      | ASE42G     | 4PDT | Gold    | .700/17.8 |
| 2-1437581-5      | ASE43      | 4P3T | Silver  | 1.10/27.9 |
| 2-1437581-6      | ASE43G     | 4P3T | Gold    | 1.10/27.9 |
| 3-1437581-1      | ASE62      | 6PDT | Silver  | 1.00/25.4 |
| 3-1437581-3      | ASE62G     | 6PDT | Gold    | 1.00/25.4 |

EXTENDED SIDE ACTUATOR



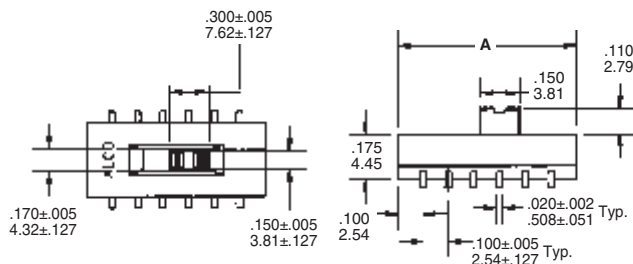
\*.105 (2.67) ASE22R, ASE22RG

NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.



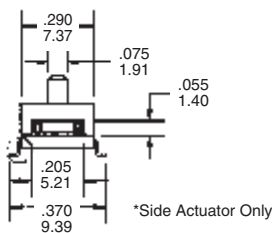
Right Angle, Through Hole, Extended Actuator

| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| 1437581-8        | ASE22R     | DPDT | Silver  | .400/10.2 |
| 1437581-9        | ASE22RG    | DPDT | Gold    | .400/10.2 |
| 1-1437581-9      | ASE42R     | 4PDT | Silver  | .700/17.8 |
| 2-1437581-0      | ASE42RG    | 4PDT | Gold    | .700/17.8 |
| 2-1437581-9      | ASE43R     | 4P3T | Silver  | 1.10/27.9 |
| 3-1437581-0      | ASE43RG    | 4P3T | Gold    | 1.10/27.9 |
| 3-1437581-6      | ASE62R     | 6PDT | Silver  | 1.00/25.4 |
| 3-1437581-7      | ASE62RG    | 6PDT | Gold    | 1.00/25.4 |



L Type Surface Mount

NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.



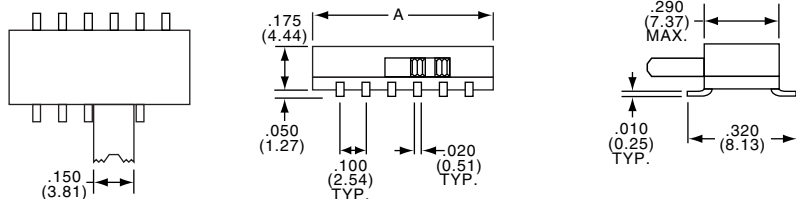
Upright, Surface Mount "L" Type, Extended Actuator

| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| 1437581-5        | ASE22GL    | DPDT | Gold    | .400/10.2 |
| 1437581-7        | ASE22L     | DPDT | Silver  | .400/10.2 |
| 1-1437581-7      | ASE42GL    | 4PDT | Gold    | .700/17.8 |
| 1-1437581-8      | ASE42L     | 4PDT | Silver  | .700/17.8 |
| 2-1437581-7      | ASE43GL    | 4P3T | Gold    | 1.10/27.9 |
| 2-1437581-8      | ASE43L     | 4P3T | Silver  | 1.10/27.9 |
| 3-1437581-4      | ASE62GL    | 6PDT | Gold    | 1.00/25.4 |
| 3-1437581-5      | ASE62L     | 6PDT | Silver  | 1.00/25.4 |

## Slide Switches, Extended Actuator, Through Hole and Surface Mount

**B**

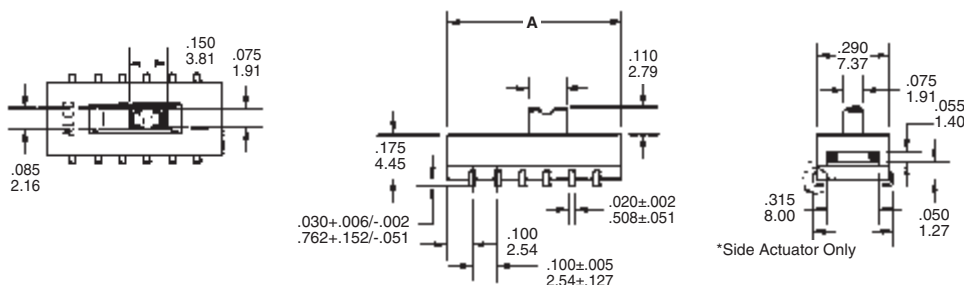
ASE/F Series



NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

Right Angle, Surface Mount "L" Type, Extended Actuator

| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| —                | ASE22RGL   | DPDT | Gold    | .400/10.2 |
| 1-1437581-1      | ASE22RL    | DPDT | Silver  | .400/10.2 |
| 2-1437581-1      | ASE42RGL   | 4PDT | Gold    | .700/17.8 |
| 2-1437581-2      | ASE42RL    | 4PDT | Silver  | .700/17.8 |
| —                | ASE43RGL   | 4P3T | Gold    | 1.10/27.9 |
| —                | ASE43RL    | 4P3T | Silver  | 1.10/27.9 |
| 3-1437581-8      | ASE62RGL   | 6PDT | Gold    | 1.00/25.4 |
| 3-1437581-9      | ASE62RL    | 6PDT | Silver  | 1.00/25.4 |

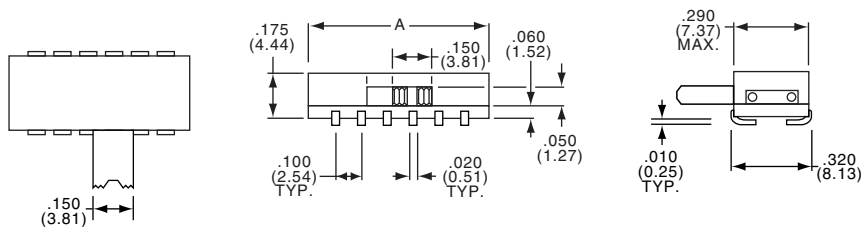


S Type Surface Mount

NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

Upright, Surface Mount "S" Type, Extended Actuator

| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| 1437581-6        | ASE22GS    | DPDT | Gold    | .400/10.2 |
| 1-1437581-3      | ASE22S     | DPDT | Silver  | .400/10.2 |
| —                | ASE42GS    | 4PDT | Gold    | .700/17.8 |
| 2-1437581-4      | ASE42S     | 4PDT | Silver  | .700/17.8 |
| —                | ASE43GS    | 4P3T | Gold    | 1.10/27.9 |
| —                | ASE43S     | 4P3T | Silver  | 1.10/27.9 |
| —                | ASE62GS    | 6PDT | Gold    | 1.00/25.4 |
| —                | ASE62S     | 6PDT | Silver  | 1.00/25.4 |

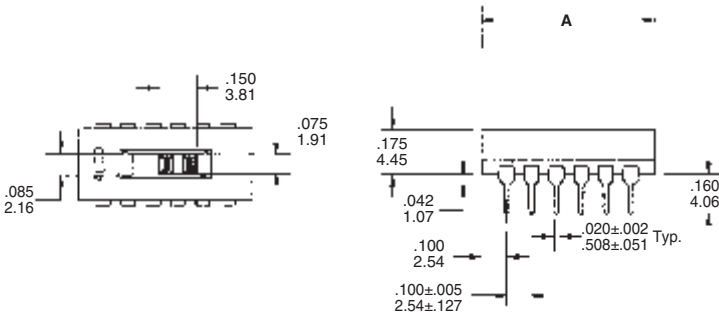


NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

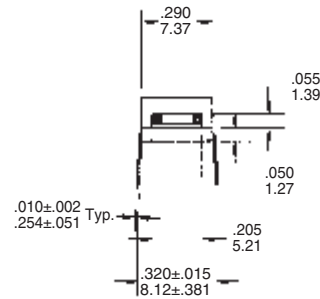
Right Angle, Surface Mount "S" Type, Extended Actuator

| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| 1-1437581-0      | ASE22RGS   | DPDT | Gold    | .400/10.2 |
| 1-1437581-2      | ASE22RS    | DPDT | Silver  | .400/10.2 |
| —                | ASE42RGS   | 4PDT | Gold    | .700/17.8 |
| 2-1437581-3      | ASE42RS    | 4PDT | Silver  | .700/17.8 |
| —                | ASE43RGS   | 4P3T | Gold    | 1.10/27.9 |
| —                | ASE43RS    | 4P3T | Silver  | 1.10/27.9 |
| —                | ASE62RGS   | 6PDT | Gold    | 1.00/25.4 |
| —                | ASE62RS    | 6PDT | Silver  | 1.00/25.4 |

## Slide Switches, Flush Actuator, Through Hole and Surface Mount

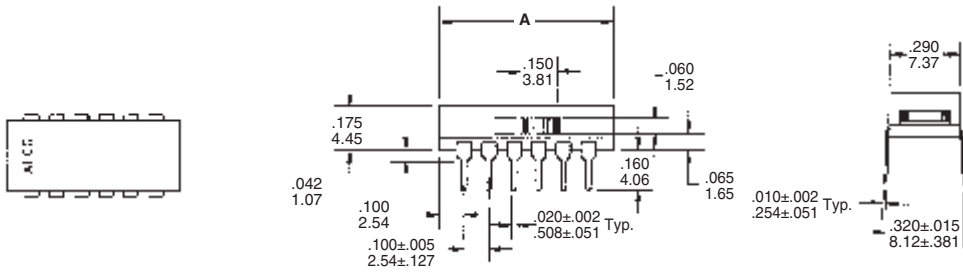


NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.



Upright, Through Hole, Flush Actuator

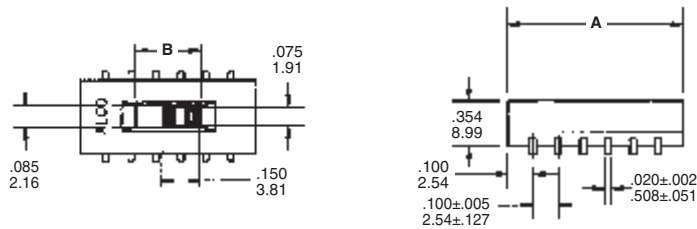
| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| 5-1437581-6      | ASF22      | DPDT | Silver  | .400/10.2 |
| 5-1437581-8      | ASF22G     | DPDT | Gold    | .400/10.2 |
| 6-1437581-8      | ASF42      | 4PDT | Silver  | .700/17.8 |
| 7-1437581-0      | ASF42G     | 4PDT | Gold    | .700/17.8 |
| 7-1437581-8      | ASF43      | 4P3T | Silver  | 1.10/27.9 |
| 7-1437581-9      | ASF43G     | 4P3T | Gold    | 1.10/27.9 |
| 8-1437581-4      | ASF62      | 6PDT | Silver  | 1.00/25.4 |
| 8-1437581-6      | ASF62G     | 6PDT | Gold    | 1.00/25.4 |



NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

Right Angle, Through Hole, Flush Actuator

| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| 6-1437581-2      | ASF22R     | DPDT | Silver  | .400/10.2 |
| 6-1437581-3      | ASF22RG    | DPDT | Gold    | .400/10.2 |
| 7-1437581-3      | ASF42R     | 4PDT | Silver  | .700/17.8 |
| 7-1437581-4      | ASF42RG    | 4PDT | Gold    | .700/17.8 |
|                  | ASF43R     | 4P3T | Silver  | 1.10/27.9 |
| 8-1437581-2      | ASF43RG    | 4P3T | Gold    | 1.10/27.9 |
| 8-1437581-9      | ASF62R     | 6PDT | Silver  | 1.00/25.4 |
| 9-1437581-1      | ASF62RG    | 6PDT | Gold    | 1.00/25.4 |



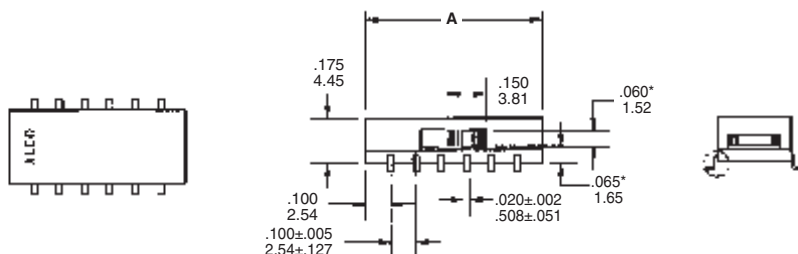
L Type Surface Mount

NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

Upright, Surface Mount "L" Type, Flush Actuator

| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| 5-1437581-9      | ASF22GL    | DPDT | Gold    | .400/10.2 |
| 6-1437581-1      | ASF22L     | DPDT | Silver  | .400/10.2 |
| 7-1437581-1      | ASF42GL    | 4PDT | Gold    | .700/17.8 |
| 7-1437581-2      | ASF42L     | 4PDT | Silver  | .700/17.8 |
| 8-1437581-0      | ASF43GL    | 4P3T | Gold    | 1.10/27.9 |
| 8-1437581-1      | ASF43L     | 4P3T | Silver  | 1.10/27.9 |
| 8-1437581-7      | ASF62GL    | 6PDT | Gold    | 1.00/25.4 |
| 8-1437581-8      | ASF62L     | 6PDT | Silver  | 1.00/25.4 |

## Slide Switches, Flush Actuator, Through Hole and Surface Mount

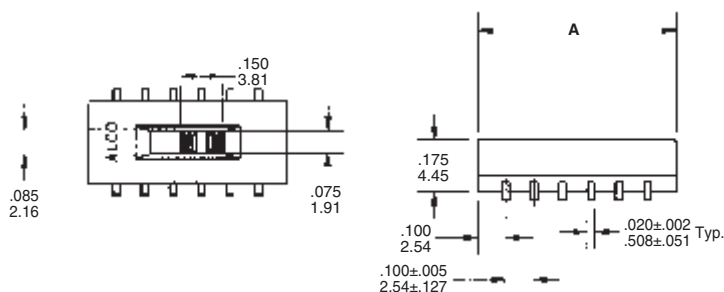


**L Type Surface Mount**

NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

**Right Angle, Surface Mount "L" Type, Flush Actuator**

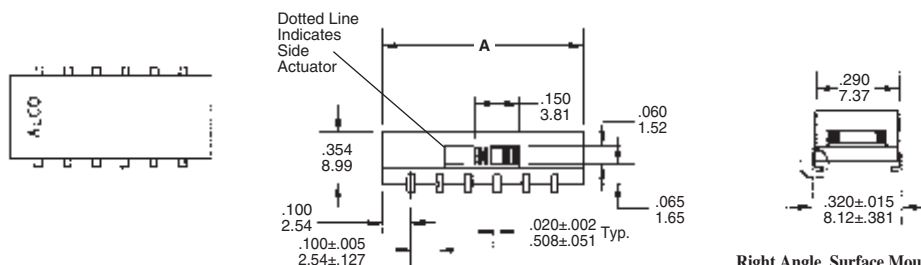
| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| 6-1437581-4      | ASF22RGL   | DPDT | Gold    | .400/10.2 |
| —                | ASF22RL    | DPDT | Silver  | .400/10.2 |
| 7-1437581-5      | ASF42RGL   | 4PDT | Gold    | .700/17.8 |
| 7-1437581-6      | ASF42RL    | 4PDT | Silver  | .700/17.8 |
| —                | ASF43RGL   | 4P3T | Gold    | 1.10/27.9 |
| —                | ASF43RL    | 4P3T | Silver  | 1.10/27.9 |
| 9-1437581-2      | ASF62RGL   | 6PDT | Gold    | 1.00/25.4 |
| —                | ASF62RL    | 6PDT | Silver  | 1.00/25.4 |



NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

**Upright, Surface Mount "S" Type, Flush Actuator**

| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| 6-1437581-0      | ASF22GS    | DPDT | Gold    | .400/10.2 |
| 6-1437581-7      | ASF22S     | DPDT | Silver  | .400/10.2 |
| —                | ASF42GS    | 4PDT | Gold    | .700/17.8 |
| 7-1437581-7      | ASF42S     | 4PDT | Silver  | .700/17.8 |
| —                | ASF43GS    | 4P3T | Gold    | 1.10/27.9 |
| 8-1437581-3      | ASF43S     | 4P3T | Silver  | 1.10/27.9 |
| —                | ASF62GS    | 6PDT | Gold    | 1.00/25.4 |
| 9-1437581-4      | ASF62S     | 6PDT | Silver  | 1.00/25.4 |



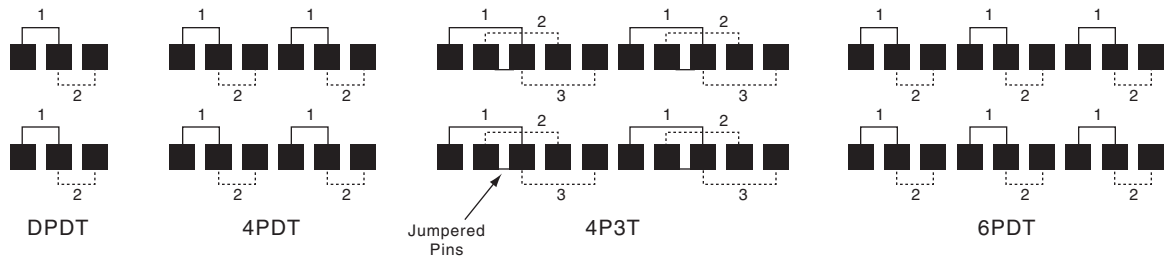
NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

**Right Angle, Surface Mount "S" Type, Flush Actuator**

| Tyco Electronics | Alcoswitch | Type | Contact | Dim A     |
|------------------|------------|------|---------|-----------|
| 6-1437581-5      | ASF22RGS   | DPDT | Gold    | .400/10.2 |
| 6-1437581-6      | ASF22RS    | DPDT | Silver  | .400/10.2 |
| —                | ASF42RGS   | 4PDT | Gold    | .700/17.8 |
| —                | ASF42RS    | 4PDT | Silver  | .700/17.8 |
| —                | ASF43RGS   | 4P3T | Gold    | 1.10/27.9 |
| —                | ASF43RS    | 4P3T | Silver  | 1.10/27.9 |
| 9-1437581-3      | ASF62RGS   | 6PDT | Gold    | 1.00/25.4 |
| —                | ASF62RS    | 6PDT | Silver  | 1.00/25.4 |

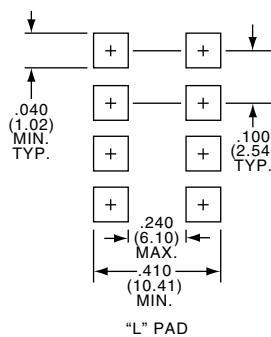
## Slide Switches, Auto-insertable, Through Hole and Surface Mount

### CIRCUIT DIAGRAMS

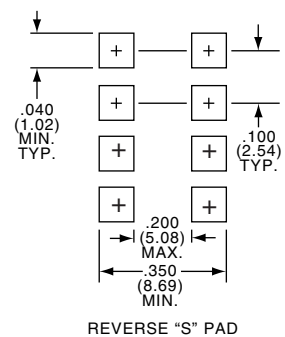


NOTE: For SPDT requirements order DPDT version and use either set of contacts for SPDT switching.

### PC LAYOUT



### PAD LAYOUT

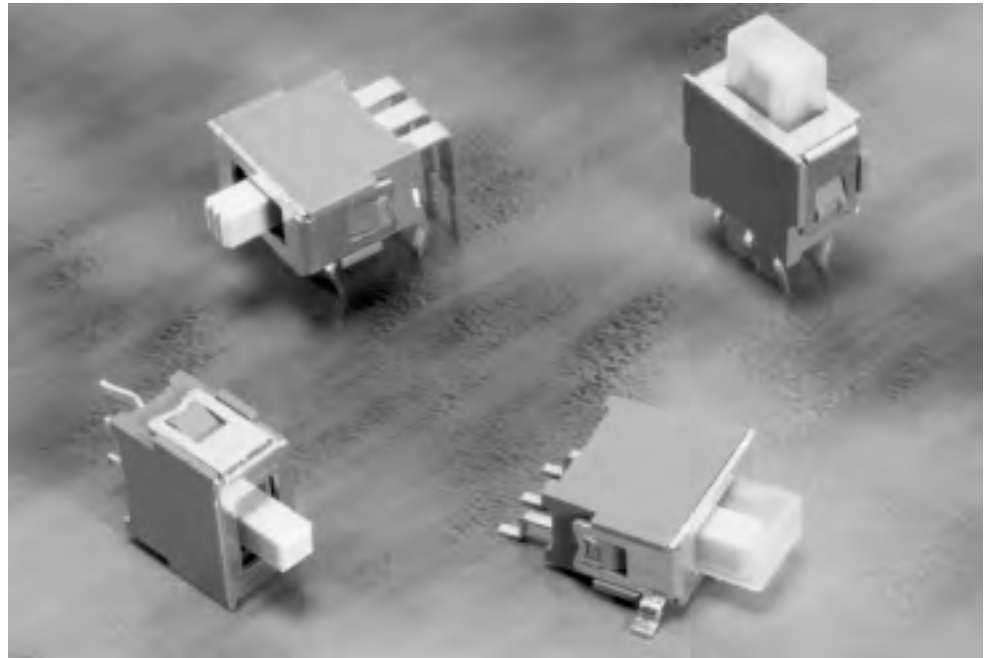




**S Series Unsealed, SE Series Sealed, Through-Hole and Surface Mount**

**Product Facts**

- ▢ Sealed or Unsealed
- ▢ Straight or Right-Angle
- ▢ Through-hole or Surface-mount
- ▢ Bulk or Tape-and-Reel packaged
- ▢ Compact size
- ▢ Double-pole function in a single-pole body
- ▢ PC retention feature
- ▢ High reliability contact system
- ▢ Epoxy sealed base
- ▢ Robust actuator for easy actuation
- ▢ Non-shorting (break-before-make)



**Switch, Slide, Surface Mount - SE1 SMT (Shown w/Boot)**

**Electrical Characteristics**

**Contact rating:** .4 VA @ 20 VDC Max.

50mA 48V AC/DC

Min. 1 micro A 20 mV AC/DC

**Initial Contact Resistance:** less than 50 milliohms

**Final Contact Resistance:** 100 milliohms max.

**Insulation Resistance:** 500 Megaohms @ 250 VDC

**Dielectric Strength:** 500 VAC between terminals and ground

**Mechanical**

**Mechanical Life:** Up to 10,000 cycles @ max. load

**Actuation Force:** 70 to 500 grams

**Materials and Finish**

**Terminals:** Tin-lead over nickel-plated phosphor bronze

**Contacts:** Gold over nickel plated phosphor bronze

**Frame:** Tin over nickel plated brass

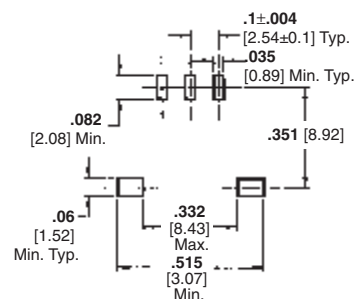
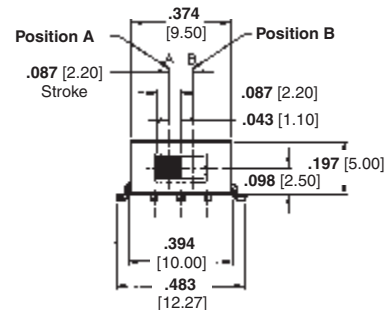
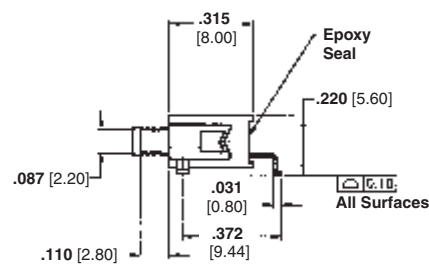
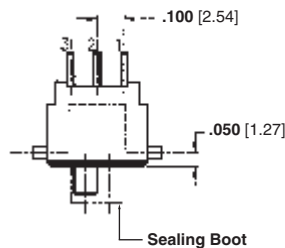
**Case, Actuator, Plunger, Terminal**

**Board:** UL 94V-0 glass-filled Polyamide

**Actuator Boot:** Silicon Rubber

**Standards & Specs**

Sealed switch per IP 67



**Recommended P.C.B. Pad Layout**

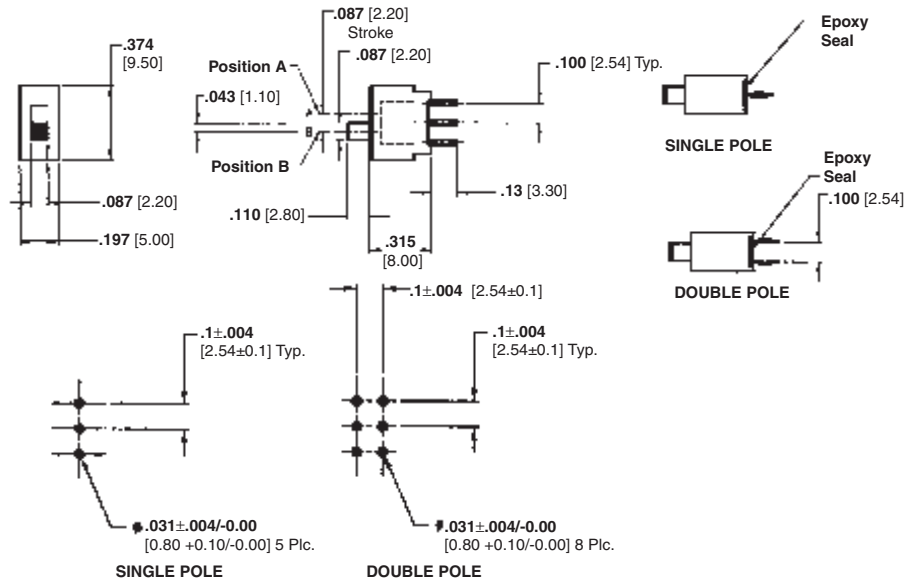
**SMT-Sealed Part Numbers**

| Tyco Electronics | Alcoswitch | Function   |
|------------------|------------|------------|
| 1571004-1        | SE1GSMST   | On-Off     |
| 1571004-2        | SE1EGSMST  | On-Off-On  |
| 1571004-3        | SE1DGSMST  | On-None-On |

**Tape & Reel Package**

| Tyco Electronics | Alcoswitch  | Function   |
|------------------|-------------|------------|
| 1571004-4        | SE1GSMTTTR  | On-Off     |
| 1571004-5        | SE1EGSMTTTR | On-Off-On  |
| 1571004-6        | SE1DGSMTTTR | On-None-On |

**Switch, Slide, PC Tail, S/SE GPC (Shown w/o Boot)**



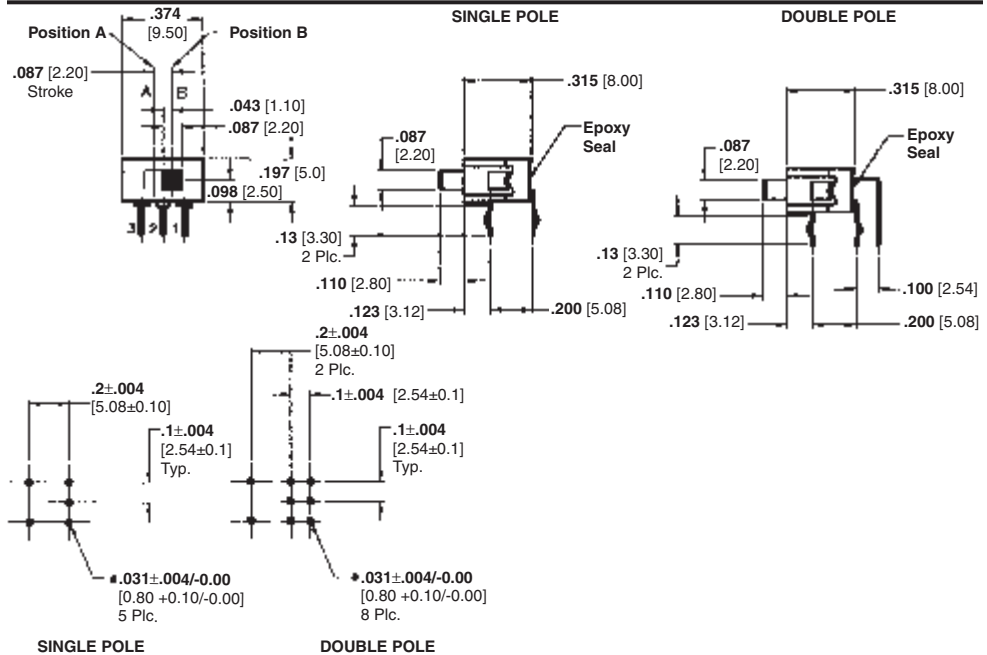
**Sealed Part Numbers w/Boot**

| Tyco Electronics | Alcoswitch | Function   |
|------------------|------------|------------|
| 1437574-9        | SE1DGPC    | On-None-On |
| 1-1437574-4      | SE1EGPC    | On-Off-On  |
| 1-1437574-6      | SE2DGPC    | On-None-On |
| 2-1437574-0      | SE2EGPC    | On-Off-On  |

**Unsealed Part Numbers w/o Boot**

| Tyco Electronics | Alcoswitch | Function   |
|------------------|------------|------------|
| 1571005-1        | S1DGPC     | On-None-On |
| 1571005-2        | S1EGPC     | On-Off-On  |
| 1571005-3        | S2DGPC     | On-None-On |
| 1571005-4        | S2EGPC     | On-Off-On  |

**Switch, Slide, Right Angle, S/SE GRA (Shown w/o Boot)**



**Sealed Part Numbers w/Boot**

| Tyco Electronics | Alcoswitch | Function   |
|------------------|------------|------------|
| 1-1437574-1      | SE1DGRA    | On-None-On |
| 1-1437574-5      | SE1EGRA    | On-Off-On  |
| 1-1437574-8      | SE2DGRA    | On-None-On |
| 2-1437574-1      | SE2EGRA    | On-Off-On  |

**Unsealed Part Numbers w/o Boot**

| Tyco Electronics | Alcoswitch | Function   |
|------------------|------------|------------|
| 1571006-1        | S1DGRA     | On-None-On |
| 1571006-2        | S1EGRA     | On-Off-On  |
| 1571006-3        | S2DGRA     | On-None-On |
| 1571006-4        | S2EGRA     | On-Off-On  |

## Slide Switches, Miniature, Low Profile, Economy Grade

### MATERIAL SPECIFICATIONS:

Contacts .....Silver clad copper alloy  
Case Material .....Steel zinc plated  
Actuator Material .....Polyester (UL 94HB)  
Terminal Seal .....Epoxy  
Terminals/Fixed Contacts .....Silver plate copper alloy

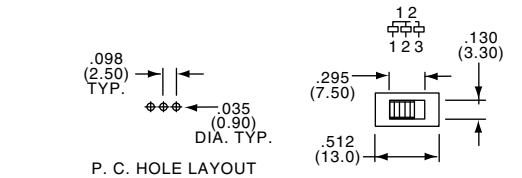
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-5°F to 140°F (-15°C to +60°C)  
Storage Temperature.....-4°F to +158°F (-20°C to +70°C)  
Solder Heat Resistance .....MIL-STD-202, Method 210

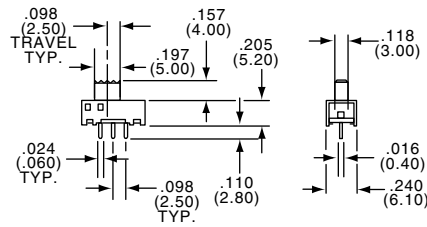
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....300 mA @ 125 VAC  
Initial Contact Resistance .....20 Milliohms max.  
Contact Timing .....Make-before-break  
Insulation Resistance .....100 Megohms min. @ 500 VDC  
Dielectric Strength .....500 VAC  
Actuation Force .....250 Grams, +150 Grams, -100 Grams  
Actuator Travel.....0.098" (2.49)  
Life Expectancy .....Up to 10,000 Cycles

**NOTICE: Bifurcated contact produces double wiping, self-cleaning contacts.**



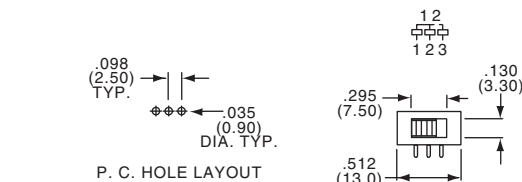
| Part Number      |            |         |                |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
| 5-1437577-8      | STS121PC   | Silver  | Upright        |



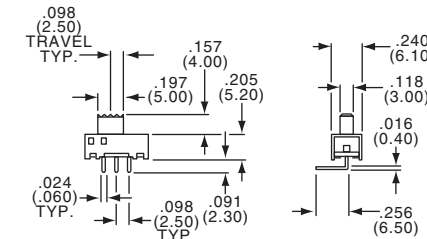
SPDT



STS121PC



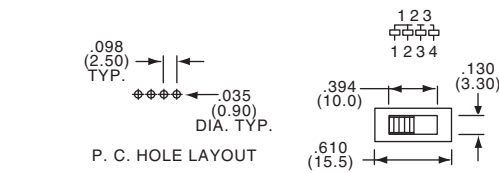
| Part Number      |            |         |                |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
| 5-1437577-9      | STS121IRA  | Silver  | Right Angle    |



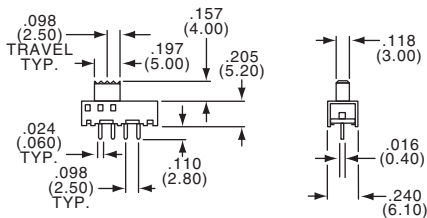
SPDT



STS121IRA



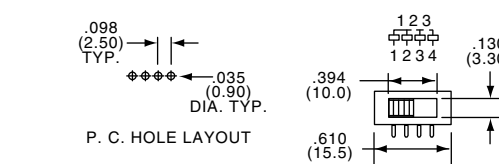
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|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
| 6-1437577-2      | STS131PC   | Silver  | Upright        |



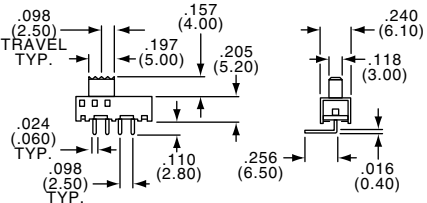
SP3T



STS131PC



| Part Number      |            |         |                |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
| 6-1437577-3      | STS131IRA  | Silver  | Right Angle    |



SP3T



STS131IRA

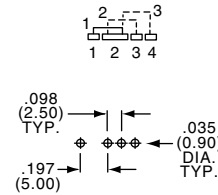
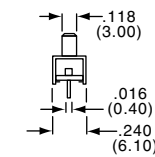
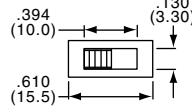
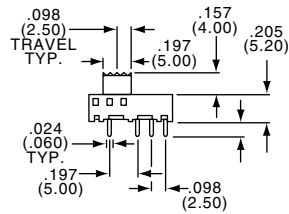
**Slide Switches, Miniature, Low Profile, Economy Grade**

SEE PAGE B13 FOR PRODUCT SPECIFICATIONS

**SP3T**



STS1300PC

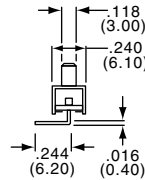
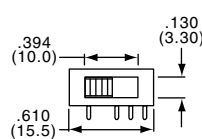


P. C. HOLE LAYOUT

**SP3T**



STS1300RA

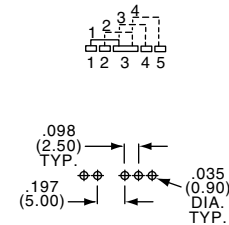
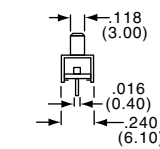
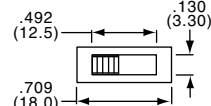
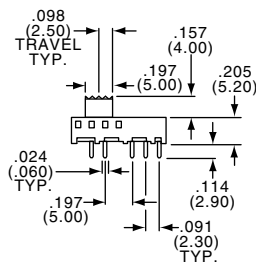


| Part Number      |            | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch |         |                |
| 6-1437577-0      | STS1300PC  | Silver  | Upright        |
| 6-1437577-1      | STS1300RA  | Silver  | Right Angle    |

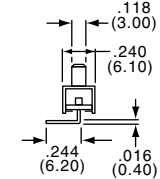
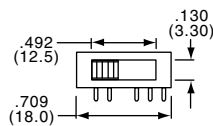
**SP4T**



STS1400PC



P. C. HOLE LAYOUT

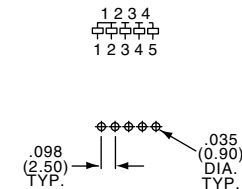
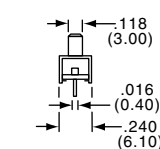
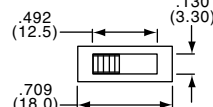
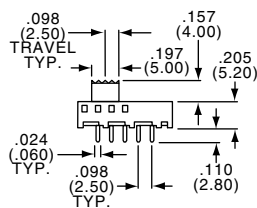


| Part Number      |            | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch |         |                |
| 6-1437577-5      | STS1400PC  | Silver  | Upright        |
| 6-1437577-6      | STS1400RA  | Silver  | Right Angle    |

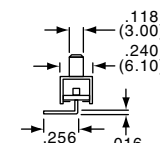
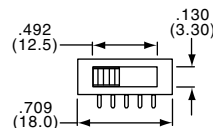
**SP4T**



STS141RA



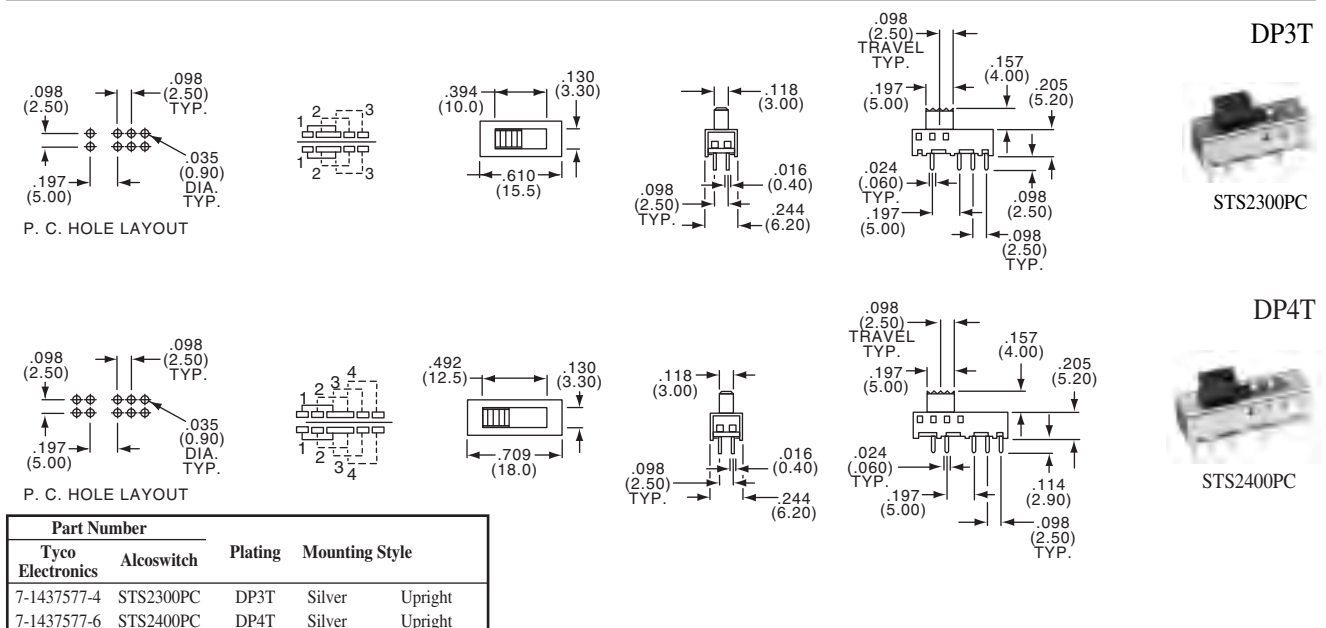
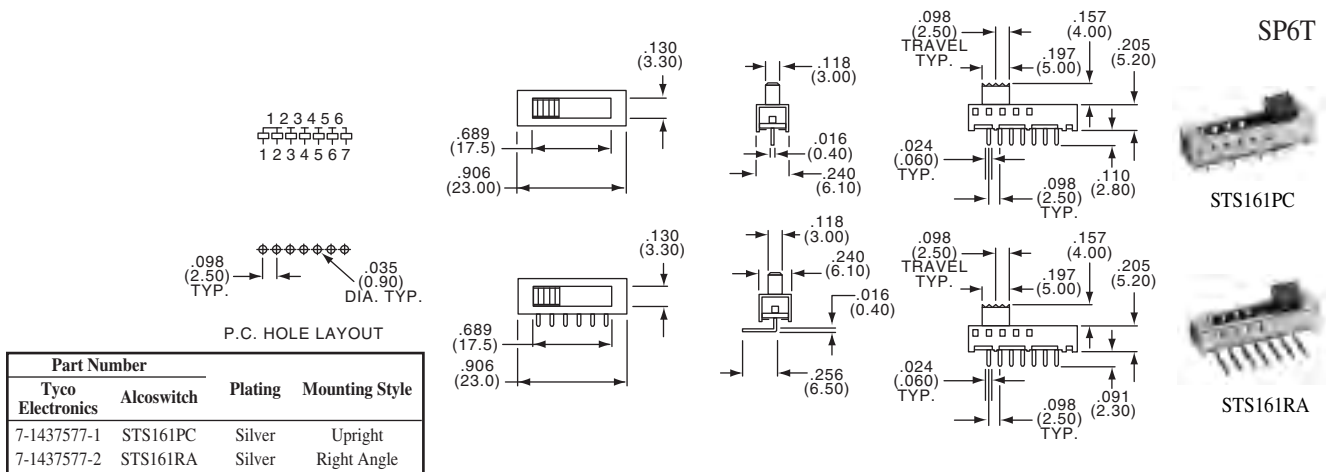
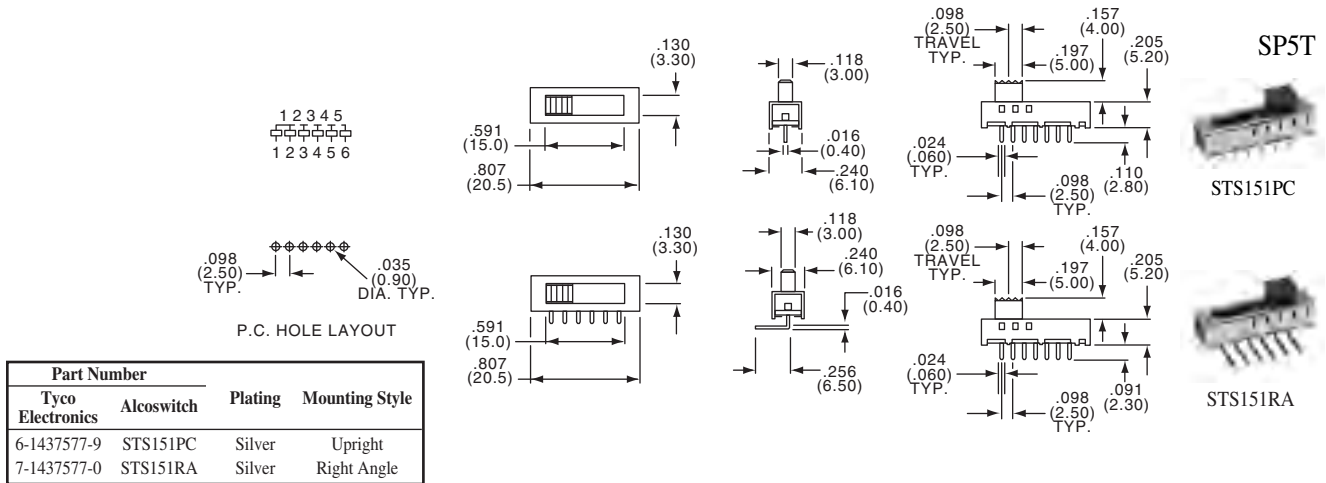
P. C. HOLE LAYOUT



| Part Number      |            | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch |         |                |
| 6-1437577-7      | STS141PC   | Silver  | Upright        |
| 6-1437577-8      | STS141RA   | Silver  | Right Angle    |

**Slide Switches, Miniature, Low Profile, Economy Grade**

SEE PAGE B13 FOR PRODUCT SPECIFICATIONS



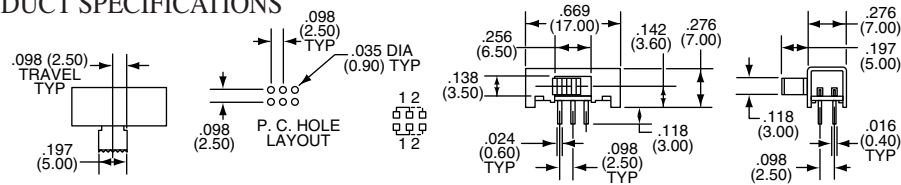
**Slide Switches, Miniature, Low Profile, Economy Grade**

SEE PAGE B13 FOR PRODUCT SPECIFICATIONS

DPDT



STSA220RA

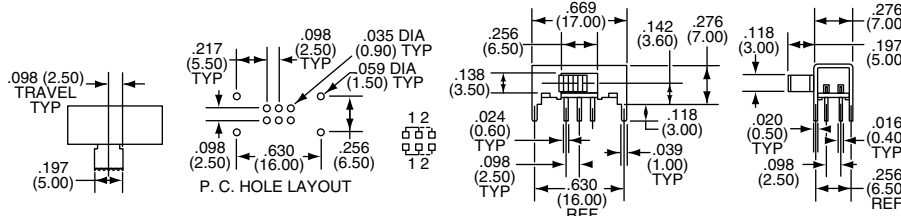


| Part Number      |            |         |                |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
| 8-1437577-0      | STSA220RA  | Silver  | Right Angle    |

DPDT



STSA220RA1

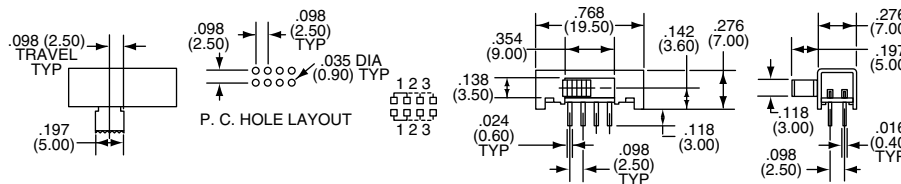


| Part Number      |            |         |                |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
| 8-1437577-1      | STSA220RA1 | Silver  | Right Angle    |

DP3T



STSA230RA

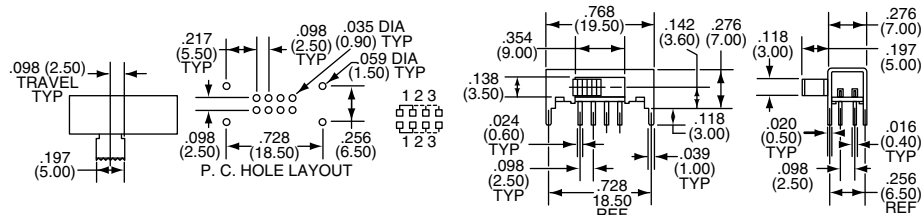


| Part Number      |            |         |                |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
| 8-1437577-2      | STSA230RA  | Silver  | Right Angle    |

DP3T



STSA230RA1

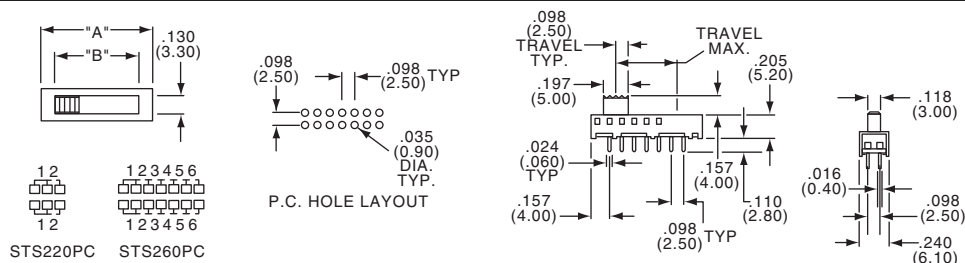


| Part Number      |            |         |                |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
| 8-1437577-3      | STSA230RA1 | Silver  | Right Angle    |

DP6T/DP5T/DP4T/  
DP3T/DP2T



STS220PC



| Part Number      |            |      |            |            |             |           | Part Number      |            |      |            |            |             |           |
|------------------|------------|------|------------|------------|-------------|-----------|------------------|------------|------|------------|------------|-------------|-----------|
| Tyco Electronics | Alcoswitch | Type | Dim.A      | Dim.B      | Travel Max. | Pin Holes | Tyco Electronics | Alcoswitch | Type | Dim.A      | Dim.B      | Travel Max. | Pin Holes |
| 7-1437577-3      | STS220PC   | DP2T | .512(13.0) | .295(7.50) | .098(2.50)  | 6         | 7-1437577-8      | STS250PC   | DP5T | .807(20.5) | .591(15.0) | .394(10.0)  | 12        |
| 7-1437577-5      | STS230PC   | DP3T | .610(15.5) | .394(10.0) | .197(5.00)  | 8         | 7-1437577-9      | STS260PC   | DP6T | .906(23.0) | .689(17.5) | .492(12.5)  | 14        |
| 7-1437577-7      | STS240PC   | DP4T | .709(18.0) | .492(12.5) | .295(7.50)  | 10        |                  |            |      |            |            |             |           |



## Slide Switches, Instrument Grade, Decorative

### MATERIAL SPECIFICATIONS:

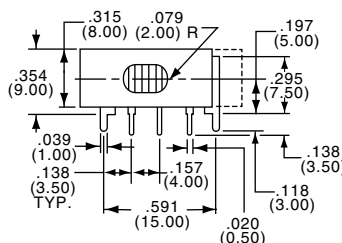
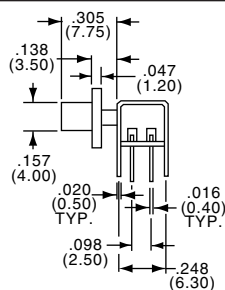
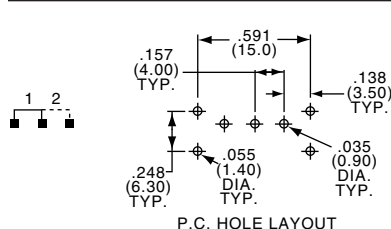
Contacts .....Silver clad copper alloy  
Case Material .....Steel, tin plated  
Actuator Material .....Polycarbonate  
Terminals/Fixed Contacts .....Silver over nickel  
Terminal Seal .....Epoxy

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-14°F to +140°F (-10°C to +60°C)  
Storage Temperature.....-14°F to +140°F (-10°C to +60°C)  
Solder Heat Resistance.....MIL-STD-202, Method 210

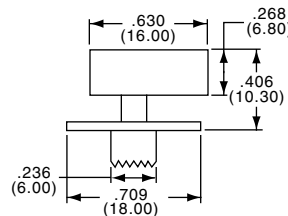
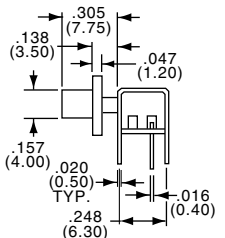
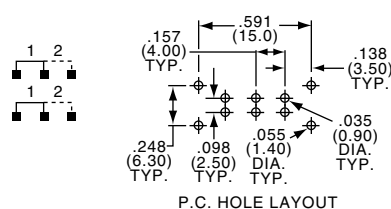
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....300 mA @ 125 VAC  
Initial Contact Resistance .....20 Milliohms max.  
Insulation Resistance .....1,000 Megohms min. @ 500 VDC  
Dielectric Strength .....500 VAC  
Actuation Force .....0.250 Grams, +200/-150  
Plunger/Actuator Travel .....0.079" (2.01)  
Life Expectancy .....Up to 10,000 Cycles

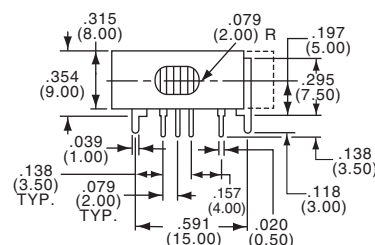
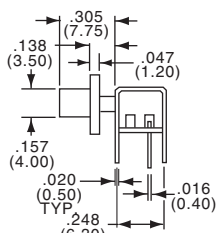
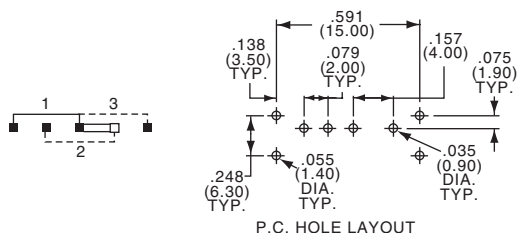


SPDT/DPDT

SDS2240RA0

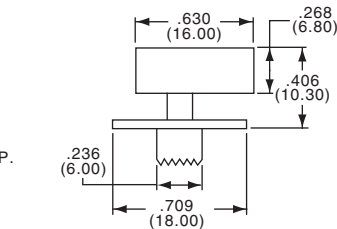
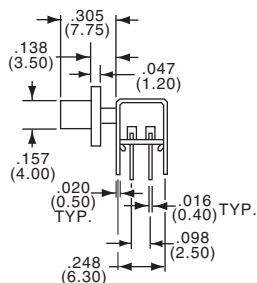
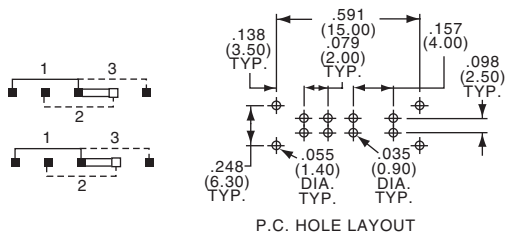


| Part Number      |            |      |                                                                                     |                                                                                     |                                                                                     |                | Part Number      |            |      |                                                                                       |                                                                                       |                                                                                       |                |
|------------------|------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------|------------------|------------|------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------|
| Tyco Electronics | Alcoswitch | Type |  |  |  | Actuator Color | Tyco Electronics | Alcoswitch | Type |  |  |  | Actuator Color |
| 1437577-2        | SDS1240RA0 | SPDT | On                                                                                  | None                                                                                | On                                                                                  | Black          | 1437577-6        | SDS2240RA0 | DPDT | On                                                                                    | None                                                                                  | On                                                                                    | Black          |
| 1437577-3        | SDS1240RA8 | SPDT | On                                                                                  | None                                                                                | On                                                                                  | Gray           | —                | SDS2240RA8 | DPDT | On                                                                                    | None                                                                                  | On                                                                                    | Gray           |



SP3T/DP3T

SDS1340RA8



| Part Number      |            |      |                                                                                     |                                                                                     |                                                                                     |                | Part Number      |            |      |                                                                                       |                                                                                       |                                                                                       |                |
|------------------|------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------|------------------|------------|------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------|
| Tyco Electronics | Alcoswitch | Type |  |  |  | Actuator Color | Tyco Electronics | Alcoswitch | Type |  |  |  | Actuator Color |
| 1437577-4        | SDS1340RA0 | SP3T | On                                                                                  | On                                                                                  | On                                                                                  | Black          | 1437577-7        | SDS2340RA0 | DP3T | On                                                                                    | On                                                                                    | On                                                                                    | Black          |
| 1437577-5        | SDS1340RA8 | SP3T | On                                                                                  | On                                                                                  | On                                                                                  | Gray           | —                | SDS2340RA8 | DP3T | On                                                                                    | On                                                                                    | On                                                                                    | Gray           |

## Slide Switches, Vertical, Single or Dual Actuator

### MATERIAL SPECIFICATIONS:

Contacts .....Copper w/gold plate over nickel  
Case Material .....High temperature polyester (94-VO)  
Actuator Material .....Polyester (94-VO)  
Terminals .....Copper alloy tin/lead/nickel or gold/nickel  
Terminal Seal .....Epoxy standard: single pole, optional: double pole

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature .....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature .....-4°F to +176°F (-20°C to +80°C)

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....Gold: 0.4 VA max. @ 20 VDC or peak AC  
Initial Contact Resistance .....20 Milliohms max.  
Contact Timing .....Non-shorting  
Insulation Resistance .....1,000 Megohms min. @ 500 VDC  
Dielectric Strength .....1,000 Volts RMS @ sea level  
Plunger/Actuator Travel .....0.120" (3.05)  
Life Expectancy .....Up to 60,000-80,000 Cycles

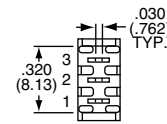
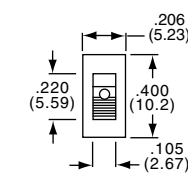
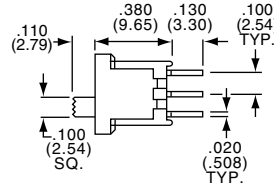
### SPST/SPDT



TSS11DGPC



TSS11DG1PC



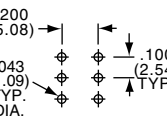
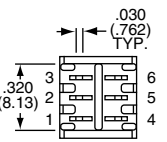
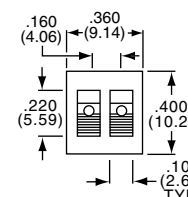
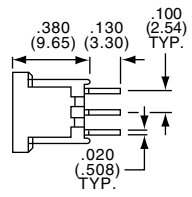
### SPST/SPDT (DUAL)



TSD21AAGPC



TSD21DDG1PC



| Extended Actuator<br>Tyco Electronics | Alcoswitch | Type | Act. Code<br>P. M6 | On | None | Off | Extended Dual Actuator<br>Tyco Electronics | Alcoswitch  | Type     | Act. Code<br>P. M6 | On | None | Off |
|---------------------------------------|------------|------|--------------------|----|------|-----|--------------------------------------------|-------------|----------|--------------------|----|------|-----|
| 1437578-3                             | TSS11AGPC  | SPST | A                  | On | None | Off | —                                          | TSD21AAGPC  | 2 x SPST | A                  | On | None | Off |
| 1-1437589-0                           | TSS11DGPC  | SPDT | D                  | On | None | On  | 1437579-5                                  | TSD21DDGPC  | 2 x SPDT | D                  | On | None | On  |
| 1-1437579-4                           | TSS11EGPC  | SPDT | E                  | On | Off  | On  | <b>Flush Dual Actuator</b>                 |             |          |                    |    |      |     |
| <b>Flush Actuator</b>                 |            |      |                    |    |      |     | —                                          | TSD21DDG1PC | 2 x SPDT | D                  | On | None | On  |
| 1437579-8                             | TSS11AG1PC | SPST | A                  | On | None | Off |                                            |             |          |                    |    |      |     |
| 1-1437579-2                           | TSS11DG1PC | SPDT | D                  | On | None | On  |                                            |             |          |                    |    |      |     |
|                                       | TSS11EG1PC | SPDT | E                  | On | Off  | On  |                                            |             |          |                    |    |      |     |

Note: No center terminals on "A" action switches.

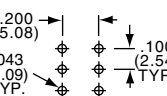
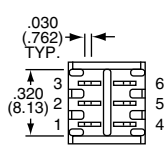
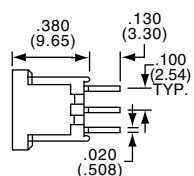
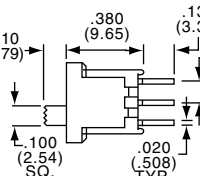
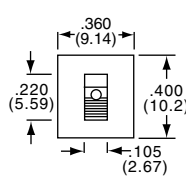
### DPST/DPDT



TSS21NGPC



TSS21PGPC



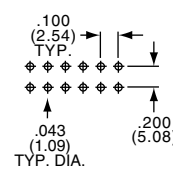
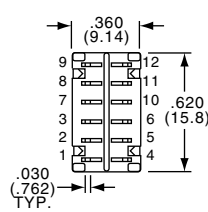
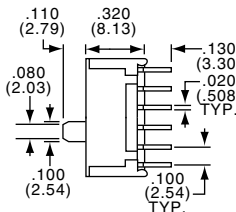
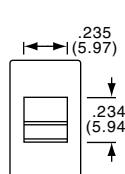
| Extended Actuator<br>Tyco Electronics | Alcoswitch | Type | Act. Code<br>P. M6 | On | None | Off | Flush Actuator<br>Tyco Electronics | Alcoswitch | Type | Act. Code<br>P. M6 | On | None | Off |
|---------------------------------------|------------|------|--------------------|----|------|-----|------------------------------------|------------|------|--------------------|----|------|-----|
| 1-1437579-6                           | TSS21KGPC  | DPST | K                  | On | None | Off | —                                  | TSS21KG1PC | DPST | K                  | On | None | Off |
| 1-1437579-9                           | TSS21NGPC  | DPDT | N                  | On | None | On  | 1-1437579-7                        | TSS21NG1PC | DPDT | N                  | On | None | On  |
| 2-1437579-3                           | TSS21PGPC  | DPDT | P                  | On | Off  | On  | 2-1437579-1                        | TSD21RG1PC | DPDT | P                  | On | Off  | On  |

Note: No center terminals on "K" action switches.

### 4PDT



TSS41NGPC



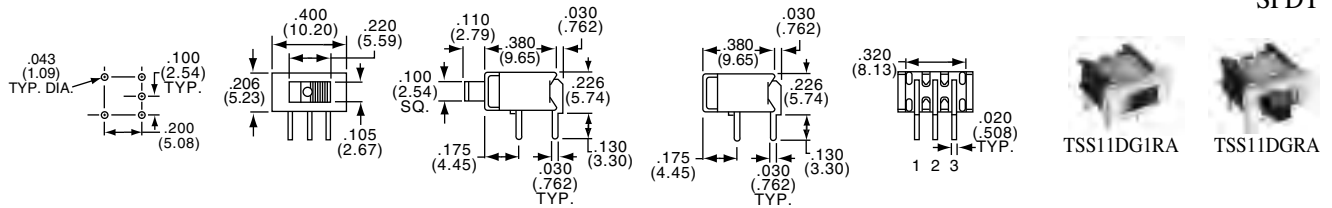
| Extended Actuator<br>Tyco Electronics | Alcoswitch | Type | Act. Code<br>P. M6 | On | None | Off |
|---------------------------------------|------------|------|--------------------|----|------|-----|
| 2-1437579-5                           | TSS41NGPC  | 4PDT | N                  | On | None | On  |



# Slide Switches, Right Angle, Single or Dual Actuator

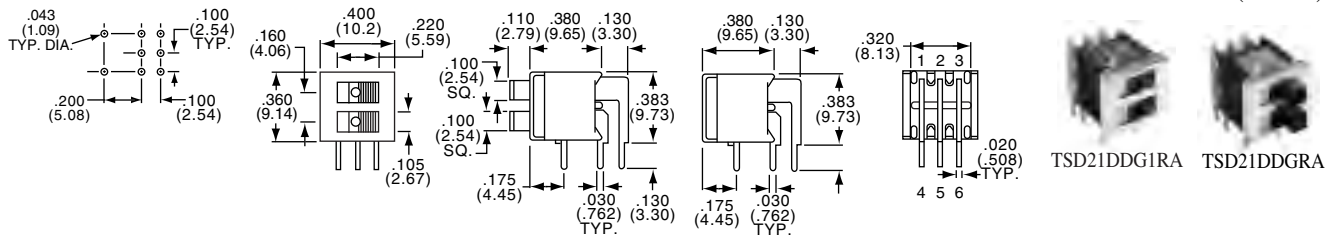
SEE PAGE B18 FOR PRODUCT SPECIFICATIONS

SPDT



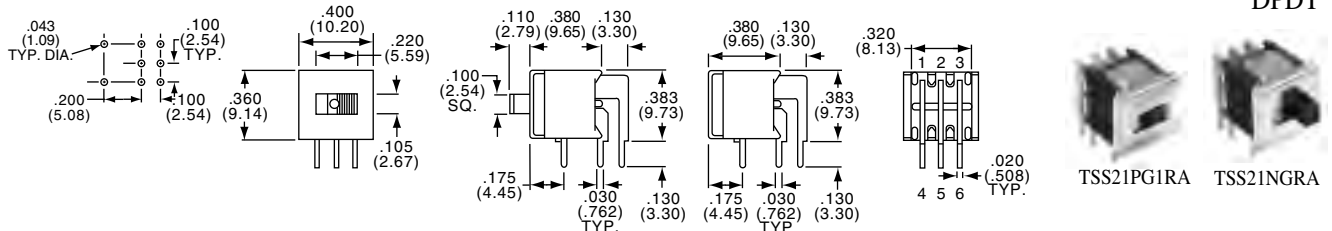
| Extended Actuator<br>Tyco Electronics | Alcoswitch | Type | Act. Code<br>P. M6 |    |      |    | Flush Actuator<br>Tyco Electronics | Alcoswitch | Type | Act. Code<br>P. M6 |    |      |    |
|---------------------------------------|------------|------|--------------------|----|------|----|------------------------------------|------------|------|--------------------|----|------|----|
| 1-1437579-1                           | TSS11DGRA  | SPDT | D                  | On | None | On | 1437579-9                          | TSS11DG1RA | SPDT | D                  | On | None | On |
| 1-1437579-5                           | TSS11EGRA  | SPDT | E                  | On | Off  | On | 1-1437579-3                        | TSS11EG1RA | SPDT | E                  | On | Off  | On |

SPDT (DUAL)



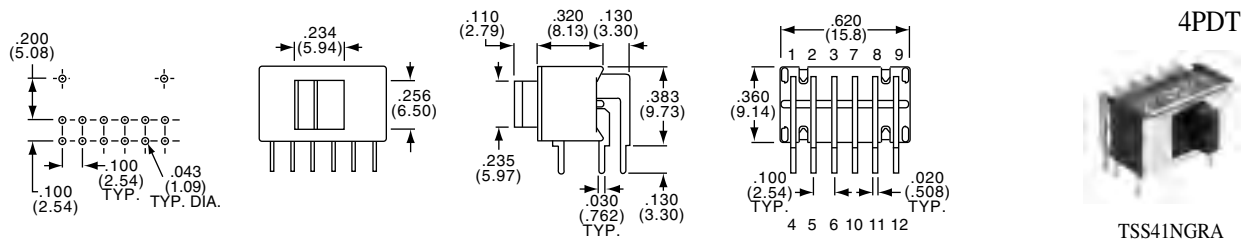
| Extended Actuator<br>Tyco Electronics | Alcoswitch | Type     | Act. Code<br>P. M6 |    |      |    | Flush Actuator<br>Tyco Electronics | Alcoswitch  | Type     | Act. Code<br>P. M6 |    |      |    |
|---------------------------------------|------------|----------|--------------------|----|------|----|------------------------------------|-------------|----------|--------------------|----|------|----|
| 1437579-6                             | TSD21DDGRA | 2 x SPDT | D                  | On | None | On | 1437579-4                          | TSD21DDG1RA | 2 x SPDT | D                  | On | None | On |
| 1437579-7                             | TSD21EEGRA | 2 x SPDT | E                  | On | Off  | On | —                                  | TSD21EEG1RA | 2 x SPDT | E                  | On | Off  | On |

DPDT



| Extended Actuator<br>Tyco Electronics | Alcoswitch | Type | Act. Code<br>P. M6 |    |      |    | Flush Actuator<br>Tyco Electronics | Alcoswitch | Type | Act. Code<br>P. M6 |    |      |    |
|---------------------------------------|------------|------|--------------------|----|------|----|------------------------------------|------------|------|--------------------|----|------|----|
| —                                     | TSS21PAGRA | SP3T | PA                 | On | On   | On | —                                  | TSS21NG1RA | DPDT | N                  | On | None | On |
| 2-1437579-0                           | TSS21NGRA  | DPDT | N                  | On | None | On | —                                  | TSS21PG1RA | DPDT | P                  | On | Off  | On |
| 2-1437579-4                           | TSS21PGRA  | DPDT | P                  | On | Off  | On |                                    |            |      |                    |    |      |    |

4PDT



| Extended Actuator<br>Tyco Electronics | Alcoswitch | Type | Act. Code<br>P. M6 |    |      |    |
|---------------------------------------|------------|------|--------------------|----|------|----|
| 2-1437579-7                           | TSS41NGRA  | 4PDT | N                  | On | None | On |

## Slide Switches, Instrumentation Grade

### MATERIAL SPECIFICATIONS:

Contacts .....Gold or silver over nickel/copper alloy  
 Frame Material .....Tin plated steel  
 Terminals/Fixed Contacts.....Gold or silver over nickel/over copper alloy  
 Terminal Seal .....Epoxy  
 Actuator Material .....POM-UL94HB

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +185°F (-20°C to +85°C)  
 Storage Temperature.....-40°F to +212°F (-40°C to +100°C)  
 Solder Heat Resistance .....See page M3-4

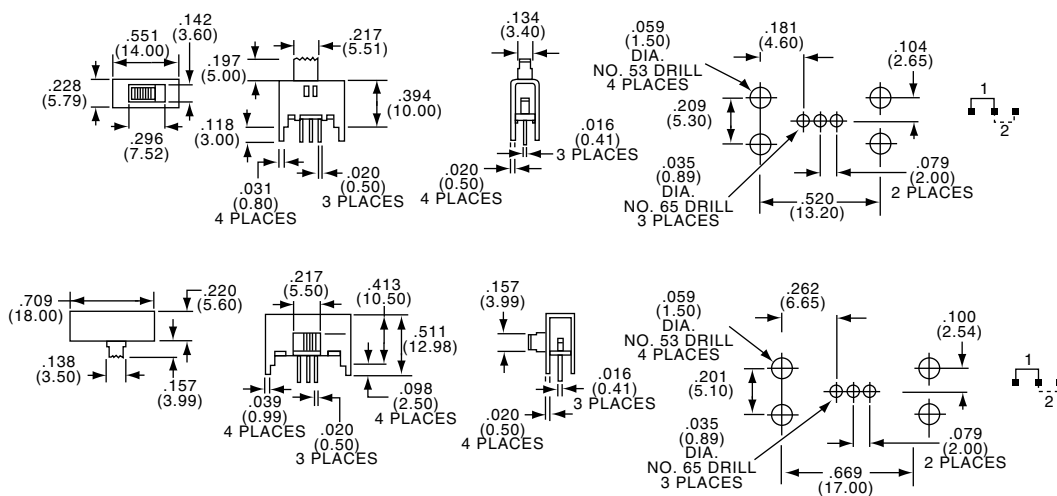
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....Gold: 0.4 VA 20 VDC or peak AC  
 Silver: 300 mA @ 125 VAC  
 Initial Contact Resistance .....20 Milliohms max.  
 Contact Timing .....Make before break  
 Insulation Resistance .....1,000 Megohms min.  
 Dielectric Strength .....500 VAC  
 Actuation Force .....100 to 600 Grams  
 Life Expectancy .....Up to 15,000 Cycles  
 Travel .....0.079" (2.01) (unless otherwise specified)

### SPDT



MSS1200

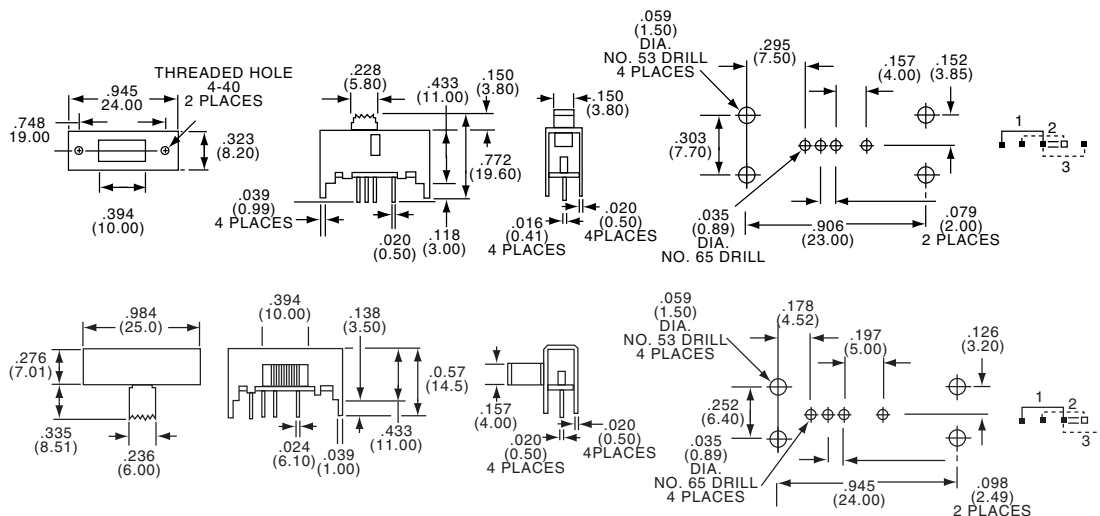


| Tyco Electronics | Alcoswitch | Plating | Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|------------------|------------|---------|
| 5-1437576-0      | MSS1200    | Silver  | 5-1437576-2      | MSS1200R   | Silver  |
| 5-1437576-1      | MSS1200G   | Gold    | 5-1437576-3      | MSS1200RG  | Gold    |

### SP3T



MSS1300

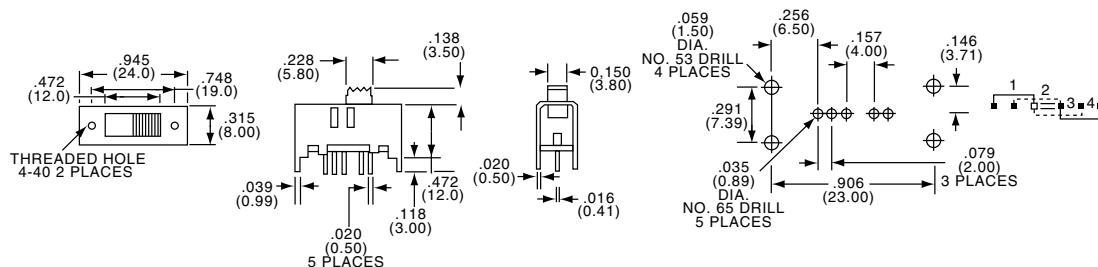


MSS1300R

| Tyco Electronics | Alcoswitch | Plating | Tyco Electronics | Alcoswitch | Plating | Total Actuator Travel |
|------------------|------------|---------|------------------|------------|---------|-----------------------|
| 5-1437576-4      | MSS1300    | Silver  | 5-1437576-6      | MSS1300R   | Silver  | .098(2.50)            |
| 5-1437576-5      | MSS1300G   | Gold    | 5-1437576-7      | MSS1300RG  | Gold    | .098(2.50)            |

## Slide Switches, Instrumentation Grade

SEE PAGE B20 FOR PRODUCT SPECIFICATIONS

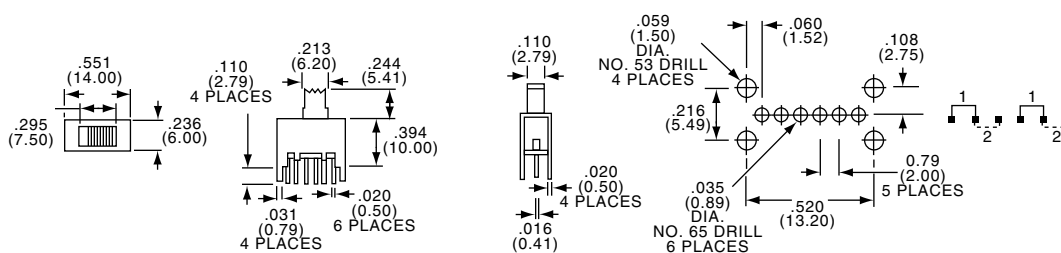


SP4T



MSS1400

| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 5-1437576-8      | MSS1400    | Silver  |
| 1571423-1        | MSS1400G   | Gold    |

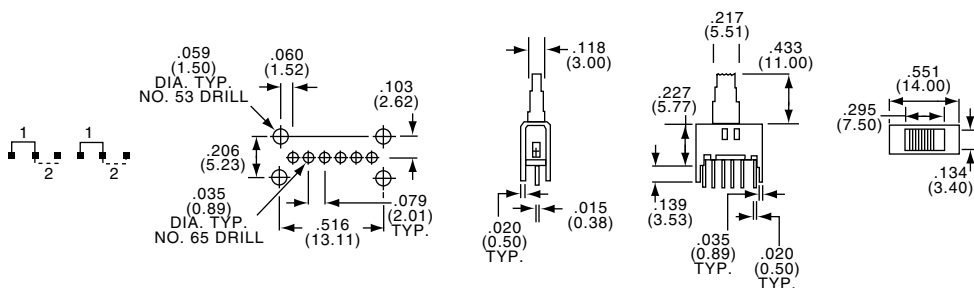


DPDT



MSS2225

| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 6-1437576-3      | MSS2225    | Silver  |
| 6-1437576-4      | MSS2225G   | Gold    |



DPDT



MSS2250

| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 6-1437576-5      | MSS2250    | Silver  |
| 6-1437576-6      | MSS2250G   | Gold    |

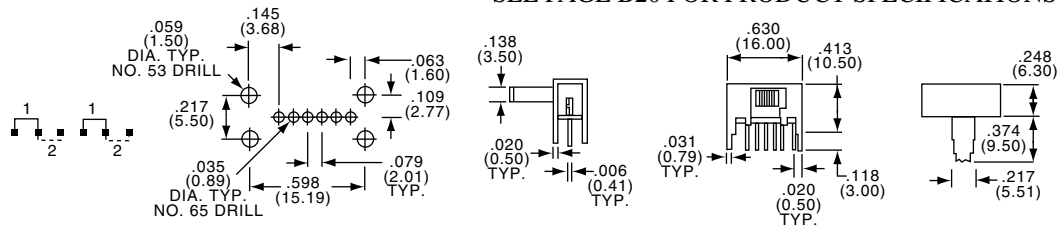
**Slide Switches, Instrumentation Grade**

SEE PAGE B20 FOR PRODUCT SPECIFICATIONS

DPDT



MSS2250R

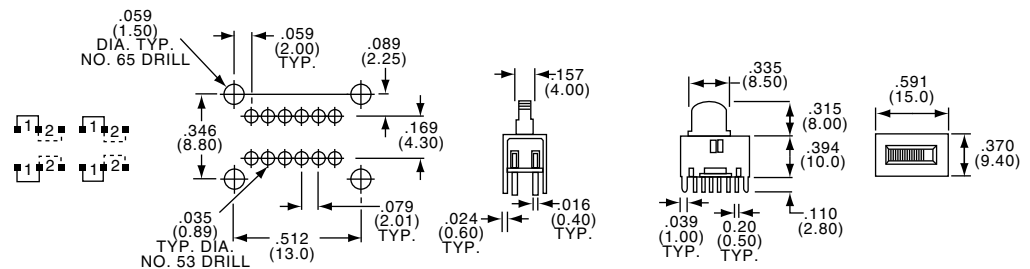


| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 6-1437576-7      | MSS2250R   | Silver  |
| 6-1437576-8      | MSS2250RG  | Gold    |

4PDT



MSS4200

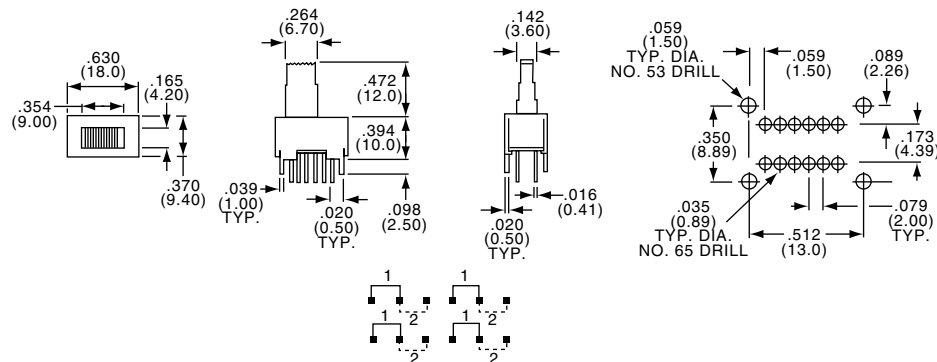


| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 6-1437576-9      | MSS4200    | Silver  |
| 7-1437576-0      | MSS4200G   | Gold    |

4PDT



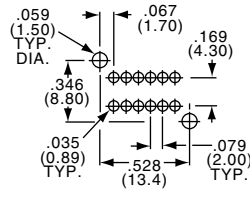
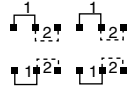
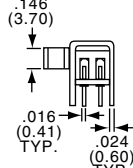
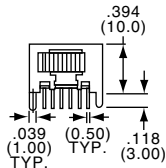
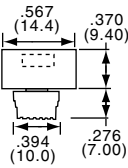
MSS4250



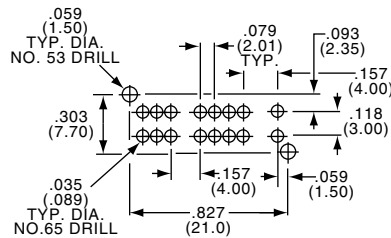
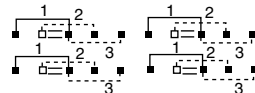
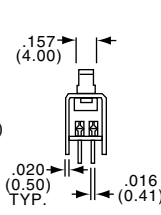
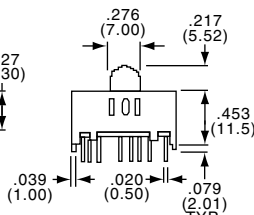
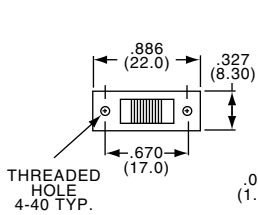
| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 7-1437576-4      | MSS4250    | Silver  |

## Slide Switches, Instrumentation Grade

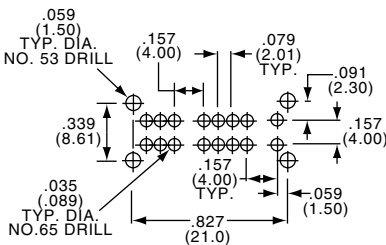
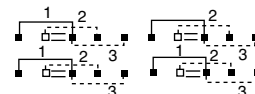
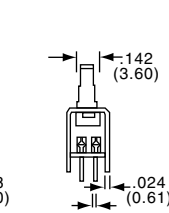
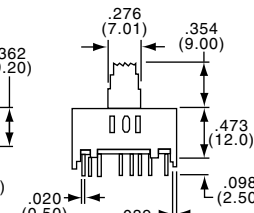
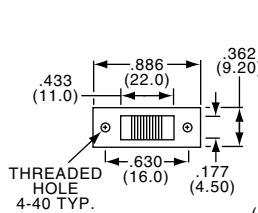
SEE PAGE B20 FOR PRODUCT SPECIFICATIONS



| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 7-1437576-2      | MSS4200R   | Silver  |
| 7-1437576-3      | MSS4200RG  | Gold    |



| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 7-1437576-5      | MSS4300    | Silver  |
| 7-1437576-6      | MSS4300G   | Gold    |



| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 7-1437576-9      | MSS4335    | Silver  |

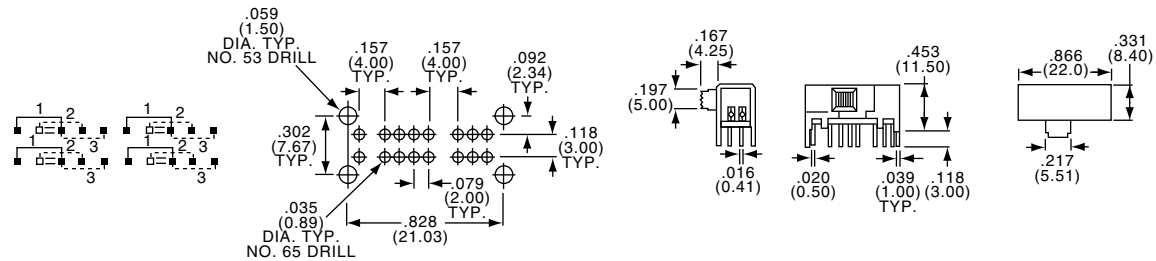
**Slide Switches, Instrumentation Grade**

SEE PAGE B20 FOR PRODUCT SPECIFICATIONS

4P3T



MSS4300R

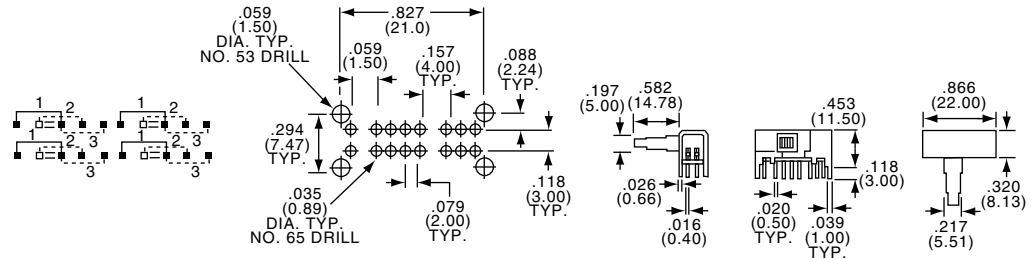


| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 7-1437576-7      | MSS4300R   | Silver  |
| 7-1437576-8      | MSS4300RG  | Gold    |

4P3T



MSS4350R

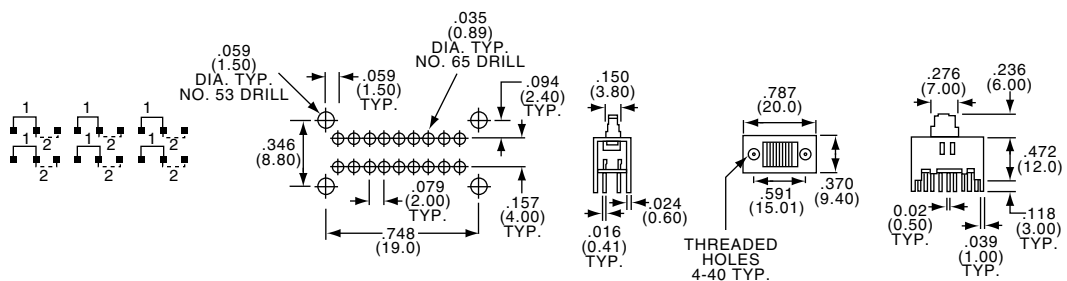


| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 8-1437576-0      | MSS4350R   | Silver  |
| 8-1437576-1      | MSS4350RG  | Gold    |

6PDT



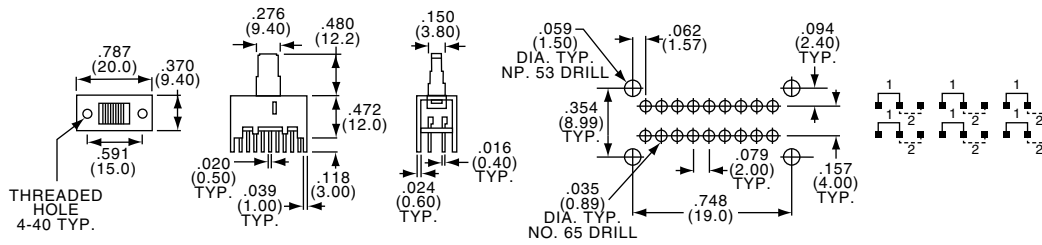
MSS6200



| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 8-1437576-8      | MSS6200    | Silver  |
| 8-1437576-9      | MSS6200G   | Gold    |

# Slide Switches, Instrumentation Grade

SEE PAGE B20 FOR PRODUCT SPECIFICATIONS

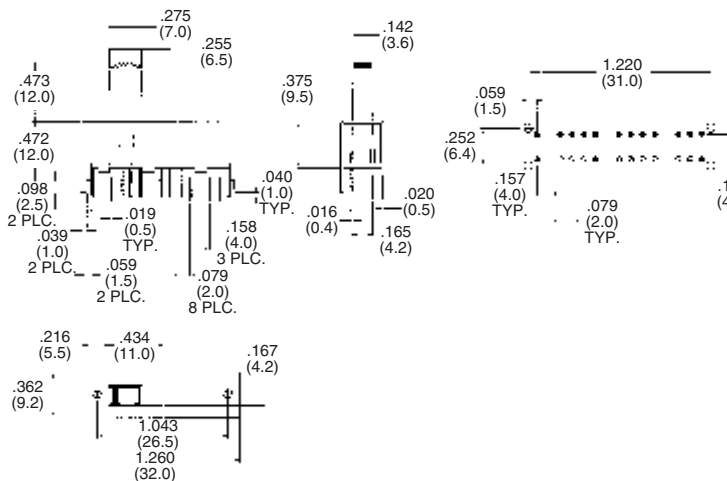


6PDT



MSS6250

| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 9-1437576-0      | MSS6250    | Silver  |



| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 9-1437576-3      | MSS6350    | Silver  |
| —                | MSS6350G   | Gold    |

6P3T



MSS6350R

| Tyco Electronics | Alcoswitch | Plating |
|------------------|------------|---------|
| 9-1437576-4      | MSS6350R   | Silver  |
| —                | MSS6350RG  | Gold    |



## Slide Switches, Instrumentation Grade

### MATERIAL SPECIFICATIONS:

|                               |                                        |
|-------------------------------|----------------------------------------|
| Contacts .....                | Silver or gold over copper alloy       |
| Case Material .....           | Cold rolled steel                      |
| Actuator Material .....       | Polyester UL94V-0                      |
| Terminals/Mixed Contacts..... | Gold or silver plate over copper alloy |
| Terminal Seal .....           | Epoxy                                  |

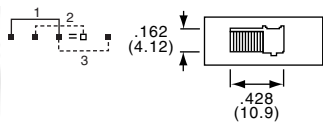
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +185°F (-20°C to +85°C)  
Storage Temperature.....-40°F to +212°F (-40°C to +100°C)  
Solder Heat Resistance .....See page M3-4

### TYPICAL PERFORMANCE CHARACTERISTICS:

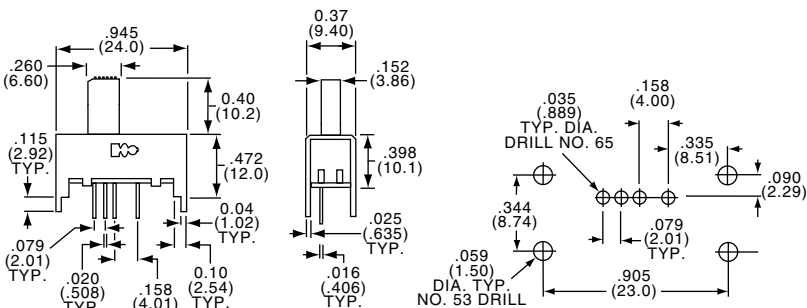
|                                  |                                                            |
|----------------------------------|------------------------------------------------------------|
| Contact Rating .....             | Gold: 0.4 VA 20 VDC or peak AC<br>Silver: 300 mA @ 125 VAC |
| Initial Contact Resistance ..... | 30 Milliohms max.                                          |
| Contact Timing .....             | Make before break                                          |
| Insulation Resistance .....      | 1,000 Megohms min.                                         |
| Dielectric Strength .....        | 500 Volts RMS @ sea level                                  |
| Actuation Force .....            | 600±300/470 Grams average                                  |
| Actuator Travel .....            | 0.079" (2.01) approximate                                  |
| Life Expectancy .....            | Up to 15,000 Cycles                                        |

## SP3T

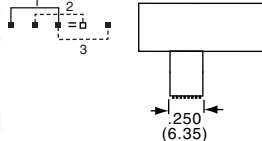


MSSA1350

| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 3-1437580-3      | MSSA1350   | Silver  | Upright        |
| 3-1437580-4      | MSSA1350G  | Gold    | Upright        |

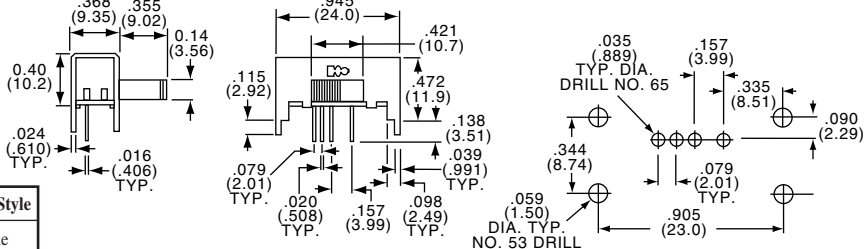


## SP3T

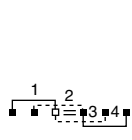


MSSA1350R

| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 3-1437580-5      | MSSA1350R  | Silver  | Rt. Angle      |
| 3-1437580-6      | MSSA1350RG | Gold    | Rt. Angle      |

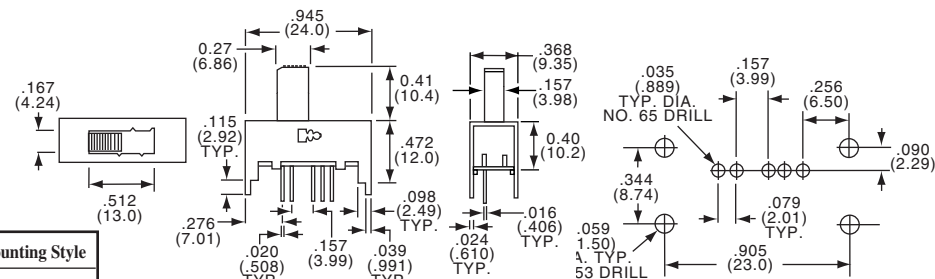


## SP4T

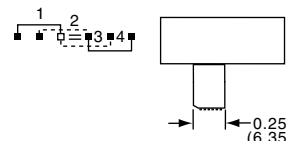


MSSA1450

| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 3-1437580-7      | MSSA1450   | Silver  | Upright        |
| 3-1437580-8      | MSSA1450G  | Gold    | Upright        |

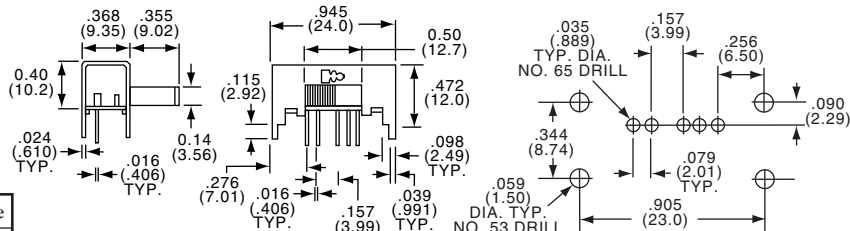


## SP4T



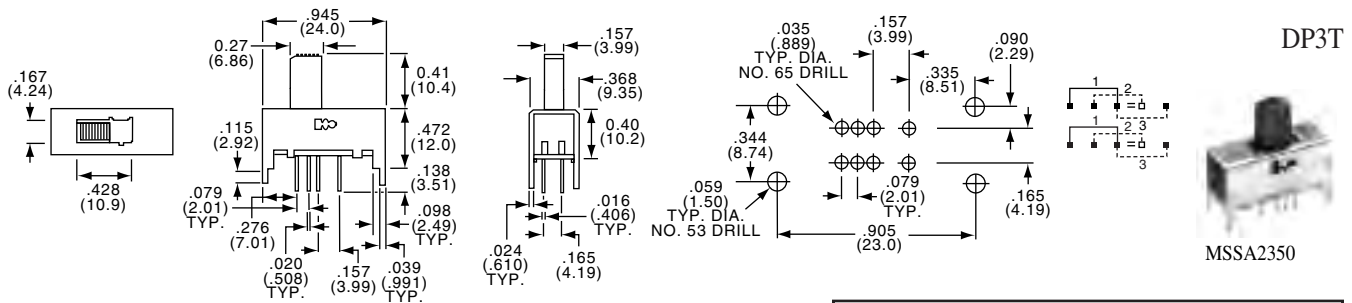
MSSA1450R

| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 3-1437580-9      | MSSA1450R  | Silver  | Rt. Angle      |
| 4-1437580-0      | MSSA1450RG | Gold    | Rt. Angle      |

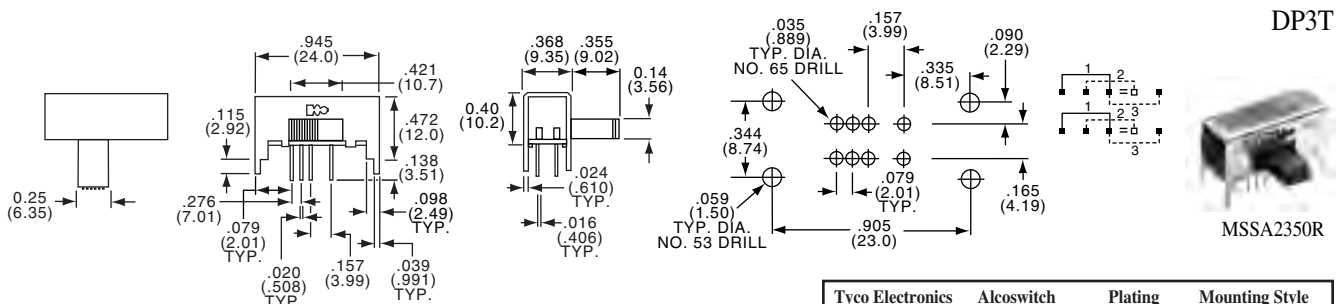


**Slide Switches, Instrumentation Grade**

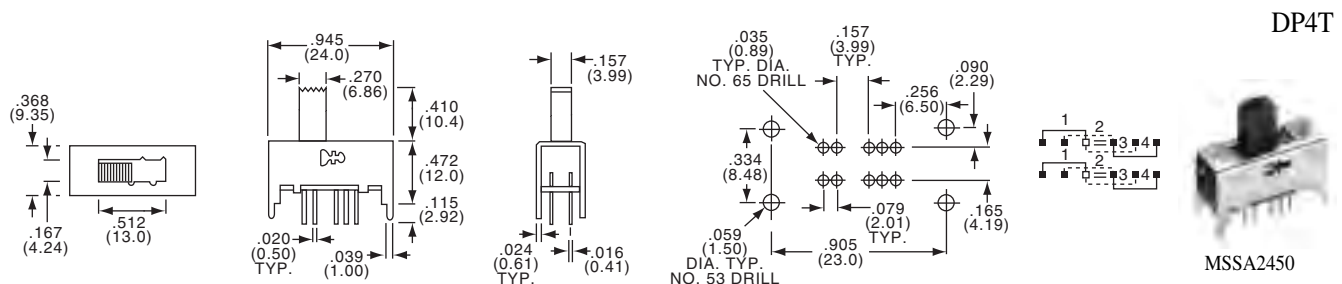
SEE PAGE B26 FOR PRODUCT SPECIFICATIONS



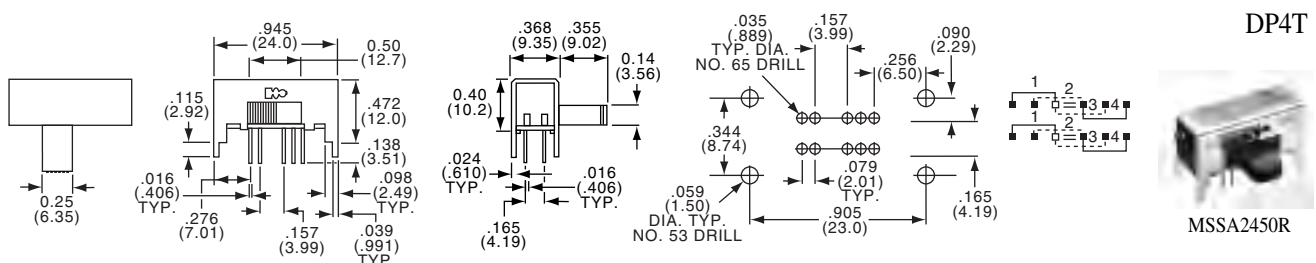
| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 5-1437580-3      | MSSA2350   | Silver  | Upright        |
| 5-1437580-4      | MSSA2350G  | Gold    | Upright        |



| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 5-1437580-5      | MSSA2350R  | Silver  | Rt. Angle      |
| 5-1437580-6      | MSSA2350RG | Gold    | Rt. Angle      |



| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 5-1437580-7      | MSSA2450   | Silver  | Upright        |
| 5-1437580-8      | MSSA2450G  | Gold    | Upright        |



| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 5-1437580-9      | MSSA2450R  | Silver  | Rt. Angle      |
| 6-1437580-0      | MSSA2450RG | Gold    | Rt. Angle      |

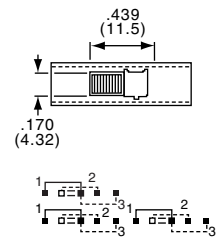
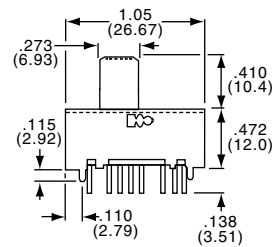
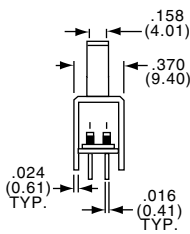
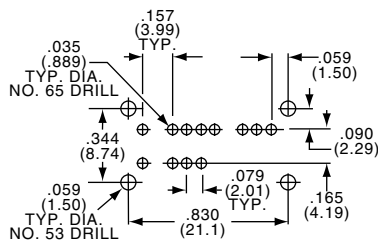
**Slide Switches, Instrumentation Grade**

SEE PAGE B26 FOR PRODUCT SPECIFICATIONS

3P3T



MSSA3350

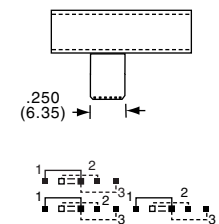
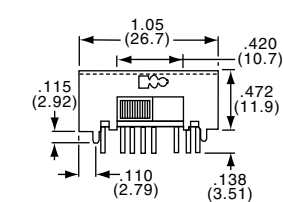
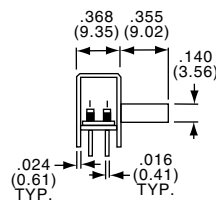
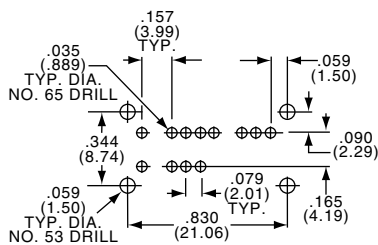


| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 6-1437580-1      | MSSA3350   | Silver  | Upright        |
| 6-1437580-2      | MSSA3350G  | Gold    | Upright        |

3P3T



MSSA3350R

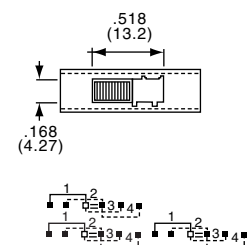
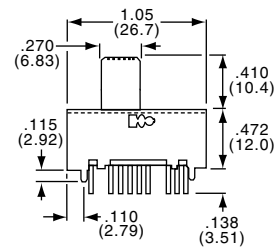
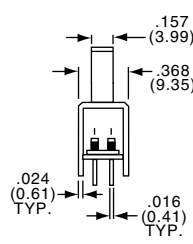
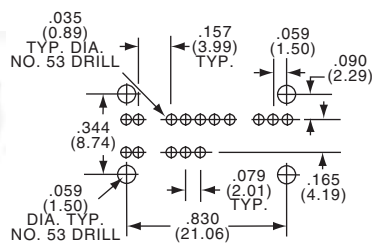


| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 6-1437580-3      | MSSA3350R  | Silver  | Rt. Angle      |
| 6-1437580-4      | MSSA3350RG | Gold    | Rt. Angle      |

3P4T



MSSA3450

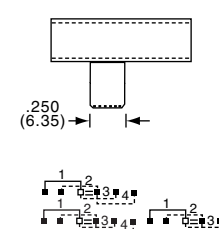
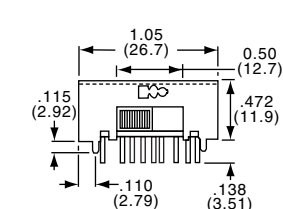
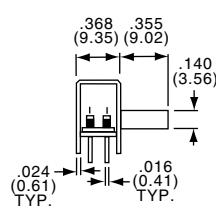
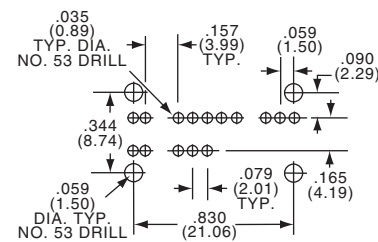


| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 6-1437580-5      | MSSA3450   | Silver  | Upright        |
| 6-1437580-6      | MSSA3450G  | Gold    | Upright        |

3P4T



MSSA3450R

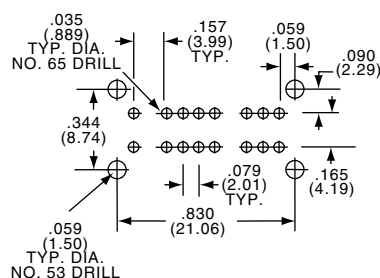
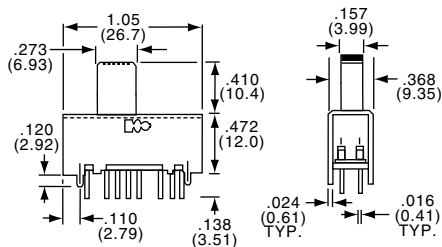
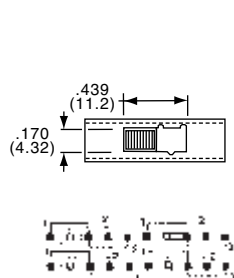


| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 6-1437580-7      | MSSA3450R  | Silver  | Rt. Angle      |
| 6-1437580-8      | MSSA3450RG | Gold    | Rt. Angle      |

## Slide Switches, Instrumentation Grade

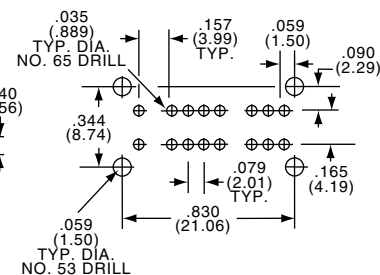
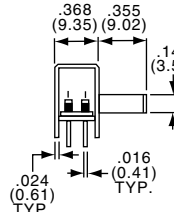
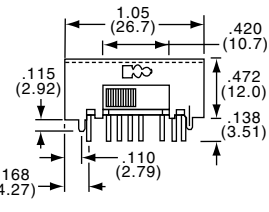
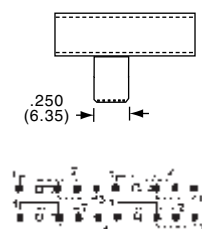
SEE PAGE B26 FOR PRODUCT SPECIFICATIONS

4P3T



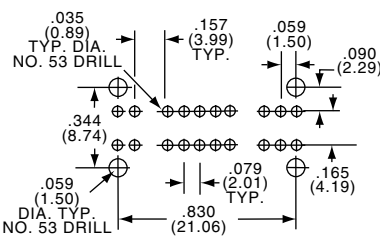
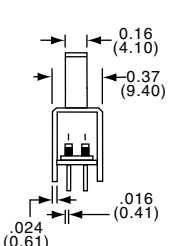
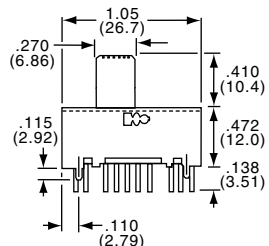
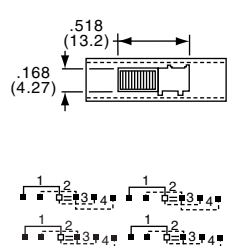
MSSA4350

| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 6-1437580-9      | MSSA4350   | Silver  | Upright        |
| 7-1437580-0      | MSSA4350G  | Gold    | Upright        |



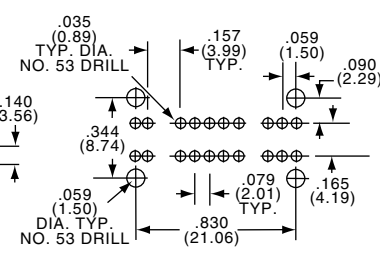
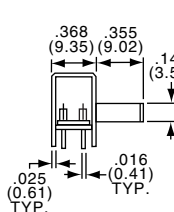
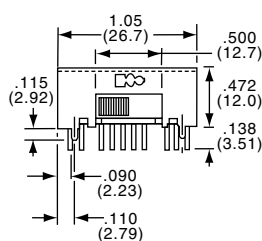
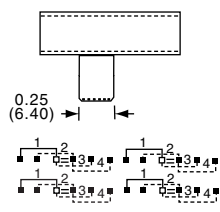
MSSA4350R

| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 7-1437580-1      | MSSA4350R  | Silver  | Rt. Angle      |
| 7-1437580-2      | MSSA4350RG | Gold    | Rt. Angle      |



MSSA4450

| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 7-1437580-3      | MSSA4450   | Silver  | Upright        |
| 7-1437580-4      | MSSA4450G  | Gold    | Upright        |



MSSA4450R

| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
|------------------|------------|---------|----------------|
| 7-1437580-5      | MSSA4450R  | Silver  | Rt. Angle      |
| 7-1437580-6      | MSSA4450RG | Gold    | Rt. Angle      |

## Slide Switches, Instrumentation Grade, .200 Terminal Spacing

### MATERIAL SPECIFICATIONS:

Contacts .....Silver clad or gold plate  
Case Material .....Polyester  
Actuator Material .....Polyamide  
Terminals .....Gold or silver plate  
Terminal Seal .....Epoxy

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +149°F (-20°C to +65°C)  
Storage Temperature.....-40°F to +212°F (-40°C to +100°C)  
Solder Heat Resistance.....See page M3-4

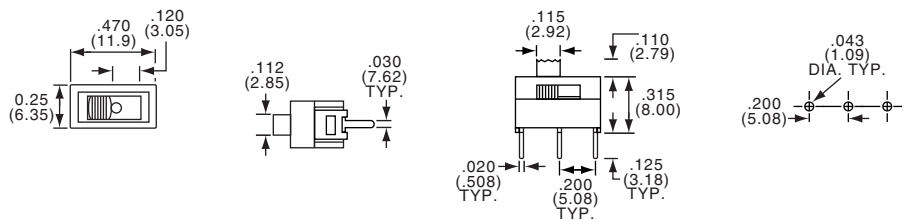
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....Gold: 0.4 VA max. 20 VDC or peak AC  
Silver: 3 A @ 115 VAC, 1.5A @ 230 VAC  
Initial Contact Resistance .....20 Milliohms max.  
Contact Timing .....Non-shorting  
Insulation Resistance .....1,000 Megohms @ 500 VDC min.  
Dielectric Strength .....500 Volts RMS @ sea level  
Actuation Force .....600 ±300 Grams  
Actuator Travel......120" (3.05) Approximate  
Life Expectancy .....Up to 30,000 Cycles

### SPDT



MSSA114D

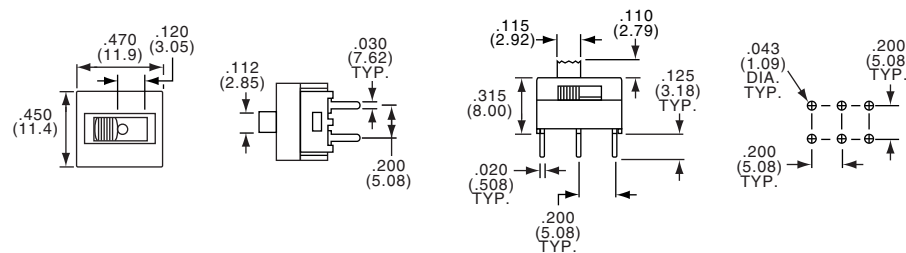


| Tyco Electronics | Alcoswitch | Act. Code | Pg. M5 | On   | Off | Contacts |
|------------------|------------|-----------|--------|------|-----|----------|
| 2-1437580-9      | MSSA111DG  | D         | On     | None | On  | Gold     |
| 3-1437580-0      | MSSA111EG  | E         | On     | Off  | On  | Gold     |
| 3-1437580-1      | MSSA114D   | D         | On     | None | On  | Silver   |
| 3-1437580-2      | MSSA114E   | E         | On     | Off  | On  | Silver   |

### DPDT



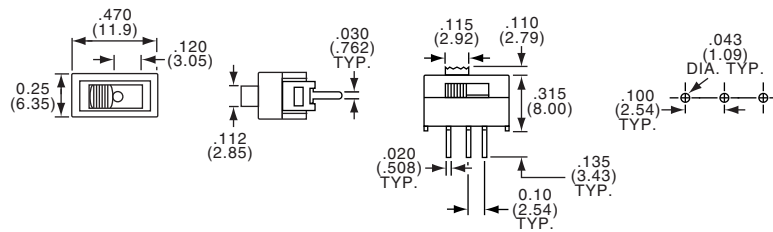
MSSA214N



| Tyco Electronics | Alcoswitch | Act. Code | Pg. M5 | On   | Off | Contacts |
|------------------|------------|-----------|--------|------|-----|----------|
| 4-1437580-9      | MSSA211NG  | N         | On     | None | On  | Gold     |
| 5-1437580-2      | MSSA214N   | N         | On     | None | On  | Silver   |

**Slide Switches, Instrumentation Grade, .100 Terminal Spacing**

SEE PAGE B30 FOR PRODUCT SPECIFICATIONS

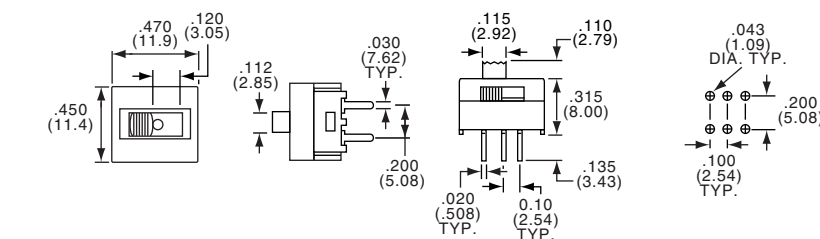


SPDT



MSSA104D

| Tyco Electronics | Alcoswitch | Act. Code | Pg. M5 |    |      |    | Contacts |
|------------------|------------|-----------|--------|----|------|----|----------|
| 1-1437580-7      | MSSA101DG  | D         |        | On | None | On | Gold     |
| —                | MSSA101EG  | E         |        | On | Off  | On | Gold     |
| 2-1437580-3      | MSSA104D   | D         |        | On | None | On | Silver   |
| 2-1437580-6      | MSSA104E   | E         |        | On | Off  | On | Silver   |

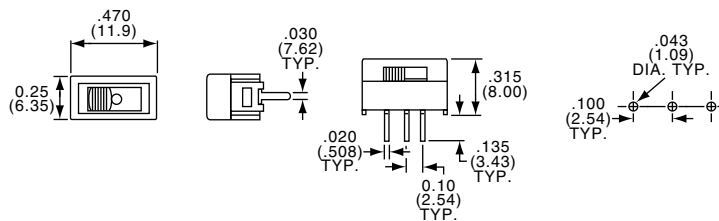


DPDT



MSSA204N

| Tyco Electronics | Alcoswitch | Act. Code | Pg. M5 |    |      |    | Contacts |
|------------------|------------|-----------|--------|----|------|----|----------|
| 4-1437580-4      | MSSA204N   | N         |        | On | None | On | Silver   |

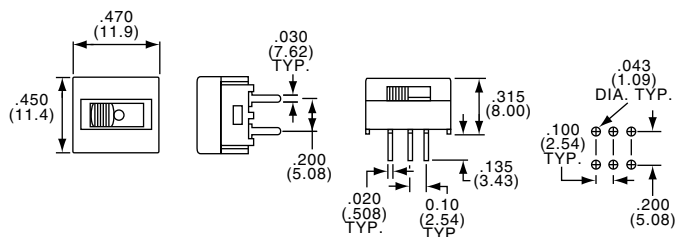


SPDT FLUSH ACTUATOR



MSSA104D1

| Tyco Electronics | Alcoswitch | Act. Code | Pg. M5 |    |      |    | Contacts |
|------------------|------------|-----------|--------|----|------|----|----------|
| 2-1437580-4      | MSSA104D1  | D         |        | On | None | On | Silver   |



DPDT FLUSH ACTUATOR



MSSA204N1

| Tyco Electronics | Alcoswitch | Act. Code | Pg. M5 |    |      |    | Contacts |
|------------------|------------|-----------|--------|----|------|----|----------|
| 4-1437580-5      | MSSA204N1  | N         |        | On | None | On | Silver   |
| 4-1437580-8      | MSSA204P1  | P         |        | On | Off  | On | Silver   |

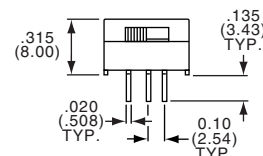
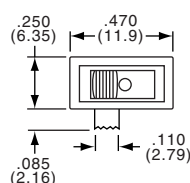
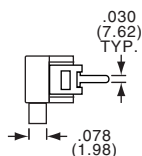
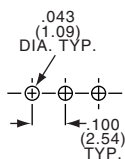
**Slide Switches, Instrumentation Grade, .100 Terminal Spacing**

SEE PAGE B30 FOR PRODUCT SPECIFICATIONS

**SPDT**



MSSA101DGRA

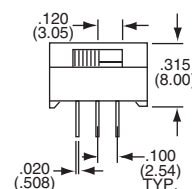
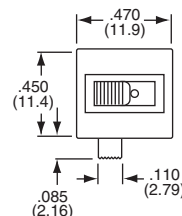
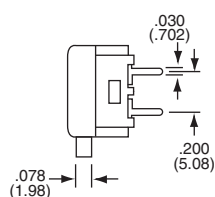
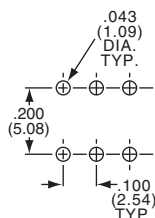


| Tyco Electronics | Alcoswitch  | Act. Code | Pg. M5 | Contacts |    |        |  |
|------------------|-------------|-----------|--------|----------|----|--------|--|
| 1-1437580-9      | MSSA101DGRA | D         | On     | None     | On | Gold   |  |
| 2-1437580-1      | MSSA101EGRA | E         | On     | Off      | On | Gold   |  |
| 2-1437580-5      | MSSA104DRA  | D         | On     | None     | On | Silver |  |
| 2-1437580-8      | MSSA104ERA  | E         | On     | Off      | On | Silver |  |

**DPDT**



MSSA204NRA



| Tyco Electronics | Alcoswitch  | Act. Code | Pg. M5 | Contacts |    |        |  |
|------------------|-------------|-----------|--------|----------|----|--------|--|
| 4-1437580-2      | MSSA201NGRA | N         | On     | None     | On | Gold   |  |
| 8-1437580-2      | MSSA201PGRA | P         | On     | Off      | On | Gold   |  |
| 4-1437580-6      | MSSA204NRA  | N         | On     | None     | On | Silver |  |
| —                | MSSA204PRA  | P         | On     | Off      | On | Silver |  |



## Slide Switches, Low Profile, Instrumentation Grade

### MATERIAL SPECIFICATIONS:

|                               |                                          |
|-------------------------------|------------------------------------------|
| Contacts .....                | Gold or silver over nickel over Cu alloy |
| Frame Material .....          | Nickel plated, Steel                     |
| Actuator Material .....       | POM 94 HB                                |
| Terminals/Fixed Contacts..... | Gold or silver over nickel over Cu alloy |
| Terminal Seal .....           | Epoxy                                    |

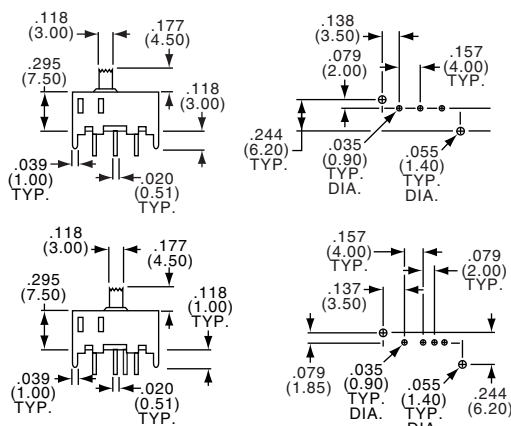
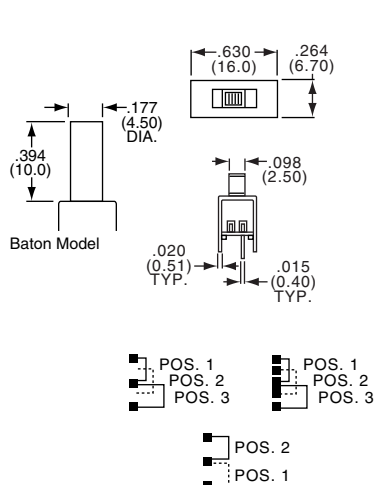
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +212°F (-20°C to +100°C)  
Storage Temperature.....-40°F to +212°F (-40°C to + 100°C)  
Solder Heat Resistance .....See page M3-4  
Recommended Cleaning.....No chlorine base or Freon can be used.  
Aqueous or 100% ethanol.

### TYPICAL PERFORMANCE CHARACTERISTICS:

|                                  |                                |
|----------------------------------|--------------------------------|
| Contact Rating .....             | Gold: 0.4 VA 20 VDC or peak AC |
|                                  | Silver: 300 mA @ 125 VAC       |
| Initial Contact Resistance ..... | 20 Milliohms max.              |
| Contact Timing .....             | Make-before-break              |
| Insulation Resistance .....      | 1000 Megohms min.              |
| Dielectric Strength .....        | 500 Volts RMS @ sea level      |
| Actuation Force .....            | 50 to 450 Grams                |
| Actuator Travel .....            | 0.079"- .158" (2.01-4.01)      |
| Life Expectancy .....            | Up to 15,000 Cycles            |

**B**  
**MHS Series**



SPDT/SP3T

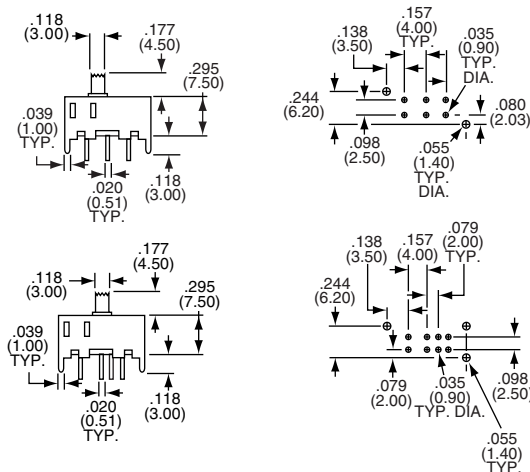
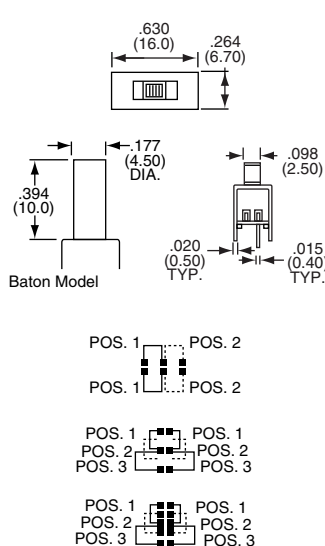


MHS122



MHS122K

| Standard Model   | Alcoswitch | Baton Model      | Alcoswitch | Type |  |  |  | Contacts |
|------------------|------------|------------------|------------|------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------|
| Tyco Electronics |            | Tyco Electronics |            |      |                                                                                       |                                                                                       |                                                                                       |          |
| 1-1437576-9      | MHS122     | 1-1437576-2      | MHS122K    | SPDT | On                                                                                    | None                                                                                  | On                                                                                    | Silver   |
| 1-1437576-5      | MHS123     | 1-1437576-7      | MHS123K    | SPDT | On                                                                                    | Off                                                                                   | On                                                                                    | Silver   |
| 1-1437576-9      | MHS133     | 2-1437576-2      | MHS133K    | SP3T | On                                                                                    | On                                                                                    | On                                                                                    | Silver   |
| 1-1437576-0      | MHS122G    | 1-1437576-3      | MHS122KG   | SPDT | On                                                                                    | None                                                                                  | On                                                                                    | Gold     |
| —                | MHS123G    | —                | MHS123KG   | SPDT | On                                                                                    | Off                                                                                   | On                                                                                    | Gold     |
| 2-1437576-0      | MHS133G    | 2-1437576-3      | MHS133KG   | SP3T | On                                                                                    | On                                                                                    | On                                                                                    | Gold     |



DPDT/DP3T



MHS233



MHS233K

| Standard Model<br>Tyco Electronics | Alcoswitch | Baton Model<br>Tyco Electronics | Alcoswitch | Type |  |  |  | Contacts |
|------------------------------------|------------|---------------------------------|------------|------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------|
| 2-1437576-5                        | MHS222     | 2-1437576-8                     | MHS222K    | DPDT | On                                                                                    | None                                                                                  | On                                                                                    | Silver   |
| 3-1437576-1                        | MHS223     | 3-1437576-4                     | MHS223K    | DPDT | On                                                                                    | Off                                                                                   | On                                                                                    | Silver   |
| 3-1437576-6                        | MHS233     | 3-1437576-9                     | MHS233K    | DP3T | On                                                                                    | On                                                                                    | On                                                                                    | Silver   |
| 2-1437576-6                        | MHS222G    | 2-1437576-9                     | MHS222KG   | DPDT | On                                                                                    | None                                                                                  | On                                                                                    | Gold     |
| 3-1437576-2                        | MHS223G    | —                               | MHS223KG   | DPDT | On                                                                                    | Off                                                                                   | On                                                                                    | Gold     |
| 3-1437576-7                        | MHS233G    | 4-1437576-0                     | MHS233KG   | DP3T | On                                                                                    | On                                                                                    | On                                                                                    | Gold     |

**Slide Switches, Low Profile, Right Angle, Instrumentation Grade**

SEE PAGE B33 FOR PRODUCT SPECIFICATIONS

**B**

**MHS Series**

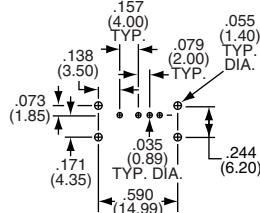
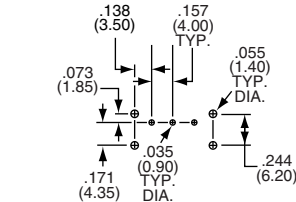
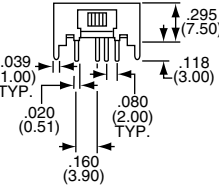
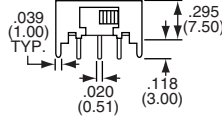
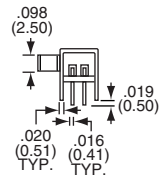
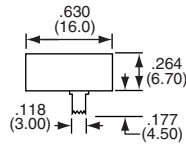
**SPDT/SP3T**



MHS122RA

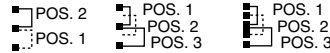


MHS133GRA



MHS122/123

MHS133



| Tyco Electronics | Alcoswitch | Type | On | Off  | On | Contacts |
|------------------|------------|------|----|------|----|----------|
| 1-1437576-4      | MHS122RA   | SPDT | On | None | On | Silver   |
| 1-1437576-8      | MHS123RA   | SPDT | On | Off  | On | Silver   |
| 2-1437576-4      | MHS133RA   | SP3T | On | On   | On | Silver   |
| 1-1437576-1      | MHS122GRA  | SPDT | On | None | On | Gold     |
| 1-1437576-6      | MHS123GRA  | SPDT | On | Off  | On | Gold     |
| 2-1437576-1      | MHS133GRA  | SP3T | On | On   | On | Gold     |

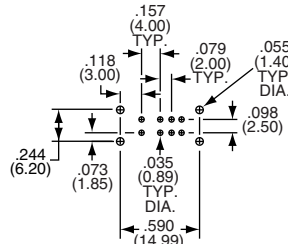
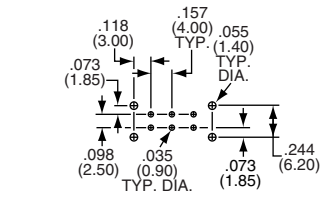
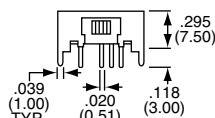
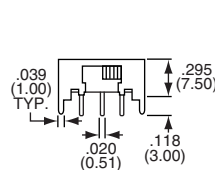
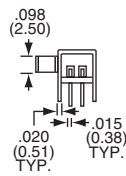
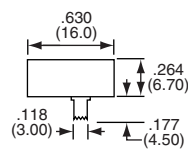
**DPDT/DP3T**



MHS222RA

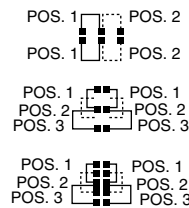


MHS233GRA



MHS222/223

MHS233



| Tyco Electronics | Alcoswitch | Type | On | Off  | On | Contacts |
|------------------|------------|------|----|------|----|----------|
| 3-1437576-0      | MHS222RA   | DPDT | On | None | On | Silver   |
| 3-1437576-5      | MHS223RA   | DPDT | On | Off  | On | Silver   |
| 4-1437576-1      | MHS233RA   | DP3T | On | On   | On | Silver   |
| 2-1437576-7      | MHS222GRA  | DPDT | On | None | On | Gold     |
| 3-1437576-3      | MHS223GRA  | DPDT | On | Off  | On | Gold     |
| 3-1437576-8      | MHS233GRA  | DP3T | On | On   | On | Gold     |

## Slide Switches, Micro Size, Instrumentation Grade

### MATERIAL SPECIFICATIONS:

Contacts .....Silver clad plate over copper alloy  
Cover Base Material .....Polyester  
Actuator Material .....Polyacetal  
Terminals .....Silver over nickel plate over copper alloy  
Terminal Seal .....Molded in

### ENVIRONMENTAL SPECIFICATIONS:

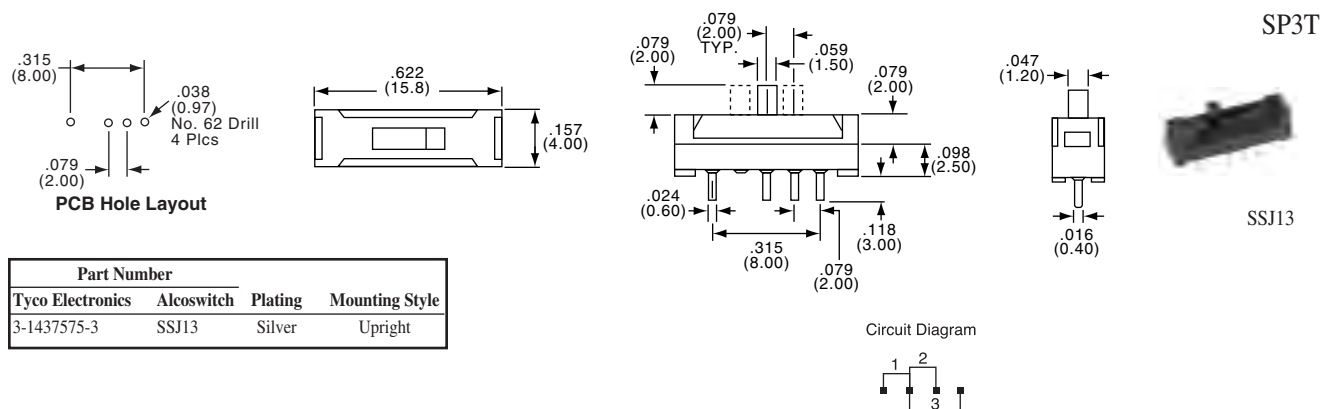
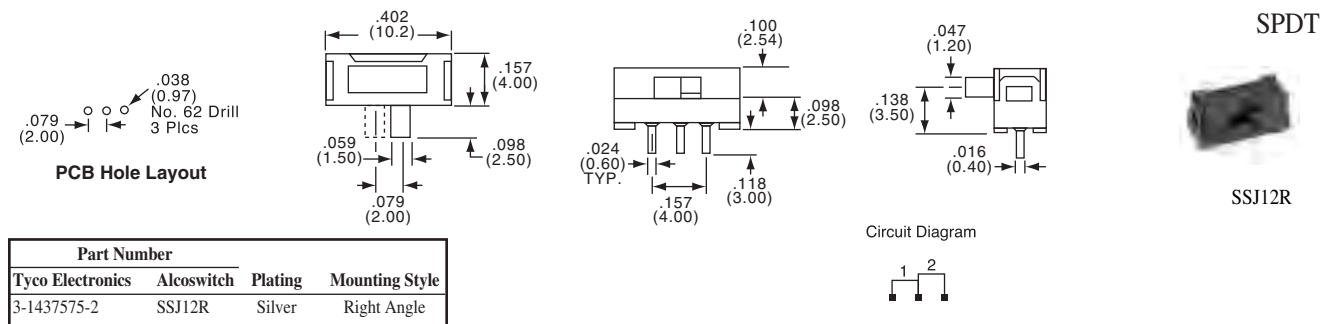
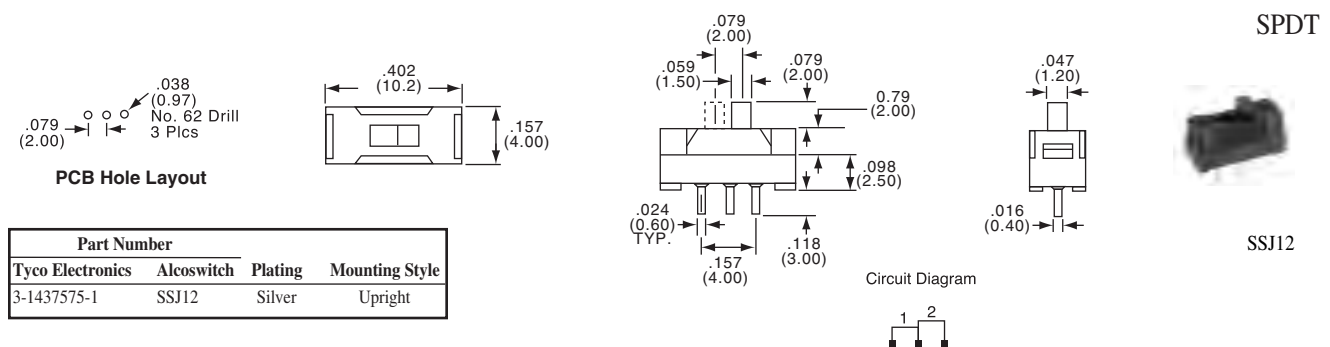
Operating Temperature.....+14°F to +140°F (-10°C to +60°C)  
Storage Temperature.....-4°F to +140°F (-20°C to +60°C)  
Solder Heat Resistance .....270°C+10°C, 5 seconds per MIL-STD-202,  
Method 210

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....100 Milliamps @ 12 VDC  
Initial Contact Resistance .....20 Milliohms max.  
Contact Timing .....Make before break  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....500 Volts RMS @ sea level  
Actuation Force .....250 Grams, (+200g, -150g)  
Actuator Travel.....0.079" (2.01)  
Life Expectancy .....Up to 10,000 Cycles

**B**

SSJ Series



**Slide Switches, Micro Size, Instrumentation Grade**

**MATERIAL SPECIFICATIONS:**

Contacts .....Silver over nickel over copper alloy  
Case Material .....Polyacetal UL94HB  
Actuator Material .....Polyester UL94HB  
Terminals .....Silver over nickel over copper alloy  
Terminal Seal .....Epoxy  
Terminal Board.....UL 94 V-O

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature.....+14°F to +140°F (-10°C to +60°C)  
Storage Temperature.....+14°F to +140°F (-10°C to +60°C)  
Solder Heat Resistance .....230 ± 150 grams ± 5°C for 3 seconds per MIL-STD-202, Method 210

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....100 mA @ 30 VDC or peak AC  
Initial Contact Resistance .....30 Milliohms max.  
Contact Timing .....Make before break  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....500 VAC  
Actuation Force .....200 ± 150 Grams  
Life Expectancy .....Up to 10,000 Cycles

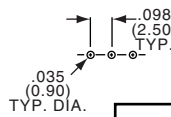
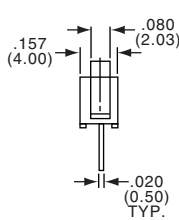
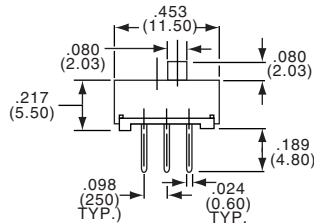
**B**

**MMS Series**

**SPDT**



MMS12



Circuit Diagram

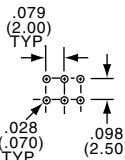
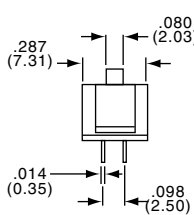
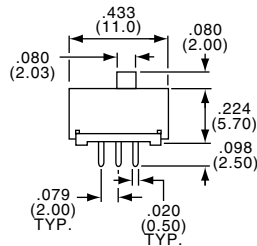


| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 1437575-4        | MMS12      | SPDT | Silver  | Upright        |

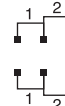
**DPDT**



MMS22



Circuit Diagram

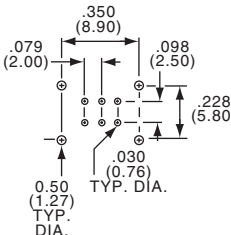
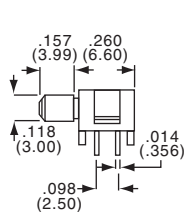
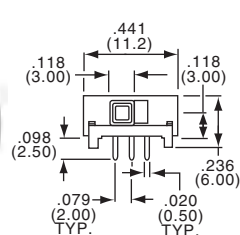


| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 1437575-5        | MMS22      | DPDT | Silver  | Upright        |

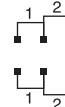
**DPDT**



MMS22R



Circuit Diagram

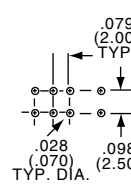
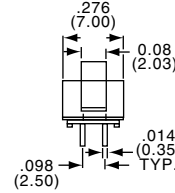
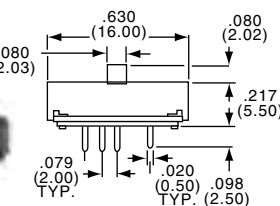


| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 1437575-6        | MMS22R     | DPDT | Silver  | Right Angle    |

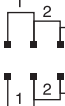
**DP3T**



MMS23



Circuit Diagram

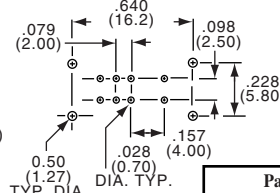
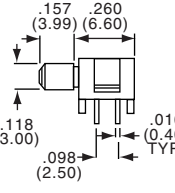
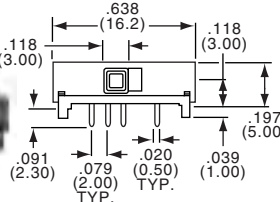


| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 1437575-8        | MMS23      | DP3T | Silver  | Upright        |

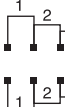
**DP3T**



MMS23R



Circuit Diagram

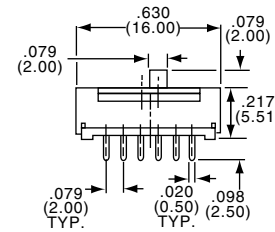
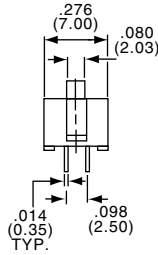
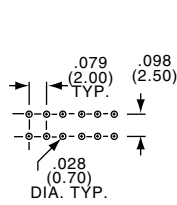
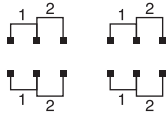


| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 1437575-9        | MMS23R     | DP3T | Silver  | Right Angle    |

**Slide Switches, Micro Size, Instrumentation Grade**

SEE PAGE B36 FOR PRODUCT SPECIFICATIONS

Circuit Diagram

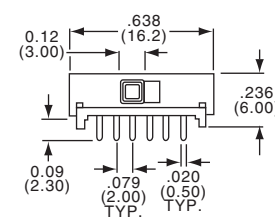
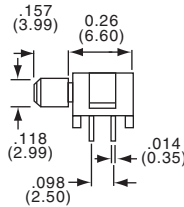
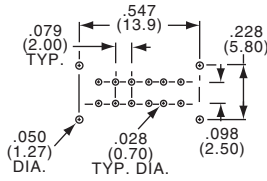
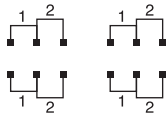


MMS42

4PDT

| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 1-1437575-0      | MMS42      | 4PDT | Silver  | Upright        |

Circuit Diagram

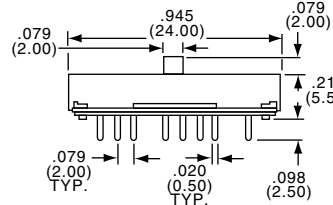
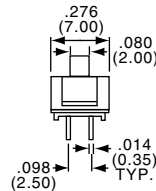
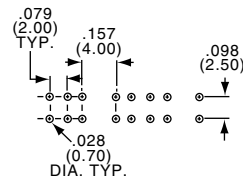
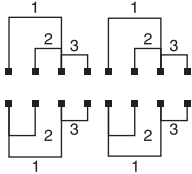


MMS42R

4PDT

| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 1-1437575-1      | MMS42R     | 4PDT | Silver  | Right Angle    |

Circuit Diagram

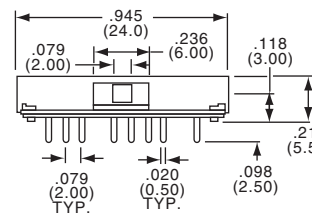
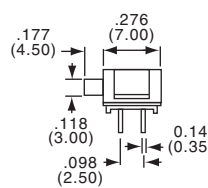
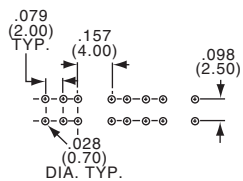
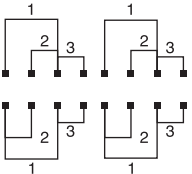


MMS43

4P3T

| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 1-1437575-2      | MMS43      | 4P3T | Silver  | Upright        |

Circuit Diagram



MMS43R

4P3T

| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 1-1437575-3      | MMS43R     | 4P3T | Silver  | Right Angle    |

## Slide Switches, Micro Size, Instrumentation Grade

### MATERIAL SPECIFICATIONS:

Contacts .....Gold or silver plate over nickel plate  
Case Material .....Steel, tin plate  
Actuator Material .....Polyacetal UL94HB  
Terminals .....Gold or silver plate over nickel plate  
Terminal Seal .....Epoxy

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature.....-40°F to +212°F (-40°C to +100°C)  
Solder Heat Resistance.....+260°C (+500°F) for 5 seconds  
per MIL-STD-202, Method 210

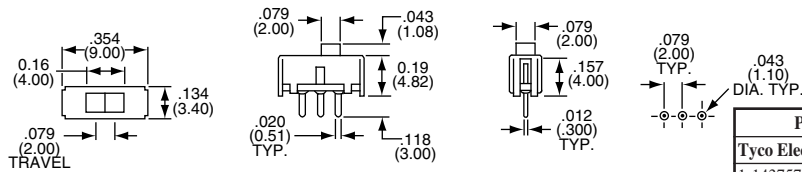
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....Gold: 0.4 VA @ 20 VDC or peak AC  
Silver: 100 mA @ 30 VDC  
Initial Contact Resistance.....30 Milliohms max.  
Contact Timing.....Make before break  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....500 VAC  
Actuation Force .....250 ± 150 Grams  
Life Expectancy .....Up to 10,000 Cycles  
Travel .....0.079" (2.01)

#### SPDT



SSB12



Circuit Diagram

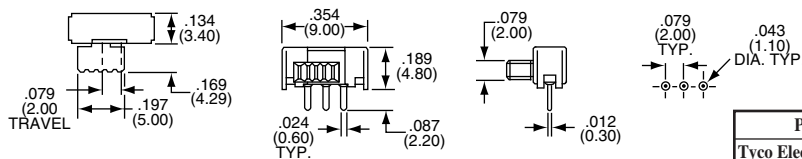


| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 1-1437575-8      | SSB12      | SPDT | Silver  | Upright        |
| 1-1437575-9      | SSB12G     | SPDT | Gold    | Upright        |

#### SPDT



SSB12R



Circuit Diagram

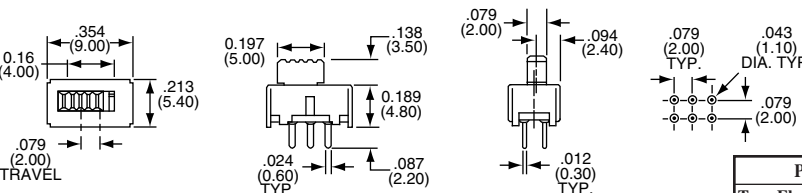


| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 2-1437575-0      | SSB12R     | SPDT | Silver  | Right Angle    |
| 2-1437575-1      | SSB12RG    | SPDT | Gold    | Right Angle    |

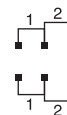
#### DPDT



SSB22



Circuit Diagram

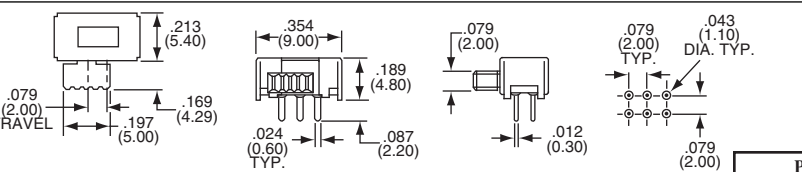


| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 2-1437575-2      | SSB22      | DPDT | Silver  | Upright        |
| 2-1437575-3      | SSB22G     | DPDT | Gold    | Upright        |

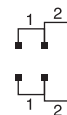
#### DPDT



SSB22R



Circuit Diagram

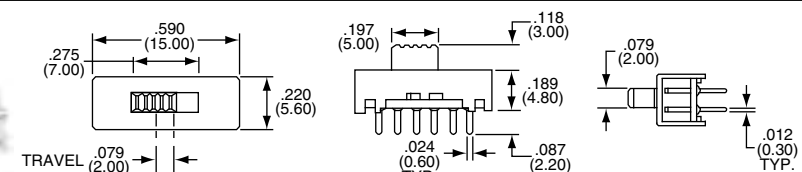


| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 2-1437575-4      | SSB22R     | DPDT | Silver  | Right Angle    |
| 2-1437575-5      | SSB22RG    | DPDT | Gold    | Right Angle    |

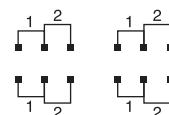
#### 4PDT



SSB42



Circuit Diagram



| Part Number      |            |      |         |                |
|------------------|------------|------|---------|----------------|
| Tyco Electronics | Alcoswitch | Type | Plating | Mounting Style |
| 2-1437575-8      | SSB42      | 4PDT | Silver  | Upright        |
| 2-1437575-9      | SSB42G     | 4PDT | Gold    | Upright        |

## Slide Switches, Micro Size, Instrumentation Grade

### MATERIAL SPECIFICATIONS:

Contacts .....Silver or gold plate  
Case Material .....Polyester PPS UL94VO  
Actuator Material .....Polyamide UL94HB  
Cover Material .....Polyamide UL94HB  
Terminals .....Silver or gold plate  
Terminal Seal .....Epoxy

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +158°F (-20°C to +70°C)  
Storage Temperature.....-40°F to +194°F (-40°C to +90°C)  
Solder Heat Resistance .....260°C (+500°F) for 5 seconds  
per MIL-STD-202, Method 210

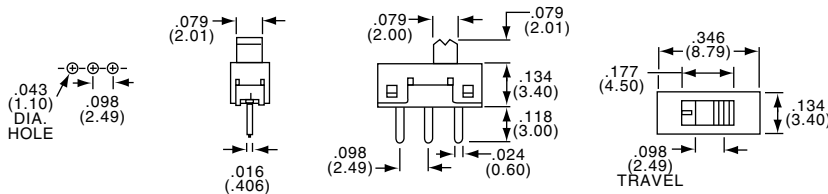
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....Gold: 0.4 VA max. @ 20 VDC or peak AC  
Silver: 100 Milliamps @ 30 VDC  
Initial Contact Resistance .....30 Milliohms max.  
Contact Timing .....Break-Before-Make  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....500 VAC  
Actuation Force .....250 ± 100 Grams  
Actuator Travel.....0.098" (2.49)  
Life Expectancy .....Up to 10,000 Cycles

**B**

**SSA Series**

### SPDT



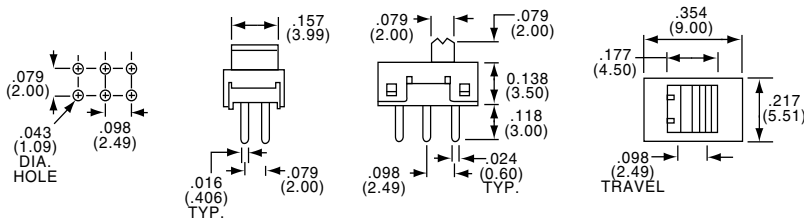
SSA12

Circuit Diagram



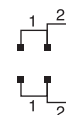
| Part Number      |            |         |                |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
| 1-1437575-4      | SSA12      | Silver  | Upright        |
| 1-1437575-5      | SSA12G     | Gold    | Upright        |

### DPDT



SSA22

Circuit Diagram



| Part Number      |            |         |                |
|------------------|------------|---------|----------------|
| Tyco Electronics | Alcoswitch | Plating | Mounting Style |
| 1-1437575-6      | SSA22      | Silver  | Upright        |
| 1-1437575-7      | SSA22G     | Gold    | Upright        |



## Slide Switches, PC Tails, Wiping Contact, Consumer Grade

### MATERIAL SPECIFICATIONS:

Contacts .....Silver plate over copper alloy  
Case Material .....Steel  
Actuator Material .....Polycarbonate  
Terminals/Fixed Contacts.....Silver plate over copper alloy  
Terminal Seal .....Epoxy

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....14°F to +140°F (-10°C to +60°C)  
Storage Temperature.....14°F to +140°F (-10°C to +60°C)

### TYPICAL PERFORMANCE CHARACTERISTICS:

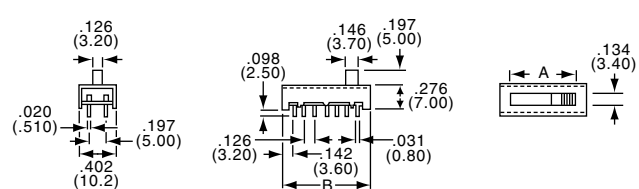
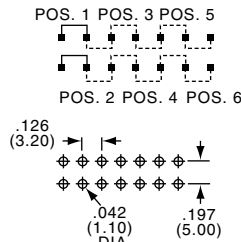
Contact Rating .....250 mA @ 125 VAC, 150 mA @ 12 VDC  
Initial Contact Resistance .....30 Milliohms max.  
Contact Timing .....Break before make  
Insulation Resistance .....500 Megohms min.  
Dielectric Strength .....500 VAC  
Actuation Force .....100-300 Grams  
Actuator Travel.....0.126" (3.20)  
Life Expectancy .....Up to 10,000 Cycles

### 2 TO 6 POSITIONS



SLS250PC

SLS220PC



SLS240PCA

SLS230PC

| Part Number      |            | Type        | Dim.A       | Dim.B        |
|------------------|------------|-------------|-------------|--------------|
| Tyco Electronics | Alcoswitch |             |             |              |
| 3-1437577-9      | SLS220PC   | 2 Positions | .272(6.91)  | .535(13.59)  |
| 4-1437577-1      | SLS230PC   | 3 Positions | .398(10.11) | .661(16.79)  |
| 4-1437577-3      | SLS240PCA  | 4 Positions | .524(13.31) | .787(19.99)  |
| 4-1437577-5      | SLS250PC   | 5 Positions | .650(16.51) | .913(23.19)  |
| 4-1437577-7      | SLS260PC   | 6 Positions | .776(19.71) | 1.039(26.39) |

### SL Series

## Slide Switches, PC Tails, Lever or Knob Actuator

### 2 TO 10 POSITIONS



SL660  
(with KSS KNOB)

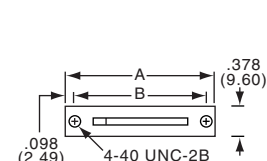
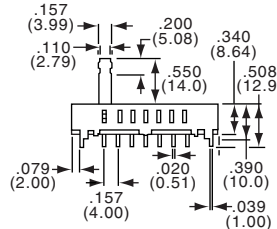
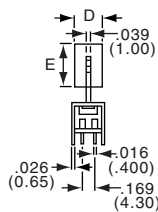
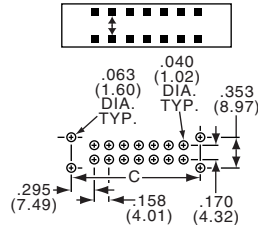


SL550



SL770

#### CONTACT ARRANGEMENT



| Part Number      |            | Type         | Dim. A      | Dim. B      | Dim. C      | Knob Only | Description            | Dim. D     | Dim. E      |
|------------------|------------|--------------|-------------|-------------|-------------|-----------|------------------------|------------|-------------|
| Tyco Electronics | Alcoswitch |              |             |             |             |           |                        |            |             |
| 1437577-9        | SL220      | 2 Positions  | .95(24.13)  | .750(19.05) | .750(19.05) | KSS10A    | Aluminum-Clear Anodize | .270(6.86) | .500(12.70) |
| 1-1437577-0      | SL330      | 3 Positions  | 1.11(28.19) | .910(23.1)  | .910(23.1)  | KSS10B    | Aluminum-Black Anodize | .270(6.86) | .500(12.70) |
| 1-1437577-1      | SL550      | 5 Positions  | 1.42(36.07) | 1.22(30.99) | 1.22(31.1)  | KSS20A    | Aluminum-Clear Anodize | .305(7.75) | .512(13.00) |
| 1-1437577-2      | SL660      | 6 Positions  | 1.58(40.13) | 1.38(35.05) | 1.38(35.1)  | KSS20B    | Aluminum-Black Anodize | .305(7.75) | .512(13.00) |
| 1-1437577-3      | SL770      | 7 Positions  | 1.74(44.20) | 1.54(39.12) | 1.54(39.1)  |           |                        |            |             |
| 1-1437577-4      | SL880      | 8 Positions  | 1.89(48.01) | 1.70(43.18) | 1.70(43.1)  |           |                        |            |             |
| 1437577-8        | SL1000     | 10 Positions | 2.21(56.13) | 2.01(51.05) | 2.01(51.5)  |           |                        |            |             |

**Slide Switches, Panel Mount, Wiping Contact, Consumer Grade**

**MATERIAL SPECIFICATIONS:**

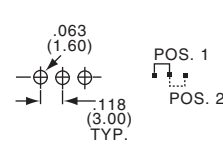
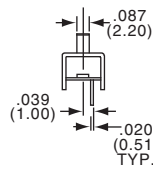
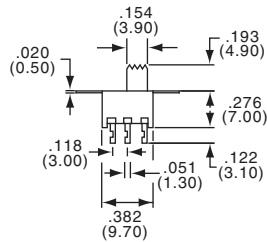
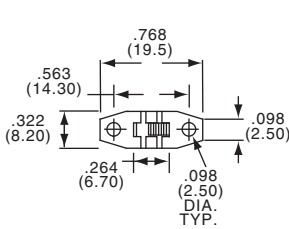
Contacts .....Silver over nickel plate copper alloy  
Case Material .....Steel-zinc plated  
Actuator Material .....PBT 30% glass  
Terminals/Fixed Contacts.....Silver over nickel plate copper alloy  
Terminal Seal .....Epoxy

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature.....-4°F to +185°F (-20°C to +85°C)  
Storage Temperature.....-40°F to +212°F (-40°C to +100°C)  
Solder Heat Resistance .....+300°C (+572°F) for 5 seconds

**TYPICAL PERFORMANCE CHARACTERISTICS:**

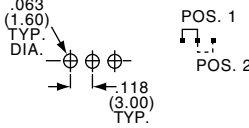
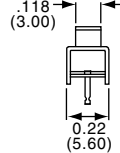
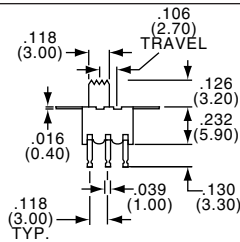
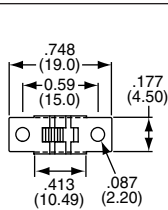
Contact Rating .....500 mA @ 125 VAC, 200 mA @ 12 VDC  
Initial Contact Resistance .....30 Milliohms max.  
Contact Timing .....Break-Before-Make  
Insulation Resistance .....500 Megohms min.  
Dielectric Strength .....500 VAC  
Actuation Force .....SLS: 100-300 Grams; SLSA: 220, 300 -500 Grams  
Plunger/Actuator Travel: .....0.106" (2.69)  
Life Expectancy .....Up to 10,000 Cycles



SPDT

SLS120

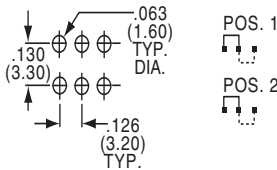
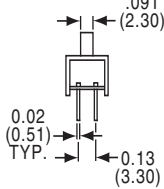
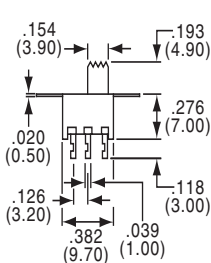
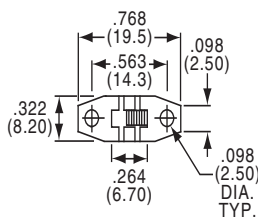
| Part Number      |            |      |          |                    |
|------------------|------------|------|----------|--------------------|
| Tyco Electronics | Alcoswitch | Type | Mounting | Terminals Contacts |
| 1-1437577-5      | SLS120     | SPDT | Panel    | Lug                |



SPDT

SLSA120

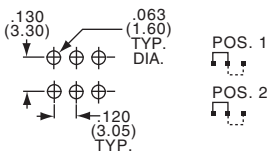
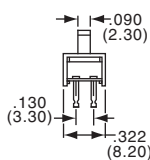
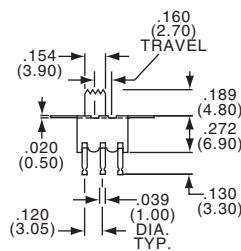
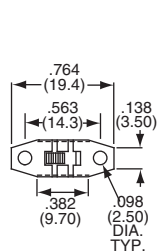
| Part Number      |            |      |          |                    |
|------------------|------------|------|----------|--------------------|
| Tyco Electronics | Alcoswitch | Type | Mounting | Terminals Contacts |
| 5-1437577-3      | SLSA120    | SPDT | Panel    | Turret             |



DPDT

SLS220

| Part Number      |            |      |          |                    |
|------------------|------------|------|----------|--------------------|
| Tyco Electronics | Alcoswitch | Type | Mounting | Terminals Contacts |
| 3-1437577-7      | SLS220     | DPDT | Panel    | Lug                |



DPDT

SLSA220

| Part Number      |            |      |          |                    |
|------------------|------------|------|----------|--------------------|
| Tyco Electronics | Alcoswitch | Type | Mounting | Terminals Contacts |
| 5-1437577-5      | SLSA220    | DPDT | Panel    | Turret             |

## Slide Switches, Wiping Contacts, Consumer Grade

### MATERIAL SPECIFICATIONS:

Contacts .....Copper alloy-silver/nickel  
Case Material .....Steel-zinc plate  
Actuator Material .....PBT 30% Glass  
Terminals/Fixed Contacts.....Copper, alloy, silver/nickel plate  
Terminal Seal .....Epoxy

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +185°F (-20°C to +85°C)  
Storage Temperature.....-40°F to +212°F (-40°C to +100°C)  
Solder Heat Resistance .....+300°C (+572°F) for 5 seconds

### TYPICAL PERFORMANCE CHARACTERISTICS:

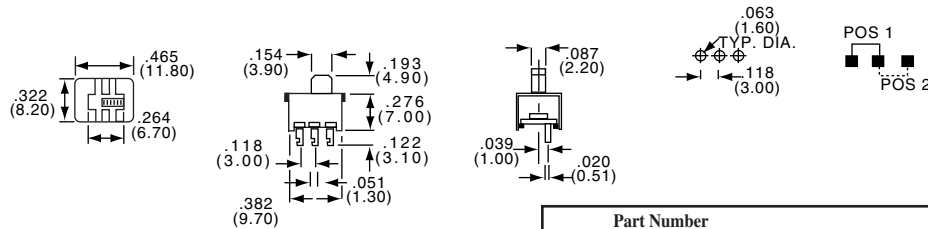
Contact Rating .....500 mA @ 125 VAC, 200 mA @ 12 VDC  
Initial Contact Resistance .....30 Milliohms max.  
Contact Timing .....Break before make  
Insulation Resistance .....500 Megohms min.  
Dielectric Strength .....500 VAC  
Actuation Force .....350±150 Grams  
Plunger/Actuator Travel: .....0.106 (2.69)  
Life Expectancy .....Up to 10,000 Cycles

### SPDT



Lug

SLS1201



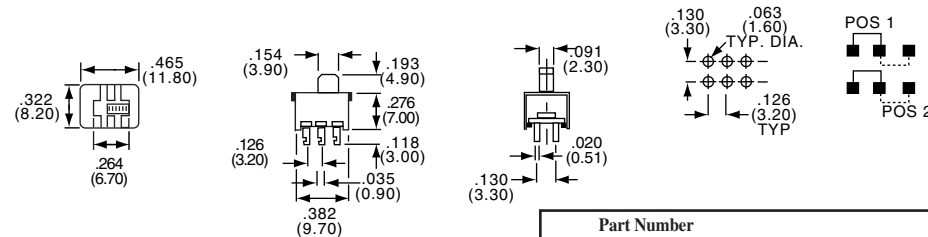
| Part Number      |            |      |          |                    |
|------------------|------------|------|----------|--------------------|
| Tyco Electronics | Alcoswitch | Type | Mounting | Terminals Contacts |
| 1-1437577-6      | SLS1201    | SPDT | PC       | Lug                |

### DPDT



Lug

SLS2201



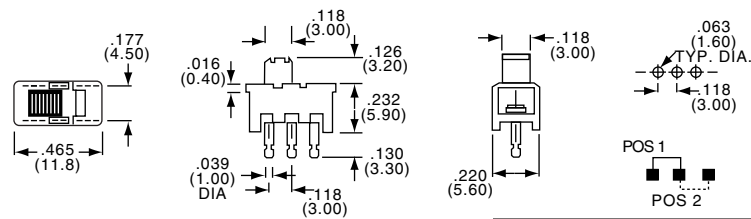
| Part Number      |            |      |          |                    |
|------------------|------------|------|----------|--------------------|
| Tyco Electronics | Alcoswitch | Type | Mounting | Terminals Contacts |
| 3-1437577-8      | SLS2201    | DPDT | PC       | Lug                |

### SPDT



Turret

SLSA1201



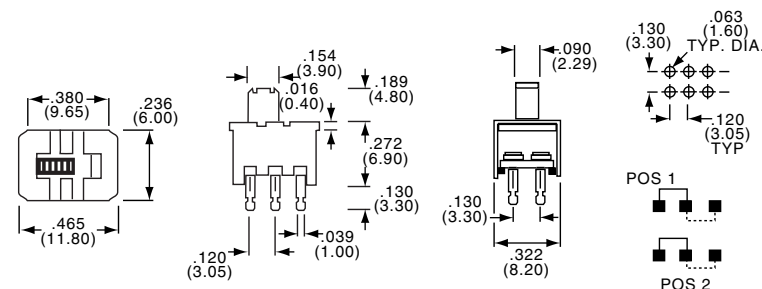
| Part Number      |            |      |          |                    |
|------------------|------------|------|----------|--------------------|
| Tyco Electronics | Alcoswitch | Type | Mounting | Terminals Contacts |
| 5-1437577-4      | SLSA1201   | SPDT | PC       | Turret             |

### DPDT



Turret

SLSA2201



| Part Number      |            |      |          |                    |
|------------------|------------|------|----------|--------------------|
| Tyco Electronics | Alcoswitch | Type | Mounting | Terminals Contacts |
| 5-1437577-6      | SLSA2201   | DPDT | PC       | Turret             |

## Slide Switches, Miniature, Rolling Contact, Economy Grade

### MATERIAL SPECIFICATIONS:

Contacts .....Silver over nickel plate over copper alloy  
Case Material .....Tin plate over steel  
Actuator Material .....Polycarbonate  
Terminals/Fixed Contacts.....Silver over nickel plate over copper alloy

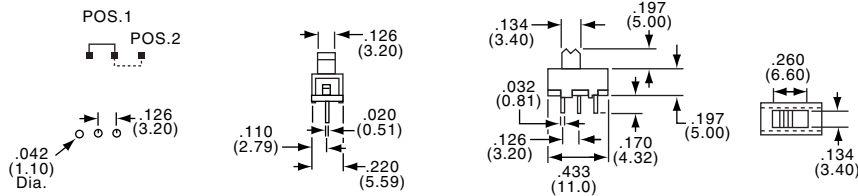
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....14°F to +185°F (-10°C to +85°C)  
Storage Temperature.....14°F to +185°F (-10°C to +85°C)

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....250 mA @ 125 VAC, 150 mA @ 12 VDC  
Initial Contact Resistance .....30 Milliohms max.  
Contact Timing .....Break before make  
Insulation Resistance .....500 Megohms min.  
Dielectric Strength .....500 VAC  
Actuation Force .....340 ± 57 Grams  
Actuator Travel.....0.126" (3.20)  
Life Expectancy .....Up to 6,000 to 10,000 Cycles

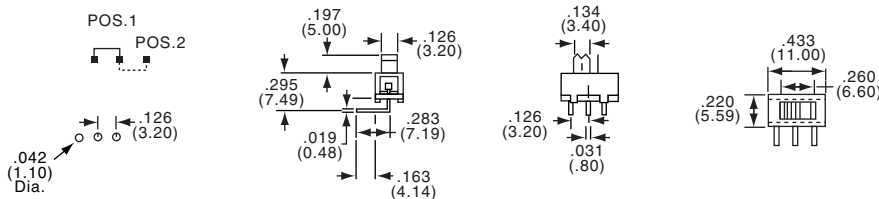
SPDT



SLS121PC

| Part Number      |            |                 |
|------------------|------------|-----------------|
| Tyco Electronics | Alcoswitch | Mounting Style  |
| 1-1437577-9      | SLS121PC   | Printed Circuit |

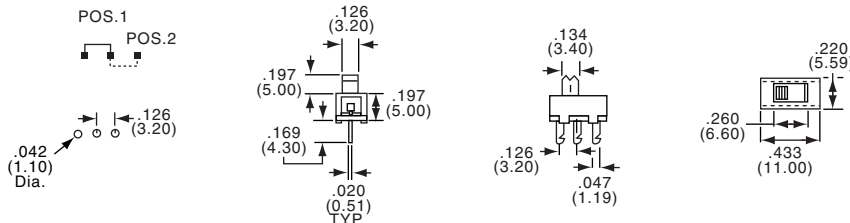
SPDT



SLS121RA

| Part Number      |            |                |
|------------------|------------|----------------|
| Tyco Electronics | Alcoswitch | Mounting Style |
| 2-1437577-2      | SLS121RA   | Right Angle PC |

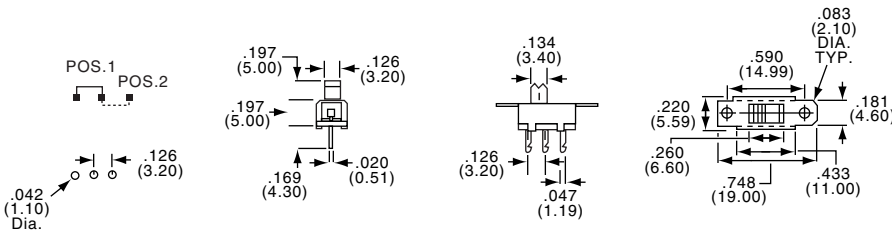
SPDT



SLS1211

| Part Number      |            |                 |
|------------------|------------|-----------------|
| Tyco Electronics | Alcoswitch | Mounting Style  |
| 1-1437577-8      | SLS1211    | Printed Circuit |

SPDT



SLS121

| Part Number      |            |                |
|------------------|------------|----------------|
| Tyco Electronics | Alcoswitch | Mounting Style |
| 1-1437577-7      | SLS121     | Panel Mounted  |

## Slide Switches, Miniature, Rolling Contact, Economy Grade

### MATERIAL SPECIFICATIONS:

Contacts .....Silver over nickel flash over copper alloy  
Case Material .....Steel  
Actuator Material .....Polycarbonate  
Terminals/Fixed Contacts.....Silver over nickel over copper alloy

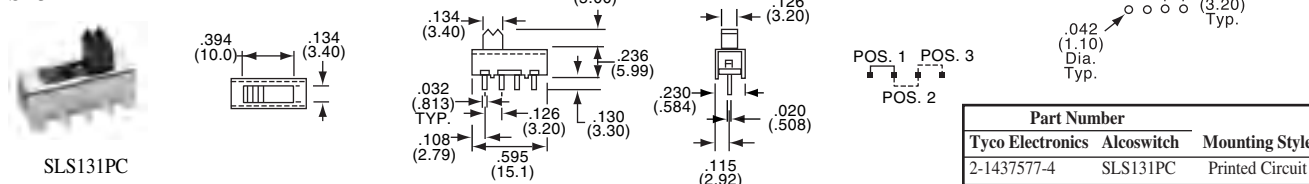
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....+14°F to +185°F (-10°C to +85°C)  
Storage Temperature.....+14°F to +185°F (-10°C to +85°C)  
Solder Heat Resistance .....+260°C for 5 seconds

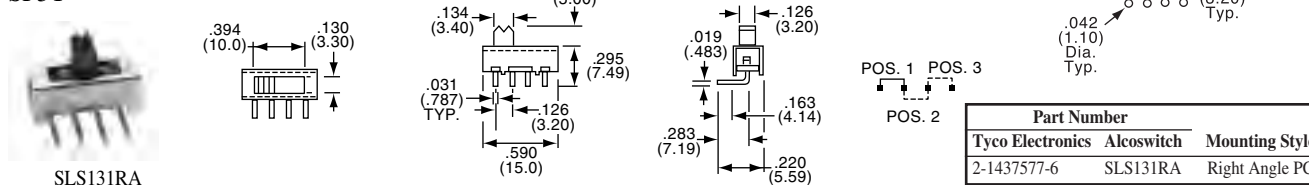
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....250mA @ 125 VAC  
150mA @ 12VDC  
Initial Contact Resistance .....20 Milliohms max.  
Contact Timing .....Break-Before-Make  
Insulation Resistance .....>50 Megohms.  
Dielectric Strength .....500 Volts RMS @ sea level  
Actuation Force .....340 ± 57 Grams  
Plunger/Actuator Travel: .....0.260" to 0.512" (6.60-13.00)  
Life Expectancy .....Up to 10,000 Cycles at no load

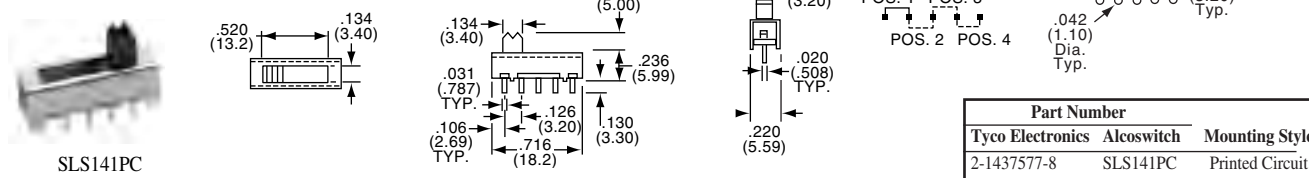
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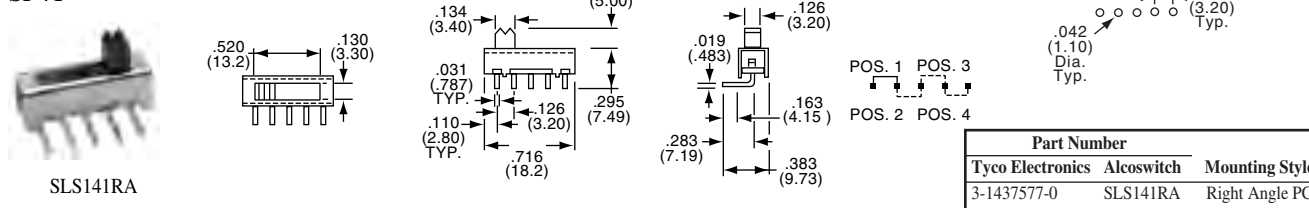
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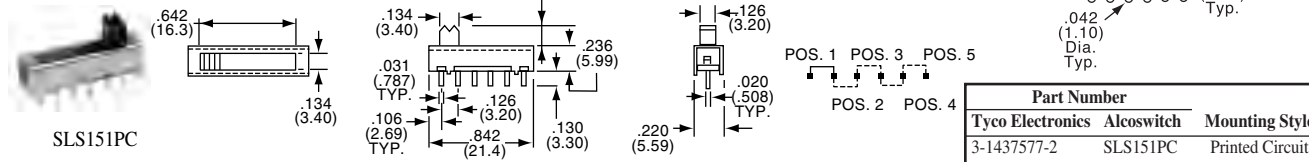
#### SP4T



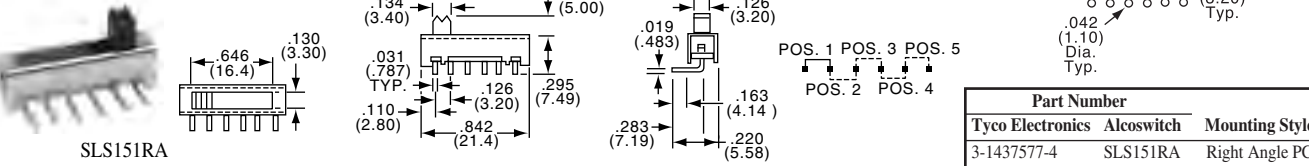
#### SP4T



#### SP5T



#### SP5T



## Slide Switches, Baton-Toggle, Multi Pole

### MATERIAL SPECIFICATIONS:

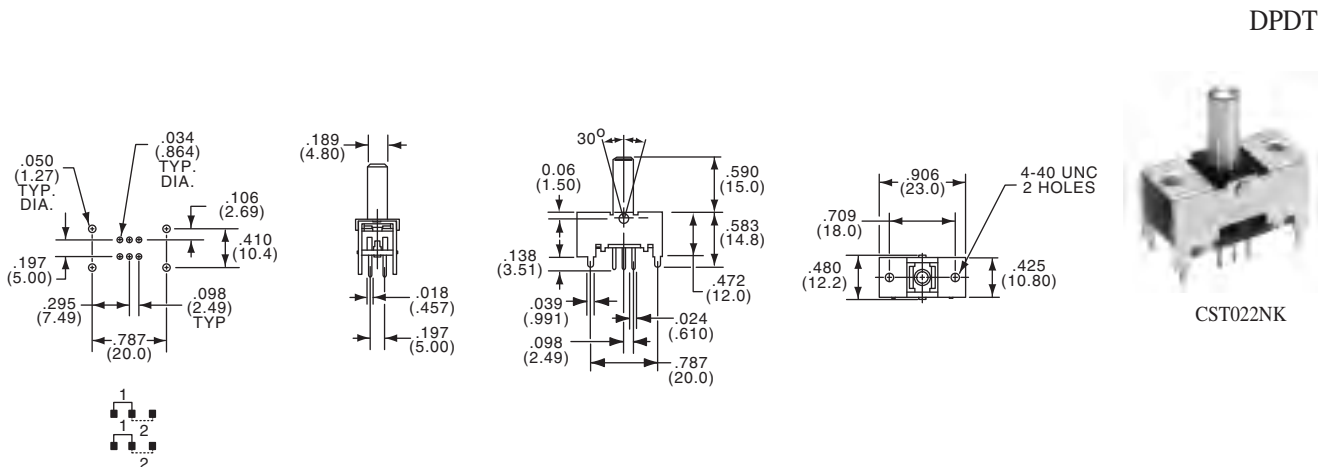
Contacts .....Silver clad over nickel plated copper alloy  
Case Material .....Steel, tin plate  
Actuator Material .....ABS plastic/Aluminum cap  
Terminals/Fixed Contacts.....Silver over nickel plated copper alloy  
Terminal Seal .....Epoxy

### ENVIRONMENTAL SPECIFICATIONS:

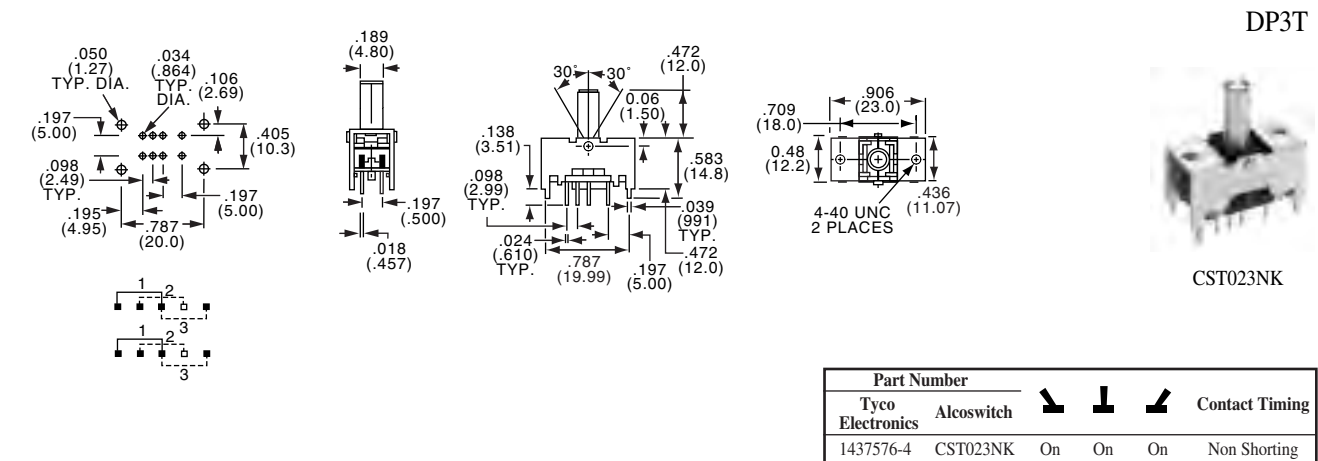
Operating Temperature.....+5°F to +131°F (-15°C to +55°C)  
Storage Temperature.....-4°F to +140°F (-20°C to +60°C)  
Solder Heat Resistance.....Hand: 300°C for 3 seconds  
Wave: 250°C for 5 seconds

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....300 mA @ 125 VAC, 200 mA @ 12VDC  
Initial Contact Resistance .....20 Milliohms max.  
Contact Timing .....See table below  
Insulation Resistance .....500 Megohms min.  
Dielectric Strength .....500 Volts RMS @ sea level  
Actuation Force .....450 ± 250 Grams  
Plunger/Actuator Travel .....30°  
Life Expectancy .....Up to 10,000 Cycles



| Part Number      |            |      |    |    | Contact Timing                                                         |
|------------------|------------|------|----|----|------------------------------------------------------------------------|
| Tyco Electronics | Alcoswitch |      |    |    |                                                                        |
| 1437576-2        | CST022NK   | None | On | On | Non Shorting - Break-Before-Make<br>(On) indicates momentary position. |



| Part Number      |            |    |    |    | Contact Timing |
|------------------|------------|----|----|----|----------------|
| Tyco Electronics | Alcoswitch |    |    |    |                |
| 1437576-4        | CST023NK   | On | On | On | Non Shorting   |



**Slide Switches, Baton-Toggle, Multi Pole**

SEE PAGE B45 FOR PRODUCT SPECIFICATIONS

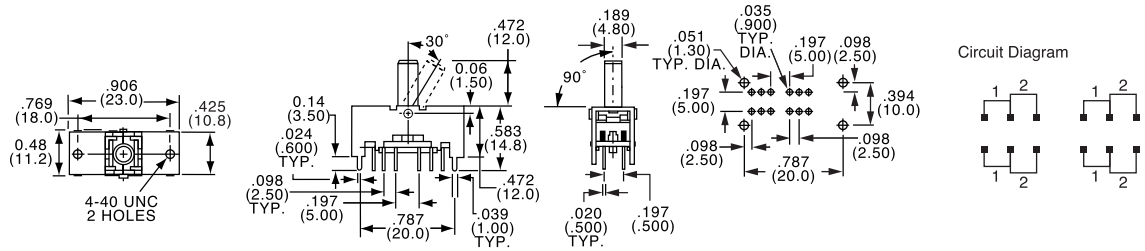
**B**

**CST Series**

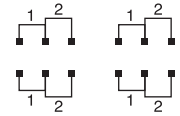
4PDT



CST042NK



Circuit Diagram

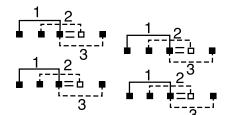
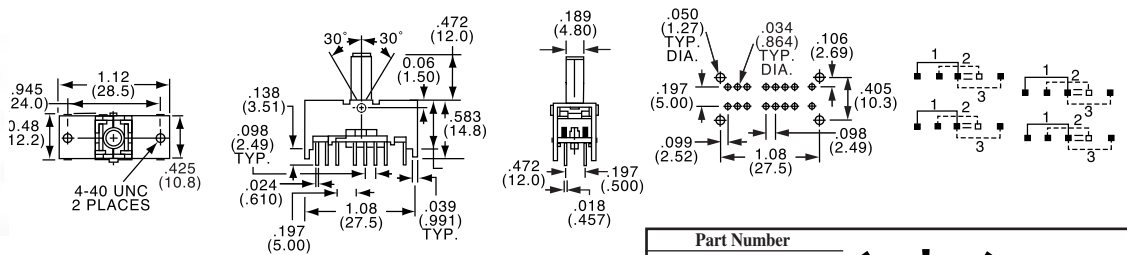


| Part Number      |            |      |    |    | Contact Timing |
|------------------|------------|------|----|----|----------------|
| Tyco Electronics | Alcoswitch |      |    |    |                |
| 1437576-5        | CST042NK   | None | On | On | Non Shorting   |

4P3T



CST043NK

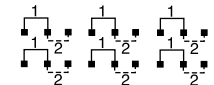
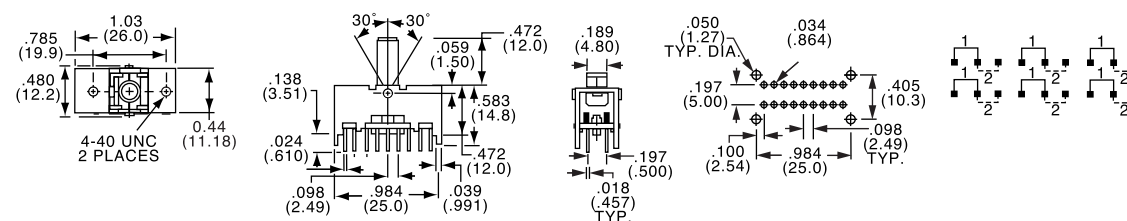


| Part Number      |            |    |    |    | Contact Timing |
|------------------|------------|----|----|----|----------------|
| Tyco Electronics | Alcoswitch |    |    |    |                |
| 1437576-6        | CST043NK   | On | On | On | Non Shorting   |

6PDT



CST062NK



| Part Number      |            |      |    |    | Contact Timing |
|------------------|------------|------|----|----|----------------|
| Tyco Electronics | Alcoswitch |      |    |    |                |
| 1437576-7        | CST062NK   | None | On | On | Non Shorting   |



## Slide Switches, Miniature, Right Angle, Surface Mount

### MATERIAL SPECIFICATIONS:

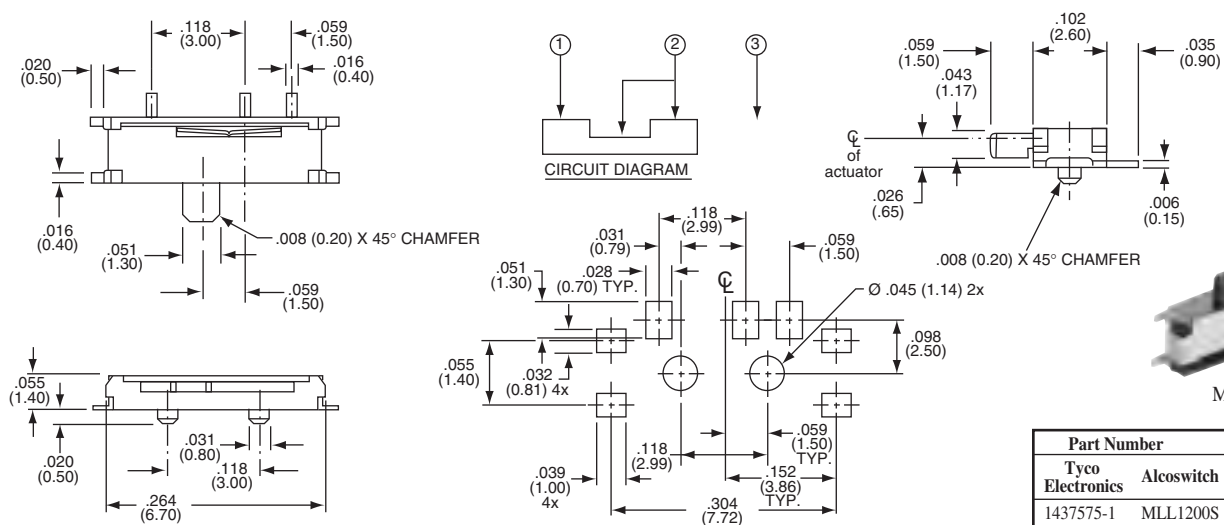
Contacts .....BeCu, copper alloy, 1 micron silver plate  
Case Material .....40% G.F. PPS, UL94V-0  
Frame .....Stainless steel, silver plated  
Actuator Material .....Nylon, UL94HB polyamide  
Terminals .....Brass, copper alloy, 1 micron silver plate  
Terminal Seal.....Epoxy

### ENVIRONMENTAL SPECIFICATIONS:

Humidity .....MIL-STD-202, Method 103, Condition B  
Moisture Resistance .....MIL-STD-202, Method 106  
Thermal Shock .....MIL-STD-202, Method 107, Condition A  
Solder Heat Resistance ...230°C per EIA 364-56 Level 2

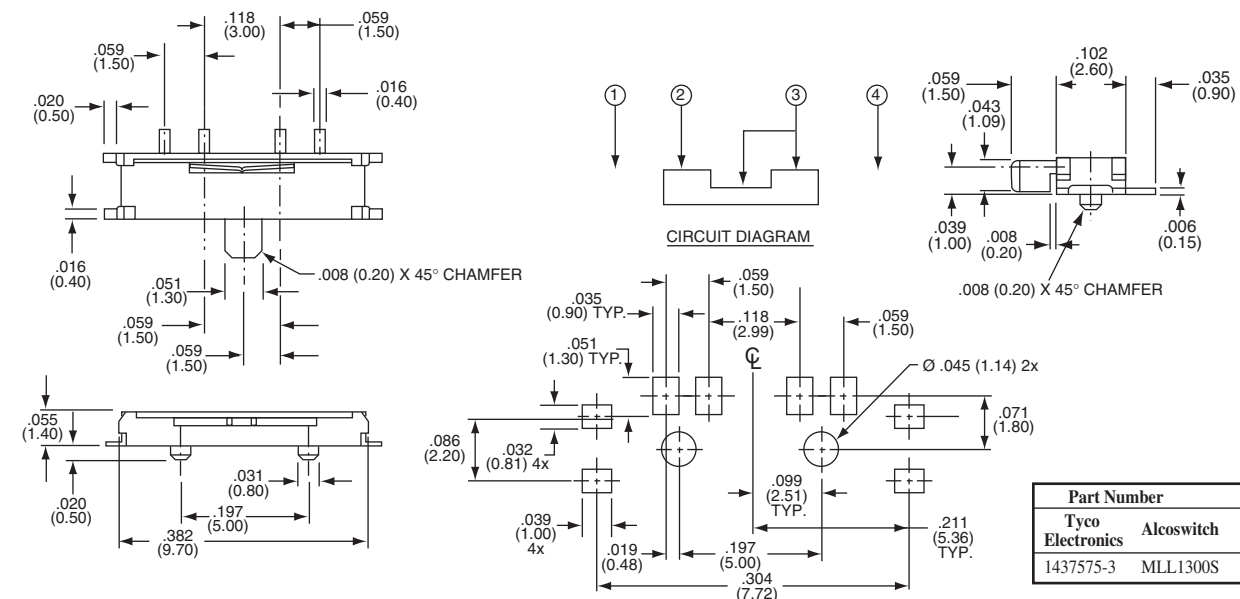
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.3 Amp, 4 VDC  
Initial Contact Resistance .....70 Milliohms  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....100 VAC min.  
Actuation Force .....175 ±100 Grams  
Life Expectancy .....Up to 10,000 Cycles  
Travel .....0.059 (1.5mm)



SPDT

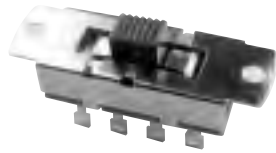
| Part Number      |            |      |
|------------------|------------|------|
| Tyco Electronics | Alcoswitch | Type |
| 1437575-1        | MLL1200S   | SPDT |
| 1437575-2        | MLL1200STR | SPDT |



SP3T

| Part Number      |            |      |
|------------------|------------|------|
| Tyco Electronics | Alcoswitch | Type |
| 1437575-3        | MLL1300S   | SP3T |

## 13 Amp & 6 Amp, Panel Mount



### ENVIRONMENTAL SPECIFICATIONS:

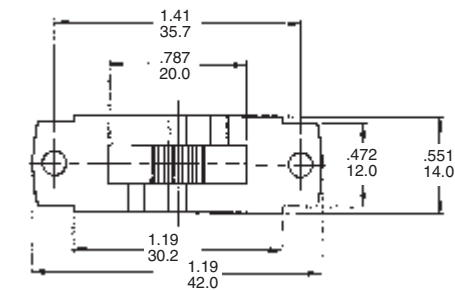
Operating Temperature ..-4°F to 149°F (-20° to +65°C)  
Storage Temperature .....-13°F to 158°F (-25° to +70°C)  
Solder Heat Resistance ..Per EIA-364-56A, Procedure 3, Condition B  
Solderability .....Per EIA-364-52, Class 2, Category 1, 95% minimum coverage

### MATERIAL SPECIFICATIONS:

Contacts .....Copper alloy, silver plate  
Board .....Phenolic, UL94V0  
Frame .....Steel, nickel plate  
Actuator Material.....Nylon, UL94V-2  
Terminals .....Copper alloy, silver plate  
Terminal Seal .....Epoxy

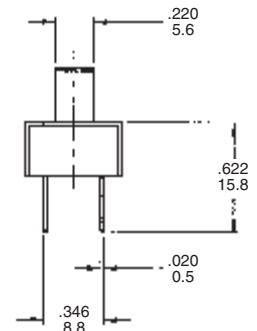
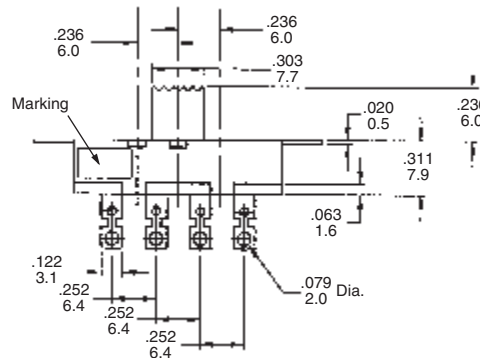
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....13 Amp, 125 VAC or 6.5 Amp, 250 VAC  
Initial Contact Resistance.....50 Milliohms max.  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....1200 VAC  
Actuation Force .....100-900 Grams  
Life Expectancy .....Up to 5000 Cycles  
Travel .....0.236 (6.0mm)



DP3T

Part Number 1571490-1



### MATERIAL SPECIFICATIONS:

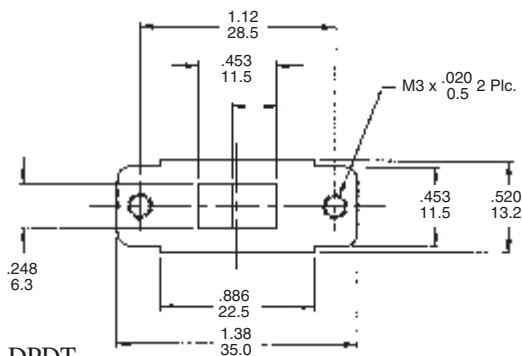
Contacts .....Copper alloy, silver plate  
Board .....Phenolic, UL94HB  
Frame .....Steel, nickel plate  
Actuator Material.....Polycarbonate, UL94V-2  
Terminals .....Copper alloy, silver plate  
Terminal Seal .....Epoxy

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....6 Amp, 125 VAC or 3 Amp, 250 VAC  
Initial Contact Resistance.....50 Milliohms max.  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....1800 VAC  
Actuation Force .....500-900 Grams  
Life Expectancy .....5000 Cycles  
Travel .....0.197 (5.0mm)

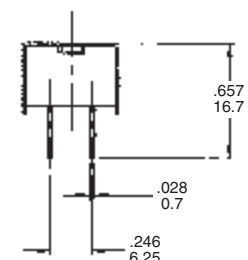
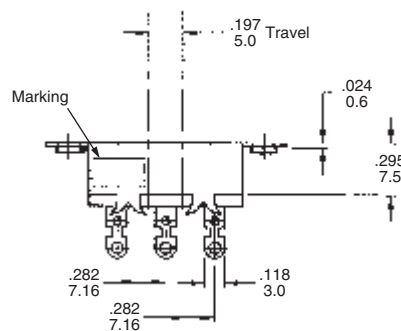
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature ..-4°F to 149°F (-20° to +65°C)  
Storage Temperature .....-13°F to 158°F (-25° to +70°C)  
Solder Heat Resistance ..Per EIA-364-56A, Procedure 3, Condition B  
Solderability .....Per EIA-364-52, Class 2, Category 1, 95% minimum coverage



DPDT

Part Number 1571491-1





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*TT Series - Page C8*



*ATE Series - Page C19*



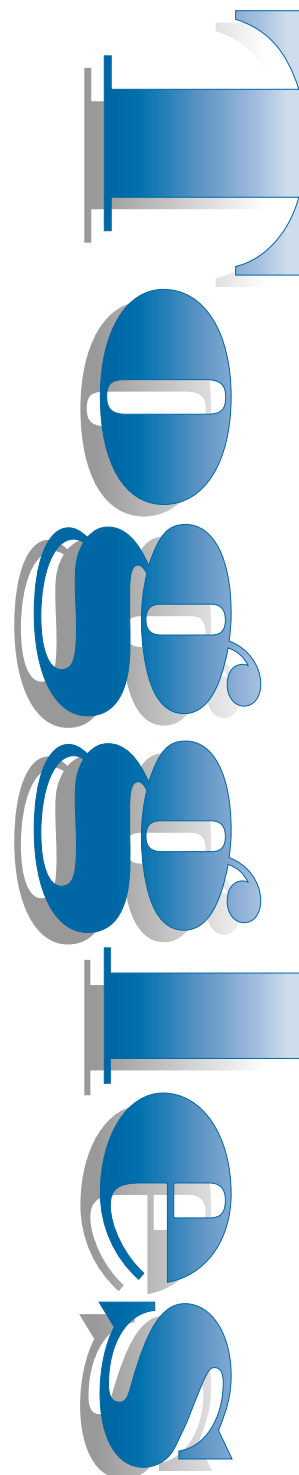
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*AE Series - Page C35*



*MT Series - Page C43*



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| MTA106E .....C43     | MTF426N .....C47        | TT11DGPC3 .....C8        | TT21PGRA7T1/4 .....C12    |
| MTA106EPC .....C44   | MTG106D .....C48        | TT11DGPC42 .....C8       | TT21PGRA8T1/4 .....C8     |
| MTA106F .....C43     | MTG106E .....C48        | TT11DGPC5T1/42 .....C8   | TT21PGRA9T1/4 .....C8     |
| MTA106FPC .....C44   | MTG106F .....C48        | TT11DGPC7T1/4 .....C8    | TT21PGVRA1 .....C11       |
| MTA106G .....C43     | MTG106G .....C48        | TT11DGPC8T1/4 .....C8    | TT21PGWW2T .....C13       |
| MTA106GPC .....C44   | MTG106H .....C48        | TT11DGPC9T1/4 .....C11   | TT21RGPC1 .....C8         |
| MTA106H .....C43     | MTG126D .....C49        | TT11DGPC9T1/4ES .....C16 | TT21RGPC7T1/4 .....C8     |
| MTA106HPC .....C44   | MTG126E .....C49        | TT11DGRA1 .....C8        | TT21RGPC9T1/4 .....C11    |
| MTA206N .....C43     | MTG206N .....C48        | TT11DGRA1ES .....C8      | TT23K2T .....C14          |
| MTA206NPC .....C44   | MTG206P .....C48        | TT11DGRA1T .....C8       | TT23K3T .....C15          |
| MTA206P .....C43     | MTG206PA .....C48       | TT11DGRA40 .....C8       | TT23K9T1/4 .....C15       |
| MTA206PA .....C43    | MTG206R .....C48        | TT11DGRA42 .....C8       | TT23N2T .....C14          |
| MTA206PAPC .....C44  | MTG206S .....C48        | TT11DGRA46 .....C8       | TT23N3T .....C15          |
| MTA206PPC .....C44   | MTG206T .....C48        | TT11DGRA49 .....C8       | TT23N4T1/40 .....C8       |
| MTA206R .....C43     | MTG226N .....C49        | TT11DGRA7T1/4 .....C12   | TT23NG6T0 .....C8         |
| MTA206RPC .....C44   | MTG226P .....C49        | TT11DGRA8T1/4 .....C8    | TT23NGT6 .....C8          |
| MTA206S .....C43     | MTG226PA .....C49       | TT11DGRA9T1/4 .....C8    | TT23N7T1/4 .....C14       |
| MTA206SA .....C43    | MTG306D .....C48        | TT11DGVR1 .....C11       | TT23N9T1/4 .....C15       |
| MTA206SAPC .....C44  | MTG306E .....C48        | TT11DGVR3T .....C11      | TT23NRA1 .....C8          |
| MTA206SPC .....C44   | MTG326D .....C49        | TT11DGWW2T .....C13      | TT23P2T .....C14          |
| MTA206T .....C43     | MTG406N .....C48        | TT11EGPC1 .....C10       | TT23P3T .....C15          |
| MTA206TA .....C43    | MTG406P .....C48        | TT11EGPC1T .....C8       | TT23P6T0 .....C8          |
| MTA206TPC .....C44   | MTG426N .....C49        | TT11EGPC3 .....C8        | TT23P7T1/4 .....C14       |
| MTA306D .....C43     | MTL106D .....C50        | TT11EGPC40 .....C8       | TT23P8T1/4 .....C8        |
| MTA306DPC .....C44   | MTL106E .....C50        | TT11EGPC5T1/40 .....C8   | TT23P9T1/4 .....C15       |
| MTA306E .....C43     | MTL206N .....C50        | TT11EGPC7T1/4 .....C8    | TT41NGPC1 .....C10        |
| MTA306EPC .....C44   | MTL206P .....C50        | TT11EGPC8T1/4 .....C8    | TT41NGPC8T1/4 .....C8     |
| MTA306F .....C43     | MTL206PA .....C50       | TT11EGPC9T1/4 .....C11   | TT41NGPC9T1/4 .....C11    |
| MTA306FPC .....C44   | MTL206S .....C50        | TT11EGPC9T1/4ES .....C16 | TT41NGRA1 .....C8         |
| MTA306H .....C43     | MTL306D .....C50        | TT11EGRA1 .....C8        | TT41NGRA2T1/4 .....C8     |
| MTA306HPC .....C44   | MTL406N .....C50        | TT11EGRA3 .....C8        | TT41NGRA3 .....C8         |
| MTA406N .....C43     | MTL406PA .....C50       | TT11EGRA40 .....C8       | TT41NGRA7T1/4 .....C12    |
| MTA406NPC .....C44   | MTM106DPC .....C51      | TT11EGRA42 .....C8       | TT41NGRA9T1/4 .....C8     |
| MTA406P .....C43     | MTM106EPC .....C51      | TT11EGRA46 .....C8       | TT41NGWW2T .....C13       |
| MTA406PA .....C43    | MTM106FPC .....C51      | TT11EGRA7T1/4 .....C12   | TT41NGWC9T1/4 .....C11    |
| MTA406PAPC .....C44  | MTM206NPC .....C51      | TT11EGRA9T1/4 .....C8    | TT43N2T .....C14          |
| MTA406PPC .....C44   | MTM206PAPC .....C51     | TT11EGVRA1 .....C11      | TT43N3T .....C15          |
| MTA8106DRA .....C52  | MTM206SPC .....C51      | TT11EGVRA1T .....C8      | TT43N7T1/4 .....C14       |
| MTA8106DVRA .....C53 | MTM306DPC .....C51      | TT11EGVRA3T .....C11     | TT43N9T1/4 .....C15       |
| MTA8106ERA .....C52  | MTM406NPC .....C51      | TT11EGWW2T .....C13      | TT43P3T .....C15          |
| MTA8106EVRA .....C53 | MTM8106DRA .....C52     | TT11FGPC7T1/4 .....C8    | TT43P7T1/4 .....C14       |
| MTA8106FRA .....C52  | MTM8106DVRA .....C53    | TT11FGPC9T1/4 .....C11   | TT43P9T1/4 .....C15       |
| MTA8106FVRA .....C53 | MTM8106ERA .....C52     | TT11IFGRA7T1/4 .....C12  | TT41NGWW2T .....C13       |
| MTA8206NRA .....C53  | MTM8106EVRA .....C53    | TT11IFGRA9T1/4 .....C8   | TTE11AG9T1/4ES .....C8    |
| MTA8206NVRA .....C54 | MTM8106FRA .....C52     | TT11IFGRA3T .....C8      | TTE11AGPC3TES .....C18    |
| MTA8206PRA .....C53  | MTM8206NRA .....C52     | TT12K8T1/4 .....C8       | TTE11AGPC9T1/4 .....C8    |
| MTA8206PVRA .....C54 | MTM8206PRA .....C52     | TT13A2T .....C14         | TTE11AGPC9T1/4ES .....C18 |
| MTA8206RRA .....C53  | MTM8206PRA .....C52     | TT13A3T .....C15         | TTE11DGPC1ES .....C17     |
| MTB106D .....C45     | MTM8206PVRA .....C53    | TT13A6T .....C8          | TTE11DGPC3TES .....C18    |
| MTB106E .....C45     | MTM8206RRA .....C52     | TT13A6T0 .....C8         | TTE11DGPC9T1/4ES .....C18 |
| MTB106F .....C45     | MTM8206RVRA .....C53    | TT13A6T2 .....C8         | TTE11DGRA1ES .....C17     |
| MTB106G .....C45     | N11-AG .....C54         | TT13A9T1/4 .....C15      | TTE11EG1 .....C8          |
| MTB206N .....C45     | N1A .....C54            | TT13D2T .....C14         | TTE11EGPC1ES .....C17     |
| MTB206P .....C45     | N1A0 .....C54           | TT13D2T1/4 .....C8       | TTE11EGPC3TES .....C18    |
| MTB206T .....C45     | N1-AG .....C54          | TT13D3T .....C15         | TTE11EGPC9T1/4ES .....C18 |
| MTB306D .....C45     | N1B .....C54,D32        | TT13D4T0 .....C8         | TTE11EGRA1ES .....C17     |
| MTB406N .....C45     | N1C .....C54            | TT13D4T1/49 .....C8      | TTE13A9T1/4 .....C8       |
| MTE106D .....C46     | N2-AG .....C54          | TT13D6T0 .....C8         | TTE13D2T .....C8          |
| MTE106E .....C46     | N35-AG .....C54,D32     | TT13D7T1/4 .....C14      | TTE13D8T1/4 .....C8       |
| MTE106F .....C46     | N3-AG .....C54          | TT13D9T1/4 .....C15      | TTE13D9T1/4 .....C8       |
| MTE106G .....C46     | N40-AG .....C54         | TT13D9T1/4ES .....C8     | TTE13DG2T .....C8         |
| MTE106H .....C46     | N43-AG .....C54         | TT13DPC2TE .....C8       | TTE13E8T1/4 .....C8       |
| MTE206N .....C46     | N45-AG .....C54,D32     | TT13E2T .....C14         | TTE21KGPC9T1/4ES .....C18 |
| MTE206P .....C46     | SPA32 .....C55          | TT13E3T .....C15         | TTE21NG2T1/4ES .....C8    |
| MTE206PA .....C46    | SPA42 .....C55          | TT13E7T1/4 .....C14      | TTE21NGPC1ES .....C8,C17  |
| MTE206R .....C46     | TST11DGPC1D .....C5,C6  | TT13E9T1/4 .....C15      | TTE21NGPC3TES .....C8,C18 |
| MTE206S .....C46     | TST11DGPC4D .....C5     | TT21KGPC1 .....C10       | TTE21NGPC9T1/4ES .....C18 |
| MTE206T .....C46     | TST11DGRA1D .....C5,C7  | TT21KGPC9T1/4 .....C11   | TTE21NGPC9T1/4S .....C8   |
| MTE306D .....C46     | TST11DGRA2D .....C5     | TT21KGPC9T1/4ES .....C16 | TTE21NGRA1ES .....C8,C17  |
| MTE306E .....C46     | TST11DGSPC1D .....C5,C6 | TT21NG2T .....C8         | TTE21PGPC1ES .....C17     |
| MTE406N .....C46     | TST11DGSRA1D .....C5,C6 | TT21NGPC1 .....C10       | TTE21PGPC3TES .....C18    |
| MTE406P .....C46     | TST11DGSRA1D .....C5,C6 | TT21NGPC1ES .....C16     | TTE21PGPC9T1/4ES .....C18 |
| MTF106D .....C47     | TST11DGVRA1D .....C5,C7 | TT21NGPC1T .....C8       | TTE21PGRA1ES .....C17     |
| MTF106E .....C47     | TST11DGVRA2D .....C5    | TT21NGPC1T1/4 .....C8    | TTE23N2T .....C8          |
| MTF106F .....C47     | TST11EGPC1D .....C5     | TT21NGPC2T1/4 .....C8    | TTE23N8T1/4 .....C8       |
| MTF106G .....C47     | TST11EGRA1D .....C5     | TT21NGPC4 .....C8        | TTE23N9T1/4 .....C8       |
| MTF106H .....C47     | TST11EGSRA1D .....C5    | TT21NGPC7T1/4 .....C8    | TTE23NG2T .....C8         |
| MTF126D .....C47     | TST11EGSRA2D .....C5    | TT21NGPC8T1/4 .....C8    | TTE23P8T1/4 .....C8       |
| MTF126E .....C47     | TST11EGVRA1D .....C5    | TT21NGPC9T1/4 .....C11   | TTE41NGPC1 .....C8        |
| MTF126F .....C47     | TST11FGPC1D .....C5     | TT21NGPC9T1/4ES .....C16 | TTE41NGWW2T .....C8       |
| MTF126G .....C47     | TST11FGRA1D .....C5     | TT21NGRA1 .....C8        | TTE43N8T1/4 .....C8       |
| MTF206N .....C47     | TST11FGSPC1D .....C5    | TT21NGRA1ES .....C8      | TTE43N9T1/4 .....C8       |
| MTF206P .....C47     | TST11FGSRA1D .....C5    | TT21NGRA3T1/4 .....C8    | TTE43N9T1/4E .....C8      |
| MTF206PA .....C47    | TST11FGVRA1D .....C5    | TT21NGRA7T1/4 .....C12   | TTE43P8T1/4 .....C8       |
| MTF206R .....C47     | TST11GGPC1D .....C5     | TT21NGRA8T1/4 .....C8    |                           |
| MTF206S .....C47     | TST11GGPC4D .....C5     | TT21NGRA9T1/4 .....C8    |                           |
| MTF206SA .....C47    | TST11GGRA1D .....C5     | TT21NGVRA1 .....C11      |                           |

**C**  
Toggle Switches

**Toggle Switches, Poles, Throws & Functions Selection Guide**

SERIES/CURRENT RATING/PAGE NUMBER

ATE Series .....0.4VA .....Page C19  
A/AE Series 0.4VA ..5 Amps.....Page C22/35

TT Series .....0.4VA 3 Amps .....Page C8  
TST Series .....0.4VA .....Page C5  
MT Series .....6 Amps .....Page C43

**C**

Toggle Switch Selection Guide

|                                 | SPDT                               | DPDT                           | 3PDT  | 4PDT                 |
|---------------------------------|------------------------------------|--------------------------------|-------|----------------------|
| On - None - On<br>2 Position    | ATE<br>Gemini<br>Tiny/TST<br>Green | ATE<br>Gemini<br>Tiny<br>Green | Green | Tiny<br>Green<br>ATE |
| On - Off - On<br>3 Position     | ATE<br>Gemini<br>Tiny/TST<br>Green | ATE<br>Gemini<br>Tiny<br>Green | Green | Tiny<br>Green        |
| On - None - (On)<br>2 Position  | ATE<br>Gemini<br>Tiny/TST<br>Green | Gemini<br>Tiny<br>Green        | Green | Tiny                 |
| (On) - Off - (On)<br>3 Position | ATE<br>Gemini<br>Green<br>TST      | ATE<br>Gemini<br>Green         | Green |                      |
| On - Off - (On)<br>3 Position   | Gemini<br>Green                    | Gemini<br>Green                | Green |                      |
| On - On - On<br>3 Position      |                                    | Gemini<br>Green                |       | Green                |
| (On) - On - (On)<br>3 Positions |                                    | Gemini<br>Green                |       |                      |
| On - On - (On)<br>3 Position    |                                    | Gemini<br>Green                |       |                      |
| On - Off<br>2 Position          | Tiny                               | Tiny                           |       |                      |



## Toggle Switches, Tiny, Sealed, Through Hole and Surface Mount

### FEATURES:

- Rating 0.4VA max. at 20VAC/DC
- High temperature plastics - Liquid crystal polymer (LCP)
- Specifically designed for thru-hole and surface mount applications - Tin lead plated terminals
- Washable process sealed construction - Internal actuator "O" Ring
- Ultrasonic welded case

### MATERIAL SPECIFICATIONS:

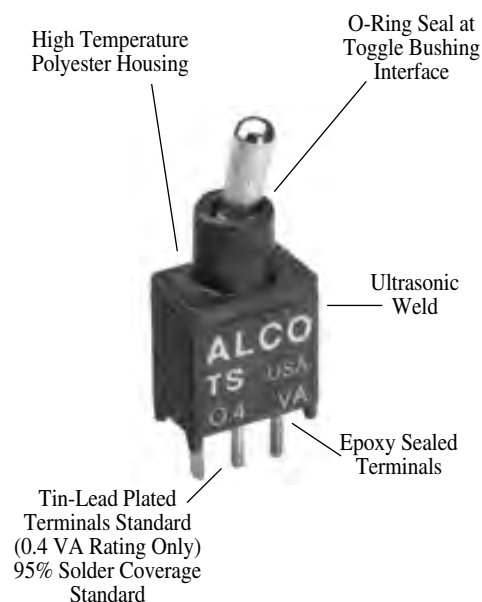
Contacts .....Copper alloy with gold over nickel plate  
 Case Material .....LCP  
 Actuator Material .....Nickel plated brass  
 Terminals .....Copper alloy with gold over nickel plating inside, tin plating outside  
 Terminal Seal .....Epoxy  
 Support Bracket .....Tin plated steel

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA @ 20 VAC/DC  
 Initial Contact Resistance .....20 Milliohms max.  
 Contact Timing .....Break-before-make  
 Insulation Resistance .....1,000 Megohms 500 VDC min.  
 Dielectric Strength .....1,000 Volt RMS @ sea level  
 Actuator Travel .....22° for E and D function  
 18° for F, G function  
 Life Expectancy .....D Function: Up to 80,000 cycles  
 E Function: Up to 60,000 cycles  
 F, G Function: Up to 30,000 cycles

### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature.....-22°F to +185°F (-30°C to +85°C)  
 Storage Temperature.....-67°F to +185°F (-55°C to +85°C)



### FUNCTION CHART

The following functions available in single pole.

None - indicates no mechanical position.

Off - indicates a mechanical position with no electrical connection.

(On) - indicates momentary connection.

|                     |             |      |      |      |
|---------------------|-------------|------|------|------|
| <b>D</b>            | 2 Positions | On   | None | On   |
| <b>E</b>            | 3 Positions | On   | Off  | On   |
| <b>F</b>            | 2 Positions | On   | None | (On) |
| <b>G</b>            | 3 Positions | (On) | Off  | (On) |
| Terminals Connected |             | 1-2  | -    | 2-3  |

### PART NUMBERING MATRIX

| Model | No. of Poles | Contact Rating | Function                                                                                                                    | Contact Plating | Terminations                                                                                                                                                                                                                                                                                                                                                                     | Actuator                                                                                                                                                                 | Bushing (Plain) |
|-------|--------------|----------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| TST   | 1            | 1              | <div> <div></div> <div>D on none on</div> <div>E on off on</div> <div>F on none(on)</div> <div>G (on) off (on)</div> </div> | G               | <div> <div>PC</div> <div>RA</div> <div>VRA</div> <div>SPC</div> <div>SRA</div> <div>SRAB</div> </div> <div>                     P.C.<br/>                     Right Angle<br/>                     Vertical Right Angle<br/>                     SurfaceMount<br/>                     Surface Mount R.A.<br/>                     SurfaceMount R.A. Butt                 </div> | <div> <div>1</div> <div>2</div> <div>4</div> </div> <div>                     .206"<br/>                     .250"<br/>                     .400"                 </div> | D               |

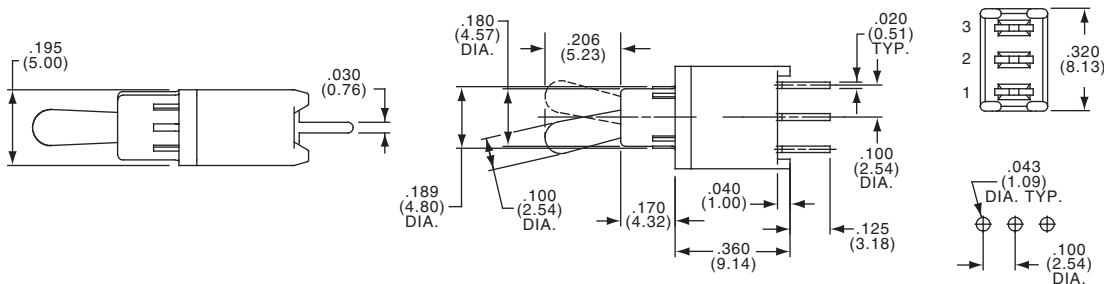
### APPLICATION NOTE:

For sealed pushbutton switches, see page D3 - D5



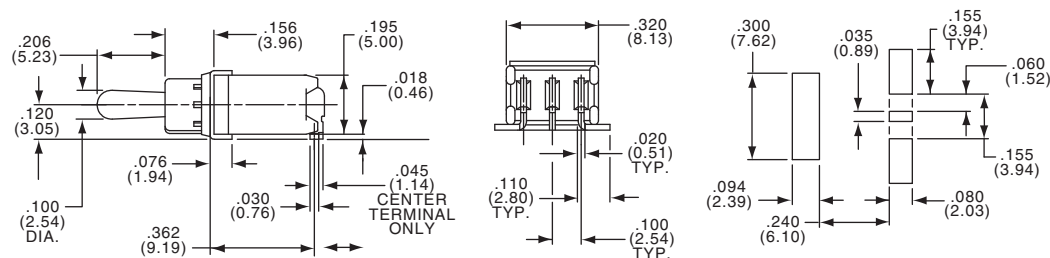
**Toggle Switches, Tiny, Sealed, Through Hole and Surface Mount**

**PC MOUNT PC**



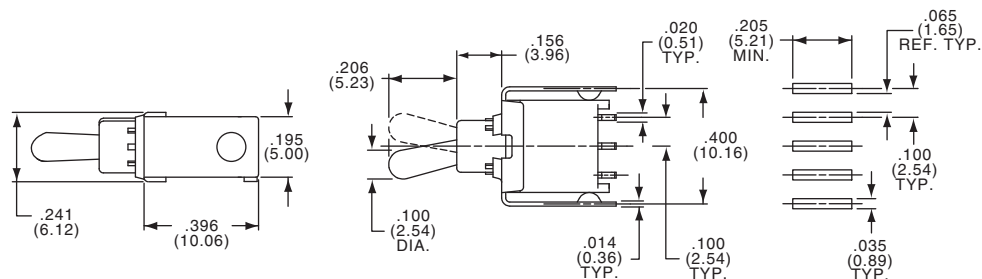
TST11DGPC1D

**SURFACE MOUNT RIGHT ANGLE "L" BEND SRA**



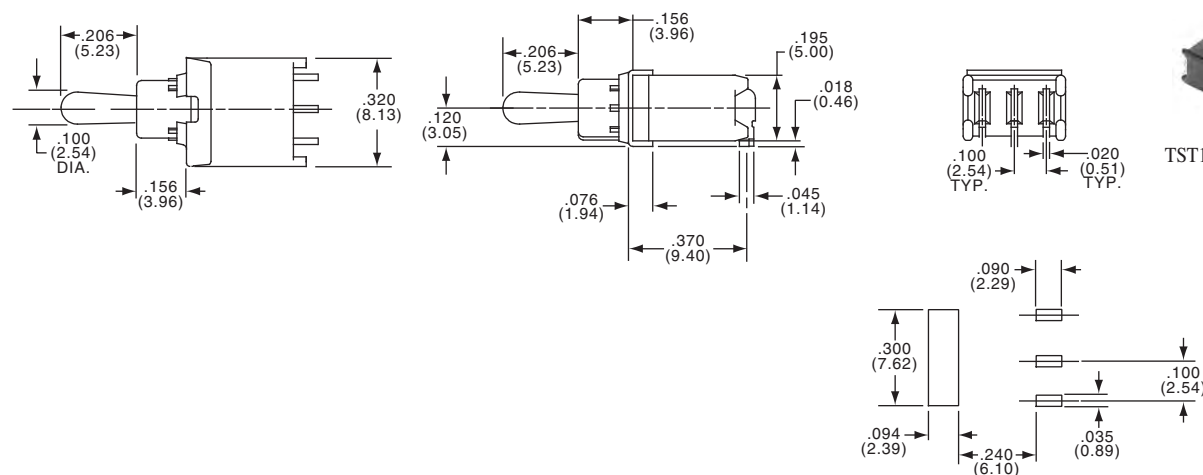
TST11DGSRA1D

**SURFACE MOUNT SPC**



TST11DGSPC1D

**SURFACE MOUNT RIGHT ANGLE BUTT SRAB**



TST11DGSRA1D

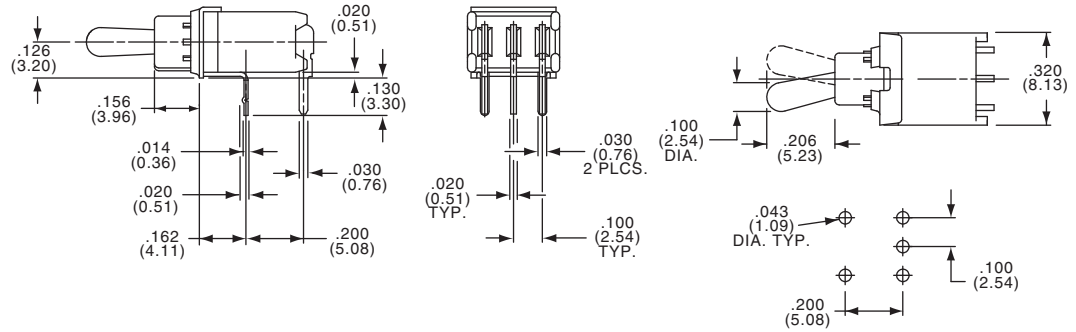
**Toggle Switches, Tiny, Sealed, Through Hole and Surface Mount**

**RA**

Right Angle



TST11DGRA1D

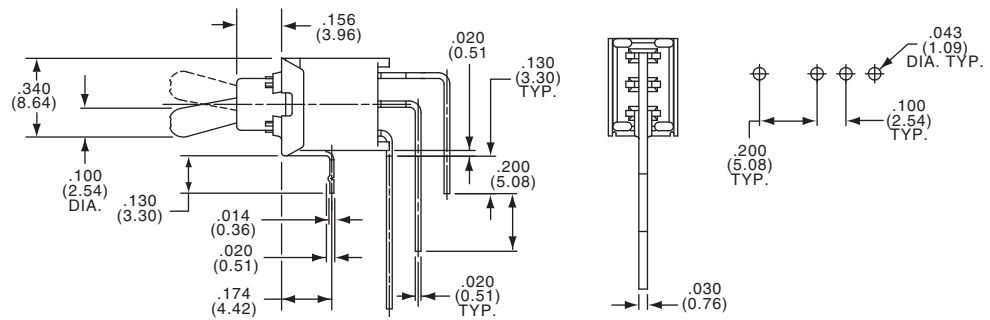


**VRA**

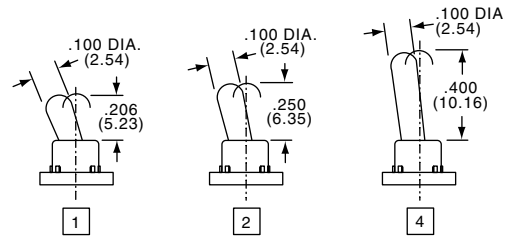
Vertical Right Angle



TST11DGVRA1D



**ACTUATORS**



## Toggle Switches, Tiny, Part Number Matrix

### MATERIAL SPECIFICATIONS:

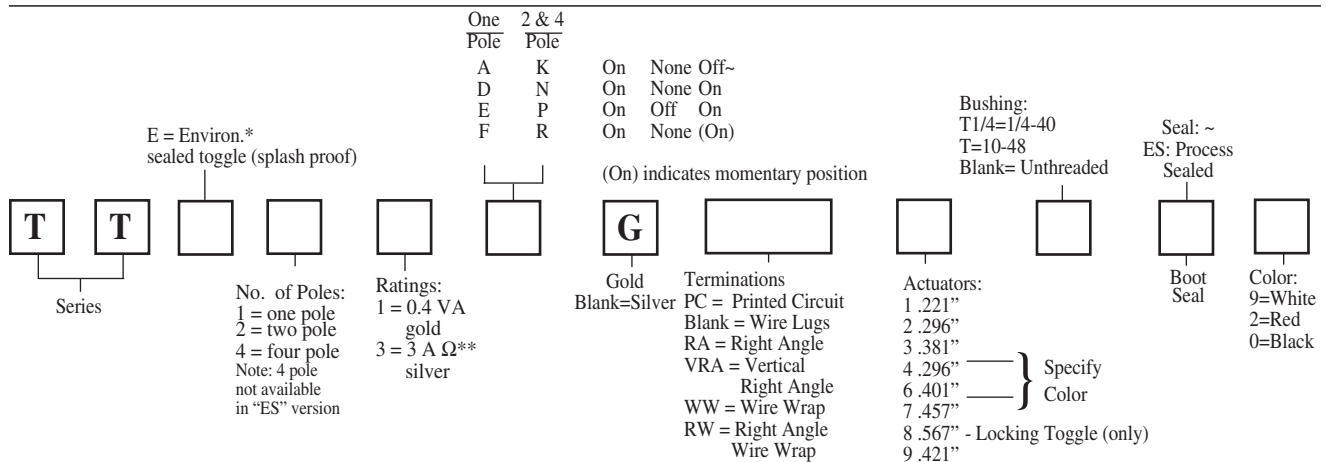
Contacts.....Gold over nickel or silver plate  
Case Material.....Thermoplastic 94V-0  
Terminals/Fixed Contacts.....Tin lead plate  
Terminal Seal.....Epoxy on single pole, optional  
on double pole  
Process Seal.....ES version only (see page C16 - C17)

### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature.....-22°F to +185°F (-30°C to +85°C)  
Storage Temperature.....-67°F to +185°F (-55°C to +85°C)  
Solder Heat Resistance.....See page M3-4  
U.L. (File E-46765).....Silver only

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating..... Gold: 0.4 VA max. @ 20 VDC or peak AC  
Silver (2 pos.): 3 A @ 125 VAC or 28 VDC  
Silver (3 pos.): 2 A @ 125 VAC or 28 VDC  
Initial Contact Resistance..... 20 Milliohms max.  
Contact Timing..... Break before Make  
Insulation Resistance..... 1,000 Megohms 500 VDC min.  
Dielectric Strength..... 1,000 Volts RMS @ sea level  
Plunger/Actuator Travel..... 26°  
High Torque Bushing Shoulder..... Yes  
Life Expectancy..... See chart below  
Note: Hardware included with switch



**Tiny toggle switch life expectancy chart**

|           |       |                 |                 |
|-----------|-------|-----------------|-----------------|
| One Pole  | 0.4VA | 80,000 (2 Pos.) | 60,000 (3 Pos.) |
| Two Pole  | 3 Amp | 20,000 (2 Pos.) | 10,000 (3 Pos.) |
| Four Pole | 0.4VA | 80,000 (2 Pos.) | 60,000 (3 Pos.) |
|           | 3 Amp | 20,000 (2 Pos.) | 10,000 (3 Pos.) |
|           | 3 Amp | 20,000 (2 Pos.) | 10,000 (3 Pos.) |

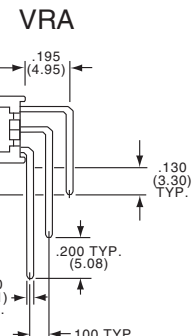
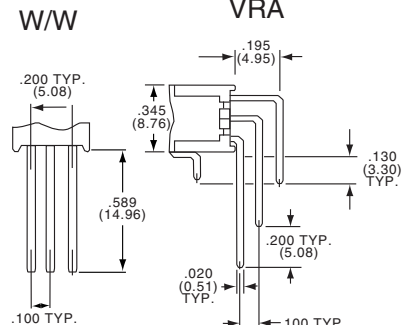
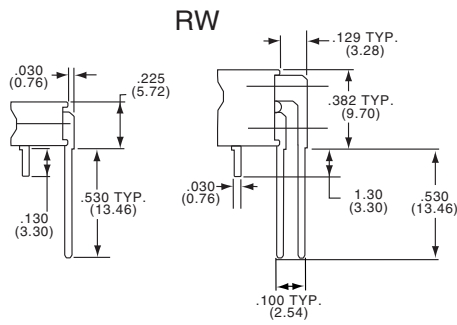
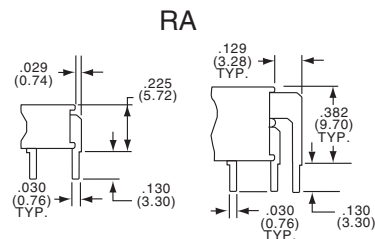
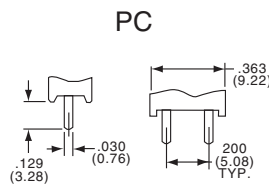
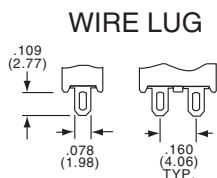
### APPLICATION NOTE:

For surface mount termination, use the "TST" series on page C5.  
For 3 pole refer to the MT Series on page C43

| Actuator Dimensions shown with |                |
|--------------------------------|----------------|
| 1,2,3,4,6                      | 10-48 bushing  |
| 7,8,9                          | 1/4-40 bushing |

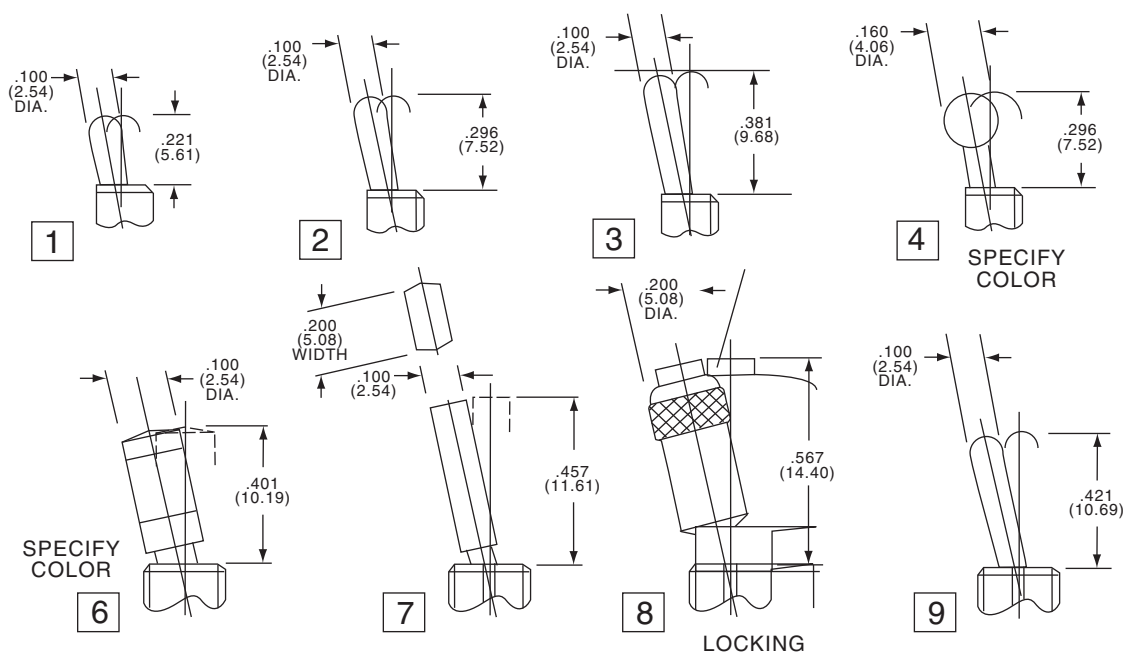
\* Not available on 7 actuator or with VRA.  
\*\* Not available in RA.  
Ω Available in PC & WL only.  
~ Available in WL & PC only.

### TERMINATIONS

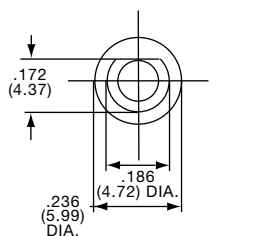
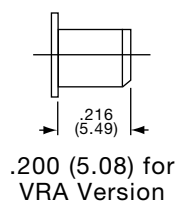


# Toggle Switches, Tiny, Actuator and Bushing Options

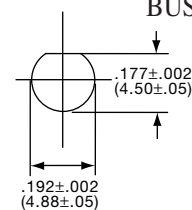
Toggle Cap  
Series C-11\*  
Available



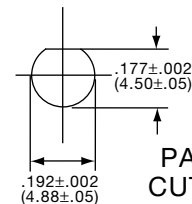
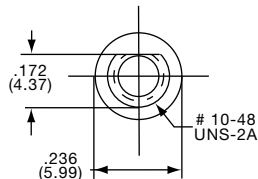
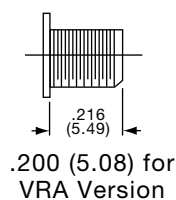
BLANK



BUSHINGS

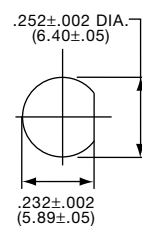
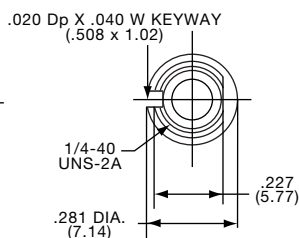
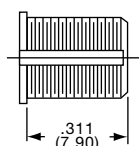


T



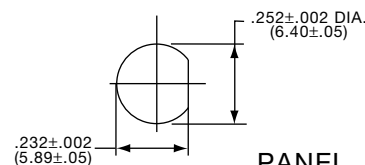
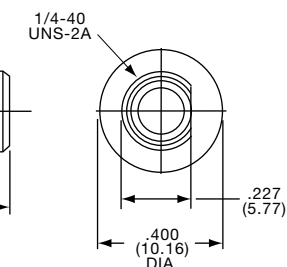
PANEL CUTOUT

T1/4



PANEL CUTOUT

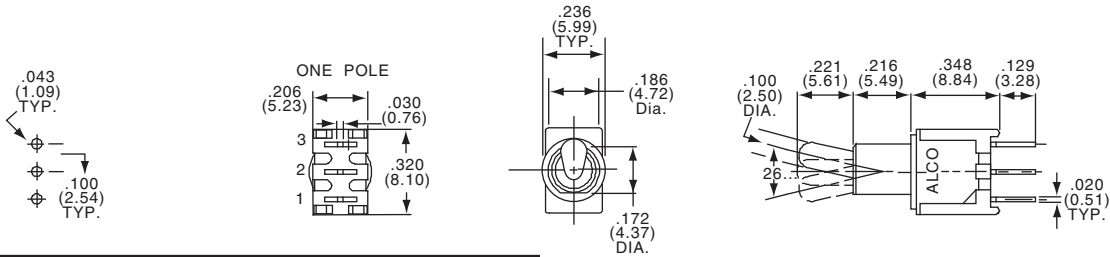
\*T1/4



PANEL CUTOUT

\*VERSION USED  
ON TTE(Enviromentally  
Sealed) Series

**Toggle Switches, Tiny, Vertical, PC Mount**



**1 POLE**

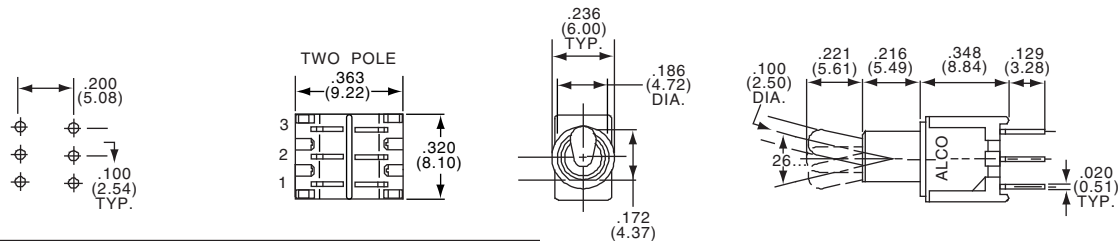
For Terminal Connections refer to Code Chart (see page M5-6)



TT11DGPC1

| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On | None | Off |
|------------------|------------|------|-----------------|----|------|-----|
| 2-1437561-3      | TT11AGPC1  | SPST | A               | On | None | Off |
| 2-1437561-6      | TT11DGPC1  | SPDT | D               | On | None | On  |
| 5-1437561-1      | TT11EGPC1  | SPDT | E               | On | Off  | On  |

Note: No center terminal on "A" switches



**2 POLE**

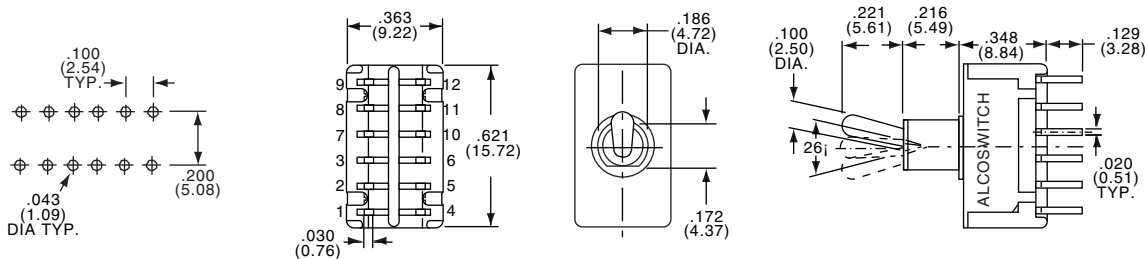
For Terminal Connections refer to Code Chart (see page M5-6)



TT21NGPC1

| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On | None | Off |
|------------------|------------|------|-----------------|----|------|-----|
| 9-1437561-9      | TT21KGPC1  | DPST | K               | On | None | Off |
| 1437562-3        | TT21NGPC1  | DPDT | N               | On | None | On  |
| 3-1437562-4      | TT21PGPC1  | DPDT | P               | On | Off  | On  |

Note: No center terminal on "K" switches



**4 POLE**



TT41NGPC1

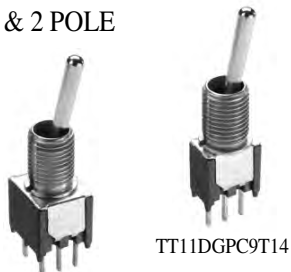
| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On | None | Off |
|------------------|------------|------|-----------------|----|------|-----|
| 6-1437562-6      | TT41NGPC1  | 4PDT | N               | On | None | On  |

**Toggle Switches, Tiny, Vertical and Vertical Right Angle, PC Mount**

SEE PAGE C8 FOR PRODUCT SPECIFICATIONS

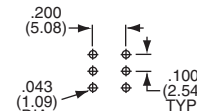
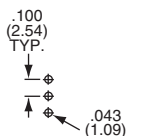
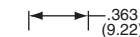
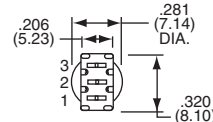
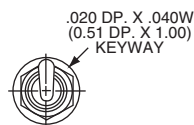
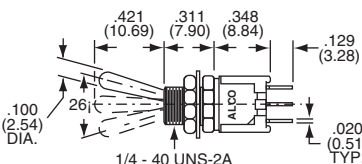
For terminal connections refer to Code Chart on page M5-6

1 & 2 POLE



TT11DGPC9T1/4

TT21NGPC9T1/4



4 POLE



TT41NGPC9T1/4

| Tyco Electronics | Alcoswitch    | Type | Act. | Code | P.   | M5  |  |  |  | Tyco Electronics | Alcoswitch    | Type | Act. | Code | P.   | M5   |  |  |  |
|------------------|---------------|------|------|------|------|-----|--|--|--|------------------|---------------|------|------|------|------|------|--|--|--|
| 2-1437561-5      | TT11AGPC9T1/4 | SPST | A    | On   | None | Off |  |  |  | 1-1437562-1      | TT21NGPC9T1/4 | DPDT | N    | On   | None | On   |  |  |  |
| 3-1437561-5      | TT11DGPC9T1/4 | SPDT | D    | On   | None | On  |  |  |  | 3-1437562-8      | TT21PGPC9T1/4 | DPDT | P    | On   | Off  | On   |  |  |  |
| 5-1437561-9      | TT11EGPC9T1/4 | SPDT | E    | On   | Off  | On  |  |  |  | 4-1437562-6      | TT21RGPC9T1/4 | DPDT | R    | On   | None | (On) |  |  |  |
| 7-1437561-3      | TT11FGPC9T1/4 | SPDT | F    | On   | None | On  |  |  |  | 6-1437562-8      | TT41NGPC9T1/4 | 4PDT | N    | On   | None | On   |  |  |  |
| 1437562-1        | TT21KGPC9T1/4 | DPST | K    | On   | None | Off |  |  |  | 7-1437562-5      | TT41PGPC9T1/4 | 4PDT | P    | On   | Off  | On   |  |  |  |

Note: No center terminal on "A" or "K" switches.

(On) indicates momentary position.

Note: Hardware Included

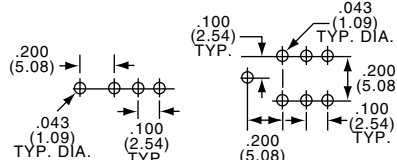
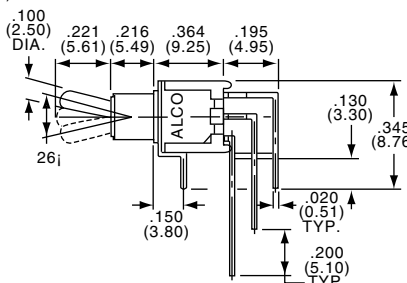
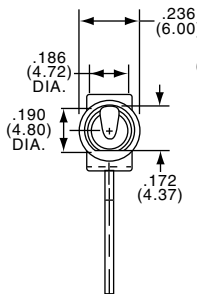
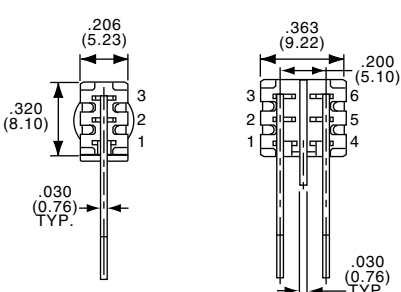
1 & 2 POLE



TT11DGVRA1  
Vertical Actuation



TT21NGVRA1  
Vertical Actuation



| Tyco Electronics | Alcoswitch | Type | Act. | Code | P.   | M5 |  |  |  |
|------------------|------------|------|------|------|------|----|--|--|--|
| 4-1437561-8      | TT11DGVRA1 | SPDT | D    | On   | None | On |  |  |  |
| 6-1437561-9      | TT11EGVRA1 | SPDT | E    | On   | Off  | On |  |  |  |
| 2-1437562-2      | TT21NGVRA1 | DPDT | N    | On   | None | On |  |  |  |
| 4-1437562-3      | TT21PGVRA1 | DPDT | P    | On   | Off  | On |  |  |  |

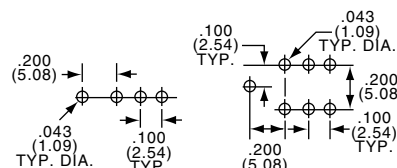
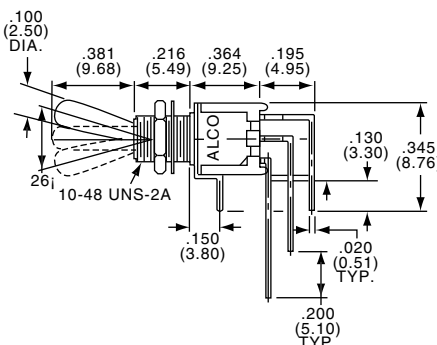
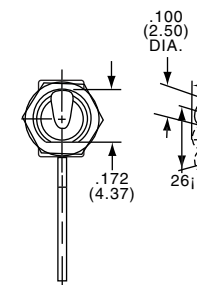
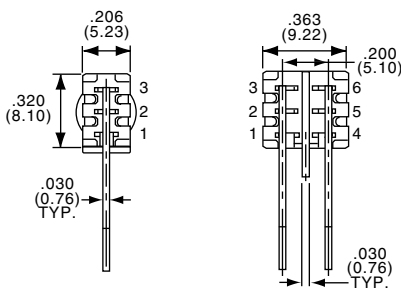
1 & 2 POLE



TT11DGVRA3T  
Vertical Actuation



TT21NGVRA3T  
Vertical Actuation



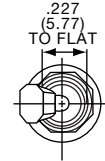
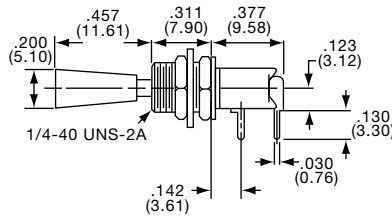
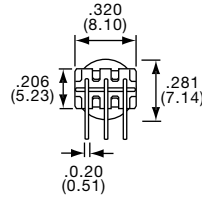
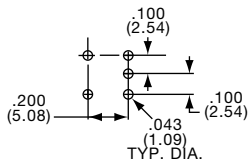
| Tyco Electronics | Alcoswitch  | Type | Act. | Code | P.   | M5 |  |  |  |
|------------------|-------------|------|------|------|------|----|--|--|--|
| 4-1437561-9      | TT11DGVRA3T | SPDT | D    | On   | None | On |  |  |  |
| 7-1437561-0      | TT11EGVRA3T | SPDT | E    | On   | Off  | On |  |  |  |
| 2-1437562-3      | TT21NGVRA3T | DPDT | N    | On   | None | On |  |  |  |

**Toggle Switches, Tiny, Right Angle, Flat Actuator**

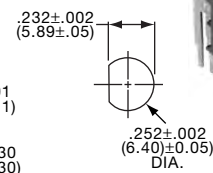
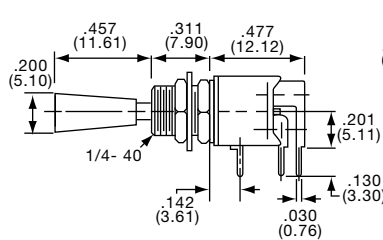
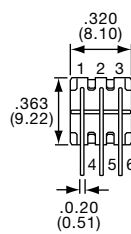
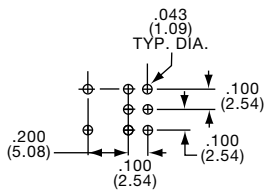
SEE PAGE C8 FOR PRODUCT SPECIFICATIONS

\* Refer to Page C8 for  
Other Options \*

1 & 2 POLE FLAT



TT11DGRA7T1/4  
Horizontal Actuation



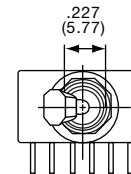
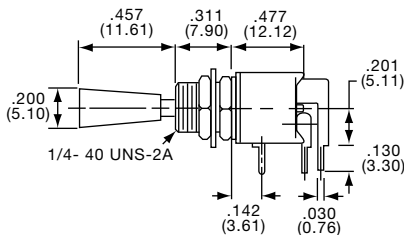
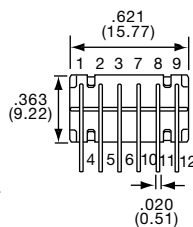
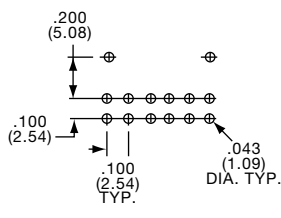
TT21NGRA7T1/4  
Horizontal Actuation

| Tyco Electronics | Alcoswitch    | Type | Act. Code | P. M5 | On | None | On   |
|------------------|---------------|------|-----------|-------|----|------|------|
| 4-1437561-5      | TT11DGRA7T1/4 | SPDT | D         |       | On | None | On   |
| 6-1437561-7      | TT11EGRA7T1/4 | SPDT | E         |       | On | Off  | On   |
| 7-1437561-4      | TT11FGRA7T1/4 | SPDT | F         |       | On | None | (On) |
| 1-1437562-9      | TT21NGRA7T1/4 | DPDT | N         |       | On | None | On   |
| 4-1437562-0      | TT21PGRA7T1/4 | DPDT | P         |       | On | Off  | On   |

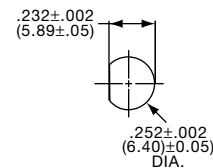
(On) indicates momentary position

Pinned for Anti-Rotation

4 POLE FLAT



TT41NGRA7T1/4  
Horizontal Actuation



| Tyco Electronics | Alcoswitch    | Type | Act. Code | P. M5 | On | None | On |
|------------------|---------------|------|-----------|-------|----|------|----|
| 7-1437562-2      | TT41NGRA7T1/4 | 4PDT | N         |       | On | None | On |

Pinned for Anti-Rotation



## Toggle Switches, Tiny, Wire Wrap Termination

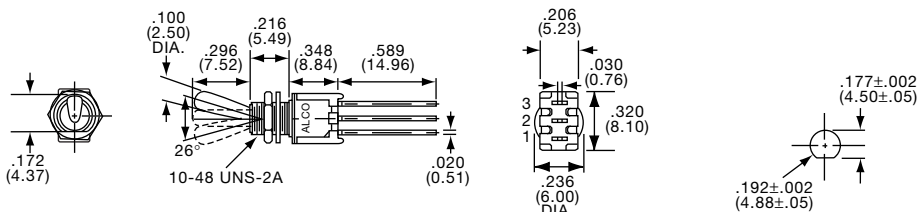
SEE PAGE C8 FOR PRODUCT SPECIFICATIONS

For terminal connections refer to Code Chart on page M5-6

### 1 POLE



TT11DGWW2T

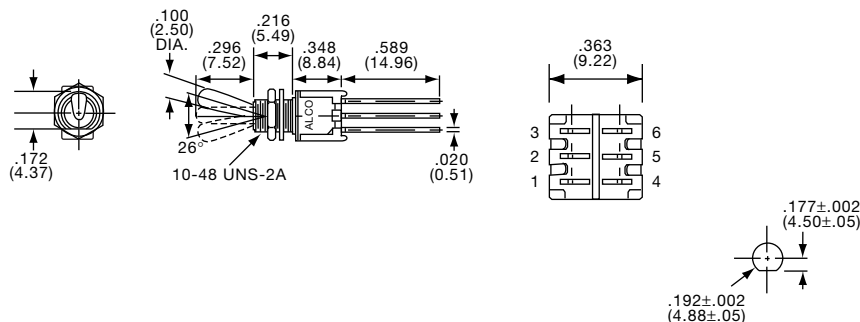


| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 |    |      |    |
|------------------|------------|------|-----------------|----|------|----|
| 5-1437561-0      | TT11DGWW2T | SPDT | D               | On | None | On |
| 7-1437561-1      | TT11EGWW2T | SPDT | E               | On | Off  | On |

### 2 POLE



TT21NGWW2T

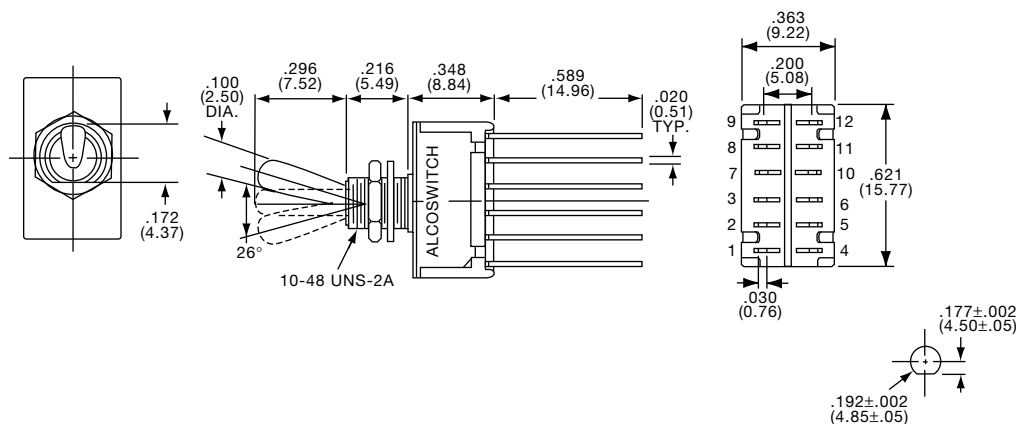


| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 |    |      |    |
|------------------|------------|------|-----------------|----|------|----|
| 2-1437562-4      | TT21NGWW2T | DPDT | N               | On | None | On |
| 4-1437562-4      | TT21PGWW2T | DPDT | P               | On | Off  | On |

### 4 POLE



TT41NGWW2T



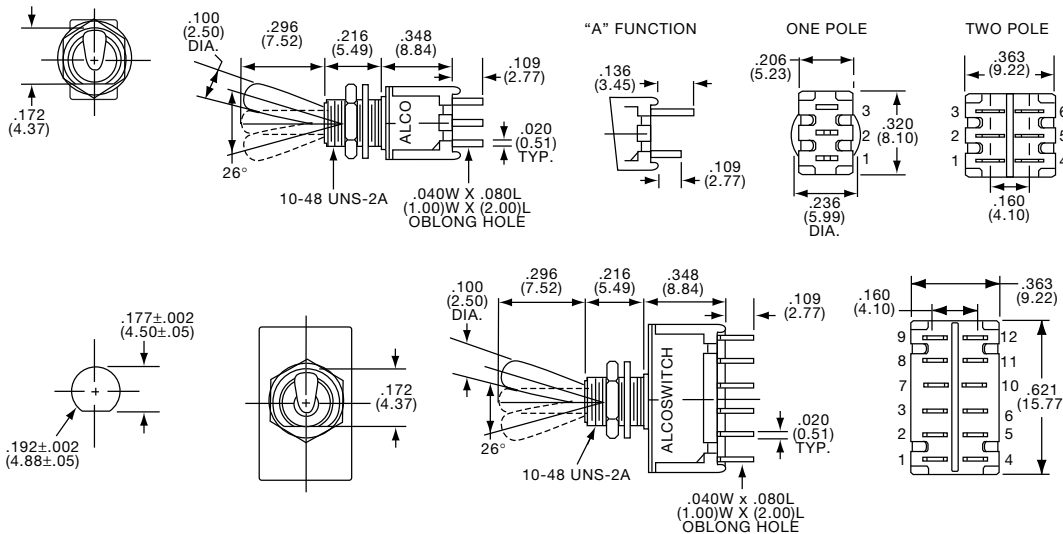
| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 |    |      |    |
|------------------|------------|------|-----------------|----|------|----|
| 7-1437562-4      | TT41NGWW2T | 4PDT | N               | On | None | On |

**Toggle Switches, Tiny, Wire Lug, Round or Flat Actuators**

SEE PAGE C8 FOR PRODUCT SPECIFICATIONS

For terminal connections refer to Code Chart on page M5-6

NOTICE: Wire lug terminals accept two No. 20 AWG wires.



1 & 2 POLE



TT13D2T



TT23N2T

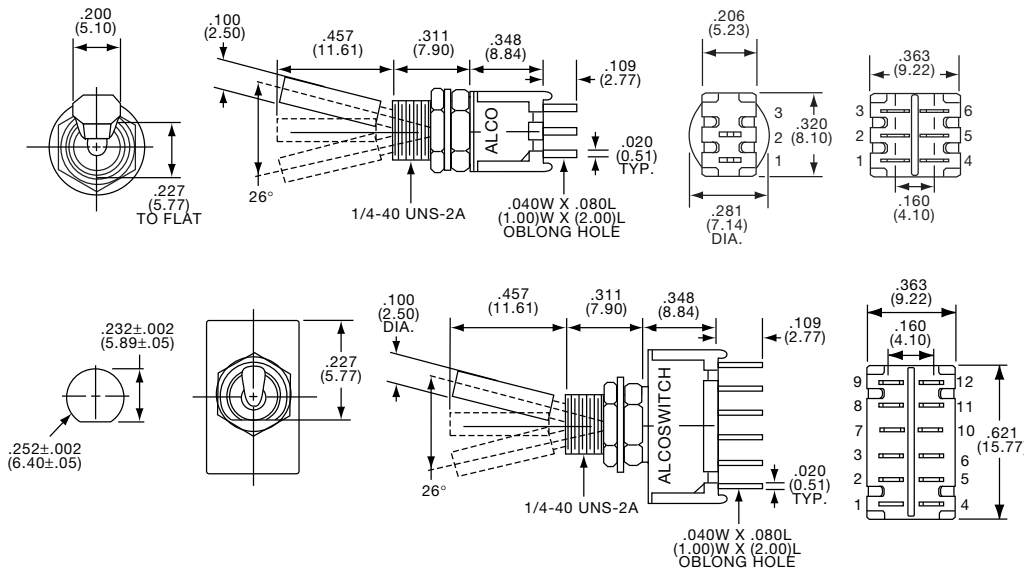
4 POLE



TT43N2T

| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On | None | Off | Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On | None | Off |
|------------------|------------|------|-----------------|----|------|-----|------------------|------------|------|-----------------|----|------|-----|
| 7-1437561-8      | TT13A2T    | SPST | A               | On | None | Off | 5-1437562-1      | TT23N2T    | DPDT | N               | On | None | On  |
| 8-1437561-5      | TT13D2T    | SPDT | D               | On | None | On  | 5-1437562-7      | TT23P2T    | DPDT | P               | On | Off  | On  |
| 9-1437561-5      | TT13E2T    | SPDT | E               | On | Off  | On  | 7-1437562-6      | TT43N2T    | 4PDT | N               | On | None | On  |
| 4-1437562-7      | TT23K2T    | DPST | K               | On | None | Off |                  |            |      |                 |    |      |     |

Note: No center terminal "A" or "K" action switches.



1 & 2 POLE



TT13D7T1/4



TT23N7T1/4

4 POLE



TT43N7T1/4

Pinned for Anti-Rotation

| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On | None | Off | Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On | None | Off |
|------------------|------------|------|-----------------|----|------|-----|------------------|------------|------|-----------------|----|------|-----|
| 9-1437561-1      | TT13D7T1/4 | SPDT | D               | On | None | On  | 6-1437562-0      | TT23P7T1/4 | DPDT | P               | On | Off  | On  |
| 9-1437561-7      | TT13E7T1/4 | SPDT | E               | On | Off  | On  | 7-1437562-8      | TT43N7T1/4 | 4PDT | N               | On | None | On  |
| 5-1437562-5      | TT23N7T1/4 | DPST | N               | On | None | On  |                  | TT43P7T1/4 | 4PDT | P               | On | Off  | On  |

## Toggle Switches, Tiny, Wire Lug, Long Actuators

SEE PAGE C8 FOR PRODUCT SPECIFICATIONS

For terminal connections refer to Code Chart on page M5-6

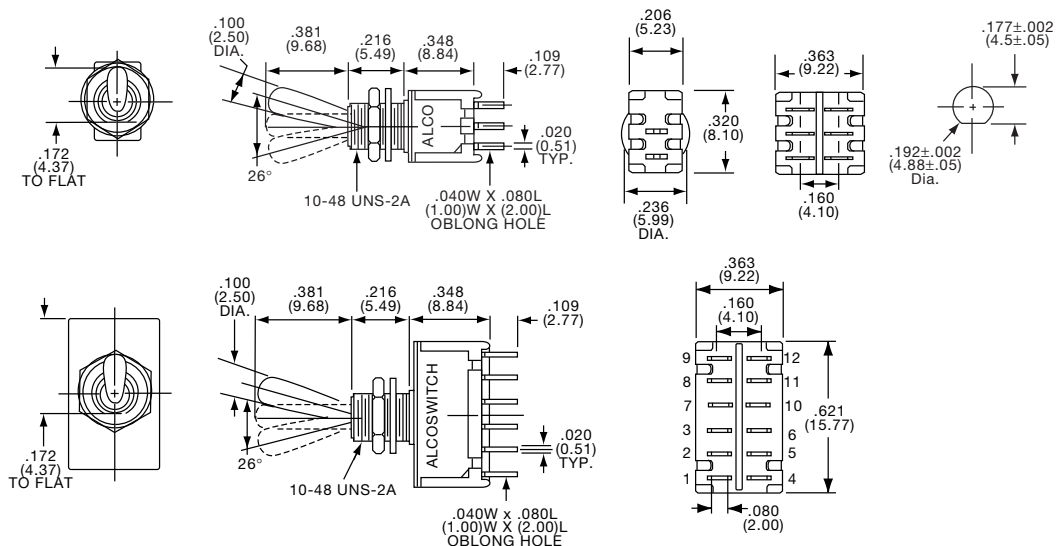
1 & 2 POLE



TT13D3T



TT23N3T



| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On | None | Off | Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On | None | Off |
|------------------|------------|------|-----------------|----|------|-----|------------------|------------|------|-----------------|----|------|-----|
| 8-1437561-0      | TT13A3T    | SPST | A               | On | None | Off | 5-1437562-8      | TT23P3T    | DPDT | P               | On | Off  | On  |
| 8-1437561-8      | TT13D3T    | SPDT | D               | On | None | On  | 7-1437562-7      | TT43N3T    | 4PDT | N               | On | None | On  |
| 9-1437561-6      | TT13E3T    | SPDT | E               | On | Off  | On  | 8-1437562-0      | TT43P3T    | 4PDT | P               | On | Off  | On  |
| 4-1437562-8      | TT23K3T    | DPST | K               | On | None | Off |                  |            |      |                 |    |      |     |
| 5-1437562-2      | TT23N3T    | DPDT | N               | On | None | On  |                  |            |      |                 |    |      |     |

Note: No center terminal on "A" or "K" action switches.

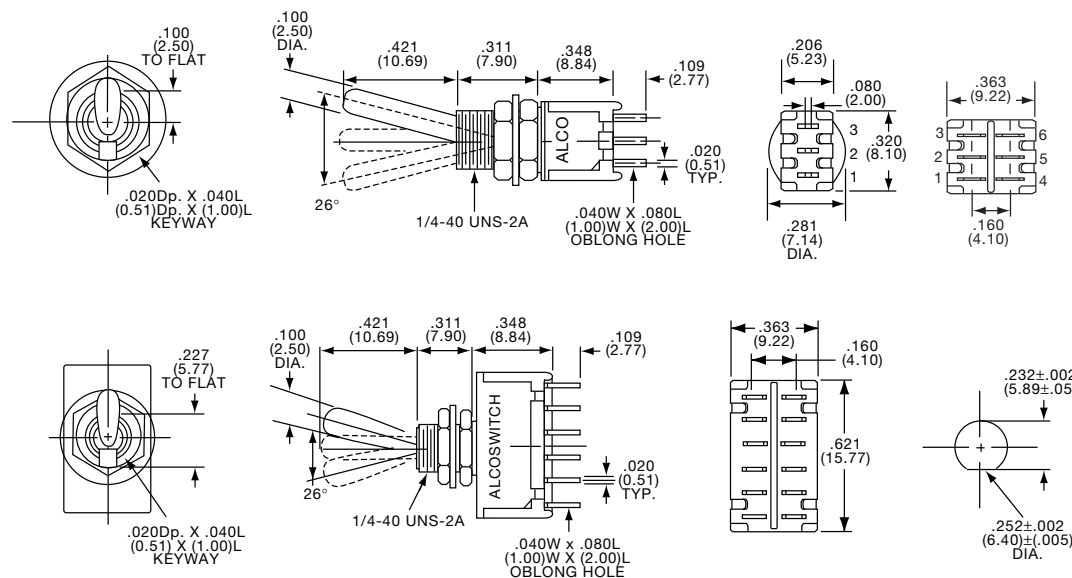
1 & 2 POLE



TT13A9T1/4



TT23N9T1/4



| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On | None | Off | Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On | None | Off |
|------------------|------------|------|-----------------|----|------|-----|------------------|------------|------|-----------------|----|------|-----|
| 8-1437561-4      | TT13A9T1/4 | SPST | A               | On | None | Off | 6-1437562-2      | TT23P9T1/4 | DPDT | P               | On | Off  | On  |
| 9-1437561-2      | TT13D9T1/4 | SPDT | D               | On | None | On  | 7-1437562-9      | TT43N9T1/4 | 4PDT | N               | On | None | On  |
| 9-1437561-8      | TT13E9T1/4 | SPDT | E               | On | Off  | On  | 8-1437562-1      | TT43P9T1/4 | 4PDT | P               | On | Off  | On  |
| 4-1437562-9      | TT23K9T1/4 | DPST | K               | On | None | Off |                  |            |      |                 |    |      |     |
| 5-1437562-6      | TT23N9T1/4 | DPDT | N               | On | None | On  |                  |            |      |                 |    |      |     |

Note: No center terminal on "A" or "K" action switches.

4 POLE



TT43N9T1/4

## Toggle Switches, Process Sealed, Vertical

### MATERIAL SPECIFICATIONS:

Contacts ..... Gold over nickel  
 Inner Case Material ..... High temperature polyester  
 Outer Case Material ..... Polyamide  
 Terminals/Fixed Contacts ..... Tin lead plate  
 Terminal Seal ..... Epoxy  
 Process Seal ..... Disposable boot, epoxied double case

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating ..... 0.4VA Max. @ 20 VDC or peak AC  
 Initial Contact Resistance ..... 20 Milliohms max.  
 Contact Timing ..... Break-before-make  
 Insulation Resistance ..... 1,000 Megohms min. 500 VDC  
 Dielectric Strength ..... 1,000 Volts RMS @ sea level  
 Plunger/Actuator Travel ..... 26°  
 Life Expectancy ..... See page C8

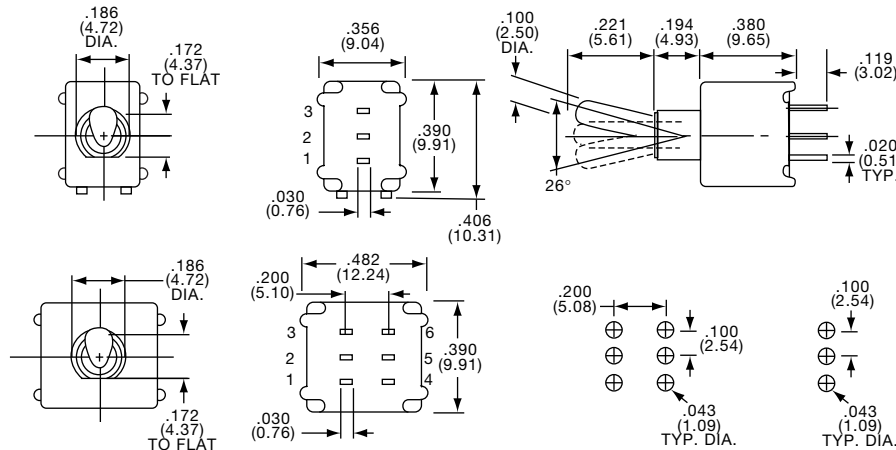
### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature ..... -22°F to +185°F (-30°C to +85°C)  
 Storage Temperature ..... -67°F to +185°F (-55°C to +85°C)  
 Solder Heat Resistance ..... See page M3-4

**APPLICATION NOTE:** Each switch is provided with a disposable boot used only during cleaning operation.

\* Refer to Page C8 for Other Options \*

Note: Hardware included with switch



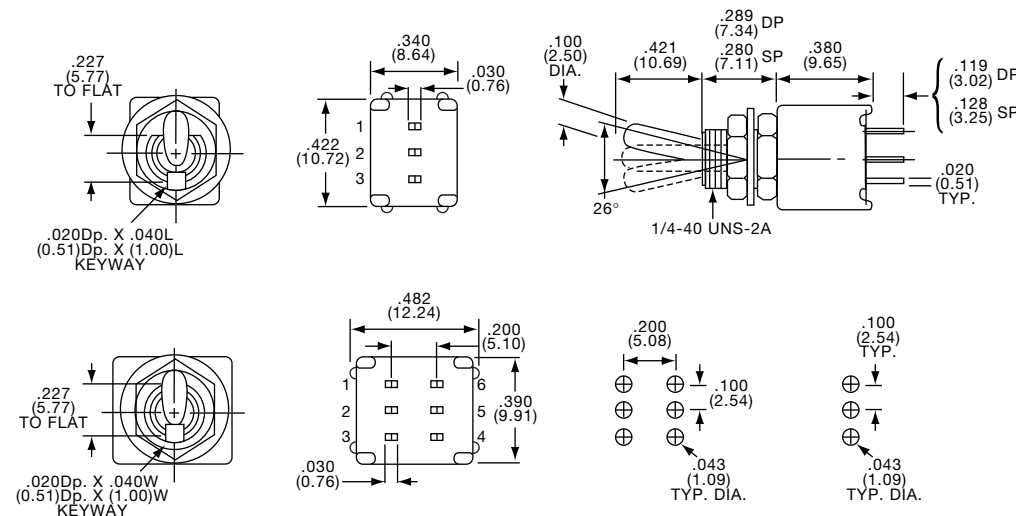
1 & 2 POLE  
UNTHREADED BUSHING



TT11DGPC1ES

| Tyco Electronics              | Alcoswitch  | Type | Act. Code P. M5 | On | None | Off |
|-------------------------------|-------------|------|-----------------|----|------|-----|
| 2-1437561-4                   | TT11AGPC1ES | SPST | A               | On | None | Off |
| 2-1437561-7                   | TT11DGPC1ES | SPDT | D               | On | None | On  |
| Note: No center terminal "A". |             |      |                 |    |      |     |

| Tyco Electronics | Alcoswitch  | Type | Act. Code P. M5 | On | None | On |
|------------------|-------------|------|-----------------|----|------|----|
| 1437562-4        | TT21NGPC1ES | DPDT | N               | On | None | On |



1 & 2 POLE  
THREADED BUSHING

TT11DGPC9T1/4ES

TT21NGPC9T1/4ES

| Tyco Electronics                                     | Alcoswitch      | Type | Act. Code P. M5 | On | None     | Off |
|------------------------------------------------------|-----------------|------|-----------------|----|----------|-----|
| 6-1437830-2                                          | TT11AGPC9T1/4ES | SPST | A               | On | None     | Off |
|                                                      | TT11DGPC9T1/4ES | SPDT | D               | On | None     | On  |
|                                                      | TT11EGPC9T1/4ES | SPDT | E               | On | Off (On) |     |
|                                                      | TT21KGPC9T1/4ES | DPST | K               | On | None     | Off |
| Note: No center terminal "A" or "K" action switches. |                 |      |                 |    |          |     |

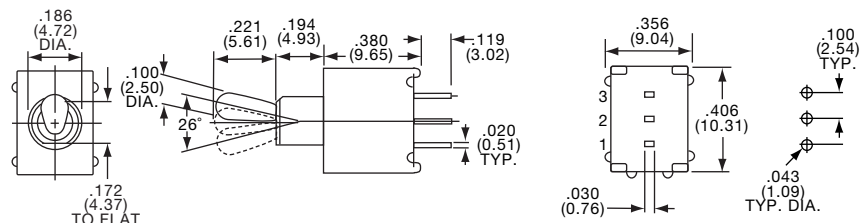
| Tyco Electronics                   | Alcoswitch      | Type | Act. Code P. M5 | On | None | On |
|------------------------------------|-----------------|------|-----------------|----|------|----|
| 1-1437562-2                        | TT21NGPC9T1/4ES | DPDT | N               | On | None | On |
|                                    | TT21PGPC9T1/4ES | DPDT | P               | On | Off  | On |
| (On) indicates momentary position. |                 |      |                 |    |      |    |

## Toggle Switches, Tiny, Enviromental and Process Sealed

SEE PAGE C16 FOR PRODUCT SPECIFICATIONS

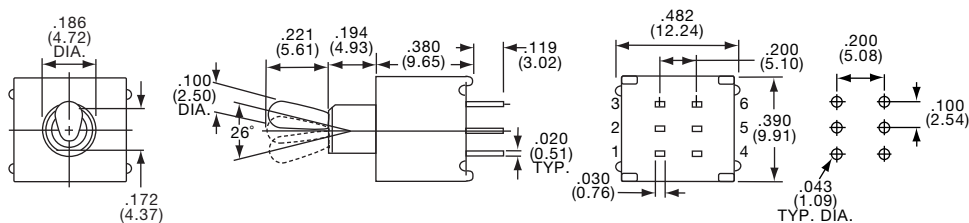
For terminal connections refer to Code Chart on page M5-6

### 1 POLE-PC VERTICAL MOUNT



| Tyco Electronics | Alcoswitch   | Type | Act. Code P. M5 | On | None | On |
|------------------|--------------|------|-----------------|----|------|----|
| 8-1437562-6      | TTE11DGPC1ES | SPDT | D               | On | None | On |
|                  | TTE11EGPC1ES | SPDT | E               | On | Off  | On |

### 2 POLE-PC VERTICAL MOUNT

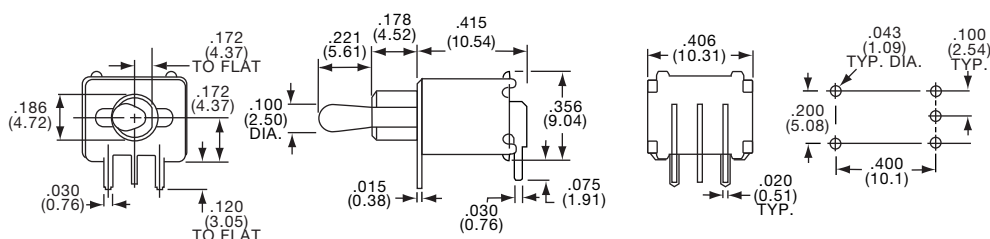


| Tyco Electronics | Alcoswitch   | Type | Act. Code P. M5 | On | None | On |
|------------------|--------------|------|-----------------|----|------|----|
| 1437563-1        | TTE21NGPC1ES | DPDT | N               | On | None | On |
|                  | TTE21PGPC1ES | DPDT | P               | On | Off  | On |

### 1 POLE-PC RIGHT ANGLE



TTE11DGRA1ES  
Horizontal Actuation

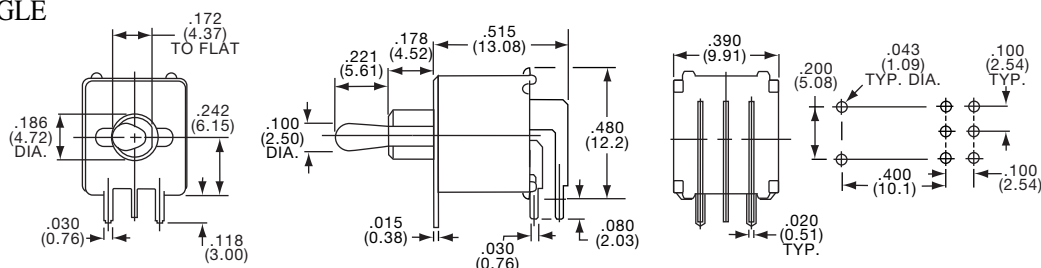


| Tyco Electronics | Alcoswitch   | Type | Act. Code P. M5 | On | None | On |
|------------------|--------------|------|-----------------|----|------|----|
| 8-1437562-9      | TTE11DGRA1ES | SPDT | D               | On | None | On |
| 9-1437562-2      | TTE11EGRA1ES | SPDT | E               | On | Off  | On |

### 2 POLE-PC RIGHT ANGLE



TTE21NGRA1ES  
Horizontal Actuation



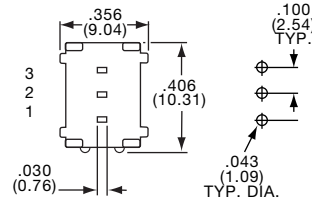
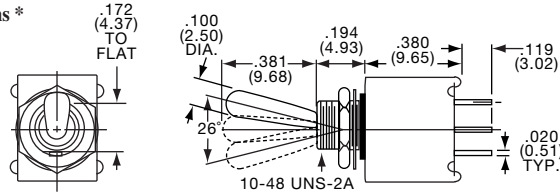
| Tyco Electronics | Alcoswitch   | Type | Act. Code P. M5 | On | None | On |
|------------------|--------------|------|-----------------|----|------|----|
| 1437563-4        | TTE21NGRA1ES | DPDT | N               | On | None | On |
|                  | TTE21PGRA1ES | DPDT | P               | On | Off  | On |

**Toggle Switches, Tiny, Enviromental and Process Sealed**

For terminal connections refer to Code Chart on page M5-6.

SEE PAGE C16 FOR PRODUCT SPECIFICATIONS

\* Refer to Page C8 for  
Other Options \*



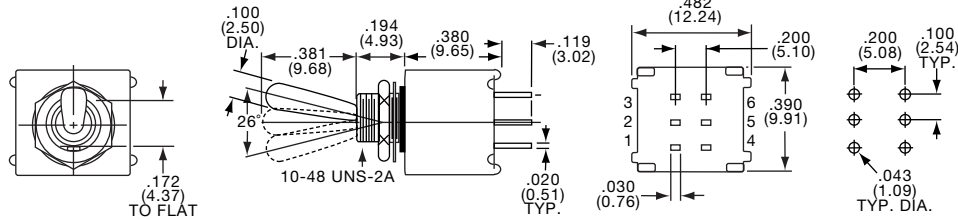
1 POLE



TTE11DGPC3TES

| Tyco Electronics | Alcoswitch    | Type | Act. Code P. M5 | On | None | Off |
|------------------|---------------|------|-----------------|----|------|-----|
| 8-1437562-5      | TTE11AGPC3TES | SPST | A               | On | None | Off |
| 8-1437562-7      | TTE11DGPC3TES | SPDT | D               | On | None | On  |
| 9-1437562-0      | TTE11EGPC3TES | SPDT | E               | On | Off  | On  |

Note: No center terminal on "A" action switches.

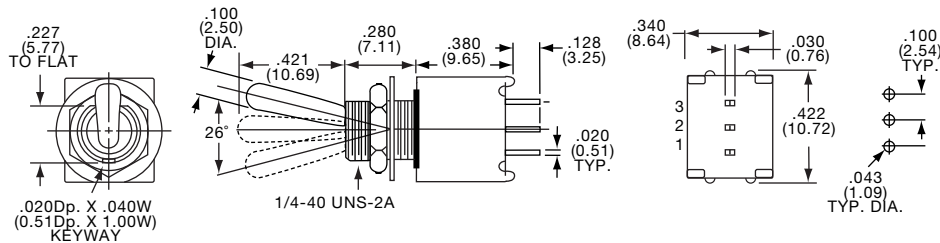


2 POLE



TTE21NGPC3TES

| Tyco Electronics | Alcoswitch    | Type | Act. Code P. M5 | On | None | On |
|------------------|---------------|------|-----------------|----|------|----|
| 1437563-2        | TTE21NGPC3TES | DPDT | N               | On | None | On |
|                  | TTE21PGPC3TES | DPDT | P               | On | Off  | On |



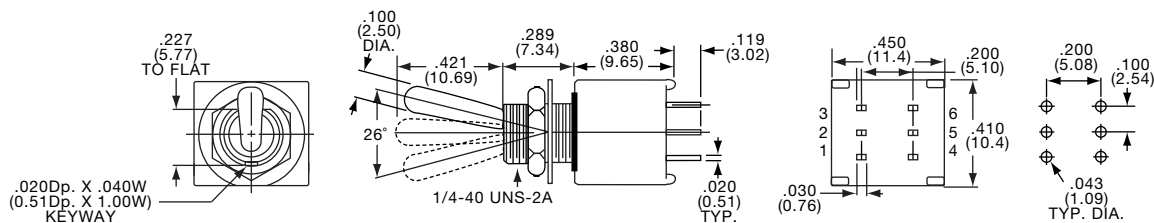
1 POLE



TTE11DGPC9T4ES

| Tyco Electronics | Alcoswitch       | Type | Act. Code P. M5 | On | None | Off |
|------------------|------------------|------|-----------------|----|------|-----|
|                  | TTE11AGPC9T1/4ES | SPST | A               | On | None | Off |
| 8-1437562-8      | TTE11DGPC9T1/4ES | SPDT | D               | On | None | On  |
| 9-1437562-1      | TTE11EGPC9T1/4ES | SPDT | E               | On | Off  | On  |

Note: No center terminal on "A" action switches.



2 POLE



TTE21NGPC9T4ES

| Tyco Electronics | Alcoswitch       | Type | Act. Code P. M5 | On | None | Off |
|------------------|------------------|------|-----------------|----|------|-----|
|                  | TTE21KGPC9T1/4ES | DPST | K               | On | None | Off |
| 1437563-3        | TTE21NGPC9T1/4ES | DPDT | N               | On | None | On  |
|                  | TTE21PGPC9T1/4ES | DPDT | P               | On | Off  | On  |

Note: No center terminal on "K" action switches.



**Toggle Switches, Process Sealed, Vertical and Right Angle, Round Actuator**

**MATERIAL SPECIFICATIONS:**

Contacts .....Gold over nickel plate  
Case Material .....Polyester 94V-0  
Actuator Material .....Nickel plated copper alloy  
Terminals .....Phosphor bronze  
Terminal Seal .....Epoxy  
Process Seal .....Tested to MIL-STD-202, method 112  
(Internal O-Ring) .....test condition A and D, 85°C

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....0.4 VA Max. @ 20 VDC  
Initial Contact Resistance .....100 Milliohms max.  
Contact Timing .....Break-before-make  
Insulation Resistance .....500 Megohms @ 250 VDC min.  
Dielectric Strength .....500 Volts RMS @ sea level  
Actuation Force .....400 Grams  
Life Expectancy .....Up to 10,000 Cycles

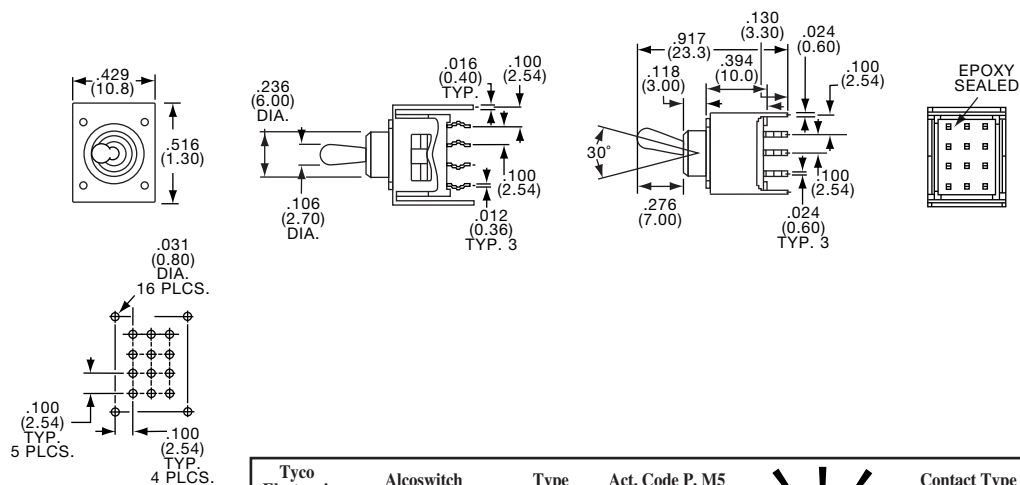
**ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature.....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature.....-40°F to +176°F (-40°C to +80°C)

**4PDT**



ATE4DGPC2

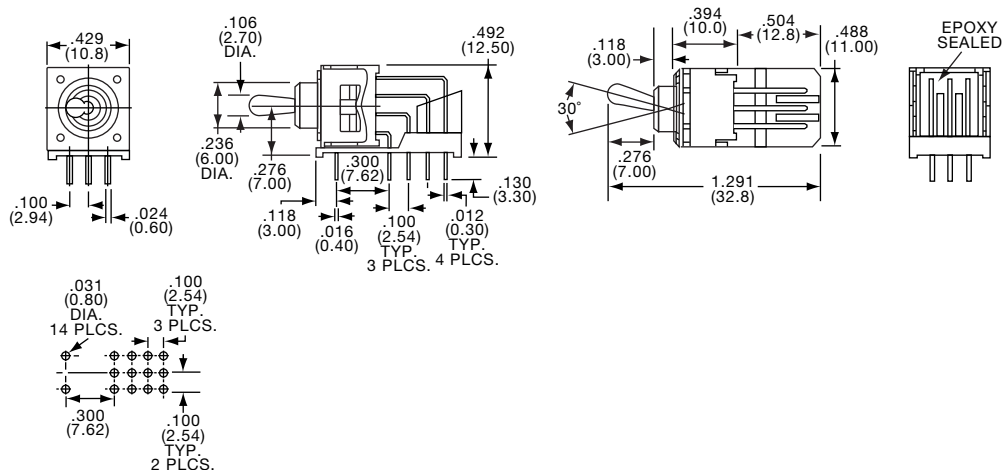


| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On None On | Contact Type |
|------------------|------------|------|-----------------|------------|--------------|
| 2-1437557-1      | ATE4DGPC2  | 4PDT | 8               | On None On | Gold         |

**4PDT**



ATE4DGRA2

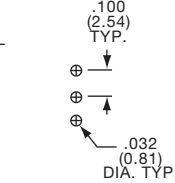
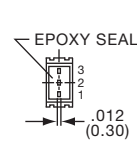
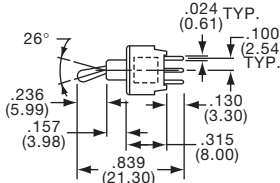
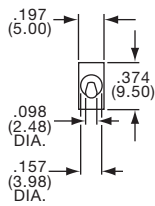


| Tyco Electronics | Alcoswitch | Type | Act. Code P. M5 | On None On | Contact Type |
|------------------|------------|------|-----------------|------------|--------------|
| 2-1437557-2      | ATE4DGRA2  | 4PDT | 8               | On None On | Gold         |



**Toggle Switches, Process Sealed, Vertical, Round or Flat Actuators**

SEE PAGE C19 FOR PRODUCT SPECIFICATIONS

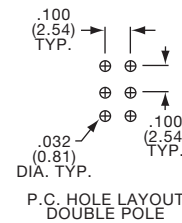
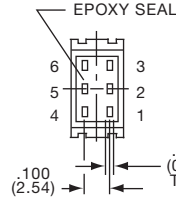
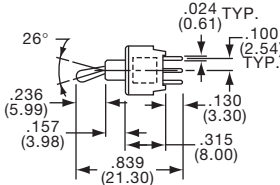
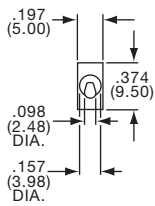


P.C. HOLE LAYOUT  
SINGLE POLE

SPDT/DPDT



ATE1DGPC1



P.C. HOLE LAYOUT  
DOUBLE POLE

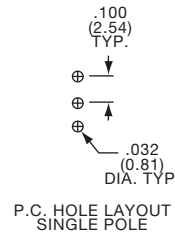
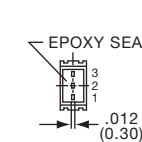
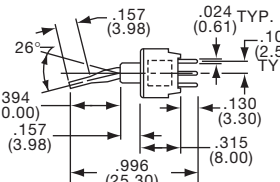
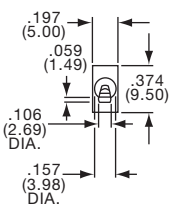
Extra compact double pole saves PCB real estate.



ATE2DGPC1

| Tyco Electronics                   | Alcoswitch | Type |  |  |  | Contact Type | Tyco Electronics     | Alcoswitch | Type |  |  |  | Contact Type |
|------------------------------------|------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------|----------------------|------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------|
| 1437557-2                          | ATE1DGPC1  | SPDT | On                                                                                | None                                                                              | On                                                                                | Gold         | 1-1437557-5          | ATE2DGPC1  | DPDT | On                                                                                  | None                                                                                | On                                                                                  | Gold         |
| 1437557-6                          | ATE1EGPC1  | SPDT | On                                                                                | Off                                                                               | On                                                                                | Gold         | 1-1437557-9          | ATE2EGPC1  | DPDT | On                                                                                  | Off                                                                                 | On                                                                                  | Gold         |
|                                    | ATE1FGPC1  | SPDT | On                                                                                | None                                                                              | (On)                                                                              | Gold         | Terminals Connected: |            |      |                                                                                     |                                                                                     |                                                                                     |              |
| 1-1437557-2                        | ATE1GGPC1  | SPDT | (On)                                                                              | Off                                                                               | (On)                                                                              | Gold         |                      |            |      | 2-3                                                                                 |                                                                                     | 2-1                                                                                 |              |
| Terminals Connected:               |            |      |                                                                                   |                                                                                   |                                                                                   |              |                      |            |      | 5-6                                                                                 |                                                                                     | 5-4                                                                                 |              |
| (On) indicates momentary position. |            |      |                                                                                   |                                                                                   |                                                                                   |              |                      |            |      |                                                                                     |                                                                                     |                                                                                     |              |

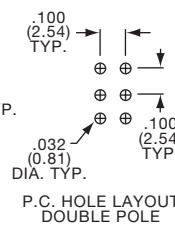
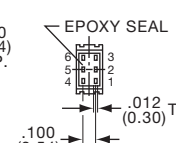
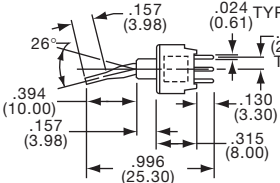
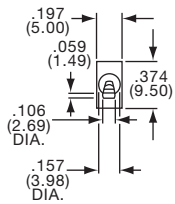
SPDT/DPDT



P.C. HOLE LAYOUT  
SINGLE POLE



ATE1DGPC7



P.C. HOLE LAYOUT  
DOUBLE POLE

Extra compact double pole saves PCB real estate.



ATE2DGPC7

| Tyco Electronics                   | Alcoswitch | Type |  |  |  | Contact Type | Tyco Electronics     | Alcoswitch | Type |  |  |  | Contact Type |
|------------------------------------|------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------|----------------------|------------|------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------|
| 1437557-3                          | ATE1DGPC7  | SPDT | On                                                                                  | None                                                                                | On                                                                                  | Gold         | 1-1437557-6          | ATE2DGPC7  | DPDT | On                                                                                    | None                                                                                  | On                                                                                    | Gold         |
| 1-1437557-3                        | ATE1GGPC7  | SPDT | (On)                                                                                | Off                                                                                 | (On)                                                                                | Gold         | Terminals Connected: |            |      |                                                                                       |                                                                                       |                                                                                       |              |
|                                    |            |      |                                                                                     |                                                                                     |                                                                                     |              | 2-3                  | 5-6        | 2-1  | 5-4                                                                                   |                                                                                       |                                                                                       |              |
| (On) indicates momentary position. |            |      |                                                                                     |                                                                                     |                                                                                     |              |                      |            |      |                                                                                       |                                                                                       |                                                                                       |              |

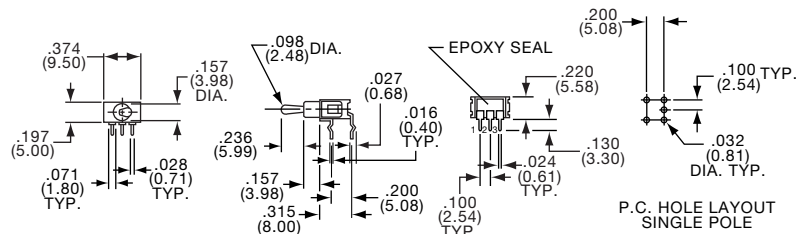
**Toggle Switches, Process Sealed, Right Angle, Retention Feature**

SEE PAGE C19 FOR PRODUCT SPECIFICATIONS

**SPDT/DPDT**



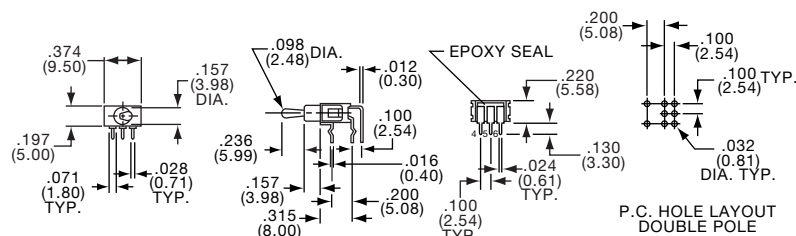
**ATE1DGRA1**  
Horizontal Actuation



Extra compact double pole  
saves PCB real estate.



**ATE2DGRA1**  
Horizontal Actuation

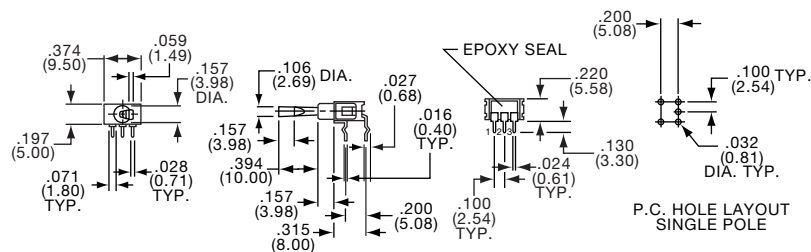


| Tyco Electronics                   | Alcoswitch | Type | On   | None      | On | Contact Type | Tyco Electronics                   | Alcoswitch | Type | On   | None | On   | Contact Type |
|------------------------------------|------------|------|------|-----------|----|--------------|------------------------------------|------------|------|------|------|------|--------------|
| 1437557-4                          | ATE1DGRA1  | SPDT | On   | None      | On | Gold         | 1-1437557-7                        | ATE2DGRA1  | DPDT | On   | None | On   | Gold         |
| 1437557-8                          | ATE1EGRA1  | SPDT | On   | Off       | On | Gold         | 3-1437592-7                        | ATE2EGRA1  | DPDT | On   | Off  | On   | Gold         |
| 1-1437557-0                        | ATE1FGRA1  | SPDT | On   | None (On) |    | Gold         |                                    | ATE2GGRA1  | DPDT | (On) | Off  | (On) | Gold         |
| 1-1437557-4                        | ATE1GGRA1  | SPDT | (On) | Off (On)  |    | Gold         | Terminals Connected:               |            |      | 2-3  |      | 2-1  |              |
| Terminals Connected:               |            |      |      |           |    |              |                                    |            |      | 5-6  |      | 5-4  |              |
| (On) indicates momentary position. |            |      |      |           |    |              | (On) indicates momentary position. |            |      |      |      |      |              |

**SPDT/DPD**



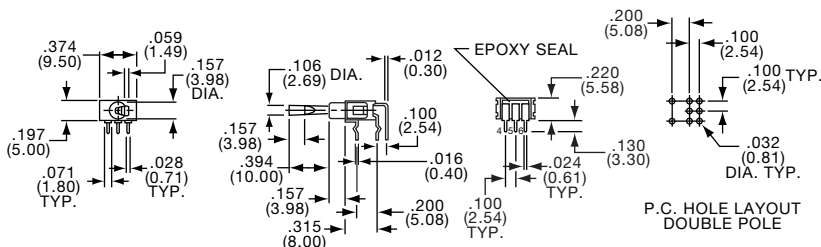
**ATE1DGRA7**  
Horizontal Actuation



Extra compact double pole  
saves PCB real estate.



**ATE2DGRA7**  
Horizontal Actuation



| Tyco Electronics                   | Alcoswitch | Type | On | None      | On | Contact Type | Tyco Electronics                   | Alcoswitch | Type | On  | None | On  | Contact Type |
|------------------------------------|------------|------|----|-----------|----|--------------|------------------------------------|------------|------|-----|------|-----|--------------|
| 1437557-5                          | ATE1DGRA7  | SPDT | On | None      | On | Gold         | 1-1437557-8                        | ATE2DGRA7  | DPDT | On  | None | On  | Gold         |
| 1437557-9                          | ATE1EGRA7  | SPDT | On | Off       | On | Gold         | Terminals Connected:               |            |      | 2-3 |      | 2-1 |              |
| 1-1437557-1                        | ATE1FGRA7  | SPDT | On | None (On) |    | Gold         |                                    |            |      | 5-6 |      | 5-4 |              |
| Terminals Connected:               |            |      |    |           |    |              | (On) indicates momentary position. |            |      |     |      |     |              |
| (On) indicates momentary position. |            |      |    |           |    |              | (On) indicates momentary position. |            |      |     |      |     |              |

## Toggle Switches, A Series, Part Number Matrix

## "A" SERIES DESIGN FEATURES

- Toggle – Machined brass, heavy nickel plated.
- Bushing & Frame – Rigid one-piece die cast, copper flashed, heavy nickel plated.
- Fixed Contact – Welded construction.
- Terminal Seal – Epoxy sealing of terminals is standard.

### MATERIAL SPECIFICATIONS:

|                     |                 |
|---------------------|-----------------|
| Contacts .....      | Gold/gold flash |
|                     | Silver/tin lead |
| Case Material ..... | Thermoset       |
| Terminal Seal ..... | Epoxy           |

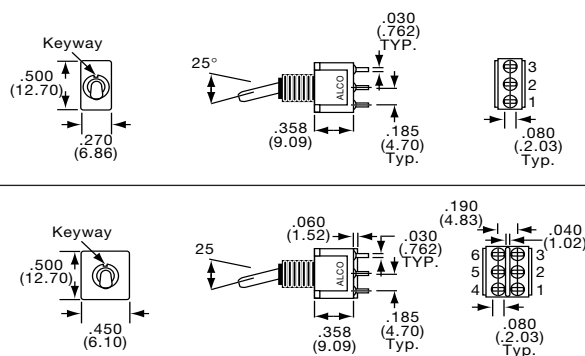
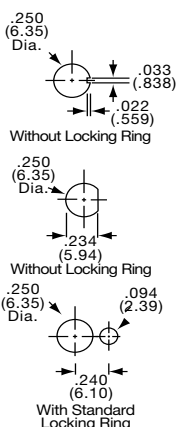
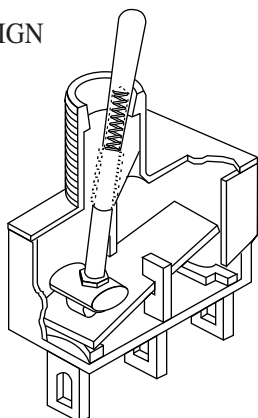
### TYPICAL PERFORMANCE CHARACTERISTICS:

|                             |                                        |
|-----------------------------|----------------------------------------|
| Contact Rating .....        | Silver: 2 A @ 250 VAC or 5 A @ 125 VAC |
|                             | Silver: 2 A @ 30 VDC                   |
|                             | Gold: 0.4 VA @ 20 VAC/DC max.          |
| Insulation Resistance ..... | 1,000 Megohms min. @ 500 VDC.          |
| Dielectric Strength .....   | 1,000 Volts RMS @ sea level initial    |
| Electrical Life .....       | Up to 30,000 Cycles                    |

## ENVIRONMENTAL SPECIFICATIONS

Operating Temperature.....-4°F to + 185°F (-20°C to + 85°C)  
Storage Temperature.....-49°F to + 212°F (-45°C to + 100°C)  
Note: Hardware included with switch

## DESIGN



## PART NUMBERING

PART NUMBERING

| Model                                             | Function              | Toggle                                       | Bushing | Terminal                                                                                        | Contact                    | Cap Color                                                  | Option                    |        |
|---------------------------------------------------|-----------------------|----------------------------------------------|---------|-------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------|---------------------------|--------|
| <div>A1Single Pole</div> <div>A2Double Pole</div> | double pole case only | S Bat. Long                                  |         | Z Wire Lug                                                                                      | Q Silver                   | K, K1: (Nickel Standard) <div>0Black</div> <div>2Red</div> | U.L.(Q or G contact only) |        |
|                                                   |                       | K Locking                                    |         | A Right Angle                                                                                   |                            |                                                            |                           | B Gold |
| 01 On-On                                          |                       | K1 Locking                                   |         | AV2 Vertical Right Angle                                                                        | G Gold over Silver         |                                                            |                           |        |
| 03 On-Off-On                                      |                       | M Bat. Short                                 |         | C Printed Circuit                                                                               | V30V40V90 Vertical Support |                                                            |                           |        |
| 05 (On)-Off-(On)                                  |                       | P3 Flatted (with Y only)                     |         | W Wire Wrap                                                                                     |                            |                                                            |                           |        |
| 07 On-Off-(On)                                    |                       | P4 Flatted (with Y only)                     |         | Z3 Quick Connect                                                                                |                            |                                                            |                           |        |
| 08 On-(On)                                        |                       | T Large Toggle & Bushing (15/32)             |         | Y 1/4-40 threaded, .35" long, slotted                                                           |                            |                                                            |                           |        |
| 11 On-On-On                                       |                       | T1 Large Toggle & Bushing (15/32)            |         | Y9 unthreaded, .35" long                                                                        |                            |                                                            |                           |        |
| 13 On-On-(On)                                     |                       | T2P Large Flatted Toggle and Bushing (15/32) |         | CW 1/4-40 threaded, .37" long, actuator & bushing flange environmental seals S & M Toggles only |                            |                                                            |                           |        |
| 15 (On)-On-(On)                                   |                       |                                              |         | D 1/4-40 threaded, .28" long, slotted                                                           |                            |                                                            |                           |        |
|                                                   |                       | D9 Unthreaded, .28" long                     |         |                                                                                                 |                            |                                                            |                           |        |
|                                                   |                       | H 1/4-40 threaded, flanged, .30" long        |         |                                                                                                 |                            |                                                            |                           |        |

Note: For surface mount termination, use the "TST" series, Page C7

**Other Options**

NBlack finish toggle, bushing and hardware. Add "N" to end of part number, but before U.L. option.

OInternal O-ring environmental actuator seal. Add letter after toggle option: S & M.

PAnti-Push-In/Anti rotate. Add letter after toggle S & M.

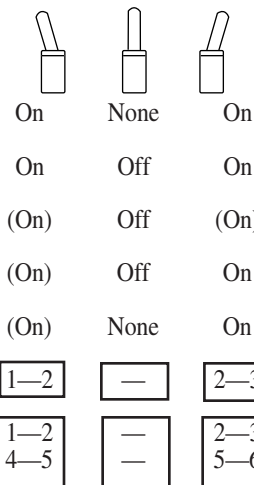
See page C23 for SP3T wiring diagram.

## Toggle Switches, A Series, Options

### FUNCTIONS

The following functions available in SP or DP.

|           |             |                                                                    |
|-----------|-------------|--------------------------------------------------------------------|
| <b>01</b> | 2 Positions | None indicates no mechanical position                              |
| <b>03</b> | 3 Positions | Off indicates a mechanical position with no electrical connection. |
| <b>05</b> | 3 Positions | (On) indicates momentary action.                                   |
| <b>07</b> | 3 Positions |                                                                    |
| <b>08</b> | 2 Positions |                                                                    |



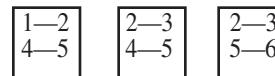
SPDT, connect terminals:

DPDT, connect terminals:

|           |             |      |    |      |
|-----------|-------------|------|----|------|
| <b>11</b> | 3 Positions | On   | On | On   |
| <b>13</b> | 3 Positions | (On) | On | On   |
| <b>15</b> | 3 Positions | (On) | On | (On) |

Functions available in DP case only

Connect terminals:

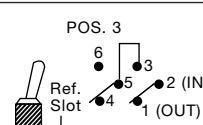
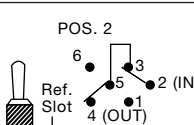
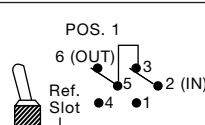
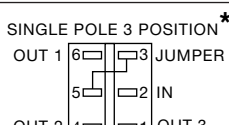
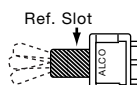


\* SP3T functions achieved with external jumper installed by customer

### WIRING DIAGRAM FOR FUNCTIONS

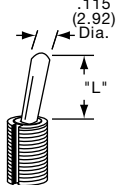


Pos. 3  
Pos. 2  
Pos. 1

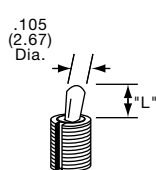


### TOGGLES

**S**  
Standard

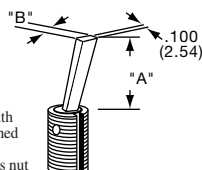


**M**  
Short



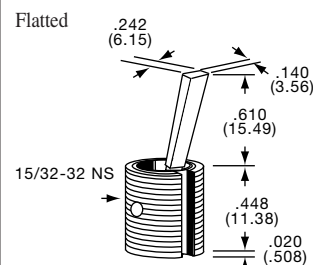
**P3**  
**P4**

**Flatted**  
Available only with "Y" bushing. Pinned for anti-rotation. Use N-3-AG dress nut for enhancement. Pg. C54



**T2P**

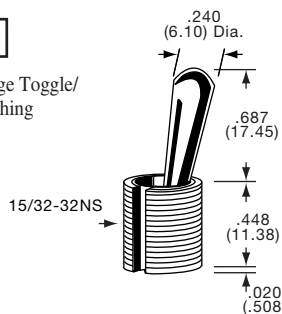
Flatted



| Dimension "L" | Bushing        | Dimension "L" | Bushing Type   | Actuator | Dimension "A" | Dimension "B" |
|---------------|----------------|---------------|----------------|----------|---------------|---------------|
| .410 (10.41)  | "Y", "H", "CW" | .200 (5.08)   | "Y", "H", "CW" | P3       | .450 (11.43)  | .200 (5.08)   |
| .480 (12.19)  | "D", "D9"      | .270 (6.86)   | "D", "D9"      | P4       | .250 (6.35)   | .165 (4.19)   |

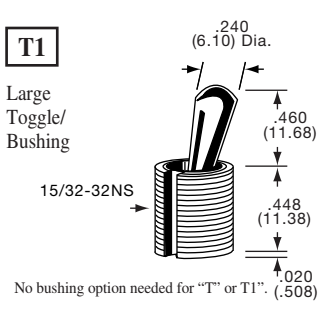
**T**

Large Toggle/  
Bushing



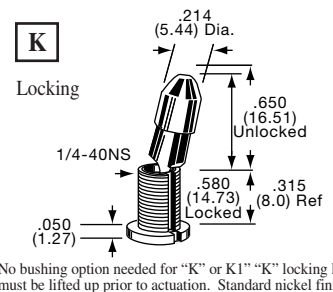
**T1**

Large  
Toggle/  
Bushing



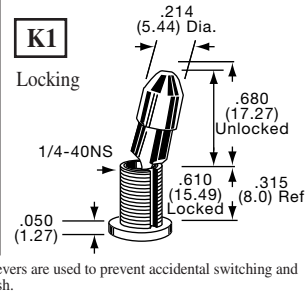
**K**

Locking



**K1**

Locking

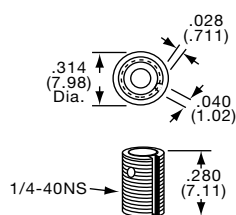


# Toggle Switches, A Series, Options

## BUSHINGS

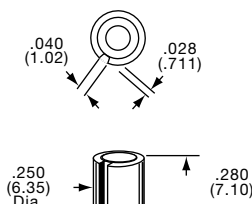
**Y**

1/4-40 Thread  
.35" long, slotted  
(Standard)



**D9**

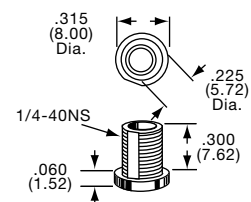
Unthreaded  
.28" long



Used with  
Z, C & W  
terminations

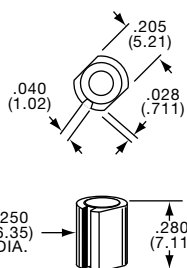
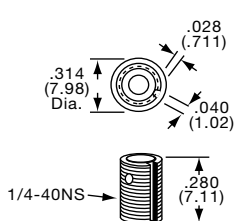
**H**

1/4-40 Thread  
Flanged, .30" long



**D**

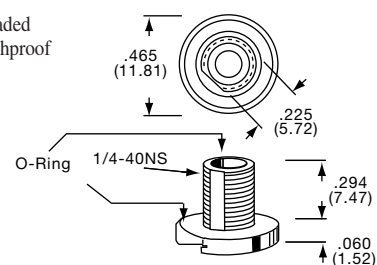
1/4-40 Thread  
.28" long, slotted



Used with  
A, AV2, V30  
V80 & V90  
terminations

**CW**

Threaded  
Splashproof

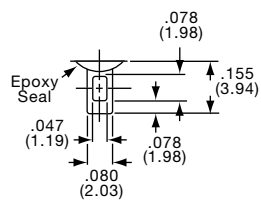


For S & M Toggles

## TERMINALS

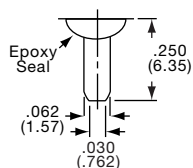
**Z**

Wire Lug



**Z3**

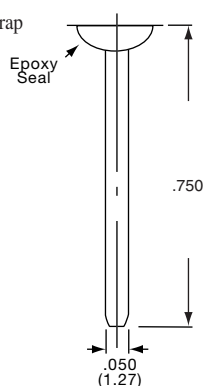
Quick Connect



Mates with Tyco  
61454 or 60900.

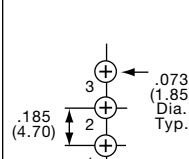
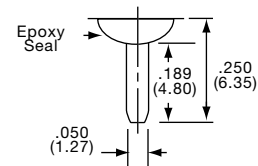
**W**

Wire Wrap

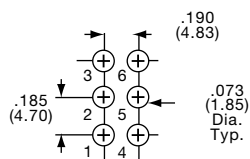


**C**

Printed Circuit



Single pole



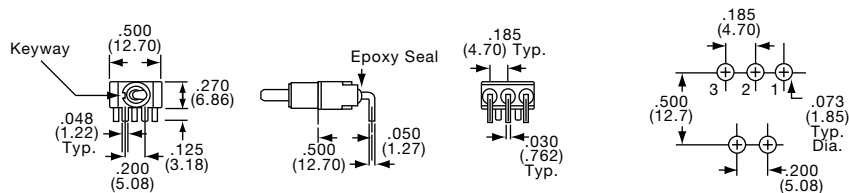
Double pole

## Toggle Switches, A Series, Options

### TERMINALS

**A**

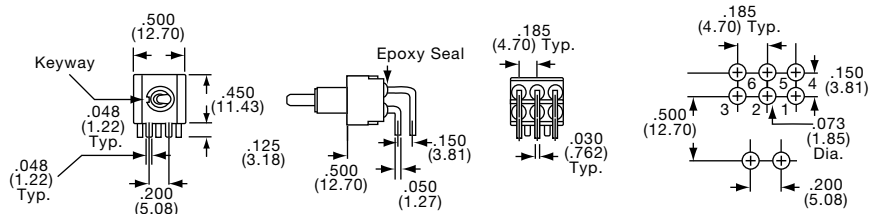
**Right Angle**  
Single Pole



Note: Terminal numbers viewed from top of P.C. boards.

**A**

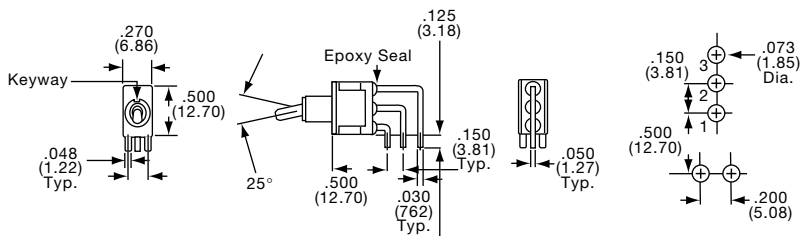
**Right Angle**  
Double Pole



Note: Terminal numbers viewed from top of P.C. boards.

**AV2**

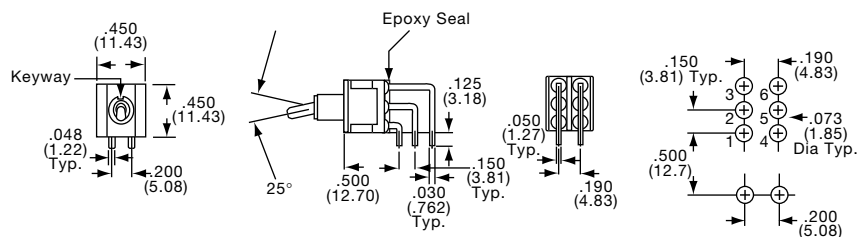
**Vertical Right Angle**  
Single Pole



Note: Terminal numbers viewed from top of P.C. boards.

**AV2**

**Vertical Right Angle**  
Double Pole



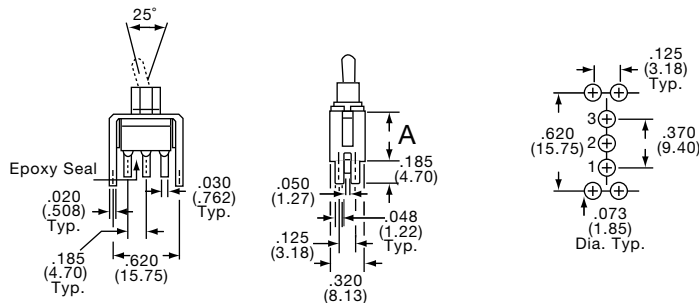
Note: Terminal numbers viewed from top of P.C. boards.

## Toggle Switches, A Series, Options

TERMINALS NOTE: Terminal numbers viewed from top of P.C. board

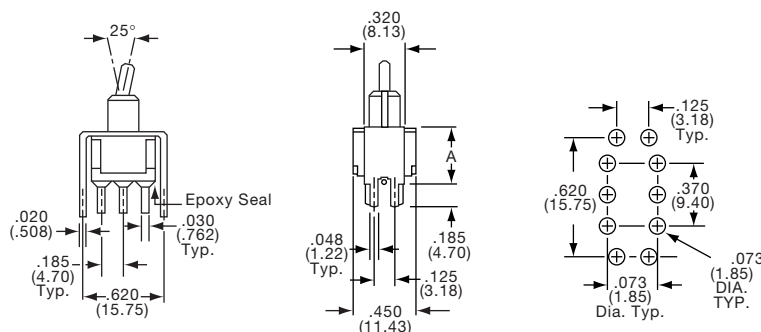
### V30 V40 V90

Vertical Support Bracket  
Single Pole



| Option Code | Dim."A"       |
|-------------|---------------|
| V30         | .460 (11.68)  |
| V40         | .630 (16.00)  |
| V90         | 1.150 (29.21) |

Vertical Support Bracket  
Double Pole



| Option Code | Dim."A"       |
|-------------|---------------|
| V30         | .460 (11.68)  |
| V40         | .630 (16.00)  |
| V90         | 1.150 (29.21) |

## CONTACTS

**B** CONTACTS: Copper alloy with gold plate, welded button.

TERMINALS: Brass with gold plate.

ELECTRICAL RATING: 0.4 VA @ 20 VAC/DC.

**Q** CONTACTS: Copper alloy with silver, welded button.

TERMINALS: Brass with tin/lead plate.

ELECTRICAL RATING: 5 A @ 125 VAC, 2 A @ 250 VAC, 2 A @ 30 VDC.

UL/CSA RATING: 5A @ 125 VAC, 3A @ 250 VAC.  
(Specify "UL" option code)

**G** CONTACTS: Copper alloy with gold plate over silver, welded button.

TERMINALS: Brass alloy, with gold plate.

Note: This contact option can be used for low-level or power switching. If level is above 0.4 VA @ 20 VAC/DC, the switch is rendered usable only for power switching due to arc-removal of gold plate.

UL/CSA RATING: 5A @ 125 VAC, 3A @ 250 VAC  
(Specify "UL" option code)

ELECTRICAL RATING: 0.4 VA @ 20 VAC/DC or 5 A @ 125 VAC, 2 A @ 250 VAC, 2 A @ 30 VDC.



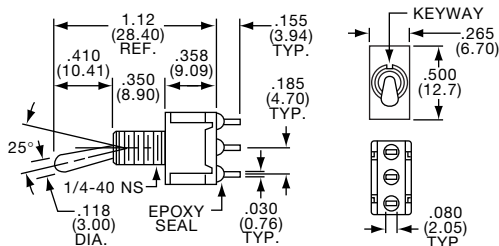
\* Refer to Pages C22-C26 for  
Additional Options \*

## Toggle Switches, A Series, Vertical, Wire Lug, Long Bat Actuator

SEE PAGE C22 FOR PRODUCT SPECIFICATIONS

SPDT

| Tyco<br>Electronics    | Alcoswitch | Type | Act. Code P.M5 |  |  |  |
|------------------------|------------|------|----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| <b>Silver Contacts</b> |            |      |                |                                                                                   |                                                                                   |                                                                                   |
| 5-1437554-0            | A101SYZQ   | SPDT | 1              | On                                                                                | None                                                                              | On                                                                                |
| 7-1437554-7            | A103SYZQ   | SPDT | 5              | On                                                                                | Off                                                                               | On                                                                                |
| 9-1437554-6            | A105SYZQ   | SPDT | 5              | (On)                                                                              | Off                                                                               | (On)                                                                              |
| 1437555-9              | A107SYZQ   | SPDT | 5              | On                                                                                | Off                                                                               | (On)                                                                              |
| 2-1437555-0            | A108SYZQ   | SPDT | 1              | On                                                                                | None                                                                              | (On)                                                                              |
| <b>Gold Contacts</b>   |            |      |                |                                                                                   |                                                                                   |                                                                                   |
| 4-1437554-9            | A101SYZB   | SPDT | 1              | On                                                                                | None                                                                              | On                                                                                |
| 7-1437554-6            | A103SYZB   | SPDT | 5              | On                                                                                | Off                                                                               | On                                                                                |
| 9-1437554-5            | A105SYZB   | SPDT | 5              | (On)                                                                              | Off                                                                               | (On)                                                                              |
|                        | A107SYZB   | SPDT | 5              | On                                                                                | Off                                                                               | (On)                                                                              |

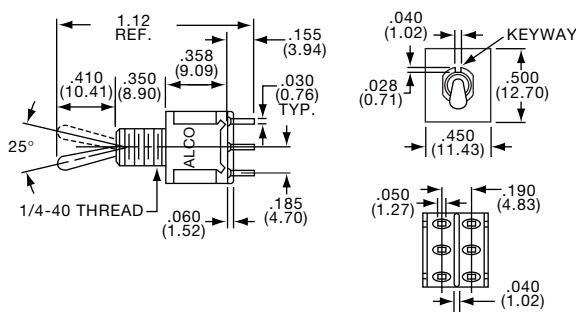


A101SYZQ

**C**  
Gemini Series

DPDT

| Tyco<br>Electronics    | Alcoswitch | Type | Act. Code P.M5 |  |  |  |
|------------------------|------------|------|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Silver Contacts</b> |            |      |                |                                                                                     |                                                                                     |                                                                                     |
| 4-1437555-9            | A201SYZQ   | DPDT | 2              | On                                                                                  | None                                                                                | On                                                                                  |
| 6-1437555-2            | A203SYZQ   | DPDT | 6              | On                                                                                  | Off                                                                                 | On                                                                                  |
| 7-1437555-0            | A205SYZQ   | DPDT | 6              | (On)                                                                                | Off                                                                                 | (On)                                                                                |
| 7-1437555-6            | A207SYZQ   | DPDT | 6              | On                                                                                  | Off                                                                                 | (On)                                                                                |
| 8-1437555-5            | A208SYZQ   | DPDT | 2              | On                                                                                  | None                                                                                | (On)                                                                                |
| 1437556-1              | A211SYZQ   | SP3T | 11             | On                                                                                  | On                                                                                  | On                                                                                  |
| 1437556-4              | A213SYZQ   | SP3T | 11             | On                                                                                  | On                                                                                  | (On)                                                                                |
| 1437556-7              | A215SYZQ   | SP3T | 11             | (On)                                                                                | On                                                                                  | (On)                                                                                |



A201SYZQ

**Toggle Switches, A Series, PC Terminals, Long Bat Actuators**

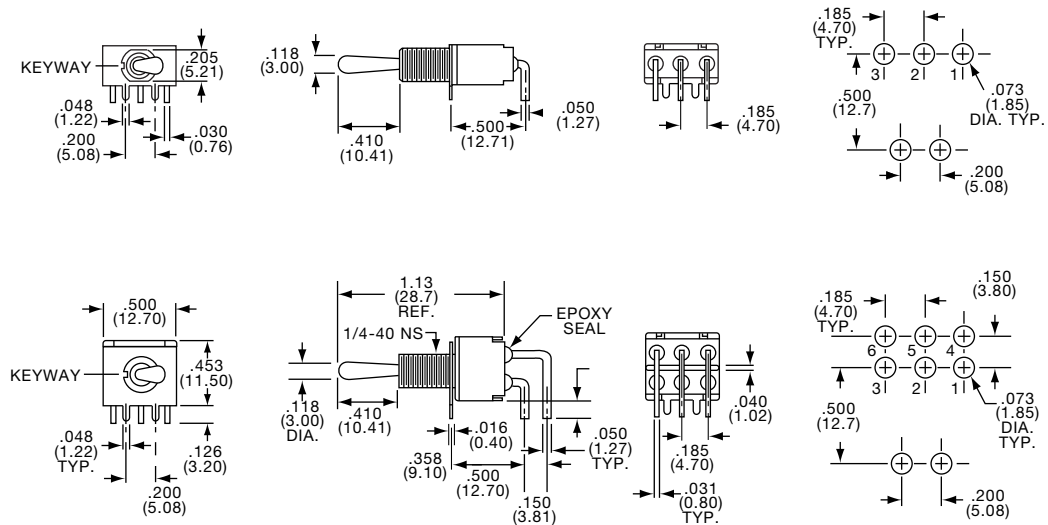
\* Refer to Pages C22-C26 for Additional Options \*

SEE PAGE C22 FOR PRODUCT SPECIFICATIONS

SPDT/DPDT



A101SYAB  
Horizontal Actuation

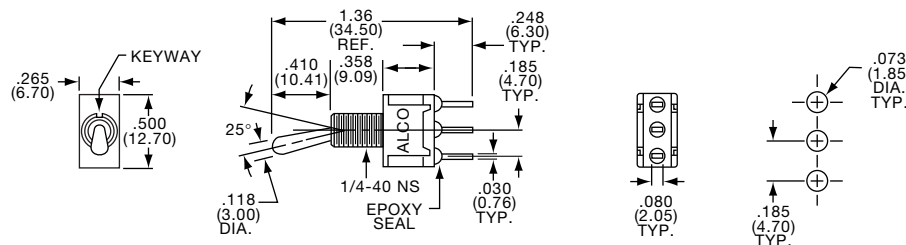


| Tyco Electronics     | Alcoswitch | Type | Act. Code P.M5 | ↗  | ↓    | ↘    |
|----------------------|------------|------|----------------|----|------|------|
| <b>Gold Contacts</b> |            |      |                |    |      |      |
| 4-1437554-3          | A101SYAB   | SPDT | 1              | On | None | On   |
|                      | A103SYAB   | SPDT | 5              | On | Off  | On   |
| 4-1437555-3          | A201SYAB   | DPDT | 2              | On | None | On   |
|                      | A208SYAB   | DPDT | 2              | On | None | (On) |

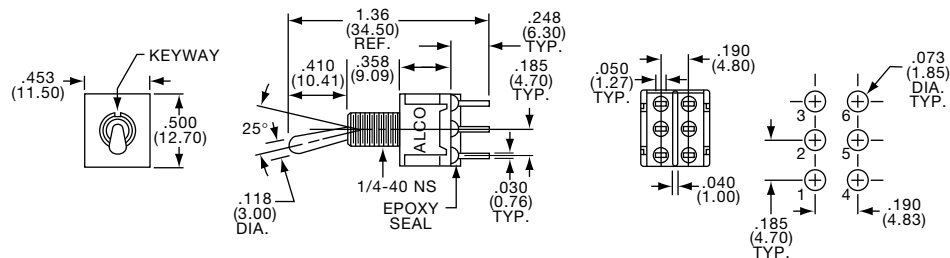
SPDT/DPDT



A101SYCB



A201SYCB

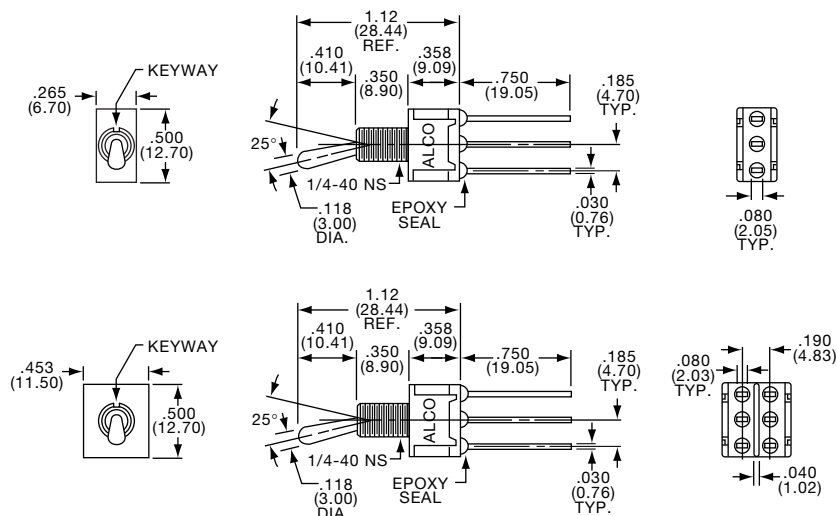


| Tyco Electronics     | Alcoswitch | Type | Act. Code P.M5 | ↗  | ↓    | ↘    |
|----------------------|------------|------|----------------|----|------|------|
| <b>Gold Contacts</b> |            |      |                |    |      |      |
| 4-1437554-5          | A101SYCB   | SPDT | 1              | On | None | On   |
| 7-1437554-2          | A103SYCB   | SPDT | 5              | On | Off  | On   |
| 1-1437555-8          | A108SYCB   | SPDT | 1              | On | None | (On) |
| 4-1437555-5          | A201SYCB   | DPDT | 2              | On | None | On   |
| 6-1437555-0          | A203SYCB   | DPDT | 6              | On | Off  | On   |
| 8-1437555-3          | A208SYCB   | DPDT | 2              | On | None | (On) |

**Toggle Switches, A Series, Wire Wrap or Wire Lug, Long Bat Actuators**

\* Refer to Pages C22-C26 for Additional Options \*

SEE PAGE C22 FOR PRODUCT SPECIFICATIONS



SPDT/DPDT

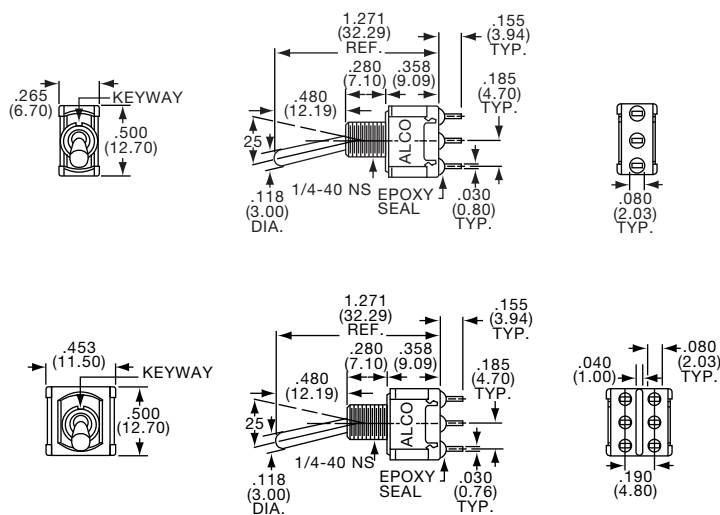


A101SYWQ



A201SYWQ

| Tyco Electronics       | Alcoswitch | Type | Act. Code P.M5 | On | None | On |
|------------------------|------------|------|----------------|----|------|----|
| <b>Silver Contacts</b> |            |      |                |    |      |    |
| 4-1437554-8            | A101SYWQ   | SPDT | 1              | On | None | On |
| 7-1437554-5            | A103SYWQ   | SPDT | 5              | On | Off  | On |
| 4-1437555-7            | A201SYWQ   | DPDT | 2              | On | None | On |
|                        | A203SYWQ   | DPDT | 6              | On | Off  | On |



SPDT/DPDT



A101SDZQ



A201SDZQ

| Tyco Electronics       | Alcoswitch | Type | Act. Code P.M5 | On | None | On |
|------------------------|------------|------|----------------|----|------|----|
| <b>Silver Contacts</b> |            |      |                |    |      |    |
| 4-1437554-0            | A101SDZQ   | SPDT | 1              | On | None | On |
| 6-1437554-9            | A103SDZQ   | SPDT | 5              | On | Off  | On |
| 4-1437555-1            | A201SDZQ   | DPDT | 2              | On | None | On |
| 5-1437555-9            | A203SDZQ   | DPDT | 6              | On | Off  | On |

\* Refer to Pages C22-C26 for  
Additional Options \*

## Toggle Switches, A Series, PC Tail, Straight or Right Angle, Long Bat Actuator

SEE PAGE C22 FOR PRODUCT SPECIFICATIONS

SPDT

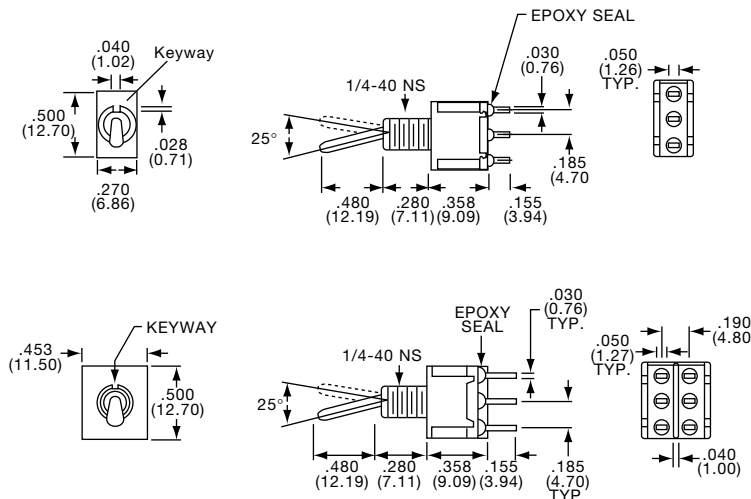


A101SDCQ

DPDT



A201SDCQ



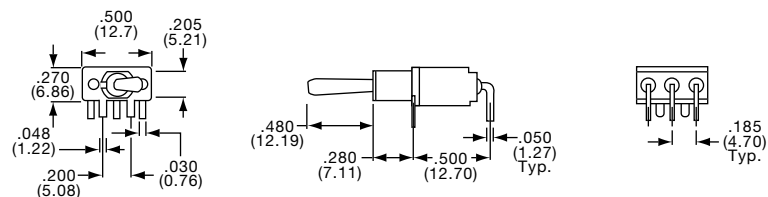
| Tyco Electronics       | Alcoswitch | Type | Act. Code P.M5 | On | Off  | On   |
|------------------------|------------|------|----------------|----|------|------|
| <b>Silver Contacts</b> |            |      |                |    |      |      |
| 3-1437554-9            | A101SDCQ   | SPDT | 1              | On | None | On   |
| 6-1437554-8            | A103SDCQ   | SPDT | 5              | On | Off  | On   |
| 1571670-1              | A201SDCQ   | DPDT | 2              | On | None | On   |
|                        | A203SDCQ   | DPDT | 6              | On | Off  | On   |
|                        | A208SDCQ   | DPDT | 2              | On | None | (On) |

SPDT/DPDT



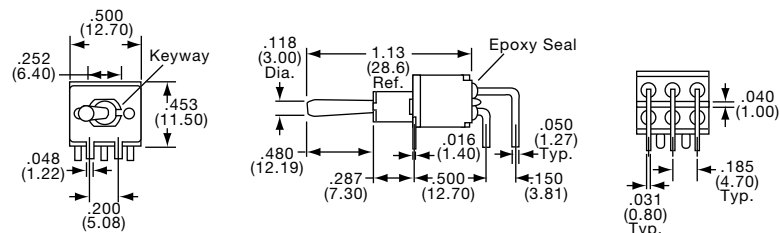
A101SD9AQ

Horizontal Actuation



A201SD9AQ

Horizontal Actuation

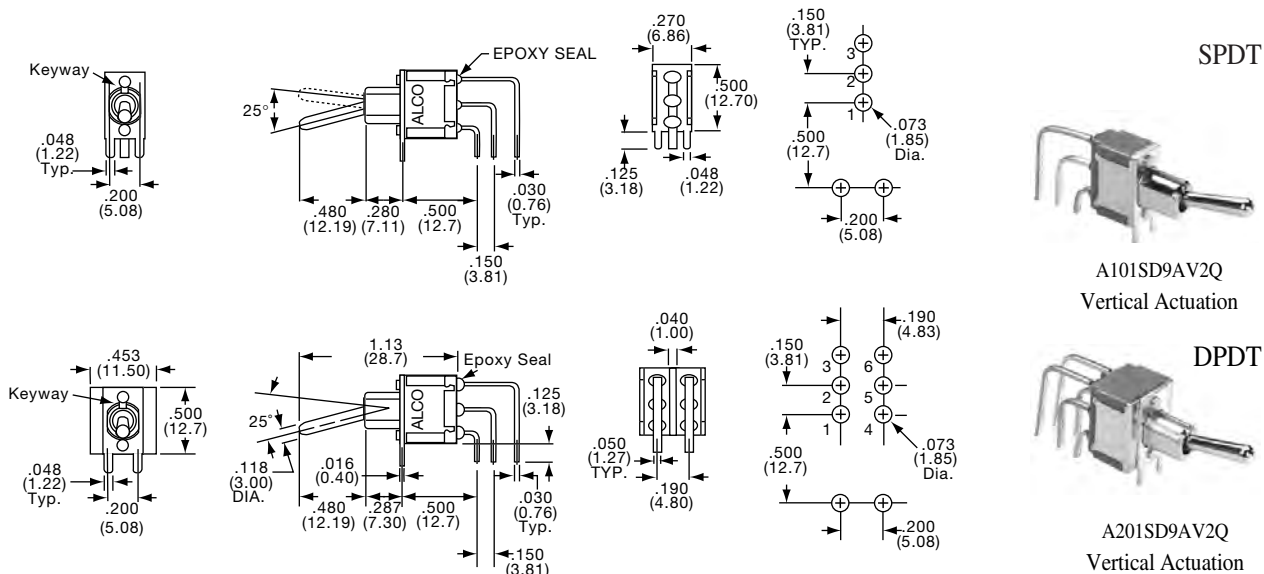


| Tyco Electronics       | Alcoswitch | Tyco Electronics                    | Alcoswitch | Type | Act. Code P. M5 | On | Off  | On   |
|------------------------|------------|-------------------------------------|------------|------|-----------------|----|------|------|
| <b>Silver Contacts</b> |            |                                     |            |      |                 |    |      |      |
| 3-1437554-4            | A101SD9AQ  | <b>Gold Contacts</b><br>3-1437554-3 | A101SD9AB  | SPDT | 1               | On | None | On   |
| 6-1437554-4            | A103SD9AQ  |                                     | A103SD9AB  | SPDT | 5               | On | Off  | On   |
| 1-1437555-6            | A108SD9AQ  |                                     |            | SPDT | 1               | On | None | (On) |
| 3-1437555-8            | A201SD9AQ  |                                     | A201SD9AB  | DPDT | 2               | On | None | On   |
| 8-1437555-1            | A208SD9AQ  |                                     | A208SD9AB  | DPDT | 2               | On | None | (On) |

## Toggle Switches, A Series, Vertical, Right Angle, Long Bat Actuator

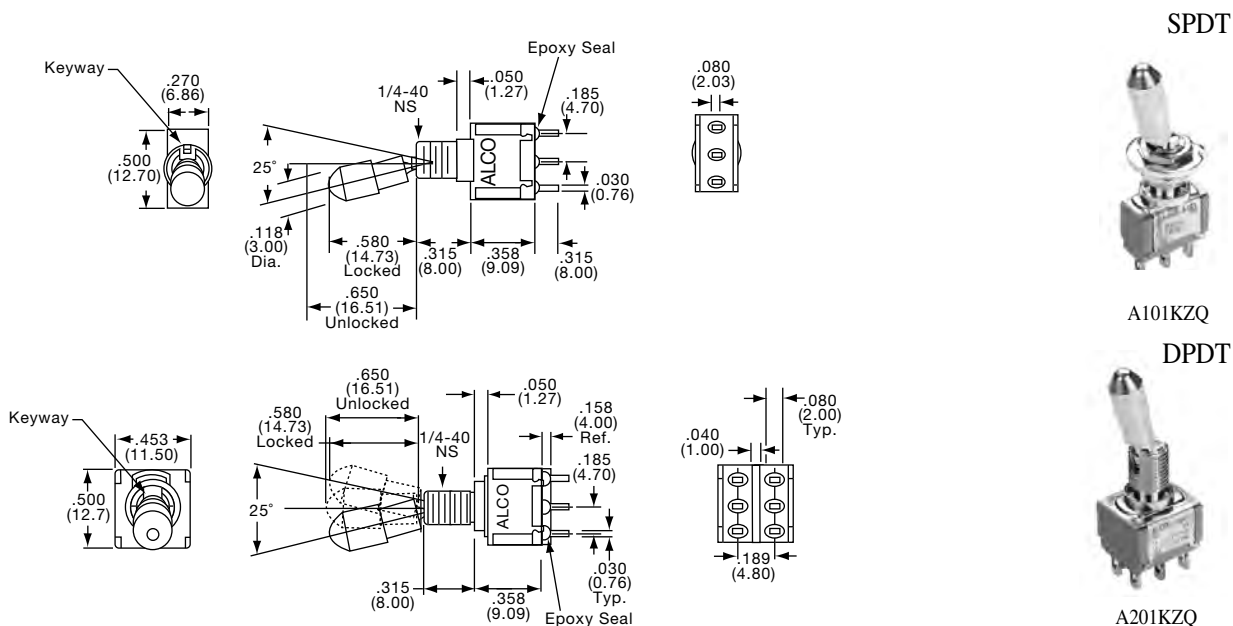
\* Refer to Pages C22-C26 for Additional Options \*

SEE PAGE C22 FOR PRODUCT SPECIFICATIONS



| Tyco Electronics | Alcoswitch  | Type | Act. Code | P.M5 | 👉    | 👇  | 👈 | Tyco Electronics | Alcoswitch  | Type | Act. Code | P.M5 | 👉    | 👇    | 👈 |
|------------------|-------------|------|-----------|------|------|----|---|------------------|-------------|------|-----------|------|------|------|---|
| Silver Contacts  |             |      |           |      |      |    |   | Silver Contacts  |             |      |           |      |      |      |   |
| 3-1437554-6      | A101SD9AV2Q | SPDT | 1         | On   | None | On |   | 3-1437555-9      | A201SD9AV2Q | DPDT | 2         | On   | None | On   |   |
| 6-1437554-6      | A103SD9AV2Q | SPDT | 5         | On   | Off  | On |   | 5-1437555-8      | A203SD9AV2Q | DPDT | 6         | On   | Off  | On   |   |
|                  |             |      |           |      |      |    |   | 8-1437555-2      | A208SD9AV2Q | DPDT | 2         | On   | None | (On) |   |

## Toggle Switches, A Series, Wire Lug, Locking Toggle



| Tyco Electronics | Alcoswitch | Type | Act. Code | P. M5 |  |  |  | Tyco Electronics | Alcoswitch  | Tyco Electronics | Alcoswitch | Type | Act. Code | P. M5 |  |  |  |
|------------------|------------|------|-----------|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------|-------------|------------------|------------|------|-----------|-------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Silver Contacts  |            |      |           |       |                                                                                     |                                                                                     |                                                                                     | Gold Contacts    |             | Silver Contacts  |            |      |           |       |                                                                                       |                                                                                       |                                                                                       |
| 1437554-9        | A101KZQ    | SPDT | 1         |       | On                                                                                  | None                                                                                | On                                                                                  | A201KZB          | 2-1437555-5 | A201KZQ          | DPDT       |      | 2         |       | On                                                                                    | None                                                                                  | On                                                                                    |
| 5-1437554-8      | A103KZQ    | SPDT | 5         |       | On                                                                                  | Off                                                                                 | On                                                                                  | A203KZB          | 5-1437555-3 | A203KZQ          | DPDT       |      | 6         |       | On                                                                                    | Off                                                                                   | On                                                                                    |
|                  |            |      |           |       |                                                                                     |                                                                                     |                                                                                     | 6-1437555-5      | A205KZB     | A205KZQ          | DPDT       |      | 6         |       | (On)                                                                                  | Off                                                                                   | (On)                                                                                  |
|                  |            |      |           |       |                                                                                     |                                                                                     |                                                                                     | 8-1437555-8      | A211KZB     | A211KZQ          | SP3T       |      | 11        |       | On                                                                                    | On                                                                                    | On                                                                                    |

\* Refer to Pages C22-C26 for  
Additional Options \*

SEE PAGE C22 FOR PRODUCT SPECIFICATIONS

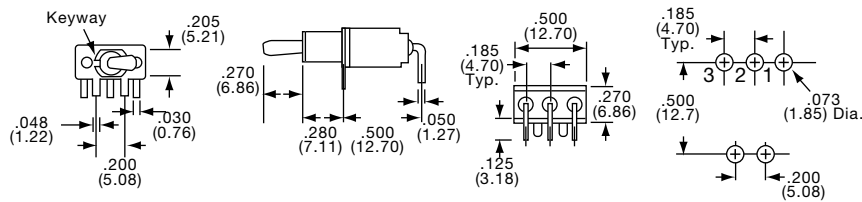
## Toggle Switches, A Series, Right Angle, Short Bat Actuators

### SPDT



A101MD9AQ

Horizontal Actuation



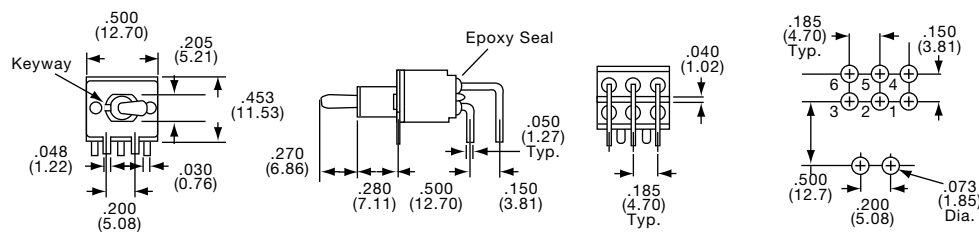
| Tyco Electronics       | Alcoswitch | Tyco Electronics     | Alcoswitch | Type | Act. Code P. M5 |    |      |      |
|------------------------|------------|----------------------|------------|------|-----------------|----|------|------|
| <b>Silver Contacts</b> |            | <b>Gold Contacts</b> |            |      |                 |    |      |      |
| 1-1437554-6            | A101MD9AQ  | 1-1437554-4          | A101MD9AB  | SPDT | 1               | On | None | On   |
| 6-1437554-1            | A103MD9AQ  | 5-1437554-9          | A103MD9AB  | SPDT | 5               | On | Off  | On   |
|                        | A108MD9AQ  | 1-1437555-2          | A108MD9AB  | SPDT | 1               | On | None | (On) |

### DPDT



A201MD9AQ

Horizontal Actuation



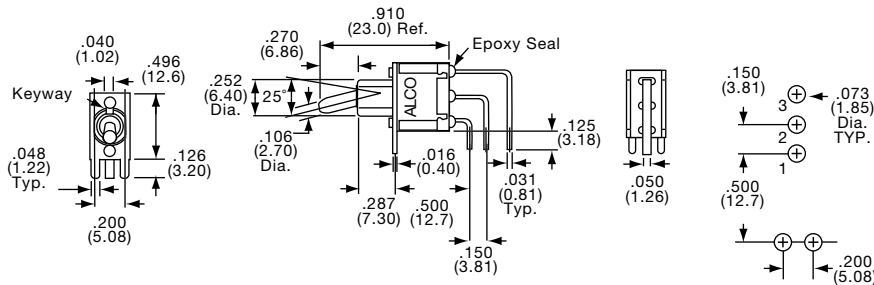
| Tyco Electronics       | Alcoswitch | Tyco Electronics     | Alcoswitch | Type | Act. Code P. M5 |    |      |    |
|------------------------|------------|----------------------|------------|------|-----------------|----|------|----|
| <b>Silver Contacts</b> |            | <b>Gold Contacts</b> |            |      |                 |    |      |    |
| 2-1437555-8            | A201MD9AQ  | 2-1437555-7          | A201MD9AB  | DPDT | 2               | On | None | On |
|                        |            | 5-1437555-4          | A203MD9AB  | DPDT | 6               | On | Off  | On |

### SPDT



A101MD9AV2Q

Vertical Actuation



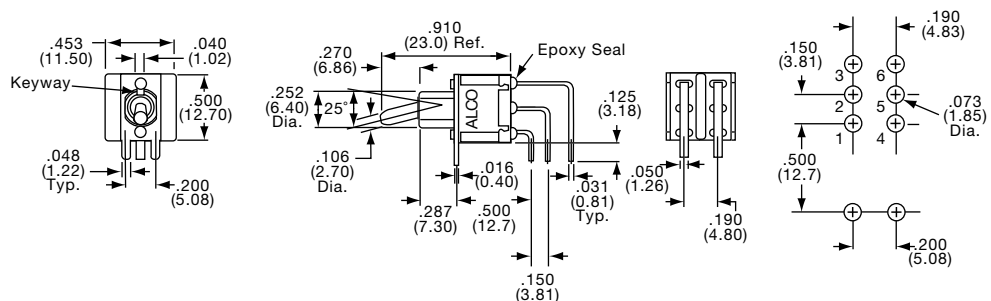
| Tyco Electronics       | Alcoswitch  | Tyco Electronics     | Alcoswitch  | Type | Act. Code P. M5 |    |      |      |
|------------------------|-------------|----------------------|-------------|------|-----------------|----|------|------|
| <b>Silver Contacts</b> |             | <b>Gold Contacts</b> |             |      |                 |    |      |      |
| 1-1437554-9            | A101MD9AV2Q | 1-1437554-7          | A101MD9AV2B | SPDT | 1               | On | None | On   |
|                        | A103MD9AV2Q | 6-1437554-2          | A103MD9AV2B | SPDT | 5               | On | Off  | On   |
|                        | A108MD9AV2Q |                      |             | SPDT | 1               | On | None | (On) |

### DPDT



A201MD9AV2AQ

Vertical Actuation



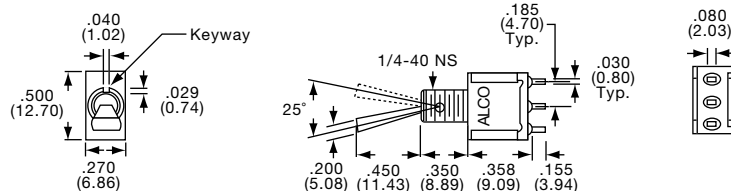
| Tyco Electronics       | Alcoswitch  | Tyco Electronics     | Alcoswitch  | Type | Act. Code P. M5 |    |      |      |
|------------------------|-------------|----------------------|-------------|------|-----------------|----|------|------|
| <b>Silver Contacts</b> |             | <b>Gold Contacts</b> |             |      |                 |    |      |      |
| 3-1437555-0            | A201MD9AV2Q | 2-1437555-9          | A201MD9AV2B | DPDT | 2               | On | None | On   |
|                        | A203MD9AV2Q |                      | A203MD9AV2B | DPDT | 6               | On | Off  | On   |
|                        | A208MD9AV2Q |                      | A208MD9AV2B | DPDT | 2               | On | None | (On) |



**Toggle Switches, A Series, Vertical, Wire Lug, Flat or Long Bat Actuator**

\* Refer to Pages C22-C26 for  
Additional Options \*

SEE PAGE C22 FOR PRODUCT SPECIFICATIONS



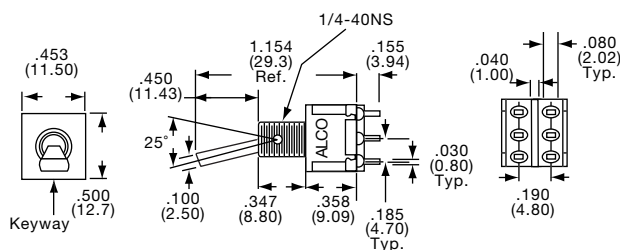
SPDT



A101P3YZQ

| Tyco Electronics       | Alcoswitch | Type | Act. Code P.M5 | ↖    | ↓    | ↗    |
|------------------------|------------|------|----------------|------|------|------|
| <b>Silver Contacts</b> |            |      |                |      |      |      |
| 2-1437554-9            | A101P3YZQ  | SPDT | 1              | On   | None | On   |
| 6-1437554-3            | A103P3YZQ  | SPDT | 5              | On   | Off  | On   |
| 8-1437554-7            | A105P3YZQ  | SPDT | 5              | (On) | Off  | (On) |
| 1437555-5              | A107P3YZQ  | SPDT | 5              | On   | Off  | (On) |
| 1-1437555-5            | A108P3YZQ  | SPDT | 1              | On   | None | (On) |

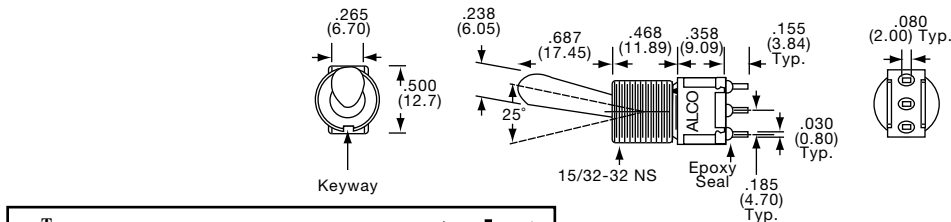
| Tyco Electronics       | Alcoswitch | Type | Act. Code P.M5 | ↖    | ↓    | ↗    |
|------------------------|------------|------|----------------|------|------|------|
| <b>Silver Contacts</b> |            |      |                |      |      |      |
| 3-1437555-6            | A201P3YZQ  | DPDT | 2              | On   | None | On   |
| 5-1437555-6            | A203P3YZQ  | DPDT | 6              | On   | Off  | On   |
| 6-1437555-6            | A205P3YZQ  | DPDT | 6              | (On) | Off  | (On) |
| 7-1437555-3            | A207P3YZQ  | DPDT | 6              | On   | Off  | (On) |
| 8-1437555-0            | A208P3YZQ  | DPDT | 2              | On   | None | (On) |
| 9-1436555-3            | A211P3YZQ  | SP3T | 11             | On   | On   | On   |
|                        | A215P3YZQ  | SP3T | 11             | (On) | On   | (On) |



DPDT



A201P3YZQ

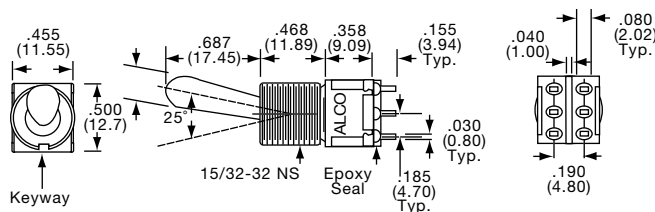


SPDT



A101TZQ

| Tyco Electronics       | Alcoswitch | Type | Act. Code P.M5 | ↖  | ↓    | ↗  |
|------------------------|------------|------|----------------|----|------|----|
| <b>Silver Contacts</b> |            |      |                |    |      |    |
| 5-1437554-6            | A101TZQ    | SPDT | 1              | On | None | On |
| 8-1437554-0            | A103TZQ    | SPDT | 5              | On | Off  | On |



DPDT



A201TZQ

| Tyco Electronics       | Alcoswitch | Type | Act. Code P.M5 | ↖  | ↓    | ↗  |
|------------------------|------------|------|----------------|----|------|----|
| <b>Silver Contacts</b> |            |      |                |    |      |    |
| 5-1437555-2            | A201TZQ    | DPDT | 2              | On | None | On |
| 6-1437555-4            | A203TZQ    | DPDT | 6              | On | Off  | On |
|                        | A211TZQ    | SP3T | 11             | On | On   | On |



**Toggle Switches, A Series, Wire Lug, 15/32 Bushing, Short Bat Actuator**

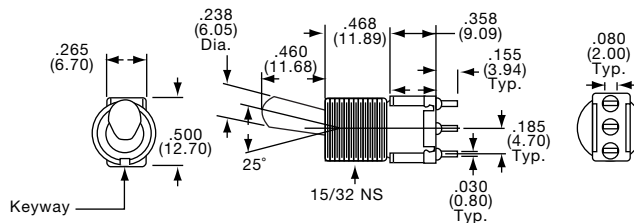
\* Refer to Pages C22-C26 for Additional Options \*

SEE PAGE C22 FOR PRODUCT SPECIFICATIONS

SPDT



A103T1ZQ

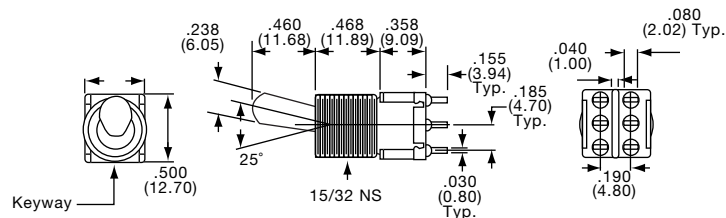


| Tyco Electronics       | Alcoswitch | Type | Act. Code | P.M5 | On   | Off  | On   |
|------------------------|------------|------|-----------|------|------|------|------|
| <b>Silver Contacts</b> |            |      |           |      |      |      |      |
| 5-1437554-4            | A101T1ZQ   | SPDT | 1         |      | On   | None | On   |
| 7-1437554-9            | A103T1ZQ   | SPDT | 5         |      | On   | Off  | On   |
| 9-1437554-8            | A105T1ZQ   | SPDT | 5         |      | (On) | Off  | (On) |
|                        | A108T1ZQ   | SPDT | 1         |      | On   | None | (On) |

DPDT



A201T1ZQ



| Tyco Electronics       | Alcoswitch | Type | Act. Code | P.M5 | On   | Off  | On   |
|------------------------|------------|------|-----------|------|------|------|------|
| <b>Silver Contacts</b> |            |      |           |      |      |      |      |
| 5-1437555-0            | A201T1ZQ   | DPDT | 2         |      | On   | None | On   |
| 6-1437555-3            | A203T1ZQ   | DPDT | 6         |      | On   | Off  | On   |
| 7-1437555-1            | A205T1ZQ   | DPDT | 6         |      | (On) | Off  | (On) |
| 7-1437555-7            | A207T1ZQ   | DPDT | 6         |      | On   | Off  | (On) |
| 8-1437555-6            | A208T1ZQ   | DPDT | 2         |      | On   | None | (On) |
| 1437556-2              | A211T1ZQ   | SP3T | 11        |      | On   | On   | On   |

## Toggle Switches, AE Series, Process Sealed, Part Number Matrix

### "AE" SERIES DESIGN FEATURES

- MIL-STD-202 Method 112C Leak Test
- Toggle – Machined brass, heavy nickel plated.
- Bushing & Cover - Nylon, ultrasonically welded to case, with integral "O-ring", UL94VO.
- Fixed Contact – Welded construction.
- Terminal Seal – Epoxy sealing of terminals is standard.
- Termination – Precious metal (gold or silver)/brass or copper strip with welded contact area.

### MATERIAL SPECIFICATIONS:

Process Sealing ..... "O-ring" seals will withstand wave soldering and various subsequent cleaning operations. Meets MIL-STD-202, Method 112C, Test Condition A & D, 85°C.

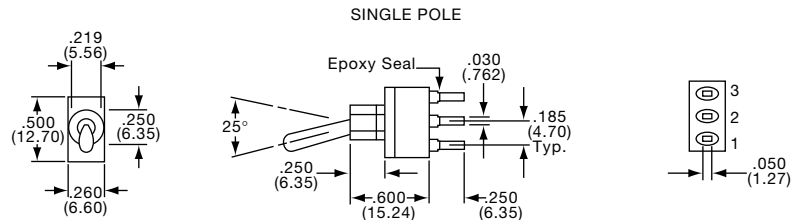
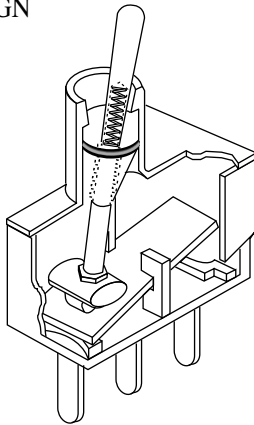
### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature.....-4°F to + 185°F (-20°C to + 85°C)  
Storage Temperature.....-49°F to + 212°F (-45°C to + 100°C)  
Solder Heat Resistance .....See page M3-4

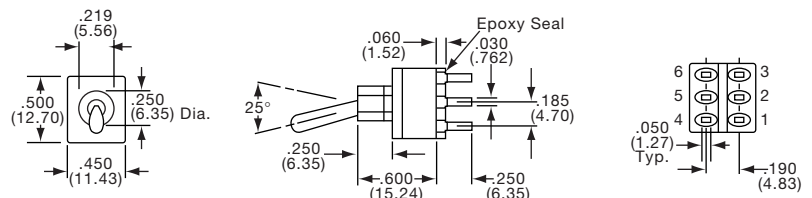
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....Silver: 2 A @ 250 VAC or 5 A @ 125 VAC  
Silver: 2 A @ 30 VDC  
Gold: 0.4 VA @ 20 VAC/DC  
Contact Resistance .....30 Milliohms max. initial  
Insulation Resistance .....1,000 Megohms min. @ 500 VDC.  
Dielectric Strength .....1,000 Volts RMS @ sea level initial  
Static Withstanding.....15 KV per IEC 801-2  
Electrical Life .....Up to 30,000 Cycles

### "O-RING" DESIGN



(TYPICAL DIMENSIONS)



DOUBLE POLE

### PART NUMBERING

| Model                   | Function | Toggle                | Bushing              | Terminal                            | Contact                   | Option                     |
|-------------------------|----------|-----------------------|----------------------|-------------------------------------|---------------------------|----------------------------|
| <b>AE1</b> Single Pole  |          | <b>S</b> Bat. Long    | <b>D1</b> Unthreaded | <b>A</b> Right Angle                | <b>B</b> Gold             | U.L. (Q or G contact only) |
| <b>AE2</b> Double Pole  |          | <b>L</b> Lever        |                      | <b>AV2</b> Vertical Right Angle     | <b>Q</b> Silver           |                            |
|                         |          | <b>L1</b> Lever       |                      | <b>C</b> Printed Circuit            | <b>G</b> Gold over Silver |                            |
|                         |          | <b>L2</b> Lever       |                      | <b>V30</b> Vertical Support Bracket |                           |                            |
| <b>01</b> On-On         |          | <b>M</b> Bat. Short   |                      | <b>W</b> Wire Wrap                  |                           |                            |
| <b>03</b> On-Off-On     |          |                       |                      | <b>Z3</b> Quick Connect             |                           |                            |
| <b>05</b> (On)-Off-(On) |          |                       |                      | <b>Z</b> Wire Lug                   |                           |                            |
| <b>07</b> On-Off-(On)   |          |                       |                      |                                     |                           |                            |
| <b>08</b> On-(On)       |          |                       |                      |                                     |                           |                            |
| <b>11</b> On-On-On      |          |                       |                      |                                     |                           |                            |
| <b>13</b> On-On-(On)    |          |                       |                      |                                     |                           |                            |
| <b>15</b> (On)-On-(On)  |          |                       |                      |                                     |                           |                            |
|                         |          | Double Pole case only |                      |                                     |                           |                            |

Application Note: For surface mount termination, use the "TST" series, Page C5

### Other Options

- N** Black finish toggle, add "N" to end of part number, but before U.L. option.

See page C36 for SP3T wiring diagram.

## Pushbutton Switches, Panel Mount, Wire Lug or PC Tails, 6 Amp

### MATERIAL SPECIFICATIONS:

Contacts .....Silver clad copper with gold flash  
Case Material.....Thermoset  
Actuator Material .....Nickel plated copper alloy  
Terminals.....Copper with gold flash  
Terminal Seal .....Molded in

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature .....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature .....-40°F to +176°F (-40°C to +80°C)  
Solder Heat Resistance .....See page M3-4

Note: Hardware included with switches

### TYPICAL PERFORMANCE CHARACTERISTICS:

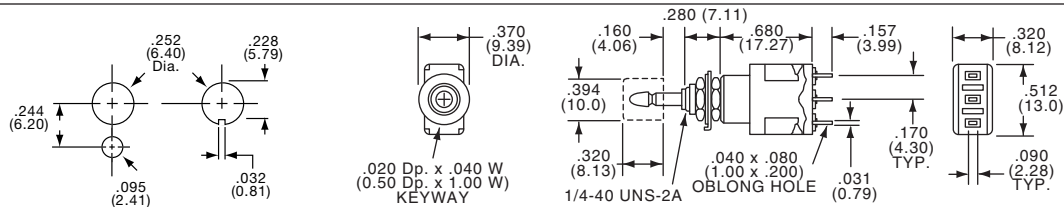
Contact Rating.....6 A @ 125 VAC, 3 A @ 250 VAC  
Initial Contact Resistance .....10 Milliohms max.  
Contact Timing .....Break-before-make  
Insulation Resistance.....1,000 Megohms min.  
Dielectric Strength.....1,500 Volts RMS @ sea level  
Actuation Force .....1.3 to 2.7 lbs.  
Actuator Travel ......140" (3.56)  
Life Expectancy.....Up to 50,000 Actuations

**Cap not supplied, order separately**  
(See Cap Model C22 and C23 on page D32.)

### SPDT



MPA106D

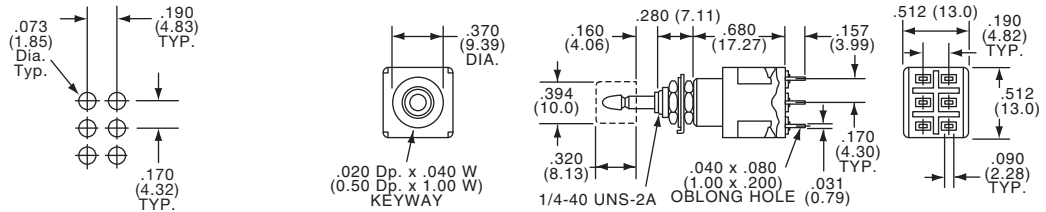


| Part Number      |            |      |                 |                  |
|------------------|------------|------|-----------------|------------------|
| Tyco Electronics | Alcoswitch | Type | Act. Code P. M6 | Action           |
| 2-1437567-8      | MPA106D    | SPDT | 23              | Push-on/Push-off |
| 2-1437567-9      | MPA106F    | SPDT | 19              | Momentary        |

### DPDT



MPA206N



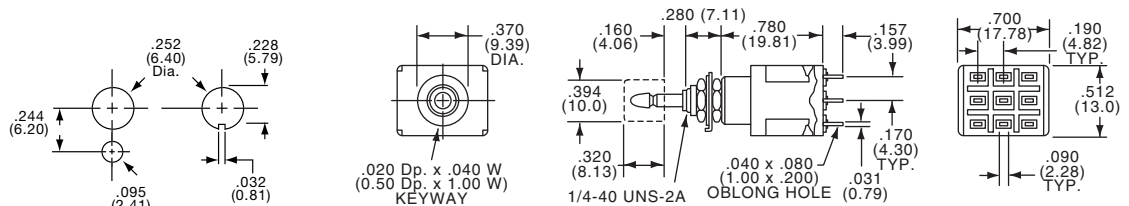
| Part Number       |            |      |                 |                  |
|-------------------|------------|------|-----------------|------------------|
| Tyco Electronics  | Alcoswitch | Type | Act. Code P. M6 | Action           |
| Wirelug Terminals |            |      |                 |                  |
| 3-1437567-1       | MPA206N    | DPDT | 24              | Push-on/Push-off |
| 3-1437567-3       | MPA206R    | DPDT | 20              | Momentary        |

| Part Number      |            |      |                 |                  |
|------------------|------------|------|-----------------|------------------|
| Tyco Electronics | Alcoswitch | Type | Act. Code P. M6 | Action           |
| PC Terminals     |            |      |                 |                  |
| 3-1437567-2      | MPA206NPC  | DPDT | 24              | Push-on/Push-off |
| 3-1437567-4      | MPA206RPC  | DPDT | 20              | Momentary        |

### 3PDT



MPA306D

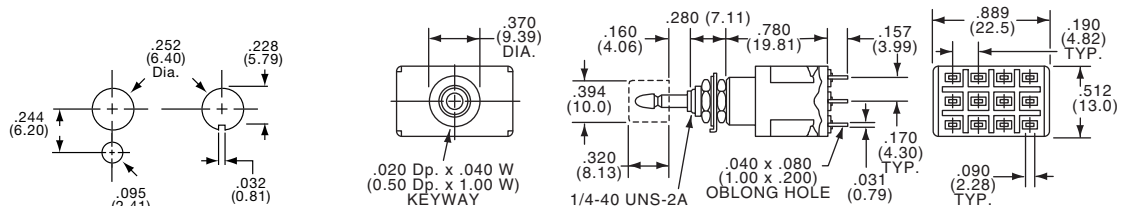


| Part Number      |            |      |                 |                  |
|------------------|------------|------|-----------------|------------------|
| Tyco Electronics | Alcoswitch | Type | Act. Code P. M6 | Action           |
| 3-1437567-5      | MPA306D    | 3PDT | 25              | Push-on/Push-off |
| 3-1437567-6      | MPA306F    | 3PDT | 21              | Momentary        |

### 4PDT



MPA406N



| Part Number      |            |      |                 |                  |
|------------------|------------|------|-----------------|------------------|
| Tyco Electronics | Alcoswitch | Type | Act. Code P. M6 | Action           |
| 3-1437567-7      | MPA406N    | 4PDT | 26              | Push-on/Push-off |
| 3-1437567-8      | MPA406R    | 4PDT | 22              | Momentary        |

## Pushbutton Switches, Splashproof, Panel Mount, Wire Lug, 6 Amp

### MATERIAL SPECIFICATIONS:

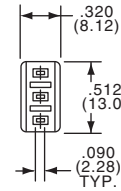
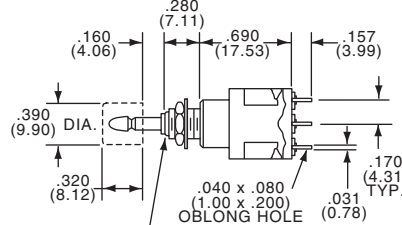
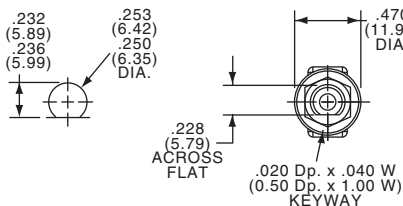
Contacts .....Silver clad copper with gold flash  
Case Material .....Thermoset  
Actuator Material .....Nickel plated copper alloy  
Terminals .....Copper with gold flash  
Terminal Seal .....Molded in

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature .....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature .....-40°F to +176°F (-40°C to +80°C)  
Note: Hardware included with switches

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....6 A @ 125 VAC, 3 A @ 250 VAC  
Initial Contact Resistance .....10 Milliohms max.  
Contact Timing .....Break-before-make  
Insulation Resistance .....1,000 Megohms min.  
Dielectric Strength .....1,500 Volts RMS @ sea level  
Actuation Force .....1.3 to 2.7 lbs.  
Actuator Travel ......140" (3.56)  
Life Expectancy .....Up to 50,000 Actuations  
**Notice: O-ring on shoulder and inside moveable shaft provides splashproof seal. Meets IP65**

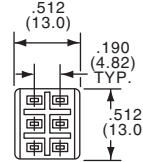
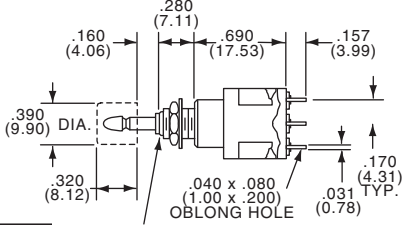
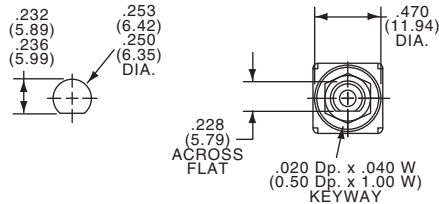


SPDT

MPE106D

| Part Number      |            | Act. Code |       | Action           |
|------------------|------------|-----------|-------|------------------|
| Tyco Electronics | Alcoswitch | Type      | P. M6 |                  |
| 4-1437567-2      | MPE106D    | SPDT      | 23    | Push on/Push off |
| 4-1437567-3      | MPE106F    | SPDT      | 19    | Momentary        |

Cap not supplied, order separately (See Cap Model C22 and C23 on page D32.)

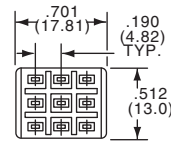
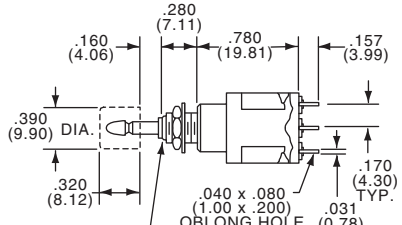
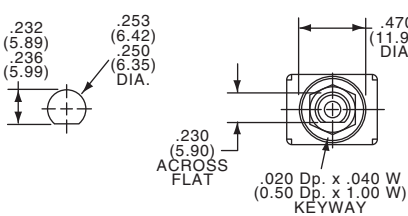


DPDT

MPE206N

| Part Number      |            | Act. Code |       | Action           |
|------------------|------------|-----------|-------|------------------|
| Tyco Electronics | Alcoswitch | Type      | P. M6 |                  |
| 4-1437567-4      | MPE206N    | DPDT      | 24    | Push on/Push off |
| 4-1437567-5      | MPE206R    | DPDT      | 20    | Momentary        |

Cap not supplied, order separately (See Cap Model C22 and C23 on page D32.)

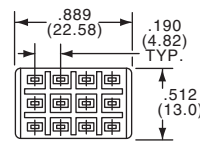
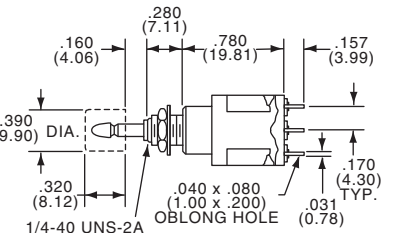
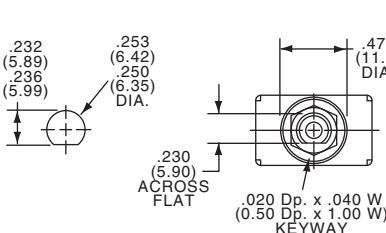


3PDT

MPE306F

| Part Number      |            | Act. Code |       | Action           |
|------------------|------------|-----------|-------|------------------|
| Tyco Electronics | Alcoswitch | Type      | P. M6 |                  |
| —                | MPE306D    | 3PDT      | 25    | Push on/Push off |
| 4-1437567-6      | MPE306F    | 3PDT      | 21    | Momentary        |

Cap not supplied, order separately (See Cap Model C22 and C23 on page D32.)



4PDT

MPE406N

| Part Number      |            | Act. Code |       | Action           |
|------------------|------------|-----------|-------|------------------|
| Tyco Electronics | Alcoswitch | Type      | P. M6 |                  |
| 4-1437567-7      | MPE406N    | 4PDT      | 26    | Push on/Push off |
| 4-1437567-8      | MPE406R    | 4PDT      | 22    | Momentary        |

Cap not supplied, order separately (See Cap Model C22 and C23 on page D32.)

**Pushbutton Switches, 15/32 Bushing, Mustang, Wire Lug or PC Tails, 6 Amp**

**MATERIAL SPECIFICATIONS:**

Contacts .....Silver clad copper with gold flash  
Case Material .....Thermoset  
Terminals .....Copper with gold flash finish  
Terminal Seal .....Molded in

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature.....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature.....-40°F to +176°F (-40°C to +80°C)  
Solder Heat Resistance .....See page M3-4

**TYPICAL PERFORMANCE CHARACTERISTICS:**

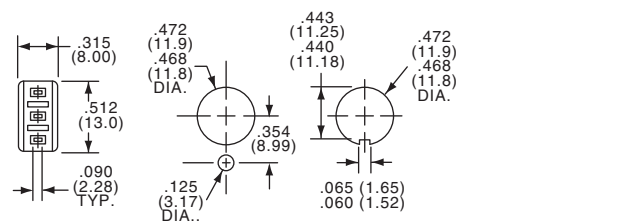
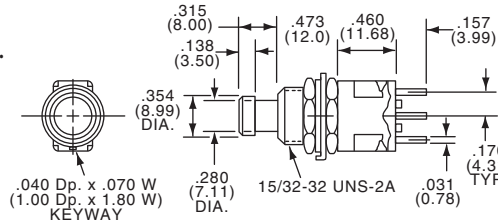
Contact Rating .....6 A @ 125 VAC, 3 A @ 250 VAC  
Initial Contact Resistance .....10 Milliohms max.  
Contact Timing.....Break-before-make  
Insulation Resistance .....1,000 Megohms min.  
Dielectric Strength .....1,500 Volts RMS @ sea level  
Actuation Force .....1.3 to 2.7 lbs.  
Actuator Travel......138" (3.51)  
Life Expectancy .....Up to 50,000 Actuations  
Note: Hardware included with switches

**SPDT**

Black Cap supplied.



MPG106D



Other Caps Available, order separately  
(See Cap Model C9 on page D32.)

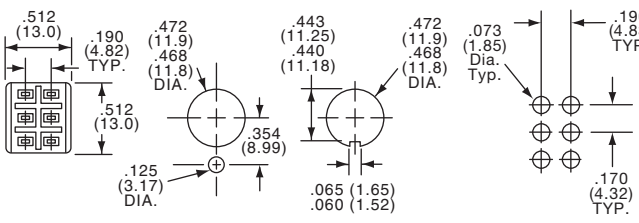
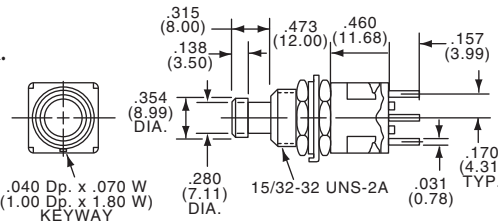
| Part Number      |            | Type | Act. Code | P. M6 | Action           | Terminals |
|------------------|------------|------|-----------|-------|------------------|-----------|
| Tyco Electronics | Alcoswitch |      |           |       |                  |           |
| 4-1437567-9      | MPG106D    | SPDT | 23        |       | Push on/Push off | Wire Lug  |
| 5-1437567-0      | MPG106F    | SPDT | 19        |       | Momentary        | Wire Lug  |

**DPDT**

Black Cap supplied.



MPG206NPC



Other Caps Available, order separately  
(See Cap Model C9 on page D32.)

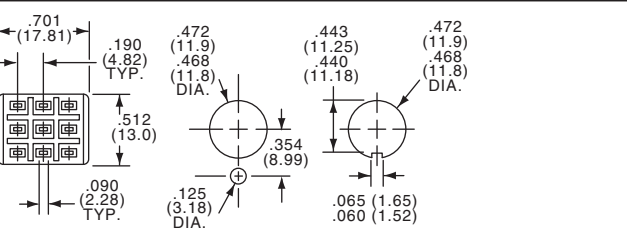
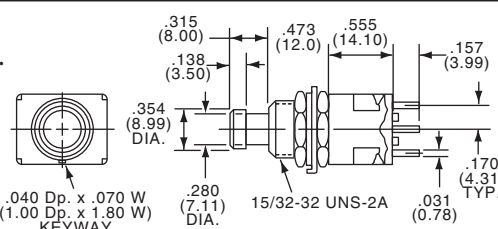
| Part Number      |            | Type | Act. Code | P. M6 | Action           | Terminals |
|------------------|------------|------|-----------|-------|------------------|-----------|
| Tyco Electronics | Alcoswitch |      |           |       |                  |           |
| 5-1437567-1      | MPG206N    | DPDT | 24        |       | Push on/Push off | Wire Lug  |
| 5-1437567-3      | MPG206R    | DPDT | 20        |       | Momentary        | Wire Lug  |
| 5-1437567-2      | MPG206NPC  | DPDT | 24        |       | Push on/Push off | PC        |
| 5-1437567-4      | MPG206RPC  | DPDT | 20        |       | Momentary        | PC        |

**3PDT**

Black Cap supplied.



MPG306D



Other Caps Available, order separately  
(See Cap Model C9 on page D32.)

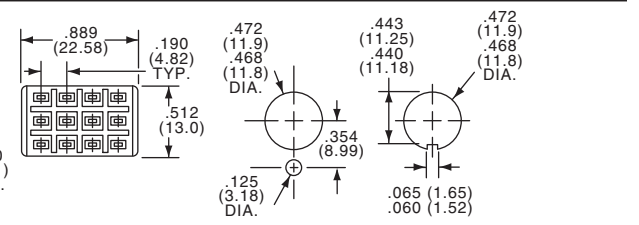
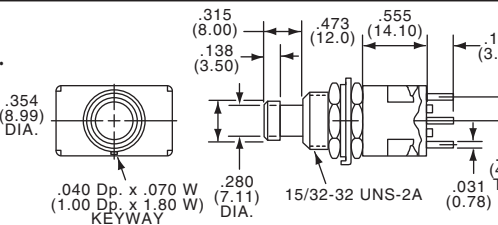
| Part Number      |            | Type | Act. Code | P. M6 | Action           | Terminals |
|------------------|------------|------|-----------|-------|------------------|-----------|
| Tyco Electronics | Alcoswitch |      |           |       |                  |           |
| 5-1437567-5      | MPG306D    | 3PDT | 25        |       | Push on/Push off | Wire Lug  |
| 5-1437567-6      | MPG306F    | 3PDT | 21        |       | Momentary        | Wire Lug  |

**4PDT**

Black Cap supplied.



MPG406N



Other Caps Available, order separately  
(See Cap Model C9 on page D32.)

| Part Number      |            | Type | Act. Code | P. M6 | Action           | Terminals |
|------------------|------------|------|-----------|-------|------------------|-----------|
| Tyco Electronics | Alcoswitch |      |           |       |                  |           |
| 5-1437567-7      | MPG406N    | 4PDT | 25        |       | Push on/Push off | Wire Lug  |
| 5-1437567-8      | MPG406R    | 4PDT | 21        |       | Momentary        | Wire Lug  |



## Pushbutton Switches, Snap Action, Wire Lug, 3 Amp

### MATERIAL SPECIFICATIONS:

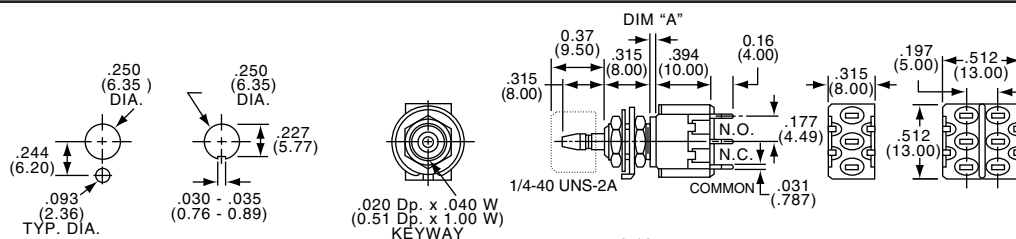
|                         |                            |
|-------------------------|----------------------------|
| Contacts .....          | Silver                     |
| Case Material .....     | Epoxy resin                |
| Actuator Material ..... | Copper alloy, nickel plate |
| Terminals .....         | Silver                     |
| Terminal Seal .....     | Epoxy                      |

### ENVIRONMENTAL SPECIFICATIONS:

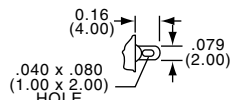
Operating Temperature.....+5°F to +158°F (-15°C to +70°C)  
Storage Temperature.....+5°F to +158°F (-15°C to +70°C)  
Solder Heat Resistance .....See page M3-4

### TYPICAL PERFORMANCE CHARACTERISTICS:

|                                  |                                                                                               |
|----------------------------------|-----------------------------------------------------------------------------------------------|
| Contact Rating .....             | 3 A @ 115 VAC or 28 VDC                                                                       |
| Initial Contact Resistance ..... | 10 Milliohms max.                                                                             |
| Contact Timing .....             | Break-before-make                                                                             |
| Insulation Resistance .....      | 1,000 Megohms @ 500 VDC min.                                                                  |
| Dielectric Strength .....        | 1,000 Volts RMS @ sea level                                                                   |
| Actuation Force .....            | Single pole - 7 to 14 oz. (200 to 400 grams)<br>Double pole - 14 to 25 oz. (400 to 700 grams) |
| Actuator Travel .....            | Momentary .040" (1.02)<br>Push on/off .098" (2.49)                                            |
| Life Expectancy .....            | Up to 50,000 Actuations                                                                       |



| Part Number      |            | Type | Action      | Dim."A" | Terminals |
|------------------|------------|------|-------------|---------|-----------|
| Tyco Electronics | Alcoswitch |      |             |         |           |
| 5-1437567-9      | MPS103D    | SPDT | Push-on/Off | .100    | Wire Lug  |
| 6-1437567-3      | MPS103F    | SPDT | Momentary   | .040    | Wire Lug  |
| 6-1437567-8      | MPS203N    | DPDT | Push-on/Off | .100    | Wire Lug  |
| 7-1437567-2      | MPS203R    | DPDT | Momentary   | .040    | Wire Lug  |



**Note: Hardware included with switches**  
**Caps not supplied, order separately. (See Cap Model C22 and C23 on Page D32.)**



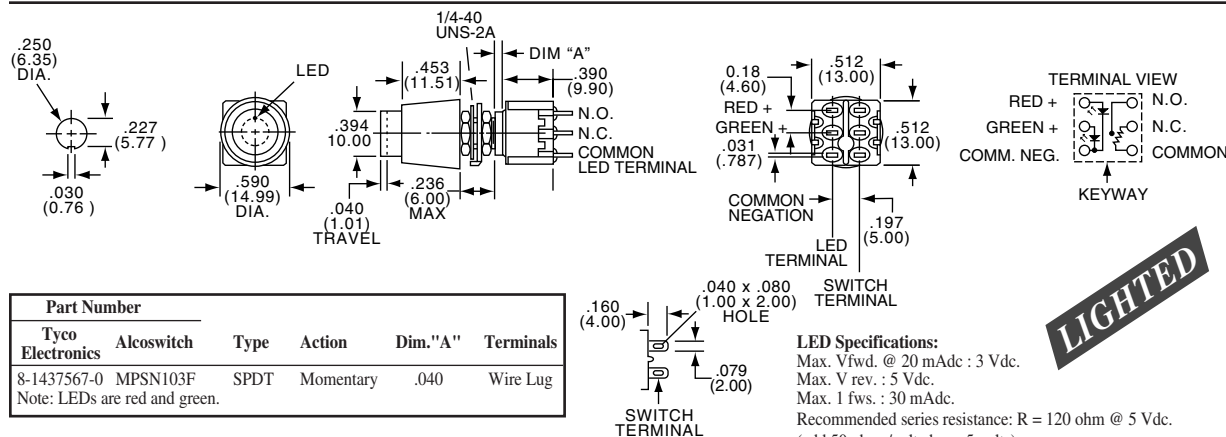
MPS203R



MPS103F

SPDT/DPDT

MPS Series



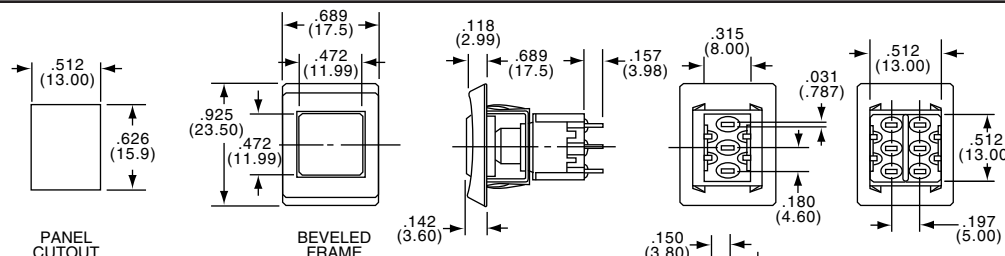
| Part Number                   |            | Type | Action    | Dim."A" | Terminals |
|-------------------------------|------------|------|-----------|---------|-----------|
| Tyco Electronics              | Alcoswitch |      |           |         |           |
| 8-1437567-0                   | MPSN103F   | SPDT | Momentary | .040    | Wire Lug  |
| Note: LEDs are red and green. |            |      |           |         |           |

**LED Specifications:**  
Max. Vfwd. @ 20 mAdc : 3 Vdc.  
Max. V rev. : 5 Vdc.  
Max. I fws. : 30 mAdc.  
Recommended series resistance:  $R = 120\ \text{ohm} @ 5\ \text{Vdc.}$   
(add 50 ohms/volt above 5 volts)



MPSN103F

SPDT



| Part Number |              | Type                   | Action    | Terminals    |
|-------------|--------------|------------------------|-----------|--------------|
| 8-1437567-1 | MPSR103F     | SPDT                   | Momentary | Wire Lug     |
| 8-1437567-2 | MPSR203R     | DPDT                   | Momentary | Wire Lug     |
|             | <b>Model</b> | <b>Description</b>     |           | <b>Color</b> |
| 2-1437628-2 | SDR0         | Plastic beveled frame  |           | Black        |
| 5-1437627-5 | C330         | Square button for MPSR |           | Black        |
| 5-1437627-6 | C332         | Square button “        |           | Red          |
| 5-1437627-8 | C339         | Square button “        |           | White        |



MPSR103F



MPSR203R

SPDT/DPDT

**C-33(\*) Button not supplied, Plastic (black)  
beveled edged frame Model SDRO, not supplied.  
ORDER SEPARATELY**

**Pushbutton Switches, Snap Action, PC or Wire Wrap Tails, 3 Amp**

SPDT/DPDT

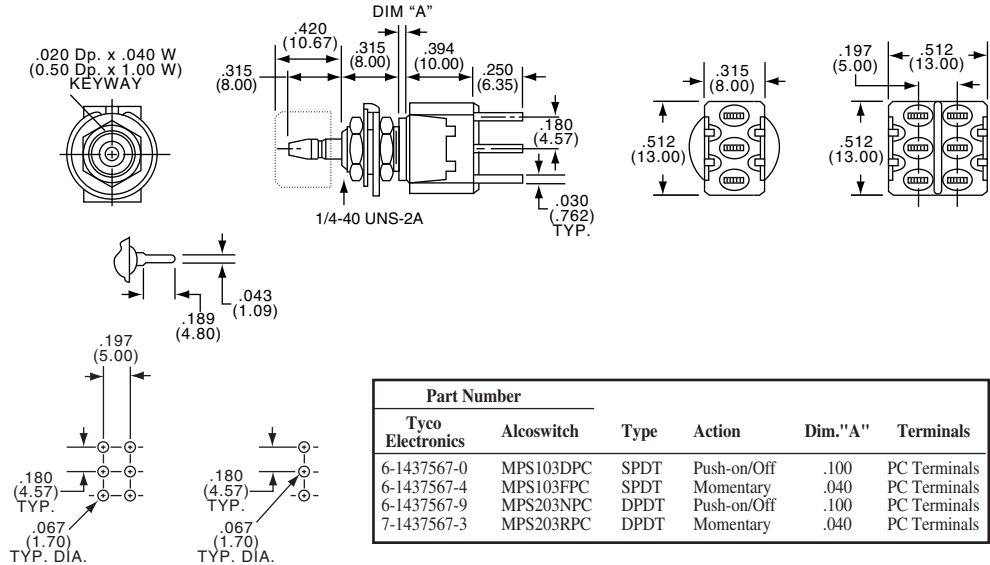
SEE PAGE D25 FOR PRODUCT SPECIFICATIONS



MPS103FPC



MPS203RPC



Caps not supplied, order separately. (See Cap Model C22 and C23 on Page D32.)

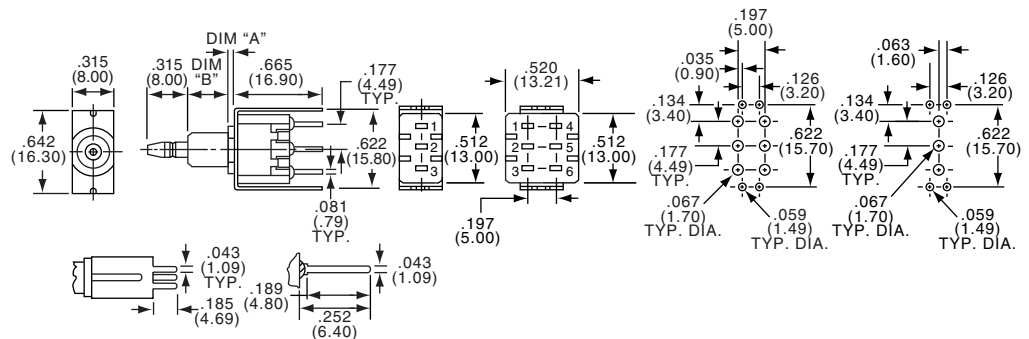
SPDT/DPDT



MPS103FPCV



MPS203RPCV



Caps not supplied, order separately.  
(See Cap Model C22 and C23 on Page D32.)

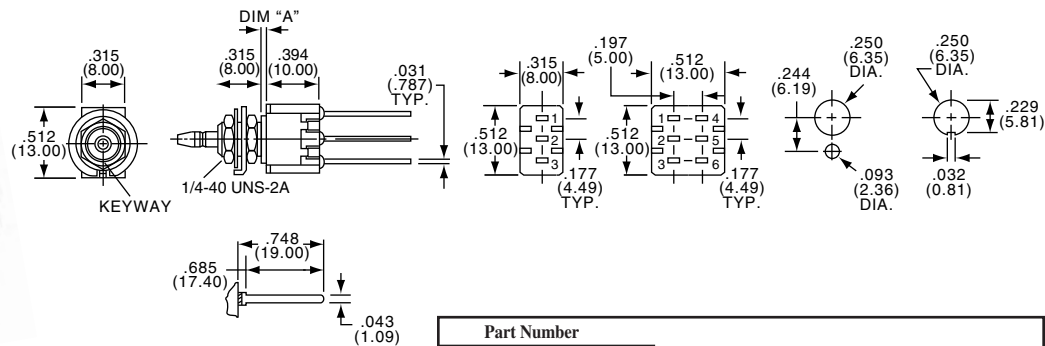
SPDT/DPDT



MPS103FWW



MPS203RWW

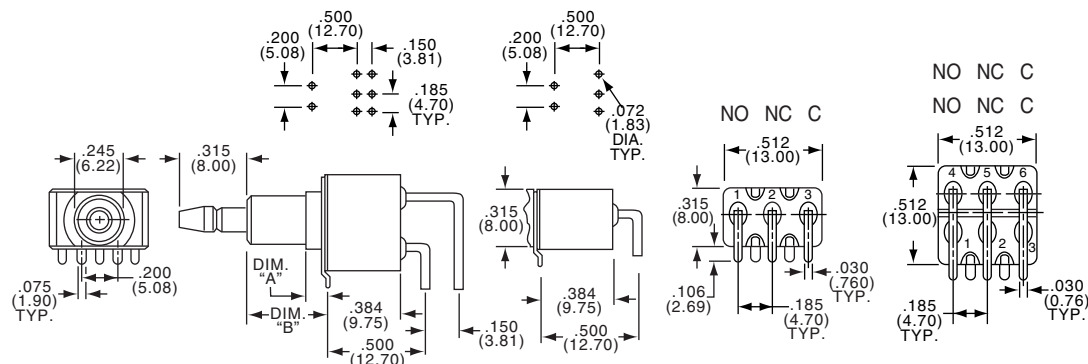


Caps not supplied, order separately.  
(See Cap Model C22 and C23 on Page D32.)



## Pushbutton Switches, Snap Action, Right Angle, 3 Amp

SEE PAGE D25 FOR PRODUCT SPECIFICATIONS



SPDT/DPDT



MPS103DRA



MPS203NRA

| Part Number      |            |      |             |            |            |                |
|------------------|------------|------|-------------|------------|------------|----------------|
| Tyco Electronics | Alcoswitch | Type | Action      | Dim."A"    | Dim."B"    | Terminals      |
| 6-1437567-2      | MPS103DRA  | SPDT | Push-on/Off | .100(2.54) | .423(10.7) | Right Angle PC |
| 6-1437567-6      | MPS103FRA  | SPDT | Momentary   | .060(1.52) | .364(9.24) | Right Angle PC |
| 7-1437567-1      | MPS203NRA  | DPDT | Push-on/Off | .100(2.54) | .423(10.7) | Right Angle PC |
| 7-1437567-5      | MPS203RRA  | DPDT | Momentary   | .060(1.52) | .364(9.24) | Right Angle PC |

Caps not supplied, order separately.  
(See Cap Model C22 and C23 on Page D32.)

### MSP3/MSPS

## Pushbutton Switches, 2.5mm Travel, Panel Mount

### MATERIAL SPECIFICATIONS:

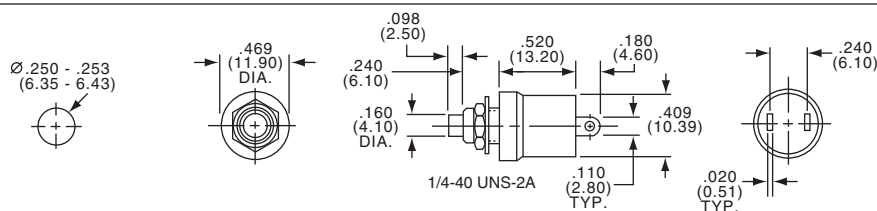
Contacts .....Silver plate over copper alloy  
Case Material .....Thermoplastic  
Actuator Material .....Thermoplastic  
Terminals .....Silver plate

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature.....+5°F to +153°F (-15°C to +75°C)  
Solder Heat Resistance .....See page M3-4  
Note: Hardware included with switches

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....MSP103 - 3 Amps @ 125 VAC  
(with over travel) .059" (1.5mm)  
MSPS103 - 0.5 Amps @ 125 VAC  
(Butt contact)  
Initial Contact Resistance .....100 Milliohms  
Contact Timing .....Break-before-make  
Insulation Resistance .....1,000 Megohms min.  
Dielectric Strength .....1,000 Volts RMS @ sea level  
Life Expectancy .....Up to 10,000 Cycles  
Travel .....2.5 mm



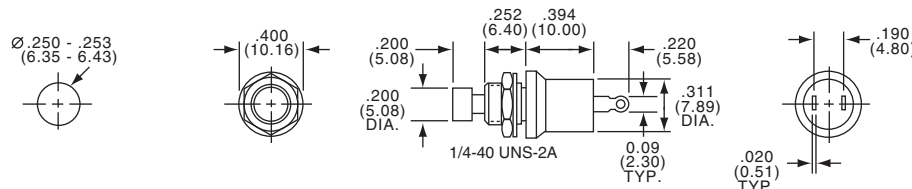
SPST



MSP103B

3 AMPS

| Part Number      |            |      |                 |                  |                |                |
|------------------|------------|------|-----------------|------------------|----------------|----------------|
| Tyco Electronics | Alcoswitch | Type | Act. Code P. M6 | Momentary Action | Bushing Length | Actuator Color |
| 8-1437567-3      | MSP103B    | SPST | 14              | Normally Closed  | .236           | Black          |
| 8-1437567-4      | MSP103C    | SPST | 13              | Normally Open    | .236           | Red            |
| 8-1437567-5      | MSP103C0   | SPST | 13              | Normally Open    | .236           | Black          |
| 8-1437567-6      | MSP103C2   | SPST | 13              | Normally Open    | .374           | Red            |



MSPS103B

0.5 AMPS

| Part Number      |            |      |                 |                  |                |                |
|------------------|------------|------|-----------------|------------------|----------------|----------------|
| Tyco Electronics | Alcoswitch | Type | Act. Code P. M6 | Momentary Action | Bushing Length | Actuator Color |
| 1437568-5        | MSPS103B   | SPST | 14              | Normally Closed  | .245           | Black          |
| 1437568-6        | MSPS103C2  | SPST | 13              | Normally Open    | .245           | Red            |
| 1437568-7        | MSPS103C0  | SPST | 13              | Normally Open    | .245           | Black          |

**Pushbutton Switches, Front or Rear Entry Mount, 15/32 Bushing**

**MATERIAL SPECIFICATIONS:**

Contacts .....Silver plate  
Case Material .....Thermoset  
Actuator Material .....Thermoplastic  
Terminals .....Silver plate  
Terminal Seal .....Epoxy

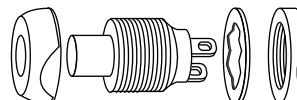
**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature.....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature.....-4°F to +176°F (-20°C to +80°C)

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....0.5 A @ 125 VAC  
Initial Contact Resistance .....100 Milliohms  
Contact Timing .....Break-before-make  
Insulation Resistance .....1,000 Megohms min.  
Dielectric Strength .....1,000 Volts RMS @ sea level  
Actuator Travel......098" (2.49)  
Life Expectancy .....Up to 10,000 Cycles

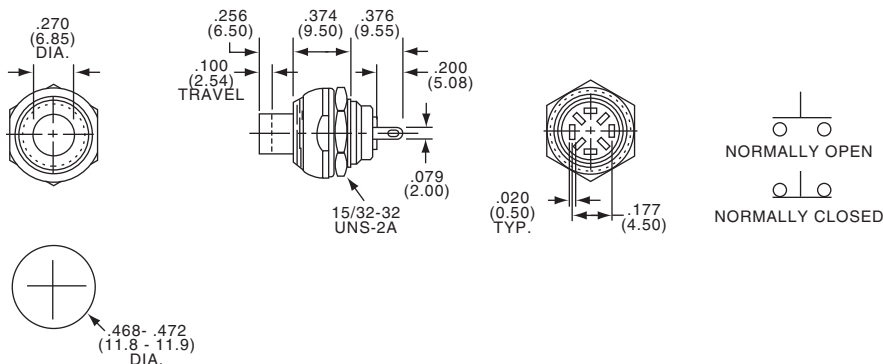
Application Note: Illustration shows versatile front or rear entry usage, with hardware supplied.



**SPST**



MSPF101B

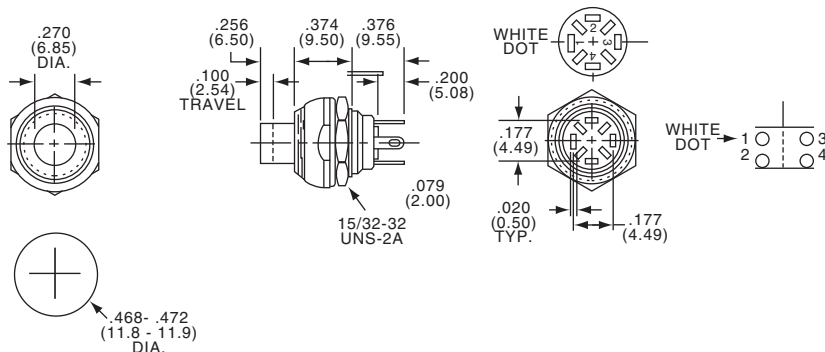


| Part Number      |            |      |                 |                |
|------------------|------------|------|-----------------|----------------|
| Tyco Electronics | Alcoswitch | Type | Action          | Actuator Color |
| 8-1437567-8      | MSPF101B   | SPST | Normally Closed | Black          |
| 9-1437567-3      | MSPF101C   | SPST | Normally Open   | Red            |

**2 CIRCUIT**



MSPF101BC



| Part Number      |            |           |                               |                |
|------------------|------------|-----------|-------------------------------|----------------|
| Tyco Electronics | Alcoswitch | Type      | Action                        | Actuator Color |
| 8-1437567-9      | MSPF101BC0 | 2 Circuit | Normally open-normally closed | Black          |
| 9-1437567-0      | MSPF101BC2 | 2 Circuit | Normally open-normally closed | Red            |
| 9-1437567-1      | MSPF101BC6 | 2 Circuit | Normally open-normally closed | Blue           |
| 9-1437567-2      | MSPF101BC9 | 2 Circuit | Normally open-normally closed | White          |

## Pushbutton Switches, Magnetic Reed, Long Life, Hermetically Sealed

### MATERIAL SPECIFICATIONS:

|                               |           |
|-------------------------------|-----------|
| Contacts .....                | Gold      |
| Case Material .....           | Steel     |
| Actuator Material .....       | Polyamide |
| Terminals/Fixed Contacts..... | Wire Lug  |

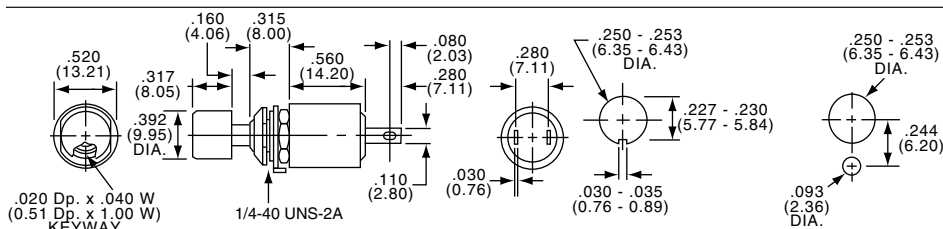
Pin useable for PC applications

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....+14°F to +176°F (-10°C to +80°C)  
Storage Temperature.....+14°F to +176°F (-10°C to +80°C)

### TYPICAL PERFORMANCE CHARACTERISTICS:

|                                       |                                                                                                       |
|---------------------------------------|-------------------------------------------------------------------------------------------------------|
| Contact Rating .....                  | 1.0 VA optimum (100 mA max., 100 VDC max.)                                                            |
| Initial Contact Resistance .....      | 100 Milliohms max.                                                                                    |
| Actuation Force .....                 | Tactile "keyboard feel" 4 to 7 oz.<br>"breakaway" reducing immediately to 1.5 oz.<br>"follow-through" |
| Actuator Travel .....                 | .078" nominal                                                                                         |
| Life Expectancy.....                  | Up to 5,000,000 Cycles @ .1 VA; 50,000 cycles<br>@ 5VA                                                |
| Solder Heat Resistance .....          | See page M3-4                                                                                         |
| Note: Hardware included with switches |                                                                                                       |



| Part Number |           | Type | Act. Code P. M6 | Action          | Actuator Type | Terminals |
|-------------|-----------|------|-----------------|-----------------|---------------|-----------|
| 9-1437567-4 | MSPM101B0 | SPST | 14              | Normally Closed | Black Cap     | Pin       |
| 1437568-1   | MSPM101C2 | SPST | 13              | Normally Open   | Red Cap       | Pin       |
| 9-1437567-5 | MSPM101B1 | SPST | 14              | Normally Closed | Black Cap     | Lug       |
| 9-1437567-9 | MSPM101C1 | SPST | 13              | Normally Open   | Red Cap       | Lug       |

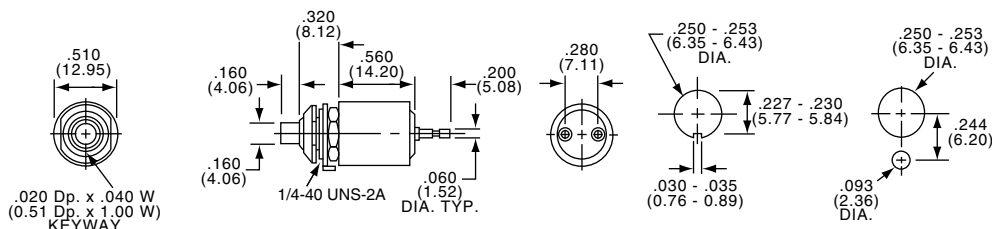
**Cap Model C22 supplied with unit.**

N.C. OR N.O.  
SOFT DETENT



MSPM101B0

MSPM101B1



| Part Number        |            | Type | Act. Code | P. M6 | Action          | Actuator Type | Terminals |
|--------------------|------------|------|-----------|-------|-----------------|---------------|-----------|
| <b>Electronics</b> |            |      |           |       |                 |               |           |
| 9-1437567-7        | MSPM101BS  | SPST | 14        |       | Normally Closed | Black Plunger | Pin       |
| 1437568-3          | MSPM101CS  | SPST | 13        |       | Normally Open   | Red Plunger   | Pin       |
| 9-1437567-8        | MSPM101BS1 | SPST | 14        |       | Normally Closed | Black Plunger | Lug       |
| 1437568-4          | MSPM101CS1 | SPST | 13        |       | Normally Open   | Red Plunger   | Lug       |

MSPM101CS1

N.C. OR N.O.  
AUDIBLE DETENT



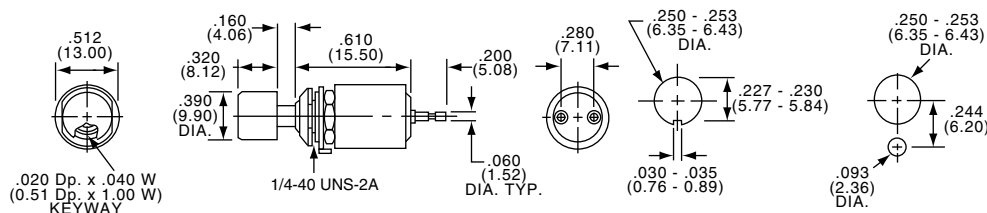
MSPM101BS

## Pushbutton Switches, Push-Pull, Magnetic Reed, Long Life, Hermetically Sealed

**SPECIFICATIONS** (Same as above except):

Travel .....125" (3.18) nominal

Actuation Force .....Tactile feel 5 to 8 oz. "breakaway" with magnetically accelerated "follow-through"



| Part Number              |           | Type | Act. Code | P. M6 | Push   | Pull   | Actuator Type | Terminals |
|--------------------------|-----------|------|-----------|-------|--------|--------|---------------|-----------|
| 9-1437567-6<br>1437568-2 | MSPM101BP | SPST | 18        |       | Open   | Closed | Black Cap     | Pin       |
|                          | MSPM101CP | SPST | 17        |       | Closed | Open   | Red Cap       | Pin       |

**Cap Model C22 supplied with unit.  
Model C23 available, order separately. (See Page D32.)**

N.C. OR N.O.



MSPM101BP

MSPM101CP

## Push Switch, JLS Series

### MATERIAL SPECIFICATIONS:

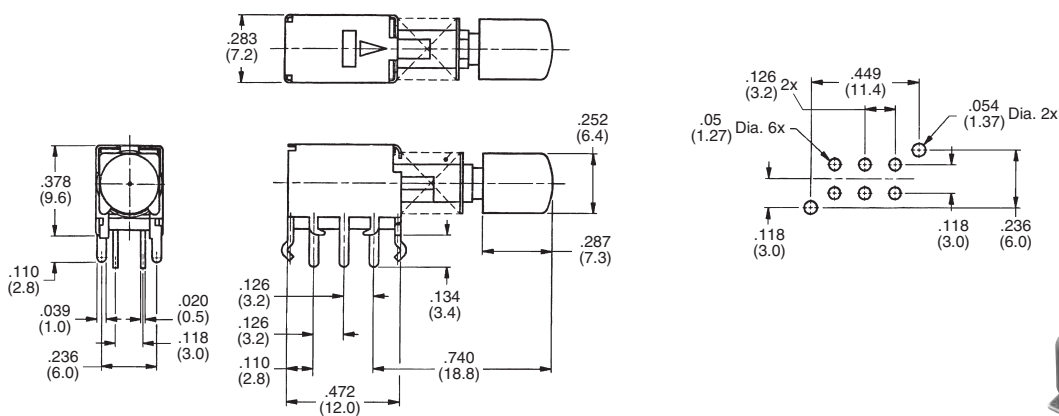
|                                |                     |
|--------------------------------|---------------------|
| Contacts .....                 | Silver clad copper  |
| Frame .....                    | Steel               |
| Actuator Material .....        | Acetal              |
| Terminals/Fixed Contacts ..... | Brass, silver plate |
| Insulator .....                | Phenol              |

### TYPICAL PERFORMANCE CHARACTERISTICS:

|                                  |                     |
|----------------------------------|---------------------|
| Contact Rating .....             | 1 Amp @25 VDC       |
| Initial Contact Resistance ..... | 100 Milliohms       |
| Actuation Force .....            | 300±150 gms         |
| Actuator Travel .....            | 0.091 (2.3)         |
| Life Expectancy .....            | Up to 10,000 cycles |

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....+14°F to +140°F (-10°C to +60°C)



| Part Number      |              | Act. Code P. M6 | Actuator Type |
|------------------|--------------|-----------------|---------------|
| Tyco Electronics | Alcoswitch   |                 |               |
| 1437566-8        | JLS91439FKBC | N               | Black Cap     |
| 1437566-7        | JLS91439FK   | N               | Gray Cap      |
| 1437566-9        | JLS91439FWC  | N               | White Cap     |

## Pushbutton Switches, Splashproof Boot Seals

A wide selection of stock boot seals for pushbuttons are available in a variety of styles and thread sizes. ALCOSWITCH seals replace standard mounting hardware to provide environmental seal. Fabricated of Neoprene in black and optional red or gray. Custom colors and thread sizes are also available on special order.

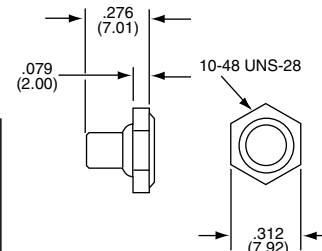


BP10480

### 10-48 PUSHBUTTON BOOT SEALS

Splashproof seal designed for "TINY" pushbutton switches having a 10-48 bushing and .14" long button actuators. The hex nut is molded-in to the Neoprene seal. No O-Ring is required. Custom colors are available on special order.

| Part Number      |            |             |            |             |                       |
|------------------|------------|-------------|------------|-------------|-----------------------|
| Tyco Electronics | Alcoswitch | Mount Color | Boot Color | Thread Size | Use with Switch Types |
| 1-1437626-4      | BP10480    | Black       | Black      | 10-48       | TP Series             |
| 1-1437626-5      | BP10482    | Red         | Red        | 10-48       | TP Series             |
| 1-1437626-6      | BP10488    | Gray        | Gray       | 10-48       | TP Series             |



BPA14400

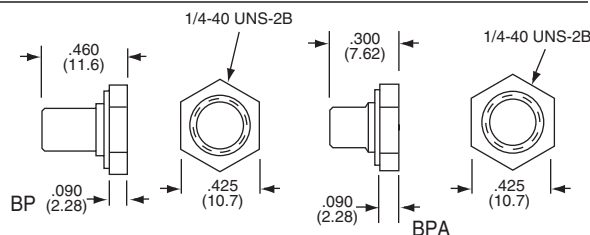


BP14400

### 1/4-40 PUSHBUTTON BOOT SEALS

Splashproof seals for miniature pushbuttons having a 1/4-40 bushing. The two models allow use with buttons that extend up to .17" (BPA) or up to .33" (BP). The hex nut is molded-in and no O-Ring is required.

| Part Number      |            |             |            |             |                                       |
|------------------|------------|-------------|------------|-------------|---------------------------------------|
| Tyco Electronics | Alcoswitch | Mount Color | Boot Color | Thread Size | Use with Switch Types                 |
| 1-1437626-7      | BP14400    | Black       | Black      | 1/4-40      | MSPM, MPA3, MPS and TP Series         |
| 1-1437626-8      | BP14402    | Red         | Red        | 1/4-40      | MSPM, MPA3, MPS and TP Series         |
| 1-1437626-9      | BP14408    | Gray        | Gray       | 1/4-40      | MSPM, MPA3, MPS and TP Series         |
| 2-1437626-7      | BPA14400   | Black       | Black      | 1/4-40      | MSPMBS, MSPMCS, MSP3, MPA3, TP Series |
| 2-1437626-8      | BPA14402   | Red         | Red        | 1/4-40      | MSPMBS, MSPMCS, MSP3, MPA3, TP Series |
| 2-1437626-9      | BPA14408   | Gray        | Gray       | 1/4-40      | MSPMBS, MSPMCS, MSP3, MPA3, TP Series |



BP20100

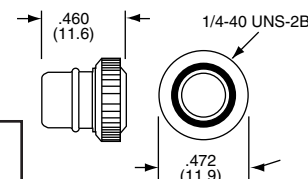


BP1900

### 1/4-40 PUSHBUTTON BOOT SEALS

Splashproof seals having 1/4-40 blind nuts integrally mounted to the black Neoprene seal. Supplied with a captive O-Ring to complete the panel seal. Used with actuators up to .37" long. Choice of two-tone with nickel finish knurled ring or all black.

| Part Number      |            |             |            |             |                                |
|------------------|------------|-------------|------------|-------------|--------------------------------|
| Tyco Electronics | Alcoswitch | Mount Color | Boot Color | Thread Size | Use with Switch Types          |
| 2-1437626-3      | BP1900     | Nickel      | Black      | 1/4-40      | MSPM, MSP3, MPA3 and TP Series |
| 2-1437626-4      | BP2010     | Black       | Black      | 1/4-40      | MSPM, MSP3, MPA3 and TP Series |

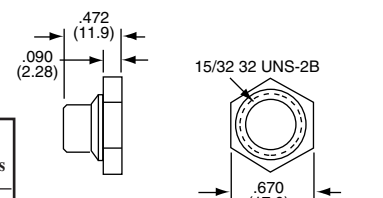


BP15320

### 15/32-32 PUSHBUTTON BOOT SEALS

Splashproof seals incorporating a molded-in hex nut for water tight and dust tight protection. Replaces standard hardware usually supplied. Recommended for large size pushbutton switches with actuators extending up to .31" long.

| Part Number      |            |             |            |             |                       |
|------------------|------------|-------------|------------|-------------|-----------------------|
| Tyco Electronics | Alcoswitch | Mount Color | Boot Color | Thread Size | Use with Switch Types |
| 2-1437626-0      | BP15320    | Black       | Black      | 15/32-32    | MSPF and MPG Series   |
| 2-1437626-1      | BP15322    | Red         | Red        | 15/32-32    | MSPF and MPG Series   |
| 2-1437626-2      | BP15328    | Gray        | Gray       | 15/32-32    | MSPF and MPG Series   |



BP5900

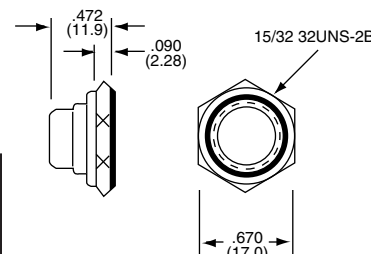


BP5890

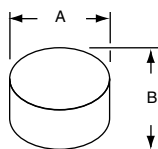
### 15/32-32 PUSHBUTTON BOOT SEALS

Splashproof seals having 15/32-32 hex shape mounts integrally bonded onto the black Neoprene seal. Supplied with a captive O-Ring for use against the panel. Readily accepts actuators up to .38" in length. Available in two tone with nickel finish hex-mount, or all black.

| Part Number      |            |             |            |             |                       |
|------------------|------------|-------------|------------|-------------|-----------------------|
| Tyco Electronics | Alcoswitch | Mount Color | Boot Color | Thread Size | Use with Switch Types |
| 2-1437626-5      | BP5890     | Nickel      | Black      | 15/32-32    | MSPF and MPG Series   |
| 2-1437626-6      | BP5900     | Black       | Black      | 15/32-32    | MSPF and MPG Series   |



## Pushbutton Switches, Accessories



### CAPS



C5



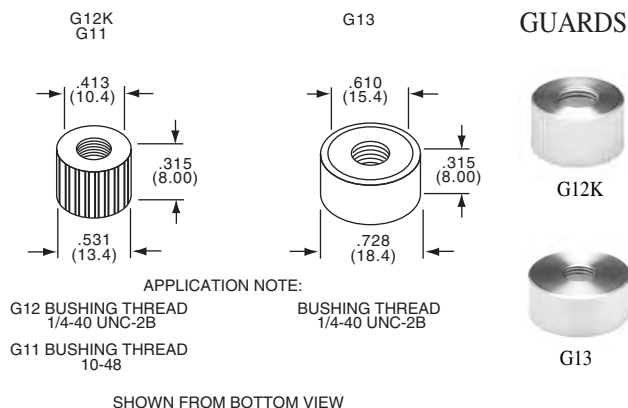
C22

| Model  | ID.     | Description                       | Use Guard | Color                             | "A" Diameter | B Height |
|--------|---------|-----------------------------------|-----------|-----------------------------------|--------------|----------|
| C5(*)  | Snapfit | Small plastic cap for MPA3 Series | -         | (0), (2), (5), (9)                | .195         | .120     |
| C8(*)  | Snapfit | Large plastic cap for MPA3 Series | -         | (0), (2), (5), (9)                | .310         | .160     |
| C9(*)  | Snapfit | Spare color cap for MPG Series    | -         | (0), (2), (6), (9)                | .354         | .138     |
| C22(*) | Snapfit | MPS/MSPM/MPE/MPA6                 | G12       | (0), (2), (3), (4), (5), (6), (9) | .394         | .315     |
| C23(*) | Snapfit | MPS/MSPM/MPE/MPA6                 | G13       | (0), (2), (3), (4), (5), (6), (9) | .590         | .394     |
| C33(*) | Snapfit | Square button for MPSR            | -         | (0), (2), (6), (9)                | .378SQ.      | .201     |

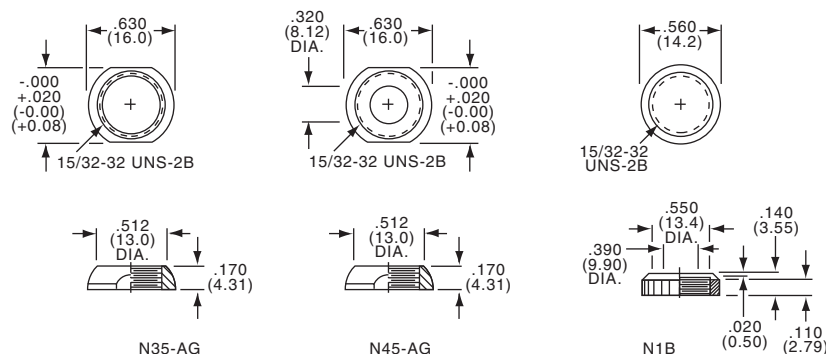
(\*) Specify color by adding suffix number: (0) Black, (2) Red, (3) Orange, (4) Yellow, (5) Green, (6) Blue, (9) White.

| Part Number      |            | Type   | Color          | Finish  | Can be Used with Cap |
|------------------|------------|--------|----------------|---------|----------------------|
| Tyco Electronics | Alcoswitch |        |                |         |                      |
| 7-1437627-6      | G11A       | 10-48  | Clear aluminum | Plain   | C22 —                |
| 7-1437627-7      | G11B       | 10-48  | Black aluminum | Plain   | C22 —                |
| 7-1437627-8      | G11C       | 10-48  | Chromed Brass  | Plain   | C22 —                |
| 8-1437627-1      | G12A       | 1/4-40 | Clear aluminum | Plain   | C12 C22              |
| 8-1437627-2      | G12B       | 1/4-40 | Black aluminum | Plain   | C12 C22              |
| 8-1437627-3      | G12C       | 1/4-40 | Chromed brass  | Plain   | C12 C22              |
| 8-1437627-4      | G12KA      | 1/4-40 | Clear aluminum | Knurled | C12 C22              |
| 8-1437627-5      | G12KB      | 1/4-40 | Black aluminum | Knurled | C12 C22              |
| 8-1437627-6      | G12KC      | 1/4-40 | Chromed brass  | Knurled | C12 C22              |
| 8-1437627-7      | G13A       | 1/4-40 | Clear aluminum | Plain   | C13 C23              |
| 8-1437627-8      | G13B       | 1/4-40 | Black aluminum | Plain   | C13 C23              |
| 8-1437627-9      | G13C       | 1/4-40 | Chromed brass  | Plain   | C13 C23              |
| 9-1437627-0      | G13KA      | 1/4-40 | Clear aluminum | Knurled | C13 C23              |
| 9-1437627-1      | G13KB      | 1/4-40 | Black aluminum | Knurled | C13 C23              |
| 9-1437627-2      | G13KC      | 1/4-40 | Chromed brass  | Knurled | C13 C23              |
| 9-1437627-3      | G15*       | 15/32" | Chromed brass  | Plain   | C13 C23              |

\*G15 Model used on the MSPF Series



### DECORATIVE HARDWARE



| Part Number      |            | Type   | Description                         |
|------------------|------------|--------|-------------------------------------|
| Tyco Electronics | Alcoswitch |        |                                     |
| 1-1437628-0      | N1B        | 15/32" | "Perfect Fit" knurled nut           |
| 1-1437628-4      | N35-AG     | 15/32" | Decorative nut (supplied on switch) |
| 1-1437628-7      | N45-AG     | 15/32" | "Perfect Fit" decorative nut        |



## Pushbutton Switches, Panel Seal

### FEATURES

The BP Series offers a unique means of sealing pushbutton switches, using a standard 1/4-40 threading bushing, to almost any thickness panel. Simply install the BP adaptor into a 15/32" dia. or 1/2" dia. panel opening and secure with its hex nut. The switch is then threaded into the previously mounted adaptor and tightened into place. A complete and decorative panel seal is the result of the simple process.

### MATERIALS

The flexible panel seal is custom molded of Neoprene rubber for long life, flexibility and chemical resistance. The threaded plastic adaptor is molded of ABS thermoplastic, is impact resistant and designed for ease of mounting.

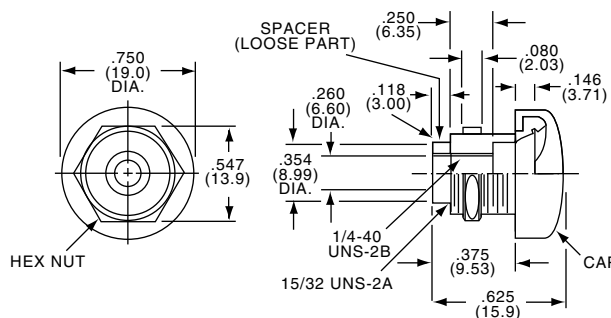
### BPM

#### For use with Miniature Pushbutton

The BPM seal adaptor accommodates all AUGAT/ALCOSWITCH MPA Series of pushbutton switches utilizing the 1/4-40 threaded bushing.



BPM15320



| Part Number      |            |                |
|------------------|------------|----------------|
| Tyco Electronics | Alcoswitch | Color* of Seal |
| 3-1437626-0      | BPM15320   | Black          |
| 3-1437626-1      | BPM15322   | Red            |
| 3-1437626-2      | BPM15328   | Gray           |

(\*) Custom seal colors are available upon special request.

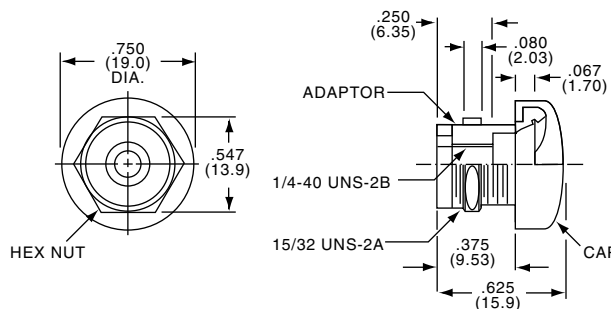
### BPT

#### For use with Tiny Series TPF Pushbutton

The BPT seal adaptor accommodates all AUGAT/ALCOSWITCH TPF Series Tiny Pushbutton switches utilizing the 1/4-40 threading bushing.



BPT15328



| Part Number      |            |                |
|------------------|------------|----------------|
| Tyco Electronics | Alcoswitch | Color* of Seal |
| 3-1437626-3      | BPT15320   | Black          |
| 3-1437626-4      | BPT15322   | Red            |
| 3-1437626-5      | BPT15328   | Grey           |

(\*) Custom seal colors are available upon special request.



## Engineering Notes

D

Engineering Notes



*TSP Series - Page D3*



*TP Series - Page D6*



*TP-ES Series - Page D13*



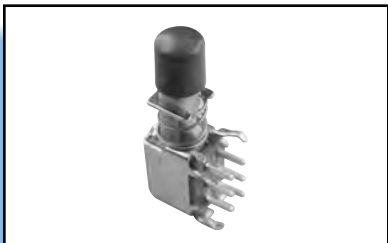
*APA Series - Page D16*



*MPA Series - Page D22*



*MSPM Series - Page D29*



*JLS Series - Page D29*



*BP Series - Page D31*

# Pushbutton

D

Pushbutton Switches

## Pushbutton Switches Part Number Index

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|---------------|-----|-------------|-----|---------------|-----|-----------------|-----|
| APA1BGPC      | D16 | MPA406R     | D22 | TPB11CGPCES   | D13 | TPCF11CGRA0     | D10 |
| APA1BGRA      | D17 | MPB103B     | D21 | TPB11CGPCES0  | D13 | TPCF11CGRA2     | D10 |
| APA1CGPC      | D16 | MPB103C     | D21 | TPB11CGPCES2  | D13 | TPCF11FGPC      | D10 |
| APA1CGRA      | D17 | MPE106D     | D23 | TPB11CGRA     | D8  | TPCF11FGPC0     | D10 |
| APA1FGPC      | D16 | MPE106F     | D23 | TPB11CGRA0    | D8  | TPCF11FGPCES    | D10 |
| APA1FGRA      | D17 | MPE206N     | D23 | TPB11CGRA2    | D8  | TPCF11FGPCES0   | D10 |
| APA21GPC      | D16 | MPE206R     | D23 | TPB11CGRAES   | D14 | TPCF11FGRA      | D10 |
| APA2MGPC      | D16 | MPE306D     | D23 | TPB11CGRAES0  | D14 | TPCF11FGRA0     | D10 |
| APA2MGRA      | D17 | MPE306F     | D23 | TPB11CGRAES2  | D14 | TPCF13C         | D10 |
| APA2RGPC      | D16 | MPE406N     | D23 | TPB11CGVRA    | D11 | TPCF13C0        | D10 |
| APA2RGRA      | D17 | MPE406R     | D23 | TPB11CGVRA0   | D11 | TPCF13F         | D10 |
| APB1BGPC      | D18 | MPG106D     | D24 | TPB11CGVRA2   | D11 | TPCF13F0        | D10 |
| APB1BGRA      | D18 | MPG106F     | D24 | TPB11FGPC     | D8  | TPD11CGPC       | D11 |
| APB1CGPC      | D18 | MPG206N     | D24 | TPB11FGPC0    | D8  | TPD11CGPC0      | D11 |
| APB1CGRA      | D18 | MPG206NPC   | D24 | TPB11FGPC2    | D8  | TPD11CGPC2      | D11 |
| APB1FGPC      | D18 | MPG206R     | D24 | TPB11FGPCES   | D13 | TPD11CGPCES     | D13 |
| APB1FGRA      | D18 | MPG206RPC   | D24 | TPB11FGPCES0  | D13 | TPD11CGPCES0    | D13 |
| APB21GPC      | D18 | MPG306D     | D24 | TPB11FGPCES2  | D13 | TPD11CGRA       | D12 |
| APB2MGRA      | D18 | MPG306F     | D24 | TPB11FGRA     | D8  | TPD11CGRA0      | D12 |
| APB2RGPC      | D18 | MPG406N     | D24 | TPB11FGRA0    | D8  | TPD11CGRA2      | D12 |
| APB2RGRA      | D18 | MPG406R     | D24 | TPB11FGRA2    | D8  | TPD11FGPC       | D11 |
| APBE1FGPC     | D19 | MPS103D     | D25 | TPB11FGRAES   | D14 | TPD11FGPC0      | D11 |
| APBE1FGRA     | D20 | MPS103DPC   | D26 | TPB11FGRAES0  | D14 | TPD11FGPC2      | D11 |
| APBE2RGPC     | D19 | MPS103DPCV  | D26 | TPB11FGRAES2  | D14 | TPD11FGPCES     | D13 |
| APBE2RGRA     | D20 | MPS103DRA   | D27 | TPB11FGVRA    | D11 | TPD11FGPCES0    | D13 |
| BP10480       | D31 | MPS103F     | D25 | TPB11FGVRA0   | D11 | TPD11FGRA       | D12 |
| BP10482       | D31 | MPS103FPC   | D26 | TPB11FGVRA2   | D11 | TPD11FGRA0      | D12 |
| BP10488       | D31 | MPS103FPCV  | D26 | TPB21MGPC     | D9  | TPD11FGRA2      | D12 |
| BP14400       | D31 | MPS103FRA   | D27 | TPB21MGPC0    | D9  | TPD21MFKA       | D12 |
| BP14402       | D31 | MPS103FW    | D26 | TPB21MGPC2    | D9  | TPD21MGPC       | D12 |
| BP14408       | D31 | MPS203N     | D25 | TPB21MGPCES   | D13 | TPD21MGPC0      | D12 |
| BP15320       | D31 | MPS203NPC   | D26 | TPB21MGRA     | D9  | TPD21MGPCES     | D14 |
| BP15322       | D31 | MPS203NRA   | D27 | TPB21MGRA0    | D9  | TPD21MGPCES0    | D14 |
| BP15328       | D31 | MPS203NWW   | D26 | TPB21MGRA2    | D9  | TPD21MGPCES2    | D14 |
| BP1900        | D31 | MPS203R     | D25 | TPB21MGRAES   | D14 | TPD21MGRA       | D12 |
| BP2010        | D31 | MPS203RPC   | D26 | TPB21RGPC     | D9  | TPD21MGRA0      | D12 |
| BP5890        | D31 | MPS203RPCV  | D26 | TPB21RGPC0    | D9  | TPD21RGPC       | D12 |
| BP5900        | D31 | MPS203RRA   | D27 | TPB21RGPC2    | D9  | TPD21RGPC0      | D12 |
| BPA14400      | D31 | MPS203RWW   | D26 | TPB21RGPCES   | D13 | TPD21RGPCES     | D14 |
| BPA14402      | D31 | MPSN103F    | D25 | TPB21RGPCES0  | D13 | TPD21RGPCES0    | D14 |
| BPA14408      | D31 | MPSR103F    | D25 | TPB21RGRA     | D9  | TPD21RGRA       | D12 |
| BPM15320      | D33 | MPSR203R    | D25 | TPB21RGRA0    | D9  | TPD21RGRA0      | D12 |
| BPM15322      | D33 | MSP103B     | D27 | TPB21RGRA2    | D9  | TPF11CGPC       | D11 |
| BPM15328      | D33 | MSP103C     | D27 | TPB21RGRAES   | D14 | TPF11CGPC0      | D11 |
| BPT15320      | D33 | MSP103C0    | D27 | TPB21RGRAES0  | D14 | TPF11CGPC2      | D11 |
| BPT15322      | D33 | MSP103C2    | D27 | TPBF11CGPC    | D10 | TPF11CGPCES     | D13 |
| BPT15328      | D33 | MSPF101B    | D28 | TPBF11CGPCES  | D15 | TPF11CGPCES0    | D13 |
| C22           | D32 | MSPF101BC0  | D28 | TPBF11CGPCES0 | D15 | TPF11CGRA       | D12 |
| C220          | D32 | MSPF101BC2  | D28 | TPBF11CGPCES2 | D15 | TPF11CGRA0      | D12 |
| C222          | D32 | MSPF101BC6  | D28 | TPBF11CGRA    | D10 | TPF11CGRA2      | D12 |
| C223          | D32 | MSPF101BC9  | D28 | TPBF11CGRA0   | D10 | TPF11CGRAES0    | D6  |
| C224          | D32 | MSPF101C    | D28 | TPBF11CGRA2   | D10 | TPF11FGPC       | D11 |
| C225          | D32 | MSPM101B0   | D29 | TPBF11CGRAES  | D15 | TPF11FGPC0      | D11 |
| C226          | D32 | MSPM101B1   | D29 | TPBF11CGRAES0 | D15 | TPF11FGPC2      | D11 |
| C229          | D32 | MSPM101BP   | D29 | TPBF11FGPC    | D10 | TPF11FGPCES     | D13 |
| C23           | D32 | MSPM101BS   | D29 | TPBF11FGPC0   | D10 | TPF11FGPCES0    | D13 |
| C230          | D32 | MSPM101BS1  | D29 | TPBF11FGPCES  | D15 | TPF11FGPCES2    | D13 |
| C232          | D32 | MSPM101C1   | D29 | TPBF11FGPCES0 | D15 | TPF11FGRA       | D12 |
| C233          | D32 | MSPM101C2   | D29 | TPBF11FGRA    | D10 | TPF11FGRA0      | D12 |
| C234          | D32 | MSPM101CP   | D29 | TPBF11FGRA0   | D10 | TPF11FGRA2      | D12 |
| C235          | D32 | MSPM101CS   | D29 | TPBF11FGRA2   | D10 | TPF13C          | D11 |
| C236          | D32 | MSPM101CS1  | D29 | TPBF11FGRAES  | D15 | TPF13C0         | D11 |
| C239          | D32 | MSPS103B    | D27 | TPBF11FGRAES0 | D15 | TPF13C2         | D11 |
| C33           | D32 | MSPS103C0   | D27 | TPC11CGPC     | D8  | TPF13F          | D11 |
| C330-AG       | D25 | MSPS103C2   | D27 | TPC11CGPC0    | D8  | TPF13F0         | D11 |
| C332          | D32 | SDR0        | D25 | TPC11CGPC2    | D8  | TPF13F2         | D11 |
| C336          | D32 | TP11CGPC    | D7  | TPC11CGPCES   | D13 | TPF21MGPC       | D12 |
| C339          | D25 | TP11CGPC0   | D7  | TPC11CGPCES0  | D13 | TPF21MGPC0      | D12 |
| C5            | D32 | TP11CGPC2   | D7  | TPC11CGPCES2  | D13 | TPF21MGPCES     | D14 |
| C50           | D32 | TP11CGRA    | D7  | TPC11CGRA     | D8  | TPF21MGPCES0    | D14 |
| C52           | D32 | TP11CGRA0   | D7  | TPC11CGRA0    | D8  | TPF21MGRA       | D12 |
| C55           | D32 | TP11CGRA2   | D7  | TPC11CGRA2    | D8  | TPF21MGRA0      | D12 |
| C59           | D32 | TP11FGPC    | D7  | TPC11CGVRA    | D11 | TPF21RGPC       | D12 |
| C8            | D32 | TP11FGPC0   | D7  | TPC11CGVRA0   | D11 | TPF21RGPC0      | D12 |
| C80           | D32 | TP11FGPC2   | D7  | TPC11FG0      | D6  | TPF21RGPC2      | D12 |
| C82           | D32 | TP11FGRA    | D7  | TPC11FG2      | D6  | TPF21RGPCES     | D14 |
| C85           | D32 | TP11FGRA0   | D7  | TPC11FGPC     | D8  | TPF21RGPCES0    | D14 |
| C89           | D32 | TP11FGRA2   | D7  | TPC11FGPC0    | D8  | TPF21RGRA       | D12 |
| C9            | D32 | TP21CCGPC   | D7  | TPC11FGPC2    | D8  | TPF21RGRA0      | D12 |
| C90           | D32 | TP21CCGPC0  | D7  | TPC11FGPCES   | D13 | TPF23M          | D11 |
| C91           | D32 | TP21CCGPC2  | D7  | TPC11FGPCES0  | D13 | TPF23M0         | D11 |
| C96           | D32 | TP21CCGRA   | D8  | TPC11FGRA     | D8  | TPF23M2         | D11 |
| C99           | D32 | TP21CCGRA0  | D8  | TPC11FGRA0    | D8  | TPF23R          | D11 |
| G11A          | D32 | TP21CCGRA2  | D8  | TPC11FGRA2    | D8  | TPF23R0         | D11 |
| G11B          | D32 | TP21FFGRA   | D8  | TPC11FGVRA    | D11 | TPF23R2         | D11 |
| G11C          | D32 | TP21FFGRA0  | D8  | TPC11FGVRA0   | D11 | TSPD11CGPC0     | D3  |
| G12A          | D32 | TP21FFGRA2  | D8  | TPC11FGVRA2   | D11 | TSPD11CGPC2     | D3  |
| G12B          | D32 | TPA11CGPC   | D7  | TPC13C        | D9  | TSPD11CGPCV0    | D3  |
| G12C          | D32 | TPA11CGPC0  | D7  | TPC13CGRA     | D9  | TSPD11CGRA0     | D3  |
| G12KA         | D32 | TPA11CGPC2  | D7  | TPC13C2       | D9  | TSPD11CGRA2     | D3  |
| G12KB         | D32 | TPA11CGRA   | D7  | TPC13CPC0     | D6  | TSPD11CGRA6     | D3  |
| G12KC         | D32 | TPA11CGRA0  | D7  | TPC13F        | D9  | TSPD11CGSPC0    | D3  |
| G13A          | D32 | TPA11CGRA2  | D7  | TPC13F0       | D9  | TSPD11CGSRA0    | D3  |
| G13B          | D32 | TPA11FGPC   | D7  | TPC13F2       | D9  | TSPD11CGSRA2    | D3  |
| G13C          | D32 | TPA11FGPC0  | D7  | TPC21MGPC     | D9  | TSPD11CGSRAB0   | D3  |
| G13KA         | D32 | TPA11FGPC2  | D7  | TPC21MGPC0    | D9  | TSPD11CGVRA0    | D3  |
| G13KB         | D32 | TPA11FGRA   | D7  | TPC21MGPCES   | D13 | TSPD11FGPC0     | D3  |
| G13RC         | D32 | TPA11FGRA0  | D7  | TPC21MGRA     | D9  | TSPD11FGPCV0    | D3  |
| G15           | D32 | TPA11FGRA2  | D7  | TPC21MGRA0    | D9  | TSPD11FGRA0     | D3  |
| JLS91439FK    | D30 | TPA21CCGPC  | D7  | TPC21MGRA2    | D9  | TSPD11FGSPC0    | D3  |
| JLS91439FKBC  | D30 | TPA21CCGPC0 | D7  | TPC21RGPC     | D9  | TSPD11FGSRA0    | D3  |
| JLS91439FWC   | D30 | TPA21CCGPC2 | D7  | TPC21RGPC0    | D9  | TSPD11FGSRA0    | D3  |
| MPA103B       | D21 | TPA21CCGRA0 | D8  | TPC21RGPCES   | D13 | TSPD11FGVRA0    | D3  |
| MPA103C       | D21 | TPA21CCGRA2 | D8  | TPC21RGRA     | D9  | TSPDF11CGPC0    | D3  |
| MPA103D       | D21 | TPA21FFGPC  | D7  | TPC21RGRA0    | D9  | TSPDF11CGRA0    | D3  |
| MPA103F       | D21 | TPA21FFGPC0 | D7  | TPC23M        | D9  | TSPDF11CGSRA0   | D3  |
| MPA106D       | D22 | TPA21FFGRA  | D8  | TPC23M0       | D9  | TSPDF11CGSRA0TR | D3  |
| MPA106F       | D22 | TPA21FFGRA0 | D8  | TPC23R        | D9  | TSPDF11CGVRA0   | D3  |
| MPA206N       | D22 | TPA21FFGRA2 | D8  | TPC23R0       | D9  | TSPDF11FGPC0    | D3  |
| MPA206NPCDPDT | D22 | TPA21MGPC0  | D6  | TPC23R2       | D9  | TSPDF11FGRA0    | D3  |
| MPA206R       | D22 | TPA21MGRA   | D8  | TPCF11CGPC    | D10 | TSPDF11FGSRA0   | D3  |
| MPA206RPCDPDT | D22 | TPA21MGRA0  | D8  | TPCF11CGPC0   | D10 | TSPDF11FGVRA0   | D3  |
| MPA306D       | D22 | TPB11CGPC   | D8  | TPCF11CGPC2   | D10 |                 |     |
| MPA306F       | D22 | TPB11CGPC0  | D8  | TPCF11CGRA    | D10 |                 |     |
| MPA406N       | D22 | TPB11CGPC2  | D8  |               |     |                 |     |

## Pushbutton Switches, Tiny, Process Sealed

### FEATURES:

- High temperature plastics — liquid crystal polymer (LCP)
- Specifically designed for thru-hole and surface mount
- Tin-lead plated terminals
- Washable process sealed construction — internal actuator O-ring

### MATERIAL SPECIFICATIONS:

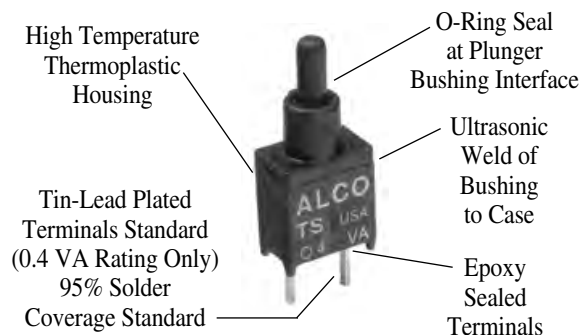
Contacts .....Copper Alloy with gold over nickel plating-  
Case & Bushing .....Thermoplastic (LCP)  
Actuator .....Glass reinforced nylon  
Nickel Plating Inside .....Tin plating outside  
Support Bracket .....Tin plated steel  
Terminals .....Copper alloy with gold over nickel plating

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature..... -22°F to +185°F (-30°C to +85°C)  
Storage Temperature.....-67°F to +185°F (-55°C to +85°C)

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA @ 20 VAC/DC  
Initial Contact Resistance .....20 Milliohms max.  
Insulation Resistance .....1,000 Megohms @ 500 VDC min.  
Terminal Seal .....Epoxy  
Actuator Travel......035" (0.89)  
Actuator Seal .....O-Ring  
Dielectric Strength .....C - 1000 VDC RMS @ sea level  
F - 500 VDC RMS @ sea level  
Life Expectancy .....C - Up to 80,000 Cycles  
F - Up to 60,000 Cycles



### FUNCTION CHART

The following functions available in single pole.

|                                            |                     |     |            |
|--------------------------------------------|---------------------|-----|------------|
| <b>C</b> Function                          | 2 Positions         | Off | (On)       |
| SPST                                       | Terminals Connected |     | <b>1-3</b> |
| Omit center terminal for function <b>C</b> |                     |     |            |

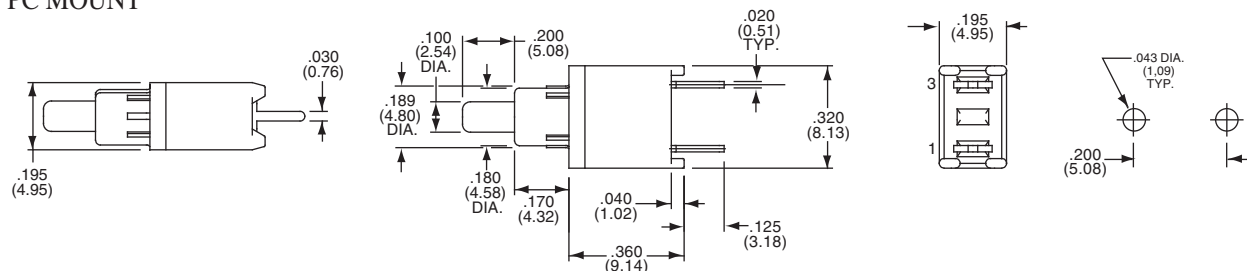
|                   |                    |            |            |
|-------------------|--------------------|------------|------------|
| <b>F</b> Function | 2 positions        | On         | (On)       |
| SPDT              | Terminal Connected | <b>1-2</b> | <b>2-3</b> |

Off Indicates a mechanical position with no electrical connection.  
(ON) INDICATES MOMENTARY ACTION

### PART NUMBERING MATRIX

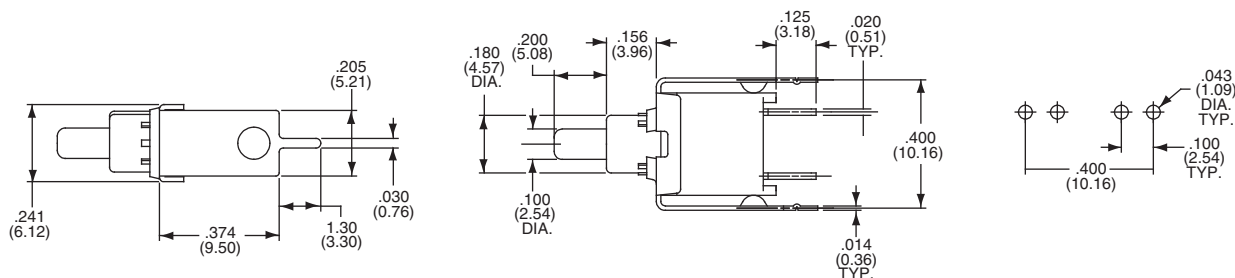
| Model | Bushing<br>(Plain) | Actuator                                             | Poles | Rating | Function                                            | Plating | Terminations                                                                                                                                                                                        | Colors                                   |
|-------|--------------------|------------------------------------------------------|-------|--------|-----------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| TSP   | D                  | <div></div> <div>Std. .200" long<br/>F = Flush</div> | 1     | 1      | <div></div> <div>C = Off (On)<br/>F = On (On)</div> | G       | <div></div> <div>PC = P.C.<br/>PCV = P.C. w/bracket<br/>RA = Right Angle<br/>VRA = Vertical Right Angle<br/>SPC = SurfaceMount<br/>SRA = Surface Mount R.A.<br/>SRAB = SurfaceMount R.A. Butt</div> | <div></div> <div>0=Black<br/>2=Red</div> |

### PC PC MOUNT

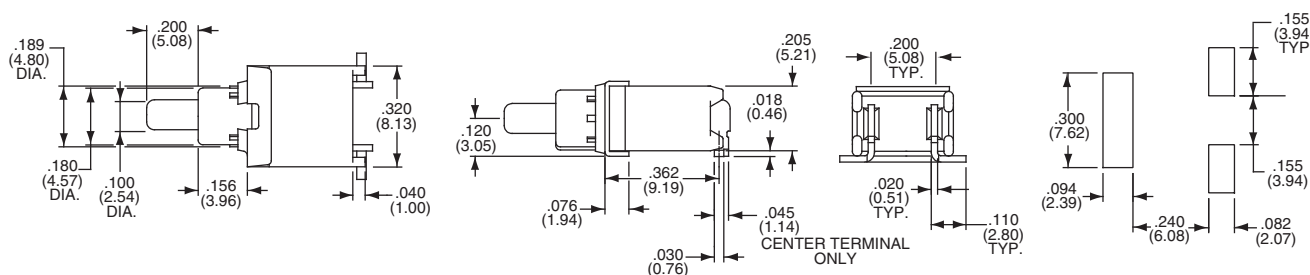


## Pushbutton Switches, Tiny, Process Sealed, Mounting Options

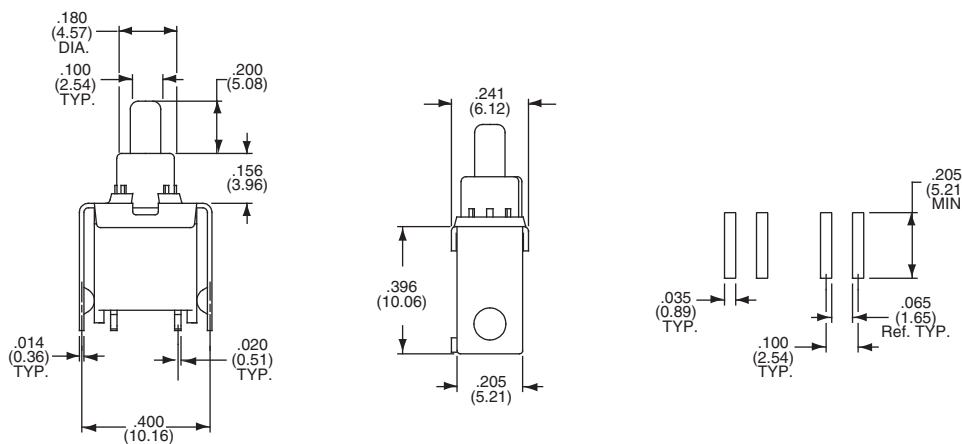
### PCV PC WITH VERTICAL SUPPORT BRACKET



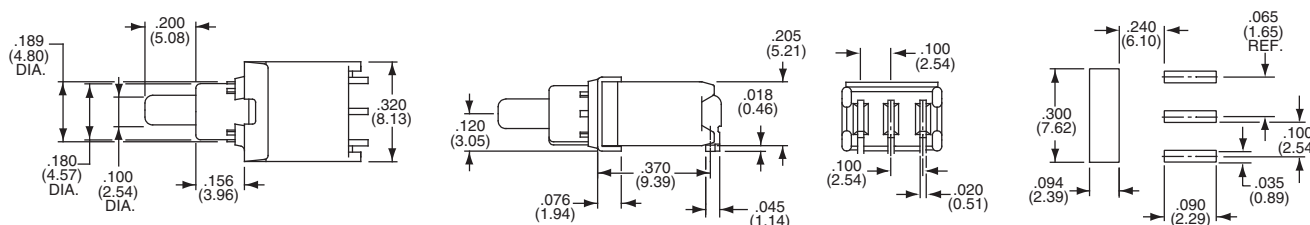
### SRA SURFACE MOUNT RIGHT ANGLE "L" BEND



### SPC SURFACE MOUNT WITH SUPPORT BRACKET

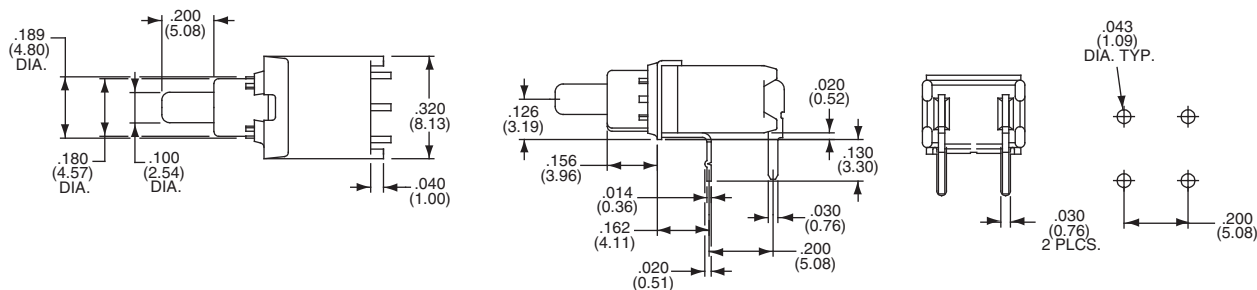


### SRAB SURFACE MOUNT RIGHT ANGLE BUTT

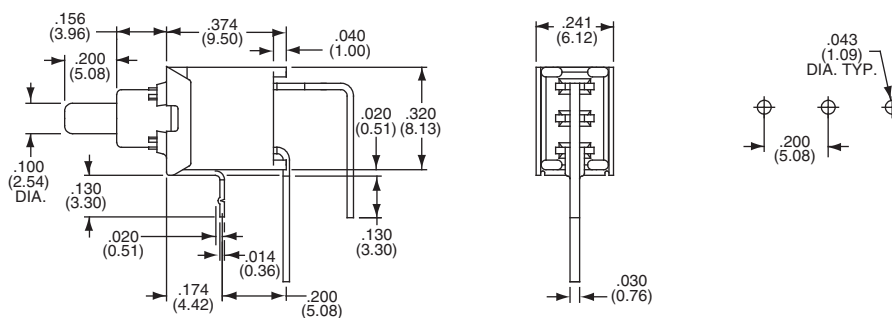


**Pushbutton Switches, Tiny, Process Sealed Options**

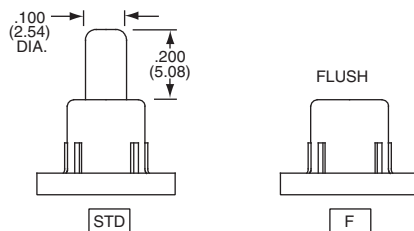
**RIGHT ANGLE RA**



**PC WITH VERTICAL SUPPORT BRACKET VRA**



**ACTUATORS**



## Pushbutton Switches, Tiny, Part Number Matrix

### MATERIAL SPECIFICATIONS:

Contacts .....Gold - gold plate, silver - silver plate  
Case Material .....High temperature polyester  
Actuator Material.....Polyamide  
Terminals/Fixed Contacts .....Tin lead plate  
Terminal Seal.....SP epoxy, DP epoxy optional

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature .....-22°F to +149°F (-30°C to +65°C)  
Storage Temperature .....-22°F to +149°F (-30°C to +65°C)  
Solder Heat Resistance .....See page M3-4

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....Gold: 0.4 VA Max. @ 20 VDC or peak AC  
Silver: 1A @ 125 VAC or 28 VDC resistive  
Initial Contact Resistance .....20 Milliohms max.  
Contact Timing .....Break-before-make  
Insulation Resistance .....1,000 Megohms @ 500VDC min.  
Dielectric Strength.....1,000 Volts @ sea level  
Actuation Force .....50 to 400 Grams  
Plunger/Actuator Travel ......030" (.762)  
Life Expectancy.....See below  
Note: Hardware included with switches

### PART NUMBERING MATRIX

| Model                                                                                                                                                                                           | Bushing     | Actuator    | Poles                                                      | Rating                                                                              | Function                    | Plating                                                                                   | Terminations                                                                          | Process Seal     | Button Colors |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------|---------------|
| <div>TP</div>                                                                                                                                                                                   | <div></div> | <div></div> | <div></div>                                                | <div></div>                                                                         | <div></div>                 | <div></div>                                                                               | <div></div>                                                                           | <div></div>      | <div></div>   |
| Blank= Sq. No Bushing<br>A=Rnd. No Bushing<br>B=Rnd., .188" Bushing Dia.<br>Unthreaded<br>C=Rnd., 10/48 Bushing Dia.<br>D=Rnd., .250" Bushing Dia.<br>Unthreaded<br>F=Rnd., 1/4-40 Bushing Dia. |             |             | 1 = Single<br>2 = Double<br><br><b>SP DP</b><br>C M<br>F R | 1 = Gold<br>0.4 VA<br>3 = Silver**<br>1 Amp<br><br>S.T. Momentary<br>D.T. Momentary | G = Gold<br>None = Silver** | Blank=Wire lug<br>PC=Printed Circuit<br>RA=Right Angle***<br>VRA=Vertical Right Angle**** | ES = Process Sealed***<br>Process Seal:<br>Disposable boot,<br>epoxied double<br>case | 0=Black<br>2=Red |               |
| F = Flush Actuator*                                                                                                                                                                             |             |             |                                                            |                                                                                     |                             |                                                                                           |                                                                                       |                  |               |

- \* Available with "B" and "C" bushing only
- \*\* Silver - available only in wire lug and PC termination
- \*\*\* Right angle, ES available with "B" and "C" bushing only
- \*\*\*\* Available only in single pole

ES switches provided with disposable boot used only during cleaning operation.

### Application Note:

For 3 pole and 4 pole, refer to pages D22 and D24 . . . "MP Series"  
For Surface Mount termination, refer to pages D3-D5 . . . "TSP Series"

| TP Series Life Expectancy Chart |         |        |
|---------------------------------|---------|--------|
| Pushbuttons                     | 1 Pole  | 2 Pole |
| 0.4 (Gold Plate)                | 100,000 | 80,000 |
| 1A (Silver Plate)               | 60,000  | 50,000 |

### PROCESS SEAL VERSION NOT



TP



TPA

### PROCESS SEAL VERSION AVAILABLE



TPB



TPC



TPD



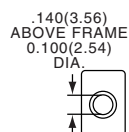
TPF

### SERIES (TP)

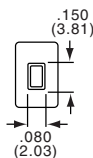


# Pushbutton Switches, Tiny, Straight or Right Angle, Single or Dual Actuators

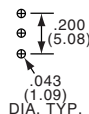
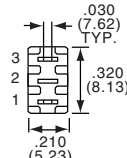
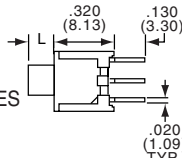
SEE PAGE D6 FOR PRODUCT SPECIFICATIONS



TPA SERIES



TP SERIES



SPST/SPDT



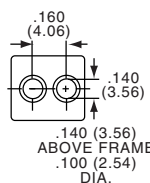
TP11CGPC0



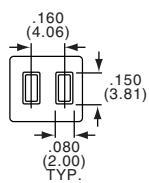
TPA11CGPC0

| Model        | Actuator Type | Dim.L | Type | Act. Code P. M6 | Action         | Contact Type |
|--------------|---------------|-------|------|-----------------|----------------|--------------|
| TP11CGPC(*)  | SQ.           | .125  | SPST | C               | N.O. Momentary | Gold         |
| TP11FGPC(*)  | SQ.           | .125  | SPDT | F               | Momentary      | Gold         |
| TPA11CGPC(*) | RND.          | .150  | SPST | C               | N.O. Momentary | Gold         |
| TPA11FGPC(*) | RND.          | .150  | SPDT | F               | Momentary      | Gold         |

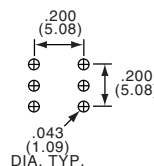
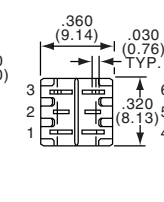
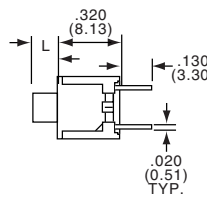
(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" action switch.



TPA SERIES



TP SERIES



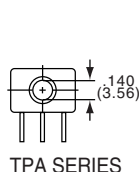
SPST/SPDT (DUAL)



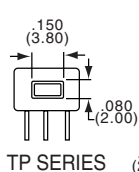
TP21CCGPC0

| Model         | Actuator Type | Dim.L | Type   | Act. Code P. M6 | Action         | Contact Type |
|---------------|---------------|-------|--------|-----------------|----------------|--------------|
| TP21CCGPC(*)  | SQ.           | .125  | 2xSPST | C               | N.O. Momentary | Gold         |
| TPA21CCGPC(*) | RND.          | .150  | 2xSPST | C               | N.O. Momentary | Gold         |
| TPA21FFGPC(*) | RND.          | .150  | 2xSPDT | F               | Momentary      | Gold         |

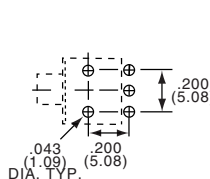
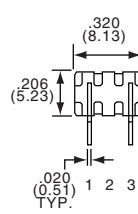
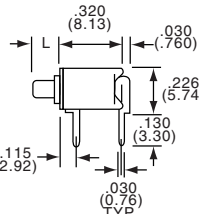
(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" action switch.



TPA SERIES



TP SERIES



SPST/SPDT



TPA11CGRA



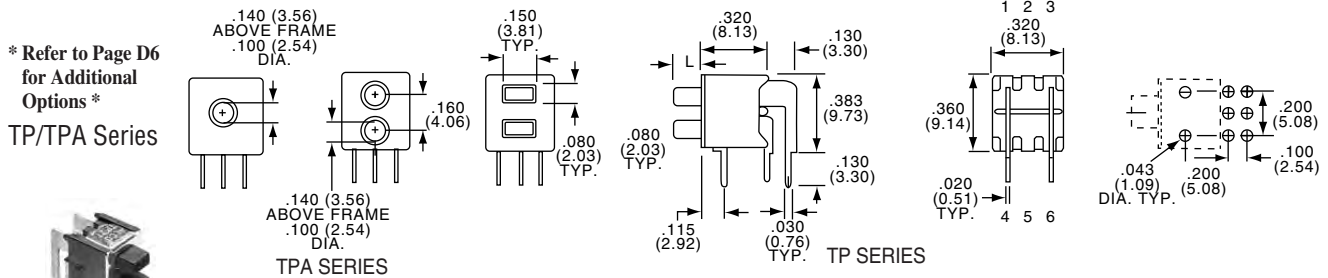
TP11CGRA

| Model        | Actuator Type | Dim.L | Type | Act. Code P. M6 | Action         | Contact Type |
|--------------|---------------|-------|------|-----------------|----------------|--------------|
| TP11CGRA(*)  | SQ.           | .125  | SPST | C               | N.O. Momentary | Gold         |
| TP11FGRA(*)  | SQ.           | .125  | SPDT | F               | Momentary      | Gold         |
| TPA11CGRA(*) | RND.          | .150  | SPST | C               | N.O. Momentary | Gold         |
| TPA11FGRA(*) | RND.          | .150  | SPDT | F               | Momentary      | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" action switch.

## Pushbutton Switches, Tiny, Right Angle, Single or Dual Actuators

SEE PAGE D6 FOR PRODUCT SPECIFICATIONS



TP21CCGRA0

SPST/SPDT (DUAL)  
DPST

| Model         | Actuator Type | Dim.L | Type   | Act. Code P. M6 | Action         | Contact Type |
|---------------|---------------|-------|--------|-----------------|----------------|--------------|
| TP21CCGRA(*)  | SQ.           | .125  | 2xSPST | C               | N.O. Momentary | Gold         |
| TP21FFGRA(*)  | SQ.           | .125  | 2xSPDT | F               | Momentary      | Gold         |
| TPA21MGRA(*)  | RND.          | .150  | DPST   | M               | N.O. Momentary | Gold         |
| TPA21CCGRA(*) | RND.          | .150  | 2xSPST | C               | N.O. Momentary | Gold         |
| TPA21FFGRA(*) | RND.          | .150  | 2xSPDT | F               | Momentary      | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" or "M" action switch.

## Pushbutton Switches, Tiny, Straight or Right Angle, Unthreaded or 10-48 Bushing

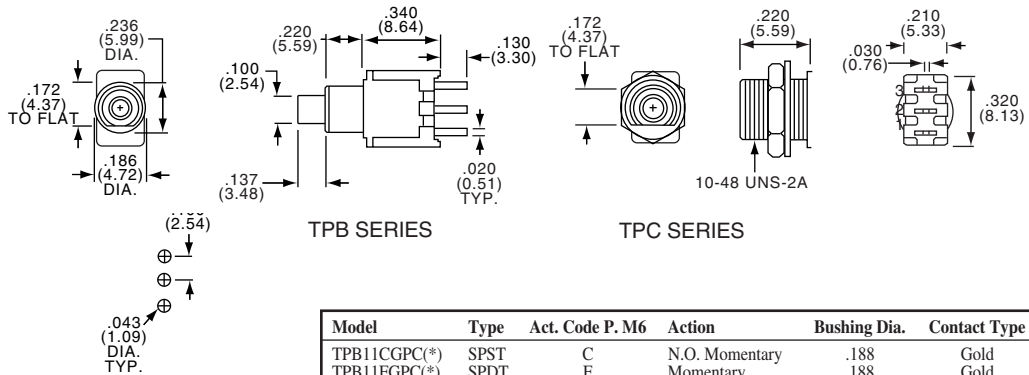
SPST/SPDT



TPB11CGPC



TPC11FGPC



| Model        | Type | Act. Code P. M6 | Action         | Bushing Dia. | Contact Type |
|--------------|------|-----------------|----------------|--------------|--------------|
| TPB11CGPC(*) | SPST | C               | N.O. Momentary | .188         | Gold         |
| TPB11FGPC(*) | SPDT | F               | Momentary      | .188         | Gold         |
| TPC11CGPC(*) | SPST | C               | N.O. Momentary | 10-48        | Gold         |
| TPC11FGPC(*) | SPDT | F               | Momentary      | 10-48        | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" action switch.

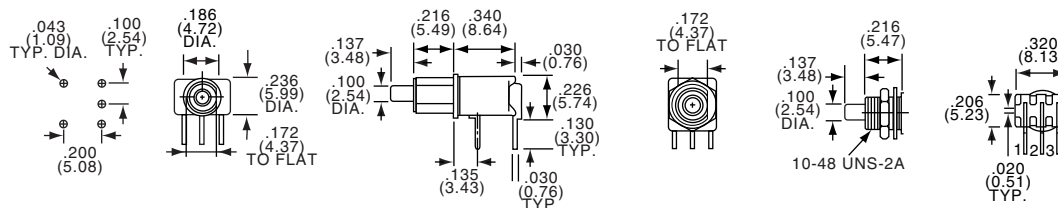
DPST/DPDT



TPB11CGRA



TPC11CGRA

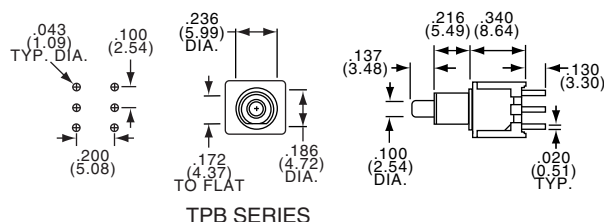


| Model        | Type | Act. Code P. M6 | Action         | Bushing Dia. | Contact Type |
|--------------|------|-----------------|----------------|--------------|--------------|
| TPB11CGRA(*) | SPST | C               | N.O. Momentary | .188         | Gold         |
| TPB11FGRA(*) | SPDT | F               | Momentary      | .188         | Gold         |
| TPC11CGRA(*) | SPST | C               | N.O. Momentary | 10-48        | Gold         |
| TPC11FGRA(*) | SPDT | F               | Momentary      | 10-48        | Gold         |

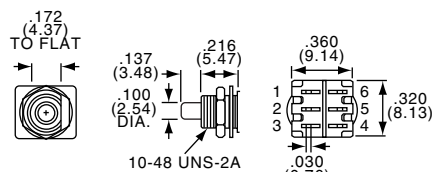
(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" action switch.

**Pushbutton Switches, Tiny, Straight or Right Angle, Unthreaded or 10-48 Bushing**

SEE PAGE D6 FOR PRODUCT SPECIFICATIONS  
DPST/DPDT



TPB SERIES



TPC SERIES



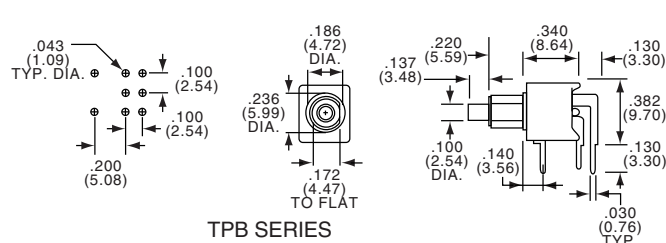
TPB21MGPC



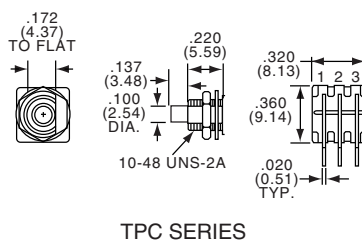
TPC21RGPC

| Model        | Type | Act. Code P. M6 | Action         | Bushing Dia. | Contact Type |
|--------------|------|-----------------|----------------|--------------|--------------|
| TPB21MGPC(*) | DPST | M               | N.O. Momentary | .188         | Gold         |
| TPB21RGPC(*) | DPDT | R               | Momentary      | .188         | Gold         |
| TPC21MGPC(*) | DPST | M               | N.O. Momentary | 10-48        | Gold         |
| TPC21RGPC(*) | DPDT | R               | Momentary      | 10-48        | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "M" action switch.



TPB SERIES



TPC SERIES

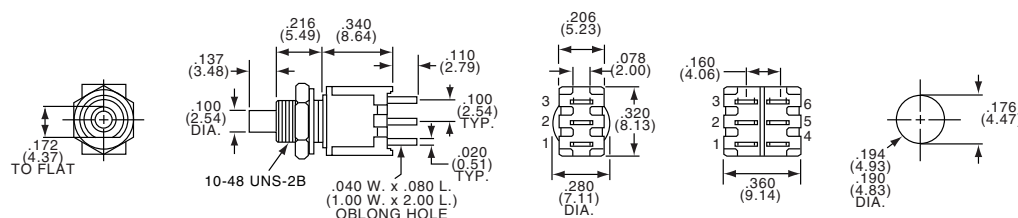
DPST/DPDT



TPC21MGRA

| Model        | Type | Act. Code P. M6 | Action         | Bushing Dia. | Contact Type |
|--------------|------|-----------------|----------------|--------------|--------------|
| TPB21MGRA(*) | DPST | M               | N.O. Momentary | .188         | Gold         |
| TPB21RGRA(*) | DPDT | R               | Momentary      | .188         | Gold         |
| TPC21MGRA(*) | DPST | M               | N.O. Momentary | 10-48        | Gold         |
| TPC21RGRA(*) | DPDT | R               | Momentary      | 10-48        | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "M" action switch.



1 & 2 POLE



TPC23M



TPC13C

| Model     | Type | Act. Code P. M6 | Action         | Contact Type |
|-----------|------|-----------------|----------------|--------------|
| TPC13C(*) | SPST | C               | N.O. Momentary | Silver       |
| TPC13F(*) | SPDT | F               | Momentary      | Silver       |
| TPC23M(*) | DPST | M               | N.O. Momentary | Silver       |
| TPC23R(*) | DPDT | R               | Momentary      | Silver       |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" or "M" action switches.

## Pushbutton Switches, Tiny, Straight or Right Angle, Flush Actuator

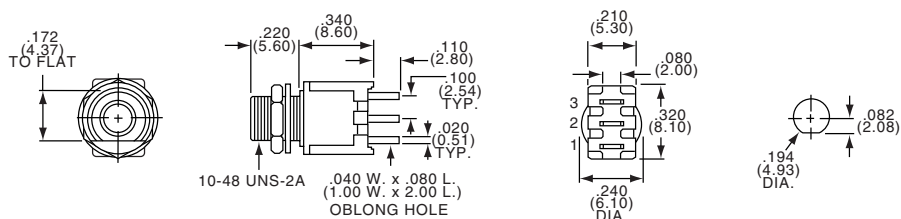
SEE PAGE D6 FOR PRODUCT SPECIFICATIONS

SPST/SPDT

### Wire Lugs 10-48 Bushing



TPCF13C



| Model      | Type | Act. Code | P. M6 | Action         | Bushing Type |
|------------|------|-----------|-------|----------------|--------------|
| TPCF13C(*) | SPST | C         |       | N.O. Momentary | Threaded     |
| TPCF13F(*) | SPDT | F         |       | Momentary      | Threaded     |

(\*) Specify button color by adding suffix numbers: (0) Black, (2) Red.  
Note: No center terminal on "C" action switch.

SPST/SPDT

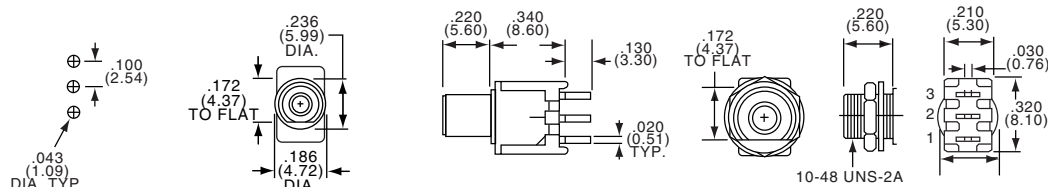
## PC 10-48 Bushing



TPBF11FGPC



TPCF11CGPC



## TPB SERIES

## TPC SERIES

| Model<br>Gold Contacts | Type | Act. Code | P. M6 | Action         | Bushing Type |
|------------------------|------|-----------|-------|----------------|--------------|
| TPBF11CGPC(*)          | SPST | C         |       | N.O. Momentary | Unthreaded   |
| TPBF11FGPC(*)          | SPDT | F         |       | Momentary      | Unthreaded   |
| TPCF11CGPC(*)          | SPST | C         |       | N.O. Momentary | Threaded     |
| TPCF11FGPC(*)          | SPDT | F         |       | Momentary      | Threaded     |

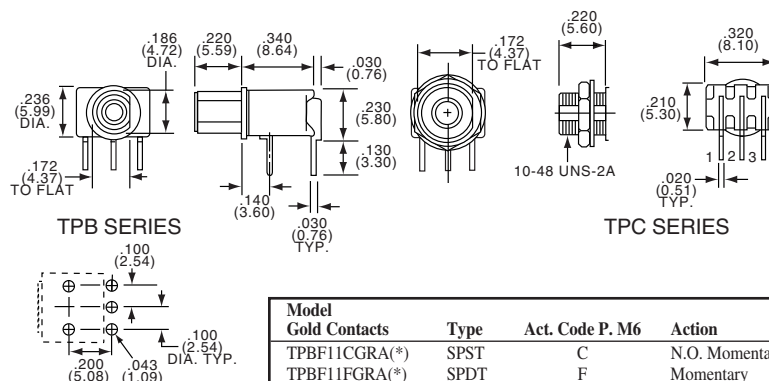
(\*) Specify button color by adding suffix numbers: (0) Black, (2) Red.  
Note: No center terminal on "C" action switch.

SPST/SPDT

## RA 10-48 Bushing



TPBF11CGRA

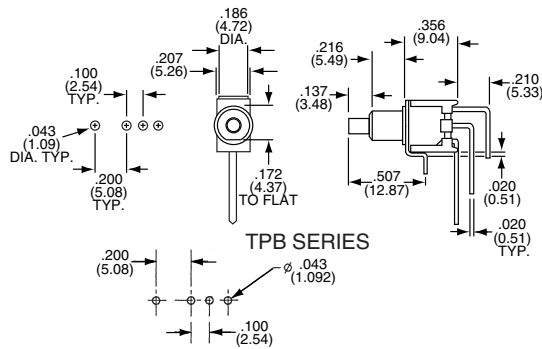


| Model         | Type | Act. Code | P. M6 | Action         | Bushing Type |
|---------------|------|-----------|-------|----------------|--------------|
| TPBF11CGRA(*) | SPST | C         |       | N.O. Momentary | Unthreaded   |
| TPBF11FGRA(*) | SPDT | F         |       | Momentary      | Unthreaded   |
| TPCF11CGRA(*) | SPST | C         |       | N.O. Momentary | Threaded     |
| TPCF11FGRA(*) | SPDT | F         |       | Momentary      | Threaded     |

(\*) Specify button color by adding suffix numbers: (0) Black, (2) Red.  
Note: No center terminal on "C"; action switch.

## Pushbutton Switches, Tiny, Vertical Right Angle, Unthreaded or 10-48 Bushing

SEE PAGE D6 FOR PRODUCT SPECIFICATIONS

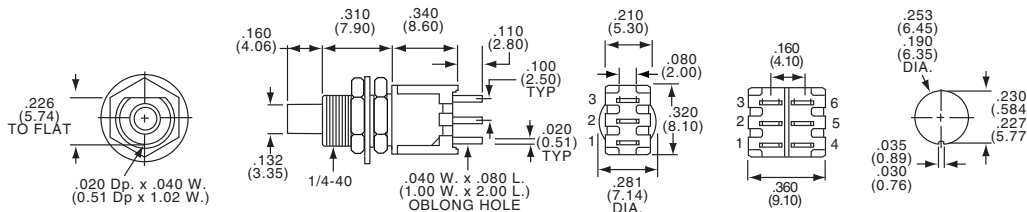


TPB11FGVRA

| Model         | Type | Act. Code P. M6 | Action         | Contact Type |
|---------------|------|-----------------|----------------|--------------|
| TPB11CGVRA(*) | SPST | C               | N.O. Momentary | Gold         |
| TPB11FGVRA(*) | SPDT | F               | Momentary      | Gold         |
| TPC11CGVRA(*) | SPST | C               | N.O. Momentary | Gold         |
| TPC11FGVRA(*) | SPDT | F               | Momentary      | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" action switches.

## Pushbutton Switches, Tiny, Vertical, Unthreaded or 1/4-40 Bushing



1 & 2 POLE



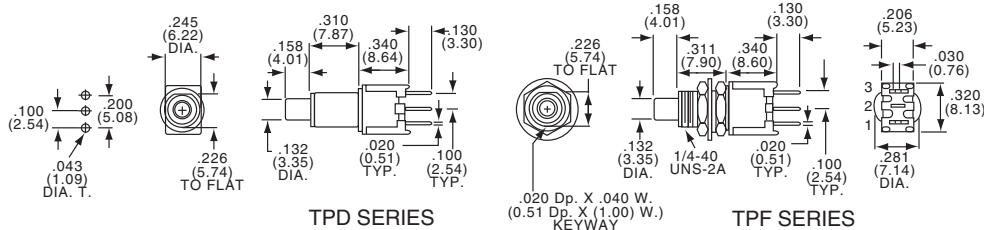
TPF23M



TPF13C

| Model     | Type | Act. Code P. M6 | Action         | Contact Type |
|-----------|------|-----------------|----------------|--------------|
| TPF13C(*) | SPST | C               | N.O. Momentary | Silver       |
| TPF13F(*) | SPDT | F               | Momentary      | Silver       |
| TPF23M(*) | DPST | M               | N.O. Momentary | Silver       |
| TPF23R(*) | DPDT | R               | Momentary      | Silver       |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" or "M" action switches.



SPST/SPDT



TPD11CGPC

| Model        | Type | Act. Code P. M6 | Action         | Bushing Dia. | Contact Type |
|--------------|------|-----------------|----------------|--------------|--------------|
| TPD11CGPC(*) | SPST | C               | N.O. Momentary | .250         | Gold         |
| TPD11FGPC(*) | SPDT | F               | Momentary      | .250         | Gold         |
| TPF11CGPC(*) | SPST | C               | N.O. Momentary | 1/4-40       | Gold         |
| TPF11FGPC(*) | SPDT | F               | Momentary      | 1/4-40       | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
NOTE: No center terminal on "C" action switch.

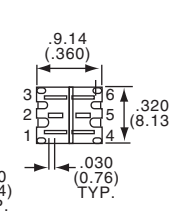
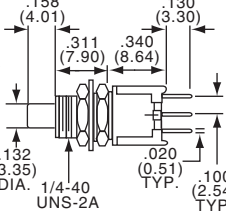
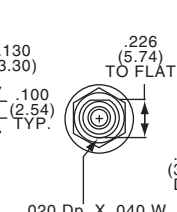
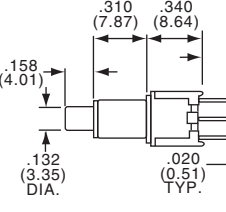
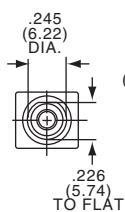
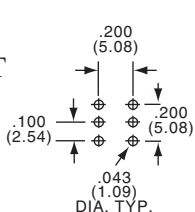
## Pushbutton Switches, Tiny, Vertical or Right Angle, Unthreaded or 1/4-40 Bushing

SEE PAGE D6 FOR PRODUCT SPECIFICATIONS

DPST/DPDT



TPD21MGPC



TPD SERIES

TPF SERIES

| Model         | Type | Act. Code | P. M6 | Action         | Bushing Dia. | Contact Type |
|---------------|------|-----------|-------|----------------|--------------|--------------|
| TPD21MGPC(*)  | DPST | M         |       | N.O. Momentary | .250         | Gold         |
| TPD21IRGPC(*) | DPDT | R         |       | Momentary      | .250         | Gold         |
| TPF21MGPC(*)  | DPST | M         |       | N.O. Momentary | 1/4-40       | Gold         |
| TPF21IRGPC(*) | DPDT | R         |       | Momentary      | 1/4-40       | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminals on "M" Action switches.

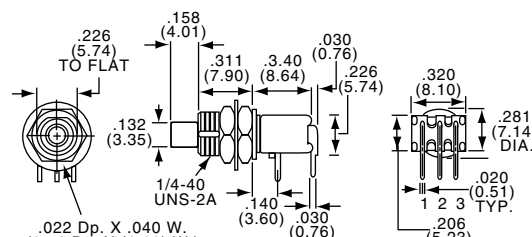
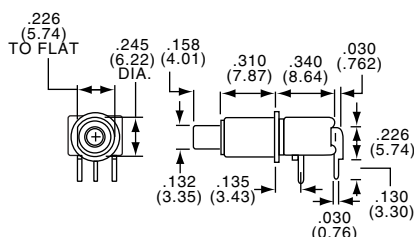
SPST/SPDT



TPD11CGRA



TPF11CGRA



TPD SERIES

TPF SERIES

| Model        | Type | Act. Code | P. M6 | Action         | Bushing Dia. | Contact Type |
|--------------|------|-----------|-------|----------------|--------------|--------------|
| TPD11CGRA(*) | SPST | C         |       | N.O. Momentary | .250         | Gold         |
| TPD11FGRA(*) | SPDT | F         |       | Momentary      | .250         | Gold         |
| TPF11CGRA(*) | SPDT | C         |       | N.O. Momentary | 1/4-40       | Gold         |
| TPF11FGRA(*) | SPDT | F         |       | Momentary      | 1/4-40       | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" action switch.

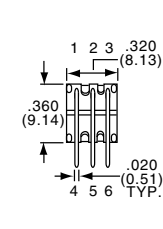
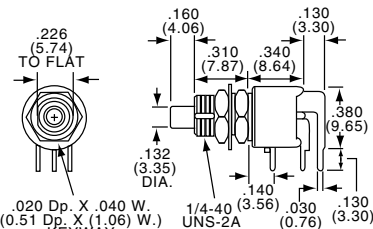
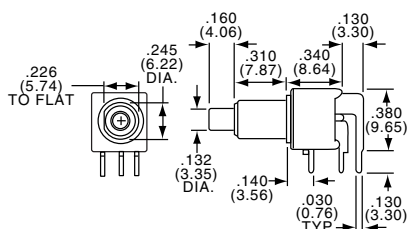
DPST/DPDT



TPF21MGRA



TPD21MGRA



TPD SERIES

TPF SERIES

| Model        | Type | Act. Code P. M6 | Action         | Bushing Dia. | Contact Type |
|--------------|------|-----------------|----------------|--------------|--------------|
| TPD21MGRA(*) | DPST | M               | N.O. Momentary | .250         | Gold         |
| TPD21RGRA(*) | DPDT | R               | Momentary      | .250         | Gold         |
| TPF21MGRA(*) | DPST | M               | N.O. Momentary | 1/4-40       | Gold         |
| TPF21RGRA(*) | DPDT | R               | Momentary      | 1/4-40       | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "M" Action switches.



## Pushbutton Switches, Tiny, Process Sealed, Straight

SEE PAGE D6 FOR PRODUCT SPECIFICATIONS

\* Refer to Page D6 for  
Additional Options \*

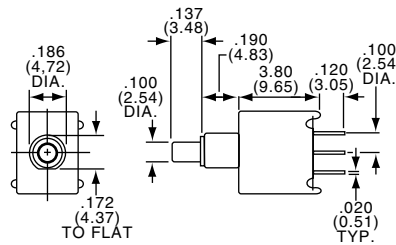
### SPST/SPDT



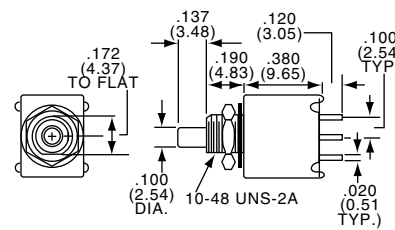
TPB11CGPCES



TPC11CGPCES



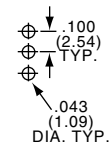
TPB SERIES



TPC SERIES

| Model          | Type | Act. Code | P. M6 | Action         | Bushing Dia. | Contact Type |
|----------------|------|-----------|-------|----------------|--------------|--------------|
| TPB11CGPCES(*) | SPST | C         |       | N.O. Momentary | .188         | Gold         |
| TPB11FGPCES(*) | SPDT | F         |       | Momentary      | .188         | Gold         |
| TPC11CGPCES(*) | SPST | C         |       | N.O. Momentary | 10-48        | Gold         |
| TPC11FGPCES(*) | SPDT | F         |       | Momentary      | 10-48        | Gold         |

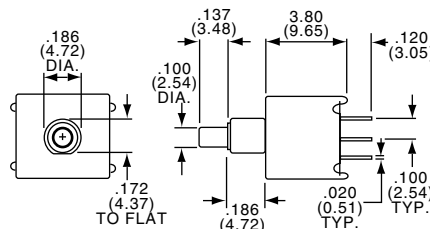
(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" action switch.



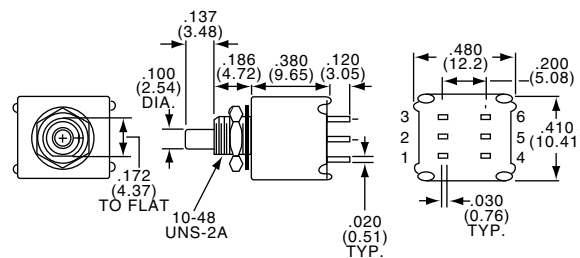
### DPST/DPDT



TPB21RGPCEs



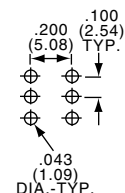
TPB SERIES



TPC SERIES

| Model          | Type | Act. Code | P. M6 | Action         | Bushing Dia. | Contact Type |
|----------------|------|-----------|-------|----------------|--------------|--------------|
| TPB21MGPCEs(*) | DPST | M         |       | N.O. Momentary | .188         | Gold         |
| TPB21RGPCEs(*) | DPDT | R         |       | Momentary      | .188         | Gold         |
| TPC21MGPCEs(*) | DPST | M         |       | N.O. Momentary | 10-48        | Gold         |
| TPC21RGPCEs(*) | DPDT | R         |       | Momentary      | 10-48        | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "M" action switch.



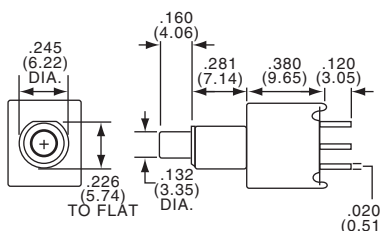
### SPST/SPDT



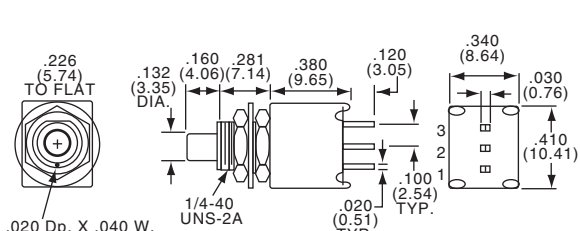
TPD11CGPCES



TPF11CGPCES



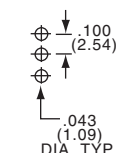
TPD SERIES



TPF SERIES

| Model          | Type | Act. Code | P. M6 | Action         | Bushing Dia. | Contact Type |
|----------------|------|-----------|-------|----------------|--------------|--------------|
| TPD11CGPCES(*) | SPST | C         |       | N.O. Momentary | .250         | Gold         |
| TPD11FGPCES(*) | SPDT | D         |       | Momentary      | .250         | Gold         |
| TPF11CGPCES(*) | SPST | C         |       | N.O. Momentary | .250         | Gold         |
| TPF11FGPCES(*) | SPDT | F         |       | Momentary      | .250         | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" action switch.

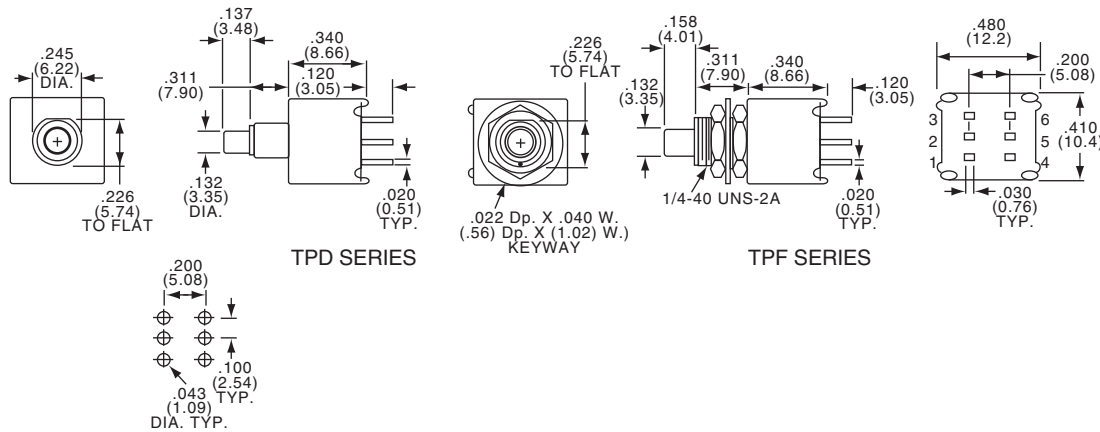




**Pushbutton Switches, Tiny, Process Sealed, Straight or Right Angle**

SEE PAGE D6 FOR PRODUCT SPECIFICATIONS

DPST/DPDT

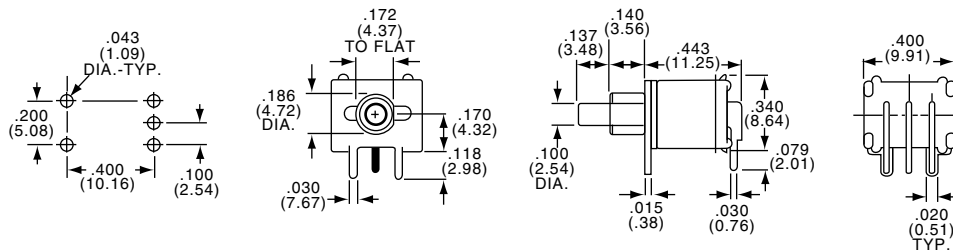


TPD21MGPCES

| Model          | Type | Act. Code P. M6 | Action         | Bushing Dia. | Contact Type |
|----------------|------|-----------------|----------------|--------------|--------------|
| TPD21MGPCES(*) | DPST | M               | N.O. Momentary | .250         | Gold         |
| TPD21RGPCES(*) | DPDT | R               | Momentary      | .250         | Gold         |
| TPF21MGPCES(*) | DPST | M               | N.O. Momentary | 1/4-40       | Gold         |
| TPF21RGPCES(*) | DPDT | R               | Momentary      | 1/4-40       | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "M" action switch.

SPST/SPDT

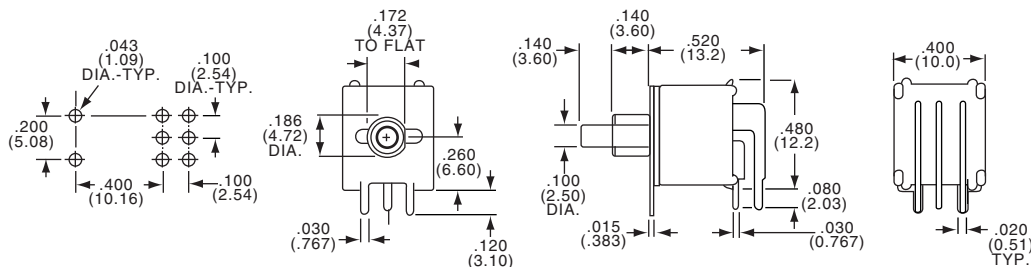


TPB11CGRAES

| Model          | Type | Act. Code P. M6 | Action         | Bushing Dia. | Contact Type |
|----------------|------|-----------------|----------------|--------------|--------------|
| TPB11CGRAES(*) | SPST | C               | N.O. Momentary | .188         | Gold         |
| TPB11FGRAES(*) | SPDT | F               | Momentary      | .188         | Gold         |

(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "C" action switch.

DPST/DPDT

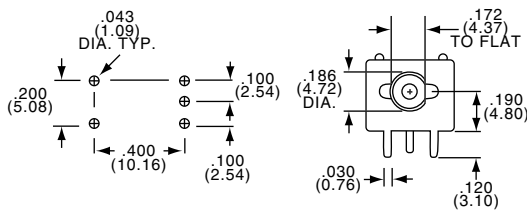


| Model          | Type | Act. Code P. M6 | Action         | Bushing Dia. | Contact Type |
|----------------|------|-----------------|----------------|--------------|--------------|
| TPB21MGRAES(*) | DPST | M               | N.O. Momentary | .188         | Gold         |
| TPB21RGRAES(*) | DPDT | R               | Momentary      | .188         | Gold         |

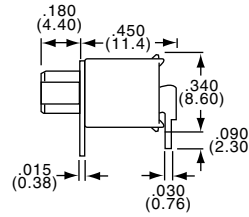
(\*) Specify button color by adding suffix number: (0) Black, (2) Red.  
Note: No center terminal on "M" action switch.

**Pushbutton Switches, Tiny, Process Sealed, Flush Actuator, Straight or Right Angle**

SEE PAGE D6 FOR PRODUCT SPECIFICATIONS



TPBF Series



SPST/SPDT

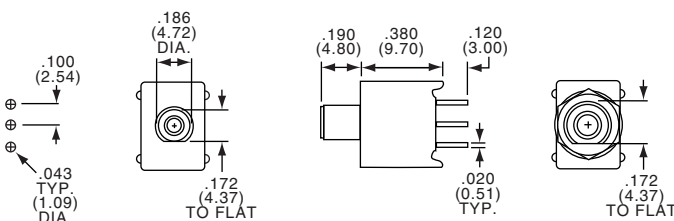


TPBF11CGRAESO

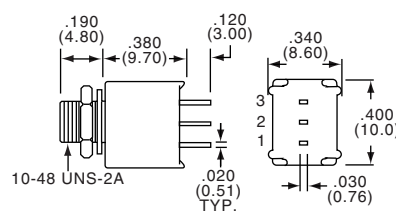
| Model           | Type | Act. Code P. M6 | Action         |
|-----------------|------|-----------------|----------------|
| TPBF11CGRAES(*) | SPST | C               | N.O. Momentary |
| TPBF11FGRAES(*) | SPDT | F               | Momentary      |

(\*) Specify button color by adding suffix numbers: (0) Black, (2) Red.

Note: No center terminal on "C" Action switches.



TPBF Series



TPCF Series

SPST/SPDT



TPBF11CGPCES

| Model           | Type | Act. Code P. M6 | Action         |
|-----------------|------|-----------------|----------------|
| TPBF11CGPCES(*) | SPST | C               | N.O. Momentary |
| TPBF11FGPCES(*) | SPDT | F               | Momentary      |
| TPCF11FGPCES(*) | SPDT | F               | Momentary      |

(\*) Specify button color by adding suffix numbers: (0) Black, (2) Red.

Note: No center terminal on "C" action switch.

## Pushbutton Switches, .120 Actuator, Straight

### MATERIAL SPECIFICATIONS:

Contacts .....Gold plate  
Case Material .....Polyester  
Actuator Material .....Polyester, black  
Terminal Seal .....Epoxy

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature.....-40°F to +176°F (-40°C to +80°C)

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA Max. @ 20 VDC or peak AC  
Initial Contact Resistance .....50 Milliohms max.  
Contact Timing .....Break-before-make  
Insulation Resistance .....1,000 Megohms @ 500 VDC min.  
Dielectric Strength .....500 Volts RMS @ sea level  
Actuator Travel......050" (1.27)  
Life Expectancy .....Up to 10,000 Cycles

FOR SEALED VERSIONS SEE PAGES D19 AND D20

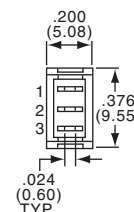
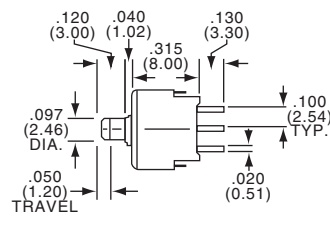
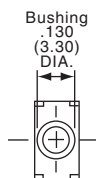
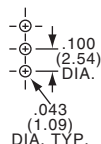
**D**

APA Series

### SPST/SPDT



APA1BGPC



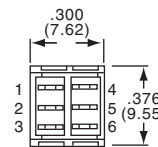
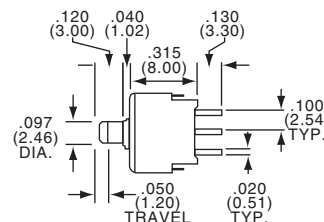
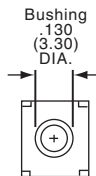
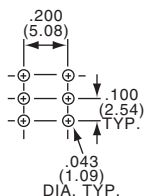
| Part Number      |            |      |                |     |       |
|------------------|------------|------|----------------|-----|-------|
| Tyco Electronics | Alcoswitch | Type | Action         |     |       |
| 1437567-2        | APA1BGPC   | SPST | N.C. Momentary | 1-3 | (—)   |
| 1437567-3        | APA1CGPC   | SPST | N.O. Momentary | —   | (1-3) |
| 1437567-5        | APA1FGPC   | SPDT | Momentary      | 2-3 | (2-1) |

Note: No center terminals on "B" or "C" action switches.

### DPST/DPDT



APA2MGPC

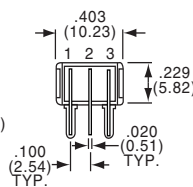
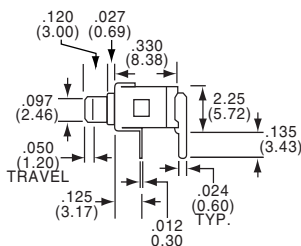
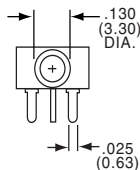
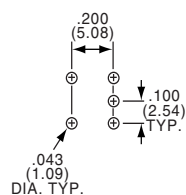


| Part Number      |            |      |                |          |            |
|------------------|------------|------|----------------|----------|------------|
| Tyco Electronics | Alcoswitch | Type | Action         |          |            |
| —                | APA2LGPC   | DPST | N.C. Momentary | 1-3, 4-6 | (—)        |
| 1437567-7        | APA2MGPC   | DPST | N.O. Momentary | —        | (1-3, 4-6) |
| 1437567-9        | APA2RGPC   | DPDT | Momentary      | 2-3, 5-6 | (2-1, 5-4) |

Note: No center terminals on "L" or "M" action switches.

## Pushbutton Switches, .120 Actuator, Right Angle

### SPST/SPDT

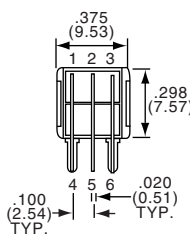
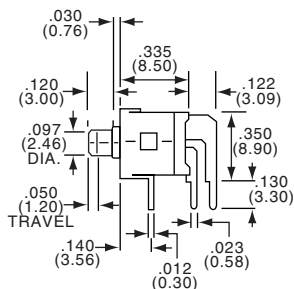
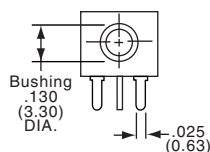
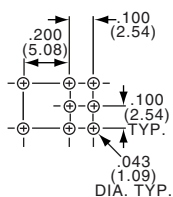


APA1FGRA

| Part Number      |            |      |                |     |       |
|------------------|------------|------|----------------|-----|-------|
| Tyco Electronics | Alcoswitch | Type | Action         |     |       |
| —                | APA1BGRA   | SPST | N.C. Momentary | 1-3 | (—)   |
| 1437567-4        | APA1CGRA   | SPST | N.O. Momentary | —   | (1-3) |
| 1437567-6        | APA1FGRA   | SPDT | Momentary      | 2-3 | (2-1) |

Note: No center terminals on "B" or "C" action switches.

### DPST/DPDT



APA2RGRA

| Part Number      |            |      |                |          |            |
|------------------|------------|------|----------------|----------|------------|
| Tyco Electronics | Alcoswitch | Type | Action         |          |            |
| 1437567-8        | APA2MGRA   | DPST | N.O. Momentary | —        | (1-3, 4-6) |
| 1-1437567-0      | APA2RGRA   | DPDT | Momentary      | 2-3, 5-6 | (2-1, 5-4) |

Note: No center terminals on "M" action switches.

## Pushbutton Switches, .157 Actuator, Vertical or Right Angle

### MATERIAL SPECIFICATIONS:

Contacts .....Gold plate  
Case Material .....Polyester  
Actuator Material .....Polyester, black  
Terminal Seal .....Epoxy

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature.....-40°F to +176°F (-40°C to +80°C)

### TYPICAL PERFORMANCE CHARACTERISTICS:

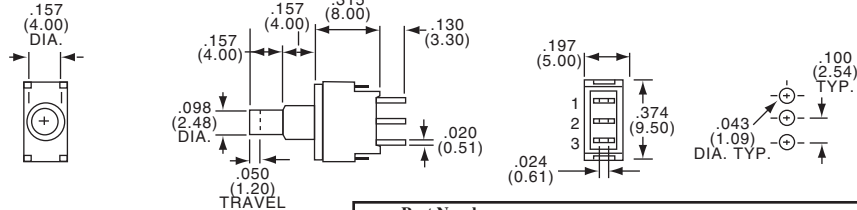
Contact Rating .....0.4 VA Max. @ 20 VDC or peak AC  
Initial Contact Resistance .....50 Milliohms max.  
Contact Timing .....Break-before-make  
Insulation Resistance .....1,000 Megohms @ 500 VDC min.  
Dielectric Strength .....500 Volts RMS @ sea level  
Actuator Travel.....0.050" (1.27)  
Life Expectancy .....Up to 10,000 Cycles

FOR SEALED VERSIONS SEE PAGES D19 AND D20

### SPST/SPDT



APB1BGPC



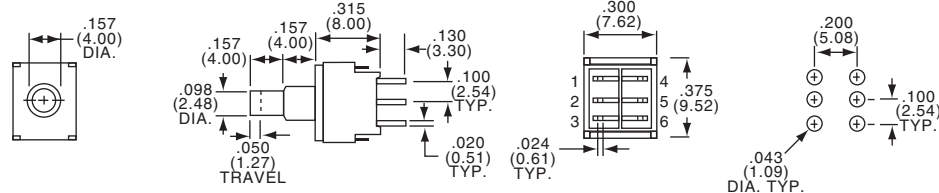
| Part Number      |            | Type | Action         |     |       |
|------------------|------------|------|----------------|-----|-------|
| Tyco Electronics | Alcoswitch |      |                |     |       |
| 1-1437567-1      | APB1BGPC   | SPST | N.C. Momentary | 1-3 | (—)   |
| 1-1437567-2      | APB1CGPC   | SPST | N.O. Momentary | —   | (1-3) |
| 1-1437567-4      | APB1FGPC   | SPDT | Momentary      | 2-3 | (2-1) |

Note: No center terminal on "B" and "C" action switches.

### DPST/DPDT



APB2RGPC



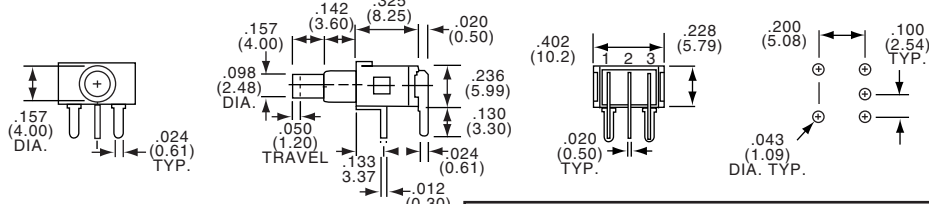
| Part Number      |            | Type | Action         |          |            |
|------------------|------------|------|----------------|----------|------------|
| Tyco Electronics | Alcoswitch |      |                |          |            |
| —                | APB2LGPC   | DPST | N.C. Momentary | 1-3, 4-6 | (—)        |
| 1-1437567-7      | APB2RGPC   | DPDT | Momentary      | 2-3, 5-6 | (2-1, 5-4) |

Note: No center terminal on "L" action switches.

### SPST/SPDT



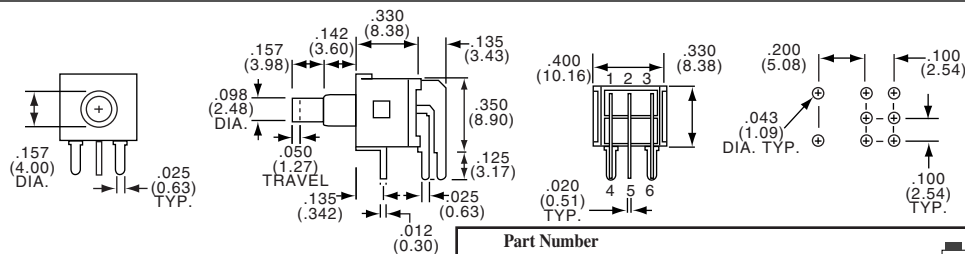
APB1FGRA



| Part Number      |            | Type | Action         |     |       |
|------------------|------------|------|----------------|-----|-------|
| Tyco Electronics | Alcoswitch |      |                |     |       |
| —                | APB1BGRA   | SPST | N.C. Momentary | 1-3 | (—)   |
| 1-1437567-3      | APB1CGRA   | SPST | N.O. Momentary | —   | (1-3) |
| 1-1437567-5      | APB1FGRA   | SPDT | Momentary      | 2-3 | (2-1) |

Note: No center terminal on "B" and "C" action switches.

### DPST/DPDT



| Part Number      |            | Type | Action         |          |            |
|------------------|------------|------|----------------|----------|------------|
| Tyco Electronics | Alcoswitch |      |                |          |            |
| 1-1437567-6      | APB2MGRA   | DPST | N.O. Momentary | —        | (1-3, 4-6) |
|                  | APB2RGRA   | DPDT | Momentary      | 2-3, 5-6 | (2-1, 5-4) |

Note: No center terminal on "M" action switches.

## Pushbutton Switches, Process Sealed, .157 Actuator, Straight, Retention Terminal

### MATERIAL SPECIFICATIONS:

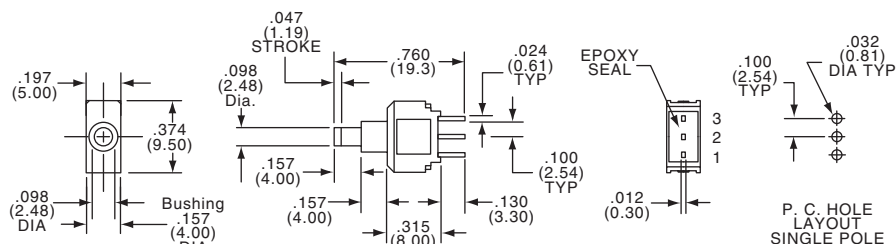
Contacts .....Gold plated  
Case Material .....Polyester  
Actuator Material .....Polyester, black  
Terminals/Fixed Contacts.....Copper alloy  
Terminal Seal .....Epoxy

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature.....-40°F to +176°F (-40°C to +80°C)

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA Max. @ 20 VDC or peak AC  
Initial Contact Resistance.....50 Milliohms max.  
Insulation Resistance .....500 Megohms @ 250 VDC min.  
Dielectric Strength .....500 Volts RMS @ sea level  
Actuator Travel.....0.047" (1.19)  
Life Expectancy .....Up to 10,000 Cycles



SPDT

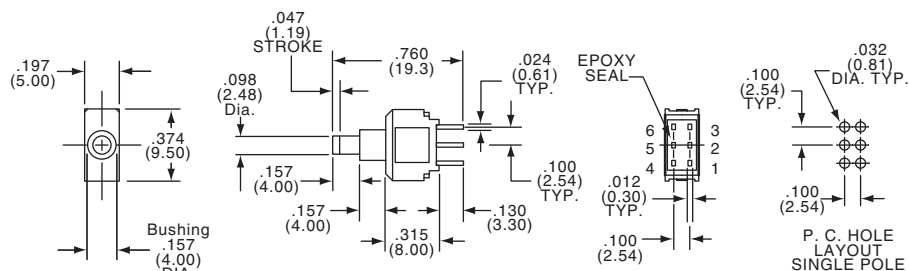


APBE1FGPC

| Part Number                        |            |      |     |       |              |
|------------------------------------|------------|------|-----|-------|--------------|
| Tyco Electronics                   | Alcoswitch | Type | On  | (On)  | Contact Type |
| 1-1437567-8                        | APBE1FGPC  | SPDT | On  | (On)  | Gold         |
| Terminals Connected:               |            |      | 2-3 | (2-1) |              |
| (On) indicates momentary position. |            |      |     |       |              |

DPDT

Extra compact double pole saves PCB real estate.



APBE2RGPC

| Part Number                        |            |      |           |             |              |
|------------------------------------|------------|------|-----------|-------------|--------------|
| Tyco Electronics                   | Alcoswitch | Type | On        | (On)        | Contact Type |
| 2-1437567-0                        | APBE2RGPC  | DPDT | On        | (On)        | Gold         |
| Terminals Connected:               |            |      | 2-3 & 5-6 | (2-1 & 5-4) |              |
| (On) indicates momentary position. |            |      |           |             |              |

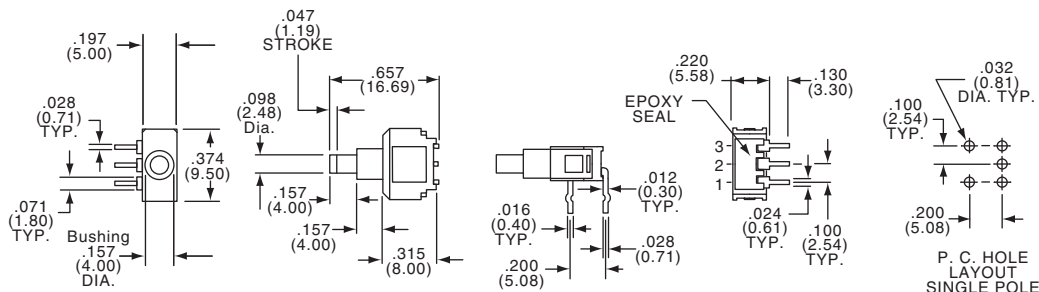
**Pushbutton Switches, Process Sealed, .157 Actuator, Retention Terminal, Right Angle**

SEE PAGE D19 FOR PRODUCT SPECIFICATIONS.

SPDT



APBE1FGRA



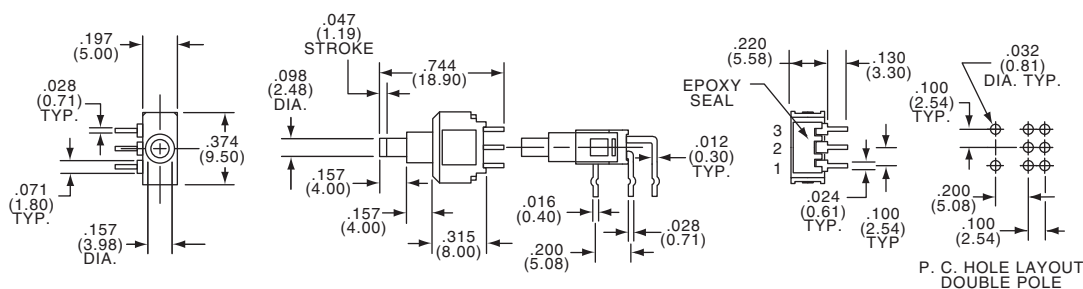
| Part Number                        |            |      |    |      |              |
|------------------------------------|------------|------|----|------|--------------|
| Tyco Electronics                   | Alcoswitch | Type |    |      | Contact Type |
| 1-1437567-9                        | APBE1FGRA  | SPDT | On | (On) | Gold         |
| Terminals Connected: 2-3 (2-1)     |            |      |    |      |              |
| (On) indicates momentary position. |            |      |    |      |              |

DPDT

Extra compact double pole saves PCB real estate.



APBE2RGRA



| Part Number                                |            |      |    |      |              |
|--------------------------------------------|------------|------|----|------|--------------|
| Tyco Electronics                           | Alcoswitch | Type |    |      | Contact Type |
| 2-1437567-1                                | APBE2RGRA  | DPDT | On | (On) | Gold         |
| Terminals Connected: 2-3 & 5-6 (2-1 & 5-4) |            |      |    |      |              |
| (On) indicates momentary position.         |            |      |    |      |              |



## Pushbutton Switches, Sub-Miniature, Panel Mount

### MPA3 Series

#### MATERIAL SPECIFICATIONS:

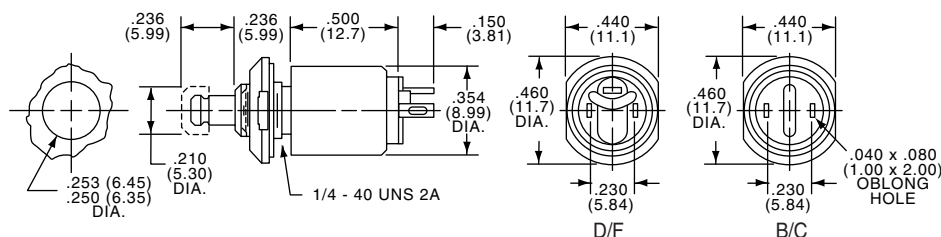
Contacts .....Silver clad  
Case Material .....Thermoset  
Actuator Material .....Polyamide  
Terminals .....Silver plate

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +158°F (-20°C to +70°C)  
Storage Temperature.....-40°F to +176°F (-40°C to +80°C)  
Solder Heat Resistance .....See page M3-4

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....3 A @ 125 VAC  
Initial Contact Resistance .....20 Milliohms max.  
Contact Timing .....Break-before-make  
Insulation Resistance .....1,000 Megohms min.  
Dielectric Strength .....1,000 Volts RMS @ sea level  
Actuation Force .....10 oz. SPST, 16 oz. SPDT average  
Actuator Travel.....100" (2.54)  
Life Expectancy .....Up to 10,000 Cycles  
Note: Hardware included with switches



SPST/SPDT



MPA103C

| Part Number      |            | Type | Act. Code | P. M6 | Action                      | Contact Rating |
|------------------|------------|------|-----------|-------|-----------------------------|----------------|
| Tyco Electronics | Alcoswitch |      |           |       |                             |                |
| 2-1437567-4      | MPA103B    | SPST | 14        |       | N. C. Momentary             | 3 Amps         |
| 2-1437567-5      | MPA103C    | SPST | 13        |       | N. O. Momentary             | 3 Amps         |
| 2-1437567-6      | MPA103D    | SPDT | 16        |       | Push on/push off- (tactile) | 3 Amps         |
| 2-1437567-7      | MPA103F    | SPDT | 15        |       | Momentary - (tactile)       | 3 Amps         |

Black Cap supplied. Other colors available, order separately.  
(See Cap C5 and C8 on Page D32.)

### MPB Series

## Pushbutton Switches, Miniature, Over-Travel

#### MATERIAL SPECIFICATIONS:

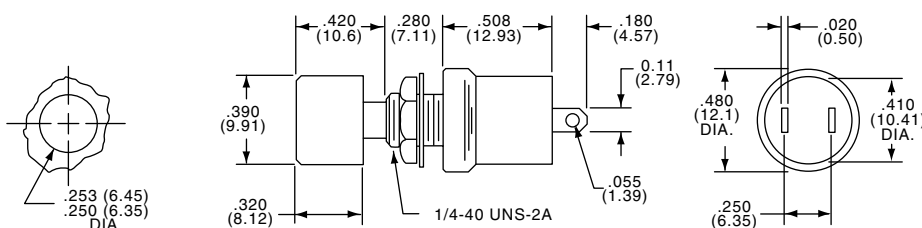
Contacts .....Silver plate  
Case Material .....Thermoset  
Actuator Material .....Polyamide  
Terminals .....Silver plate

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....+14°F to +140°F (-10°C to +60°C)  
Storage Temperature.....+5°F to +158°F (-15°C to +70°C)  
Solder Heat Resistance .....See page M3-4

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....3 A @ 125 VAC  
Initial Contact Resistance .....20 Milliohms max.  
Insulation Resistance .....1,000 Megohms min.  
Dielectric Strength .....1,000 Volts RMS @ sea level  
Actuator Travel.....100" (2.54) Overtravel .059" (1.5mm)  
Life Expectancy .....20,000 Cycles  
Note: Hardware included with switches



SPST

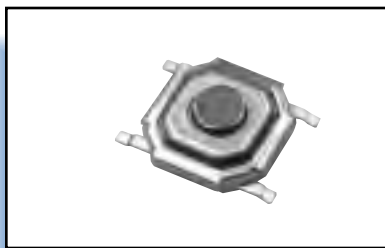


MPB103B

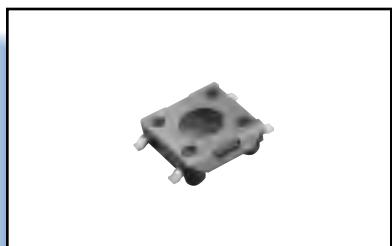
| Part Number      |            | Type | Act. Code | P. M6 | Action         | Actuator Color |
|------------------|------------|------|-----------|-------|----------------|----------------|
| Tyco Electronics | Alcoswitch |      |           |       |                |                |
| 3-1437567-9      | MPB103B    | SPST | 14        |       | N.C. Momentary | Black          |
| 4-1437567-0      | MPB103C    | SPST | 13        |       | N.O. Momentary | Red            |



*FSM Series - Page E3*



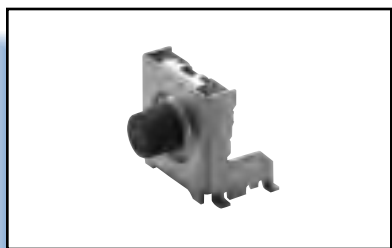
*4.9mm Series - Page E11*



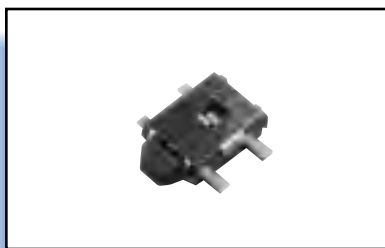
*Low Profile Series - Page E12*



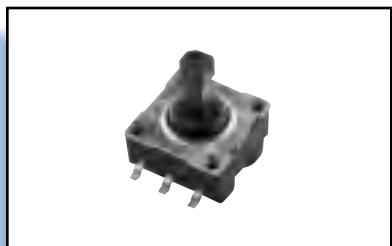
*High Life Tactile - Page E12*



*Sealed Series - Page E27*



*Side Actuated - Page E29*



*Multi-Directional Actuation - Page E30*

# Tactile

E

Tactile Switches

## Tactile Switches Part Number Index

|                   |                   |                   |
|-------------------|-------------------|-------------------|
| FSM .....E3       | FSM4JA .....E5    | FSMRA 8JL .....E7 |
| FSM100 .....E16   | FSM4JAA .....E5   | FSMRACD .....E8   |
| FSM100A .....E16  | FSM4JART .....E6  | FSMRACDA .....E8  |
| FSM101 .....E16   | FSM4JL .....E5    | FSMSM .....E9     |
| FSM102 .....E17   | FSM4JRT .....E6   | FSMSMTR.....E9    |
| FSM102A .....E17  | FSM4JSMA .....E10 | 1571217 .....E18  |
| FSM103 .....E17   | FSM4JSMAA ...E10  | 1571218 .....E19  |
| FSM104 .....E17   | FSM4JSMAATR E10   | 1571219 .....E20  |
| FSM10J .....E5    | FSM4JSMATR ..E10  | 1571220 .....E21  |
| FSM10JA .....E5   | FSM4LP .....E15   | 1571262 .....E29  |
| FSM10JAA .....E5  | FSM4LPTR .....E15 | 1571294 .....E22  |
| FSM10JL .....E5   | FSM5J .....E5     | 1571295 .....E24  |
| FSM11J .....E5    | FSM5JA .....E5    | 1571296 .....E23  |
| FSM11JA .....E5   | FSM5JAA .....E5   | 1571297 .....E26  |
| FSM11JAA .....E5  | FSM5JL .....E5    | 1571298 .....E25  |
| FSM11JL .....E5   | FSM6J .....E5     | 1571300 .....E27  |
| FSM12J .....E5    | FSM6JA .....E5    | 1571407 .....E28  |
| FSM12JA .....E5   | FSM6JAA .....E5   | 1571514 .....E30  |
| FSM12JAA .....E5  | FSM6JART .....E6  | 1571515 .....E30  |
| FSM12JL .....E5   | FSM6JL .....E5    | 1571625 .....E12  |
| FSM13J .....E5    | FSM6JRT .....E6   | 1571626 .....E13  |
| FSM13JA .....E5   | FSM6JSMA .....E10 | 1571636 .....E14  |
| FSM13JAA .....E5  | FSM6JSMAA ...E10  |                   |
| FSM13JL .....E5   | FSM6JSMAATR E10   |                   |
| FSM14J .....E5    | FSM6JSMATR ..E10  |                   |
| FSM14JA .....E5   | FSM7J .....E5     |                   |
| FSM14JAA .....E5  | FSM7JA .....E5    |                   |
| FSM14JL .....E5   | FSM7JAA .....E5   |                   |
| FSM14JRT .....E6  | FSM7JL .....E5    |                   |
| FSM15J .....E5    | FSM8J .....E5     |                   |
| FSM15JA .....E5   | FSM8JA .....E5    |                   |
| FSM15JAA .....E5  | FSM8JAA .....E5   |                   |
| FSM15JL .....E5   | FSM8JART .....E6  |                   |
| FSM16J .....E5    | FSM8JL .....E5    |                   |
| FSM16JA .....E5   | FSM8JRT .....E6   |                   |
| FSM16JAA .....E5  | FSM8JSMA .....E10 |                   |
| FSM16JL .....E5   | FSM8JSMATR ..E10  |                   |
| FSM17J .....E5    | FSM9J .....E5     |                   |
| FSM17JA .....E5   | FSM9JA .....E5    |                   |
| FSM17JAA .....E5  | FSM9JAA .....E5   |                   |
| FSM17JL .....E5   | FSM9JL .....E5    |                   |
| FSM18J .....E5    | FSMC .....E3      |                   |
| FSM18JA .....E5   | FSMCD .....E8     |                   |
| FSM18JAA .....E5  | FSMCD .....E8     |                   |
| FSM18JL .....E5   | FSMCTATR .....E11 |                   |
| FSM1J .....E4,E5  | FSMCTTR .....E11  |                   |
| FSM1JA .....E5    | FSMJM3.5ATR ..E9  |                   |
| FSM1JAA .....E5   | FSMJM4.3 .....E9  |                   |
| FSM1JL .....E5    | FSMJM4.3ATR ..E9  |                   |
| FSM1LP .....E15   | FSMJM4.3TR ...E9  |                   |
| FSM1LPA .....E15  | FSMJM5.0ATR ..E9  |                   |
| FSM1LPATR.....E15 | FSMRA 1J .....E7  |                   |
| FSM1LPTR .....E15 | FSMRA 1JL .....E7 |                   |
| FSM201A .....E16  | FSMRA 2J .....E7  |                   |
| FSM2J .....E4,E5  | FSMRA 2JA .....E7 |                   |
| FSM2JA .....E5    | FSMRA 2JH .....E7 |                   |
| FSM2JAA .....E5   | FSMRA 2JL .....E7 |                   |
| FSM2JART .....E6  | FSMRA 3J .....E7  |                   |
| FSM2JL .....E5    | FSMRA 3JL .....E7 |                   |
| FSM2JRT .....E6   | FSMRA 4J .....E7  |                   |
| FSM2JSMA .....E10 | FSMRA 4JA .....E7 |                   |
| FSM2JSMAA ...E10  | FSMRA 4JL .....E7 |                   |
| FSM2JSMAATR E10   | FSMRA 5J .....E7  |                   |
| FSM2JSMATR ..E10  | FSMRA 5JL .....E7 |                   |
| FSM3J .....E5     | FSMRA 6J .....E7  |                   |
| FSM3JA .....E5    | FSMRA 6JL .....E7 |                   |
| FSM3JAA .....E5   | FSMRA 7J .....E7  |                   |
| FSM3JL .....E5    | FSMRA 7JL .....E7 |                   |
| FSM4J .....E5     | FSMRA 8J .....E7  |                   |

**Tactile Switches, .138 [3.5] x .236 [6], Through Hole**

**MATERIAL SPECIFICATIONS:**

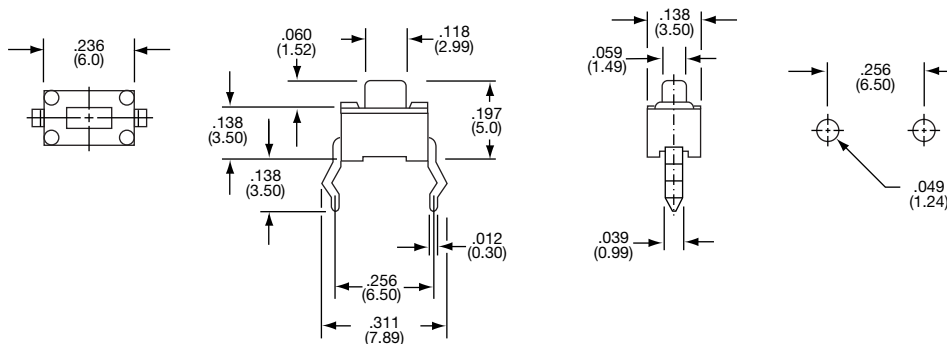
Contacts .....Stainless/Silver clad plate  
Case Material .....Nylon  
Actuator Material .....PBT  
Terminals/Fixed Contacts.....Copper alloy, Silver/Nickel

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature.....-40°F to +185°F (-40°C to + 85°C)  
Storage Temperature.....-40°F to +185°F (-40°C to + 85°C)  
Solder Heat Resistance .....See Page M3-4

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50 mA @ 12 VDC  
Initial Contact Resistance .....100 Milliohms max.  
Insulation Resistance .....100 Megohms min. @ 500 VDC  
Dielectric Strength .....500 VAC for 1 minute  
Actuation Force .....130±50 Grams  
Actuator Travel......010"(.254)  
Life Expectancy .....Up to 20,000 Cycles

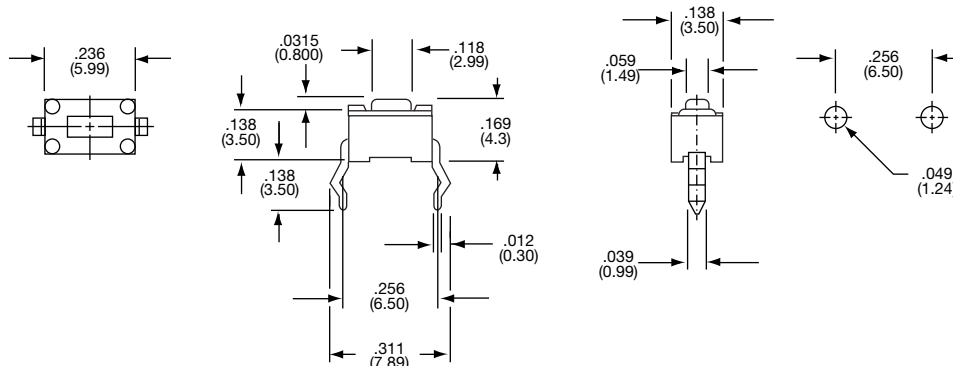


3.5 x 6mm



FSM

| Tyco Electronics                   | Alcoswitch | Type | Off | On   |
|------------------------------------|------------|------|-----|------|
| 1437565-1                          | FSM        | SPST | Off | (On) |
| (On) indicates momentary position. |            |      |     |      |



3.5 x 6mm



FSMC

| Tyco Electronics                   | Alcoswitch | Type | Off | On   |
|------------------------------------|------------|------|-----|------|
| 7-1437565-6                        | FSMC       | SPST | Off | (On) |
| (On) indicates momentary position. |            |      |     |      |

**Tactile Switches, .236 [6] x .236 [6], Through Hole**

**MATERIAL SPECIFICATIONS:**

Contacts .....Copper alloy, silver plate  
Case.....Polyamide  
Actuator Button .....Polyacetal Resin  
Frame .....Steel, tin plate  
Terminals .....Copper alloy, silver plate

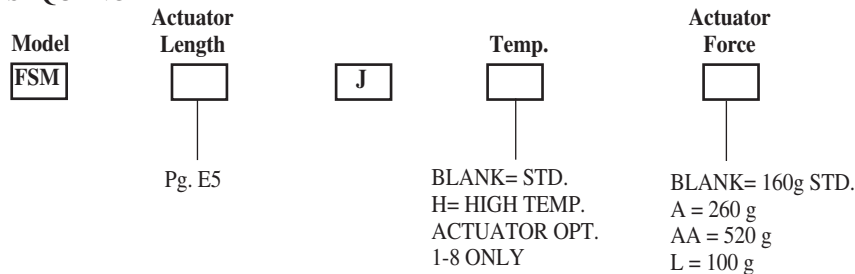
**ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature.....-40°F to +221°F (-40°C to +105°C)  
Storage Temperature.....-40°F to +221°F (-40°C to +105°C)  
Solder Heat Resistance .....See Page M3-4

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50 mA @ 12 VDC  
Initial Contact Resistance .....100 Milliohms max.  
Insulation Resistance .....100 Megohms min. @ 100 VDC  
Dielectric Strength .....500 VAC  
Actuation Force .....See page E5  
Actuator Travel......012" (0,3)  
Electrostatic Discharge  
w/ESD Ground Terminal .....5Kv w/no discharge  
Life Expectancy .....Up to 100,000 Cycles

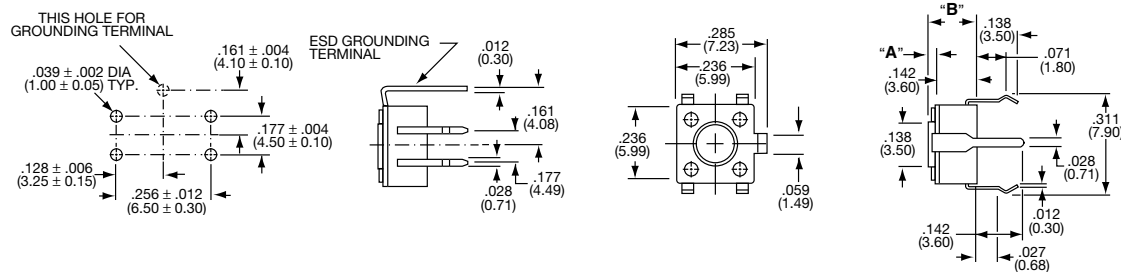
**PART NUMBERING SEQUENCE**



6 x 6 mm



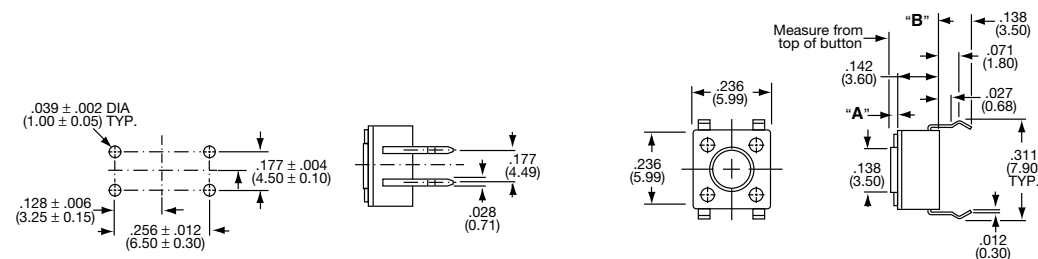
FSM1J  
WITH  
ESD  
TERMINAL



6 x 6 mm



FSM2J  
WITHOUT  
ESD  
TERMINAL



**Tactile Switches, .236 [6] x .236 [6], Through Hole (Continued)**

| TYCO Electronics<br>Part Number | ALCO<br>Part Number | DIMENSIONS    |               | Actuation<br>Force | Actuator<br>Material | Life<br>Cycles |
|---------------------------------|---------------------|---------------|---------------|--------------------|----------------------|----------------|
|                                 |                     | A             | B             |                    |                      |                |
| With Ground Terminal            |                     |               |               |                    |                      |                |
| 1-1437565-5                     | FSM1J               | 0.028 (0.70)  | 0.169 (4.30)  | 160±50gf           | PBT                  | 100,000        |
| —                               | FSM1JAA             | 0.028 (0.70)  | 0.169 (4.30)  | 260±50gf           | PBT                  | 100,000        |
| —                               | FSM1JAA             | 0.028 (0.70)  | 0.169 (4.30)  | 520±100gf          | PBT                  | 100,000        |
| —                               | FSM1JL              | 0.028 (0.70)  | 0.169 (4.30)  | 100±50gf           | PBT                  | 100,000        |
| 3-1437565-3                     | FSM3J               | 0.055 (1.40)  | 0.196 (5.00)  | 160±50gf           | PBT                  | 100,000        |
| —                               | FSM3JAA             | 0.055 (1.40)  | 0.196 (5.00)  | 260±50gf           | PBT                  | 100,000        |
| —                               | FSM3JAA             | 0.055 (1.40)  | 0.196 (5.00)  | 520±100gf          | PBT                  | 100,000        |
| —                               | FSM3JL              | 0.055 (1.40)  | 0.196 (5.00)  | 100±50gf           | PBT                  | 100,000        |
| 4-1437565-4                     | FSM5J               | 0.134 (3.40)  | 0.276 (7.00)  | 160±50gf           | ACETAL               | 100,000        |
| —                               | FSM5JAA             | 0.134 (3.40)  | 0.276 (7.00)  | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM5JAA             | 0.134 (3.40)  | 0.276 (7.00)  | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM5JL              | 0.134 (3.40)  | 0.276 (7.00)  | 100±50gf           | ACETAL               | 100,000        |
| 5-1437565-1                     | FSM7J               | 0.232 (5.90)  | 0.374 (9.50)  | 160±50gf           | PBT                  | 100,000        |
| —                               | FSM7JAA             | 0.232 (5.90)  | 0.374 (9.50)  | 260±50gf           | PBT                  | 100,000        |
| —                               | FSM7JAA             | 0.232 (5.90)  | 0.374 (9.50)  | 520±100gf          | PBT                  | 100,000        |
| —                               | FSM7JL              | 0.232 (5.90)  | 0.374 (9.50)  | 100±50gf           | PBT                  | 100,000        |
| 7-1437565-5                     | FSM9J               | 0.146 (3.70)  | 0.287 (7.30)  | 160±50gf           | ACETAL               | 100,000        |
| —                               | FSM9JAA             | 0.146 (3.70)  | 0.287 (7.30)  | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM9JAA             | 0.146 (3.70)  | 0.287 (7.30)  | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM9JL              | 0.146 (3.70)  | 0.287 (7.30)  | 100±50gf           | ACETAL               | 100,000        |
| 1437565-8                       | FSM11J              | 0.173 (4.40)  | 0.315 (8.00)  | 160±50gf           | ACETAL               | 100,000        |
| —                               | FSM11JAA            | 0.173 (4.40)  | 0.315 (8.00)  | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM11JAA            | 0.173 (4.40)  | 0.315 (8.00)  | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM11JL             | 0.173 (4.40)  | 0.315 (8.00)  | 100±50gf           | ACETAL               | 100,000        |
| 1-1437565-0                     | FSM13J              | 0.370 (9.40)  | 0.512 (13.00) | 160±50gf           | ACETAL               | 100,000        |
| 1-1437565-1                     | FSM13JAA            | 0.370 (9.40)  | 0.512 (13.00) | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM13JAA            | 0.370 (9.40)  | 0.512 (13.00) | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM13JL             | 0.370 (9.40)  | 0.512 (13.00) | 100±50gf           | ACETAL               | 100,000        |
| —                               | FSM15J              | 0.527 (13.40) | 0.669 (17.00) | 160±50gf           | ACETAL               | 100,000        |
| 147916-1                        | FSM15JAA            | 0.527 (13.40) | 0.669 (17.00) | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM15JAA            | 0.527 (13.40) | 0.669 (17.00) | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM15JL             | 0.527 (13.40) | 0.669 (17.00) | 100±50gf           | ACETAL               | 100,000        |
| —                               | FSM17J              | 0.193 (4.90)  | 0.335 (8.51)  | 160±50gf           | ACETAL               | 100,000        |
| —                               | FSM17JAA            | 0.193 (4.90)  | 0.335 (8.51)  | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM17JAA            | 0.193 (4.90)  | 0.335 (8.51)  | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM17JL             | 0.193 (4.90)  | 0.335 (8.51)  | 100±50gf           | ACETAL               | 100,000        |
| Without Ground Terminal         |                     |               |               |                    |                      |                |
| 2-1437565-0                     | FSM2J               | 0.028 (0.70)  | 0.169 (4.30)  | 160±50gf           | PBT                  | 100,000        |
| 2-1437565-1                     | FSM2JAA             | 0.028 (0.70)  | 0.169 (4.30)  | 260±50gf           | PBT                  | 100,000        |
| —                               | FSM2JAA             | 0.028 (0.70)  | 0.169 (4.30)  | 520±100gf          | PBT                  | 100,000        |
| 2-1437565-4                     | FSM2JL              | 0.028 (0.70)  | 0.169 (4.30)  | 100±50gf           | PBT                  | 100,000        |
| 3-1437565-6                     | FSM4J               | 0.055 (1.40)  | 0.196 (5.00)  | 160±50gf           | PBT                  | 100,000        |
| 3-1437565-7                     | FSM4JAA             | 0.055 (1.40)  | 0.196 (5.00)  | 260±50gf           | PBT                  | 100,000        |
| 3-1437565-8                     | FSM4JAA             | 0.055 (1.40)  | 0.196 (5.00)  | 520±100gf          | PBT                  | 100,000        |
| —                               | FSM4JL              | 0.055 (1.40)  | 0.196 (5.00)  | 100±50gf           | PBT                  | 100,000        |
| 4-1437565-5                     | FSM6J               | 0.134 (3.40)  | 0.276 (7.00)  | 160±50gf           | ACETAL               | 100,000        |
| 4-1437565-6                     | FSM6JAA             | 0.134 (3.40)  | 0.276 (7.00)  | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM6JAA             | 0.134 (3.40)  | 0.276 (7.00)  | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM6JL              | 0.134 (3.40)  | 0.276 (7.00)  | 100±50gf           | ACETAL               | 100,000        |
| 5-1437565-2                     | FSM8J               | 0.232 (5.90)  | 0.374 (9.50)  | 160±50gf           | PBT                  | 100,000        |
| 5-1437565-3                     | FSM8JAA             | 0.232 (5.90)  | 0.374 (9.50)  | 260±50gf           | PBT                  | 100,000        |
| 5-1437565-4                     | FSM8JAA             | 0.232 (5.90)  | 0.374 (9.50)  | 520±100gf          | PBT                  | 100,000        |
| 1571376-1                       | FSM8JL              | 0.232 (5.90)  | 0.374 (9.50)  | 100±50gf           | PBT                  | 100,000        |
| 1437565-7                       | FSM10J              | 0.146 (3.70)  | 0.287 (7.30)  | 160±50gf           | ACETAL               | 100,000        |
| —                               | FSM10JAA            | 0.146 (3.70)  | 0.287 (7.30)  | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM10JAA            | 0.146 (3.70)  | 0.287 (7.30)  | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM10JL             | 0.146 (3.70)  | 0.287 (7.30)  | 100±50gf           | ACETAL               | 100,000        |
| 1437565-9                       | FSM12J              | 0.173 (4.40)  | 0.315 (8.00)  | 160±50gf           | ACETAL               | 100,000        |
| —                               | FSM12JAA            | 0.173 (4.40)  | 0.315 (8.00)  | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM12JAA            | 0.173 (4.40)  | 0.315 (8.00)  | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM12JL             | 0.173 (4.40)  | 0.315 (8.00)  | 100±50gf           | ACETAL               | 100,000        |
| 1-1437565-2                     | FSM14J              | 0.370 (9.40)  | 0.512 (13.00) | 160±50gf           | ACETAL               | 100,000        |
| —                               | FSM14JAA            | 0.370 (9.40)  | 0.512 (13.00) | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM14JAA            | 0.370 (9.40)  | 0.512 (13.00) | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM14JL             | 0.370 (9.40)  | 0.512 (13.00) | 100±50gf           | ACETAL               | 100,000        |
| 1-1437565-3                     | FSM16J              | 0.527 (13.40) | 0.669 (17.00) | 160±50gf           | ACETAL               | 100,000        |
| —                               | FSM16JAA            | 0.527 (13.40) | 0.669 (17.00) | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM16JAA            | 0.527 (13.40) | 0.669 (17.00) | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM16JL             | 0.527 (13.40) | 0.669 (17.00) | 100±50gf           | ACETAL               | 100,000        |
| 1-1437565-4                     | FSM18J              | 0.193 (4.90)  | 0.335 (8.51)  | 160±50gf           | ACETAL               | 100,000        |
| —                               | FSM18JAA            | 0.193 (4.90)  | 0.335 (8.51)  | 260±50gf           | ACETAL               | 100,000        |
| —                               | FSM18JAA            | 0.193 (4.90)  | 0.335 (8.51)  | 520±100gf          | ACETAL               | 100,000        |
| —                               | FSM18JL             | 0.193 (4.90)  | 0.335 (8.51)  | 100±50gf           | ACETAL               | 100,000        |

**Tactile Switches, .236 [6] x .236 [6], Radial Tape**

**MATERIAL SPECIFICATIONS:**

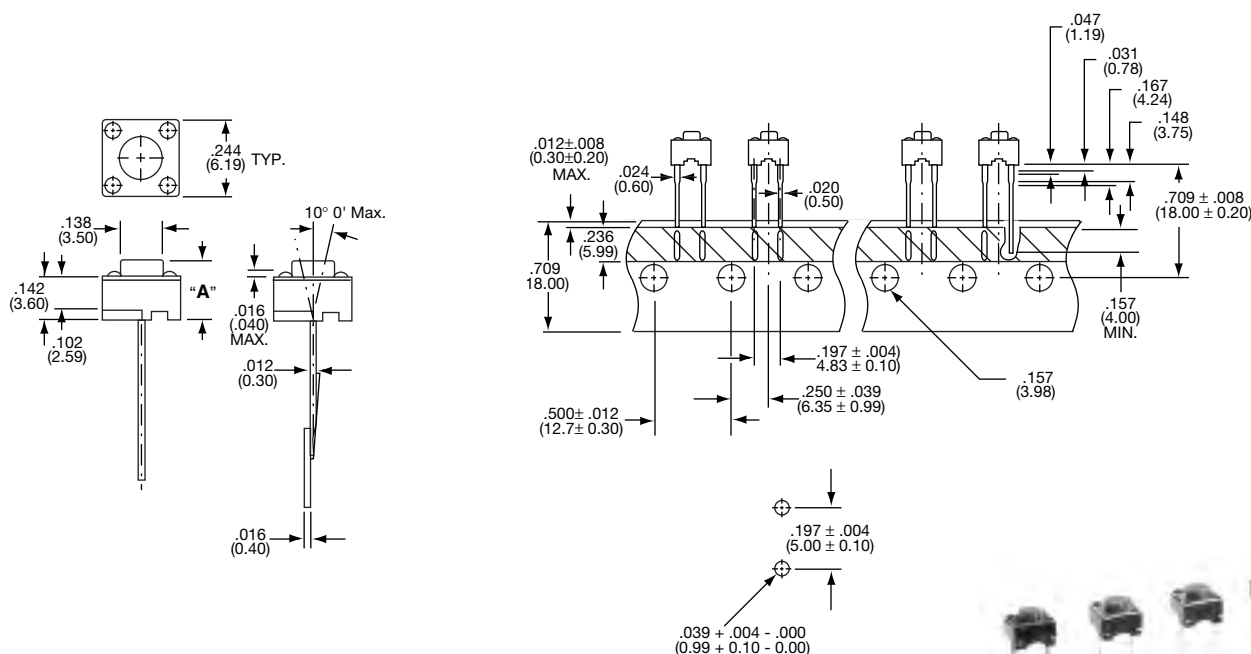
Contacts .....Copper alloy, silver clad plate  
Case.....Nylon  
Actuator Button .....PBT  
Cover.....Steel, tin plate  
Terminals .....Copper alloy, silver clad plate

**ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature..... -40°F to +221°F (-40°C to +105°C)  
Storage Temperature.....-40°F to +221°F (-40°C to +105°C)  
Solder Heat Resistance .....See Page M3-4

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50 mA @ 12 VDC  
Initial Contact Resistance .....100 Milliohms max.  
Insulation Resistance .....100 Megohms min. @ 100 VDC  
Dielectric Strength .....500 VAC for 1 minute  
Actuation Force .....See Below  
Actuator Travel......010" (.254)  
Life Expectancy .....Up to 100,000 Cycles



FSM4JRT

| Tyco Electronics | Alcoswitch | Dimension A | Actuation Force |
|------------------|------------|-------------|-----------------|
| 2-1437565-6      | FSM2JRT    | 4.3 (.169)  | 160 +/-50 gm    |
| 2-1437565-2      | FSM2JART   | 4.3 (.169)  | 260 +/-75 gm    |
| 4-1437565-0      | FSM4JRT    | 5.0 (.197)  | 160 +/-50 gm    |
| 147997-1         | FSM4JART   | 5.0 (.197)  | 260 +/-75 gm    |
| 4-1437565-8      | FSM6JRT    | 7.0 (.276)  | 160 +/-50 gm    |
| 1571402-1        | FSM6JART   | 7.0 (.276)  | 260 +/-75 gm    |
| 147694-1         | FSM8JRT    | 9.5 (.374)  | 160 +/-50 gm    |
| 147871-1         | FSM8JART   | 9.5 (.374)  | 260 +/-75 gm    |
| 1571010-1        | FSM14JRT   | 13.0 (.512) | 160 +/-50 gm    |



**Tactile Switches, .236 [6] x .236 [6], Right Angle**

**MATERIAL SPECIFICATIONS:**

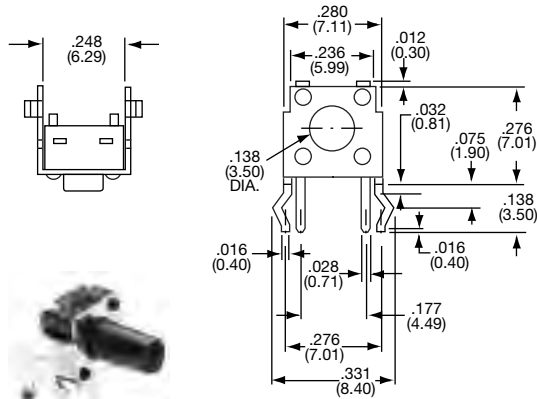
Contacts .....Copper alloy, silver clad plate  
Case.....PBT  
Actuator Button .....Nylon/acetel  
Frame .....Steel, tin plate  
Terminals .....Copper alloy, silver plate

**ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature.....-4°F to +185°F (-20°C to +85°C)  
Storage Temperature.....-22°F to +185°F (-30°C to +85°C)  
Solder Heat Resistance .....See Page M3-4

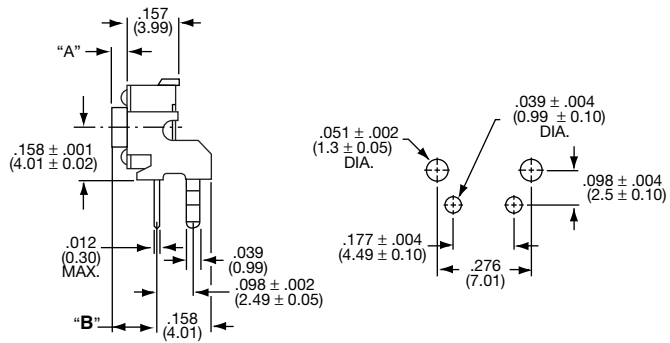
**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50 mA @ 12 VDC  
Initial Contact Resistance .....100 Milliohms max.  
Insulation Resistance .....100 Megohms min. @ 100 VDC  
Dielectric Strength .....500 VAC for 1 minute  
Actuation Force .....See Below  
Actuator Travel......012" (0,3)  
Life Expectancy .....Up to 100,000 Cycles  
Up to 50,000 Cycles 520 GF (AA option)



FSMRA7J

| Type | Off                                | On   |
|------|------------------------------------|------|
| SPST | Off                                | (On) |
|      | (On) indicates momentary position. |      |



| Tyco Electronics | Alcoswitch | Dim. A        | Dim B         |
|------------------|------------|---------------|---------------|
| 8-1437565-4      | FSMRA 1J   | .022" (0,55)  | .124" (3,15)  |
| 1571386-2        | FSMRA 1JL  | .022" (0,55)  | .124" (3,15)  |
| 8-1437565-5      | FSMRA 2J   | .049" (1,25)  | .152" (3,86)  |
| 1571386-1        | FSMRA 2JL  | .049" (1,25)  | .152" (3,86)  |
| 8-1437565-8      | FSMRA 2JA  | .049" (1,25)  | .152" (3,86)  |
| 8-1437565-9      | FSMRA 2JH  | .049" (1,25)  | .152" (3,86)  |
| 9-1437565-0      | FSMRA 3J   | .128" (3,25)  | .230" (5,84)  |
| 1571386-3        | FSMRA 3JL  | .128" (3,25)  | .230" (5,84)  |
| 9-1437565-1      | FSMRA 4J   | .226" (5,74)  | .329" (8,36)  |
| 1571819-1        | FSMRA 4JA  | .226" (5,74)  | .329" (8,36)  |
| 1571386-4        | FSMRA 4JL  | .226" (5,74)  | .329" (8,36)  |
| 9-1437565-2      | FSMRA 5J   | .140" (3,55)  | .242" (6,15)  |
| 1571386-5        | FSMRA 5JL  | .140" (3,55)  | .242" (6,15)  |
| 9-1437565-3      | FSMRA 6J   | .167" (4,25)  | .269" (6,85)  |
| 1571386-6        | FSMRA 6JL  | .167" (4,25)  | .269" (6,85)  |
| 9-1437565-5      | FSMRA 7J   | .364" (9,25)  | .467" (11,86) |
| 1571386-7        | FSMRA 7JL  | .364" (9,25)  | .467" (11,86) |
| 1571419-1        | FSMRA 8J   | .522" (13,26) | .624" (15,85) |
| 1571386-8        | FSMRA 8JL  | .522" (13,26) | .624" (15,85) |

**PART NUMBERING SEQUENCE**

| Model                   | Actuator Length       | Temperature                          | Actuation Force                                                                   |
|-------------------------|-----------------------|--------------------------------------|-----------------------------------------------------------------------------------|
| FSMRA                   | J                     |                                      |                                                                                   |
| ACTUATOR LENGTH DIM "A" | SWITCH HEIGHT DIM "B" | BLANK = STD. TEMP.<br>H = HIGH TEMP. | BLANK = 160 g (STD.)<br>A = 260 g (OPT.)<br>AA = 520 g (OPT.)<br>L = 100 g (OPT.) |
| .022" (0,56)            | .124" (3,15)          |                                      |                                                                                   |
| .049" (1,24)            | .152" (3,86)          |                                      |                                                                                   |
| .128" (3,25)            | .230" (5,84)          |                                      |                                                                                   |
| .226" (5,74)            | .329" (8,36)          |                                      |                                                                                   |
| .140" (3,55)            | .242" (6,15)          |                                      |                                                                                   |
| .167" (4,24)            | .269" (6,85)          |                                      |                                                                                   |
| .364" (9,24)            | .467" (11,86)         |                                      |                                                                                   |
| .522" (13,26)           | .624" (15,85)         |                                      |                                                                                   |

CONSULT FACTORY  
FOR OTHER OPTIONS

**Tactile Switches, .236 [6] x .236 [6], Square Button, Straight or Right Angle**

### MATERIAL SPECIFICATIONS:

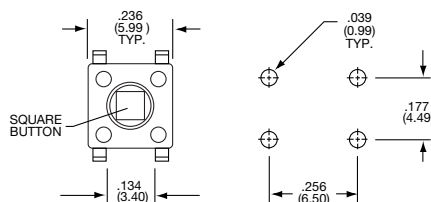
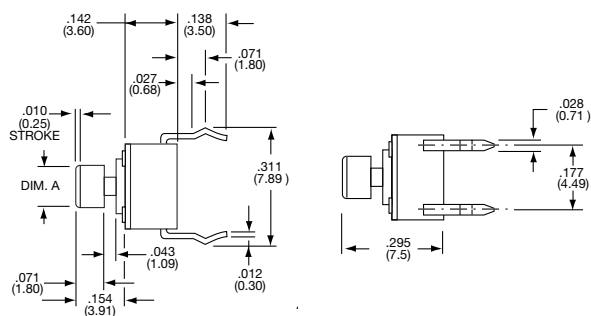
|                       |                                 |
|-----------------------|---------------------------------|
| Contacts .....        | Copper alloy, silver clad plate |
| Case.....             | Nylon                           |
| Actuator Button ..... | Polyacetal Resin                |
| Cover .....           | Pet film                        |
| Terminals .....       | Copper alloy, silver plate      |
| Frame (R/A) .....     | Steel, tin plate                |

### TYPICAL PERFORMANCE CHARACTERISTICS:

|                                  |                            |
|----------------------------------|----------------------------|
| Contact Rating .....             | 50 mA @ 12 VDC             |
| Initial Contact Resistance ..... | 100 Milliohms Max.         |
| Insulation Resistance .....      | 100 Megohms min. @ 100 VDC |
| Dielectric Strength .....        | 500 VAC for 1 minute       |
| Actuation Force .....            | 100 and 160 ±50 Grams      |
| Actuator Travel .....            | .010"(.254)                |
| Life Expectancy .....            | Up to 100,000 Cycles       |

## ENVIRONMENTAL SPECIFICATIONS

Operating Temperature..... -4°F to +185°F (-20°C to +85°C)  
Storage Temperature..... -22°F to +185°F (-30°C to +85°C)  
Solder Heat Resistance .....See Page M3-4



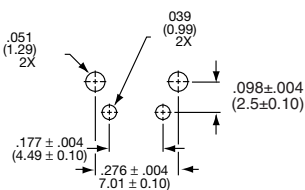
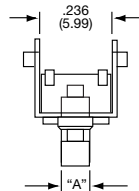
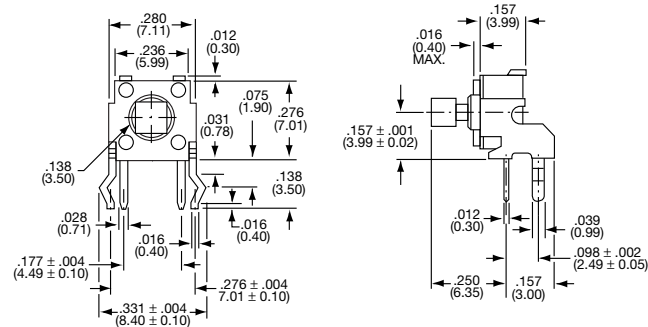
6 x 6 mm



FSMCDA

| Tyco Electronics | Alcoswitch | Dim. A      | Type |  |  | Force   |
|------------------|------------|-------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------|
| 7-1437565-8      | FSMCD      | .095 (2,42) | SPST | Off                                                                                 | (On)                                                                                | 100±50g |
| 7-1437565-9      | FSMCDA     | .110 (2,80) | SPST | Off                                                                                 | (On)                                                                                | 160±50g |

(On) indicates momentary position.



6 x 6 mm



FSMRACDA

| Tyco Electronics | Alcoswitch | Dim. A      | Force   |
|------------------|------------|-------------|---------|
| 9-1437565-9      | FSMRACD    | .095 (2,42) | 100±50g |
| 1437566-1        | FSMRACDA   | .110 (2,80) | 160±50g |

**Tactile Switches, .138 [3.5] x .236 [6], Surface Mount**

**MATERIAL SPECIFICATIONS:**

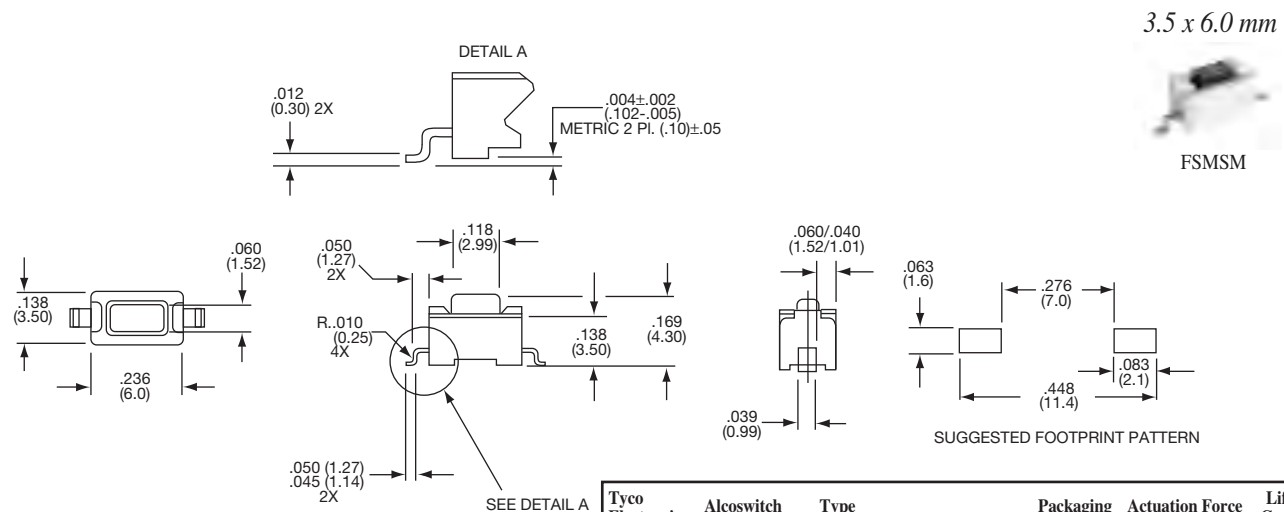
Contacts .....Stainless steel, silver clad plate  
Case Material .....FSMSM: PPS  
Actuator Material .....FSMSM: Nylon  
FSMJM: PPS  
Terminals .....Copper alloy, silver plate or tin plate  
Cover.....Stainless steel

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50 mA @ 12 VDC  
Initial Contact Resistance .....100 Milliohms max.  
Insulation Resistance .....100 Megohms min. @ 500 VDC  
Dielectric Strength .....500 VAC for 1 minute  
Actuator Travel......010"(.254)  
Life Expectancy .....20,000-40,000 Cycles

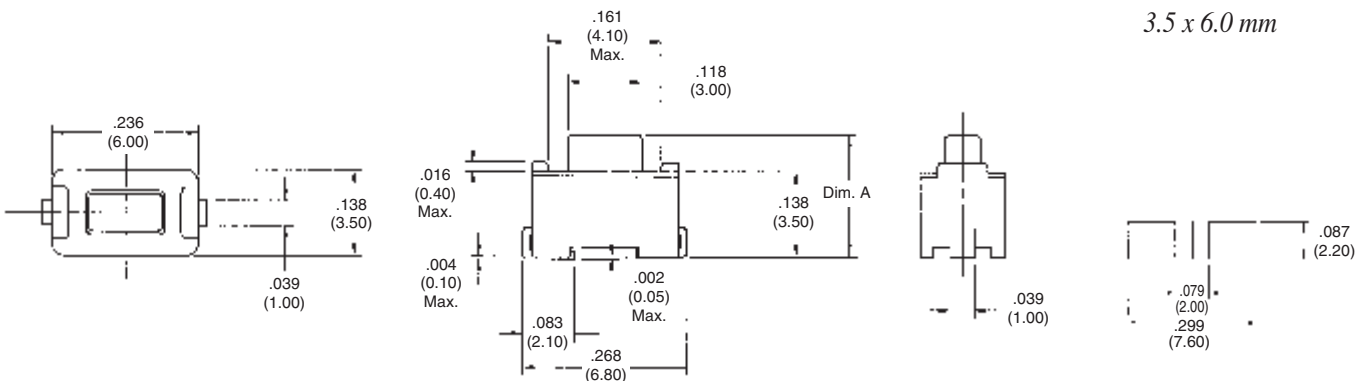
**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature.....-40°F to +185°F (-40°C to +85°C)  
Storage Temperature.....-40°F to +185°F (-40°C to +85°C)  
Solder Heat Resistance .....FSMSM IR Soldering EIA-364-56,  
Procedure 5 Level 1, 215° C  
FSMJM IR Soldering per EIA 364-56  
Procedure 5, level 2, 464°F (240°C)



| Tyco Electronics | Alcoswitch | Type          | Packaging | Actuation Force | Life Cycle |
|------------------|------------|---------------|-----------|-----------------|------------|
| 1437566-3        | FSMSM      | SPST Off (On) | Bulk      | 180±50          | 20,000     |
| 1437566-4        | FSMSMTR    |               | Reel      | 180±50          | 20,000     |

(On) indicates momentary position.



| Tyco Electronics | Alcoswitch  | Type | Dim. A      | Actuation Force | Packaging | Life Cycle |
|------------------|-------------|------|-------------|-----------------|-----------|------------|
| 147873-1         | FSMJM5.0ATR | SPST | .197 (5.00) | 180±50          | Reel      | 40,000     |
| 147873-2         | FSMJM4.3ATR | SPST | .169 (4.30) | 180±50          | Reel      | 40,000     |
| 147873-3         | FSMJM3.5ATR | SPST | .138 (3.50) | 180±50          | Reel      | 40,000     |
| 147942-1         | FSMJM4.3    | SPST | .169 (4.30) | 130±50          | Bulk      | 40,000     |
| 147942-2         | FSMJM4.3TR  | SPST | .169 (4.30) | 130±50          | Reel      | 40,000     |

**Tactile Switches, .236 [6] x .236 [6], Surface Mount**

**MATERIAL SPECIFICATIONS:**

Contacts .....Copper alloy, silver plate  
Case.....PPS  
Actuator Button .....PPS  
Cover.....Steel, tin plate  
Terminals .....Copper alloy, silver plate

**ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature.....-4°F to +185°F (-20°C to +85°C)  
Storage Temperature.....-22°F to +185°F (-30°C to +85°C)  
Solder Heat Resistance .....IR Soldering EIA-364-56  
Procedure 5 Level 3, 500°F (260°C)

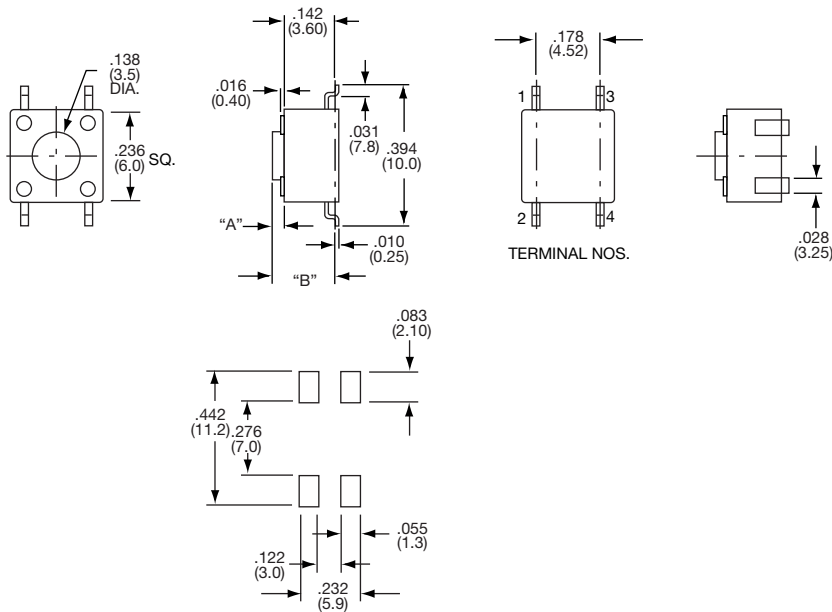
**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50 mA @ 12 VDC  
Initial Contact Resistance .....100 Milliohms max.  
Insulation Resistance .....100 Megohms min. @ 100 VDC  
Dielectric Strength .....500 VAC for 1 minute  
Actuation Force .....See Below  
Actuator Travel......010"(.254)  
Life Expectancy .....Up to 100,000 Cycles

6 x 6 mm



FSMJ SMA



| Bulk Pack Part Number |            | Tape & Reel Part Number |             | Actuator Length | Switch Height | Actuation Force |
|-----------------------|------------|-------------------------|-------------|-----------------|---------------|-----------------|
| Tyco Electronics      | Alcoswitch | Tyco Electronics        | Alcoswitch  | Dimension A     | Dimension B   |                 |
| 2-1437565-7           | FSM2JSMA   | 3-1437565-0             | FSM2JSMATR  | .028 (0.70)     | .169 (4.30)   | 160 ± 50 grams  |
| 4-1437565-1           | FSM4JSMA   | 4-1437565-2             | FSM4JSMATR  | .055 (1.40)     | .196 (5.00)   | 160 ± 50 grams  |
| 4-1437565-9           | FSM6JSMA   | 5-1437565-0             | FSM6JSMATR  | .134 (3.40)     | .276 (7.00)   | 160 ± 50 grams  |
| 2-1437565-8           | FSM2JSMAA  | 2-1437565-9             | FSM2JSMAATR | .028 (0.70)     | .169 (4.30)   | 260 ± 50 grams  |
| 1571563-1             | FSM4JSML   | 1571563-2               | FSM4JSMLTR  | .055 (1.40)     | .196 (5.00)   | 100 ± 50 grams  |
| 1571563-3             | FSM4JSMAA  | 1571563-4               | FSM4JSMAATR | .055 (1.40)     | .196 (5.00)   | 260 ± 50 grams  |
| —                     | FSM6JSMAA  | —                       | FSM6JSMAATR | .134 (3.40)     | .276 (7.00)   | 260 ± 50 grams  |
| 3-1437566-8           | FSM8JSMA   | —                       | FSM8JSMATR  | .232 (5.90)     | .374 (9.50)   | 260 ± 50 grams  |
| 1571527-1             | FSM2JSML   | 1571527-2               | FSM2JSMLTR  | .028 (0.70)     | .169 (4.30)   | 100 ± 50 grams  |

## Low Profile Series FSMCT Tactile Switches, .196 [5.0] x .196 [5.0], Surface Mount

### MATERIAL SPECIFICATIONS:

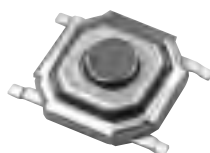
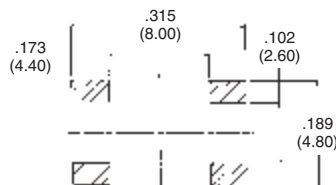
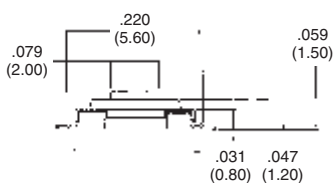
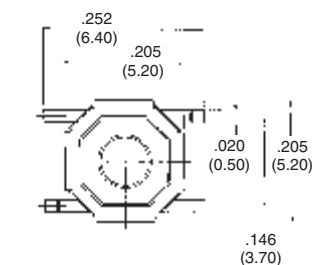
|                      |                                    |
|----------------------|------------------------------------|
| Cover .....          | Nickel Silver                      |
| Stem/Actuator .....  | Brass-"J" Lead                     |
|                      | Brass nickel plate-gullwing        |
| Contacts:            |                                    |
| Moving .....         | Stainless Steel, Silver Clad-Plate |
| Fixed/Terminal ..... | Copper Alloy, Silver-Plate         |
| Case .....           | Nylon, UL94V-0                     |

### TYPICAL PERFORMANCE CHARACTERISTICS:

|                                  |                                    |
|----------------------------------|------------------------------------|
| Contact Rating .....             | 20mA @ 15VDC                       |
| Initial Contact Resistance ..... | 100MilliOhms Max                   |
| Insulation Resistance .....      | 100Megaohms @ 100VDC Min.          |
| Dielectric Strength .....        | 500 VAC for 1 minute               |
| Actuation Travel .....           | 0.25 +0.1/-0.2                     |
| Life Expectancy .....            | Up to 500,000 and 1,000,000 Cycles |

### ENVIRONMENTAL SPECIFICATIONS:

|                                 |                                                                                                                   |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Operating Temperature .....     | -4 to +185°F (-20 to +85°C)                                                                                       |
| Storage Temperature .....       | -22 to +185°F (-30 to +85°C)                                                                                      |
| Resistance to solder heat ..... | Per EIA-364-56A, Procedure 4 & 5,<br>Level 3                                                                      |
| Solderability .....             | Per EIA-364-52, Class 2, Category 1,<br>Temp. 473°F (245°C) max., Time 2.5<br>seconds max., 95% minimum coverage. |



| Tyco Electronics | Alcoswitch | Type | Force  | Life Cycle |
|------------------|------------|------|--------|------------|
| 8-1437565-0      | FSMCTTR    | SPST | 160±50 | 1,000,000  |
| 8-1437565-1      | FSMCTATR   | SPST | 260±50 | 500,000    |

"J" lead option in development. Contact factory for additional information.

**Low Profile, 6 x 6 SMT J-Lead, Extended Life**

**MATERIAL SPECIFICATIONS:**

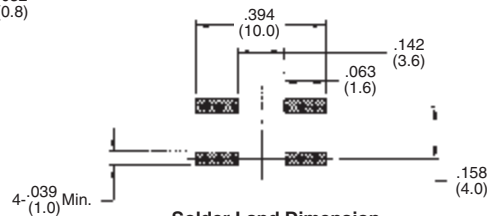
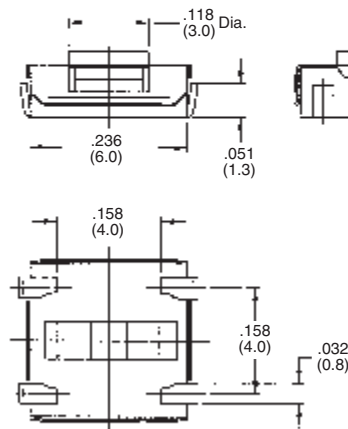
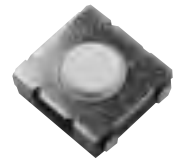
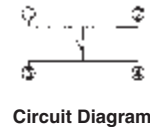
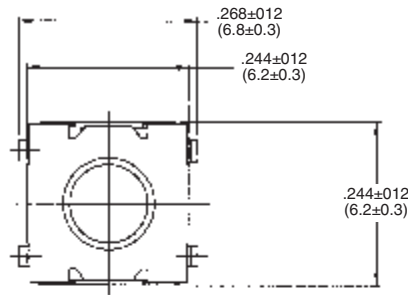
Cover .....Stainless Steel  
 Stem/Actuator .....Nylon UL94V-0  
 Contacts:  
     Moving .....Stainless Steel, Silver Clad-Plate  
     Fixed/Terminal .....Copper Alloy, Silver-Plate  
 Case .....Thermoplastic, UL94V-0, Black  
 Tape .....Teflon

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC for 1 minute  
 Actuation Travel .....0.008 +/-0.004 (.2 +/- .10)

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4 to +185°F (-20 to +85°C)  
 Storage Temperature .....-22 to +185°F (-30 to +85°C)  
 Resistance to solder heat .....Per EIA-364-56A, Procedure 4 & 5,  
     Level 3  
 Solderability .....Per EIA-364-52, Class 2, Category 1,  
     Temp 473°F (245°C), 95% minimum  
     coverage.



**Solder Land Dimension**

| Tyco Electronics | Dim L      | Force | Life      | Packaging |
|------------------|------------|-------|-----------|-----------|
| 1571625-1        | .098 (2.5) | 50gf  | 2,000,000 | Bulk      |
| 1571625-2        | .098 (2.5) | 50gf  | 2,000,000 | T&R       |
| 1571625-3        | .098 (2.5) | 100gf | 1,000,000 | Bulk      |
| 1571625-4        | .098 (2.5) | 100gf | 1,000,000 | T&R       |
| 1571625-5        | .098 (2.5) | 160gf | 1,000,000 | Bulk      |
| 1571625-6        | .098 (2.5) | 160gf | 1,000,000 | T&R       |
| 1571625-7        | .098 (2.5) | 260gf | 100,000   | Bulk      |
| 1571625-8        | .098 (2.5) | 260gf | 100,000   | T&R       |

## Low Profile, 6 x 6 SMT, Gull Wing, Extended Life

### MATERIAL SPECIFICATIONS:

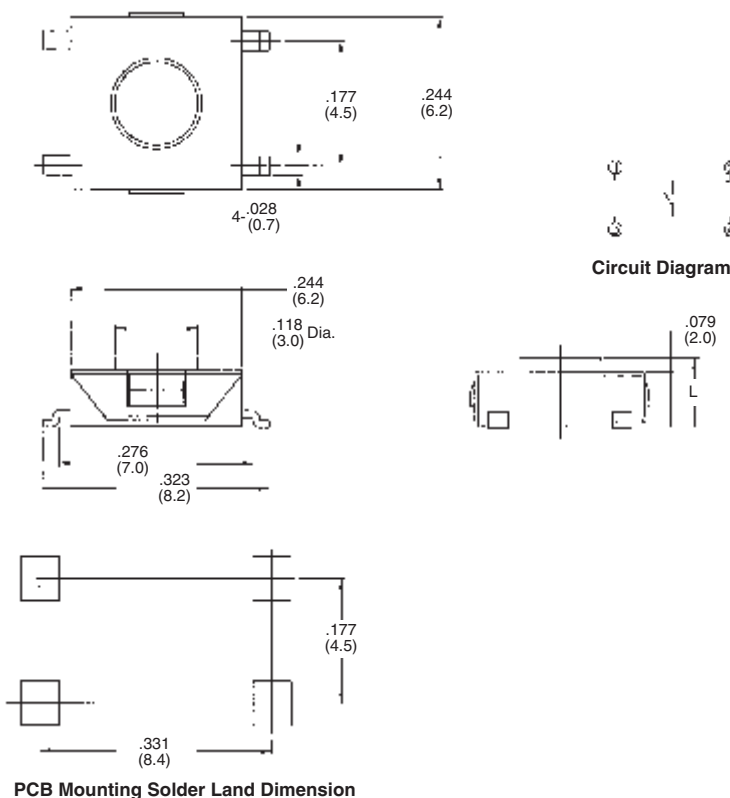
Cover .....Copper Alloy, Tin Lead Plate  
 Stem/Actuator .....Nylon UL94V-0  
 Contacts:  
   Moving .....Stainless Steel, Silver Clad-Plate  
   Fixed/Terminal .....Copper Alloy, Silver-Plate  
 Case .....Thermoplastic, UL94V-0, Black  
 Tape .....Teflon

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC for 1 minute  
 Actuation Travel .....0.010 +/-0.004 (.25 +/- .10)

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature .....-4 to +185°F (-20 to +85°C)  
 Storage Temperature .....-22 to +185°F (-30 to +85°C)  
 Resistance to solder heat .....Per EIA-364-56A, Procedure 4 & 5,  
   Level 3  
 Solderability .....Per EIA-364-52, Class 2, Category 1,  
   Temp 473°F (245°C) max., time 2.5  
   seconds max., 95% minimum coverage.



| Tyco Electronics | Dim L      | Force | Life      | Packaging |
|------------------|------------|-------|-----------|-----------|
| 1571626-1        | .098 (2.5) | 50gf  | 1,000,000 | Bulk      |
| 1571626-2        | .098 (2.5) | 50gf  | 1,000,000 | T&R       |
| 1571626-3        | .098 (2.5) | 100gf | 1,000,000 | Bulk      |
| 1571626-4        | .098 (2.5) | 100gf | 1,000,000 | T&R       |
| 1571626-5        | .098 (2.5) | 160gf | 1,000,000 | Bulk      |
| 1571626-6        | .098 (2.5) | 160gf | 1,000,000 | T&R       |
| 1571626-7        | .079 (2.0) | 160gf | 1,000,000 | Bulk      |
| 1571626-8        | .079 (2.0) | 160gf | 1,000,000 | T&R       |
| 1571626-9        | .098 (2.5) | 260gf | 100,000   | Bulk      |
| 1-1571626-0      | .098 (2.5) | 260gf | 100,000   | T&R       |



**Low Profile, 6 x 6 SMT, Gull Wing w/ESD Terminal, Extended Life**

**MATERIAL SPECIFICATIONS:**

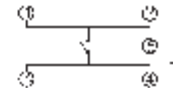
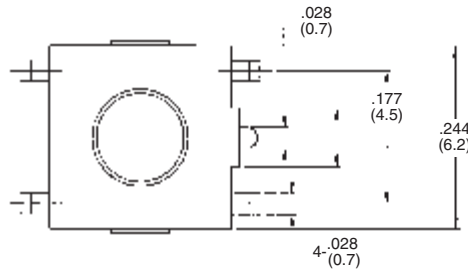
Cover .....Copper Alloy, Tin Lead Plate  
 Stem/Actuator .....Nylon UL94V-0  
 Contacts:  
     Moving .....Stainless Steel, Silver Clad-Plate  
     Fixed/Terminal .....Copper Alloy, Silver-Plate  
 Case .....Thermoplastic, UL94V-0, Black  
 Tape .....Teflon

**TYPICAL PERFORMANCE CHARACTERISTICS:**

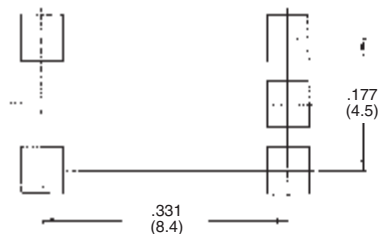
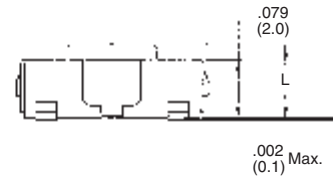
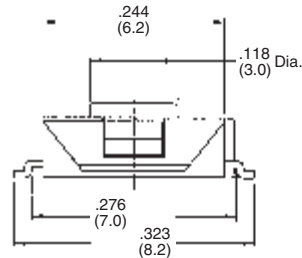
Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100V DC Min.  
 Dielectric Strength .....500 VAC for 1 minute  
 Actuation Travel .....0.010 +/- .004 (.25 +/- .10)

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4 to +185°F (-20 to +85°C)  
 Storage Temperature .....-22 to +185°F (-30 to +85°C)  
 Resistance to solder heat .....Per EIA-364-56A, Procedure 4 & 5,  
     Level 3  
 Solderability .....Per EIA-364-52, Class 2, Category 1,  
     Temp 473°F (245°C) max., time 2.5  
     seconds max., 95% minimum coverage.



**Circuit Diagram**



**PCB Mounting Solder Land Dimension**

| Tyco Electronics | Dim L      | Force | Life      | Packaging |
|------------------|------------|-------|-----------|-----------|
| 1571636-1        | .098 (2.5) | 50gf  | 1,000,000 | Bulk      |
| 1571636-2        | .098 (2.5) | 50gf  | 1,000,000 | T&R       |
| 1571636-3        | .098 (2.5) | 100gf | 1,000,000 | Bulk      |
| 1571636-4        | .098 (2.5) | 100gf | 1,000,000 | T&R       |
| 1571636-5        | .098 (2.5) | 160gf | 1,000,000 | Bulk      |
| 1571636-6        | .098 (2.5) | 160gf | 1,000,000 | T&R       |
| 1571636-7        | .079 (2.0) | 160gf | 1,000,000 | Bulk      |
| 1571636-8        | .079 (2.0) | 160gf | 1,000,000 | T&R       |
| 1571636-9        | .098 (2.5) | 260gf | 100,000   | Bulk      |
| 1-1571636-0      | .098 (2.5) | 260gf | 100,000   | T&R       |

**Tactile Switches, .236 [6] x .236 [6], Low Profile, Surface Mount**

**MATERIAL SPECIFICATIONS:**

Contacts .....Copper Alloy, silver clad plated  
Case Material .....PPS  
Stem .....PPS  
Cover.....Steel, tin-plate  
Terminals .....Copper alloy, silver plated

**ENVIRONMENTAL SPECIFICATIONS:**

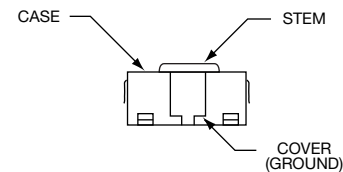
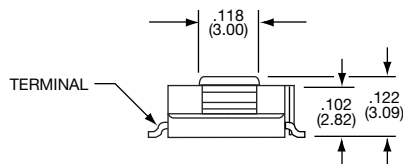
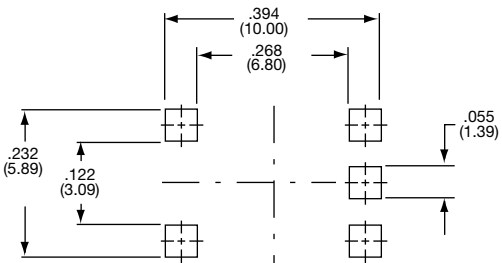
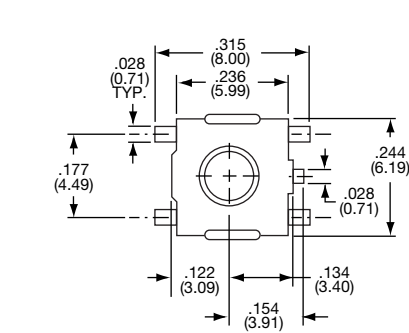
Operating Temperature.....-4°F to +185°F (-20°C to +85°C)  
Storage Temperature.....-22°F to +185°F (-30°C to +85°C)  
Solder Heat Resistance .....IR Soldering EIA-364-56  
Procedure 5 Level 2, 464°F (240°C)

**TYPICAL PERFORMANCE CHARACTERISTICS:**

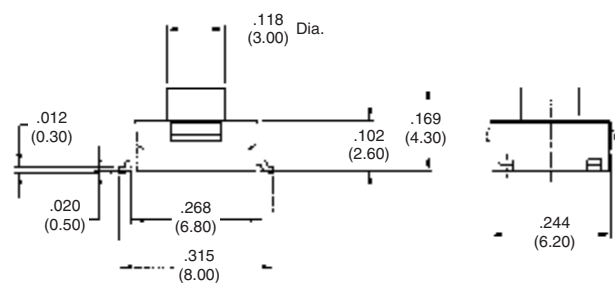
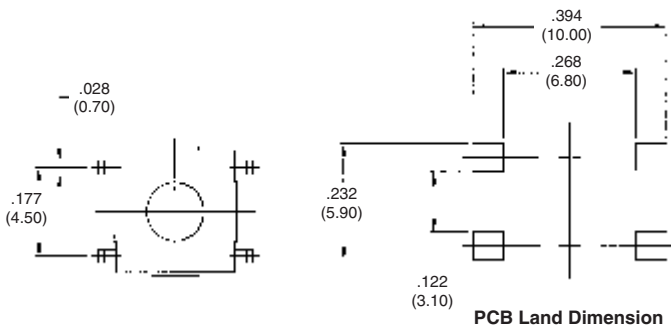
Contact Rating .....50mA @ 12 VDC  
Initial Contact Resistance .....100 Milliohms max.  
Insulation Resistance .....100 Megohms min. @ 100 VDC  
Dielectric Strength .....500 VAC, 1 minute  
Actuation Force .....See Below.  
Life Expectancy .....Up to 100,000 Cycles



FSM1LP



FSM4LP



PCB Land Dimension

| Tyco Electronics | Alcoswitch | Force | Actuator Packaging |
|------------------|------------|-------|--------------------|
| 1-1437565-6      | FSM1LP     | 160   | Bulk               |
| 1-1437565-7      | FSM1LPA    | 260   | Bulk               |
| 1-1437565-9      | FSM1LPTR   | 160   | Tape & Reel        |
| 1-1437565-8      | FSM1LPATR  | 260   | Tape & Reel        |
| 1571621-1        | FSM4LP     | 260   | Bulk               |
| 4-1437565-3      | FSM4LPTR   | 260   | Tape & Reel        |

**Tactile Switches, .472 [12] x .472 [12], Flush or Extended Actuators**

**MATERIAL SPECIFICATIONS:**

Contacts .....Copper alloy, silver clad plate  
Case.....PBT  
Actuator Button .....Polyacetal Resin  
Cover.....PET film  
Terminals .....Copper alloy, silver plate  
Frame (R/A) .....Nylon

**TYPICAL PERFORMANCE CHARACTERISTICS:**

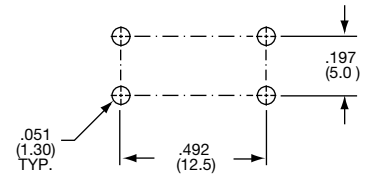
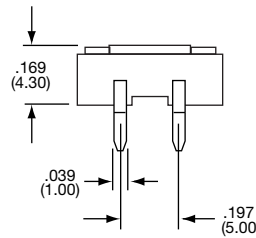
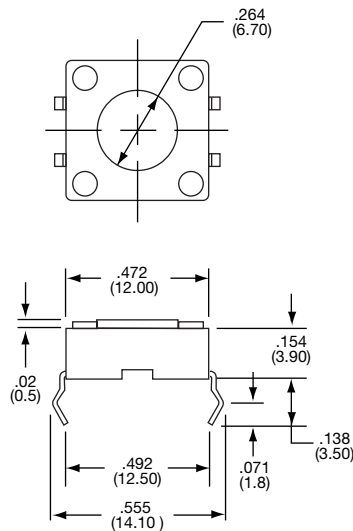
Contact Rating .....50 mA @ 12 VDC  
Initial Contact Resistance .....100 Milliohms max.  
Insulation Resistance .....100 Megohms min. @100 VDC  
Dielectric Strength .....500 VAC for 1 minute  
Actuation Force .....See below  
Actuator Travel.....0.012"(0.3)  
Life Expectancy .....Up to 100,000 cycles

**ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature.....4°F to +185°F (-20°C to +85°C)  
Storage Temperature.....-22°F to +185°F (-30°C to +85°C)  
Solder Heat Resistance .....See Page M3-4



FSM100

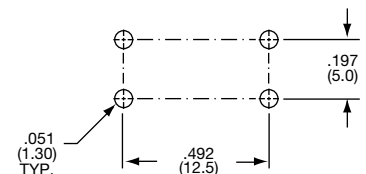
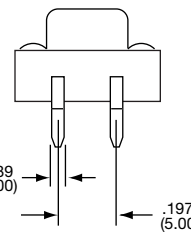
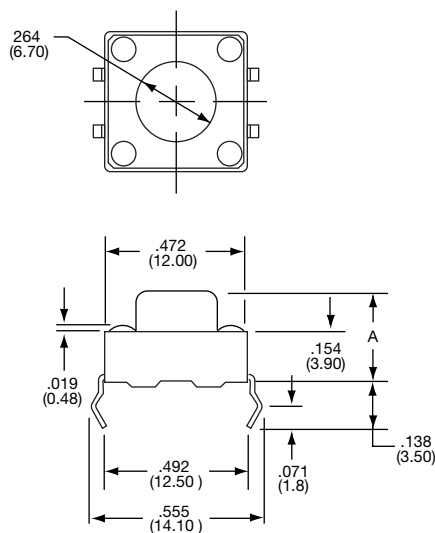


| Tyco Electronics | Alcoswitch | Type | Off | On   | Force    |
|------------------|------------|------|-----|------|----------|
| 1437565-2        | FSM100     | SPST | Off | (On) | 160±50gf |
| 1571139-1        | FSM100A    | SPST | Off | (On) | 260±50gf |

(On) indicates momentary position.



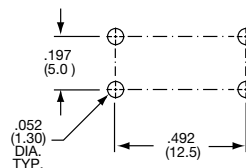
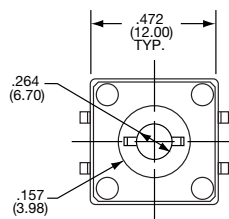
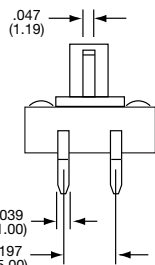
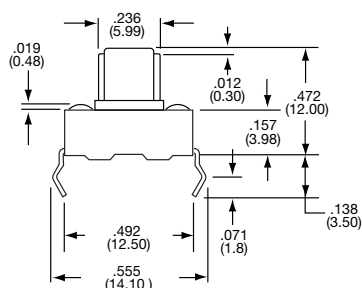
FSM101



| Tyco Electronics | Alcoswitch | Type | Off | On   | Force    | Dim A        |
|------------------|------------|------|-----|------|----------|--------------|
| 1437565-3        | FSM101     | SPST | Off | (On) | 160±50gf | .295 [7.5mm] |
| 1571140-1        | FSM201A    | SPST | Off | (On) | 260±50gf | .335 [8.5mm] |

(On) indicates momentary position.

**Tactile Switches, .472 [12] x .472 [12], Vertical or Right Angle**



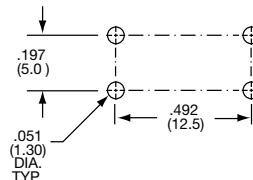
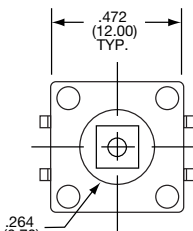
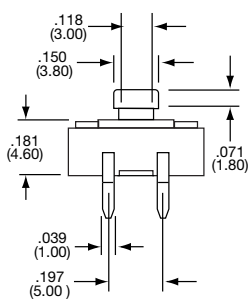
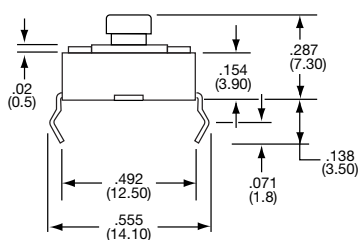
FSM102

| Tyco Electronics | Alcoswitch | Type |     |      | Force    |
|------------------|------------|------|-----|------|----------|
| 1437565-4        | FSM102     | SPST | Off | (On) | 160±50gf |
| 1571061-1        | FSM102A    | SPST | Off | (On) | 260±50gf |

(On) indicates momentary position.

E

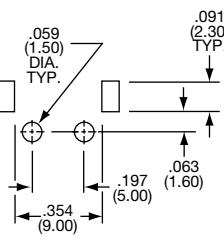
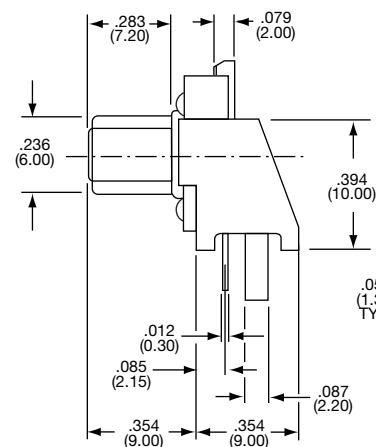
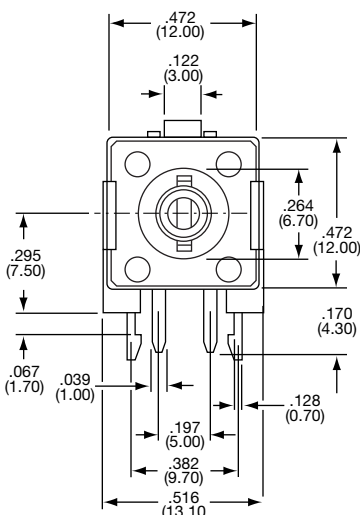
FSM100-104 Series



FSM103

| Tyco Electronics | Alcoswitch | Type |     |      | Force    |
|------------------|------------|------|-----|------|----------|
| 1437565-5        | FSM103     | SPST | Off | (On) | 160±50gf |

(On) indicates momentary position.



| Tyco Electronics | Alcoswitch | Type |     |      | Force    |
|------------------|------------|------|-----|------|----------|
| 1437565-6        | FSM104     | SPST | Off | (On) | 160±50gf |

(On) indicates momentary position.

**Tactile Switches, Sealed .472 [12] x .472 [12], Surface Mount, Projected Actuator**

**MATERIAL SPECIFICATIONS:**

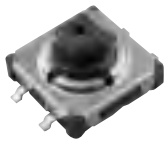
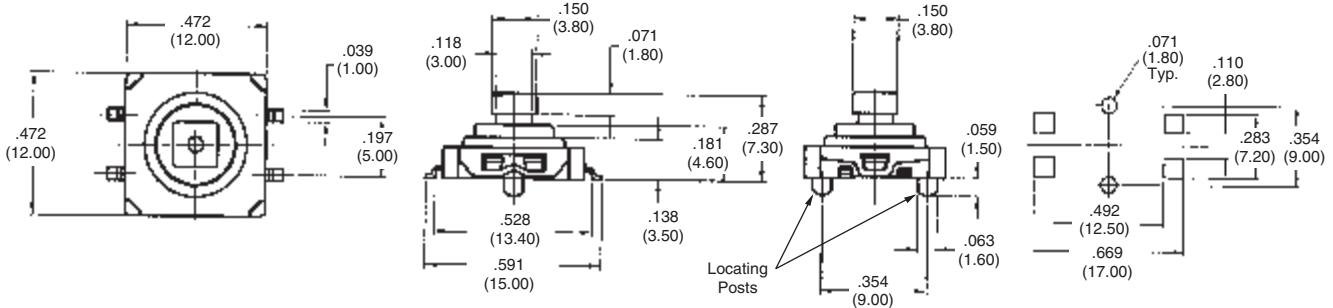
Case .....Thermoplastic, UL94V-0, Black  
 Stem/Actuator .....Thermoplastic, UL94V-0, Black  
 Cover .....Stainless Steel  
 Seal .....Silicone Rubber, Black  
 Contact.....Stainless Steel, Plating—Silver  
 Terminal .....Copper Alloy, Plating—Silver/Nickel

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC  
 Actuation Travel .....0.014 +/- .008 (.35 +/- .20)  
 Life .....Up to 1,000,000 Cycles

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4 to +185°F (-20 to +70°C)  
 Storage Temperature .....-4 to +185°F (-20 to +70°C)  
 Resistance to solder heat .....Per EIA-364-56, Procedure 4 & 5, Level 3  
 Solderability .....Per EIA RS-186-9E  
 Seal .....Per IP67



| Tyco Electronics | Locating Post | Packaging | Actuator Height | Force    |
|------------------|---------------|-----------|-----------------|----------|
| 1571217-1        | No            | Bulk      | .287 (7.30)     | 160±70gf |
| 1571217-2        | Yes           | Bulk      | .287 (7.30)     | 160±70gf |
| 1571217-3        | No            | T&R       | .287 (7.30)     | 160±70gf |
| 1571217-4        | Yes           | T&R       | .287 (7.30)     | 160±70gf |

**Tactile Switches, Sealed .472 [12] x .472 [12], Surface Mount, Flush, Actuator**

**MATERIAL SPECIFICATIONS:**

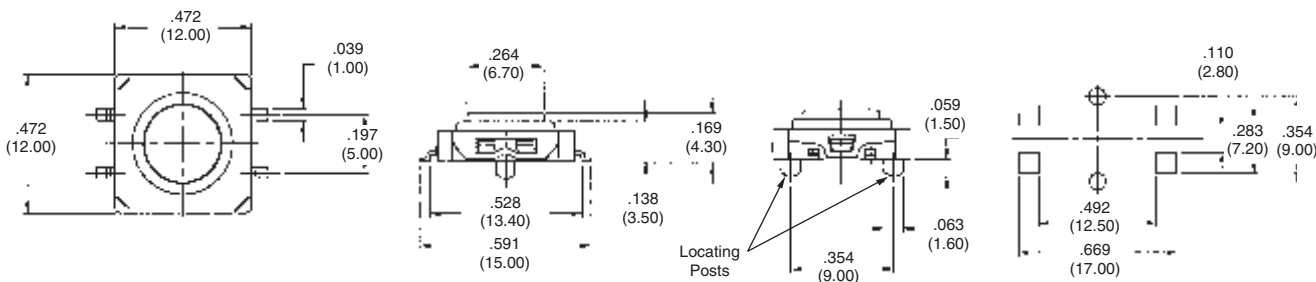
Case .....Thermoplastic, UL94V-0, Black  
 Stem/Actuator .....Thermoplastic, UL94V-0, Black  
 Cover .....Stainless Steel  
 Seal .....Silicone Rubber, Black  
 Contact.....Stainless Steel, Plating—Silver  
 Terminal .....Copper Alloy, Plating—Silver/Nickel

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC  
 Actuation Travel .....0.014 +/- .008 (.35 +/- .20)  
 Life .....Up to 1,000,000 Cycles

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4 to +185°F (-20 to +85°C)  
 Storage Temperature .....-4 to +185°F (-20 to +85°C)  
 Resistance to solder heat .....Per EIA-364-56, Procedure 4 & 5, Level 3  
 Solderability .....Per EIA RS-186-9E  
 Seal .....Per IP67



| Tyco Electronics | Locating Post | Packaging | Actuator Height | Force    |
|------------------|---------------|-----------|-----------------|----------|
| 1571218-1        | No            | Bulk      | .169 (4.30)     | 160±70gf |
| 1571218-2        | Yes           | Bulk      | .169 (4.30)     | 160±70gf |
| 1571218-3        | No            | T&R       | .169 (4.30)     | 160±70gf |
| 1571218-4        | Yes           | T&R       | .169 (4.30)     | 160±70gf |

**Tactile Switches, Sealed .472 [12] x .472 [12], Thru-Hole, Projected Actuator**

**MATERIAL SPECIFICATIONS:**

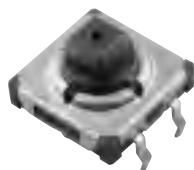
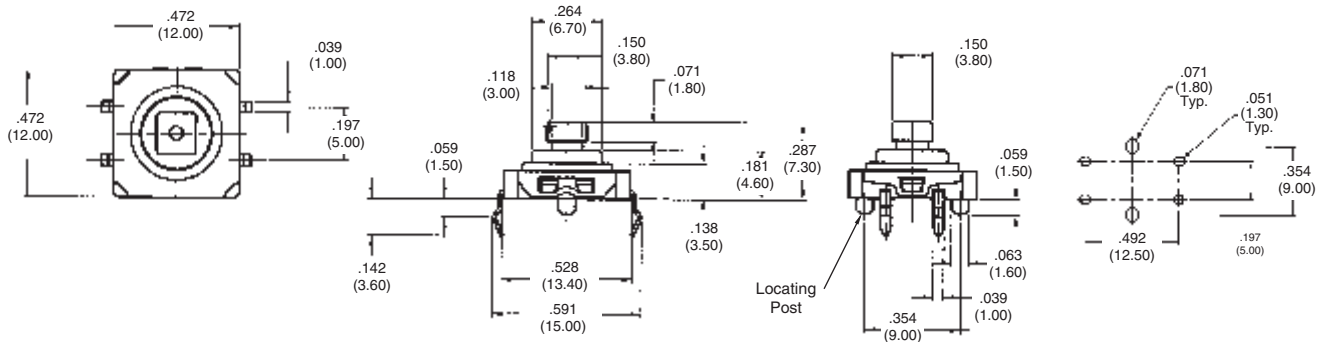
Case .....Thermoplastic, UL94V-0, Black  
 Stem/Actuator .....Thermoplastic, UL94V-0, Black  
 Cover .....Stainless Steel  
 Seal .....Silicone Rubber, Black  
 Contact.....Stainless Steel, Plating—Silver  
 Terminal .....Copper Alloy, Plating—Silver/Nickel

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC  
 Actuation Travel .....0.014 +/- .008 (.35 +/- .20)  
 Life .....1,000,000 Cycles

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4 to +185°F (-20 to +85°C)  
 Storage Temperature .....-4 to +185°F (-20 to +85°C)  
 Resistance to solder heat .....Per EIA-364-56, Procedure 3, Test Cond. B  
 Solderability .....Per EIA RS-186-9E  
 Seal .....Per IP67



| Tyco Electronics | Locating Post | Packaging | Actuator Height | Force    |
|------------------|---------------|-----------|-----------------|----------|
| 1571219-1        | No            | Bulk      | .287 (7.30)     | 160±70gf |
| 1571219-2        | Yes           | Bulk      | .287 (7.30)     | 160±70gf |



**Tactile Switches, Sealed .472 [12] x .472 [12], Thru-Hole, Flush Actuator**

**MATERIAL SPECIFICATIONS:**

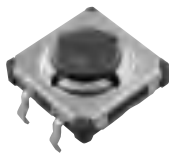
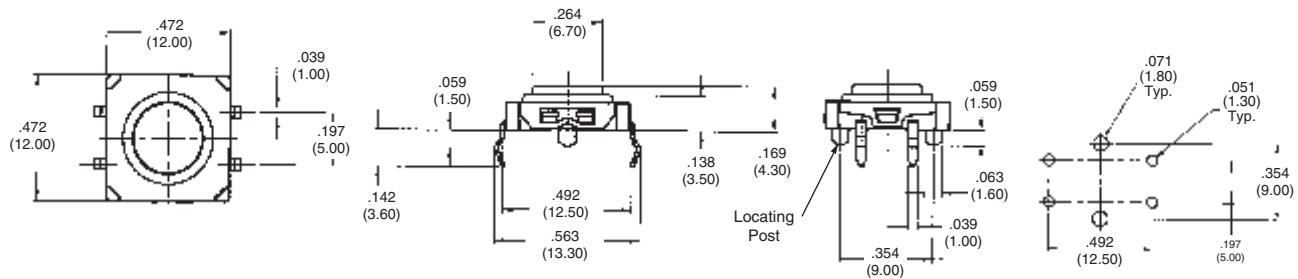
Case .....Thermoplastic, UL94V-0, Black  
 Stem/Actuator .....Thermoplastic, UL94V-0, Black  
 Cover .....Stainless Steel  
 Seal .....Silicone Rubber, Black  
 Contact.....Stainless Steel, Plating—Silver  
 Terminal .....Copper Alloy, Plating—Silver/Nickel

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC  
 Actuation Travel .....0.014 +/- .008 (.35 +/- .20)  
 Life .....1,000,000 Cycles

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4 to +185°F (-20 to +85°C)  
 Storage Temperature .....-4 to +185°F (-20 to +85°C)  
 Resistance to solder heat .....Per EIA-364-56, Procedure 3, Test Cond. B  
 Solderability .....Per EIA RS-186-9E  
 Seal .....Per IP67



| Tyco Electronics | Locating Post | Packaging | Actuator Height | Force    |
|------------------|---------------|-----------|-----------------|----------|
| 1571220-1        | No            | Bulk      | .169 (4.30)     | 160±70gf |
| 1571220-2        | Yes           | Bulk      | .169 (4.30)     | 160±70gf |

**Tactile Switches, Sealed .299 [7.6] x .287 [7.3], Surface Mount, Extended Actuator**

**MATERIAL SPECIFICATIONS:**

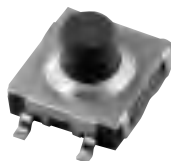
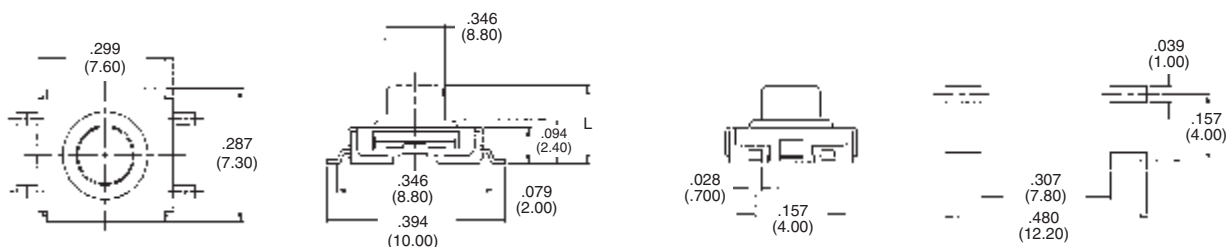
Case .....Thermoplastic, UL94V-0, Black  
 Stem/Actuator .....Thermoplastic, UL94V-0, Black  
 Cover .....Stainless Steel  
 Seal .....Silicone Rubber, Black  
 Contact.....Stainless Steel, Plating—Silver  
 Terminal .....Copper Alloy, Plating—Silver

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC  
 Actuation Travel .....0.014 +/- .008 (.35 +/- .20)  
 Life .....Up to 1,000,000 Cycles

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4 to +185°F (-20 to +85°C)  
 Storage Temperature .....-4 to +185°F (-20 to +85°C)  
 Resistance to solder heat .....Per EIA-364-56, Procedure 4 & 5, Level 3  
 Solderability .....Per EIA RS-186-9E  
 Seal .....Per IP67



| Tyco Electronics | Packaging | L           | Force    |
|------------------|-----------|-------------|----------|
| 1571294-1        | Bulk      | .169 (4.30) | 160±50gf |
| 1571294-2        | T&R       | .169 (4.30) | 160±50gf |
| 1571294-3        | Bulk      | .197 (5.00) | 160±50gf |
| 1571294-4        | T&R       | .197 (5.00) | 160±50gf |

**Tactile Switches, Sealed .299 [7.6] x .287 [7.3], Surface Mount, Flush Actuator**

**MATERIAL SPECIFICATIONS:**

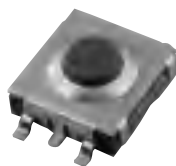
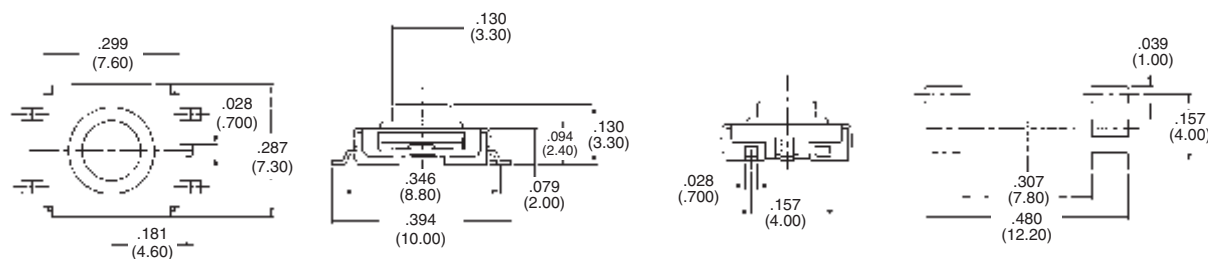
Case .....Thermoplastic, UL94V-0, Black  
 Stem/Actuator .....Thermoplastic, UL94V-0, Black  
 Cover .....Stainless Steel  
 Seal .....Silicone Rubber, Black  
 Contact.....Stainless Steel, Plating—Silver  
 Terminal .....Copper Alloy, Plating—Silver/Nickel

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC  
 Actuation Travel .....0.014 +/- .008 (.35 +/- .20)  
 Life .....Up to 1,000,000 Cycles

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4 to +185°F (-20 to +85°C)  
 Storage Temperature .....-4 to +185°F (-20 to +85°C)  
 Resistance to solder heat .....Per EIA-364-56, Procedure 4 & 5, Level 3  
 Solderability .....Per EIA RS-186-9E  
 Seal .....Per IP67



| Tyco Electronics | Packaging | Actuator Height | Force    |
|------------------|-----------|-----------------|----------|
| 1571296-1        | Bulk      | .130 (3.30)     | 160±50gf |
| 1571296-2        | T&R       | .130 (3.30)     | 160±50gf |

**Tactile Switches, Sealed .299 [7.6] x .287 [7.3], Thru-Hole, Extended Actuator**

**MATERIAL SPECIFICATIONS:**

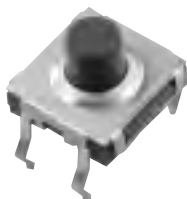
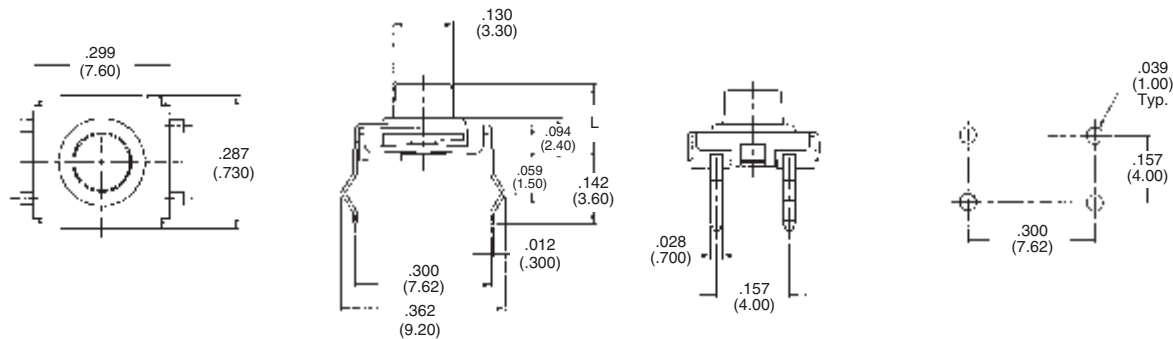
Case .....Thermoplastic, UL94V-0, Black  
 Actuator .....Thermoplastic, UL94V-0, Black  
 Cover .....Stainless Steel  
 Seal .....Silicone Rubber, Black  
 Contact.....Stainless Steel, Plating—Silver  
 Terminal .....Copper Alloy, Plating—Silver/Nickel

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC  
 Actuation Travel .....0.014 +/-0.008 (.35 +/- .20)  
 Life .....Up to 1,000,000 Cycles

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4 to +185°F (-20 to +85°C)  
 Storage Temperature .....-4 to +185°F (-20 to +85°C)  
 Resistance to solder heat .....Per EIA-364-56, Procedure 3, Test Cond.B  
 Solderability .....Per EIA RS-186-9E  
 Seal .....Per IP67



| Tyco Electronics | Packaging | L           | Force    |
|------------------|-----------|-------------|----------|
| 1571295-1        | Bulk      | .169 (4.30) | 160±50gf |
| 1571295-2        | Bulk      | .197 (5.00) | 160±50gf |

**Tactile Switches, Sealed .185 [4.7] x .268 [6.8], Surface Mount**

**MATERIAL SPECIFICATIONS:**

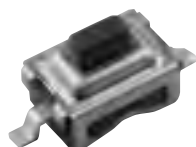
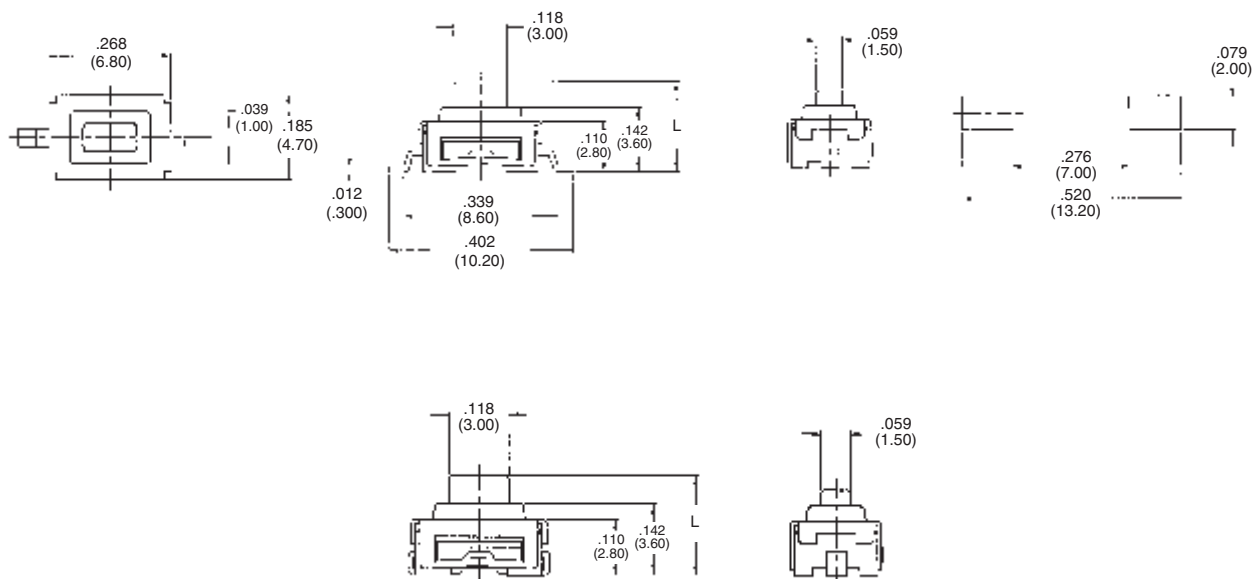
Case .....Thermoplastic, UL94V-0, Black  
 Stem/Actuator .....Thermoplastic, UL94V-0, Black  
 Cover .....Stainless Steel  
 Seal .....Silicone Rubber, Black  
 Contact.....Stainless Steel, Plating—Silver  
 Terminal .....Copper Alloy, Plating—Silver/Nickel

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC  
 Actuation Travel .....0.014 +/-0.008 (.35 +/- .20)  
 Life .....Up to 50,000 Cycles

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4 to +185°F (-20 to +85°C)  
 Storage Temperature .....-4 to +185°F (-20 to +85°C)  
 Resistance to solder heat .....Per EIA-364-56, Procedure 4 & 5, Level 3  
 Solderability .....Per EIA RS-186-9E  
 Seal .....Per IP67



| Tyco Electronics | Packaging | L           | Operating Force | Lead Style |
|------------------|-----------|-------------|-----------------|------------|
| 1571298-1        | Bulk      | .197 (5.00) | 130 ± 50gf      | Gull Wing  |
| 1571298-2        | T&R       | .197 (5.00) | 130 ± 50gf      | Gull Wing  |
| 1571299-1        | Bulk      | .169 (4.30) | 130 ± 50gf      | J Lead     |
| 1571299-2        | T&R       | .169 (4.30) | 130 ± 50gf      | J Lead     |
| 1571299-3        | Bulk      | .197 (5.00) | 130 ± 50gf      | J Lead     |
| 1571299-4        | T&R       | .197 (5.00) | 130 ± 50gf      | J Lead     |

**Tactile Switches, Sealed .185 [4.7] x .268 [6.8], Thru-Hole**

**MATERIAL SPECIFICATIONS:**

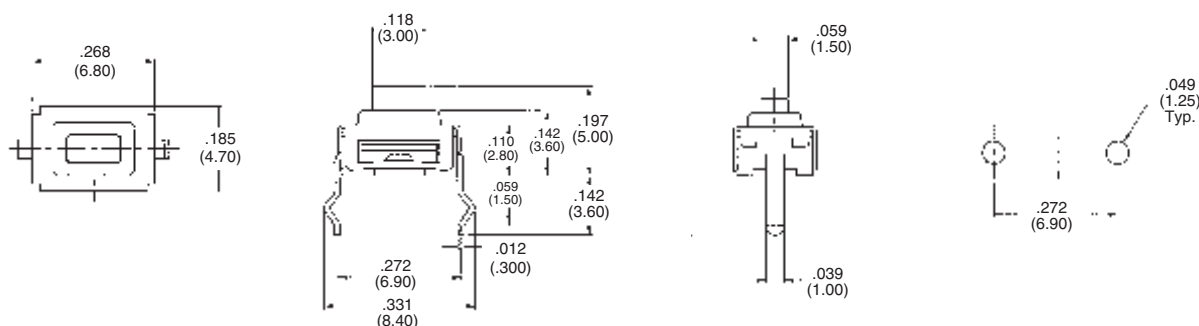
Case .....Thermoplastic, UL94V-0, Black  
 Stem/Actuator .....Thermoplastic, UL94V-0, Black  
 Cover .....Stainless Steel  
 Seal .....Silicone Rubber, Black  
 Contact.....Stainless Steel, Plating—Silver  
 Terminal .....Copper Alloy, Plating—Silver/Nickel

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC  
 Actuation Travel .....0.014 +/- .008 (.35 +/- .20)  
 Life .....Up to 50,000 Cycles

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4 to +185°F (-20 to +85°C)  
 Storage Temperature .....-4 to +185°F (-20 to +85°C)  
 Resistance to solder heat .....Per EIA-364-56, Procedure 3, Test Cond. B  
 Solderability .....Per EIA RS-186-9E  
 Seal .....Per IP67



| Tyco Electronics | Packaging | Actuator Height | Operating Force |
|------------------|-----------|-----------------|-----------------|
| 1571297-1        | Bulk      | .197 (5.00)     | 130 ± 50gf      |

## Tactile Switches, Sealed Right Angle, Surface Mount

### MATERIAL SPECIFICATIONS:

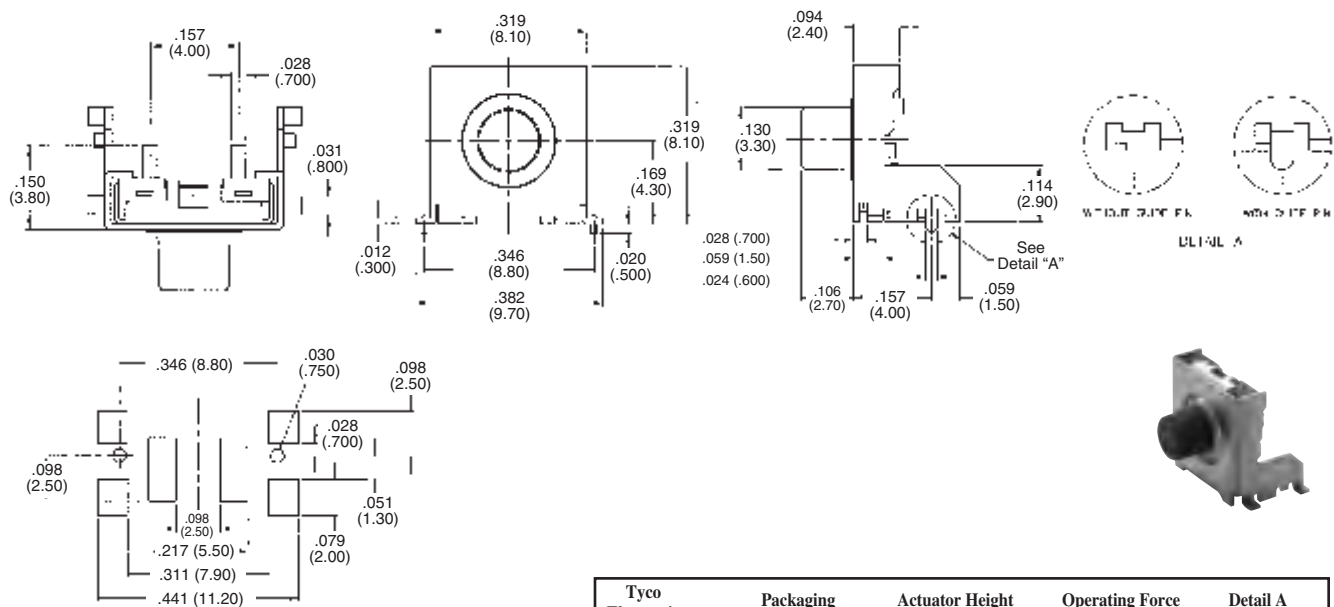
Case .....Thermoplastic, UL94V-0, Black  
 Stem/Actuator .....Thermoplastic, UL94V-0, Black  
 Cover .....Stainless Steel  
 Seal .....Silicone Rubber, Black  
 Contact.....Stainless Steel, Plating—Silver  
 Terminal .....Copper Alloy, Plating—Silver/Nickel

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC  
 Actuation Travel .....0.014 +/-0.008 (.35 +/- .20)  
 Life .....Up to 1,000,000 Cycles

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature .....-4° to +185°F (-20°to +85°C)  
 Storage Temperature .....-4° to +185°F (-20°to +85°C)  
 Resistance to solder heat .....Per EIA-364-56, Procedure 4 & 5, Level 3  
 Solderability .....Per EIA RS-186-9E  
 Seal .....Per IP67



| Tyco Electronics | Packaging | Actuator Height | Operating Force | Detail A    |
|------------------|-----------|-----------------|-----------------|-------------|
| 1571300-1        | Bulk      | .106 (2.70)     | 130 ± 50gf      | Without Pin |
| 1571300-2        | Bulk      | .106 (2.70)     | 130 ± 50gf      | With Pin    |



## Tactile Switches, Sealed Right Angle, Surface Mount

### MATERIAL SPECIFICATIONS:

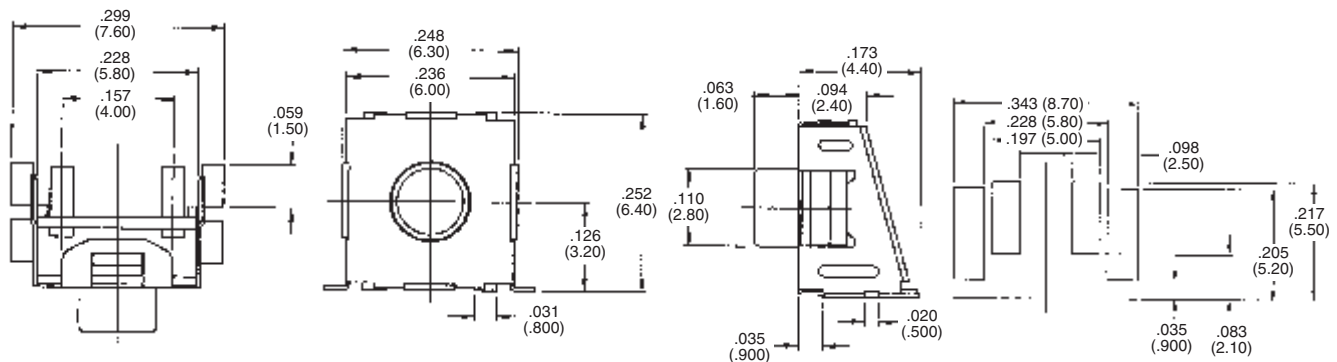
Case .....Thermoplastic, UL94V-0, Black  
 Stem/Actuator .....Thermoplastic, UL94V-0, Black  
 Cover .....Stainless Steel  
 Seal .....Silicone Rubber, Black  
 Contact.....Stainless Steel, Plating—Silver  
 Terminal .....Copper Alloy, Plating—Silver

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....50mA @ 12 V DC  
 Initial Contact Resistance .....100MilliOhms Max  
 Insulation Resistance .....100Megaohms @ 100VDC Min.  
 Dielectric Strength .....500 VAC  
 Actuation Travel .....0.014 +/- .008 (.35 +/- .20)  
 Life .....Up to 1,000,000 Cycles

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature .....-4° to +185°F (-20°to +85°C)  
 Storage Temperature .....-4° to +185°F (-20°to +85°C)  
 Resistance to solder heat .....Per EIA-364-56, Procedure 4 & 5, Level 3  
 Solderability .....Per EIA RS-186-9E  
 Seal .....Per IP67



| Tyco Electronics | Packaging | Actuator Height | Operating Force |
|------------------|-----------|-----------------|-----------------|
| 1571407-1        | Bulk      | .063 (1.60)     | 260 ± 100gf     |
| 1571407-2        | T&R       | .063 (1.60)     | 260 ± 100gf     |

**Tactile Switches, Side Actuated, Surface Mount**

**MATERIAL SPECIFICATIONS:**

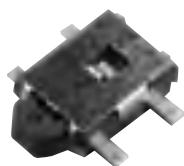
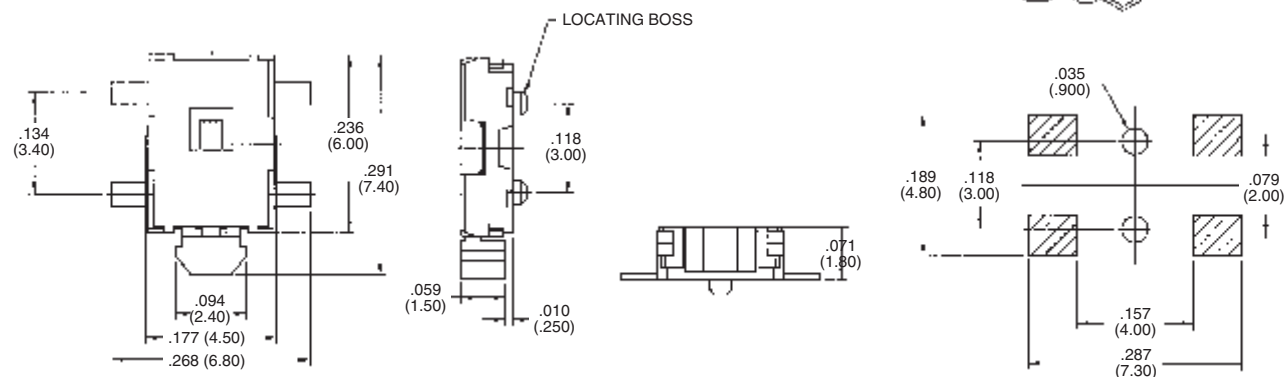
|                     |                                                   |
|---------------------|---------------------------------------------------|
| Case .....          | Nylon 4/6, UL94V-0, Black                         |
| Stem/Actuator ..... | Nylon 4/6, UL94V-0, Black                         |
| Cover .....         | Stainless Steel                                   |
| Contact Plate ..... | Stainless Steel, Silver Clad Over<br>Nickel Plate |
| Terminal .....      | Copper Alloy, Silver Over Nickel Plate            |
| Masking Tape .....  | Teflon                                            |

**TYPICAL PERFORMANCE CHARACTERISTICS:**

|                                  |                           |
|----------------------------------|---------------------------|
| Contact Rating .....             | 50mA @ 12 V DC            |
| Initial Contact Resistance ..... | 100MilliOhms Max          |
| Insulation Resistance .....      | 100Megaohms @ 100VDC Min. |
| Dielectric Strength .....        | 500 VAC for 1 minute      |
| Force .....                      | 160 (+70/-40gm)           |
| Travel .....                     | 30 (+.1/- .2mm)           |
| Life .....                       | Up to 100,000 Cycles      |

**ENVIRONMENTAL SPECIFICATIONS:**

|                                 |                                                                                                             |
|---------------------------------|-------------------------------------------------------------------------------------------------------------|
| Operating Temperature .....     | -4° to +185°F (-20°to +85°C)                                                                                |
| Storage Temperature .....       | -22° to +185°F (-30°to +85°C)                                                                               |
| Resistance to Solder Heat ..... | Per EIA-364-56A, procedure 4 and 5,<br>Level 3                                                              |
| Solderability .....             | Per EIA-364-52, Class 2, Category 1,<br>Temp. 473°F (245°C) max., time 2.5 sec.<br>max., 95% min. coverage. |



| Tyco Electronics | Feature   | Packaging |
|------------------|-----------|-----------|
| 1571262-1        | W/O Boss  | Bulk      |
| 1571262-2        | W/O Boss  | T&R       |
| 1571262-3        | with Boss | Bulk      |
| 1571262-4        | with Boss | T&R       |

### Multi-Directional Actuation

### MATERIAL SPECIFICATIONS:

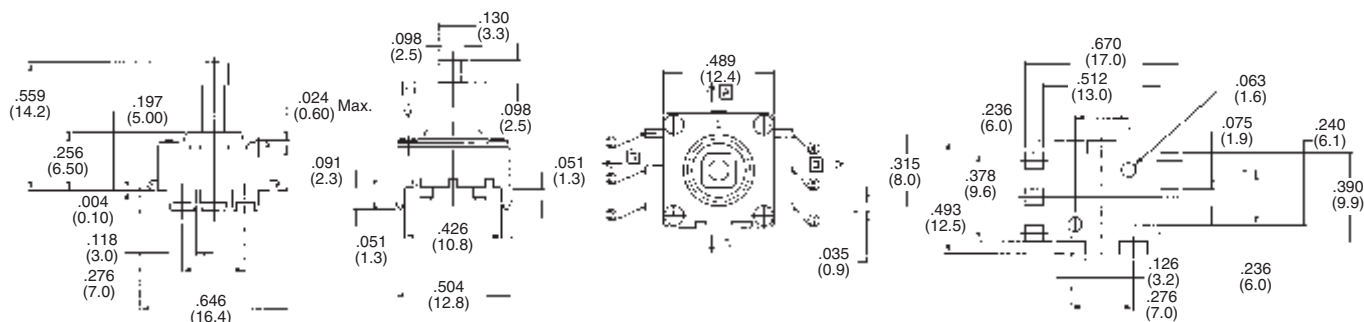
|                               |                                         |
|-------------------------------|-----------------------------------------|
| Contact .....                 | Copper alloy - silver clad/nickel       |
| Case Material .....           | Nylon - UL 94-HB, Black                 |
| Actuator Material .....       | Nylon - UL 94-HB, Black                 |
| Terminals/Fixed Contact ..... | Copper alloy - plate silver clad/nickel |

## ENVIRONMENTAL SPECIFICATIONS

|                             |                                                                                        |
|-----------------------------|----------------------------------------------------------------------------------------|
| Operating Temperature ..... | -13° to 158°F (-25° to +70°C)                                                          |
| Storage Temperature .....   | -40° to 185°F (-40° to +85°C)                                                          |
| Solder Heat Resistance..... | Per EIA-364-56A, Procedure 4 and 5, Level 3                                            |
| Solderability .....         | Per EIA-364-52, Class 2 Cat. 1, temp. 255° max., time 5 seconds max. 95% min. coverage |

## TYPICAL PERFORMANCE CHARACTERISTICS

|                                 |                                                                             |
|---------------------------------|-----------------------------------------------------------------------------|
| Contact Rating .....            | 20mA @15VDC                                                                 |
| Initial Contact Resistance..... | 100 Milliohms max.                                                          |
| Insulation Resistance .....     | 100 Megohm min.                                                             |
| Dielectric Strength .....       | 100 VAC for 1 min.                                                          |
| Life Expectancy .....           | Up to 50,000 Cycles                                                         |
| Actuation Force .....           | 500±150 gf (center push),<br>200±100 gf (4-directional)                     |
| Actuation Travel.....           | 0.039 (1.0) ±0.012 (.3) (4-directional),<br>0.315 (8.0) ±2° (4-directional) |



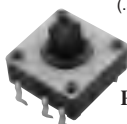
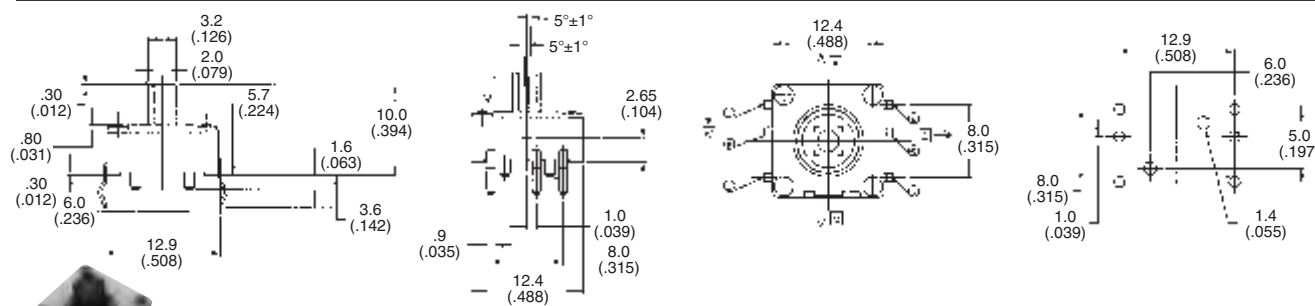
| Tyco Electronics | Dimension L |
|------------------|-------------|
| 1571514-1        | .559 (14.2) |
| 1571514-2        | .480 (12.2) |
| 1571514-3        | .413 (10.5) |

### MATERIAL SPECIFICATIONS:

|                                |                                                                                              |
|--------------------------------|----------------------------------------------------------------------------------------------|
| Contacts.....                  | Stainless steel, plate silver<br>clad/nickel                                                 |
| Case Material .....            | Nylon - UL 94-HB, Black                                                                      |
| Actuator Material .....        | PBT, UL 94-HB                                                                                |
| Terminals/Fixed Contacts ..... | Copper alloy - plate silver/nickel                                                           |
| Environmental Specifications   |                                                                                              |
| Operating Temperature .....    | -13° to 158°F (-25° to +70°C)                                                                |
| Storage Temperature .....      | -40° to 185°F (-40° to +85°C)                                                                |
| Solder Heat Resistance .....   | Per EIA-364-56A, Procedure 3,<br>Condition B                                                 |
| Solderability .....            | Per EIA-364-52, Class 2 Cat. 1,<br>temp. 255° max., time 5 seconds<br>max. 95% min. coverage |

## TYPICAL PERFORMANCE CHARACTERISTICS

|                                  |                                                                          |
|----------------------------------|--------------------------------------------------------------------------|
| Contact Rating .....             | 20mA @15VDC                                                              |
| Initial Contact Resistance ..... | 100 Milliohms max.                                                       |
| Insulation Resistance .....      | 100 Megohm min.                                                          |
| Dielectric Strength .....        | 100 VAC for 1 min.                                                       |
| Life Expectancy .....            | Up to 50,000 Cycles                                                      |
| Actuation Force .....            | 350±100 gf (center push),<br>200±70/-50 gf (4-directional)               |
| Actuation Travel.....            | 0.010 (.25) ±.008 (.2) (center push),<br>0.197 (5.0) ±1° (4-directional) |



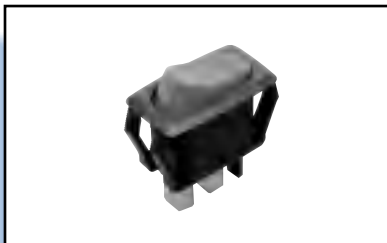
Part Number 1571515-1



*TRD Series - Page F3*



*Gemini Series - Page F7*



*Power Rocker Switches - Page F21*

# Rocker/Paddle

F

Rocker/Paddle Switches

## Rocker/Paddle Switches Part Number Index

|                |        |                  |     |                   |     |
|----------------|--------|------------------|-----|-------------------|-----|
| A101J15ZQ00    | F7     | A205J51ZQ00      | F7  | PRBSD3-16F-BW000  | F23 |
| A101J16WQ00    | F7     | A205J61ZQ00      | F7  | PRDDA1-16F-BB000  | F24 |
| A101J16Z3G00UL | F7     | A207J1ZQ00       | F7  | PRDDA1-16F-BB0BW  | F24 |
| A101J16Z3Q00UL | F7     | A207J3ZQ00       | F7  | PRDDA1-16F-BB0CW  | F24 |
| A101J16ZB00    | F7     | A207J51ZQ00      | F7  | PRDDA1-16F-BB0HW  | F24 |
| A101J16ZQ00    | F7     | A207J61ZQ00      | F7  | PRDDA1-16F-BR000  | F24 |
| A101J1AB0      | F7     | A208J16C000UL    | F7  | PRDDA1-16F-BR0HW  | F24 |
| A101J1AQ0      | F14    | A208J1V3Q00      | F7  | PRDDDB1-16F-BA000 | F24 |
| A101J1AQ2      | F7     | A208J51ZQ00      | F7  | PRDDDB1-16F-BR000 | F24 |
| A101J1AV2B0    | F7     | A208J61ZQ00      | F7  | PRDDDB1-16F-BR000 | F24 |
| A101J1AV2Q0    | F13    | A211J51ZQ00      | F7  | PRDDDB1-16F-BR000 | F24 |
| A101J1CQ0      | F7     | A213J61ZQ00      | F7  | PRDDDB1-16F-BR000 | F24 |
| A101J1CQ0      | F13    | AE101J1AB0       | F17 | PRDDDB1-16F-BR000 | F24 |
| A101J1V3B0     | F7     | AE101J1AG0UL     | F17 | PRDDDB1-16F-BR000 | F24 |
| A101J1V3Q0     | F7     | AE101J1AQ0       | F17 | PRDDDB1-16F-BR000 | F24 |
| A101J1ZB0      | F7     | AE101J1AQ4UL     | F17 | PRDDDB1-16F-BR000 | F24 |
| A101J1ZQ0      | F14    | AE101J1AV2G0     | F17 | PRDDDB1-16F-BR000 | F24 |
| A101J2AQ0      | F15    | AE101J1AV2Q0     | F17 | TRD1D1D1(*WL)     | F6  |
| A101J2AV2Q0    | F16    | AE101J1V3B0      | F17 | TRD1D1D10PC       | F3  |
| A101J2ZB9      | F7     | AE101J1V3Q0      | F17 | TRD1D1D10PCLR25   | F3  |
| A101J2ZQ0      | F15    | AE103J1V3Q0      | F17 | TRD1D1D10QC       | F3  |
| A101J3V3Q2     | F7     | AE103J2CB0       | F17 | TRD1D1D10QCSLR5   | F3  |
| A101J3ZQ0UL    | F7     | AE103J50V3B0     | F17 | TRD1D1D10QCL2     | F3  |
| A101J4ZQ0      | F7     | AE103J60V3Q02    | F17 | TRD1D1D10QCL5     | F3  |
| A101J50AV2Q0   | F7     | AE105J1AQ0       | F17 | TRD1D1D10QCLR2    | F3  |
| A101J50V3Q0    | F7     | AE105J1V3B0      | F17 | TRD1D1D10WL       | F6  |
| A101J50V3Q2    | F7     | AE105J1V3Q0      | F17 | TRD1D1D10WLLR     | F6  |
| A101J50ZQ0     | F7     | AE105J1ZB0       | F17 | TRD1D1D10WLLR5    | F6  |
| A101J51CB00    | F7     | AE105J60V3B0     | F17 | TRD1D1D12WL       | F3  |
| A101J51Z3G00UL | F7     | AE107J1AQ0       | F17 | TRD1D1E1(*WL)     | F6  |
| A101J51Z3Q00   | F7     | AE107J1ZQ0       | F17 | TRD1D1E10WL       | F6  |
| A101J51Z3Q00UL | F7     | AE108J1CQ0       | F17 | TRD1D1E10WLLR     | F6  |
| A101J51ZB0     | F7     | AE108J1ZQ0       | F17 | TRD1D1E10WLLR25   | F6  |
| A101J51ZQ00    | F7     | AE108J60V3B0     | F17 | TRD1D1E1(*WL)     | F6  |
| A101J51ZQ20    | F7     | AE201J1AQ0       | F17 | TRD1D1F10QC       | F3  |
| A101J61ZQ00    | F7     | AE201J1AV2G0UL   | F17 | TRD1D1F10QCL2     | F3  |
| A103J16ZQ00    | F7     | AE201J1AV2Q0     | F17 | TRD1D1F10QCLR2    | F3  |
| A103J1AQ0      | F7     | AE201J1V3B0      | F17 | TRD1D1F10WL       | F6  |
| A103J1AV2B0    | F7     | AE201J1V3Q0      | F17 | TRD1D1F10WLLR     | F6  |
| A103J1AV2Q0    | F7     | AE201J2AQ2       | F17 | TRD1D1F20QC       | F3  |
| A103J1V3Q0     | F7     | AE203J1AQ0       | F17 | TRD1D1G100C5      | F3  |
| A103J1ZQ0      | F14    | AE205J50V3B0     | F17 | TRD1D1G10WL       | F3  |
| A103J2AQ0      | F15    | AE205J60V3B0     | F17 | TRD1D1G20QC       | F3  |
| A103J2CB0      | F7     | AE208J50V3B0     | F17 | TRD1D1D1(*WL)     | F6  |
| A103J2ZQ0      | F15    | PRADA1-07F-BB000 | F22 | TRD1D1D10QC       | F3  |
| A103J3ZQ0      | F7     | PRADA1-07F-BB0BW | F22 | TRD1D1D10QCL5     | F3  |
| A103J51ZQ00    | F7     | PRADA1-07F-BB0CW | F22 | TRD1D1D10QCLR2    | F3  |
| A103J61ZQ00    | F7     | PRADA1-07F-BB0BW | F22 | TRD1D1D10QCLR25   | F3  |
| A105J16CQ00    | F7     | PRADD1-07F-BB000 | F22 | TRD1D1D10QCLR5    | F3  |
| A105J16ZQ00    | F7     | PRADD1-07F-BB0DW | F22 | TRD1D1D10WL       | F6  |
| A105J1AQ0      | F14    | PRADD1-07F-BB0EW | F22 | TRD1D1D10WLL2     | F3  |
| A105J1AV2Q0    | F7,F13 | PRADD2-07F-BB000 | F22 | TRD1D1D10WLLR     | F6  |
| A105J1CQ0      | F13    | PRADD2-07F-BB0DW | F22 | TRD1D1D10WLLR2    | F6  |
| A105J1V3B0     | F7     | PRADD2-07F-BB0EW | F22 | TRD1D1D10WLLR25   | F6  |
| A105J1ZQ0      | F14    | PRADD3-07F-BB000 | F22 | TRD1D1D10WLLR4    | F3  |
| A105J2AQ0      | F15    | PRADD3-07F-BB0FW | F22 | TRD1D1D10WLLR5    | F3  |
| A105J2AV2Q0    | F16    | PRADD3-07F-BB0GW | F22 | TRD1D1D10WLUL     | F3  |
| A105J2CQ0      | F16    | PRADD4-07F-BB000 | F22 | TRD1D1D12QC       | F3  |
| A105J2ZQ0      | F15    | PRADD4-07F-BB0FW | F22 | TRD1D1D12QC5      | F3  |
| A105J3CQ0      | F7     | PRADD4-07F-BB0GW | F22 | TRD1D1D12QCLR25   | F3  |
| A105J3CQ20     | F7     | PRASA1-16F-BB000 | F22 | TRD1D1D12WL       | F3  |
| A105J3ZQ0      | F7     | PRASA1-16F-BB0BW | F22 | TRD1D1D12WL5LR2   | F3  |
| A105J4ZQ0      | F7     | PRASA1-16F-BB0CW | F22 | TRD1D1E1(*WL)     | F6  |
| A105J51ZQ00    | F7     | PRASA1-16F-BB0HW | F22 | TRD1D1E10QC       | F3  |
| A105J52ZQ20    | F7     | PRASA1-16F-BR000 | F22 | TRD1D1E10WL       | F6  |
| A105J61ZG00    | F7     | PRASA1-16L-BB000 | F22 | TRD1D1E10WL5      | F6  |
| A105J61ZQ00    | F7     | PRASA1-16L-BB0BW | F22 | TRD1D1E10WLLR     | F6  |
| A107J51ZQ00    | F7     | PRASA1-16L-BB0CW | F22 | TRD1D1E10WLLR2    | F6  |
| A107J61ZQ00    | F7     | PRASA1-16L-BR000 | F22 | TRD1D1F1(*WL)     | F6  |
| A108J1V3Q0     | F7     | PRASA2-16F-BB0BW | F22 | TRD1D1F10QC       | F3  |
| A108J1ZQ0      | F7     | PRASA3-16F-BB000 | F22 | TRD1D1F10QCLR2    | F3  |
| A108J51ZQ00    | F7     | PRASB1-16F-BB000 | F22 | TRD1D1F10WL       | F6  |
| A108J61ZQ00    | F7     | PRASB2-16F-BB000 | F22 | TRD1D1F10WLLR     | F6  |
| A201J16ZQ00    | F7     | PRASC1-16F-BB000 | F22 | TRD1D1F12QC       | F3  |
| A201J1AQ0      | F14    | PRASD1-16F-BB000 | F22 | TRD1D1F12WL       | F3  |
| A201J1AQ2      | F7     | PRASD1-16F-BB0DW | F22 | TRD1D1G10QC       | F3  |
| A201J1AV2Q0    | F7,F13 | PRASD1-16F-BB0EW | F22 | TRD1D1G10WL       | F3  |
| A201J1CQ0      | F13    | PRASD2-16F-BB000 | F22 | TRD1D1G10WLLR2    | F3  |
| A201J1V3Q0     | F7     | PRASD2-16F-BB0DW | F22 | TRD1D1G20QC       | F3  |
| A201J1ZQ0      | F14    | PRASD2-16F-BB0EW | F22 | TRD1D1G20WL       | F3  |
| A201J2AQ0      | F15    | PRASD3-16F-BB000 | F22 | TRD2IN1(*WL)      | F6  |
| A201J2AV2Q0    | F16    | PRASD3-16F-BB0FW | F22 | TRD2IN10QC        | F3  |
| A201J2CQ0      | F16    | PRASD3-16F-BB0GW | F22 | TRD2IN10WL        | F6  |
| A201J2ZQ0      | F15    | PRASD4-16F-BB000 | F22 | TRD2IN10WLL2      | F3  |
| A201J3V3Q0     | F7     | PRASD4-16F-BB0FW | F22 | TRD2IN12QCL2      | F3  |
| A201J3ZB0      | F7     | PRASD4-16F-BB0GW | F22 | TRD2IN12WL        | F3  |
| A201J3ZQ0      | F7     | PRBSA1-16F-BB000 | F23 | TRD2IP1(*WL)      | F6  |
| A201J50AQ0     | F7     | PRBSA1-16F-BB0BW | F23 | TRD2IP10WL        | F6  |
| A201J50AV2Q0   | F7     | PRBSA1-16F-BB0CW | F23 | TRD2IP10WLL25     | F3  |
| A201J50ZQ0     | F7     | PRBSA1-16F-BB0HW | F23 | TRD2IP12WL        | F3  |
| A201J51ZQ00    | F7     | PRBSA1-16F-BR000 | F23 | TRD2N1(*WL)       | F6  |
| A201J51ZQ00UL  | F7     | PRBSA1-16F-BR0HW | F23 | TRD2N10QC         | F3  |
| A201J51ZQ09    | F7     | PRBSA1-16F-BW000 | F23 | TRD2N10WL         | F6  |
| A201J61ZQ00    | F7     | PRBSA1-16F-BW0HB | F23 | TRD2N10WLL5       | F3  |
| A203J1AQ0      | F14    | PRBSA1-16L-BB000 | F23 | TRD2N12QC         | F3  |
| A203J1AV2Q0    | F7     | PRBSA1-16L-BB0BW | F23 | TRD2N12QCL5       | F3  |
| A203J1CQ0      | F13    | PRBSA1-16L-BB0CW | F23 | TRD2N12WL         | F3  |
| A203J1CQ2      | F7     | PRBSA1-16L-BR000 | F23 | TRD2N20QC         | F3  |
| A203J1ZQ0      | F14    | PRBSB1-16F-BA000 | F23 | TRD2N20WL         | F3  |
| A203J2AQ0      | F7,F15 | PRBSB1-16F-BC000 | F23 | TRD2N20WLL2       | F3  |
| A203J2ZQ0      | F15    | PRBSB1-16F-BR000 | F23 | TRD2N20WLL5       | F3  |
| A203J51ZQ00    | F7     | PRBSB1-16F-BR0BW | F23 | TRD2N22WL         | F3  |
| A203J61ZQ00    | F7     | PRBSC1-16F-BB000 | F23 | TRD2N3P1(*WL)     | F6  |
| A205J15ZQ00    | F7     | PRBSC1-16L-BB000 | F23 | TRD2N3P10QC       | F3  |
| A205J1AQ0      | F14    | PRBSD1-16F-BB000 | F23 | TRD2N3P10WL       | F6  |
| A205J1AV2Q0    | F13    | PRBSD1-16F-BB0DW | F23 | TRD2N3P12WL       | F3  |
| A205J1CQ0      | F13    | PRBSD1-16F-BB0EW | F23 | TRD2N3P20WL       | F3  |
| A205J1ZQ0      | F7,F14 | PRBSD3-16F-BB000 | F23 |                   |     |
| A205J2AQ0      | F15    | PRBSD3-16F-BB0FW | F23 |                   |     |
| A205J2CQ0      | F16    | PRBSD3-16F-BB0GW | F23 |                   |     |
| A205J2ZQ0      | F15    |                  |     |                   |     |

## Rocker/Paddle Switches, TRD Series Part Number Matrix

### MATERIAL SPECIFICATIONS:

|                               |                                                   |
|-------------------------------|---------------------------------------------------|
| Movable Contacts .....        | Copper alloy w/silver inlay contact or gold plate |
| Terminals/Fixed Contacts..... | Copper alloy w/silver inlay contact or gold plate |
| Terminal Seal .....           | Epoxy                                             |
| Housing/Beveled Frame .....   | Polvamide, black matte finish                     |

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature.....-49°F to +199°F (-45°C to +93°C)  
Solder Heat Resistance.....Meets MIL-STD-202, method 210

### TYPICAL PERFORMANCE CHARACTERISTICS:

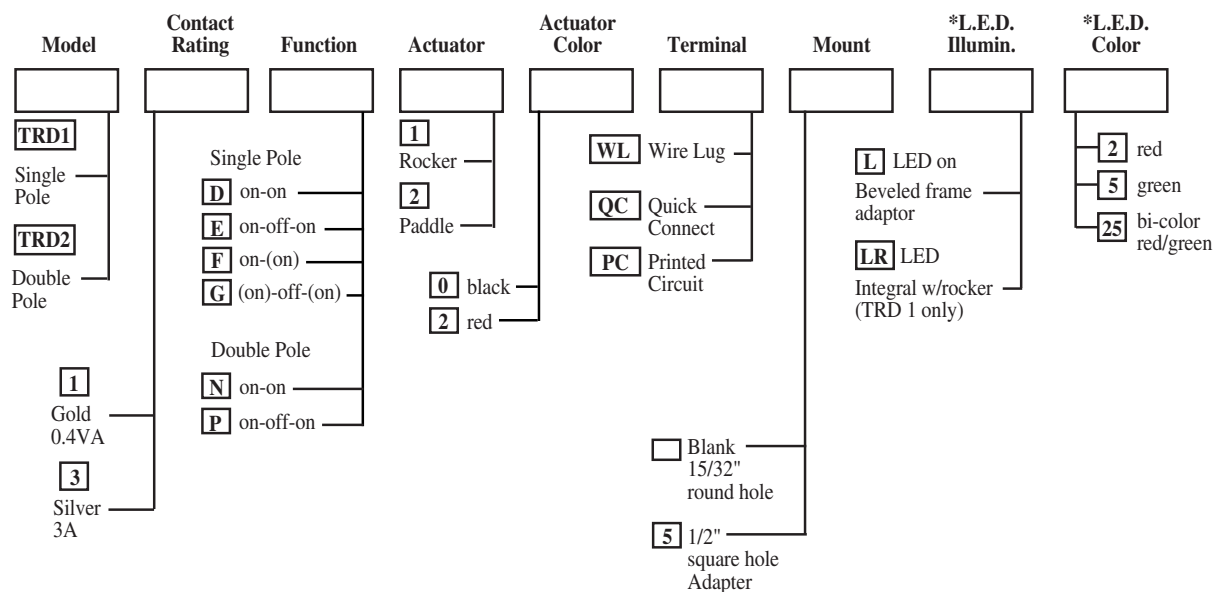
|                                  |                                                                                                                |
|----------------------------------|----------------------------------------------------------------------------------------------------------------|
| Contact Rating .....             | Silver: 3A max. @ 125 VAC, option 3<br>Gold: 0.4VA max. @ 20 VDC, option 1                                     |
| Initial Contact Resistance ..... | 20 Milliohms max.                                                                                              |
| Static Withstanding .....        | 15KV, per IEC 801-2                                                                                            |
| Insulation Resistance .....      | 1,000 Megohms min. @ 500 VDC                                                                                   |
| Dielectric Strength .....        | 500 Volts RMS @ sea level                                                                                      |
| Electrical Life                  | 2 Pos. 20K cycles @ full rated 3A load,<br>80K @ 0.4VA, 3 pos. 10K cycles @ full<br>rated 3A load. 60K @ 0.4VA |

**\*NOTICE:** Caution should be used when hand-soldering. Solder heat Resistance -550°-600°F for less than 5 seconds. Solder with the switch in the closed position.

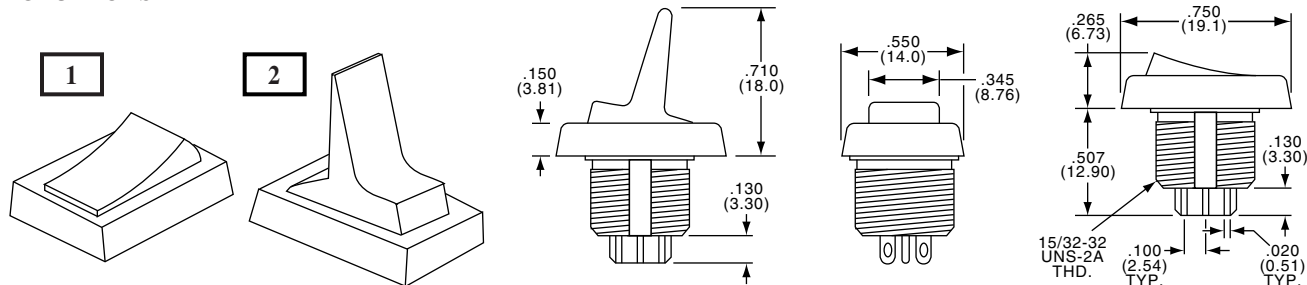
**UL options available, consult Tyco Electronics Product Information Center**

## HOW TO ORDER

\* Leave blank if LED not required.



## ACTUATORS





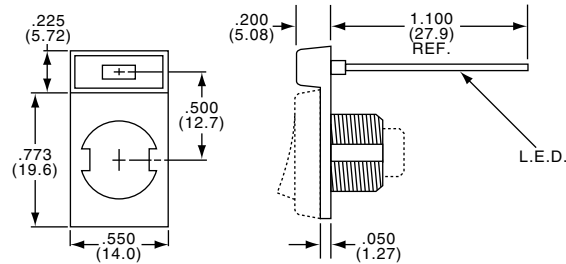


## Rocker/Paddle Switches, TRD Series Options

**L**

### L.E.D. BEVELED FRAME ADAPTOR

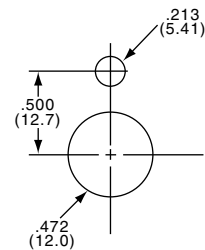
(Accepts rectangular L.E.D.)



**Material:** Nylon 6/6  
**Color/Finish:** Black, matte

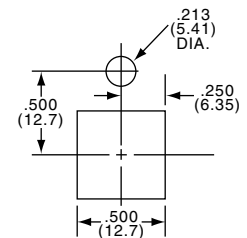
### MOUNTING

#### 15/32" HOLE STANDARD



**Recommended Panel Thickness:** .030 to .220:

#### 1/2" SQUARE CUTOUT



**Recommended Panel Thickness:** .030 to .095"

### FUNCTIONS

| Single Pole                 | Double Pole                |  |  |  |
|-----------------------------|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                             |                            | 123<br>456                                                                        | 123<br>456                                                                        | 123<br>456                                                                        |
| <input type="checkbox"/> D  | <input type="checkbox"/> N | On                                                                                | None                                                                              | On                                                                                |
| <input type="checkbox"/> E  | <input type="checkbox"/> P | On                                                                                | Off                                                                               | On                                                                                |
| <input type="checkbox"/> F  |                            | On                                                                                | None                                                                              | (On)                                                                              |
| <input type="checkbox"/> G  |                            | (On)                                                                              | Off                                                                               | (On)                                                                              |
| SPDT<br>Terminals Connected |                            | 2-3                                                                               | ---                                                                               | 1-2                                                                               |
| DPDT<br>Terminals Connected |                            | 2-3<br>5-6                                                                        | ---                                                                               | 1-2<br>4-5                                                                        |

**None** No mechanical position

**Off** Mechanical position, no electrical connection

**(On)** Momentary mechanical position, and electrical connection

F

TRD Series

\* Refer to Pages F3-F5 for  
Other Options \*

**MATERIAL SPECIFICATIONS:**

Contacts .....Gold over nickel or silver plate  
Case Material .....Polyamide, black matte finish  
Actuator Material .....Polyamide  
Terminals/Fixed Contacts.....Copper alloy with gold or silver plate  
Terminal Seal .....Epoxy

**ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature.....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature.....-49°F to +199°F (-45°C to +93°C)

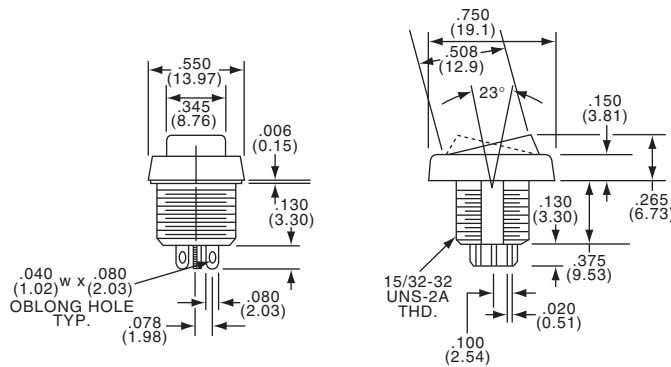
**Rocker Switches, TRD Series Illuminated or Non-Illuminated, Wire Lug**

**TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating .....0.4 VA Max. @ 20 VDC or peak AC  
3 A @ 125 VAC or 28 VDC (2 pos.) 2A  
Initial Contact Resistance .....20 Milliohms max.  
Contact Timing .....Break-before-make  
Insulation Resistance .....1,000 Megohms min.  
Dielectric Strength .....500 Volts RMS @ sea level  
Actuator Travel.....23°  
Life Expectancy .....2 Pos. - Up to 100,000 actuations  
3 Pos. - Up to 50,000 actuations

**NOTE:** Part numbering matrix page F3

**NOTE:** When hand soldering, solder with switch in closed position.  
Solder temperature 550-600°F less than 5 seconds.



DPDT



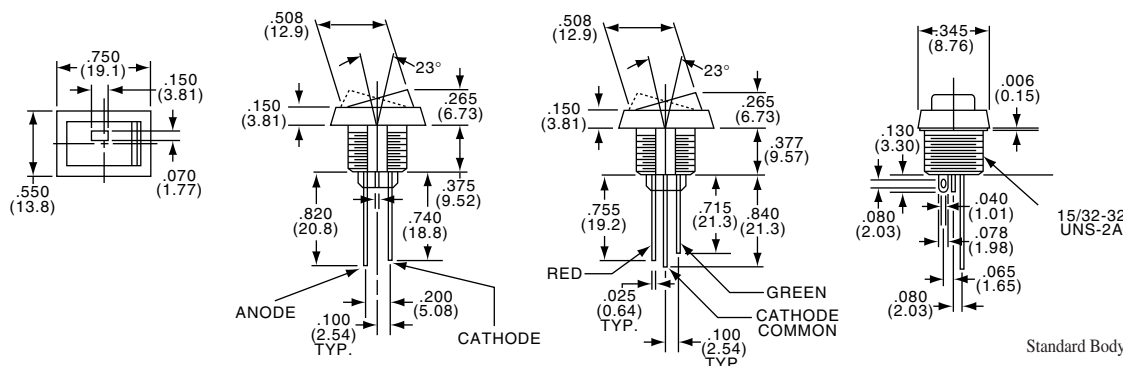
TRD21N10WL

Standard Body Color - (Black)

| Model        | Type | Function     | Act. Code Pg. M5 | Contact | Terminal | Model        | Type | Function     | Act. Code Pg. M5 | Contact | Terminal |
|--------------|------|--------------|------------------|---------|----------|--------------|------|--------------|------------------|---------|----------|
| TRD11D1(*)WL | SPDT | On None On   | 1                | Gold    | Wire Lug | TRD13D1(*)WL | SPDT | On None On   | 1                | Silver  | Wire Lug |
| TRD11E1(*)WL | SPDT | On Off On    | 5                | Gold    | Wire Lug | TRD13E1(*)WL | SPDT | On Off On    | 5                | Silver  | Wire Lug |
| TRD11F1(*)WL | SPDT | On None (On) | 1                | Gold    | Wire Lug | TRD13F1(*)WL | SPDT | On None (On) | 1                | Silver  | Wire Lug |
| TRD21N1(*)WL | DPDT | On None On   | 2                | Gold    | Wire Lug | TRD23N1(*)WL | DPDT | On None On   | 2                | Silver  | Wire Lug |
| TRD21P1(*)WL | DPDT | On Off On    | 6                | Gold    | Wire Lug | TRD23P1(*)WL | DPDT | On Off On    | 6                | Silver  | Wire Lug |

(\*) Specify rocker color by adding suffix number: (0) Black (2) Red,

(On) indicates momentary position.



SPDT



TRD11D10WLLR

Standard Body and Rocker Color - (Black)

**ILLUMINATED**

| Model           | Type | Function     | Act. Code Pg. M5 | Contact | Terminal |
|-----------------|------|--------------|------------------|---------|----------|
| TRD11D10WLLR(*) | SPDT | On None On   | 1                | Gold    | Wire Lug |
| TRD11E10WLLR(*) | SPDT | On Off On    | 5                | Gold    | Wire Lug |
| TRD11F10WLLR(*) | SPDT | On None (On) | 1                | Gold    | Wire Lug |

(\*) Specify LED color by adding suffix number: (2) Red, (5) Green, (25) Red/Green - Bi-color

**ILLUMINATED**

| Model           | Type | Function     | Act. Code Pg. M5 | Contact | Terminal |
|-----------------|------|--------------|------------------|---------|----------|
| TRD13D10WLLR(*) | SPDT | On None On   | 1                | Silver  | Wire Lug |
| TRD13E10WLLR(*) | SPDT | On Off On    | 5                | Silver  | Wire Lug |
| TRD13F10WLLR(*) | SPDT | On None (On) | 1                | Silver  | Wire Lug |

(On) indicates momentary position.

## Rocker/Paddle Switches, A Series, Part Number Matrix

### MATERIAL SPECIFICATIONS:

Contacts/Terminals.....Gold/gold flash  
Silver/tin lead  
Case Material .....Thermoset 94V-0  
Actuator Material .....Polyamide  
Terminal Seal .....Epoxy

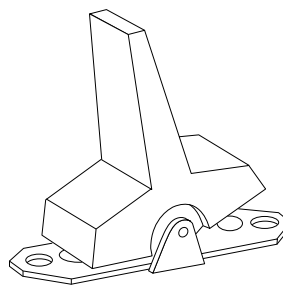
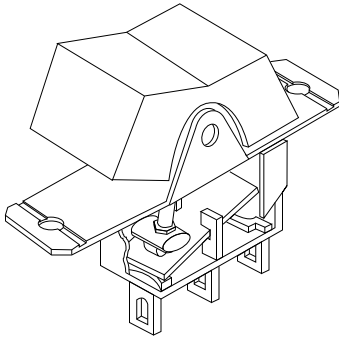
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +185°F (-20°C to +85°C)  
Storage Temperature.....-49°F to +212°F (-45°C to +100°C)

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....Gold: 0.4 VA @ 20 AC/DC  
Silver: 2 A @ 250 VAC; 5 A @ 125 VAC  
Silver: 2 A @ 30 VDC  
Initial Contact Resistance .....30 Milliohms max.  
Contact Timing .....Break-before-make  
Insulation Resistance .....1,000 Megohms @ 500 VDC  
Dielectric Strength .....1,000 Volts RMS @ sea level  
Actuator Travel.....25°  
Life Expectancy .....Up to 30,000 Cycles

### DESIGN



### PART NUMBERING

| Model                   | Function | Actuator                                 | Terminal                                     | Contact                   | Actuator Color        | Beveled Frame Color   | Option                    |
|-------------------------|----------|------------------------------------------|----------------------------------------------|---------------------------|-----------------------|-----------------------|---------------------------|
| <b>A1</b> Single Pole   |          | <b>J1</b> Small                          | <b>Z</b> Wire Lug                            | <b>Q</b> Silver           | <b>0</b> Black (Std.) | <b>0</b> Black (Std.) | UL (Q or G) contacts only |
| <b>A2</b> Double Pole   |          | <b>J3</b> Large                          | <b>A</b> Right Angle                         | <b>B</b> Gold             | <b>2</b> Red          |                       |                           |
| <b>01</b> On-On         |          | <b>J15</b> Snap-in                       | <b>AV2</b> Vert. Right Angle                 | <b>G</b> Gold over Silver |                       |                       |                           |
| <b>03</b> On-Off-On     |          | <b>J16</b> Snap-in w/beveled frame       | <b>C</b> Printed Circuit                     |                           |                       |                       |                           |
| <b>05</b> (On)-Off-(On) |          | <b>J50</b> Snap-in                       | <b>V5</b> Vertical Right Angle               |                           |                       |                       |                           |
|                         |          | <b>J51</b> Snap-in w/beveled frame       | <b>V3</b> <b>V4</b> Vertical Support Bracket |                           |                       |                       |                           |
|                         |          | <b>J52</b> Snap-in w/beveled frame LED   | <b>W</b> Wire Wrap                           |                           |                       |                       |                           |
|                         |          | <b>Paddle</b>                            | <b>Z3</b> Quick Connect                      |                           |                       |                       |                           |
|                         |          | <b>J2</b> Small                          |                                              |                           |                       |                       |                           |
|                         |          | <b>J4</b> Large                          |                                              |                           |                       |                       |                           |
|                         |          | <b>J5</b> Large                          |                                              |                           |                       |                       |                           |
|                         |          | <b>J60</b> Snap-in                       |                                              |                           |                       |                       |                           |
|                         |          | <b>J61</b> Snap-in w/beveled frame       |                                              |                           |                       |                       |                           |
|                         |          | <b>J62</b> Snap-in w/beveled frame & LED |                                              |                           |                       |                       |                           |

### OPTIONAL:

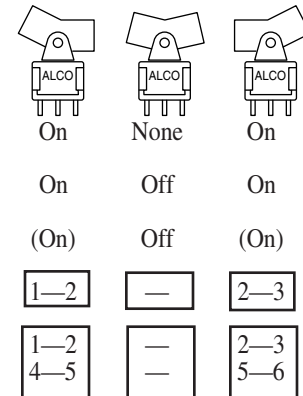
UL recognized under the Component Program of Underwriters Laboratories Inc. File # E46765  
CSA Certified File #LR65901

## Rocker/Paddle Switches, A Series, Options

### FUNCTIONS

The following functions available in SP or DP.

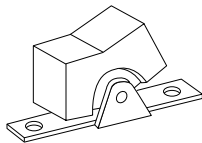
|                          |             |                                                                    |
|--------------------------|-------------|--------------------------------------------------------------------|
| <b>01</b>                | 2 Positions | None indicates no mechanical position                              |
| <b>03</b>                | 3 Positions | Off indicates a mechanical position with no electrical connection. |
| <b>05</b>                | 3 Positions | (On) indicates momentary operation.                                |
| SPDT, connect terminals: |             |                                                                    |
| DPDT, connect terminals: |             |                                                                    |



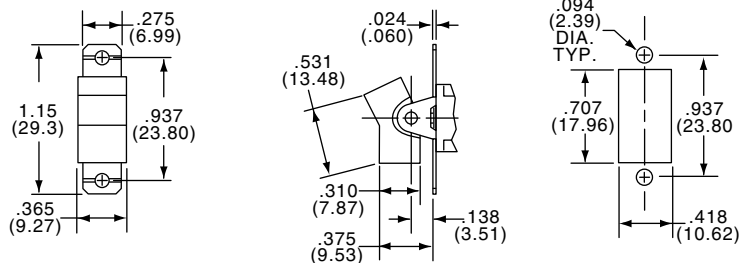
### ACTUATORS

#### **J1** Rockers

Small

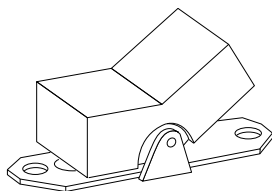


Mounting Type Standard with C or Z Terminal Type

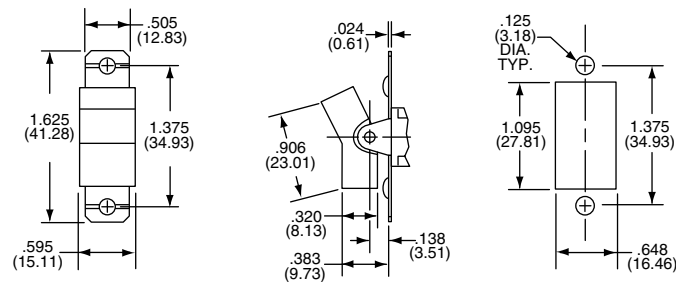


#### **J3**

Large



Mounting Type Standard with C or Z Terminal Type

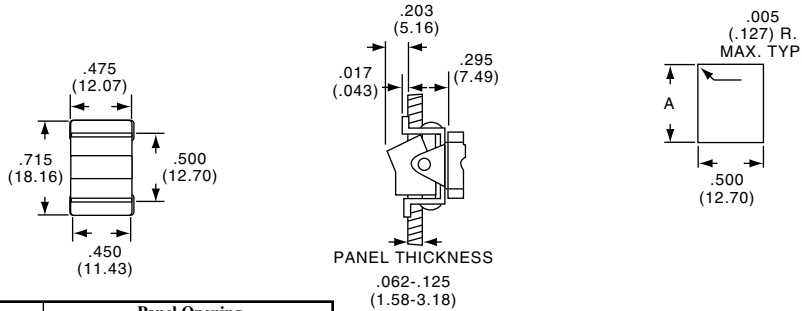
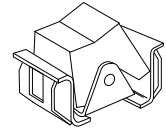


## Rocker/Paddle Switches, A Series, Options

### ROCKER

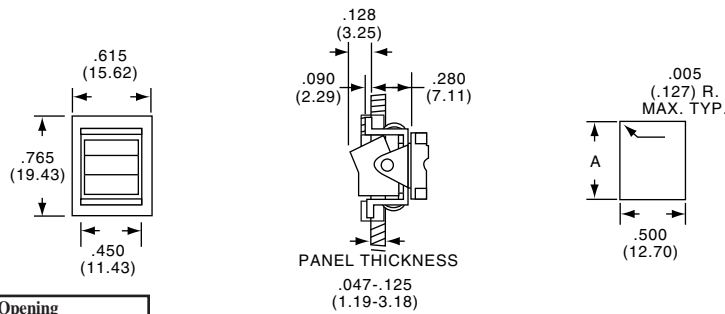
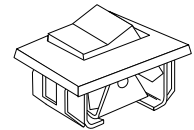


Snap-in



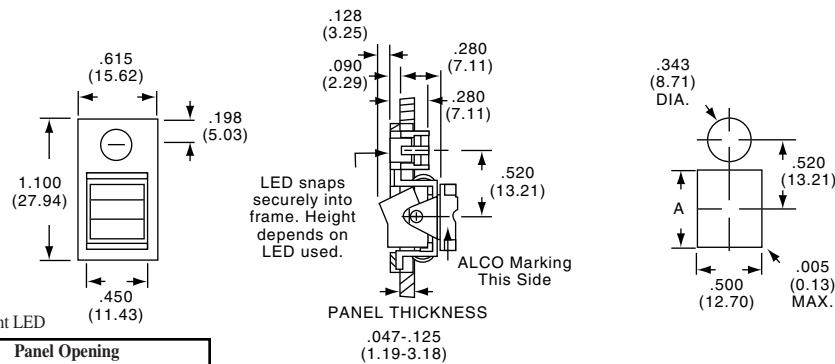
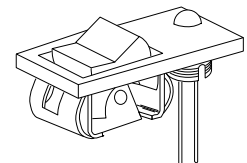
|                 | Panel Opening |           |           |
|-----------------|---------------|-----------|-----------|
| Panel Thickness | .062          | .093      | .125      |
| "A"             | .600-.605     | .610-.615 | .620-.625 |

### Snap-in with beveled frame



|                 | Panel Opening |           |           |
|-----------------|---------------|-----------|-----------|
| Panel Thickness | .062          | .093      | .125      |
| "A"             | .600-.605     | .610-.615 | .620-.625 |

### Snap-in with beveled frame/L.E.D.



Accepts BL-17 or equivalent LED

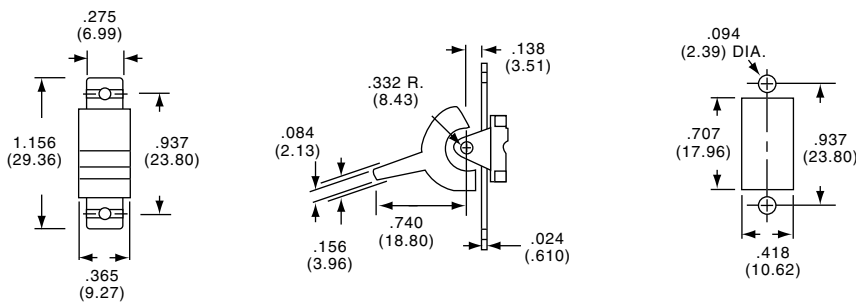
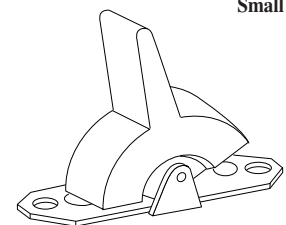
|                 | Panel Opening |           |           |
|-----------------|---------------|-----------|-----------|
| Panel Thickness | .062          | .093      | .125      |
| "A"             | .600-.605     | .610-.615 | .620-.625 |

L.E.D. Not supplied.

### PADDLE

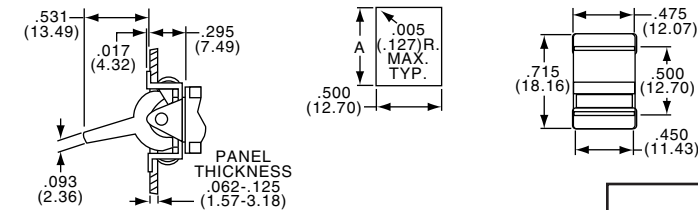
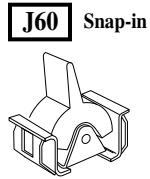
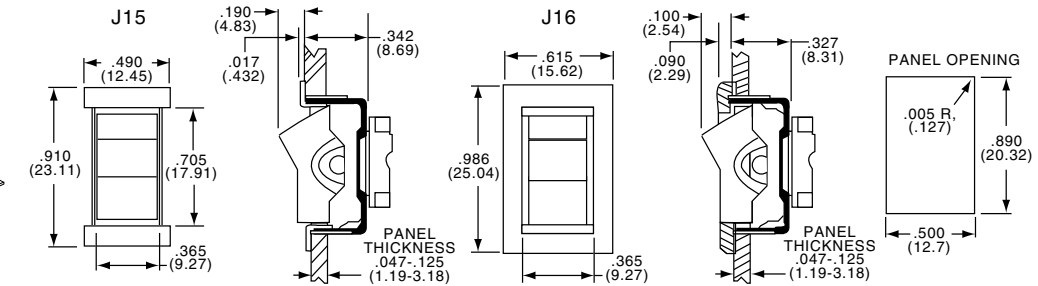
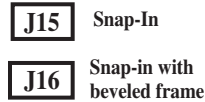
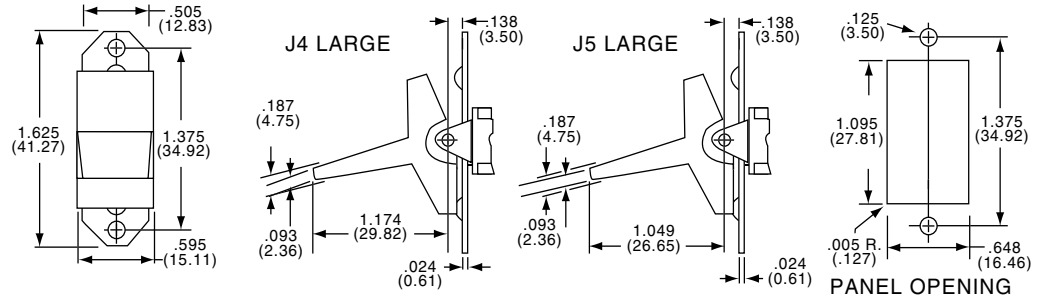
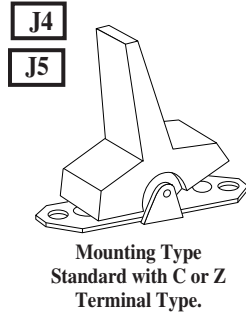


Small

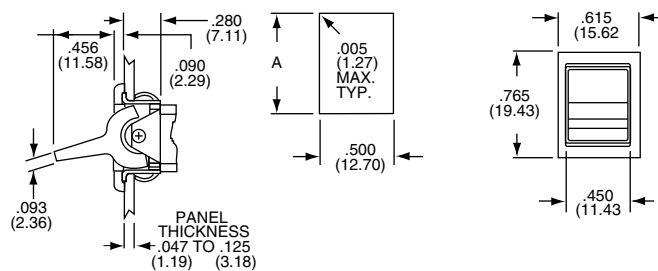
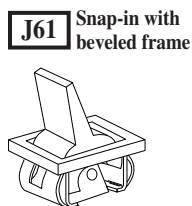


Mounting Type Standard with C or Z Terminal Type.

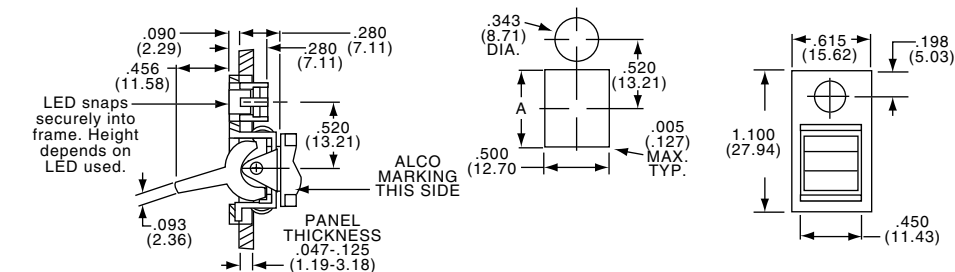
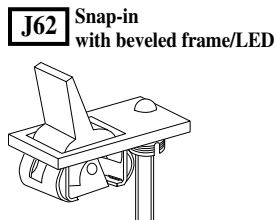
## Rocker/Paddle Switches, A Series, Options



| Panel Opening   |           |           |           |
|-----------------|-----------|-----------|-----------|
| Panel Thickness | .062      | .093      | .125      |
| "A"             | .600-.605 | .610-.615 | .620-.625 |



| Panel Opening   |           |           |           |
|-----------------|-----------|-----------|-----------|
| Panel Thickness | .062      | .093      | .125      |
| "A"             | .600-.605 | .610-.615 | .620-.625 |



| Panel Opening   |           |           |           |
|-----------------|-----------|-----------|-----------|
| Panel Thickness | .062      | .093      | .125      |
| "A"             | .600-.605 | .610-.615 | .620-.625 |

Accepts BL-17 or equivalent LED

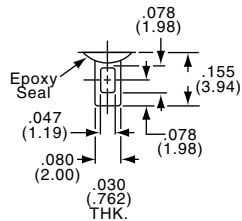
L.E.D. not supplied

# Rocker/Paddle Switches, A Series, Termination Options

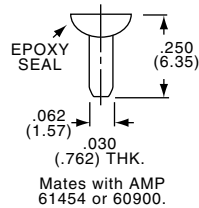
## TERMINALS



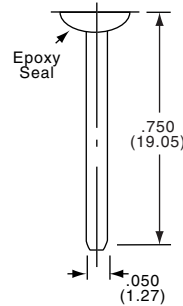
**Wire Lug Standard**



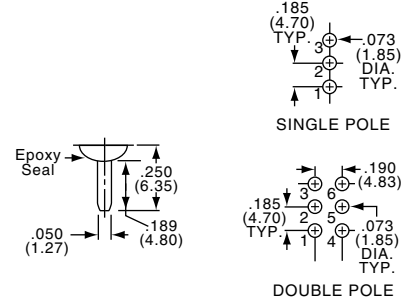
**Quick Connect**



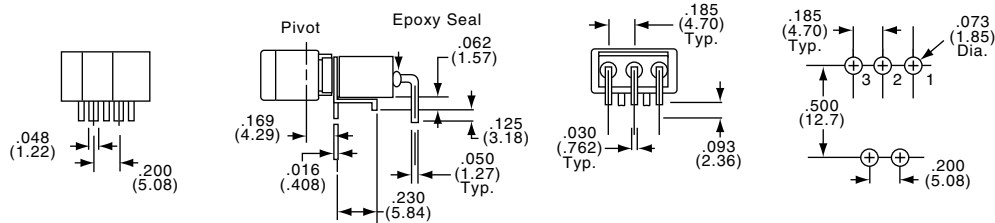
**Wire Wrap**



**Printed Circuit**



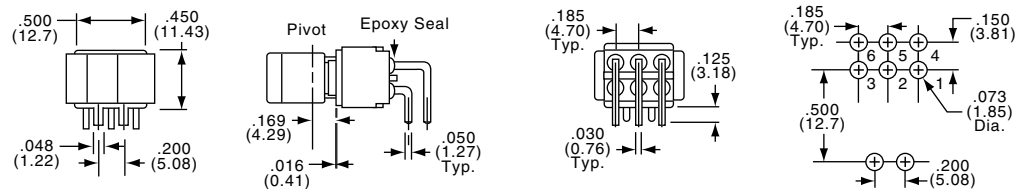
**Right Angle Single Pole**



NOTE: Terminal numbers viewed from top of P.C. board.



**Right Angle Double Pole**



NOTE: Terminal numbers viewed from top of P.C. board.



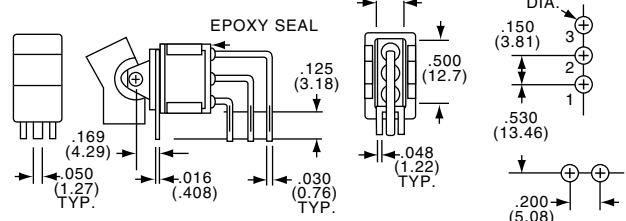
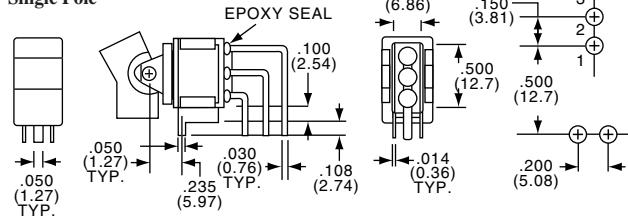
**Gemini Series Rocker/Paddle Switches**



## Rocker/Paddle Switches, A Series, Options

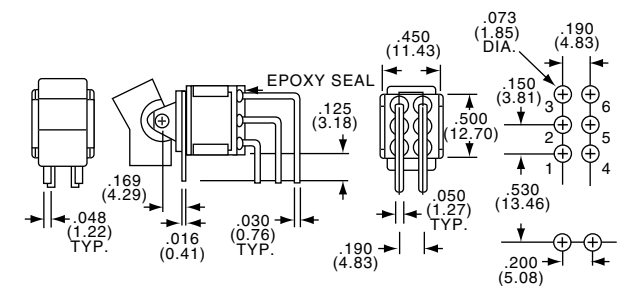
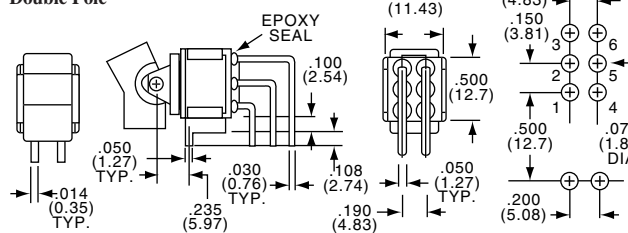


**Vertical Right Angle Single Pole**



NOTE: Terminal numbers viewed from top of P.C. board.

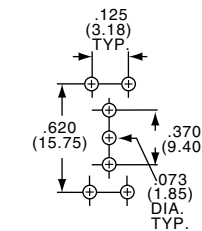
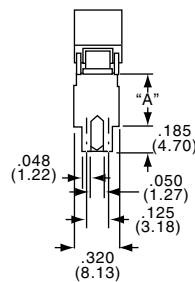
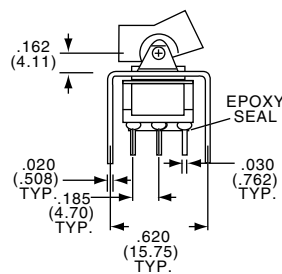
**Right Angle Double Pole**



NOTE: Terminal numbers viewed from top of P.C. board.

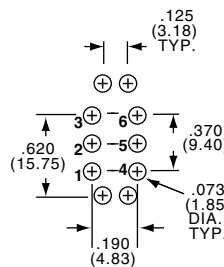
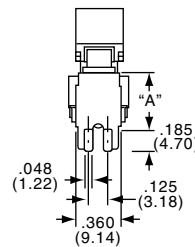
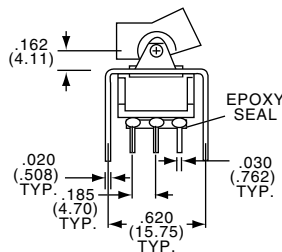


**Vertical Support Bracket Single Pole**



| Option Code | Dim. "A"     |
|-------------|--------------|
| V3          | .460 (11.68) |
| V4          | .630 (16.00) |

**Vertical Support Bracket Double Pole**



| Option Code | Dim. "A"     |
|-------------|--------------|
| V3          | .460 (11.68) |
| V4          | .630 (16.00) |

## CONTACTS

**B** CONTACTS: Copper alloy with gold plate, welded button.

TERMINALS: Copper alloy with gold plate.

ELECTRICAL RATING: 0.4VA @ 20 VAC/DC.

**Q** CONTACTS: Copper alloy with silver, welded button.

TERMINALS: Copper alloy with tin/lead plate.

ELECTRICAL RATING: 5 A @ 125 VAC, 2 A @ 250 VAC, 2 A @ 30 VDC.  
UL/CSA RATING: 5A @ 125 VAC, 3 @ 250 VAC (Specify "UL" option code)

**G** CONTACTS: Copper alloy with gold plate over silver, welded button.

TERMINALS: Copper alloy with gold plate.

ELECTRICAL RATING: 0.4 VA @ 20 VAC/DC or 5 A @ 125 VAC, 2 A @ 250 VAC, 2 A @ 30 VDC.

Note: This contact option can be used for low-level or power switching. If level is above 0.4 VA @ 20 VAC/DC, the switch is rendered usable only for power switching due to arc-removal of gold plate.

UL/CSA RATING: 5A @ 125 VAC, 3 @ 250 VAC (Specify "UL" option code)

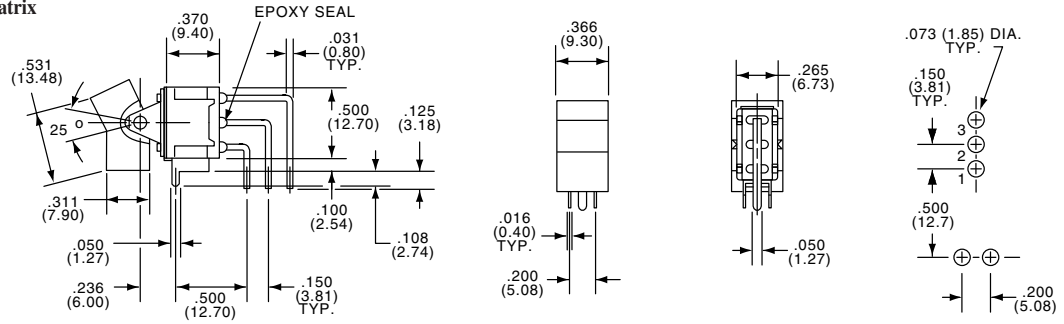
**Rocker Switches, A Series, PC Tail, Straight or Vertical Right Angle**

\* Refer to Pages F7 for Product Specifications and Part Matrix

SPDT



A101J1AV2Q0

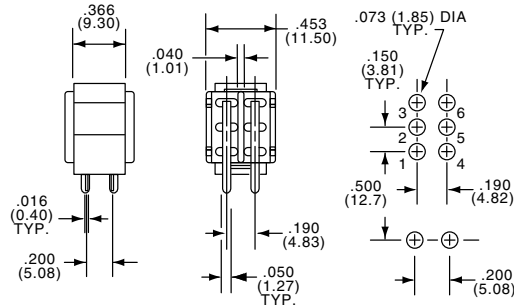


DPDT



A205J1AV2Q0

Standard Rocker Color - (Black)

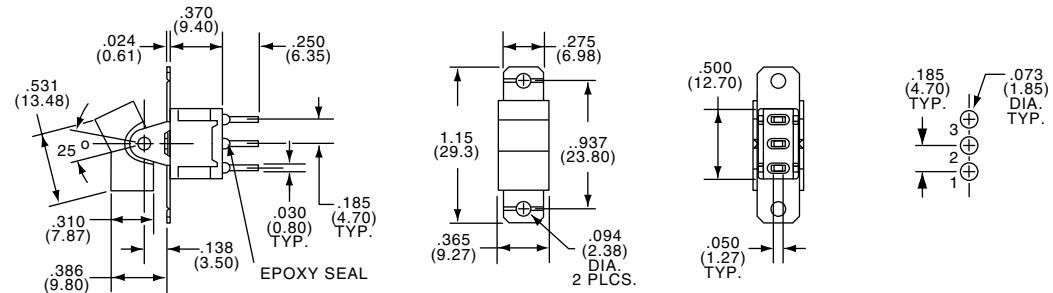


| Silver Contacts  |             | Type | Act. Code. | P. M5 |      |      |  |
|------------------|-------------|------|------------|-------|------|------|--|
| Tyco Electronics | Alcoswitch  |      |            |       |      |      |  |
| 1-1437591-1      | A101J1AV2Q0 | SPDT | 1          | On    | None | On   |  |
| 4-1437591-7      | A105J1AV2Q0 | SPDT | 5          | (On)  | Off  | (On) |  |
| 7-1437591-1      | A201J1AV2Q0 | DPDT | 2          | On    | None | On   |  |
| 9-1437591-6      | A205J1AV2Q0 | DPDT | 6          | (On)  | Off  | (On) |  |

SPDT



A101J1CQ0

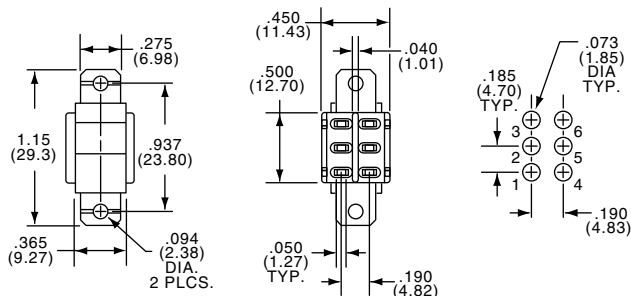


DPDT



A201J1CQ0

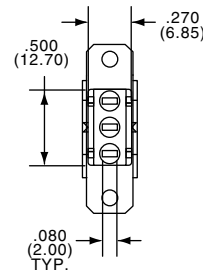
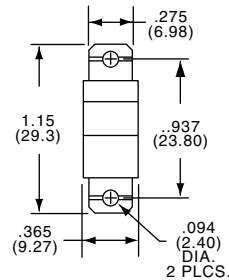
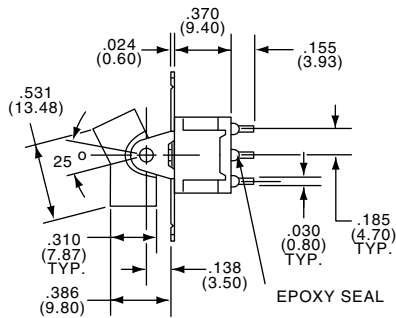
Standard Rocker Color - (Black)



| Silver Contacts  |            | Type | Act. Code. | P. M5 |      |      |  |
|------------------|------------|------|------------|-------|------|------|--|
| Tyco Electronics | Alcoswitch |      |            |       |      |      |  |
| 1-1437591-3      | A101J1CQ0  | SPDT | 1          | On    | None | On   |  |
| 4-1437591-8      | A105J1CQ0  | SPDT | 5          | (On)  | Off  | (On) |  |
| 7-1437591-2      | A201J1CQ0  | DPDT | 2          | On    | None | On   |  |
| —                | A203J1CQ0  | DPDT | 6          | On    | Off  | On   |  |
| —                | A205J1CQ0  | DPDT | 6          | (On)  | Off  | (On) |  |

**Rocker Switches, A Series, Wire Lug or Right Angle**

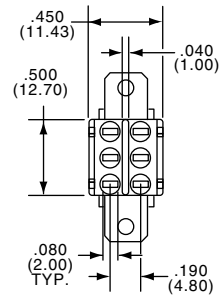
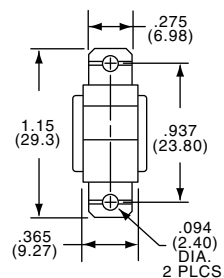
SEE PAGE F7 FOR PRODUCT SPECIFICATIONS AND PART MATRIX



SPDT



A101J1ZQ0



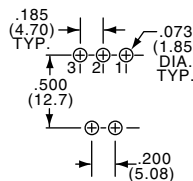
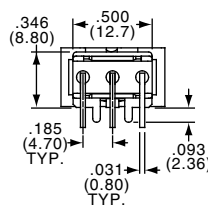
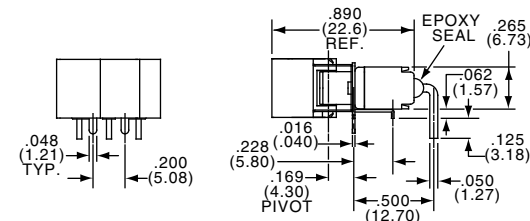
DPDT



A201J1ZQ0

Standard Rocker Color - (Black)

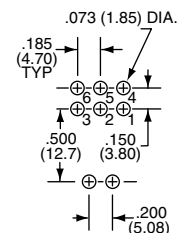
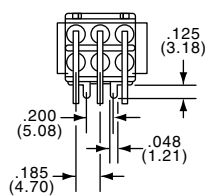
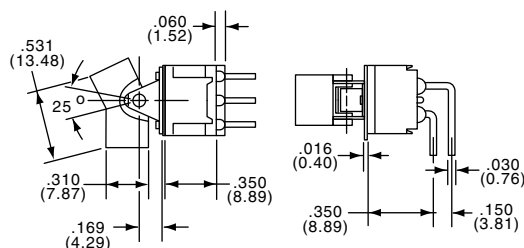
| Silver Contacts  |            |      |      |       |       |                                                                                   |                                                                                   | Silver Contacts                                                                   |                  |            |      |      |       |       |                                                                                     |                                                                                     |                                                                                     |
|------------------|------------|------|------|-------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------|------------|------|------|-------|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Tyco Electronics | Alcoswitch | Type | Act. | Code. | P. M5 |  |  |  | Tyco Electronics | Alcoswitch | Type | Act. | Code. | P. M5 |  |  |  |
| 1-1437591-7      | A101J1ZQ0  | SPDT | 1    | On    | None  | On                                                                                |                                                                                   |                                                                                   | 7-1437591-4      | A201J1ZQ0  | DPDT | 2    | On    | None  | On                                                                                  |                                                                                     |                                                                                     |
| 3-1437591-8      | A103J1ZQ0  | SPDT | 5    | On    | Off   | On                                                                                |                                                                                   |                                                                                   | 9-1437591-1      | A203J1ZQ0  | DPDT | 6    | On    | Off   | On                                                                                  |                                                                                     |                                                                                     |
| 5-1437591-0      | A105J1ZQ0  | SPDT | 5    | (On)  | Off   | (On)                                                                              |                                                                                   |                                                                                   | 9-1437591-7      | A205J1ZQ0  | DPDT | 6    | (On)  | Off   | (On)                                                                                |                                                                                     |                                                                                     |



SPDT



A101J1AQ0



DPDT



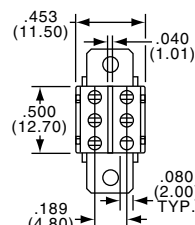
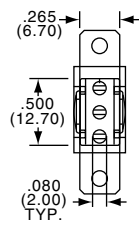
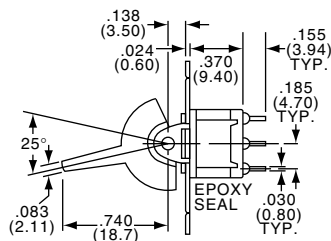
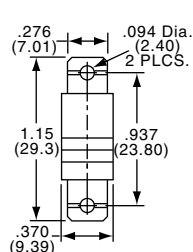
A201J1AQ0

Standard Rocker Color - (Black)

| Silver Contacts  |            |      |      |       |  |  |  | Silver Contacts  |            |      |      |       |  |  |  |  |
|------------------|------------|------|------|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------|------------|------|------|-------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--|
| Tyco Electronics | Alcoswitch | Type | Act. | Code. | P. M5                                                                               |                                                                                     |                                                                                      | Tyco Electronics | Alcoswitch | Type | Act. | Code. | P. M5                                                                                 |                                                                                       |                                                                                       |  |
| 1437591-8        | A101J1AQ0  | SPDT | 1    | On    | None                                                                                | On                                                                                  |                                                                                      | 6-1437591-9      | A201J1AQ0  | DPDT | 2    | On    | None                                                                                  | On                                                                                    |                                                                                       |  |
| 4-1437591-6      | A105J1AQ0  | SPDT | 5    | (On)  | Off                                                                                 | (On)                                                                                |                                                                                      | 8-1437591-7      | A203J1AQ0  | DPDT | 6    | On    | Off                                                                                   | On                                                                                    |                                                                                       |  |
|                  |            |      |      |       |                                                                                     |                                                                                     |                                                                                      | —                | A205J1AQ0  | DPDT | 6    | (On)  | Off                                                                                   | (On)                                                                                  |                                                                                       |  |

**\* Refer to Pages F7 for Product Specifications and Part Matrix**

## Paddle Switches, A Series, Wire Lug or Right Angle



SPDT

DPDT



SPDT

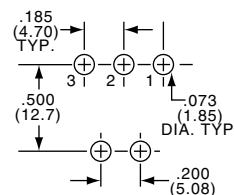
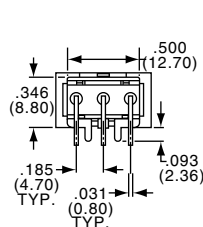
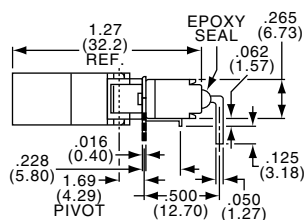
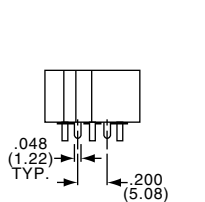


DPDT

A201J2ZQO

Standard Paddle Color - (Black)

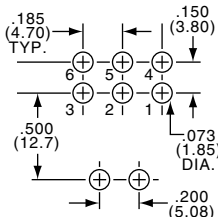
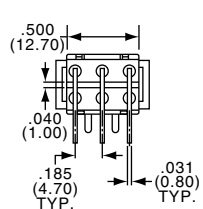
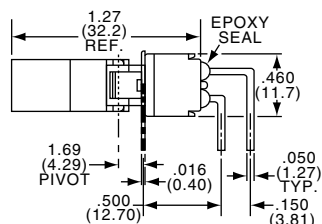
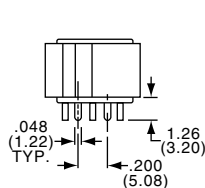
| Silver Contacts<br>Tyco Electronics |           |      |      |       |      |      |      | Silver Contacts<br>Tyco Electronics |           |      |      |       |      |      |      |
|-------------------------------------|-----------|------|------|-------|------|------|------|-------------------------------------|-----------|------|------|-------|------|------|------|
| Alcoswitch                          | Type      | Act. | Code | P. M5 |      |      |      | Alcoswitch                          | Type      | Act. | Code | P. M5 |      |      |      |
| 1-1437591-9                         | A101J2ZQ0 | SPDT | 1    | On    | None | On   | On   | 7-1437591-6                         | A201J2ZQ0 | DPDT | 2    | On    | None | On   | On   |
| 4-1437591-0                         | A103J2ZQ0 | SPDT | 5    | On    | Off  | On   | On   | —                                   | A203J2ZQ0 | DPDT | 6    | On    | Off  | On   | On   |
| 5-1437591-3                         | A105J2ZQ0 | SPDT | 5    | (On)  | Off  | (On) | (On) | 9-1437591-9                         | A205J2ZQ0 | DPDT | 6    | (On)  | Off  | (On) | (On) |



SPDT / DPDT



A201J2AQ0



Standard Paddle Color - (Black)

| Silver Contacts<br>Tyco Electronics |           |      |      |      |      |      | Silver Contacts<br>Tyco Electronics |           |      |      |      |      |      |
|-------------------------------------|-----------|------|------|------|------|------|-------------------------------------|-----------|------|------|------|------|------|
| Alcoswitch                          | Type      | Act. | Code | P.   | M5   |      | Alcoswitch                          | Type      | Act. | Code | P.   | M5   |      |
| —                                   | A101J2AQ0 | SPDT | 1    | On   | None | On   | —                                   | A201J2AQ0 | DPDT | 2    | On   | None | On   |
| —                                   | A103J2AQ0 | SPDT | 5    | On   | Off  | On   | —                                   | A203J2AQ0 | DPDT | 6    | On   | Off  | On   |
| 5-1437591-1                         | A105J2AQ0 | SPDT | 5    | (On) | Off  | (On) | —                                   | A205J2AQ0 | DPDT | 6    | (On) | Off  | (On) |

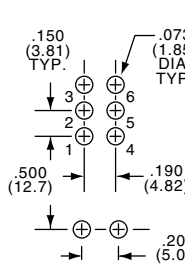
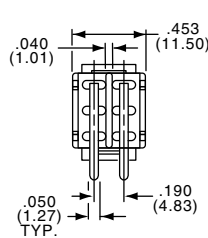
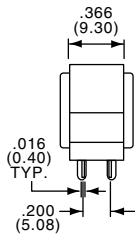
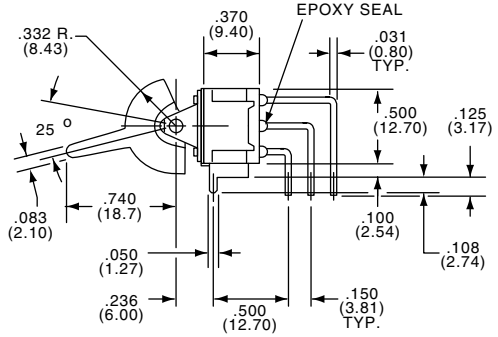
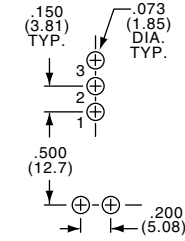
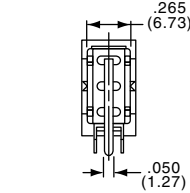
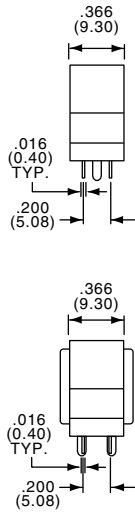
**Paddle Switches, A Series, PC Tail, Straight or Vertical Right Angle**

SEE PAGE F7 FOR PRODUCT SPECIFICATIONS AND PART MATRIX

SPDT / DPDT



A105J2AV2Q0



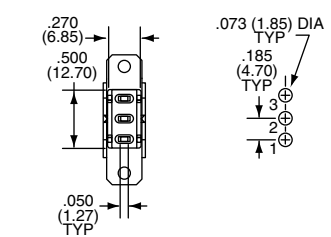
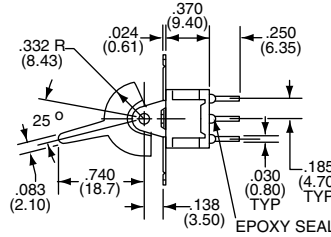
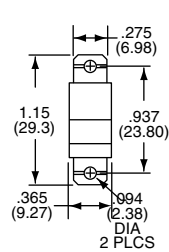
Standard Paddle Color - (Black)

| Silver Contacts<br>Tyco Electronics | Alcoswitch  | Type | Act. Code | P. M5 | On    | None | On | Silver Contacts<br>Tyco Electronics | Alcoswitch  | Type | Act. Code | P. M5 | On   | None | On |
|-------------------------------------|-------------|------|-----------|-------|-------|------|----|-------------------------------------|-------------|------|-----------|-------|------|------|----|
| 1-1437591-8                         | A101J2AV2Q0 | SPDT | 1         | On    | None  | On   |    | —                                   | A201J2AV2Q0 | DPDT | 2         | On    | None | On   |    |
| 5-1437591-2                         | A105J2AV2Q0 | SPDT | 5         | (On)  | (Off) | (On) |    |                                     |             |      |           |       |      |      |    |

SPDT



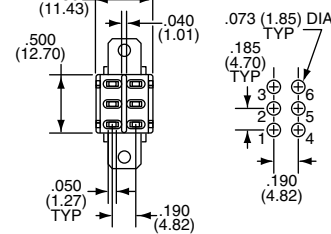
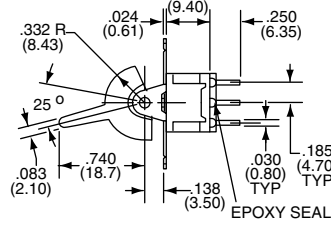
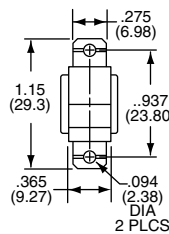
A105J2CQ0



DPDT



A205J2CQ0



| Silver Contacts<br>Tyco Electronics | Alcoswitch | Type | Act. Code | P. M5 | On    | None | On | Silver Contacts<br>Tyco Electronics | Alcoswitch | Type | Act. Code | P. M5 | On    | None | On |
|-------------------------------------|------------|------|-----------|-------|-------|------|----|-------------------------------------|------------|------|-----------|-------|-------|------|----|
| —                                   | A103J2CQ0  | SPDT | 5         | (On)  | (Off) | (On) |    | 7-1437591-5                         | A201J2CQ0  | DPDT | 2         | On    | None  | On   |    |
| —                                   | A105J2CQ0  | SPDT | 5         | (On)  | (Off) | (On) |    | 9-1437591-8                         | A205J2CQ0  | DPDT | 6         | (On)  | (Off) | (On) |    |

## Rocker/Paddle Switches, AE Series, Process Sealed, Part Number Matrix

### MATERIAL SPECIFICATIONS:

|                         |                                                                         |
|-------------------------|-------------------------------------------------------------------------|
| Terminal Seal .....     | Epoxy (standard)                                                        |
| Process Sealing .....   | Seals will withstand wave soldering and subsequent cleaning operations. |
| Contact/Terminals ..... | Gold/gold flash over tin/lead<br>Silver/tin lead                        |
| Case Material .....     | Thermoplastic                                                           |
| Actuator Material ..... | Polyamide                                                               |

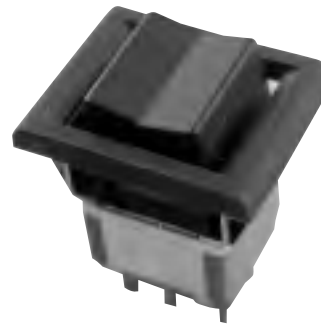
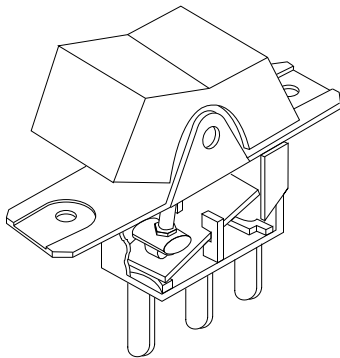
### ENVIRONMENTAL SPECIFICATIONS:

|                                                      |                                   |
|------------------------------------------------------|-----------------------------------|
| Operating Temperature.....                           | -4°F to +185°F (-20°C to +85°C)   |
| Storage Temperature.....                             | -49°F to +212°F (-45°C to +100°C) |
| Meets MIL-STD-202, method 112C, Test Condition A & D | 85°C.                             |

### TYPICAL PERFORMANCE CHARACTERISTICS:

|                             |                                                                                            |
|-----------------------------|--------------------------------------------------------------------------------------------|
| Contact Rating .....        | Silver: 2 A @ 250 VAC, 5 A @ 125 VAC<br>Silver: 2 A @ 30 VDC<br>Gold: 0.4 VA @ 20 VDC max. |
| Contact Resistance .....    | 30 Milliohms max. initial                                                                  |
| Insulation Resistance ..... | 1,000 Megohms min. @ 500 VDC.                                                              |
| Dielectric Strength .....   | 1,000 Volts RMS @ sea level initial                                                        |
| Static Withstanding.....    | 15KV Per IEC 801-2.                                                                        |
| Electrical Life .....       | Up to 30,000 Cycles                                                                        |
| Actuator Travel.....        | .25°                                                                                       |
| Contact Timing .....        | Break before make                                                                          |

### DESIGN



### PART NUMBERING

| Model                   | Function | Actuator           | Terminal                                     | Contact                   | Actuator Color        | Option                    |
|-------------------------|----------|--------------------|----------------------------------------------|---------------------------|-----------------------|---------------------------|
| <b>AE1</b> Single Pole  |          | <b>Rocker</b>      | <b>Z</b> Wire Lug                            | <b>B</b> Gold             | <b>0</b> Black (Std.) | UL (Q or G) contacts only |
| <b>AE2</b> Double Pole  |          | <b>J1</b> Standard | <b>A</b> Right Angle                         | <b>Q</b> Silver           | <b>2</b> Red          |                           |
| <b>01</b> On-On         |          | <b>J50</b> Small   | <b>AV2</b> Vert. Right Angle                 | <b>G</b> Gold over Silver |                       |                           |
| <b>03</b> On-Off-On     |          | <b>Paddle</b>      | <b>C</b> Printed Circuit                     |                           |                       |                           |
| <b>05</b> (On)-Off-(On) |          | <b>J2</b> Standard | <b>V5</b> Vertical Right Angle               |                           |                       |                           |
|                         |          | <b>J60</b> Small   | <b>V3</b> <b>V4</b> Vertical Support Bracket |                           |                       |                           |
|                         |          |                    | <b>W</b> Wire Wrap                           |                           |                       |                           |
|                         |          |                    | <b>Z3</b> Quick Connect                      |                           |                       |                           |

U.L. Available upon request

### OPTIONAL:

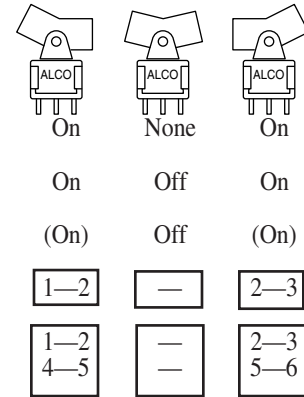
UL recognized under the Component Program Underwriters Laboratories Inc.  
File #E46765  
CSA Certified File #LR65901

# Rocker/Paddle Switches, AE Series, Process Sealed, Options

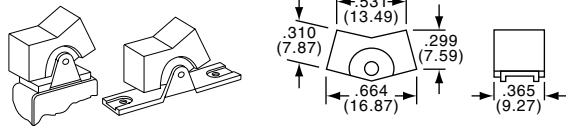
## FUNCTIONS

The following functions available in SP or DP.

|                          |             |                                                                    |
|--------------------------|-------------|--------------------------------------------------------------------|
| <b>01</b>                | 2 Positions | None indicates no mechanical position                              |
| <b>03</b>                | 3 Positions | Off indicates a mechanical position with no electrical connection. |
| <b>05</b>                | 3 Positions | (On) indicates momentary operation                                 |
| SPDT, connect terminals: |             |                                                                    |
| DPDT, connect terminals: |             |                                                                    |



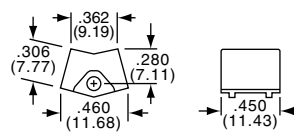
### J1 Rocker



Mounting Provided with  
C or Z Terminal Type.

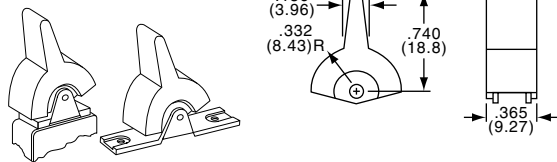
### ACTUATORS

#### J50 Rocker



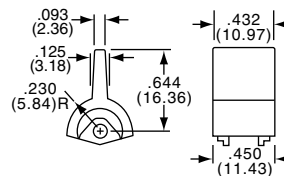
Mounting Provided with  
C or Z Terminal Type.

### J2 Paddle



Mounting Provided with  
C or Z Terminal Type.

### J60 Paddle



Mounting Provided with  
C or Z Terminal Type.

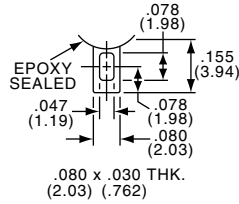


**Rocker/Paddle Switches, AE Series, Process Sealed, Termination Options**

TERMINALS

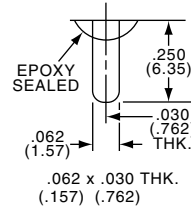
**Z**

Wire Lug



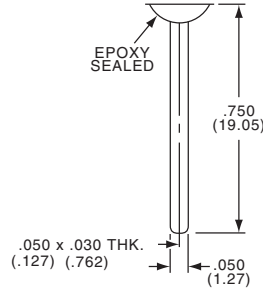
**Q**

Quick Connect



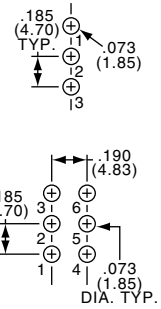
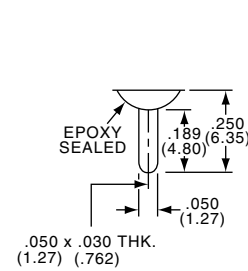
**W**

Wire Wrap



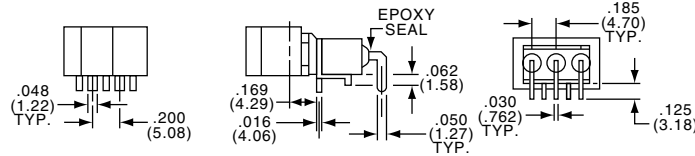
**C**

Printed Circuit

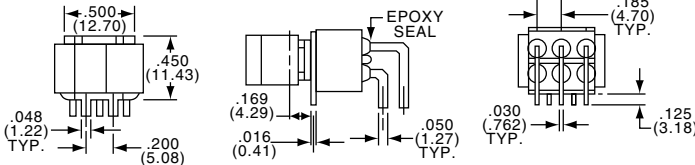


**A**

Right Angle  
Single Pole

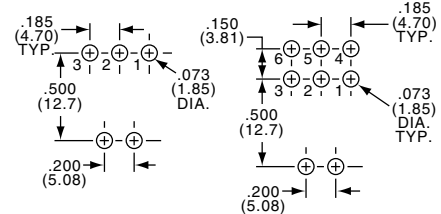


Right Angle  
Double Pole



SINGLE POLE

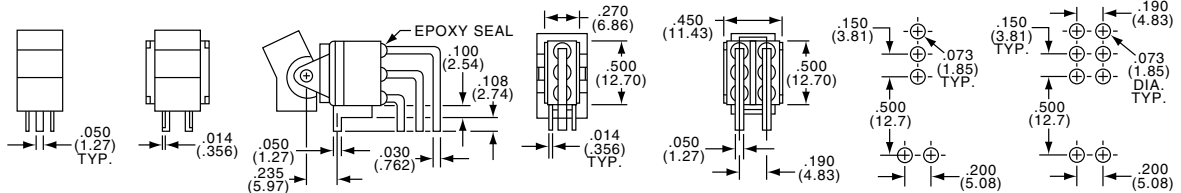
DOUBLE POLE



NOTE: Terminal numbers viewed from top of P.C. board.

**V**

Vertical  
Right Angle



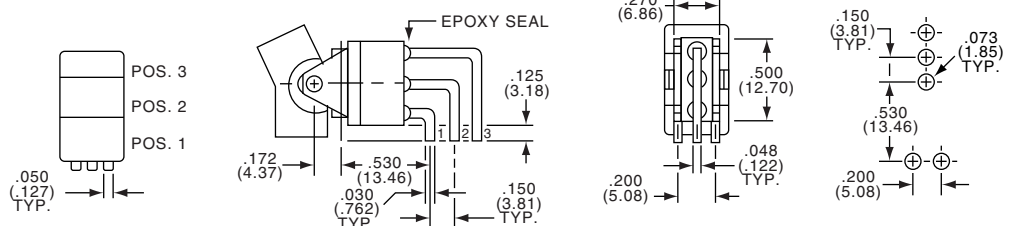
SINGLE POLE

DOUBLE POLE

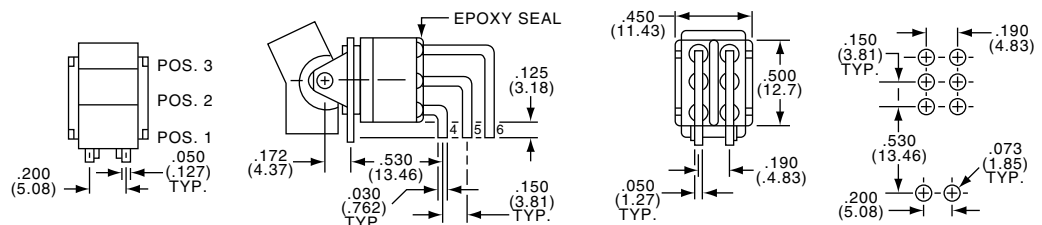
NOTE: Terminal numbers viewed from top of P.C. board.

**V**

Vertical  
Right Angle  
Single Pole



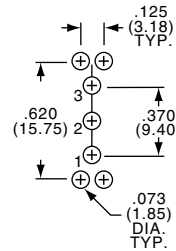
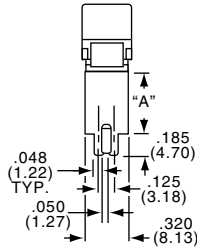
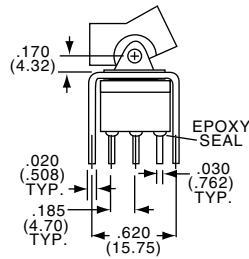
Vertical Right Angle  
Double Pole



## Rocker/Paddle Switches, AE Series, Process Sealed, Options

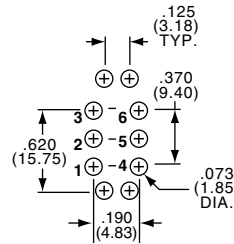
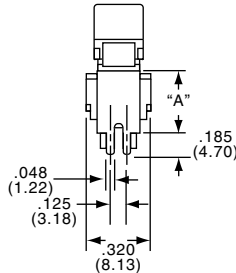
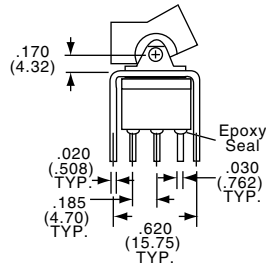


**Vertical Support Bracket  
Single Pole**



| Option Code | Dim. "A"     |
|-------------|--------------|
| V3          | .460 (11.68) |
| V4          | .630 (16.00) |

**Vertical Support Bracket  
Double Pole**



| Option Code | Dim. "A"     |
|-------------|--------------|
| V3          | .460 (11.68) |
| V4          | .630 (16.00) |

## CONTACTS

**B** CONTACTS: Copper alloy with gold plate, welded button.

TERMINALS: Copper alloy with gold plate.

ELECTRICAL RATING: 0.4VA @ 20 VAC/DC.

**Q** CONTACTS: Copper alloy with silver, welded button.

TERMINALS: Copper alloy with tin/lead plate.

ELECTRICAL RATING: 5 amps @ 125 VAC, 2 amps @ 250 VAC, 2 amps @ 30 VDC.

UL/CSA RATING: 5A @ 125 VAC, 3 @ 250 VAC (Specify "UL" option code)

**G** CONTACTS: Copper alloy with gold plate over silver, welded button.

TERMINALS: Copper alloy with gold plate.

ELECTRICAL RATING: 0.4 VA @ 20 VAC/DC or 5 amps @ 125 VAC, 2 amps @ 250 VAC, 2 amps @ 30 VDC.

Note: This contact option can be used for low-level or power switching. If level is above 0.4 VA @ 20 VAC/DC, the switch is rendered usable only for power switching due to arc-removal of gold plate.

UL/CSA RATING: 5A @ 125 VAC, 3 @ 250 VAC (Specify "UL" option code)

## Series PRA, PRB and PRD

### Product Facts

- Full line of single or double-pole power rocker switches for three different industry compatible panel cut-out sizes
- Easy to install snap-in mounting
- Dust resistant
- Dual color rocker option
- Full-illuminated rocker option
- LED or neon window illuminated option
- Wide range of marking options and functions available
- Solder lugs or .187 & .250 FASTON Tab terminals
- Cost competitive

### Electrical Characteristics

**Current:** 16A@125 VAC 1/3 HP

10A@250 VAC 1/2 HP

**PRA Series Double Pole:**

7A@125 VAC

6A@250 VAC

**PRA Series Single Pole:**

6 (3)A 250V ~ 10A 125V ~

μ 25T85

**Inrush Current:** 50A/3msec  
(capacitive load)

**Contact Resistance (initial):** <50m  
Ohms

**Dielectric Strength (initial):** >1000  
VAC, 1 min.

**Insulation Resistance (initial):**  
>100Mohms min.

**Electrical Life Endurance:**

>6000 operations

Voltage drop <100 mV

### Mechanical Characteristics

**Operating Life Endurance:** up to  
>100,000 operations

**Actuating Force:**

Series PRA 150g min., 650g max.

Series PRB 300g min., 700g max.

Series PRD 850g min., 1250g max.



### Materials and Finish

**Housing:** Nylon 6/6 UL 94V-2

**Rocker:** Nylon 6/6 UL 94V-2 or  
Polycarbonate UL 94V-2

**Contact:** Silver-tin Oxide

**Terminals, Active Contactor:** Silver  
plated copper alloy

**Plunger:** Nickel plated copper alloy

**Spring:** Steel Wire

### Standards & Specs

UL Approved - File No. E46765

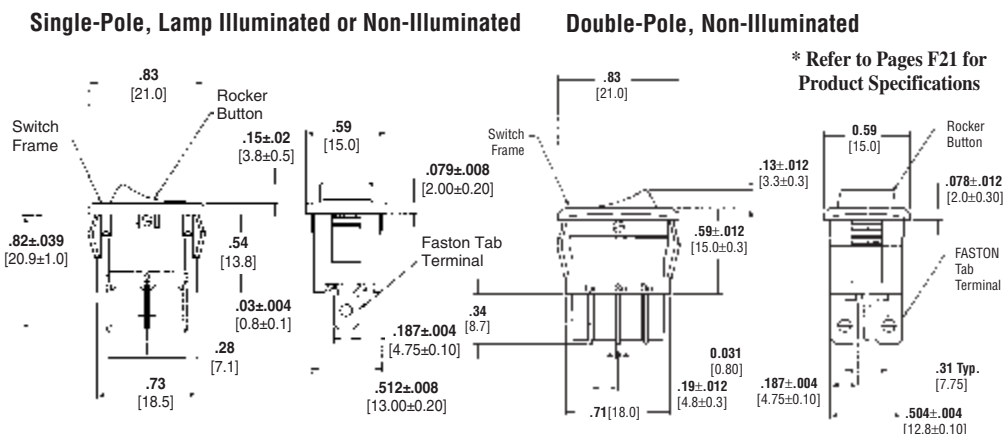
ENEC/VDE approval - File No.  
40006757 (PRA Single Pole Series  
only)

**.51 [13.0] x .76 [19.2] Panel Cutout**



## Product Facts

- **Easy to install snap-in mounting**
- **Dust resistant**
- **Dual color rocker option**
- **Full-illuminated rocker option**
- **LED or neon window illuminated option**
- **Wide range of marking options and functions available**
- **Solder lugs or .187 FASTON Tab terminals**
- **Cost competitive**



**Non-Illuminated Version Shown**

**Alcoswitch Part Number**

|                                                                                                           |    |   |   |    |   |    |   |   |   |   |   |   |
|-----------------------------------------------------------------------------------------------------------|----|---|---|----|---|----|---|---|---|---|---|---|
| <b>Switch Type</b>                                                                                        | PR | A | X | XX | - | XX | X | - | X | X | X | X |
| PR Power Rockers                                                                                          |    |   |   |    |   |    |   |   |   |   |   |   |
| <b>Panel Cut-out Size</b>                                                                                 |    |   |   |    |   |    |   |   |   |   |   |   |
| A .51 [13.0] x .76 [19.2]                                                                                 |    |   |   |    |   |    |   |   |   |   |   |   |
| <b>Number of Poles</b>                                                                                    |    |   |   |    |   |    |   |   |   |   |   |   |
| S Single Pole                                                                                             |    |   |   |    |   |    |   |   |   |   |   |   |
| D Double Pole                                                                                             |    |   |   |    |   |    |   |   |   |   |   |   |
| <b>Switch Functions</b>                                                                                   |    |   |   |    |   |    |   |   |   |   |   |   |
| A1 ON-OFF; opaque, single-color rocker button                                                             |    |   |   |    |   |    |   |   |   |   |   |   |
| A2 ON-OFF; opaque, dual-color rocker button                                                               |    |   |   |    |   |    |   |   |   |   |   |   |
| A3 (ON)-OFF; opaque, single-color rocker button                                                           |    |   |   |    |   |    |   |   |   |   |   |   |
| B1 ON-OFF; transparent, lamp-illuminated rocker button<br>(100-125 V lamp voltage)                        |    |   |   |    |   |    |   |   |   |   |   |   |
| B2 ON-OFF; opaque, with lamp window, lamp-illuminated rocker button<br>(100-125 V lamp voltage)           |    |   |   |    |   |    |   |   |   |   |   |   |
| B3 ON-OFF; transparent, lamp-illuminated rocker button<br>(200-250 V lamp voltage)                        |    |   |   |    |   |    |   |   |   |   |   |   |
| B4 ON-OFF; opaque, with lamp window, lamp-illuminated rocker button<br>(200-250 V lamp voltage)           |    |   |   |    |   |    |   |   |   |   |   |   |
| C1 ON-OFF; opaque, with LED window, LED-illuminated rocker button                                         |    |   |   |    |   |    |   |   |   |   |   |   |
| D1 ON-ON; opaque, single-color rocker button                                                              |    |   |   |    |   |    |   |   |   |   |   |   |
| D2 ON-(ON); opaque, single-color rocker button                                                            |    |   |   |    |   |    |   |   |   |   |   |   |
| D3 ON-OFF-ON; opaque, single-color rocker button                                                          |    |   |   |    |   |    |   |   |   |   |   |   |
| D4 ON-OFF-(ON); opaque, single-color rocker button                                                        |    |   |   |    |   |    |   |   |   |   |   |   |
| <b>Power Rating</b>                                                                                       |    |   |   |    |   |    |   |   |   |   |   |   |
| 07 7A @ 125 VAC; 6A @ 250 VAC (Double-pole only)                                                          |    |   |   |    |   |    |   |   |   |   |   |   |
| 16 16A, 1/3 Hp @ 125 VAC (Single-pole only)<br>10A, 1/2 Hp @ 250 VAC<br>10A 125V~ 6 (3)A 250V~<br>u 25T85 |    |   |   |    |   |    |   |   |   |   |   |   |

**Legend Text Color**

|                  |         |
|------------------|---------|
| 0 Not Applicable | R Red   |
| B Black          | W White |
| G Green          |         |

**Legend Text Pattern**

|                  |          |
|------------------|----------|
| 0 Not Applicable | E        |
| A Dot            | F -- o = |
| B o ~            | G   o    |
| C o !            | H ON OFF |
| D ==             | J ->     |

**Secondary Rocker Color, Window Color, or LED Color**

|                  |         |
|------------------|---------|
| 0 Not Applicable | C Clear |
| A Amber          | G Green |
| B Black          | R Red   |
|                  | W White |

**Rocker Color**

|         |         |
|---------|---------|
| A Amber | G Green |
| B Black | R Red   |
| C Clear | W White |

**Frame Color**

|         |  |
|---------|--|
| B Black |  |
| W White |  |

**Terminal Type**

|              |  |
|--------------|--|
| F FASTON Tab |  |
| L Solder Lug |  |

## Part No.

| Tyco Electronics | Alcoswitch       |
|------------------|------------------|
| 1571076-9        | PRASA1-16F-BB000 |
| 1-1571076-0      | PRASA1-16F-BB0BW |
| 1-1571076-1      | PRASA1-16F-BB0CW |
| 1-1571076-2      | PRASA1-16L-BB000 |
| 1-1571076-3      | PRASA1-16L-BB0BW |
| 1-1571076-4      | PRASA1-16L-BB0CW |
| 1-1571076-5      | PRASA1-16F-BR000 |
| 1-1571076-6      | PRASA1-16L-BR000 |
| 1-1571076-7      | PRASA2-16F-BBRBR |
| 2-1571076-0      | PRASA1-16F-BB0HW |
| 2-1571076-1      | PRASA3-16F-BB0JW |
| 1571078-2        | PRASB1-16F-BR000 |
| 1571078-4        | PRASB2-16F-BBR00 |
| 1571079-4        | PRASD1-16F-BB000 |
| 1571079-5        | PRASD1-16F-BB0DW |
| 1571079-6        | PRASD1-16F-BB0EW |

| Tyco Electronics | Alcoswitch       |
|------------------|------------------|
| 1571079-7        | PRASD3-16F-BB000 |
| 1571079-8        | PRASD3-16F-BB0FW |
| 1571079-9        | PRASD3-16F-BB0GW |
| 1-1571079-0      | PRASD2-16F-BB000 |
| 1-1571079-1      | PRASD2-16F-BB0DW |
| 1-1571079-2      | PRASD2-16F-BB0EW |
| 1-1571079-3      | PRASD4-16F-BB000 |
| 1-1571079-4      | PRASD4-16F-BB0FW |
| 1-1571079-5      | PRASD4-16F-BB0GW |
| 1571083-2        | PRASC1-16F-BBR00 |
| 1571084-1        | PRADA1-07F-BB000 |
| 1571084-2        | PRADA1-07F-BB0BW |
| 1571084-3        | PRADA1-07F-BB0CW |
| 1571084-4        | PRADA1-07F-BR000 |

| Tyco Electronics | Alcoswitch       |
|------------------|------------------|
| 1571084-5        | PRADA1-07F-BR0BW |
| 1571086-1        | PRADD1-07F-BB000 |
| 1571086-2        | PRADD1-07F-BB0DW |
| 1571086-3        | PRADD1-07F-BB0EW |
| 1571086-4        | PRADD3-07F-BB000 |
| 1571086-5        | PRADD3-07F-BB0FW |
| 1571086-6        | PRADD3-07F-BB0GW |
| 1571086-7        | PRADD2-07F-BB000 |
| 1571086-8        | PRADD2-07F-BB0DW |
| 1571086-9        | PRADD2-07F-BB0EW |
| 1-1571086-0      | PRADD4-07F-BB000 |
| 1-1571086-1      | PRADD4-07F-BB0FW |
| 1-1571086-2      | PRADD4-07F-BB0GW |

PVC Waterproof Cover: 1571786-

**PVC Waterproof Cover: 1571786-1**

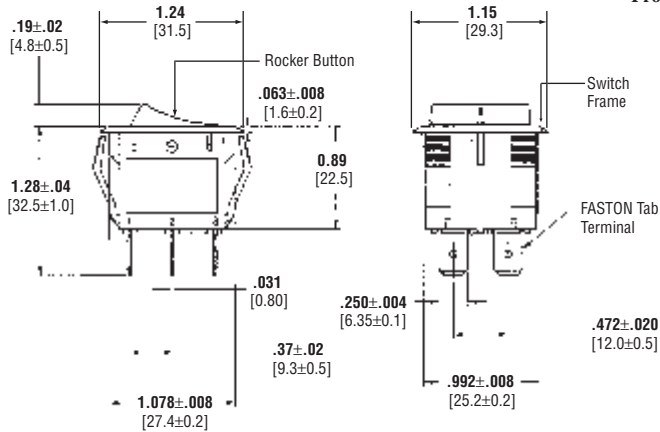


## 1.00 [25.4] x 1.09 [27.6] Panel Cutout



### Product Facts

- Easy to install snap-in mounting
- Full illuminated rocker option
- Wide range of marking options and functions available
- FASTON .250 Tab terminals
- Cost competitive



\* Refer to Pages F21 for Product Specifications

### Alcoswitch Part Number

|                                                                                 |    |   |   |    |    |   |   |   |   |   |   |
|---------------------------------------------------------------------------------|----|---|---|----|----|---|---|---|---|---|---|
| <b>Switch Type</b>                                                              | PR | D | D | XX | XX | X | X | X | X | X | X |
| PR Power Rockers                                                                |    |   |   |    |    |   |   |   |   |   |   |
| <b>Panel Cut-out Size</b>                                                       |    |   |   |    |    |   |   |   |   |   |   |
| B 1.00 [25.4] x 1.09 [27.6]                                                     |    |   |   |    |    |   |   |   |   |   |   |
| <b>Number of Poles</b>                                                          |    |   |   |    |    |   |   |   |   |   |   |
| S Double Pole                                                                   |    |   |   |    |    |   |   |   |   |   |   |
| <b>Switch Functions</b>                                                         |    |   |   |    |    |   |   |   |   |   |   |
| A1 ON-OFF; opaque, single-color rocker button                                   |    |   |   |    |    |   |   |   |   |   |   |
| B1 ON-OFF; transparent, lamp-illuminated rocker button (100-125 V lamp voltage) |    |   |   |    |    |   |   |   |   |   |   |
| B3 ON-OFF; transparent, lamp-illuminated rocker button (200-250 V lamp voltage) |    |   |   |    |    |   |   |   |   |   |   |
| D1 ON-ON; opaque, single-color rocker button                                    |    |   |   |    |    |   |   |   |   |   |   |
| D3 ON-OFF-ON; opaque, single-color rocker button                                |    |   |   |    |    |   |   |   |   |   |   |
| <b>Power Rating</b>                                                             |    |   |   |    |    |   |   |   |   |   |   |
| 16 16A, 1/3 Hp @ 125 VAC                                                        |    |   |   |    |    |   |   |   |   |   |   |
| 10A, 1/2 Hp @ 250 VAC                                                           |    |   |   |    |    |   |   |   |   |   |   |
| <b>Terminal Type</b>                                                            |    |   |   |    |    |   |   |   |   |   |   |
| F FASTON Tab                                                                    |    |   |   |    |    |   |   |   |   |   |   |
| <b>Legend Text Color</b>                                                        |    |   |   |    |    |   |   |   |   |   |   |
| 0 Not Applicable                                                                |    |   |   |    |    |   |   |   |   |   |   |
| B Black                                                                         |    |   |   |    |    |   |   |   |   |   |   |
| G Green                                                                         |    |   |   |    |    |   |   |   |   |   |   |
| R Red                                                                           |    |   |   |    |    |   |   |   |   |   |   |
| W White                                                                         |    |   |   |    |    |   |   |   |   |   |   |
| <b>Legend Text Pattern</b>                                                      |    |   |   |    |    |   |   |   |   |   |   |
| 0 Not Applicable                                                                |    |   |   |    |    |   |   |   |   |   |   |
| A Dot                                                                           |    |   |   |    |    |   |   |   |   |   |   |
| B o - -                                                                         |    |   |   |    |    |   |   |   |   |   |   |
| C o                                                                             |    |   |   |    |    |   |   |   |   |   |   |
| D - =                                                                           |    |   |   |    |    |   |   |   |   |   |   |
| E                                                                               |    |   |   |    |    |   |   |   |   |   |   |
| F - o =                                                                         |    |   |   |    |    |   |   |   |   |   |   |
| G   o                                                                           |    |   |   |    |    |   |   |   |   |   |   |
| H ON OFF                                                                        |    |   |   |    |    |   |   |   |   |   |   |
| <b>Secondary Rocker Color, Window Color, or LED Color</b>                       |    |   |   |    |    |   |   |   |   |   |   |
| 0 Not Applicable                                                                |    |   |   |    |    |   |   |   |   |   |   |
| <b>Rocker Color</b>                                                             |    |   |   |    |    |   |   |   |   |   |   |
| A Amber                                                                         |    |   |   |    |    |   |   |   |   |   |   |
| B Black                                                                         |    |   |   |    |    |   |   |   |   |   |   |
| C Clear                                                                         |    |   |   |    |    |   |   |   |   |   |   |
| G Green                                                                         |    |   |   |    |    |   |   |   |   |   |   |
| R Red                                                                           |    |   |   |    |    |   |   |   |   |   |   |
| W White                                                                         |    |   |   |    |    |   |   |   |   |   |   |
| <b>Frame Color</b>                                                              |    |   |   |    |    |   |   |   |   |   |   |
| B Black                                                                         |    |   |   |    |    |   |   |   |   |   |   |
| W White                                                                         |    |   |   |    |    |   |   |   |   |   |   |

### Part No.

| Tyco Electronics | Alcoswitch       |
|------------------|------------------|
| 1571103-1        | PRDDA1-16F-BB000 |
| 1571103-2        | PRDDA1-16F-BB0BW |
| 1571103-3        | PRDDA1-16F-BB0CW |
| 1571103-4        | PRDDA1-16F-BR000 |
| 1571103-5        | PRDDA1-16F-BB0HW |
| 1571103-6        | PRDDA1-16F-BR0HW |
| 1571113-7        | PRDDD3-16F-BR000 |

| Tyco Electronics | Alcoswitch       |
|------------------|------------------|
| 1571112-1        | PRddb1-16F-BR000 |
| 1571112-2        | PRddb1-16F-BA000 |
| 1571113-1        | PRddd1-16F-BB000 |
| 1571113-2        | PRddd1-16F-BB0DW |
| 1571113-3        | PRddd1-16F-BB0EW |
| 1571113-4        | PRddd3-16F-BB000 |
| 1571113-5        | PRddd3-16F-BB0FW |
| 1571113-6        | PRddd3-16F-BB0GW |



*MRC Series - Page G3*



*MRJ Series - Page G4*



*MRJE Series - Page G4*



*MRJB Series - Page G4*



*6000 Series - Page G5*



*3100 Series - page G9*





## Rotary Switches Part Number Index

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| 435987 .....  | G10 |
| 436022 .....  | G10 |
| 436024 .....  | G10 |
| 436028 .....  | G10 |
| 436037 .....  | G10 |
| 436287 .....  | G11 |

# Rotary Switches, 500m Amp, Adjustable Stop, 36° Throw

## MATERIAL SPECIFICATIONS:

Contacts .....Silver  
Case Material .....Aluminum  
Actuator Material .....Brass  
Terminals/Fixed Contacts.....Silver plated brass  
Terminal Seal .....Insert molded, DAP bas

## ENVIRONMENTAL SPECIFICATIONS:

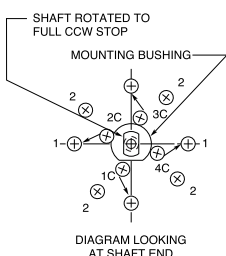
Operating Temperature.....-4°F to +176°F (-20°C to +80°C)  
Storage Temperature .....-4°F to +212°F (-20°C to +100°C)  
Solder Heat Resistance.....Manual: 270°C for 3 seconds  
Wave: 245°C for 3 seconds

**NOTICE: Set stop positions by presetting external pin plate provided.**

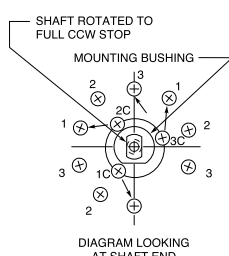
## TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....500 Milliamps @ 125 VAC or  
28 VDC resistive  
Initial Contact Resistance.....50 Milliohms max.  
Contact Timing.....Non-shorting  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....1,000 Volts RMS @ sea level  
Rotation Torque .....14 Inch ounce max.  
High Torque Bushing Shoulder .....Nickle plated brass  
Plunger/Actuator Travel.....36°  
Life Expectancy .....Up to 10,000 Cycles @ full contact  
rating  
Up to 25,000 Cycles @ 150 mA @  
125 VAC or 250 mA @ 28 VDC

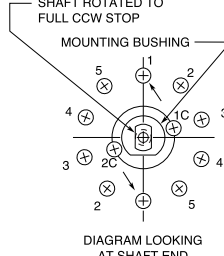
### 4 Pole, 2 Positions



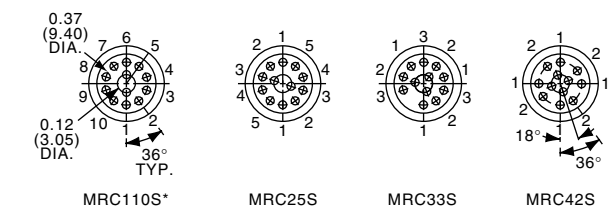
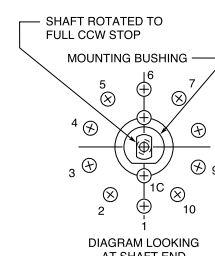
### 3 Pole, 2-3 Positions, Adjustable



### 2 Pole, 2-5 Positions, Adjustable

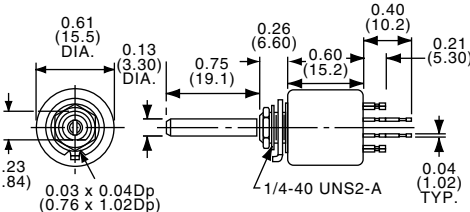


### 1 Pole, 2-10 Positions, Adjustable



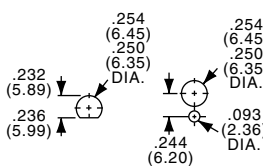
\* Two common terminals are internally shorted. Use either one.

## 36° ANGLE OF THROW



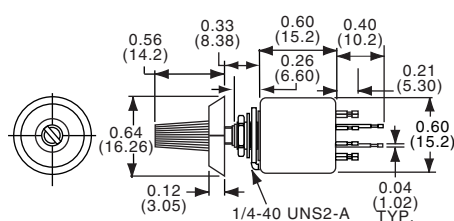
MRC33S

| Part Number      |            | No. Poles | Adjustable Positions |
|------------------|------------|-----------|----------------------|
| Tyco Electronics | Alcoswitch |           |                      |
| 1437629-2        | MRC110S    | 1 Pole    | 2 to 10 Positions    |
| 1437629-4        | MRC25S     | 2 Poles   | 2 to 5 Positions     |
| 1437629-6        | MRC33S     | 3 Poles   | 2 to 3 Positions     |
| 1437629-8        | MRC42S     | 4 Poles   | 2 Positions (fixed)  |

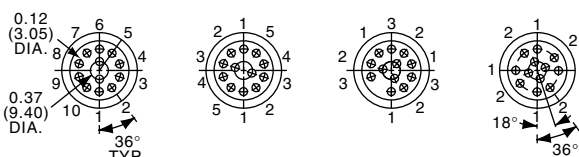


G  
MRC Series

## 36° ANGLE OF THROW



KNOB NOT SOLD SEPARATELY



\* Two common terminals are internally shorted. Use either one.



MRC25

| Part Number      |            | No. Poles | Adjustable Positions |
|------------------|------------|-----------|----------------------|
| Tyco Electronics | Alcoswitch |           |                      |
| 1437629-1        | MRC110     | 1 Pole    | 2 to 10 Positions    |
| 1437629-3        | MRC25      | 2 Poles   | 2 to 5 Positions     |
| 1437629-5        | MRC33      | 3 Poles   | 2 to 3 Positions     |
| 1437629-7        | MRC42      | 4 Poles   | 2 Positions (fixed)  |

## Rotary Switches, .4VA, PC Mount, 30° Throw

### MATERIAL SPECIFICATIONS:

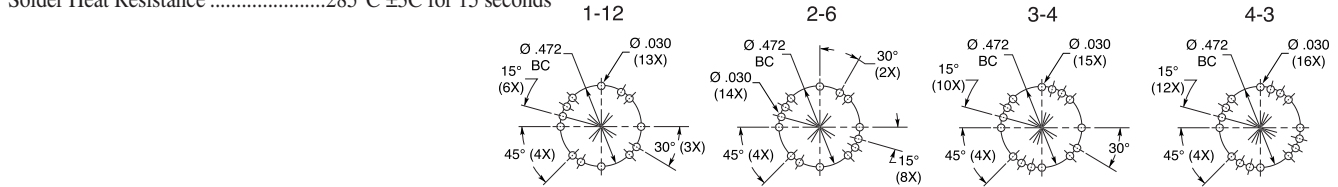
Contacts.....Gold plate over nickel plate  
Case Material .....Zinc die cast  
Actuator Material .....Brass  
Terminals/Fixed Contacts .....Gold plated  
Terminal Seal .....Molded-in epoxy base  
Process Seal .....MRJB and MRJE

### ENVIRONMENTAL SPECIFICATIONS:

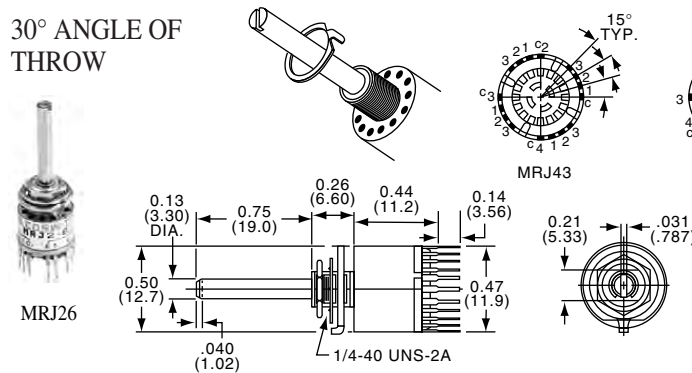
Operating Temperature.....-4°F to +158°F (-20°C to +70°C)  
Storage Temperature.....-4°F to +158°F (-20°C to +70°C)  
Solder Heat Resistance .....285°C ±3C for 15 seconds

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4VA max. @ 20 VDC or peak AC  
Initial Contact Resistance .....30 Milliohms max.  
Contact Timing .....Non-shorting  
Insulation Resistance .....10,000 Megohms min.  
Dielectric Strength .....1,000 Volts RMS @ sea level  
Actuation Force.....14 Inch oz. max.  
Plunger/Actuator Travel .....30°  
Life Expectancy .....Up to 10,000 Cycles @ full contact rating  
Up to 30,000 Cycles @ 0.1 mA, 12 VDC



### 30° ANGLE OF THROW



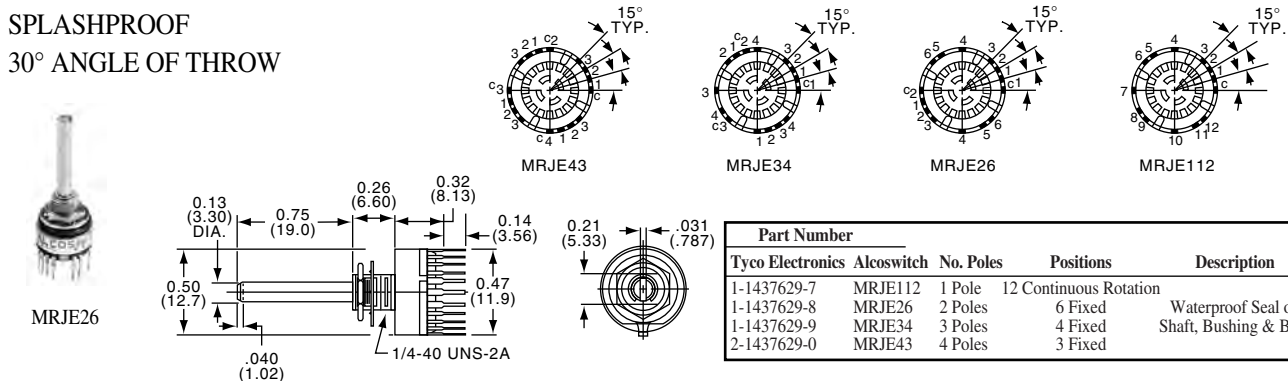
| Part Number      |            | No. Poles | Positions           | Description                     |
|------------------|------------|-----------|---------------------|---------------------------------|
| Tyco Electronics | Alcoswitch |           |                     |                                 |
| 1-1437629-9      | *MRJ112    | 1 Pole    | 2 to 12, Adjustable |                                 |
| 1-1437629-0      | MRJ26      | 2 Poles   | 2 to 6, Adjustable  | 3/4" long, 1/8" Diameter shaft. |
| 1-1437629-1      | MRJ34      | 3 Poles   | 2 to 4, Adjustable  |                                 |
| 1-1437629-2      | MRJ43      | 4 Poles   | 2 to 3, Adjustable  |                                 |

\* Also usable as continuous rotation.

Application Note: Set stop positions by presetting external pin plate provided.

### SPLASHPROOF

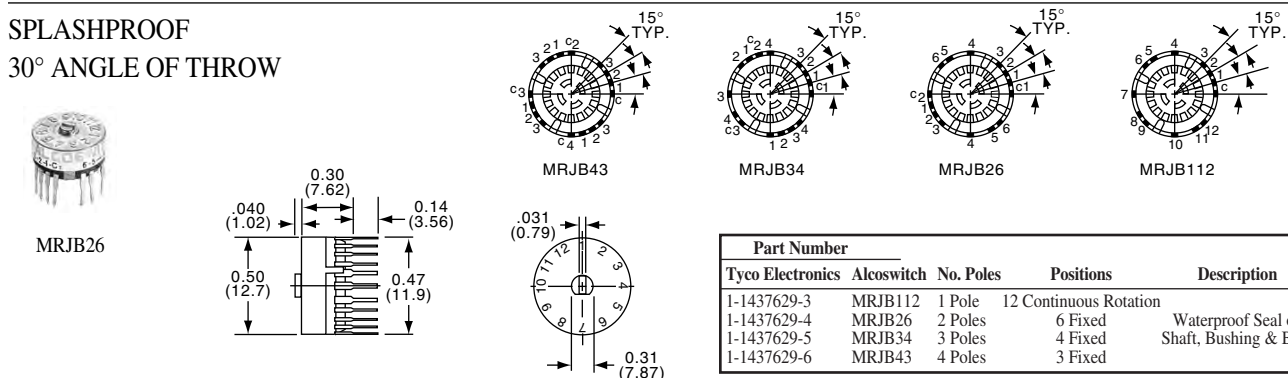
### 30° ANGLE OF THROW



| Part Number      |            | No. Poles | Positions              | Description                              |
|------------------|------------|-----------|------------------------|------------------------------------------|
| Tyco Electronics | Alcoswitch |           |                        |                                          |
| 1-1437629-7      | MRJE112    | 1 Pole    | 12 Continuous Rotation |                                          |
| 1-1437629-8      | MRJE26     | 2 Poles   | 6 Fixed                | Waterproof Seal on Shaft, Bushing & Base |
| 1-1437629-9      | MRJE34     | 3 Poles   | 4 Fixed                |                                          |
| 2-1437629-0      | MRJE43     | 4 Poles   | 3 Fixed                |                                          |

### SPLASHPROOF

### 30° ANGLE OF THROW



| Part Number      |            | No. Poles | Positions              | Description                              |
|------------------|------------|-----------|------------------------|------------------------------------------|
| Tyco Electronics | Alcoswitch |           |                        |                                          |
| 1-1437629-3      | MRJB112    | 1 Pole    | 12 Continuous Rotation |                                          |
| 1-1437629-4      | MRJB26     | 2 Poles   | 6 Fixed                | Waterproof Seal on Shaft, Bushing & Base |
| 1-1437629-5      | MRJB34     | 3 Poles   | 4 Fixed                |                                          |
| 1-1437629-6      | MRJB43     | 4 Poles   | 3 Fixed                |                                          |

## Rotary Switches, 6000 Series

Alcoswitch 6000 Series Rotary Switches are used in programming electrical and mechanical circuits in machine tools, test equipment, and input data terminals. These manually operated switches are specifically designed to be mounted on a pc board and offer output capabilities which include: 8-position binary-coded octal (BC), 10-position binary-coded decimal (BCD), 16-position hexadecimal plus 10- and 16-position single pole decimal. All switches feature a small diameter and very low profile.

In addition to varied output capabilities, these versatile Alcoswitch switches can also be supplied in three different styles, allowing you to select the operation method best suited to your specific application. One version incorporates a slot which accepts a screwdriver, coin or other similar device. This particular style permits operation of the switch without sacrificing overall height. Its height of .220 [5.59] above the pc board is no greater than the usual board-mounted discrete components. The other two versions have either a bar-type knob or thumbwheel for their operation. All three styles can be rotated bidirectionally.

Rugged construction, positive detent action contacts plus large, readable characters are additional features of the Alcoswitch 6000 Series PC Board Rotary Switches. All these features, coupled with a fully enclosed design for better environmental protection, provide excellent electrical and mechanical performance.

### PERFORMANCE CHARACTERISTICS

**Current/Voltage Rating**—  
Signal application only.  
**Dielectric Breakdown Voltage**—  
500 VDC min.  
**Insulation Resistance**—  
1 x 10<sup>8</sup> ohms  
**Initial Contact Resistance**—  
25 milliohms (at 50 millivolts, 100 milliamperes) closed circuit  
**Circuit Capacitance**—  
5 picofarads (at 100 KHz)  
**Durability**—  
1000 cycles  
**Operating Torque**—  
2 - 12 inch-ounces initial and after durability  
**Temperature Rating**—  
**Operating** — -18°C to +88°C  
**Storage** — -45°C to +88°C  
**Humidity**—  
Withstands an environment of +40°C and 95% RH for 96 hours

### MATERIALS

**Contacts**—  
Phosphor bronze, gold over nickel plated  
**Solder Tabs and Pins**—  
**Coded Switches** — Beryllium copper, tin plated  
**Single Pole Switches** — Brass, tin plated  
**Structural Parts** — Thermoplastic

#### Technical Documents

**Product Specification**—  
108-7514  
**Instruction Sheet**—  
408-07523  
**Application Specification**—  
114-7005

### Product Facts

- n **Compact design** — small diameter, low profile switches are ideal for pc board mounting
- n **Wide choice of outputs:** 8-position binary-coded octal, 10-position binary-coded decimal, 16-position hexadecimal and 10- and 16-position single pole
- n **Versatile application** — styles include slotted, bar-type and thumbwheel versions for hand rotation
- n **Positive switching** — contacts have positive detent action
- n **All positions are easily identified** by large readable characters or dots
- n **Optimum reliability** — fully enclosed design protects contacts against contamination

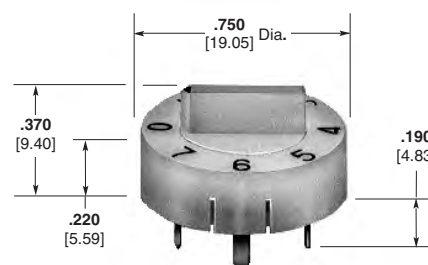
# Rotary Switches, PC Mount, 8 or 10 Positions

| Switch Position | Common to: |
|-----------------|------------|
| 0               | 1 2 3      |
| 1               |            |
| 2               |            |
| 3               |            |
| 4               |            |
| 5               |            |
| 6               |            |
| 7               |            |

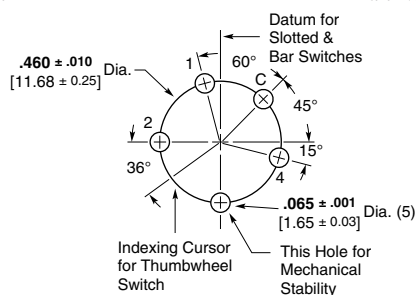


Screwdriver/Coin Actuated  
Part No. 435174-1

## 8-POSITION BINARY CODED OCTAL (BCO)



Bar-Type Knob  
Part No. 1- 435174-1 (Shown)



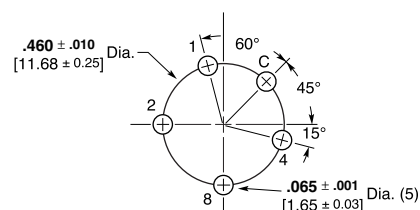
Recommended PC Board Hole Pattern  
(Switch Side)

| Switch Position | Common to: |
|-----------------|------------|
| 0               | 1 2 4 8    |
| 1               |            |
| 2               |            |
| 3               |            |
| 4               |            |
| 5               |            |
| 6               |            |
| 7               |            |
| 8               |            |
| 9               |            |

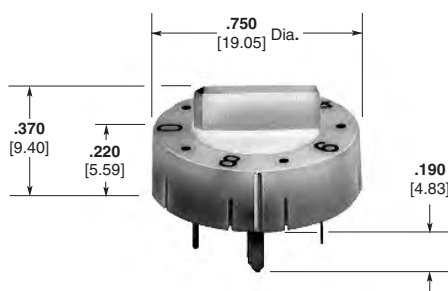


Screwdriver/Coin Actuated  
Part No. 435005-1

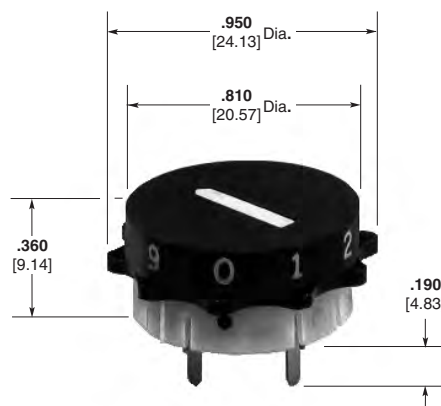
## 10-POSITION BINARY CODED DECIMAL (BCD)



Recommended PC Board Hole Pattern  
(Switch Side)



Bar-Type Knob  
Part No. 435123-1

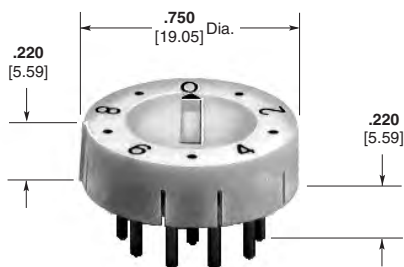


Thumbwheel  
Part No. 435128-1

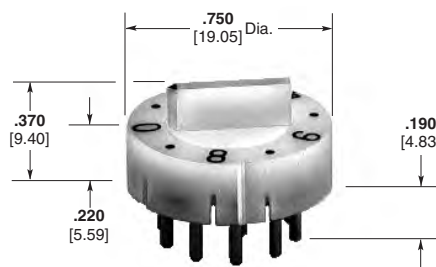
## Rotary Switches, PC Mount, 10 or 16 Position

### 10-POSITION SINGLE POLE

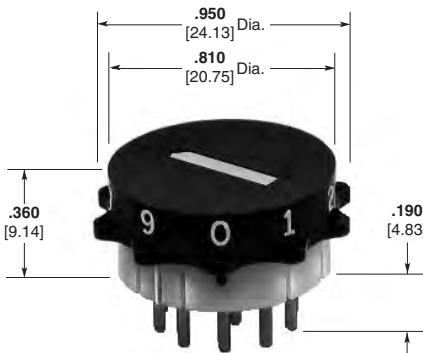
| Switch Position | Common to:          |
|-----------------|---------------------|
|                 | 0 1 2 3 4 5 6 7 8 9 |
| 0               | •                   |
| 1               | •                   |
| 2               | •                   |
| 3               | •                   |
| 4               | •                   |
| 5               | •                   |
| 6               | •                   |
| 7               | •                   |
| 8               | •                   |
| 9               | •                   |



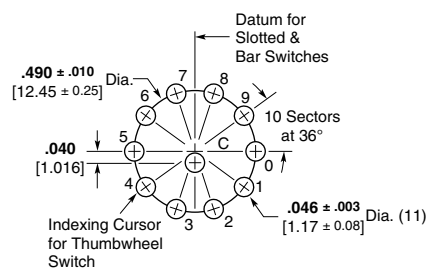
Screwdriver/Coin Actuated  
Part No. 1-435097-1



Bar-Type Knob  
Part No. 2-435097-1



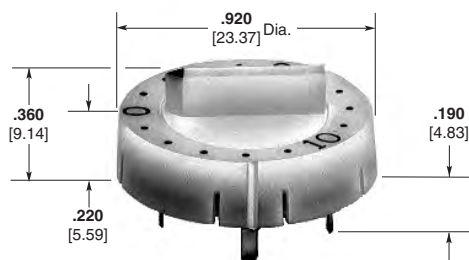
Thumbwheel  
Part No. 435097-1 (Shown)  
Part No. 435097-2 (With Numbers 1 - 10)



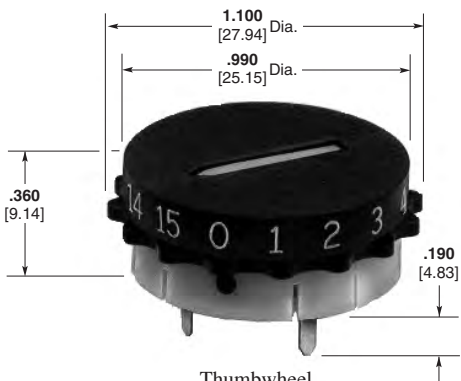
Recommended PC Board Hole Pattern  
(Switch Side)

### 16-POSITION HEXADECIMAL

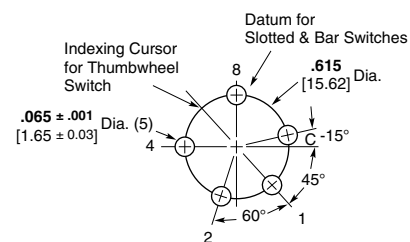
| Switch Position | Common to: |
|-----------------|------------|
|                 | 1 2 4 8    |
| 0               |            |
| 1               | •          |
| 2               | •          |
| 3               | •          |
| 4               | •          |
| 5               | •          |
| 6               | •          |
| 7               | •          |
| 8               | •          |
| 9               | •          |
| 10              | •          |
| 11              | •          |
| 12              | •          |
| 13              | •          |
| 14              | •          |
| 15              | •          |



Bar-Type Knob  
Part No. 1-435167-1



Thumbwheel  
Part No. 2-435167-1 (Shown)



Recommended PC Board Hole Pattern  
(Switch Side)



## 3100 Series Rotary Switches

Alcoswitch Rotary Switches provide a highly reliable means of manually programming various types of electronic equipment. They are specifically designed for logic level circuitry, but are capable of controlling electrical circuits that operate at current ratings of 2 amperes, 115 VAC (nonswitching) and up to 125 milliamperes, 115 VAC (switching).

Positive detent action, with a quick make/break operation, is provided by durable stainless steel balls and springs as well as the detents which form an integral part of the housing. All contact surfaces are fully enclosed within the housing, thus greatly reducing operational failures due to dirty contacts. The contacts are made of phosphor bronze with gold-over-nickel plating.

Alcoswitch Rotary Switches can be supplied with a variety of options to afford complete application versatility and adaptability. Output codes include decimal, BCD and BCD complement with 10, 12, 16, 24 and 32 switching positions.

Interconnection of switches may be achieved by the use of AMPMODU receptacles. Stops supplied with the switches may be customer installed when it is desired to limit rotation to less than 360°.

### PERFORMANCE CHARACTERISTICS

#### Circuit Current Rating—

**Nonswitching** — 2.0 amperes at 115 VAC max.

**Switching (Resistive Load)** — 125 milliamperes at 115 VAC max.

#### Dielectric Withstanding Voltage—

500 VDC

#### Insulation Resistance—

1 x 10<sup>8</sup> ohms min. at 100 VDC

#### Initial Contact Resistance—

150 milliohms (input terminal to output terminal)

#### Initial Operating Force—

1/2 to 2 in.-lbs.

#### Contact Life Expectancy—

25,000 rotations at rated load

#### Operating Temperature—

-18°C to +88°C

### MATERIALS

#### Housing—

Polyester, black

#### Detent Ball and Spring—

Stainless steel

#### Operating Shaft and Detent—

Thermoplastic, 94V-0 rated, black

#### Printed Circuit Board—

Flame retardant, glass epoxy laminate, copper clad

#### Contacts—

Phosphor bronze, gold-over-nickel plated

#### Hardware—

Brass or corrosion resistant steel

### TECHNICAL DOCUMENTS

#### Product Specification—

108-7518

#### Instruction Sheet—

408-07936

### Product Facts

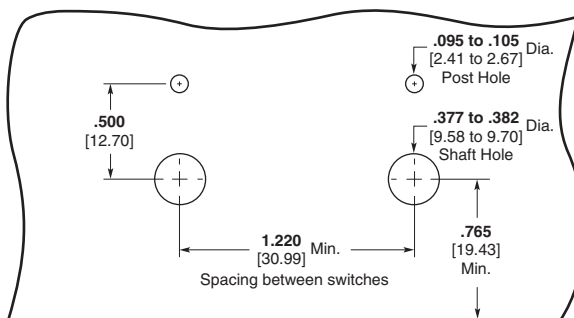
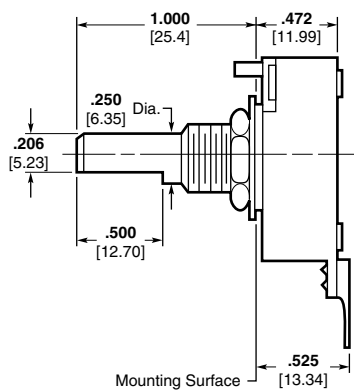
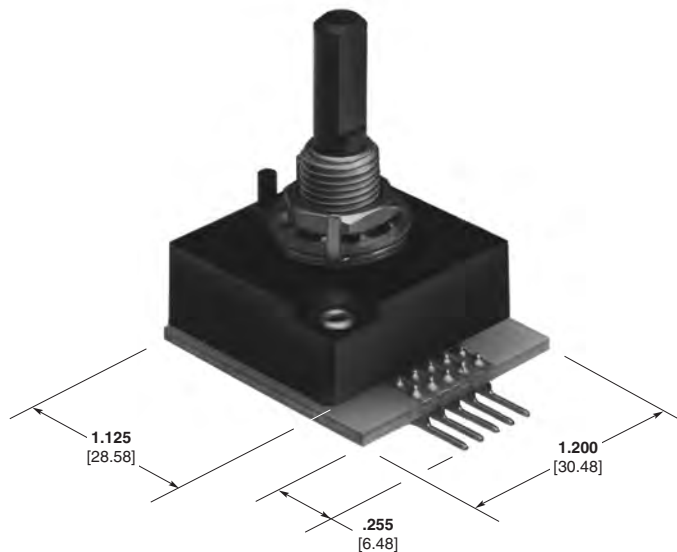
- ▮ **Code flexibility** — switch output capabilities include decimal, BCD and BCD complement, and various other codes
- ▮ **Positive switching** — positive detent action of stainless steel detent balls and springs assures error-free operation
- ▮ **Enclosed contacts** — contact surfaces are better protected against dirt, dust and other environmental hazards





**Rotary Switches, PC Mount, 10, 12 or 16 Position**

10-, 12- AND 16-POSITION  
SWITCHES

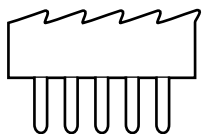


Panel Cutout

Note: See Section K for knob selection.

# Rotary Switches, PC Mount, 10, 12 or 16 Position

## CODING



Part No.

|   |   |   |   |   |            |
|---|---|---|---|---|------------|
| 2 | 1 | C | 8 | 4 | 435984-1,7 |
| 8 | 2 | 4 | 1 | C | 436037-1   |
| 1 | 2 | C | 8 | 4 | 435986-1   |
| 2 | C | 1 | 8 | 4 | 436022-1   |
| C | 4 | 8 | 1 | 2 | 436024-1   |
| 8 | 2 | 4 | C | 1 | 435987-1   |

10-Position  
36° Throw  
BCD

Part No. 435984-1 (Shown)

Part No. 435984-7 (Right Angle)

| Switch Position | Common to: |
|-----------------|------------|
|                 | 1 2 4 8    |
| 0               |            |
| 1               | •          |
| 2               | •          |
| 3               | • •        |
| 4               | •          |
| 5               | • •        |
| 6               | • •        |
| 7               | • • •      |
| 8               | •          |
| 9               | • •        |

12-Position  
30° Throw  
BCD

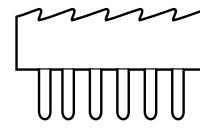
Part No. 436037-1

| Switch Position | Common to: |
|-----------------|------------|
|                 | 1 2 4 8    |
| 0               |            |
| 1               | •          |
| 2               | •          |
| 3               | • •        |
| 4               | •          |
| 5               | • •        |
| 6               | • •        |
| 7               | • • •      |
| 8               | •          |
| 9               | • •        |
| 10              | • •        |
| 11              | • • •      |

16-Position  
22½° Throw  
Hexadecimal

Part No. 435986-1

| Switch Position | Common to: |
|-----------------|------------|
|                 | 1 2 4 8    |
| 0               |            |
| 1               | •          |
| 2               | •          |
| 3               | • •        |
| 4               | •          |
| 5               | • •        |
| 6               | • •        |
| 7               | • • •      |
| 8               | •          |
| 9               | • •        |
| 10              | • •        |
| 11              | • • •      |
| 12              | • •        |
| 13              | • • •      |
| 14              | • • •      |
| 15              | • • • •    |



C 16 2 4 1 8

10-Position  
36° Throw  
BCD Complement

Part No. 436022-1

| Switch Position | Common to: |
|-----------------|------------|
|                 | 1 2 4 8    |
| 0               | • • • •    |
| 1               | • • • •    |
| 2               | • • • •    |
| 3               | • • • •    |
| 4               | • • • •    |
| 5               | • • • •    |
| 6               | • • • •    |
| 7               | • • • •    |
| 8               | • • • •    |
| 9               | • • • •    |

12-Position  
30° Throw  
BCD Complement

Part No. 436024-1

| Switch Position | Common to: |
|-----------------|------------|
|                 | 1 2 4 8    |
| 0               | • • • •    |
| 1               | • • • •    |
| 2               | • • • •    |
| 3               | • • • •    |
| 4               | • • • •    |
| 5               | • • • •    |
| 6               | • • • •    |
| 7               | • • • •    |
| 8               | • • • •    |
| 9               | • • • •    |
| 10              | • • • •    |
| 11              | • • • •    |

16-Position  
22½° Throw  
HEX Complement

Part No. 435987-1

| Switch Position | Common to: |
|-----------------|------------|
|                 | 1 2 4 8    |
| 0               | • • • •    |
| 1               | • • • •    |
| 2               | • • • •    |
| 3               | • • • •    |
| 4               | • • • •    |
| 5               | • • • •    |
| 6               | • • • •    |
| 7               | • • • •    |
| 8               | • • • •    |
| 9               | • • • •    |
| 10              | • • • •    |
| 11              | • • • •    |
| 12              | • • • •    |
| 13              | • • • •    |
| 14              | • • • •    |
| 15              | • • • •    |

24-Position  
15° Throw BCD

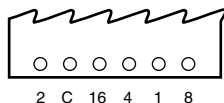
Part No. 436028-1

| Switch Position | Common to: |
|-----------------|------------|
|                 | 1 2 4 8 16 |
| 0               |            |
| 1               | •          |
| 2               | •          |
| 3               | • •        |
| 4               | •          |
| 5               | • •        |
| 6               | • •        |
| 7               | • • •      |
| 8               | •          |
| 9               | • •        |
| 10              | • •        |
| 11              | • • •      |
| 12              | • •        |
| 13              | • • •      |
| 14              | • • •      |
| 15              | • • • •    |
| 16              | •          |
| 17              | • •        |
| 18              | • •        |
| 19              | • • •      |
| 20              | • •        |
| 21              | • • •      |
| 22              | • • •      |
| 23              | • • • •    |

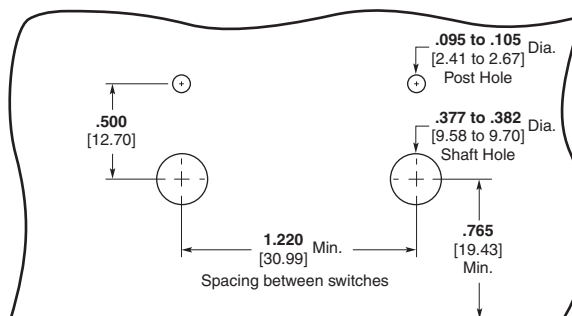
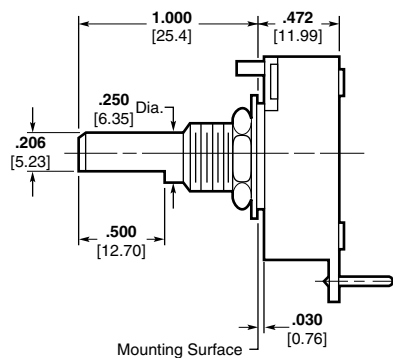
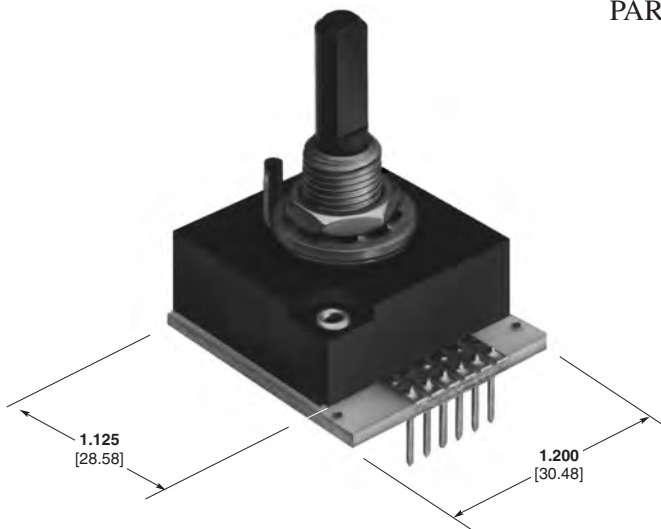
Note: See Section K for knob selection.

## Rotary Switches, PC Mount, 32 Position

32-POSITION  
11 1/4° THROW BCD  
PART NO. 436287-1



| Switch Position | Common to: |   |   |   |    |
|-----------------|------------|---|---|---|----|
|                 | 1          | 2 | 4 | 8 | 16 |
| 0               |            |   |   |   |    |
| 1               | •          |   |   |   |    |
| 2               |            | • |   |   |    |
| 3               | •          | • |   |   |    |
| 4               |            |   | • |   |    |
| 5               | •          |   | • |   |    |
| 6               |            | • | • | • |    |
| 7               | •          | • | • |   |    |
| 8               |            |   |   | • |    |
| 9               | •          |   |   | • |    |
| 10              |            | • |   | • |    |
| 11              | •          | • |   | • |    |
| 12              |            |   | • | • |    |
| 13              | •          |   | • | • |    |
| 14              |            | • | • | • |    |
| 15              | •          | • | • | • |    |
| 16              |            |   |   |   | •  |
| 17              | •          |   |   |   | •  |
| 18              |            | • |   |   | •  |
| 19              | •          | • |   |   | •  |
| 20              |            |   | • |   | •  |
| 21              | •          |   | • |   | •  |
| 22              |            | • | • |   | •  |
| 23              | •          | • | • |   | •  |
| 24              |            |   |   | • | •  |
| 25              | •          |   |   | • | •  |
| 26              |            | • |   |   | •  |
| 27              | •          | • |   |   | •  |
| 28              |            |   | • | • | •  |
| 29              | •          |   | • | • | •  |
| 30              |            | • | • | • | •  |
| 31              | •          | • | • | • | •  |



Note: See Section K for knob selection.

Panel Cutout

**Engineering Notes****G****Engineering Notes**

G12

Catalog 1308390  
Issued 9-04

[www.tycoelectronics.com](http://www.tycoelectronics.com)

Dimensions are in inches  
and millimeters unless otherwise  
specified. Values in parentheses  
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Dimensions are shown for  
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Specifications subject  
to change.

USA: 1-800-522-6752  
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C. America: 52-55-5-729-0425

South America: 55-11-3611-1514  
Hong Kong: 852-2735-1628  
Japan: 81-44-844-8013  
UK: 44-141-810-8967



2SWK Series - Page H2



SKF Series - Page H4



SKT Series - Page H3



SWK Series - Page H5

## Keylock Part Number Index

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| 2SKF132AEL01 ..... | H4 | SKT132GAEL01 ..... | H3 |
| 2SKF133AEL01 ..... | H4 | SKT331AEL01 .....  | H3 |
| 2SKF231AEL01 ..... | H4 | SKT331GAEL01 ..... | H3 |
| 2SWK131AL101 ..... | H2 | SKT332AEL01 .....  | H3 |
| 2SWK132AL101 ..... | H2 | SKT332GAEL01 ..... | H3 |
| 2SWK231AL101 ..... | H2 | SWK12 .....        | H5 |
| SKF1323AEL01 ..... | H4 | SWK121F315 .....   | H5 |
| SKT13 .....        | H3 | SWK123F315 .....   | H5 |
| SKT131AEL01 .....  | H3 | SWK12F315 .....    | H5 |
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| SKT1323AEL01 ..... | H3 | SWK1323AL101 ..... | H2 |

KEYLOCK

H

Keylock

## Key Switches, Medium Security

### MATERIAL SPECIFICATIONS

Contacts .....Silver  
Cylinder Material.....Zinc alloy  
Lock Body .....Zinc alloy  
Key Material .....Brass  
Terminals/Fixed Contacts ....Screw type  
Beveled Frame Finish .....302 Stainless steel

### ENVIRONMENTAL SPECIFICATIONS

Solder Heat Resistance .....See page M3-4

### TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating .....1A at 120 VAC resistive  
Initial Contact Resistance .....50 Milliohms max.  
Contact Timing.....Non-shorting  
Plunger/Actuator Travel .....90°  
Key Changes .....25 Standard  
Life Expectancy .....Up to 10,000 Cycles

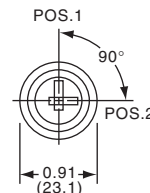
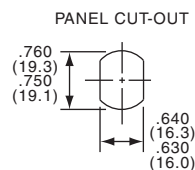
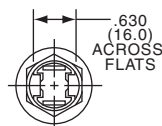
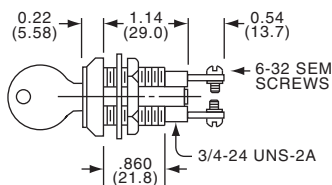
**NOTE: All Keylocks are supplied with 2 brass keys on a ring.**

### SPST

#### 5 Disc Tumblers



2SWK131



| Part Number      |              |      |        |        |                 | Part Number      |              |                                                                |        |        |            |
|------------------|--------------|------|--------|--------|-----------------|------------------|--------------|----------------------------------------------------------------|--------|--------|------------|
| Tyco Electronics | Alcoswitch   | Type | Pos. 1 | Pos. 2 | Remove Key      | Tyco Electronics | Alcoswitch   | Type                                                           | Pos. 1 | Pos. 2 | Remove Key |
| 1-1437597-7      | 2SWK131AL101 | SPST | Off    | On     | Position 1      | 2-1437597-7      | 2SWK231AL101 | SPST                                                           | Off    | (On)   | Position 1 |
| 2-1437597-3      | 2SWK132AL101 | SPST | Off    | On     | Position 1 or 2 | 4-1437597-3      | SWK1323AL101 | Spare Key for SWK Series<br>(On) indicates momentary position. |        |        |            |
|                  |              |      |        |        |                 |                  |              |                                                                |        |        |            |

## 2 Position Key Switch

### MATERIAL SPECIFICATIONS

|                          |                      |
|--------------------------|----------------------|
| Contacts                 | Gold or silver plate |
| Cylinder Material        | Zinc alloy           |
| Lock Body                | Zinc alloy           |
| Key Material             | Brass                |
| Terminals/Fixed Contacts | Tin lead plate       |
| Terminal Seal            | SP epoxy             |

### ENVIRONMENTAL SPECIFICATIONS

|                        |                                  |
|------------------------|----------------------------------|
| Operating Temperature  | -30°C to +85°C (-22°F to +185°F) |
| Storage Temperature    | -30°C to +85°C (-22°F to +185°F) |
| Solder Heat Resistance | See page M3-4                    |

### TYPICAL PERFORMANCE CHARACTERISTICS

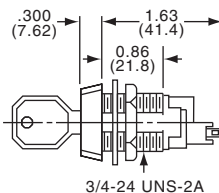
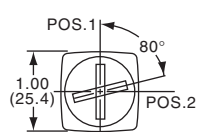
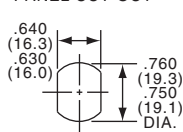
|                            |                                                                                   |
|----------------------------|-----------------------------------------------------------------------------------|
| Contact Rating             | Gold: 0.4 VA max. @ 20 VDC or peak AC<br>Silver: 3A @ 125 VAC or 28 VDC resistive |
| Initial Contact Resistance | 20 Milliohms max.                                                                 |
| Contact Timing             | Non-shorting                                                                      |
| Insulation Resistance      | 1,000 Megohms @ 500 VDC min.                                                      |
| Dielectric Strength        | 1,000 Volts @ sea level                                                           |
| Actuator Travel            | 80°                                                                               |

**Note:** All keylocks are supplied with 2 brass keys on a ring.

SPDT/DPDT

4 Disc Tumblers

PANEL CUT-OUT



SKT131

| Tyco Electronics | Alcoswitch   | Type                       | ①  | ②  | Remove Key | Contacts |
|------------------|--------------|----------------------------|----|----|------------|----------|
| 1437598-4        | SKT131AEL01  | SPDT                       | On | On | 1 Only     | Silver   |
| 1437598-5        | SKT131GAEL01 | SPDT                       | On | On | 1 Only     | Gold     |
| 1437598-7        | SKT132AEL01  | SPDT                       | On | On | 1 or 2     | Silver   |
| 1437598-8        | SKT132GAEL01 | SPDT                       | On | On | 1 or 2     | Gold     |
| 1437598-9        | SKT331AEL01  | DPDT                       | On | On | 1 Only     | Silver   |
| 1-1437598-0      | SKT331GAEL01 | DPDT                       | On | On | 1 Only     | Gold     |
| 1-1437598-1      | SKT332AEL01  | DPDT                       | On | On | 1 or 2     | Silver   |
| 1-1437598-3      | SKT332GAEL01 | DPDT                       | On | On | 1 or 2     | Gold     |
| 3-1437598-4      | SK1323AEL01  | Spare key for SKT13 Series |    |    |            |          |

H

SKT Series



## Medium Security Key Switch

### MATERIAL SPECIFICATIONS

Contacts .....Silver  
 Cylinder Material .....Zinc alloy  
 Lock Body .....Zinc alloy  
 Key Material .....Brass  
 Terminals/Fixed Contacts ...Screw type  
 Beveled Frame Finish .....Brushed chrome

### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature .....-22°F + 185° F (-30°C to +85°C)  
 Storage Temperature .....-22°F + 185° F (-30°C to +85°C)  
 Solder Heat Resistance .....See page M3-4

### TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating .....1 A @ 120 VAC resistive  
 Initial Contact Resistance ...50 Milliohms max.  
 Contact Timing .....Non-shorting  
 Actuator Travel .....90°  
 Key Changes .....10 Standard  
 Life Expectancy .....Up to 10,000 Cycles

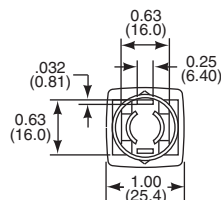
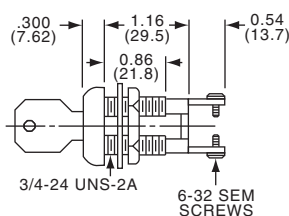
**NOTE: All Keylocks are supplied with 2 brass keys on a ring.**

### SPST

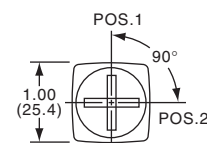
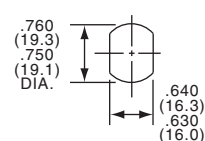
#### 4 Disc Tumblers



SKF131



#### PANEL CUT-OUT



| Tyco Electronics | Alcoswitch   | Type | Pos. 1 | Pos. 2 | Remove Key      | Tyco Electronics | Alcoswitch   | Type                               | Pos. 1 | Pos. 2 | Remove Key |
|------------------|--------------|------|--------|--------|-----------------|------------------|--------------|------------------------------------|--------|--------|------------|
| 1437597-1        | 2SKF131AEL01 | SPST | Off    | On     | Position 1      | 1-1437597-1      | 2SKF231AEL01 | SPST                               | Off    | (On)   | Position 1 |
| 1437597-7        | 2SKF132AEL01 | SPST | Off    | On     | Position 1 or 2 | 3-1437597-4      | SK1323AEL01  | Spare key for SK Series            |        |        |            |
| 1-1437597-0      | 2SKF133AEL01 | SPST | On     | Off    | Position 1      |                  |              | (On) indicates momentary position. |        |        |            |

## High Security Key Switch

### MATERIAL SPECIFICATIONS

Contacts .....Silver  
 Cylinder Material .....Zinc alloy  
 Lock Body .....Zinc alloy  
 Actuator Material .....Brass key  
 Terminals/Fixed Contacts.....Screw type  
 Beveled Frame Finish .....Polished chrome

### ENVIRONMENTAL SPECIFICATIONS

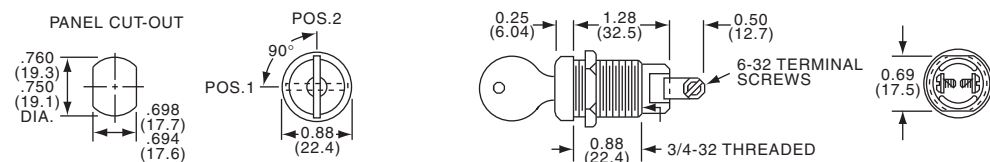
Operating Temperature.....-22°F to +185° (-30°C to +85°C)  
 Storage Temperature .....-22°F to +185° (-30°C to +85°C)  
 Solder Heat Resistance.....See page M3-4

### TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating .....5A @ 115 VAC, 15A @ 24 VDC  
 ..... resistive  
 Initial Contact Resistance ....50 Milliohms max.  
 Contact Timing .....Non-shorting  
 Dielectric Strength .....1,000 VAC @ sea level  
 Actuator Travel .....90°  
 Key Changes .....25 Standard  
 Life Expectancy .....Up to 20,000 Cycles

**NOTE: All Keylocks are supplied with 2 brass keys on a ring.**

SPST  
 8 Disc Tumblers



SWK12

| Tyco Electronics | Alcoswitch | Type                       | Pos. 1 | Pos. 2 | Remove Key      |
|------------------|------------|----------------------------|--------|--------|-----------------|
| 4-1437597-0      | SWK12F315  | SPST                       | On     | Off    | Position 1 or 2 |
| 3-1437597-6      | SWK121F315 | SPST                       | On     | Off    | Position 2      |
| 3-1437597-8      | SWK123F315 | SPST                       | On     | Off    | Position 1      |
| 4-1437597-2      | SWK12KF315 | Spare key for SWK12 Series |        |        |                 |

## Engineering Notes

H

Engineering Notes

H6

Catalog 1308390  
Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

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Hong Kong: 852-2735-1628  
Japan: 81-44-844-8013  
UK: 44-141-810-8967



*RT Series - Page I3  
22mm Mounting*



*QT Series - Page I4  
22mm Mounting*



*RM Series - Page I5  
22mm Mounting*



*Block Assemblies - Page I8*



*6000 Series - Page I11  
30mm Mounting*



*164/165 Command Series - Page I16  
16mm Mounting*

# Industrial Controls

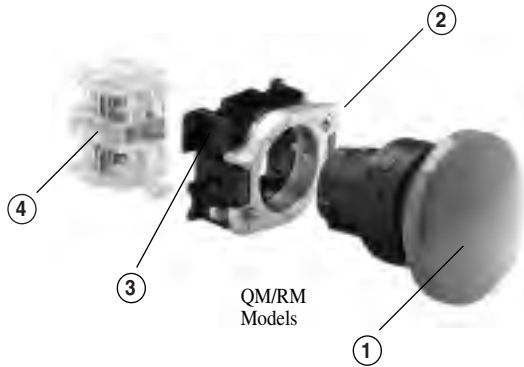
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| 164JB33 .....I17   | 381-AG .....I20      | RM130 .....I6        |                    |
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| 164JA33 .....I17   | 5B0 .....I6,I7,I15   | RM150 .....I6        |                    |
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| 164SL522 .....I16  | M6010 .....I11       | RM280 .....I6        |                    |
| 164SL533 .....I16  | M6020 .....I11       | RM3040 .....I5       |                    |
| 164SZ .....I18     | M60532 .....I11      | RM3100 .....I5       |                    |
| 164TL11 .....I16   | M6057 .....I11       | RM3120 .....I5       |                    |
| 164TL22 .....I16   | M60582 .....I11      | RM3130 .....I5       |                    |
| 164TL33 .....I16   | M60652 .....I11      | RM3700 .....I5       |                    |
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| 164TZ .....I18     | M6153(*)406 .....I13 | RM4100 .....I5       |                    |
| 165EL11 .....I16   | M6200 .....I13       | RM4120 .....I5       |                    |
| 165EL22 .....I16   | M6201 .....I13       | RM4130 .....I5       |                    |
| 165EL33 .....I16   | M6210 .....I13       | RM4700 .....I5       |                    |
| 165EL511 .....I16  | M6250 .....I13       | RM4800 .....I5       |                    |
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| 165EL533 .....I16  | M6280 .....I13       | RM650 .....I6        |                    |
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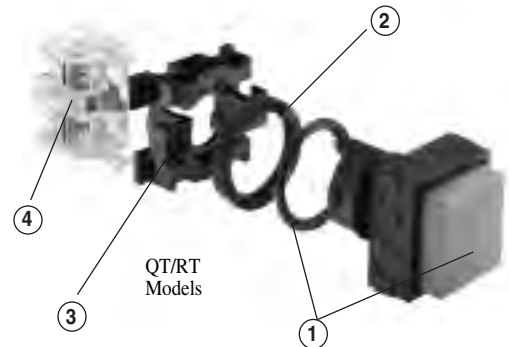
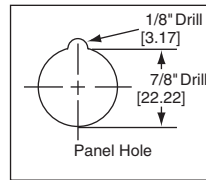
## Pushbutton Switches, 22mm, Oil-Tight, Round

### FEATURES

- Fits 7/8" (22mm) diameter holes
- Full size buttons
- Meets NEMA 1, 12 and 13
- Rugged heavy-duty metal bushing, or thermoplastic bushings for full installation
- Matte black beveled frame finish
- IP65 protection level
- Snap-block contacts
- 6A @ 600VAC, 6A @ 125VDC V40, V50, F40, F50  
6A @ 600VAC, 4A @ 125VDC VAO, VRO, FAO, FRO
- Easy "no tool" mounting
- Choice of screw terminals or dual .110/.250 quick connects
- Double-break silver contacts standard, gold plated optional
- Stackable



QM/RM  
Models



QT/RT  
Models

### INSTALLATION & ASSEMBLY

- Engage the operator (1) into the 22.5mm dia. mounting hole.
- Engage metal ring (2) with operator (bayonet lock). Tighten set screws against back of panel.
- Snap the contact blocks (4) on the support (3).
- Snap the support (3) complete with contact blocks (4) on the metal ring (2).

- Engage the operator and seal (1) into the 22.5mm dia. mounting hole.
- Mount back-up nut (2) on bushing and then tighten against panel.
- Snap the contact blocks (4) on the support (3).
- Snap the support (3) complete the contact blocks (4) onto operator (1).

### MOMENTARY

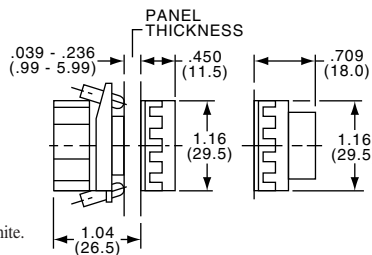
#### Metal Bushings

Contact blocks not supplied, order separately.  
(See page I8.)

| Model    | Type            |
|----------|-----------------|
| RM010(*) | Flush Button    |
| RM020(*) | Extended Button |
| RM015(*) | Extended Guard  |

(\*) Specify color by adding suffix number:  
(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (8) Grey, (9) White.

Note: Front beveled frame is black.



RM010(\*)

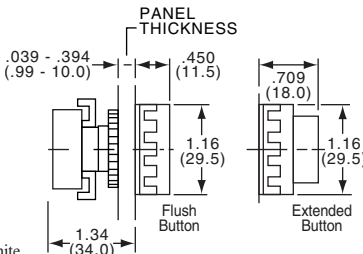
#### Thermoplastic Bushings (Threaded)

Contact blocks not supplied, order separately.  
(See page I8.)

| Model    | Type            |
|----------|-----------------|
| RT010(*) | Flush Button    |
| RT020(*) | Extended Button |

(\*) Specify color by adding suffix number:  
(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (8) Grey, (9) White.

Note: Front beveled frame is black.



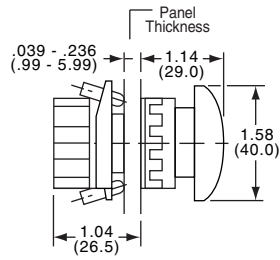
RT010

RT020

## Pushbutton Switches, 22mm, Oil-Tight, Round or Mushroom or Dual Button



RM0502



### MOMENTARY

#### Mushroom

Contact blocks not supplied, order separately. (See page I8.)

| Tyco Electronics | Alcoswitch | Type            | Bushing                         |
|------------------|------------|-----------------|---------------------------------|
| 3-1437614-7      | RM0502     | Mushroom, Red   | Metal, Bayonet                  |
| 1437615-2        | RT0502     | Mushroom, Red   | Thermoplastic, Threaded Bushing |
| 3-1437614-6      | RM0500     | Mushroom, Black | Metal, Bayonet                  |
| 1437615-1        | RT0500     | Mushroom, Black | Thermoplastic, Threaded Bushing |
| 3-1437614-9      | RM0552     | Mushroom, Red   | Metal, Bayonet (Wobble)         |
|                  | RT050(*)   | Mushroom        |                                 |

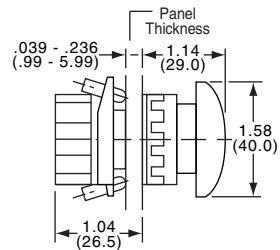
(\*) Specify color by adding suffix number:

(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue.

**Note: Front beveled frame is black.**



RM0652



### PUSH-TO-LOCK, TWIST-RELEASE

#### Metal Bushings

Contact blocks not supplied, order separately. (See page I8.)

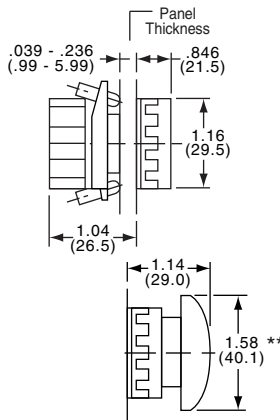
Note: Use F40/V40 for N.C. contacts, and FAO/VAO for N.O. contacts.

| Tyco Electronics | Alcoswitch | Type          | Arrow |
|------------------|------------|---------------|-------|
| 4-1437614-0      | RM0652     | Mushroom, Red | White |

**Note: Front beveled frame is black.**



RM030(\*)



### MAINTAINED

Contact blocks not supplied, order separately. (See page I8.)

Note: Use F40/V40 for N.C. contacts and FAO/VAO for N.O. contacts.

| Tyco Electronics | Alcoswitch | Type                     |
|------------------|------------|--------------------------|
| —                | RM030(*)   | Flush Button             |
| 3-1437614-4      | RM0450     | Mushroom, Black          |
| 3-1437614-5      | RM0452     | Mushroom, Red            |
| 3-1437614-8      | RM0532     | Push-Pull, Mushroom, Red |

(\*) Specify color by adding suffix number:

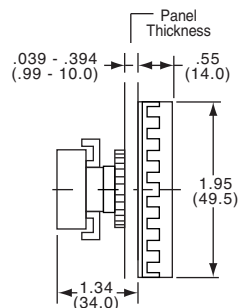
(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (8) Grey, (9) White.

**Note: Front beveled frame is black.**

**\*\* Note: RM0532 mushroom 35mm Dia. (1.38)**



QT01201



### MOMENTARY DUAL OPERATOR\*

#### Threaded Thermoplastic bushing

Contact blocks not supplied, order separately. (See page I8.)

Black buttons available.

| Tyco Electronics | Alcoswitch | Color      | Legend                  |
|------------------|------------|------------|-------------------------|
| 1437614-9        | QT01201    | Green, Red | As Shown                |
| —                | QT012STSTH | Green, Red | Start & Stop Horizontal |

\*Not oil tight construction, not sealed; meets NEMA 1 only.

**Note: Front beveled frame is black.**



## Pushbutton or Keylock or Selector Switches, 22mm, Oil-Tight

### MOMENTARY

#### Metal Bushings

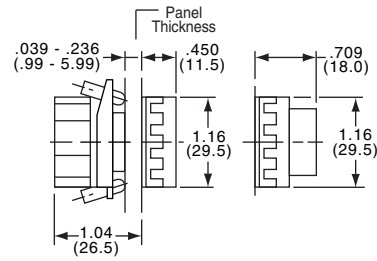
Contact blocks not supplied, order separately. (See page I8.)

| Model    | Type            |
|----------|-----------------|
| QM010(*) | Flush Button    |
| QM020(*) | Extended Button |

(\*) Specify color by adding suffix number:

(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (8) Grey, (9) White.

**Note: Front beveled frame is black.**



QM010(\*)

#### Thermoplastic Bushings (Threaded)

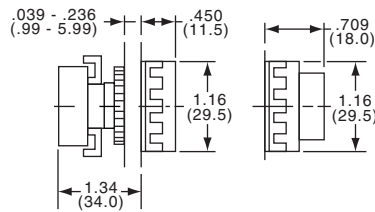
Contact blocks not supplied, order separately. (See page I8.)

| Model    | Type            |
|----------|-----------------|
| QT010(*) | Flush Button    |
| QT020(*) | Extended Button |

(\*) Specify color by adding suffix number:

(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (8) Grey, (9) White.

**Note: Front beveled frame is black.**



QT010(\*)

### 2 POSITION SELECTORS/KEYLOCK MAINTAINED

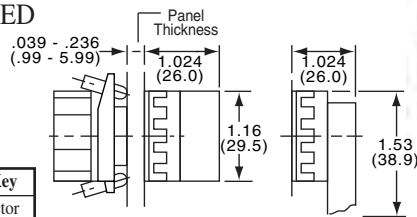
#### Metal Bushings

Contact blocks not supplied, order separately.

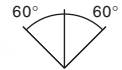
(See page I8.)

| Tyco Electronics | Alcoswitch | Action            | Throw | CAM | Remove Key    |
|------------------|------------|-------------------|-------|-----|---------------|
| 7-1437614-7      | RM4040     | Maintained, Black | 120°  | 1   | Long Selector |
| 7-1437614-0      | RM3040     | Maintained, Black | 120°  | 1   | Selector      |
| 5-1437614-4      | RM200      | Maintained        | 60°   | 1   | ⊙             |
| 5-1437614-5      | RM201      | Maintained        | 60°   | 1   | ⊗             |
| 6-1437614-5      | RM250      | Momentary, Right  | 60°   | 1   | ⊙             |
| 5-1437614-6      | RM204      | Maintained        | 120°  | 1   | ⊗             |
| 5-1437614-7      | RM205      | Maintained        | 120°  | 1   | ⊗             |
| 1437614-1        | E1         | Spare Key         |       |     | ⊗             |

**Note: Front beveled frame is black.**



RM4040



RM3040



RM200/201 with 2 keys

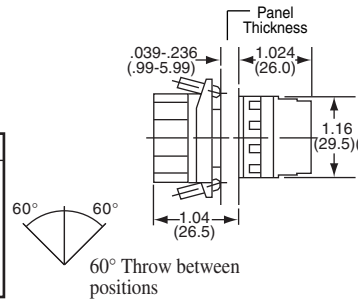
### 3 POSITION SELECTORS

#### Short Handle, Metal Bushings

Contact blocks not supplied, order separately. (See page I8.)

| Tyco Electronics | Alcoswitch | Action            | CAM | Tyco Electronics | Alcoswitch | Action                       | CAM |
|------------------|------------|-------------------|-----|------------------|------------|------------------------------|-----|
| 7-1437614-1      | RM3100     | Maintained, Black | 2   | 7-1437614-4      | RM3700     | Momentary, Right Side, Black | 2   |
| 7-1437614-2      | RM3120     | Maintained, Black | 3   | 7-1437614-5      | RM3800     | Double Momentary, Black      | 2   |
| 7-1437614-3      | RM3130     | Maintained, Black | 4   | 7-1437614-6      | RM3830     | Double Momentary, Black      | 4   |

**Note: Front beveled frame is black.**



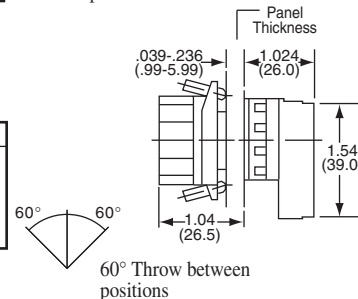
RM3100

#### Long Handle, Metal Bushings

Contact blocks not supplied, order separately. (See page I8.)

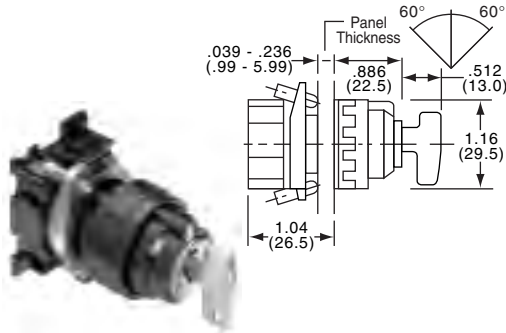
| Tyco Electronics | Alcoswitch | Action     | CAM | Tyco Electronics | Alcoswitch | Action                | CAM |
|------------------|------------|------------|-----|------------------|------------|-----------------------|-----|
| 7-1437614-8      | RM4100     | Maintained | 2   | —                | RM4700     | Momentary, Right Side | 2   |
| —                | RM4120     | Maintained | 3   | 7-1437614-9      | RM4800     | Double Momentary      | 2   |
| —                | RM4130     | Maintained | 4   |                  |            |                       |     |

**Note: Front beveled frame is black.**



RM4100

## Keylock or Pushbutton Switches, 22mm, Oil-Tight or Pilot Lights



Supplied with 2 keys

### 3 POSITION KEYLOCK SELECTOR MAINTAINED OR MOMENTARY

#### Metal Bushings

Contact blocks not supplied, order separately. (See page I8.)

| Tyco Electronics | Alcoswitch | Action     | CAM | Remove Key | Tyco Electronics | Alcoswitch | Action          | CAM | Remove Key |
|------------------|------------|------------|-----|------------|------------------|------------|-----------------|-----|------------|
| 5-1437614-8      | RM210      | Maintained | 2   | ⊙          | 6-1437614-4      | RM243      | Maintained      | 4   | ⊙          |
| 5-1437614-9      | RM220      | Maintained | 2   | ⊙          | 6-1437614-6      | RM270      | Mom. Right Side | 2   | ⊙          |
| 6-1437614-0      | RM222      | Maintained | 3   | ⊙          | 6-1437614-7      | RM272      | Mom. Right Side | 3   | ⊙          |
| 6-1437614-1      | RM230      | Maintained | 2   | ⊙          | 6-1437614-8      | RM273      | Mom. Right Side | 4   | ⊙          |
| 6-1437614-2      | RM232      | Maintained | 3   | ⊙          | 6-1437614-9      | RM280      | Mom. Both Sides | 2   | ⊙          |
| 6-1437614-3      | RM233      | Maintained | 4   | ⊙          | 1437614-1        | E1         | Spare Key       |     | ⊙          |
| —                | RM240      | Maintained | 2   | ⊙          |                  |            |                 |     |            |

Note: Front beveled frame is black.

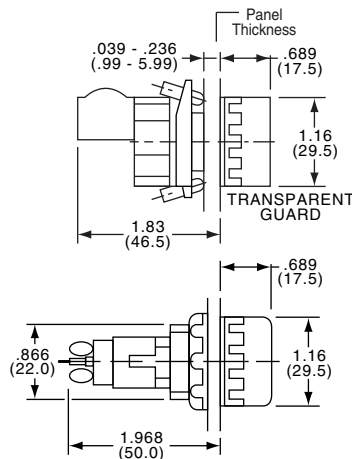


QM600  
(RM600)

Metal Bushing



SR601  
Threaded  
Thermoplastic  
Bushing Front lampable



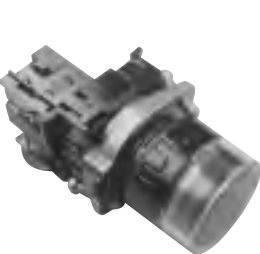
### PILOT LIGHTS (FULL VOLTAGE TYPE)

Lamps: order separately, miniature bayonet base. (See page I15.)

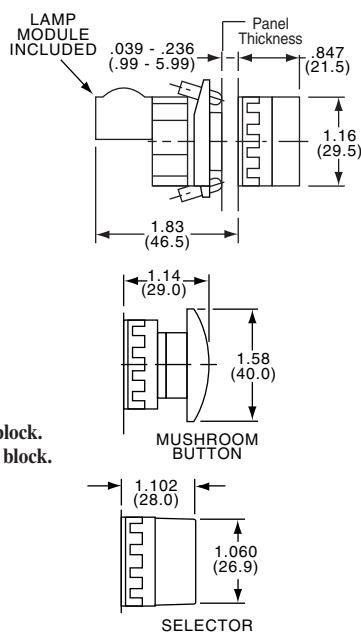
Lamps: use G3 1/2 on QM600(\*), use T3 1/4 on SR601(\*), RM600(\*). Custom legends available.

| Model    | Type                                          |
|----------|-----------------------------------------------|
| QM600(*) | Square pilot light, metal bushing             |
| SR601(*) | Round pilot light, plastic bushing screw turn |
| RM600(*) | Round pilot light, metal bushing              |

(\*) Specify color by adding suffix number: (2) Red, (3) Orange, (4) Yellow, (5) Green, (6) Blue, (9) White.



RM120(\*)



**Application Note:**  
+V40/F40 used for N.C contact block.  
+VA0/FA0 used for N.O. contact block.

### ILLUMINATED/ROUND MOMENTARY/MAINTAINED

#### Metal Bushing

Contact blocks not supplied, order separately. (See page I8.)

Lamp circuit isolated. Order lamp separately. (See page I15.)

Lamps: Use T-3 1/4 or G3 1/2 incandescent or neon lamps.

| Tyco Electronics             | Alcoswitch | Action        | Type               | Cam Type                                     |
|------------------------------|------------|---------------|--------------------|----------------------------------------------|
| —                            | RM120(*)   | Momentary     | Extended Button    |                                              |
| —                            | RM122(*)   | Momentary     | Guarded Button     |                                              |
| —                            | +RM130(*)  | Maintained    | Flush Button       | } Push-On - Push-Off<br>See Application Note |
| —                            | +RM145(*)  | Maintained    | Mushroom           |                                              |
| —                            | RM150(*)   | Momentary     | Mushroom           |                                              |
| 5-1437614-3                  | RM1652     | Twist Release | Mushroom, Red      |                                              |
| <b>Illuminated Selectors</b> |            |               |                    |                                              |
| —                            | RM650(*)   | Maintained    | 2-Pos. Selector**1 |                                              |
| —                            | RM653(*)   | Maintained    | 3-Pos. Selector**2 |                                              |

When operating from line voltage use step down transformers 5BO or 570. (See page I15.)

(\*) Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green, (6) Blue, (9) White.

Note: RM145 and RM150 available only in red, yellow, green.

\*\*Use G3 1/2 lamps only.

Note: Front beveled frame is black.

## Pushbutton Switches, 22mm, Oil-Tight, Round or Square Buttons

### SQUARE, MOMENTARY ILLUMINATED

Metal Bushing

Contact blocks not supplied, order separately. (See page I8.)

Lamp circuit isolated. Order lamps separately.

Lamps: Use G3 1/2. (See page I15.)

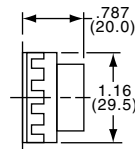
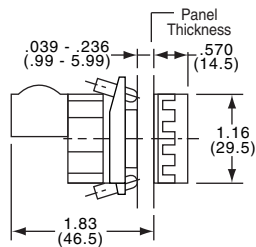
Custom legends available.

| Model    | Type            |
|----------|-----------------|
| QM122(*) | Flush Button    |
| QM120(*) | Extended Button |

When operating from line voltage use step down transformers 5B0 or 570. (See page I15.)

(\*) Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green, (6) Blue, (9) White.

**Note: Front beveled frame is black.**



QM122(\*)



QM120(\*)

### ROUND, MOMENTARY ILLUMINATED

Thermoplastic

Contact blocks not supplied, order separately. (See page I8.)

Lamp circuit isolated. Order lamps separately. (See page I15.)

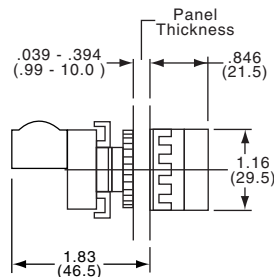
Lamps: use T-3 1/4 or G3 1/2 incandescent or neon lamps.

| Model    | Action    | Type            |
|----------|-----------|-----------------|
| RT120(*) | Momentary | Extended Button |

When operating from line voltage use step down transformers 5B0 or 570. (See page I15.)

(\*) Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green, (6) Blue, (9) White.

**Note: Front beveled frame is black.**



RT120(\*)

## Standard Contact Blocks

An almost unlimited number of circuit control options are possible using various combinations of contact blocks. 8 different "V" or "F" family modular blocks may be used with any operator in the Reliant 22, 2200 or 6000 series, depending on circuit requirements and operator design. The exclusive SNAP-BLOC design permits assembly without the use of tools – no screws or hardware to get lost. Choose either screw terminals or dual

male .110"/.250" quick connect terminals. Plunger color indicates closure mode. The double break silver contacts are enclosed in a tough transparent polycarbonate housing, permitting visual inspection of contacts. Designed-in rocking action for long, reliable life; over several million operations in normal use. Operating temperature range: -25°C to +60°C. Storage temp. -40°C to +80°C.

### Application Notes

1. A total of 4 (2 upper and 2 lower) contact blocks may be stacked and snap-mounted in either the upper and/or lower position on the back on any Reliant 22, Series 4000 or 6000 operator.
2. In order to maintain optimum insulating distances when contact blocks are stacked, wiring connections should be in same polarity for operation above 300VAC.
3. Blocks may be prewired and snapped into place for easier assembly.
4. Remove blocks by simply prying tabs. Small screwdriver is all that is necessary.

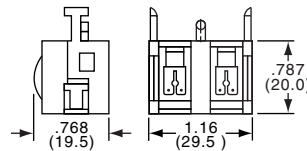
F&V Contact blocks are UL recognized. File Number E-60363  
CSA LR-20785-19 CE MARK

### ELECTRICAL CONTACT RATINGS

| Condition       | Function                           | Standard Series<br>(600 VAC Max.) |            |            |
|-----------------|------------------------------------|-----------------------------------|------------|------------|
|                 |                                    | 120V                              | 300V       | 600V       |
| AC Operation    | Inductive Loads                    | Make<br>30A<br>6A                 | 12A<br>6A  | 6A<br>6A   |
|                 |                                    |                                   |            |            |
|                 | Break<br>.350 P.F. min.            | 3A<br>6A                          | 1.2A<br>6A | 0.6A<br>6A |
|                 |                                    |                                   |            |            |
| Resistive Loads | Make, Continuous<br>.750 P.F. min. | 6A                                | 6A         | 6A         |
|                 | Carry & Break                      |                                   |            |            |
| DC Operation    | Inductive &<br>Resistive           | 1.1A<br>6A                        | 6A         | 6A         |
|                 |                                    |                                   |            |            |
|                 | Loads                              | 1.1A                              |            |            |



F Series



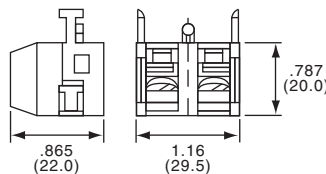
### QUICK CONNECT

| Tyco Electronics | Alcoswitch | Contacts        | Plunger Color |
|------------------|------------|-----------------|---------------|
| 1437612-9        | F40        | Normally Closed | Red           |
| 1-1437612-0      | F50        | Normally Open   | Green         |
| 1-1437612-1      | FA0        | N.O. Early Make | Yellow        |
| 1-1437612-2      | FR0        | N.C. Late Break | Black         |

Note: FA0 and FR0 contacts "overlap."



V Series



### SCREW TERMINAL

| Tyco Electronics | Alcoswitch | Contacts        | Plunger Color |
|------------------|------------|-----------------|---------------|
| 1-1437612-3      | V40        | Normally Closed | Red           |
| 1-1437612-5      | V50        | Normally Open   | Green         |
| 1-1437612-8      | VA0        | N.O. Early Make | Yellow        |
| 1-1437612-9      | VR0        | N.C. Late Break | Black         |

Note: "V" Series is available with gold plated contacts; order V40G, V50G, VA0G, VR0G. Note: VAO and VRO contacts "overlap."

## Series 6000 and Reliant'22 Contact Selection

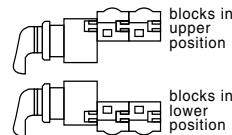
- Determine how many contacts are required for the application, and what contact closure sequence is needed for each contact.
  - 2-Position Operators: There are only two practical possibilities for contact closure sequence. Using "O" to indicate an open and "X" to indicate a closed contact, the options are shown in the table to the right. All Reliant 22 and Series 6000 2-position selection selector and keylock operators provide these options.
  - 3-Position Operators: There are six practical possibilities for contact closure sequence. Using "O" to indicate an open contact, and "X" to indicate a closed contact, the options are shown in the table to the right. Four different cam types are available to provide various combinations of contact closure sequence. Cam Type 2 (see table below) provides the most popular closure sequence, and Cam Type 3 provides all six possibilities, depending on the contact block models chosen. Note that each operator has an upper and lower contact block location, and that the cam profiles are different for upper and lower locations, except for Cam Type 2.
- Make a truth table similar to that shown in the example at the bottom of the page, in which each contact required by the circuit of the application is represented. Up to 12 contacts may be used for each operator, depending on the sequences required and the types of contact blocks chosen.
- Refer to the contact sequence table (below). Find the cam type that will provide all of the required contact closure sequences, and note which contact block model will be needed for each circuit contact.
- Now refer to the tables on pages I5-I6 for 22mm and pages I12-I13 for 30mm to find the operator model that has the cam type needed in the application and that provides the desired features with respect to action (maintained or momentary) type of actuator (lever or key), etc.

| 2 Position Operators |       |
|----------------------|-------|
| 0                    | 1     |
| left                 | right |
| O                    | X     |
| X                    | O     |

| 3 Position Operators |        |       |
|----------------------|--------|-------|
| 2                    | 0      | 1     |
| left                 | center | right |
| O                    | O      | X     |
| X                    | O      | O     |
| O                    | X      | X     |
| X                    | X      | O     |
| O                    | X      | O     |
| X                    | O      | X     |

### SELECTOR & KEYLOCK OPERATORS

ALCOSWITCH selector and keylock operators, in combination with the contact blocks listed on page I8, are designed to fulfill the circuit requirements of almost any 2- or 3-position control application. Each operator has two locations (upper and lower) into which contact blocks may be snap-mounted. Up to four contact blocks may be stacked in each location, the maximum number depending on the contact block models chosen and the contact closure sequences required. (Note: only one logic level block may be used in each location.)



### CONTACT CLOSURE SEQUENCE CHART

| Contact Blocks    |                                          | 2-Position Operators |           | 3-Position Operators |           |                   |  |                   |           |                   |           |                   |  |
|-------------------|------------------------------------------|----------------------|-----------|----------------------|-----------|-------------------|--|-------------------|-----------|-------------------|-----------|-------------------|--|
| Model             | CAM Type 1<br>upper & lower<br>locations | CAM Type 2           |           |                      |           | CAM Type 3        |  |                   |           | CAM Type 4        |           |                   |  |
|                   |                                          | upper<br>location    |           | lower<br>location    |           | upper<br>location |  | lower<br>location |           | upper<br>location |           | lower<br>location |  |
|                   | 0    1                                   | 2   0   1            | 2   0   1 |                      | 2   0   1 | 2   0   1         |  | 2   0   1         | 2   0   1 |                   | 2   0   1 | 2   0   1         |  |
| V40 or F40 Red    | X    0                                   | X   0   0            | X   0   0 |                      | X   0   0 | 0   X   0         |  | X   0   0         | 0   X   0 |                   | 0   X   X | X   X   0         |  |
| V50 or F50 Green  | 0    X                                   | 0   0   X            | 0   0   X |                      | 0   0   X | 0   0   X         |  | 0   0   X         | 0   0   X |                   | X   0   0 | 0   0   X         |  |
| VA0 or FA0 Yellow | 0    X*                                  | 0   X   X            | 0   X   X |                      | 0   X   X | X   0   X         |  | X   0   X         | X   0   X |                   | X   0   0 | 0   0   X         |  |
| VR0 or FR0 Black  | X    0*                                  | X   X   0            | X   X   0 |                      | X   X   0 | X   X   0         |  | 0   X   X         | X   X   0 |                   | 0   X   X | X   X   0         |  |

X = Closed 0 = Open

\*VA0 and FA0 contacts overlap with VR0 and FR0 contacts between position of 2 position operators providing "Make Before Break" action.

Example: An "Off-On-Reset" circuit control requires a 3-position or 2-position keylock switch. The key is to be removable in the "OFF" and "ON" position and the "Reset" position must be momentary (spring return from right to center). All contacts are open in the "Off" position, and two contacts are closed in the "On" position. In the "Reset" position a third contact must close and one of the contacts

in the "on" position must open. This contact closure sequence is shown by the following truth table:

| Contact Number | Off (2) | On (0) | Reset (1) |
|----------------|---------|--------|-----------|
| 1              | O       | X      | X         |
| 2              | O       | X      | O         |
| 3              | O       | O      | X         |

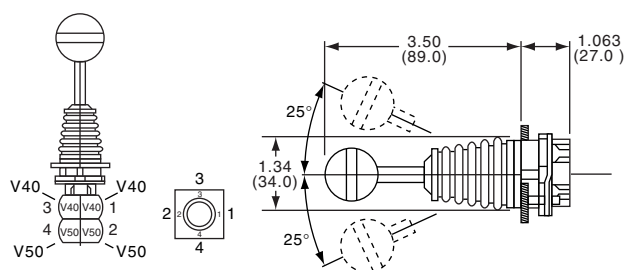
Referring to the Contact Closure Sequence Table, it is seen that cam Type 3 provides these sequences. In addition, the contact block models that should be used are given; model VA0 (or FA0) for contact No. 1, to be installed in the upper contact block location; model V40 (or F40) for contact No. 2, to be installed in the lower

contact block location; and model V50 (or F50) for contact No. 3, which may be used in either the upper or lower contact block location, behind one of the other two blocks. Reference to the operator model listings shows that model RM272 provides cam Type 3 and has desired momentary action and key removability.

## Joystick, 22mm



M25310



### 5 POSITION JOYSTICK (4 Action + Center-Off)

#### Metal Bushing

Maintained or momentary models, inherent design requires use of N.O. and N.C. contact blocks. Supplied with legend plate, and black knob. Contact blocks not supplied, order separately. (See page I8.)

| Tyco Electronics | Alcoswitch | Description            |      |      |     |      |      |
|------------------|------------|------------------------|------|------|-----|------|------|
| 1437609-2        | M25310     | Momentary, 3 Position  | —    | (ON) | OFF | (ON) | —    |
| 1437609-3        | M25500     | Maintained, 5 Position | ON   | ON   | OFF | ON   | ON   |
| 1437609-4        | M25510     | Momentary, 5 Position  | (ON) | (ON) | OFF | (ON) | (ON) |

(ON) indicates momentary position

**Note:** All positions are mutually exclusive and action must pass through neutral for all changes of operator level.

### CONTACT ARRANGEMENT

Contact blocks should be placed as shown. All contacts are held open in neutral position. Each numbered contact closed when activated. M25310 operators require one N.O. and one N.C. contact block, and M25500 and M25510 require two N.O. and two N.C. blocks.



## Pushbutton Switches, 30mm, Round or Mushroom Buttons

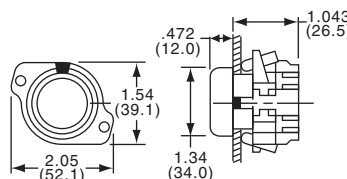
### FLUSH GUARD MOMENTARY

Metal Bushing

Contact blocks not supplied, order separately. (See page I8.)

| Model    | Special Details |
|----------|-----------------|
| M6010(*) | Momentary       |

(\*) Specify color by adding suffix number:  
(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (9) White.



M6010(\*)

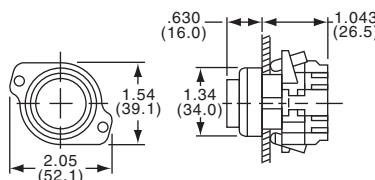
### EXTENDED BUTTON MOMENTARY

Metal Bushing

Contact blocks not supplied, order separately. (See page I8.)

| Model    | Special Details |
|----------|-----------------|
| M6020(*) | Momentary       |

(\*) Specify color by adding suffix number:  
(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (9) White.



M6020(\*)

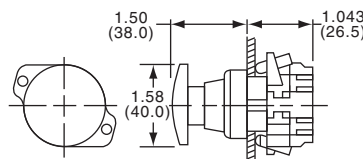
### MUSHROOM HEAD MOMENTARY PUSH MAINTAINED

Metal Bushing

Contact blocks not supplied, order separately. (See page I8.)

| Tyco Electronics | Alcoswitch | Special Details            | Color |
|------------------|------------|----------------------------|-------|
| —                | M6057(*)   | Momentary                  | (*)   |
| 1437610-6        | M60532     | Push-Pull                  | Red   |
| 1-1437610-3      | M60652     | Push-Lock/Twist To Release | Red   |

(\*) Specify color by adding suffix number:  
(0) Black, (2) Red, (3) Orange, (4) Yellow, (5) Green, (6) Blue, (9) White.



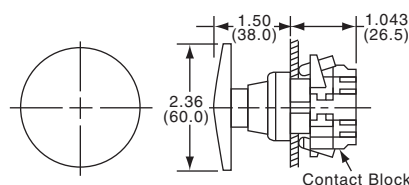
M6057(\*)

### LARGE MUSHROOM HEAD MOMENTARY PUSH

Metal Bushing

Contact blocks not supplied, order separately. (See page I8.)

| Tyco Electronics | Alcoswitch | Special Details | Color |
|------------------|------------|-----------------|-------|
| 1-1437610-2      | M60582     | Momentary       | Red   |



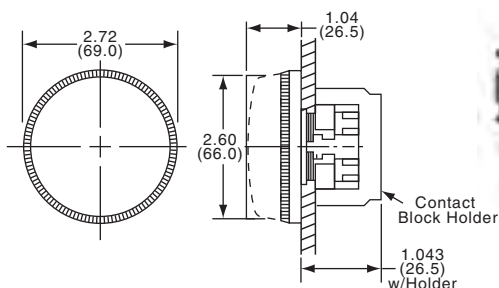
M60582

### LARGE GUARDED MUSHROOM HEAD MOMENTARY PUSH

Metal Bushing. Heavy duty metal bushing and guard.  
Contact blocks not supplied, order separately. (See page I8.)

| Model    | Special Details |
|----------|-----------------|
| M6080(*) | Momentary       |

(\*) Specify color by adding suffix number: (0) Black, (2) Red, (5) Green.



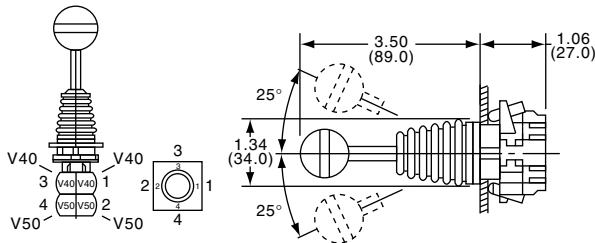
M6080(\*)



## Selector Switches or Joysticks, 30mm



M65510



### 5-POSITION JOYSTICK (4 Active & Center-Off)

#### Metal Bushing

Maintained or momentary model with or without mechanical latch. Inherent design requires use of N.O. and N.C. Contact blocks not supplied, order separately. (See page I8.) Supplied with legend plate (1-2-3-4), black knob.

#### CONTACT ARRANGEMENT

Contact blocks should be placed as shown. All contacts are held open in neutral position. Each number contact closed when activated. Model M65310 has only two active positions, requires one N.O. and one N.C. contact block.

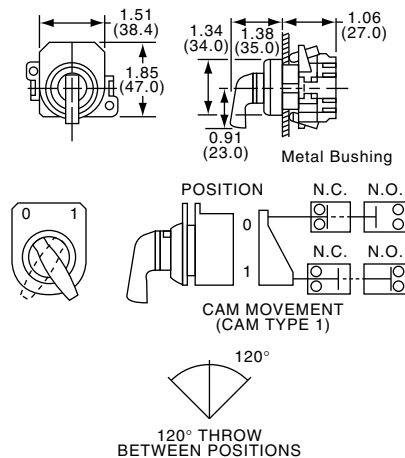
Note: All positions are mutually exclusive and action must pass through neutral for all changes of operator level.

| Tyco Electronics | Alcoswitch | Action               |      |      |      |      |      |
|------------------|------------|----------------------|------|------|------|------|------|
| 3-1437610-5      | M65310     | Momentary, No Latch  | (On) | Off  | (On) |      |      |
| —                | M65500     | Maintained, No Latch | On   | On   | Off  | On   | On   |
| 3-1437610-6      | M65510     | Momentary, No Latch  | (On) | (On) | Off  | (On) | (On) |
| 3-1437610-7      | M65810     | Momentary w/Latch    | (On) | (On) | Off  | (On) | (On) |

(On) indicates momentary position.



M6402(\*)



### 2-POSITION SELECTOR MAINTAINED

#### Metal Bushing

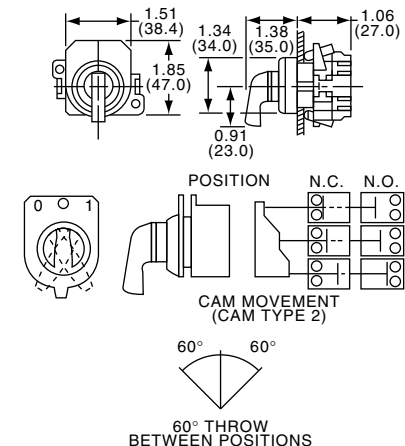
Contact blocks not supplied, order separately. (See page I8.) Legend plant included.

| Model    | Action     | Lever | Position Number |
|----------|------------|-------|-----------------|
| M6402(*) | Maintained | Long  | 0 1             |

(\*) Specify color by adding suffix number: (0) Black, (2) Red.



M6412(\*)



### 3-POSITION SELECTOR MAINTAINED OR MOMENTARY

#### Metal Bushing

Contact blocks not supplied, order separately. (See page I8.) Legend plate included.

| Model    | Action       | Lever | Cam | Position Number |
|----------|--------------|-------|-----|-----------------|
| M6410(*) | Maintained   | Long  | 2   | 2 0 1           |
| M6412(*) | Maintained   | Long  | 3   | 2 0 1           |
| M6470(*) | Mom. 1 Side  | Long  | 2   | 2 0 ← 1         |
| M6480(*) | Mom. 2 Sides | Long  | 2   | 2 → 0 ← 1       |

Indicates momentary return position

(\*) Specify color by adding suffix number: (0) Black, (2) Red.

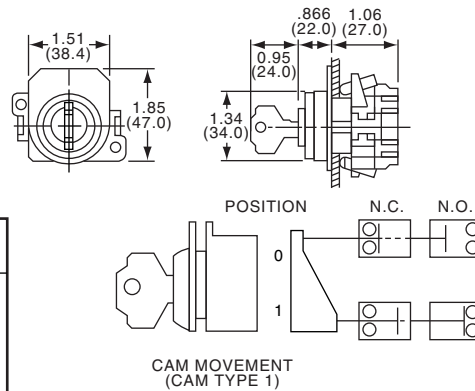
## Keylock or Pushbutton Switches, 30mm

### 2 POSITION KEY SELECTOR MAINTAINED OR MOMENTARY

Metal Bushing  
Supplied with two keys and legend plate.  
Contact blocks not supplied, order separately.  
(See page I8)

| Tyco Electronics | Alcoswitch | Action          | Cam | Position Number | Throw | Remove Key |
|------------------|------------|-----------------|-----|-----------------|-------|------------|
| 2-1437610-2      | M6200      | Maintained      | 1   | 0 1             | 60°   | ⊙          |
| 2-1437610-3      | M6201      | Maintained      | 1   | 0 1             | 60°   | ⊗          |
| 2-1437610-6      | M6250      | Momentary       | 1   | 0 ← 1           | 60°   | ⊙          |
| 1437617-1        | G001       | Additional Keys |     |                 |       |            |

← Indicates momentary return position

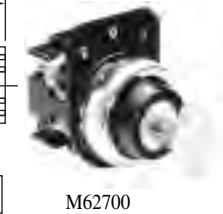
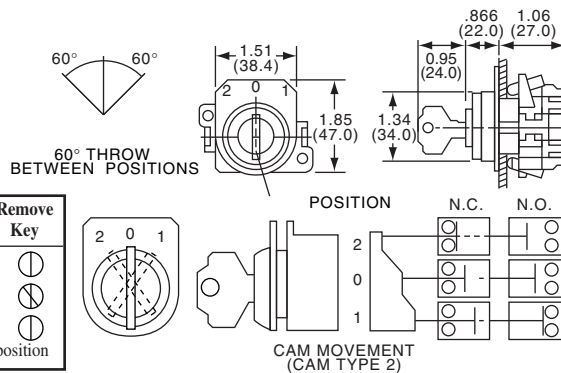


### 3 POSITION KEY SELECTOR MAINTAINED OR MOMENTARY

Metal Bushing  
Supplied with two keys and legend plate.  
Contact blocks not supplied, order separately.  
(See page I8.)

| Tyco Electronics | Alcoswitch | Action          | Cam | Position Number | Remove Key |
|------------------|------------|-----------------|-----|-----------------|------------|
| 2-1437610-5      | M6210      | Maintained      | 2   | 2 0 1           | ⊙          |
| 2-1437610-7      | M6270      | Mom. 1 Side     | 2   | 2 0 ← 1         | ⊗          |
| 2-1437610-8      | M6280      | Mom. 2 Sides    | 2   | 2 → 0 ← 1       | ⊙          |
| 1437617-1        | G001       | Additional Keys |     |                 |            |

← Indicates momentary return position

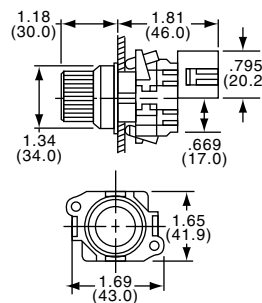


### ILLUMINATED EXTENDED BUTTON MOMENTARY

Metal Bushing  
Lamp not supplied, order separately. (See page I15.) Uses T31/4 miniature bayonet base lamps. Lamp circuit is isolated. Contact blocks not supplied, order separately. (See page I8)

| Model       | Special Details |
|-------------|-----------------|
| M6120(*)406 | Momentary       |

(\*) Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green, (9) White.

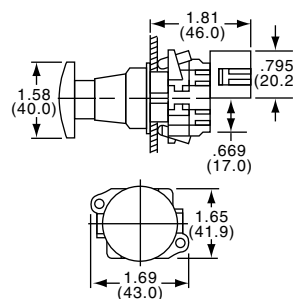


### ILLUMINATED MUSHROOM MAINTAINED OR MOMENTARY

Metal Bushing  
Lamp not supplied, order separately. (See page I15.)  
Uses miniature bayonet base lamps. Lamp circuit is isolated.  
Contact block not supplied, order separately. (See page I8.)

| Model       | Special Details       |
|-------------|-----------------------|
| M6150(*)406 | Momentary             |
| M6153(*)406 | Maintained, Push-Pull |

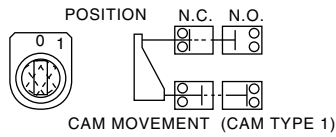
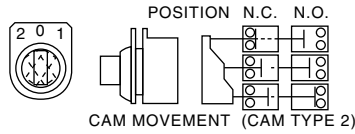
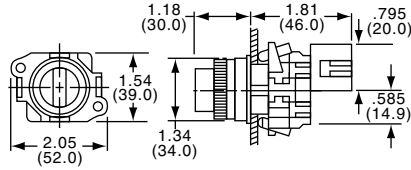
(\*) Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green, (9) White.



## Selector Switches, 30mm, Illuminated



M6650(\*)06



### ILLUMINATED MAINTAINED SELECTOR

Metal Bushing

Lamp not supplied, order separately. (See page I15.)

G31/2 lamps. Lamp circuit is isolated. Contact blocks not supplied, order separately. (See page I8.)

| Model       | Number Position | Action     | Position Number |
|-------------|-----------------|------------|-----------------|
| M6653(*)406 | 3               | Maintained | 2 0 1           |
| M6650(*)406 | 2               | Maintained | 0 1             |

(\*) Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green.

| Model      | Action     | 2-Position Operator |   |   | 3-Position Operator |   |  |
|------------|------------|---------------------|---|---|---------------------|---|--|
| V40 or F40 | N.C.       | O                   | 1 | 1 | O                   | 2 |  |
| V50 or F50 | N.O.       | X                   | O | X | O                   | O |  |
| VA0 or FA0 | N.O. Early | O                   | X | O | X                   | X |  |
| VR0 or FR0 | N.C. Make  | X                   | O | X | X                   | 0 |  |
|            | N.C. Break |                     |   |   |                     |   |  |

O=Open  
X = Closed

#### KEY TO SELECTION OF CONTACT BLOCKS

Contact closure variations depend on the contact block models chosen. For these operators listed use this table for guidance in selecting blocks.

## Lamps/Transformers

### LAMPS

The lamps with G31/2 bulbs fit all Reliant 22, Series 6000 illuminated operators and pilot lights. Lamps with T31/4 Bayonet Base fit all Reliant 22 and Series 6000 illuminated models (except QM120, QM122, and M6650, and M6655).

| Tyco Electronics | Alcoswitch | Bulb  | Rated Volts | Design Amps | MSCP | Average Rated Hours |
|------------------|------------|-------|-------------|-------------|------|---------------------|
| 1-1437620-5      | 755        | T31/4 | 6.3         | .15         | .33  | 20,000              |
| 1-1437620-6      | 757        | T31/4 | 28          | .08         | .62  | 7,500               |

\*Not recommended for use with green or blue lenses.



NE51HR

755

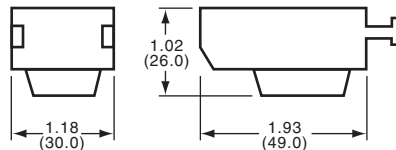
Application Note: For additional specifications, see page K10

### STEP-DOWN TRANSFORMERS

#### AC LINE TO 6V/6.3V

Snap mount on lighted operators and QM600, T6632 and RM600 pilot lights. Spade tipped leads connect to lamp terminals on operator. Screw terminals on primary. Use 6-6.3V lamps. 0-9 to 1.35 watts. Secondary winding is energy-limited.

| Tyco Electronics | Alcoswitch | Primary Voltage |
|------------------|------------|-----------------|
| 1437612-8        | 5B0        | 110-120 VAC     |
| 1437612-7        | 570        | 220-240 VAC     |



U.L.  
Recognized

5B0

## Panel Layouts

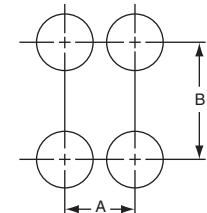
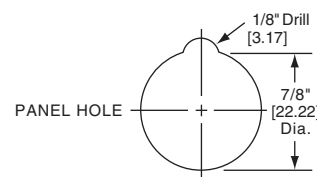
### RELIANT 22 MINIATURE MODELS

#### Recommended hole mounting dimensions\*

Minimum Center-To-Center Spacing  
Inches/(mm)

| Operator Type       | A         | B         |
|---------------------|-----------|-----------|
| Pushbuttons, Pilots | 1.19/30.2 | 1.66/42.2 |
| Mushroom, Selector  | 1.50/37.8 | 1.66/42.2 |
| Others              | 1.94/49.3 | 1.94/49.3 |

\*Check dimensions for layouts using legend plates.



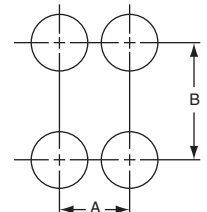
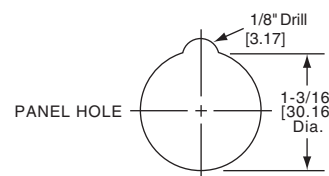
### SERIES 6000 STANDARD MODELS

#### Recommended hole mounting dimensions\*

Minimum Center-To-Center Spacing  
Inches/(mm)

| Operator Type       | A         | B         |
|---------------------|-----------|-----------|
| Pushbuttons, Pilots | 1.88/47.8 | 1.97/50.0 |
| Mushroom, Selector  | 2.25/57.2 | 2.25/57.2 |
| Large Mushroom      | 3.00/76.2 | 3.00/76.2 |

\*Check dimensions for layouts using legend plates.



## Pushbutton Switches, 16mm, Illuminated

### FEATURES:

Command Series Illuminated Pushbuttons are instrument-grade switches having snap-acting double break contacts, silver clad and gold plated to satisfy the requirements of logic level and power switching. **Contacts are electrically independent of one another and are isolated from the lamp circuit.** Tactile feel is excellent and maintained models have latching feature for visible indication of status. Uses T1-3/4 midget flanged base lamp, relampable from front of panel. Legends may be provided using printed transparent tape affixed to inner button. UL Recognized, File E-51302, CSA LR-20479

Note: Recommended panel thickness 4mm max.

### MATERIAL SPECIFICATIONS:

Contacts .....Gold plate over silver clad

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA @ 20 VDC or Peak AC  
5 A @ 250 VAC or 24 VDC (Resistive)  
Initial Contact Resistance .....20 Milliohms max.  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....1,500 VAC  
Life Expectancy .....100,000 Operations @ rated current

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +122°F (-20°C to +50°C)  
Oiltight .....IP65, NEMA 1, 12 & 13  
Non-oiltight.....IP40

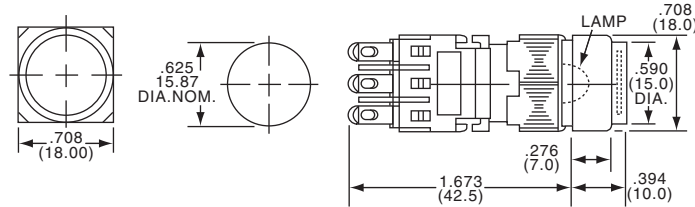
### ROUND

Lens set and lamps not supplied.



164EL11

Application Note: For lens sets, accessories and lamps, see page I18 to I20



| Non-Oiltight     |            | Oiltight         |            | Contact       | Action           |
|------------------|------------|------------------|------------|---------------|------------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |               |                  |
| 1437569-2        | 164EL11    | 4-1437569-2      | 165EL11    | 1 N.O. & N.C. | Momentary        |
| 1437569-3        | 164EL22    | 4-1437569-3      | 165EL22    | 2 N.O. & N.C. | Momentary        |
| —                | 164EL33    | —                | 165EL33    | 3 N.O. & N.C. | Momentary        |
| 1437569-5        | 164EL511   | 4-1437569-4      | 165EL511   | 1 N.O. & N.C. | Push on/Push off |
| 1437569-6        | 164EL522   | 4-1437569-5      | 165EL522   | 2 N.O. & N.C. | Push on/Push off |
| 1437569-7        | 164EL533   | —                | 165EL533   | 3 N.O. & N.C. | Push on/Push off |

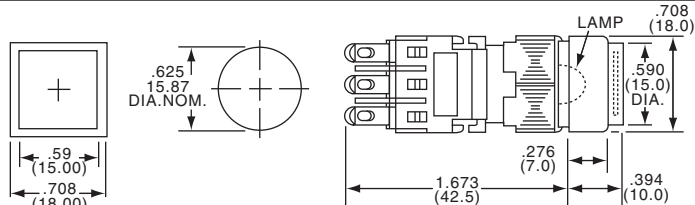
### SQUARE

Lens set and lamps not supplied.



164SL11

Application Note: For lens sets, accessories and lamps, see page I18 to I20



| Non-Oiltight     |            | Oiltight         |            | Contact       | Action           |
|------------------|------------|------------------|------------|---------------|------------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |               |                  |
| 2-1437569-5      | 164SL11    | 4-1437569-9      | 165SL11    | 1 N.O. & N.C. | Momentary        |
| 2-1437569-6      | 164SL22    | 5-1437569-0      | 165SL22    | 2 N.O. & N.C. | Momentary        |
| 2-1437569-7      | 164SL33    | —                | 165SL33    | 3 N.O. & N.C. | Momentary        |
| 2-1437569-9      | 164SL511   | 5-1437569-1      | 165SL511   | 1 N.O. & N.C. | Push on/Push off |
| 3-1437569-0      | 164SL522   | 5-1437569-2      | 165SL522   | 2 N.O. & N.C. | Push on/Push off |
| 3-1437569-1      | 164SL533   | —                | 165SL533   | 3 N.O. & N.C. | Push on/Push off |

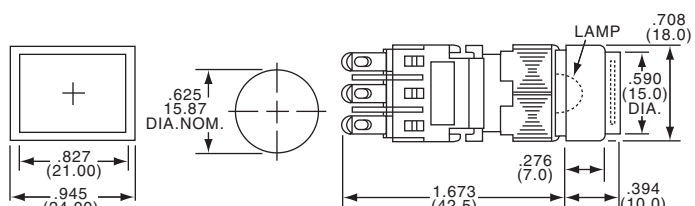
### RECTANGULAR

Lens set and lamps not supplied.



164TL11

Application Note: For lens sets, accessories and lamps, see page I18 to I20



| Non-Oiltight     |            | Oiltight         |            | Contact       | Action           |
|------------------|------------|------------------|------------|---------------|------------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |               |                  |
| 3-1437569-4      | 164TL11    | 5-1437569-4      | 165TL11    | 1 N.O. & N.C. | Momentary        |
| 3-1437569-5      | 164TL22    | 5-1437569-5      | 165TL22    | 2 N.O. & N.C. | Momentary        |
| 3-1437569-6      | 164TL33    | —                | 165TL33    | 3 N.O. & N.C. | Momentary        |
| 3-1437569-8      | 164TL511   | 5-1437569-6      | 165TL511   | 1 N.O. & N.C. | Push on/Push off |
| 3-1437569-9      | 164TL522   | 5-1437569-7      | 165TL522   | 2 N.O. & N.C. | Push on/Push off |
| 4-1437569-0      | 164TL533   | 5-1437569-8      | 165TL533   | 3 N.O. & N.C. | Push on/Push off |

## Selector or Keylock Switches, 16mm

### FEATURES:

Command Series Selector & Keylock Switches are 2 & 3-position rotary types with snap-acting double break contacts. All models have 90° throw. Contacts are silver-clad and gold-plated to provide reliable operation at logic levels as well as for power switching applications. Contacts are electrically isolated from one another. Keylock types are supplied with two keys. Oiltight models meet NEMA 1, 12 & 13 requirements.

UL Recognized File E-51302

CSA LR-20479

### MATERIAL SPECIFICATIONS:

Contacts .....Gold plate over silver clad

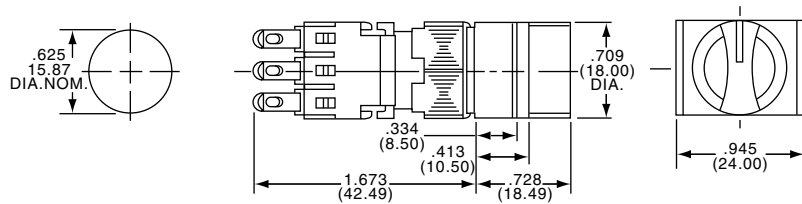
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA @ 20 VDC or Peak AC  
5 A @ 250 VAC or 24 VDC (Resistive)  
Initial Contact Resistance .....20 Milliohms max.  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....1,500 VAC  
Life Expectancy .....100,000 Operations at rated current

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +158°F (-20°C to +70°C)

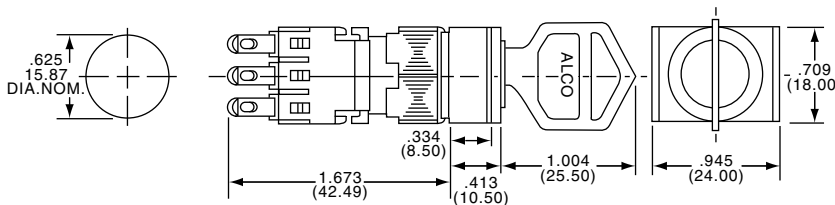
## SELECTORS



164P2B11

| Non-Oiltight     |            | Oiltight         |            | Contact      | Action                       |
|------------------|------------|------------------|------------|--------------|------------------------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |              |                              |
| 2-1437569-0      | 164P2B11   | 4-1437569-8      | 165P2B11   | 1N.O. & N.C. | 2 Pos. Maintained            |
| 2-1437569-1      | 164P2B22   | —                | 165P2B22   | 2N.O. & N.C. | 2 Pos. Maintained            |
| —                | 164P2B33   | —                | 165P2B33   | 3N.O. & N.C. | 2 Pos. Maintained            |
| 1-1437569-9      | 164P0B22   | —                | —          | 2N.O. & N.C. | 2 Pos. Momentary Right       |
| —                | 164P0B33   | —                | —          | 3N.O. & N.C. | 2 Pos. Momentary Right       |
| 2-1437569-2      | 164P3B22   | —                | 165P3B22   | 2N.O. & N.C. | 3 Pos. Center Off/Maintained |
| 2-1437569-3      | 164P3B33   | —                | 165P3B33   | 3N.O. & N.C. | 3 Pos. Center Off            |

## KEYLOCKS



164J2A11

| 2 Position Keylocks |            |                  |            |              |                                | 3 Position Keylocks |            |                  |            |              |                                |
|---------------------|------------|------------------|------------|--------------|--------------------------------|---------------------|------------|------------------|------------|--------------|--------------------------------|
| Non-Oiltight        |            | Oiltight         |            | Contact      | Action                         | Non-Oiltight        |            | Oiltight         |            | Contact      | Action                         |
| Tyco Electronics    | Alcoswitch | Tyco Electronics | Alcoswitch |              |                                | Tyco Electronics    | Alcoswitch | Tyco Electronics | Alcoswitch |              |                                |
| 1-1437569-1         | 164J2A11   | 4-1437569-7      | 165J2A11   | 1N.O. & N.C. | Maintained, key pull left      | —                   | 164J3A22   | —                | 165J3A22   | 2N.O. & N.C. | Maintained, key pull left      |
| 1-1437569-2         | 164J2A22   | —                | 165J2A22   | 2N.O. & N.C. | Maintained, key pull left      | 1-1437569-5         | 164J3A33   | —                | 165J3A33   | 3N.O. & N.C. | Maintained, key pull left      |
| —                   | 164J2A33   | —                | 165J2A33   | 3N.O. & N.C. | Maintained, key pull left      | —                   | 164J3E22   | —                | 165J3E22   | 2N.O. & N.C. | Maintained, key pull center    |
| 1-1437569-3         | 164J2B11   | —                | 165J2B11   | 1N.O. & N.C. | Maintained, key pull both      | —                   | 164J3E33   | —                | 165J3E33   | 3N.O. & N.C. | Maintained, key pull center    |
| 1-1437569-4         | 164J2B22   | —                | 165J2B22   | 2N.O. & N.C. | Maintained, key pull both      | 1-1437569-6         | 164J3C22   | —                | 165J3C22   | 2N.O. & N.C. | Maintained, key pull all       |
| —                   | 164J2B33   | —                | 165J2B33   | 3N.O. & N.C. | Maintained, key pull both      | —                   | 164J3C33   | —                | 165J3C33   | 3N.O. & N.C. | Maintained, key pull all       |
| 1437569-9           | 164J0A11   | —                | —          | 1N.O. & N.C. | Momentary right, key pull left | —                   | 164J7A22   | —                | 165J7A22   | 2N.O. & N.C. | Momentary right, key pull left |
| 1-1437569-0         | 164J0A22   | —                | —          | 2N.O. & N.C. | Momentary right, key pull left | 1-1437569-8         | 164KA      | —                | —          | —            | Spare Keys                     |
| —                   | 164J0A33   | —                | —          | 3N.O. & N.C. | Momentary right, key pull left | —                   | —          | —                | —          | —            | —                              |



## Pilot Light Indicators or Lens Sets, 16mm

### FEATURES

Command Series Pilot Light Indicators match the appearance of both lighted and unlighted Command Series pushbuttons. The same lens buttons are snapped into place and legends may be easily inserted. Illumination is from T - 1 3/4 midget flange based lamps, which are installed from the front panel. Lenses and lamps are ordered separately. Oiltight models meet NEMA 1, 12 & 13 requirements. UL File No. E-51302  
CSA LR-20479

### TYPICAL PERFORMANCE CHARACTERISTICS:

LAMP DISSIPATION 1.2W MAX.  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....1,500 VAC

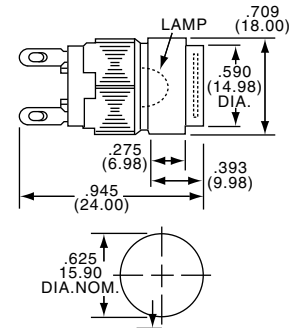
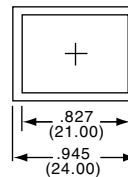
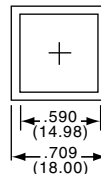
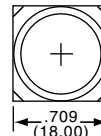
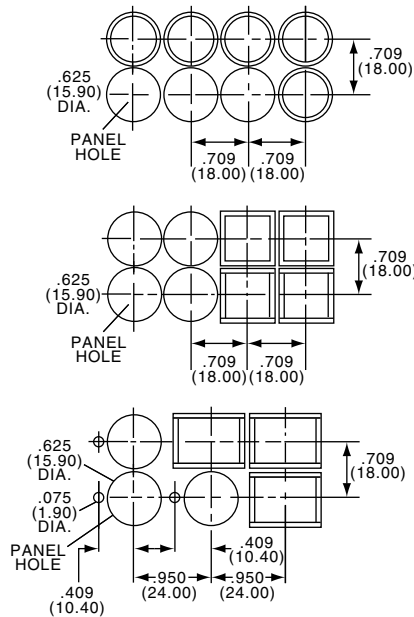
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +122°F (-20°C to +50°C)

### PILOT LIGHT INDICATORS



164EZ



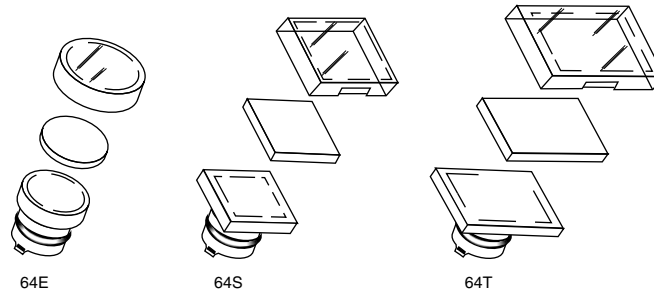
| Non-Oiltight     |            | Oiltight         |            | Description |
|------------------|------------|------------------|------------|-------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |             |
| 1437569-8        | 164EZ      | —                | 165EZ      | Round       |
| 3-1437569-2      | 164SZ      | —                | 165SZ      | Square      |
| 4-1437569-1      | 164TZ      | —                | 165TZ      | Rectangular |

Lens set and lamp not supplied, order separately, see below.  
U.L. Recognized E-51302

### LENS SET



64E



| Model                                                                                                             | Description          |
|-------------------------------------------------------------------------------------------------------------------|----------------------|
| 64E(*)                                                                                                            | Round lens set       |
| 64S(*)                                                                                                            | Square lens set      |
| 64T(*)                                                                                                            | Rectangular lens set |
| All fit oiltight and non-oiltight indicators.                                                                     |                      |
| (*) Specify color by adding suffix number: (2) Red, (3) Orange, (4) Yellow, (5) Green, (6) Blue, (9) White/Clear. |                      |

**Application Note:**  
Lens sets include, button, diffuser and cap.

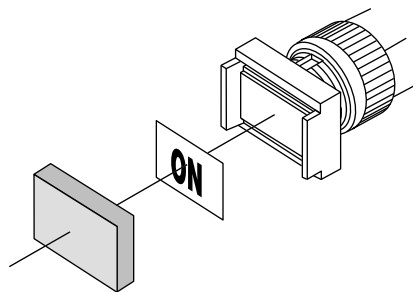


## Accessories and Tools, 16mm

### FEATURES:

Standard Legends on Transparent Adhesive Tape are available for Illuminated Command Series switches and pilot lights. Legends are easily affixed to the translucent white button and are protected by the lens cap. The black lettering is back-lit by the lamp and the inscription is visible through the lens cap. This method of providing legends is also suitable in some applications using non-illuminated white (clear), yellow or orange lens caps.

Standard legends, listed below, are intended to be used with round, square or rectangular pushbuttons and pilot lights. Sold only in sheets of 10 identical legends.



| Tyco Electronics | Alcoswitch |     |
|------------------|------------|-----|
| 6-1437569-3      | 616        | On  |
| 6-1437569-2      | 616        | Off |

Note: Model numbers must include complete legend nomenclature.

### LEGEND MODEL NUMBERS

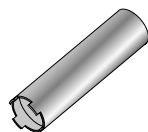


Legend (film)

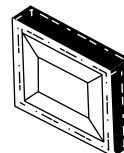
### Accessories

#### MOUNTING WRENCH

Sturdy tubular brass wrench fits mounting nuts on all Command Series switches.



| Tyco Electronics | Alcoswitch |
|------------------|------------|
| 6-1437569-0      | 601-AG     |



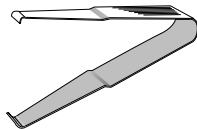
#### SPLASH PROOF SEAL

Flexible clear seal fits all rectangular pushbuttons and pilot lights.

| Tyco Electronics | Alcoswitch |
|------------------|------------|
| 9-1437569-2      | 668        |

#### LENS REMOVER

Dual purpose metal tool facilitates removal of lenses, buttons.

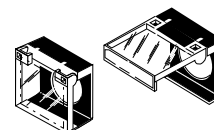


| Tyco Electronics | Alcoswitch |
|------------------|------------|
| 6-1437569-9      | 618-AG     |

#### FLIP COVER SWITCH GUARD

669 used with rectangular series pushbutton switches.  
671 used with square and round series pushbutton switches.

| Tyco Electronics | Alcoswitch              |
|------------------|-------------------------|
| 9-1437569-4      | 669 Rectangular         |
| 9-1437569-3      | 671-AG Square and Round |

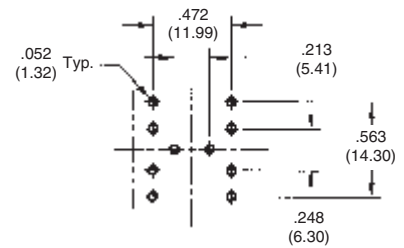
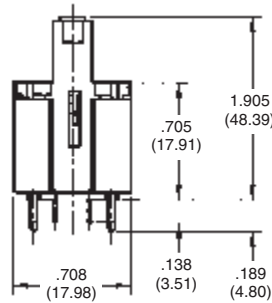


## Socket for 16mm Command Series Switches

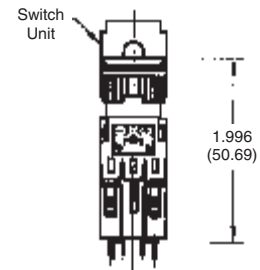
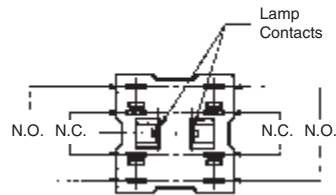
697-PL



9-1437569-5



**Recommended PCB Footprint**



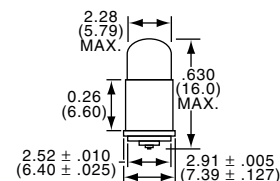
## T1 3/4 Series Midget Incandescent Lamps

Average Life ratings indicate the lamp life obtained in controlled laboratory conditions while operating lamps at the design voltage (AC) (DC will shorten life by 50%). The life of a subminiature lamp is inversely proportional to the 12th power of the applied voltage.

ALCOSWITCH subminiature lamps are a "T" class, meaning that the envelopes are made of glass tubing, the "T" number indicating the diameter of the tubing in eighths of an inch.

| Tyco Electronics | Alcoswitch | Rated Volts | Design Amps | Rated MSCP | Average Rated Hours |
|------------------|------------|-------------|-------------|------------|---------------------|
| 9-1437620-6      | 7333       | 5.0         | .060        | .05        | 40,000              |
| 1-1437620-8      | 815-AG     | —           | .115        | .147       | 40,000              |
| 1437620-7        | 381-AG     | 6.3         | .20         | .40        | 50,000              |
| 1437620-8        | 382-AG     | 14.0        | .08         | .30        | 50,000              |
| 1437620-9        | 385        | 28.0        | .04         | .20        | 50,000              |
| 1-1437620-1      | 387        | 28.0        | .04         | .30        | 25,000              |
| 1437620-5        | 327-AG     | 28.0        | .04         | .34        | 7,000               |

**FLANGE BASE- T1 3/4**





*SH6 Series - Page J3*



*PICOD Series - Page J4*

# Pushwheel



Pushwheel Switches

## Pushwheel Switches Part Number Index

|                     |          |                   |          |
|---------------------|----------|-------------------|----------|
| B11LS .....         | J9,J10   | SMCADP .....      | J9       |
| B12L .....          | J11      | SMCD .....        | J4,J6,J8 |
| B12LS .....         | J11      | SMCD111AK .....   | J9       |
| B5L .....           | J7       | SMCD131AK .....   | J9       |
| B5LS .....          | J7,J8    | SMCD131AKLS ..... | J9       |
| B9L .....           | J9,J10   | SMCD131ALD .....  | J9       |
| B9LS .....          | J9,J10   | SMCD137AK .....   | J9       |
| B9LS5PIN .....      | J9       | SMCD301AK .....   | J9       |
| DPS .....           | J6       | SMCL .....        | J9       |
| DPS10 .....         | J5,J11   | SMCPK .....       | J9       |
| DPS10111AK .....    | J11      | SP1.2 .....       | J9, J10  |
| DPS10131AK .....    | J11      | SP1.5 .....       | J11      |
| DPS10131ALD .....   | J11      |                   |          |
| DPS10137AK .....    | J11      |                   |          |
| DPS10141AK .....    | J11      |                   |          |
| DPS10301AK .....    | J11      |                   |          |
| DPS10L .....        | J11      |                   |          |
| DPS8 .....          | J5,J10   |                   |          |
| DPS8111AK .....     | J10      |                   |          |
| DPS8131AK .....     | J10      |                   |          |
| DPS8131AKLS .....   | J10      |                   |          |
| DPS8131AKULS .....  | J10      |                   |          |
| DPS8131ALD .....    | J10      |                   |          |
| DPS8137AK .....     | J10      |                   |          |
| DPS8137AKLS .....   | J10      |                   |          |
| DPS8137AKU .....    | J10      |                   |          |
| DPS8137AKULS .....  | J10      |                   |          |
| DPS8301AK .....     | J10      |                   |          |
| DPS8301AKULS .....  | J10      |                   |          |
| DPS8A .....         | J10      |                   |          |
| DPS8L .....         | J10      |                   |          |
| DPS8P .....         | J10      |                   |          |
| DPS8PW .....        | J10      |                   |          |
| DPS9 .....          | J5,J11   |                   |          |
| DPS910A .....       | J11      |                   |          |
| DPS910P .....       | J11      |                   |          |
| DPS9111AK .....     | J11      |                   |          |
| DPS9131AK .....     | J11      |                   |          |
| DPS9131AL .....     | J11      |                   |          |
| DPS9131ALD .....    | J11      |                   |          |
| DPS9137AK .....     | J11      |                   |          |
| DPS9301AK .....     | J11      |                   |          |
| DPS9307AK .....     | J11      |                   |          |
| DPS9L .....         | J11      |                   |          |
| PICOA .....         | J7       |                   |          |
| PICOADP .....       | J7       |                   |          |
| PICOBG .....        | J7       |                   |          |
| PICOD .....         | J4,J6,J8 |                   |          |
| PICOD111AL .....    | J7       |                   |          |
| PICOD131AK .....    | J7       |                   |          |
| PICOD131ALD .....   | J7       |                   |          |
| PICOD131ALULS ..... | J7,J8    |                   |          |
| PICOD137AK .....    | J7       |                   |          |
| PICOD137ALULS ..... | J7,J8    |                   |          |
| PICOD301AK .....    | J7       |                   |          |
| PICOD301ALD .....   | J7       |                   |          |
| PICOD301ALULS ..... | J7,J8    |                   |          |
| PICOP .....         | J7       |                   |          |
| SH131AK .....       | J6       |                   |          |
| SH6 .....           | J4,J6    |                   |          |
| SH6131AK .....      | J6       |                   |          |
| SH6131AKK2 .....    | J6       |                   |          |
| SMCA .....          | J9       |                   |          |

## Order Description and Code Tables (Wiring Diagram)

### DPS10 - 131 - AK

| Series/types | Codes                  | Connections                  |
|--------------|------------------------|------------------------------|
| SH6          | 111 = Decimal          | AK = pcb short               |
| PICOD        | 131 = BCD              | AL = pcb long                |
| SMCD         | 137 = BCD Complement   | LS = solder pin              |
| DPS8         | 141 = BCD + Complement | AL/D = pcb long, interrupted |
| DPS9         | 301 = Hexadecimal      | AKU = pcb long downward      |
| DPS10        | 307 = Hexa. Complement | ALU = pcb long downward      |
|              | 400 = Switch-over      |                              |

#### FACTORY ASSEMBLED GROUP

Special type numbers will be assigned for customers requiring delivery of assembled groups of code switches. These will be pre-tested, identified and individually packaged. Consult factory for details.

#### CUSTOM SWITCHES

Contact factory for information concerning the feasibility, pricing and delivery of special switches, including non-standard codes, limit stopping, special markings, PC terminals and optional colors.

### Code tables (wiring diagram)

Code 131

| BCD |   |   |   |     |
|-----|---|---|---|-----|
|     | C | 1 | 2 | 4 8 |
| 0   | • |   |   |     |
| 1   | • | • |   |     |
| 2   | • |   | • |     |
| 3   | • | • | • |     |
| 4   | • |   |   | •   |
| 5   | • | • |   |     |
| 6   | • |   | • | •   |
| 7   | • | • | • |     |
| 8   | • |   |   | •   |
| 9   | • | • |   | •   |

Code 137

| BCD Complement |   |   |   |     |
|----------------|---|---|---|-----|
|                | C | 1 | 2 | 4 8 |
| 0              | • | • | • | •   |
| 1              | • | • | • | •   |
| 2              | • | • | • | •   |
| 3              | • | • | • | •   |
| 4              | • | • | • | •   |
| 5              | • | • | • | •   |
| 6              | • | • | • | •   |
| 7              | • | • | • | •   |
| 8              | • | • | • | •   |
| 9              | • | • | • | •   |

Code 141

| BCD + Compl. |   |   |   |   |   |   |   |   |   |
|--------------|---|---|---|---|---|---|---|---|---|
|              | C | 1 | 2 | 4 | 8 | 1 | 2 | 4 | 8 |
| 0            | • |   |   |   |   | • | • | • | • |
| 1            | • | • |   |   |   | • | • | • | • |
| 2            | • |   | • |   |   | • | • | • | • |
| 3            | • | • | • |   |   | • | • | • | • |
| 4            | • |   |   | • |   | • | • | • | • |
| 5            | • | • | • | • |   | • | • | • | • |
| 6            | • | • | • | • | • | • | • | • | • |
| 7            | • | • | • | • | • | • | • | • | • |
| 8            | • | • | • | • | • | • | • | • | • |
| 9            | • | • | • | • | • | • | • | • | • |

Code 400

| change-over switch |   |    |    |
|--------------------|---|----|----|
|                    | C | A+ | A- |
| +                  | • | •  |    |
| -                  | • |    | •  |
| +                  | • | •  |    |
| -                  | • |    | •  |
| +                  | • | •  |    |
| -                  | • |    | •  |
| +                  | • | •  |    |
| -                  | • |    | •  |

Code 301

| Hexadecimal |   |   |   |     |
|-------------|---|---|---|-----|
|             | 1 | 2 | 4 | 8 C |
| 0           |   |   |   | •   |
| 1           | • |   |   | •   |
| 2           |   | • |   | •   |
| 3           | • | • |   | •   |
| 4           |   |   | • | •   |
| 5           | • |   | • | •   |
| 6           | • | • | • | •   |
| 7           | • | • | • | •   |
| 8           |   |   | • | •   |
| 9           | • |   | • | •   |
| A           | • | • | • | •   |
| B           | • | • | • | •   |
| C           | • | • | • | •   |
| D           | • | • | • | •   |
| E           | • | • | • | •   |
| F           | • | • | • | •   |

Code 307

| Hexadecimal Compl. |   |   |   |     |
|--------------------|---|---|---|-----|
|                    | C | 1 | 2 | 4 8 |
| 0                  | • | • | • | •   |
| 1                  | • | • | • | •   |
| 2                  | • | • | • | •   |
| 3                  | • | • | • | •   |
| 4                  | • | • | • | •   |
| 5                  | • | • | • | •   |
| 6                  | • | • | • | •   |
| 7                  | • | • | • | •   |
| 8                  | • | • | • | •   |
| 9                  | • | • | • | •   |
| A                  | • | • | • | •   |
| B                  | • | • | • | •   |
| C                  | • | • | • | •   |
| D                  | • | • | • | •   |
| E                  | • | • | • | •   |
| F                  | • | • | • | •   |

Code 111

| Decimal |   |   |   |   |   |   |   |   |   |     |
|---------|---|---|---|---|---|---|---|---|---|-----|
|         | C | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 9 |
| 0       | • | • |   |   |   |   |   |   |   |     |
| 1       | • |   | • |   |   |   |   |   |   |     |
| 2       | • |   |   | • |   |   |   |   |   |     |
| 3       | • |   |   |   | • |   |   |   |   |     |
| 4       | • |   |   |   |   | • |   |   |   |     |
| 5       | • |   |   |   |   |   | • |   |   |     |
| 6       | • |   |   |   |   |   |   | • |   |     |
| 7       | • |   |   |   |   |   |   |   | • |     |
| 8       | • |   |   |   |   |   |   |   |   | •   |
| 9       | • |   |   |   |   |   |   |   |   | •   |

## Specifications

| Series/Types<br>Catalog Page                                                                      |                       |                  | SH6<br>J6         | PICOD<br>J7-8     | SMC-D<br>J9       |
|---------------------------------------------------------------------------------------------------|-----------------------|------------------|-------------------|-------------------|-------------------|
| <b>Dimensions/type of mounting</b>                                                                |                       |                  |                   |                   |                   |
| panel / height x width                                                                            |                       |                  | 15x6 mm           | 15x7.62 mm        | 24x7.62mm         |
| installed depth width PCB, short/long                                                             |                       |                  | 23.5/30.8 mm      | 24/34.5 mm        | 32/42mm           |
| insertion from the front                                                                          |                       |                  | x                 | x                 | x                 |
| insertion from the rear                                                                           |                       |                  | x                 |                   |                   |
| <b>Codes</b>                                                                                      |                       |                  |                   |                   |                   |
| Code                                                                                              | switching<br>position | printing         |                   |                   |                   |
| 111 decimal                                                                                       | 10                    | 0-9              |                   | x                 | x                 |
| 131 BCD                                                                                           | 10                    | 0-9              | x                 | x                 | x                 |
| 137 BCD complement                                                                                | 10                    | 0-9              | x                 | x                 | x                 |
| 141 BCD + complement                                                                              | 10                    | 0-9              |                   |                   | x                 |
| 301 hexadecimal                                                                                   | 16                    | 0-9-A-F (0-15)   |                   | x                 | x                 |
| 307 hexadecimal compl.                                                                            | 16                    | 0-9-A-F (0-15)   |                   |                   |                   |
| 400 change-over switch                                                                            | 10                    | +, -, +, -, etc. |                   | x                 |                   |
| <b>Electrical data</b>                                                                            |                       |                  |                   |                   |                   |
| operating voltage max.                                                                            |                       |                  | 40V               | 40V               | 40V               |
| contact load, static max.                                                                         |                       |                  | 0.5A              | 0.5A              | 1A                |
| contact load, dynamic (resistive) max.                                                            |                       |                  | 100mA             | 100mA             | 100mA             |
| contact resistance type AK<br>(measured from the supply line to the output)                       |                       |                  | < 100 mOhm        | < 100 mOhm        | < 100 mOhm        |
| <b>Technical data</b>                                                                             |                       |                  |                   |                   |                   |
| permissible ambient temperature                                                                   |                       |                  | -20...+80°C       | -20...+60°C       | -20...+80°C       |
| expected life (switching cycles)                                                                  |                       |                  | > 10 <sup>5</sup> | > 10 <sup>5</sup> | > 10 <sup>6</sup> |
| actuating force approx.                                                                           |                       |                  | 4 N               | 3 N               | 4 N               |
| weight approx.                                                                                    |                       |                  | 1.5 g             | 2 g               | 4 g               |
| digit height 10-/16-digit                                                                         |                       |                  | 3.1mm             | 3.1/2.4mm         | 4.9/3.4mm         |
| click action (working point)                                                                      |                       |                  | x                 | x                 | x                 |
| vibration DIN EN 60068-2-6                                                                        |                       |                  | x                 | x                 | x                 |
| shock DIN EN 60068-2-27                                                                           |                       |                  | x                 | x                 | x                 |
| <b>Material</b>                                                                                   |                       |                  |                   |                   |                   |
| housing: PPO UL94V-0                                                                              |                       |                  | x                 | x                 | x                 |
| pc board: base material FR 4 respectively CEM3<br>DIN IEC 249-2, contact surface Au over Ni on Cu |                       |                  | x                 | x                 | x                 |
| <b>Connections</b>                                                                                |                       |                  |                   |                   |                   |
| AK: short                                                                                         |                       |                  | x                 | x                 | x                 |
| AL: long                                                                                          |                       |                  | x                 | x                 | x                 |
| LS: solder point                                                                                  |                       |                  | x                 | x                 | x                 |
| AL/D: long/interrupted                                                                            |                       |                  |                   | x                 |                   |
| ALU: long downward                                                                                |                       |                  |                   | x                 | x                 |

## Specifications

| Series/Types<br>Catalog Page                                                                      |                       |                | DPS8<br>J10       | DPS9<br>J11       | DPS10<br>J11      |
|---------------------------------------------------------------------------------------------------|-----------------------|----------------|-------------------|-------------------|-------------------|
| <b>Dimensions/type of mounting</b>                                                                |                       |                |                   |                   |                   |
| panel / height x width                                                                            |                       |                | 18x8mm            | 33x8mm            | 33x10mm           |
| installed depth width PCB, short/long                                                             |                       |                | 32/41mm           | 39/50mm           | 39/50mm           |
| insertion from the front                                                                          |                       |                | x                 | x                 |                   |
| insertion from the rear                                                                           |                       |                |                   | x                 |                   |
| <b>Codes</b>                                                                                      |                       |                |                   |                   |                   |
| Code                                                                                              | switching<br>position | printing       |                   |                   |                   |
| 111 decimal                                                                                       | 10                    | 0-9            | x                 | x                 | x                 |
| 131 BCD                                                                                           | 10                    | 0-9            | x                 | x                 | x                 |
| 137 BCD complement                                                                                | 10                    | 0-9            | x                 | x                 | x                 |
| 141 BCD + complement                                                                              | 10                    | 0-9            | x                 |                   |                   |
| 301 hexadecimal                                                                                   | 16                    | 0-9-A-F (0-15) | x                 | x                 | x                 |
| 307 hexadecimal compl.                                                                            | 16                    | 0-9-A-F (0-15) |                   |                   |                   |
| 400 change-over switch                                                                            | 10                    | +, -, +-, etc. |                   |                   |                   |
| <b>Electrical data</b>                                                                            |                       |                |                   |                   |                   |
| operating voltage max.                                                                            |                       |                | 40V               | 40V               | 40V               |
| contact load, static max.                                                                         |                       |                | 1A                | 1A                | 1A                |
| contact load, dynamic (resistive) max.                                                            |                       |                | 100mA             | 100mA             | 100mA             |
| contact resistance type AK<br>(measured from the supply line to the output)                       |                       |                | < 100 mOhm        | < 100 mOhm        | < 100 mOhm        |
| <b>Technical data</b>                                                                             |                       |                |                   |                   |                   |
| permissible ambient temperature                                                                   |                       |                | -20...+80°C       | -20...+80°C       | -20...+80°C       |
| expected life (switching cycles)                                                                  |                       |                | > 10 <sup>6</sup> | > 10 <sup>6</sup> | > 10 <sup>6</sup> |
| actuating force approx.                                                                           |                       |                | 4 N               | 4 N               | 4 N               |
| weight approx.                                                                                    |                       |                | 4 g               | 6.5 g             | 7.5 g             |
| digit height 10-/16-digit                                                                         |                       |                | 4.9/3.4mm         | 6.8/4.3mm         | 7.0/4.3mm         |
| click action (working point)                                                                      |                       |                | x                 | x                 | x                 |
| vibration DIN EN 60068-2-6                                                                        |                       |                | x                 | x                 | x                 |
| shock DIN EN 60068-2-27                                                                           |                       |                | x                 | x                 | x                 |
| <b>Material</b>                                                                                   |                       |                |                   |                   |                   |
| housing: PPO UL94V-0                                                                              |                       |                | x                 | x                 | x                 |
| pc board: base material FR 4 respectively CEM3<br>DIN IEC 249-2, contact surface Au over Ni on Cu |                       |                | x                 | x                 | x                 |
| <b>Connections</b>                                                                                |                       |                |                   |                   |                   |
| AK: short                                                                                         |                       |                | x                 | x                 | x                 |
| AL: long                                                                                          |                       |                | x                 | x                 | x                 |
| LS: solder point                                                                                  |                       |                | x                 | x                 | x                 |
| AKU: short downward                                                                               |                       |                |                   |                   | x                 |
| ALU: long downward                                                                                |                       |                | x                 |                   |                   |



## Pushwheel Switches, Subminiature, Panel Mount, Dual Button

SH6 Series pushwheel switches are the smallest panel mounted dual pushbutton code switches available. They have a snap-action detent with an audible click. The dual-purpose finger terminals may be used for direct mounting on printed circuit boards, or wire may be soldered directly to the gold-plated conductors. The SH6 is designed for several means of panel mounting: groups of any number of switches may be snapped into panel holes of proper size and retained by the integral clips (front mounting), or groups may be held in place in a panel hole by being supported from rear when the switches are PC mounted. These reliable switches are made to the same exacting requirements as the SMCD, PICOD and DPS Series.

### MATERIAL SPECIFICATIONS

Moving Contacts ..... Gold-clad Ni over copper alloy  
Fixed Contacts ..... AU over Ni  
PC Board ..... FR4 Glass Epoxy  
Molded Parts ..... Noryl-SE1, black matte finish  
Window ..... Thermoplastic resin

### TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating ..... 0.4 VA @ 20 VDC (max.)  
Contact Circuit Resistance ..... 0.12 ohm max.

### PERFORMANCE CHARACTERISTICS

Operating Force ..... Approx. 11 oz.  
PC Terminal Spacing ..... 0.100"  
Character Height/Color ..... 0.118" White  
Life Expectancy ..... More than 10<sup>5</sup> operations  
Operating Temperature ..... -20°C to +80°C

### SH6 SERIES



SH6131AK

### SH6 - 131 - AK

#### Codes

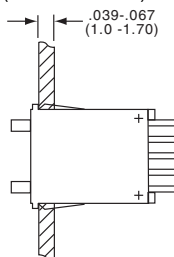
131 = BCD  
137 = BCD Complement

#### Connections

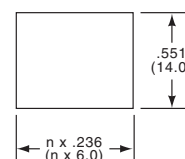
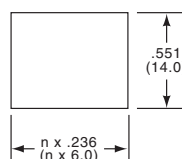
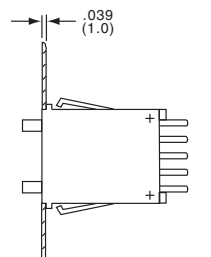
AK = pcb short  
AL = pcb long  
LS = solder pin

See Code Tables on Page J3

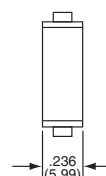
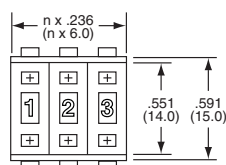
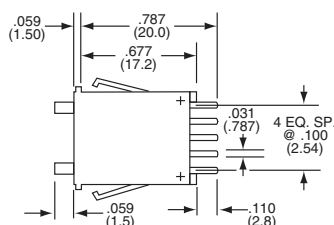
#### FRONT MOUNTING (See note below)



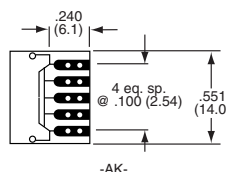
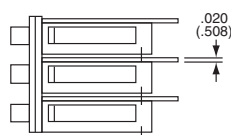
#### REAR MOUNTING



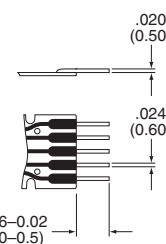
n = Number of switches



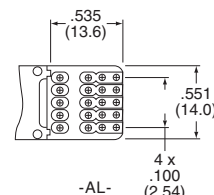
|     |   |   |   |   |   |
|-----|---|---|---|---|---|
| 131 | 1 | 2 | 4 | 8 | C |
| 137 | 2 | 8 | C | 1 | 4 |



-AK-



-LS-



-AL-

Note: Remove locating lugs from side of last switch to enable mounting from the front panel.

Note: Use Card Edge Connector B5LS or B5L with AK type.

## Pushwheel Switches, Subminiature, Panel Mount, Dual Button

The PICOD family offers small panel-mounted pushwheel code switches, ideally suited for high density applications. They are used for the controlling and programming of frequency synthesizers, counters and timers, data comparators, security encoders, weighing machines, etc. The dependable pushbutton action allows narrow 0.3 inch width on panel. Changes to higher or lower settings are accomplished rapidly by successive operation of the appropriate buttons. The featherweight PICOD is less than 0.6 inch high, yet rugged enough for hand-held and portable instruments that may be subjected to field abuse. Heavy gold plating on wiping contacts affords low contact resistance for reliable operation over long periods of service. Easy-to-read characters are viewed through dust-sealed window. Installation costs are minimized by snap-together design – no inconvenient hardware.

### MATERIAL SPECIFICATIONS:

Fixed Contacts .....1 microns AU over Ni over Cu  
Moving Contacts .....Gold-clad Ni over copper alloy  
PC Board .....FR4 Glass epoxy  
Molded Parts .....Noryl-SE1, Black matte finish  
Window .....Thermoplastic resin

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA @ 20 VDC max.  
Contact Circuit Resistance .....0.15 Ohm max.  
Operating Force .....Approx. 11 oz.  
PC Terminal Spacing .....0.100"  
Character Height/Color .....122" White (.094" for hex codes)  
Life Expectancy .....More than 10<sup>5</sup> operations  
Operating temperature .....-10° C to + 60° C

## PICOD - 131 - AK

| Codes                  | Connections                  |
|------------------------|------------------------------|
| 111 = Decimal          | AK = pcb short               |
| 131 = BCD              | AL = pcb long                |
| 137 = BCD Complement   | LS = solder pin              |
| 301 = Hexadecimal      | AL/D = pcb long, interrupted |
| 307 = Hexa. Complement | ALU = pcb long downward      |
| 400 = Switch-over      |                              |

See Code Tables on Page J3



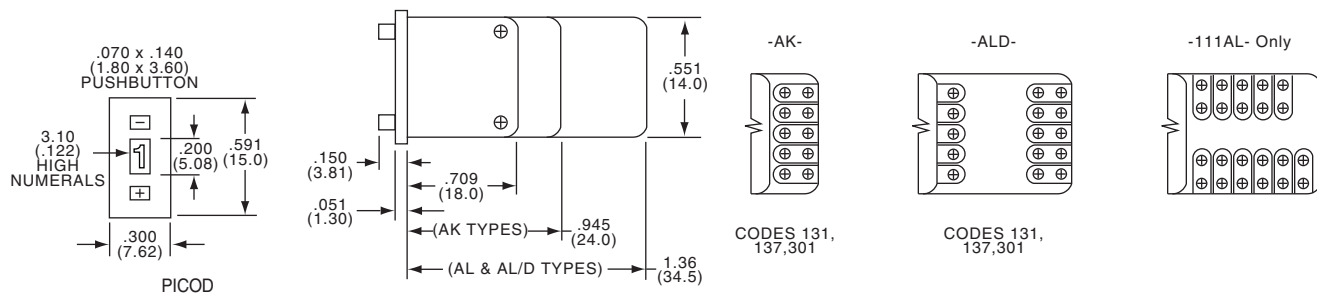
PICOD111AL

## ACCESSORIES

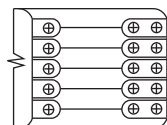
| Front Mount<br>Snap Detent | Description                                            | Wheel<br>Marks |
|----------------------------|--------------------------------------------------------|----------------|
| PICOA                      | Spacer, 0.1" wide                                      |                |
| PICOADP                    | Spacer, 0.1" wide, with decimal point                  |                |
| PICOBG                     | Spacer, 0.3" wide (same size as switch)                |                |
| PICOP                      | End-plate pair                                         |                |
| B5LS                       | 5 pin connector with PC pins for AK types              |                |
| B5L                        | 5 pin connector with wire lug termination for AK types |                |

## Pushwheel Switches, Options

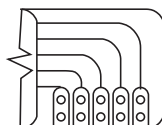
### PICOD



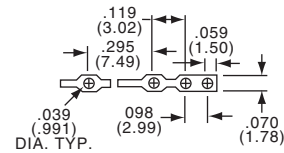
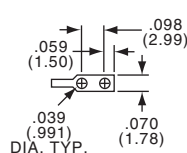
-AL-



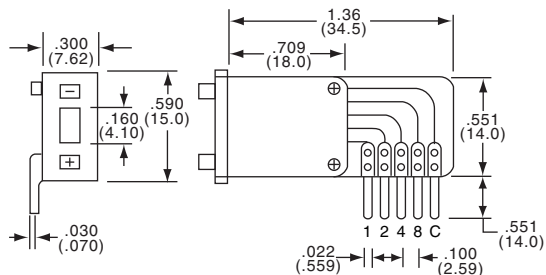
-ALU-



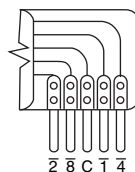
AL TYPES BOARD TRACE DETAIL ALD TYPES



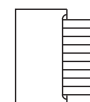
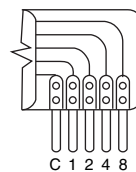
PICOD  
131ALULS



PICOD  
137ALULS

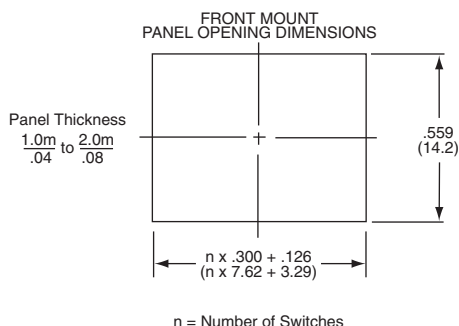


PICOD  
301ALULS



B5LS  
Connector with PC terminals for PICO family switches with AK terminal configuration.

### PICOD



n = Number of Switches

## Pushwheel Switches, Mini, Front Mount

SMCD Series have large visible readout characters despite it's small size. This popular family is used in measurement and test instrumentation for range setting, data programming and count controlling; and in communications equipment for digital tuning. The simple, reliable bi-direction pushbutton mechanism permits rapid changes to either higher or lower numerical settings. Instrument-grade performance and long service life are enhanced by the heavy gold wiping contacts. Large readout characters are protected by dust-sealed windows. Snap-together grouping and snap-in panel mounting minimize installation time and cost. SMCD models have snap detent with slight audible click.

SMCD bi-directional code switches may be easily assembled into groups of any number. The tabs or pins of one decade section press fit into the holes in the adjacent section. Spacers and end mounting plates may be included in the same manner as desired.

Groups of SMCD switches with end plates snap into panel holes of the recommended size and are retained by plastic clips. Again, tools and additional hardware items are not required.

### MATERIAL SPECIFICATIONS:

|                             |                               |
|-----------------------------|-------------------------------|
| PC Board.....               | Glass epoxy type, FR4         |
| PC Terminals .....          | Gold over Ni on Cu            |
| Character Height/Color..... | White on black background     |
|                             | SMC .197/.134; SMCD .193/.134 |
|                             | Except 301 & SG558: .140 and  |
|                             | SG557 .120                    |
| Molded parts .....          | Noryl-SE1, Black matte finish |
| Housing.....                | Black matte finish            |

### TYPICAL PERFORMANCE CHARACTERISTICS:

|                                  |                                          |
|----------------------------------|------------------------------------------|
| Contact Rating .....             | 0.4 VA @ 20 VDC or Peak AC               |
| Contact Circuit Resistance ..... | 0.12 Ohm max. (Total internal ckt. res.) |
| Mechanical Life .....            | More than 10 <sup>6</sup> operations     |
| Operational Force .....          | Approx. 14 oz.                           |

### ENVIRONMENTAL SPECIFICATIONS

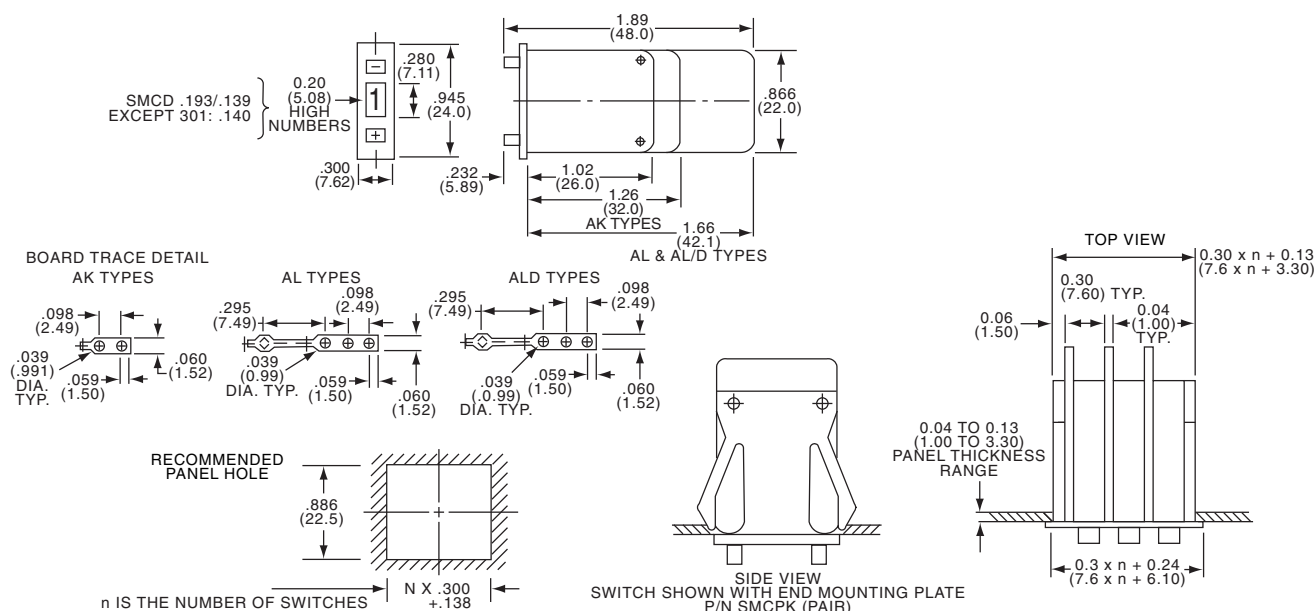
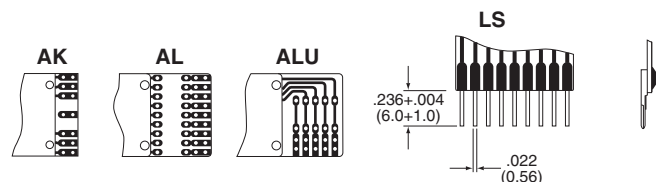
|                            |                  |
|----------------------------|------------------|
| Operating Temperature..... | (-20°C to +80°C) |
|----------------------------|------------------|

| Model    | Description                                       |
|----------|---------------------------------------------------|
| SMCPK    | End mounting plates (pair)                        |
| SMCL     | 300" spacer section                               |
| SMCA     | .100" spacer (with mounting clips)                |
| SMCADP   | .100" spacer, decimal point (with mounting clips) |
| B9L      | Connector, 9 contacts, solder lug terminals       |
| B9LS     | Connector, 9 contacts, PC pins                    |
| B9LS5PIN | Connector, 5 contacts, PC pins                    |
| B11LS    | Connectors, 11 contacts, PC pins (for 111)        |
| SP1.2    | Limit stop pin for SMD 10 position only           |

## SMCD - 131 - AK

| Codes                  | Connections             |
|------------------------|-------------------------|
| 111 = Decimal          | AK = pcb short          |
| 131 = BCD              | AL = pcb long           |
| 137 = BCD Complement   | LS = solder pin         |
| 141 = BCD + Complement | ALU = pcb long downward |
| 301 = Hexadecimal      |                         |

See Code Tables on Page J3



## Pushwheel Switches, Mini, Rear Mount

The DPS8 Series is a compact, lower cost family of instrument grade, pushbutton code switches for numerical input applications. DPS8 models are similar in size to those of the SMCD Series and also feature a fast-snap-together assembly with conventional behind-the-panel mounting. A simple reliable bidirectional pushbutton mechanism allows rapid changes to either higher or lower numerical setting. Reliable performance in logic level circuits and long service life are provided by gold clad wiping contacts. A dust-sealed window protects the readout characters, which are larger than those of comparable thumbwheel switches. DPS8 switches have snap-action detent.

### MATERIAL SPECIFICATIONS

PC Board .....Glass epoxy type, FR4  
PC Terminal Spacing .....DSP811: .079", 131,137, 141: .100"  
Character Height/Color .....0.193" White on black background  
Housing .....Noryl-SE1, Black, matte finish  
Operating Force .....Approx. 14 oz.

### TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating .....0.4 VA @ 20 VDC or Peak AC  
Contact Circuit Resistance ...0.15 ohms max.  
Mechanical Life .....More than 10<sup>6</sup> operations

### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature .....(-20°C to +80°C)

### MODULE ASSEMBLY METHOD

DPS bi-directional code switches may be easily assembled into groups of any number. Each switch, spacer or end-plate pair has appropriate snap-together assembly. No tools are required, little time consumed.

Groups of DPS8 switches, with end-plates mount into panel holes of the recommended size using four screws plus nuts and washers.

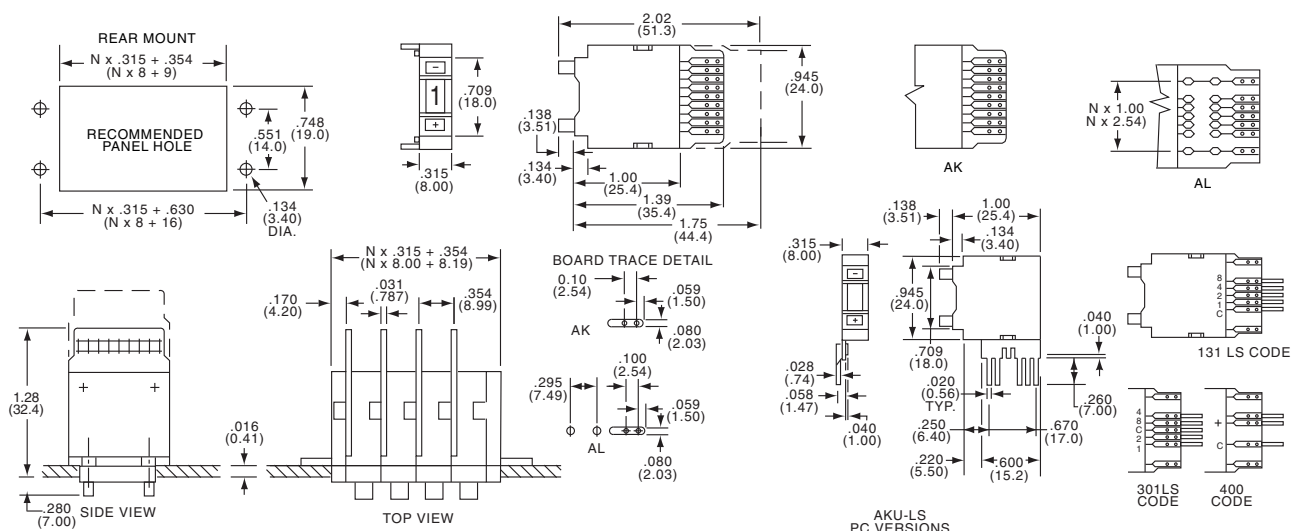
### ACCESSORIES

| Model  | Description                                                |
|--------|------------------------------------------------------------|
| DPS8A  | Spacer .157" (4mm)                                         |
| DPS8L  | .315" spacer section                                       |
| DPS8P  | End mounting plates, decorative only (pair)                |
| DPS8PW | End mounting plates, flanged with mounting holes (pair)    |
| B9L    | Connector, 9 contacts, solder lug terminals                |
| B9LS   | Connector, 9 contacts, pc terminals                        |
| B11LS  | Connector, 11 contacts, PC terminals (for Code III Switch) |
| SP1.2  | Limit stop pin for 10 position only.                       |

## DPS8 - 131 - AK

| Codes                  | Connections              |
|------------------------|--------------------------|
| 111 = Decimal          | AK = pcb short           |
| 131 = BCD              | AL = pcb long            |
| 137 = BCD Complement   | LS = solder pin          |
| 141 = BCD + Complement | AKU = pcb short downward |
| 301 = Hexadecimal      | ALU = pcb long downward  |

See Code Tables on Page J3



## Pushwheel Switches, Front Mount

DPS9 and DPS10 dual pushbutton code switches have identical heights but differ in width. These switches provide silent, reliable state-of-the-art bi-directional operation and can directly retrofit common thumbwheel switches. The readout characters are up to 60% larger than those of comparable thumbwheels. DPS9 models have the popular .315" per section width, and DPS10 types are .395" wide.

A simple reliable dual pushbutton mechanism permits rapid change to a higher or a lower numerical setting. Gold clad wiping contacts provide dependable low-level operation and extended life expectancy. Snap-together modular design enables fast assembly hardware. Wheel markings are protected by a dust-sealed window.

### MATERIAL SPECIFICATIONS:

PC Board .....Glass epoxy type, FR4  
PC Terminal Spacing .....100" Centers on integral multiples  
Character Height/Color .....See below  
Housing .....Noryl-SE1, Black, matte finish

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA @ 20 VDC or Peak AC  
Contact Circuit Resistance ...0.20 Ohm max.  
Mechanical Life .....More than 10<sup>6</sup> operations  
Operating Force .....Approx. 16 oz.

### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature .....(-20°C to +80°C)

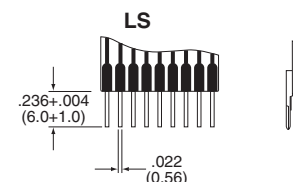
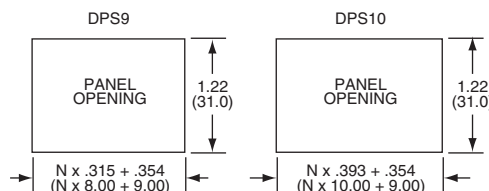
### ACCESSORIES

| DPS9 Model | DPS10 Model | Description                            |
|------------|-------------|----------------------------------------|
| DPS910A    | DPS910A     | Spacer, 0.1 inch                       |
|            | DPS10       | *Dummy switch (no electrical function) |
| DPS9L      | DPS10L      | Spacer, same width as switch           |
| **DPS910P  | **DPS910P   | End mounting plate pair                |
| B12L       | B12L        | Connector, 12 contacts, solder lugs    |
| B12LS      | B12LS       | Connector, 12 contacts, PC terminals   |
| SP1.5      | SP1.5       | Limit stop pin for 10 position switch  |

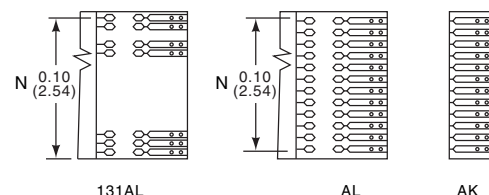
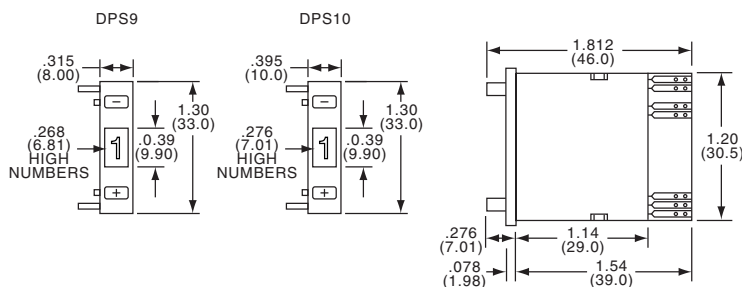
\* Indicates switch mechanically operable, optionally available with wheel in fixed position.; \*\* Indicates sold in pairs only.

## DPS9 - 131 - AK

| Series/types | Codes                | Connections     |
|--------------|----------------------|-----------------|
| DPS9         | 111 = Decimal        | AK = pcb short  |
| DPS10        | 131 = BCD            | AL = pcb long   |
|              | 137 = BCD Complement | LS = solder pin |
|              | 301 = Hexadecimal    |                 |



See Code Tables on Page J3



|                        |             |               |
|------------------------|-------------|---------------|
| Character height . . . | Model DPS9  | 10 digit .268 |
|                        |             | 16 digit .169 |
|                        | Model DPS10 | 10 digit .276 |
|                        |             | 16 digit .169 |

## Engineering Notes





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*KCB Series - Page K5*



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*KLNS Series - Page K8*



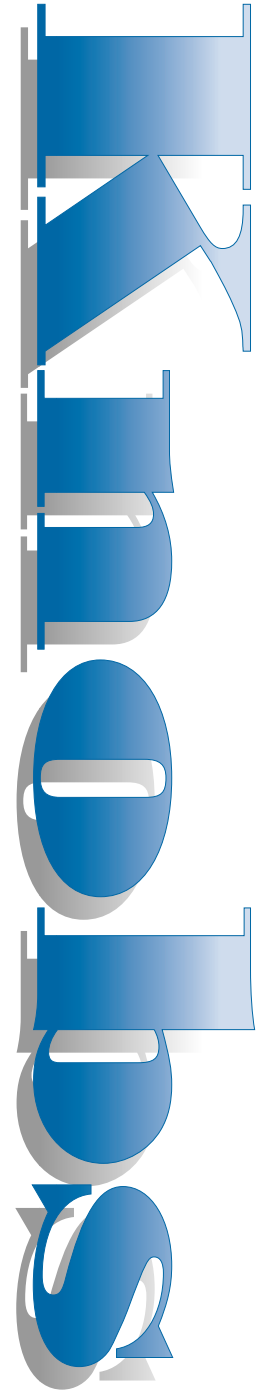
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*PKD Series - Page K14*



**K**

Alcoknob

**Alcocknob Part Number Index**

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|                    |    |                    |    | PKD60B101/8 .....  | K14 |                     |     |

## General Knob Information

### SPECIFICATIONS

#### A. STANDARD KNOB TYPES

1. INSPECTION CRITERIA - Normal inspection is performed without magnification while holding knob at a distance of 12 to 14 inches for a period of 5 seconds, under normal light. The following imperfections are not acceptable:  
 Finish: visible marks or scratches, runs, or non-uniform coverage.  
 Artwork: voids, specks, bleeding or other inconsistencies
2. MATERIALS - K Series: Machined aluminum alloy stock  
 Finish: gloss anodize  
 Setscrews: Stainless steel, type 303, hex head, cup point  
 P Series: General purpose phenolic (thermoset) (Max. Temp. 120-125°C continuous)  
 Finish: Gloss (except PKX, matte)  
 Insert: Brass  
 Setscrews: Stainless steel, hex head, cup point  
 Inlays: Skirts: Aluminum alloy, spun finish

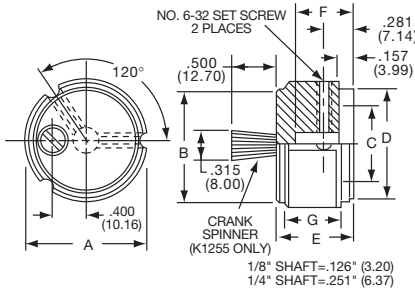
#### B. CUSTOM TYPES

1. ALUMINUM Configuration - most semi-standard or custom designs can be machined. A drawing is required to provide a quotation. Non-standard shaft hole diameters are available also.  
 Finish - Anodizing or paint of various colors can be provided. A color chip is required to ensure proper color shade.  
 Artwork - alpha-numeric lettering, indicator lines, markings, etc. can be provided.  
 Silkscreening and other processes are available.
2. PHENOLIC Configuration - most custom styles can be molded.  
 Colors - various custom colored standard knobs can be provided. Color chip is required.  
 Artwork - lettering, markings, etc. can be provided.

## Knobs, Machined Aluminum

### K SERIES

K700B1/4



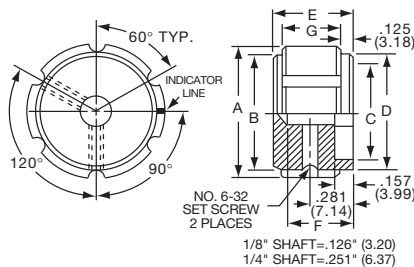
| 3 Flute Design with and without Indicator Line |             |            |            |            |            |             |            |            |             |   |
|------------------------------------------------|-------------|------------|------------|------------|------------|-------------|------------|------------|-------------|---|
| Tyco                                           | Electronics | Alcoswitch | Color      | A          | B          | C           | D          | E          | F           | G |
| 1437621-7                                      | K500A1/8    | Natural    | .500(12.7) | .430(10.9) | .374(9.50) | .430(10.9)  | .625(15.9) | .429(10.9) | .512(13.0)  |   |
| 1437621-6                                      | K500A1/4    | Natural    | .500(12.7) | .430(10.9) | .374(9.50) | .430(10.9)  | .625(15.9) | .429(10.9) | .512(13.0)  |   |
| 1437621-9                                      | K500B1/8    | Black      | .500(12.7) | .430(10.9) | .374(9.50) | .430(10.9)  | .625(15.9) | .429(10.9) | .512(13.0)  |   |
| 1437621-8                                      | K500B1/4    | Black      | .500(12.7) | .430(10.9) | .374(9.50) | .430(10.9)  | .625(15.9) | .429(10.9) | .512(13.0)  |   |
| 1-1437621-0                                    | K700A1/4    | Natural    | .740(18.8) | .655(16.6) | .591(15.0) | .655(16.6)  | .625(15.9) | .429(10.9) | .512(13.0)  |   |
| 1-1437621-1                                    | K700B1/4    | Black      | .740(18.8) | .655(16.6) | .591(15.0) | .655(16.6)  | .625(15.9) | .429(10.9) | .512(13.0)  |   |
| 1-1437621-3                                    | K900A1/4    | Natural    | .937(23.8) | .817(20.8) | .709(18.0) | .817(20.8)  | .625(15.9) | .429(10.9) | .512(13.0)  |   |
| 1-1437621-4                                    | K900B1/4    | Black      | .937(23.8) | .817(20.8) | .709(18.0) | .8827(20.8) | .625(15.9) | .429(10.9) | .512(13.0)  |   |
| 1437621-2                                      | K1250A1/4   | Natural    | 1.25(31.8) | 1.11(28.2) | .984(25.0) | 1.11(28.2)  | .750(19.1) | .554(14.1) | .630(16.00) |   |
| 1437621-3                                      | K1250B1/4   | Black      | 1.25(31.8) | 1.11(28.2) | .984(25.0) | 1.11(28.2)  | .750(19.1) | .554(14.1) | .630(16.00) |   |
| Less Indicator                                 |             |            |            |            |            |             |            |            |             |   |
| 1437621-4                                      | K1251B1/4   | Black      | 1.25(31.8) | 1.11(28.2) | .984(25.0) | 1.11(28.2)  | .750(19.1) | .554(14.1) | .630(16.00) |   |
| With Crank Spinner + Less Indicator            |             |            |            |            |            |             |            |            |             |   |
|                                                | K1255AS1/4  | Natural    | 1.25(21.8) | 1.11(28.2) | .984(25.0) | 1.11(28.2)  | .750(19.1) | .554(14.1) | .630(16.00) |   |
| 1437621-5                                      | K1255BS1/4  | Black      | 1.25(31.8) | 1.11(28.2) | .984(25.0) | 1.11(28.2)  | .750(19.1) | .554(14.1) | .630(16.00) |   |

### KA SERIES



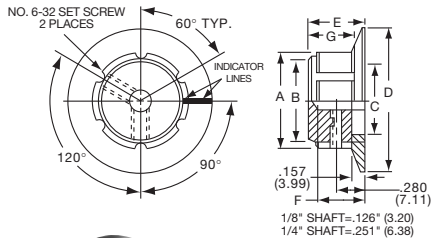
KA500A1/4

KA700B1/4



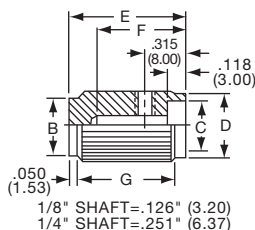
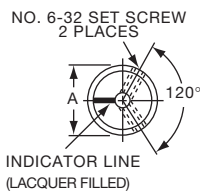
| 6 Flute Design with Indicator Line |            |         |            |            |            |            |            |            |            |  |
|------------------------------------|------------|---------|------------|------------|------------|------------|------------|------------|------------|--|
| Tyco                               |            |         | A          | B          | C          | D          | E          | F          | G          |  |
| Electronics                        | Alcoswitch | Color   |            |            |            |            |            |            |            |  |
| 2-1437621-0                        | KA500A1/8  | Natural | .500(12.7) | .430(10.9) | .375(9.53) | .430(10.9) | .625(15.9) | .512(13.0) | .430(10.9) |  |
| 1-1437621-9                        | KA500A1/4  | Natural | .500(12.7) | .430(10.9) | .375(9.53) | .430(10.9) | .625(15.9) | .512(13.0) | .430(10.9) |  |
| 2-1437621-2                        | KA500B1/8  | Black   | .500(12.7) | .430(10.9) | .375(9.53) | .430(10.9) | .625(15.9) | .512(13.0) | .430(10.9) |  |
| 2-1437621-1                        | KA500B1/4  | Black   | .500(12.7) | .430(10.9) | .375(9.53) | .430(10.9) | .625(15.9) | .512(13.0) | .430(10.9) |  |
| 2-1437621-3                        | KA700A1/4  | Natural | .750(19.1) | .655(16.6) | .590(15.0) | .655(16.6) | .625(15.9) | .512(13.0) | .430(10.9) |  |
| 2-1437621-4                        | KA700B1/4  | Black   | .750(19.1) | .655(16.6) | .590(15.0) | .655(16.6) | .625(15.9) | .512(13.0) | .430(10.9) |  |
| 2-1437621-5                        | KA900A1/4  | Natural | .937(23.8) | .817(20.8) | .700(17.8) | .817(20.8) | .625(15.9) | .512(13.0) | .430(10.9) |  |
| 2-1437621-6                        | KA900B1/4  | Black   | .937(23.8) | .817(20.8) | .700(17.8) | .817(20.8) | .625(15.9) | .512(13.0) | .430(10.9) |  |
| 1-1437621-8                        | KA1250A1/4 | Natural | 1.25(31.8) | 1.11(28.2) | .985(25.0) | 1.11(28.2) | .750(19.1) | .630(16.0) | .554(14.1) |  |
|                                    | KA1250B1/4 | Black   | 1.25(31.8) | 1.11(28.2) | .985(25.0) | 1.11(28.2) | .750(19.1) | .630(16.0) | .554(14.1) |  |

### KAS SERIES



| 6 Flute Design with Aluminum Skirt and Indicator Lines |             |            |            |            |            |            |            |            |            |   |
|--------------------------------------------------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|---|
| Tyco                                                   | Electronics | Alcoswitch | Color      | A          | B          | C          | D          | E          | F          | G |
| 2-1437621-8                                            | KAS500A1/8  | Natural    | .500(12.7) | .430(10.9) | .380(9.65) | .740(18.8) | .630(16.0) | .510(13.0) | .430(10.9) |   |
| 2-1437621-7                                            | KAS500A1/4  | Natural    | .500(12.7) | .430(10.9) | .380(9.65) | .740(18.8) | .630(16.0) | .510(13.0) | .430(10.9) |   |
| 3-1437621-0                                            | KAS500B1/8  | Black      | .500(12.7) | .430(10.9) | .380(9.65) | .740(18.8) | .630(16.0) | .510(13.0) | .430(10.9) |   |
| 2-1437621-9                                            | KAS500B1/4  | Black      | .500(12.7) | .430(10.9) | .380(9.65) | .740(18.8) | .630(16.0) | .510(13.0) | .430(10.9) |   |
| 3-1437621-1                                            | KAS700A1/4  | Natural    | .750(19.1) | .650(16.5) | .590(15.0) | 1.14(29.0) | .630(16.0) | .510(13.0) | .430(10.9) |   |
| 3-1437621-2                                            | KAS700B1/4  | Black      | .750(19.1) | .650(16.5) | .590(15.0) | 1.14(29.0) | .630(16.0) | .510(13.0) | .430(10.9) |   |
| 3-1437621-3                                            | KAS900A1/4  | Natural    | .940(23.9) | .820(20.8) | .710(18.0) | 1.40(35.6) | .630(16.0) | .510(13.0) | .430(10.9) |   |
| 3-1437621-4                                            | KAS900B1/4  | Black      | .940(23.9) | .820(20.8) | .710(18.0) | 1.40(35.6) | .630(16.0) | .510(13.0) | .430(10.9) |   |

## Knobs, Machined Aluminum



### KB SERIES

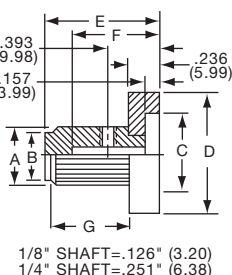
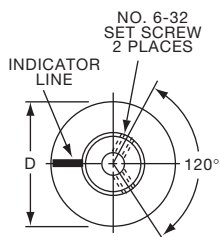


KB500A1/4



KB900B1/4

| Control Knob with Straight Knurl and Top Line Indicator |             |            |            |            |            |            |            |            |
|---------------------------------------------------------|-------------|------------|------------|------------|------------|------------|------------|------------|
| Tyco                                                    | Electronics | Alcoswitch | Color      | A          | B          | C          | D          | G          |
| 3-1437621-6                                             | KB500A1/8   | Natural    | .500(12.7) | .433(11.0) | .394(10.0) | .472(12.0) | .787(20.0) | .610(15.5) |
| 3-1437621-5                                             | KB500A1/4   | Natural    | .500(12.7) | .433(11.0) | .394(10.0) | .472(12.0) | .787(20.0) | .610(15.5) |
| 3-1437621-9                                             | KB500B1/8   | Black      | .500(12.7) | .433(11.0) | .394(10.0) | .472(12.0) | .787(20.0) | .610(15.5) |
| 3-1437621-8                                             | KB500B1/4   | Black      | .500(12.7) | .433(11.0) | .394(10.0) | .472(12.0) | .787(20.0) | .610(15.5) |
| 4-1437621-0                                             | KB700A1/4   | Natural    | .750(19.0) | .673(17.1) | .581(15.0) | .705(17.9) | .787(20.0) | .610(15.5) |
| 4-1437621-2                                             | KB700B1/4   | Black      | .750(19.0) | .673(17.1) | .581(15.0) | .705(17.9) | .787(20.0) | .610(15.5) |
| 4-1437621-4                                             | KB900A1/4   | Natural    | .930(23.6) | .866(22.0) | .710(18.0) | .902(22.9) | .787(20.0) | .610(15.5) |
| 4-1437621-5                                             | KB900B1/4   | Black      | .930(23.6) | .866(22.0) | .710(18.0) | .902(22.9) | .787(20.0) | .610(15.5) |

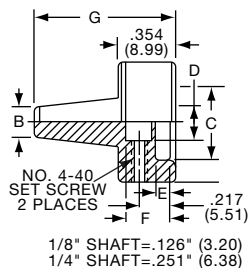
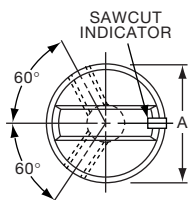


### KBS SERIES



KBS500A101/4

| Control Knob with Straight Knurl and Skirt |              |            |            |            |            |            |            |            |
|--------------------------------------------|--------------|------------|------------|------------|------------|------------|------------|------------|
| Tyco                                       | Electronics  | Alcoswitch | Color      | A          | B          | C          | D          | G          |
| With 0-9 Numerals (36°)                    |              |            |            |            |            |            |            |            |
| 4-1437621-9                                | KBS500A101/8 | Natural    | .500(12.7) | .433(11.0) | .708(18.0) | 1.00(25.4) | .950(24.1) | .826(21.0) |
| 4-1437621-6                                | KBS500A101/4 | Natural    | .500(12.7) | .433(11.0) | .708(18.0) | 1.00(25.4) | .950(24.1) | .826(21.0) |
| 5-1437621-3                                | KBS500B101/8 | Black      | .500(12.7) | .433(11.0) | .708(18.0) | 1.00(25.4) | .950(24.1) | .826(21.0) |
| 5-1437621-2                                | KBS500B101/4 | Black      | .500(12.7) | .433(11.0) | .708(18.0) | 1.00(25.4) | .950(24.1) | .826(21.0) |
| With Indicator Line                        |              |            |            |            |            |            |            |            |
| 4-1437621-8                                | KBS500A1/8   | Natural    | .500(12.7) | .433(11.0) | .708(18.0) | 1.00(25.4) | .950(24.1) | .826(21.0) |
| 4-1437621-7                                | KBS500A1/4   | Natural    | .500(12.7) | .433(11.0) | .708(18.0) | 1.00(25.4) | .950(24.1) | .826(21.0) |
| 5-1437621-1                                | KBS500B1/8   | Black      | .500(12.7) | .433(11.0) | .708(18.0) | 1.00(25.4) | .950(24.1) | .826(21.0) |
| 5-1437621-0                                | KBS500B1/4   | Black      | .500(12.7) | .433(11.0) | .708(18.0) | 1.00(25.4) | .950(24.1) | .826(21.0) |



### KCB SERIES



KCB500A1/4



KCB700B1/4

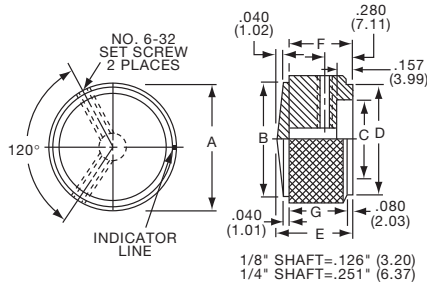
| Control Knob with Sawcut Indicator |             |            |            |            |            |            |            |            |
|------------------------------------|-------------|------------|------------|------------|------------|------------|------------|------------|
| Tyco                               | Electronics | Alcoswitch | Color      | A          | B          | C          | D          | G          |
| 5-1437621-7                        | KCB500A1/8  | Natural    | .500(12.7) | .197(5.08) | .374(9.50) | .126(3.20) | .118(3.00) | .335(8.51) |
| 5-1437621-6                        | KCB500A1/4  | Natural    | .500(12.7) | .197(5.08) | .374(9.50) | .126(3.20) | .118(3.00) | .335(8.51) |
| 5-1437621-9                        | KCB500B1/8  | Black      | .500(12.7) | .197(5.08) | .374(9.50) | .126(3.20) | .118(3.00) | .335(8.51) |
| 5-1437621-8                        | KCB500B1/4  | Black      | .500(12.7) | .197(5.08) | .374(9.50) | .126(3.20) | .118(3.00) | .335(8.51) |
| 6-1437621-0                        | KCB600A1/8  | Natural    | .618(15.7) | .197(5.08) | .394(10.0) | .126(3.20) | .118(3.00) | .335(8.51) |
| 6-1437621-1                        | KCB600A1/4  | Natural    | .618(15.7) | .197(5.08) | .394(10.0) | .126(3.20) | .118(3.00) | .335(8.51) |
| 6-1437621-2                        | KCB600B1/8  | Black      | .618(15.7) | .197(5.08) | .394(10.0) | .126(3.20) | .118(3.00) | .335(8.51) |
| 6-1437621-1                        | KCB600B1/4  | Black      | .618(15.7) | .197(5.08) | .394(10.0) | .126(3.20) | .118(3.00) | .335(8.51) |
| 6-1437621-3                        | KCB700A1/4  | Natural    | .746(18.8) | .197(5.08) | .512(13.0) | .250(6.35) | .118(3.00) | .335(8.51) |
| 6-1437621-4                        | KCB700B1/4  | Black      | .746(18.8) | .197(5.08) | .512(13.0) | .250(6.35) | .118(3.00) | .335(8.51) |
| 6-1437621-5                        | KCB900A1/4  | Natural    | .937(23.8) | .197(5.08) | .709(18.0) | .250(6.35) | .118(3.00) | .335(8.51) |
| 6-1437621-7                        | KCB900B1/4  | Black      | .937(23.8) | .197(5.08) | .709(18.0) | .250(6.35) | .118(3.00) | .335(8.51) |

**Knobs, Machined Aluminum**

**KD SERIES**



KD1250B1/4

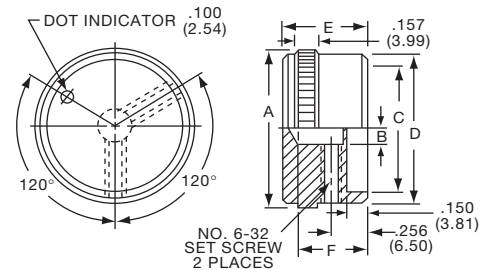


| Tyco<br>Diamond Knurl with Indicator Line |            |         |            |            |            |            |            |            |            |
|-------------------------------------------|------------|---------|------------|------------|------------|------------|------------|------------|------------|
| Tyco Electronics                          | Alcoswitch | Color   | A          | B          | C          | D          | E          | F          | G          |
| 7-1437621-1                               | KD500A1/8  | Natural | .500(12.7) | .430(10.9) | .380(9.65) | .430(10.9) | .630(16.0) | .510(13.0) | .470(11.9) |
| 7-1437621-0                               | KD500A1/4  | Natural | .500(12.7) | .430(10.9) | .380(9.65) | .430(10.9) | .630(16.0) | .510(13.0) | .470(11.9) |
| 7-1437621-3                               | KD500B1/8  | Black   | .500(12.7) | .430(10.9) | .380(9.65) | .430(10.9) | .630(16.0) | .510(13.0) | .470(11.9) |
| 7-1437621-2                               | KD500B1/4  | Black   | .500(12.7) | .430(10.9) | .380(9.65) | .430(10.9) | .630(16.0) | .510(13.0) | .470(11.9) |
| 7-1437621-4                               | KD700A1/4  | Natural | .750(19.1) | .660(16.8) | .590(15.0) | .660(16.8) | .630(16.0) | .510(13.0) | .470(11.9) |
| 7-1437621-5                               | KD700B1/4  | Black   | .750(19.1) | .660(16.8) | .590(15.0) | .660(16.8) | .630(16.0) | .510(13.0) | .470(11.9) |
| 7-1437621-6                               | KD900A1/4  | Natural | .940(23.9) | .820(20.8) | .710(18.0) | .820(20.8) | .630(16.0) | .510(13.0) | .470(11.9) |
| 7-1437621-7                               | KD900B1/4  | Black   | .940(23.9) | .820(20.8) | .710(18.0) | .820(20.8) | .630(16.0) | .510(13.0) | .470(11.9) |
| 6-1437621-8                               | KD1250A1/4 | Natural | 1.25(31.8) | 1.11(28.2) | .980(24.9) | 1.11(28.2) | .750(19.1) | .630(16.0) | .590(15.0) |
| 6-1437621-9                               | KD1250B1/4 | Black   | 1.25(31.8) | 1.11(28.2) | .980(24.9) | 1.11(28.2) | .750(19.1) | .630(16.0) | .590(15.0) |

**KE SERIES**



KE900AB1/4



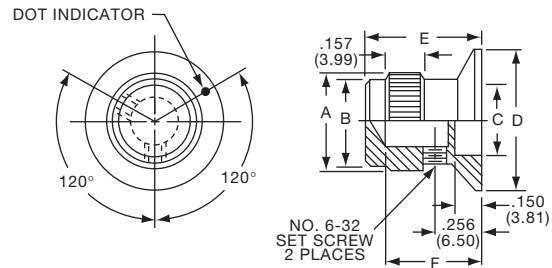
KE500AB1/4

| Tyco<br>Knurl Grip with Top Dot Indicator |             |             |            |            |            |            |            |
|-------------------------------------------|-------------|-------------|------------|------------|------------|------------|------------|
| Tyco Electronics                          | Alcoswitch  | Color       | A          | B          | C          | D          | F          |
| 8-1437621-0                               | KE500AB1/8  | Ntl. - Blk. | .500(12.7) | .126(3.20) | .382(9.70) | .460(11.7) | .625(15.9) |
| 7-1437621-9                               | KE500AB1/4  | Ntl. - Blk. | .500(12.7) | .126(3.20) | .382(9.70) | .460(11.7) | .625(15.9) |
| 8-1437621-1                               | KE700AB1/4  | Ntl. - Blk. | .740(18.8) | .251(6.38) | .630(16.0) | .708(18.0) | .625(15.9) |
| 8-1437621-2                               | KE900AB1/4  | Ntl. - Blk. | .93(23.8)  | .251(6.38) | .787(20.0) | .900(22.9) | .625(15.9) |
| 7-1437621-8                               | KE1250AB1/4 | Ntl. - Blk. | 1.25(31.8) | .251(6.38) | 1.06(26.9) | 1.17(29.7) | .625(15.9) |

**KES SERIES**



KES500AB1/4

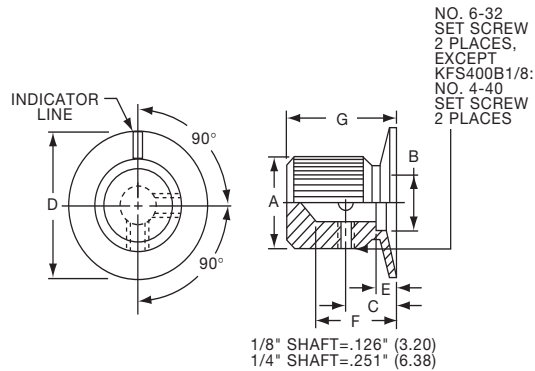


| Tyco<br>Knurl Grip with Dot Indicator on Skirt |             |             |            |            |            |            |            |
|------------------------------------------------|-------------|-------------|------------|------------|------------|------------|------------|
| Tyco Electronics                               | Alcoswitch  | Color       | A          | B          | C          | D          | F          |
| 8-1437621-4                                    | KES500AB1/8 | Ntl. - Blk. | .500(12.7) | .460(11.7) | .382(9.70) | .750(19.1) | .625(15.9) |
| 8-1437621-3                                    | KES500AB1/4 | Ntl. - Blk. | .500(12.7) | .460(11.7) | .382(9.70) | .750(19.1) | .625(15.9) |
| 8-1437621-5                                    | KES700AB1/4 | Ntl. - Blk. | .750(19.1) | .710(18.1) | .630(16.0) | 1.13(28.7) | .625(15.9) |
|                                                | KES900AB1/4 | Ntl. - Blk. | .937(23.8) | .897(22.8) | .787(20.0) | 1.44(36.6) | .625(15.9) |



## Knobs, Machined Aluminum

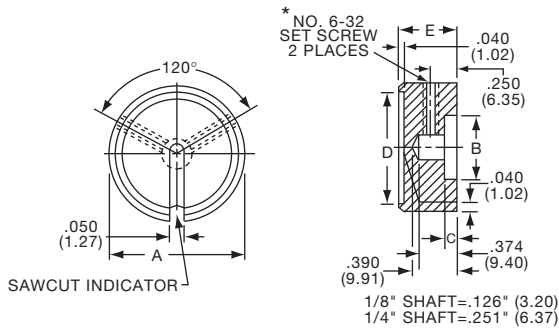
### KFS SERIES



KFS400B1/8

| Tyco<br>Electronics Alcoswitch Color   |            |             |            |            |            |            |            |            |
|----------------------------------------|------------|-------------|------------|------------|------------|------------|------------|------------|
| Straight Knurl with Indicator on Skirt |            |             |            |            |            |            |            |            |
|                                        |            |             | A          | B          | C          | D          | E          | F          |
| 8-1437621-6                            | KFS400B1/8 | Black Matte | .380(9.65) | .382(9.70) | .256(6.50) | .500(12.7) | .098(2.49) | .469(11.9) |
| 8-1437621-8                            | KFS500B1/8 | Black Matte | .500(12.7) | .382(9.70) | .252(6.48) | .630(16.0) | .161(4.09) | .469(11.9) |
| 8-1437621-7                            | KFS500B1/4 | Black Matte | .618(15.7) | .280(7.11) | .382(9.70) | 1.00(25.4) | .161(4.09) | .630(16.0) |
| 8-1437621-9                            | KFS600B1/4 | Black Matte | .618(15.7) | .280(7.11) | .382(9.70) | 1.00(25.4) | .161(4.09) | .630(16.0) |

### KHF SERIES



KHF500, 700, 900 1 set screw



KHF500A1/4

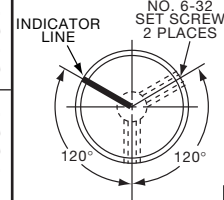


KHF900A1/4

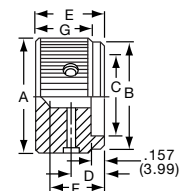
| Tyco<br>Electronics Alcoswitch Color          |             |         |            |            |            |
|-----------------------------------------------|-------------|---------|------------|------------|------------|
| Plain Body with Top and Side Sawcut Indicator |             |         |            |            |            |
|                                               |             |         | A          | B          | C          |
| 9-1437621-1                                   | KHF500A1/4  | Natural | .500(12.7) | .374(9.50) | .118(3.00) |
| 9-1437621-2                                   | KHF700A1/4  | Natural | .740(18.8) | .590(15.0) | .118(3.00) |
| 9-1437621-3                                   | KHF900A1/4  | Natural | .937(23.8) | .708(18.0) | .118(3.00) |
| *9-1437621-0                                  | KHF1250A1/4 | Natural | 1.23(31.8) | .984(25.0) | .118(3.00) |

### KLN SERIES

| Tyco<br>Electronics Alcoswitch Color       |             |         |              |              |             |            |            |            |
|--------------------------------------------|-------------|---------|--------------|--------------|-------------|------------|------------|------------|
| Straight Knurl with Top and Side Indicator |             |         |              |              |             |            |            |            |
|                                            |             |         | A            | B            | C           | D          | E          | F          |
| 9-1437621-7                                | KLN500A1/8  | Natural | .500(12.7)   | 0.445(11.3)  | .374(9.50)  | .281(7.14) | .625(15.9) | .512(13.0) |
| 9-1437621-6                                | KLN500A1/4  | Natural | .500(12.7)   | 0.445(11.3)  | .374(9.50)  | .281(7.14) | .625(15.9) | .512(13.0) |
| 9-1437621-9                                | KLN500B1/8  | Black   | .500(12.7)   | 0.445(11.3)  | .374(9.50)  | .281(7.14) | .625(15.9) | .512(13.0) |
| 9-1437621-8                                | KLN500B1/4  | Black   | .500(12.7)   | 0.445(11.3)  | .374(9.50)  | .281(7.14) | .625(15.9) | .512(13.0) |
| 1437622-1                                  | KLN500S1/4  | Smoke   | .500(12.7)   | 0.445(11.3)  | .374(9.50)  | .281(7.14) | .625(15.9) | .512(13.0) |
| 1437622-2                                  | KLN700A1/4  | Natural | .740(18.8)   | .685(17.4)   | .591(15.0)  | .281(7.14) | .625(15.9) | .512(13.0) |
| 1437622-3                                  | KLN700B1/4  | Black   | .740(18.8)   | .685(17.4)   | .591(15.0)  | .281(7.14) | .625(15.9) | .512(13.0) |
| 1437622-4                                  | KLN700B1/8  | Black   | .740(18.8)   | .685(17.4)   | .591(15.0)  | .281(7.14) | .625(15.9) | .512(13.0) |
| 1437622-5                                  | KLN700S1/4  | Smoke   | .740(18.8)   | .685(17.4)   | .591(15.0)  | .281(7.14) | .625(15.9) | .512(13.0) |
| 1437622-6                                  | KLN900A1/4  | Natural | .937(23.8)   | .882(22.4)   | 0.709(18.0) | .281(7.14) | .625(15.9) | .512(13.0) |
| 1437622-7                                  | KLN900B1/4  | Black   | .937(23.8)   | .882(22.4)   | 0.709(18.0) | .281(7.14) | .625(15.9) | .512(13.0) |
| 1437622-8                                  | KLN900S1/4  | Smoke   | .937(23.8)   | .882(22.4)   | 0.709(18.0) | .281(7.14) | .625(15.9) | .512(13.0) |
| 9-1437621-4                                | KLN1250A1/4 | Natural | 1.252(31.80) | 1.195(30.35) | .984(25.0)  | .281(7.14) | .625(15.9) | .512(13.0) |
| 9-1437621-5                                | KLN1250B1/4 | Black   | 1.252(31.80) | 1.195(30.35) | .984(25.0)  | .281(7.14) | .625(15.9) | .512(13.0) |



KLN500A1/4



1/8" SHAFT=.126" (3.20)  
1/4" SHAFT=.251" (6.38)



## Knobs, Machined Aluminum

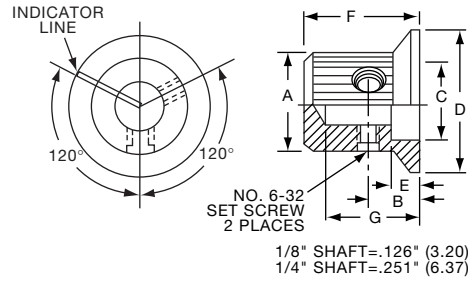
### KLNS SERIES



KLNS500B1/8



KLNS900B1/4



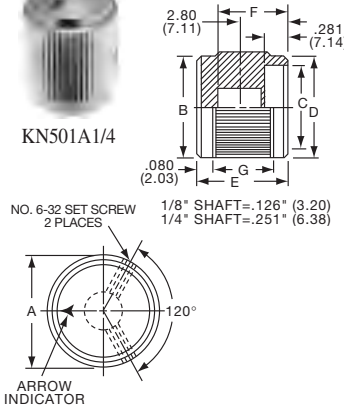
**Straight Knurl with Indicator Line on Top, Side and Skirt**

| Tyco Electronics | Alcoswitch  | Color   | A          | B          | C          | D          | E          | F          | G          |
|------------------|-------------|---------|------------|------------|------------|------------|------------|------------|------------|
| 1-1437622-6      | KLNS500A1/8 | Natural | .500(12.7) | .280(7.11) | .380(9.65) | .750(19.0) | .160(4.07) | .630(16.0) | .510(13.0) |
| 1-1437622-5      | KLNS500A1/4 | Natural | .500(12.7) | .280(7.11) | .380(9.65) | .750(19.0) | .160(4.07) | .630(16.0) | .510(13.0) |
| 1-1437622-8      | KLNS500B1/8 | Black   | .500(12.7) | .280(7.11) | .380(9.65) | .750(19.0) | .160(4.07) | .630(16.0) | .510(13.0) |
| 1-1437622-7      | KLNS500B1/4 | Black   | .500(12.7) | .280(7.11) | .380(9.65) | .750(19.0) | .160(4.07) | .630(16.0) | .510(13.0) |
| 2-1437622-0      | KLNS700A1/4 | Natural | .750(19.0) | .280(7.11) | .590(14.9) | 1.13(28.7) | .160(4.07) | .630(16.0) | .510(13.0) |
| 2-1437622-1      | KLNS700B1/4 | Black   | .750(19.0) | .280(7.11) | .590(14.9) | 1.13(28.7) | .160(4.07) | .630(16.0) | .510(13.0) |
| 2-1437622-2      | KLNS900A1/4 | Natural | .940(23.9) | .280(7.11) | .710(18.0) | 1.40(35.5) | .160(4.07) | .630(16.0) | .510(13.0) |
| 2-1437622-3      | KLNS900B1/4 | Black   | .940(23.9) | .280(7.11) | .710(18.0) | 1.40(35.5) | .160(4.07) | .630(16.0) | .510(13.0) |

### KN SERIES



KN501A1/4



**Straight Knurl with Arrowhead Indicator**

| Tyco Electronics | Alcoswitch | Color       | A          | B          | C          | D          | E          | F          | G           |
|------------------|------------|-------------|------------|------------|------------|------------|------------|------------|-------------|
| 5-1437622-1      | KN501A1/8  | Natural     | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.3) | .625(15.9) | .512(13.0) | .456(11.58) |
| 5-1437622-0      | KN501A1/4  | Natural     | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.3) | .625(15.9) | .512(13.0) | .456(11.58) |
| 5-1437622-3      | KN501B1/8  | Black       | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.3) | .625(15.9) | .512(13.0) | .456(11.58) |
| 5-1437622-2      | KN501B1/4  | Black       | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.3) | .625(15.9) | .512(13.0) | .456(11.58) |
| 6-1437622-2      | KN701A1/4  | Natural     | .750(19.1) | .695(17.7) | .590(15.0) | .695(17.7) | .625(15.9) | .512(13.0) | .456(11.58) |
| 6-1437622-3      | KN701B1/4  | Black       | .750(19.1) | .695(17.7) | .590(15.0) | .695(17.7) | .625(15.9) | .512(13.0) | .456(11.58) |
| 5-1437622-5      | KN501BA1/8 | Blk. - Ntl. | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.3) | .625(15.9) | .512(13.0) | .456(11.58) |
| 5-1437622-4      | KN501BA1/4 | Blk. - Ntl. | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.3) | .625(15.9) | .512(13.0) | .456(11.58) |
| 6-1437622-5      | KN701BA1/8 | Blk. - Ntl. | .750(19.1) | .695(17.7) | .590(15.0) | .695(17.7) | .625(15.9) | .512(13.0) | .456(11.58) |
| 6-1437622-4      | KN701BA1/4 | Blk. - Ntl. | .750(19.1) | .695(17.7) | .590(15.0) | .695(17.7) | .625(15.9) | .512(13.0) | .456(11.58) |

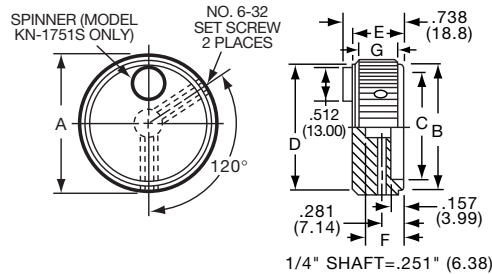
### KN SERIES



KN1751AS1/4



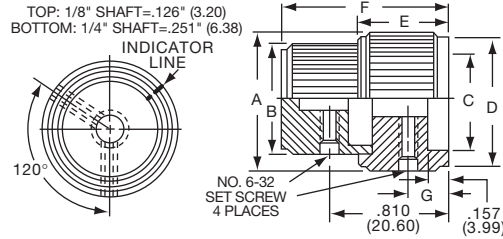
KN1751B1/4



**Straight Knurl with & without "Fingertip" Spinner**

| Tyco Electronics                   | Alcoswitch  | Color          | A          | B          | C          | D          | E          | F          | G          |
|------------------------------------|-------------|----------------|------------|------------|------------|------------|------------|------------|------------|
| <b>Less Indicator</b>              |             |                |            |            |            |            |            |            |            |
| 3-1437622-2                        | KN1751A1/4  | Natural        | 1.75(44.5) | 1.55(39.4) | 1.38(35.1) | 1.65(41.9) | .620(15.0) | .508(12.9) | .480(12.2) |
| 3-1437622-6                        | KN1751B1/4  | Black          | 1.75(44.5) | 1.55(39.4) | 1.38(35.1) | 1.65(41.9) | .620(15.8) | .508(12.9) | .480(12.2) |
| <b>Two Toned</b>                   |             |                |            |            |            |            |            |            |            |
| 3-1437622-3                        | KN1751AB1/4 | Ntl. - Blk.    | 1.75(44.5) | 1.55(39.4) | 1.38(35.1) | 1.65(41.9) | .620(15.8) | .508(12.9) | .480(12.2) |
| 3-1437622-7                        | KN1751BA1/4 | Blk. - Natural | 1.75(44.5) | 1.55(39.4) | 1.38(35.1) | 1.65(41.9) | .620(15.8) | .508(12.9) | .480(12.2) |
| <b>With Indicator</b>              |             |                |            |            |            |            |            |            |            |
| 3-1437622-1                        | KN1750A1/4  | Natural        | 1.75(44.5) | 1.55(39.4) | 1.38(35.1) | 1.65(41.9) | .620(15.8) | .508(12.9) | .480(12.2) |
| 3-1437622-1                        | KN1750B1/4  | Black          | 1.75(44.5) | 1.55(39.4) | 1.38(35.1) | 1.65(41.9) | .620(15.8) | .508(12.9) | .480(12.2) |
| <b>With Spinner/Less Indicator</b> |             |                |            |            |            |            |            |            |            |
| 3-1437622-5                        | KN1751AS1/4 | Natural        | 1.75(44.5) | 1.55(39.4) | 1.38(35.1) | 1.65(41.9) | .620(15.8) | .508(12.9) | .480(12.2) |
| 3-1437622-8                        | KN1751BS1/4 | Black          | 1.75(44.5) | 1.55(39.4) | 1.38(35.1) | 1.65(41.9) | .620(15.8) | .508(12.9) | .480(12.2) |

## Knobs, Machined Aluminum



### KN SERIES



KN5700B1/4

| Concentric Set with Straight Knurl with Indicator Lines |            |         |            |            |            |            |            |            |            |
|---------------------------------------------------------|------------|---------|------------|------------|------------|------------|------------|------------|------------|
| Tyco Electronics                                        | Alcoswitch | Color   | A          | B          | C          | D          | E          | F          | G          |
| 5-1437622-6                                             | KN5700A1/4 | Natural | .750(19.1) | .500(12.7) | .590(15.0) | .700(17.8) | .625(15.9) | 1.16(29.5) | .281(7.14) |
| 5-1437622-7                                             | KN5700B1/4 | Black   | .750(19.1) | .500(12.7) | .590(15.0) | .700(17.8) | .625(15.9) | 1.16(29.5) | .281(7.14) |

### Straight Knurl with & without Indicator Line Diameter Dimensions

| Tyco Electronics      | Alcoswitch  | Color Body-Top | A          | B          | C          | D          | E          | F          | G          |
|-----------------------|-------------|----------------|------------|------------|------------|------------|------------|------------|------------|
| 4-1437622-3           | KN500A1/8   | Natural        | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| 4-1437622-2           | KN500A1/4   | Natural        | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| 4-1437622-7           | KN500B1/8   | Black          | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| 4-1437622-6           | KN500B1/4   | Black          | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| 5-1437622-8           | KN700A1/4   | Natural        | .750(19.1) | .695(17.7) | .590(15.0) | .695(17.7) | .625(15.9) | .512(13.0) | .456(11.6) |
| 6-1437622-0           | KN700B1/4   | Black          | .750(19.1) | .695(17.7) | .590(15.0) | .695(17.7) | .625(15.9) | .512(13.0) | .456(11.6) |
| 6-1437622-6           | KN900A1/4   | Natural        | .949(24.1) | .894(22.7) | .696(17.7) | .894(22.7) | .625(15.9) | .512(13.0) | .456(11.6) |
| 6-1437622-8           | KN900B1/4   | Black          | .949(24.1) | .894(22.7) | .696(17.7) | .894(22.7) | .625(15.9) | .512(13.0) | .456(11.6) |
| 2-1437622-5           | KN1250A1/4  | Natural        | 1.25(31.8) | 1.20(30.5) | .984(25.0) | 1.20(30.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| 2-1437622-7           | KN1250B1/4  | Black          | 1.25(31.8) | 1.20(30.5) | .984(25.0) | 1.20(30.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| <b>Two-Toned</b>      |             |                |            |            |            |            |            |            |            |
| 4-1437622-5           | KN500AB1/8  | Ntl - Blk.     | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| 4-1437622-4           | KN500AB1/4  | Ntl - Blk.     | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| 4-1437622-9           | KN500BA1/8  | Blk. - Ntl.    | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| 4-1437622-8           | KN500BA1/4  | Blk. - Ntl.    | .500(12.7) | .445(11.3) | .374(9.50) | .445(11.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| 5-1437622-9           | KN700AB1/4  | Ntl - Blk.     | .750(19.1) | .695(17.7) | .445(11.5) | .695(17.7) | .625(15.9) | .512(13.0) | .456(11.6) |
| 6-1437622-1           | KN700BA1/4  | Blk. - Ntl.    | .750(19.1) | .695(17.7) | .445(11.5) | .695(17.7) | .625(15.9) | .512(13.0) | .456(11.6) |
| 6-1437622-7           | KN900AB1/4  | Ntl - Blk.     | .949(24.1) | .894(22.7) | .695(17.7) | .894(22.7) | .625(15.9) | .512(13.0) | .456(11.6) |
| 6-1437622-9           | KN900BA1/4  | Blk. - Ntl.    | .949(24.1) | .894(22.7) | .695(17.7) | .894(22.7) | .625(15.9) | .512(13.0) | .456(11.6) |
| 2-1437622-6           | KN1250AB1/4 | Ntl - Blk.     | 1.25(31.8) | 1.20(30.5) | .984(25.0) | 1.20(30.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| 2-1437622-8           | KN1250BA1/4 | Blk. - Ntl.    | 1.25(31.8) | 1.20(30.5) | .984(25.0) | 1.20(30.5) | .625(15.9) | .512(13.0) | .456(11.6) |
| <b>Less Indicator</b> |             |                |            |            |            |            |            |            |            |
| 2-1437622-9           | KN1251A1/4  | Natural        | 1.25(31.8) | 1.20(30.5) | .984(25.0) | 1.25(31.7) | .625(15.9) | .512(13.0) | .456(11.7) |
| 3-1437622-0           | KN1251B1/4  | Black          | 1.25(31.8) | 1.20(30.5) | .984(25.0) | 1.25(31.7) | .625(15.9) | .512(13.0) | .456(11.7) |

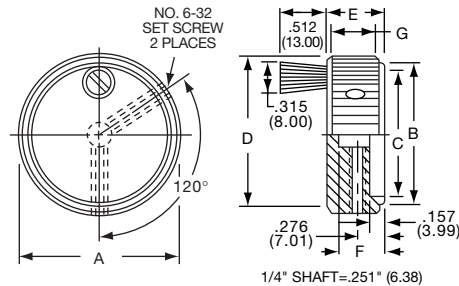
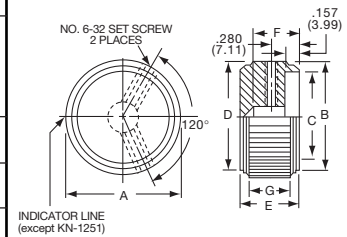
### KN SERIES



KN500A1/4



KN900BA1/4



### KN SERIES



KN1755BS1/4

| Straight Knurl with "Crank" Spinner |              |                     |            |            |            |            |            |            |            |
|-------------------------------------|--------------|---------------------|------------|------------|------------|------------|------------|------------|------------|
| Tyco Electronics                    | Alcoswitch   | Color Body-Top/Spin | A          | B          | C          | D          | E          | F          | G          |
| 4-1437622-1                         | KN1755AS1/4  | Natural             | 1.76(44.7) | 1.56(39.5) | .138(35.0) | 1.65(41.8) | .630(16.0) | .512(13.0) | .492(12.5) |
|                                     | KN1755BS1/4  | Black               | 1.76(44.7) | 1.56(39.5) | .138(35.0) | 1.65(41.8) | .630(16.0) | .512(13.0) | .492(12.5) |
| 3-1437622-9                         | KN1755ABS1/4 | Ntl.-Blk./Blk.      | 1.76(44.7) | 1.56(39.5) | 1.38(35.0) | 1.65(41.8) | .630(16.0) | .512(13.0) | .492(12.5) |
| 4-1437622-0                         | KN1755BAS1/4 | Blk.-Ntl. Blk.      | 1.76(44.7) | 1.56(39.5) | 1.38(35.0) | 1.65(41.8) | .630(16.0) | .512(13.0) | .492(12.5) |

## Knobs, Machined Aluminum

### KNS SERIES

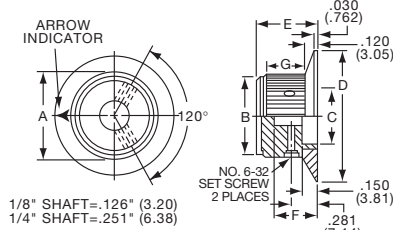


KNS501A1/4



KNS701B1/4

KNS701BA1/4

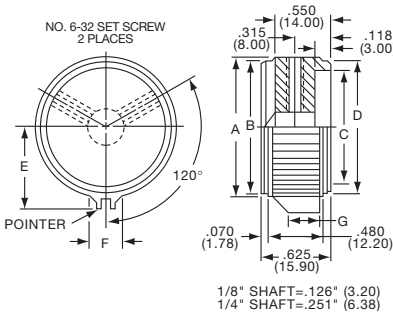


| Straight Knurl with Arrowhead Indicator on Skirt |             |                |            |            |            |            |            |            |            |
|--------------------------------------------------|-------------|----------------|------------|------------|------------|------------|------------|------------|------------|
| Tyco                                             |             |                |            |            |            |            |            |            |            |
| Electronics                                      | Alcoswitch  | Color          | A          | B          | C          | D          | E          | F          | G          |
| 7-1437622-3                                      | KNS501A1/8  | Natural        | .500(12.7) | .445(11.3) | .370(9.40) | .750(19.1) | .625(15.9) | .512(13.0) | .428(10.9) |
| 7-1437622-2                                      | KNS501A1/4  | Natural        | .500(12.7) | .445(11.3) | .370(9.40) | .750(19.1) | .625(15.9) | .512(13.0) | .428(10.9) |
| 7-1437622-5                                      | KNS501B1/8  | Black          | .500(12.7) | .445(11.3) | .370(9.40) | .750(19.1) | .625(15.9) | .512(13.0) | .428(10.9) |
| 7-1437622-4                                      | KNS501B1/4  | Black          | .500(12.7) | .445(11.3) | .370(9.40) | .750(19.1) | .625(15.9) | .512(13.0) | .428(10.9) |
| 7-1437622-8                                      | KNS701A1/4  | Natural        | .750(19.1) | .695(17.7) | .590(15.0) | 1.12(28.5) | .625(15.9) | .512(13.0) | .428(10.9) |
| 7-1437622-9                                      | KNS701B1/4  | Black          | .750(19.1) | .695(17.7) | .590(15.0) | 1.12(28.5) | .625(15.9) | .512(13.0) | .428(10.9) |
| Two-Toned                                        |             | Body-Top/Skirt |            |            |            |            |            |            |            |
| 7-1437622-7                                      | KNS501BA1/8 | Blk.- Ntl.     | .500(12.7) | .695(17.7) | .370(9.40) | .750(19.1) | .625(15.9) | .512(13.0) | .428(10.9) |
| 7-1437622-6                                      | KNS501BA1/4 | Blk.- Ntl.     | .500(12.7) | .695(17.7) | .370(9.40) | .750(19.1) | .625(15.9) | .512(13.0) | .428(10.9) |
| 8-1437622-1                                      | KNS701BA1/8 | Blk.- Ntl.     | .750(19.1) | .695(17.7) | .590(15.0) | 1.12(28.5) | .625(15.9) | .512(13.0) | .428(10.9) |
| 8-1437622-0                                      | KNS701BA1/4 | Blk.- Ntl.     | .750(19.1) | .695(17.7) | .590(15.0) | 1.12(28.5) | .625(15.9) | .512(13.0) | .428(10.9) |

### KPN SERIES



KPN500B1/8

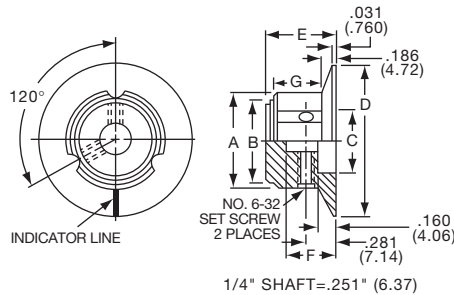


| Straight Knurl with Pointer and Indicator Line |            |                |            |             |            |            |            |            |            |
|------------------------------------------------|------------|----------------|------------|-------------|------------|------------|------------|------------|------------|
| Tyco Electronics                               | Alcoswitch | Color Body-Top | A          | B           | C          | D          | E          | F          | G          |
| 9-1437622-1                                    | KPN500A1/8 | Natural        | .500(12.7) | .445(11.3)  | .372(9.45) | .445(11.3) | .368(9.35) | .195(4.95) | .354(8.99) |
| 9-1437622-0                                    | KPN500A1/4 | Natural        | .500(12.7) | .445(11.3)  | .372(9.45) | .445(11.3) | .368(9.35) | .195(4.95) | .354(8.99) |
| 9-1437622-3                                    | KPN500B1/8 | Black          | .500(12.7) | .445(11.3)  | .372(9.45) | .445(11.3) | .368(9.35) | .195(4.95) | .354(8.99) |
| 9-1437622-2                                    | KPN500B1/4 | Black          | .500(12.7) | .445(11.3)  | .372(9.45) | .445(11.3) | .368(9.35) | .195(4.95) | .354(8.99) |
| 9-1437622-5                                    | KPN700A1/4 | Natural        | .750(19.1) | .695(17.65) | .590(15.0) | .695(17.7) | .515(13.1) | .234(5.94) | .394(10.0) |
| 9-1437622-6                                    | KPN700B1/4 | Black          | .750(19.1) | .695(17.65) | .590(15.0) | .695(17.7) | .515(13.1) | .234(5.94) | .394(10.0) |
| 9-1437622-7                                    | KPN900A1/4 | Natural        | .937(23.8) | .882(22.40) | .692(17.6) | .882(22.4) | .630(16.0) | .276(7.01) | .350(8.90) |
| 9-1437622-9                                    | KPN900B1/4 | Black          | .937(23.8) | .882(22.40) | .692(17.6) | .882(22.4) | .630(16.0) | .276(7.01) | .350(8.90) |

### KS SERIES



KS500A1/4

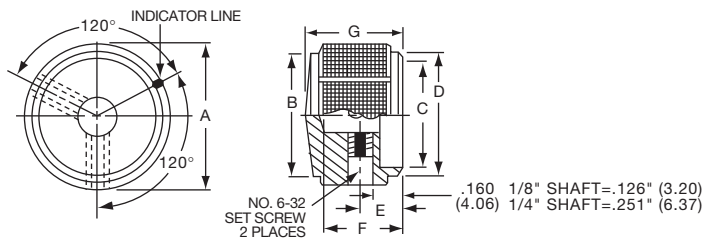


| Tyco        |            | 3 Flute Design with Aluminum Skirt and Indicator Line |            |            |            |            |            |            |            |
|-------------|------------|-------------------------------------------------------|------------|------------|------------|------------|------------|------------|------------|
| Electronics | Alcoswitch | Color                                                 | A          | B          | C          | D          | E          | F          | G          |
| 1437623-3   | KS500A1/8  | Natural                                               | .500(12.7) | .430(10.9) | .360(9.14) | .750(19.1) | .620(15.8) | .510(13.0) | .430(10.9) |
| 1437623-2   | KS500A1/4  | Natural                                               | .500(12.7) | .430(10.9) | .360(9.14) | .750(19.1) | .620(15.8) | .510(13.0) | .430(10.9) |
| 1437623-5   | KS500B1/8  | Black                                                 | .500(12.7) | .430(10.9) | .360(9.14) | .750(19.1) | .620(15.8) | .510(13.0) | .430(10.9) |
| 1437623-4   | KS500B1/4  | Black                                                 | .500(12.7) | .430(10.9) | .360(9.14) | .750(19.1) | .620(15.8) | .510(13.0) | .430(10.9) |
| 1437623-6   | KS700A1/4  | Natural                                               | .750(19.0) | .650(16.5) | .590(14.9) | 1.12(28.4) | .620(15.8) | .510(13.0) | .430(10.9) |
| 1437623-7   | KS700B1/4  | Black                                                 | .750(19.0) | .650(16.5) | .590(14.9) | 1.12(28.4) | .620(15.8) | .510(13.0) | .430(10.9) |
| 1437623-8   | KS900A1/4  | Natural                                               | .940(23.9) | .820(20.8) | .710(18.0) | 1.40(35.6) | .620(15.8) | .510(13.0) | .430(10.9) |
| 1437623-9   | KS900B1/4  | Black                                                 | .940(23.9) | .820(20.8) | .710(18.0) | 1.40(35.6) | .620(15.8) | .510(13.0) | .430(10.9) |



KS900B1/4

# Knobs, Machined Aluminum



## KT SERIES

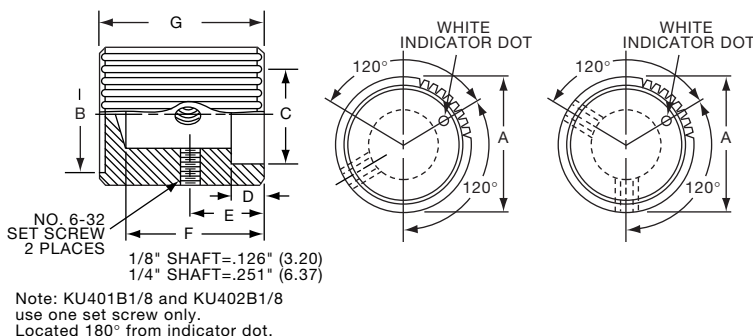


KT500A1/4

| Square Serration with Indicator Line |            |         |            |            |            |            |            |            |            |
|--------------------------------------|------------|---------|------------|------------|------------|------------|------------|------------|------------|
| Tyco                                 |            |         |            |            |            |            |            |            |            |
| Electronics                          | Alcoswitch | Color   | A          | B          | C          | D          | E          | F          | G          |
| 1-1437623-2                          | KT500A1/4  | Natural | .500(12.7) | .430(10.9) | .375(9.53) | .430(10.9) | .280(7.11) | .510(13.0) | .630(16.0) |
| 1-1437623-4                          | KT500B1/8  | Black   | .500(12.7) | .430(10.9) | .375(9.53) | .430(10.9) | .280(7.11) | .510(13.0) | .630(16.0) |
| 1-1437623-3                          | KT500B1/4  | Black   | .500(12.7) | .430(10.9) | .375(9.53) | .430(10.9) | .280(7.11) | .510(13.0) | .630(16.0) |
| 1-1437623-6                          | KT700A1/4  | Natural | .740(18.8) | .650(16.5) | .590(15.0) | .650(16.5) | .280(7.11) | .510(13.0) | .630(16.0) |
| 1-1437623-7                          | KT700B1/4  | Black   | .740(18.8) | .650(16.5) | .590(15.0) | .650(16.5) | .280(7.11) | .510(13.0) | .630(16.0) |
| 1-1437623-8                          | KT900A1/4  | Natural | .940(23.9) | .816(20.7) | .710(18.0) | .816(20.7) | .280(7.11) | .510(13.0) | .630(16.0) |
| 1-1437623-9                          | KT900B1/4  | Black   | .940(23.9) | .816(20.7) | .710(18.0) | .816(20.7) | .280(7.11) | .510(13.0) | .630(16.0) |



KT700A1/4

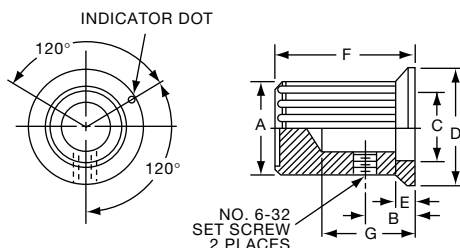


## KU SERIES



KU402B1/8

| Serrated Diamond Trim Cut with Dot Indicator |            |       |            |            |            |            |            |            |             |
|----------------------------------------------|------------|-------|------------|------------|------------|------------|------------|------------|-------------|
| Tyco                                         |            |       |            |            |            |            |            |            |             |
| Electronics                                  | Alcoswitch | Color | A          | B          | C          | D          | E          | F          | G           |
| 2-1437623-1                                  | KU401B1/8  | Black | .374(9.50) | .283(7.19) | .276(7.01) | .098(2.49) | .177(4.50) | .236(5.99) | .299(7.60)  |
| 2-1437623-2                                  | KU402B1/8  | Black | .374(9.50) | .283(7.19) | .276(7.01) | .098(2.49) | .197(5.00) | .354(8.99) | .449(11.40) |
| 2-1437623-3                                  | KU500B1/8  | Black | .500(12.7) | .409(10.4) | .374(9.50) | .118(3.00) | .276(7.01) | .512(13.0) | .598(15.2)  |
|                                              | KU500B1/4  | Black | .500(12.7) | .409(10.4) | .374(9.50) | .118(3.00) | .276(7.01) | .512(13.0) | .598(15.2)  |
| 2-1437623-4                                  | KU700B1/4  | Black | .740(18.8) | .650(16.5) | .591(15.0) | .118(3.00) | .276(7.01) | .512(13.0) | .598(15.2)  |



## KUS SERIES



KUS402B1/8

| Serrated Diamond Trim Cut with Dot Indicator |             |            |       |            |            |            |            |            |            |            |
|----------------------------------------------|-------------|------------|-------|------------|------------|------------|------------|------------|------------|------------|
| Tyco                                         | Electronics | Alcoswitch | Color | A          | B          | C          | D          | E          | F          | G          |
| 2-1437623-9                                  | KUS402B1/8  | Black      |       | .374(9.50) | .197(5.00) | .276(7.01) | .520(13.2) | .098(2.49) | .450(11.4) | .354(8.99) |
| 3-1437623-0                                  | KUS500B1/8  | Black      |       | .500(12.7) | .276(7.01) | .374(9.50) | .700(17.8) | .118(3.00) | .600(15.2) | .512(13.0) |
|                                              | KUS500B1/4  | Black      |       | .500(12.7) | .276(7.01) | .374(9.50) | .700(17.8) | .118(3.00) | .600(15.2) | .512(13.0) |
| 3-1437623-1                                  | KUS700B1/4  | Black      |       | .740(18.8) | .276(7.01) | .591(15.0) | 1.03(26.2) | .118(3.00) | .600(15.2) | .512(13.0) |



KUS700B1/4

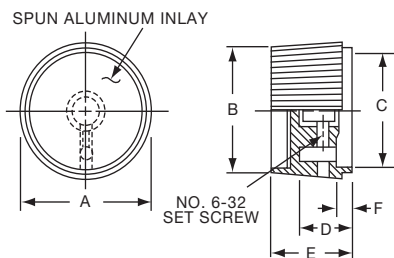
Note: KUS402B1/8 has #4.40 setscrew

## Knobs, Molded Phenolic

### PH SERIES



PH15181/4



| Tyco        |            | Straight Knurl Less Indicator Line |            |            |            |            |            |
|-------------|------------|------------------------------------|------------|------------|------------|------------|------------|
| Electronics | Alcoswitch | A                                  | B          | C          | D          | E          | F          |
| 1437624-2   | PH15181/4  | .996(25.3)                         | .972(24.7) | .799(20.3) | .472(12.0) | .669(17.0) | .157(3.99) |

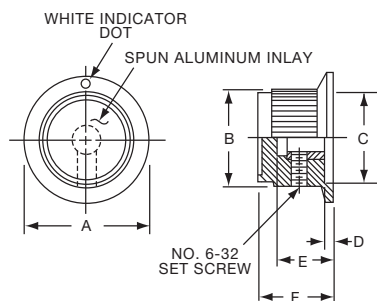
### PK SERIES



PK50B1/8



PK701/4

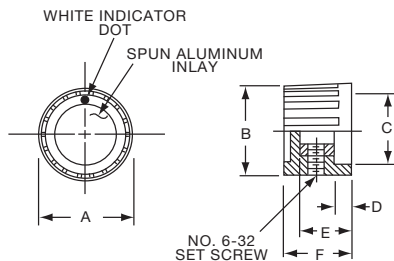


| Tyco        |            | Straight Knurl with Dot Indicator on Skirt |            |             |            |            |             |
|-------------|------------|--------------------------------------------|------------|-------------|------------|------------|-------------|
| Electronics | Alcoswitch | A                                          | B          | C           | D          | E          | F           |
| 1437624-7   | PK50B1/8   | .748(19.0)                                 | .570(14.5) | .500(12.70) | .055(1.40) | .460(11.7) | .550(13.97) |
| 1437624-6   | PK50B1/4   | .748(19.0)                                 | .570(14.5) | .500(12.70) | .055(1.40) | .460(11.7) | .550(13.97) |
| 1437624-8   | PK70B1/4   | .984(25.0)                                 | .728(18.5) | .710(18.03) | .079(2.01) | .500(12.7) | .590(14.99) |
| 1437624-9   | PK90B1/4   | 1.25(31.8)                                 | .985(25.0) | .870(22.01) | .098(2.49) | .470(11.9) | .595(15.10) |

### PK SERIES

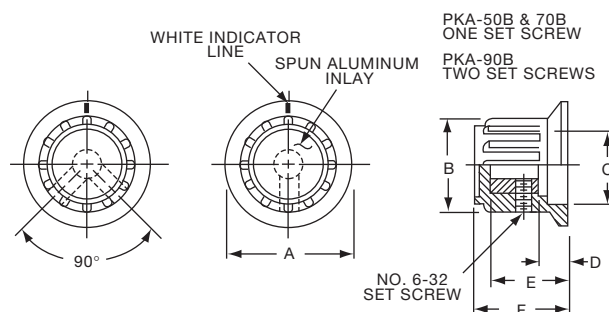


PK1100B1/4



| Tyco        |            | Serrated with Dot Indicator on Top |            |             |            |             |            |
|-------------|------------|------------------------------------|------------|-------------|------------|-------------|------------|
| Electronics | Alcoswitch | A                                  | B          | C           | D          | E           | F          |
| 1437624-4   | PK1100B1/8 | .700(17.8)                         | .643(16.3) | .565(14.35) | .125(3.18) | .453(11.51) | .530(13.5) |

## Knobs, Molded Phenolic



### PKA SERIES

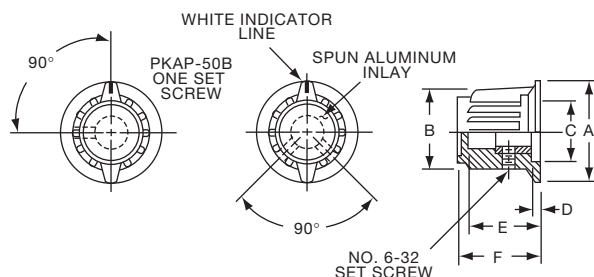


PKA50B1/4



PKA90B1/4

| Tyco Electronics Alcoswitch |           | Ribbed with Line Indicator on Skirt |            |            |            |            |            |
|-----------------------------|-----------|-------------------------------------|------------|------------|------------|------------|------------|
|                             |           | A                                   | B          | C          | D          | E          | F          |
| 1-1437624-1                 | PKA50B1/8 | .795(20.2)                          | .580(14.7) | .540(13.7) | .080(2.03) | .450(11.4) | .590(15.0) |
| 1-1437624-0                 | PKA50B1/4 | .795(20.2)                          | .580(14.7) | .540(13.7) | .080(2.03) | .450(11.4) | .590(15.0) |
| 1-1437624-4                 | PKA55B1/8 | .780(19.8)                          | .580(14.7) | .475(12.1) | .135(3.43) | .585(14.9) | .675(17.2) |
| 1-1437624-3                 | PKA55B1/4 | .780(19.8)                          | .580(14.7) | .475(12.1) | .135(3.43) | .585(14.9) | .675(17.2) |
| 1-1437624-5                 | PKA70B1/4 | .980(24.9)                          | .740(18.8) | .680(17.3) | .118(3.00) | .650(16.5) | .750(19.1) |
| 1-1437624-7                 | PKA90B1/4 | 1.375(34.9)                         | .970(24.6) | .670(17.0) | .195(4.95) | .750(19.1) | .840(21.3) |



### PKAP SERIES



PKAP50B1/8



PKAP90B1/4

| Tyco Electronics Alcoswitch |            | Ribbed with Skirt and Pointer with Indicator Line |            |            |            |            |             |
|-----------------------------|------------|---------------------------------------------------|------------|------------|------------|------------|-------------|
|                             |            | A                                                 | B          | C          | D          | E          | F           |
| 1-1437624-8                 | PKAP50B1/4 | .787(20.0)                                        | .693(17.6) | .508(12.9) | .082(2.08) | .579(14.7) | .689(17.5)  |
| 1-1437624-9                 | PKAP50B1/8 | .787(20.0)                                        | .693(17.6) | .508(12.9) | .082(2.08) | .579(14.7) | .689(17.5)  |
| 2-1437624-0                 | PKAP70B1/4 | .976(24.8)                                        | .874(22.1) | .668(17.0) | .158(4.01) | .634(16.1) | .737(18.72) |

**K**

**P Series**

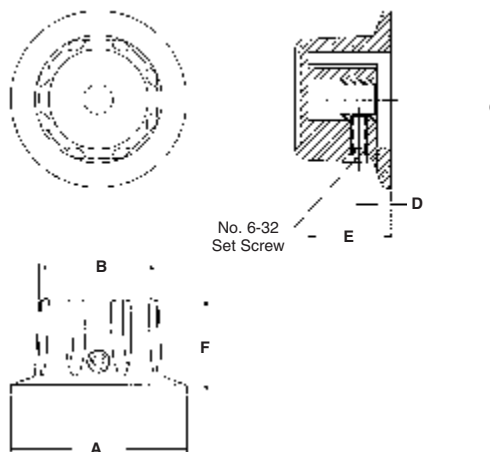


## Knobs, Molded Phenolic

### PKB SERIES



PKB90B1/4



|             |            | Fluted with Indicator Line On Skirt |            |            |           |            |            |
|-------------|------------|-------------------------------------|------------|------------|-----------|------------|------------|
| Tyco        |            | A                                   | B          | C          | D         | E          | F          |
| Electronics | Alcoswitch |                                     |            |            |           |            |            |
| 2-1437624-3 | PKB70B1/4  | 1.12(28.3)                          | .750(19.1) | .670(17.0) | .118(3.0) | .490(12.5) | .600(15.2) |
| 2-1437624-4 | PKB90B1/4  | 1.50(38.1)                          | 1.02(25.8) | .800(20.3) | .118(3.0) | .705(17.9) | .820(20.8) |

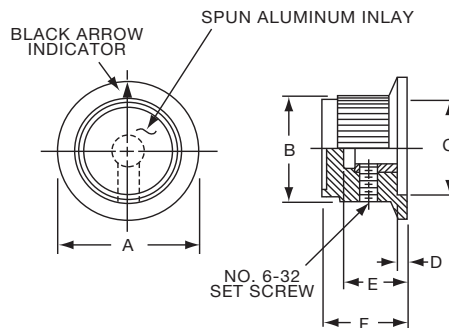
### PKD SERIES



PKD60B1/4



PKD100B1/4



|             |            | Straight Knurl Aluminum Skirt w/Arrow Indicator |            |            |           |            |            |
|-------------|------------|-------------------------------------------------|------------|------------|-----------|------------|------------|
| Tyco        |            | A                                               | B          | C          | D         | E          | F          |
| Electronics | Alcoswitch |                                                 |            |            |           |            |            |
| 2-1437624-8 | PKD60B1/8  | .780(19.8)                                      | .566(14.4) | .487(12.4) | .059(1.5) | .492(12.5) | .563(14.3) |
| 2-1437624-7 | PKD60B1/4  | .780(19.8)                                      | .566(14.4) | .487(12.4) | .059(1.5) | .492(12.5) | .563(14.3) |
| 3-1437624-1 | PKD70B1/4  | 1.02(25.9)                                      | .750(19.1) | .700(17.8) | .080(2.0) | .490(12.5) | .610(15.5) |
| 2-1437624-5 | PKD100B1/4 | 1.29(32.8)                                      | 1.00(25.4) | .865(22.0) | .050(1.3) | .500(12.7) | .590(15.0) |

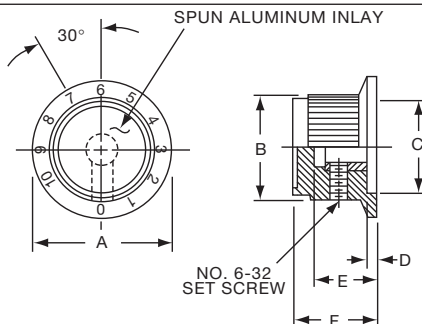
### PKD SERIES



PKD60B101/8



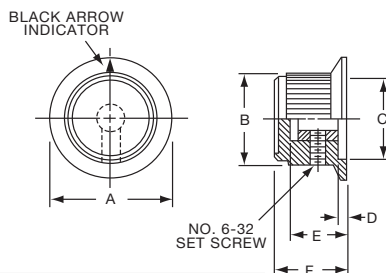
PKD100B101/4



|             |              | Straight Knurl Skirt w/0-10 Numerals |            |            |           |            |            |
|-------------|--------------|--------------------------------------|------------|------------|-----------|------------|------------|
| Tyco        |              | A                                    | B          | C          | D         | E          | F          |
| Electronics | Alcoswitch   |                                      |            |            |           |            |            |
| 3-1437624-0 | PKD60B101/8  | .780(19.8)                           | .566(14.4) | .487(12.4) | .059(1.5) | .492(12.5) | .563(14.3) |
| 2-1437624-9 | PKD60B101/4  | .780(19.8)                           | .566(14.4) | .487(12.4) | .059(1.5) | .492(12.5) | .563(14.3) |
| 3-1437624-2 | PKD70B101/4  | 1.02(25.9)                           | .750(19.1) | .700(17.8) | .080(2.0) | .490(12.5) | .610(15.5) |
| 2-1437624-6 | PKD100B101/4 | 1.29(32.8)                           | 1.00(25.4) | .865(22.0) | .050(1.3) | .500(12.7) | .590(15.0) |



## Knobs, Molded Phenolic

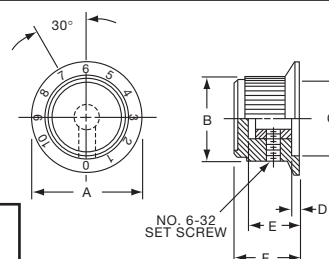


PKDT SERIES



PKDT100B1/4

| Black Spin Cap with "Diamond Cut" and Arrow Indicator |             |            |            |            |            |            |            |
|-------------------------------------------------------|-------------|------------|------------|------------|------------|------------|------------|
| Tyco Electronics                                      | Alcoswitch  | A          | B          | C          | D          | E          | F          |
| 3-1437624-9                                           | PKDT70B1/4  | 1.03(26.0) | .738(18.8) | .720(18.3) | .098(2.49) | .500(12.7) | .635(16.1) |
| 3-1437624-3                                           | PKDT100B1/4 | 1.29(32.8) | 1.02(25.9) | .860(21.8) | .042(1.07) | .500(12.7) | .638(16.2) |

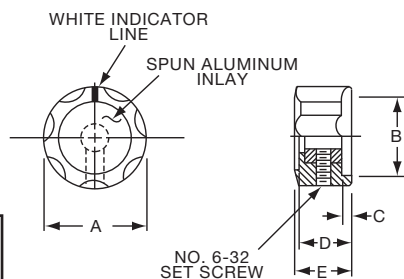


PKDT SERIES



PKDT100B101/4

| Black Spin Cap with "Diamond Cut" & 0-10 Numerals |               |            |            |            |            |            |            |
|---------------------------------------------------|---------------|------------|------------|------------|------------|------------|------------|
| Tyco Electronics                                  | Alcoswitch    | A          | B          | C          | D          | E          | F          |
| 3-1437624-8                                       | PKDT60B101/8  | .778(19.8) | .605(15.4) | .560(12.5) | .060(1.53) | .392(9.96) | .562(14.3) |
| 4-1437624-0                                       | PKDT70B101/4  | 1.03(26.0) | .738(18.8) | .720(18.3) | .098(2.49) | .500(12.7) | .635(16.1) |
| 3-1437624-4                                       | PKDT100B101/4 | 1.29(32.8) | 1.02(25.9) | .860(21.8) | .042(1.07) | .500(12.7) | .638(16.2) |

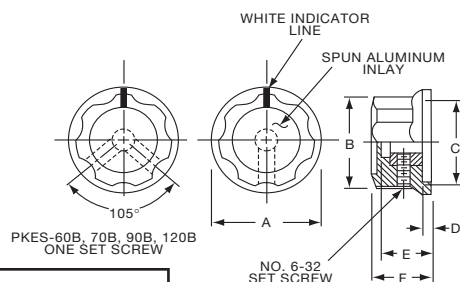


PKE SERIES



PKE90B1/4

| Fluted with Indicator Line |            |            |            |            |            |
|----------------------------|------------|------------|------------|------------|------------|
| Tyco Electronics           | Alcoswitch | A          | B          | C          | D          |
| 4-1437624-4                | PKE60B1/8  | .626(15.9) | .472(12.0) | .091(2.31) | .394(10.0) |
| 4-1437624-3                | PKE60B1/4  | .626(15.9) | .472(12.0) | .091(2.31) | .394(10.0) |
| 4-1437624-5                | PKE90B1/4  | .890(22.6) | .724(18.4) | .098(2.49) | .480(12.2) |



PKES SERIES



PKES60B1/4

| Fluted with Skirt and Indicator Line |             |            |            |            |            |            |
|--------------------------------------|-------------|------------|------------|------------|------------|------------|
| Tyco Electronics                     | Alcoswitch  | A          | B          | C          | D          | F          |
| 5-1437624-1                          | PKES60B1/8  | .748(19.0) | .618(15.7) | .460(11.7) | .090(2.29) | .470(11.9) |
| 5-1437624-0                          | PKES60B1/4  | .748(19.0) | .618(15.7) | .460(11.7) | .090(2.29) | .470(11.9) |
| 5-1437624-2                          | PKES70B1/4  | .855(21.7) | .744(18.9) | .705(17.9) | .080(2.03) | .526(13.4) |
| 5-1437624-3                          | PKES90B1/4  | 1.01(25.7) | .889(22.6) | .846(21.5) | .079(2.01) | .570(14.5) |
| 4-1437624-6                          | PKES120B1/4 | 1.30(32.9) | 1.16(29.5) | 1.02(25.9) | .118(3.00) | .628(16.0) |
| 4-1437624-7                          | PKES140B1/4 | 1.50(38.1) | 1.37(34.9) | 1.22(30.9) | .118(3.00) | .693(17.6) |
| 4-1437624-8                          | PKES150B1/4 | 1.77(44.9) | 1.55(39.4) | 1.41(35.9) | .118(3.00) | .831(21.1) |



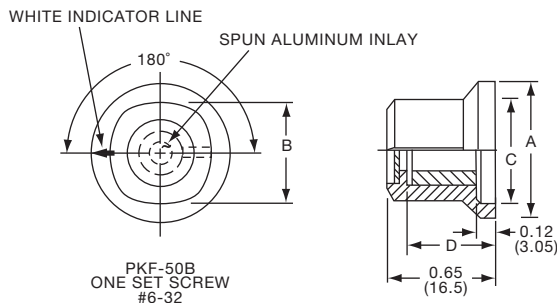
PKES70B1/4

## Knobs, Molded Phenolic

### PKF SERIES



PKF50B1/8

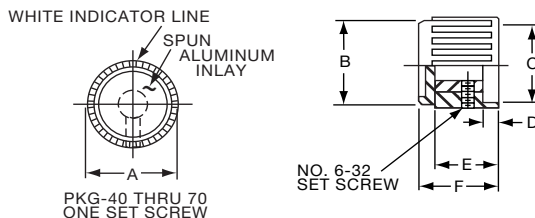


| Tyco Plain Quadrate with Indicator Line & Arrow |            |            |             |             |            |
|-------------------------------------------------|------------|------------|-------------|-------------|------------|
| Electronics                                     | Alcoswitch | A          | B           | C           | D          |
| 5-1437624-5                                     | PKF50B1/8  | .670(17.0) | .454(11.53) | .570(14.48) | .520(13.2) |

### PKG SERIES



PKG40B1/8

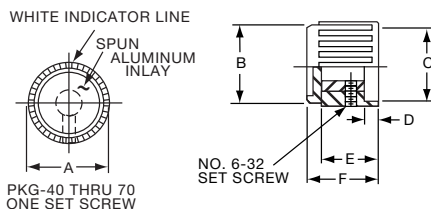


| Tyco Ribbed with Indicator Line |            |            |            |            |            |             |
|---------------------------------|------------|------------|------------|------------|------------|-------------|
| Electronics                     | Alcoswitch | A          | B          | C          | D          | E           |
| 5-1437624-9                     | *PKG40B1/8 | .437(11.1) | .410(10.4) | .304(7.72) | .079(2.00) | .385(9.78)  |
| 6-1437624-1                     | PKG50B1/8  | .551(14.0) | .500(12.7) | .442(10.7) | .056(1.42) | .395(10.03) |
| 6-1437624-0                     | PKG50B1/4  | .551(14.0) | .500(12.7) | .442(10.7) | .056(1.42) | .395(10.03) |

\*Note: Knob uses #4-40 set screw

## Knobs, Molded Phenolic

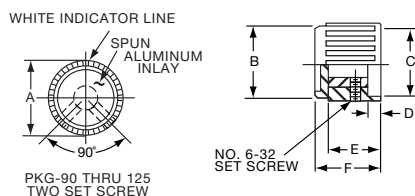
### PKG SERIES



PKG70B1/8

| Tyco        |            | Ribbed with Indicator Line |            |            |            |            |            |
|-------------|------------|----------------------------|------------|------------|------------|------------|------------|
| Electronics | Alcoswitch | A                          | B          | C          | D          | E          | F          |
| 6-1437624-6 | PKG60B1/8  | .660(16.8)                 | .615(15.6) | .551(14.0) | .080(2.03) | .430(10.9) | .551(14.0) |
| 6-1437624-5 | PKG60B1/4  | .660(16.8)                 | .615(15.6) | .551(14.0) | .080(2.03) | .430(10.9) | .551(14.0) |
| 6-1437624-8 | PKG70B1/8  | .740(18.8)                 | .698(17.7) | .591(15.0) | .080(2.03) | .453(11.5) | .559(14.2) |
| 6-1437624-7 | PKG70B1/4  | .740(18.8)                 | .698(17.7) | .591(15.0) | .080(2.03) | .453(11.5) | .559(14.2) |

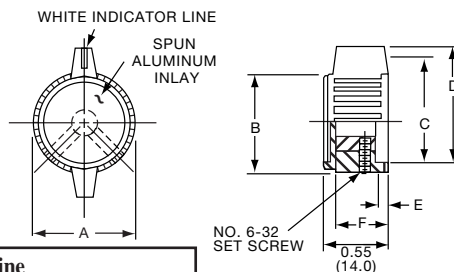
### PKG SERIES



PKG90B1/4

| Tyco        |            | Ribbed with Indicator Line |            |            |            |            |             |
|-------------|------------|----------------------------|------------|------------|------------|------------|-------------|
| Electronics | Alcoswitch | A                          | B          | C          | D          | E          | F           |
| 7-1437624-0 | PKG90B1/8  | .862(21.9)                 | .811(20.6) | .710(18.0) | .080(2.03) | .450(11.4) | .550(13.97) |
| 6-1437624-9 | PKG90B1/4  | .862(21.9)                 | .811(20.6) | .710(18.0) | .080(2.03) | .450(11.4) | .550(13.97) |
| 5-1437624-7 | PKG100B1/4 | 1.055(26.80)               | 1.01(25.5) | .920(23.4) | .080(2.03) | .430(10.9) | .555(14.1)  |
| 5-1437624-8 | PKG125B1/4 | 1.248(31.70)               | 1.20(30.4) | .690(17.5) | .080(2.03) | .430(10.9) | .565(14.4)  |

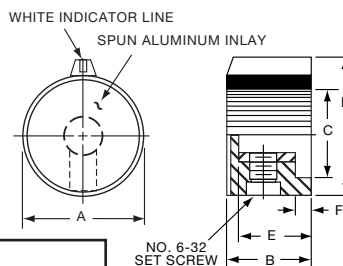
### PKGP SERIES



PKGP70B1/4

| Tyco        |             | Ribbed with Bar Pointers and Indicator Line |            |            |            |            |            |
|-------------|-------------|---------------------------------------------|------------|------------|------------|------------|------------|
| Electronics | Alcoswitch  | A                                           | B          | C          | D          | E          | F          |
| 7-1437624-2 | PKGP70B1/4  | .740(18.8)                                  | .700(17.8) | .590(15.0) | .990(25.2) | .080(2.03) | .460(11.7) |
| 7-1437624-3 | PKGP90B1/4  | .860(21.8)                                  | .810(20.6) | .700(17.8) | 1.28(32.5) | .080(2.03) | .460(11.7) |
| 7-1437624-1 | PKGP100B1/4 | 1.05(26.2)                                  | 1.00(25.4) | .900(22.9) | 1.62(41.2) | .080(2.03) | .480(12.2) |

### PKJ SERIES



PKJ50B1/8

| Tyco        |            | Straight Knurl with Bar Pointers and Indicator Line |            |            |            |            |           |
|-------------|------------|-----------------------------------------------------|------------|------------|------------|------------|-----------|
| Electronics | Alcoswitch | A                                                   | B          | C          | D          | E          | F         |
| 7-1437624-5 | PKJ50B1/8  | .500(12.7)                                          | .512(13.0) | .420(10.7) | .577(14.7) | .429(10.9) | .113(2.9) |
| 7-1437624-4 | *PKJ50B1/4 | .500(12.7)                                          | .512(13.0) | .420(10.7) | .577(14.7) | .429(10.9) | .113(2.9) |
| 7-1437624-6 | PKJ60B1/4  | .630(16.0)                                          | .530(13.5) | .468(11.9) | .758(19.3) | .440(11.2) | .110(2.8) |
| 7-1437624-7 | PKJ70B1/4  | .760(19.3)                                          | .555(14.1) | .545(13.8) | .915(23.2) | .450(11.4) | .118(3.0) |

\*Note: Knob uses #4-40 set screw



PKJ70B1/4

## Knobs, Molded Phenolic

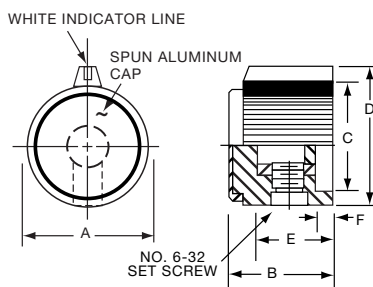
### PKJT SERIES



PKJT50B1/4



PKJT70B1/4



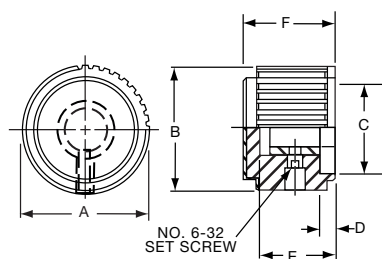
| Straight Knurl with Bar Pointer & Indicator Line and Aluminum Spin Cap<br>Tyco |             |            |            |            |            |            |            |
|--------------------------------------------------------------------------------|-------------|------------|------------|------------|------------|------------|------------|
| Electronics                                                                    | Alcoswitch  | A          | B          | C          | D          | E          | F          |
| 7-1437624-9                                                                    | PKJT50B1/8  | .515(13.1) | .585(14.9) | .350(8.89) | .595(15.1) | .414(10.5) | .130(3.30) |
| 7-1437624-8                                                                    | *PKJT50B1/4 | .515(13.1) | .585(14.9) | .350(8.89) | .595(15.1) | .414(10.5) | .130(3.30) |
| 8-1437624-0                                                                    | PKJT60B1/4  | .640(16.3) | .605(15.4) | .470(11.9) | .760(19.3) | .445(11.3) | .118(3.00) |
| 8-1437624-1                                                                    | PKJT70B1/4  | .760(19.3) | .625(15.9) | .550(14.0) | .915(23.2) | .445(11.3) | .118(3.00) |

\*Knob uses #4-40 set screw.

### PKNT SERIES



PKNT60B1/4

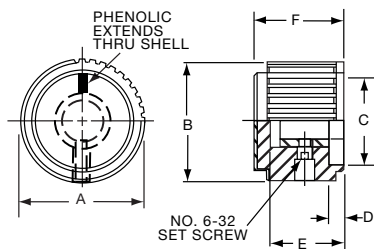


| Black Spin Cap with "Diamond Cut" Less Indicator<br>Tyco |            |            |            |            |            |            |            |
|----------------------------------------------------------|------------|------------|------------|------------|------------|------------|------------|
| Electronics                                              | Alcoswitch | A          | B          | C          | D          | E          | F          |
| 8-1437624-6                                              | PKNT60B1/8 | .591(15.0) | .579(14.7) | .394(10.0) | .079(2.01) | .394(10.0) | .472(11.9) |
| 8-1437624-5                                              | PKNT60B1/4 | .591(15.0) | .579(14.7) | .394(10.0) | .079(2.01) | .394(10.0) | .472(11.9) |
| 8-1437624-7                                              | PKNT70B1/4 | .787(19.9) | .764(19.4) | .571(14.5) | .098(2.49) | .492(12.5) | .591(14.7) |
| 8-1437624-8                                              | PKNT90B1/4 | .984(25.0) | .957(24.3) | .748(19.0) | .098(2.49) | .591(15.0) | .689(17.5) |

### PKN SERIES



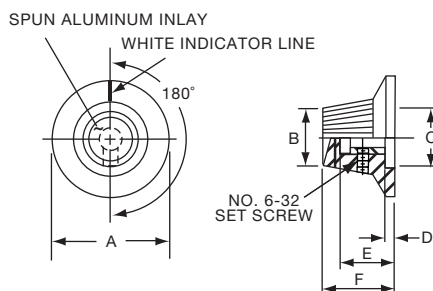
PKN60B1/8



| Line Indicator on Natural Aluminum Spin Cap<br>Tyco |            |            |            |            |            |            |            |
|-----------------------------------------------------|------------|------------|------------|------------|------------|------------|------------|
| Electronics                                         | Alcoswitch | A          | B          | C          | D          | E          | F          |
| 8-1437624-2                                         | PKN60B1/8  | .591(15.0) | .579(14.7) | .394(10.0) | .079(2.01) | .394(10.0) | .453(11.5) |
|                                                     | PKN60B1/4  | .591(15.0) | .579(14.7) | .394(10.0) | .079(2.01) | .394(10.0) | .453(11.5) |
| 8-1437624-3                                         | PKN70B1/4  | .787(20.0) | .764(19.4) | .571(14.5) | .098(2.49) | .492(12.5) | .591(15.0) |
| 8-1437624-4                                         | PKN90B1/4  | .984(25.0) | .957(24.3) | .748(19.0) | .098(2.49) | .591(15.0) | .689(17.5) |

## Knobs, Molded Phenolic

### PKS SERIES



PKS1104B1/4

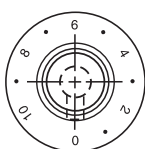
|                  |             | Straight Knurl with Indicator Line on Skirt |            |            |            |             |            |
|------------------|-------------|---------------------------------------------|------------|------------|------------|-------------|------------|
| Tyco Electronics | Alcoswitch  | A                                           | B          | C          | D          | E           | F          |
| 9-1437624-5      | PKS1104B1/4 | 1.12(28.5)                                  | .567(14.4) | .620(15.8) | .090(2.29) | .510(12.95) | .670(17.0) |

### PKS SERIES

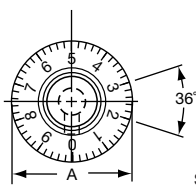
| Straight Knurl Aluminum Skirt Has Line or 0-9 Numbers |               |            |            |            |            |            |            |         |
|-------------------------------------------------------|---------------|------------|------------|------------|------------|------------|------------|---------|
| Tyco Electronics                                      | Alcoswitch    | A          | B          | C          | D          | E          | F          | Marking |
| 9-1437624-4                                           | PKS1103B101/4 | 1.17(29.6) | .571(14.5) | .620(15.7) | .098(2.49) | .516(13.1) | .670(17.0) | Numbers |
| 9-1437624-7                                           | PKS1106B1/4   | 1.17(29.6) | .571(14.5) | .618(15.7) | .098(2.49) | .516(13.1) | .670(17.0) | Line    |
| 9-1437624-6                                           | PKS1105B101/4 | 1.17(29.6) | .571(14.5) | .618(15.7) | .098(2.49) | .516(13.1) | .670(17.0) | Numbers |



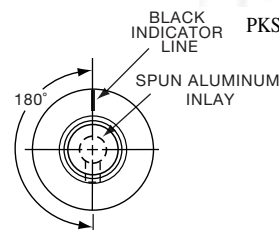
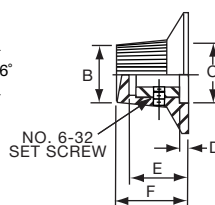
PKS1106B1/4



PKS1103B101/4

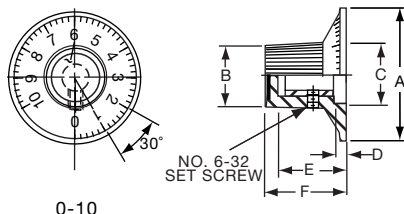


PKS1105B101/4



### PKS SERIES

SPUN ALUMINUM INLAY



0-10



+5-5



0-9



Indicator Line



PKS1132B51/4

| Tyco                                   |               | Choice of Indicator Line or 0-9, 0-10, -5+5 Numerals |            |            |            |             |            |                |
|----------------------------------------|---------------|------------------------------------------------------|------------|------------|------------|-------------|------------|----------------|
| Electronics                            | Alcoswitch    | A                                                    | B          | C          | D          | E           | F          | Marking        |
| 1437625-1                              | PKS1132B51/4  | 1.18(30.0)                                           | .551(14.0) | .551(14.0) | .118(30.0) | .615(15.62) | .748(19.0) | +5-0-5         |
| 1437625-2                              | PKS1132B91/4  | 1.18(30.0)                                           | .551(14.0) | .551(14.0) | .118(30.0) | .615(15.62) | .748(19.0) | 0-9            |
| 9-1437624-9                            | PKS1132B101/4 | 1.18(30.0)                                           | .551(14.0) | .551(14.0) | .118(30.0) | .615(15.62) | .748(19.0) | 0-10           |
| 9-1437624-8                            | *PKS1132B1/4  | 1.18(30.0)                                           | .551(14.0) | .551(14.0) | .118(30.0) | .615(15.62) | .748(19.0) | Indicator Line |
| *1 Set screw 180° from indicator line. |               |                                                      |            |            |            |             |            |                |

\*1 Set screw 180° from indicator line.



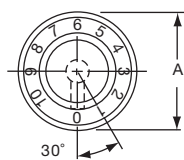
PKS1132B91/4

## Knobs, Molded Phenolic

### PKS SERIES



PKS90B1/4

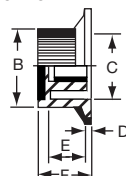


PKS90B101/4

SPUN ALUMINUM INLAY  
BLACK ARROW INDICATOR



NO. 6-32  
SET SCREW

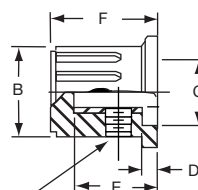
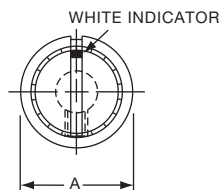


| Tyco        |             | Straight Knurl with Aluminum Skirt Choice of Arrow or 1-10 Numbers |            |            |            |            |            |         |
|-------------|-------------|--------------------------------------------------------------------|------------|------------|------------|------------|------------|---------|
| Electronics | Alcoswitch  | A                                                                  | B          | C          | D          | E          | F          | Marking |
| 1437625-5   | PKS90B1/4   | 1.42(36.1)                                                         | .917(23.3) | .780(19.8) | .065(1.65) | .490(12.5) | .596(15.1) | Arrow   |
| 1437625-6   | PKS90B101/4 | 1.42(36.1)                                                         | .917(23.3) | .780(19.8) | .065(1.65) | .490(12.5) | .596(15.1) | Numbers |

### PKX SERIES



PKX50B1/8



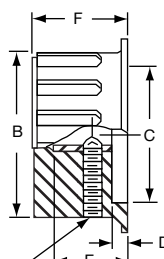
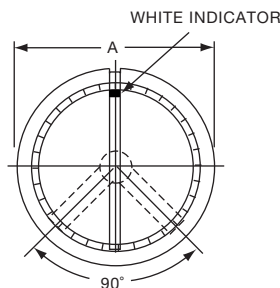
(1) 6-32 SET SCREW EXCEPT  
PKX-50B, (1) 4-40

| Tyco        |            | Ribbed Body, Matte Finish with White Square Indicator on Top |            |            |            |             |            |
|-------------|------------|--------------------------------------------------------------|------------|------------|------------|-------------|------------|
| Electronics | Alcoswitch | A                                                            | B          | C          | D          | E           | F          |
| 1-1437625-5 | PKX50B1/8  | .590(15.0)                                                   | .472(12.0) | .374(9.49) | .059(1.50) | .463(11.76) | .551(14.0) |
| 1-1437625-4 | PKX50B1/4  | .590(15.0)                                                   | .472(12.0) | .374(9.49) | .059(1.50) | .463(11.76) | .551(14.0) |
| 1-1437625-7 | PKX60B1/8  | .787(20.0)                                                   | .625(15.9) | .472(12.0) | .078(1.98) | .510(13.0)  | .598(15.2) |
| 1-1437625-6 | PKX60B1/4  | .787(20.0)                                                   | .625(15.9) | .472(12.0) | .078(1.98) | .510(13.0)  | .598(15.2) |

### PKX SERIES



PKX110B1/4

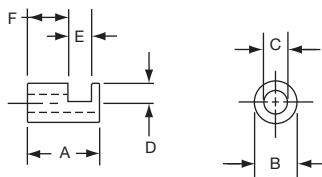


(2) 6-32  
SET SCREWS

| Tyco        |            | Ribbed Body, Matte Finish with White Square Indicator on Top |              |             |            |             |             |
|-------------|------------|--------------------------------------------------------------|--------------|-------------|------------|-------------|-------------|
| Electronics | Alcoswitch | A                                                            | B            | C           | D          | E           | F           |
| 1-1437625-1 | PKX100B1/4 | 1.17(29.7)                                                   | .970(24.6)   | .780(19.81) | .114(2.90) | .570(14.48) | .674(17.12) |
| 1-1437625-2 | PKX110B1/4 | 1.37(34.8)                                                   | 1.120(28.45) | .940(23.88) | .100(2.54) | .527(13.38) | .705(17.91) |
| 1-1437625-3 | PKX130B1/4 | 1.57(40.0)                                                   | 1.308(33.22) | 1.09(27.6)  | .118(3.00) | .623(15.82) | .750(19.05) |

**Knob Accessories**

ACCESSORIES



KR1

|             |                   | Shaft Hole Size Adaptors |            |            |            |            |            |
|-------------|-------------------|--------------------------|------------|------------|------------|------------|------------|
| Tyco        | Alcoswitch        | A                        | B          | C          | D          | E          | F          |
| 9-1437627-6 | KR1 (1/4"TO1/8")  | .374(9.50)               | .250(6.35) | .128(3.25) | .122(3.10) | .217(5.51) | .122(3.10) |
| 9-1437627-7 | KR2 (1/4"TO3/16") | .375(9.53)               | .250(6.35) | .190(4.83) | .122(3.10) | .216(5.49) | .123(3.12) |
| 9-1437627-8 | KR3 (1/4"TO4MM)   | .375(9.53)               | .248(6.30) | .161(4.09) | .122(3.10) | .216(5.49) | .123(3.12) |



## Engineering Notes



K

Engineering Notes

K22

Catalog 1308390  
Issued 9-04

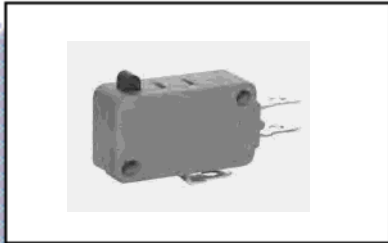
[www.tycoelectronics.com](http://www.tycoelectronics.com)

Dimensions are in inches  
and millimeters unless otherwise  
specified. Values in parentheses  
or brackets are metric equivalents.

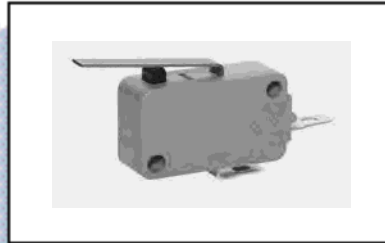
Dimensions are shown for  
reference purposes only.  
Specifications subject  
to change.

USA: 1-800-522-6752  
Canada: 1-905-470-4425  
Mexico: 01-800-733-8926  
C. America: 52-55-5-729-0425

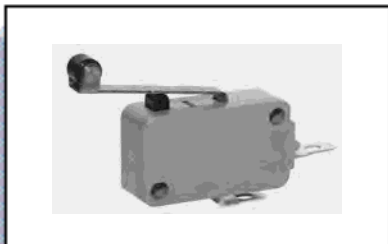
South America: 55-11-3611-1514  
Hong Kong: 852-2735-1628  
Japan: 81-44-844-8013  
UK: 44-141-810-8967



*Miniature Pin Plunger - Page L3*



*Miniature Lever - Page L5*



*Miniature Roller - Page L7*



*Miniature Simulator Lever - Page L9*



*Subminiature Pin Plunger - Page L11*



*Subminiature Lever - Page L11*



*Subminiature Roller - Page L12*



*Subminiature Simulator Lever - Page*

# Microswitches

## Microswitches Part Number Index

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| 1478600-4 | L12 | 1478610-5 | L7 | 1478619-7 | L9 |
| 1478600-5 | L12 | 1478610-6 | L8 | 1478620-1 | L3 |
| 1478601-1 | L11 | 1478610-7 | L9 | 1478620-2 | L4 |
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| 1478601-4 | L12 | 1478611-3 | L5 | 1478620-5 | L7 |
| 1478601-5 | L12 | 1478611-4 | L6 | 1478620-6 | L8 |
| 1478602-1 | L11 | 1478611-5 | L7 | 1478620-7 | L9 |
| 1478602-2 | L11 | 1478611-6 | L8 | 1478667-1 | L3 |
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| 1478602-4 | L12 | 1478612-1 | L3 | 1478667-3 | L5 |
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| 1478605-4 | L6  | 1478614-6 | L8 | 1478670-1 | L3 |
| 1478605-5 | L7  | 1478614-7 | L9 | 1478670-2 | L4 |
| 1478605-6 | L8  | 1478615-1 | L3 | 1478670-3 | L5 |
| 1478605-7 | L9  | 1478615-2 | L4 | 1478670-4 | L6 |
| 1478606-1 | L3  | 1478615-3 | L5 | 1478670-5 | L7 |
| 1478606-2 | L4  | 1478615-4 | L6 | 1478670-6 | L8 |
| 1478606-3 | L5  | 1478615-5 | L7 | 1478670-7 | L9 |
| 1478606-4 | L6  | 1478615-6 | L8 | 1478671-1 | L3 |
| 1478606-5 | L7  | 1478615-7 | L9 | 1478671-2 | L4 |
| 1478606-6 | L8  | 1478616-1 | L3 | 1478671-3 | L5 |
| 1478606-7 | L9  | 1478616-2 | L4 | 1478671-4 | L6 |
| 1478607-1 | L3  | 1478616-3 | L5 | 1478671-5 | L7 |
| 1478607-2 | L4  | 1478616-4 | L6 | 1478671-6 | L8 |
| 1478607-3 | L5  | 1478616-5 | L7 | 1478671-7 | L9 |
| 1478607-4 | L6  | 1478616-6 | L8 | 1478672-1 | L3 |
| 1478607-5 | L7  | 1478616-7 | L9 | 1478672-2 | L4 |
| 1478607-6 | L8  | 1478617-1 | L3 | 1478672-3 | L5 |
| 1478607-7 | L9  | 1478617-2 | L4 | 1478672-4 | L6 |
| 1478608-1 | L3  | 1478617-3 | L5 | 1478672-5 | L7 |
| 1478608-2 | L4  | 1478617-4 | L6 | 1478672-6 | L8 |
| 1478608-3 | L5  | 1478617-5 | L7 | 1478672-7 | L9 |
| 1478608-4 | L6  | 1478617-6 | L8 |           |    |
| 1478608-5 | L7  | 1478617-7 | L9 |           |    |
| 1478608-6 | L8  | 1478618-1 | L3 |           |    |
| 1478608-7 | L9  | 1478618-2 | L4 |           |    |
| 1478609-1 | L3  | 1478618-3 | L5 |           |    |
| 1478609-2 | L4  | 1478618-4 | L6 |           |    |
| 1478609-3 | L5  | 1478618-5 | L7 |           |    |
| 1478609-4 | L6  | 1478618-6 | L8 |           |    |
| 1478609-5 | L7  | 1478618-7 | L9 |           |    |
| 1478609-6 | L8  | 1478619-1 | L3 |           |    |
| 1478609-7 | L9  | 1478619-2 | L4 |           |    |
| 1478610-1 | L3  | 1478619-3 | L5 |           |    |

## Miniature Microswitch Introduction

Alcoswitch miniature microswitches are offered with many options to suit most typical applications.

These switches are available in a current range from 16A to .1A. Additional options available throughout the different current ratings include:

**Pin Plunger**

**Short, normal and long lever**

**Short and normal roller**

**Simulated lever**

**SPDT, SPNO and SPNC circuitry**

Within the 16A range, in addition to two different terminal options, there are three different actuation force options.

You can count on this offering of switches to be high reliability and low cost to fulfill your basic microswitch needs. Of course if you need something custom, we can offer that also. Contact your Tyco Electronics sales engineer for details.

## Technical Information

### Performance Information

| Amp Rating                                    | 16                                                                 | 5                      | 0.1                       |
|-----------------------------------------------|--------------------------------------------------------------------|------------------------|---------------------------|
| Insulation Resistance                         | Min. 100M ohm                                                      |                        |                           |
| Contact Resistance                            | max 15M ohm                                                        |                        | Max 50M ohm               |
| Dielectric Strength                           | Between Non-consecutive terminals<br>Between each terminal & earth | AC 2,000V<br>AC 2,000V |                           |
| Operating Speed                               | 0.2mm/sec - 1,000mm/sec                                            |                        | 1mm/sec - 500mm/sec       |
| Max Allowed Mechanical Open/close Frequencies | 600 Cycles/min                                                     |                        | 300 Cycles/min            |
| Shock Resistance (without lever)              | 300mm/sec <sup>2</sup> (approx 30G)                                |                        |                           |
| Vibration Resistance (without lever)          | 1.5mm 10 - 55Hz (2Hr)                                              |                        | 1.5mm 10 - 20Hz (2Hr)     |
| Electrical Life                               | 100,000 Operations at rated load<br>(max 20 Operations/min)        |                        | 1,000,000 Operations      |
| Mechanical Life                               | 10,000,000 operations<br>(Max 200 operations/min)                  |                        |                           |
| Safety Approval                               | UL / CSA / VDE                                                     |                        |                           |
| Operating Temperature Range                   | -20°C to +130°C RH85% Max                                          |                        | -30°C to +130°C RH90% Max |

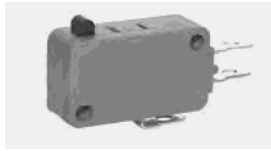
See drawings for DC ratings.

### Materials

|                   | 5 & 16A                   | .1A                       |
|-------------------|---------------------------|---------------------------|
| Case and Cover    | P.B.T Resin, UL 94 V-0    | P.B.T Resin, UL 94 V-0    |
| Movable Contactor | Brass, Silver Plated      | Phosphor Bronze           |
| Guide Plate       | Brass, Silver Plated      | Brass, Silver Plated      |
| Plate Spring      | Beryllium Copper          | Beryllium Copper          |
| Terminal Aid      | Brass                     | Brass                     |
| Contact           | Silver Alloy              | Gold Alloy                |
| Common Terminal   | Brass, Silver Plated      | Brass, Silver Plated      |
| Terminals         | Brass, Silver Plated      | Brass                     |
| Actuator          | Phenolic Resin, UL 94 V-0 | Phenolic Resin, UL 94 V-0 |
| Lever             | Stainless Steel           | Stainless Steel           |

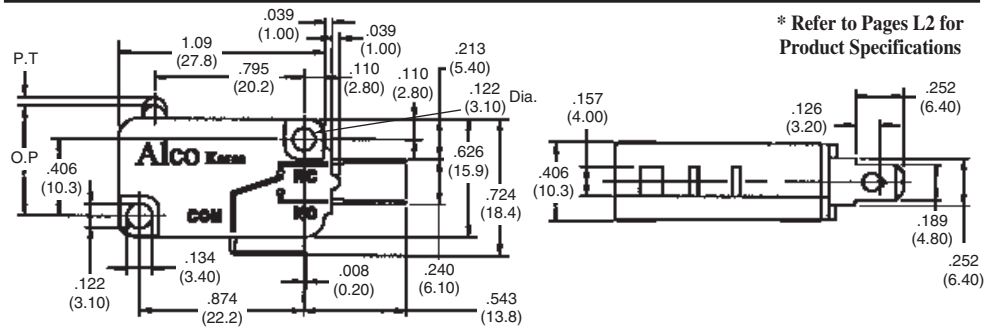
## Miniature Pin Plunger

### Spade/Solder Type Terminal



#### Product Facts

- .187 [4.75] tab with solder hole
- Use .187 [4.75] FASTON receptacles or solder wire directly to terminal



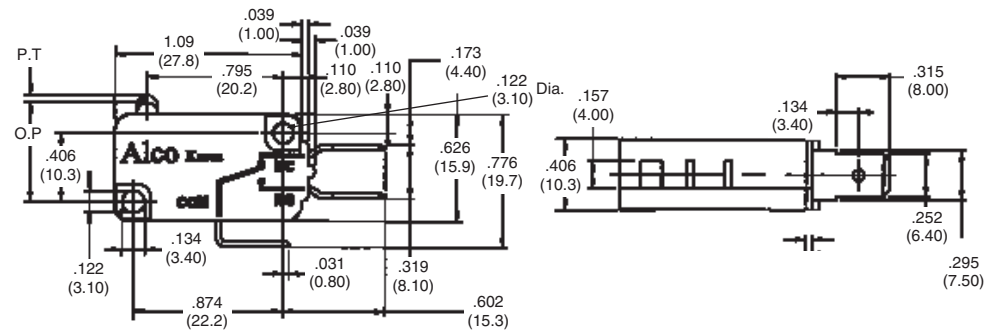
| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position       | Over Travel       | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| 16  | SPDT            | 120g            | 20g             | 1.6 m/m<br>[.063] | 14.8 ±0.4<br>[.582±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478603-1   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478604-1   |
|     |                 | 300g            | 70g             |                   |                          |                   |                       | 1478605-1   |
|     | SPNC            | 120g            | 20g             | 1.6 m/m<br>[.063] | 14.8 ±0.4<br>[.582±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478609-1   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478610-1   |
|     |                 | 300g            | 70g             |                   |                          |                   |                       | 1478611-1   |
| 5   | SPNO            | 120g            | 20g             | 1.6 m/m<br>[.063] | 14.8 ±0.4<br>[.582±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478615-1   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478616-1   |
|     |                 | 300g            | 70g             |                   |                          |                   |                       | 1478617-1   |
| 0.1 | SPDT            | 60g             | 12g             | 1.6 m/m<br>[.063] | 14.8 ±0.4<br>[.582±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478667-1   |
|     |                 |                 |                 |                   |                          |                   |                       | 1478668-1   |
|     |                 |                 |                 |                   |                          |                   |                       | 1478669-1   |
| 0.1 | SPNC            | 60g             | 12g             | 1.6 m/m<br>[.063] | 14.8 ±0.4<br>[.582±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478670-1   |
|     |                 |                 |                 |                   |                          |                   |                       | 1478671-1   |
|     |                 |                 |                 |                   |                          |                   |                       | 1478672-1   |

### Spade Type Terminal



#### Product Facts

- .250 [6.35] tab for use with .250 [6.35] FASTON receptacles



| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position       | Over Travel       | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| 16  | SPDT            | 120g            | 20g             | 1.6 m/m<br>[.063] | 14.8 ±0.4<br>[.582±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478606-1   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478607-1   |
|     |                 | 300g            | 70g             |                   |                          |                   |                       | 1478608-1   |
|     | SPNC            | 120g            | 20g             | 1.6 m/m<br>[.063] | 14.8 ±0.4<br>[.582±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478612-1   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478613-1   |
|     |                 | 300g            | 70g             |                   |                          |                   |                       | 1478614-1   |
| 0.1 | SPNO            | 120g            | 20g             | 1.6 m/m<br>[.063] | 14.8 ±0.4<br>[.582±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478618-1   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478619-1   |
|     |                 | 300g            | 70g             |                   |                          |                   |                       | 1478620-1   |

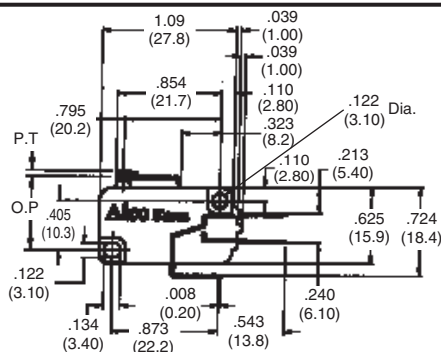
## Miniature Short Lever

### Spade/Solder Type Terminal

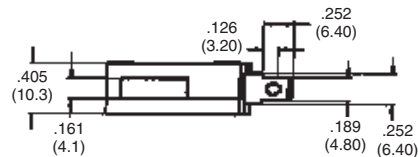


### Product Facts

- n .187 [4.75] tab with solder hole
- n Use .187 [4.75] FASTON receptacles or solder wire directly to terminal
- n Short lever to increase operating position

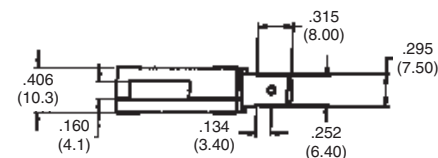
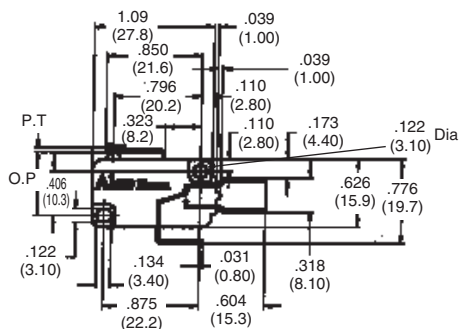


\* Refer to Pages L2 for Product Specifications



| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position       | Over Travel       | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| 16  | SPDT            | 120g            | 20g             | 1.6 m/m<br>[.063] | 14.8 ±0.4<br>[.606±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478603-2   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478604-2   |
|     |                 | 330g            | 70g             |                   |                          |                   |                       | 1478605-2   |
|     | SPNC            | 120g            | 20g             |                   |                          |                   |                       | 1478609-2   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478610-2   |
|     |                 | 330g            | 70g             |                   |                          |                   |                       | 1478611-2   |
| 5   | SPNO            | 120g            | 20g             | 1.6 m/m<br>[.063] | 14.8 ±0.4<br>[.606±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478615-2   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478616-2   |
|     |                 | 330g            | 70g             |                   |                          |                   |                       | 1478617-2   |
| 0.1 | SPDT            | 60g             | 12g             | 1.6 m/m<br>[.063] | 14.8 ±0.4<br>[.606±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478667-2   |
|     | SPNC            |                 |                 |                   |                          |                   |                       | 1478668-2   |
|     | SPNO            |                 |                 |                   |                          |                   |                       | 1478669-2   |
|     | SPDT            |                 |                 |                   |                          |                   |                       | 1478670-2   |
|     | SPNC            |                 |                 |                   |                          |                   |                       | 1478671-2   |
|     |                 |                 |                 |                   |                          |                   |                       | 1478672-2   |

### Spade Type Terminal



### Product Facts

- n .250 [6.35] tab for use with .250 [6.35] FASTON receptacles
- n Short lever to increase operating positions

| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position       | Over Travel       | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| 16  | SPDT            | 120g            | 20g             | 1.6 m/m<br>[.063] | 15.4 ±0.4<br>[.606±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478606-2   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478607-2   |
|     |                 | 330g            | 70g             |                   |                          |                   |                       | 1478608-2   |
|     | SPNC            | 120g            | 20g             |                   |                          |                   |                       | 1478612-2   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478613-2   |
|     |                 | 330g            | 70g             |                   |                          |                   |                       | 1478614-2   |
|     | SPNO            | 120g            | 20g             | 1.6 m/m<br>[.063] | 15.4 ±0.4<br>[.606±.016] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478618-2   |
|     |                 | 200g            | 50g             |                   |                          |                   |                       | 1478619-2   |
|     |                 | 330g            | 70g             |                   |                          |                   |                       | 1478620-2   |

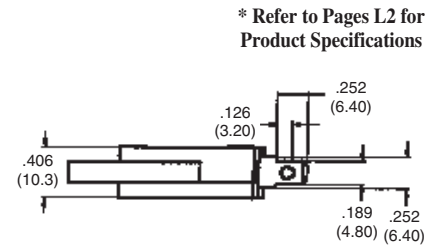
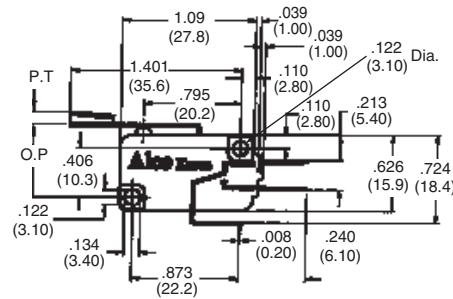
## Miniature Normal Lever

### Spade/Solder Type Terminal



#### Product Facts

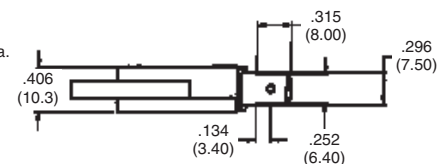
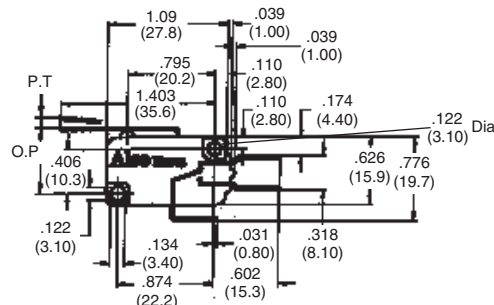
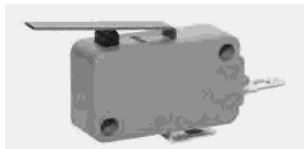
- n .187 [4.75] tab with solder hole
- n Use .187 [4.75] FASTON receptacles or solder wire directly to terminal
- n Lever to increase travel and operating position as well as reduce operating force



\* Refer to Pages L2 for Product Specifications

| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position | Over Travel | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------|-------------|-----------------------|-------------|
| 16  | SPDT            | 60g             | 10g             | 4.0 m/m           | 15.4 ±1.4          | 1.3 m/m     | 1.2 m/m               | 1478603-3   |
|     |                 | 120g            | 20g             | [.157]            | [.606±.055]        | [.051]      | [.047]                | 1478604-3   |
|     |                 | 180g            | 30g             |                   |                    |             |                       | 1478605-3   |
|     | SPNC            | 60g             | 10g             | 4.0 m/m           | 15.4 ±1.4          | 1.3 m/m     | 1.2 m/m               | 1478609-3   |
|     |                 | 120g            | 20g             | [.157]            | [.606±.055]        | [.051]      | [.047]                | 1478610-3   |
|     |                 | 180g            | 30g             |                   |                    |             |                       | 1478611-3   |
|     | SPNO            | 60g             | 10g             | 4.0 m/m           | 15.4 ±1.4          | 1.3 m/m     | 1.2 m/m               | 1478615-3   |
|     |                 | 120g            | 20g             | [.157]            | [.606±.055]        | [.051]      | [.047]                | 1478616-3   |
|     |                 | 180g            | 30g             |                   |                    |             |                       | 1478617-3   |
| 5   | SPDT            | 60g             | 10g             | 4.0 m/m           | 15.4 ±1.4          | 1.3 m/m     | 1.2 m/m               | 1478667-3   |
|     | SPNC            |                 |                 |                   |                    |             |                       | 1478668-3   |
|     | SPNO            |                 |                 |                   |                    |             |                       | 1478669-3   |
| 0.1 | SPDT            | 35g             | 6g              | 4.0 m/m           | 15.4 ±1.4          | 1.3 m/m     | 1.2 m/m               | 1478670-3   |
|     | SPNC            |                 |                 |                   |                    |             |                       | 1478671-3   |
|     | SPNO            |                 |                 |                   |                    |             |                       | 1478672-3   |

### Spade Type Terminal



#### Product Facts

- n .250 [6.35] tab for use with .250 [6.35] FASTON receptacles
- n Lever to increase travel and operating position as well as reduce operating force

| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position | Over Travel | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------|-------------|-----------------------|-------------|
| 16  | SPDT            | 60g             | 10g             | 4.0 m/m           | 15.4 ±1.4          | 1.3 m/m     | 1.2 m/m               | 1478606-3   |
|     |                 | 120g            | 20g             | [.157]            | [.606±.055]        | [.051]      | [.047]                | 1478607-3   |
|     |                 | 180g            | 30g             |                   |                    |             |                       | 1478608-3   |
|     | SPNC            | 60g             | 10g             | 4.0 m/m           | 15.4 ±1.4          | 1.3 m/m     | 1.2 m/m               | 1478612-3   |
|     |                 | 120g            | 20g             | [.157]            | [.606±.055]        | [.051]      | [.047]                | 1478613-3   |
|     |                 | 180g            | 30g             |                   |                    |             |                       | 1478614-3   |
|     | SPNO            | 60g             | 10g             | 4.0 m/m           | 15.4 ±1.4          | 1.3 m/m     | 1.2 m/m               | 1478618-3   |
|     |                 | 120g            | 20g             | [.157]            | [.606±.055]        | [.051]      | [.047]                | 1478619-3   |
|     |                 | 180g            | 30g             |                   |                    |             |                       | 1478620-3   |



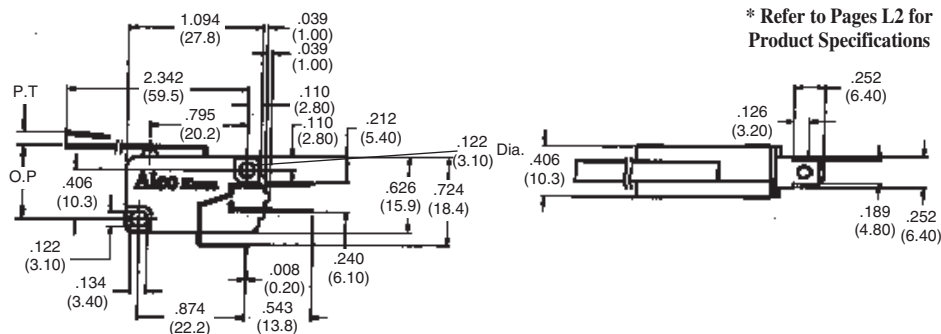
## Miniature Long Lever

### Spade/Solder Type Terminal



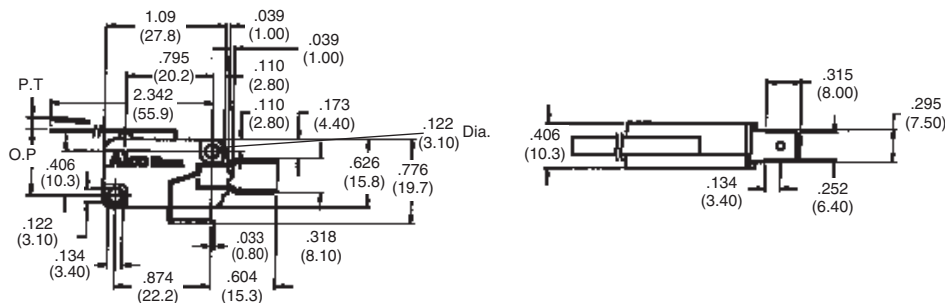
#### Product Facts

- .187 [4.75] tab with solder holes
- Use .187 [4.75] FASTON receptacles or solder wire directly to terminal
- Long lever to increase travel and reduce operating force



| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position       | Over Travel       | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| 16  | SPDT            | 30g             | 5g              | 7.5 m/m<br>[.295] | 15.4 ±3.0<br>[.606±.118] | 2.6 m/m<br>[.102] | 2.4 m/m<br>[.094]     | 1478603-4   |
|     |                 | 60g             | 10g             |                   |                          |                   |                       | 1478604-4   |
|     |                 | 90g             | 15g             |                   |                          |                   |                       | 1478605-4   |
|     | SPNC            | 30g             | 5g              | 7.5 m/m<br>[.295] | 15.4 ±3.0<br>[.606±.118] | 2.6 m/m<br>[.102] | 2.4 m/m<br>[.094]     | 1478609-4   |
|     |                 | 60g             | 10g             |                   |                          |                   |                       | 1478610-4   |
|     |                 | 90g             | 15g             |                   |                          |                   |                       | 1478611-4   |
|     | SPNO            | 30g             | 5g              | 7.5 m/m<br>[.295] | 15.4 ±3.0<br>[.606±.118] | 2.6 m/m<br>[.102] | 2.4 m/m<br>[.094]     | 1478615-4   |
|     |                 | 60g             | 10g             |                   |                          |                   |                       | 1478616-4   |
|     |                 | 90g             | 15g             |                   |                          |                   |                       | 1478617-4   |
| 5   | SPDT            | 30g             | 5g              | 7.5 m/m<br>[.295] | 15.4 ±3.0<br>[.606±.118] | 2.6 m/m<br>[.102] | 2.4 m/m<br>[.094]     | 1478667-4   |
|     | SPNC            |                 |                 |                   |                          |                   |                       | 1478668-4   |
|     | SPNO            |                 |                 |                   |                          |                   |                       | 1478669-4   |
| 0.1 | SPDT            | 15g             | 3g              | 7.5 m/m<br>[.295] | 15.4 ±3.0<br>[.606±.118] | 2.6 m/m<br>[.102] | 2.4 m/m<br>[.094]     | 1478670-4   |
|     | SPNC            |                 |                 |                   |                          |                   |                       | 1478671-4   |
|     | SPNO            |                 |                 |                   |                          |                   |                       | 1478672-4   |

### Spade Type Terminal



#### Product Facts

- .250 [6.35] tab for use with .250 [6.35] FASTON receptacles
- Long lever to increase travel and reduce operating force

| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position       | Over Travel       | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| 16  | SPDT            | 30g             | 5g              | 7.5 m/m<br>[.295] | 15.4 ±3.0<br>[.606±.118] | 2.6 m/m<br>[.102] | 2.4 m/m<br>[.094]     | 1478606-4   |
|     |                 | 60g             | 10g             |                   |                          |                   |                       | 1478607-4   |
|     |                 | 90g             | 15g             |                   |                          |                   |                       | 1478608-4   |
|     | SPNC            | 30g             | 5g              | 7.5 m/m<br>[.295] | 15.4 ±3.0<br>[.606±.118] | 2.6 m/m<br>[.102] | 2.4 m/m<br>[.094]     | 1478612-4   |
|     |                 | 60g             | 10g             |                   |                          |                   |                       | 1478613-4   |
|     |                 | 90g             | 15g             |                   |                          |                   |                       | 1478614-4   |
|     | SPNO            | 30g             | 5g              | 7.5 m/m<br>[.295] | 15.4 ±3.0<br>[.606±.118] | 2.6 m/m<br>[.102] | 2.4 m/m<br>[.094]     | 1478618-4   |
|     |                 | 60g             | 10g             |                   |                          |                   |                       | 1478619-4   |
|     |                 | 90g             | 15g             |                   |                          |                   |                       | 1478620-4   |

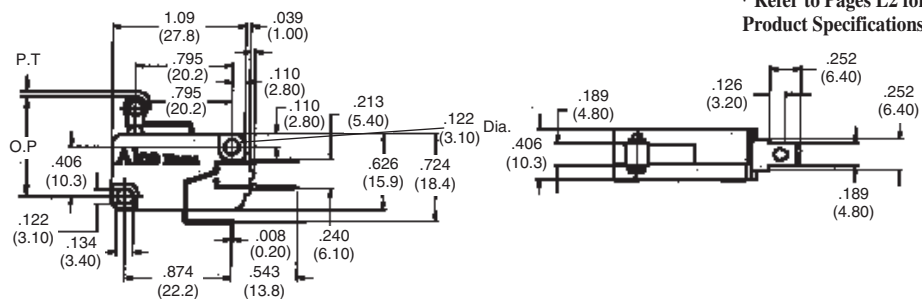
## Miniature Short Roller

### Spade/Solder Type Terminal



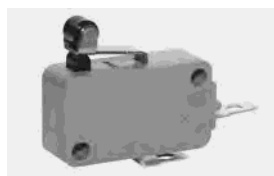
#### Product Facts

- .187 [4.75] tab with solder holes
- Use .187 [4.75] FASTON receptacles or solder wire directly to terminal
- Short roller to increase operating force and position



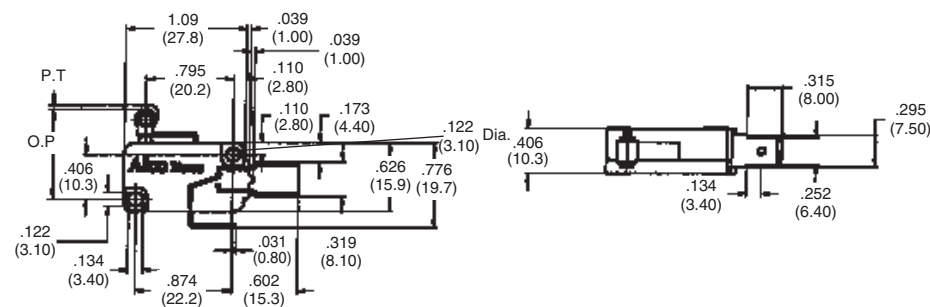
| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position       | Over Travel       | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| 16  | SPDT            | 140g            | 20g             | 1.6 m/m<br>[.063] | 20.7 ±0.8<br>[.815±.003] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478603-5   |
|     |                 | 240g            | 50g             |                   |                          |                   |                       | 1478604-5   |
|     |                 | 350g            | 70g             |                   |                          |                   |                       | 1478605-5   |
|     | SPNC            | 140g            | 20g             | 1.6 m/m<br>[.063] | 20.7 ±0.8<br>[.815±.003] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478609-5   |
|     |                 | 240g            | 50g             |                   |                          |                   |                       | 1478610-5   |
|     |                 | 350g            | 70g             |                   |                          |                   |                       | 1478611-5   |
|     | SPNO            | 140g            | 20g             | 1.6 m/m<br>[.063] | 20.7 ±0.8<br>[.815±.003] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478615-5   |
|     |                 | 240g            | 50g             |                   |                          |                   |                       | 1478616-5   |
|     |                 | 350g            | 70g             |                   |                          |                   |                       | 1478617-5   |
| 5   | SPDT            | 140g            | 20g             | 1.6 m/m<br>[.063] | 20.7 ±0.8<br>[.815±.003] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478667-5   |
|     | SPNC            |                 |                 |                   |                          |                   |                       | 1478668-5   |
|     | SPNO            |                 |                 |                   |                          |                   |                       | 1478669-5   |
| 0.1 | SPDT            | 60g             | 12g             | 1.6 m/m<br>[.063] | 20.7 ±0.8<br>[.815±.003] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478670-5   |
|     | SPNC            |                 |                 |                   |                          |                   |                       | 1478671-5   |
|     | SPNO            |                 |                 |                   |                          |                   |                       | 1478672-5   |

### Spade Type Terminal



#### Product Facts

- .250 [6.35] tab for use with .250 [6.35] FASTON receptacles
- Short roller to increase operating force and position



| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position       | Over Travel       | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| 16  | SPDT            | 140g            | 20g             | 1.6 m/m<br>[.063] | 20.7 ±0.8<br>[.815±.003] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478606-5   |
|     |                 | 240g            | 50g             |                   |                          |                   |                       | 1478607-5   |
|     |                 | 350g            | 70g             |                   |                          |                   |                       | 1478608-5   |
|     | SPNC            | 140g            | 20g             | 1.6 m/m<br>[.063] | 20.7 ±0.8<br>[.815±.003] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478612-5   |
|     |                 | 240g            | 50g             |                   |                          |                   |                       | 1478613-5   |
|     |                 | 350g            | 70g             |                   |                          |                   |                       | 1478614-5   |
|     | SPNO            | 140g            | 20g             | 1.6 m/m<br>[.063] | 20.7 ±0.8<br>[.815±.003] | 0.8 m/m<br>[.031] | 0.4 m/m<br>[.016]     | 1478618-5   |
|     |                 | 240g            | 50g             |                   |                          |                   |                       | 1478619-5   |
|     |                 | 350g            | 70g             |                   |                          |                   |                       | 1478620-5   |

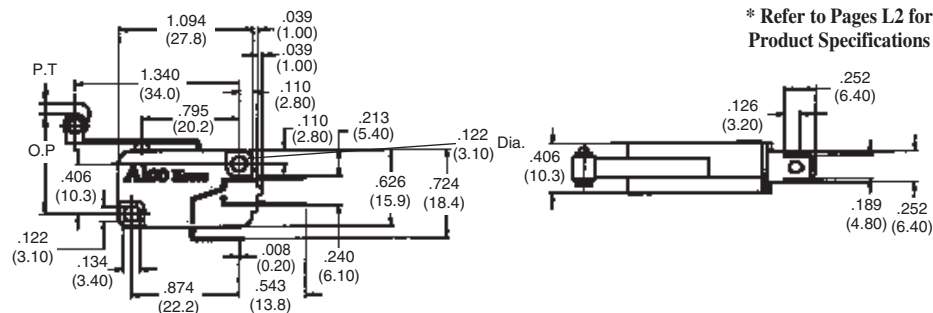
## Miniature Normal Roller

### Spade/Solder Type Terminal



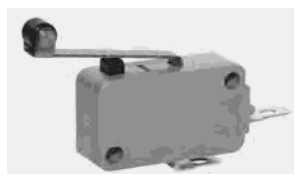
#### Product Facts

- .187 [4.75] tab with solder hole
- Use with .187 [4.75] FASTON receptacles or solder directly to terminal
- Roller to increase travel and operating position as well as reduce operating force



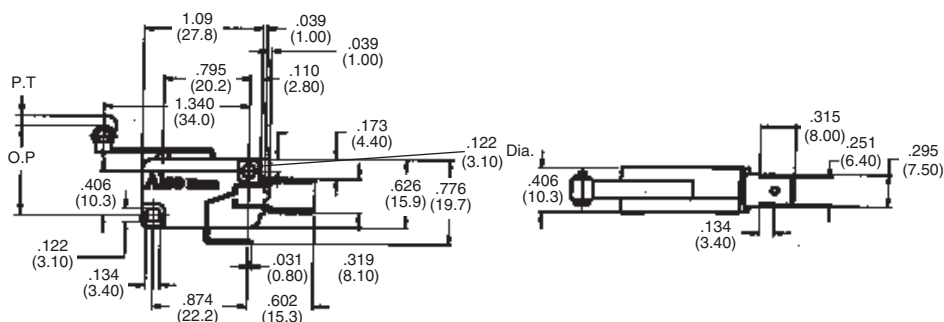
| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position       | Over Travel       | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| 16  | SPDT            | 60g             | 10g             | 4.0 m/m<br>[.157] | 20.7 ±1.6<br>[.815±.063] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478603-6   |
|     |                 | 120g            | 20g             |                   |                          |                   |                       | 1478604-6   |
|     |                 | 180g            | 30g             |                   |                          |                   |                       | 1478605-6   |
|     | SPNC            | 60g             | 10g             | 4.0 m/m<br>[.157] | 20.7 ±1.6<br>[.815±.063] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478609-6   |
|     |                 | 120g            | 20g             |                   |                          |                   |                       | 1478610-6   |
|     |                 | 180g            | 30g             |                   |                          |                   |                       | 1478611-6   |
|     | SPNO            | 60g             | 10g             | 4.0 m/m<br>[.157] | 20.7 ±1.6<br>[.815±.063] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478615-6   |
|     |                 | 120g            | 20g             |                   |                          |                   |                       | 1478616-6   |
|     |                 | 180g            | 30g             |                   |                          |                   |                       | 1478617-6   |
| 5   | SPDT            | 60g             | 10g             | 4.0 m/m<br>[.157] | 20.7 ±1.6<br>[.815±.063] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478667-6   |
|     | SPNC            |                 |                 |                   |                          |                   |                       | 1478668-6   |
|     | SPNO            |                 |                 |                   |                          |                   |                       | 1478669-6   |
| 0.1 | SPDT            | 35g             | 6g              | 4.0 m/m<br>[.157] | 20.7 ±1.6<br>[.815±.063] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478670-6   |
|     | SPNC            |                 |                 |                   |                          |                   |                       | 1478671-6   |
|     | SPNO            |                 |                 |                   |                          |                   |                       | 1478672-6   |

### Spade Type Terminal



#### Product Facts

- .250 [6.35] tab for use with .250 [6.35] FASTON receptacles
- Roller to increase travel and operating position as well as reduce operating force



| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position       | Over Travel       | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| 16  | SPDT            | 60g             | 10g             | 4.0 m/m<br>[.157] | 20.7 ±1.6<br>[.815±.063] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478606-6   |
|     |                 | 120g            | 20g             |                   |                          |                   |                       | 1478607-6   |
|     |                 | 180g            | 30g             |                   |                          |                   |                       | 1478608-6   |
|     | SPNC            | 60g             | 10g             | 4.0 m/m<br>[.157] | 20.7 ±1.6<br>[.815±.063] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478612-6   |
|     |                 | 120g            | 20g             |                   |                          |                   |                       | 1478613-6   |
|     |                 | 180g            | 30g             |                   |                          |                   |                       | 1478614-6   |
|     | SPNO            | 60g             | 10g             | 4.0 m/m<br>[.157] | 20.7 ±1.6<br>[.815±.063] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478618-6   |
|     |                 | 120g            | 20g             |                   |                          |                   |                       | 1478619-6   |
|     |                 | 180g            | 30g             |                   |                          |                   |                       | 1478620-6   |

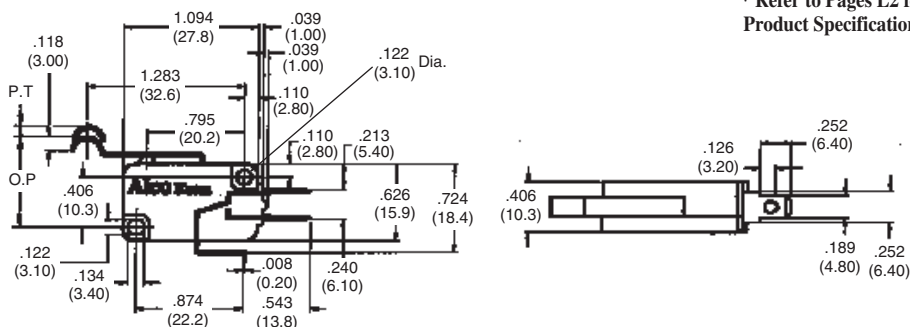
### Miniature Simulator Lever

### Spade/Solder Type Terminal



## Product Facts

- n **.187 [4.75] tab with solder hole**
- n **Use .187 [4.75] FASTON receptacles or solder directly to terminal**
- n **Simulator lever for operating position between a roller and a lever**



**\* Refer to Pages L2 for Product Specifications**

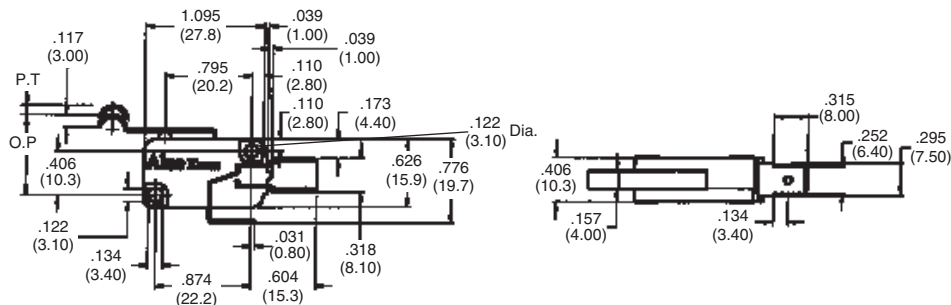
| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position       | Over Travel       | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| 16  | SPDT            | 60g             | 10g             | 4.0 m/m<br>[.157] | 18.6 ±1.5<br>[.732±.059] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478603-7   |
|     |                 | 120g            | 20g             |                   |                          |                   |                       | 1478604-7   |
|     |                 | 180g            | 30g             |                   |                          |                   |                       | 1478605-7   |
|     | SPNC            | 60g             | 10g             | 4.0 m/m<br>[.157] | 18.6 ±1.5<br>[.732±.059] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478609-7   |
|     |                 | 120g            | 20g             |                   |                          |                   |                       | 1478610-7   |
|     |                 | 180g            | 30g             |                   |                          |                   |                       | 1478611-7   |
|     | SPNO            | 60g             | 10g             | 4.0 m/m<br>[.157] | 18.6 ±1.5<br>[.732±.059] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478615-7   |
|     |                 | 120g            | 20g             |                   |                          |                   |                       | 1478616-7   |
|     |                 | 180g            | 30g             |                   |                          |                   |                       | 1478617-7   |
| 5   | SPDT            | 60g             | 10g             | 4.0 m/m<br>[.157] | 18.6 ±1.5<br>[.732±.059] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478667-7   |
|     | SPNC            |                 |                 |                   |                          |                   |                       | 1478668-7   |
|     | SPNO            |                 |                 |                   |                          |                   |                       | 1478669-7   |
| 0.1 | SPDT            | 35g             | 6g              | 4.0 m/m<br>[.157] | 18.6 ±1.5<br>[.732±.059] | 1.3 m/m<br>[.051] | 1.2 m/m<br>[.047]     | 1478670-7   |
|     | SPNC            |                 |                 |                   |                          |                   |                       | 1478671-7   |
|     | SPNO            |                 |                 |                   |                          |                   |                       | 1478672-7   |

## Spade Type Terminal



## Product Facts

- n .250 [6.35] tab for use with .250 [6.35] FASTON receptacles
- n Simulator lever for operating position between a roller and a lever



| AMP | Switch Position | Operating Force | Releasing Force | Pre Travel (P.T.) | Operating Position | Over Travel | Movement Differential | Part Number |
|-----|-----------------|-----------------|-----------------|-------------------|--------------------|-------------|-----------------------|-------------|
| 16  | SPDT            | 60g             | 10g             |                   |                    |             |                       | 1478606-7   |
|     |                 | 120g            | 20g             | 4.0 m/m           | 18.6 ±1.5          | 1.3 m/m     | 1.2 m/m               | 1478607-7   |
|     |                 | 180g            | 30g             | [.157]            | [.732±.059]        | [.051]      | [.047]                | 1478608-7   |
|     | SPNC            | 60g             | 10g             |                   |                    |             |                       | 1478612-7   |
|     |                 | 120g            | 20g             | 4.0 m/m           | 18.6 ±1.5          | 1.3 m/m     | 1.2 m/m               | 1478613-7   |
|     |                 | 180g            | 30g             | [.157]            | [.732±.059]        | [.051]      | [.047]                | 1478614-7   |
|     | SPNO            | 60g             | 10g             |                   |                    |             |                       | 1478618-7   |
|     |                 | 120g            | 20g             | 4.0 m/m           | 18.6 ±1.5          | 1.3 m/m     | 1.2 m/m               | 1478619-7   |
|     |                 | 180g            | 30g             | [.157]            | [.732±.059]        | [.051]      | [.047]                | 1478620-7   |

## Subminiature Microswitches

Alcoswitch subminiature micro switches are available with many options to fit applications with limited space and a 5 Amp or less current draw.

With the options of levers, rollers and simulator, a variety of operating forces, operating positions and travel distances are available to fit most applications. In addition to tabs and solder terminals, this line is available with PC terminals to mount directly to your PC board.

If this offering doesn't fit your application needs, contact the product information center or your Tyco sales person to discuss a custom product.

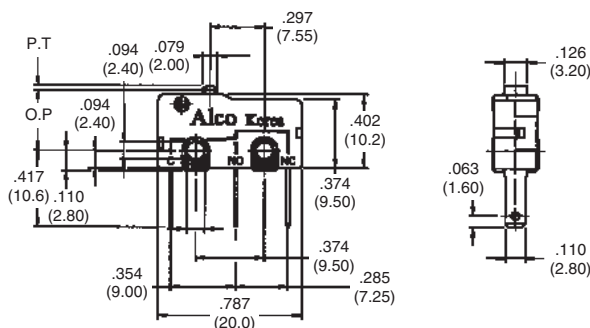
## Technical Information

| Performance Information              |                                               |                                                                           |
|--------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------|
| Amp Rating                           |                                               | 5                                                                         |
| Insulation Resistance                |                                               | Min. 100M ohm (at 500V DC)                                                |
| Contact Resistance                   |                                               | Max 50M ohm (by voltage drop, 1A 6V-8V DC)                                |
| Dielectric Strength                  | Between terminals                             | 1000Vrms for 1 min                                                        |
|                                      | Between terminals & other exposed metal parts | 1500Vrms for 1 min                                                        |
|                                      | Between terminals and earth                   | 1500Vrms for 1 min                                                        |
| Temperature Rise                     |                                               | 30°C Max                                                                  |
| Terminal Strength                    |                                               | 6kg pulling and push torque shall be applied for 1min                     |
| Allowable Operating Speed            |                                               | 0.1 to 1,000 mm/sec                                                       |
| Shock Resistance (without lever)     | Min 30G (O.F. 100g. 150g)                     | Contact opening max 1msec                                                 |
|                                      | Min 15G (O.F. 50g)                            | —                                                                         |
| Vibration Resistance (without lever) |                                               | 9G, 10 to 55 Hz at double amplitude of 1.5mm (contact opening, max 1msec) |
| Electrical Life                      |                                               | 50,000 at 20cpm                                                           |
| Mechanical Life                      |                                               | 500,000 at 60cpm                                                          |
| Mechanical Repeatability             |                                               | 300 cpm                                                                   |
| Safety Approval                      |                                               | UL / CSA                                                                  |
| Ambient Temperature                  |                                               | -25°C to +85°C                                                            |

| Materials         |                                                  |
|-------------------|--------------------------------------------------|
| Case and Cover    | P.B.T Resin, UL94 V-0<br>PA 66, UL94 V-0         |
| Movable Contactor | Beryllium Copper, with or without silver plating |
| Button            | Phenolic Resin, UL94 HB or UL94V0                |
| Common Terminal   | Brass, silver plated                             |
| Terminal (NC)     | Brass                                            |
| Terminal (NO)     | Brass                                            |
| Movable Contact   | Silver alloy                                     |
| Fixed Contact     | Silver alloy, silver plated                      |
| Lever             | Stainless Steel                                  |

## Subminiature Pin Plunger

### Pin Plunger



\* Refer to Pages L10 for Product Specifications

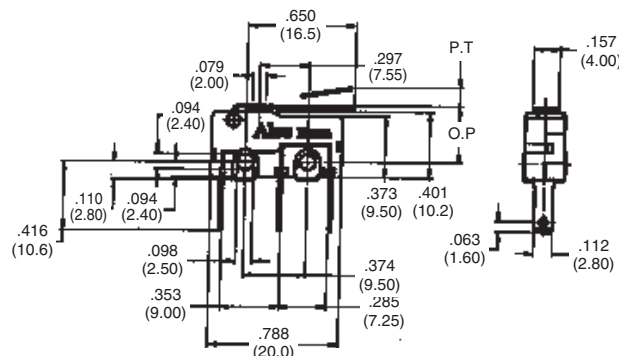
### Product Facts

- Available in tab, PCB or solder terminals
- Versatile pin plunger option

| Terminal Style | AMP | Switch Position | Operating Force | Releasing Force | Pre Travel     | Operating Position   | Over Travel    | Movement Differential | Part Number |
|----------------|-----|-----------------|-----------------|-----------------|----------------|----------------------|----------------|-----------------------|-------------|
| TAB            | 5   | SPDT            | 150g            | 20g             | 0.6 m/m [.024] | 8.4 ±0.4 [.331±.016] | 0.3 m/m [.012] | 0.2 m/m [.008]        | 1478600-1   |
| PCB            |     |                 |                 |                 |                |                      |                |                       | 1478601-1   |
| Solder         |     |                 |                 |                 |                |                      |                |                       | 1478602-1   |

## Subminiature Normal Lever

### Normal Lever



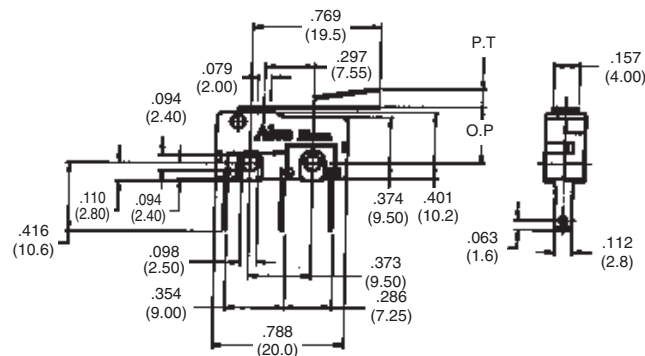
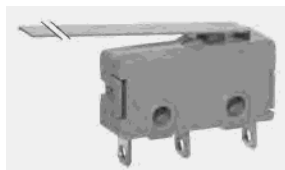
### Product Facts

- Available in tab, PCB or solder terminals
- Lever length to reduce actuation force and increase travel

| Terminal Style | AMP | Switch Position | Operating Force | Releasing Force | Pre Travel     | Operating Position   | Over Travel    | Movement Differential | Part Number |
|----------------|-----|-----------------|-----------------|-----------------|----------------|----------------------|----------------|-----------------------|-------------|
| TAB            | 5   | SPDT            | 55g             | 3.5g            | 2.8 m/m [.110] | 8.8 ±0.8 [.346±.031] | 1.2 m/m [.047] | 0.8 m/m [.031]        | 1478600-2   |
| PCB            |     |                 |                 |                 |                |                      |                |                       | 1478601-2   |
| Solder         |     |                 |                 |                 |                |                      |                |                       | 1478602-2   |

## Subminiature Long Lever

### Long Lever



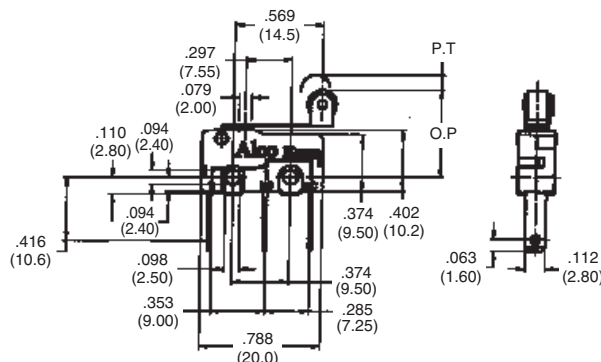
### Product Facts

- Available in tab, PCB or solder terminals
- Long lever for increased travel and reduced force

| Terminal Style | AMP | Switch Position | Operating Force | Releasing Force | Pre Travel     | Operating Position   | Over Travel    | Movement Differential | Part Number |
|----------------|-----|-----------------|-----------------|-----------------|----------------|----------------------|----------------|-----------------------|-------------|
| TAB            | 5   | SPDT            | 45g             | 3.0g            | 3.5 m/m [.138] | 8.8 ±1.2 [.346±.047] | 1.6 m/m [.063] | 1.0 m/m [.039]        | 1478600-3   |
| PCB            |     |                 |                 |                 |                |                      |                |                       | 1478601-3   |
| Solder         |     |                 |                 |                 |                |                      |                |                       | 1478602-3   |

## Subminiature Roller Lever

### Roller Lever



\* Refer to Pages L10 for Product Specifications

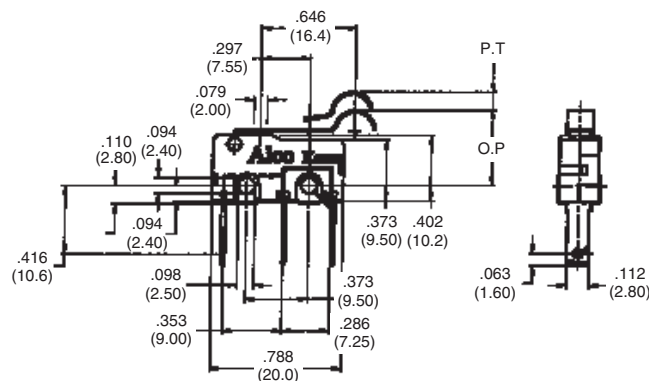
### Product Facts

- Available in tab, PCB or solder terminals
- Roller lever for increased operating position

| Terminal Style | AMP | Switch Position | Operating Force | Releasing Force | Pre Travel        | Operating Position       | Over Travel       | Movement Differential | Part Number |
|----------------|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| TAB            |     |                 |                 |                 |                   |                          |                   |                       | 1478600-4   |
| PCB            | 5   | SPDT            | 60g             | 4.0g            | 2.5 m/m<br>[.098] | 14.5 ±0.8<br>[.570±.031] | 0.8 m/m<br>[.031] | 0.5 m/m<br>[.020]     | 1478601-4   |
| Solder         |     |                 |                 |                 |                   |                          |                   |                       | 1478602-4   |

## Subminiature Simulator Lever

### Simulator Lever



### Product Facts

- Available in tab, PCB, or solder terminals
- Simulator lever for operating position between a roller and a lever

| Terminal Style | AMP | Switch Position | Operating Force | Releasing Force | Pre Travel        | Operating Position       | Over Travel       | Movement Differential | Part Number |
|----------------|-----|-----------------|-----------------|-----------------|-------------------|--------------------------|-------------------|-----------------------|-------------|
| TAB            |     |                 |                 |                 |                   |                          |                   |                       | 1478600-5   |
| PCB            | 5   | SPDT            | 40g             | 3.0g            | 3.6 m/m<br>[.142] | 11.6 ±0.8<br>[.457±.031] | 0.8 m/m<br>[.031] | 0.6 m/m<br>[.024]     | 1478601-5   |
| Solder         |     |                 |                 |                 |                   |                          |                   |                       | 1478602-5   |



## Engineering Notes



L

Engineering Notes

L14

Catalog 1308390  
Issued 9-04

[www.tycoelectronics.com](http://www.tycoelectronics.com)

Dimensions are in inches  
and millimeters unless otherwise  
specified. Values in parentheses  
or brackets are metric equivalents.

Dimensions are shown for  
reference purposes only.  
Specifications subject  
to change.

USA: 1-800-522-6752  
Canada: 1-905-470-4425  
Mexico: 01-800-733-8926  
C. America: 52-55-5-729-0425

South America: 55-11-3611-1514  
Hong Kong: 852-2735-1628  
Japan: 81-44-844-8013  
UK: 44-141-810-8967

|                                                                       |                  |
|-----------------------------------------------------------------------|------------------|
| <b>Solder Process Guide</b>                                           | <b>M2 - M4</b>   |
| <b>Actuator Code Chart</b>                                            | <b>M5 - M6</b>   |
| <b>Glossary</b>                                                       | <b>M7 - M9</b>   |
| <b>Worksheet</b>                                                      | <b>M10</b>       |
| <b>Alcoswitch to Tyco Electronics<br/>Part Number Cross Reference</b> | <b>M11 - M23</b> |
| <b>Tyco Electronics to Alcoswitch<br/>Part Number Cross Reference</b> | <b>M24 - M36</b> |

# Index/Matrixes

## Soldering Process Recommendation Guide

The majority of customers utilizing miniature or sub-miniature switches in the industry today have a great concern about the switches' capabilities during their soldering and cleaning cycles. This concern centers around the introduction of contaminants into the switch contact area which could cause the switch to experience various failure modes either immediately or during the life of the switch.

These failure modes can show in a number of manners. The following are just a few examples: high contact resistance, open contacts, low dielectric strength, and high actuation forces causing use-related malfunctions. Since most fluxes become active with the introduction of high temperatures used in all soldering techniques, the switch

must either prevent these fluxes from entering into its contact area or allow cleaning techniques to carry flux particles out. It must be understood that switch contamination can occur during any procedure: from hand soldering to Surface Mount systems for solder reflow.

We at Alcoswitch offer a wide range of switches to handle any soldering operations. However, certain soldering conditions will not apply to all switches. The following conditions and charts should help assist you in the soldering of our switches in your application. If you need additional information, please contact the factory.

### SOLDERING TYPES

#### A. WAVE SOLDERING

Top & Bottom board preheat: 200°F (93°C) for approximately 3 to 4 minutes.

Solder Temperature & Dwell Time: 500°F (260°C) for approximately 3 to 5 seconds.

#### B. HAND SOLDERING

1. 500°F-600°F (260°C-316°C) Utilizing a controlled 40 watt iron for 3 to 5 seconds maximum.

2. 500°F (260°C) Utilizing a controlled 30 watt iron for 10 seconds maximum.

#### C. DIP SOLDERING

1. Solder Temperature & Dwell Time: 500°F (260°C) for 3-5 seconds maximum.

2. Mounted on PCB .060" thick - Solder Temperature & Dwell Time: 500°F (260°C) for 10 seconds maximum.

#### D. SURFACE MOUNT

Tyco Electronics performs testing of their Surface Mount switches in accordance with EIA-364-56, Resistance to Soldering Heat, test procedures 4 (Vapor Phase) and Procedure 5 (Infrared).

### CLEANING TYPES

A. Solvent Wash (1.1.1 Trichlorethylene, T.M.S., T.M.C.)

B. Vapor Degreasing

C. Solvent Immersion

D. Aqueous Cleaning

## Soldering Process Recommendation Guide

[illegible]

## Soldering Process Recommendation Guide

[illegible]

**Actuation Code Chart Toggles, Rockers and Paddles**

|   |  |      |                                        |    |      |  |                                        |  |     |  |      |  |
|---|--|------|----------------------------------------|----|------|--|----------------------------------------|--|-----|--|------|--|
|   |  |      |                                        |    |      |  |                                        |  | A   |  | NONE |  |
|   |  |      |                                        |    |      |  |                                        |  | D   |  | NONE |  |
|   |  |      |                                        |    |      |  |                                        |  | E   |  |      |  |
|   |  |      | SINGLE MOMENTARY ON (WHERE APPLICABLE) |    |      |  | SINGLE MOMENTARY ON (WHERE APPLICABLE) |  | F   |  | NONE |  |
| 1 |  | NONE |                                        | 8  |      |  |                                        |  | K   |  | NONE |  |
| 2 |  | NONE |                                        | 9  | NONE |  |                                        |  | N   |  | NONE |  |
| 3 |  | NONE |                                        | 10 | NONE |  |                                        |  | P   |  |      |  |
| 4 |  | NONE |                                        | 11 |      |  |                                        |  | R   |  | NONE |  |
| 5 |  |      |                                        | 12 |      |  |                                        |  | PA* |  |      |  |
| 6 |  |      |                                        |    |      |  |                                        |  |     |  |      |  |
| 7 |  |      |                                        |    |      |  |                                        |  |     |  |      |  |

**Note:** Three throw function achieved with external jumpers installed by customer.

⊙ In (Common)

⊗ Out



## Actuation Code Chart Pushbuttons and Slides

The following CODE CHARTS show schematically, the electrical contact closures of a switch relative to the actuator position. All diagrams represent a TOP view of the switch with the ALCO imprint facing and bushing slot, if any, pointing left. Terminal numbers are for reference only and may not appear on switches.

Code numbers are found throughout the catalog alongside part numbers. The same schematic may show either maintained or momentary action in some cases; momentary closures are indicated by the symbol (ON).

### PUSHBUTTONS

|                      |                     |
|----------------------|---------------------|
| 13 N.O. MOMENTARY ON | 21 MOMENTARY        |
| 14 N.C. MOMENTARY ON | 22 MOM.             |
| 15 ON MOMENTARY ON   | 23 PUSH-ON PUSH-OFF |
| 16 PUSH-ON PUSH-OFF  | 24 PUSH-ON PUSH-OFF |
| 17 PUSH-ON PUSH-OFF  | 25 PUSH-ON PUSH-OFF |
| 18 PUSH-ON PUSH-OFF  | 26 PUSH-ON PUSH-OFF |
| 19 MOMENTARY         |                     |
| 20 MOMENTARY         |                     |

### TP SERIES PUSHBUTTONS

|      |  |      |  |
|------|--|------|--|
| C    |  | NONE |  |
| F FT |  | NONE |  |
| M    |  | NONE |  |
| R    |  | NONE |  |

### TSS SERIES SLIDE SWITCHES

|    |  |      |  |
|----|--|------|--|
| A  |  | NONE |  |
| D  |  | NONE |  |
| E  |  | NONE |  |
| K  |  | NONE |  |
| N  |  | NONE |  |
| P  |  | NONE |  |
| PA |  | NONE |  |



## Glossary

- **Actuation Force (Operating Force):** The force required to change the actuator of a switch from one position to the other. Unit of Measure: Slides - lbs., oz. or grams. Toggles and pushbuttons - oz. Rotary products-torque.
- **Actuator:** A movable part of a switch which causes a change in the electrical configurations of the switch.  
Example:      Toggle      Rocker      Slider  
                 Plunger      Paddle      Shaft
- **Alternate Action:** See Push-Push.
- **Angle of Throw:** The angle or arc through which an actuator passes during actuation. Typically used to refer to the movement of toggle or rocker actuators. Unit of Measure: Degree.
- **Antistatic:** An antistatic device will withstand a specified potential without conducting between the actuator and any conducting element, usually the terminals or bushing. Unit of Measure: Typical value 15-20 kilovolts DC.
- **Bifurcated Contact:** A wiping movable contact consisting of two spring fingers that grip fixed contacts. Typically found in slide switches. Self-cleaning action. See Wiping Contact.
- **Bobbin Contact:** A movable contact shaped like a thread bobbin that rolls along the stationary contacts. Found only in slide switches.
- **Bounce:** See Contact Bounce.
- **Break-Before-Make (Non-shorting, Break First):** On actuation, the movable contact breaks contact with one fixed contact before making contact with another fixed contact. Contrast with make-before-break. Typical of toggle and pushbutton switches. (BBM)
- **Break First:** See Break-Before-Make.
- **Butt Contact:** A contact mechanism in which the movable contact makes contact with the fixed (stationary) contact without wiping motion between the surfaces. Typical of toggle and pushbutton switches. See Wiping Contact.
- **Capacitive Load:** A load in which the initial current on making (closing) of the contacts is higher than the steady state current on breaking (opening) of the contacts, the current is less than steady state. Current leads voltage in capacitive loads. See Resistive Load, Inductive Load, Power Factor and Inrush.
- **Carrying Current:** The maximum current that can be passed through the already closed contacts of a switch. Contrast with "Contact Rating."
- **Contact (Contact Area):** The metal surfaces that come into physical contact to complete an electrical circuit. These surfaces are found on moveable contacts (see) and terminals (see).
- **Contact Block:** A switching element which is added singly or in groups to an operator (see) to make a complete switch.
- **Contact Bounce (Bounce):** The time during switching in which electrical instability caused by the rebound of the contacts is observed. Unit of Measure: Millisecond.
- **Contact Gap:** The distance between a stationary contact and a moveable contact in the open position.
- **Contact Rating (Switching Rating):** The capacity to switch (connect or interrupt) an electrical load. Unit of Measure: Volts, amps, load characteristic (resistive, inductive, capacitive, power factor). Contrast with non-switching rating.
- **Contact Resistance:** The total resistance of the switch, comprised of the contact interface and terminals. Unit of Measure: Milliohms.
- **Cycles:** The number of times a switch can be actuated from one extreme position to the opposite extreme position and back to the original position.
- **Detent:** A mechanical stop that holds the contacts in a given position after the actuation force is removed or prevents the changing of contact position at less than a specified actuation force.
- **Detent Angle:** The angle or arc between detent positions in rotary switches. Unit of Measure: Degree.
- **Dielectric Strength (Dielectric Withstanding Voltage, DWV, Leakage Resistance, Breakdown Voltage):** The ability of an insulator to withstand a voltage without arcing across its surface. Most often applies to insulator between switch terminals and metal exposed to operator of switch. Unit of Measure: Volts RMS, Volts AC.
- **Dielectric Withstanding Voltage:** See Dielectric Strength.
- **DIP:** Dual-in-Line Package refers to a component with two rows of PC terminals. The terminals are most commonly on a 0.100" pitch with 0.300" between rows.
- **Double-Break Contacts:** A contact mechanism using two sets of contacts to make or break a given circuit. This provides better power handling capacity and longer switch life. Typical of high power industrial switches. See Single-Break Contacts.
- **Dry Circuit (Low Energy, Logic Level):** An application in which power levels do not cause arcing, melting or softening of contacts. Typically requires gold plated contacts for reliable switch operation. Typical Definition: 0.4VA max. @ 20 VDC or peak AC.
- **DWV:** See Dielectric Strength.
- **Electrical Life:** The number of operations at a given electrical load that does not result in a degradation of any electrical or mechanical parameter beyond the standard set by the applicable end-of-life criteria. Unit of Measure: Cycles (on-off operations) (rotations).

## Glossary

- **End of Life Criteria:** Those specifications that a switch must meet at the end of its specified electrical life. Typically contact resistance and/or heat rise of contacts at full rated load at end of life.
- **Environmental Seal:** A seal that totally encapsulates the switch or relay providing a specified level of protection against intrusion of solids, liquids or gases into the body of the device.
- **Fixed Contact (Stationary or Statis Contact):** The non-moving contact. Typically integral to the end of the terminal inside the switch body.
- **Flux:** A material added during soldering to the metal surfaces which on heating prevents oxidation and aids the flowing of the solder.
- **Gas-Tight Contact:** A contact interface (movable to fixed contacts) in which the forces holding the contacts together are high enough to prevent gases from migrating between the members. This prevents static oxidation of the contact and subsequent intermittencies of high contact resistance. Typical forces are 280,000 PSI and higher.
- **Gold Flash:** A plating of gold typically less than 10 microinches (millionths) thick. Used only as a barrier to oxidation or corrosion of terminals to maintain solderability.
- **Heat Rise:** An indirect measurement of contact resistance used by rating agencies. The temperature rise over ambient of a contact set carrying a prescribed current is measured to determine whether it falls within safe limits.
- **Inductive Load:** A load in which the initial current on making (closing) of the contacts is lower than the steady state. On breaking (opening) of the contacts, the current is greater than the steady state. Current lags voltage in inductive loads. Motors are the most common inductive load. See Resistive Load, Capacitive Load, Power Factor.
- **Inrush:** A transitory high-level of current through a contact set on making (closing). A characteristic of capacitive and some resistive loads. The inrush currents can be large and long enough to cause severe degradation of the contacts. See Resistive Load, Capacitive Load, Power Factor.
- **Insert Molding:** In switches and relays used to refer to terminations that are placed in the mold so that plastic is molded around the terminations. The chief benefit is an inherent seal against the intrusion of flux into the body of the device. Therefore no epoxy terminal seal is required.
- **Insulation Resistance:** The resistance between insulated parts measured at a specified DC voltage. Unit of Measure: Megohm.
- **IP:** An industrial specification used in Europe (and worldwide) to indicate the degree of protection provided by a component against accidental contact, penetration of solids or liquids into or through the component. See NEMA.
- **Leakage Barrier:** A ridge or web molded into a switch housing between terminals or contacts to increase the surface distance between them.
- **Leakage Resistance:** Dielectric Strength.
- **Life:** See Electrical Life: Mechanical Life.
- **Logic Level:** Refers to power levels typical of solid state electronic circuits (TTL, CMOS, etc.). For switch selection see Dry Circuit.
- **Low Energy:** See Dry Circuit.
- **Maintained:** A position (throw) of a switch which remains unchanged when actuation force is removed from switch actuator. Contrast with Momentary.
- **Make-Before-Break (Shorting Contact, Make First):** Movable contact makes the next circuit before breaking the first circuit. Typically found in slide switches. Contrast with Break-Before-Make (MBB).
- **Make First:** See Make-Before-Break.
- **Mechanical Life:** The number of operations of a switch without electrical load that does not result in a degradation of parameters beyond the standard set by the applicable end-of-life criteria.
- **Momentary (Spring Return):** A momentary switch position (throw) is held only for duration of force applied to the switch actuator.
- **Movable Contact (Dynamic Contact):** The contact moved by the switch actuator into and away from contact with a fixed contact thus forming the electrical circuits possible for a given device.
- **N.C.:** See Normally Closed.
- **NEMA:** National Electrical Manufacturers Association. A US Standards setting group for switch products most often applied to switches mounted in various enclosures offering specified degrees of protection against intrusion of liquids, dust, corrosive elements, etc. NEMA ratings are common in industrial or outdoor applications. See IP.
- **NO:** See Normally Open.
- **Non-shorting:** See Break-Before-Make.
- **Non-switching Rating:** The power carrying capacity of a switch after contact closure and end of contact bounce. Typically far higher than the contact rating (switching rating) of a switch. Unit of Measure: Volts and Amps.
- **Normally Closed (NC):** Normally closed contacts are closed when switch actuator is in its unactuated position (e.g., the plunger is in the resting position in the case of a pushbutton switch).
- **Normally Open (NO):** Normally open contacts are open when the switch actuator is in its unactuated or resting position.

## Glossary

- **Oil-tight:** A generic term for a panel seal (see) commonly used in industrial settings. Defined by NEMA (see) and IP (see) standards.
- **Operating Force:** See Actuation Force.
- **Operating Temperature:** The range of temperature within which the device may be used. Unit of Measure: Degrees celsius or fahrenheit (C or F).
- **Operator:** A panel mounted mechanical device (pushbutton, selector, keylock, etc.) without contacts to which one or more contact blocks (see) may be added to make a complete switch.
- **Overtravel:** The distance the actuator may move between initial contact position and the extreme mechanical position of the actuator without damage to the switch. See travel. Pretravel. Unit of Measure: Inch. Degree.
- **Panel Seal:** A panel seal provides a defined level of protection against penetration of liquids through which the switch and switch-to-panel interface to the rear of a panel. Unit of Measure: Inches/ft. of water.
- **Pole:** The number of separate circuits that can be active through a switch at any one time. A single pole switch allows one closed circuit at a time. A double pole switch allows two closed circuits, etc.
- **Power Factor (PF):** A measure of the inductive or capacitive character of an electrical load. Unit of Measure: 0 to 1 (e.g. 0.75)
- **Process Seal:** A seal that prevents damage to or contamination of the switch during the specified mechanical process. See wave solderable. Surface Moutable.
- **Push-On/Push-Off:** See Push-Push.
- **Push-Push (Alternative Action, Push-On/Push-Off):** A pushbutton switch style in which the electrical state of the switch is maintained between actuations of the plunger.
- **Quick-Connect Terminals:** Flat tab or blade style terminals designed to accept push-on female wire connectors (instead of soldering). The most popular sizes are: 0.250", 0.110" wide.
- **Resistive load:** A load in which the current and voltage are in phase. See Capacitive Load, Inductive Load, Power Factor, Inrush.
- **Shorting Contact:** See Make-Before-Break.
- **Single Break Contacts:** A contact mechanism using one set of contacts to make or break a given circuit. Typical of electronic or low power switches. See Double-Break Contacts.
- **Splashproof:** See panel Seal.
- **Spring Return:** See Momentary.
- **Storage Temperature:** The range of temperature within which the device may be stored. Typically this is a wider range than operating temperature. Unit of Measure: Degrees celsius or fahrenheit (C or F).
- **Surface Mount Devices:** Components that are compatible with surface mount PC board technology. Holes are not used for component mounting. Component leads are soldered to pads on the surface of the PC boards. For switches typically defined by surface mount terminations (e.g., J-bend, L-bend, butt, etc.) and compatibility with surface mount soldering (e.g., vapor phase reflow, infrared, etc.) and cleaning processes.
- **Tactile Feel (Feedback):** A mechanical signal (typically a "snap" or "click") that indicates contact closure to the operator.
- **Terminal:** The metal portion of the switch, exterior to the body, that is used to connect the switch to an electrical circuit. Examples: PC, wire lug, Turrett, quick-connect, wire-wrap, etc.
- **Throws:** Number of circuits that can be controlled by any one pole of a switch. Example: In a single pole — double throw (SPDT) switch, only one circuit may be completed at a time. However, there are two possible circuits (throws) that can be made.
- **Travel:** The total distance the actuator moves to change electrical position. See Pretravel. Overtravel. Unit of Measure: Inches, degrees.
- **Washable:** Applied to PC board mounted devices indicating compatibility with cleaning processes used after soldering. No degradation of electrical or mechanical parameters occurs.
- **Wave Solderable:** Indicates the device is suitable for the wave soldering and cleaning processes as supplied. See Process Seal.
- **Wiping Contact:** A contact mechanism in which the movable contact with the fixed contact with a wiping motion. Typical to slide and rotary switches.

## Alcoswitch & Tyco Electronics Power Tool Switches Application Worksheet

### Required Information

#### Electrical Considerations:

Voltage of Applications: \_\_\_\_\_ Current of Application: \_\_\_\_\_

Circuitry Configuration: \_\_\_\_\_ Number of Poles: \_\_\_\_\_ Number of Throws: \_\_\_\_\_

Number of Operations anticipated: \_\_\_\_\_

Agency Approvals or Listings Desired: \_\_\_\_\_

#### Mechanical Considerations

Type of Switch (Actuator Type): ☐ Toggle ☐ Pushbutton ☐ Rotary ☐ Trigger ☐ Other

Switch Function: (On/Off/On) \_\_\_\_\_ On/Off \_\_\_\_\_ Momentary: \_\_\_\_\_

Termination: ☐ Thru-Hole (PC) ☐ Surface Mount ☐ Wire Lug ☐ Quick Connect ☐ Other

Sealing Contamination Requirements: \_\_\_\_\_

#### Product Processing Considerations

Anticipated Soldering Process: ☐ Hand ☐ Wave ☐ SMT ☐ Other

### Required Information For Power Tool Switches Only

#### Output Characteristics:

Variable Speed, Two Speed, On/Off, etc.: \_\_\_\_\_ Reversing/Non-Reversing: \_\_\_\_\_

Lock-on, Lock-off, or Neither: \_\_\_\_\_

Hook-up wire size and configuration (i.e. stranded/solder tinned, fused, terminated, etc.) and retention force requirements (how many pounds pull force and what directions required): \_\_\_\_\_

### Optional Information

#### Electrical Considerations:

Contact Resistance Requirements: Initial: \_\_\_\_\_ After Life Cycles: \_\_\_\_\_

Electrostatic Discharge: (E.S.D.) Requirements: \_\_\_\_\_

Contact Timing: ☐ Shorting (Make-Before-Break) ☐ Non Shorting (Break-Before-Make)

Other Electrical Considerations: \_\_\_\_\_

#### Mechanical Considerations

Actuation Force Requirements: \_\_\_\_\_

Actuator Travel Distance or Degrees of Throw: \_\_\_\_\_

Special Plating Requirements: \_\_\_\_\_ Flammability Rating: \_\_\_\_\_ Oxygen Index: \_\_\_\_\_

Special Material Requirements: \_\_\_\_\_ % Solder Coverage: \_\_\_\_\_

Marking Required: \_\_\_\_\_

Desired Product Color Options: \_\_\_\_\_

Other Mechanical Considerations: \_\_\_\_\_

#### Environmental Considerations

Operating Temperature Range: \_\_\_\_\_

Storage Temperature Range: \_\_\_\_\_

Chemical Resistance Requirements: \_\_\_\_\_

Other Environmental Considerations: \_\_\_\_\_



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