



## Features

- RoHS compliant\*
- Push-pull switch
- Linear and audio tapers
- PC board and bushing mount
- Splash seal
- Metal bushing and shaft

## Applications

- Test and measurement equipment
- Communications equipment
- Medical diagnostic equipment
- Professional audio equipment

# 54 - 1/2 " (12.5 mm) Panel Control w/Push-Pull Switch

### Electrical Characteristics<sup>1</sup>

|  |                       |
|--|-----------------------|
| Standard Resistance Range  |                       |
| Linear.....  | 1K to 500K ohms       |
| Audio.....   | 1K to 500K ohms       |
| Total Resistance Tolerance   |                       |
| B & D Tapers.....  | ±20 %                 |
| E & S Tapers.....  | ±10 %                 |
| Independent Linearity.....   | ±5 %                  |
| Absolute Minimum Resistance.....                                     | 2 ohms maximum        |
| Effective Electrical Angle.....                                      | 270 ° ±5              |
| Contact Resistance Variation.....                                    | ±2 %                  |
| Dielectric Withstanding Voltage (MIL-STD-202 – Method 301)           |                       |
| Sea Level.....   | 1,500 VAC minimum     |
| 70,000.....  | 500 VAC minimum       |
| Insulation Resistance.....   | 1,000 megohms minimum |
| Power Rating At 70 °C (Derate To 0 At 125 °C)                        |                       |
| (Voltage Limited By Power Dissipation or 350 VAC, Whichever Is Less) |                       |
| Linear Tapers.....   | 0.5 watt              |
| Audio Tapers.....  | 0.25 watt             |
| Theoretical Resolution.....  | Essentially infinite  |

### Environmental Characteristics<sup>1</sup>

|   |                   |
|---|-------------------|
| Operating Temperature Range.....                            | +1 °C to +125 °C  |
| Storage Temperature Range.....                              | -55 °C to +125 °C |
| Temperature Coefficient Over Storage Temperature Range..... | ±1,000 ppm/°C     |
| Vibration.....  | 8 G               |
| Total Resistance Shift.....                                 | ±2 % maximum      |
| Voltage Ratio Shift.....                                    | ±5 % maximum      |
| Shock.....  | 20 G              |
| Total Resistance Shift.....                                 | +2 % maximum      |
| Voltage Ratio Shift.....                                    | ±5 % maximum      |
| Load Life.....  | 1,000 hours       |
| Total Resistance Shift.....                                 | ±10 % TRS maximum |
| Rotational Life (No Load).....                              | 50,000 cycles     |
| Total Resistance Shift.....                                 | ±10 % TRS maximum |
| Contact Resistance Variation.....                           | ±2 %              |
| Moisture Resistance (MIL-STD-202, Method 103, Condition B)  |                   |
| B & E.....  | ±10 % TRS         |
| D & S.....  | ±20 % TRS         |
| IP Rating   |                   |
| Entire Unit.....  | IP64              |
| Shaft/Bushing.....  | IP65              |

### Mechanical Characteristics

|  |   |
|--|---|
| Stop Strength.....                             | 39.5 N-cm (3.5 lb.-in.)   |
| Mechanical Angle.....                          | 290 ° ±5 °  |
| Torque   |   |
| Starting/Running.....                          | 0.2 to 1.3 N-cm (0.25 to 2.0 oz.-in.)   |
| Mounting (Torque on Bushing).....              | 1.7 to 2.0 N-m (15 to 18 lb.-in.)   |
| Weight.....                                    | 10 grams  |
| Terminals.....                                 | PC pin or solder lug  |
| Soldering Condition.....                       | Recommended hand soldering using Sn95/Ag5 no clean solder, 0.025 " wire diameter.<br>Maximum temperature 399 °C (750 °F) for 3 seconds. No wash process to be used with no clean flux.<br>Part can be wave soldered at 260 °C (500 °F) for 5 seconds, no wash process with no clean flux. |
| Marking.....                                   | Manufacturer's trademark, part number, resistance value and date code.  |
| Ganging (Multiple Section Potentiometers)..... | Inquire for availability, minimum order quantity and price.   |
| Hardware.....                                  | One lockwasher and one mounting nut is shipped with each potentiometer.   |

<sup>1</sup>At room ambient: +25 °C nominal and 50 % relative humidity nominal, except as noted.

# 54 - 1/2 " (12.5 mm) Panel Control w/Push-Pull Switch

**BOURNS®**

## Initial Electrical Characteristics - Switch

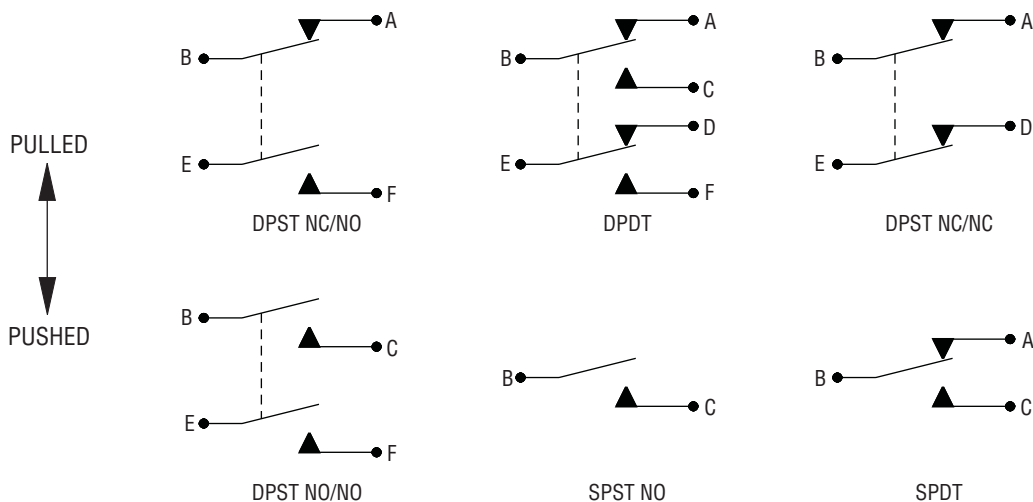
|  |                            |
|--|----------------------------|
| Switch Type .....  | DPDT (Break before make)   |
| Power Rating (Resistive Load) .....  | 0.25 A @ 30 VDC            |
| Dielectric Withstanding Voltage (MIL-STD-202, Method 301)<br>Sea Level ..... | 1000 VAC minimum           |
| Insulation Resistance .....  | 1500 megohms minimum       |
| Contact Resistance .....   | 100 milliohms maximum      |
| Actuating Stroke .....   | 0.41 cm (0.16 in.) maximum |

## Environmental Characteristics<sup>1</sup>

|  |                          |
|--|--------------------------|
| Vibration .....  | 8 G                      |
| Contact Resistance .....   | 100 milliohms maximum    |
| Contact Bounce .....   | 0.1 milliseconds maximum |
| Shock .....  | 20 G                     |
| Contact Resistance .....   | 100 milliohms maximum    |
| Contact Bounce .....   | 0.1 milliseconds maximum |
| Switch Life @ Rated Power .....  | 15,000 actuations        |
| Switch Actuating Force .....   | 0.45 kg (1.0 lb) minimum |
| Contact Resistance .....   | 100 milliohms maximum    |
| Moisture Resistance (MIL-STD-202, Method 103, Condition B)<br>Contact Resistance ..... | 100 milliohms maximum    |
| Insulation Resistance (After 24 Hours @ Room Temperature - 500 VDC) .....              | 100 megohms minimum      |

<sup>1</sup>At room ambient: +25 °C nominal and 50 % relative humidity nominal, except as noted.

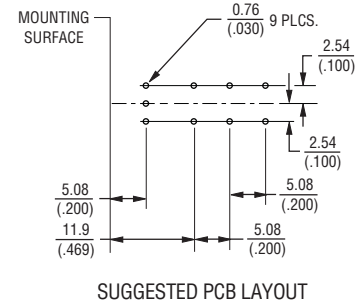
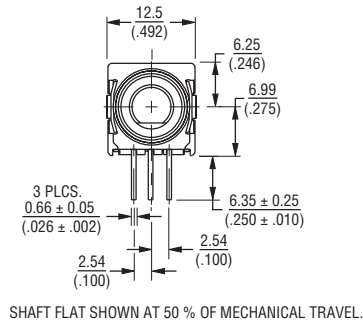
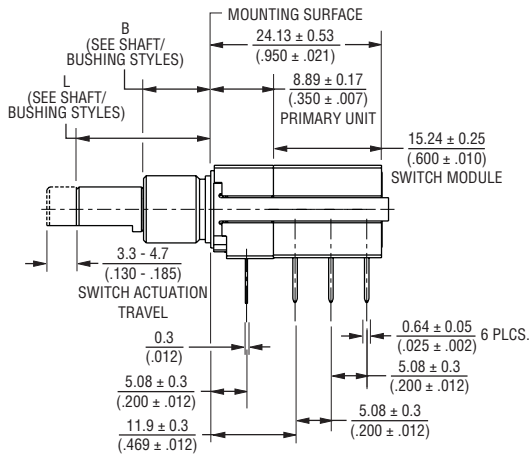
## Switch Configurations (Shown in Pulled Position)



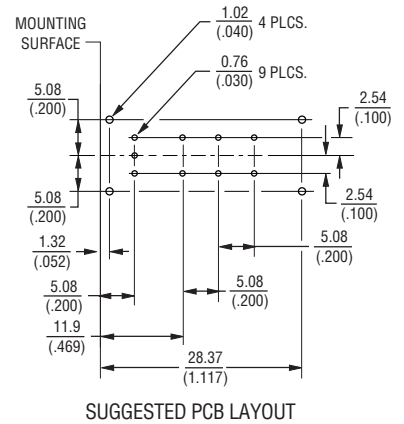
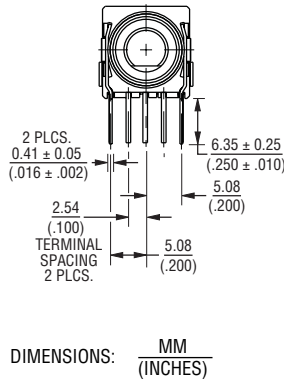
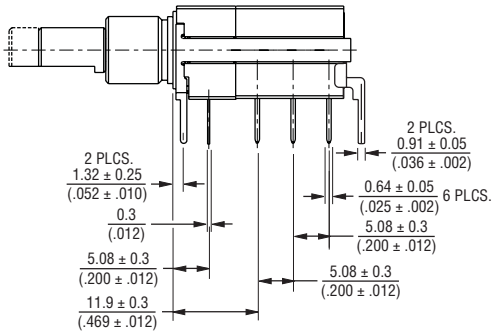
# 54 - 1/2" (12.5 mm) Panel Control w/Push-Pull Switch



## Product Dimensions

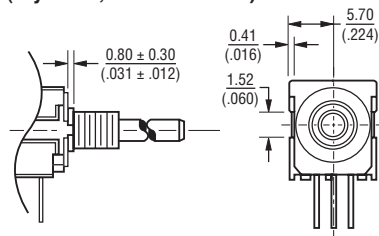


## PACKAGE DIMENSIONS WITH FRONT AND REAR PCB MOUNTING BRACKET



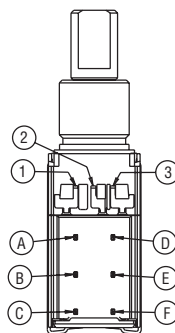
## Anti-Rotation Lug

(Style "A", 90° CW Shown)

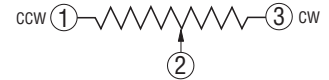


FOR TOLERANCES SHOWN: .XX ±  $\frac{.25}{.010}$   
 .XXX ±  $\frac{.13}{.005}$   
 SHAFT DIMENSIONS ±  $\frac{.80}{(1/32)}$

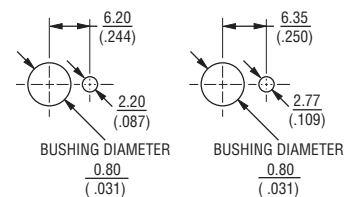
## Terminal Layout



## Electrical Schematic



## Suggested Panel Layouts

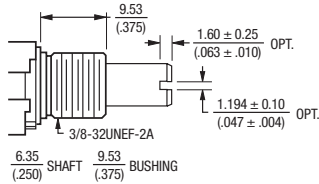


The Model 54 can be used with either of the two panel layouts shown below.

# 54 - 1/2" (12.5 mm) Panel Control w/Push-Pull Switch

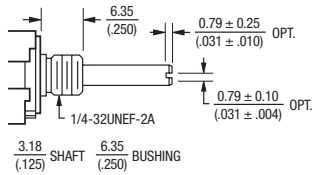


## Shaft/Bushing Styles



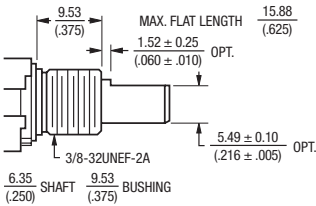
### A Style Bushing

| STD. LENGTH 'L' |         |
|-----------------|---------|
| .750            | (19.05) |
| .875            | (22.23) |



### C Style Bushing

| STD. LENGTH 'L' |         |
|-----------------|---------|
| .750            | (19.05) |
| .875            | (22.23) |



### A Style Bushing - Flatted Shaft

| STD. LENGTH 'L' |         |
|-----------------|---------|
| .750            | (19.05) |
| .875            | (22.23) |

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

## How To Order

**54 A A D - C 28 - B 15 / P50 L**

| ANTI-ROTATION LUG / BRACKET OPTION |                        |
|------------------------------------|------------------------|
| Code                               | Description            |
| A                                  | AR Lug 90° CW          |
| D                                  | No AR Lug or Bracket   |
| L                                  | Front Bracket          |
| N                                  | Front and Rear Bracket |

| RoHS IDENTIFIER |             |
|-----------------|-------------|
| Code            | Description |
| L               | Compliant   |

| SWITCH OPTION |             |
|---------------|-------------|
| Code          | Description |
| P50           | DPDT        |

| NO. OF SECTIONS |                    |
|-----------------|--------------------|
| Code            | Description        |
| A               | Single plus Switch |

| RESISTANCE CODES |               |
|------------------|---------------|
| Code             | Value in Ohms |
| 10               | 1K            |
| 13               | 5K            |
| 15               | 10K           |
| 18               | 50K           |
| 20               | 100K          |
| 22               | 250K          |
| 23               | 500K          |

| BUSHING DESIGNATOR |                          |
|--------------------|--------------------------|
| Code               | Description              |
| A                  | 3/8" D x 3/8" L Threaded |
| C                  | 1/4" D x 1/4" L Threaded |

| MODEL |                                 |
|-------|---------------------------------|
| Code  | Description                     |
| 54    | PC Terminals w/Push-Pull Switch |

| ELEMENT TAPER TYPE/TOLERANCE |                   |
|------------------------------|-------------------|
| Code                         | Description       |
| B                            | Linear CP ±20 %   |
| E                            | Linear CP ±10 %   |
| D                            | CW Audio CP ±20 % |
| S                            | CW Audio CP ±10 % |

| SHAFT LENGTH DESIGNATOR |               |
|-------------------------|---------------|
| Code                    | Description   |
| 24                      | 3/4" FMS Long |
| 28                      | 7/8" FMS Long |

| SHAFT STYLE |                    | AVAILABLE ONLY WITH BUSHING |
|-------------|--------------------|-----------------------------|
| Code        | Description        | Code                        |
| B           | 1/4" D Slotted End | A                           |
| C           | 1/4" D Flatted End | A                           |
| E           | 1/8" D Slotted End | C                           |

*Boldface features are Bourns standard options. All others are available with higher minimum order quantities.*



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