



## 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. Maximum temperature 399 °C (750 °F) for 3 seconds. No wash process to be used with no clean flux. 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.....	Locking bushing versions are shipped with one additional locking nut (Bushing A: H-37-2 & H-38-2; Bushing C: H-37-1 & H-38-1)

<sup>1</sup>Electrical specifications tested at 200 RPM, at room ambient: +25 °C nominal.



**WARNING**  
**Cancer and Reproductive Harm**  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.  
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# 54 – 1/2" (12.5 mm) Panel Control w/Push-Pull Switch

**BOURNS®**

## Initial Electrical Characteristics - Switch

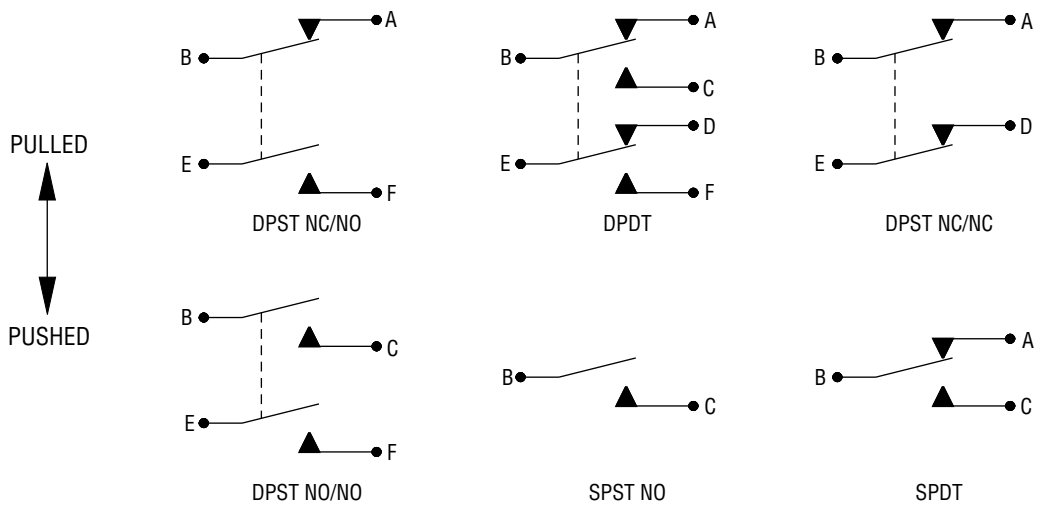
Switch Type .....	DPDT (Break before make)
Power Rating (Resistive Load) .....	0.25 A @ 30 VDC
Dielectric Withstanding Voltage (MIL-STD-202, Method 301)	
Sea Level .....	1000 VAC minimum
Insulation Resistance .....	1500 megohms minimum
Contact Resistance .....	100 milliohms maximum
Actuating Stroke .....	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)	
Contact Resistance .....	100 milliohms maximum
Insulation Resistance (After 24 Hours @ Room Temperature - 500 VDC) .....	100 megohms minimum

<sup>1</sup>Electrical specifications tested at 200 RPM at room ambient: +25 °C nominal.

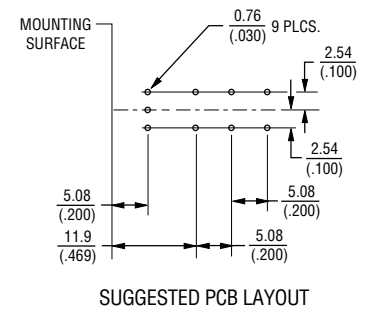
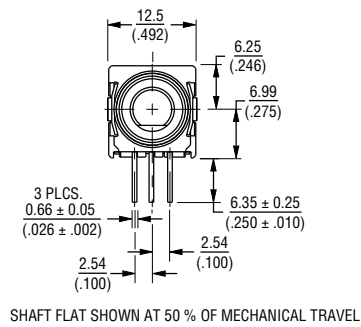
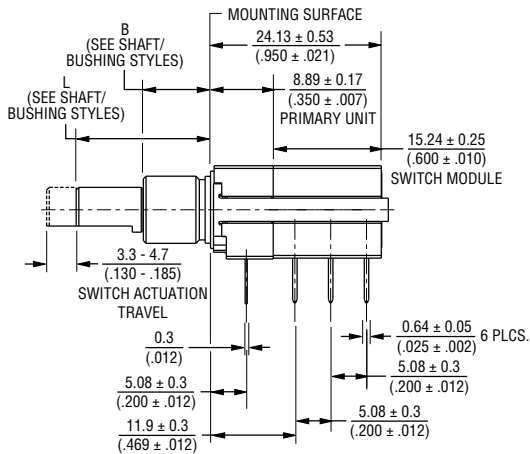
## Switch Configurations (Shown in Pulled Position)



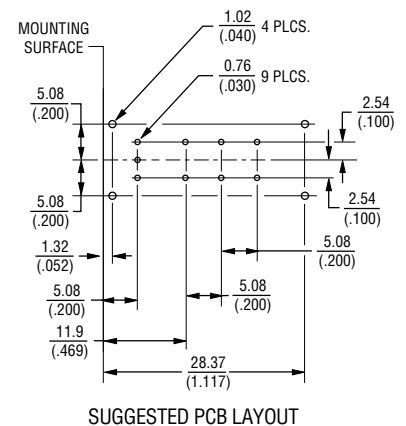
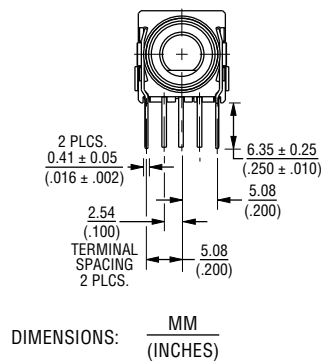
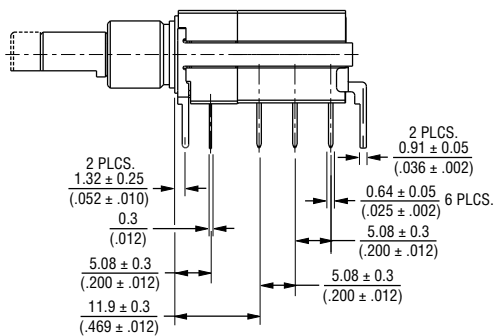
# 54 – 1/2" (12.5 mm) Panel Control w/Push-Pull Switch



## Product Dimensions

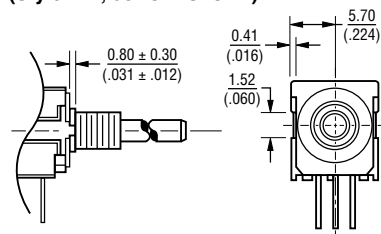


## PACKAGE DIMENSIONS WITH FRONT AND REAR PCB MOUNTING BRACKET



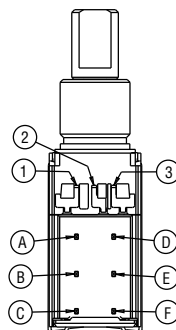
## Anti-Rotation Lug

(Style "A", 90° CW Shown)

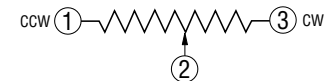


FOR TOLERANCES SHOWN: .XX = ±  $\frac{.25}{.010}$   
 .XXX = ±  $\frac{.13}{.005}$   
 SHAFT DIMENSIONS ±  $\frac{.80}{(1/32)}$

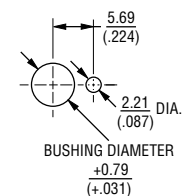
## Terminal Layout



## Electrical Schematic



## Suggested Panel Layouts



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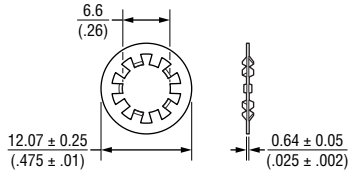
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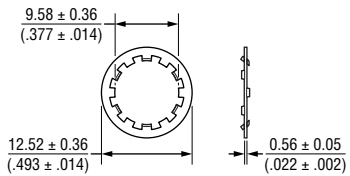
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## Hardware

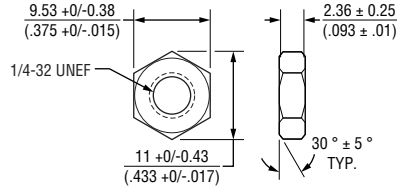
### LOCKWASHER H-37-1



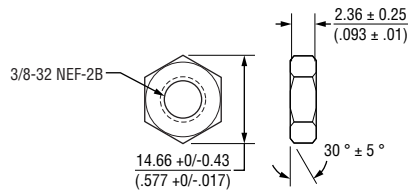
### LOCKWASHER H-37-2



### NUT H-38-1



### NUT H-38-2



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

## Date Code Description

YY WW M

M = COUNTRY OF MANUFACTURE (MEXICO)  
 WW = WEEK NUMBER  
 YY = LAST TWO DIGITS OF YEAR MANUFACTURED

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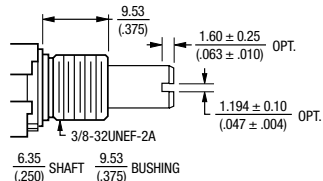
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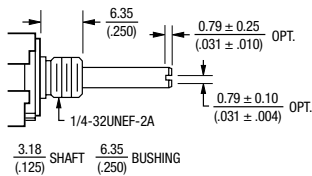


## Shaft/Bushing Styles



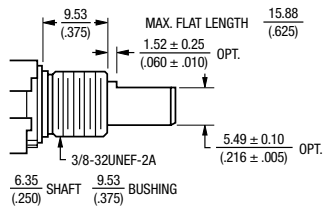
### A Style Bushing

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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