

Features

- RoHS compliant*
- Conductive plastic or cermet
- Linear and audio tapers
- PC board and bushing mount
- Gangable
- Metal bushing and shaft
- Sealed for board washing



51/53 – Sealed 1/2" (12.5 mm) Square Control

| Electrical Characteristics ¹ | Conductive Plastic | Cermet |
|---|-----------------------------|-----------------------|
| Standard Resistance Range | | |
| Linear | 1 K ohms to 1 megohm | 150 ohms to 1 megohm |
| Audio | 1 K ohms to 1 megohm | 1 K ohms to 1 megohm |
| Total Resistance Tolerance | | |
| Linear Tapers | ±10 % or ±20 % | ±10 % or ±5 % |
| Audio Tapers | ±10 % or ±20 % | ±10 % |
| Independent Linearity | ±5 % | ±5 % |
| Absolute Minimum Resistance | 2 ohms maximum | 2 ohms maximum |
| Effective Electrical Angle | 270 ° ±5 ° | 270 ° ±5 ° |
| Contact Resistance Variation | 2 % | 2 % |
| Dielectric Withstanding Voltage (MIL-STD-202 – Method 301) | | |
| Sea Level | 1,500 VAC minimum | 1,500 VAC minimum |
| 70,000 | 500 VAC minimum | 500 VAC minimum |
| Insulation Resistance | 1,000 megohms minimum | 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 | 1.0 watt |
| Audio Tapers | 0.25 watt | 0.5 watt |
| Theoretical Resolution | Essentially infinite | Essentially infinite |

| Environmental Characteristics ¹ | Conductive Plastic | Cermet |
|--|-------------------------|-------------------|
| Operating Temperature Range | +1 °C to +125 °C | +1 °C to +125 °C |
| Storage Temperature Range | -55 °C to +125 °C | -55 °C to +125 °C |
| Temperature Coefficient Over Storage Temperature Range | ±1,000 ppm/°C | ±150 ppm/°C |
| Vibration (Single Section) | 15 G | 15 G |
| Total Resistance Shift | ±2 % maximum | ±2 % maximum |
| Voltage Ratio Shift | ±5 % maximum | ±5 % maximum |
| Shock (Single Section) | 30 G | 30 G |
| Total Resistance Shift | ±2 % maximum | ±2 % maximum |
| Voltage Ratio Shift | ±5 % maximum | ±5 % maximum |
| Load Life | 1,000 hours | 1,000 hours |
| Total Resistance Shift | ±10 % TRS maximum | ±5 % TRS maximum |
| Rotational Life (No Load) | 50,000 cycles | 25,000 cycles |
| Total Resistance Shift | ±10 % TRS maximum | ±10 % TRS maximum |
| Contact Resistance Variation @ 25,000 Cycles | ±2 % | ±4 % |
| Moisture Resistance (MIL-STD-202, Method 103, Condition B) | | |
| Total Resistance Shift | ±10 % TRS | ±5 % TRS |
| IP Rating | | |
| Entire Unit | IP64 | IP64 |
| Shaft/Bushing | IP65 | IP65 |

| Mechanical Characteristics | Conductive Plastic | Cermet |
|--|--|--------|
| Stop Strength | 56 N-cm (5 lb.-in.) | |
| Mechanical Angle | 290 ° ±5 ° | |
| Torque | | |
| Starting (Dual Sections) | +0.35 N-cm (+0.5 oz.-in.) maximum | |
| Running (Single Section) | 0.15 to 1.4 N-cm (0.2 to 2.0 oz.-in.) | |
| Running (Dual Section) | 0.35 to 1.8 N-cm (0.5 to 2.5 oz.-in.) | |
| Detent (Single Section) | 1.94 N-cm (2.75 oz.-in.) minimum | |
| Mounting (Torque on Bushing) | 1.7 to 2.0 N-m (15 to 18 lb.-in.) maximum | |
| Weight (Single Section) | 5.5 grams | |
| (Additional Section) | 3.0 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 and date code | |
| Ganging (Multiple Section Potentiometer) | 2 sections maximum** | |
| Hardware | One lockwasher and one mounting nut is shipped with each potentiometer (Bushing A: H-37-2 & H-38-2; Bushing C: H-37-1 & H-38-1; Bushing R: H-37-4 & H-38-9; Bushing S: H-37-1 & H-38-14; Bushing U: H-37-3 & H-38-8) | |

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

** Additional sections available on special request with higher minimum order quantities.



WARNING
Cancer and Reproductive Harm
www.P65Warnings.ca.gov

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

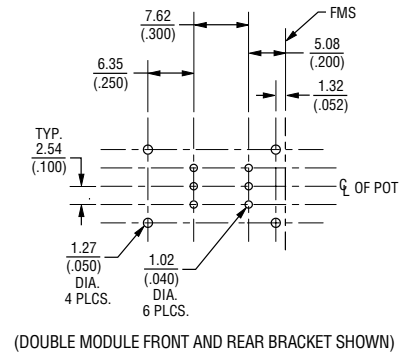
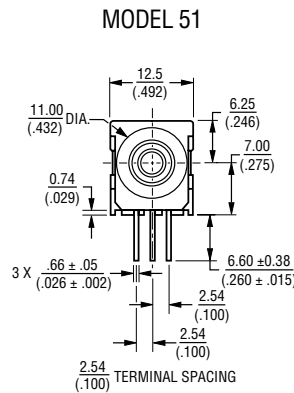
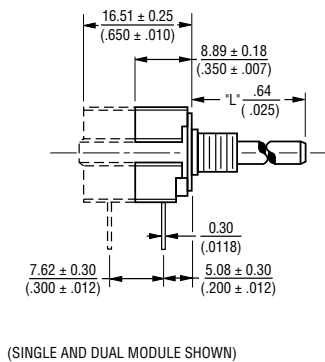
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51/53 – Sealed 1/2" (12.5 mm) Square Control

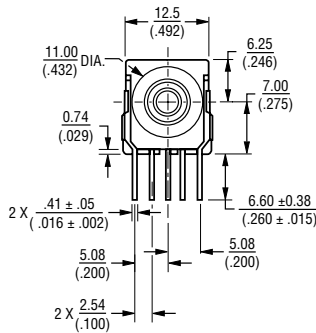
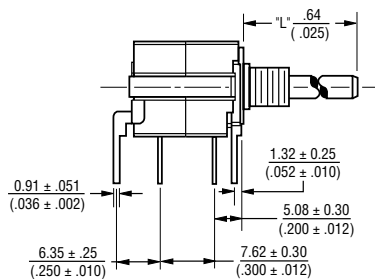
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Product Dimensions

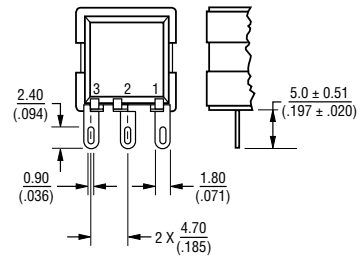
PACKAGE DIMENSIONS



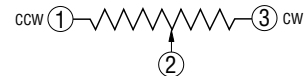
PACKAGE DIMENSIONS PCB MOUNTING BRACKET



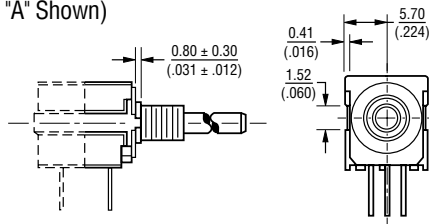
SOLDER LUG TERMINALS MODEL 53



ELECTRICAL SCHEMATIC

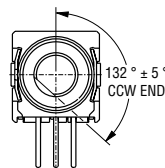


ANTI-ROTATION LUG (Style "A" Shown)

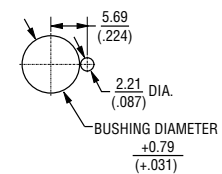


DIMENSIONS: $\frac{\text{MM}}{\text{(INCHES)}}$

SHAFT FLAT ORIENTATION



SUGGESTED PANEL LAYOUT



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

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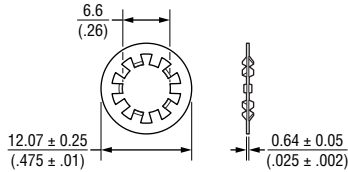
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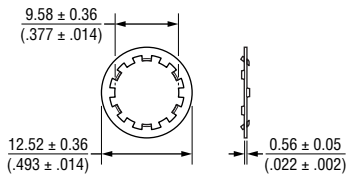
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Hardware

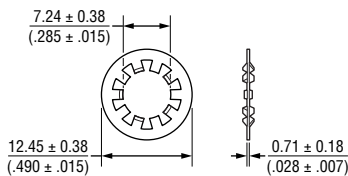
LOCKWASHER H-37-1



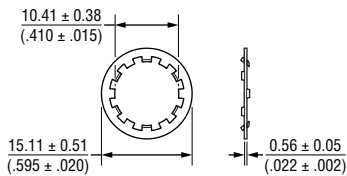
LOCKWASHER H-37-2



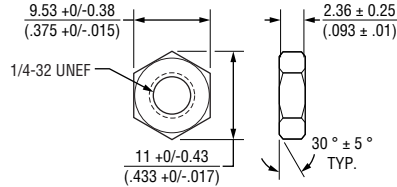
LOCKWASHER H-37-3



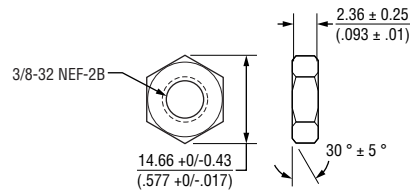
LOCKWASHER H-37-4



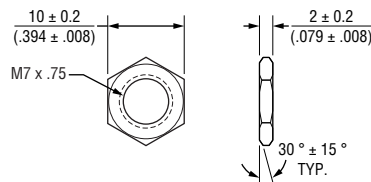
NUT H-38-1



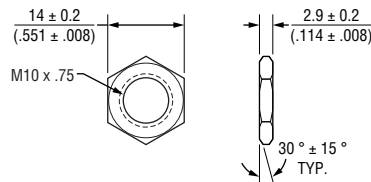
NUT H-38-2



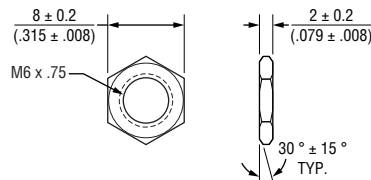
NUT H-38-8



NUT H-38-9



NUT H-38-14



Date Code Description

YY WW M

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

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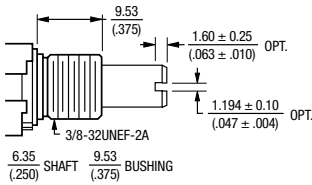
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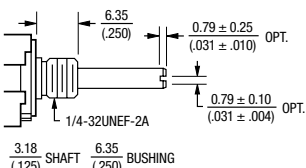
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Shaft/Bushing Styles



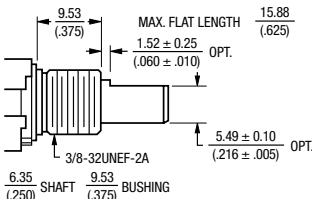
A Style Bushing

| STD. LENGTH 'L' | |
|-----------------|---------|
| .500 | (12.7) |
| .625 | (15.88) |
| .750 | (19.05) |
| .875 | (22.23) |
| 1.000 | (25.4) |



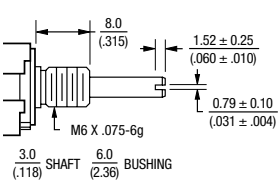
C Style Bushing

| STD. LENGTH 'L' | |
|-----------------|---------|
| .375 | (9.53) |
| .500 | (12.7) |
| .625 | (15.88) |
| .750 | (19.05) |
| .875 | (22.23) |
| 1.000 | (25.4) |



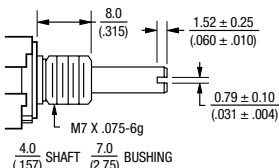
A Style Bushing - Flatted Shaft

| STD. LENGTH 'L' | |
|-----------------|---------|
| .625 | (15.88) |
| .750 | (19.05) |
| .875 | (22.23) |
| 1.000 | (25.4) |



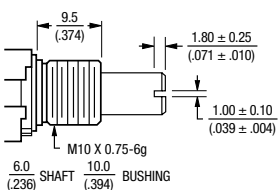
S Style Bushing

| STD. LENGTH 'L' | |
|-----------------|--------|
| .630 | (16.0) |
| .866 | (22.0) |
| .984 | (25.0) |



U Style Bushing

| STD. LENGTH 'L' | |
|-----------------|--------|
| .630 | (16.0) |
| .866 | (22.0) |
| .984 | (25.0) |



R Style Bushing

| STD. LENGTH 'L' | |
|-----------------|--------|
| .630 | (16.0) |
| .866 | (22.0) |
| .984 | (25.0) |

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

How To Order

51 A A D - B 28 - A 15 / A15 L

Part number for multiple section potentiometers must have a taper and resistance value for each section.

| RoHS IDENTIFIER | |
|-----------------|-----------|
| L | Compliant |

MOUNTING BRACKET/ ANTI-ROTATION LUG

| Code | Description |
|------|------------------------|
| A | AR Lug 90 °CW |
| D | No AR Lug or Bracket |
| L | Front Bracket |
| M | Rear Bracket |
| N | Front and Rear Bracket |

SECTIONS/DETENTS

| Code | Description |
|------|------------------------|
| A | Single No Detent |
| B | Double No Detent |
| E | Single w/Center Detent |
| F | Double w/Center Detent |

BUSHING CONFIGURATION

| Code | Description |
|------|--------------------|
| A | 3/8" D x 3/8" L |
| C | 1/4" D x 1/4" L |
| R | 10 mm D x 9.5 mm L |
| S | 6 mm D x 8 mm L |
| U | 7 mm D x 8 mm L |

MODEL

| Code | Description |
|------|-------------------------|
| 51 | PC Pins (.100" centers) |
| 53 | Solder Lugs |

| ELEMENT TAPER TYPE/TOLERANCE | | RESISTANCE (CODE) | |
|------------------------------|-------------------------------|--------------------|---------------------|
| Code | Description | VALUE IN OHMS | |
| (A) | Linear Cermet ±10 % | (28) – 150 | (14) – 7.5 K |
| (H) | Linear Cermet ±5 % | (06) – 200 | (15) – 10 K |
| | | (07) – 250 | (30) – 15 K |
| | | (08) – 500 | (16) – 20 K |
| | | (09) – 750 | (17) – 25 K |
| | | (10) – 1 K | (18) – 50 K |
| | | (29) – 1.5 K | (19) – 75 K |
| | | (11) – 2 K | (20) – 100 K |
| | | (12) – 2.5 K | (23) – 500 K |
| | | (13) – 5 K | (25) – 1 M |
| (B) | Linear C-P ±20 % | (10) – 1 K | (18) – 50 K |
| (E) | Linear C-P ±10 % | (12) – 2.5 K | (20) – 100 K |
| | | (13) – 5 K | (22) – 250 K |
| | | (15) – 10 K | (23) – 500 K |
| | | (16) – 20 K | (25) – 1 M |
| | | (17) – 25 K | |
| (C) | CW Audio Cermet ±10 % | (10) – 1 K | (18) – 50 K |
| (F) | CCW Audio Cermet ±10 % | (12) – 2.5 K | (20) – 100 K |
| | | (13) – 5 K | (23) – 500 K |
| | | (15) – 10 K | (25) – 1 M |
| | | (17) – 25 K | |
| (D) | CW Audio C-P ±20 % | (10) – 1 K | (18) – 50 K |
| (S) | CW Audio C-P ±10 % | (12) – 2.5 K | (20) – 100 K |
| | | (13) – 5 K | (22) – 250 K |
| | | (15) – 10 K | (23) – 500 K |
| | | (16) – 20 K | (25) – 1 M |
| | | (17) – 25 K | |
| (G) | CCW Audio C-P ±20 % | (10) – 1 K | (18) – 50 K |
| (T) | CCW Audio C-P ±10 % | (12) – 2.5 K | (20) – 100 K |
| | | (13) – 5 K | (22) – 250 K |
| | | (15) – 10 K | (23) – 500 K |
| | | (17) – 25 K | (25) – 1 M |
| (Y) | CW Dual Audio Taper C-P ±20 % | (10) – 1 K | (18) – 50 K |
| | | (12) – 2.5 K | (20) – 100 K |
| | | (13) – 5 K | (22) – 250 K |
| | | (15) – 10 K | (23) – 500 K |
| | | (17) – 25 K | (25) – 1 M |

| SHAFT TYPE | | AVAILABLE ONLY IN BUSHINGS | |
|------------|-----------------------|----------------------------|----------------|
| Code | Description | Code | Description |
| B | Single Slotted 1/4" D | A | 24,28 |
| C | Single Flatted 1/4" D | A | 20,24,28,32 |
| E | Single Slotted 1/8" D | C | 12,16,20,24,28 |
| R | Single Slotted 6 mm D | R | 16,22,25 |
| T | Single Slotted 4 mm D | U | 16,22,25 |
| U | Single Slotted 3 mm D | S | 16,22,25 |

| SHAFT LENGTH (FMS) | | AVAILABLE ONLY IN BUSHING |
|--------------------|-------------|---------------------------|
| Code | Description | Code |
| 12 | 3/8" | C |
| 16 | 1/2" | A, C |
| 20 | 5/8" | A, C |
| 24 | 3/4" | A, C |
| 28 | 7/8" | A, C |
| 32 | 1" | A, C |
| Metric | | |
| 16 | 16 mm | R, S, U |
| 22 | 22 mm | R, S, U |
| 25 | 25 mm | R, S, U |

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

REV. 10/20

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