



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..... | IP 64..... | IP 64 |

| Mechanical Characteristics | |
|--|---|
| Stop Strength | 56 N-cm (5 lb.-in.) |
| Mechanical Angle..... | 290 ° ±5 ° |
| Torque | |
| Starting (All Sections)..... | Running torque +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 or Triple Section)..... | 0.35 to 1.8 N-cm (0.5 to 2.5 oz.-in.) |
| Mounting (Torque on Bushing)..... | 1.7 to 2.0 N-m (15 to 18 lb.-in.) maximum |
| Weight (Single Section)..... | 5.5 grams |
| (Each 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, resistance value and date code. |
| Ganging (Multiple Section Potentiometers)..... | 6 cups maximum |
| Hardware..... | One lockwasher and one mounting nut is shipped with each potentiometer, except where noted in the part number. |

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

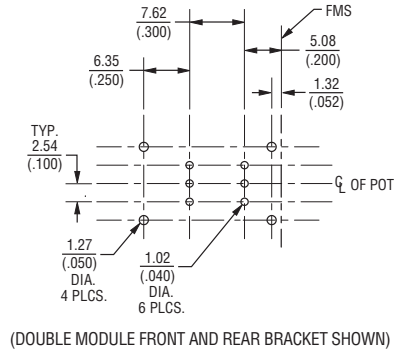
*RoHS Directive 2002/95/EC Jan 27 2003 including Annex
Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

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

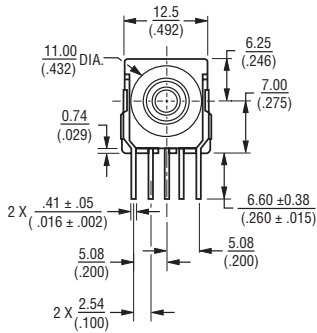
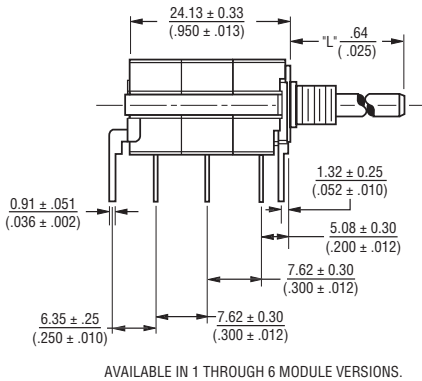
BOURNS®

Product Dimensions

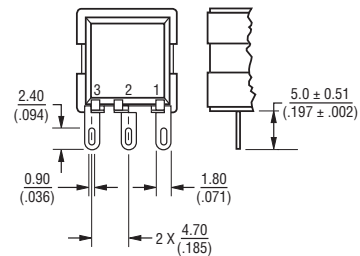
PACKAGE DIMENSIONS



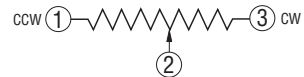
PACKAGE DIMENSIONS PCB MOUNTING BRACKET



SOLDER LUG TERMINALS MODEL 53



ELECTRICAL SCHEMATIC



ANTI-ROTATION LUG (Style "A", 90° CW Shown)



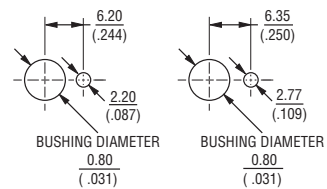
DIMENSIONS: $\frac{MM}{(INCHES)}$

SHAFT FLAT ORIENTATION



SUGGESTED PANEL LAYOUTS

The Model 50 can be used with either of the two panel layouts shown below.



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

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

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Shaft/Bushing Styles



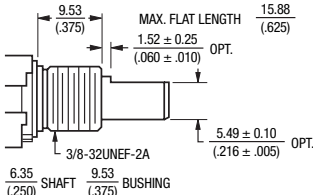
A Style Bushing

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



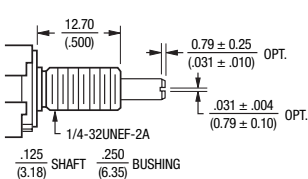
C Style Bushing

| 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) |



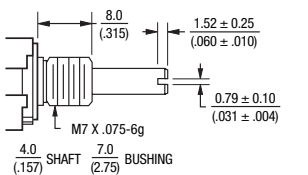
F Style Bushing

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



S Style Bushing

| STD. LENGTH 'L' |
|-----------------|
| .394 (10.0) |
| .512 (13.0) |
| .630 (16.0) |
| .866 (22.0) |
| .984 (25.0) |



U Style Bushing

| STD. LENGTH 'L' |
|-----------------|
| .394 (10.0) |
| .512 (13.0) |
| .630 (16.0) |
| .866 (22.0) |
| .984 (25.0) |



R Style Bushing

| STD. LENGTH 'L' |
|-----------------|
| .512 (13.0) |
| .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 L

| MOUNTING BRACKET/ ANTI-ROTATION LUG | |
|--|------------------------|
| Code | Description |
| A | AR Lug 90 °CW |
| C | AR Lug 270 °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 |
| C | Triple No Detent |
| D | Quad No Detent |
| E | Single w/Center Detent |
| F | Double w/Center Detent |
| G | Triple w/Center Detent |
| H | Quad w/Center Detent |
| J | Five Section |
| K | Six Section |
| L | Five Section w/Detent |
| M | Six Section w/Detent |

| BUSHING CONFIGURATION | |
|-----------------------|--------------------|
| Code | Description |
| A | 3/8 " D x 3/8 " L |
| C | 1/4 " D x 1/4 " L |
| F | 1/4 " D x 1/2 " 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 |

| Code | SHAFT TYPE Description | AVAILABLE ONLY IN | |
|------|---------------------------|-------------------|------------------------|
| | | BUSHINGS Code | LENGTHS Description |
| A | Single Plain 1/4 "D | A | 20,24,28,32 |
| B | Single Slotted 1/4 "D | A | 12,16,20,24,28,32 |
| C | Single Flatted 1/4 "D | A | 20,24,28,32 |
| D | Single Plain 1/8 "D | C, F | 16,20,24,28,32 |
| E | Single Slotted 1/8 "D | C, F | 12,16,20,24,28,32 |
| R | Single Slotted 6 mmD | R | 10,13,16,22,25 |
| T | Single Slotted 4 mmD | U | 10,13,16,22,25 |
| U | Single Slotted 3 mmD | S | 10,13,16,22,25 |

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

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

| SHAFT LENGTH (FMS) | | AVAILABLE ONLY IN BUSHING |
|-----------------------|-------------|---------------------------------|
| Code | Description | Code |
| 12 | 3/8 " | B, C |
| 16 | 1/2 " | A, C |
| 20 | 5/8 " | A, C, F |
| 24 | 3/4 " | A, C, F |
| 28 | 7/8 " | A, C, F |
| 32 | 1 " | A, C, F |
| Metric | | |
| 10 | 10 mm | R, S, U, T |
| 13 | 13 mm | R, S, U, T |
| 16 | 16 mm | R, S, U, T |
| 22 | 22 mm | R, S, U, T |
| 25 | 25 mm | R, S, U, T |

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

REV. 09/22/10

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