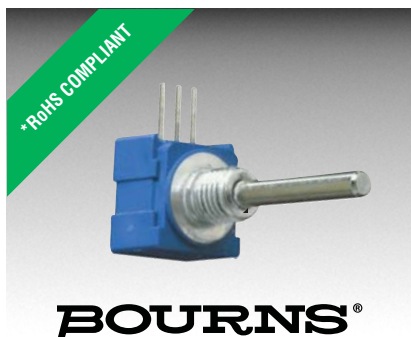




## Features

- 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 <sup>1</sup>                              | 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 <sup>1</sup>                           |                                                                                                                |                       |
| 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 (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.)                                                                          |                       |
| 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, resistance value and date code.                                         |                       |
| Ganging (Multiple Section Potentiometer) .....                       | 2 sections maximum**                                                                                           |                       |
| Hardware .....                                                       | One lockwasher and one mounting nut is shipped with each potentiometer, except where noted in the part number. |                       |

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

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

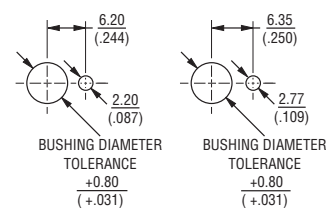
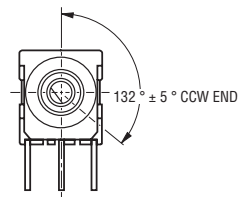
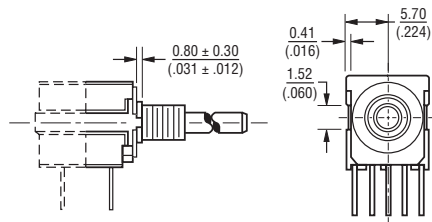
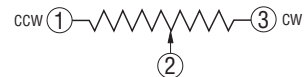
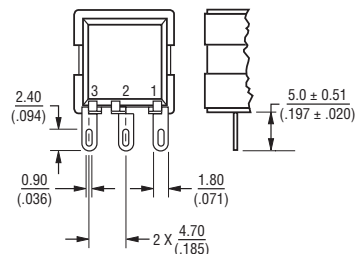
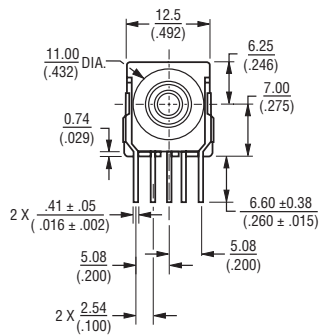
\*RoHS Directive 2002/95/EC Jan 27, 2003 including Annex.

Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

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## PACKAGE DIMENSIONS



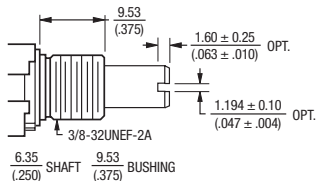
FOR TOLERANCES SHOWN: .XX =  $\pm \frac{.25}{(.010)}$   
 .XXX =  $\pm \frac{.13}{(.005)}$   
 SHAFT DIMENSIONS  $\pm \frac{.80}{(1/32)}$

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

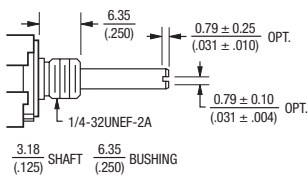
**BOURNS®**

## Shaft/Bushing Styles



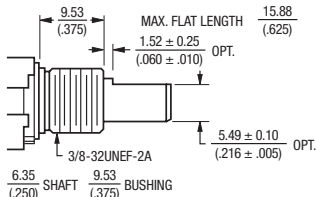
### A Style Bushing

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



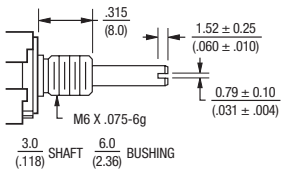
### C Style Bushing

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



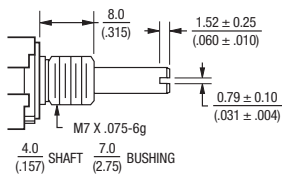
### A Style Bushing - Flatted Shaft

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



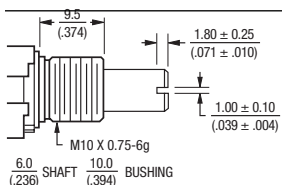
### S Style Bushing

| STD. LENGTH "L" |
|-----------------|
| .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          |
| 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              |

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

| ELEMENT TAPER TYPE/TOLERANCE |                                    | RESISTANCE (CODE) |              |
|------------------------------|------------------------------------|-------------------|--------------|
| Code                         | Description                        | VALUE IN OHMS     |              |
| (A)                          | Linear Cermet $\pm 10\%$           | (28) — 150        | (14) — 7.5 K |
| (H)                          | Linear Cermet $\pm 5\%$            | (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 $\pm 20\%$              | (10) — 1 K        | (18) — 50 K  |
| (E)                          | Linear C-P $\pm 10\%$              | (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 $\pm 10\%$         | (10) — 1 K        | (18) — 50 K  |
| (F)                          | CCW Audio Cermet $\pm 10\%$        | (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 $\pm 20\%$            | (10) — 1 K        | (18) — 50 K  |
| (S)                          | CW Audio C-P $\pm 10\%$            | (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   |
| (G)                          | CCW Audio C-P $\pm 20\%$           | (10) — 1 K        | (18) — 50 K  |
| (T)                          | CCW Audio C-P $\pm 10\%$           | (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 $\pm 20\%$ | (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    |
| D          | Single Plain 1/8 "D   | C                          | 16,20,24,28    |
| E          | Single Slotted 1/8 "D | C                          | 12,16,20,24,28 |
| R          | Single Slotted 6 mmD  | R                          | 16,22,25       |
| T          | Single Slotted 4 mmD  | U                          | 16,22,25       |
| U          | Single Slotted 3 mmD  | 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. 09/11

Specifications are subject to change without notice. Customers should verify actual device performance in their specific applications.