



## Features

- Compatible with other members of the Model 80 Series
- The only 10-turn precision potentiometer in a modular panel control package
- Up to 2 sections available
- RoHS compliant\*

## 83/84 - 5/8 " Square 10-Turn

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

|                                                                                   | Wirewound Element (J Taper)                  | Hybritron® Element (K Taper) |
|-----------------------------------------------------------------------------------|----------------------------------------------|------------------------------|
| Standard Resistance Range.....                                                    | 200 to 100 K ohms.....                       | 1 K to 100 K ohms            |
| Total Resistance Tolerance.....                                                   | ±5 % .....                                   | ±10 %                        |
| Independent Linearity.....                                                        | ±0.25 % .....                                | ±0.25 %                      |
| Absolute Minimum Resistance (J Taper).....                                        | 1.0 ohm or 0.1 % (whichever is greater)..... | -                            |
| Effective Electrical Angle.....                                                   | 3600 ° +10 °, -0 °.....                      | 3600 ° +10 °, -0 °           |
| Dielectric Withstanding Voltage (MIL-STD-202, Method 301)                         |                                              |                              |
| Sea Level.....                                                                    | 1,000 VAC minimum .....                      | 1,000 VAC minimum            |
| Insulation Resistance (500 VDC).....                                              | 1,000 megohms minimum .....                  | 1,000 megohms minimum        |
| Power Rating (Voltage Limited By Power Dissipation or 350 VAC, Whichever Is Less) |                                              |                              |
| +70 °C.....                                                                       | 1 watt .....                                 | 1 watts                      |
| +125 °C.....                                                                      | 0 watt .....                                 | 0 watt                       |
| Theoretical Resolution.....                                                       | See table.....                               | Essentially infinite         |
| End Voltage (K Taper).....                                                        | -.....                                       | 0.2 % of applied voltage     |
| Noise (J Taper).....                                                              | 100 ohms ENR maximum.....                    | -                            |
| Output Smoothness (K Taper).....                                                  | -.....                                       | 0.15 % maximum               |

### 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..... | ±50 ppm/°C .....                 | ±100 ppm/°C                 |
| Vibration.....                                              | 15 G.....                        | 15 G                        |
| Total Resistance Shift.....                                 | ±2 % .....                       | ±2 %                        |
| Voltage Ratio Shift.....                                    | ±0.2 % .....                     | ±0.2 %                      |
| Wiper Bounce.....                                           | 0.1 millisecond maximum .....    | 0.1 millisecond maximum     |
| Shock.....                                                  | 50 G.....                        | 50 G                        |
| Total Resistance Shift.....                                 | ±2 % .....                       | ±2 %                        |
| Voltage Ratio Shift.....                                    | ±0.2 % .....                     | ±0.2 %                      |
| Wiper Bounce.....                                           | 0.1 millisecond maximum .....    | 0.1 millisecond maximum     |
| Load Life.....                                              | 1,000 hours .....                | 1,000 hours                 |
| Total Resistance Shift.....                                 | ±2 % maximum .....               | ±5 % maximum                |
| Rotational Life (No Load).....                              | 1,000,000 shaft revolutions..... | 4,000,000 shaft revolutions |
| Total Resistance Shift.....                                 | ±5 % maximum .....               | ±5 % maximum                |
| Moisture Resistance (MIL-STD-202, Method 103, Condition B)  |                                  |                             |
| Total Resistance Shift.....                                 | ±2 % maximum .....               | ±5 % maximum                |
| Insulation Resistance (500 VDC).....                        | 100 megohms minimum .....        | 100 megohms minimum         |
| IP Rating.....                                              | IP 40.....                       | IP 40                       |

### Mechanical Characteristics<sup>1</sup>

|                                                |                                                                                                                                                                                    |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stop Strength.....                             | 33.90 N-cm (48.0 oz.-in.) minimum                                                                                                                                                  |
| Mechanical Angle.....                          | 3600 ° +15 °, -0 °                                                                                                                                                                 |
| Torque                                         |                                                                                                                                                                                    |
| Starting.....                                  | Running torque plus 0.7 N-cm (1.0 oz.-in.) maximum                                                                                                                                 |
| Running (1 or 2 Section).....                  | 0.18 to 1.41 N-cm (0.25 to 2.0 oz.-in.)                                                                                                                                            |
| Mounting (Torque on Bushing).....              | 1.7-2.0 N-m (15-18 lb.-in.) maximum                                                                                                                                                |
| Shaft Runout.....                              | 0.15 mm (0.006 in.) T.I.R.                                                                                                                                                         |
| Shaft End Play.....                            | 0.36 mm (0.014 in.) T.I.R.                                                                                                                                                         |
| Shaft Radial Play.....                         | 0.13 mm (0.005 in.) T.I.R.                                                                                                                                                         |
| Weight (Single Section).....                   | 21 gm (0.75 oz.)                                                                                                                                                                   |
| (Each Additional Section).....                 | 18 gm (0.65 oz.)                                                                                                                                                                   |
| Terminals.....                                 | Printed circuit terminals or solder lugs                                                                                                                                           |
| 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 |
| Marking.....                                   | Manufacturer's trademark, wiring diagram, date code and resistance, manufacturer's part number                                                                                     |
| Ganging (Multiple Section Potentiometers)..... | 2 cup maximum                                                                                                                                                                      |
| Hardware.....                                  | One lockwasher and one mounting nut is shipped with each potentiometer, except where noted in the part number.                                                                     |

NOTE: Model 83/84 performance specifications do not apply to units subjected to printed circuit board cleaning procedures.

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

# 83/84 - 5/8 " Square 10-Turn

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## Wirewound Resolution Table

| Resistance (Ohms) | Resolution (Nom.) (%) |
|-------------------|-----------------------|
| 200               | .048                  |
| 500               | .037                  |
| 1 K               | .032                  |
| 2 K               | .031                  |
| 5 K               | .023                  |
| 10 K              | .020                  |
| 20 K              | .015                  |
| 50 K              | .012                  |
| 100 K             | .010                  |

## Dimensional Drawings

Dual Section Model 84 Solder Lugs



Dual Section Model 83 PC Pins



Note: The Models 83/84 dimensions for dual section assembly are for either single or dual concentric shaft styles.

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

# 83/84 - 5/8" Square 10-Turn

# BOURNS®

## Product Dimensions

### PC Pin Model 83



### Solder Lug Model 84



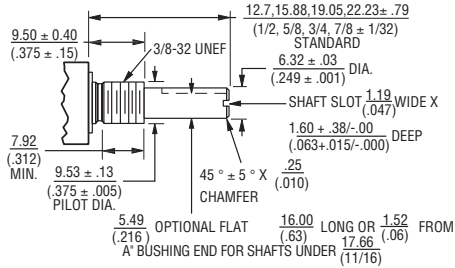
### "C" Bushing 1/4" (6.35 mm) Dia. Plain - Single Shaft



### "E" Bushing 1/4" (6.35 mm) Dia. Locking - Single Shaft



### "A" Bushing 3/8" (9.53 mm) Dia. Plain - Single Shaft



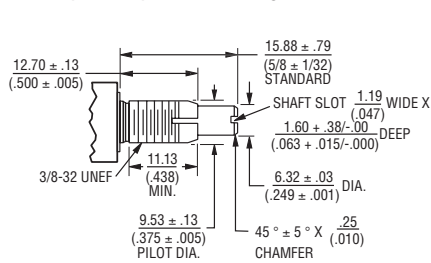
### "A" Bushing 3/8" (9.53 mm) Dia. Plain - Concentric Shaft



### Shaft Flat Orientation



### "B" Bushing 3/8" (9.53 mm) Dia. Plain - Single Shaft



### "C" Bushing 1/4" (6.35 mm) Dia. Plain - Concentric Shaft



### Locating Lug Options - All Model 80 Series



NOTE: "D" OPTION - NO A/R LUG. OTHER LOCATING LUG OPTIONS AVAILABLE. FOR DETAILS CONSULT FACTORY.

TOLERANCES EXCEPT AS SHOWN: DECIMALS .XXX ± (.005)  
 .XX ± (.015)  
 ANGLE ± 5°  
 FRACTIONS ± 1/64

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

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

# 83/84 - 5/8 " Square 10-Turn

# BOURNS®

## How To Order

**83 A 1 A - B 28 - J 15 L**

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

| ANTI-ROTATION LUG |                               |
|-------------------|-------------------------------|
| A                 | Single .305 R, 90 °CW         |
| B                 | Double .305 R, 90 ° & 270 °CW |
| C                 | Single .305 R, 270 °CW        |
| D                 | No Lug                        |
| E                 | Single .531 R, 90 °CW         |
| F                 | Single .305 R, 180 °CW        |
| J                 | Single .375 R, 90 °CW         |
| K                 | Double .375 R, 90 ° & 270 °CW |

| # SECTIONS |        |
|------------|--------|
| 1          | Single |
| 2          | Double |
| 3          | Triple |

| BUSHING |                                               |
|---------|-----------------------------------------------|
| A       | Plain 3/8 " (9.53 mm) D x 3/8 " (9.53 mm) L   |
| B       | Locking 3/8 " (9.53 mm) D x 1/2 " (12.7 mm) L |
| C       | Plain 1/4 " (6.35 mm) D x 1/4 " (6.35 mm) L   |
| E       | Locking 1/4 " (6.35 mm) D x 1/2 " (12.7 mm) L |
| J       | Plain 3/8 " (9.53 mm) D x 1/4 " (6.35 mm) L   |
| N       | Plain 1/4 " (6.35 mm) D x 3/8 " (9.53 mm) L   |
| R       | Plain 10 mm D x 9 mm L                        |
| U       | Plain 7 mm D x 6 mm L                         |

| SHAFT LENGTH (FMS) |             | AVAILABLE ONLY IN BUSHING |
|--------------------|-------------|---------------------------|
| Code               | Description | Code                      |
| 12                 | 3/8 " L     | C, N, J                   |
| 16                 | 1/2 " L     | A, C, J, N                |
| 20                 | 5/8 " L     | A, B, C, E, J, N          |
| 24                 | 3/4 " L     | A, B, C, E, J, N          |
| 28                 | 7/8 " L     | A, B, C, E, J, N          |
| 32                 | 1 " L       | A, B, C, E, J, N          |
| 36                 | 1-1/8 " L   | A, B, C, E, J, N          |
| 40                 | 1-1/4 " L   | A, B, C, E, J, N          |
| Metric             |             |                           |
| 10                 | 10 mmL      | U                         |
| 13                 | 13 mmL      | U                         |
| 16                 | 16 mmL      | R                         |
| 19                 | 19 mmL      | R                         |
| 22                 | 22 mmL      | R, U                      |
| 30                 | 30 mmL      | R                         |
| 42                 | 42 mmL      | R                         |
| 50                 | 50 mmL      | R                         |

| ELEMENT TAPER TYPE/TOLERANCE |                                                                                 | RESISTANCE CODE VALUE IN OHMS |              |
|------------------------------|---------------------------------------------------------------------------------|-------------------------------|--------------|
|                              |                                                                                 | J K                           |              |
| (J)                          | Linear Wirewound<br>10-Turn ±5 %<br>Linear Hybritron®<br>Elements 10-Turn ±10 % | (06) - 200                    | (10) - 1 K   |
| (K)                          |                                                                                 | (08) - 500                    | (11) - 2 K   |
|                              |                                                                                 | (10) - 1 K                    | (13) - 5 K   |
|                              |                                                                                 | (11) - 2 K                    | (15) - 10 K  |
|                              |                                                                                 | (13) - 5 K                    | (16) - 20 K  |
|                              |                                                                                 | (15) - 10 K                   | (18) - 50 K  |
|                              |                                                                                 | (16) - 20 K                   | (20) - 100 K |
|                              |                                                                                 | (18) - 50 K                   |              |
|                              |                                                                                 | (20) - 100 K                  |              |

| MODEL |                      |
|-------|----------------------|
| 83    | 10-Turn, PC Pins     |
| 84    | 10-Turn, Solder Lugs |

| SHAFT TYPE | AVAILABLE ONLY IN                                                                        |                        |
|------------|------------------------------------------------------------------------------------------|------------------------|
|            | LENGTHS (CODE)                                                                           | BUSHINGS (CODE)        |
| A          | Single Plain 1/4 " (6.35 mm) D                                                           | 16,20,24,28 A, B, J    |
| B          | Single Slotted 1/4 " (6.35 mm) D                                                         | 16,20,24,28 A, B, J    |
| C          | Single Flatted 1/4 " (6.35 mm) D                                                         | 20,24,28 A, B, J       |
| E          | Single Slotted 1/8 " (3.18 mm) D                                                         | 12,16,20,24,28 C, E, N |
| F          | Single Flatted 1/8 " (3.18 mm) D                                                         | Consult Factory C, N   |
| G          | Dual Concentric Plain 1/4 " (6.35 mm) D - 1/8 " (3.18 mm) D Outer Operates Section 1     | 36,40 A, J             |
| K          | Dual Concentric Plain 1/8 " (3.18 mm) D - 5/64 " (1.98 mm) D Outer Operates Section 1    | 32,36 C, N             |
| L          | Dual Concentric Plain 1/4 " (6.35 mm) D - 1/8 " (3.18 mm) D Outer Operates Section 1/2   | 36,40 A, J             |
| M          | Dual Concentric Plain 1/8 " (3.18 mm) D - 5/64 " (1.98 mm) D Outer Operates Section 1    | 32,36 C, N             |
| N          | Dual Concentric Plain 1/4 " (6.35 mm) D - 1/8 " (3.18 mm) D Outer Operates Section 1/2/3 | 36,40 A, J             |
| P          | Dual Concentric Plain 1/8 " (3.18 mm) D - 5/64 " (1.98 mm) D Outer Operates Section 1/2  | 32,36 C, N             |
| R          | Single Slotted 6 mm D                                                                    | 16,19,22,50 R, S       |
| T          | Single Slotted 4 mm D                                                                    | 10, 13, 22 U           |
| V          | Dual Concentric Plain 6 mm D - 3 mm D Outer Operates Section 1                           | 30, 42 R               |

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

REV. 06/12

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