

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*

Additional Information

Click these links for more information:



83/84 – 5/8" Square 10-Turn Panel Control

Initial Electrical Characteristics¹

| | 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 Characteristics¹

| | | |
|---|----------------------------------|-----------------------------|
| 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 Characteristics¹

| | |
|--|---|
| 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; locking bushing versions are shipped with one additional locking nut (Bushing A: H-37-2 & H-38-2; Bushing B: H-37-2, H-38-2 & H-38-4; Bushing C: H-37-1 & H-38-1; Bushing E: H-37-1, H-38-1 & H-38-3; Bushing J: H-37-2 & H-38-2; Bushing N: H-37-1 & H-38-1; Bushing R: H-37-4 & H-38-9; Bushing U: H-37-3 & H-38-8) |

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

¹Electrical specifications tested at 250 RPM, at room ambient: +25 °C nominal.



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

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
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83/84 – 5/8" Square 10-Turn Panel Control

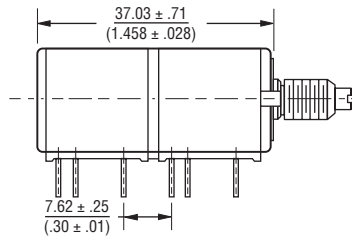
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Wirewound Resolution Table

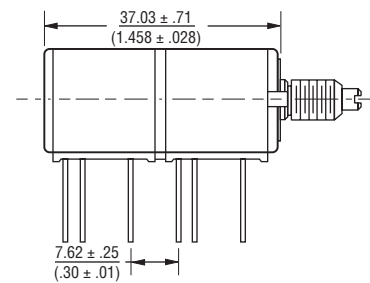
| Resistance (Ohms) | Resolution (Nom.) (%) |
|-------------------|-----------------------|
| 200 | .048 |
| 500 | .037 |
| 1 K | .032 |
| 2 K | .031 |
| 5 K | .023 |
| 10 K | .020 |
| 20 K | .015 |
| 50 K | .012 |
| 100 K | .010 |

Dimensional Drawings

Dual Section Model 84 Solder Lugs



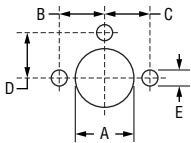
Dual Section Model 83 PC Pins



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

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

Suggested Panel Layout



| BUSHING | DIM A |
|----------|-----------------------|
| A, B & J | $\frac{9.91}{(.39)}$ |
| C, E & N | $\frac{6.73}{(.265)}$ |
| R & S | $\frac{10.5}{(.413)}$ |
| U | $\frac{7.5}{(.295)}$ |

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

| ANTI-ROTATION LUG | DIM B | DIM C | DIM D | DIM E |
|-------------------|------------------------|-----------------------|-----------------------|-----------------------|
| A | $\frac{7.75}{(.305)}$ | N/A | N/A | $\frac{2.49}{(.098)}$ |
| B | $\frac{7.75}{(.305)}$ | $\frac{7.75}{(.305)}$ | N/A | $\frac{2.49}{(.098)}$ |
| C | N/A | $\frac{7.75}{(.305)}$ | N/A | $\frac{2.49}{(.098)}$ |
| E | $\frac{13.49}{(.531)}$ | N/A | N/A | $\frac{3.45}{(.136)}$ |
| F | N/A | N/A | $\frac{7.75}{(.305)}$ | $\frac{2.54}{(.100)}$ |
| J | $\frac{9.53}{(.375)}$ | N/A | N/A | $\frac{2.54}{(.100)}$ |

Date Code Description

YYWWM

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

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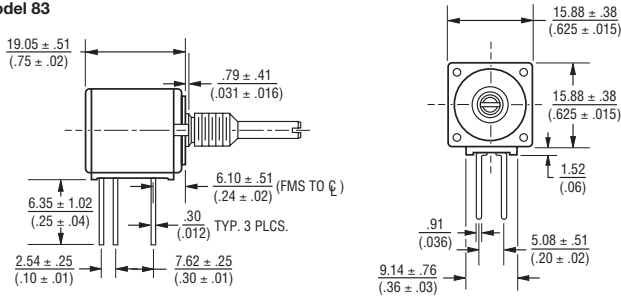
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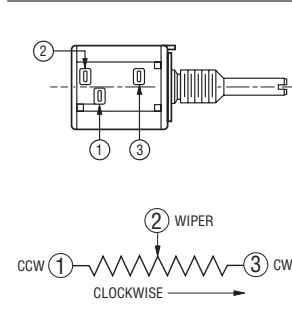
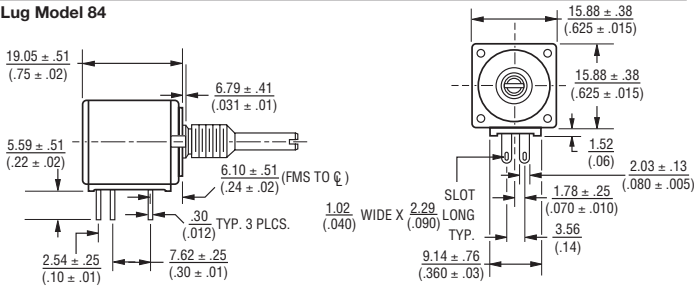
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Product Dimensions

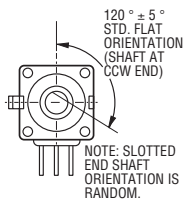
PC Pin Model 83



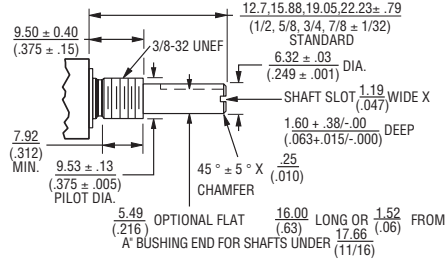
Solder Lug Model 84



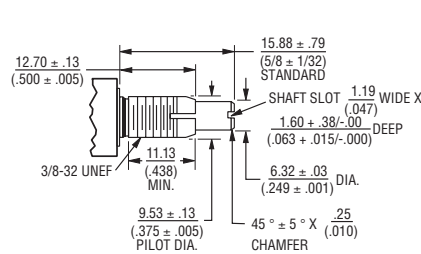
Shaft Flat Orientation



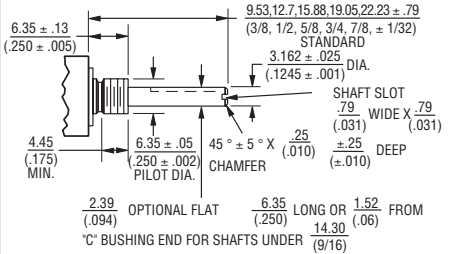
"A" Bushing 3/8" (9.53 mm) Dia. Plain - Single Shaft



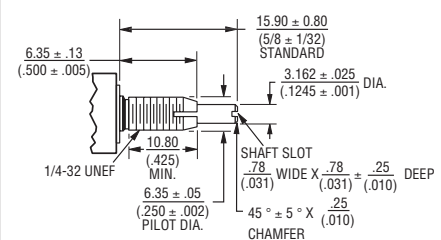
"B" Bushing 3/8" (9.53 mm) Dia. Plain - Single Shaft



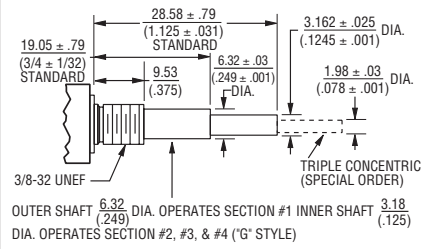
"C" Bushing 1/4" (6.35 mm) Dia. Plain - Single Shaft



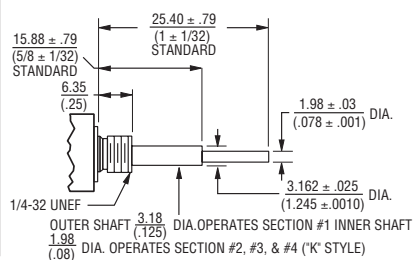
"E" Bushing 1/4" (6.35 mm) Dia. Locking - Single Shaft



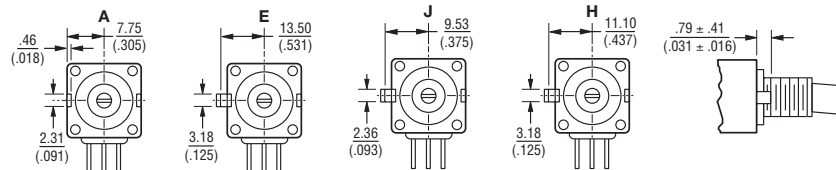
"A" Bushing 3/8" (9.53 mm) Dia. Plain - Concentric Shaft



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



Locating Lug Options - All Model 80 Series



TOLERANCES EXCEPT AS SHOWN: DECIMALS .XXX ± .127 (.005)
 .XX ± .38 (.015)
 ANGLE ± 5°
 FRACTIONS ± 1/64

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

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

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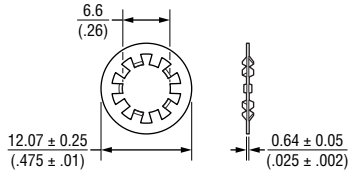
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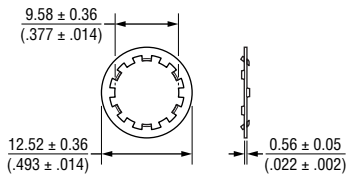
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Hardware

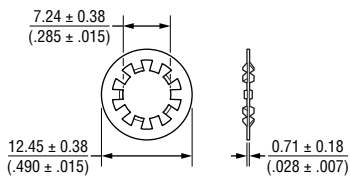
LOCKWASHER H-37-1



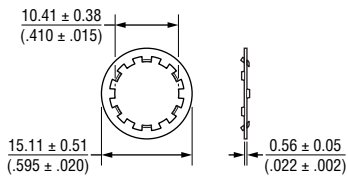
LOCKWASHER H-37-2



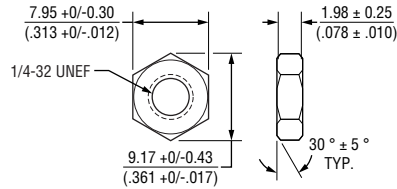
LOCKWASHER H-37-3



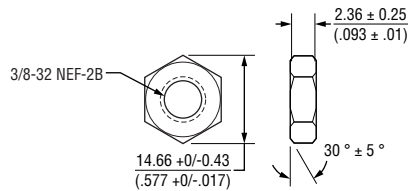
LOCKWASHER H-37-4



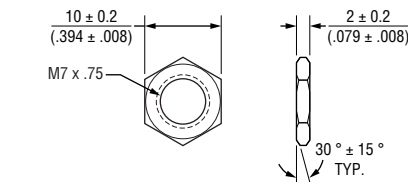
NUT H-38-1



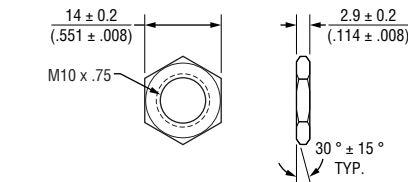
NUT H-38-2



NUT H-38-8

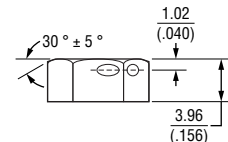
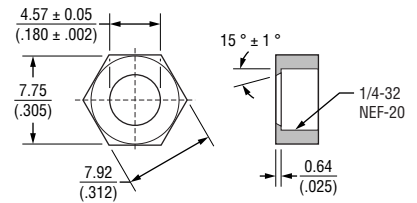


NUT H-38-9

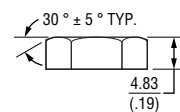
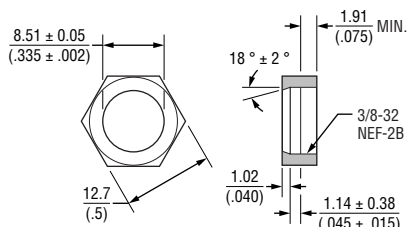


DIMENSIONS: $\frac{\text{MM}}{\text{(INCHES)}}$

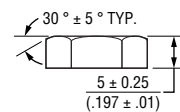
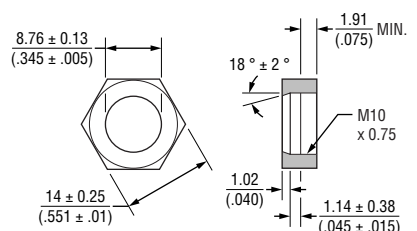
LOCKNUT H-38-3



LOCKNUT H-38-4



LOCKNUT H-38-10



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83/84 – 5/8" Square 10-Turn Panel Control

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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 |

| # 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 10-Turn ±5 % Linear Hybritron® 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 (C 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. 04/25

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