



## Features

- Single-turn (3851 and 3852)
- Linear and audio tapers
- 3-3/4-turn (3856)
- Wide resistance range
- Minimal depth package
- Good resolution

## 3851/3852/3856 - 3/4 " Diameter Panel Control

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

|                                                                                   | 3851<br>Conductive Plastic Element                          | 3852/3856<br>Cermet Element                                  |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|
| Standard Resistance Range                                                         |                                                             |                                                              |
| Linear Tapers (A, B, E, and H).....                                               | 1 K to 1 megohm.....                                        | 100 ohms to 1 megohm                                         |
| Audio Tapers (C, D, F, and G).....                                                | 1 K to 1 megohm.....                                        | 1 K ohms to 1 megohm                                         |
| Total Resistance Tolerance.....                                                   | ±10 % or ±20 %.....                                         | ±5 % or ±10 %                                                |
| Independent Linearity.....                                                        | ±10 %.....                                                  | (A & H tapers) ±5 %                                          |
| Absolute Minimum Resistance.....                                                  | 2 ohms maximum.....                                         | 2 ohms maximum                                               |
| Effective Electrical Angle.....                                                   | 250 ° ±5 °.....                                             | 250 ° ±5 °                                                   |
| Contact Resistance Variation.....                                                 | ±1 %.....                                                   | ±3 % of total resistance or 3 ohms<br>(whichever is greater) |
| Dielectric Withstanding Voltage (MIL-STD-202, Method 301)                         |                                                             |                                                              |
| Sea Level.....                                                                    | 900 VAC minimum.....                                        | 900 VAC minimum                                              |
| 70,000 Feet.....                                                                  | 350 VAC minimum.....                                        | 350 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.....                                                                       | (Linear tapers) 1 watt.....<br>(Audio tapers) 0.5 watt..... | (Linear tapers) 2 watts<br>(Audio tapers) 1 watt             |
| +125 °C.....                                                                      | 0 watt                                                      |                                                              |
| +150 °C.....                                                                      |                                                             | 0 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.....                             | -65 °C to +125 °C..... | -65 °C to +150 °C                       |
| Temperature Coefficient Over                               |                        |                                         |
| Storage Temperature Range.....                             | ±1,000 ppm/°C.....     | ±150 ppm/°C                             |
| Vibration.....                                             | 20 G.....              | 20 G                                    |
| Total Resistance Shift.....                                | ±2 % maximum.....      | ±2 % maximum                            |
| Voltage Ratio Shift.....                                   | ±5 % maximum.....      | ±6 % maximum                            |
| Shock.....                                                 | 100 G.....             | 100 G                                   |
| Total Resistance Shift.....                                | ±2 % maximum.....      | ±2 % maximum                            |
| Voltage Ratio Shift.....                                   | ±5 % maximum.....      | ±6 % maximum                            |
| Load Life.....                                             | 1,000 hours.....       | 1,000 hours                             |
| Total Resistance Shift.....                                | ±10 % maximum.....     | ±3 % maximum                            |
| Rotational Life (No Load).....                             | 100,000 cycles.....    | 50,000 cycles                           |
| Total Resistance Shift.....                                | ±15 % TRS maximum..... | ±5 % or 5 ohms TRS whichever is greater |
| Contact Resistance Variation.....                          | ±3 %.....              | ±3 %                                    |
| Moisture Resistance (MIL-STD-202, Method 103, Condition B) |                        |                                         |
| Total Resistance Shift.....                                | ±10 % maximum.....     | ±2 % maximum                            |
| IP Rating.....                                             | IP 40.....             | IP 40                                   |

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

|                                                |                                                                                                                                                                                                                                                                                           |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stop Strength                                  |                                                                                                                                                                                                                                                                                           |
| 3851 & 3852.....                               | 56.5 N-cm (5 lb.-in.)                                                                                                                                                                                                                                                                     |
| 3856.....                                      | Continuous turn                                                                                                                                                                                                                                                                           |
| Mechanical Angle.....                          | 280 ° ±5 ° / 3856 – 1350 ° ±50 °                                                                                                                                                                                                                                                          |
| Torque (Starting and Running).....             | A & B bushings 0.35 to 4.23 N-cm (0.05 to 6.0 oz.-in.)<br>C & E bushings 0.21 to 4.23 N-cm (0.3 to 6.0 oz.-in.)<br>3856 – 0.11 to 2.12 N-cm (0.15 to 3.0 oz.-in.)                                                                                                                         |
| Mounting (Torque on Bushing).....              | 1.7-2.0 N-m (15-18 lb.-in.) maximum                                                                                                                                                                                                                                                       |
| Weight (Single Section).....                   | 30 grams maximum                                                                                                                                                                                                                                                                          |
| Terminals.....                                 | Printed circuit terminals or solder lugs                                                                                                                                                                                                                                                  |
| Soldering Condition.....                       | Recommended hand soldering using Sn95/Ag5 no clean solder, 0.025 " wire diameter.<br>Maximum temperature 399 °C (750 °F) for 3 seconds. No wash process to be used with no clean flux.<br>Part can be wave soldered at 260 °C (500 °F) for 5 seconds, no wash process with no clean flux. |
| Marking.....                                   | Manufacturer's trademark, wiring diagram, resistance, date code, and part number                                                                                                                                                                                                          |
| Ganging (Multiple Section Potentiometers)..... | 1 cup 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.

\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.  
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Users should verify actual device performance in their specific applications.

# 3851/3852/3856 - 3/4 " Diameter Panel Control

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## Product Dimensions

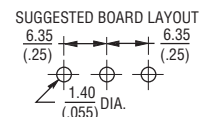
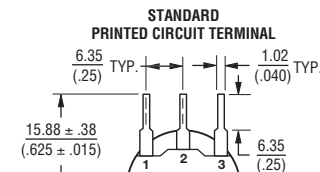
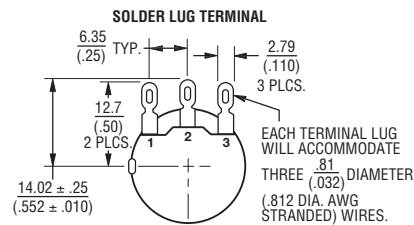
### 3851A/3852A



### 3851B/3852B



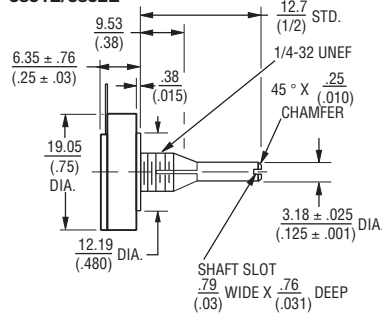
## Terminal Configuration



### 3851C/3852C

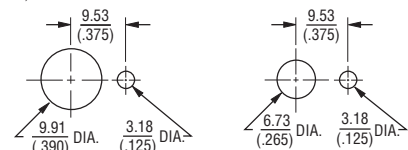


### 3851E/3852E

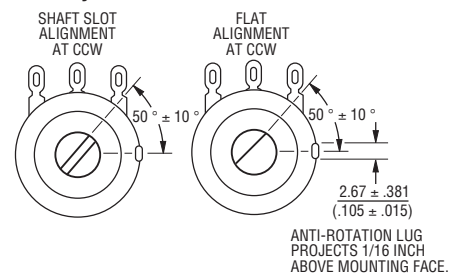


## 3851/3852/3856

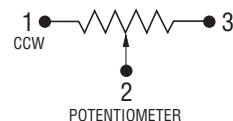
### A, B & H BUSHINGS



## Shaft End Detail 3850 Family



TOLERANCES EXCEPT AS NOTED:  
DECIMALS: .XXX ± .127 (.005), .XX ± .38 (.015)  
FRACTIONS: ± 1/64  
ANGLE: ± 3 %



DIMENSIONS: MM (INCHES)

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## How To Order

3852 A - 28 2 - 103 A L

| SHAFT TYPE<br>(FMS) & DIAMETER |                                        | AVAILABLE ONLY IN  |           |
|--------------------------------|----------------------------------------|--------------------|-----------|
|                                |                                        | MODELS             | BUSHINGS  |
| 12                             | 3/8 " (9.53 mm) L X 1/8 " (3.18 mm) D  | 3851, 3852         | C         |
| 16                             | 1/2 " (12.7 mm) L x 1/4 " (6.35 mm) D  | 3851, 3852         | A         |
| 16                             | 1/2 " (12.7 mm) L x 1/8 " (3.18 mm) D  | 3851, 3852         | C, E      |
| 20                             | 5/8 " (15.88 mm) L X 1/4 " (6.35 mm) D | 3851, 3852         | A, B      |
| 28                             | 7/8 " (22.20 mm) L X 1/4 " (6.35 mm) D | 3851, 3852<br>3856 | A, B<br>A |
| 28                             | 7/8 " (22.20 mm) L X 1/8 " (3.18 mm) D | 3851, 3852<br>3856 | C, E<br>H |

Consult factory for lengths not shown.

| BUSHING                                         | APPLICABLE MODELS      |
|-------------------------------------------------|------------------------|
| A Plain 3/8 " (9.53 mm) D x 3/8 " (9.53 mm) L   | 3851, 3852, 3856       |
| B Locking 3/8 " (9.53 mm) D x 1/2 " (12.7 mm) L | 3851, 3852             |
| C Plain 1/4 " (6.35 mm) D x 1/4 " (6.35 mm) L   | 3851, 3852             |
| E Locking 1/4 " (6.35 mm) D x 1/2 " (12.7 mm) L | 3851, 3852             |
| H Plain 3/8 " (9.53 mm) D x 3/8 " (9.53 mm) L   | 3856 (3.18 mm D Shaft) |

| MODEL                                      |
|--------------------------------------------|
| 3851 3/4 " (19.05 mm) D Single-Turn C.P.   |
| 3852 3/4 " (19.05 mm) D Single-Turn Cermet |
| 3856 3/4 " (19.05 mm) D 3-3/4-Turn Cermet  |

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

| TERMINAL STYLE AND<br>SHAFT TYPE  |
|-----------------------------------|
| 1 Solder Lugs, Plain End          |
| <b>2 Solder Lugs, Slotted End</b> |
| 3 Solder Lugs, Flatted Shaft      |
| 5 PC Pins, Plain End              |
| <b>6 PC Pins, Slotted End</b>     |
| 7 PC Pins, Flatted Shaft          |

| RESISTANCE<br>CODE/VALUE<br>(IN OHMS)<br>Model 3851 |              |
|-----------------------------------------------------|--------------|
| (102)                                               | <b>1 K</b>   |
| (252)                                               | 2.5 K        |
| (502)                                               | <b>5 K</b>   |
| (103)                                               | <b>10 K</b>  |
| (253)                                               | 25 K         |
| (503)                                               | <b>50 K</b>  |
| (104)                                               | <b>100 K</b> |
| (254)                                               | 250 K        |
| (504)                                               | 500 K        |
| (105)                                               | 1 M          |
| Models 3852/3856                                    |              |
| (101)                                               | 100          |
| (251)                                               | 250          |
| (501)                                               | 500          |
| (102)                                               | <b>1 K</b>   |
| (252)                                               | <b>2.5 K</b> |
| (502)                                               | <b>5 K</b>   |
| (103)                                               | <b>10 K</b>  |
| (253)                                               | 25 K         |
| (503)                                               | <b>50 K</b>  |
| (104)                                               | <b>100 K</b> |
| (254)                                               | 250 K        |
| (504)                                               | 500 K        |
| (105)                                               | 1 M          |

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

| ELEMENT<br>TAPER/TOLERANCE | APPLICABLE<br>MODELS |
|----------------------------|----------------------|
| A Linear ±10 %             | 3852, 3856           |
| B Linear ±20 %             | 3851                 |
| C Audio CW ±10 %           | 3852, 3856           |
| D Audio CW ±20 %           | 3851                 |
| E Linear ±10 %             | 3851                 |
| F Audio CCW ±10 %          | 3852, 3856           |
| G Audio CCW ±20 %          | 3851                 |
| H Linear ±5 %              | 3852, 3856           |

REV. 03/15

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