



## 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>

|   | <b>3851<br/>Conductive Plastic Element</b>                  | <b>3852/3856<br/>Cermet Element</b>                          |
|---|---|--|
| 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.

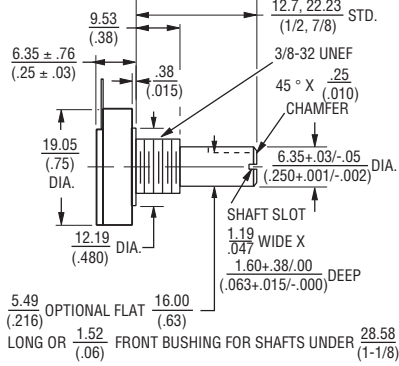
\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.  
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# 3851/3852/3856 - 3/4 " Diameter Panel Control

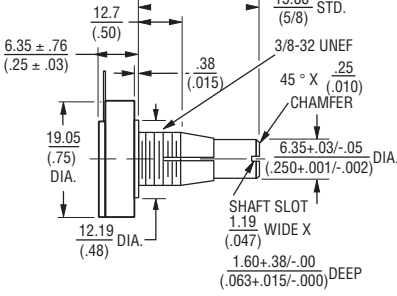
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## Product Dimensions

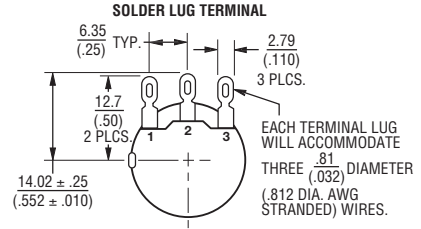
### 3851A/3852A



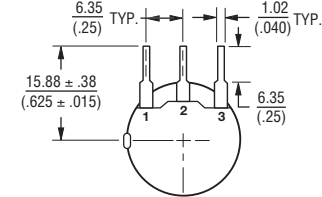
### 3851B/3852B



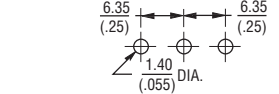
## Terminal Configuration



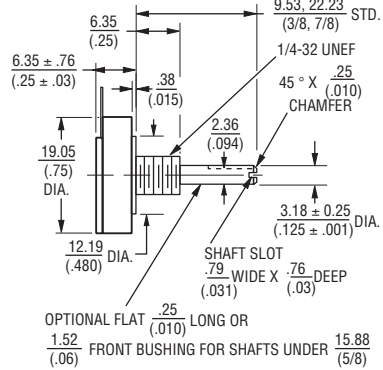
## STANDARD PRINTED CIRCUIT TERMINAL



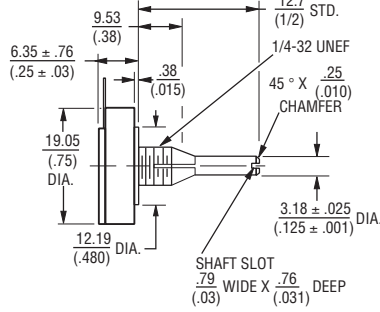
## SUGGESTED BOARD LAYOUT



### 3851C/3852C

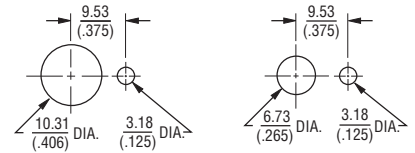


### 3851E/3852E

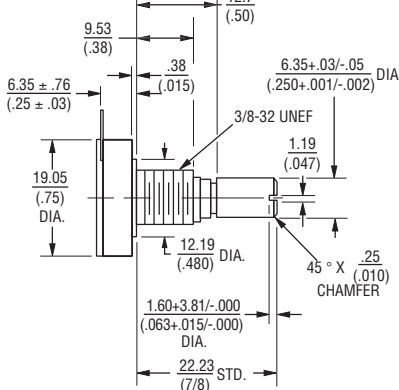


## 3851/3852/3856

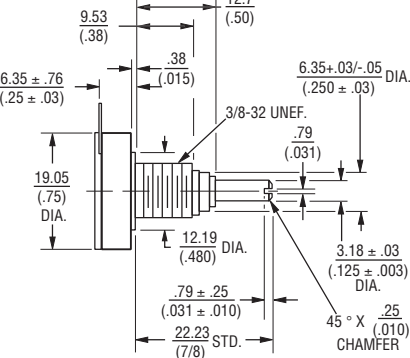
### A, B & H BUSHINGS



### 3856A

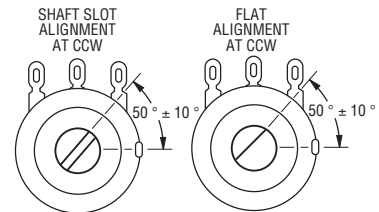


### 3856H

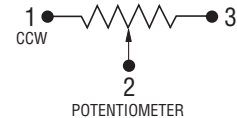


DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

## Shaft End Detail 3850 Family



TOLERANCES EXCEPT AS NOTED:  
 DECIMALS: .XXX ±  $\frac{.127}{(0.005)}$ , .XX ±  $\frac{.38}{(0.015)}$   
 FRACTIONS: ± 1/64  
 ANGLE: ± 3°



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## How To Order

**3852 A - 28 2 - 103 A L**

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

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

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

| ELEMENT TAPER/TOLERANCE | APPLICABLE 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. 09/14

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