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## 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 (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                             | 56.5 N-cm (5 lb.-in.)   |
| 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. 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, 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.  |

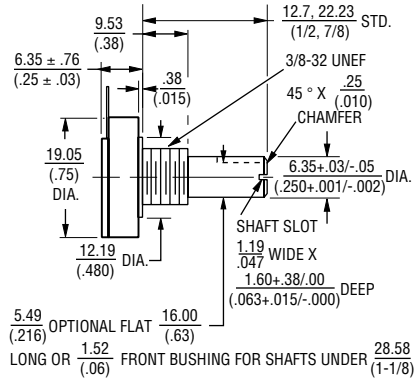
<sup>1</sup>AT ROOM AMBIENT: +25 °C NOMINAL AND 50 % RELATIVE HUMIDITY NOMINAL, EXCEPT AS NOTED.

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

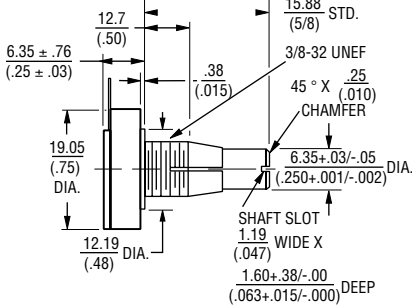
# BOURNS®

## Product Dimensions

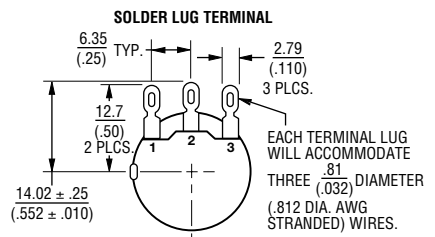
### 3851A/3852A



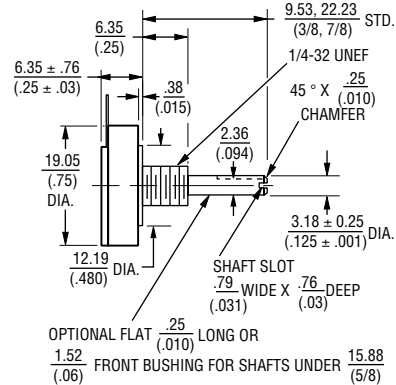
### 3851B/3852B



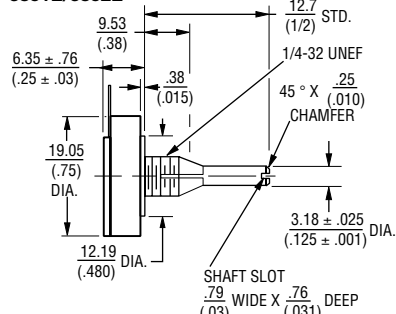
### Terminal Configuration



### 3851C/3852C

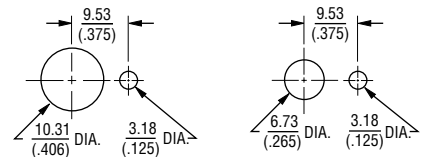


### 3851E/3852E

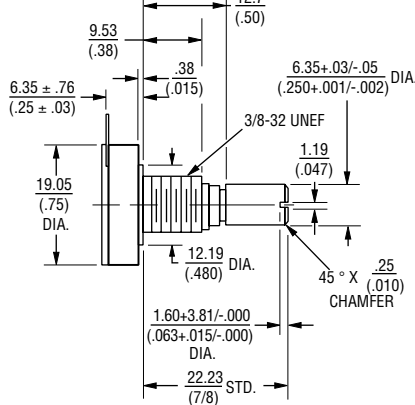


### 3851/3852/3856

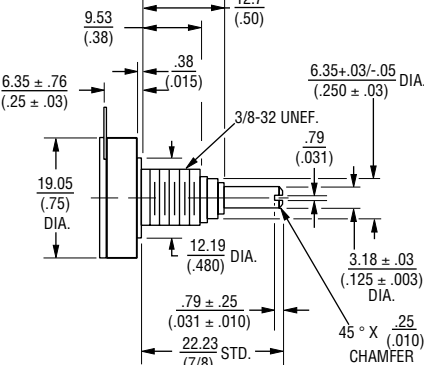
#### A, B & H BUSHINGS



### 3856A

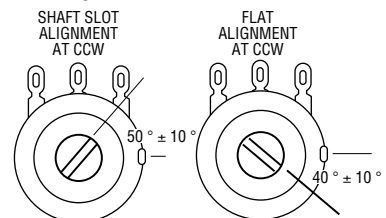


### 3856H



### Shaft End Detail

#### 3850 Family



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

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

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

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

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## How To Order

3852 A - 28 2 - 103 A

| 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) |

| RESISTANCE CODE/VALUE (IN OHMS) |       |
|---------------------------------|-------|
| <b>Model 3851</b>               |       |
| (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   |
| <b>Models 3852/3856</b>         |       |
| (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   |

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

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

| ELEMENT TAPER/TOLERANCE | APPLICABLE MODELS |
|-------------------------|-------------------|
| <b>A</b> 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        |

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