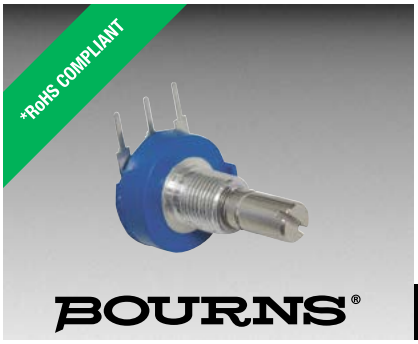


## Features

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

# 3851/3852/3856 – 3/4 ˝ Diameter Panel Control

### Initial Electrical Characteristics[1]

| | 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 | (Linear tapers) 250 ° ±5 ° | (Linear tapers) 250 ° ±5 ° |
| | (Audio tapers) 225 ° ±5 ° | (Audio tapers) 225 ° ±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 | (Linear tapers) 2 watts |
| | (Audio tapers) 0.5 watt | (Audio tapers) 1 watt |
| +125 °C | 0 watt | |
| +150 °C | | 0 watt |
| Theoretical Resolution | Essentially infinite | Essentially infinite |

### Environmental Characteristics[1]

| | | |
|---|---|---|
| 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 | 20,000 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 |

[1] Electrical 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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## Mechanical Characteristics[1]

| | |
|---|---|
| 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;<br>locking bushing versions are shipped with one additional locking nut<br>(Bushing A&H: 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;<br>Bushing E: H-37-1, H-38-1 & H-38-3) |

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

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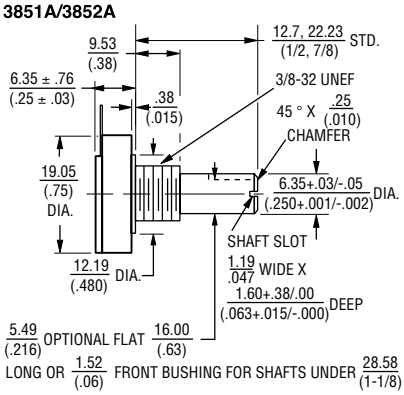
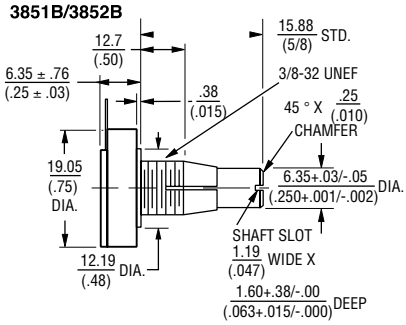
## Product Dimensions

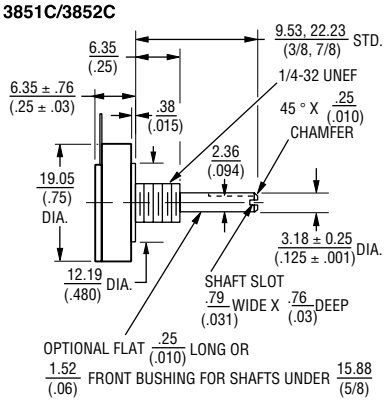
### 3851A/3852A



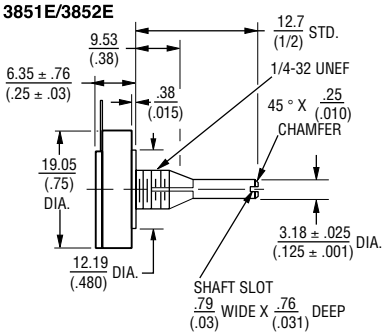

### 3851B/3852B



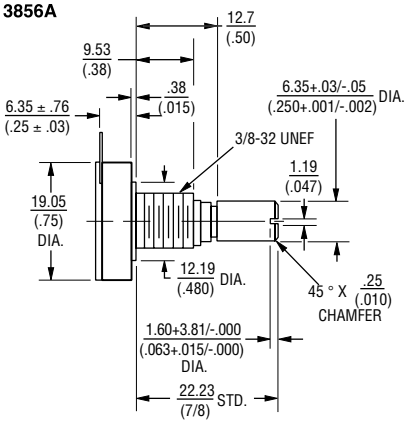

### 3851C/3852C



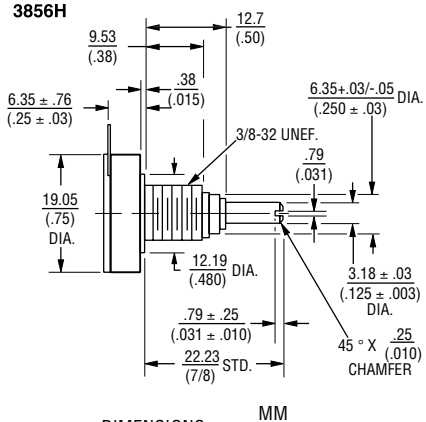

### 3851E/3852E




### 3856A



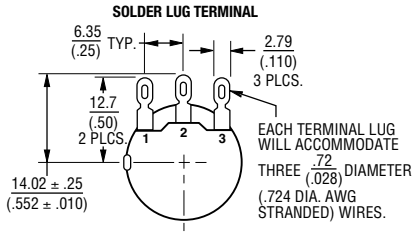

### 3856H



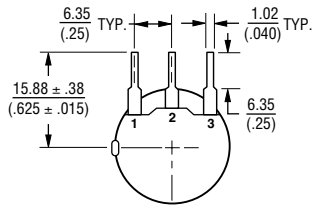

DIMENSIONS: MM / (INCHES)

### Terminal Configuration

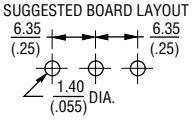
**SOLDER LUG TERMINAL**




**STANDARD PRINTED CIRCUIT TERMINAL**

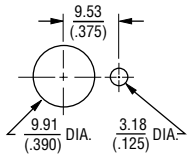



SUGGESTED BOARD LAYOUT

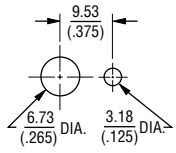



### 3851/3852/3856

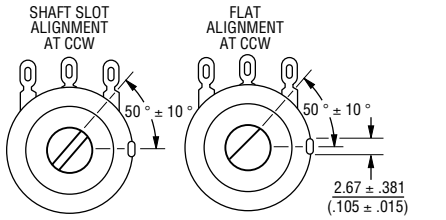
A, B & H BUSHINGS



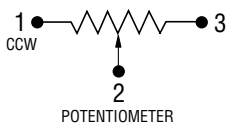

C & E BUSHINGS




### Shaft End Detail
### 3850 Family




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

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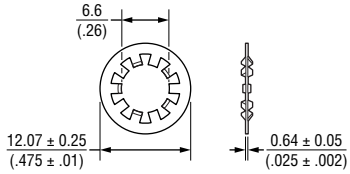
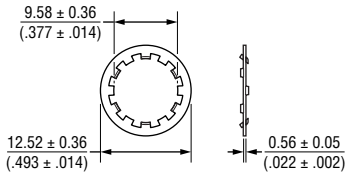
## Hardware

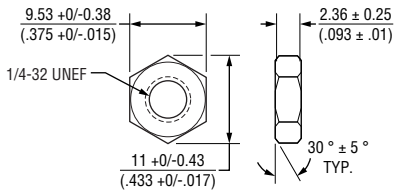
**LOCKWASHER H-37-1**



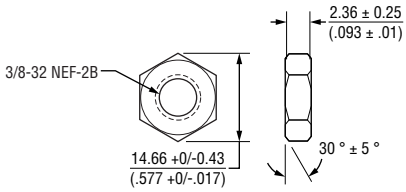

**LOCKWASHER H-37-2**




**NUT H-38-1**

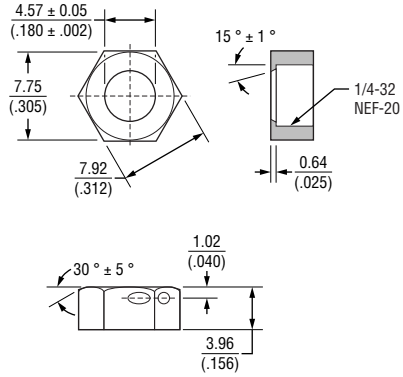



**NUT H-38-2**

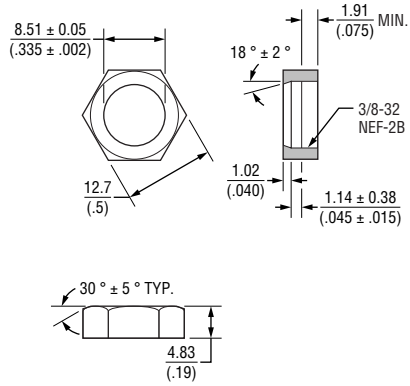



DIMENSIONS: MM / (INCHES)

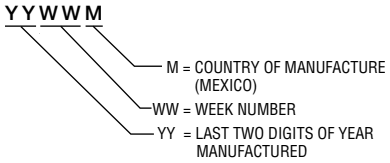
**LOCKNUT H-38-3**




**LOCKNUT H-38-4**




## Date Code Description

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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.

| RESISTANCE CODE/VALUE (IN OHMS) 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** |

| | 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** | **Solder Lugs, Slotted End** |
| 3 | Solder Lugs, Flatted Shaft |
| 5 | PC Pins, Plain End |
| **6** | **PC Pins, Slotted End** |
| 7 | PC Pins, Flatted Shaft |

| 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 |

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REV. 10/20

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