



## Features

- Wirewound and Hybritron® elements
- High rotational life
- Optional 0.1 % linearity
- Optional A/R lug
- RoHS compliant\*
- Suitable for use under some side load conditions
- Designed for HMI and MMI applications
- Dual gang option
- Servo mount option
- Dual ball bearing option

## 3549 - 10-Turn Precision Potentiometer

| Electrical Characteristics <sup>1</sup>                   | Wirewound Element           | Hybritron® Element    |
|-----------------------------------------------------------|-----------------------------|-----------------------|
| Standard Resistance Range.....                            | 100 to 100K ohms.....       | 1K to 100K ohms       |
| Total Resistance Tolerance.....                           | ±3 %.....                   | ±10 %                 |
| Independent Linearity.....                                | ±0.2 %.....                 | ±0.2 %                |
| Independent Linearity (Maximum Practical).....            | ±0.1 %.....                 | ±0.1 %                |
| Effective Electrical Angle.....                           | 3600 ° +10 °, -0 °.....     | 3600 ° +10 °, -0 °    |
| Absolute Minimum Resistance/End Voltage.....              | 1 ohm or 0.1 % maximum..... | 0.2 % maximum         |
| (whichever is greater)                                    |                             |                       |
| Noise/Output Smoothness.....                              | 100 ohms maximum.....       | 0.10 % maximum        |
| Max. Wiper Current @ 5K ohms.....                         | 20 mA.....                  | 10 mA                 |
| 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 |
| Resolution.....                                           | See How to Order chart..... | Essentially infinite  |
| Power Rating (Voltage Limited By Power Dissipation)       |                             |                       |
| +70 °C.....                                               | 2 watts.....                | 2 watts               |
| +125 °C.....                                              | 0 watt.....                 | 0 watt                |

| Environmental Characteristics <sup>1</sup>                        |                                  |                              |
|-------------------------------------------------------------------|----------------------------------|------------------------------|
| Operating Temperature Range                                       |                                  |                              |
| Dynamic.....                                                      | -40 °C to +125 °C.....           | -40 °C to +125 °C            |
| Static.....                                                       | -55 °C to +125 °C.....           | -55 °C to +125 °C            |
| Temperature Coefficient (Over Static Temperature Range).....      | ±50 ppm/°C.....                  | ±100 ppm/°C                  |
| Temperature Cycling (5 Cycles Over Static Temperature Range)..... | ±2 % TR shift max.....           | ±4 % TR shift max.           |
| Vibration (15 Gs, 10 Hz to 2 kHz)                                 |                                  |                              |
| Wiper Bounce.....                                                 | 0.1 ms max.....                  | 0.1 ms max.                  |
| Shock (100 Gs, 6 ms sawtooth)                                     |                                  |                              |
| Wiper Bounce.....                                                 | 0.1 ms max.....                  | 0.1 ms max.                  |
| Load Life (1,000 hours @ 70 °C).....                              | ±2 % TR shift.....               | ±5 % TR shift max.           |
| Rotational Life                                                   |                                  |                              |
| No Load or Powered.....                                           | 2,000,000 shaft revolutions..... | 5,000,000 shaft revolutions  |
| No Load or Powered (Dual Ball Bearing).....                       | N/A.....                         | 10,000,000 shaft revolutions |
| Moisture Resistance (Mil-Std-202, Method 103).....                | ±2 % TR shift max.....           | ±5 % TR shift max.           |
| IP Rating.....                                                    | IP 50.....                       | IP 50                        |

| Mechanical Characteristics <sup>1</sup>          |                                                                                                |
|--------------------------------------------------|------------------------------------------------------------------------------------------------|
| Mechanical Angle.....                            | 3600 ° +10 °, -0 °                                                                             |
| Backlash.....                                    | 1.0 ° max.                                                                                     |
| Stop Strength.....                               | 53 N-cm (75 oz-in.) min.                                                                       |
| Torque                                           |                                                                                                |
| Starting.....                                    | 0.5 N-cm (0.7 oz-in.) max.                                                                     |
| Running.....                                     | 0.5 N-cm (0.7 oz-in.) max.                                                                     |
| Clutch.....                                      | 1.0 to 4.2 N-cm (1.5 to 6.0 oz-in.)                                                            |
| Mounting.....                                    | 170-200 N-cm (15-18 in.-lb.) max.                                                              |
| Shaft Runout T.I.R.....                          | 0.08 mm (0.003 in.)                                                                            |
| Lateral Runout T.I.R.....                        | 0.13 mm (0.005 in.)                                                                            |
| Shaft End Play T.I.R.....                        | 0.15 mm (0.006 in.)                                                                            |
| Shaft Radial Play T.I.R.....                     | 0.08 mm (0.003 in.)                                                                            |
| Pilot Diameter Runout T.I.R.....                 | 0.08 mm (0.003 in.)                                                                            |
| Weight                                           |                                                                                                |
| Single.....                                      | 20 gm (0.7 oz.) typ.                                                                           |
| Dual.....                                        | 36 gm (1.27 oz) typ.                                                                           |
| Shaft Side Load (Max. Allowable)                 |                                                                                                |
| Nickel Plated Brass Shaft w/Brass Bushing.....   | 50 gm (1.7 ozf)                                                                                |
| Stainless Steel Shaft w/Bronze Bushing.....      | 250 gm (8.8 ozf)                                                                               |
| Terminals.....                                   | Gold-plated solder lugs                                                                        |
| Soldering Condition                              |                                                                                                |
| Manual Soldering.....                            | 96.5Sn/3.0Ag/0.5Cu solid wire or no-clean rosin cored wire, 370 °C (700 °F) max. for 3 seconds |
| Wave Soldering.....                              | 96.5Sn/3.0Ag/0.5Cu solder with no-clean flux, 260 °C (500 °F) max. for 5 seconds               |
| Wash processes.....                              | Not recommended                                                                                |
| Mounting Hardware.....                           | One lockwasher and one mounting nut is shipped with each potentiometer                         |
| Recommended Panel Thickness (Bushing Mount)..... | 2.46-3.81 mm (0.097-0.150 in.)                                                                 |
| Marking.....                                     | Manufacturer's symbol, model number, product code and date code                                |
| Standard Packaging.....                          | Plastic trays (5 pcs./tray)                                                                    |

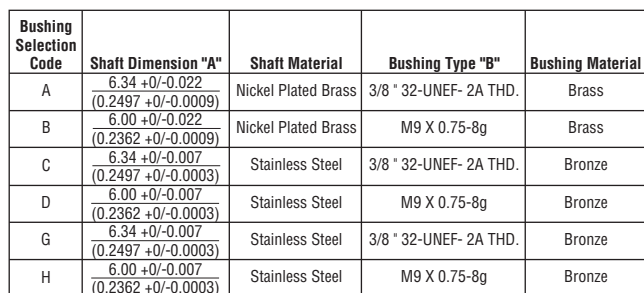
<sup>1</sup>At room ambient: +25 °C nominal and 50 % relative humidity nominal, except as noted.  
For other options, please consult factory.

\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.  
Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.  
Users should verify actual device performance in their specific applications.

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### Single Gang, Bushing Mount

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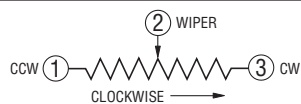
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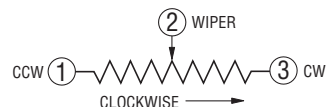
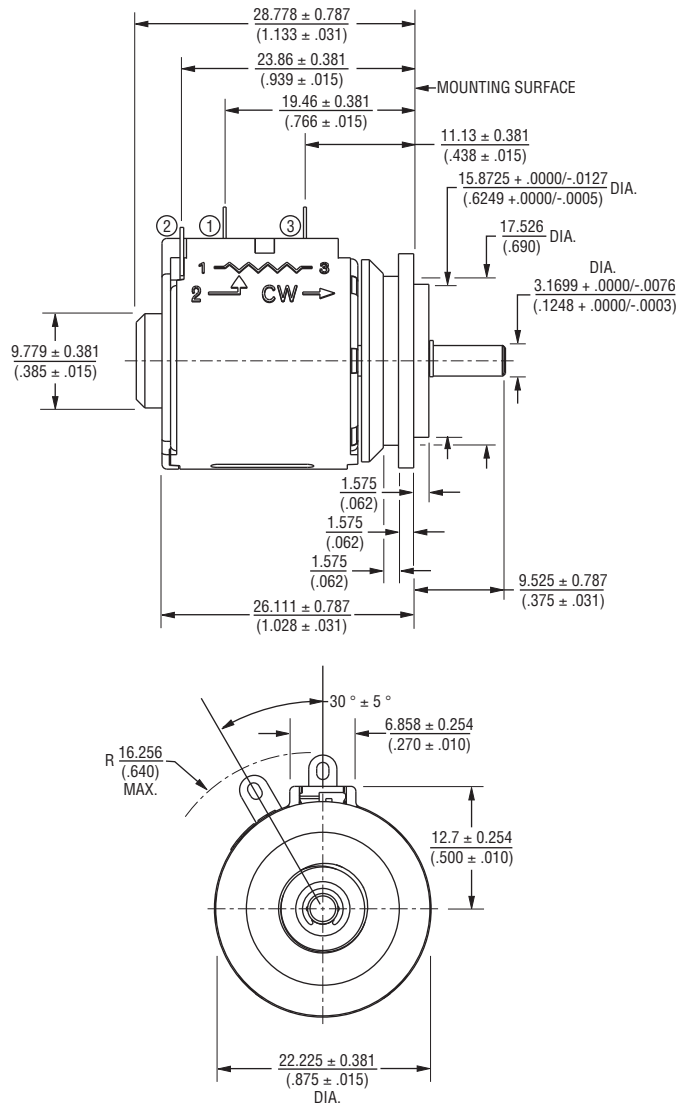
## Product Dimensions

### Single Gang, Servo Mount



TOLERANCES: EXCEPT WHERE NOTED  
 DECIMALS: .XX ± .50 (0.02) .XXX ± .127 (0.005) .XXXX ± .0127 (0.0005)  
 DIMENSIONS:  $\frac{\text{MM}}{(\text{IN})}$

### Single Gang, Servo Mount, Dual Ball Bearing



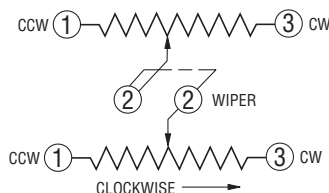
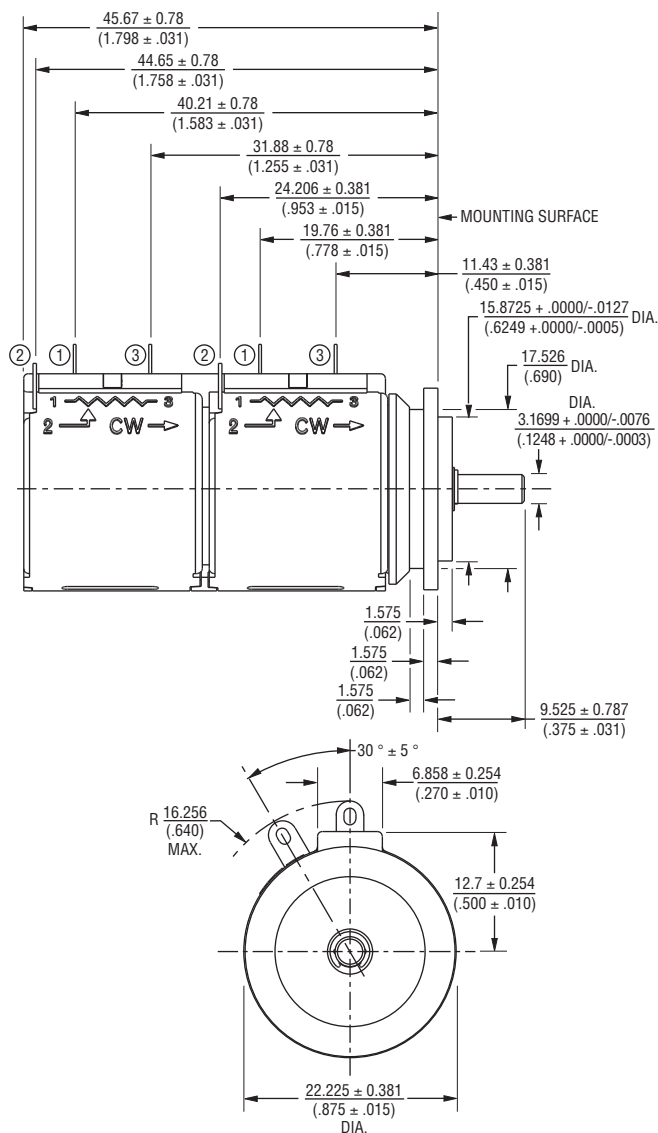
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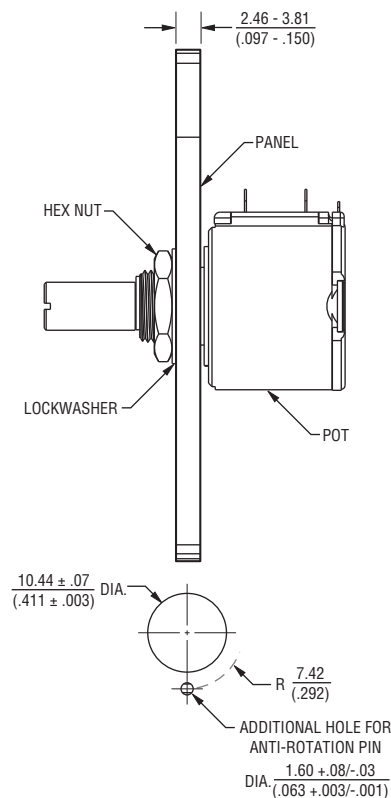
## Product Dimensions

### Dual Gang, Servo Mount



## Panel Thickness Dimensions

### (For Bushing Mount Only)



Anti-rotation pin hole is shown at six o'clock position for reference only. The actual location is determined by the customer's application. Refer to the front view of the potentiometer to see the location of the optional A/R pin.

Panel thickness and hole diameters are recommended for best fit. However, customers may adjust the dimensions to suit their specific application.

DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$  TOLERANCES:  $\pm \frac{0.127}{(.005)}$

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## How To Order

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 4 | 9 | S | - | 2 | A | A | - | 1 | 0 | 3 | / | 1 | 0 | 3 | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| MODEL DESIGNATOR |             |
|------------------|-------------|
| Code             | Description |
| 3549             | 10-Turn     |

| ELEMENT TYPE |             |
|--------------|-------------|
| Code         | Description |
| H            | Hybritron®  |
| S            | Wirewound   |

| NO. OF SECTIONS |             |
|-----------------|-------------|
| Code            | Description |
| 1               | Single      |
| 2               | Dual        |

| ANTI-ROTATION LUG |             |
|-------------------|-------------|
| Code              | Description |
| A                 | None        |
| B                 | 180 °       |

\* Anti-rotation lug is not available for servo mount versions.

| INDEPENDENT LINEARITY |             |
|-----------------------|-------------|
| Code                  | Description |
| A                     | 0.20 %      |
| B                     | 0.10 %      |

| RESISTANCE**    |              |                |
|-----------------|--------------|----------------|
| Code            | Element Type | Resolution (%) |
| 102 (1K ohms)   | Hybritron®   | —              |
| 202 (2K ohms)   | Hybritron®   | —              |
| 502 (5K ohms)   | Hybritron®   | —              |
| 103 (10K ohms)  | Hybritron®   | —              |
| 203 (20K ohms)  | Hybritron®   | —              |
| 503 (50K ohms)  | Hybritron®   | —              |
| 104 (100K ohms) | Hybritron®   | —              |
| 101 (100 ohms)  | Wirewound    | 0.055          |
| 201 (200 ohms)  | Wirewound    | 0.042          |
| 501 (500 ohms)  | Wirewound    | 0.031          |
| 102 (1K ohms)   | Wirewound    | 0.027          |
| 202 (2K ohms)   | Wirewound    | 0.021          |
| 502 (5K ohms)   | Wirewound    | 0.016          |
| 103 (10K ohms)  | Wirewound    | 0.019          |
| 203 (20K ohms)  | Wirewound    | 0.014          |
| 503 (50K ohms)  | Wirewound    | 0.011          |
| 104 (100K ohms) | Wirewound    | 0.008          |

\*\* For Single gang, use only first three digits.  
For Dual gang, use six digits separated by a "/".

| BUSHING MOUNT |           |            |                     |              |                  |             |
|---------------|-----------|------------|---------------------|--------------|------------------|-------------|
| Code          | Shaft FMS | Shaft Dia. | Shaft Material      | Bushing Dia. | Bushing Material | Slip Clutch |
| A             | 13/16 "   | 1/4 "      | Nickel Plated Brass | 3/8 "        | Brass            | N/A         |
| B             | 20.6 mm   | 6 mm       | Nickel Plated Brass | 9 mm         | Brass            | N/A         |
| C             | 13/16 "   | 1/4 "      | Stainless Steel     | 3/8 "        | Bronze           | N/A         |
| D             | 20.6 mm   | 6 mm       | Stainless Steel     | 9 mm         | Bronze           | N/A         |
| G             | 13/16 "   | 1/4 "      | Stainless Steel     | 3/8 "        | Bronze           | Yes***      |
| H             | 20.6 mm   | 6 mm       | Stainless Steel     | 9 mm         | Bronze           | Yes***      |

| SERVO MOUNT |           |            |                 |                  |
|-------------|-----------|------------|-----------------|------------------|
| Code        | Shaft FMS | Shaft Dia. | Shaft Material  | Ball Bearings    |
| E           | 3/8 "     | 1/8 "      | Stainless Steel | N/A              |
| F           | 3/8 "     | 1/8 "      | Stainless Steel | Front & Rear**** |

\*\*\* Not available in dual gang version.

\*\*\*\* Available in Hybritron® version only and limited to single section.

REV. 10/14

"Hybritron" is a registered trademark of Bourns, Inc.

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