Series S159-10 5/8" Modular Precision 10-Turn Potentiometer

Description:
The Series S159-10 Precision 10-Turn Potentiometer modules are 5/8" square (15.88mm), with metal shaft and bushing.

Wirewound or Hybritron® elements are available. Hybritron is a wirewound element covered with a Conductive Plastic coating, which offers temperature stability, low-noise, and virtually infinite resolution. Combine up to 2 modules.

For more information about this product, visit our website at: www.potentiometers.com

Electrical Specifications

Resistance Range - Wirewound Element
  J Linear Taper: 200 ohms to 100K ohms

Resistance Range - Hybritron® Hybrid Element
  K Linear Taper: 1K ohms to 100K ohms

Total Resistance Tolerance
  Wirewound: ±5%
  Hybritron: ±10%

Independent Linearity: ±0.25 %

Absolute Minimum Resistance:
  Wirewound: 1.0 ohm or 0.1 % (whichever is greater)

Effective Electrical Angle: 3600° +10, -0°

Dielectric Withstanding Voltage (MIL-STD-202 - Method 301)
  Sea Level: 1,000 VAC minimum

Insulation Resistance: 1,000 megohms minimum

Power Rating:
  +70 °C: 1 watt; +125 °C: 0 watt
  (Voltage Limited By Power Dissipation or 350 VAC, Whichever Is Less)

Theoretical Resolution:
  Wirewound: See table
  Hybritron: Essentially Infinite

End Voltage
  Hybritron (K Taper): 0.2 % of applied voltage

Noise:
  Wirewound: (J Taper): 100 ohms

Output Smoothness
  Hybritron (K Taper): 0.15 % maximum

Mechanical Specifications

Mechanical Angle: 3600° +15°, -0°

Stop Strength:
  33.90 N-cm (48.0 oz.-in.) minimum

Starting Torque:
  Running torque plus 0.7 N-cm (1.0 oz.-in.) max

Running Torque (1 or 2 sections):
  0.18 to 1.41 N-cm (0.25 to 2.0 oz.-in.)

Mounting Torque (Torque on Bushing):
  1.7-2.0 N-m (15-18 lb.-in.) maximum

Shaft Runout: 0.15 mm (0.006 in.) T.I.R.

Shaft End Play: 0.36 mm (0.014 in.) T.I.R.

Shaft Radial Play:
  0.13 mm (0.005 in.) T.I.R.

Weight:
  Single Section - 21 gm (0.75 oz.)
  Each additional Section: 18 gm (0.65 oz.)

Terminals: Printed circuit terminals or solder lugs

Soldering Condition:
  Recommended hand soldering using Sn95/Au5 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.

Ganging (Multiple Section Potentiometers): 2 modules max.

Features:
- 5/8" Square Modular 10 Turn Panel Control
- Stackable - up to 2 modules
- Linear Taper
- ±0.25% Independent Linearity
- Wirewound or Hybritron® Hybrid Element
- Metal Shaft and Bushing
- PCB or Solder Lug Terminals
- IP40 Rating
- RoHS Compliant
Series S159-10 5/8" Modular Precision 10-Turn Potentiometer

Environmental Specifications

Operating Temperature Range: +1°C to +125°C

Storage Temperature Range: -55°C to +125°C

Temperature Coefficient over Storage Range:
  Wirewound: ±50 ppm/°C;
  Hybritron: ±100 ppm/°C

Vibration (Single Section): 15 G
  Total Resistance Shift: ±2% maximum
  Voltage Ratio Shift: ±0.2% maximum
  Wiper Bounce: 0.1 millisecond maximum

Shock (Single Section): 50 G
  Total Resistance Shift: ±2% maximum
  Voltage Ratio Shift: ±0.2% maximum
  Wiper Bounce: 0.1 millisecond maximum

Load Life: 1,000 hours
  Wirewound: Total Resistance Shift: ±2% max.
  Hybritron: Total Resistance Shift: ±5% max.

Rotational Life - Wirewound (No Load):
  1,000,000 shaft revolutions, ±5% TRS maximum

Rotational Life - Hybritron (No Load):
  4,000,000 shaft revolutions, ±5% TRS maximum

Moisture Resistance (MIL-STD-202, Method 103, Condition B)
  Wirewound: ±2% Total Resistance Shift max.
  Hybritron: ±5% Total Resistance Shift max.

Insulation Resistance (500 VDC): 100 megohms minimum

IP Rating: IP40

Wirewound Resolution Table

<table>
<thead>
<tr>
<th>Resistance (Ohms)</th>
<th>Resolution (Nom. %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>.048</td>
</tr>
<tr>
<td>500</td>
<td>.037</td>
</tr>
<tr>
<td>1 K</td>
<td>.032</td>
</tr>
<tr>
<td>2 K</td>
<td>.031</td>
</tr>
<tr>
<td>5 K</td>
<td>.023</td>
</tr>
<tr>
<td>10 K</td>
<td>.020</td>
</tr>
<tr>
<td>20 K</td>
<td>.015</td>
</tr>
<tr>
<td>50 K</td>
<td>.012</td>
</tr>
<tr>
<td>100 K</td>
<td>.010</td>
</tr>
</tbody>
</table>

Dimensional Drawings

Dual Section Model S159-10 PC Pins

Dual Section Model S159-10 Solder Lugs

Note: The dimensions for dual section assembly are for either single or dual concentric shaft styles.
### Ordering Information - S159-10 Precision Ten Turn Modular Potentiometer

**Example Part Number:** S159-10-PC-A2A-B28-J103

#### Style
- **PC** = PC Pins
- **SH** = Solder Lugs

#### Modules:
- **1** = Single
- **2** = Double

#### Anti-Rotation Lug:
- **A** = Single .305" R, 90° CW
- **B** = Double .305" R, 90° & 270° CW
- **C** = Single .305" R, 270° CW
- **D** = No Lug
- **E** = Single .531" R, 90° CW
- **F** = Single .305" R, 180° CW
- **J** = Single .375" R, 90° CW
- **K** = Double .375" R, 90° & 270° CW

#### Bushing:
- **A** = Plain 3/8" Dia. x 3/8" Length
- **B** = Locking 3/8" Dia. x 1/2" Length
- **C** = Plain 1/4" Dia. x 1/4" Length
- **D** = No Lug
- **E** = Single .531" R, 90° CW
- **F** = Single .305" R, 180° CW
- **J** = Single .375" R, 90° CW
- **K** = Double .375" R, 90° & 270° CW
- **N** = Plain 1/4" Dia. x 3/8" Length
- **R** = Plain 10mm Dia. x 9mm Length
- **U** = Plain 7mm Dia. x 6mm Length

#### Shaft Available Lengths
- **(FMS)** = available only in bushing code

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>3/8&quot;</td>
<td>C, J</td>
</tr>
<tr>
<td>16</td>
<td>1/2&quot;</td>
<td>A, C, J, N</td>
</tr>
<tr>
<td>20</td>
<td>5/8&quot;</td>
<td>A, B, C, E, J, N</td>
</tr>
<tr>
<td>24</td>
<td>3/4&quot;</td>
<td>A, B, C, E, J, N</td>
</tr>
<tr>
<td>28</td>
<td>7/8&quot;</td>
<td>A, B, C, E, J, N</td>
</tr>
<tr>
<td>32</td>
<td>1&quot;</td>
<td>A, B, C, E, J, N</td>
</tr>
<tr>
<td>36</td>
<td>1-1/8&quot;</td>
<td>A, B, C, E, J, N</td>
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<tr>
<td>40</td>
<td>1-1/4&quot;</td>
<td>A, B, C, E, J, N</td>
</tr>
</tbody>
</table>

**Element & Taper:**
- **J** = Linear Wirewound 10-Turn ±5%
- **K** = Linear Hybritron 10-Turn ±10%

**Available Resistance Values**

<table>
<thead>
<tr>
<th>Code</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>200 ohms</td>
</tr>
<tr>
<td>501</td>
<td>500 ohms</td>
</tr>
<tr>
<td>102</td>
<td>1.0 K ohms</td>
</tr>
<tr>
<td>202</td>
<td>2.0 K ohms</td>
</tr>
<tr>
<td>502</td>
<td>5.0 K ohms</td>
</tr>
<tr>
<td>103</td>
<td>10 K ohms</td>
</tr>
<tr>
<td>203</td>
<td>20 K ohms</td>
</tr>
<tr>
<td>503</td>
<td>50 K ohms</td>
</tr>
<tr>
<td>104</td>
<td>100 K ohms</td>
</tr>
</tbody>
</table>

**Modules:**
- **1** = Single
- **2** = Double

**Shaft Type Code Description**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Single Plain 1/4&quot; Dia</td>
</tr>
<tr>
<td>B</td>
<td>Single Slotted 1/4&quot; Dia</td>
</tr>
<tr>
<td>C</td>
<td>Single Flatted 1/4&quot; Dia</td>
</tr>
<tr>
<td>E</td>
<td>Single Slotted 1/8&quot; Dia</td>
</tr>
<tr>
<td>G</td>
<td>Dual Concentric Plain (Outer 1/4&quot; Dia - Inner 1/8&quot; Dia) Outer Operates Section 1</td>
</tr>
<tr>
<td>K</td>
<td>Dual Concentric Plain (Outer 1/8&quot; Dia - Inner 5/64&quot; Dia) Outer Operates Section 1</td>
</tr>
<tr>
<td>L</td>
<td>Dual Concentric Plain (Outer 1/4&quot; Dia - Inner 1/8&quot; Dia) Outer Operates Section 1/2</td>
</tr>
<tr>
<td>M</td>
<td>Dual Concentric Plain (Outer 1/8&quot; Dia - Inner 5/64&quot; Dia) Outer Operates Section 1</td>
</tr>
<tr>
<td>N</td>
<td>Dual Concentric Plain (Outer 1/4&quot; Dia - Inner 1/8&quot; Dia) Outer Operates Section 1/2</td>
</tr>
<tr>
<td>P</td>
<td>Dual Concentric Plain (Outer 1/8&quot; Dia - Inner 5/64&quot; Dia) Outer Operates Section 1/2</td>
</tr>
<tr>
<td>R</td>
<td>Single Slotted 6 mm Dia</td>
</tr>
<tr>
<td>T</td>
<td>Single Slotted 4 mm Dia</td>
</tr>
<tr>
<td>V</td>
<td>Dual Concentric Plain (Outer 6mm Dia - Inner 3mm Dia) Outer Operates Section 1</td>
</tr>
</tbody>
</table>

For Pricing and Delivery information, [Create an RFQ on our website](http://www.potentiometers.com) or Contact your State Electronics Sales Representative at 973-887-2550

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