



## Features

- Essentially infinite resolution
- Excellent rotational life
- High quality, rugged construction
- General purpose applications
- Non-standard features available
- Cost and space saving

**BOURNS®**

## 6539/6639 - Precision Potentiometer

Electrical Characteristics <sup>1</sup>	6539 Servo Mount	6639 Bushing Mount
Standard Resistance Range	1 K to 100 K ohms	1 K to 100 K ohms
Total Resistance Tolerance	±15 %	±15 %
Independent Linearity	±2.0 %	±2.0 %
Effective Electrical Angle	340° +3°	340° +3°
End Voltage	0.5 % maximum	0.5 % maximum
Output Smoothness	0.1 %	0.1 %
Dielectric Withstanding Voltage (MIL-STD-202, Method 301)		
Sea Level	750 VAC minimum	750 VAC minimum
Power Rating (Voltage Limited By Power Dissipation or 300 VAC, Whichever is Less)		
+70 °C	1.0 watt	1.0 watt
+125 °C	0 watt	0 watt
Insulation Resistance (500 VDC)	500 megohms minimum	500 megohms minimum
Resolution	Essentially infinite	Essentially infinite

### Environmental Characteristics<sup>1</sup>

Operating Temperature Range	+1 °C to +125 °C	-40 °C to +125 °C
Storage Temperature Range	-65 °C to +125 °C	-65 °C to +125 °C
Temperature Coefficient		
Over Storage Temperature Range	±500 ppm/°C maximum	±500 ppm/°C maximum
Vibration	15 G	15 G
Wiper Bounce	0.1 millisecond maximum	0.1 millisecond maximum
Total Resistance Shift	±10 %	±10 %
Voltage Ratio Shift	±0.5 %	±0.5 %
Shock	50 G	50 G
Wiper Bounce	0.1 millisecond maximum	0.1 millisecond maximum
Total Resistance Shift	±5 %	±5 %
Voltage Ratio Shift	±0.5 %	±0.5 %
Load Life	1,000 hours, 1 watt	1,000 hours, 1 watt
Total Resistance Shift	±10 %	±10 %
Rotational Life (No Load)	10,000,000 shaft revolutions	10,000,000 shaft revolutions
Total Resistance Shift	±10 % maximum	±10 % maximum
Moisture Resistance (MIL-STD-202, Method 106)		
Total Resistance Shift	±15 %	±15 %
IP Rating	IP 40	IP 40

### Mechanical Characteristics<sup>1</sup>

Mechanical Angle	Continuous, Stops (340° +8°, -0°) available
Torque (Starting & Running) <sup>2</sup>	0.40 N-cm (0.5 oz.-in.) max.
Mounting	170-200 N-cm (15-18 lb.-in.) maximum
Shaft Runout	0.13 mm (0.005 in.) T.I.R.
Lateral Runout	0.08 mm (0.003 in.) T.I.R.
Shaft End Play	0.13 mm (0.005 in.) T.I.R.
Shaft Radial Play	0.13 mm (0.005 in.) T.I.R.
Pilot Diameter Runout	0.06 mm (0.0025 in.) T.I.R.
Backlash	0.1° maximum
Weight	18 gm (6539 Servo Mount), 24 gm (6639 Bushing Mount)
Terminals	Rear Turret Type
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.
Marking	Manufacturer's name and part number, resistance value and tolerance, linearity tolerance, wiring diagram, and date code.
Ganging (Multiple Section Pots)	1 cup maximum
Hardware (6639 only)	One lockwasher (H-37-2) and one mounting nut (H-38-2) is shipped with potentiometer.

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

<sup>2</sup> 2.82 N-cm (4.0 oz.-in.) max. at -40 °C.

### Recommended Part Numbers

Part Number	Resistance (Ω)
6539S-1-102	1,000
6539S-1-502	5,000
6539S-1-103	10,000

Part Numbers		Resistance (Ω)
Continuous Turn	Mechanical Stops	
6639S-1-102	6639S-301-102	1,000
6639S-1-202	6639S-301-202	2,000
6639S-1-502	6639S-301-502	5,000
6639S-1-103	6639S-301-103	10,000
6639S-1-203		20,000

**BOLDFACE LISTINGS ARE IN STOCK AND READILY AVAILABLE THROUGH DISTRIBUTION.**

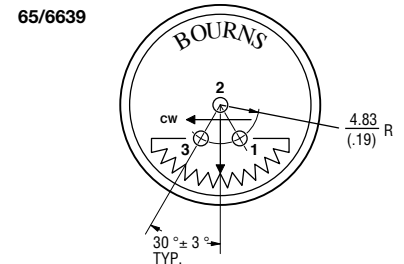
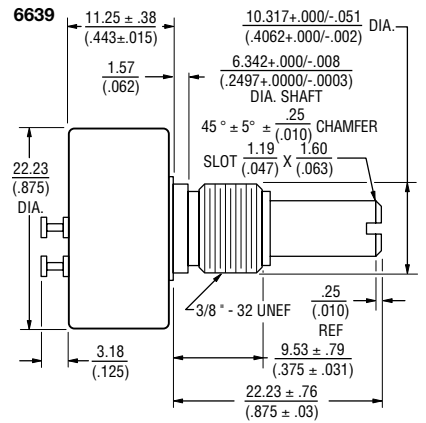
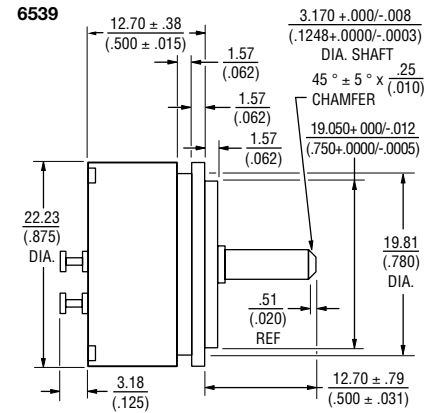
FOR OTHER OPTIONS CONSULT FACTORY.

REV. 04/04

Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

### Product Dimensions

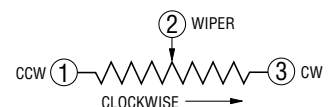


TOLERANCES: EXCEPT WHERE NOTED

DECIMALS: XX ± 0.51 (0.020), XXX ± 0.13 (0.005)

FRACTIONS: ±1/64

DIMENSIONS: MM (IN.)



# MATERIAL DATA SHEET



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Material #	6639S
Product Line	Precisions
Posted Date	03/02/2005
Compliance Date	Since Inception
RoHS Compliant	Yes



No.	Construction element	Material group	Material weight [g]	Materials	CAS if applicable	Average mass [%]	Sum [%]
1	Cover Molded	Phthalate	1.403	Antimony Trioxide	1309-64-4	<5%	7.9117%
				Alumina	21645-51-2	<20%	
				Glass Fiber	65997-17-3	<50%	
				Phthalate	*****	Remainder	
2	Terminal Gold Plated	Gold Plating	0.012	Gold	7440-57-5	>90.00%	0.0677%
3	Terminal Unplated	Leaded Brass	0.125	Copper	7440-50-8	55-72%	0.7049%
				Lead	7439-92-1	0-3.5%	
				Tin	7440-31-5	0-1%	
				Zinc	7440-66-6	35-45%	
4	Terminal Gold Plated	Gold Plating	0.012	Gold	7440-57-5	>90.00%	0.0677%
5	Terminal Unplated	Leaded Brass	0.125	Copper	7440-50-8	55-72%	0.7049%
				Lead	7439-92-1	0-3.5%	
				Tin	7440-31-5	0-1%	
				Zinc	7440-66-6	35-45%	
6	Termination Ink	Conductor Ink	0.005	Formaldehyde Polymer with Phenol & Methyl phenol	9039-25-2	<20%	0.0282%
				2-Ethyl Acetate	124-17-4	<30%	
				Silver	7440-22-4	<50%	
7	Ink	CP-10	0.0003	Amorphous Silica	7631-86-9	<3%	0.0017%
				Carbon	7440-44-0	20%	



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				Silver	7440-22-4	<42%	
				Phenol Resin	*****	<66%	
8	Catalyst	Catalyst	0.00004	Dimethyleformamide	68-12-2	45%	0.0002%
				2-Ethylimidazol	1072-62-4	55%	
9	Conductive Epoxy	BCC	0.0004	Biphenyl A Polyglycidyl Ether	25068-38-6	27%	0.0023%
				Butyl Glydicyl Ether	2426-08-6	9%	
				Silver	7440-22-4	64%	
10	Rotor Molded	PBT	0.9	Glass	65997-17-3	10-30%	5.0752%
				Antimony Oxide	1309-64-4	1-5%	
				PBT	*****	65-89%	
11	Shaft	Steel Alloy	6.85	Nickel	7440-02-0	8.90	38.6282%
				Chromium	7440-47-3	18.30	
				Iron	1309-37-1	Balance	
				Manganese	7439-96-5	1.80	
				Silicon	7440-21-3	1.00	
12	Contact Spring	Palmet Alloy	0.00095	Copper	7440-50-8	0-20%	0.0054%
				Nickel	7440-05-0	0-20%	
				Palladium	7440-05-3	40-60%	
				Platinum	7440-06-4	0-20%	
				Silver	7440-22-4	20-40%	
13	Housing & Bushing Molded	PBT	2.0307	Glass	65997-17-3	10-30%	11.4514%
				PBT	*****	65-89%	
				Antimony Oxide	1309-64-4	1-5%	
14	Bushing	Leaded Brass	4.7923	Copper	7440-50-8	55-72%	27.0245%
				Lead	7439-92-1	0-3.5%	
				Tin	7440-31-5	0-1%	
				Zinc	7440-66-6	35-45%	
15	Hex Nut	Brass Alloy	1.179	Copper	7440-50-8	55.5-86%	6.6486%
				Zinc	7440-66-6	13.90-42.5%	
				Lead	7439-92-1	.00-3.7%	
				Tin	7440-31-5	.00-1.2%	
				Aluminum	7429-90-5	.00-2.3%	
				Manganese	7439-96-5	.00-3.5%	
				Silicon	7440-21-3	.00-1.5%	
				Nickel	7440-02-0	.00-.02%	



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16	Lock Washer	Steel	0.2945	Carbon	7440-11-0	0.51%	1.6607%
				Manganese	7439-98-5	0.75%	
				Phosphorus	7723-14-0	0.02%	
				Sulfur	7704-39-9	0.025%	
				Iron	7439-89-6	98.695%	
		Zinc Plating	0.002975	Chromium	16065-83-1	0.1%	0.0168%
				Tin	7440-31-5	0.64%	
				Zinc	7440-66-6	99.25%	
		Total weight	17.733165				