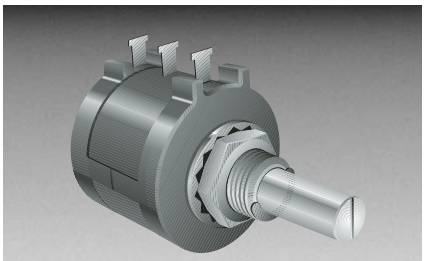


BOURNS®

Features

- Bushing mount
- Optional AR pin feature
- Plastic or metal shaft and bushings
- Wirewound
- Solder lugs or PC pins
- Sealable (Full body seal)
- Non-standard features and specifications available

3590 - Precision Potentiometer

Electrical Characteristics[1]

Standard Resistance Range ..... 200 to 100 K ohms
Total Resistance Tolerance ..... ±5 %
Independent Linearity ..... ±0.25 %
Effective Electrical Angle ..... 3600 ° +10 °, -0 °
Absolute Minimum Resistance ..... 1 ohm or 0.1 % maximum (whichever is greater)
Noise ..... 100 ohms ENR maximum
Dielectric Withstanding Voltage (MIL-STD-202, Method 301)
  Sea Level ..... 1,500 VAC minimum
Power Rating (Voltage Limited By Power Dissipation or 450 VAC, Whichever is Less)
  +40 °C ..... 2 watts
  +125 °C ..... 0 watt
Insulation Resistance (500 VDC) ..... 1,000 megohms minimum
Resolution ..... See recommended part numbers

Environmental Characteristics[1]

Operating Temperature Range ..... +1 °C to +125 °C
Storage Temperature Range ..... -55 °C to +125 °C
Temperature Coefficient Over Storage Temperature Range[2] ..... ±50 ppm/°C maximum/unit
Vibration ..... 15 G
  Wiper Bounce ..... 0.1 millisecond maximum
Shock ..... 50 G
  Wiper Bounce ..... 0.1 millisecond maximum
Load Life ..... 1,000 hours, 2 watts
  Total Resistance Shift ..... ±2 % maximum
Rotational Life (No Load) ..... 1,000,000 shaft revolutions
  Total Resistance Shift ..... ±5 % maximum
Moisture Resistance (MIL-STD-202, Method 103, Condition B)
  Total Resistance Shift ..... ±2 % maximum
IP Rating
  Sealed Versions (-3, -4, -7, and -8) ..... IP 65
  Unsealed Versions (-1 -2, -5, and -6) ..... IP 40

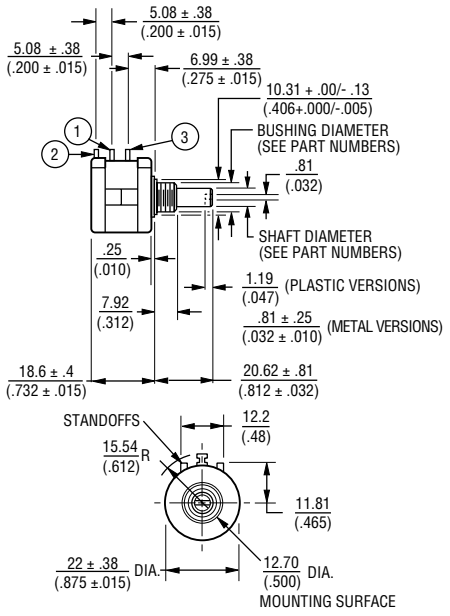
Mechanical Characteristics[1]

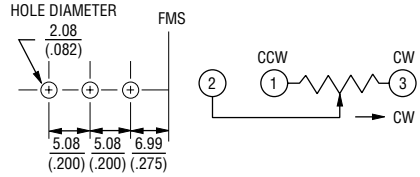
Stop Strength ..... 45 N-cm (64 oz.-in.) minimum
Mechanical Angle ..... 3600 ° +10 °, -0 °
Torque (Starting & Running) ..... 0.35 N-cm (0.5 oz.-in.) maximum (unsealed)
  1.1 N-cm (1.5 oz.-in.) maximum (sealed)
  Mounting ..... 55-80 N-cm (5-7 lb.-in.) (plastic)
  170-200 N-cm (15-18 in.-lb.) (metal)
Shaft Runout ..... 0.13 mm (0.005 in.) T.I.R.
Lateral Runout ..... 0.20 mm (0.008 in.) T.I.R.
Shaft End Play ..... 0.25 mm (0.010 in.) T.I.R.
Shaft Radial Play ..... 0.13 mm (0.005 in.) T.I.R.
Pilot Diameter Runout ..... 0.08 mm (0.003 in.) T.I.R.
Backlash ..... 1.0 ° maximum
Weight ..... Approximately 19 G
Terminals ..... Solder lugs or PC pins
  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 Potentiometers) ..... 1 cup maximum
Hardware ..... One lockwasher and one mounting nut is shipped with each potentiometer.

NOTE: For Anti-rotation pin add 91 after configuration dash number. Example: -2 becomes -291 to add AR pin.

Recommended Part Numbers

(Printed Circuit)	(Solder Lug)	(Solder Lug)	Resistance (Ω)	Resolution (%)
3590P-2-102	**3590S-2-102**	3590S-1-102	**1,000**	**.029**
3590P-2-202	**3590S-2-202**	3590S-1-202	**2,000**	**.023**
3590P-2-502	**3590S-2-502**	3590S-1-502	**5,000**	**.025**
3590P-2-103	**3590S-2-103**	3590S-1-103	**10,000**	**.020**
3590P-2-203	**3590S-2-203**	3590S-1-203	**20,000**	**.019**
3590P-2-503	**3590S-2-503**	3590S-1-503	**50,000**	**.013**
3590P-2-104	**3590S-2-104**	3590S-1-104	**100,000**	**.009**





TOLERANCES: EXCEPT WHERE NOTED
DECIMALS: .XX ± .51 (.02), .XXX ± .13 (.005)
FRACTIONS: ±1/64
DIMENSIONS: MM (IN.)

SHAFT & BUSHING CONFIGURATIONS

(Bushing - DxL, Shaft - D)
(-1) Plastic Bushing (3/8 " x 5/16 ") and Shaft (.2480 + .001, - .002)
(-2) Metal Bushing (3/8 " x 5/16 ") and Shaft (.2497 + .0000, - .0009)
(-3) Sealed, Plastic Bushing (3/8 " x 5/16 ") and Shaft (.2480 + .001, - .002)
(-4) Sealed, Metal Bushing (3/8 " x 5/16 ") and Shaft (.2497 + .0000, - .0009)
(-5) Metric, Plastic Bushing (9 mm x 7.94 mm) and Shaft (6 mm + 0, - .076 mm)
(-6) Metric, Metal Bushing (9 mm x 7.94 mm) and Shaft (6 mm + 0, - .023 mm)
(-7) Metric, Sealed, Plastic Bushing (9 mm x 7.94 mm) and Shaft (6 mm + 0, - .076 mm)
(-8) Metric, Sealed, Metal Bushing (9 mm x 7.94 mm) and Shaft (6 mm + 0, - .023 mm)

BOLDFACE LISTINGS ARE IN STOCK AND READILY AVAILABLE THROUGH DISTRIBUTION.

FOR OTHER OPTIONS CONSULT FACTORY.

REV. 03/04

MATERIAL DATA SHEET

BOURNS®
Reliable Electronic Solutions

Material #	3590S-1
Product Line	Precisions
Posted Date	03/02/2005
Date	Since Inception
RoHS Compliant	Yes

No.	Construction element	Material group	Material weight [g]	Materials	CAS If applicable	Average mass [%]	Sum [%]
1	Mandrel Wire	Copper	1.242	Copper	7440-50-8	100%	10.3136%
2	Resist Wire	Nickel Alloy	0.1714	Nickel	7440-02-0	100%	1.4233%
3	Varnish	Insulating Varnish	0.0621	Phenolic Resin	UNK00185	100%	0.5157%
4	Housing Molded	PBT	3.064	Glass	65997-17-3	10-30%	25.4436%
				PBT	**********	65-89%	
				Antimony Oxide	1309-64-4	1-5%	
5	Terminals Plated	Gold Plate Nickel Plate	0.1945	Gold	7440-57-5	TRACE	1.6151%
				Nickel	7440-02-0	TRACE	
6	Terminals Wiper Unplated	Phosphor Bronze	0.1945	Copper	7440-50-8	90-96%	1.6151%
				Tin	7440-31-5	3.5-9%	
7	Cover Molded	PBT	1.3885	Glass	65997-17-3	10-30%	11.5302%
				PBT	**********	65-89%	
				Antimony Oxide	1309-64-4	1-5%	
8	Hex Nut	Brass Alloy	1.179	Copper	7440-50-8	55.5-86%	9.7905%
				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%	
9	Lock Washer	Steel Alloy	0.2945	Carbon	7440-11-0	0.51%	2.4455%
				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 Coating	0.002975	Chromium	16065-83-1	0.1%	0.0247%
				Tin	7440-31-5	0.64%	
				Zinc	7440-66-6	99.25%	
10	Lube	Fluorosilicone Grease	0.00815	Polysiloxane	**********	100%	0.0677%
11	Lube	Lubricating Grease	0.00899	Polysiloxane	**********	100%	0.0747%
12	Slider Molded	Nylon	0.11	Nylon	32131-17-2	59-69%	0.9134%
				Glass Fibers	65997-17-3	24-34%	
				PTFE	3002-84-0	3-13%	
13	Spring Contact Rough / Spring Heat Treated	Steel Alloy	0.004	Copper	7440-50-8	0-20%	0.0332%
				Nickel	7440-02-0	0-20%	
				Palladium	7440-05-3	40-60%	
				Platinum	7440-06-4	0-20%	
				Silver	7440-22-4	20-40%	
14	Collector Bar Plated	Nickel Plate	0.0235	Nickel	7440-02-0	100%	0.1951%
15	Collector Bar Unplated	Copper Alloy	0.0275	Copper	7440-50-8	97.6-98.2%	0.2284%
				Cobalt	7440-48-4	0.2-0.35%	
				Beryllium	7440-41-7	1.6-2%	
16	Lid Molded	PBT	1.8195	Glass	65997-17-3	10-30%	15.1092%
				PBT	**********	65-89%	
				Antimony Oxide	1309-64-4	1-5%	
17	Rotor \ Shaft Molded	PBT	2.2365	Glass	65997-17-3	10-30%	18.5720%
				PBT	**********	65-89%	
				Antimony Oxide	1309-64-4	1-5%	
18	Teflon Washer	PTFE	0.0025	Polytetrafluoroathylene	9002-84-0	15%	0.0208%
				1-Dichloro-1-Fluoroathane	1717-00-6	85%	
19	Teflon Washer	PTFE	0.0082	Polytetrafluoroathylene	9002-84-0	15%	0.0681%
				1-Dichloro-1-Fluoroathane	1717-00-6	85%	

Total weight	12.042315