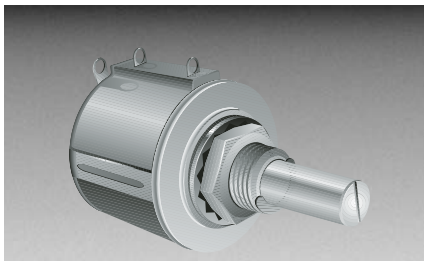


BOURNS®

Features

- Bushing mount
- Optional center tap and rear shaft extension
- Optional AR lug feature
- Gangable with common or concentric shafts
- High torque available
- Optional 0.1 % linearity
- Non-standard features and specifications available

3540/3541 - Precision Potentiometer

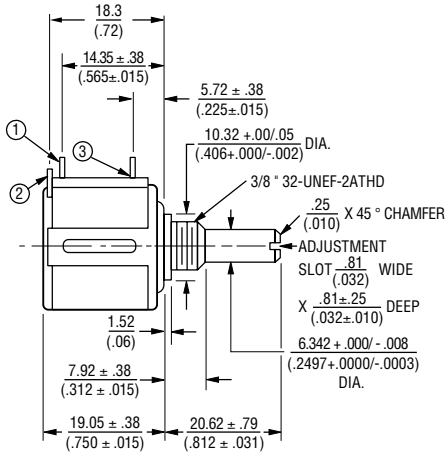
Electrical Characteristics[1]	3540 Wirewound Element	3541 Hybritron® Element
Standard Resistance Range	100 to 100 K ohms	1 K to 100 K ohms
Total Resistance Tolerance	±5 %	±10 %
Independent Linearity	±0.25 %	±0.25 %
Effective Electrical Angle	3600 ° +10 °, -0 °	3600 ° +10 °, -0 °
Absolute Minimum Resistance/ Minimum Voltage	1 ohm or 0.1 % maximum (whichever is greater)	0.2 % maximum
Noise/Output Smoothness	100 ohms ENR maximum	0.1 % maximum
Dielectric Withstanding Voltage (MIL-STD-202, Method 301)		
Sea Level	1,000 VAC minimum	1,000 VAC minimum
Power Rating (Voltage Limited By Power Dissipation or 447 VAC, Whichever Is Less)		
+70 °C	2 watts	2 watts
+125 °C	0 watt	0 watt
Insulation Resistance (500 VDC)	1,000 megohms minimum	1,000 megohms minimum
Resolution	See recommended part nos.	Essentially infinite

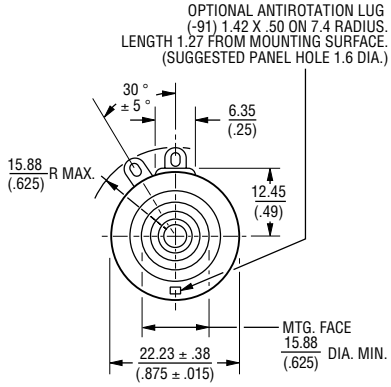
Environmental Characteristics[1]		
Operating Temperature Range	+1 °C to +125 °C	+1 °C to +125 °C
Storage Temperature Range	-55 °C to +125 °C	-55 °C to +125 °C
Temperature Coefficient Over Storage Temperature Range[2]	±50 ppm/°C maximum/unit	±100 ppm/°C maximum/unit
Vibration	15 G	15 G
Wiper Bounce	0.1 millisecond maximum	0.1 millisecond maximum
Shock	50 G	50 G
Wiper Bounce	0.1 millisecond maximum	0.1 millisecond maximum
Load Life	1,000 hours, 2 watts	1,000 hours, 2 watts
Total Resistance Shift	±2 %	±5 %
Rotational Life (No Load)	1,000,000 shaft revolutions[2]	5,000,000 shaft revolutions[2]
Total Resistance Shift	±5 % maximum	±5 % maximum
Moisture Resistance (MIL-STD-202, Method 103, Condition B)		
Total Resistance Shift	±2 % maximum	±5 % maximum
IP Rating	IP 40	IP 40

Mechanical Characteristics[1]	
Stop Strength	53 N-cm (75 oz-in.) minimum
Mechanical Angle	3600 ° +10 °, -0 °
Torque (Starting & Running)	0.35 N-cm (0.5 oz.-in.) max.
Mounting	170-200 N-cm (15-18 lb.-in.) max.
Shaft Runout	0.08 mm (0.003 in.) T.I.R.
Lateral Runout	0.13 mm (0.005 in.) T.I.R.
Shaft End Play	0.30 mm (0.012 in.) T.I.R.
Shaft Radial Play	0.08 mm (0.003 in.) T.I.R.
Pilot Diameter Runout	0.08 mm (0.003 in.) T.I.R.
Backlash	1.0 ° maximum
Weight	Approximately 21 gm
Terminals	Gold-plated solder lugs
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.)	2 cups maximum
Hardware	One lockwasher (H-37-2) and one mounting nut (H-38-2) is shipped with each potentiometer.

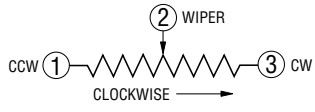
[1]At room ambient: +25 °C nominal and 50 % relative humidity nominal, except as noted.
[2]Consult manufacturer for complete specification details.

3540S-1/3541H-1





TOLERANCES: EXCEPT WHERE NOTED
DECIMALS: .XX ± .25 (.010), .XXX ± .13 (.005)
FRACTIONS: ±1/64
DIMENSIONS: MM (IN.)



Recommended Part Numbers

Part Number	Resistance	Resolution
3540S-1-201	**200**	**.042**
3540S-1-501	**500**	**.031**
3540S-1-102	**1,000**	**.027**
3540S-1-202	**2,000**	**.021**
3540S-1-502	**5,000**	**.021**
3540S-1-103	**10,000**	**.019**
3540S-1-203	**20,000**	**.014**
3540S-1-503	**50,000**	**.011**
3540S-1-104	**100,000**	**.008**

Part Number	Resistance
3541H-1-102	**1,000**
3541H-1-202	**2,000**
3541H-1-502	**5,000**
3541H-1-103	**10,000**
3541H-1-203	**20,000**
3541H-1-503	**50,000**
3541H-1-104	**100,000**

BOLDFACE LISTINGS ARE IN STOCK AND READILY AVAILABLE THROUGH DISTRIBUTION.

FOR SERVO MOUNT VERSION AND OTHER OPTIONS CONSULT FACTORY.

REV. 12/03

MATERIAL DATA SHEET

Reliable Electronic Solutions

Material #	3540S-1
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	Mandrel Wire	Metal Alloy	2.252	Copper	7440-50-8	92-99%	15.3253%
				Organic Coatings	**********	1-8%	
2	Resist Wire	Copper Alloy	0.5783	Nickel	7440-02-0	2-47%	3.9355%
				Copper	7440-50-8	Balance	
				Iron	1300-37-1	Max3%	
				Manganese	7439-96-5	Max 3%	
				Cobalt	7440-48-4	Max 0.5%	
3	Varnish	Insulating Varnish	0.1587	Phenolic Resin	UNK00185	100%	1.0800%
4	Terminal Cover Molded	PBT	0.2905	Carbon Black	1333-86-4	0.1-1%	1.9769%
				Glass	65997-17-3	10-30%	
				PBT	**********	65-89%	
				Antimony Oxide	1309-64-4	1-5%	
5	Terminals	Brass Alloy	0.0375	Copper	7440-50-8	59-96%	0.2552%
				Zinc	7440-66-6	4-41%	
				Lead	7439-92-1	0.03-0.3%	
6	Housing Molded	PBT	2.654	Glass	65997-17-3	10-30%	18.0610%
				PBT	**********	65-89%	
				Antimony Oxide	1309-64-4	1-5%	
7	Shaft	Brass Alloy	1.179	Copper	7440-50-8	55.5-86%	8.0233%
				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%	
8	C-Ring	Stainless Steel Alloy	0.009	Iron	7439-89-6	48-89%	0.0612%
				Chromium	7440-47-3	10-27%	
				Nickel	7440-02-0	0-22%	
				Manganese	7439-96-5	0-15%	
				Tungsten	7440-33-7	0-4%	
				Molybdenum	7439-98-7	0-4%	
				Aluminum	7429-90-5	0-2%	
				Copper	7440-50-8	0-4%	
				Silicon	7440-51-3	0-5%	
				Cobalt	7440-48-4	0-5%	
9	Bushing	Aluminum Bar	1.142	Aluminum	7429-90-5	100%	7.7715%
10	Rotor Molded	PBT	1.325	Glass	65997-17-3	10-30%	9.0169%
				PBT	**********	65-89%	
				Antimony Oxide	1309-64-4	1-5%	
11	Washer	Stainless Steel Alloy	0.008	Iron	7493-89-6	52-78%	0.0544%
				Chromium	7440-47-3	12-24%	
				Nickel	7440-02-0	6.0-19%	
				Molybdenum	7439-98-7	0-5.0%	
				Silicon	7440-21-3	0-6%	
				Manganese	7439-96-3	0-2.0%	
				Tungsten	7440-33-7	0-1.8%	
				Aluminum	7429-90-5	0-1.5%	
				Columbium	7440-03-1	0-1.0%	
				Titanium	7440-32-6	0-0.7%	
				Copper	7440-50-8	0.075%	
				Cobalt	7440-48-4	0.1.0%	
12	Cover Molded	PBT	0.7005	Glass	65997-17-3	10-30%	4.7670%
				PBT	**********	65-89%	
				Antimony Oxide	1309-64-4	1-5%	
13	Hex Nut	Brass Alloy	1.179	Copper	7440-50-8	55.5-86%	8.0233%
				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%	
14	Lock Washer	Steel Alloy	0.2945	Carbon	7440-11-0	0.51%	2.0041%
				Manganese	7439-98-5	0.75%	
				Phosphorus	7723-14-0	0.02%	
				Sulfur	7704-39-9	0.025%	
				Iron	7439-89-6	98.695%	
				Chromium	16065-83-1	0.1%	
		Zinc Plating	0.002975	Tin	7440-31-5	0.64%	0.0202%
				Zinc	7440-66-6	99.25%	
15	Lube	Lubricating Grease	0.00815	Polysiloxane	**********	100%	0.0555%
16	Contact Spring	Noble Metal Alloy	0.0145	Silver	7440-22-4	30.0%	0.0987%
				Copper	7440-50-8	14.0%	
				Zinc	7440-66-6	1.0%	
				Platinum	7440-06-4	10.0%	
				Iron	7439-89-6	Remainder	
17	Slider Molded	PBT	0.193	Glass	65997-17-3	10-30%	0.4423%
				PBT	**********	65-89%	
				Antimony Oxide	1309-64-4	1-5%	
18	Collector Bar	Nickel Silver Alloy	0.065	Copper	7440-50-8	50-80%	0.4423%
				Nickel	7440-02-0	7-19.5%	
				Lead	7439-92-1	0-2.5%	
				Zinc	7440-66-6	Remainder	
19	Strap	Metal Alloy	2.303	Copper	7440-50-8	53.5-71.0%	15.6724%
				Lead	7439-92-1	0.1	
				Nickel	7439-02-0	21.0	
				Zinc	7440-66-6	13.24-32.0%	
20	Terminals Wiper	Brass Alloy	0.3	Copper	7440-50-8	59-96%	2.0416%
				Zinc	7440-66-6	4-41%	
				Lead	7439-92-1	0.03-0.3%	
		Total weight	14.694625				