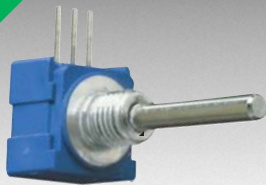


\*RoHS COMPLIANT



**BOURNS®**

**Features**

- RoHS compliant\*
- Conductive plastic or cermet
- Linear and audio tapers
- PC board and bushing mount
- Gangable
- Metal bushing and shaft
- Sealed for board washing



**51/53 - Sealed 1/2" (12.5 mm) Square Control**

**Electrical Characteristics<sup>1</sup>**

	Conductive Plastic	Cermet
Standard Resistance Range		
Linear .....	1 K ohms to 1 megohm.....	150 ohms to 1 megohm
Audio.....	1 K ohms to 1 megohm.....	1 K ohms to 1 megohm
Total Resistance Tolerance		
Linear Tapers.....	±10 % or ±20 %.....	±10 % or ±5 %
Audio Tapers.....	±10 % or ±20 %.....	±10 %
Independent Linearity.....	±5 %.....	±5 %
Absolute Minimum Resistance.....	2 ohms maximum.....	2 ohms maximum
Effective Electrical Angle.....	270 ° ±5 °.....	270 ° ±5 °
Contact Resistance Variation.....	2 %.....	2 %
Dielectric Withstanding Voltage (MIL-STD-202 – Method 301)		
Sea Level.....	1,500 VAC minimum.....	1,500 VAC minimum
70,000.....	500 VAC minimum.....	500 VAC minimum
Insulation Resistance.....	1,000 megohms minimum.....	1,000 megohms minimum
Power Rating At 70 °C (Derate To 0 At 125 °C) (Voltage Limited By Power Dissipation or 350 VAC, Whichever Is Less)		
Linear Tapers.....	0.5 watt.....	1.0 watt
Audio Tapers.....	0.25 watt.....	0.5 watt
Theoretical Resolution.....	Essentially infinite.....	Essentially infinite

**Environmental Characteristics<sup>1</sup>**

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 .....	±1,000 ppm/°C.....	±150 ppm/°C
Vibration (Single Section).....	15 G.....	15 G
Total Resistance Shift.....	±2 % maximum.....	±2 % maximum
Voltage Ratio Shift.....	±5 % maximum.....	±5 % maximum
Shock (Single Section).....	30 G.....	30 G
Total Resistance Shift.....	±2 % maximum.....	±2 % maximum
Voltage Ratio Shift.....	±5 % maximum.....	±5 % maximum
Load Life.....	1,000 hours.....	1,000 hours
Total Resistance Shift.....	±10 % TRS maximum.....	±5 % TRS maximum
Rotational Life (No Load).....	50,000 cycles.....	25,000 cycles
Total Resistance Shift.....	±10 % TRS maximum.....	±10 % TRS maximum
Contact Resistance Variation @ 25,000 Cycles.....	±2 %.....	±4 %
Moisture Resistance (MIL-STD-202, Method 103, Condition B)		
Total Resistance Shift.....	±10 % TRS.....	±5 % TRS
IP Rating.....	IP 64.....	IP 64

**Mechanical Characteristics**

Stop Strength .....	56 N-cm (5 lb.-in.)
Mechanical Angle .....	290 ° ±5 °
Torque	
Starting (All Sections).....	Running torque +0.35 N-cm (+0.5 oz.-in.) maximum
Running (Single Section).....	0.15 to 1.4 N-cm (0.2 to 2.0 oz.-in.)
Running (Dual or Triple Section).....	0.35 to 1.8 N-cm (0.5 to 2.5 oz.-in.)
Mounting (Torque on Bushing).....	1.7 to 2.0 N-m (15 to 18 lb.-in.) maximum
Weight (Single Section).....	5.5 grams
(Each Additional Section).....	3.0 grams
Terminals .....	PC pin or solder lug
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. Part can be wave soldered at 260 °C (500 °F) for 5 seconds, no wash process with no clean flux.
Marking.....	Manufacturer's trademark, part number, resistance value and date code.
Ganging (Multiple Section Potentiometers).....	6 cups maximum
Hardware.....	One lockwasher and one mounting nut is shipped with each potentiometer, except where noted in the part number.

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

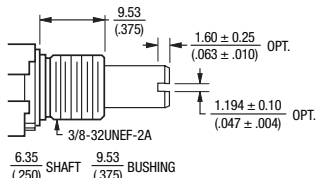
\*RoHS Directive 2002/95/EC Jan 27 2003 including Annex  
Specifications are subject to change without notice.  
Customers should verify actual device performance in their specific applications.



# 51/53 - Sealed 1/2" (12.5 mm) Square Control

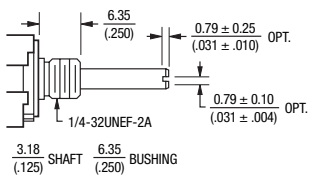
# BOURNS®

## Shaft/Bushing Styles



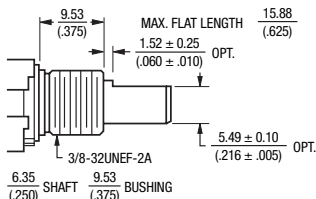
**A Style Bushing**

STD. LENGTH 'L'
.500 (12.7)
.625 (15.88)
.750 (19.05)
.875 (22.23)
1.000 (25.4)



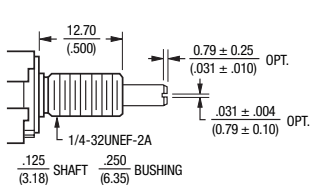
**C Style Bushing**

STD. LENGTH 'L'
.375 (9.53)
.500 (12.7)
.625 (15.88)
.750 (19.05)
.875 (22.23)
1.000 (25.4)



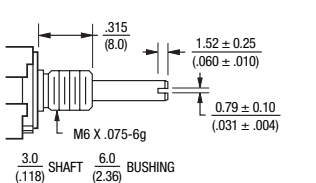
**A Style Bushing - Flatted Shaft**

STD. LENGTH 'L'
.625 (15.88)
.750 (19.05)
.875 (22.23)
1.000 (25.4)



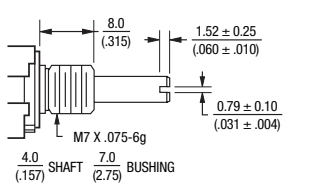
**F Style Bushing**

STD. LENGTH 'L'
.625 (15.88)
.750 (19.05)
.875 (22.23)
1.000 (25.4)



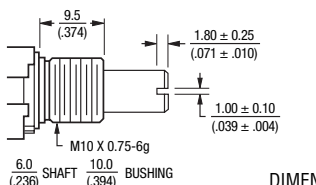
**S Style Bushing**

STD. LENGTH 'L'
.394 (10.0)
.512 (13.0)
.630 (16.0)
.866 (22.0)
.984 (25.0)



**U Style Bushing**

STD. LENGTH 'L'
.394 (10.0)
.512 (13.0)
.630 (16.0)
.866 (22.0)
.984 (25.0)



**R Style Bushing**

STD. LENGTH 'L'
.512 (13.0)
.630 (16.0)
.866 (22.0)
.984 (25.0)

## How To Order

51	A	A	D	-	B	28	-	A	15	L
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MOUNTING BRACKET/ ANTI-ROTATION LUG	
Code	Description
A	AR Lug 90 °CW
C	AR Lug 270 °CW
D	No AR Lug or Bracket
L	Front Bracket
M	Rear Bracket
N	Front and Rear Bracket

# SECTIONS/DETENTS	
Code	Description
A	Single No Detent
B	Double No Detent
C	Triple No Detent
D	Quad No Detent
E	Single w/Center Detent
F	Double w/Center Detent
G	Triple w/Center Detent
H	Quad w/Center Detent
J	Five Section
K	Six Section
L	Five Section w/Detent
M	Six Section w/Detent

BUSHING CONFIGURATION	
Code	Description
A	3/8" D x 3/8" L
C	1/4" D x 1/4" L
F	1/4" D x 1/2" L
R	10 mm D x 9.5 mm L
S	6 mm D x 8 mm L
U	7 mm D x 8 mm L

MODEL	
Code	Description
51	PC Pins (.100" centers)
53	Solder Lugs

Code	SHAFT TYPE Description	AVAILABLE ONLY IN	
		BUSHINGS Code	LENGTHS Description
A	Single Plain 1/4" D	A	20,24,28,32
B	Single Slotted 1/4" D	A	12,16,20,24,28,32
C	Single Flatted 1/4" D	A	20,24,28,32
D	Single Plain 1/8" D	C, F	16,20,24,28,32
E	Single Slotted 1/8" D	C, F	12,16,20,24,28,32
R	Single Slotted 6 mmD	R	10,13,16,22,25
T	Single Slotted 4 mmD	U	10,13,16,22,25
U	Single Slotted 3 mmD	S	10,13,16,22,25

RoHS IDENTIFIER	
Code	Description
L	Compliant

ELEMENT TAPER TYPE/TOLERANCE		RESISTANCE (CODE)	
Code	Description	VALUE IN OHMS	
(A)	Linear Cermet ±10 %	(28) — 150	(14) — 7.5 K
(H)	Linear Cermet ±5 %	(06) — 200	(15) — 10 K
		(07) — 250	(30) — 15 K
		(08) — 500	(16) — 20 K
		(09) — 750	(17) — 25 K
		(10) — 1 K	(18) — 50 K
		(29) — 1.5 K	(19) — 75 K
		(11) — 2 K	(20) — 100 K
		(12) — 2.5 K	(23) — 500 K
		(13) — 5 K	(25) — 1 M
(B)	Linear C-P ±20 %	(10) — 1 K	(18) — 50 K
(E)	Linear C-P ±10 %	(12) — 2.5 K	(20) — 100 K
		(13) — 5 K	(22) — 250 K
		(15) — 10 K	(23) — 500 K
		(16) — 20 K	(25) — 1 M
		(17) — 25 K	
(C)	CW Audio Cermet ±10 %	(10) — 1 K	(18) — 50 K
(F)	CCW Audio Cermet ±10 %	(12) — 2.5 K	(20) — 100 K
		(13) — 5 K	(23) — 500 K
		(15) — 10 K	(25) — 1 M
		(17) — 25 K	
(D)	CW Audio C-P ±20 %	(10) — 1 K	(18) — 50 K
(S)	CW Audio C-P ±10 %	(12) — 2.5 K	(20) — 100 K
		(13) — 5 K	(22) — 250 K
		(15) — 10 K	(23) — 500 K
		(17) — 25 K	(25) — 1 M
(G)	CCW Audio C-P ±20 %	(10) — 1 K	(18) — 50 K
(T)	CCW Audio C-P ±10 %	(12) — 2.5 K	(20) — 100 K
		(13) — 5 K	(22) — 250 K
		(15) — 10 K	(23) — 500 K
		(17) — 25 K	(25) — 1 M
(Y)	CW Dual Audio Taper C-P ±20 %	(10) — 1 K	(18) — 50 K
		(12) — 2.5 K	(20) — 100 K
		(13) — 5 K	(22) — 250 K
		(15) — 10 K	(23) — 500 K
		(17) — 25 K	(25) — 1 M

SHAFT LENGTH (FMS)		AVAILABLE ONLY IN BUSHING
Code	Description	Code
12	3/8"	B, C
16	1/2"	A, C
20	5/8"	A, C, F
24	3/4"	A, C, F
28	7/8"	A, C, F
32	1"	A, C, F
Metric		
10	10 mm	R, S, U, T
13	13 mm	R, S, U, T
16	16 mm	R, S, U, T
22	22 mm	R, S, U, T
25	25 mm	R, S, U, T

Boldface features are Bourns standard options. All others are available with higher minimum order quantities.

DIMENSIONS: MM (INCHES)