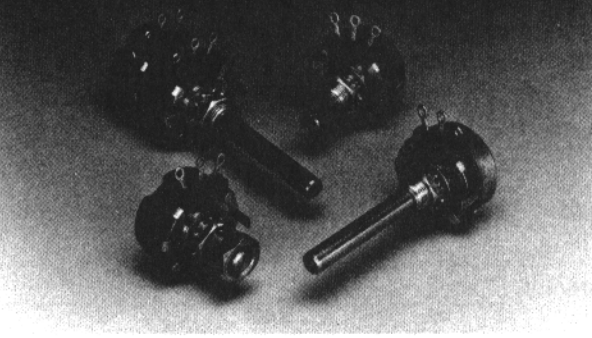


Series 380, 53/RV4, 485

## 2 Watt, Conductive Plastic Potentiometer



### Description

The Series 380 "Quiet One" is a 2-watt conductive plastic potentiometer offering superior dynamic noise and a long rotational life. And it's manufactured to MIL-R-94 specifications where applicable.

Our 53/RV4 is a dual-marked potentiometer with all the fine features of the Series 380 in a more economical package. And it's built in strict accordance with MIL-R-94.

Series 485 has all the exceptional features of the 380 with a bonus of ten times the rotational life. (Special order only.)

### Features

- **Series 380**  
1% dynamic noise  
100,000 cycle life  
Stainless-steel shaft
- **Series 53/RV4**  
Economical  
Wide range of values and tapers  
Shaft and mounting seals available
- **Series 485**  
1% dynamic noise  
1 million cycle life  
Available on special order only

### Series 380, 53/RV4, 485, Electrical Specifications

#### Resistance Range

50 $\Omega$  to 5 Megohms, linear.

250 $\Omega$  to 2.5 Megohms, tapered.

485 series only, 100 $\Omega$  to 2.5 Megohm, linear.

#### Resistance Tolerance

Linear, up to 1 Megohm  $\pm 10\%$ , above 1 Megohm  $\pm 20\%$ .

Tapers, up to 500K $\Omega$   $\pm 10\%$ ; above 500K $\Omega$   $\pm 20\%$ .

#### Power Rating (Watts)

2 watts maximum continuous power rating for linear taper, but voltage not to exceed rating. Full rating @ 70°C, derated linearly to zero watts at 120°C.

Derate all non-linear tapers by multiplying wattage rating by 0.5. See Chart A, page 44.

#### Electrical Rotation

312°  $\pm 3^\circ$  without switch; 333°  $\pm 3^\circ$  with switch.

#### Effective Rotation

270°, -0°/ +10°

#### Tapers

Right or left-hand available.

See Chart B, page 45.

#### End Resistance

Linear units: 4 $\Omega$  maximum for total resistances up to 250K; 10 $\Omega$  for resistances 250K and higher.

Taper units: High end of element 1% of total resistance or 4 $\Omega$  whichever is greater; low end same as for linear units.

#### Dielectric Strength

1000 Vac for 60 seconds @ ATM pressure.

450 Vac for 60 seconds @ 3.4 in. Hg.

#### Working Voltage

500 Vdc across end terminals, but power not to exceed rating.

#### Resistance Temperature Characteristics

See Chart C, page 45.

#### Dynamic Noise

Linear single controls maximum initial noise level of 1% of total resistance. Measurement made using a constant current source and oscilloscope detection technique.

#### Static noise

See Chart D, page 45.

#### Linearity

$\pm 5\%$  independent — linear tapers only

#### Voltage Coefficient

.005%/Volt, maximum

#### Switch Characteristics

Rotary

See Chart E, page 47.

**Mechanical Rotation**

312° ±3° without switch; 333° ±3° with switch

**Stop Torque Withstanding Strength**

12 lb. in. minimum, single shaft

8 lb. in. minimum, concentric shaft

**Torque Range**

Single control 1 oz. in. to 4 oz. in., 2 oz. in. variation through mechanical rotation within a control.

Single control with shaft seal 1 oz. in. to 6 oz. in.

Single control with shaft locking feature and jam nut tightened to 10 lb. in. Starting torque is 30 oz. in.

**Standard Bushing Lengths**

Plain, 1/4 in. (6.35mm), 3/8 in. (9.53mm), 1/2 in. (12.7mm)

Panel Seal, 3/8 in. (9.53mm)

Shaft Locking, 1/2 in. (12.7mm)

Thread, 3/8 in. (9.53mm)-32 NEF-2A

Other bushings available on special order.

**Standard Shafts (Single Control Only)**

Standard diameter 1/4 in. (6.35mm). Standard lengths every 1/8 in. (3.18mm) from 3/8 in. (9.53mm) minimum to 5 in. (127 mm) maximum. 380, stainless steel.

53/RV4 and 485 brass, nickel-plated.

Available in round, slotted or flatted configurations. All shafts measured from mounting surface. Other shaft configurations available on special order.

**Weight**

Single .072 lbs. approximate

**Hardware**

Must be ordered separately.

(a) Hex mounting nut, 3/8 in. (9.53mm) x 32 -NEF-2A thread, 1/2 in. (12.7mm) across flats, 3/32 in. (2.38mm) thick.

(b) Internal tooth lockwasher, 11/16 in. (17.46mm) outer diameter. x .022 in. (0.56 mm) thick.

(c) Jam hex nut, 1/2 in. (12.7mm) across flats, 7/32 in. (5.56mm) thick, supplied on locking-type bushing.

**Marking**

Will appear on rear surface without switch. On periphery when switch is used. Unless otherwise specified, marking will consist of:

- (a) Customer part number or Clarostat part number,
- (b) EIA source and date code.

NOTE: SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

**Operating Temperature Range**

-55°C to +120°C

**Rotational Life (Standard)**

**Series 380:** Rotational life for linear control; 100,000 cycles for units up to and including 100,000Ω, change not to exceed 5% R; above 100,000Ω change not to exceed 10% R.

**Series 53/RV4:** All resistance values: 25,000 cycles.

**Series 485:** 10% maximum change in total resistance as a result of 1,500,000 shaft rotations life test under full load for resistance values 1K to 2.5 Megohms; 1,000,000 shaft rotations under full load for resistance values 100Ω to 1KΩ

Figure 1

Chart A

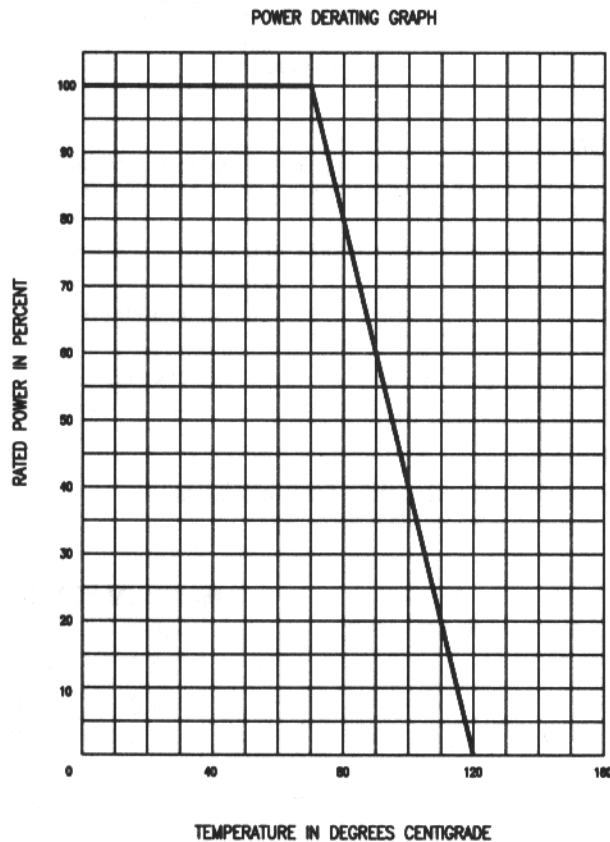
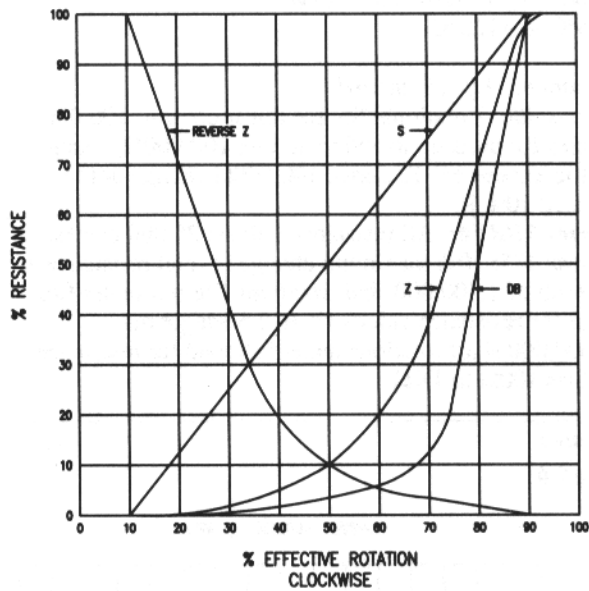


Figure 2  
Chart B



#### Curve Standard

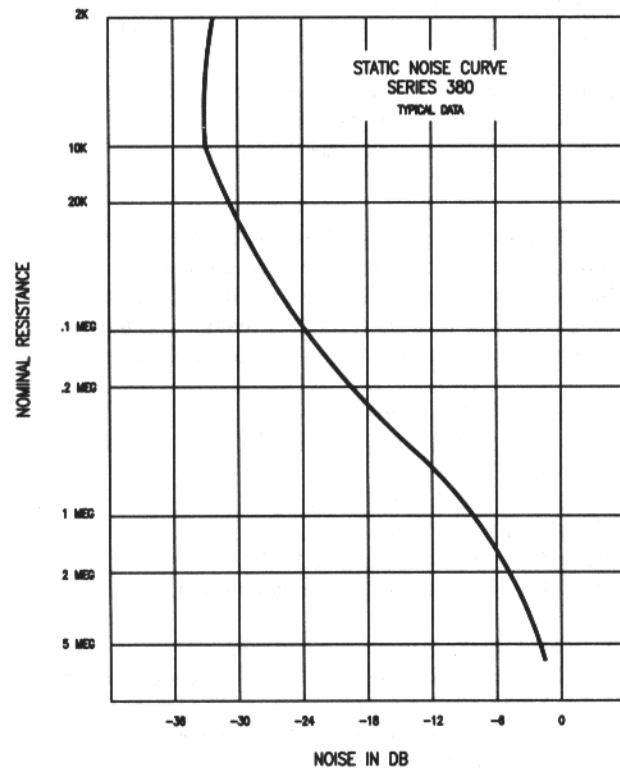
The "S" taper is linear, the change in resistance value being directly proportional to the degree of rotation. It can be used either as right-hand or left-hand taper.

The "Z" taper attains 10% resistance value at 50% of clockwise rotation (left-hand).

The reverse "Z" taper attains 10% resistance values at 50% of counter-clockwise rotation (right-hand).

For conformity and special output curves, consult factory.

Figure 3  
Chart D



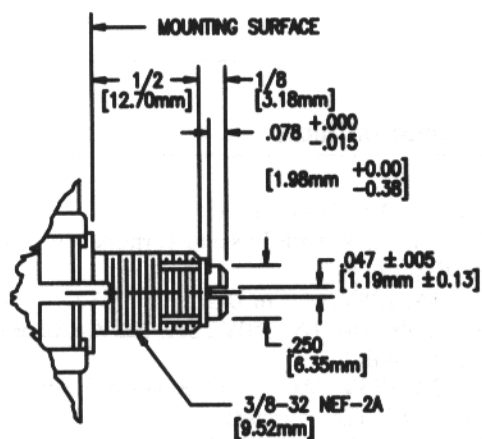
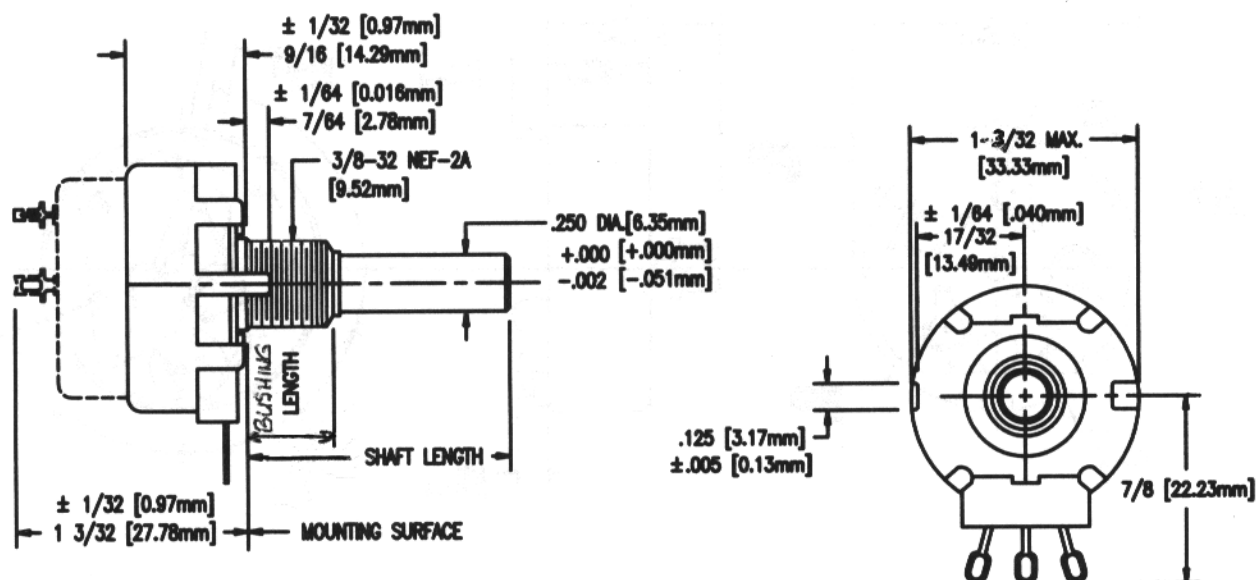
#### Chart C

##### Resistance Temperature Characteristics

| NOMINAL RESISTANCE | MAXIMUM PERCENT TEMPORARY RESISTANCE FROM 25°C |       |      |       |       |        |        |
|--------------------|------------------------------------------------|-------|------|-------|-------|--------|--------|
|                    | -55°C                                          | -40°C | 0°C  | +25°C | +85°C | +105°C | +120°C |
| 100 OHMS           | ±5.0                                           | ±3.0  | ±1.5 | 0     | ±1.5  | ±2.5   | ±3.5   |
| 10K OHMS           | +5.5                                           | +4.0  | +2.0 | 0     | ±2.5  | ±3.0   | ±4.0   |
| 100K OHMS          | +6.5                                           | +5.5  | +2.0 | 0     | ±3.0  | ±4.0   | ±5.5   |
| 1 MEGOHMS          | +9.0                                           | +8.0  | +2.5 | 0     | ±3.5  | ±5.5   | ±7.0   |

Figure 4

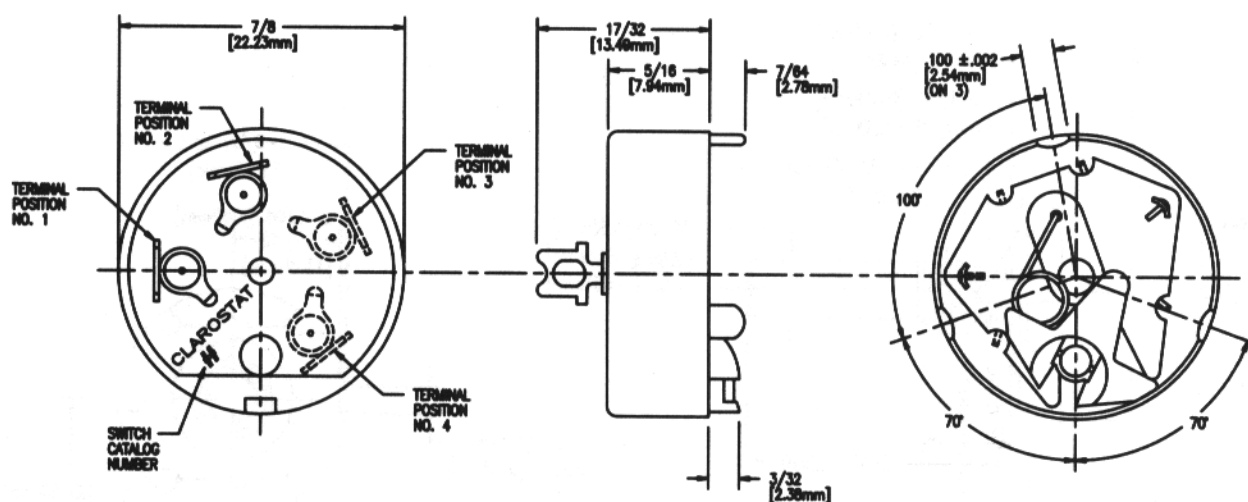
Series 380, 53/RV4 Dimensions



OPTIONAL SPLIT BUSHING  
JAM NUT SUPPLIED

Figure 5

Chart E



| Type No. | Switch Variations                                              | Terminal Positions | Max. Operating Torque-Oz. In. |
|----------|----------------------------------------------------------------|--------------------|-------------------------------|
| AE-10    | S.P.S.T. 1A, 250 V.; 3A, 125V (AC or DC)                       | 1-2                | 12                            |
| AE-11    | S.P.S.T. 1A, 250V.; 3A, 125V. with Bussing Terminal (AC or DC) | 1-2-4              | 12                            |
| AE-13    | S.P.S.T. 15A, 10V. (DC Only)                                   | 1-4                | 16                            |
| *AE-20   | D.P.S.T. 1A, 250V.; 3A, 125V. (AC or DC)                       | 1-2-3-4            | 16                            |
| AE-21    | D.P. 1 Pole on, 1 Pole off—1A, 250V.; 3A, 125V. (Ac or DC)     | 1-2-3-4            | 16                            |
| AE-23    | D.P.S.T. 15A, 10V. (DC only)                                   | 1-2-3-4            | 16                            |
| *AE-24   | D.P.S.T. 1A, 250V.; 3A, 125V. (AC or DC) Reverse Action        | 1-2-3-4            | 16                            |
| AE-25    | D.P.S.T. 250MA. 24V.D.C. (Dry Circuit)                         | 1-2-3-4            | 12                            |
| AE-30    | S.P.D.T. 1A, 250V.; 3A, 125V. (AC or DC)                       | 2-3-4              | 16                            |

\* May be employed as a single pole, single throw, two circuit switch.  
 To Designate this application add an "A" to the end of switch type.  
 Example: AE-20A

## Series 380 Standard Resistance Values

### Stock Values (Ohms) Series 380C1

|      |       |      |      |          |
|------|-------|------|------|----------|
| 50   | 1000  | 10K  | 100K | 1 meg    |
| 100  | 1500  | 15K  | 150K | 1.5 meg* |
| 150  | 2000  | 20K  | 200K | 2 meg    |
| 250  | 2500  | 25K  | 250K | 2.5 meg* |
| 350* | 3500* | 35K  | 350K | 3 meg*   |
| 500  | 5000  | 50K  | 500K | 3.5 meg* |
| 750* | 7500* | 75K* | 750K | 4 meg    |
|      |       |      |      | 5 meg    |

\*Made-to-order; please consult Factory.

### Stock Values (Ohms) Series 380C2

|      |       |      |       |          |
|------|-------|------|-------|----------|
| 50*  | 1000  | 10K  | 100K  | 1 meg    |
| 100  | 1500* | 15K  | 150K  | 1.5 meg  |
| 150  | 2000  | 20K  | 200K* | 2 meg*   |
| 250  | 2500  | 25K  | 250K  | 2.5 meg* |
| 350  | 3500  | 35K* | 350K  | 3 meg*   |
| 500  | 5000  | 50K  | 500K  | 3.5 meg  |
| 750* | 7500* | 75K* | 750K* | 4 meg*   |
|      |       |      |       | 5 meg    |

\*Made-to-order; please consult Factory.

### Stock Values (Ohms) Series 380C3

|      |       |      |       |          |
|------|-------|------|-------|----------|
| 50   | 1000  | 10K  | 100K  | 1 meg    |
| 100  | 1500  | 15K  | 150K  | 1.5 meg  |
| 150* | 2000  | 20K  | 200K  | 2 meg    |
| 250  | 2500  | 25K  | 250K  | 2.5 meg  |
| 350* | 3500  | 35K* | 350K* | 3 meg    |
| 500  | 5000  | 50K  | 500K  | 3.5 meg* |
| 750* | 7500* | 75K  | 750K  | 4 meg    |
|      |       |      |       | 5 meg    |

\*Made-to-order; please consult Factory.

## Series 380 How To Order

| Catalog Number | Description                                                                        |
|----------------|------------------------------------------------------------------------------------|
| 380C1          | 2" round shaft FMS; 3/8" long bushing with 3/8 x 32-NEF-2A thread.                 |
| 380C2          | 5/8" screwdriver slotted shaft FMS; with a 1/2" split locking bushing.             |
| 380C3          | 7/8" screwdriver slotted shaft FMS; 3/8" long bushing with 3/8 x 32-NEF-2A thread. |

Example: **380-C1-10K-S**

|            |                                                       |                            |                                             |
|------------|-------------------------------------------------------|----------------------------|---------------------------------------------|
| <b>380</b> | <b>C1</b>                                             | <b>10K</b>                 | <b>S</b>                                    |
| Series     | Shaft & Bushing<br>See Catalog Number and Description | Resistance Value<br>(Ohms) | Taper<br>See Chart B<br>(Figure 2, page 45) |

## Series 53 Standard Resistance Values

Series 53: Brass, nickel-plated shaft. Economical version of 380.

### Series 53 Stock Values (Ohms)

#### 53C1, 53C2, 53C3 Linear

|      |      |      |         |         |
|------|------|------|---------|---------|
| 50   | 1500 | 20K  | 250K    | 3 Meg   |
| 100  | 2000 | 25K  | 350K    | 3.5 Meg |
| 150  | 2500 | 35K  | 500K    | 4 Meg   |
| 250  | 3500 | 50K  | 750K    | 5 Meg   |
| 350  | 5000 | 75K  | 1 Meg   | 7.5 Meg |
| 500  | 7500 | 100K | 1.5 Meg | 10 Meg  |
| 750  | 10K  | 150K | 2.5 Meg |         |
| 1000 | 15K  | 200K |         |         |

#### Dual Taper D53C1      Z-Taper 53C1-Z      Reversed Z-Taper 53C1-RZ

|       |      |         |      |
|-------|------|---------|------|
| 10K   | 500  | 150K    | 10K  |
| 25K   | 1K   | 200K    | 25K  |
| 50K   | 2.5K | 250K    | 50K  |
| 100K  | 5K   | 500K    | 100K |
| 250K  | 10K  | 750K    | 250K |
| 500K  | 15K  | 1 Meg   | 500K |
| 1 Meg | 20K  | 2 Meg   |      |
|       | 25K  | 2.5 Meg |      |
|       | 50K  | 5 Meg   |      |
|       | 100K |         |      |

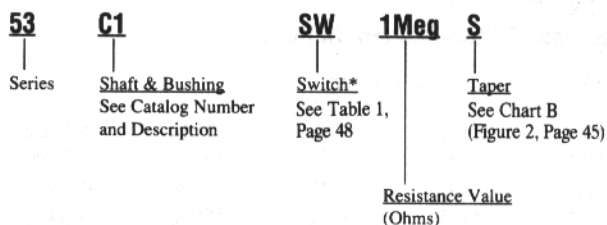
## Series 53 How to Order

| Catalog Number | Description                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------------------|
| 53C1           | 2 in. (.50.5mm) round shaft FMS; 3/8 in. (9.52mm) long bushing with 3/8 in. (9.52mm) x 32-NEF-2A thread.                |
| 53C2           | 5/8" screwdriver slotted shaft FMS; with a 1/2 in. (.50.5mm) split locking bushing.                                     |
| 53C3           | 7/8 in (22.22mm) screwdriver slotted shaft FMS; 3/8 in. (9.52mm) long bushing with 38 in. (203.2mm) x 32-NEF 2A thread. |
| 53C1SW         | Unsealed version of 53C1 available for use with field assembled switches. Order as 53C1 SW                              |
| 53C1-Z         | see table 1 for switch ordering.                                                                                        |
| 53C1-RZ        | Same as 53C1 but with Z taper (see chart B, page 45).                                                                   |
| D53C1          | Same as 53C1 but with Reversed Z taper (see chart B, page 45).                                                          |
| D53C1          | Dual ganged. Bushing and shaft same as 53C1.                                                                            |

Table 1  
Switches for 53C1 SW only. Must be ordered separately on a made-to-order basis.

|       |                           |
|-------|---------------------------|
| 53-10 | SPST-3A-125 Vac           |
| 53-20 | DPST-3A-125 Vac           |
| 53-21 | (Mod.) DPST-3A-125 Vac/dc |

Series 53 How to Order, continued next page

Example: **53-C1-SW-1Meg-S**

\*Leave blank if switch is not required.

**Series RV4 Standard Resistance Values**

Series RV4: Military version of Series 53

**RV4 Stock Values (Ohms, Tolerance and Tapers)**

| RV4NAYSD |      |      |      | RV4NAYSK |       |
|----------|------|------|------|----------|-------|
| 500A     | 252A | 753A | 205B | 101A*    | 503A  |
| 101A     | 352A | 104A | 255B | 251A*    | 104A* |
| 151A     | 502A | 154A | 355B | 501A*    | 254A  |
| 251A     | 752A | 204A | 505B | 102A     | 504A  |
| 351A     | 103A | 254A |      | 252A*    | 105A* |
| 501A     | 153A | 354A |      | 502A     | 255B  |
| 751A     | 203A | 504A |      | 103A     | 505B  |
| 102A     | 253A | 754A |      | 253A     |       |
| 152A     | 353A | 105A |      |          |       |
| 202A     | 503A | 155B |      |          |       |

\*Made-to-order; please consult Factory.

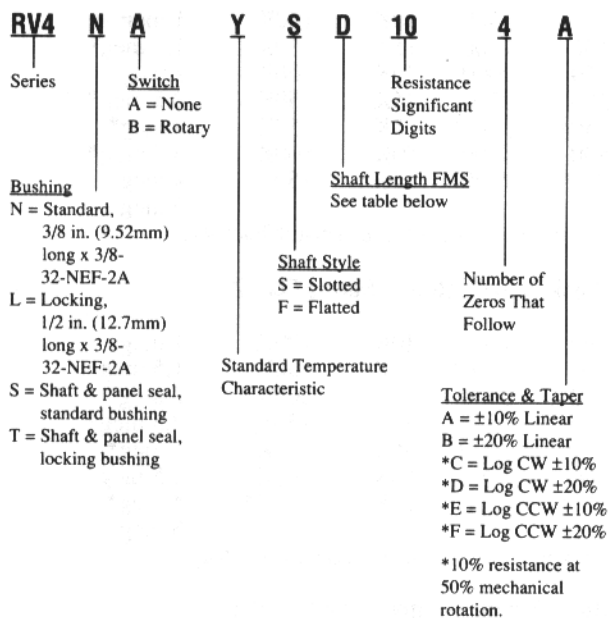
| RV4LAYSA |      |       |      | RV4NAYSB |       |
|----------|------|-------|------|----------|-------|
| 500A     | 252A | 753A  | 205B | 101A*    | 503A  |
| 101A     | 352A | 104A  | 255B | 251A     | 104A  |
| 151A     | 502A | 154A  | 355B | 501A     | 254A  |
| 251A     | 752A | 204A  | 505B | 102A     | 504A  |
| 351A     | 103A | 254A  |      | 252A*    | 105A  |
| 501A     | 153A | 354A  |      | 502A     | 255B  |
| 751A*    | 203A | 504A  |      | 103A     | 505B* |
| 102A     | 253A | 754A  |      | 253A     |       |
| 152A     | 353A | 105A  |      |          |       |
| 202A     | 503A | 155B* |      |          |       |

\*Made-to-order; please consult Factory.

**RV4LAYSD**

|      |       |
|------|-------|
| 101A | 503A  |
| 251A | 104A  |
| 501A | 254A  |
| 102A | 504A  |
| 252A | 105A  |
| 502A | 255B* |
| 103A | 505B  |
| 253A |       |

\*Made-to-order; please consult Factory.

**Series RV4 How To Order**Example: **RV4-N-A-Y-S-D-10-4-A****Shaft Length from Mounting Surface Table**

| Shaft<br>Length Code | With 3/8 in. (9.52mm) Lg<br>Bushings N & S | With 1/2 in. (12.7mm) Lg<br>Bushings L & T |
|----------------------|--------------------------------------------|--------------------------------------------|
| A                    | N/A                                        | 5/8 in. (15.88 mm)                         |
| B                    | 1/2 in. (12.7 mm)                          | N/A                                        |
| D                    | 7/8 in. (22.23 mm)                         | 7/8 in. (22.23 mm)                         |
| G                    | 1 1/4 in. (31.75 mm)                       | N/A                                        |
| J                    | 2 in. (50.8 mm)                            | N/A                                        |
| K                    | 2 1/2 in. (63.5 mm)                        | N/A                                        |

N/A = Not available

**Series 485 How To Order**

Series 485 available on a made-to-order basis only.  
Please consult Factory for pricing, delivery, and  
minimums.