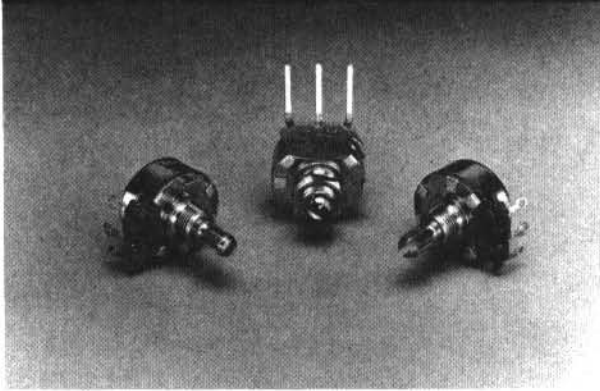


Series 470 and A47 Panel Mount  
**0.5 Watt, Thick-Film,**  
Conductive-Plastic Potentiometerer



### Description

Series 470 and A47 are extremely versatile families of high-quality potentiometers. Their multiple configurations and adaptability to any mounting requirements have established their wide use in industry.

### Features

- *Conductive plastic resistive element*
- *2% dynamic noise*
- *±5% independent linearity*
- *25,000-cycle rotational life*
- *Tab mounting*
- *Wire wrap terminals*

### Special Features

- *Insulating shafts*
- *Concentric shafts*
- *Varied shaft configurations*
- *Varied mounting configurations*
- *Shaft seal*
- *Mounting seal*
- *Dust shields*
- *High torque*
- *High dielectric strength*
- *Special tapers*

### Series 470 and A47 Electrical Specifications

#### Resistance Range

150 $\Omega$  to 5 Megohms linear;  
1K $\Omega$  to 2.5 Megohms tapered.

#### Resistance Tolerance

Linear up to 500K $\Omega$ ,  $\pm 10\%$ ; above 500K $\Omega$ ,  $\pm 20\%$ .  
Tapers up to 100K $\Omega$ ;  $\pm 10\%$ ; above 100K $\Omega$ ,  $\pm 20\%$ .

#### Power Rating

Linear: 0.5 watts at 70°C.  
Non Linear: 0.25 watts at 70°C.  
Multiple section controls, derate wattage by 40%.  
Full rating at 70°C derated linearly to zero watts at 120°C. *See Chart B, page 70.*

#### Effective Rotation

270°  $\pm 10^\circ$  with and without switch

#### Electrical Rotation

300°  $\pm 5^\circ$  with and without switch

#### Taper Tolerance

$\pm 20\%$  of nominal resistance @ 50%  $\pm 3\%$  mechanical rotation.

#### Tapers

Right and left-hand available. *See Chart A, page 70.*

#### End Resistance

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

#### Dielectric Withstanding Voltage

1000 Vac for 60 seconds @ ATM.  
450 Vac for 60 seconds @ 3.5 in. (86mm) Hg.

#### Working Voltage

500 Vdc maximum, but power not to exceed rating

#### Dynamic Noise

2% of total resistance. 1% available (linear).

#### Linearity

$\pm 5\%$  independent linearity under 1 Megohm;  
 $\pm 10\%$  1 Megohm and above.

#### Switches

Rotary actions; *see Figure 3, page 71* for switch characteristics.

#### Location of Tap

Single tap at 50% of rotation

#### Insulation Resistance

50 Megohms minimum

**Series 470 and A47 Mechanical Specifications**

**Mechanical Rotation**

300° ±5° without switch; 330° ±5° with switch, standard.

**Stop Torque**

8 lb. in. minimum, standard

**Operating Torque Range**

Standard bushing each section 0.5 to 6 oz. in.

High torque 6 to 20 oz. in.

Locking bushing 30 oz. in. minimum with jam nut tightened to 10 lb. in.

**Maximum Number of Sections**

Three

**Weight**

.069 lb. single; .050 lb. each additional section;

.079 lb. with switch.

**Hardware**

(a) Hex mounting nut, 3/8 in. (9.52mm) x 32 thread, 1/2 in. (12.7mm) across flats, 3/32 in. (2.38mm) thick.

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

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

*Note: Hardware for custom orders must be ordered separately.*

**Marking**

Depending on construction, marking will appear on rear surface or periphery. 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.

**Series 470 and A47 Operational Specifications**

**Operating Temperature Range**

-40° to +120°C

**Storage Temperature Range**

-55°C to +120°C

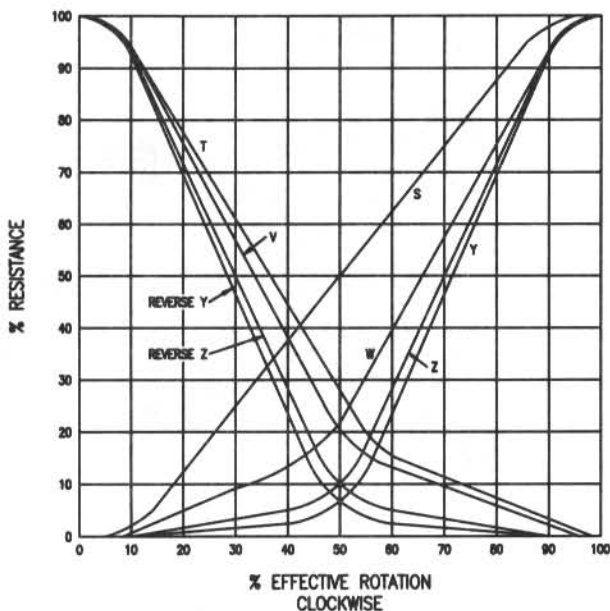
**Rotational Life**

25,000 cycles (500 cycles locking bushing types)

10 cycles per minute maximum.

Figure 1

Chart A



**Curves 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 2

Chart B

Power Derating Graph for Series 470

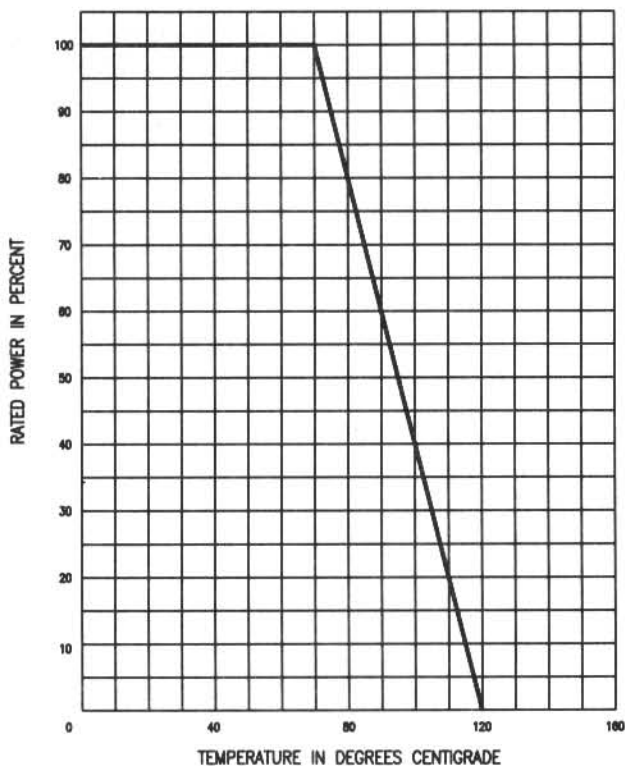
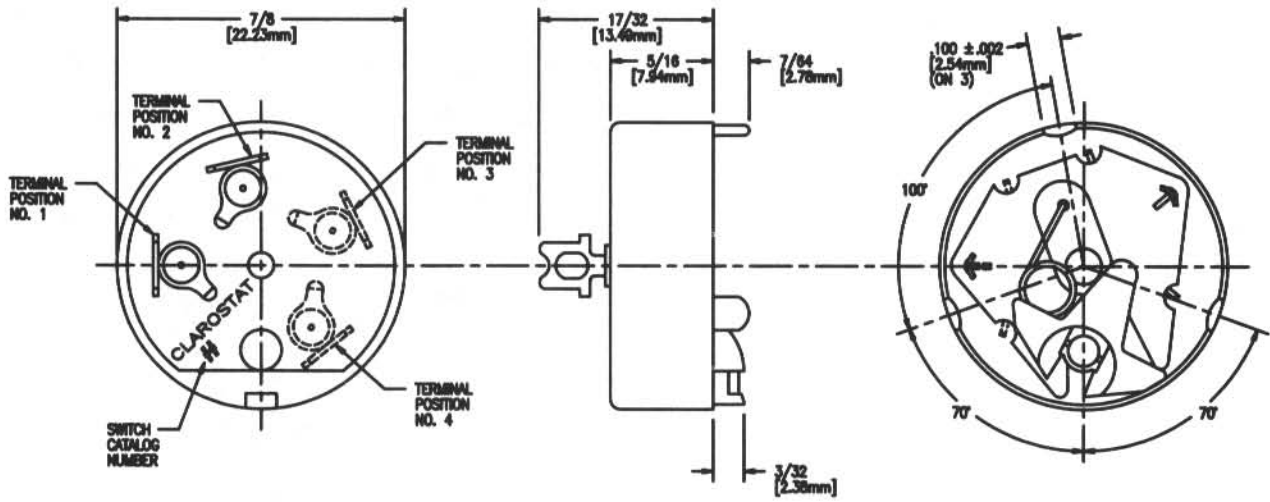


Figure 3  
AE Switch



Type Number	Switch Variations	Terminal Positions	Max. Operating Torque-oz.in.
AE-10	S.P.S.T. 1a, 250V; 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. 250 ma. 24Vdc (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.



Figure 6

Series 470 Tab Mounted

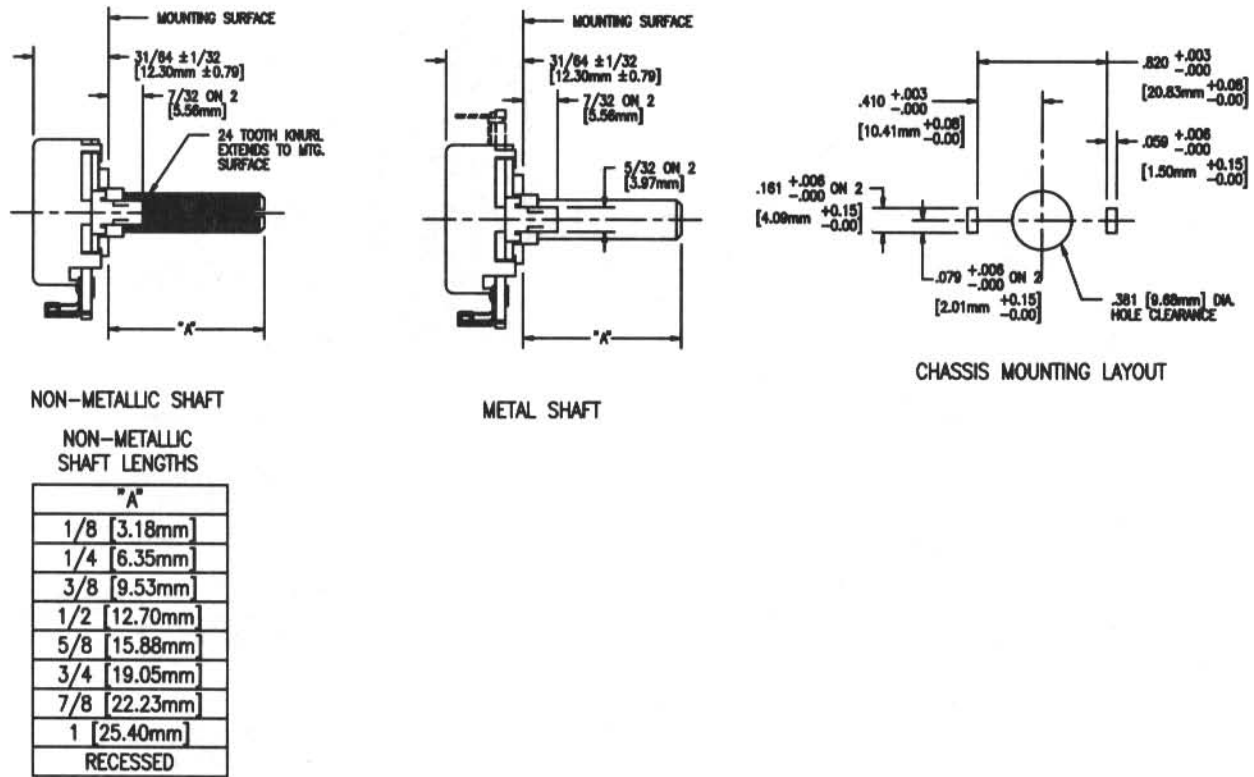


Figure 7

Series 470 Type B-3 Printed Circuit Terminals

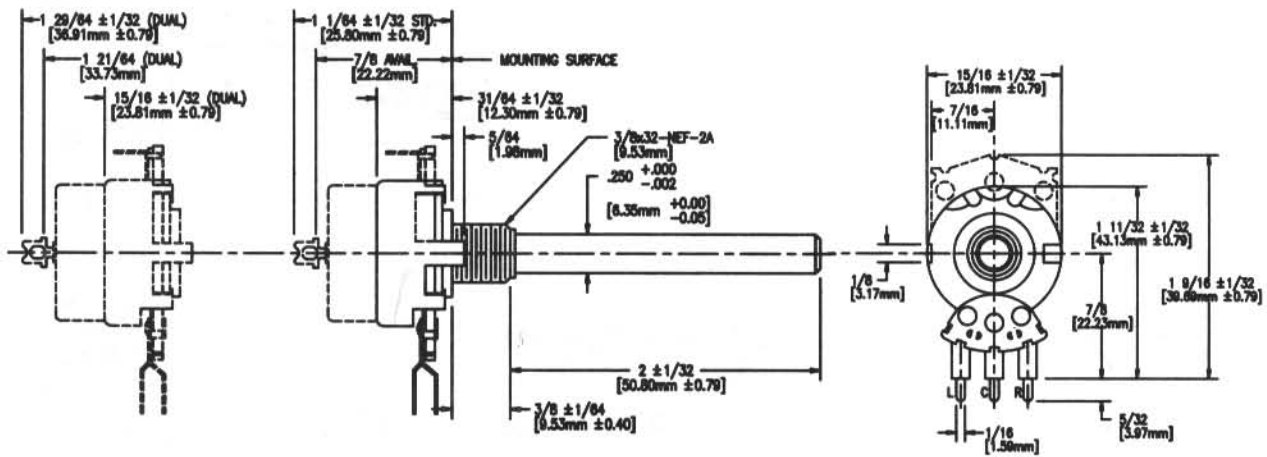


Figure 8

Series 460 Mounting Layout

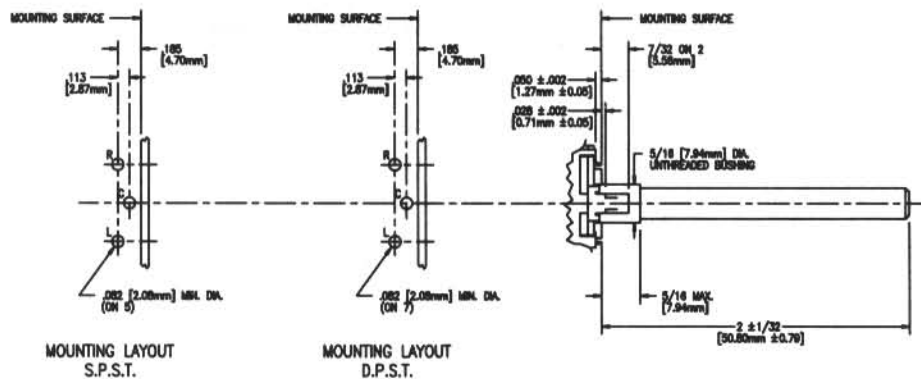
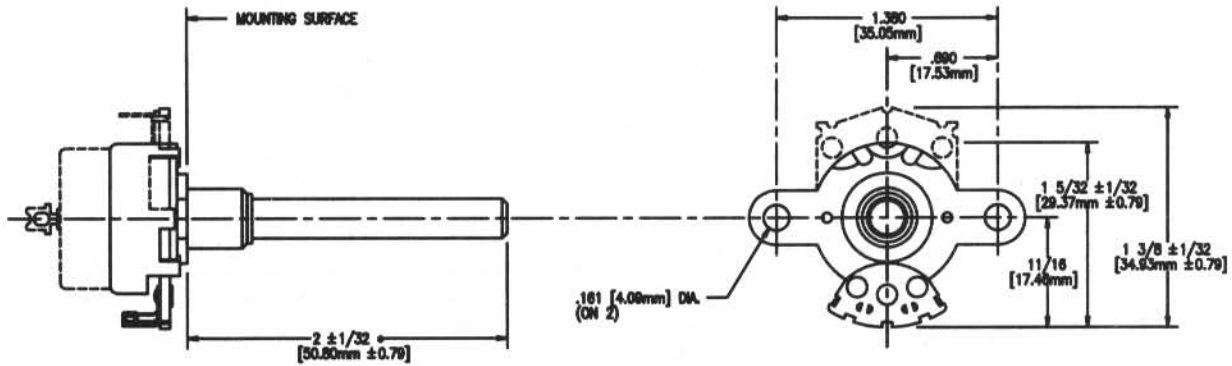


Figure 9

Series 470 Ear Mounting



Series A47  
 .5 Watt  
 Pick-A-Shaft, Conductive Plastic Potentiometer

Description

“Pick-A-Shaft” controls take any shaft listed below. Your choice of one of 13 shafts listed (This does not include insulated shaft), with each control. Tolerance  $\pm 20\%$  up to and including 100K $\Omega$ ;  $\pm 30\%$  above 100K $\Omega$ . Items not listed are special; prices and information on request.

Shafts

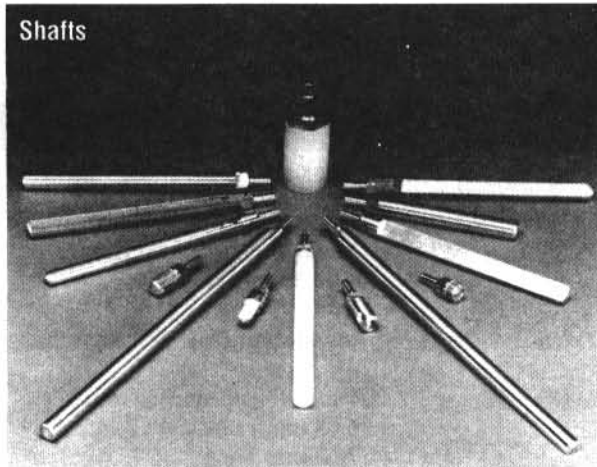
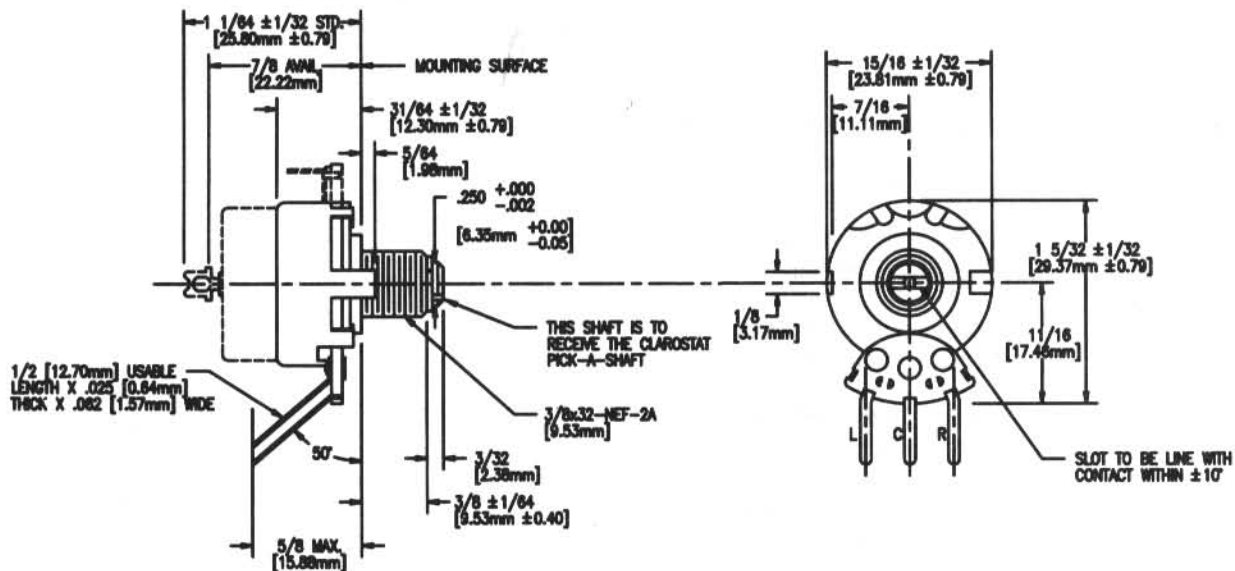


Figure 10

Series A-47 Pick-A-Shaft Control Dimensions



## Series A47 Standard Resistance Values

### Stock Values

A47-500-S	A47-10K-Z	A47-75K-S	A47-1 Meg-S
A47-750-S	A47-15K-S	A47-75K-V*	A47-1 Meg-Z
A47-1000-S	A47-15K-V*	A47-100K-S	A47-1.5 Meg-S
A47-1500-S	A47-15K-W*	A47-100K-Z	A47-2 Meg-S
A47-2000-S	A47-20K-S	A47-150K-S	A47-2.5 Meg-S
A47-2500-S	A47-25K-S	A47-200K-S	A47-3 Meg-S
A47-3000-S	A47-25K-W	A47-250K-S	A47-3 Meg-Z*
A47-4000-S*	A47-25K-V*	A47-250K-Z	A47-4 Meg-S*
A47-5000-S	A47-30K-S*	A47-300K-S*	A47-4 Meg-Z*
A47-7500-S*	A47-40K-S	A47-500K-S	A47-5 Meg-Z*
A47-10K-S	A47-50K-S	A47-500K-Z	A47-5 Meg-S
A47-10K-V*	A47-50K-W*	A47-750K-S*	A47-7.5 Meg-S*
A47-10K-W	A47-50K-Z	A47-750K-Z*	A47-10 Meg-S

\*Items made-to-order. Please consult Factory.

Your choice of shaft furnished, at no extra charge with each "Pick-A-Shaft" control. See the following shafts.

### Shafts

Catalog Number	Description
(1) SS-3/8	(Male) to take female fitting 3/8 in. (9.35mm)
(2) RS-2	Round shaft, 2 in. (50.8mm) long
(3) RS-3/16	Round slotted shaft 3/16 in. (6.687mm) diameter, 3 in. (76.2mm) long
(4) KSS-3	Knurled, split shaft, 3 in. (76.2mm) long
(5) RS-5	Round shaft, 5 in. (127mm) long
(6) FS-5	Flatted shaft, 5 in. (127mm) long
(7) KSS-5	Knurled, split shaft, 5in. (127mm) long
(8) FS-3	Flatted shaft, 3 in. (76.2mm) long
(9) RS-3	Round shaft, 3 in. (76.2mm) long
(10) DFS-1/2	Doubled-flatted, Philco-type, 1/2 in. (12.7mm) long
(11) FKS-1/4	Fine-knurled, slotted shaft, 1/4 in. (6.35mm) long
(12) KFS-3	Knurled, flatted shaft, 3in. (76.2mm) long
(13) FKS-1/2	Fine-knurled, slotted shaft, 1/2 in. (12.7mm)long

## Switches

Catalog Number	Description
SWE-10	SPST 3A-125 Vac
SWE-13	SPST 15A-10 Vdc
SWE-20	DPST 3A-125 Vac
SWE-21 (Mod.)	DPST 3A-125 Vac/dc
SWE-23	DPST 15A-10 Vdc

Catalog Number 59-186: spacer and bushing assembly.  
Catalog number RN-3: non-metallic shaft round 3 in. (76.2mm) long. High voltage shaft for operation up to 10K Volts. Attaches to any Clarostat "Pick-A-Shaft" control.

## Series 470 and A47 How To Order

**Series 470 Control** — Please consult Factory for pricing and delivery.

### Series A47 Control

Example: **A47-750-S**

<b>A47</b>	<b>750</b>	<b>S</b>
470 Series Pick-A-Shaft version	Resistance Value (Ohms)	Taper See Chart A, Figure 1, Page 70)

### Shaft Adder

Example: **SS - 3/8**

<b>SS</b>	<b>3/8</b>
Description of shaft	Length of shaft (inches)