

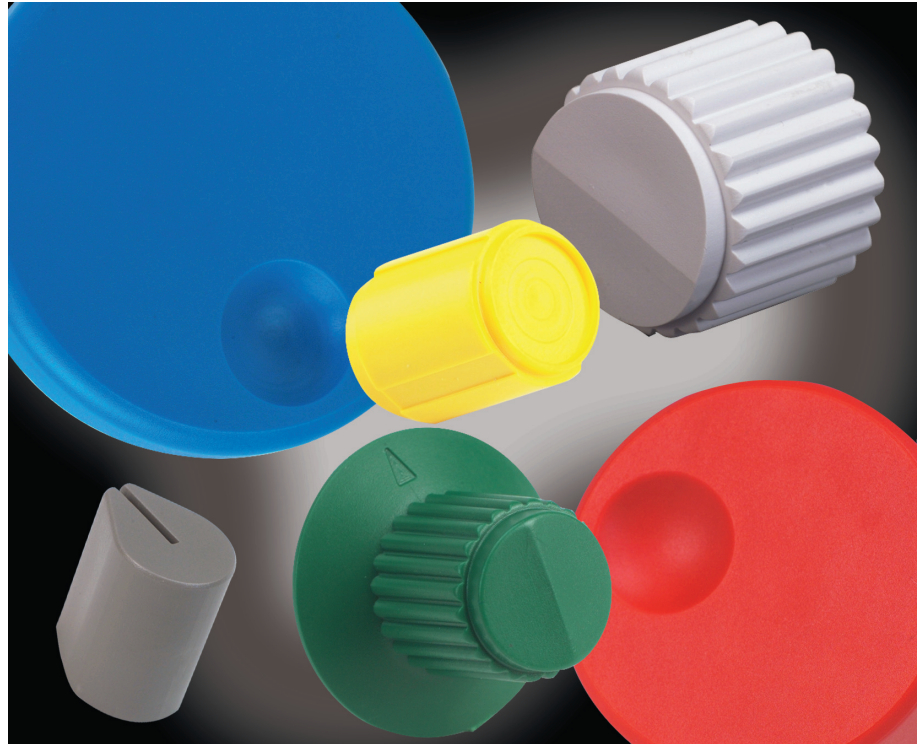
## CONTROL KNOBS

Ideally Suited for Encoder and Rotary Switches

### FEATURES

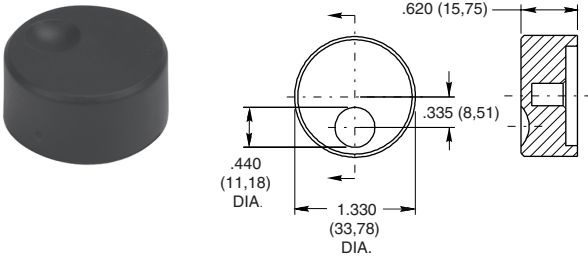
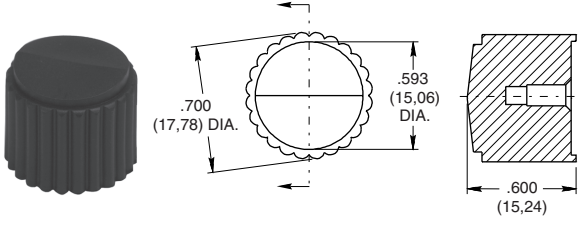
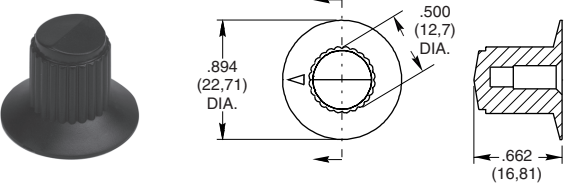
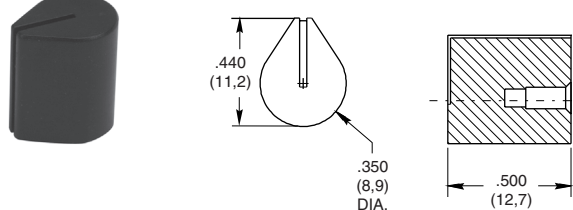
- Standard Fit for Grayhill Encoder and Rotary Switches
- Custom Materials, Styles, Colors and Markings Available
- Standard Black or Gray
- Choice of Spring Clip (Press-On) or Metal Insert with Set Screw Versions

Contact Grayhill for special design considerations



Optical and Mechanical Encoders

### DIMENSIONS In inches (and millimeters)

<p><b>Style 5013</b></p>  <p>Available in .250 Dia. Shaft only.*</p>	<p><b>Style 5014</b></p> 
<p><b>Style 5015</b></p> 	<p><b>Style 5017</b></p>  <p>Available in .125 and .157 (4mm) dia. shaft in spring clip (press-on) version only.*</p>

\*See Ordering Information.

**DIMENSIONS** In inches (and millimeters)

<p><b>Style 5019</b></p> <p><b>Top View</b></p>	<p><b>Style 5020</b></p> <p><b>Top View</b></p> <p>Available in ABS, .250 dia. shaft in spring clip (press-on). The locking clip is also available, requires a custom shaft.**</p>
<p><b>Style 5028</b></p> <p><b>Top View</b></p>	<p><b>Style 5029</b></p> <p><b>Top View</b></p>

\*See Ordering Information.

\*\*Contact Grayhill representative

Optical and Mechanical Encoders

**ORDERING INFORMATION**

**11K5028-KCNB**

**Series**  
**Style\*:** 5013, 5014, 5015, 5017, 5019, 5020, 5028, 5029  
 (see dimension drawings for style options)

**Shaft Diameter:**  
**J** = .125 dia. shaft  
**E** = .157 (4mm) dia. shaft  
**K** = .250 dia. shaft

**Knob Color:**  
**B** = Black  
**G** = Gray

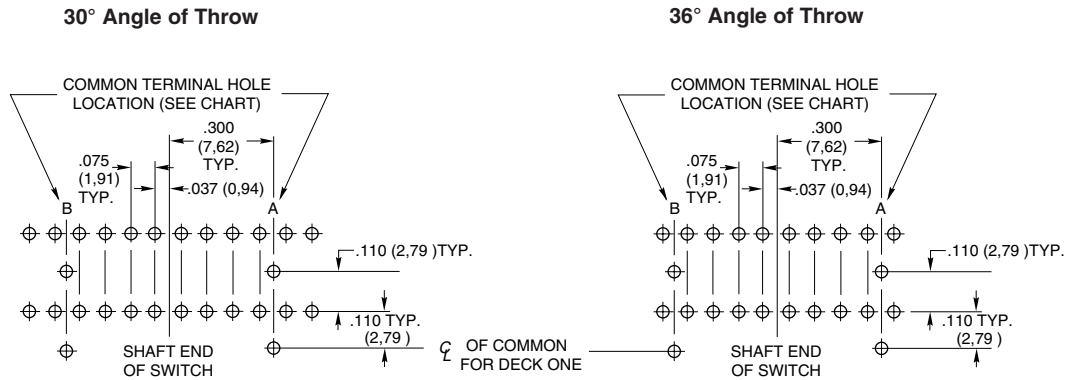
**Material:**  
**A** = ABS (available on the styles 5017 and 5020 only)  
**N** = Nylon

**Version:**  
**C** = Spring Clip (press-on)  
**L** = Locking Clip (available on the style 5020 only)  
**M** = Metal Insert w/Set Screw(s)

Custom materials, styles and colors are available.  
 For prices and discounts, contact a local sales office or Grayhill.

## SERIES 71: PC Board Pattern In inches (and millimeters)

### All Styles Except 71BT



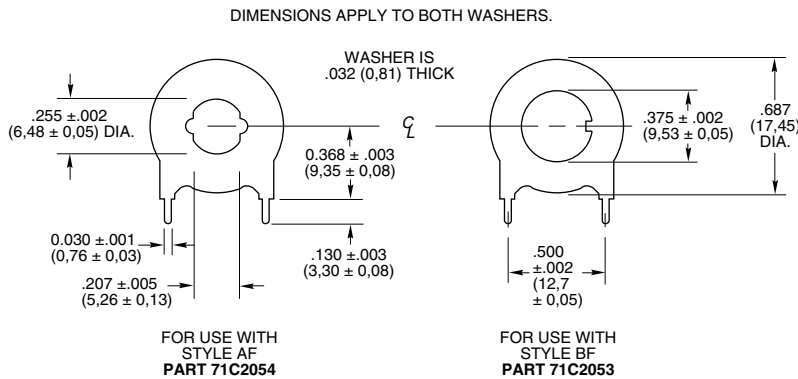
Spacer decks can be supplied to facilitate PC board layouts of three or more decks. A spacer deck does not have any terminals and provides no switching function. Dimensionally, it requires the same space as one normal switch deck. Spacer deck can be placed at any location in the switch, per your instructions. Switches which include spacer decks are procured under a special part number.

Shown for a two deck switch.  
Bushing mount is recommended.

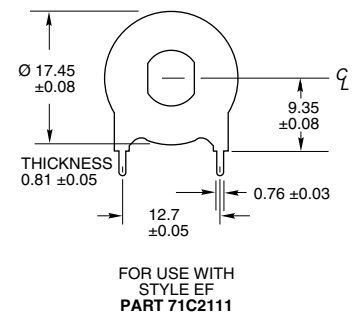
Number of Poles Per Deck	Common Terminal Hole Location
1	A
2	A and B

## SERIES 71: PC MOUNT ACCESSORY

### 1/8" and 1/4" Diameter Shaft Styles In inches (and millimeters)



### Metric Mount Styles In millimeters



For printed circuit styles. Mounting bushing provides additional support for the front end of the switch. Order separately by appropriate part number. Rotary switch discount applies.

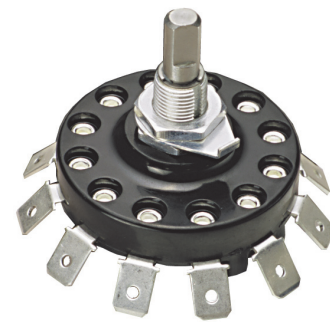
## SERIES 19

2" Diameter, 15 Amp



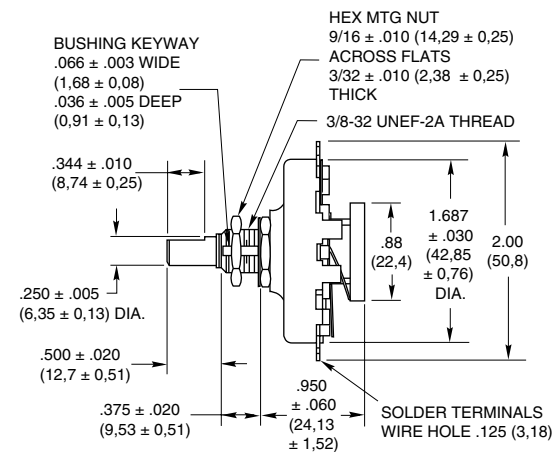
### FEATURES

- UL Recognized
- Rugged Construction
- Choice of Termination

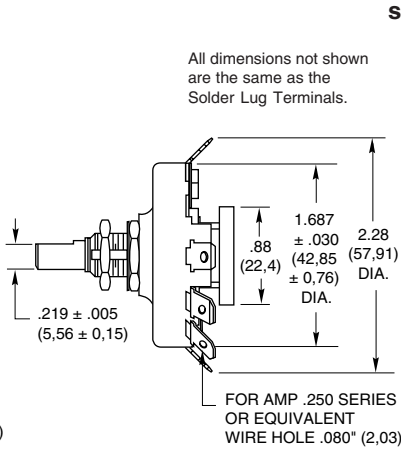


### DIMENSIONS In inches (and millimeters)

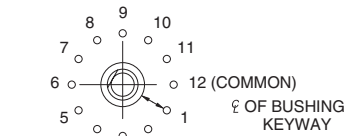
#### Solder Lug Terminals



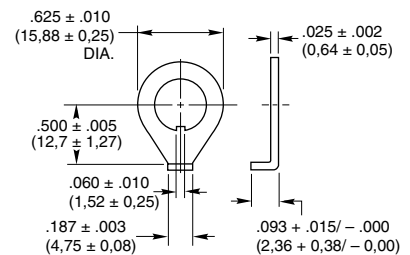
#### 'Faston' Terminals



#### Circuit Diagram viewed from shaft end with switch in position #1



#### Non-Turn Washer Detail



Grayhill part number and date code marked on label. Customer part number marked on request.

## SPECIFICATIONS

### Electrical Rating

**Rated:** UL Recognition: File Number E35289  
 15 Amps, 120 Vac, non-inductive load.  
 One Amp, 120 Vdc, non-inductive load.  
 Additional Grayhill Rating: 7.5 Amps, 220 Vac,  
 non-inductive load.

This rating is based on the following criteria:  
 Overload—50 operations at 125% rated ac load  
 and 150% rated DC load.

Endurance—6000 operations at rated load with  
 900 Vac dielectric strength before and after test.  
 Temperature Rise—Not to exceed 30°C when  
 carrying rated ac load after endurance test.  
 Contacts will carry 20 Amps at 115 volts AC with  
 30°C maximum temperature rise.

**Contact Resistance:** (Measured at 2 Vdc and  
 approximately 100 mA) for new switch  
 approximately 10 milliohms.

**Insulation Resistance:** Approximately 100,000  
 Mohms. Between mutually insulated parts.

**Voltage Breakdown:** Approximately 2500 Vac  
 between mutually insulated parts.

### Materials and Finishes

**Rotor Contact:** Silver alloy

**Stator Contact:** Silver alloy

**Shaft:** 303 Stainless steel

**Stop Rivet:** Steel, tin/zinc-plated

**Mounting Bushing:** Brass, tin/zinc-plated

**Base and Drive Hub:** Heat resistant, electrical  
 grade phenolic.

**Mounting Nut:** Brass, tin/zinc-plated or stain-  
 less steel.

**Detent Mechanism:** Brass, silver-plated

**"Faston" Terminal:** Brass, silver-plated

**Solder Terminal:** Brass, silver-plated

**Mounting Hardware:** One mounting nut 9/16"  
 across flats, 3/32" thick and one non-turn washer  
 (see detail) are supplied with each switch.

### Additional Characteristics

**Single Pole, Single Deck:** 2 to 11 positions  
 plus common 30° Indexing.

**Contacts:** Non-shorting type

**Stops:** A rivet provides the fixed stop on all  
 switches. Minimum number of positions is 2,  
 and maximum is 11. Terminal 12, the common,  
 is isolated from rotation.

**Rotational Torque:** 30 to 75 ounce-inches on  
 a new switch. Approximately 22 ounce-inches  
 after 25,000 cycles of operation.

**Contact Force:** Approximately 12 ounces

**Shaft Flat Orientation:** Opposite point of con-  
 tact (see circuit diagram).

## ACCESSORIES

### Screw Terminal Adapter

Spring loaded, plug-in adapters for 'Faston'  
 Terminals provide excellent mechanical fit and  
 electrical contact. Adapter material is brass  
 tin-plated. The terminal adapters are avail-  
 able with a 6-32 thread (-1) or 8-32 thread  
 (-2). A 1/4" panhead screw is provided as  
 part of the adapter.



Part No. SC906-1 .....6-32 Thread

Part No. SC906-2 .....8-32 Thread

### Non-Turn Washer

Brass, tin/zinc-plated washer, detailed above  
 may be purchased as a separate item.  
 Part No. 19C1014.

## ORDERING INFORMATION

Part Numbers: Designate as follows, using the  
 2 digits after the dash to indicate the number of  
 positions.

### For Faston Terminal:

Use 19101-02UL through 19101-11UL

### For Solder Terminal:

Use 19001-02UL through 19001-11UL

**Specials:** Not available through Distributors.  
 For special shafts, bushings, etc. contact Grayhill.

**Available from your local Grayhill  
 Distributor.** For prices and discounts, contact  
 a local Sales Office, an authorized local  
 Distributor or Grayhill.

**ACCESSORIES**

**Internal Tooth Lockwasher—Figure A**

For a 3/8" bushing. Approximately 0.500" (12,7) outside diameter, .022" (0,56) thickness. Material is cadmium-plated steel. Part No. **12Q1272-1**  
 For a 1/4" bushing. Approximately 0.400" (10,16) outside diameter, .018" (0,46) thickness. Material is steel, tin/zinc plated.



FIGURE A

**Non-Turn Washer—Figure B**

Can be ordered as extra hardware for the Series 5000, 24, 42, 43, 44, 54, 71B, 53, 57 and 59 rotary switches. The internal key of the washer slides into the bushing keyway. The right angle tab locks into a predrilled hole on the back side of the mounting panel. Material is brass, tin/zinc plated. Part No. **12C1087-1**

bushing to the panel. The kit consists of four items: a grooved hex nut, a keyed washer, a keyed seal and a non-turn washer. Assembly is described on Page J-53. Dimensions of panel seal kit items are shown in Figure C. This kit seals the bushing to the panel; it does not seal the shaft to the bushing. Not usable with adjustable stop switches. Part No. **42-24**

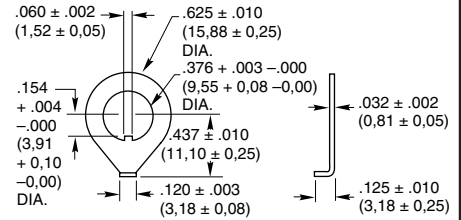


FIGURE B

**Panel Seal Kit—Figure C**

Sold as a separate item to seal the switch

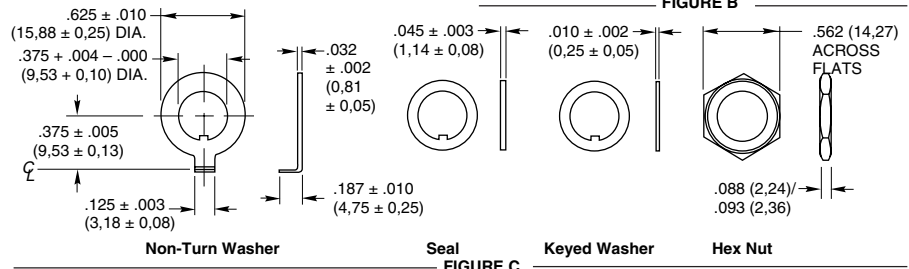
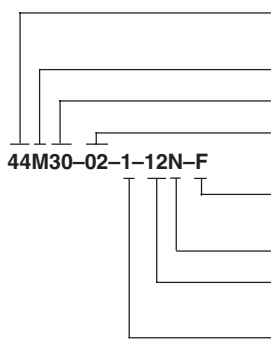


FIGURE C

**ORDERING INFORMATION: Single Shaft Switches, Add-A-Pot Switches**

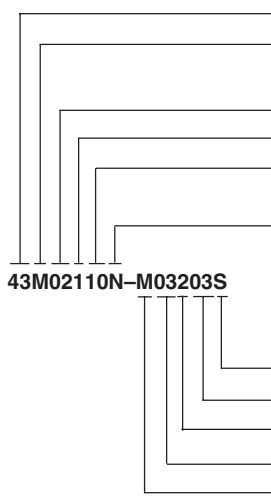


44M30-02-1-12N-F

- Series:** Determined by the type of switch and the angle of throw
- Style\*:** Letter(s) from the Choices and Limitations chart
- Angle of Throw: Must agree with Series Number
- Number of Decks:** As limited by the angle of throw, the poles per deck, switch style and type of contacts
- Stop Arrangement:** Add letter F to a one pole per deck switch with the maximum number of positions for a stop between position 1 and the last position. Leave blank for continuous rotation
- Type of Contacts:** N = Non-shortening; S = Shortening
- Positions Per Pole:** Requires 02 positions as a minimum to maximum allowable dependent on the angle of throw and poles per deck. Use AJ for adjustable stops (Styles D and UD).
- Poles Per Deck:** As limited by angle of throw, switch series and style

\* All rotary switches that are required to have military designated markings and testing adhering to MIL-3786 are to be ordered by specifying the military part number identified on the appropriate slash sheet.

**ORDERING INFORMATION: Concentric Shaft Rotary Switches**



43M02110N-M03203S

- Series:** Determined by the angle of throw, applicable to both sections
- Style\*:** Letter(s) from the Choices and Limitations chart
- Section A (front)**
- Number of Decks:** As limited by the number of poles per deck
- Poles Per Deck:** As limited by the angle of throw
- Positions Per Pole:** Requires 02 positions as a minimum to the maximum allowable dependent on the angle of throw and the poles per deck
- Type of Contacts:** N=Non-shortening, S=Shortening. All one pole per deck switches with the maximum number of positions are continuous rotation
- Section B (rear)**
- The limitations listed for Section A apply to Section B
- Type of Contacts**
- Positions Per Pole**
- Poles Per Deck**
- Number of Decks**
- Style**

\* All rotary switches that are required to have military designated markings and testing adhering to MIL-3786 are to be ordered by specifying the military part number identified on the appropriate slash sheet.

Available from your local Grayhill Distributor For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.