

## SERIES 61B

### 16, 24, or 32 Position, Optional Pushbutton

### FEATURES

- Positions Screen Cursor
- More Friendly than Keyboards
- Permits Visual Concentration
- Economic Touchscreen Alternative
- Pushbutton for Entry Function
- Detent for Tactile Feedback and Minimal Backlash
- Optical Coupled for Long Life
- Rugged Construction



### APPLICATIONS

#### Display Input

The Series 61 rotary encoder switch can move cursor or icon on a display. Use the rotary and pushbutton switch to simply select a menu item and enter it, or write more elaborate display software. Use the Series 61 to input limit settings for a monitored function. Change an item on a checklist to a new value while viewing the remainder of the list.

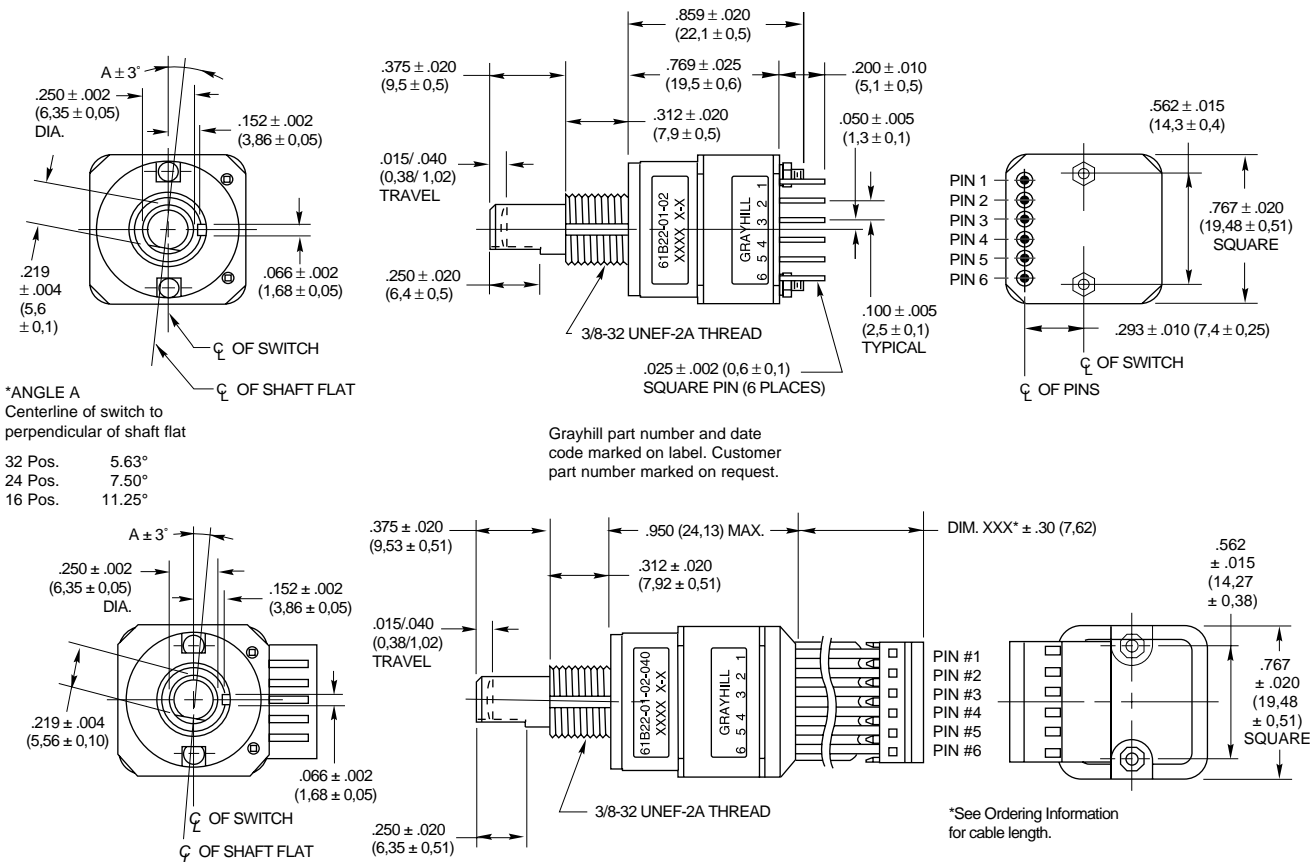
#### Incremental Input

Use the Series 61 with an interface chip to provide step by step input for setting radio frequency, drill depth, RPM, etc. These changes are usually a few steps, and you need not turn the switch several revolutions for the desired value. Some examples are as follows:

- Robot Position
- Volume Setting
- Radio Tuning
- Limit Setting
- Motor Control

### DIMENSIONS In inches (and millimeters)

Diagram illustrates a 16-position switch with integral pushbutton switch.



Unless otherwise indicated, tolerances are  $\pm .010$  (0,25).

**SPECIFICATIONS**

**Pushbutton Switch Ratings**

**Rating:** 5 Vdc, 10 mA, Resistive  
**Contact Resistance:** less than 10 (TTL or CMOS Compatible)  
**Voltage Breakdown:** 250 Vac between mutually insulated parts.  
**Contact Bounce:** Less than 4 milliseconds at make and less than 10 milliseconds at break  
**Actuation Life:** 3,000,000 operations  
**Actuation Force:** Maximum actuation force of 615 grams and a minimum actuation force of 415 grams.

**Encoder Ratings**

**Coding:** 2-bit quadrature coded output  
**Operating Voltage:** 5 ±.25 Vdc  
**Supply Current:** 30 mA maximum at 5 Vdc  
**Logic High:** 3.8V minimum  
**Logic Low:** 0.8V maximum  
**Logic Rise and Fall Times:** Rise Time less than 30 mS at 16.6 RPM. Fall Time less than 30 mS at 16.6 RPM.

**Operating Torque:** 2.0 ± .75 in-oz  
**Rotational Life:** more than 1,000,000 cycles of operation (1 cycle = 360° rotation and return)  
**Shaft Push Out Force:** 50 lbs minimum  
**Mounting Torque:** 15 in-lbs maximum

**Environmental Ratings**

**Operating Temperature Range:** -40°C to 85°C  
**Storage Temperature Range:** -55°C to 100°C  
**Vibration Resistance:** Harmonic motion with amplitude of 15g, within a varied 10 to 2000 Hz frequency for 12 hours per MIL-STD-202, Method 204  
**Shock Resistance:** Test 1: 100g for 6 mS half sine wave with velocity change of 12.3 ft/s. Test 2: 100g for 6 mS, sawtooth wave with velocity change of 9.7 ft/s.  
**Relative Humidity:** 90–95% at 40°C for 96 hours

**Materials and Finishes**

**Detent Cover:** Thermosetting plastic  
**Bushing:** Zinc casting, cadmium-plated per QQP-416, Class 2, Type II  
**Shaft:** Reinforced thermoplastic *Note: Earlier versions may have electropolished stainless steel shafts (still available in customs only).*  
**Detent Balls:** Passivated, stainless steel  
**Detent Spring:** Tinned music wire  
**Printed Circuit Boards:** NEMA Grade FR-4  
**Board Terminals:** Copper alloy, CDA No. 725  
**Through Bolts:** Stainless steel, unplated  
**Through Bolt Nuts:** Stainless steel  
**Switch Assembly Cover and Code Rotor:** PBT polyester thermoplastic  
**Mounting Hardware:** One brass, cadmium-plated nut and lockwasher supplied with each switch. Nut is 0.094" thick by 0.562" across flats.  
**Strain Relief:** PBT polyester thermoplastic (cable version only)  
**Cable:** 26 AWG, stranded/tinned wire, PVC coated on .100 (2,54) centers (cable version only)

**CIRCUITRY, TRUTH TABLE, AND WAVEFORM: Standard Quadrature 2-Bit Code**

| Clockwise Rotation |          |          |
|--------------------|----------|----------|
| Position           | Output A | Output B |
| 1                  |          |          |
| 2                  | ●        |          |
| 3                  | ●        | ●        |
| 4                  |          | ●        |

● Indicates logic high; blank indicates logic low. Code repeats every 4 positions.

\*EXTERNAL PULL UP RESISTORS REQUIRED FOR OPERATION. 8.2 kΩ IS SUGGESTED FOR TTL; 3.3 kΩ IS SUGGESTED FOR CMOS

**ORDERING INFORMATION**

**Series**  
**Style:** B = Standard, unsealed  
**Angle of Throw:** 11 = 11.25° or 32 Positions  
 15 = 15° or 24 Positions  
 22 = 22.25° or 16 Positions  
**Coding:** 01 = Quadrature  
**Pushbutton Option:** 01 = Without pushbutton, 02 = With pushbutton

**61B11-01-02-020**

**Termination:** Blank (no dash or numbers) = pins as described in drawing  
 Cable Termination 020 = 2.0 inches minimum to 250 = 25 inches maximum. Provided in increments of 1/2 inch. Example 035 = 3.5", 060 = 6 inches. Cable is terminated with standard Amp Connector 640442-6. Use any 6 position, .100 center header to mate with the cable assembly. Contact Grayhill

Custom shaft and bushing lengths, shaft/panel seal, and additional supply voltages are available through Grayhill only. Control knobs available, see page I-57.

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

**ACCESSORIES**

See page I-41.