

**SERIES 62A,V,D**  
1/2" Package

**FEATURES**

- Low Cost
- Long Life
- Available in 3.3 or 5.0 Vdc Operating Voltages
- High Torque Version to Emphasize Rotational Feel
- Economical Size
- Optically Coupled for More than a Million Cycles
- Optional Integral Pushbutton
- Compatible with CMOS, TTL and HCMOS Logic
- Available in 12,16, 20, 24 and 32 Detent Positions (Non-detent Also Available)
- Choices of Cable Length and Terminations

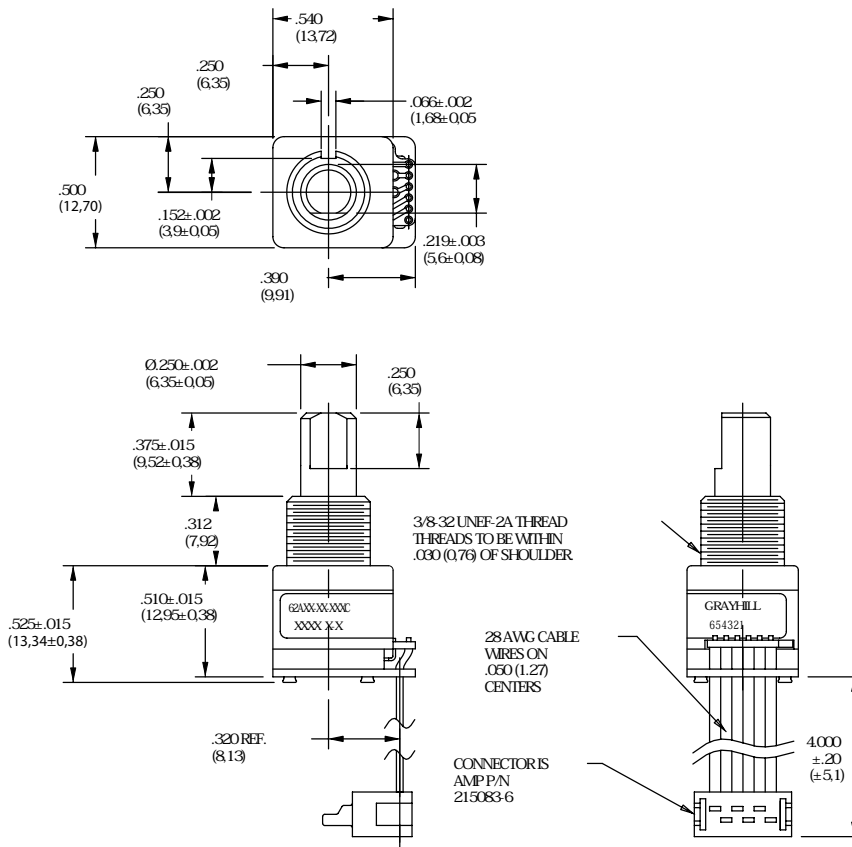
**APPLICATIONS**

- Global Positioning/Driver Information Systems
- Medical Equipment

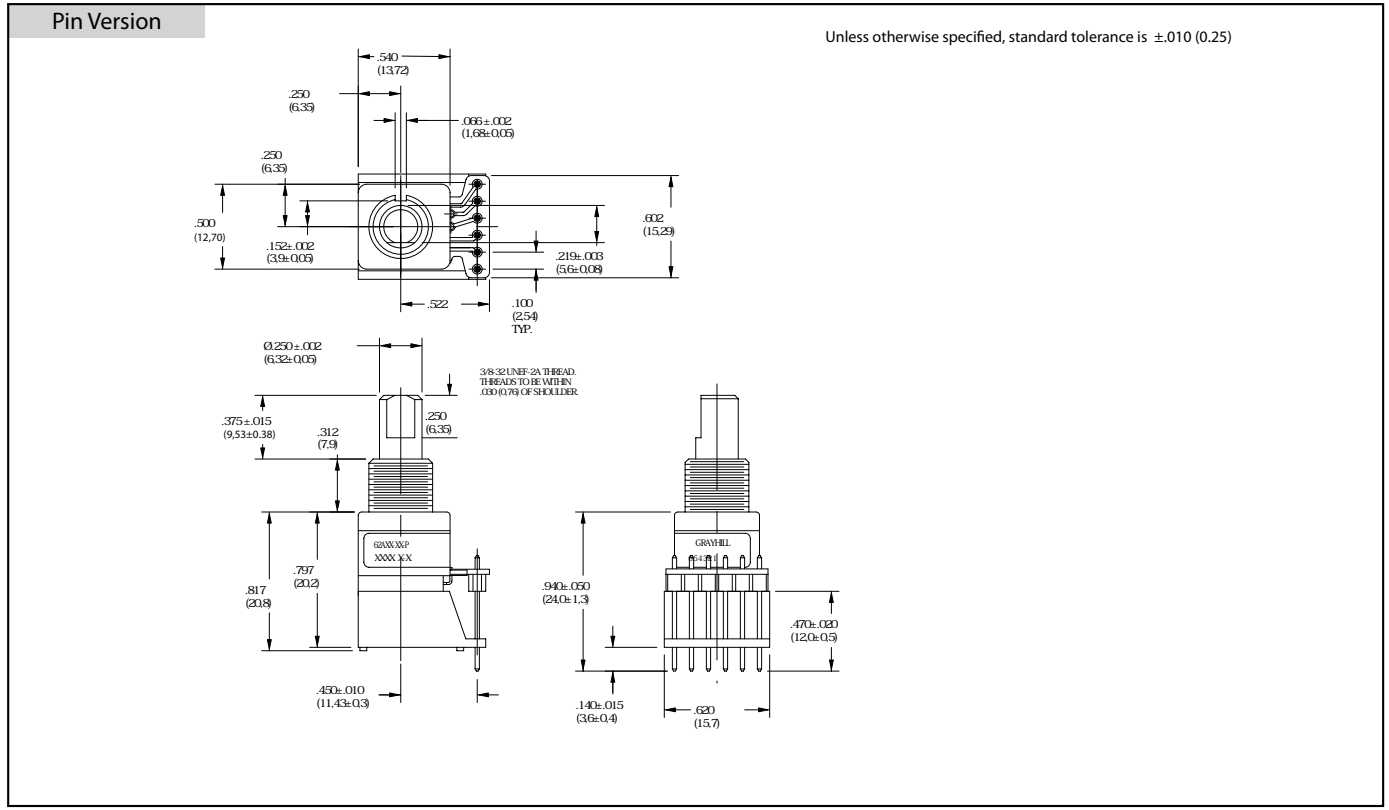


**DIMENSIONS** In inches (and millimeters)

**Cable Version**



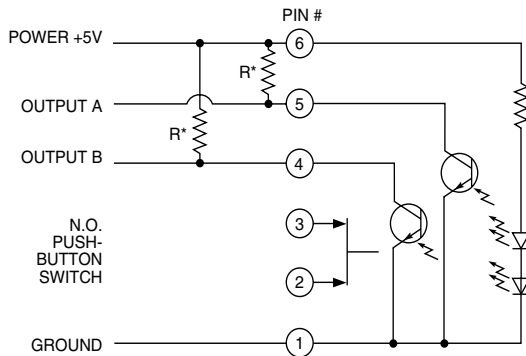
## DIMENSIONS In inches (and millimeters)



Optical and Mechanical Encoders

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

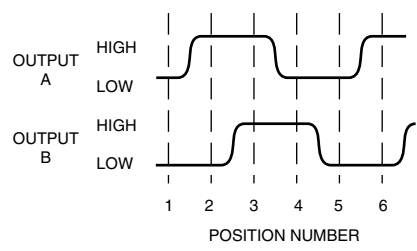
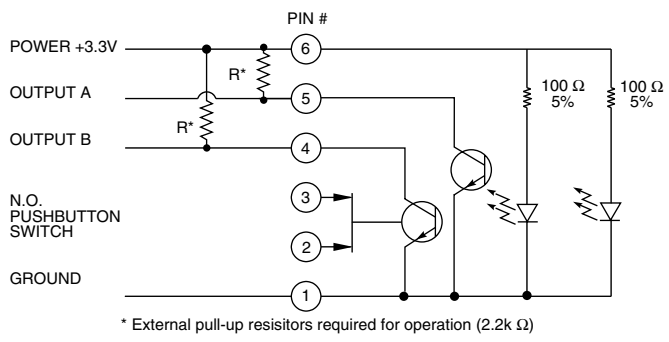
### Standard 5.0 Volt (Styles A and D)



Clockwise Rotation		
Position	Output A	Output B
1		
2	•	
3	•	•
4		•

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

### 3.3 Volt (Style V only)



**SPECIFICATIONS**

**Electrical and Mechanical Ratings**

Rating: 5 Vdc, 10 mA, resistive  
 Contact Resistance: less than 10 ohms (TTL or CMOS compatible)  
 Pushbutton Life: 3 million actuations minimum  
 Contact Bounce: less than 4 mS at make and less than 10 mS at break  
 Actuation Force: 1000 ±300 grams  
 Pushbutton Travel: .010/.025 inch  
 Coding: 2-bit quadrature coded output  
 Operating Voltage: 5.0 ±.25 Vdc, 3.30±.125 Vdc (style V only)  
 Voltage Breakdown: 250 Vac between mutually insulated parts  
 Supply Current: 30 mA maximum  
 Logic Output Characteristics:  
 Logic High: 3.8 Vdc (5.0 Vdc); 2.3 (3.3 Vdc) minimum  
 Logic Low: 0.8 Vdc maximum  
 Rotational Life: 1,000,000 cycles minimum (One cycle is a rotation through all positions and a full return)  
 Minimum Sink Current: 2.0 mA for 5 Vdc; 1.0 mA for 3.3 Vdc  
 Power Consumption: 150 mW maximum for 5 Vdc; 80 mW for 3.3 Vdc  
 Optical Rise and Fall Times: less than 30 mS maximum

**Operating Torque:**

Style A and V: 2.0 ±1.4 in-oz. initially  
 Style D: 3.5 ±1.4 in-oz initially  
 Non-detent: less than 1.5 in-oz initially  
 Shaft Push Out Force: 45 lbs minimum  
 Mounting Torque: 15 in-lbs maximum  
 Terminal Strength: 15 lbs cable pull-out force minimum  
 Operating Speed: 100 RPM maximum  
 Axial Shaft Play: .010 maximum

**Environmental Ratings**

Operating Temperature Range: -40°C to 85°C  
 Storage Temperature Range: -55°C to 100°C  
 Relative Humidity: 90–95% at 40°C for 96 hours  
 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  
 Mechanical Shock: Test 1: 100G for 6 mS, half sine, 12.3 ft/s; Test 2: 100G for 6 mS, sawtooth, 9.7 ft/s

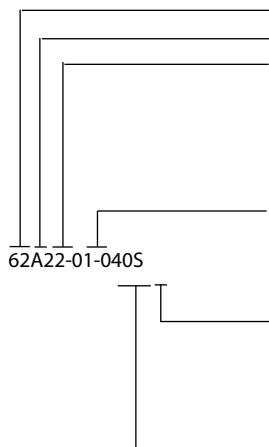
**Printed Circuit Boards:** NEMA grade FR-4

gold over nickel or palladium  
 Terminals: Brass, tin-plated  
 Mounting Hardware: One brass, nickel-plated nut and stainless steel lockwasher supplied with each switch. Nut is 0.094 inches thick by 0.562 inches across flats.  
 Rotor: Thermoplastic  
 Code Housing: Thermoplastic  
 Pushbutton Dome: Stainless steel  
 Dome Retaining Disk: Thermoplastic  
 Pushbutton Housing: Thermoplastic  
 Phototransistor: Planar Silicon NPN  
 Infrared Emitter: Gallium aluminum arsenide  
 Pushbutton Contact: Brass, nickel-plated  
 Flex Cable: 28 AWG, stranded/top coated wire, PVC coated on .050 or .100" centers (cabled version)  
 Header Pins: Phosphor bronze, tin-plated  
 Spacer: ABS  
 Backplate/Strain Relief: Stainless steel

**Materials and Finishes**

Code Housing: Reinforced thermoplastic  
 Shaft: Zinc or aluminum  
 Bushing: Zinc casting  
 Shaft Retaining Ring: Stainless steel  
 Detent Spring: Stainless steel

**ORDERING INFORMATION**



**Series**  
 Style: A = 1/2" package, 5.0 Vdc Input, D = high torque w/5.0 Vdc input, V = 3.3 Vdc input  
**Angle of Throw:**  
 Detent  
 11 = 11.25° or 32 positions  
 15 = 15° or 24 positions  
 18 = 18° or 20 positions  
 22 = 22.5° or 16 positions  
 30 = 30° or 12 positions  
 Non-detent (Styles A&V only)  
 01 = 11.25° or 32 positions  
 05 = 15° or 24 positions  
 08 = 18° or 20 positions  
 02 = 22.5° or 16 positions  
 03 = 30° or 12 positions

Pushbutton Option: 01 = w/o pushbutton, 02 = with pushbutton

**Termination:** S = Stripped cable; .050" centers  
 SH = Stripped cable; .100" centers  
 C = Connector; .050" centers  
 CH = Connector; .100" centers  
 P = Pin; .100" centers

**Cable Length:** Cable Termination: 040 = 4.0in. Cable is terminated with Amp P/N 215083-6. See Amp Mateability Guide for Mating Connector details.  
 \*Eliminate cable length if ordering pins. (Ex: 62A22-02-P).

These switches have Quadrature 2-bit code output and an optional shaft actuated pushbutton switch.

Custom materials, styles, colors, and markings are available. Control knobs available.

Available from your local Grayhill Component Distributor.

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