

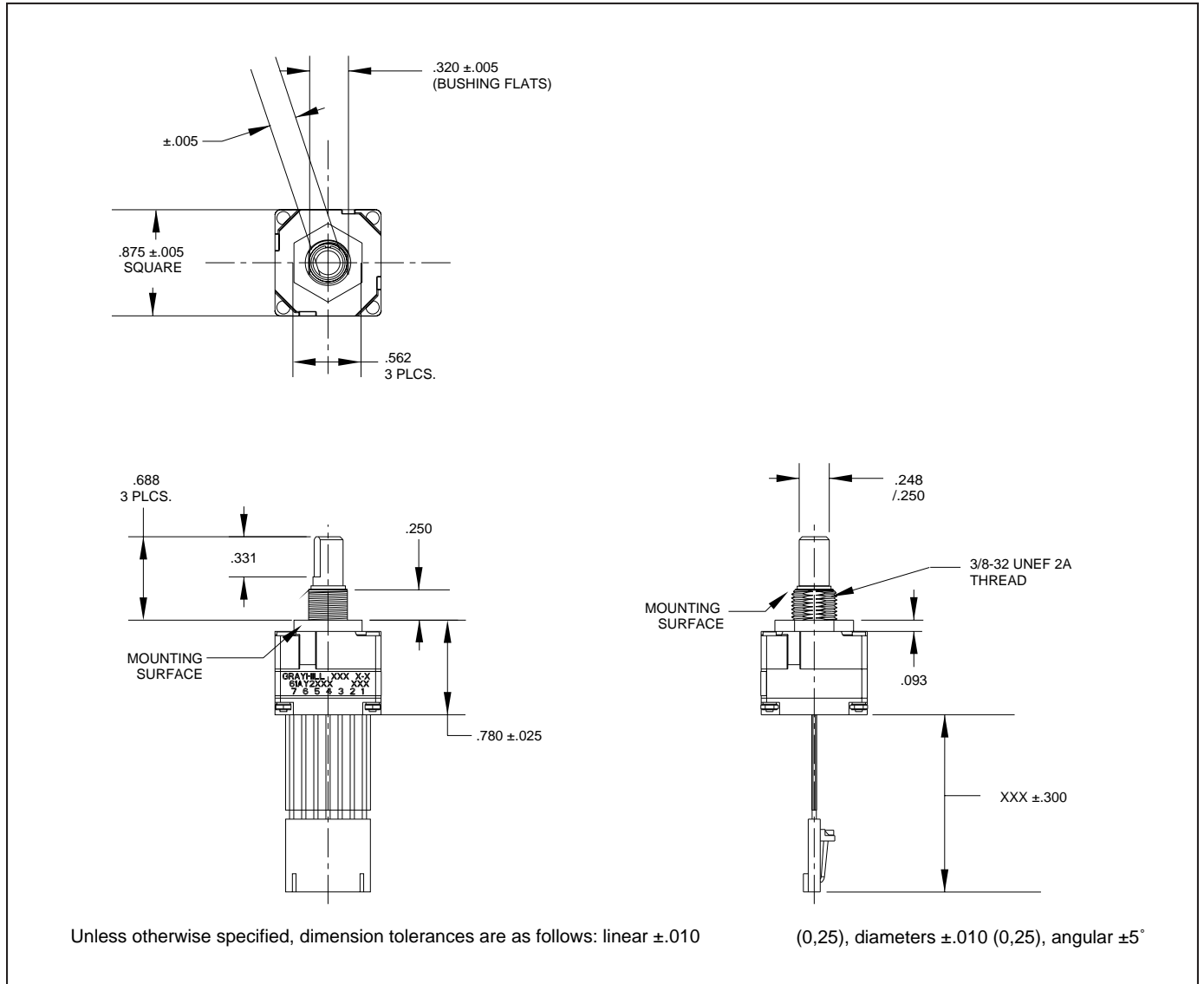
**SERIES 61A**  
Custom, Absolute

**FEATURES**

- Absolute Position Sensing
- 3, 4, or 5-Bit Custom Output Coding
- 8 to 32 Positions
- Continuous Rotation and Fixed Stops Available
- Angles of Throw to 45° (Design Specifications Will Dictate the Angle of Throw)



**DIMENSIONS** In inches (and millimeters)



Optical and Mechanical Encoders

**SPECIFICATIONS**

**Ratings**

**Operating Voltage:** 5 ±.25V DC  
**Supply Current:** 85 mA maximum at 5V DC  
**Life:** 1 million cycles of operation; 1 cycle is rotation through all positions and a full return  
**Rotational Torque:** 1.5 in-oz (Initial)  
**Output High:** 3.8V minimum for CMOS & HCMOS; 2.7V minimum for TTL  
**Output Low:** 0.8V maximum  
**Shaft Push Out Force:** 25 lbs.  
**Mounting Torque:** 10 in-lb maximum  
**Load Current:** 5 mA maximum per channel  
**Logic Rise and Fall Times:** 30 mSec typical

**Environmental**

**Operating Temperature Range:** -40°C to +85°C  
**Storage Temperature Range:** -55°C to +100°C  
**Vibration:** MIL-STD 202, method 204, condition B  
**Mechanical Shock:** 100 g's, 6 ms, half Sine  
 12.3 ft/s and 100 g's, 6 ms, sawtooth, 9.7 ft/s  
**Humidity:** 90-95% Relative humidity at 40°C for 96 hrs.

**Materials and Finishes**

**Detent Housing/Bushing:** Nylon 6/10  
**Shaft:** Glass-filled nylon  
**Detent Balls:** Steel, nickel-plated  
**Code Housings:** Nylon 6/10  
**Backplate:** Nylon 6/10  
**Aperture:** Chemically etched stainless steel with black oxide finish  
**Rotor:** Electroformed nickel and chemically etched stainless steel with black nickel finish  
**Detent Springs:** Tinned music wire  
**PC Boards:** NEMA grade FR-4  
**Through Bolts:** Stainless steel, unplated  
**Through Bolt Nuts:** Stainless steel  
**Switch Assembly Cover:** Thermosetting plastic  
**Mounting Hardware:** One brass, cadmium-plated nut and lockwasher supplied with each switch. Nut is 0.094 inches thick by 0.562 inches across flats.

**ACCESSORIES**

See page I-41. For control knobs see page I-57.

**ORDERING INFORMATION**

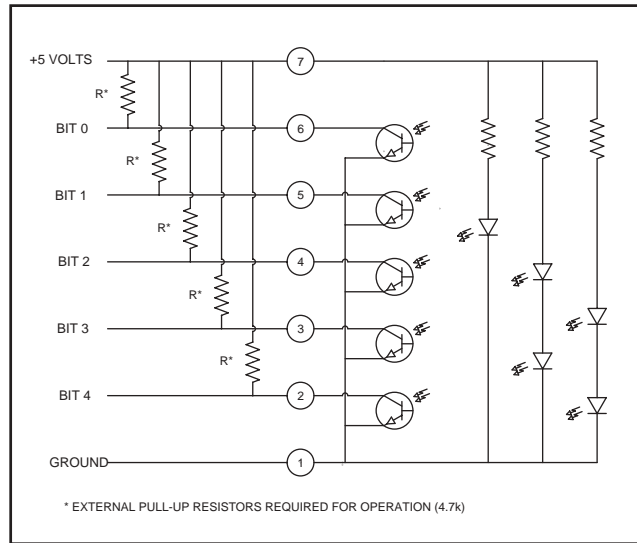
Options include stainless steel detent housing for higher rotational torque applications. Metal shaft and bushing available. Custom shaft and bushing configurations available. Contact Grayhill for information on angles of throw and stop strength.

**61A32-025**

**NUMBER OF POSITIONS**  
 32 = 32 POSITIONS WITH 10° OF THROW  
 24 = 24 POSITIONS WITH 12° OF THROW  
 16 = 16 POSITIONS WITH 18° OF THROW  
 8 = 8 POSITIONS WITH 36° OF THROW

**TERMINATION**  
 BLANK = PINS  
 -XXX = CABLE LENGTH  
 CABLE LENGTH IS DENOTED IN .5" INCREMENTS FROM 025=2.5 INCHES TO 250=25.0 INCHES.

**CIRCUITRY**



**TRUTH TABLE**

**3 BIT, 8 POSITION**

Position	B2	B3	B4
1			
2			●
3		●	●
4		●	
5	●	●	
6	●	●	●
7	●		●
8	●		

● INDICATES LOGIC HIGH  
 BLANK INDICATES LOGIC LOW

**4 BIT, 16 POSITION**

Position	B1	B2	B3	B4
1				
2				●
3			●	●
4			●	
5		●	●	
6		●	●	●
7		●		●
8		●		
9	●	●		
10	●	●		●
11	●	●	●	●
12	●	●	●	
13	●	●	●	
14	●		●	●
15	●		●	
16	●			●

● INDICATES LOGIC HIGH  
 BLANK INDICATES LOGIC LOW

**5 BIT, 32 AND 24 POSITION**

Position	B0	B1	B2	B3	B4
1					
2					●
3				●	●
4				●	
5			●	●	
6			●	●	●
7			●		●
8			●		
9		●	●		
10		●	●		●
11		●	●	●	●
12		●	●	●	
13		●		●	
14		●		●	●
15		●			●
16		●			
17	●	●			
18	●	●			●
19	●	●		●	●
20	●	●		●	
21	●	●	●	●	
22	●	●	●	●	●
23	●	●	●		●
24	●	●	●		
25	●		●		
26	●		●		●
27	●		●	●	●
28	●		●	●	
29	●			●	
30	●			●	●
31	●				●
32	●				

● INDICATES LOGIC HIGH  
 BLANK INDICATES LOGIC LOW