

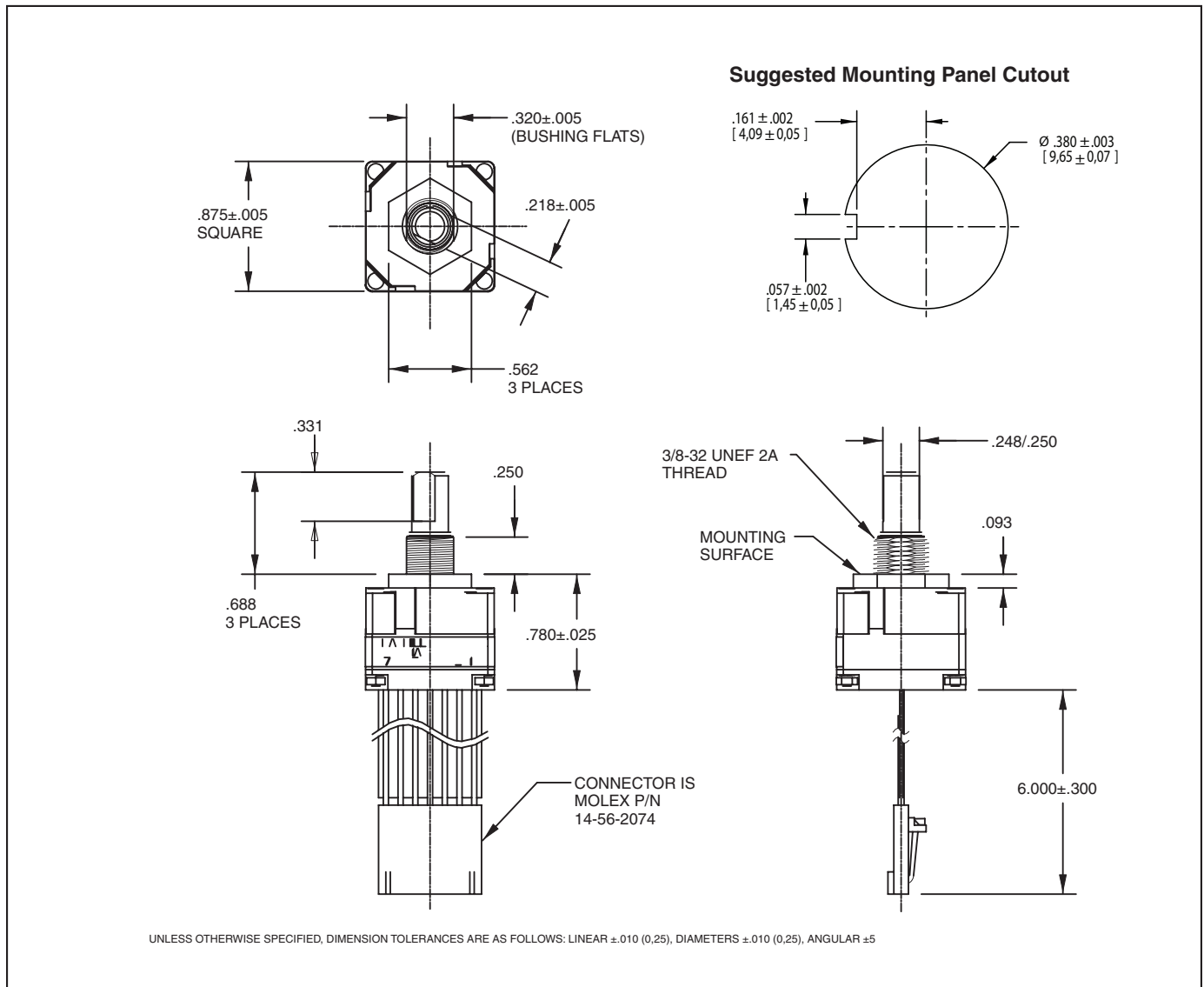
## SERIES 61A Custom, Absolute

### FEATURES

- Absolute Position Sensing
- 3, 4, or 5-Bit Custom Output Coding
- Available in 8, 16 and 32 detent positions
- Fixed Stops Only
- Angles of Throw to 45° (Design Specifications Will Dictate the Angle of Throw)



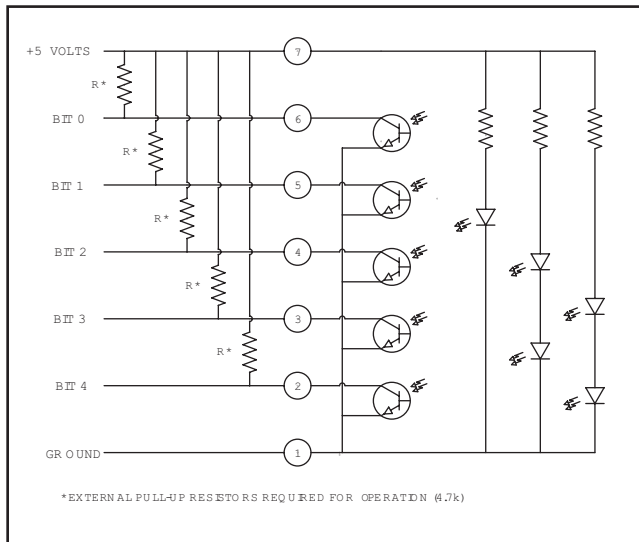
### DIMENSIONS in inches (and millimeters)





# Optical Encoders

## 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

### 5 BIT, 32 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

### 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

## 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:** 12 ±4 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 Temp. Range:** -40°C to +85°C
- Storage Temp. Range:** -55°C to +100°C
- Vibration:** MIL-STD 202, method 204, cond. 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:** Stainless Steel
- Bushing:** Brass, tin/zinc plated
- Shaft:** Stainless steel
- 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 oxide finish
- Detent Springs:** Tinned music wire
- PC Boards:** NEMA grade FR-4
- Through Bolts:** Stainless steel, unplated
- Through Bolt Nuts:** Stainless steel
- Mounting Hardware:** One brass, tin/zinc-plated nut and one stainless steel, zinc-plated lockwasher supplied with each switch. Nut is 0.094 inch thick by 0.562 inch across flats.

## ORDERING INFORMATION

**Series**  
**Style:** A = Absolute position sensing  
**Number of positions:** 32 = 32 positions with 10° of throw  
 16 = 16 positions with 18° of throw  
 8 = 8 positions with 36° of throw

**61A32-060**  
**Termination:** 060 = 6.0 inches cable terminated with Molex connector P/N 14-56-2074.

Available from your local Grayhill Component Distributor.

For prices and discounts, contact a local sales office, an authorized local distributor, or Grayhill direct.