



Optical Encoders

**SERIES 61L**  
**Full Quadrature Cycle Per Detent**

**FEATURES**

- .650 sq. inch package size
- Optically coupled for 1 million rotational cycles
- Optional integrated pushbutton
- Detented and non-detented versions available
- Available in 24 positions

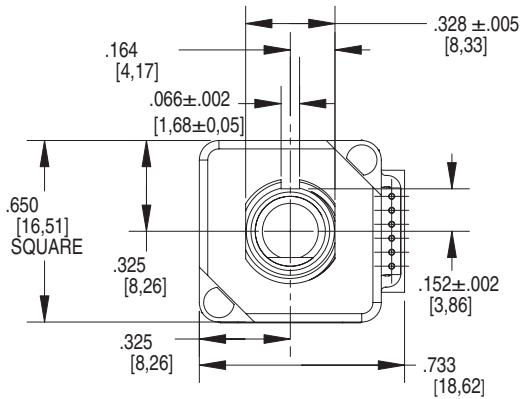
**APPLICATIONS**

- Medical Devices
- Test and Measurement Equipment
- Other Scroll and Select Applications

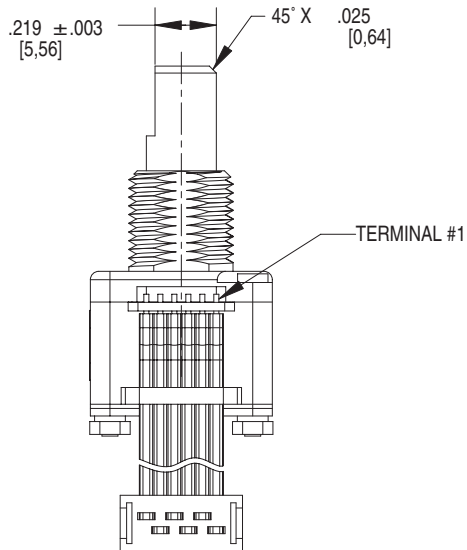
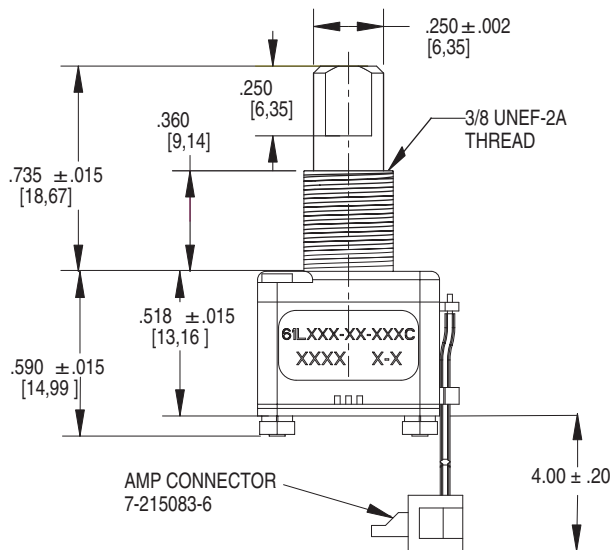
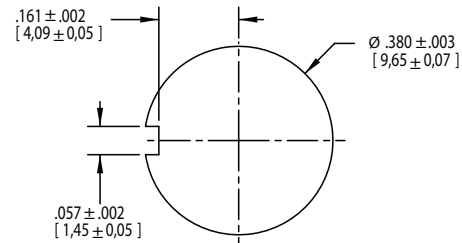


**DIMENSIONS** in inches (and millimeters)

Unless otherwise specified, standard tolerances are:  
 Linear  $\pm .025$   
 Diameter  $\pm .010$   
 Angle  $\pm 2.0^\circ$

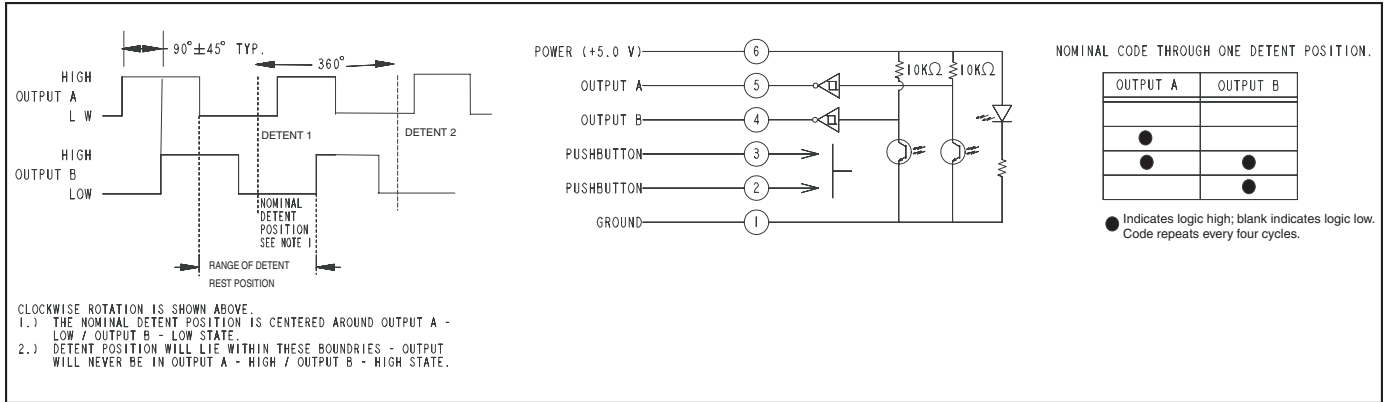


**Suggested Mounting Panel Cutout**



Optical and Mechanical Encoders

## CIRCUITRY, WAVEFORM AND TRUTH TABLE



## SPECIFICATIONS

### Environmental Specifications

**Operating Temperature Range:** -40°C to 85°C

**Storage Temperature Range:** -55°C to 100°C

**Humidity:** 96 hours at 90-95% humidity at 40°C

**Mechanical Vibration:** Harmonic motion with amplitude of 15g, within a varied frequency of 10 to 2000 Hz

### Mechanical Shock:

Test 1: 100g for 6 ms half-sine wave with a velocity change of 12.3 ft/sec

Test 2: 100g for 6 ms sawtooth wave with a velocity change of 9.7 ft/sec

### Rotary Electrical and Mechanical Specifications

**Operating Voltage:** 5.00±.25Vdc

**Supply Current:** 30 mA maximum at 5Vdc

**Output Code:** Two-bit quadrature, channel A leads channel B by 90° electrically during clockwise rotation of the shaft.

### Logic Output Characteristics:

Logic high signal shall be no less than 3.8 Vdc

Logic low signal shall be no greater than 0.8 Vdc

**Minimum Sink Current:** 2.0 mA

**Power Consumption:** 150 mW maximum

**Mechanical Life:** 1 million cycles of operation for Medium, Low and Non-Detent. 1/2 million cycles of operation for High. One cycle is a rotation through all positions and a full return.

**Average Rotational Torque:** H= 6.0 ± 2.6

in-oz, M= 2.7 ± 1.8 in-oz, L= 1.4 ± 0.8 in-oz, N= <0.5 in-oz. Torque shall be within 50% of initial value throughout life.

**Mounting Torque:** 15 in-oz maximum

**Shaft Push-Out Force:** 45 lbs minimum

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**Terminal Strength:** 15 lbs minimum terminal pull-out force for cable or header termination

**Solderability:** 95% free of pinholes and voids

### Pushbutton Electrical and Mechanical Specifications

**Rating:** 50 mA at 12 Vdc

**Contact Resistance:** <10Ω

**Life:** 1/2 million actuations minimum

**Contact Bounce:** <4 ms make, <10 ms break

**Actuation Force:** 510 ±150 grams

**Shaft Travel:** .025 ± .015 inch

### Materials and Finishes

**Bushing:** Zinc

**Shaft:** Aluminum

**Cable:** Copper Standard with Topcoat in PVC Insulation

**Connector:** Glass filled Polyester, Tin/Nickel Phosphor Bronze

**Solder:** 96.5% tin / 3% silver / 0.5% copper, no clean

**Lockwasher:** Stainless Steel

**Hex Nuts:** Stainless Steel

This product series is ROHS Compliant.

