

## SERIES 61L Full Quadrature Cycle Per Detent

### FEATURES

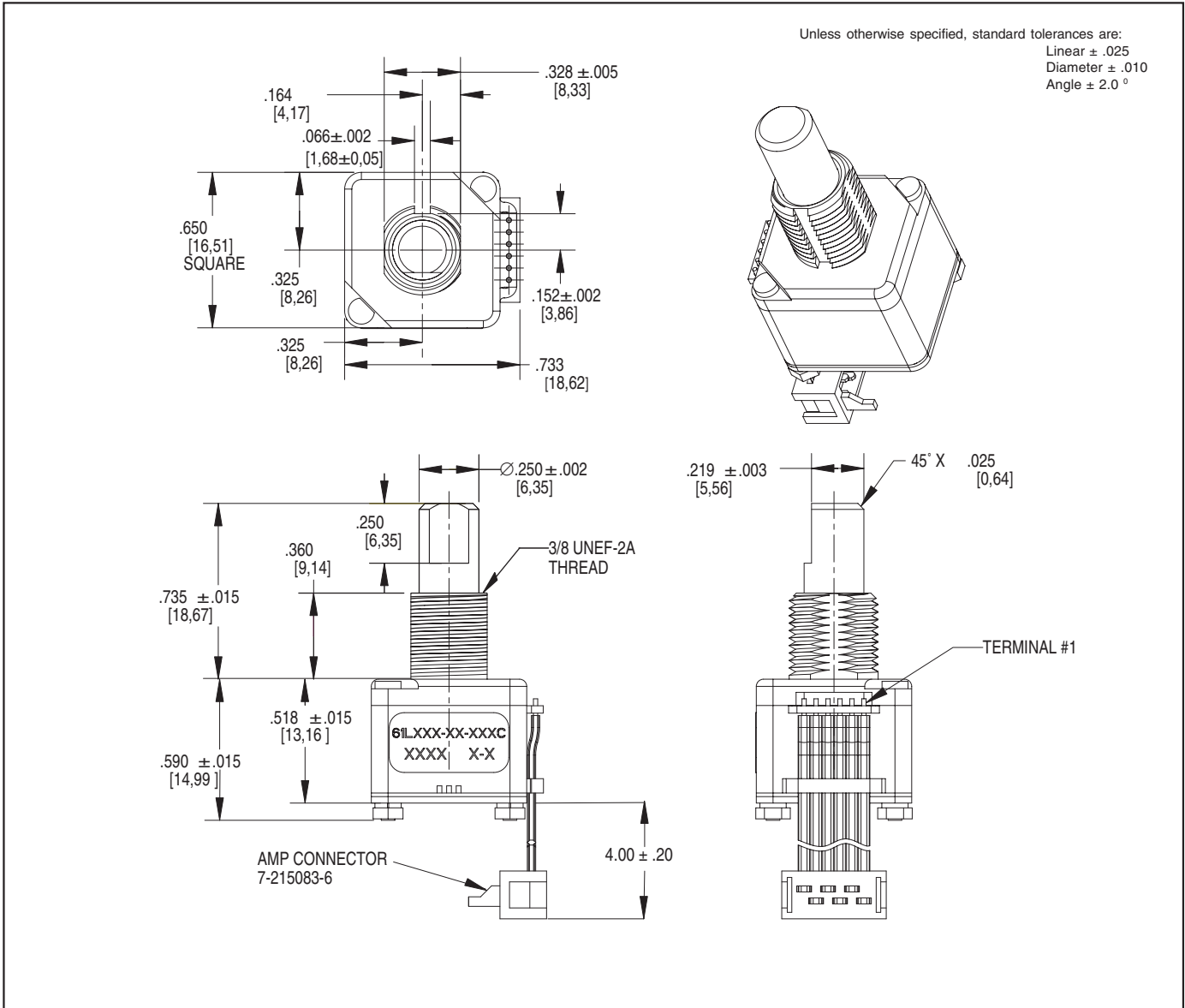
- .650 sq. inch package size
- Optically coupled for 1 million rotational cycles
- Optional integrated pushbutton
- Detented and non-detented versions available
- Available in 24 positions

### APPLICATIONS

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

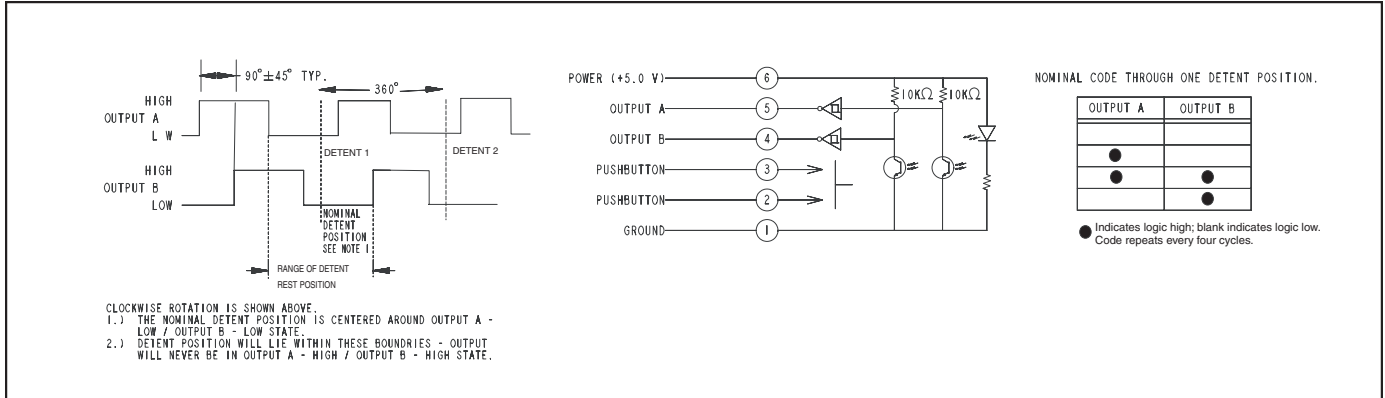


### DIMENSIONS In inches (and millimeters)



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= <0.50 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**

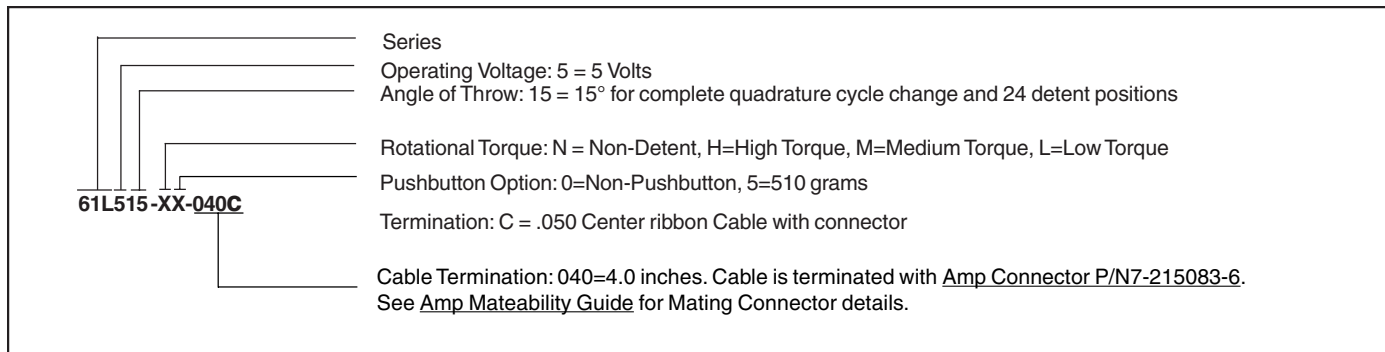
**Rating:** 50 mA at 12 Vdc  
**Contact Resistance:** <10Ω  
**Life:** 1/2 million actuations minimum  
**Contact Bounce:** <4 ms make, <10 ms break  
**Actuation Force:** 510 ± 150 grams  
**Shaft Travel:** .025 ± .015 inch

**Materials and Finishes**

**Bushing:** Zinc  
**Shaft:** Aluminum  
**Retaining Ring:** Stainless Steel  
**Detent Spring:** Music Wire  
**Detent Ball:** High Carbon Chrome, Nickel finish  
**Code Housing:** Polyamide Polymer, Hiloy 610  
**Aperture:** Stainless Steel

**Detent:** Polyamide Polymer, Hiloy 610  
**Rotor Hub:** Polyamide Polymer, Hiloy 610  
**Code Rotor:** Stainless Steel  
**Printed Circuit Boards:** Nema Grade FR4, Double Clad with Copper, Plated with Gold over Nickel  
**Infrared Light Emitting Diode Chips:** Gallium Aluminum Arsenide  
**Silicon Phototransistor Chips:** Gold and Aluminum Alloys  
**Resistor:** Metal Oxide on Ceramic Substrate  
**Solder Pins:** Brass, Plated with Tin  
**Tact Switch:** Cover - Stainless Steel, contact Disc - Phosphor Bronze with silver cladding, terminal - brass with silver cladding, base - UL94V-0 Nylon 19: High Temp  
**Back Plate:** Stainless Steel  
**Spacer:** Nomex Type 410  
**Cable:** Copper Standard with Topcoat in PVC Insulation  
**Connector:** Glass filled Polyester, Tin/Nickel Phosphor Bronze  
**Label:** TT406 Thermal Transfer Cast Film  
**Solder:** 96.5% tin / 3% silver / 0.5% copper, no clean  
**Lubricating Grease:** NYE Nyogel 774L  
**Studs:** Stainless Steel  
**Lockwasher:** Stainless Steel  
**Hex Nuts:** Stainless Steel

Optical and Mechanical Encoders



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