



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

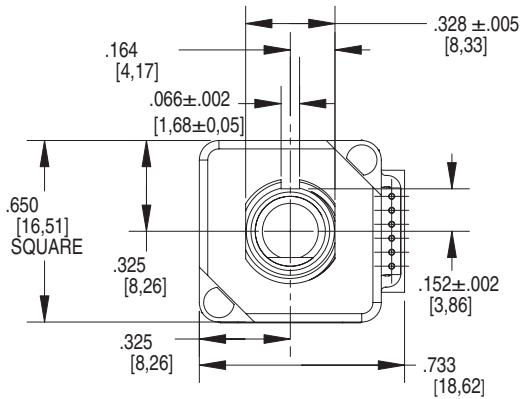
APPLICATIONS

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

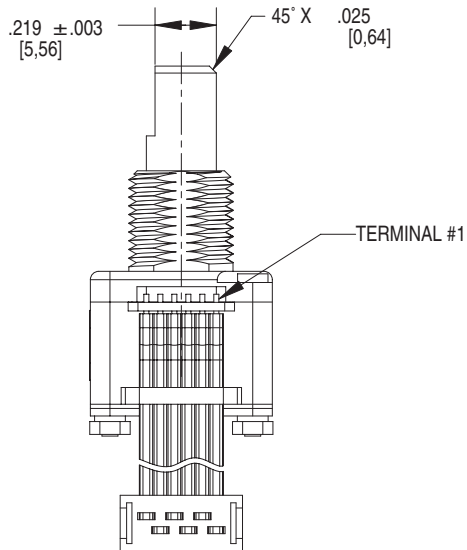
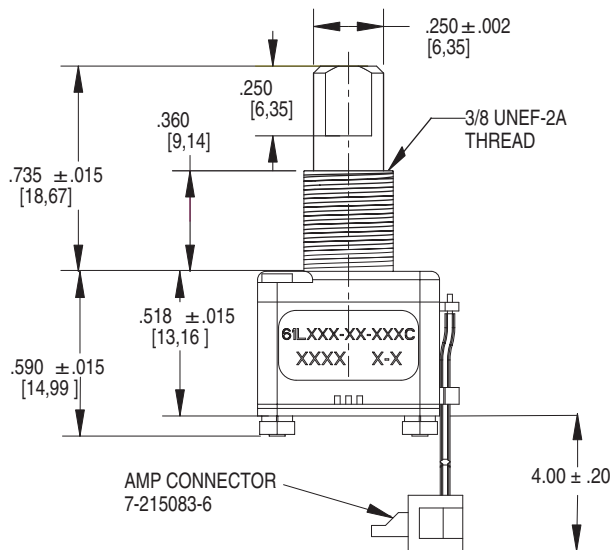
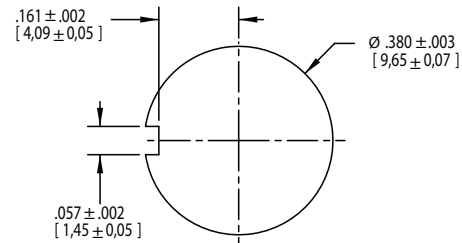


DIMENSIONS in inches (and millimeters)

Unless otherwise specified, standard tolerances are:
 Linear ± .025
 Diameter ± .010
 Angle ± 2.0 °

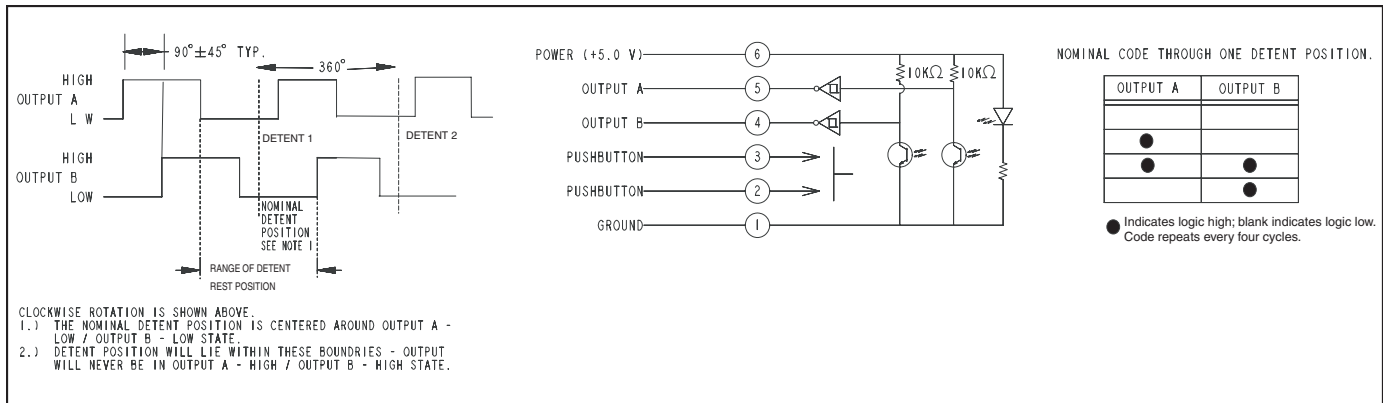


Suggested Mounting Panel Cutout



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= <0.50 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



Series

Operating Voltage: 3 = 3.3 Volts, 5 = 5 Volts

Angle of Throw: 07 = 7.2° for complete quadrature cycle change and 50 detent positions
15 = 15° for complete quadrature cycle change and 24 detent positions

Rotational Torque: N = Non-Detent, H=High Torque, M=Medium Torque, L=Low Torque

Pushbutton Option: 0=Non-Pushbutton, 5=510 grams

Termination: C = .050 Center ribbon Cable with connector

Cable Termination: 040=4.0 inches. Cable is terminated with [Amp Connector P/N7-215083-6](#). See [Amp Mateability Guide](#) for Mating Connector details.