

Optical Encoders

## SERIES 61M Optically Coupled for Simulated Mechanical Rotary Switch Output

# FEATURES

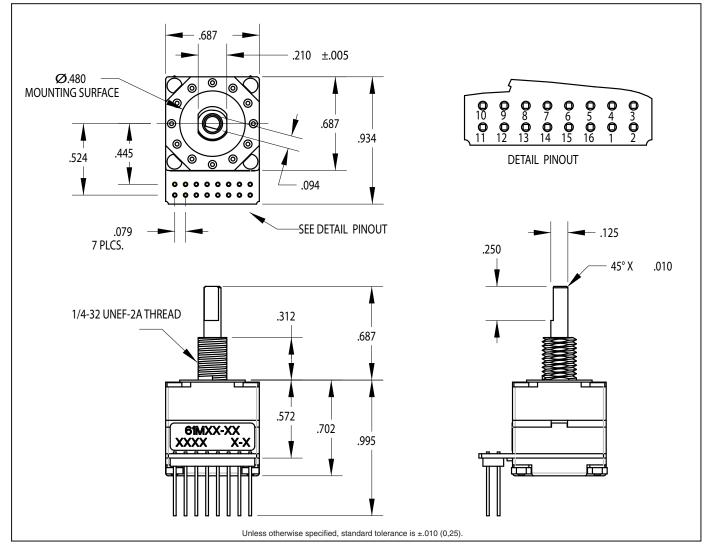
- Optical Alternative to Rotary Contacts
- One Pulse Per Detent Position Per Rotation
- Long Life of a Million Cycles
- With or Without Pushbutton
- Continuous Rotation and Fixed Stops Available
- Rugged Construction

# Applications

- Avionics
- Any application requiring rotary switch output and the increased reliability of an optical device.



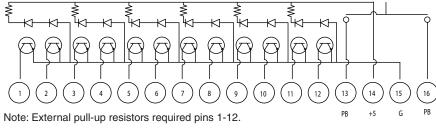




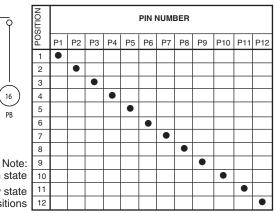
Optical Encoders

# <u>Grayhill</u>

## **CIRCUITRY and TRUTH TABLE**



Blank Indicates high state Indicates low state Code repeats every 12 positions



#### **SPECIFICATIONS**

## **Pushbutton Specifications**

Rating: 10mA at 5 Vdc Contact Resistance: Less than 10 Ohms Contact Bounce: Less than 4 mS at make and less than 10 mS at break Actuation Life: 3,000,000 actuations Actuation Force: 8-850±200g, 5-550±200g Shaft Travel: .020±.010 inch

#### **Rotary Specifications**

Rating: 5.0 ± .25 Vdc
Supply Current: 60mA maximum at 5 Vdc
Output: Open collector phototransistor, external pull-up resistors are required
Output Code: One pulse per position per rotation (360 degrees CW/CCW)
Logic High: 3.0V minimum
Logic Low: 1.0V maximum
Power Consumption: 300mW maximum

Mechanical Life: 1 million cycles of operation (1 cycle= $360^{\circ}$  rotation) Rotational Torque: H- 10.0 $\pm$ 3.0 in\*oz, (initial) L- 4.0 $\pm$ 1.5 in\*oz (torque shall be within 50% of initial value throughout life) Shaft Pushout Force: 50 lbs. minimum Shaft Pullout Force: 50 lbs. minimum

#### Environmental

#### **Operating and Storage Temperature Range:** -40°C to +85°C **Humidity:** 90-95% Relative Humidity at

40°C for 96 hours Vibration: Harmonic motion with amplitude

of 15g, within a varied frequency of 10-2000 hZ

Mechanical Shock: 100g's, 6 ms, Half Sine, 12.3 ft/s and 100g's, 6 ms, Sawtooth, 9.7 ft/s

#### **Materials and Finishes**

Shaft: Stainless steel Detent/Bushing Housing: Stainless steel Code Rotor: Reinforced Thermoplastic Stop Arm: Stainless steel Deck Spacer: Reinforced thermoplastic Detent Springs: Piano wire Detent Balls: Nickel plated stainless steel Pushbutton Actuator: Zytel 70G33L Domes: Stainless steel Backplate: Reinforced Thermoplastic Printed Circuit Boards: NEMA Grade FR-4, double clad copper, gold plated over nickel Phototransistor: Planar silicone Infrared Emitter: Gallium aluminum arsenide Solder Pins: Tin plated brass Header: Hi-temp glass filled thermoplastic UL94V-0, phosphor bronze Resistor: Metal oxide on ceramic substrate

## **ORDERING INFORMATION**

