



# Optical Encoders

## SERIES 62M Magnetic Detent

### FEATURES

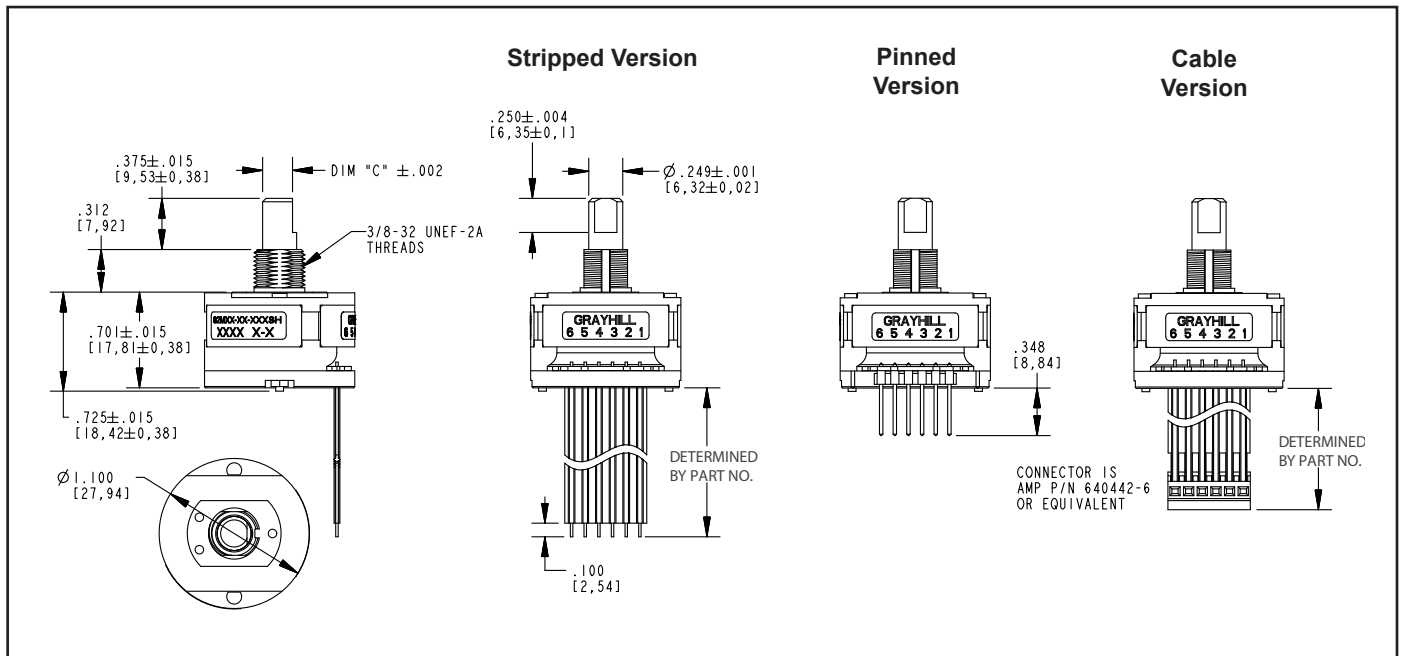
- Ultra Smooth Magnetic Detent
- 3 Million Rotational Cycles, Ten Times the Life of a Mechanical Detent System
- Optional Integrated Pushbutton
- Available in 24 Positions
- Choice of Cable Lengths

### Applications

- Medical
- Audio
- Instrumentation

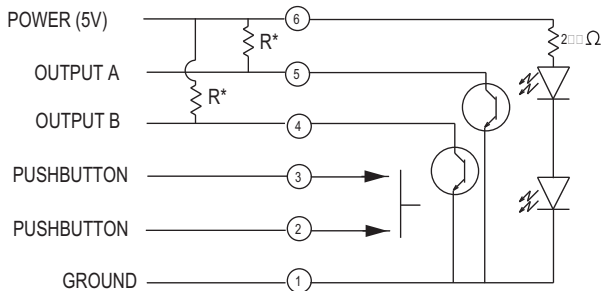


### DIMENSIONS in inches (and millimeters)



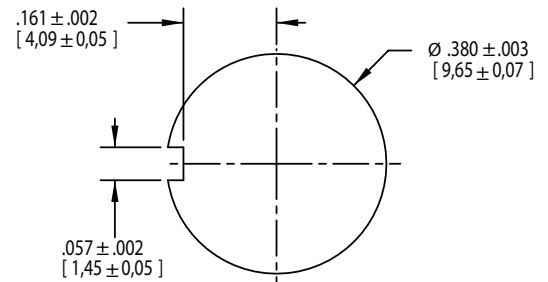
Optical and Mechanical Encoders

### SWITCH SCHEMATIC

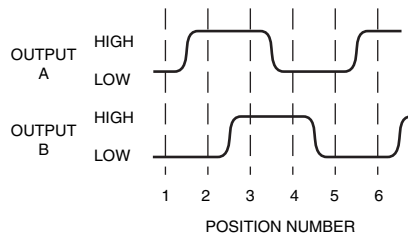


\*EXTERNAL 2.2k Ω PULL-UP RESISTORS REQUIRED FOR OPERATION.

### RECOMMENDED PANEL CUTOUT



## WAVEFORM AND TRUTH TABLE



Clockwise Rotation		
Position	Output A	Output B
1		
2	•	
3	•	•
4		•

• Indicates logic high; blank indicates logic low. Code repeats every 4 positions.

## 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 15 g, within a varied frequency of 10 to 2000 Hz

### Mechanical Shock:

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

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

### Rotary Electrical and

### Mechanical Specifications

**Operating Voltage:** 5.00±.25 Vdc

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

**Output:** Open collector phototransistor, external pull-up resistors are required.

**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 3.0 Vdc

Logic low signal shall be no greater than 1.0 Vdc

**Minimum Sink Current:** 2.0 mA

**Power Consumption:** 150 mW maximum

**Mechanical Life:** 3 million rotational cycles of operation. One cycle is a rotation through all positions and a full return

**Rotational Torque:** H=1.70 ± 1.00 in-oz, M=1.25 ± 0.75 in-oz, L=0.75 ± 0.5 in-oz

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

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

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

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

**Solderability:** 95% free of pin holes and voids

### Pushbutton Electrical and Mechanical Specifications

**Rating:** 10 mA at 5 Vdc

**Contact Resistance:** <10 ohms

**Life:** 3 million actuations minimum

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

**Actuation Force:** 2=200±75 grams, 3=300±90 grams, 4=510±150 grams

**Shaft Travel:** .025 ± .010 inches

### Materials and Finishes

**Bushing:** Zinc Diecast, Cadmium Plated per QQP-416, Class II, Type II

Insert Molded into 25% Glass Reinforced

Nylon Zytel FR-50

**Shaft:** NdFeB XE-3594 over Aluminum

**Stator:** Powdered Metal per F-0000-20

**Through Bolts:** 305 Stainless Steel

**Through Bolts Nuts:** Stainless Steel

**Spacer Washer:** Brass

**Snap Dome:** 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

**Code Rotor:** Acetal (Delrin 100)

**Code Housing:** Polyamide Polymer (Nylon 6/10 Alloy)

**Backplate Strain Relief:** Polyamide Polymer (Nylon 6/10 Alloy - Hiloy-610)

**Cable:** Copper Standard with Topcoat in PVC Insulation (Cabled Versions Only)

**Connector:** PA4.6 with Tin Plated Copper Alloy (Cable/Connector Versions)

**Label:** TT406 Thermal Transfer Cast Film

**Solder:** Sn/Ag/Cu, Lead Free, No Clean

**Mounting Hex Nut:** Cadmium over 1/2 Hard Brass

**Lockwasher:** 8-18 Stainless Steel, Passivate Finish

**Pin Header:** Hi-Temp Glass Filled Thermoplastic UL94V-0, Phosphor Bronze (Pinned Versions Only)

