

# Optical Encoder

## Series 62M

## Magnetic Detent



### FEATURES

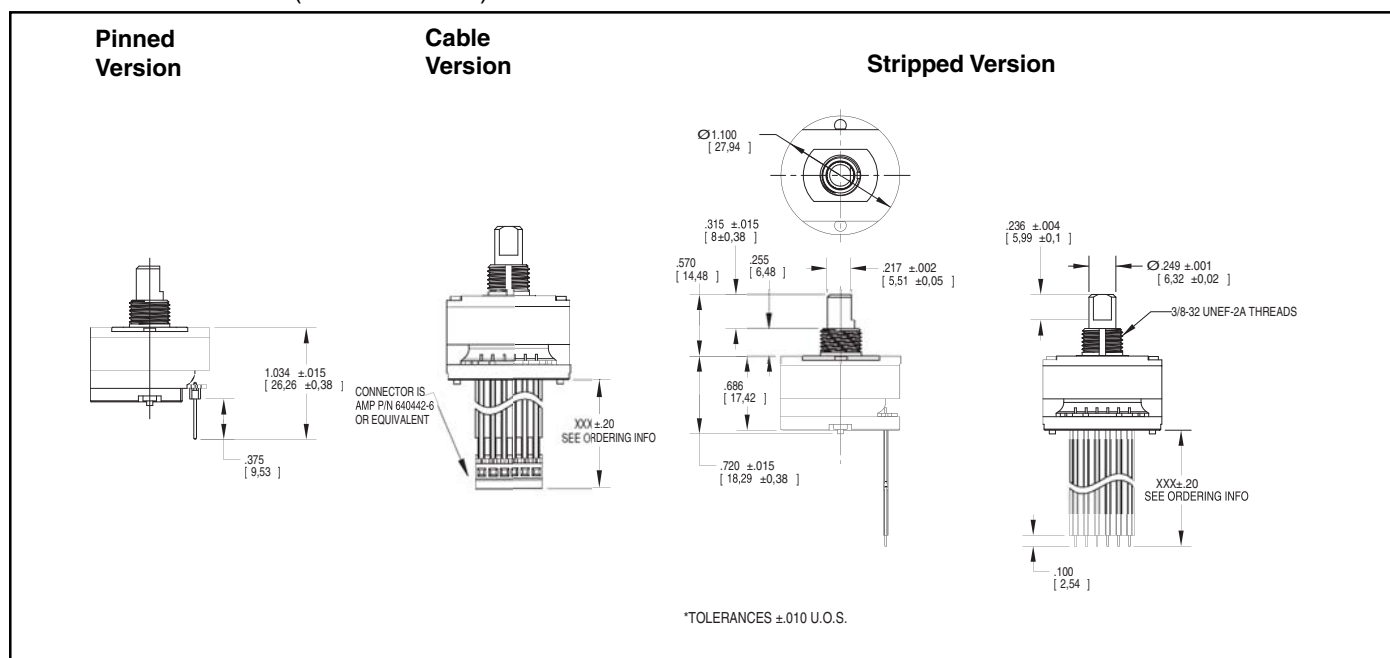
- Ultra Smooth Magnetic Detent
- 10 Million Rotational Cycles, Ten Times the Life of a Mechanical Detent System
- Optional Integrated Pushbutton
- Available in 16 and 24 Positions
- Choice of Cable Lengths

### Applications

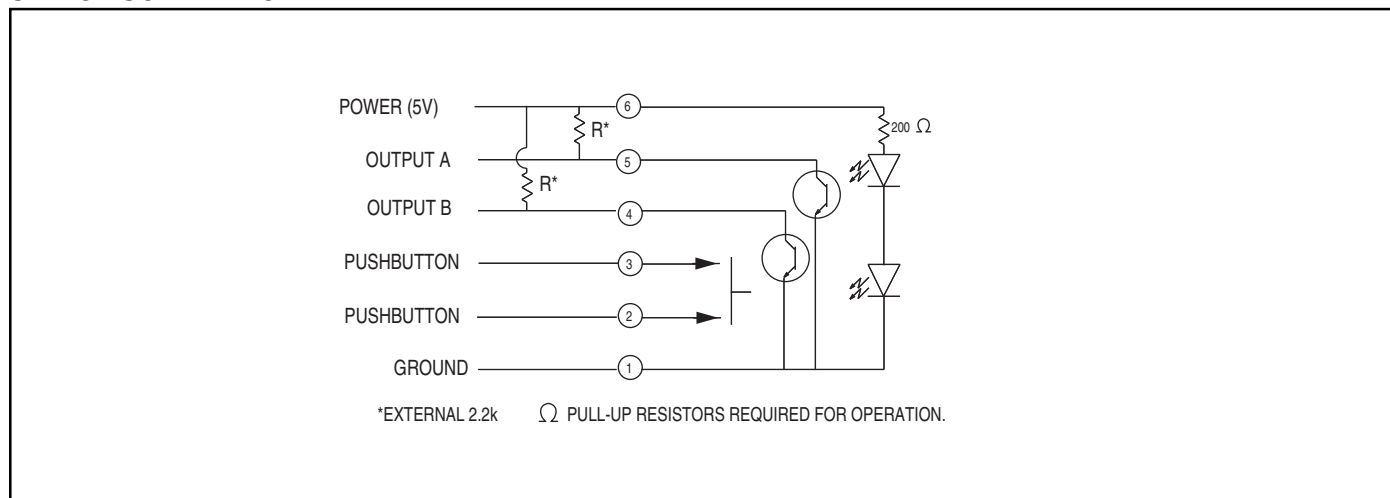
- Medical
- Audio
- Instrumentation



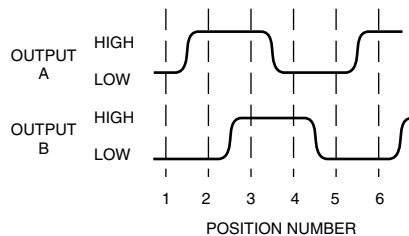
### DIMENSIONS In inches (and millimeters)



### SWITCH SCHEMATIC



## 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:** 10 million rotational cycles of operation. One cycle is a rotation through all positions and a full return

**Average Rotational Torque:** H=2.00 in-oz  
M=1.00 in-oz, L=.50 in-oz

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

**Shaft Pull-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:** .25 ± .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 Grilamid LV23H

**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:** Hiloy-610

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

**Connector:** PA4.6 with Tin/Lead Plated Phosphor Bronze (Cable/Connector Versions)

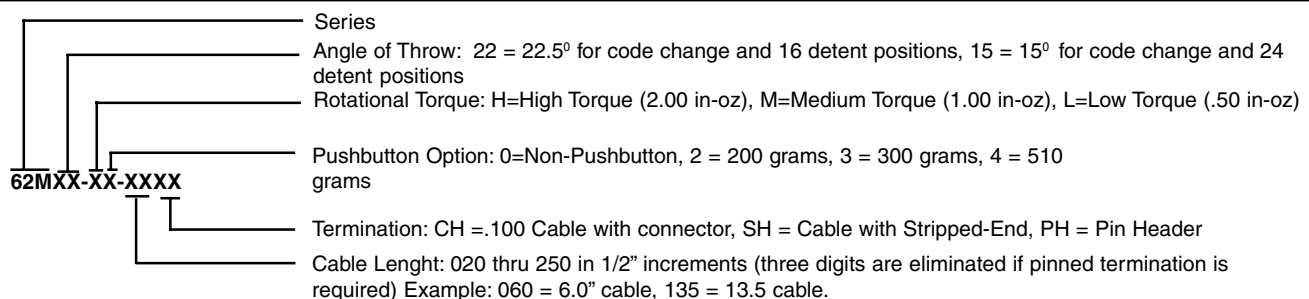
**Label:** TT406 Thermal Transfer Cast Film

**Solder:** 60/40 Tin Lead, No Clean - Low Residue Flux

**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)



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

561 Hillgrove Avenue • LaGrange, IL 60525 • Phone: 708.354.1040 • Fax: 708-354-2820 • [www.grayhill.com](http://www.grayhill.com)