



# Optical Encoders

## SERIES 62B Push-Pull, High Torque

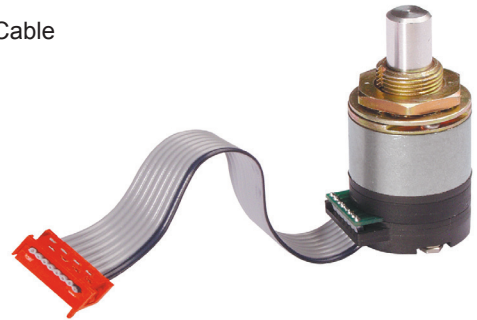
### FEATURES

- Multiple Switching Functions Available in One Compact Device
- Push and Pull Travel Options
- Pull Shaft Resists Accidental Actuation
- High Rotational Torque for Positive Detent Feel and Superior Tactile Feedback
- Long Life, High Reliability
- CMOS, HCMOS, and TTL Compatible

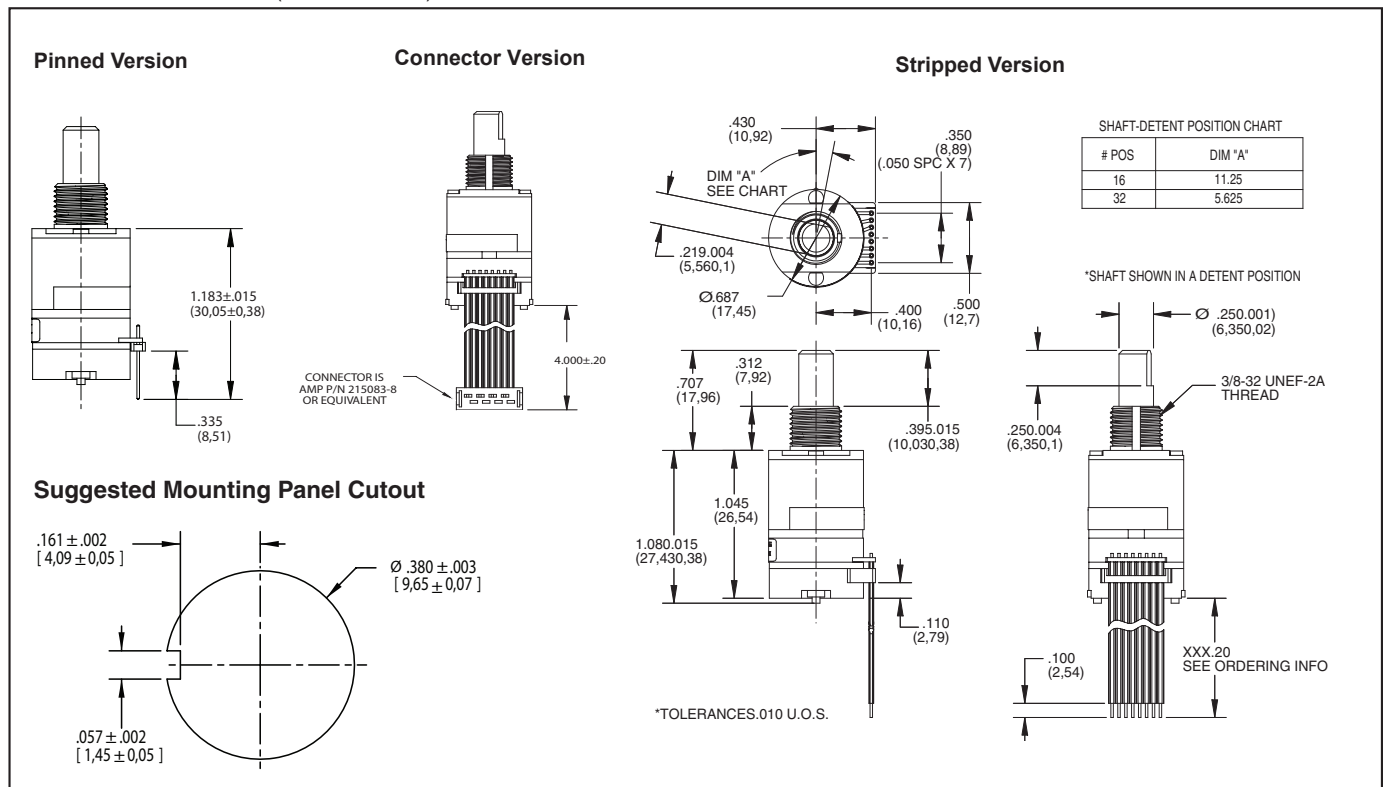
- Pin, Cable and Connector with Cable Termination Options
- Custom Modifications Available

### APPLICATIONS

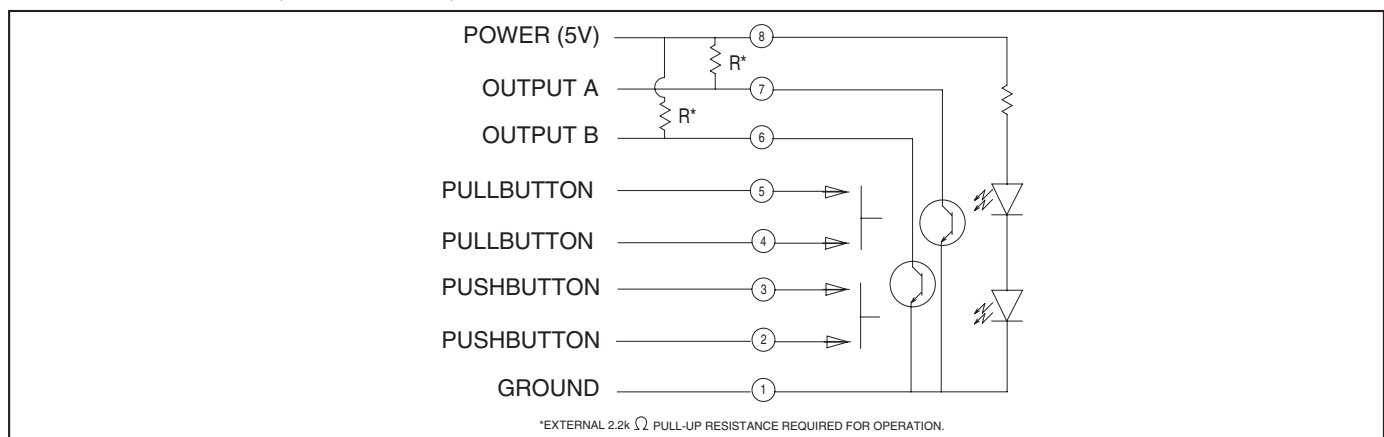
- Use for Menu Scrolling or Function Selection
- Avionics
- Industrial
- Medical



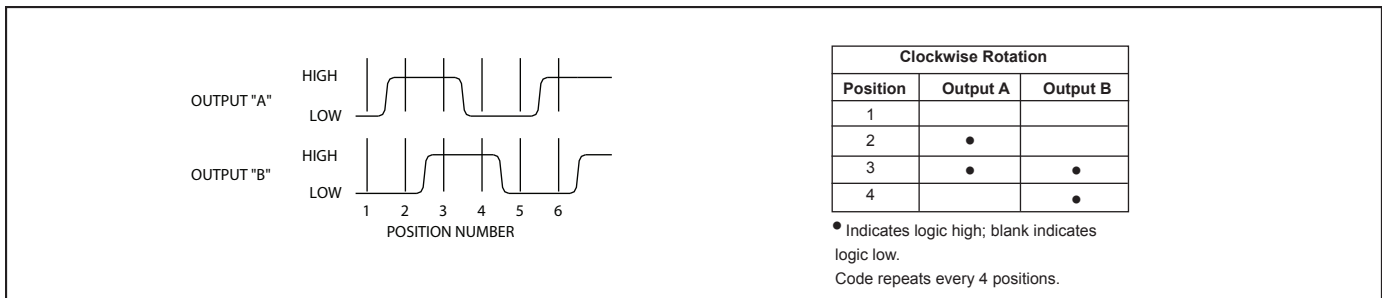
### DIMENSIONS in inches (and millimeters)



### SWITCH SCHEMATIC, WAVEFORM, AND TRUTH TABLE



**WAVEFORM AND TRUTH TABLE** Standard Quadrature 2-Bit Code



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

**Average Rotational Torque:** 16 position: 5.0 ± 1.5 in-oz, 32-position: 2.5 ± 1.5 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

**Shaft Pull-Out Force:** 20 lbs minimum

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

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

**Pull-Button/Push-Button 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:** 1700±450 g for both push and pull-button

**Shaft Travel:** .030±.010 standard travel. .050±.010 long travel

**Materials and Finishes**

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

**Shaft:** Aluminum

**Detent Cover:** Powdered Metal per SS-316N1-25

**Through Bolts:** 305 Stainless Steel

**Through Bolts Nuts:** 305 Stainless Steel

**Shaft Travel Springs:** Carbon Steel, Oil Dip Finish

**Detent Ball:** Stainless Steel

**Detent Spring:** Tinned Music Wire

**Spacer/ Push Dome Retainer:** Ryton R-4

**Push Actuator:** Zytel 70G33L

**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:** Delrin 100

**Code Housing:** Hiloy-610

**Pull Dome Retainer:** Ryton R-4

**Pull Actuator:** Polyurethane, Isoplast 101 LGF40 Blk

**Cover:** Ryton R-4

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

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

**Label:** TT406 Thermal Transfer Cast Film

**Solder:** Sn/Ag/Cu, lead-free, no clean

**Lubricating Grease:** Nye Nyogel 774L

**Mounting Hex Nut:** Tin/Zinc 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)

Optical and Mechanical Encoders

**ORDERING INFORMATION**

**Series**  
**Angle of Throw:** 22 = 22.5° For Code Change and 16 Detent Positions.  
 11 = 11.25° For Code Change and 32 Detent Positions.  
**Push/Pull-Button Travel:** S = Standard Travel (.030" Both Directions). L = Long Travel (.050" Both Directions)  
**Push/Pull Option:** P = Pull-Button Only. PP = Push and Pull-Button  
**Termination:** C = .050" Pitch Ribbon Cable with Connector  
 S = .050" Pitch Ribbon Cable with Stripped End  
 P = .050" Pitch Pin Header  
**Cable Termination:** 040 = 4.0in. Cable is terminated with Amp Connector P/N 215083-6. See Amp Mateability Guide for mating connector details.  
 \*Eliminate cable length if ordering pins (Ex: 62B22-SP-P)