

**SERIES 62S**  
Compact 1/2" Package

**FEATURES**

- Compact Size, Requires Minimal Behind Panel Space
- 1 Million Rotational Cycles, 3 Million for Non-Detent Styles
- Optional Integral Pushbutton
- Choices of Cable Length and Terminations

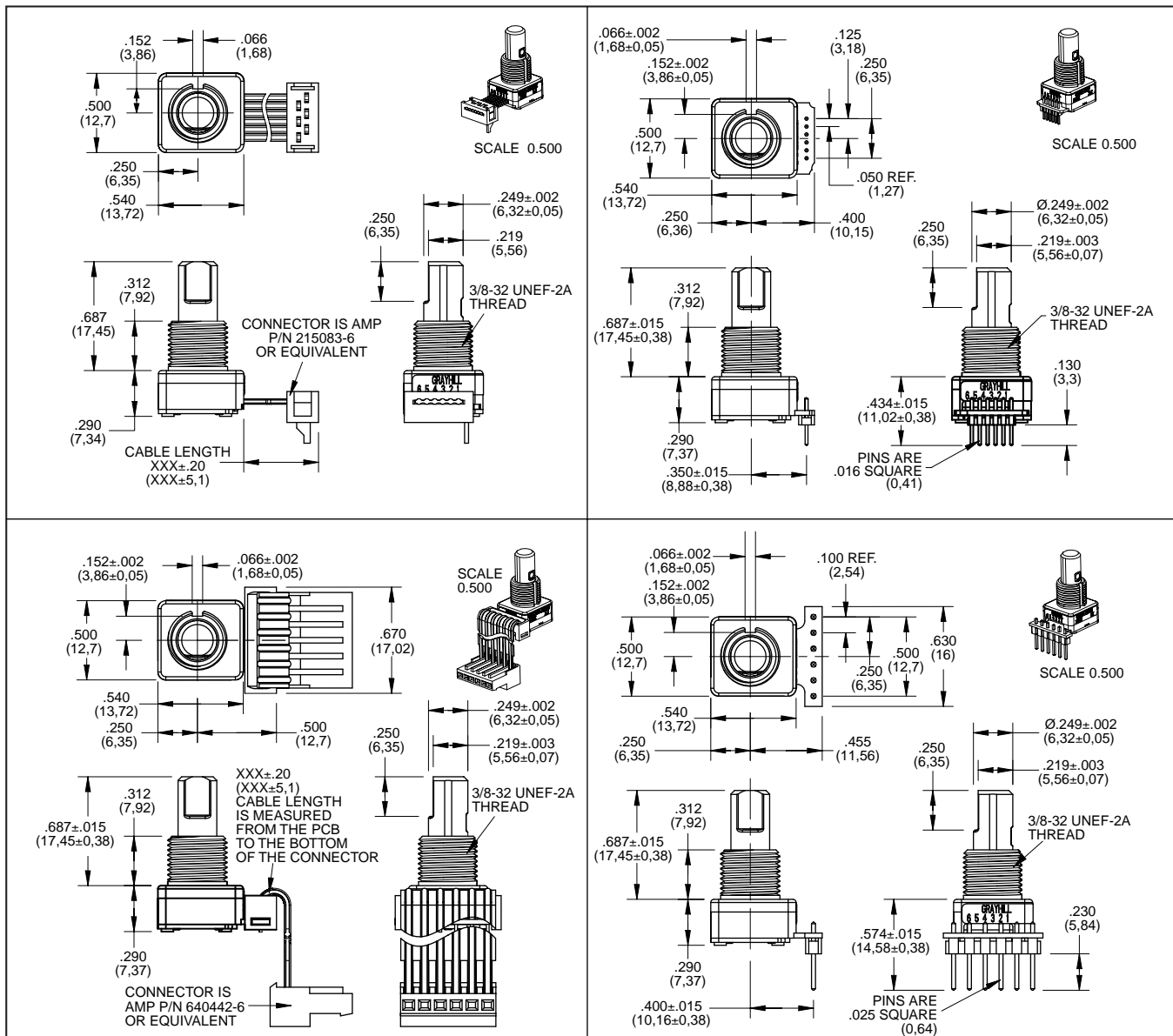
**APPLICATIONS**

- Global Positioning/Driver Information Systems
- Medical Equipment



**DIMENSIONS** In inches (and millimeters)

Unless otherwise specified, standard tolerance is  $\pm 0.010$  (0,25)



Optical and Mechanical Encoders

## CIRCUITRY, TRUTH TABLE, AND WAVEFORM 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 15G's, 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/s; Test 2: 100G for 6 mS, sawtooth wave with a velocity change of 9.7 ft/s

#### Rotary Electrical and Mechanical Specifications

**Operating Voltage:** 5.00 ±0.25 Vdc

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

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

**Output Code:** 2-Bit quadrature, channel A leads channel B by 90° electrically during clockwise rotation of the shaft

#### Logic Output Characteristics:

Logic High shall be no less than 3.0 Vdc

Logic Low shall be no greater than 1.0 Vdc

**Minimum Sink Current:** 2.0 mA

**Power Consumption:** 150 mW maximum

#### Mechanical Life:

Non-Detent 3 Million Cycles

Low & Medium 1 Million Cycles

High 1/2 Million Cycles

1 cycle is a rotation through all positions and a full return

**Average Rotational Torque:** H-3.60±1.60 in-oz, M-2.20±1.40 in-oz, L-1.20±0.50 in-oz, N-<0.50 in-oz initially, 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 pin holes and voids

#### Pushbutton Electrical and Mechanical Specifications

**Rating:** 10 mA at 5 Vdc

**Contact Resistance:** <10Ω

**Life:** 3 million actuations minimum

**Contact Bounce:** <4 ms Make, <10 ms Break

**Actuation Force:** 9-950±250 grams, 5-510±110 grams, 4-400±100 grams, 3-300±90 grams, 2-200±75 grams

**Shaft Travel:** .020±.010 inch

#### Materials and Finishes

**Bushing:** Zamak 2

**Shaft:** Aluminum or Zamak 2

**Retaining Ring:** Stainless steel

**Pushbutton Actuator:** Zytel 70G33L

**Detent Spring:** Music wire

**Detent Ball:** Stainless steel

**Code Housing:** Polyamide polymer, nylon 6/10 alloy UL94HB

**Code Rotor:** Delrin 100

**Printed Circuit Boards:** NEMA grade FR-4, double clad with copper, plated with gold over nickel

**Infrared 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

**Pushbutton Dome:** Stainless steel

**Backplate:** Stainless steel

**Cable:** Copper stranded with topcoat in PVC insulation (Cable version only)

**Connector (.050 Center):** PA4.6 with tin/lead plated phosphor bronze

**Connector (.100 Center):** Nylon UL94V-2, tin plated copper alloy

**Label:** TT406 Thermal transfer cast film

**Solder:** 60/40 Tin lead, no clean – low residue flux

**Lubricating Grease:** NYE nyogel 774L

**Hex Nut:** Nickel, plated with brass

**Lockwasher:** Stainless steel

**Header:** Hi-Temp glass filled thermoplastic UL94V-0, phosphor bronze (pinned versions only)

**Strain Relief:** Glass filled thermoplastic (.100 center cable versions only)

### OPTIONS

Contact Grayhill for custom terminations, shaft and bushing configurations, rotational torque pushbutton force, and code output. Control knobs are also available.

### ORDERING INFORMATION

