



## Optical Encoders

### SERIES 62SG

Compact / Cost Effective

#### FEATURES

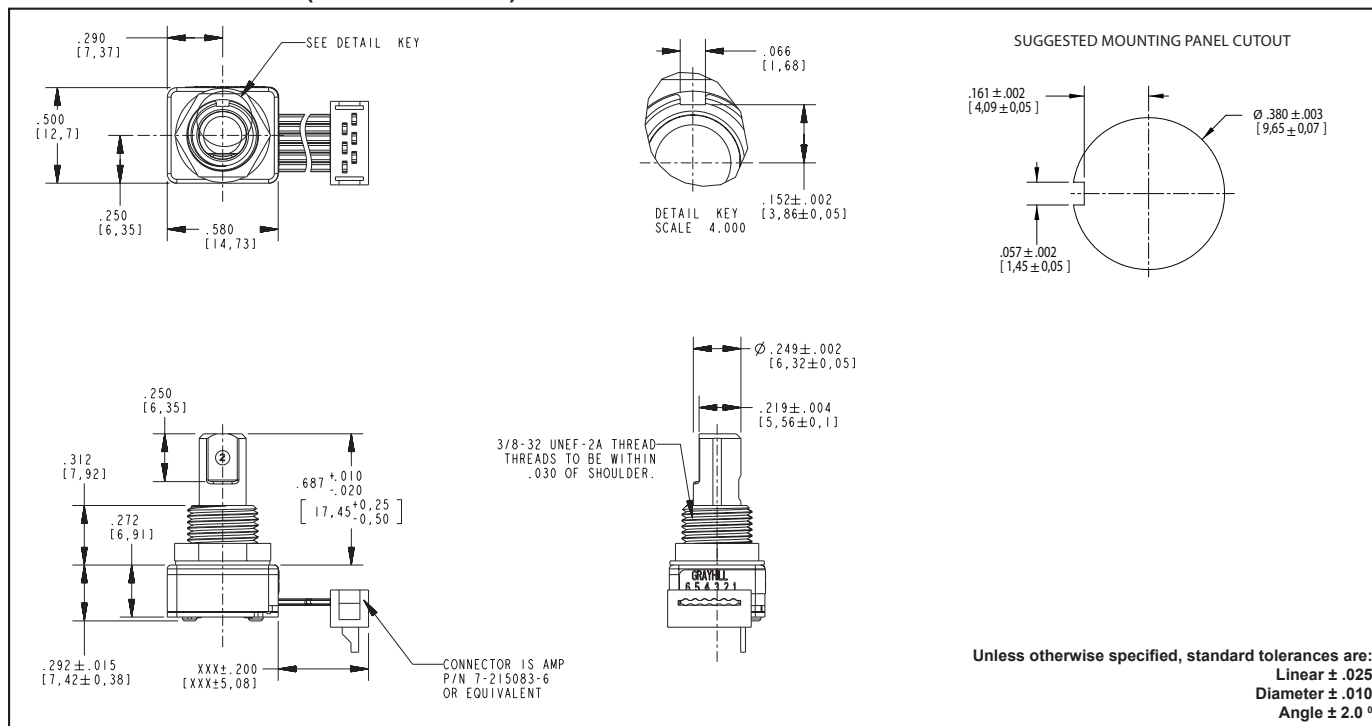
- Just 0.3-inch behind panel depth
- Over 1 million rotational cycles
- 2-bit gray code output
- Quadrature coding
- Available in 16, 24 and 32 detent positions
- Optional integrated pushbutton
- Light pipe technology
- Cost competitive with mechanical encoders at higher volumes

#### APPLICATIONS

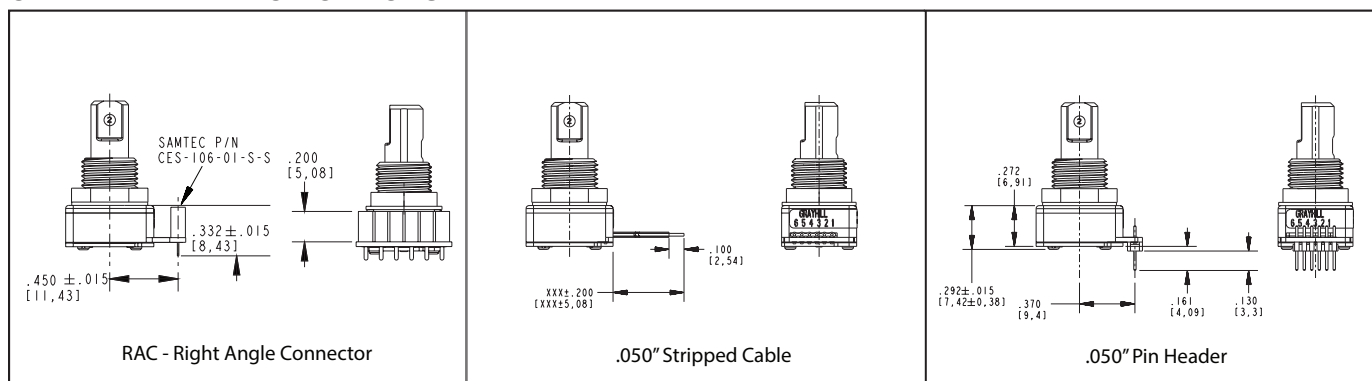
- Automotive
  - audio systems
  - navigation systems
- Medical
  - patient monitoring systems
- Test & Measurement
  - analyzers
  - oscilloscopes
- Audio & Video
  - consumer electronics
  - professional editing equipment



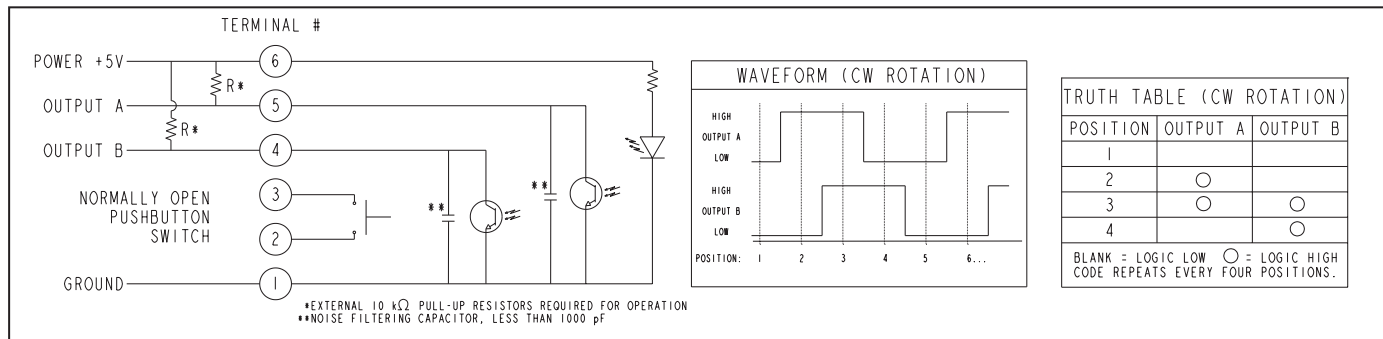
#### DIMENSIONS in inches (and millimeters)



#### OTHER TERMINATION OPTIONS



## WAVEFORM AND TRUTH TABLE



## SPECIFICATIONS

## Environmental Specifications

**Operating Temperature:** -40°C to 85°C**Storage Temperature:** -40°C to 85°C**Humidity:** 96 hours@90-95% humidity@40°C**Mechanical Vibration:** Harmonic motion with amplitude of 15g within a varied frequency of 10 to 2000 Hz for 12 hours**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:** 30 mA maximum**Logic Output Characteristics:****Logic High:**  $V_{OH} = 3.0$  Vdc MIN at  $V_{CC} = 4.75$  Vdc with 10 kΩ PULL-UP RESISTOR**Logic Low:**  $V_{OL} = 1.0$  Vdc MAX at  $V_{CC} = 5.25$  Vdc with 10 kΩ PULL-UP RESISTOR**Output:** Open Collector Phototransistor**Optical Rise Time:** 30ms maximum**Optical Fall Time:** 30ms maximum**Mechanical Life:** 1,000,000 cycles of operation. 1 cycle is a rotation through all positions and a full return**Mounting Torque:** 15in.-lbs. maximum**Shaft Pushout Force:** 45 lbs. minimum**Terminal Strength:** 15 lbs. cable pull out force minimum**Solderability:** 95% free of pin holes & voids**Pushbutton Electrical and Mechanical Specifications****Rating:** 30 mA @ 5 Vdc**Contact Resistance:** <10 Ω (Compatible with CMOS or TTL)**Life:** 1 million actuations minimum**Contact Bounce:** <4 ms make, <10ms break**Actuation Force:** 5 = 550 ± 200 grams

9 = 1050 ± 200 grams

**Shaft Travel:** .020 ± .008 inch**Materials and Finishes****Bushing:** Zamak 2**Shaft:** Zamak 2**Detent Ball:** 302 Stainless Steel**Detent Spring:** Music Wire**Retaining Ring:** 301 Stainless Steel**Code Housing:** Nylon 6/6 25% glass**Light Pipe:** Lexan, GE**Code Rotor:** Delrin 100**Pushbutton Actuator:** Glass Reinforced nylon 6/6. Zytel 70G33L. UL 94**Pushbutton Dome:** 301 Stainless Steel**Printed Circuit Board:** NEMA Grade FR4, Double clad with copper, Plated with gold over nickel**Infrared Emitting Diode:** Gallium Aluminum Arsenide**Phototransistor Diode:** NPN Silicon**Resistor:** Metal oxide on ceramic substrate**Spacer:** Pet plastic**Backplate:** 302 Stainless Steel**Label:** TT406 thermal transfer cast film**Solder:** 96.5% tin / 3% silver / 0.5% copper. No clean**Hex Nut:** Brass, Plated with nickel**Lockwasher:** Zinc Plated Spring Steel with Clear Trivalent Chromate Finish**Cable:** Copper Stranded with topcoat in PVC insulation**Connector (.050 center):** PA4.6 with tin/nickel plated phosphor bronze.

TORQUE TABLE (IN-OZ)	L	M	H
16-POSITION	1.70±1.05	2.10±1.20	3.05±1.50
24-POSITION	1.15±0.75	1.50±0.75	2.80±1.40
32-POSITION	1.00±0.65	1.20±0.8	1.50±0.9

40% of initial value after 1 million cycles.

