



# 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

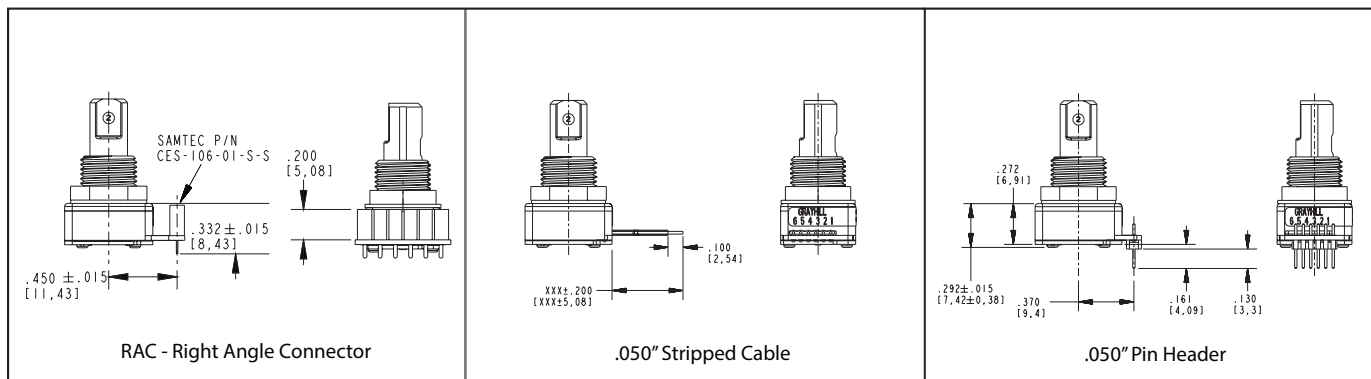
- Automotive
  - audio systems
  - navigation systems
- Medical
  - patient monitoring systems
- Test & Measurement
  - analyzers
  - oscilloscopes
- Audio & Video
  - consumer electronics
  - professional editing equipment



### DIMENSIONS in inches (and millimeters)



### OTHER TERMINATION OPTIONS



Optical and Mechanical Encoders

## 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<sub>OH</sub> = 3.0 Vdc MIN at V<sub>CC</sub> = 4.75 Vdc with 10 kΩ PULL-UP RESISTOR  
**Logic Low:** V<sub>OL</sub> = 1.0 Vdc MAX at V<sub>CC</sub> = 5.25 Vdc with 10 kΩ PULL-UP RESISTOR  
**Output:** Open Collector Phototransistor  
**Optical Rise Time:** 30ms maximum  
**Optical Fall Time:** 30ms maximum

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.

**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 reinforced. Zytel FR-50  
**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.

