



# 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

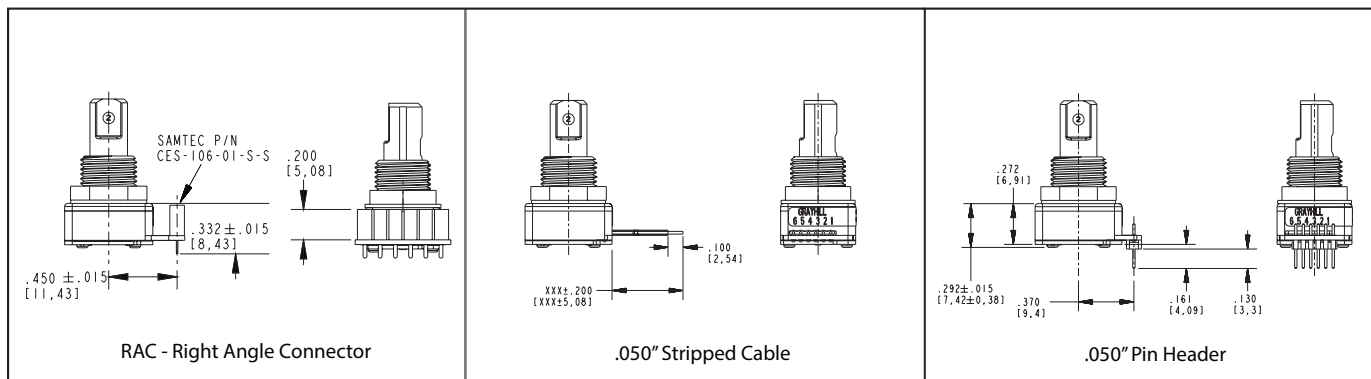
- Automotive
  - audio systems
  - navigation systems
- Medical
  - patient monitoring systems
- Test & Measurement
  - analyzers
  - oscilloscopes
- Audio & Video
  - consumer electronics
  - professional editing equipment



### 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.

- 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

- 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.

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

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

	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.

Optical and Mechanical Encoders

