



## Optical Encoders

### SERIES 62SG

Compact / Cost Effective

#### FEATURES

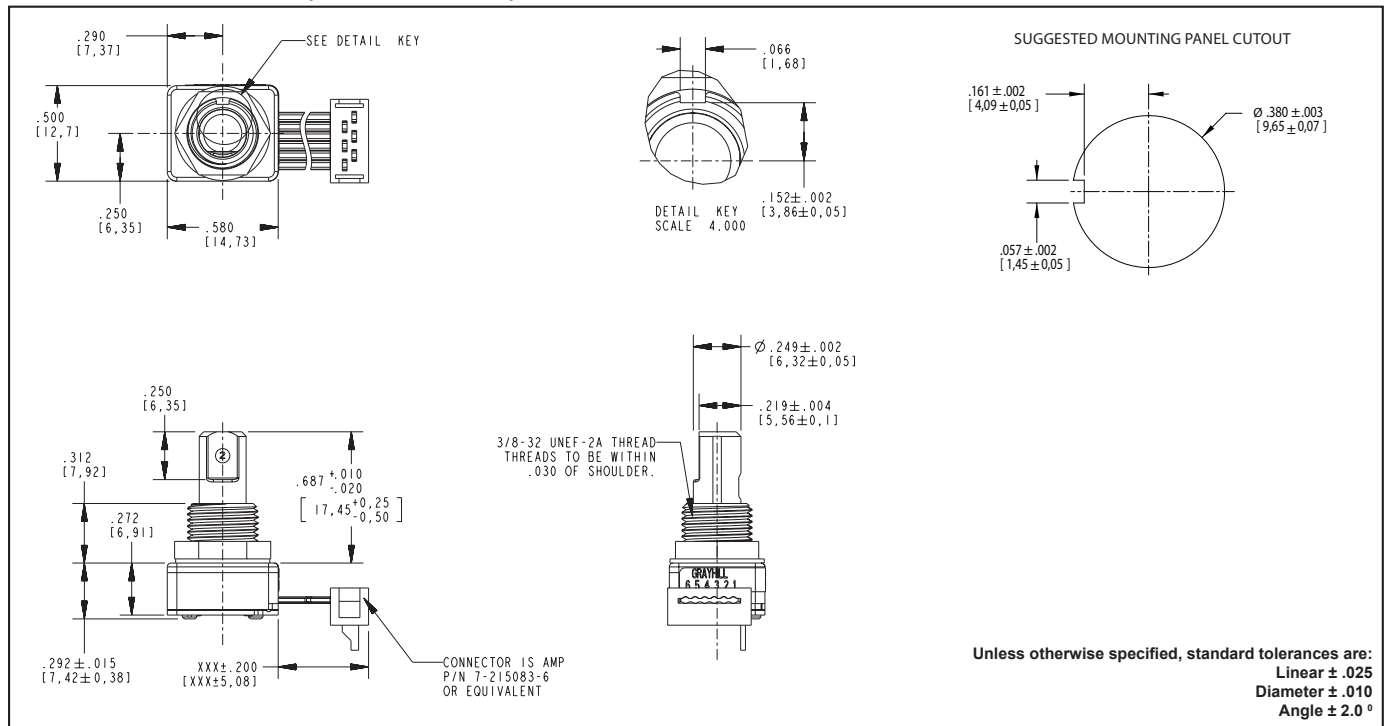
- Just 0.3-inch behind panel depth
- Over 1 million rotational cycles
- 2-bit gray code output
- Quadrature coding
- Available in 16, 24 and 32 detent positions
- Optional integrated pushbutton
- Light pipe technology
- Cost competitive with mechanical encoders at higher volumes

#### APPLICATIONS

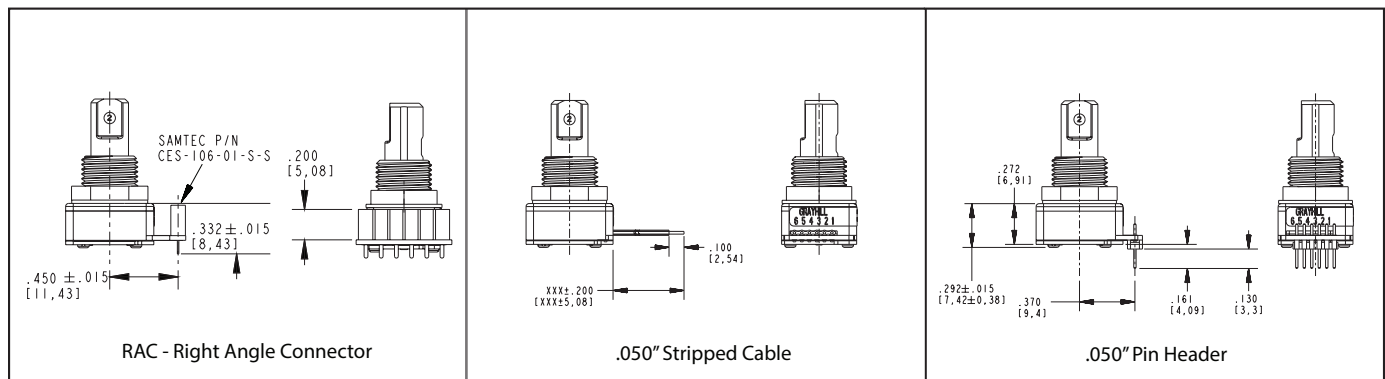
- Automotive
  - audio systems
  - navigation systems
- Medical
  - patient monitoring systems
- Test & Measurement
  - analyzers
  - oscilloscopes
- Audio & Video
  - consumer electronics
  - professional editing equipment



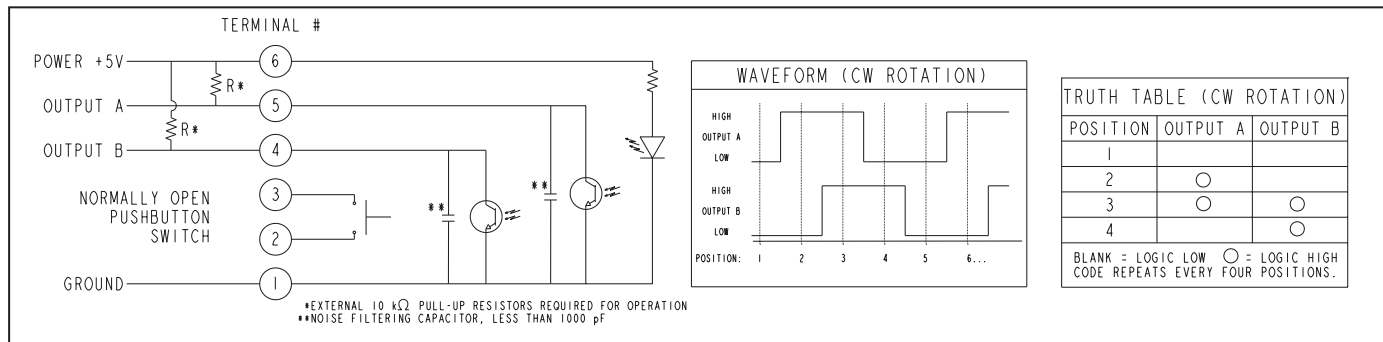
#### DIMENSIONS in inches (and millimeters)



#### 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  $\pm$  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 k $\Omega$  PULL-UP RESISTORLogic Low:  $V_{OL}$  = 1.0 Vdc MAX at  $V_{CC}$  = 5.25 Vdc with 10 k $\Omega$  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 &amp; voids

## Pushbutton Electrical and Mechanical Specifications

Rating: 30 mA @ 5 Vdc

Contact Resistance: <10  $\Omega$  (Compatible with CMOS or TTL)

Life: 1 million actuations minimum

Contact Bounce: &lt;4 ms make, &lt;10ms break

Actuation Force: 5 = 550  $\pm$  200 grams9 = 1050  $\pm$  200 gramsShaft Travel: .020  $\pm$  .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.

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

40% of initial value after 1 million cycles.

