

# SERIES 62SG

Compact / Cost Effective

## APPLICATIONS

### AUTOMOTIVE

- Audio systems, Navigation systems

### MEDICAL

- Patient monitoring systems

### TEST & MEASUREMENT

- Analyzers, oscilloscopes

### AUDIO & VIDEO

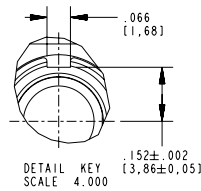
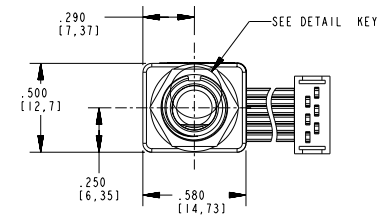
- Consumer electronics, professional editing equipment

## FEATURES

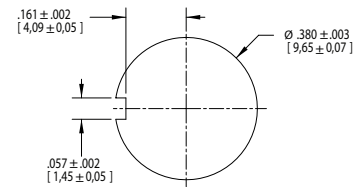
- Just 0.3-inch behind panel depth
- Over 1 million rotational cycles
- 2-bit gray code output
- Quadrature coding
- Available in 16, 24 and 32 detent positions
- Optional integrated pushbutton
- Light pipe technology
- Cost competitive with mechanical encoders at higher volumes
- Optional shaft and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



## DIMENSIONS in inches (and millimeters)

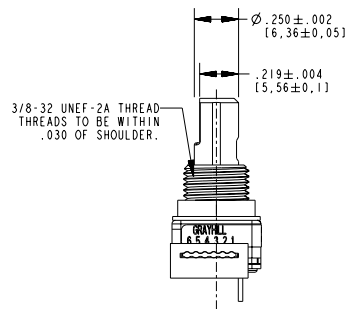
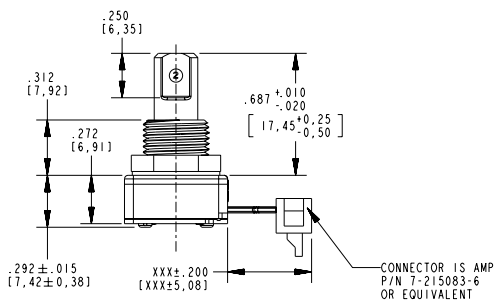


### SUGGESTED MOUNTING PANEL CUTOUT



### MOUNTING PANEL RECOMMENDATIONS FOR PANEL SEAL VERSIONS:

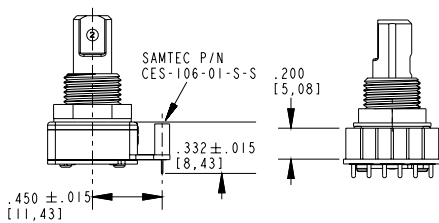
1. PANEL THICKNESS SHOULD NOT EXCEED .157.
2. MOUNTING HOLE TO BE Ø.375 - Ø.385.
3. Ø.470x.020 DEEP COUNTERBORE ON REVERSE OF PANEL REQUIRED FOR PROPER SEALING.
4. ANTI-ROTATION FEATURE IS RECOMMENDED. FEATURE SHOULD BE DESIGNED TO LOCK INTO BUSHING KEYWAY.



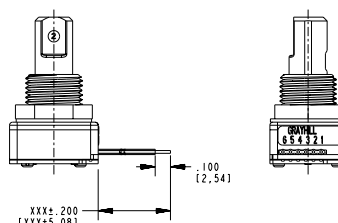
Unless otherwise specified, standard tolerances are:

Linear ± .025  
Diameter ± .010  
Angle ± 2.0 °

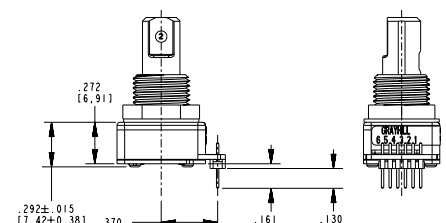
## OTHER TERMINATION OPTIONS



RAC: Right Angle Connector



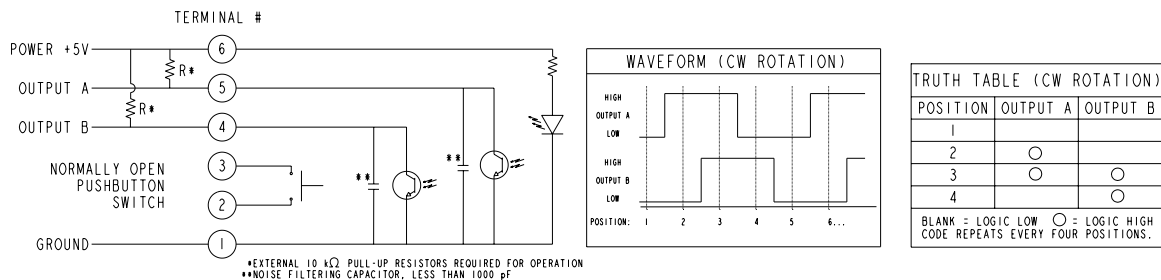
.050" Stripped Cable



.050" Pin Header



## 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

**Seal:** Meets IP67 (above panel for sealed options only)

### 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

**Shaft and Panel Seals:** Silicone Rubber

**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±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  |

| TORQUE TABLE (IN-OZ) | L         | M         | H         |
|----------------------|-----------|-----------|-----------|
| 16-POSITION          | 1.80±1.20 | 2.35±1.30 | 3.30±1.60 |
| 24-POSITION          | 1.35±1.00 | 1.75±1.10 | 2.75±1.00 |
| 32-POSITION          | 1.40±0.7  | 1.60±0.8  | 1.75±0.9  |

40% of initial value after 1 million cycles.

## ORDERING INFORMATION

| ROTATIONAL TORQUE AND PUSHBUTTON AVAILABILITY |            |               |              |    |
|-----------------------------------------------|------------|---------------|--------------|----|
| ROTATIONAL TORQUE                             | PUSHBUTTON |               |              |    |
|                                               | 0 NONE     | 5 550 GRAMS   | 9 1050 GRAMS |    |
|                                               | L          | L0            | L5           | L9 |
|                                               | M          | M0            | M5           | M9 |
| H                                             | H0         | NOT AVAILABLE |              | H9 |

