

SERIES 62SG Compact / Cost Effective

FEATURES

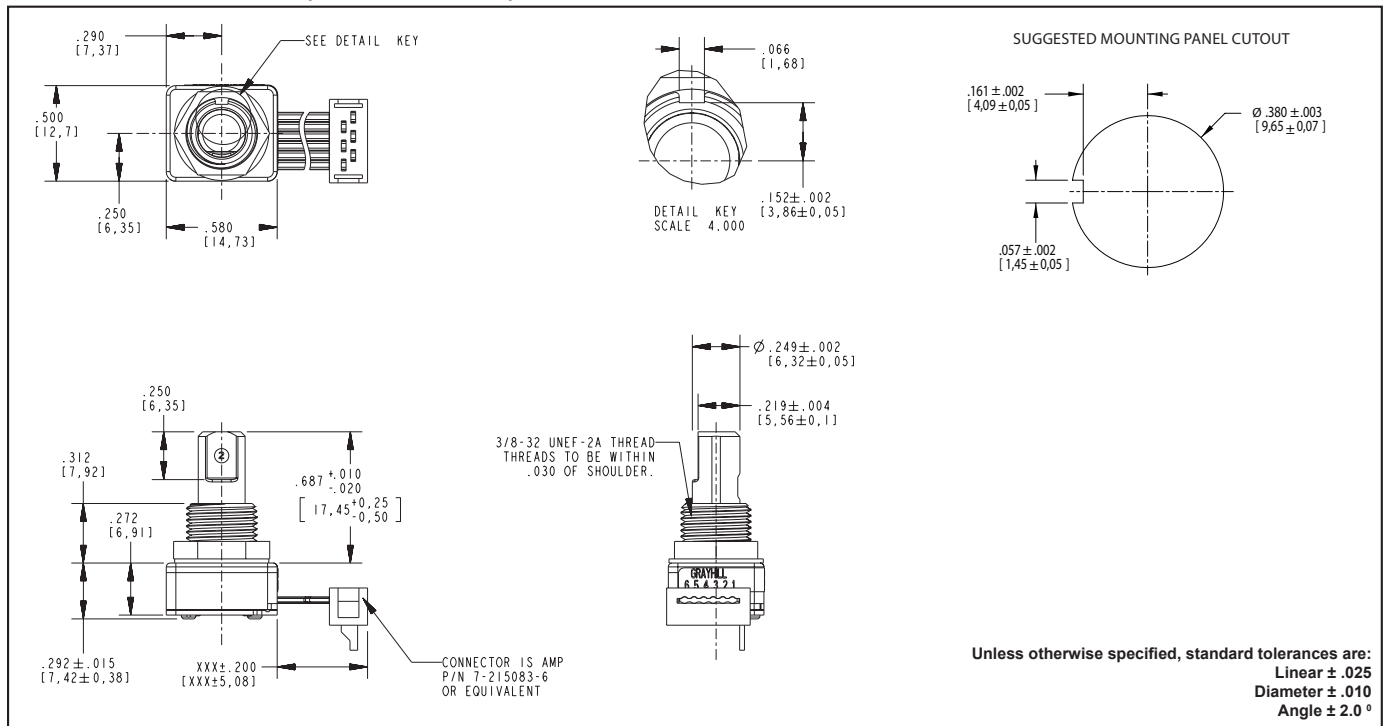
- Just 0.3-inch behind panel depth
- Over 1 million rotational cycles
- 2-bit gray code output
- Quadrature coding
- Available in 16, 24 and 32 detent positions
- Optional integrated pushbutton
- Light pipe technology
- Cost competitive with mechanical encoders at higher volumes

APPLICATIONS

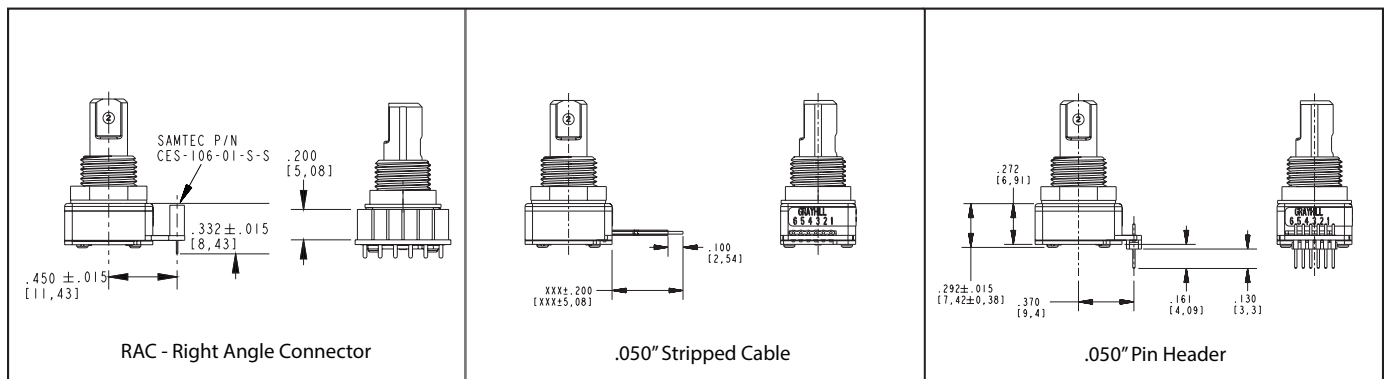
- Automotive
 - audio systems
 - navigation systems
- Medical
 - patient monitoring systems
- Test & Measurement
 - analyzers
 - oscilloscopes
- Audio & Video
 - consumer electronics
 - professional editing equipment



DIMENSIONS in inches (and millimeters)



OTHER TERMINATION OPTIONS



WAVEFORM AND TRUTH TABLE

TERMINAL #

POWER +5V

OUTPUT A

OUTPUT B

NORMALLY OPEN PUSHBUTTON SWITCH

GROUND

WAVEFORM (CW ROTATION)

TRUTH TABLE (CW ROTATION)

| POSITION | OUTPUT A | OUTPUT B |
|----------|----------|----------|
| 1 | | |
| 2 | ○ | |
| 3 | ○ | ○ |
| 4 | | ○ |

BLANK = LOGIC LOW ○ = LOGIC HIGH
CODE REPEATS EVERY FOUR POSITIONS.

*EXTERNAL 10 kΩ PULL-UP RESISTORS REQUIRED FOR OPERATION
**NOISE FILTERING CAPACITOR, LESS THAN 1000 pF

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_{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

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

| TORQUE TABLE (IN-OZ) | L | M | H |
|--------------------------|------|------|------|
| 16-POSITION (±1.0 IN-OZ) | 1.80 | 2.10 | 2.55 |
| 24-POSITION (±0.5 IN-OZ) | 1.25 | 1.65 | 2.45 |
| 32-POSITION (±0.5 IN-OZ) | 1.00 | 1.20 | 1.50 |

40% of initial value after 1 million cycles.

Optical and Mechanical Encoders

Series
Style: SG
Angle of Throw: 11 = 11.25° code change and 32 detent positions;
 15 = 15° code change and 24 detent positions;
 22 = 22.5° code change and 16 detent positions
Rotational Torque Option: L = Low Torque, M = Medium Torque, H = High Torque
Pushbutton Option: 0 = No pushbutton, 5 = 550 grams, 9 = 1050 grams

62SGXX-XX-XXXX

Termination:
C = .050 Center Ribbon Cable with connector, **S** = .050 Center Ribbon Cable with .100 stripped end,
P = .050 Center Pins with 0.185 inch length, **RAC** = Right Angle Connector; .050" centers
Cable Length: 020 = 2.00" Cable, 040 = 4.00" Cable, 060 = 6.00" Cable, leave blank if pinned
 *Eliminate cable length if ordering "P" or "RAC" termination option

*62SG15-L5-RAC available as standard P/N, for additional options, please contact Grayhill

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