



# Optical Encoders

## SERIES 62NG

### Encoder with a Separate Non-rotating Pushbutton Shaft

#### FEATURES

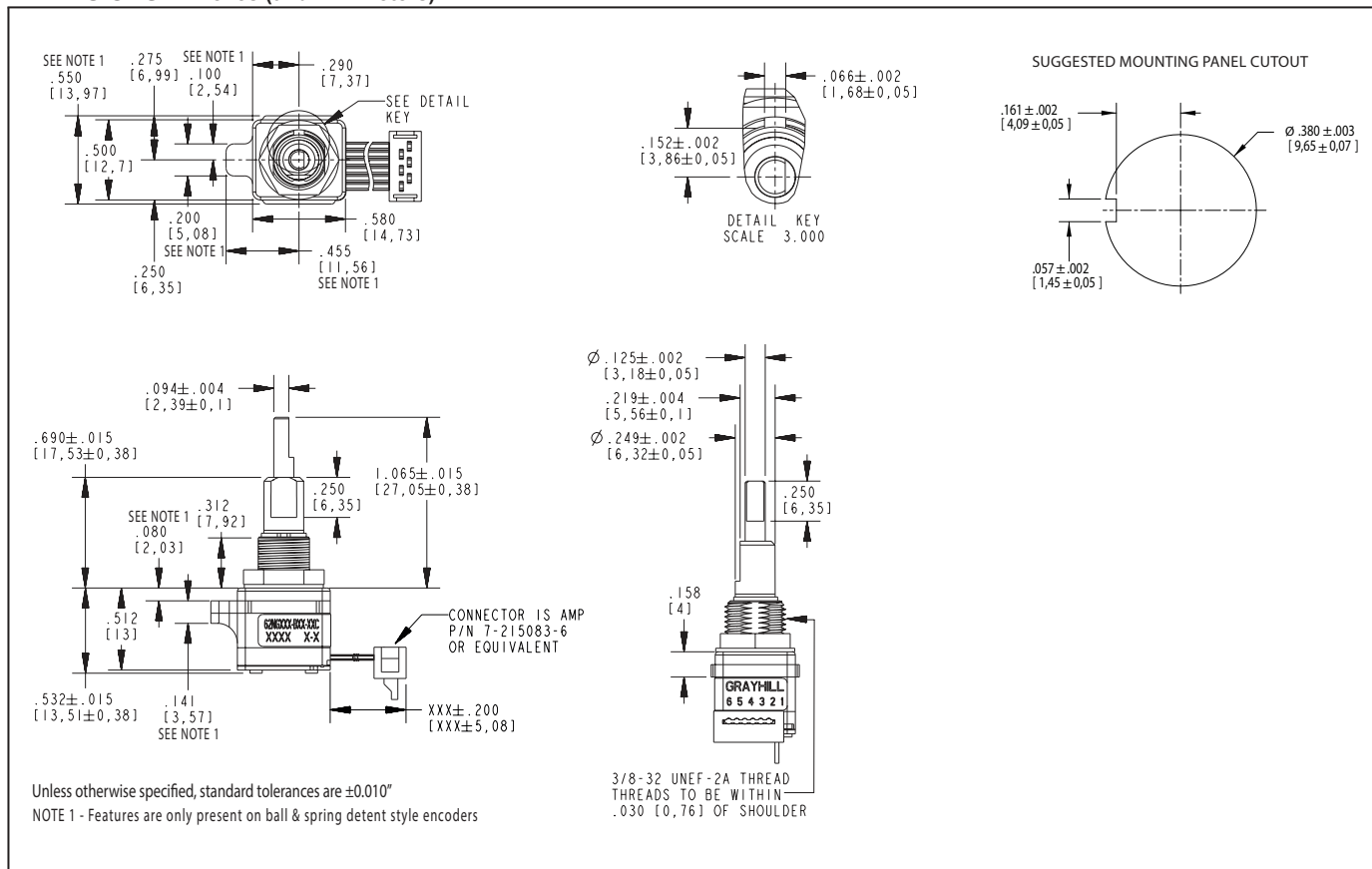
- Non-turn pushbutton to ensure pushbutton text and orientation
- Low cost version of our popular 62N series
- Patented light pipe technology
- Optically coupled for more than a million cycles
- Available for 5 Vdc & 3.3 Vdc
- Available in 16, 20, 24, and 32 detent positions
- Choices of cable length and terminations

#### APPLICATIONS

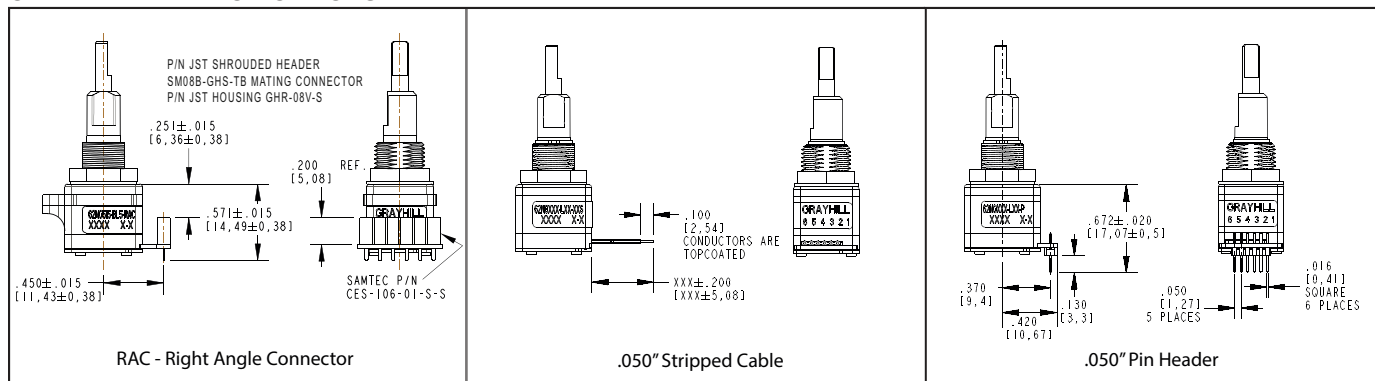
- Global positioning
- Driver information systems
- Ultrasound, patient monitor and other medical equipment
- Commercial and military cockpit controls



#### DIMENSIONS in inches (and millimeters)



#### OTHER TERMINATION OPTIONS



**SPECIFICATIONS**

**Pushbutton Switch Ratings**

**Electrical Rating:** at 24 Vdc max, 10 mA, resistive  
**Contact Resistance:** less than 10 ohms  
**Pushbutton Life Expectancy:** 1 million actuations minimum  
**Contact Bounce:** less than 4 mS at make and less than 10 mS at break  
**Actuation Force:** 5 = 455 ±140 g  
**Pushbutton Travel:** .019±.008 in

**Encoder Ratings**

**Coding:** 2-bit quadrature coded output  
**Operating Voltage:** NG5: 5.0 ±.25 Vdc, NG3: 3.3 ±.125 Vdc  
**Supply Current:** NG5: 30 mA maximum @5.0 Vdc, NG3: 30 mA maximum @3.3 Vdc  
**Logic Output Characteristics:**  
**Logic High:** NG5: 3.0 Vdc minimum, NG3: 2.0 Vdc minimum  
**Logic Low:** NG5: 1.0 Vdc maximum, NG3: 1.0 Vdc maximum  
**Mechanical Life:** 1,000,000 cycles (one cycle is a rotation through all positions and a full return)  
**Max Rotational Speed:** 100 RPM

**Shaft Pushout / Pullout Force:** 45 lbs/45 lbs minimum  
**Mounting Torque:** 15 in-lbs maximum  
**Terminal Strength:** 15 lbs minimum cable or header pullout force, MIL-STD-202, Method 211A, Test Condition A  
**Solderability:** 95% free of pin holes and voids, MIL-STD-202, Method 208

**Environmental Ratings**

**Operating Temperature Range:** -40°C to 85°C, IEC 68-2-1, Test Aa and IEC 68-2-2, Test Aa  
**Storage Temperature Range:** -40°C to 85°C, IEC 68-2-1, Method Aa and IEC 68-2-2, Method Ba  
**Mechanical Shock:** Test 1: 100G, 6 mS, half sine, 12.3 ft/s; Test 2: 100G, 6 mS, sawtooth, 9.7 ft/s, MIL-STD-202, Method 213, Test Condition C and I  
**Relative Humidity:** 90–95% at 40°C for 96 hours, MIL-STD-202, Method 103B  
**Mechanical Vibration:** Harmonic motion with amplitude 15G within a varied 10 - 2000Hz frequency for 12 hours, MIL-STD-202, Method 204, Test Condition B

**Materials and Finishes**

**Shafts:** Zinc  
**Bushing:** Zinc  
**Header Pins:** Tin-plated phosphor bronze  
**Hex Nut:** Nickel plated brass  
**Lockwasher:** Spring steel, zinc plate with clear trivalent chromate finish  
**Cable:** Copper stranded with topcoat in PVC insulation (cable version only)

**EMC Ratings**

**Radiated Immunity:** Meets IEC 61000-4-3, level 3  
**Conducted Immunity:** Meets IEC 61000-4-6, level 3  
**Radiated Emissions:** Meets ANSI C63.4  
**Conducted Emissions:** Meets EN 55022  
**Electrostatic Discharge:** Meets IEC 61000-4-2  
**Power Frequency Magnetic Field:** Meets IEC 61000-4-8

INITIAL AVERAGE ROTATIONAL TORQUE (IN-OZ)				
50% OF INITIAL TORQUE THROUGHOUT LIFE				
	LOW LEAF SPRING (LL)	HIGH LEAF SPRING (LH)	LOW BALL & SPRING (BL)	HIGH BALL & SPRING (BH)
16 POSITION	2.00±1.40	3.50±1.40	0.90±0.45	1.60±0.90
20 POSITION	2.00±1.40	3.50±1.40	0.80±0.40	1.60±0.90
24 POSITION	2.00±1.40	3.50±1.40	0.70±0.40	1.60±0.90
32 POSITION	2.00±1.40	3.50±1.40	0.60±0.40	1.15±0.65

**CIRCUITRY, TRUTH TABLE, AND WAVEFORM**

•EXTERNAL 100kΩ PULL-UP RESISTORS REQUIRED FOR OPERATION  
 ••NOISE FILTERING CAPACITOR, LESS THAN 1000pF

**(CW ROTATION)**

(CW ROTATION)		
POSITION	OUTPUT A	OUTPUT B
1		
2	●	
3	●	●
4		●

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

**ORDERING INFORMATION**

Grayhill Series Number  
 Voltage: 5 = 5.0V; 3 = 3.3V  
 Angle of Throw : 11 = 11.25° - 32 positions  
                           15 = 15.00° - 24 positions  
                           18 = 18.00° - 20 positions  
                           22 = 22.50° - 16 positions

**62NGXXX-XXX-XXX**

**Detent Style:**  
 L = Leaf Spring  
 B = Ball & Spring

**Rotational Torque:**  
 L = Low Torque  
 H = High Torque

**Cable Length:**  
 02 = 2.00" Cable  
 04 = 4.00" Cable  
 06 = 6.00" Cable

**Termination:**  
 S = .050" Stripped Cable  
 C = .050" Connector  
 P = .050" Header  
 RAC = Right Angle Connector  
 .050" centers (See JST Connector Guide for mating connector details)

\*Eliminate cable length if ordering "P" or "RAC" termination option

**Pushbutton:**  
 5 = 455±150 g

\*62NG515-BL5-RAC available as standard P/N, for additional options, please contact Grayhill

BALL & SPRING  
DETENT STYLE

LEAF SPRING  
DETENT STYLE