

# Optical Encoder

**Series 62R** Compact, 1/2" Package, Redundant Circuitry

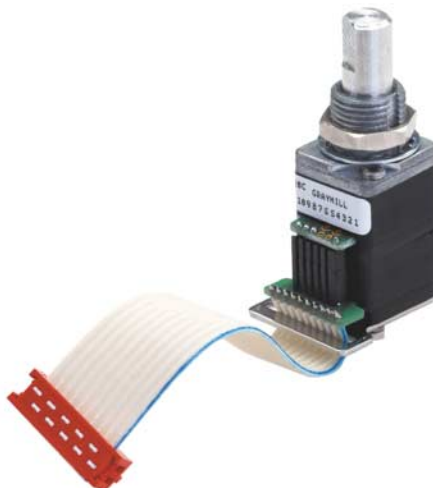


## FEATURES

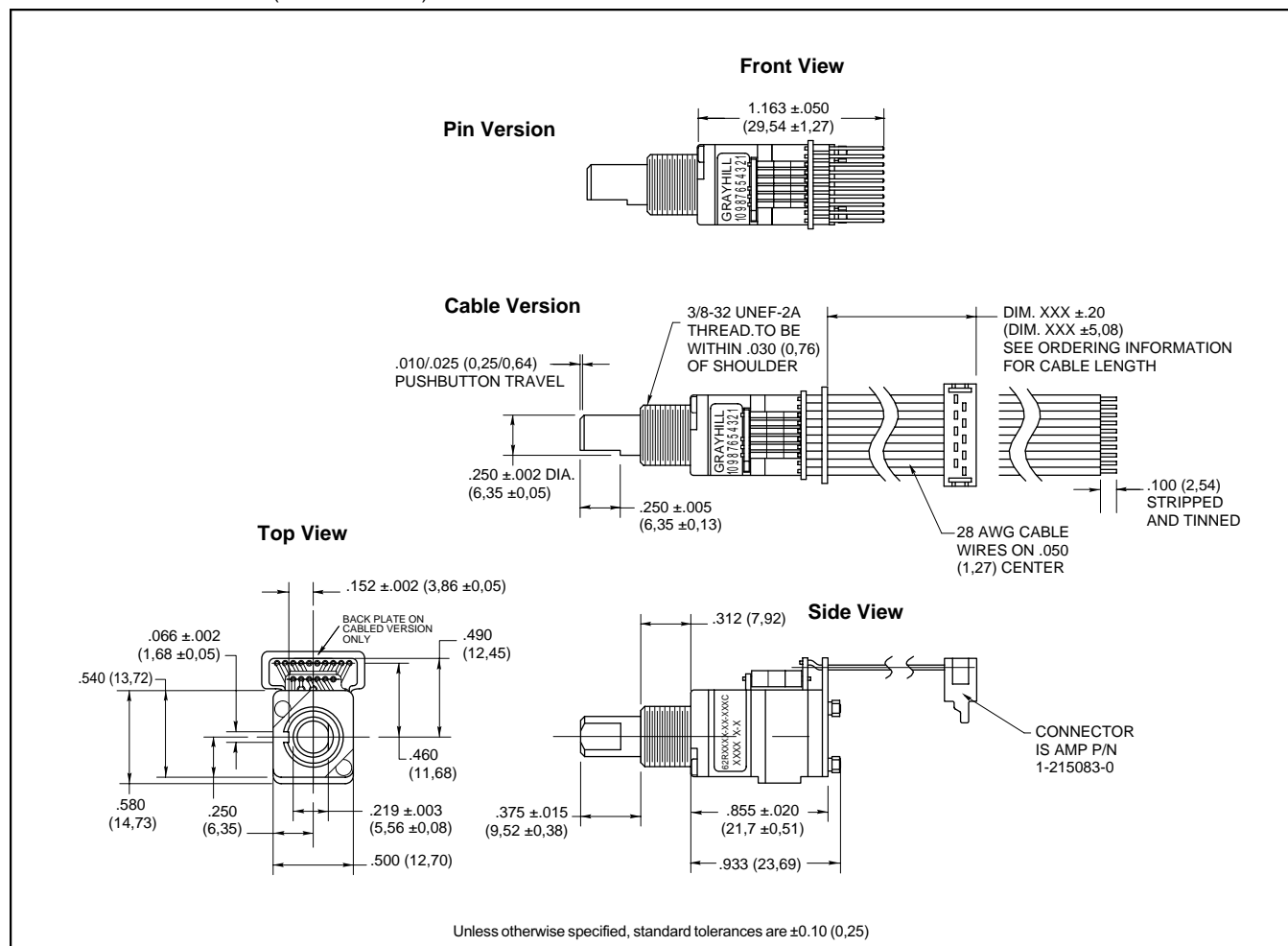
- Redundant Circuitry
- 1 Million Rotational Cycles
- Compatible with CMOS, TTL and HCMOS Logic
- Optional Integral Pushbutton
- Available in 16, 24, and 32 Detent Positions
- Choices of Cable Length and Terminations
- Ideal for Critical Applications

## APPLICATIONS

- Cockpit Controls
- Medical Equipment



## DIMENSIONS In inches (and millimeters)



#### CIRCUITRY, TRUTH TABLE, AND WAVEFORM Standard Quadrature 2-Bit Code

**Switch Schematic**

\* 2.2k EXTERNAL PULL-UP RESISTORS REQUIRED FOR OPERATION

**Truth Table (CW Rotation)**

POSITION	DECK A		DECK B	
	OUTPUT "A"	OUTPUT "B"	OUTPUT "A"	OUTPUT "B"
1				
2	●		●	
3	●	●	●	●
4		●		●

● INDICATES LOGIC HIGH. BLANK INDICATES LOGIC LOW. CODE REPEATS EVERY 4 POSITIONS

**Wave Form (CW Rotation)**

### SPECIFICATIONS

#### Pushbutton Switch Ratings

**Pushbutton Rating:** 10 mA, 5 Vdc, resistive

**Contact Resistance:** less than 10 ohms (TTL or CMOS compatible)

**Pushbutton Life:** 3 million actuations min.

**Contact Bounce:** less than 4 mS at make and less than 10 mS at break

**Actuation Force:** 1000 ±300 grams

**Pushbutton Travel:** .010/.025"

#### Switch Ratings

**Coding:** 2-bit quadrature coded output

**Operating Voltage:** 5.0 ±.25 Vdc

**Voltage Breakdown:** 250 Vac between mutually insulated parts

**Supply Current:** 30 mA maximum@5.0 Vdc (per deck)

#### Logic Output Characteristics:

Logic High: 3.5 Vdc minimum

Logic Low: 1.5 Vdc maximum

**Mechanical Life:** 1,000,000 cycles minimum (One cycle is a rotation through all positions and a full return)

**Minimum Sink Current:** 2.0 mA

**Power Consumption:** 150mW max. (per deck)

**Output:** open collector phototransistor

**Optical Rise and Fall Times:** less than 30 mS maximum

**Operating Torque:** 3.5 ±1.4 in-oz initially

**Shaft Push Out Force:** 45 lbs minimum

**Mounting Torque:** 15 in-lbs max.

**Terminal Strength:** 15 lbs cable pull-out force min.

**Operating Speed:** 100 RPM max.

#### Environmental Ratings

**Operating Temperature Range:** -40°C to 85°C

**Storage Temperature Range:** -55°C to 100°C

**Vibration Resistance:** Harmonic motion with amplitude of 15G's, within a varied 10 to 2000 Hz frequency for 12 hours

**Mechanical Shock:** Test 1: 100g, 6 mS, half sine, 12.3 ft/s; Test 2: 100g, 6 mS, sawtooth, 9.7 ft/s

**Humidity:** 90–95% at 40°C for 96 hours

#### Materials and Finishes

**Shaft:** Aluminum

**Bushing:** Zinc casting

**Shaft Retaining Ring:** Stainless steel

**Detent Spring:** Stainless steel

**Printed Circuit Boards:** NEMA grade FR-4 gold over nickel or palladium

**Terminals:** Brass, tin-plated

**Mounting Hardware:** One brass, nickel-plated nut and stainless steel lockwasher supplied with each switch. Nut is 0.094 inches thick by 0.562 inches across flats

**Rotor:** Thermoplastic

**Code Housing:** Thermoplastic

**Pushbutton Dome:** Stainless steel

**Dome Retaining Disk:** Thermoplastic

**Pushbutton Housing:** Thermoplastic

**Phototransistor:** Planar Silicon NPN

**Infrared Emitter:** Gallium aluminum arsenide

**Pushbutton Contact:** Brass, nickel-plated

**Flex Cable:** 28 AWG stranded, halogen-free polyolefin insulation on .050" centers (cabled version)

**Header Pins:** Phosphor bronze, tin-plated

**Spacer:** ABS

**Backplate/Strain Relief:** Stainless steel

**Lockwasher(s):** Stainless steel

**Hex Nuts:** Stainless steel

**Studs:** Stainless steel

### OPTIONS

Contact Grayhill for custom terminations, shaft and bushing configurations, and resolutions. Control knobs are also available.

### ORDERING INFORMATION

**62R22-01-020S**

**Series**

**Style:** R = Redundant

**Angle of Throw:** 11 = 11.25° or 32 pos., 15 = 15° or 24 pos., 22 = 22.5° or 16 positions

**Pushbutton Option:** 01 = w/o pushbutton, 02 = with pushbutton

**Termination:** .050" centers; S = Stripped cable, C = Connector, P = Pin

**Cable Length:** 020 = 2.0 inches minimum to 250 = 25.0 inches maximum. Provided in increments of 1/2 inch. Example: 035 = 3.5", 060 = 6.0". \*Eliminate cable length if ordering pins. (Ex: 62R22-02-P)

Custom materials, styles, colors, and markings are available. Control knobs available.

Available from your local Component Grayhill Distributor. For prices and discounts, contact a local Sales Office, an authorized local Distributor