

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

Clockwise Rotation		
Position	Output A	Output B
1		
2	●	
3	●	●
4		●

● Indicates logic high; blank indicates logic low. Code repeats every 4 positions.

SPECIFICATIONS

Pushbutton Switch Ratings

- Rating:** 5 Vdc, 10 mA, resistive
- Contact Resistance:** less than 10 ohms (TTL or CMOS compatible)
- Pushbutton Life:** 3 million actuations minimum
- Contact Bounce:** less than 4 mS at make and less than 10 mS at break
- Actuation Force:** 500 ±300 grams
- Pushbutton Travel:** .010/.025 inch

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
- Logic Output Characteristics:**
 - Logic High:** 3.8 Vdc minimum
 - Logic Low:** 0.8 Vdc maximum
- Rotational 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 maximum
- Optical Rise and Fall Times:** less than 30 mS maximum

Operating Torque:

- Detent: 2.0 ±1.4 in-oz initially
- Non-detent: less than 1.5 in-oz initially
- Shaft Push Out Force:** 45 lbs minimum
- Mounting Torque:** 15 in-lbs maximum
- Terminal Strength:** 15 lbs cable pull-out force minimum
- Operating Speed:** 100 RPM maximum
- Axial Shaft Play:** .010 maximum

Environmental Ratings

- Operating Temperature Range:** -40°C to 85°C
- Storage Temperature Range:** -55°C to 100°C
- Relative Humidity:** 90–95% at 40°C for 96 hours
- Vibration Resistance:** Harmonic motion with amplitude of 15G's, within a varied 10 to 2000 Hz frequency for 12 hours per MIL-STD-202, Method 204
- Mechanical Shock:** Test 1: 100G for 6 mS, half sine, 12.3 ft/s; Test 2: 100G for 6 mS, sawtooth, 9.7 ft/s

Materials and Finishes

- Code Housing:** Reinforced thermoplastic
- 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

Pushbutton Contact: Brass, nickel-plated

Flex Cable: 28 AWG, stranded/top coated wire, PVC coated on .050 or .100" centers (cabled version)

Header Pins: Phosphor bronze, tin-plated

Spacer: ABS

Backplate/Strain Relief: Stainless steel

Lockwasher: Stainless steel

Light Pipe: Thermoplastic

LED Housing: Thermoplastic

OPTIONS

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

ORDERING INFORMATION

Series

Angle of Throw: Detent

- 11 = 11.25° or 32 pos.
- 15 = 15° or 24 positions
- 18 = 18° or 20 pos.
- 22 = 22.5° or 16 positions

Non-detent

- 01 = 11.25° or 32 positions
- 05 = 15° or 24 positions
- 08 = 18° or 20 positions
- 02 = 22.5° or 16 positions

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

LED: blank = no LED, L = supplied with LED

Termination: S = Stripped cable; S-L = Stripped cable, LED; C = Connector; C-L = Connector, LED; P = Pin; P-L = Pin, LED

Cable Termination: 040 = 4.0in. Cable is terminated with Amp P/N 215083-6. See Amp Mateability guide for mating connector details.

*Eliminate cable length if ordering pins. (Ex: 62A22-02-P)

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

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

Optical and Mechanical Encoders