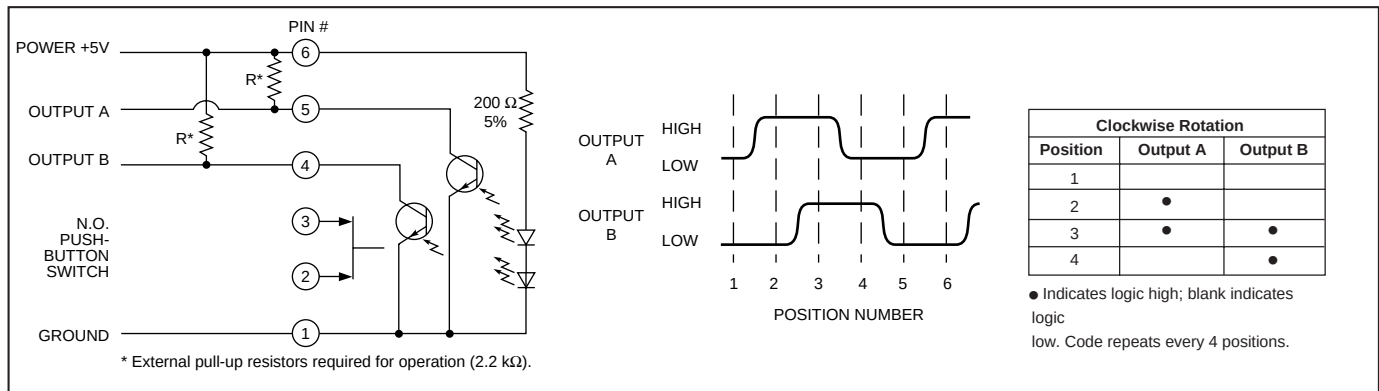


CIRCUITRY, TRUTH TABLE, AND WAVEFORM Standard Quadrature 2-Bit Code



SPECIFICATIONS

Environmental Specifications

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

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

Humidity: 96 Hours at 90–95% humidity at 40°C

Mechanical Vibration: Harmonic motion with amplitude of 15G's, within a varied frequency of 10 to 2000 Hz

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

Rotary Electrical and Mechanical Specifications

Operating Voltage: 5.00 ±0.25 Vdc

Supply Current: 30mA maximum at 5Vdc

Output: Open collector phototransistor, external pull up resistors are required

Output Code: 2-Bit quadrature, channel A leads channel B by 90° electrically during clockwise rotation of the shaft

Logic Output Characteristics:

Logic High shall be no less than 3.0 Vdc

Logic Low shall be no greater than 1.0 Vdc

Minimum Sink Current: 2.0 mA

Power Consumption: 150 mW maximum

Mechanical Life:

Non-Detent 3 Million Cycles

Low & Medium 1 Million Cycles

High 1/2 Million Cycles

1 cycle is a rotation through all positions and a full return

Average Rotational Torque: H-3.60±1.60 in-oz, M-2.20±1.40 in-oz, L-1.20±0.50 in-oz, N-<0.50 in-oz initially, torque shall be within 50% of initial value throughout life

Mounting Torque: 15 in-oz maximum

Shaft Push-Out Force: 45 lbs minimum

Shaft Pull-Out Force: 45 lbs minimum

Terminal Strength: 15 lbs minimum terminal

Solderability: 95% free of pin holes and voids

Pushbutton Electrical and Mechanical Specifications

Rating: 10 mA at 5 Vdc

Contact Resistance: <10Ω

Life: 3 million actuations minimum

Contact Bounce: <4 ms Make, <10 ms Break

Actuation Force: 9-950±250 grams, 5-510±110 grams, 4-400±100 grams, 3-300±90 grams, 2-200±75 grams

Shaft Travel: .020±.010 inch

Materials and Finishes

Bushing: Zamak 2

Shaft: Aluminum or Zamak 2

Retaining Ring: Stainless steel

Pushbutton Actuator: Zytel 70G33L

Detent Spring: Music wire

Detent Ball: Stainless steel

Code Housing: Polyamide polymer, nylon 6/10 alloy UL94HB

Code Rotor: Delrin 100

Printed Circuit Boards: NEMA grade FR-4, double clad with copper, plated with gold over nickel

Infrared Emitting Diode Chips: Gallium aluminum arsenide

Silicon Phototransistor Chips: Gold and Aluminum Alloys

Resistor: Metal oxide on ceramic substrate

Solder Pins: Brass, plated with tin

Pushbutton Dome: Stainless steel

Backplate: Stainless steel

Cable: Copper stranded with topcoat in PVC insulation (Cable version only)

Connector (.050 Center): PA4.6 with tin/lead plated phosphor bronze

Connector (.100 Center): Nylon UL94V-2, tin plated copper alloy

Label: TT406 Thermal transfer cast film

Solder: 60/40 Tin lead, no clean – low residue flux

Lubricating Grease: NYE nyogel 774L

Hex Nut: Nickel, plated with brass

Lockwasher: Stainless steel

Header: Hi-Temp glass filled thermoplastic UL94V-0, phosphor bronze (pinned versions only)

Strain Relief: Glass filled thermoplastic (.100 center cable versions only)

OPTIONS

Contact Grayhill for custom terminations, shaft and bushing configurations, rotational torque pushbutton force, and code output. Control knobs are also available.

ORDERING INFORMATION

Angle of Throw

45=45° for Code Change and 8 Detent Positions

30=30° for Code Change and 12 Detent Positions

22=22.5° for Code Change and 16 Detent Positions

18=18° for Code Change and 20 Detent Positions

15=15° for Code Change and 24 Detent Positions

11=11.25° for Code Change and 32 Detent Positions

Rotational Torque Option

N = Non-detent

L = Low Torque (available with 0, 4, 5, 9 pushbutton only)

M = Medium Torque (available with 0, 5, 9 pushbutton only)

H = High Torque (available with 0, 9 pushbutton only)

Termination

C = .050 Center Ribbon Cable with Connector

S = .050 Center Ribbon Cable with .100 Stripped End

P = .050 Center Pins with .185 Length

CH = .100 Center Ribbon Cable with Connector

SH = .100 Center Ribbon Cable with .100 Stripped End

PH = .100 Center Pins with .230 Length

Cable Length

020 thru 250 in 1/2 inch increments

3 Digits are eliminated if pinned termination is required.

Examples:

060 = 6.0 inch cable

135 = 13.5 inch cable

Pushbutton Option

0 = NO PUSHBUTTON 4 = 400 Grams

9 = 950 Grams 3 = 300 Grams

5 = 510 Grams 2 = 200 Grams