



## SERIES 68P

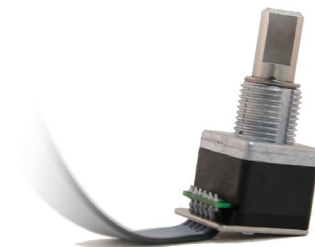
### Long Life Potentiometer Substitute

#### FEATURES

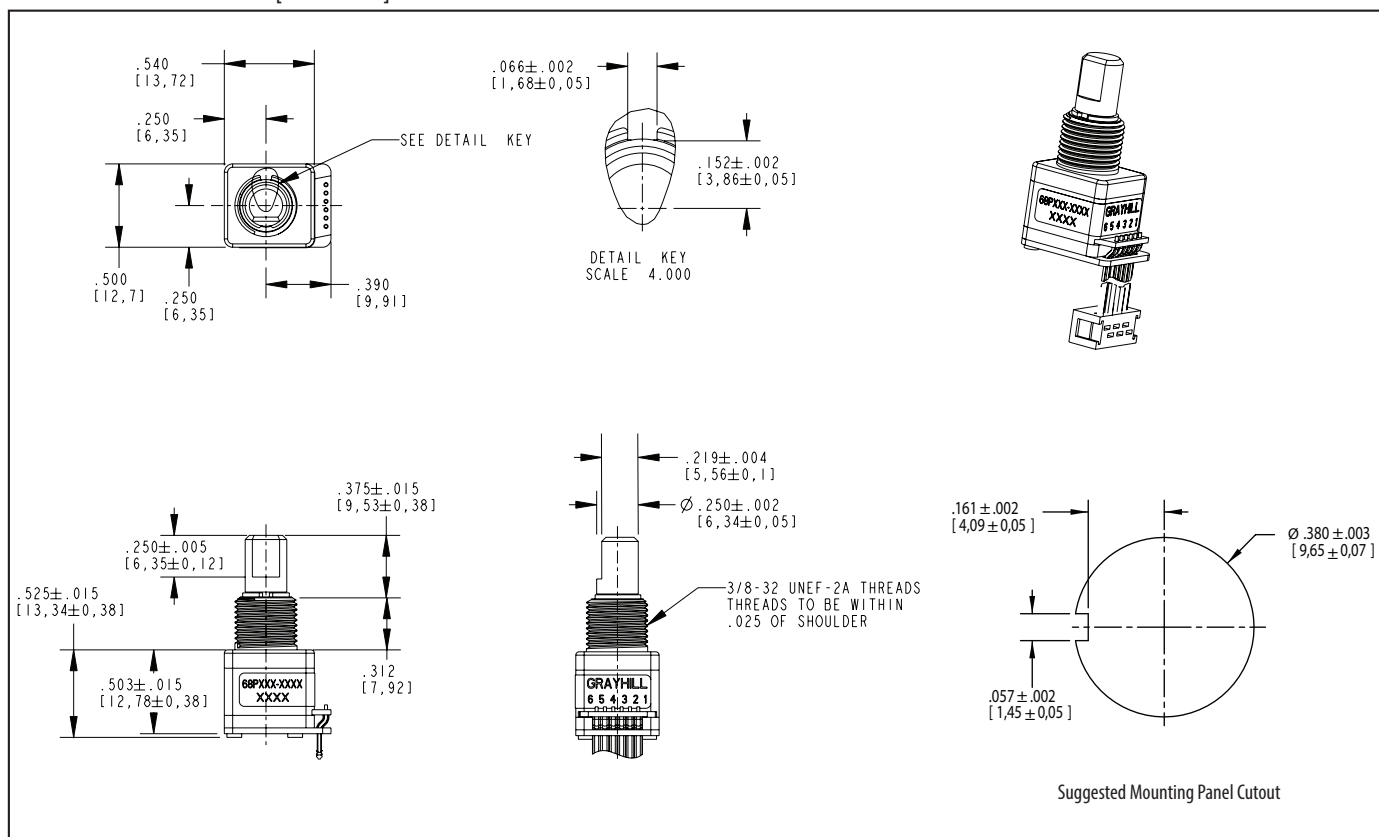
- Ratiometric analog output
- Debris resistant Hall effect sensor technology
- 7 million rotational cycles
- Single or redundant output
- Custom output options
- Optional shaft and panel seal
- Reverse voltage and overvoltage protection

#### APPLICATIONS

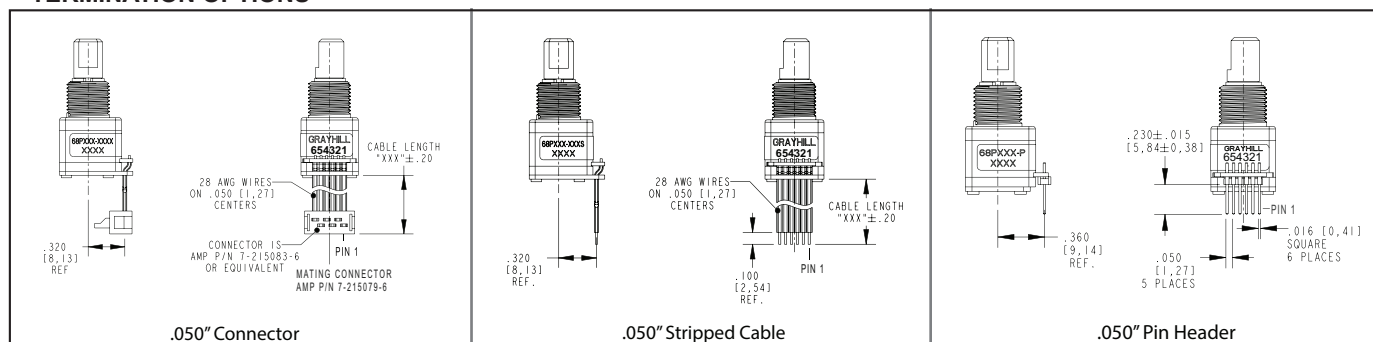
- Test & Measurement equipment
- Audio / Visual equipment
- Potentiometer substitute with long life
- Agriculture & Construction engine speed control



#### DIMENSIONS in inches [millimeters]



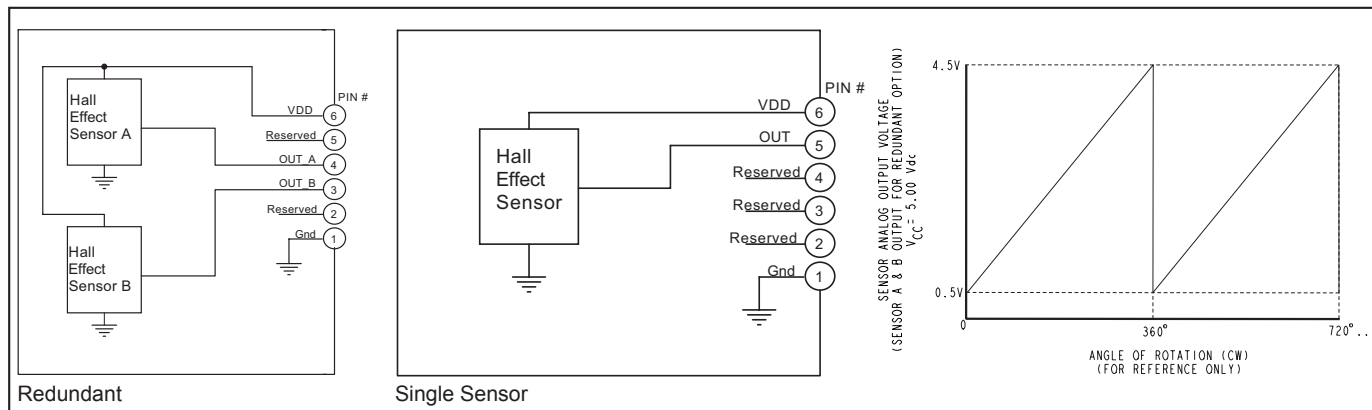
#### TERMINATION OPTIONS



## Hall-Effect



### ELECTRICAL SCHEMATIC



\* Customized electrical outputs are available. Contact Grayhill for additional details.

### SPECIFICATIONS

#### Electrical Ratings

**Operating Voltage:** Minimum 4.5V, maximum 5.5V (VDD)

**Absolute Maximum Voltage\*** on Pin 6 (VDD): -18V to +27V

**Supply Current Redundant Sensors:** Typical 22mA, maximum 40mA

**Supply Current Single Sensor:** Typical 11mA, maximum 20mA

**Output Current:** 2.5mA max

**Recommended Load:** 2K-5.6K Ohms Pull-Down Resistor

**Power-Up Time:** 20ms

**Sensor Error:** When an internal sensor error occurs, the output goes to  $\leq 4\%$  of supply (VDD)

**Solderability:** 95% free of pin holes & voids, MIL-STD-202, Method 208

#### Environmental Ratings

**Operating Temperature:** -40°C to 85°C, IEC 68-2-1, Test Aa and IEC 68-2-2, Test Aa

**Storage Temperature:** -55°C to 85°C, IEC 68-2-1, Method Aa and IEC 68-2-2, Method Ba

**Humidity:** 96 hours @ 90-95% humidity @ 40°C, MIL-STD-202, Method 103B

**Mechanical Vibration:** Harmonic motion with amplitude of 15g within a varied frequency of 10 to 2000 Hz for 12 hours, MIL-STD-202, Method 204, Test Condition B

#### 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, MIL-STD-202, Method 213, Test Condition C and I

**Thermal Shock:** 25 cycles from -55°C to 100°C, MIL-STD-810F, Method 503.4, procedure I

**Seal:** IP67, Meets IEC 60529

**Cable:** Copper stranded with topcoat in PVC, 28 AWG (cable version only)

**Header Pins:** Tin-plated phosphor bronze

**ROHS Compliant**

#### EMC Ratings

**Radiated Immunity:** Meets ANSI/ASAE EP455 5.16 (100 V/m, 0.014-1000 MHz, 3 orientations)

**Conducted Immunity:** Meets IEC 61000-4-6, Level 3

**Radiated Emissions:** Meets ISO 14982, Sec 6.4 (Broadband), Sec 6.5 (Narrowband) limits

**Conducted Emissions:** Meets CISPR 25, Class 3

**Electrostatic Discharge:** Meets ANSI/ASAE EP455 5.12, Level 1

**Power Frequency Magnetic Field:** Meets IEC 61000-4-8, 100 V/m

\* Exceeding the Absolute Maximum Voltage may result in permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operation listings of this specification is not implied.

#### Soldering Recommendation

Hand solder only per IPC J-STD-001

#### Physical & Mechanical Ratings Mechanical

**Life:** 7,000,000 cycles of operation. 1 cycle is a rotation through all positions and a full return

**Average Rotational Torque:** 1.5 in-oz maximum

**Maximum rotational speed:** 100 rpm

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

**Shaft Pushout / Pullout Force:** 45 lbs. / 45 lbs. minimum

**Terminal Strength:** 15 lbs. minimum. Cable or Header pullout force, MIL-STD-202, Method 211A, Test Condition A

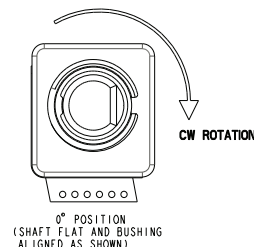
#### Materials and Finishes

**Bushing:** Zinc

**Shaft:** Stainless Steel

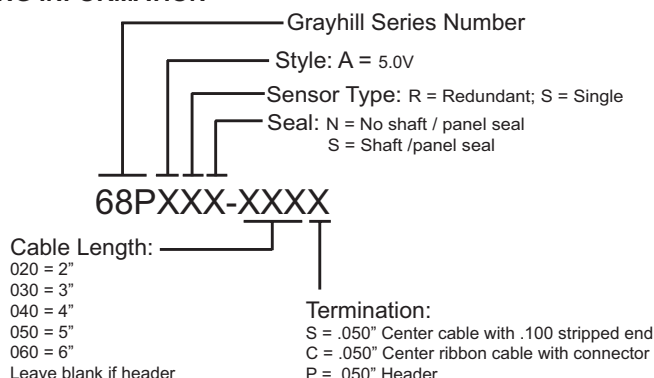
**Hex Nut:** Nickel plated brass

**Lockwasher:** Spring steel, zinc plate with clear trivalent chromate finish



Encoder has ratiometric analog output (output levels are proportional to the supply voltage). Specifications on this datasheet apply @ VDD = 5.00 V.

### ORDERING INFORMATION



For prices and custom configurations, contact a local sales office, an authorized distributor, or Grayhill's sales department.

### MOUNTING PANEL RECOMMENDATIONS FOR PANEL SEAL VERSION:

1. Panel thickness should not exceed 0.157".
2. Mounting hole diameter to be per recommended dimensions.
3. 0.470" X 0.020" counter bore required for proper sealing.
4. Anti-rotation feature is recommended. Feature should be designed to lock into bushing keyway.