



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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# SERIES 68P

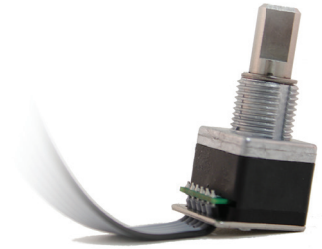
## Long Life Potentiometer Substitute

### FEATURES

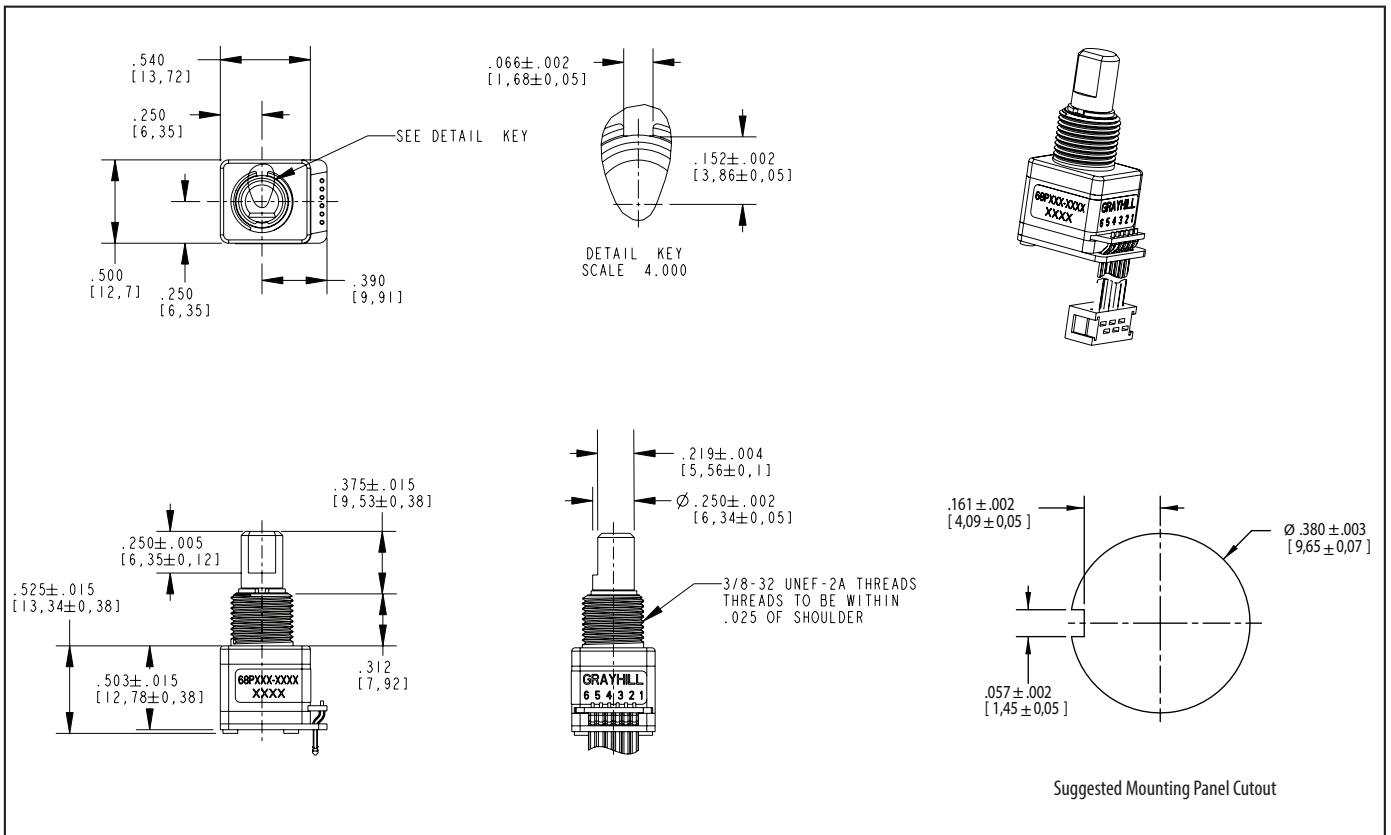
- Ratiometric analog output
- Debris resistant Hall effect sensor technology
- 3 million rotational cycles
- Single or redundant output
- Custom output options
- Optional shaft and panel seal
- Reverse voltage and overvoltage protection

### APPLICATIONS

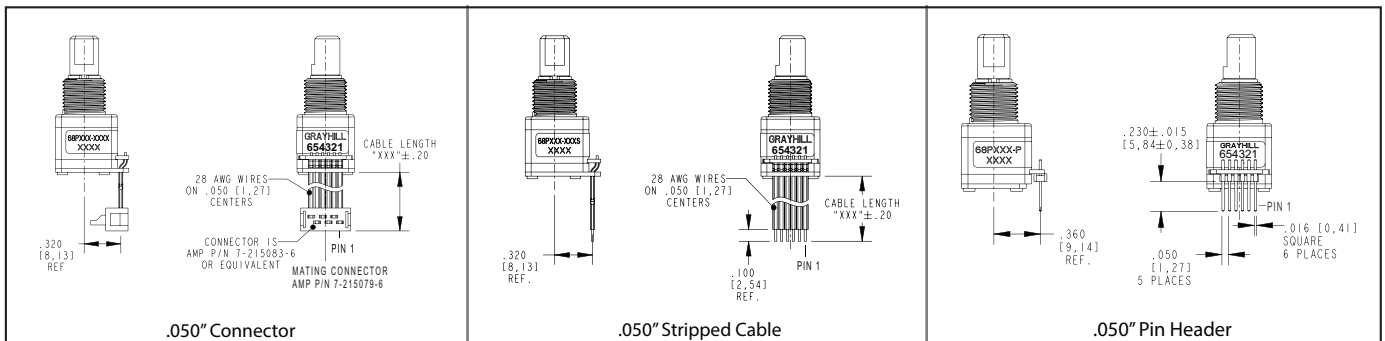
- Test & Measurement equipment
- Audio / Visual equipment
- Potentiometer substitute with long life
- Agriculture & Construction engine speed control



### DIMENSIONS in inches [millimeters]



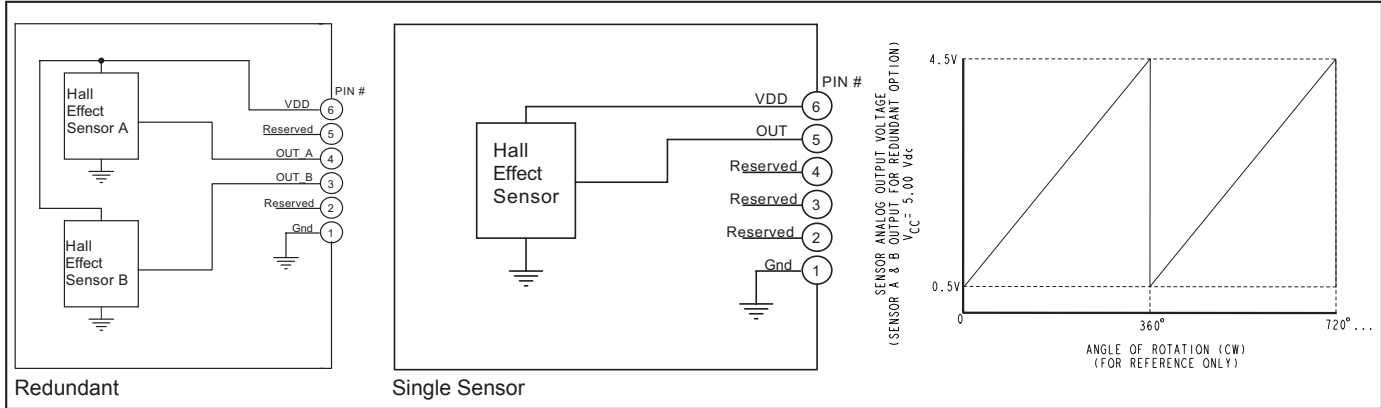
### TERMINATION OPTIONS



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 ≤ 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:** 3,000,000 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

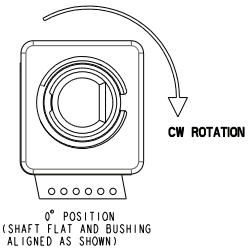
**Materials and Finishes**

**Bushing:** Zinc

**Shaft:** Stainless Steel

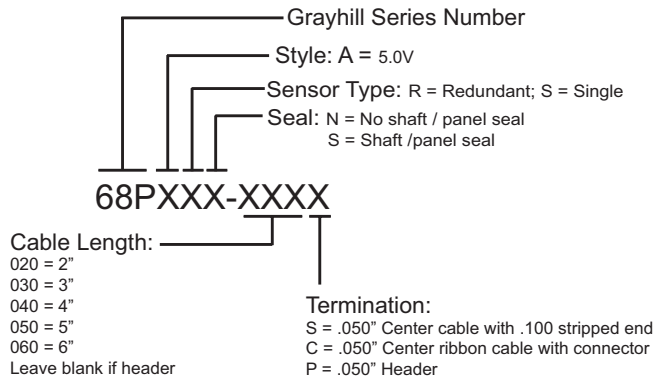
**Hex Nut:** Nickel plated brass

**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**



**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.

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