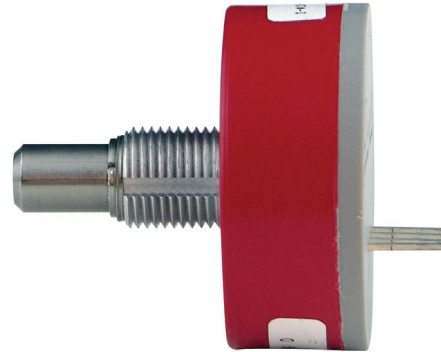


SERIES 61K High Resolution, 4-Pin

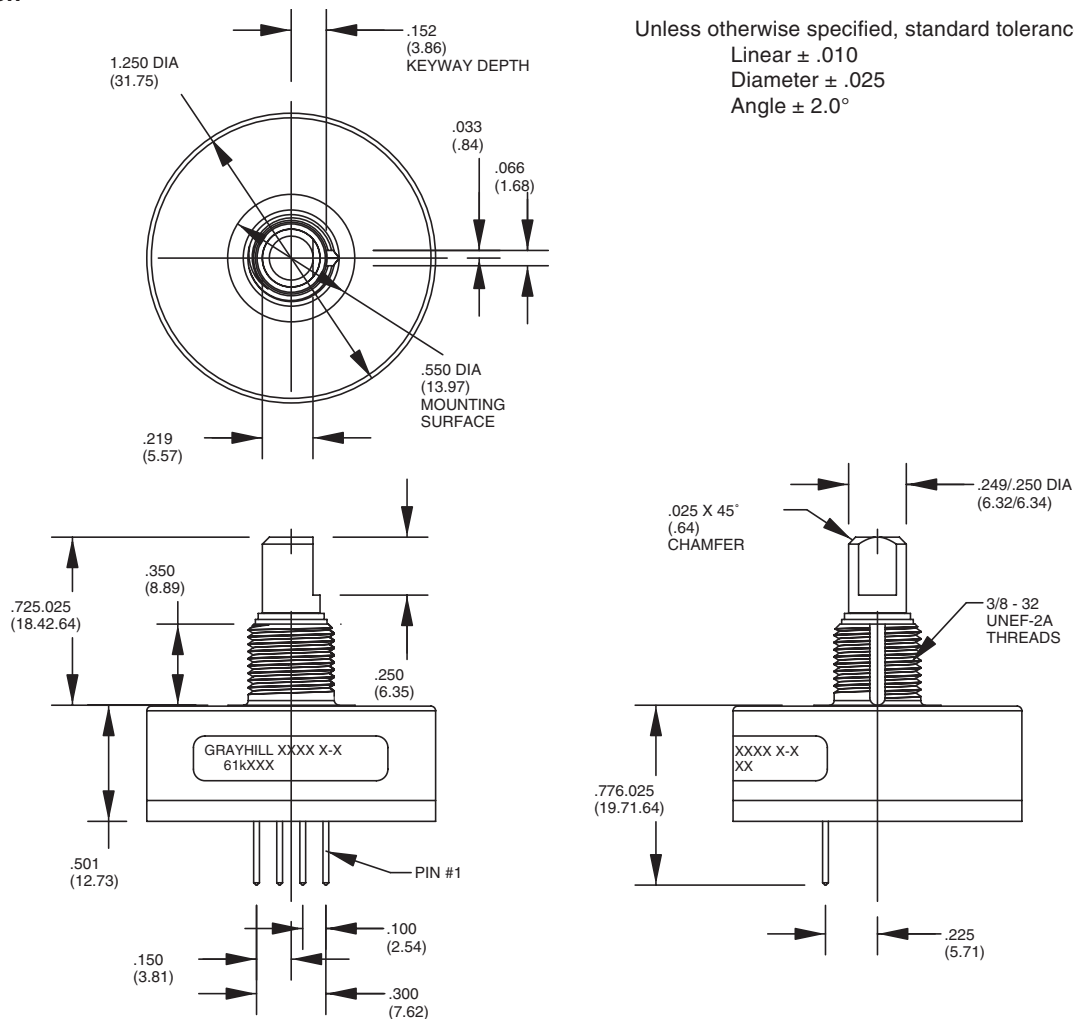
FEATURES

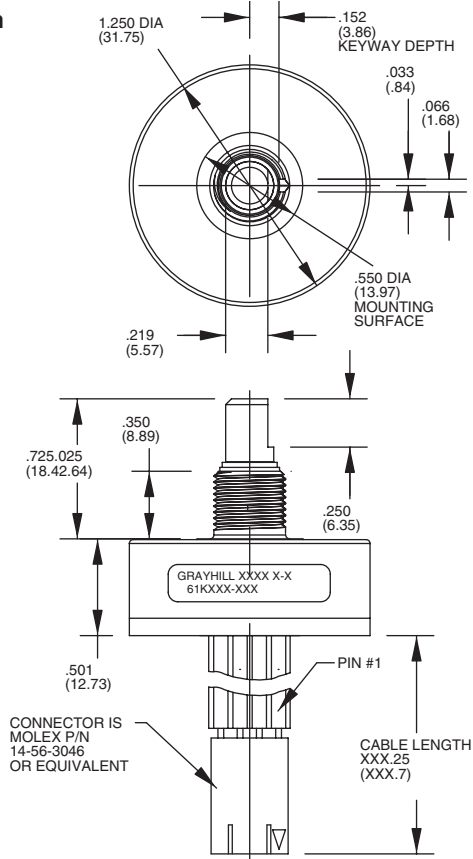
- 25, 32, 50, 64, 100, 128 and 256 Cycles per Revolution Available
- Sealed Version Available
- Rugged Construction
- Cable or Pin Versions
- 10 Million Rotational Life Cycles
- 300 RPM Shaft Rotation



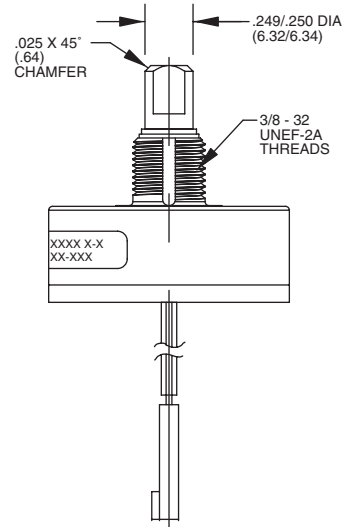
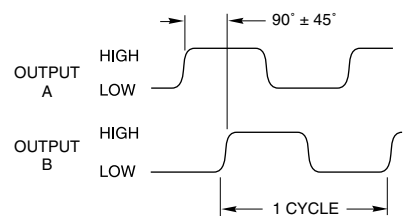
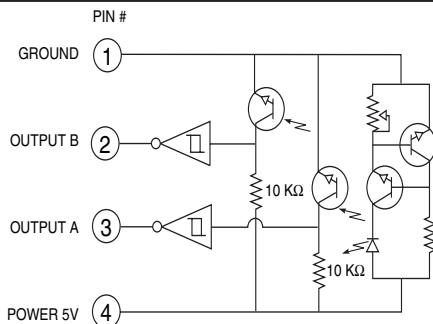
DIMENSIONS In inches (and millimeters)

Pin Version



DIMENSIONS In inches (and millimeters)**Cable Version**

UNLESS OTHERWISE SPECIFIED, DIMENSION TOLERANCES ARE AS FOLLOWS:
 LINEAR .010 (.25), DIAMETERS .010 (.25), ANGULAR 5°

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

CHANNEL A LEADS CHANNEL B BY
 $90^\circ \pm 45^\circ$ IN ALL ROTATIONS FOR
 CLOCKWISE ROTATION OF SHAFT.

SPECIFICATIONS**Electrical Ratings**

Operating Voltage: $5.0 \pm .25$ Vdc

Supply Current: 30 mA maximum at 5 Vdc

Logic Output Characteristics:

Output Type: Open collector with integrated

Schmitt Trigger and 10K ohms pull-up resistor

Maximum Sink Current: 16 mA at .40 volts

Power Consumption: 150 mW maximum

Optical Rise Time: 500 nS typical

Optical Fall Time: 16 nS typical

degradation data)

Mounting Torque: 20 in-lbs maximum

Shaft Push Out Force: 100 lbs

Terminal Strength: 5 lbs terminal pull-out
 force minimum

Solderability: 95% free of pin holes and voids
Operating Torque: 1.5 in-oz maximum (no
 detents) for unsealed versions

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, 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 wave with velocity change of 12.3 ft/s. Test
 2: 100g for 6 mS, sawtooth wave with velocity
 change of 9.7 ft/s.

Materials and Finishes

See page I-41.

ACCESSORIES

See page I-41. For control knobs see page
 I-57.

Mechanical Ratings

Mechanical Life: 10 million revolutions

Time Life: Guaranteed for 10 years of
 continuous operation (calculated from emitter

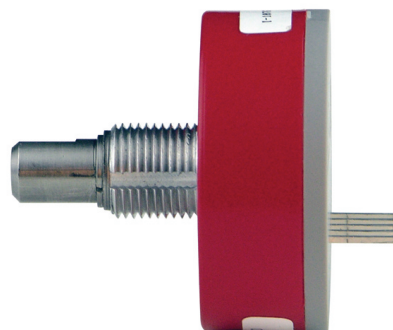
SERIES 61R

High Resolution, 5-Pin

(Polarized Connection)

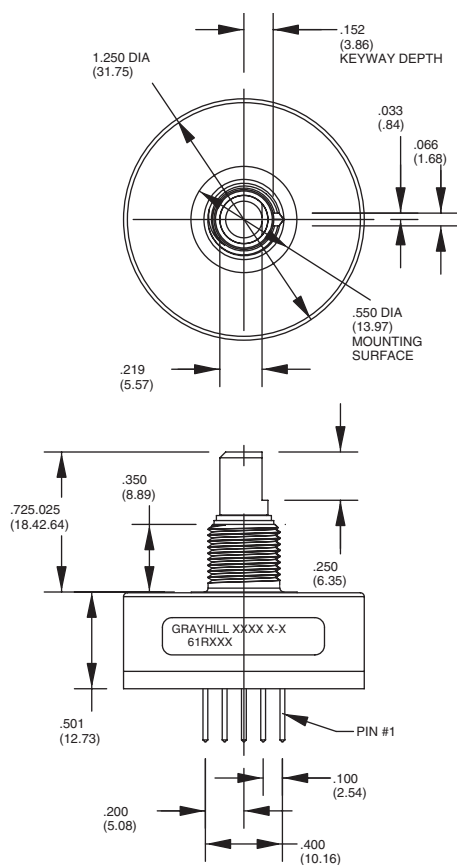
FEATURES

- 25, 32, 50, 64, 100, 128 and 256 Cycles per Revolution Available
- Sealed Version Available
- Rugged Construction
- Cable or Pin Version
- 10 Million Rotational Cycles
- 300 RPM Shaft Rotation
- Index Pulse Available



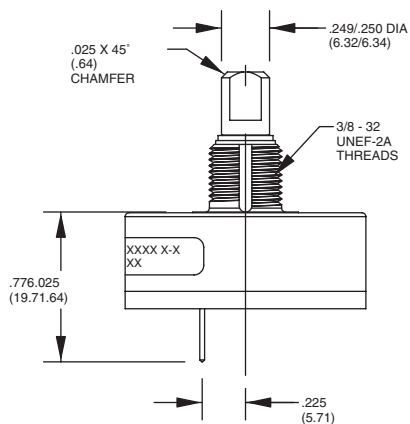
DIMENSIONS In inches (and millimeters)

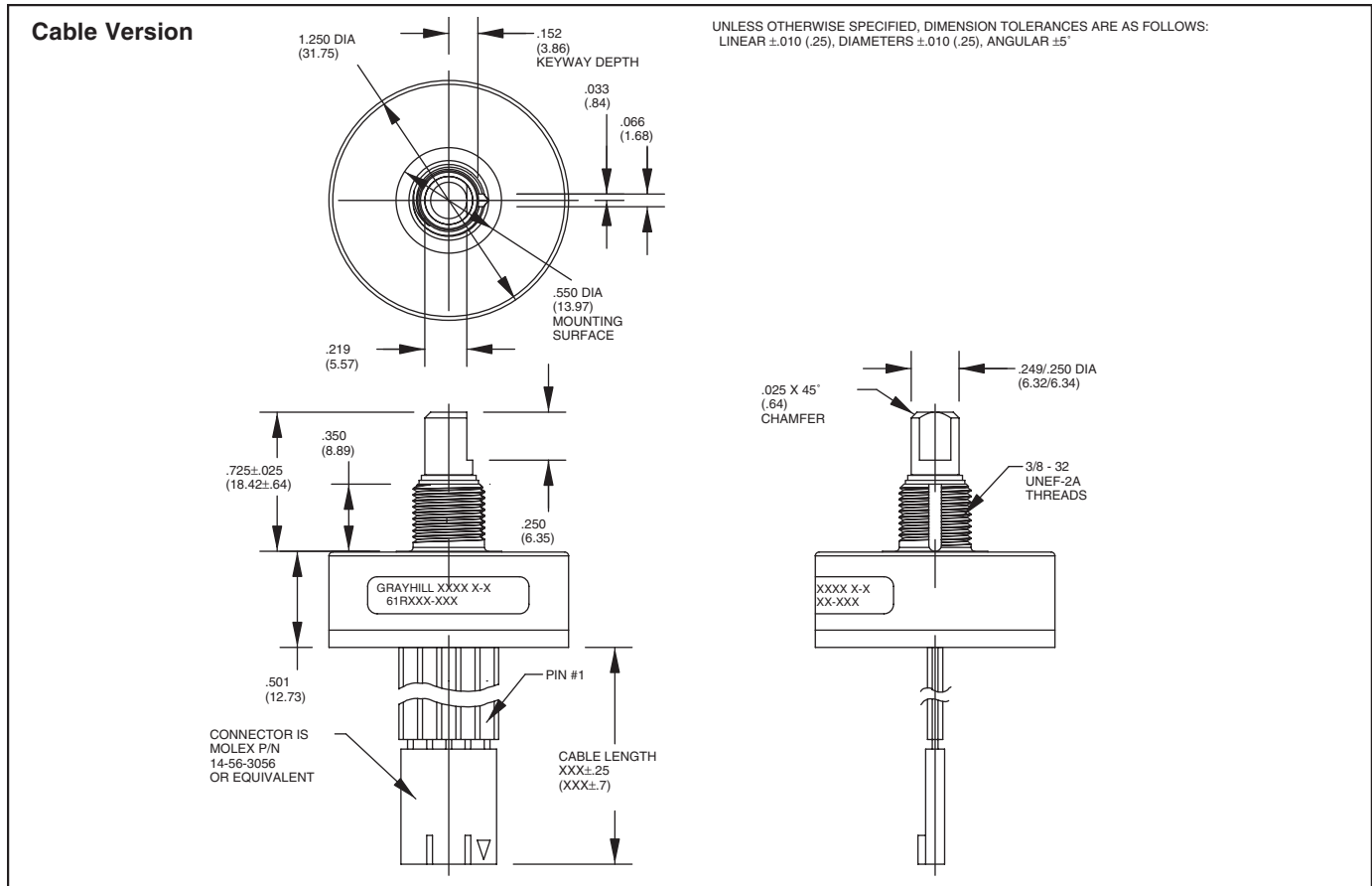
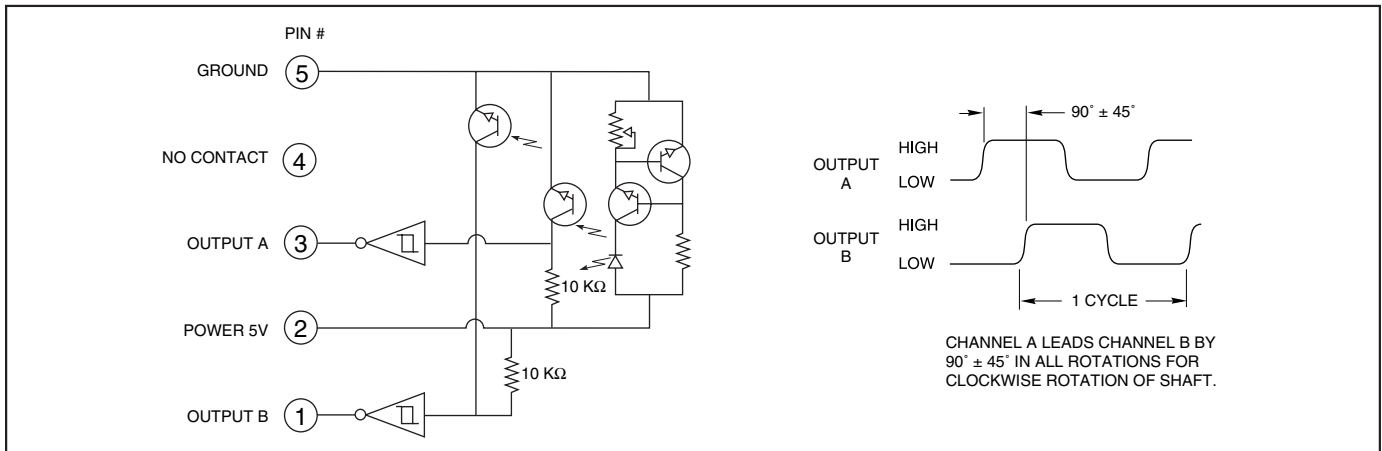
Pin Version



Unless otherwise specified, standard tolerance are:

Linear $\pm .010$
Diameter $\pm .025$
Angle $\pm 2.0^\circ$



DIMENSIONS In inches (and millimeters)**CIRCUITRY, TRUTH TABLE, AND WAVEFORM: Standard Quadrature 2-Bit Code****SPECIFICATIONS****Electrical Ratings****Operating Voltage:** 5.0 $\pm$.25 Vdc**Supply Current:** 30 mA maximum at 5 Vdc**Logic Output Characteristics:**

Output Type: Open collector with integrated Schmitt Trigger and 10K ohms pull-up resistor

Maximum Sink Current: 16 mA at .40 volts

Power Consumption: 150 mW maximum**Optical Rise Time:** 500 nS typical**Optical Fall Time:** 16 nS typical**Mechanical Ratings****Mechanical Life:** 10 million revolutions**Time Life:** Guaranteed for 10 years of continuous operation (calculated from emitter degradation data)**Mounting Torque:** 20 in-lbs maximum**Shaft Push Out Force:** 100 lbs**Terminal Strength:** 5 lbs terminal pull-out force minimum**Solderability:** 95% free of pin holes and voids**Operating Torque:** 1.5 in-oz maximum (no detents) for unsealed versions**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, within a varied 10 to 2000 Hz frequency for 12 hours per MIL-STD-202, Method 204

Shock Resistance: Test 1: 100g for 6 mS, half-sine wave with velocity change of 12.3 ft/s. Test 2: 100g for 6 mS, sawtooth wave with velocity change of 9.7 ft/s.

Materials and Finishes

Bushing: Aluminum
Code Housing: Hiloy 610B
Shaft: Stainless steel
Retaining Ring: Stainless steel
Code Rotor and Aperture: Chemically etched stainless steel/electroformed nickel

Printed Circuit Board: NEMA Grade FR-4.
 Five microinches minimum gold over 100 microinches minimum nickel over copper
Optical Barrier: Polyphenylene sulfide, 94 V-0
Backplate: Polyester
Header: Phosphor bronze, 200 microinches tin over 50 microinches nickel (pin version only)
Infrared Emitter: Gallium aluminum arsenide
Photo IC: Planar silicon
Cable: 26 AWG, stranded/tinned wire, PVC coated on .100 (2,54) centers (cable version only)

ORDERING INFORMATION



Series

Style: K = Standard, 4-pin, high resolution
 KS = Sealed, 4-pin, high resolution
 R = Standard, 5-pin, high resolution
 RS = Sealed, 5-pin, high resolution

Cycles: per channel per revolution = 25, 32, 50, 64, 100, 128, 256

Cable Termination: 060 = 6.0in. Cable is terminated with Molex Connector P/N 14-56-3056. To purchase an Molex Mating Connector visit www.avnet.com.

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

ACCESSORIES

Non-Turn Washer

The Series 61 bushing is 3/8 inches in diameter and has a non-turn keyway to prevent rotation of the switch body when the panel is cut to fit. Another way to keep the switch from turning is to use a non-turn washer. The washer is cadmium-plated brass.

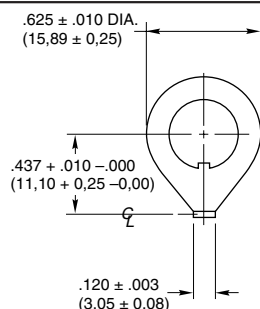
Part number: **12C1087-1**

Part number: **SHH694-11**, 302-2B stainless steel, no plating

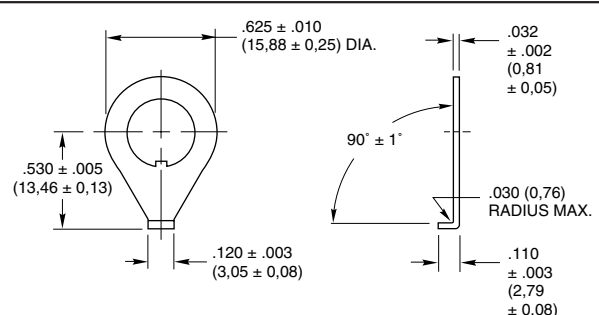
Shaft and Panel Seal

For shaft and panel seal version, the shaft is sealed by an o-ring inside the bushing. The panel is sealed by a flat gasket .045" thick at the base of the bushing. The panel seals will increase the behind panel dimension by .020" to .040", when the switch is mounted. The panel seal is silicon rubber.

DIMENSIONS In inches (and millimeters)



Part Number: **12C1087-1**



Part Number: **SHH694-11**