

**PERFORMANCE SPECIFICATION
PIEZORESISTIVE ACCELEROMETER
(71M1-XX)**

Document Number	Rev	Date	Entered By	Description of Change	Change Accountable Engineer	ECO
75847	A	6/26/23	NAD	Zero Measurand Output Updated	JKN	53965

1.0 DESCRIPTION

The Endevco Model 71M1-60K is a family of miniature, rugged, undamped, piezoresistive accelerometers designed for shock measurements. The Leadless Chip Carrier package is designed for surface mount attachment to circuit boards. The highly efficient sensing system of the Model 71M1-60K is sculpted from single crystal silicon, which includes the inertial mass and strain gages arranged in a four-active-arm Wheatstone bridge circuit (patent numbers 4,498,229, 4,605,919 and 4,689,600). The extremely small size and unique construction of the element provides exceptionally high resonant frequency. On-chip balance resistors provide low zero measure and output and low thermal zero drift. The light weight flat case is designed for adhesive mounting.

2.0 PERFORMANCE

(See Note 1 for the relations between sensitivity, resonant frequency and range limitations)

MODEL	<u>Sensitivity</u> (microvolts/g)		<u>Resonant Frequency</u> (Kilohertz)		<u>Range</u> (g's)	<u>Overrange Limit</u> (g's)
	Min	Typ	Max	Typ		
71M1-60K	0.75	1.5	2.5	700	60 000 *	120 000
71M1-20K	2.5	5	7.5	350	20 000 *	60 000
71M1-6K	7.5	15	25	180	6 000 *	18 000
71M1-2K	25	50	75	90	2 000 *	10 000

All specifications assume +75°F (+24°C) and 5 volts excitation.

* Refer to Note 3 for cautions and mounting procedures when operating at these acceleration levels.

- 2.1 AMPLITUDE LINEARITY [1] ±2% of reading typical up to full scale acceleration.
- 2.2 ZERO SHIFT DUE TO HALF SINE ACCELERATION AT FULL RANGE. 0.25 mV maximum
- 2.3 MOUNTED FREQUENCY RESPONSE [2]

<u>MODEL</u>	<u>±5% Deviation at</u>
-60 K	100 kHz
-20 K	50 kHz
-6 K	20 kHz
-2 K	10 kHz
- 2.4 ZERO MEASURAND OUTPUT ±10 mV/V maximum at +75°F (+24°C)
- 2.5 TRANSVERSE SENSITIVITY [3] 5% maximum
- 2.6 THERMAL ZERO SHIFT < 5.0 mV typical from 0°F to 150°F, reference 75°F
- 2.7 THERMAL SENSITIVITY SHIFT Typical deviation is -.067% /°F (-.12% /°C)

3.0 ELECTRICAL

- 3.1 EXCITATION 5.0 Vdc, 12 Vdc maximum [4] [6]
- 3.2 RESISTANCE
INPUT 650 ±300 ohms
OUTPUT 650 ±300 ohms
- 3.3 WARM-UP TIME REQUIRED TO MEET ABOVE SPECIFICATIONS [3] 2 minutes maximum, 15 seconds typical

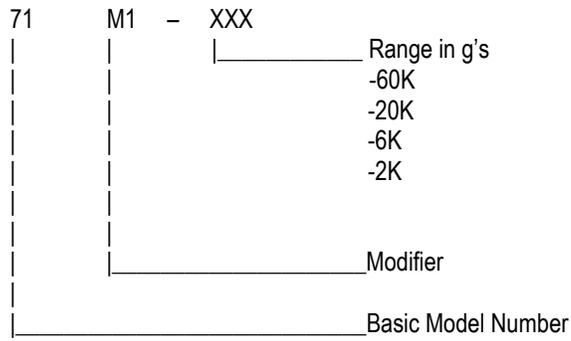
4.0 PHYSICAL

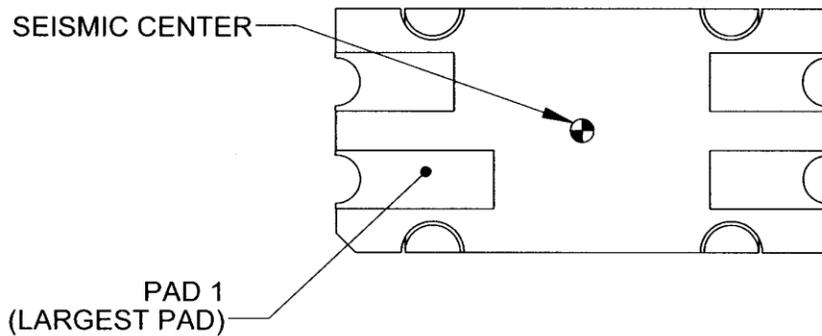
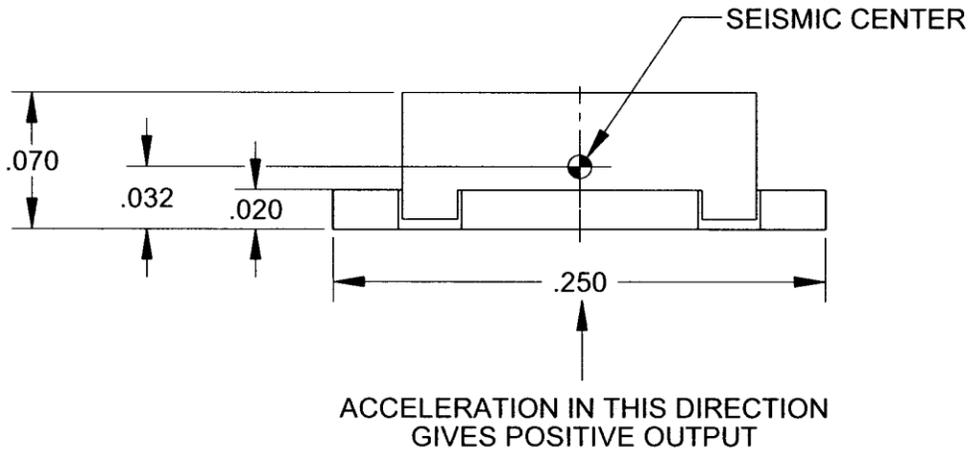
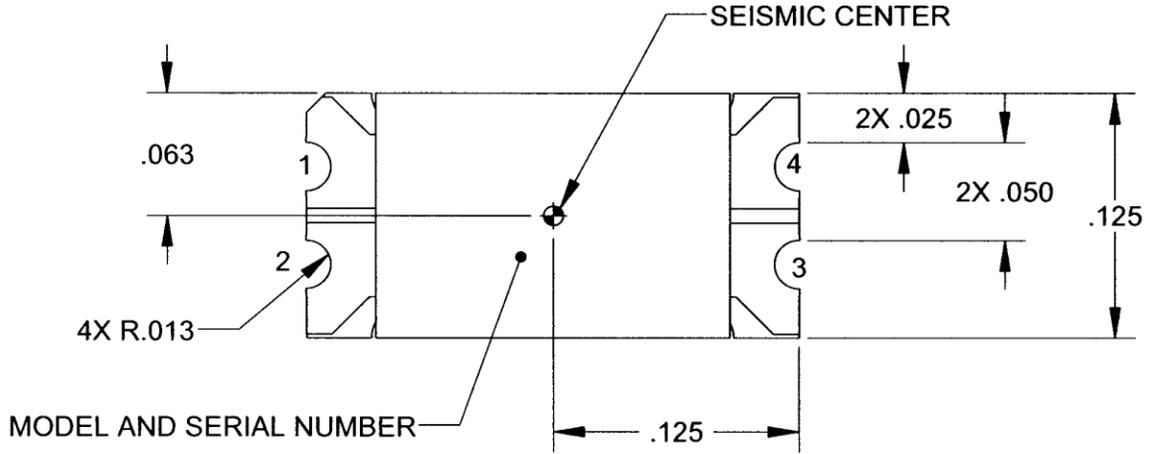
- 4.1 CASE MATERIAL Alumina substrate with plastic cover.
- 4.2 WEIGHT 0.06 grams
- 4.3 IDENTIFICATION Model and serial number engraved into top of unit.
- 4.4 MOUNTING [3] Recommended mounting is with structural epoxy across the entire surface of the alumina substrate, with electrical connections made via solder or conductive epoxy to the metalized castellations. If electrical contact is made to the mounting surface, epoxy under fill is required to enable the unit to withstand high g shocks. Refer to instruction manual IM71 or IM71-60K for detailed mounting instructions.

5.0 ENVIRONMENTAL

- 5.1 TEMPERATURE
Operating: -65°F to +150°F (-54°C to +66°C) [4]
Non-operating: -65°F to +300°F (-54°C to +149°C)
- 5.2 SHOCK LIMITS (In any direction) [1] Half sine pulse at full scale range. Pulse duration should be the greater of 20 microseconds or five periods of the resonant frequency.
- 5.3 HUMIDITY Epoxy sealed
- 5.4 BASE STRAIN SENSITIVITY Typically less than 0.5 mV for 250 microstrain when tested per ISA 37.2, para 6.5.
- 5.5 VIBRATION No damage or degradation of performance was observed when subjected to random vibration in all 3 axes at .04 g²/Hz from 80 to 350 Hz, with 30 dB/Octave roll offs down to 20 Hz and down to 2000 Hz.

[7] Model Number Definition:





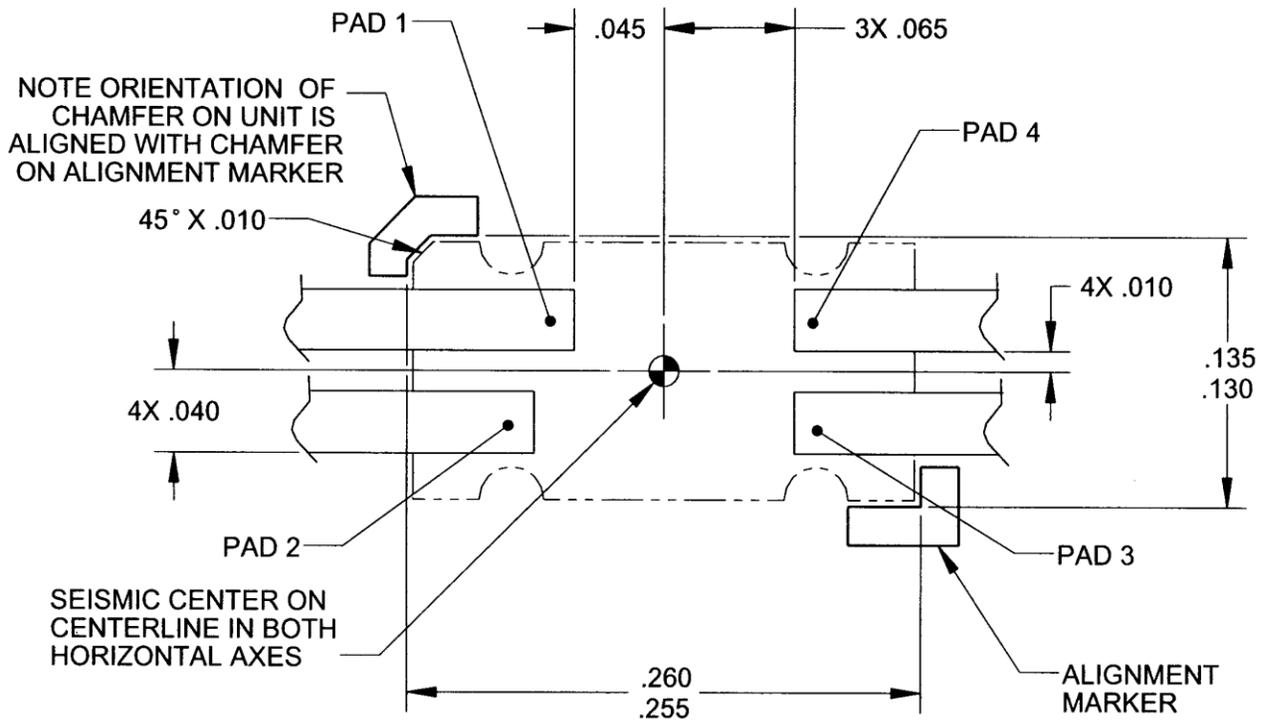
STANDARD TOLERANCE

INCHES [MILLIMETERS]

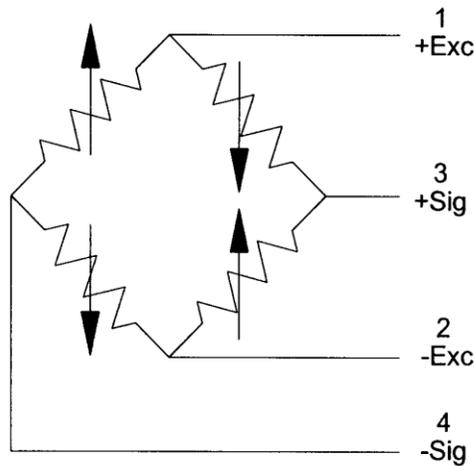
.XX = ± .02 [.X = ± .5]

XXX = ± .005 [.XX = ± .13]

FIGURE 1 - OUTLINE DRAWING



RECOMMENDED FOOTPRINT FOR MOUNTING



STANDARD TOLERANCE

INCHES [MILLIMETERS]

.XX = ± .02 [.X = ± .5]

.XXX = ± .005 [.XX = ± .13]

FIGURE 2 - OUTLINE DRAWING