

4-202 Strain Gauge Accelerometer

Applications

- Aircraft Flight Test
- Missile Rocket Test
- Auto Crash Test
- Suspension Testing
- Deceleration/Brake Test



Features

- Operates $\pm 5g$ to $\pm 500g$
- Wide Temperature Range ($-54^{\circ}C$ to $121^{\circ}C$)
- Low Cross Axis Sensitivity (0.01 g/g)

Description

Performance characteristics of the CEC 4-202 Strain Gauge Accelerometer are distinctly superior to any comparable instrument available today. It is one of the smallest temperature compensated strain gage accelerometers on the market. External dimensions are approximately 1 inch cubed, and the weight is 3 ounces.

Designed for measuring static or dynamic accelerations perpendicular to the mounting surface, the 4-202 is available in ranges from $\pm 5 g$ to $\pm 500 g$. Operable temperature range is $-70^{\circ}F$ to $+300^{\circ}F$ ($-57^{\circ}C$ to $+149^{\circ}C$). Combined linearity and hysteresis is conservatively rated at less than $\pm 0.75\%$ of full range output.

The 4-202 is a linear unbonded strain gauge bidirectional accelerometer with four active arm, spring type sensing elements. Allowable over acceleration — up to 20 times rated range — is achieved by incorporating mechanical stops on the instrument.

Performance Specifications

INPUT

Acceleration Ranges: $\pm 5 g$ to $\pm 500 g$

Standard Ranges (g): $\pm 5, \pm 10, \pm 15, \pm 25, \pm 50, \pm 100, \pm 250$ and ± 500

Static Over Acceleration: No damage will be caused by static accelerations listed below when applied along each of the three mutually perpendicular axes.

Instrument Range (g)	Static Over Acceleration (g)	Approx. Natural Frequency (Hz)
± 5	100	300
± 10	100	400
± 15	100	530
± 25	200	650
± 50	250	880
± 100	500	1250
± 250	500	2000
± 500	750	
2900		



Cross Axis Sensitivity: The sensitivity to acceleration applied perpendicular to the sensitive axis will be less than 0.01 g/g for inputs up to three times rated range or 150 g's whichever is less.

Rated Electrical Excitation: 5 VDC

Maximum Electrical Excitation: 12 VDC or AC RMS without damage

Input Resistance: 350 ohms \pm 15%

OUTPUT (At rated excitation and 77° F)

Full Range Output: 32mV +25%/-10% for 5 g range
40mV +25%/-10% for 10-500 g range

Typical Frequency Response: \pm 5%, 0 Hz to 1/3 natural frequency

Residual Unbalance: Within \pm 5% of full range output at zero acceleration

Linearity and Hysteresis: Combined effects of linearity and hysteresis do not exceed \pm 0.75% of full range output as measured from the best straight line through the calibration points, when tested within the compensated temperature range.

Damping: 0.7 \pm 0.1 of critical

Output Resistance: 350 ohms \pm 15%

Resolution: Infinite

ENVIRONMENTAL

Compensated Temperature Range: -54° C to +121° C (-65° F to +250° F)

Operable Temperature Range: -57° C to +149° C (-70° F to +300° F)

Thermal Zero Shift: Within 0.01% full range output/°F over the compensated temperature range.

Thermal Coefficient of Sensitivity: Within 0.01% full range output/°F over the compensated temperature range.

Vibration Limit: The instrument performs within the specification after being exposed to linear vibration of 25 g's peak from 10 to 2000 Hz (limited by 1/2" D.A.), when applied along any axis perpendicular to the sensitive axis. Shock:
Three 100 g half sine wave shaped impacts in each direction of each axis with a duration of 11 milliseconds will not cause damage.

Altitude: Any pressure altitude from 0-15 psia.

Humidity: The unit operates satisfactorily after exposure to the humidity test as outlined in MIL-E-5272, Procedure 1, Rev. C.

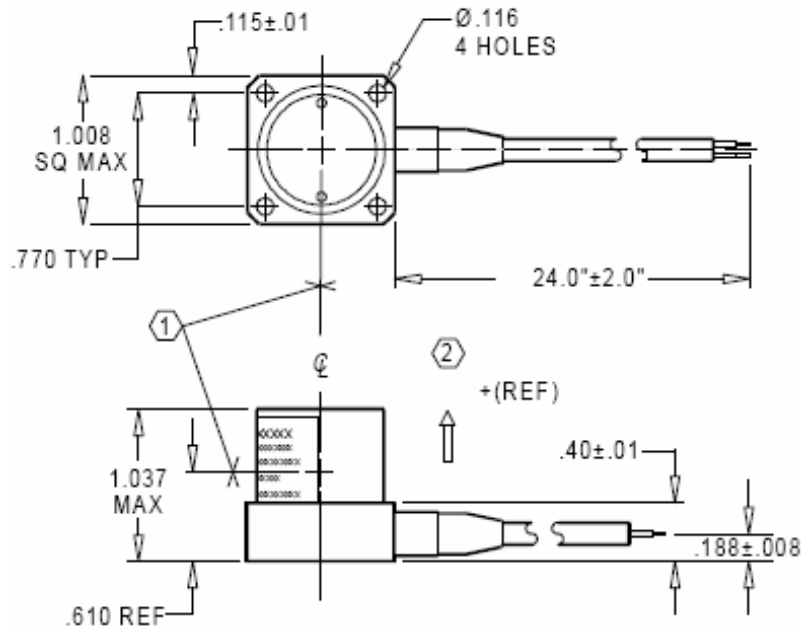
PHYSICAL Dimensional Outline: See drawing

Electrical Connection: Two feet of shielded 4-conductor cable. The cable shield is electrically insulated from the instrument case.

Insulation Resistance: 500 mega ohms minimum at 45 VDC over compensated temperature range.

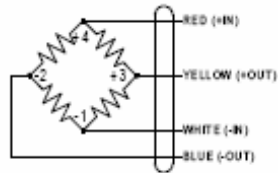
Weight: Less than 3.0 ounces, excluding cable

Finish: Clear anodized



Dimensions are in inches.

SCHEMATIC



1. Dimensions indicate center of gravity of seismic mass.
2. Acceleration of unit in this direction produces positive output.

Ordering Information

When ordering, specify Type number for acceleration range.

Type	Range	Type	Range
4-202-0001	± 5 g	4-202-0018	± 50 g
4-202-0015	± 10 g	4-202-0019	± 100 g
4-202-0016	± 15 g	4-202-0020	± 250 g
4-202-0017	± 25 g	4-202-0021	± 500 g