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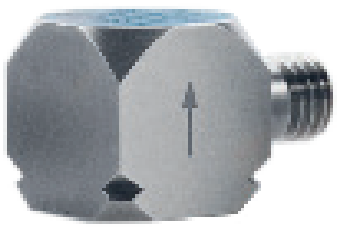
Kistler News

Acceleration

Unbeaten Sensitivity-to-Size Ratio for SIMO/MIMO Modal Analysis and Seismic Monitoring Applications

The uniaxial Type 8640A(x) and triaxial 8688A(x) PiezoBeam IEPE families provide an inexpensive modal analysis solution with very wide mounting flexibility, designed for accurate measurement frequency events from 0,5 Hz … 5 000 Hz. With their exceptional bandwidth, phase accuracy and shock survivability, Kistler Types 8640A(x) and 8688A(x) are ideal for use in SIMO or MIMO modal analysis, operational modal analysis or seismic monitoring applications.

Available in 5, 10 and 50 g, the Kistler Types 8640A(x) and 8688A(x) incorporate a bimorph piezoceramic sensing element, with an internal Piezotron® charge converter compatible with most current front end systems with constant current capability (IEPE) as well as DAQ. Patented methods are used to thermally compensate the sensing element.



Three axis accelerometer Type 8688A(x) allows various mounting technologies.

Kistler Types 8640A(x) and 8688A(x) also offer TEDS IEEE1451.4 capability as an option to simplify daily measurement work. Excellent low noise offers a very high resolution up to 140 µg.

This three axis accelerometer with a cube-shaped titanium housing is hermetically sealed and allows various mounting technologies: attachment to the test surface with any wax, adhesive, or tape. Clip and stud technology can also be used as the sensor has a 5-40UNF threaded hole.

For detailed technical specifications, drawings or a quotation please contact Kistler Group. www.kistler.com

Best-in-class Accuracy with Ultra-low Thermal Sensitivity Shift

Expert's Corner: Testing of Resonant Frequency

Exceptional Modularity, Accuracy and High Shock Survivability

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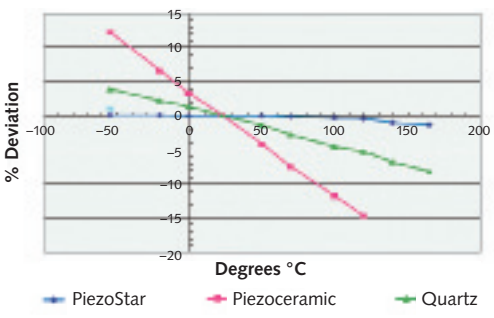
Best-in-class Accuracy with Ultra-low Thermal Sensitivity Shift

New Kistler Type 8766A(x) triaxial PiezoStar® accelerometer family features a small cube with a mass of 3,7 g designed for accurate measurement of frequency events from 0,5 Hz … 10 000 Hz. The extremely low thermal sensitivity shift of –0,005 %/°C provides accurate vibration measurement and is well suited to applications with changing temperatures.

With its ultra-stable operation a range of –54 °C … 165 °C, as well as wide and flat frequency response, this triaxial accelerometer family was designed for use in modal and durability testing under elevated temperatures for automotive, aerospace and space structures, as well as for crash-induced sound sensing of automotive impact testing.

The extremely rigid PiezoStar® crystal sensing element provides a flat frequency response with no slope over the entire usable frequency range in contrast to softer piezoceramic sensors, thus providing a more robust solution (see comparison of typical performance shown below). The 8766A(x) is unique: it provides a threaded hole for flexible mounting in 3 perpendicular orientations as well as frequency response calibration without an adapter in a back-to-back calibration. The titanium housing is hermetically sealed and can be exposed to extreme environmental conditions.

Typical % Sensitivity Deviation (Ref 23 °C) versus Temperature



New Kistler Type 8766A(x) triaxial PiezoStar® accelerometer designed for accurate measurement of frequency events from 0,5 Hz … 10 000 Hz.

Available in 50 g, 100 g, 250 g and 500 g ranges, the Kistler Type 8766(x) incorporates a shear piezoelectric PiezoStar® crystal sensing element, with internal Piezotron® charge converter for compatible operation with front end systems, constant current capability (IEPE) and DAQ.

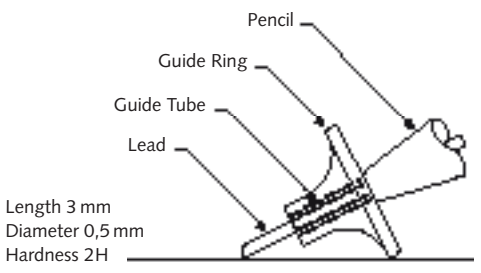
The 8766A(X) family provides two connector options with the industry standard ¼-28, 4-pin connector and the miniature M4.5, 4-pin connector, which minimizes mass for wide frequency response. It offers a standard temperature range from –54 °C … 120 °C and an optional extended temperature range from –54 °C … 165 °C. IEEE 1451.2 TEDS options are also available.

For detailed technical or commercial questions please contact Kistler Group. www.kistler.com

Expert's Corner: Testing of Resonant Frequency

For a given accelerometer, 20 % of the mounted resonance frequency is usually the practical working frequency range with a sensitivity deviation of ±5 %. Vibrations or shocks at high frequencies may excite the mechanical resonance of the test accelerometer, resulting in 'amplified' output signals or possibly a non-linear or saturated output. The general rule is to use an accelerometer in an operational frequency range < 0,2 * fr (mounted resonance frequency).

In order to define this ideal operational frequency range, the HSU-NIELSEN ASTM Std. E976-1984 method (see box) is valuable. The test set-up usually requires the use of a lead with a diameter of 0,5 mm (0,35 mm for smaller intensities). A lead length of approx. 3 mm is usually applied. The plastic form piece provides the right break angle to the surface of the body and prevents bruising (double impact) caused by the metal end piece of the pencil and the mounting surface.



A lead hardness of 2H is always recommended for this testing. However,

a) to increase signal intensity use a larger lead diameter, e. g. 0,5 mm, 0,7 mm or larger
b) to limit the bandwidth use a softer lead hardness, such as 2H, H, HB, etc.

This simple method provides valuable insights into the sensor and mounting operation.

The HSU-NIELSEN ASTM Std. E976-1984 is an easy method to excite a wide frequency range as well as the resonance of the sensor by breaking a lead in a fine line pencil. This helps in assessing the mounting technique and expected frequency performance. The accelerometer is connected to an adequate amplifier and the signal is collected by a transient recorder or DAQ. The lead break event creates a wide frequency condition that causes the accelerometer to 'ring' or resonate.

For further information please contact Kistler Group. www.kistler.com

Exceptional Modularity, Accuracy and High Shock Survivability

Kistler Type 8315A mounted for use.

Types 8315A(x) and 8395(x) K-Beam® MEMS technologies provide both temperature stability and low noise for accurate measurement of low-frequency events from DC up to a 1 000 Hz bandwidth. They are ideal for use in aircraft flight and flutter testing, automotive rough road body motion studies, suspension system tests, railroad or automotive modal and durability testing, among many other applications.

Kistler's uniaxial 8315A(x) and triaxial 8395(x) families are based on a high-precision Micro-Electro-Mechanical System (MEMS) variable capacitance accelerometer. Available in six ranges (2 … 200 g), these sensors incorporate a sensing element with gas damping and internal over-range stops. This enables the accelerometers to survive high shock and acceleration loads in addition to providing precise measurements. Types 8315A(x) and 8395(x) also offer wide temperature use between –55 °C and 125 °C (1 % FSO typical non-linearity and hysteresis for most ranges). Many input, output, housing and cable options are available to accommodate most applications.

For detailed technical specifications, drawings or a quotation please contact Kistler Group. www.kistler.com

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