Calibration Chart for DeltaTron® Accelerometer Type 4397 A



Serial No.: 2258422

Brüel & Kiær

Reference Sensitivity $^{1)}$ at 159.2 Hz ($\omega = 1000 \text{ s}^{-1}$), 20 ms $^{-2}$ RMS

4 mA supply current and 22 °C: 0.999 mV/ms-2 (9.80 mV/g)

Frequency Range: Amplitude (±10%): 1 Hz to 25 kHz Phase (± 5°):

4 Hz to 2.5 kHz Mounted Resonance Frequency: 53 kHz

Transverse Sensitivity 2):

Maximum (at 30 Hz, 100 ms⁻²): 1.0 % re Reference Sensitivity Angle of minimum, α : (see drawing)

Transverse Resonance Frequency:

17 kHz

65 °

Calculated values for TEDS 3):

54.9 kHz Resonance frequency: Quality factor @ free: 90 Amplitude slope: -2.1%/decade High pass cut-off frequency: 0.04 Hz

Low pass cut-off frequency: kHz 41

Measuring Range:

T < 100°C: T < 125°C: ± 7500 ms-2 peak (± 750 g peak) ± 5000 ms-2 peak (± 500 g peak)

Polarity of the electrical signal is positive for an acceleration in the direction of the arrow on the drawing.

¹⁾ This calibration is obtained on a modified Brüel & Kjær Calibration System Type 9610 System No.: 150117.3 and is traceable (amplitude only) to the National Institute of Standards and Technology, USA and Physikalisch-Technische Bundesanstalt, Germany.

The expanded uncertainty 5 Hz to 4 kHz; 1.0%, 4 kHz to 7 kHz; 1.4% and 7 kHz to 10 kHz; 2.0% is determined in accordance with EAL-R2. A coverage factor k=2 is used. This corresponds to a coverage probability of 95% for a normal distribution.

2) The uncertainty is 0.3% of Reference Sensitivity and 5° on the angle.

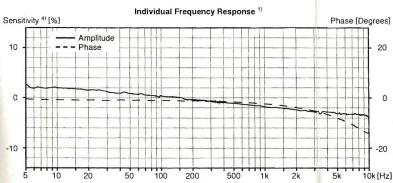
3) Transducer Electronic Data Sheet according to IEEE P1451.4, Built-in ID-information not included.

4) Deviation from Reference Sensitivity.

For further information, please see http://www.bksv.com and Product Data Sheet BP 1288 and







Electrical:

at 25°C and 4 mA: Bias Voltage: + 12 V ± 0.5 V

at full temperature and current range: + 8 V to + 15 V

+ 2 to + 10 mA T < 125°C: Unloaded Supply Voltage: + 24 V to + 30 V

T < 100°C:

Output Impedance:

Start-up time (to final bias ± 10%): 5 s

Inherent Noise (RMS):

Broadband (1 Hz to 22 kHz): corresponding to $< 0.015 \text{ ms}^{-2}$ ($< 1500 \mu g$)

Power Supply requirements: Constant Current:

10 Hz: 7.9x10-4 ms-2/VHz Spectral: (79 µg/√Hz) 2.1x10⁻⁴ ms⁻²/√Hz 100 Hz:

(21 ug/√Hz) 1.4x10-4 ms-2/VHz 1000 Hz: $(14 \mu g/\sqrt{Hz})$

Ground Loops can introduce error signals. These can be avoided by insulating the accelerometer from the mounting surface using Insulating Stud UA 1216.

AO 1381 Recommended cable:

Mounting Technique:

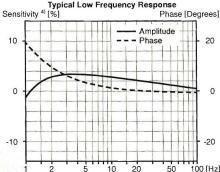
Examine the mounting surface for cleanliness and smoothness.

If necessary, machine surface to a flatness < 10 μm and a roughness < 2 μm.

Fasten the accelerometer using the appropriate stud. Take care not to exceed the recommended mounting torque and that the stud does not bottom in the mounting hole.

A thin film of oil or grease between the accelerometer and the mounting surface helps achieve good contact and improves mounting stiffness.

See also ISO 5348. For other types of mounting, see the Brüel & Kjær handbook "Piezoelectric Accelerometers and Vibration Preamplifiers" (available from your local Brüel & Kiær representative).



Environmental:

- 50 to + 125°C (- 58 to + 257°F) Temperature Range:

Temperature Coefficient of Sensitivity: + 0.05%/°C

2 ms⁻²/°C Temp. Transient Sensitivity (3 Hz Low. Lim. Frg. (-3 dB, 6 dB/oct)):

50 ms⁻²/T Magnetic Sensitivity (50 Hz, 0.038 T):

Acoustic Sensitivity (154 dB SPL): 0.01 ms⁻²

Base Strain Sensitivity (at 250 µE in base plane): 0.005 ms⁻²/με

100 kms⁻² peak (10000 g peak) Max. Non-destructive Shock: Axial:

Transverse: 50 kms-2 peak (5000 g peak)

Humidity: 90 % RH non-condensing

Mechanical:

10 Ω

 $< 15 \mu V$

Titanium ASTM Grade 2 Case Material:

Piezoelectric, Type PZ 23 Sensing Element:

Construction: Delta Shear®

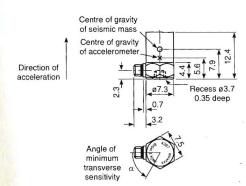
Sealing: Weight: 2.4 gram (0.085 oz)

Electrical Connector: Coaxial M3

Mounting Thread: M3. Depth 2.4 mm

Mounting Surface Flatness: < 3 um

Max. 0.6 Nm (5.3 lbf-in). Min. 0.2 Nm (1.8 lbf-in) **Mounting Torque:**



All dimensions in millimetres

30 May 2001 Operator CJ

Specifications obtained in accordance with ANSI S2.11-1969 and parts of ISO 5347. All values are typical at 25°C (77°F) unless measurement uncertainty is specified.

BC 0325-13

Welded