

PRODUCT DATA

Piezoelectric Accelerometer DeltaTron[®] Accelerometer — Type 4511-001

USES

- Flight-test applications
- Measurement in harsh environments
- Health Usage Monitoring Systems (HUMS)
- Gearboxes

FEATURES

- Case insulated and internally shielded
- Hermetically sealed
- High frequency (15 kHz)
- High temperature (150°C)
- Low-impedance output
- EMI and radiation resistant
- Centre bolt (360° orientation)
- Flight certified

Description

Type 4511-001 has been specifically designed for Health Usage Monitoring of gearboxes on helicopters, is flight-test certified, and all processes and materials comply with MIL-STD-11268. The primary design objective has been reliability under extreme conditions yielding very high robustness versus mechanical, electrical and environmental influences.

Although designed for robustness, the transducer has a resonance frequency at 43 kHz, a low noise floor and a high measuring range. The integrated high-temperature electronics allow operation to above 150°C.

Characteristics

The piezoelectric accelerometer features a built-in preamplifier. The sensitivity is expressed in terms of voltage per unit acceleration (mV/g).

Type 4511-001 uses an Annular Shear design where the piezoelectric element and the mass are formed into rings and mounted around a centre post. This design provides

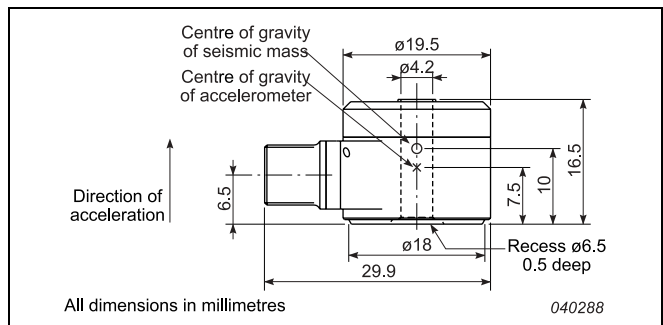


high resistance to base bending, temperature transients, high sound pressure levels, etc. The housing material is stainless steel (AISI 316-L).

Calibration

Each Type 4511-001 is individually calibrated and supplied with a comprehensive calibration chart, using state-of-the-art, random FFT technology, providing an 800-point high-resolution calibration (magnitude and phase), ultimately giving a unique characterisation and securing the integrity of the vibration measurement.

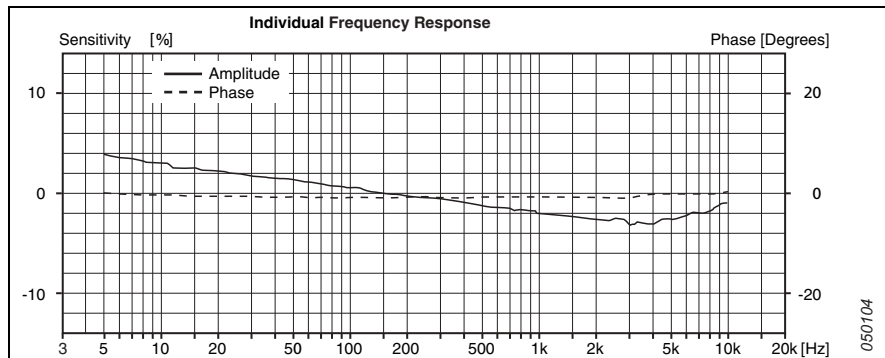
The sensitivity given on the calibration chart has been measured at 159.2 Hz with a 95% confidence level, using a coverage factor $k = 2$.




Specifications – Centre Bolt DeltaTron® Accelerometer Type 4511-001

	Units	4511-001
Dynamic Characteristics		
Voltage Sensitivity (@ 159.2 Hz)	mV/g	10 ± 10%
Measuring Range	g	± 500
Frequency Response		See typical amplitude response
Mounted Resonance Frequency	kHz	43
Amplitude Response ±10%	Hz	1 to 15000
Residual Noise	mg	< 1
Transverse Sensitivity	%	< 5
Electrical Characteristics		
DC Output Bias Voltage	V DC	11 ± 0.5
Output Impedance	Ω	< 100
Power Supply	mA	2 to 20
Start-up Time	s	2
Grounding		Case insulated
Environmental Characteristics		
Temperature Range	°C (°F)	-51 to +150 (-60 to +302)
Humidity		Hermetically sealed
Max. Operational Sinusoidal Vibration (peak)	g pk	500
Max. Operational Shock (peak)	g pk	5000
Base Strain Sensitivity	Equiv. g/μ strain	0.001
Physical Characteristics		
Dimensions		See outline drawing
Weight	gram (oz.)	35 (1.23)
Case Material		Stainless steel AISI 316-L
Connector		3-pin hermetic
Mounting		M4 centre bolt or 10–32 UNF stud

All values typical at 25°C (77°F) unless measurement uncertainty is specified



COMPLIANCE WITH STANDARDS

 Compliance with EMC Directive and Low Voltage Directive of the EU



Compliance with the EMC requirements of Australia and New Zealand

Brüel & Kjær reserves the right to change specifications and accessories without notice

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Local representatives and service organisations worldwide

Ordering Information

Type 4511-001 includes the following accessories:

- Carrying Box
- Calibration Chart
- M4 Centre Mount Stainless Steel Bolt with Lock Wire Holes

OPTIONAL ACCESSORIES*

- AO 0642: 3-pin Hermetic Connector to Open-end (pigtail), 3 m

SERVICE

- 4511-CAF: DeltaTron Accelerometer Accredited Calibration
- 4511-CAI: DeltaTron Accelerometer, Accredited Calibration performed as initial
- 4511-CTF: DeltaTron Accelerometer, Traceable Calibration
- 4511-CTI: DeltaTron Accelerometer, Traceable Calibration performed as initial
- 4511-EW1: DeltaTron Accelerometer, Extended Warranty, one year extension

* Additional accessories, cables and services are available (see www.bksv.com)

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