

# PRODUCT DATA

## Piezoelectric Accelerometer Miniature DeltaTron<sup>®</sup> Accelerometers — Types 4517 and 4517-002

### FEATURES AND USES

- Ground insulated (Type 4517-002)
- Hermetically sealed
- High frequency
- Low weight
- Low impedance
- Adhesive mounting
- Detachable cable
- Measurements in confined spaces
- Measurements on delicate structures

### Description

Types 4517 and 4517-002 are piezoelectric Shear accelerometers with a side connection. Their low weight makes them an excellent choice for measurement on delicate structures and small objects. The sensors feature a miniature 3–56 UNF connector supplied with a special, detachable, low-noise cable that terminates in a 10–32 UNF female connector. Types 4517 and 4517-002 are mounted on the object adhesively. A removal wrench is supplied for easy removal of the transducer.

### Characteristics

The piezoelectric accelerometers feature built-in preamplifiers. The sensitivity is expressed in terms of voltage per unit acceleration (mV/g).

In the Shear design, the piezoelectric element undergoes shear deformation as in the DeltaShear<sup>®</sup> design. Two rectangular slices of piezoelectric material are arranged on each side of a rectangular centre post. This design gives a high degree of linearity, and excellent immunity to base bending and temperature fluctuations. The signal is collected and amplified in the built-in amplifier. The housing material is titanium and the sensing element is quartz.

### Calibration

The transducers are individually calibrated using state-of-the-art random FFT technology, providing an 800-point high-resolution calibration (magnitude and phase), ulti-



mately giving a unique characterisation and securing the integrity of the vibration measurement.

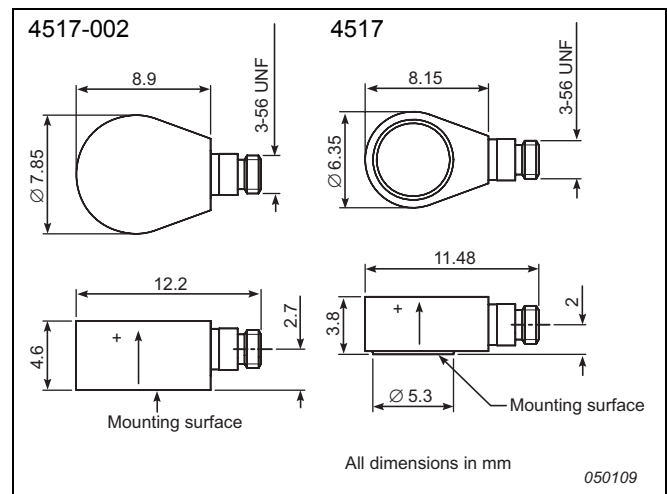
The sensitivity given on the calibration chart has been measured at 159.2 Hz with a 95% confidence level, using a coverage factor  $k = 2$ .

### Versions

Type 4517-002 has an anodized case providing electrical insulation.

### Recommended Mounting

Due to the small size, careful mounting is required to ensure correct operation over the full frequency range of the accelerometer.

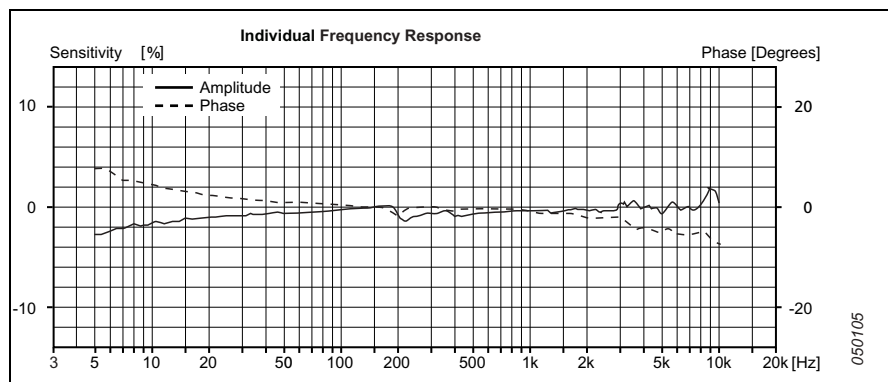


## Specifications – Miniature DeltaTron Accelerometers Types 4517 and 4517-002

	Units	4517	4517-002
<b>Dynamic Characteristics</b>			
Voltage Sensitivity (@ 160Hz)	mV/g	10 ± 10%	
Measuring Range	g	± 500	
Frequency Response		See typical amplitude response	
Mounted Resonance Frequency	kHz	75	
Amplitude Response ±10% (typical) <sup>a</sup>	Hz	1 to 20000	
Residual Noise	mg	6	
Transverse Sensitivity	%	<5	
<b>Electrical Characteristics</b>			
Output Impedance	Ω	< 100	
DC Output	At room temperature	V	
Bias Voltage	In specified temp. range	V	
Power Supply		mA	
Start-up Time		s	
Grounding		Case grounded	Insulated
<b>Environmental Characteristics</b>			
Temperature Range	°C (°F)	-51 to +121 (-60 to +250)	
Humidity		Hermetically sealed	
Max. Operational Shock (peak)	g pk	5000	
Base Strain Sensitivity	Equiv. g/μ strain	0.08	0.05
Thermal Transient Sensitivity	Equiv. %/°C (%/°F)	0.05 (0.03)	
Thermal Shock Sensitivity	ms <sup>2</sup> /°C (g/°F)	2.6 (0.15)	
<b>Physical Characteristics</b>			
Dimensions		See outline drawing	
Weight	gram (oz.)	0.6 (0.021)	1.0 (0.035)
Case Material		Titanium	
Connector		3–56 UNF thread	
Mounting		Adhesive	

a. Individual frequency response calibration up to 10 kHz

All values are 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

## Ordering Information

Types 4517 and 4517-002 include the following accessories:

- Carrying box
- Calibration chart
- Low noise cable fitted with 3–56 UNF connector to 10–32 UNF female connector, 1.2 m (4 ft)
- Removal wrench

### OPTIONAL ACCESSORIES\*

- AO 0531: PVC insulated flexible cable, 10–32 UNF to BNC, 5 m (16.4 ft), –5 to +70°C (+23 to +158°F)
- AO 0038: 260°C Teflon® low-noise cable, 10–32 UNF, length 1.2 m (4 ft)
- AO 0122: 250°C, reinforced super low noise cable, 10–32 UNF, 3 m (10 ft)
- AO 1382: Teflon low noise cable, double screened 10–32 UNF, 1.2 m (4 ft)
- JP 0145: Plug adaptor, BNC/10–32 UNF
- QS 0007: Tube of cyanoacrylate adhesive
- YJ 0216: Beeswax for mounting
- QA 0230: Removal wrench

### SERVICE

- 4517-CAF: Miniature IEPE Accelerometer, Accredited Calibration
- 4517-CAI: Miniature IEPE Accelerometer, Accredited Calibration Performed as initial
- 4517-CTF: Miniature IEPE Accelerometer, Traceable Calibration
- 4517-CTI: Miniature IEPE Accelerometer, Traceable Calibration Performed as initial
- 4517-EW1: Miniature IEPE Accelerometer, Extended Warranty, one year extension

\* Additional accessories and cables are available (see [www.bksv.com](http://www.bksv.com))

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

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