

# PRODUCT DATA

## Piezoelectric Accelerometer Miniature DeltaTron<sup>®</sup> Accelerometers — Types 4519, 4519-001, 4519-002 and 4519-003

### FEATURES AND USES

- Hermetically sealed
- Low weight
- Low-impedance output
- Measurements in confined spaces
- Measurements on delicate structures
- 360° orientation (Types 4519-002 and 4519-003)
- High frequency range (> 20 kHz)

### Description

Types 4519, 4519-001, 4519-002 and 4519-003 are piezoelectric Shear accelerometers with integral electronics. The transducers feature an M3 side connector and are hermetically sealed for high resistance to harsh environments. The transducers have a high resolution, giving an excellent signal-to-noise ratio.

Two types have been designed for mounting on the object by means of an integrated M3 threaded stud and two types for adhesive mounting with 360° freedom of orientation.

### 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.

### 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-

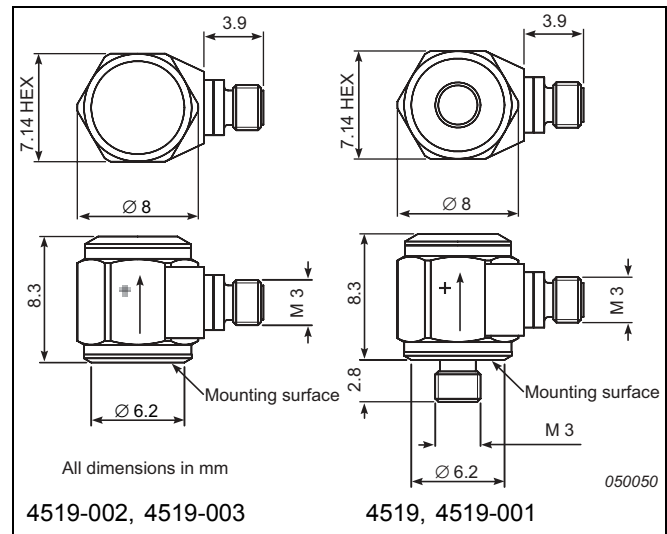


mately giving a unique characterisation and securing the integrity of the vibration measurement.

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

### Recommended Mounting

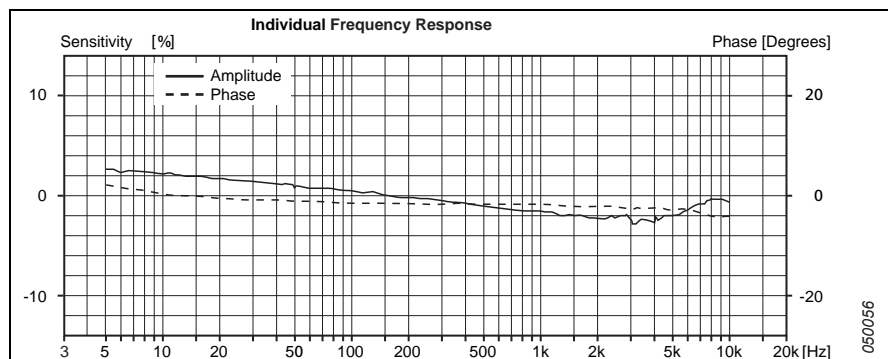
Due to the small size, careful mounting is required to ensure correct operation over the full frequency range of the accelerometer.



## Specifications – Miniature DeltaTron Accelerometers Types 4519, 4519-001, 4519-002 and 4519-003

	Units	4519	4519-001	4519-002	4519-003
<b>Dynamic Characteristics</b>					
Voltage Sensitivity (@ 160Hz)	mV/g	10 ±10%	100 ±10%	10 ±10%	100 ±10%
Measuring Range	g	±500	±50	±500	±50
Frequency Response		See typical amplitude response			
Mounted Resonance Frequency	kHz	45			
Amplitude Response ±10% (typical) <sup>a</sup>	Hz	0.5 to 20000			
Residual Noise	mg	2.0	0.9	2.0	0.9
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			
<b>Environmental Characteristics</b>					
Temperature Range	°C	-51 to +121	-51 to +100	-51 to +121	-51 to +100
	°F	-60 to +250	-60 to +212	-60 to +250	-60 to +212
Humidity		Hermetically sealed			
Max. Operational Shock (peak)	g pk	5000			
Base Strain Sensitivity	Equiv. g/μ strain	0.007			
Thermal Sensitivity	Equiv. %/°C (%/°F)	0.2 (0.1)			
<b>Physical Characteristics</b>					
Dimensions		See outline drawing			
Weight	gram (oz.)	1.6 (0.06)		1.5 (0.05)	
Case Material		Titanium			
Connector		M3			
Mounting		M3 Stud		Adhesive	
Max. Mounting Torque	Nm (lb. in.)	1.7 (15)			–

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

### TRADEMARKS

Teflon is a registered trademark of E.I. du Pont de Nemours and Company.

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

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Local representatives and service organisations worldwide

## Ordering Information

All versions of Type 4519 include the following accessories:

- Carrying box
- Calibration chart

### OPTIONAL ACCESSORIES\*

- AO-0641: PVC insulated flexible cable, M3 to BNC, 5 m (16.4 ft), -5 to +70°C (+23 to +158°F)
- AO-0283: 260°C Teflon® low-noise cable, 10–32 UNF/M3, length 1.2 m (4 ft)
- AO-0339: Flexible low-noise cable, 10–32 UNF/M3, 1.2 m (4 ft)
- UA-0186: Extension connector for 10–32 UNF cables, set of 25
- JP-0145: 10–32 UNF to BNC connector adaptor
- QA-0041: Tap for M3 thread
- QS-0007: Tube of cyanoacrylate adhesive
- YJ-0216: Beeswax for mounting
- DB-1425: Adaptor 10–32 UNF to M3 hole
- YO-0073: 25 × adhesive mounting disc; length 5 mm

### SERVICE

- 4519-CAF: Miniature IEPE Accelerometer, Accredited Calibration
- 4519-CAI: Miniature IEPE Accelerometer, Accredited Calibration Performed as initial
- 4519-CTF: Miniature IEPE Accelerometer, Traceable Calibration
- 4519-CTI: Miniature IEPE Accelerometer, Traceable Calibration Performed as initial
- 4519-EW1: Miniature IEPE Accelerometer, Extended Warranty, one year extension

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

