

# PRODUCT DATA

## Piezoelectric Accelerometer Miniature Deltatron® Accelerometers — Types 4516 and 4516-001

### FEATURES AND USES

- Low weight: 1.5 grams
- Low-impedance output
- Adhesive mounting
- Measurements in confined spaces
- Measurements on delicate structures
- High frequency range (> 20 kHz)

### Description

Types 4516 and 4516-001 are piezoelectric Shear accelerometers with integral electronics. The transducers feature an integral low noise cable terminating in a 10–32 connector. The two types are mounted on the object adhesively.

### Characteristics

The piezoelectric accelerometer features a built-in preamplifier. 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® design. Two rectangular slices of piezoelectric material are arranged on each side of a rectangular centre post. Two bolts pre-stress the piezoelectric elements. 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 stainless steel and the sensing element is quartz.

### Calibration

The transducers are individually calibrated using state-of-the-art random FFT technology, providing an 800-point

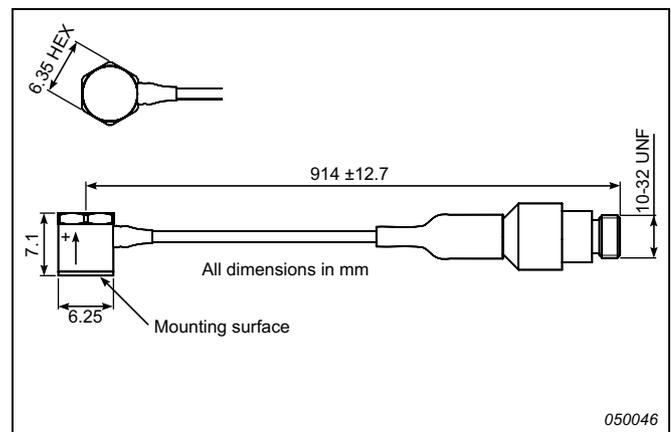


high-resolution calibration (magnitude and phase), ultimately giving a unique characterisation and securing the integrity of the vibration measurement.

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

### Recommended Mounting

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

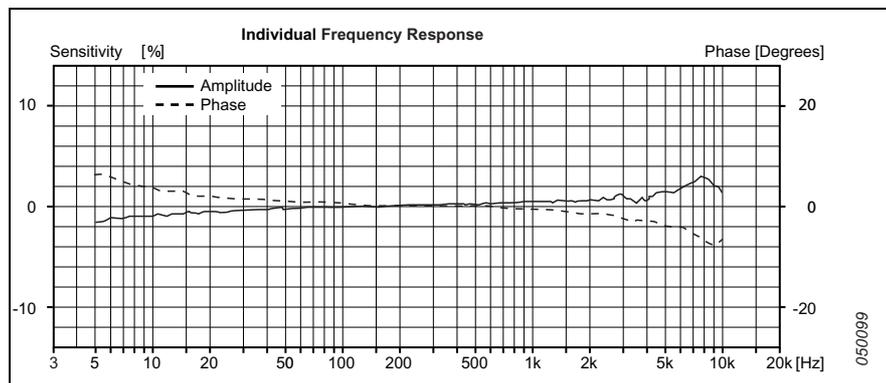


## Specifications – Miniature DeltaTron Accelerometers Types 4516 and 4516-001

	Units	4516	4516-001
<b>Dynamic Characteristics</b>			
Voltage Sensitivity (@ 160Hz)	mV/g	10 ±10%	5 ±10%
Measuring Range	g	±500	±1000
Frequency Response		See typical amplitude response	
Mounted Resonance Frequency	kHz	>60	
Amplitude Response ±10% (typical) <sup>a</sup>	Hz	1 to 20000	
Residual Noise	mg	6	12
Transverse Sensitivity	%	<5	
<b>Electrical Characteristics</b>			
Output Impedance	Ω	<100	
DC Output	At room temperature	V	10 ±15%
Bias Voltage	In specified temperature range	V	8 to 16
Power Supply		mA	2 to 20
Start-up Time		s	1
Grounding		Case grounded	
<b>Environmental Characteristics</b>			
Temperature Range	°C (°F)	-51 to +121 (-60 to +250)	
Humidity		Epoxy sealed	
Max. Operational Shock (peak)	g pk	5000	
Base Strain Sensitivity	Equiv. g/μ strain	0.01	
Thermal Transient Sensitivity	Equiv. %/°C (%/°F)	0.11 (0.06)	
Thermal Shock Sensitivity	ms <sup>2</sup> /°C (g/°F)	7.1 (0.4)	
<b>Physical Characteristics</b>			
Dimensions		See outline drawing	
Weight, excl. cable	gram (oz.)	1.5 (0.05)	
Weight, incl. cable	gram (oz.)	5.6 (0.2)	
Case Material		Stainless steel	
Connector		Integral cable 10–32 UNF female connector, length 0.45 m (18")	
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

**CE** 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

Types 4516 and 4516-001 include the following accessories:

- Carrying box
- Calibration chart

### OPTIONAL ACCESSORIES\*

- AO 0531: PVC insulated flexible cable, 10–32 UNF to BNC, 5 m (16.4 ft)
- AO 0038: 260°C Teflon<sup>®</sup> low-noise cable, 10–32 UNF, length 1.2 m (4 ft)
- AO 0122: 250°C, reinforced super low noise cable, 10–32, 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

### SERVICE

- 4516-CAF: Miniature IEPE Accelerometer, Accredited Calibration
- 4516-CAI: Miniature IEPE Accelerometer, Accredited Calibration Performed as initial
- 4516-CTF: Miniature IEPE Accelerometer, Traceable Calibration
- 4516-CTI: Miniature IEPE Accelerometer, Traceable Calibration Performed as initial
- 4516-EW1: Miniature IEPE Accelerometer, Extended Warranty, one year extension

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

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