

# PRODUCT DATA

## Piezoelectric Accelerometers Miniature Triaxial DeltaTron® Accelerometers — Types 4520, 4520-001 and 4520-004

### USES AND FEATURES

- General purpose
- Structural analysis
- Modal measurements
- Triaxial
- Lightweight
- Hermetically sealed

### Description

Types 4520, 4520-001 and 4520-004 are small, lightweight, triaxial, piezoelectric accelerometers, with sensitivities of 10 or 1 mV/g. All types feature a hermetic 4-pin receptacle 1/4"-28 UNF-2A with three independent outputs for simultaneous measurements on the x-, y- and z-axes. Their light weight makes them ideal for measurements on light structures.

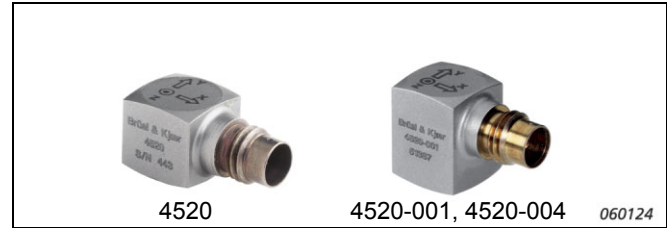
### Mounting

Careful mounting is required to ensure correct operation over the full frequency range of the accelerometers.

### Versions

Type 4520 weighs <3 grams and is mounted adhesively.

Types 4520-001 and 4520-004 weigh 4 grams and can be mounted either adhesively or by using a stud and the M3 tapped hole.



### Characteristics

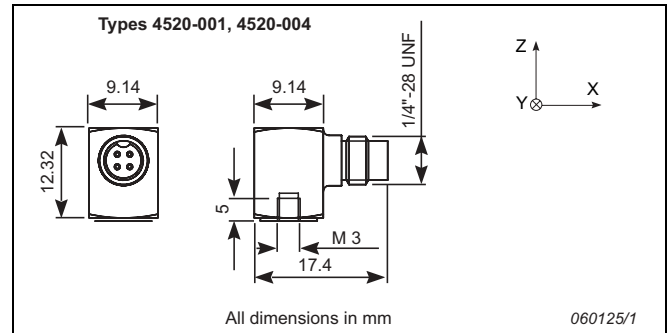
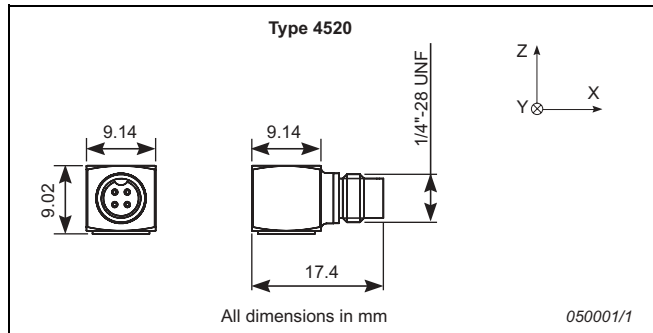
The accelerometer design features a built-in preamplifier. The accelerometer's sensitivity is expressed in terms of voltage per unit acceleration,  $\text{mV}/\text{ms}^{-2}$  (mV/g).

The accelerometers are Shear designs where the piezoelectric elements undergo shear deformation. This design exhibits good characteristics regarding base strain and temperature variations. The housing is titanium, the unit is hermetically sealed, and the sensing element is quartz.

### Calibration

Each accelerometer is individually calibrated using state-of-the-art, random FFT technology to provide a comprehensive, 1600-point, high-resolution calibration chart (magnitude and phase), which ultimately gives a unique characterisation and secures the integrity of the vibration measurement.

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





## Specifications – Miniature Triaxial DeltaTron Accelerometers Types 4520, 4520-001 and 4520-004

		Units	4520 <sup>a</sup>	4520-001 <sup>b</sup>	4520-004 <sup>c</sup>
<b>Dynamic Characteristics</b>					
Voltage Sensitivity (@ 159.2 Hz)		mV/ms <sup>-2</sup> (mV/g)	1 +12/-8% (10 ±10%)		0.1 +12/-8% (1 ±10%)
Measuring Range		ms <sup>-2</sup> (g)	± 5000 (± 500)		± 50000 (± 5000)
Mounted Resonance Frequency		kHz	x, y: 30 z: 40	x: 20 y: 25 z: 30	
Amplitude Response ±10% [1]		Hz	x, y, z: 2 to 7000	x, y: 2 to 4000 z: 2 to 7000	
Residual Noise (2 Hz to 7 kHz)		mg	x, y, z: 7		x, y, z: 56
Transverse Sensitivity		%	<5		
<b>Electrical Characteristics</b>					
DC Output	At room temperature	V DC	8.5 to 11.5		
Bias Voltage	In specified temp. range	V DC	8 to 16		
Output Impedance		Ω	<100		
Grounding			Signal ground connected to case		
<b>Power Requirements</b>					
Supply Voltage		V DC	18 to 30		
Supply Current		mA	2 to 20		
Warm-up Time		s	1		
<b>Environmental Characteristics</b>					
Temperature Range		°C (°F)	-51 to +121 (-60 to +250)		
Humidity			Hermetically sealed		
Operational Sinusoidal Vibration Limit (peak)		ms <sup>-2</sup> (g)	5000 (500)		50000 (5000)
Shock Limit (peak)		ms <sup>-2</sup> (g)	50000 (5000)		
Base Strain Sensitivity		Equiv. g/μstrain	0.03	0.015	
Magnetic Sensitivity		g/T	1.2		4
Temperature Response		%/°C (%/°F)	-0.06 (-0.033)		
Thermal Transient Sensitivity		g/°C (g/°F)	0.36 (0.2)		
<b>Physical Characteristics</b>					
Dimensions			See outline drawing		
Weight		gram (oz.)	2.9 (0.10)	4 (0.14)	
Case Material			Titanium		
Connector			Hermetic 4-pin receptacle ¼"-28 UNF-2A		
Mounting			Adhesive	M3 tapped hole or adhesive	

[1] 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

**Note:** The unit may be sensitive to conducted RF<sup>c</sup> and surge transients<sup>a, b, c</sup>

## Ordering Information

Type 4520 includes the following accessories:

- Carrying Box
- Calibration Chart

Types 4520-001 and 4520-004 include the following accessories:

- Carrying Box
- Calibration Chart
- M3 to M3 Mounting Stud with Flange

### OPTIONAL ACCESSORIES

AO-0526-D-050	Cable with 4-pin to 3 × BNC Connectors, 5 m (16 ft) 85°C (185°F)
AO-0527-D-050	Cable with 4-pin to 3 × 10-32 UNF Connectors, 5 m (16 ft) 85°C (185°F)
AO-0528-D-050	Cable with 4-pin to 4-pin Connectors, 5 m (16 ft) 85°C (185°F)
AO-0534-D-050	Cable with 4-pin to 3 × BNC Connectors, 5 m (16 ft) 120°C (248°F)
DB-1425	Adaptor M3 to 10-32 UNF
QS-0007	Tube of Cyanoacrylate Adhesive
UA-1075	Mounting Magnet with M3 Stud
UA-1193	Set of 10 M3 to M3 Insulating Studs
UA-1221	Set of 25 M3 to M3 Studs with Flange
UA-2065	Set of 10 M3 Steel Studs
WA-0224	Mechanical Filter
WB-1453	DeltaTron Power Supply

### SERVICE

4520-CAF	Miniature Cubic Triaxial IEPE Accelerometer, Accredited Calibration
4520-CAI	Miniature Cubic Triaxial IEPE Accelerometer, Accredited Calibration Performed as Initial
4520-CTF	Miniature Cubic Triaxial IEPE Accelerometer, Traceable Calibration
4520-CTI	Miniature Cubic Triaxial IEPE Accelerometer, Traceable Calibration Performed as Initial
4520-EW1	Miniature Cubic Triaxial IEPE Accelerometer, Extended Warranty, one year extension

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

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