

PRODUCT DATA

DeltaTron® Accelerometers — Types 4514, 4514-001, 4514-002, 4514-004, 4514-B, 4514-B-001, 4514-B-002 and 4514-B-004

The wide frequency range, low noise-to-signal ratio and choice of sensitivity from 1 to 50 mV/ms⁻² (10 to 500 mV/g) means the Type 4514 range of accelerometers covers a wide range of measurement applications and can be used in a variety of environmental conditions.

FEATURES

- Insulated base
- Hermetically sealed
- High resolution
- Low noise
- Low-impedance output
- TEDS – ‘B’ types only

Description

The Type 4514 accelerometer family are piezoelectric Shear accelerometers with integral electronics. The transducers feature a 10–32 UNF top connector, an insulated base and are hermetically sealed. The transducers have a high resolution, giving an excellent signal-to-noise ratio. The three types can be mounted by means of a 10–32 UNF threaded stud, or adhesively mounted.

Characteristics

In the Shear design, the piezoelectric element undergoes shear deformation as in the DeltaShear® design. Two rectangular slices of piezoelectric material are arranged on opposite sides 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.

TEDS Versions (‘B’ Types)

The ‘B’ version of each Type 4514 includes Transducer Electronic Datasheet (TEDS), containing sensor specific and application specific information, including frequency and phase response compensation. The ‘B’ versions are in all other aspects identical to the ‘non-B’ versions. The TEDS device will survive the temperature range of the

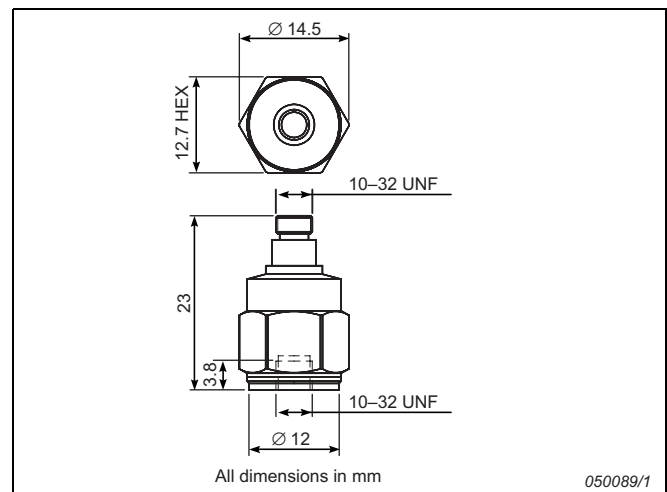


accelerometer and operate in the temperature range from –40°C to +85°C.

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 $k = 2$.

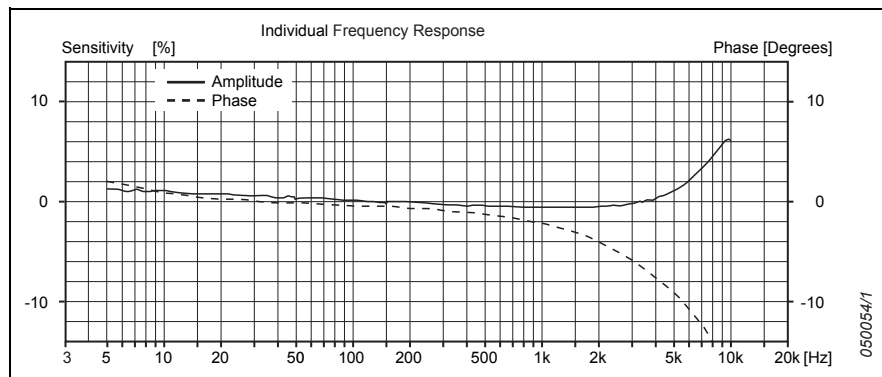


Specifications – General Purpose DeltaTron Accelerometers Types 4514(-B), 4514(-B)-001, 4514(-B)-002 and 4514(-B)-004

| | Units | 4514/ 4514-B | 4514-001/ 4514-B-001 | 4514-002/ 4514-B-002 | 4514-004/ 4514-B-004 |
|--|-------------------------------|--------------------------------|---------------------------|---------------------------|-------------------------|
| Dynamic Characteristics | | | | | |
| Voltage Sensitivity (@ 160Hz) | mV/ms ⁻² (mV/g) | 1 +12/-8% (10 ± 10%) | 10 +12/-8% (100 ± 10%) | 50 +12/-8% (500 ± 10%) | 5 +12/-8% (50 ± 10%) |
| Measuring Range (±pk) | ms ⁻² (g) | 4900 (500) | 490 (50) | 98 (10) | 980 (100) |
| Frequency Response | | See typical amplitude response | | | |
| Mounted Resonance Frequency | kHz | 32 | | | |
| Amplitude Response ±10% (typical) ^a | Hz | 1 to 10000 | | | |
| Residual Noise | mg | 0.8 | 0.2 | 0.1 | 0.3 |
| Transverse Sensitivity | % | <5 | | | |
| Electrical Characteristics | | | | | |
| Output Impedance (typical) | Ω | 20 | 100 | 200 | 50 |
| DC Output At room temperature | V | 12 ± 1 | | | |
| Bias Voltage In specified temp. range | V | 8 to 16 | | | |
| Power Supply | mA | 2 to 20 | | | |
| Start-up Time | s | 1 | 1 | 3 | 1 |
| Grounding | | Insulated base | | | |
| Environmental Characteristics | | | | | |
| Temperature Range | °C | -51 to +121 | -51 to +100 | -51 to +100 | -51 to +121 |
| | °F | -60 to +250 | -60 to +212 | -60 to +212 | -60 to +250 |
| Humidity | | Hermetically sealed | | | |
| Max. Operational Shock (peak) | g pk | 5000 | | | |
| Base Strain Sensitivity | Equiv. g/μ strain | 0.003 | | | |
| Thermal Sensitivity | Equiv. %/°C (%/°F) | 0.35 (0.19) | | | |
| Thermal Shock Sensitivity | g/°C | 0.04 | | | |
| Physical Characteristics | | | | | |
| Dimensions | | See outline drawing | | | |
| Weight | gram (oz.) | 8.7 (0.3) | | | |
| Case Material | | Titanium | | | |
| Connector | | 10-32 UNF | | | |
| Mounting | | 10-32 UNF threaded hole | | | |
| 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



TRADEMARKS

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

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Local representatives and service organisations worldwide

COMPLIANCE WITH STANDARDS

CE Compliance with EMC Directive and Low Voltage Directive of the EU

C Compliance with the EMC requirements of Australia and New Zealand

Ordering Information

Types 4514(-B), 4514(-B)-001, 4514(-B)-002 and 4514(-B)-004 include the following accessories:

- Carrying box
- Calibration chart
- 10-32 UNF Beryllium mounting stud, length 6.7 mm (0.26")
- 'B' versions include TEDS

OPTIONAL ACCESSORIES*

- AO-0038-D-012: Teflon® super low-noise cable, 10-32 UNF to 10-32 UNF connector 250°C (482°F), length 1.2 m (4ft)
- AO-0531-D-050: PVC insulated flexible cable, 10-32 UNF to BNC connector 70°C (158°F), 5 m (17ft)
- JP-0145: Plug adaptor, BNC/10-32 UNF
- UA-0186: Extension connector for 10-32 UNF cables, set of 25
- QS-0007: Tube of cyanoacrylate adhesive
- YJ-0216: Beeswax for mounting
- DB-0544: 10-32 UNF Round tip
- QA-0029: Tap for 10-32 UNF thread
- UA-0866: Cement stud 10-32 UNF 0.14 mm (0.005") (set of 25)
- UA-2064: 10-32 UNF threaded steel stud with flange, length 5.3 mm (0.2"), set of 10
- UA-2063: 10-32 UNF threaded steel studs, length 7.5 mm (0.3"), set of 10

SERVICE

- 4514-CAF: IEPE Accelerometer, Accredited Calibration
- 4514-CAI: IEPE Accelerometer, Accredited Calibration Performed as initial
- 4514-CTF: IEPE Accelerometer, Traceable Calibration
- 4514-CTI: IEPE Accelerometer, Traceable Calibration Performed as initial
- 4514-EW1: IEPE Accelerometer, Extended Warranty, one year extension

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

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