Piezoelectric Charge Accelerometer Type 4521-C

Uses

- Measurements in confined spaces
- Measurements in high-temperature environments
- Flight-test applications

180085

Features

- Hermetically sealed
- Insulated case
- Low weight (2.7 g)
- Centre-bolt mounting
- High operating temperature
- High resonance frequency

Description

Type 4521-C is a miniature piezoelectric charge accelerometer. It features an M3 side connector and an M2 centre-bolt mounting that gives 360° freedom in cable orientation. It is hermetically sealed so it is well suited for use in harsh environmental conditions, and its low weight makes it ideal for measurements on delicate structures and small objects.

Type 4521-C has a hard-anodized mounting surface that provides electrical isolation from the test object. The piezoelectrical element used in Type 4521-C is ceramic, and the housing material is a titanium alloy.

Characteristics

This piezoelectric accelerometer may be treated as a charge source. Its sensitivity is expressed in terms of charge per unit acceleration (pC/ms^{-2}, pC/*g*).

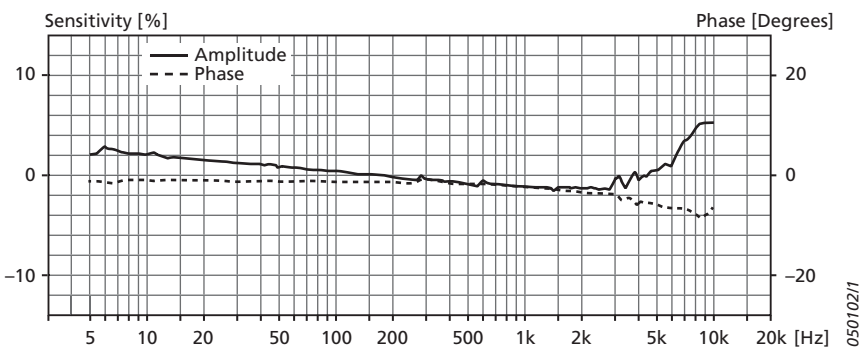
Calibration

Each accelerometer is calibrated using random excitation and 1600-line FFT transformation to provide a high-resolution (amplitude and phase) frequency response. This yields a unique characterization and secures the integrity of your vibration measurements.

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

The upper frequency limits given on the calibration chart are frequencies where the deviation from the reference sensitivity at 159.2 Hz is within ±10%. The upper frequency limit is approximately 30% of the mounted resonance frequency. This assumes that the accelerometer is correctly mounted on the test structure – poor mounting can have a marked effect on the mounted resonance frequency.

Fig. 1 *Individual frequency response curve for Type 4521-C, as from a calibration chart*



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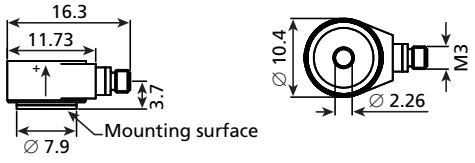
Specifications – Charge Accelerometer Type 4521-C

Type Number			4521-C
General			
Weight		g	2.700
		oz	0.095
Charge Sensitivity (at 159.2 Hz)		pC/ms^{-2}	1±20%
		pC/*g*	9.8±20%
Frequency Range	±10% limit	Hz	1 to 9000
	±5% limit		1 to 7000
Mounted Resonance Frequency		kHz	35
Max. Transverse Sensitivity (at 30 Hz, 100 ms^{-2})		%	<5
Max. Operational Continuous Sinusoidal Acceleration (peak)		kms^{-2}	20
		g	2000
Electrical			
Residual Noise Level (measured with NEXUS Type 2692-001 in the specified frequency range)		mms^{-2}	1.60
		m*g*	0.16
Capacitance (excluding cable)		pF	1300
Min. Leakage Resistance (at 20 °C)		GΩ	>20
Environmental			
Operating Temperature Range		°C	−51 to +230
		°F	−60 to +446
Temperature Coefficient of Sensitivity		%/°C	0.11
Temperature Transient Sensitivity (3 Hz Low. Lim. Freq. (−3 dB, 6 dB/octave))		ms^{-2}/°C	0.55
		g/°F	0.030
Base Strain Sensitivity (at 250 με in the base plane)		$ms^{-2}/\mu\varepsilon$	1
		g/με	0.1
Magnetic Sensitivity (50 Hz, 0.038 T)		ms^{-2}/T	6
		g/kG	0.06
Max. Non-destructive Shock (± peak)		kms^{-2}	20
		g	2000
Mechanical			
Housing Material			Titanium Alloy
Piezoelectric Sensing Element			Ceramic
Construction			Planar Shear
Sealing			Hermetic
Electrical Connector			M3
Mounting			Insulated M2 screw
Mounting Torque	Max.	Nm (lbf·in)	0.5 (4)
	Typical		0.3 (3)

All values are typical at 25 °C (77 °F) unless measurement uncertainty is stated

Fig. 2 *Dimensions of Type 4521-C*



All dimensions in millimetres 180086

Ordering Information

Type 4521-C
Includes the following accessories:
- Carrying box
- Calibration chart
- Insulated M2 mounting screw, length 10 mm

Optional Accessories†	
AO-0283-x-yyy‡	Super low-noise coaxial cable, M3 to 10−32 UNF, 250 °C (482 °F)
AO-0339-x-yyy‡	Flexible low-noise coaxial cable, M3 to 10−32 UNF, 250 °C (482 °F)
AO-1381-x-yyy‡	Flexible double-screened, low-noise cable, M3 to 10−32 UNF, 250 °C (482 °F)
JP-0145	Plug adaptor, 10−32 UNF to BNC
UA-0186	Extension connector, 10−32 UNF (set of 25)
UA-2055	Mounting screw, 2−56 UNF, length 9.5 mm (set of 10)
UA-2069	Mounting screw, M2, length 10 mm (set of 10)
Type 4294	Calibration Exciter
Calibration Services	
ACC-M-CAF	Accredited calibration
ACC-M-CAI	Accredited initial calibration

† Additional accessories and cables are available (see www.bksv.com)
‡ x = D (decimetres) or M (metres)
yyy = length in decimetres or metres
Please specify cable length when ordering

COMPLIANCE WITH STANDARDS

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BP 2074 – 15

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