

## CCLD Accelerometer Type 4523

Piezoelectric Accelerometer

### Uses

- Flight-test applications
- Measurement in harsh environments
- Health Usage Monitoring Systems (HUMS)
- Gearboxes

### Features

- Isolated mounting
- Hermetically sealed
- High frequency (13 kHz)
- High temperature (150 °C)
- Low-impedance output
- EMI resistant
- Centre bolt (360° orientation)



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### Description

Type 4523 has been specifically designed for health usage monitoring of gearboxes on helicopters. All processes and materials comply with MIL-P-11268. The transducer has been designed to be reliable despite mechanical and environmental influences.

It has a resonance frequency of 43 kHz, a low noise floor and a high measuring range. It can even, due to high-temperature electronics, operate in temperatures of 150 °C and above.

### Characteristics

This piezoelectric accelerometer features a built-in CCLD\* preamplifier, so it must be supplied with a constant current and treated as a voltage source. The sensitivity is expressed in terms of voltage per unit acceleration (mV/g).

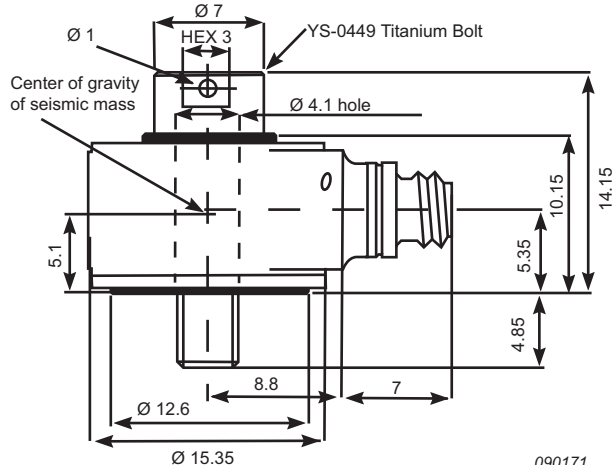
Type 4523 uses an Annular Shear design where the piezoelectric element and the mass are formed into rings and mounted around a centre post. This design provides high resistance to temperature transients, high sound pressure levels, etc. The housing material is stainless steel (AISI 316-L).

\* CCLD: Constant Current Line Drive, also known as DeltaTron®. ICP and IEPE compatible

### Calibration

Each Type 4523 is individually calibrated and supplied with a 1600-point high-resolution calibration (magnitude and phase) chart. This chart gives a unique characterization of the instrument and secures the integrity of its vibration measurements.

Fig. 1 Outline drawing of Type 4523



All dimensions in millimetres

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	Unit	4523*
<b>Dynamic Characteristic</b>		
Voltage Sensitivity (@ 159.2 Hz)	mV/ms <sup>-2</sup> (mV/g)	10 ± 5% (10 ± 5%)
Measuring Range	ms <sup>-2</sup> (g)	± 5000 (± 500)
Frequency Range Amplitude (± 10%) Phase (± 5°)	Hz	1 to 15,000 2 to 10,000
Mounted Resonance Frequency	kHz	43
Transverse Sensitivity	%	< 5
<b>Electrical Characteristics</b>		
Bias Voltage (full temperature and current range)	V DC	12 ± 2
Output Impedance	Ω	< 2
Power Supply Constant Current Unloaded Supply Voltage	mA V	2 to 20 18 to 30
Start-up Time to 90%	s	< 5
Residual Noise – Broadband 1 Hz to 13 kHz 2 Hz to 25 kHz	μg	< 1600 < 2150
Residual Noise – Spectral 10 Hz 100 Hz 1000 Hz	μg/√Hz	160 150 16
Insulation Resistance	MΩ	< 100
Grounding		Signal ground connected to case and isolated from mounting surface
<b>Environmental Characteristics</b>		
Operating Temperature Range	°C (°F)	-54 to +150 (-65 to +302)
Temperature Coefficient of Sensitivity	%/°C	0.09
Temperature Transient Sensitivity (3 Hz LLF, 20 dB/decade)	ms <sup>-2</sup> /°C	0.002
Humidity		100% RH non-condensed
Magnetic Sensitivity (5.0 Hz, 0.038 T))	ms <sup>-2</sup> / T	24
Max. Non-destructive Shock (peak)	ms <sup>-2</sup> (g) pk	50000 (5000)
Base Strain Sensitivity (250 ε in the base plane)	Equiv. ms <sup>-2</sup> / ε	0.002
<b>Physical Characteristics</b>		
Dimensions		See outline drawing
Weight (accelerometer only)	gram (oz)	13.3 (0.47)
Case Material		Stainless steel AISI 316-L
Sensing Element		Piezoelectric, Type PZ23
Construction		Annular Shear
Electrical Connector		10–32 UNF–2A
Mounting		Adhesively or M4 titanium centre bolt
Mounting Torque	Nm (lbf·in)	Max: 1.8 (16) Min: 0.8 (7)
Sealing		Hermetically sealed

\* All values are typical at 25 °C (77 °F) unless otherwise specified

**Type 4523** CCLD Accelerometer includes the following accessories:

- Carrying Box
- Calibration Chart
- M4 Titanium Mounting Bolt YS-0449

<b>Optional Accessories*</b>	
AO-0038-x-yyy <sup>†</sup>	Super low-noise cable, 10–32 UNF to 10–32 UNF, -75 °C to +250 °C
AO-0531-x-yyy <sup>†</sup>	PVC coaxial single-screen cable. 10–32 UNF to BNC. -20 °C to +70 °C
QS-0007	Tube of Cyanoacrylate Adhesive
YJ-0216	Beeswax for mounting
JP-0145	Plug Adapter, BNC to 10–32 UNF
Type 4294	Vibration Calibrator
<b>Calibration Services</b>	
ACC-T-CAF	Accredited Calibration
ACC-T-CAI	Accredited Initial Calibration
ACC-T-CFF	Factory Standard Calibration with calibration chart
ACC-T-CTF	Traceable Calibration

\* Additional accessories, cables and services are available (see [www.bksv.com](http://www.bksv.com))

† x = D (decimetres) or M (metres)

yyy = length in decimetres or metres

Please specify cable length when ordering



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