

# PRODUCT DATA

## Piezoelectric Accelerometer DeltaTron<sup>®</sup> Accelerometer — Type 4523

### 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)

### 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

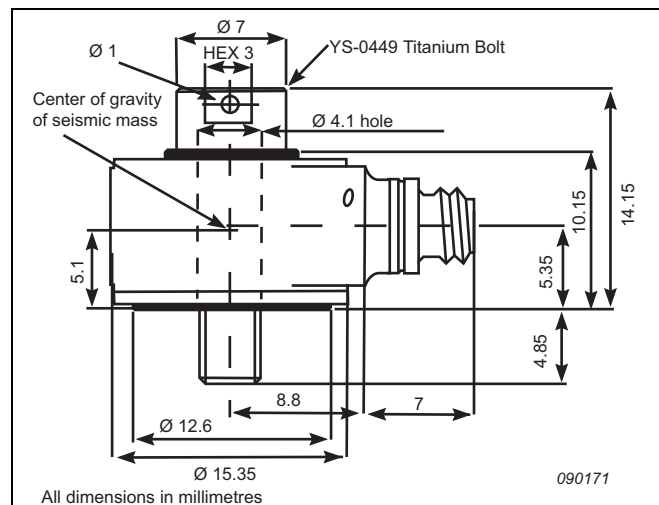
This piezoelectric accelerometer features a built-in DeltaTron preamplifier, so it must be supplied with a constant current and treated as a voltage source. The sensitivity is expressed in terms of voltage per unit acceleration (mV/g).

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).



### 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 characterisation of the instrument and secures the integrity of its vibration measurements.





## Specifications – DeltaTron Accelerometer Type 4523

	Units	4523
<b>General Characteristics</b>		
Voltage Sensitivity (@159.2 Hz)	mV/ms <sup>-2</sup> (mV/g)	1 ± 5% (10 ± 5%)
Measuring Range	ms <sup>-2</sup> (g)	±5000 (±500)
Frequency Range		
Amplitude (±10%)	Hz	1 to 15000
Phase (± 5°)	Hz	2 to 10000
Mounted Resonance Frequency	kHz	43
Transverse Sensitivity	%	<5
Polarity		Polarity of the electrical signal is positive for an accelerometer in the direction of the arrow on the drawing
<b>Electrical Characteristics</b>		
Bias Voltage (Full Temperature and Current Range)	VDC	+12 ± 2
Power Supply:		
Constant Current	mA	+2 to +20
Unloaded Supply Voltage	V	+18 to +30
Output Impedance	Ω	<2
Start-up Time to 90%	s	<5
Residual Noise		
Broadband		
1 Hz to 13 kHz	μg	<1600
2 Hz to 25 kHz		<2150
Spectral		
10 Hz	μg/√Hz	160
100 Hz		150
1000 Hz		16
Insulation Resistance	MΩ	>100
Grounding		Signal ground connected to case and Isolated from mounting surface

	Units	4523
<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 (3Hz LLF, 20dB/decade)	ms <sup>-2</sup> /°C	0.002
Base Strain Sensitivity (250ε in the base plane)	Equiv. ms <sup>-2</sup> /ε	0.002
Magnetic Sensitivity (50 Hz, 0.038 T)	ms <sup>-2</sup> /T	24
Max. Non-destructive Shock (peak)	ms <sup>-2</sup> (g) pk	50000 (5000)
Humidity		100% RH non-condensing
<b>Physical Characteristics</b>		
Case Material		Stainless steel AISI 316-LS
Sensing Element		Piezoelectric, Type PZ23
Construction		Annular Shear
Sealing		Hermetically sealed
Weight (Accelerometer only)	gram (oz)	13.3 (0.47)
Electrical Connector		10–32 UNF – 2A
Mounting		Adhesively or M4 titanium centre bolt YS-0449
Mounting Torque	Nm (lbf-in)	Max: 1.8 (16) Min: 0.8 (7)
Dimensions		See outline drawing

All values are typical at 25°C 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

## Ordering Information

Type 4523 includes the following accessories:

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

### OPTIONAL ACCESSORIES

YS-0449 M4 titanium mounting bolt  
 AO-0038-D-xxx<sup>a</sup>Teflon® super low-noise cable, 10–32 UNF to 10–32 UNF, -75°C to +250°C

a. xxx = cable length in decimeters

AO-0531-D-xxx<sup>a</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 adaptor, BNC to 10–32 UNF  
 4294 Calibrator Exciter

### SERVICE

4523-CAF Accredited Calibration  
 4523-CAI Accredited Initial Calibration  
 4523-CFF Factory Standard Calibration  
 4523-CTF Traceable Calibration  
 4523-EW1 Extended Warranty, one year extension

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

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