

## Reference Standard Accelerometer Types 8305 and 8305-001

### Features

- Excellent temperature and temperature transient characteristics
- Long term stability
- Low sensitivity to loading and base strain
- Accredited primary calibration as initial calibration

### Uses

#### General

- Measurements in vibration calibration laboratories
- Inter-laboratory comparisons (ILCs)
- Calibration according to ISO 16063-21:2003

#### Type 8305

- Back-to-back Reference Standard Accelerometer
- Direct comparison, as the Reference Standard
- Comparison by substitution, as the Working Standard



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#### Type 8305-001

- Reference Standard Accelerometer
- Transfer of primary calibration data
- Direct comparison of Back-to-back Reference Standard and Working Standard Accelerometers

### Introduction

Reference Standard Accelerometer Types 8305 and 8305-001 have similar construction but are suited to different calibration applications due to a difference in their mounting surfaces.

### Design and Materials

Types 8305 and 8305-001 have a centre-mounted compression design (inverted for Type 8305) that minimizes base strain sensitivity and gives a well-defined frequency response and low transverse sensitivity.

The accelerometers feature stainless steel housing and piezoelectric element PZ 100 quartz crystal. The element is carefully prepared to ensure excellent temperature and temperature transient characteristics and long-term stability.

### Mounting Surfaces

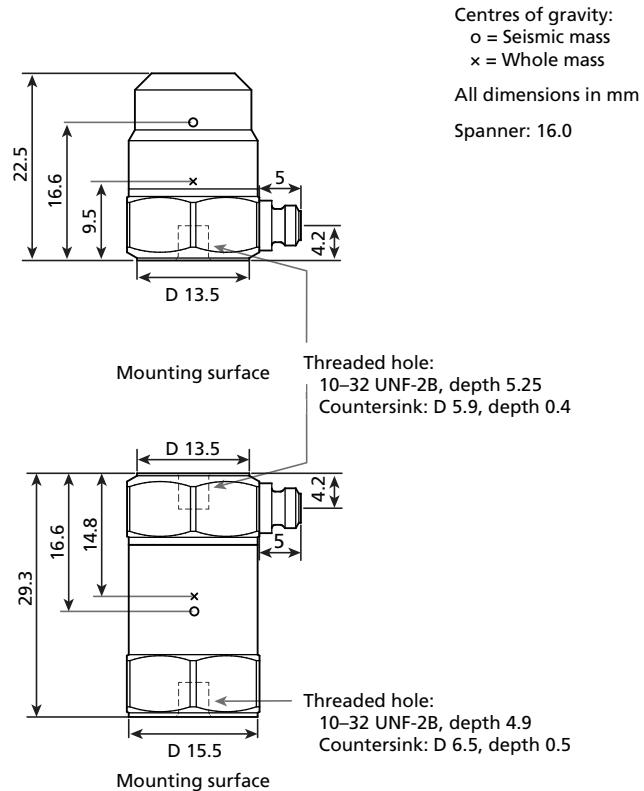
#### Type 8305

Type 8305 has two mounting surfaces (top and base) with threaded holes. It can be used for direct comparison (back-to-back) calibration as described in ISO 16063-21:2003 by mounting the base of Type 8305 on a vibration exciter and an accelerometer on its top.

#### Type 8305-001

Type 8305-001 has one mounting surface (base) with a threaded hole for mounting on either a reference transducer or an exciter. Type 8305-001 can be used for direct comparison calibration or to accurately transfer calibration data between, for example, primary and secondary calibration laboratories.

**Fig. 1** Dimensions of Type 8305 (bottom) and 8305-001 (top)



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## Included BKSVDPLA Services

Types 8305 and 8305-001 come with an accredited primary calibration at 160 Hz\* and an instrument check (BKSVDPLA services ET-2041 and ET-2050 respectively). The calibration complies with ISO 16063-11:1999, Method 3 and is performed as the initial calibration.

The included services are performed at BKSVDPLA, the Danish Primary Laboratory of Acoustics (DPLA) at Brüel & Kjær

\* ET-2041 uncertainty: 0.4% at  $k = 2$  (CIPM MRA)

Sound & Vibration Measurement A/S (BKSVDPLA) is a Designated Institute as part of the Danish metrology system and accredited by DANA, the national accreditation body in Denmark, according to ISO 17025:2005.

The accelerometer is delivered with a calibration certificate which provides the accelerometer's:

- Resonance curve (20 g load)
- Resonance frequency (20 g load)
- Transverse sensitivity (at 30 Hz)
- Weight and capacitance

## Specifications – Accelerometer Types 8305 and 8305-001

Type No.			8305	8305-001			
<b>General</b>							
Sensitivity ( $\pm 10\%$ )	after Sept. 1, 2016	$\text{pC}/\text{ms}^{-2}$ (pC/g)	0.110 (1.08)				
	before Sept. 1, 2016	$\text{pC}/\text{ms}^{-2}$ (pC/g)	0.125 (1.23)				
Frequency Range * †	Amplitude	Hz	0.2 to 10000				
			0.2 to 5000				
	Phase <sup>‡</sup>		0.2 to 10000				
Mounted Resonance Frequency <sup>‡</sup>		kHz	$\geq 40$				
Transverse Sensitivity		%	$\leq 2$				
<b>Electrical</b>							
Insulation Resistance		$\text{T}\Omega$	$\geq 1$				
Capacitance (typical)		$\text{pF}$	70				
Signal Ground			Case grounded				
<b>Environmental</b>							
Operating Temperature Range		$^{\circ}\text{C}$ ( $^{\circ}\text{F}$ )	$-74$ to $+200$ ( $-101$ to $+392$ )				
Base Strain Sensitivity (at $250 \mu\text{e}$ )	Top	$\text{ms}^{-2}/\mu\text{e}$ (g/ $\mu\text{e}$ )	0.01 (0.001)	–			
	Base		0.003 (0.0003)	0.01 (0.001)			
Acoustic Sensitivity (154 dB SPL, 2 to 100 Hz)		$\text{ms}^{-2}$ (mg)	0.008 (0.8)				
Temperature Transient Sensitivity (3 Hz LLF)		$\text{ms}^{-2}/^{\circ}\text{C}$ (g/ $^{\circ}\text{F}$ )	0.5 (0.03)				
Magnetic Sensitivity (50 Hz, $-0.03$ T)		$\text{ms}^{-2}/\text{T}$ ( $\mu\text{g}/\text{kG}$ )	1 (10)				
Max. Operating Sinusoidal Vibration (peak)		$\text{g}$	1000				
Max. Non-destructive Shock (peak, half sine, 1 ms minimum duration)		$\text{ms}^{-2}$	10000				
		$\text{g}$	1000				
<b>Mechanical</b>							
Connector		Miniature coaxial, 10–32 UNF-2A					
Piezoelectric Sensing Element		PZ 100					
Construction		Inverted compression	Compression				
Housing Material		Stainless steel, ANSI 316L					
Sealing		Hermetic					
Weight (excluding cable)		$\text{g}$ (oz)	40 (1.4)	26 (0.92)			
<b>Mounting</b>							
Mounting Torque		Nm	0.5 to 3.5 (recommended: 2.0)				

\* Low-end frequency response of the transducer is a function of its associated electronics

† With 20 g load or mounted on a 20 g high-frequency accelerometer or equivalent structure

‡ Relative to  $180^{\circ}$  on Type 8305, relative to  $0^{\circ}$  on Type 8305-001

All values are typical at  $23^{\circ}\text{C}$  unless measurement uncertainty is specified

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## Ordering Information

**Type 8305** Reference Standard Accelerometer, two mounting surfaces

**Type 8305-001** Reference Standard Accelerometer, one mounting surface

Each accelerometer is delivered in a case with the following accessories:

- Calibration chart
- AO-0038: Super low-noise cable, 10–32 UNF (M) connectors, 1.2 m (4 ft),  $260^{\circ}\text{C}$  ( $482^{\circ}\text{F}$ )
- Set screws:
  - YQ-2960: 10–32 UNF  $\times$  12.7 mm (0.5 in)
  - YQ-2962: 10–32 UNF  $\times$  7.62 mm (0.3125 in)
- YP-0150: Insulated stud, 10–32 UNF  $\times$  12.7 mm (0.5 in)
- YM-0414: Nut, 10–32 UNF
- YO-0534: Mica washer, D: 15 mm (0.59 in), d: 5.5 mm (0.22 in)
- QA-0029: Tap, 10–32 UNF thread
- QA-0013: Hex key, 10–32 UNF socket screws
- Adaptors:
  - DB-1425: M3 (F) to 10–32 UNF (M)
  - DB-1440: 4–40 UNC (M) to 10–32 UNF (M)
  - DB-1441: 6–32 UNC (M) to 10–32 UNF (M)
  - DB-1442: 8–32 UNC (M) to 10–32 UNF (M)
  - DB-1443: 1/4–28 UNF (M) to 10–32 UNF (M)

### PRIMARY CALIBRATION SERVICES

ET-2041 Single-point calibration at 160 Hz

ET-2042 Multi-point calibration, 10 Hz to 10 kHz, 1/3-octave values

ET-2043 Additional measurement points

ET-2044 Multi-point calibration, 10 Hz to 5 kHz, 1/1-octave values

ET-2045 Multi-point calibration, 1 Hz to 20 Hz, 1/3-octave values

ET-2050 Instrument check

ET-2051 Investigation

See Service Information [BU 0200](#) for information about BKSVDPLA and a complete list of accelerometer calibration services

### SECONDARY CALIBRATION SERVICES

8305-CAF Accredited calibration, 10 Hz to 10 kHz, 1/3-octave values

BK-0068-015 Accredited low frequency calibration from 1 Hz to 20 Hz, 1/3-octave values