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

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

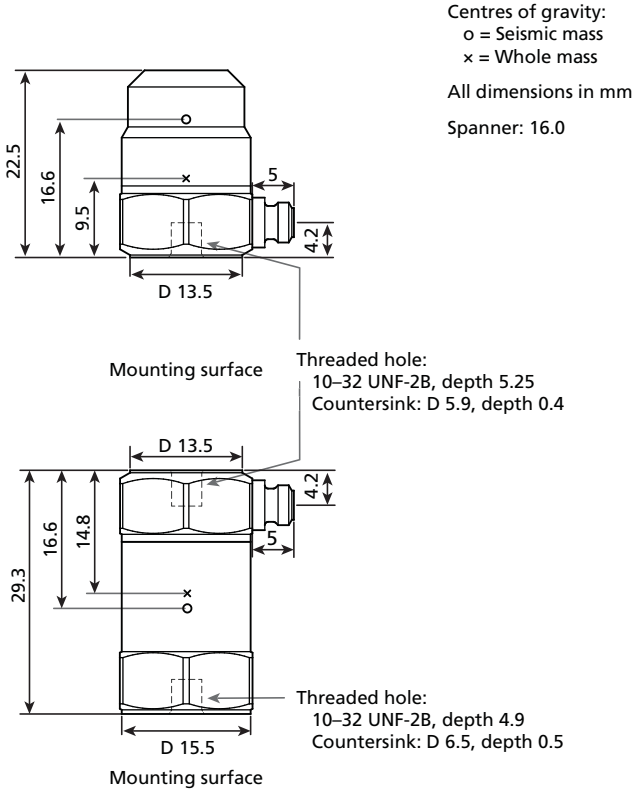
Type 8305

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**)*



Brüel & Kjær

Included BKSV-DPLA Services

Types 8305 and 8305-001 come with an accredited primary calibration at 160 Hz* and an instrument check (BKSV-DPLA 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 BKSV-DPLA, the Danish Primary Laboratory of Acoustics (DPLA) at Brüel & Kjær Sound & Vibration Measurement A/S (BKSV). BKSV-DPLA is a Designated Institute as part of the Danish metrology system and accredited by DANAK, 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

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

Specifications – Accelerometer Types 8305 and 8305-001

Type No.				8305	8305-001
General					
Sensitivity (±10%)	after Sept. 1, 2016		pC/ms^{-2} (pC/*g*)	0.110 (1.08)	
	before Sept. 1, 2016		pC/ms^{-2} (pC/*g*)	0.125 (1.23)	
Frequency Range* †	Amplitude	±10%	Hz	0.2 to 10000	
		±2%		0.2 to 5000	
	Phase‡	±1°		0.2 to 10000	
Mounted Resonance Frequency ‡			kHz	≥ 40	
Transverse Sensitivity			%	≤ 2	
Electrical					
Insulation Resistance			TΩ	≥ 1	
Capacitance (typical)			pF	70	
Signal Ground				Case grounded	
Environmental					
Operating Temperature Range			°C (°F)	−74 to +200 (−101 to +392)	
Base Strain Sensitivity (at 250 με)		Top	ms^{-2}/με (*g*/με)	0.01 (0.001)	–
		Base		0.003 (0.0003)	0.01 (0.001)
Acoustic Sensitivity (154 dB SPL, 2 to 100 Hz)			ms^{-2} (m*g*)	0.008 (0.8)	
Temperature Transient Sensitivity (3 Hz LLF)			ms^{-2}/°C (*g*/°F)	0.5 (0.03)	
Magnetic Sensitivity (50 Hz, −0.03 T)			ms^{-2}/T (μ*g*/kG)	1 (10)	
Max. Operating Sinusoidal Vibration (peak)			*g*	1000	
Max. Non-destructive Shock (peak, half sine, 1 ms minimum duration)			ms^{-2}	10000	
			g	1000	
Mechanical					
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)			g (oz)	40 (1.4)	26 (0.92)
Mounting					
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° on Type 8305, relative to 0° on Type 8305-001

All values are typical at 23 °C unless measurement uncertainty is specified

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 °C (482 °F)
- Set screws:
  - YQ-2960: 10–32 UNF × 12.7 mm (0.5 in)
  - YQ-2962: 10–32 UNF × 7.62 mm (0.3125 in)
- YP-0150: Insulated stud, 10–32 UNF × 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 BKSV-DPLA 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

2018-08
BP 2052 – 13

Brüel & Kjær Sound & Vibration Measurement A/S
DK-2850 Nærum · Denmark · Telephone: +45 77 41 20 00 · Fax: +45 45 80 14 05
www.bksv.com · info@bksv.com
Local representatives and service organizations worldwide

Brüel & Kjær