

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

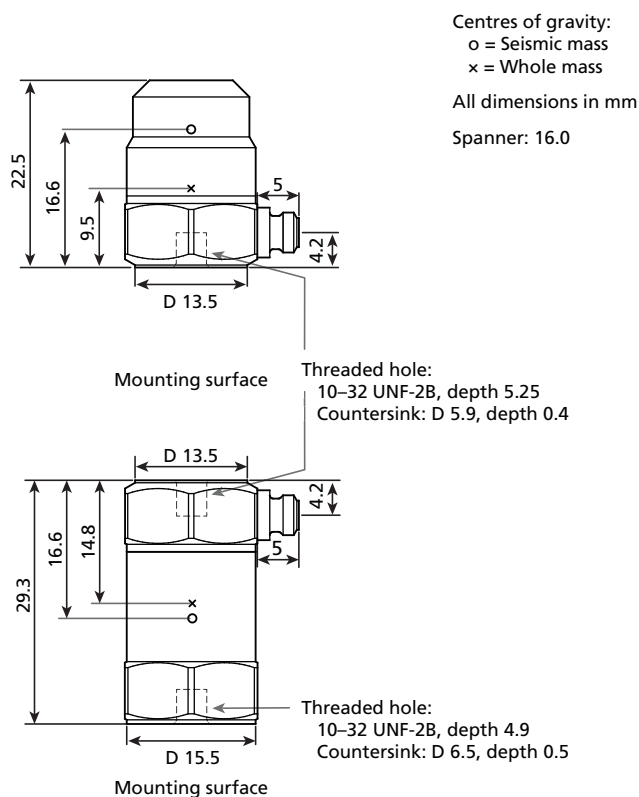
Type 8305

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)



170080

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). BKSVDPLA 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

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 (mg) | | 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 (µg/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

Brüel & Kjær and all other trademarks, service marks, trade names, logos and product names are the property of Brüel & Kjær or a third-party company.

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 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 |