

# PRODUCT DATA

## Calibration Exciter — Type 4294

*Calibration Exciter Type 4294 is a small, handy, completely self-contained vibration reference source. It is intended for rapid calibration and checking of vibration measurement, monitoring and recording systems.*

### FEATURES

- Small, lightweight and battery-driven
- Leather case with impact protection – designed for everyday use in harsh environment
- Drop- and environment-tested according to IEC 60068
- Splash-proof according to IP54 (IEC 60529)
- High precision, crystal controlled servo-operating at 159.15 Hz (1000 rad s<sup>-1</sup>)

### USES

- Quick, easy field calibration of vibration measurement and recording systems
- System fault finding and continuity checking
- Acceleration, velocity and displacement calibration



010058

---

## Description



---

Type 4294 permits accurate adjustment of measuring instrumentation to a standard acceleration level of 10 ms<sup>-2</sup>, thus calibrating the system for correct measurement of other vibration levels. The reference signal may additionally be used for velocity and displacement calibration, at 10 mms<sup>-1</sup> and 10 μm respectively. The Calibrator embodies an electromagnetic exciter driven by a crystal oscillator at a frequency of 159.15 Hz (1000 rad s<sup>-1</sup>). Servo feedback via a small accelerometer on the underside of the vibration table is used to maintain a constant and accurate vibration level independent of the mass of the transducer. To prevent overload, power for the calibrator is automatically disconnected if a transducer mass of more than 70 grams is mounted on the table.

Use of the calibrator is very straightforward. The transducer is conveniently attached to the calibrator table using a 10–32 UNF steel stud YQ 2963. Alternatively, the Mounting Disc DB2996 (10 grams) supplied provides a convenient means of attaching transducers manufactured with 3 mm threads or those fitted with a Mounting Magnet UA 0642. The Mounting Disc also permits the attachment of transducers with either Beeswax or Cyanoacrylate adhesive. The calibrator is actuated by pressing the small button on the side of its housing. Following system adjustment, the calibrator is switched off by pressing the button a second time. To prolong the useful life of its built-in battery, the 4294 automatically switches off after approximately 100 s.

4294

## Compliance with Standards

 	CE-mark indicates compliance with: EMC Directive C-Tick mark indicates compliance with the EMC requirements of Australia and New Zealand
<b>Safety</b>	EN 61010-1 and IEC 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use. UL3111-1: Standard for Safety – Electrical measuring and test equipment
<b>EMC Emission</b>	EN 50081-1 and IEC 61000-6-3: Generic emission standard. Part 1: Residential, commercial and light industry. EN 50081-2 and IEC 61000-6-4: Generic emission standard. Part 2: Industrial environment. CISPR 22: Radio disturbance characteristics of information technology equipment. Class B Limits. FCC Rules, Part 15: Complies with the limits for a Class B digital device.
<b>EMC Immunity</b>	EN 50082-1 and IEC 61000-6-1: Generic immunity standard. Part 1: Residential, commercial and light industry. EN 50082-2 and IEC 61000-6-2: Generic immunity standard. Part 2: Industrial environment. <b>Note 1:</b> The above is guaranteed using accessories listed in this Product Data sheet only.
<b>Temperature</b>	IEC 60068-2-1 & IEC 60068-2-2: Environmental Testing. Cold and Dry Heat. Operating Temperature: +10 to +40 °C (50 to 104 °F) for 10 ms <sup>-2</sup> reference within ± 3% -10 to +55 °C (14 to 131 °F) for 10 ms <sup>-2</sup> reference within ± 5% Storage Temperature: -25 to +70 °C (-13 to 158 °F) IEC 60068-2-14: Change of Temperature: -10 to +55 °C (2 cycles, 1 °C/min.)
<b>Humidity</b>	IEC 60068-2-3: Damp Heat: 90% RH (non-condensing at 30 °C (86 °F))
<b>Mechanical</b>	Non-operating: IEC 60068-2-6: Vibration: 0.3 mm, 20 m/s <sup>2</sup> , 10-500 Hz IEC 60068-2-27: Shock: 1000 m/s <sup>2</sup> IEC 60068-2-29: Bump: 1000 bumps at 400 m/s <sup>2</sup>
<b>Enclosure</b>	IEC 60529 (1989): Protection provided by enclosures: IP54

## Specifications – Calibration Exciter Type 4294

### VIBRATION SYSTEM

Electromagnetic exciter with internal built-in accelerometer for servo regulation of vibration amplitude

**Frequency:** 159.15 Hz ± 0.02% (1000 rad s<sup>-1</sup>)

**Acceleration:** 10 ms<sup>-2</sup> (RMS) ± 3%

**Velocity:** 10 mms<sup>-1</sup> (RMS) ± 3%

**Displacement:** 10 µm (RMS) ± 3%

**Transverse amplitude:** less than 5% of main axis amplitude

**Distortion:** less than 2% for 10 to 70 gram load; less than 7% for 0 to 10 gram. Use DB 2996 (10g) with very light accelerometers to achieve 2% distortion

**Warm-up Time:** Less than 5 seconds

**Signal Duration:** 103 ± 1 s with automatic stop

**Long Term Stability:** better than 1% per year for acceleration, velocity and displacement; better than 10 ppm per year for frequency

### TRANSDUCER MOUNTING

**Maximum Load:** 70 grams

**Mounting Torque:** max. 0.5 Nm

**Mounting Thread:** 10-32 UNF

### POWER REQUIREMENTS

**Built-in Battery:** One 9V Alkaline Battery QB 0016 (IEC type 6LR61)

**Battery Life:** Approximately 200 calibrations each lasting approximately 100 s with automatic switching off at the end of each calibration

### DIMENSIONS

**Length:** 155 mm (6.1 in)

**Diameter:** 52 mm (2.05 in)

**Weight:** 500 grams (17.6 oz.) including battery and leather case

### Accessories Included

KE 0278	Leather Case
QB 0016	9V Battery
YQ 2962	10-32 UNF Steel Stud
DB 2996	Mounting Disc Adaptor

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