

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^{-1})

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^{-2} , 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^{-1} and $10 \mu\text{m}$ respectively. The Calibrator embodies an electromagnetic exciter driven by a crystal oscillator at a frequency of 159.15 Hz (1000 rad s^{-1}). 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
Safety	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
EMC Emission	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.
EMC Immunity	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. Note 1: The above is guaranteed using accessories listed in this Product Data sheet only.
Temperature	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 ⁻² reference within ± 3% -10 to +55 °C (14 to 131 °F) for 10 ms ⁻² 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.)
Humidity	IEC 60068-2-3: Damp Heat: 90% RH (non-condensing at 30 °C (86 °F))
Mechanical	Non-operating: IEC 60068-2-6: Vibration: 0.3 mm, 20 m/s ² , 10-500 Hz IEC 60068-2-27: Shock: 1000 m/s ² IEC 60068-2-29: Bump: 1000 bumps at 400 m/s ²
Enclosure	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⁻¹)

Acceleration: 10 ms⁻² (RMS) ± 3%

Velocity: 10 mms⁻¹ (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.