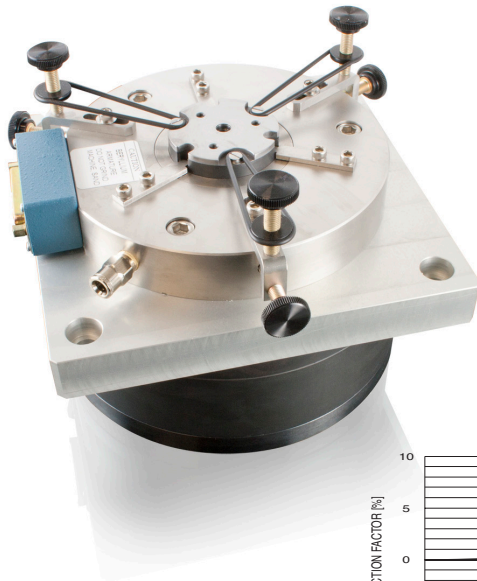


Vibration standard-shaker

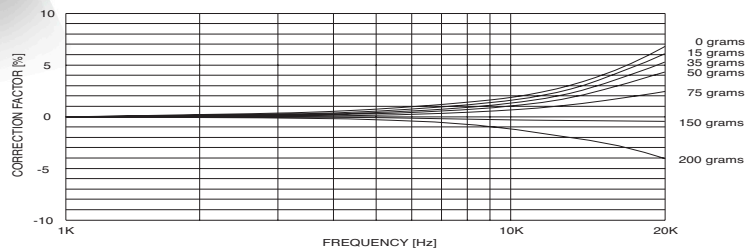
Model 2911



Calibration system using 2911

±1.2%	100.0 Hz Sensitivity
±1.5%	10.0 < f < =100.0 Hz
±1.2%	100.0 < f < =2500.0 Hz
±2.5%	2500.0 < f < =10000.0 Hz
±5.0%	10000.0 < f < =20000.0 Hz

TYPICAL FREQUENCY RESPONSE AND RELATIVE MOTION



Key features

- Built-in model 2270M18 standard accelerometer
- High performance beryllium armature
- Wide frequency range 2 Hz to 40 kHz
- 10 mm stroke with unique air bearing

The Endevco® model 2911 shaker is designed specifically for the demanding requirements of comparison accelerometer calibration. By combining a high-performance beryllium armature with a 10 mm stroke displacement, and a unique air-bearing suspension system, Endevco is able to provide a shaker with characteristics superior to any other equipment used for calibrating accelerometers and velocity pickups. The performance characteristics of the model 2911 standard-shaker are in its unique design using the model 2270M18 beryllium alloy armature containing a built-in Endevco primary vibration standard accelerometer. With the resonance frequency of the built-in standard far above the armature resonance, the 2911 performs accurate sensitivity and frequency response calibrations at frequencies up to 20k Hz and for resonance frequency searches up to 40k Hz, virtually free of waveform distortion and transverse motion.

The model 2911 is designed to be an integral part of the Endevco Automated Accelerometer Calibration System (AACS). AACS is a complete automated system, and its advanced software and signal conditioning that makes maximum use of the 2911.

In addition, Endevco recommends the use of the model 2270M8 transfer standard accelerometer as a means of maintaining the calibration of the 2911 shaker at the user's facility. The 2270M8 has been specifically developed for calibrating back-to-back primary standard accelerometers.

Uncertainty estimate [95% confidence, k=2]

Vibration standard-shaker

Model 2911

Specifications

The following performance specifications conform to ISA-RP-37.2 (1964) and are typical values, referenced at +75°F (+24°C) and 100 Hz, unless otherwise noted. Calibration data, traceable to National Institute of Standards and Technology (NIST), is supplied.

Dynamic characteristics

Voltage sensitivity
Frequency response
 Calibration
 Resonant frequency search
Mass loading effect (1)

Model 2270M18 built-in standard

18-22 mV/g 20 mV/g typical
 2 to 20 000 Hz
 to 40 000 Hz
 Sensitivity change due to relative motion resulting from the mass of the test accelerometer plus adapters or fixtures (see curves on front page)
 ±0.2% maximum for up to 100 gm at 100 Hz
 -2% for 50 gm at 10 kHz or 100 gm at 5 kHz
 Sensitivity increases approximately 0.03% per 100 g up to 250 g
 0.019% / °F (0.034% / °C) typical

Amplitude linearity
Temperature response

Electrical characteristics

Output bias voltage
Output impedance
Isolation
Crystal material
Polarity

10 V ±2V
 100 Ω maximum
 10 MΩ minimum; signal ground to armature housing
 Piezite® Element Type P-23
 Positive output for acceleration into the base of the test transducer

Armature characteristics

Weight
Material
Coil resistance
Continuous coil current
Test transducer mounting (2)
Armature resonance

armature assembly

6 oz. (170 gm) typical
 Beryllium alloy
 3Ω typical
 5 A rms without cooling
 1/4-28 UNF thread, .38 deep
 60 kHz typical

Shaker characteristics

Magnetic field
Current sensitivity
Acceleration distortion (3)
Transverse motion (4)
Size
Weight

model 2911 shaker assembly

Permanent magnet
 2 lb / ampere (0.9 kgf / ampere)
 2%
 5% maximum
 Approximately 6.25" high X 7.2" X 7.2" (159 cm X 183 cm x 183 cm)
 Shaker 40 lbs (18 kg)
 Shipping weight 60 lbs (27 kg) approximately
 Inlet 1/8-27 pipe thread
 Nipple supplied 1/8-27 pipe thread to 1/4" OD tube
 Pressure 20 to 40 psig

Air supply

Environmental characteristics

Temperature
Altitude
Humidity

Operating 50°F to 125°F (10°C to 52°C)
 Storage -65°F to 200°F (-54°C to 93°C)
 Not affected
 Accelerometer is epoxy-sealed

Calibration

STANDARD
 CS130L & CS130H

Comparison sensitivity at 100 Hz and 10 g peak, and a comparison frequency response from 2 Hz to 20 000 Hz. Test results are furnished in a formal report that includes sensitivity and frequency response plots

Vibration standard-shaker

Model 2911

Accessories

Product	Description	2911
15071	Adapter stud, 1/4-28 UNF to 10-32 UNF	Included
14159-1	Adapter bushing, 10-32 UNF	Included
14159-2	Adapter bushing, 6-32 UNC	Included
14159-4	Adapter bushing, 2-56 UNC	Included
14159-3	Adapter bushing, 4-40 UNC	Optional
14159-5	Adapter bushing, 4-48 UNF	Optional
14159-6	Adapter bushing, 8-32 UNC	Optional
14159-7	Adapter bushing, M3 x 0.5	Optional
EHX268	Acoustic couplant	Optional
31137	Vibration isolation kit	Optional

Notes:

1. Estimated accuracy of correction factor from curves showing typical response is $\pm 1\%$. Sensitivity is the standard output divided by the acceleration motion at the surface provided for attaching test accelerometers.
2. Recommended torque for attachment is 18 lbf - in (2 Nm). Torque values above 24 lbf - in could cause permanent damage to the mounting threads.
3. Somewhat larger harmonic distortion is present below 5 Hz and above 10 kHz at frequencies which are the 1/3 and 1/5 subharmonics of armature or accelerometer resonance frequencies.
4. Up to 10 000 Hz with a balanced load
5. Maintain high levels of precision and accuracy using Endevco's factory calibration services. Call Endevco's inside sales force at 866-ENDEVCO for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.

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