

Vibration Standard-Shaker

**ENDEVCO
MODEL
2911**

Model 2911

- **Built-in Model 2270M18 Standard Accelerometer**
- **High Performance Beryllium Armature**
- **Wide Frequency Range
2Hz to 40kHz**
- **10 mm Stroke with Unique Air Bearing**



Not Actual size

DESCRIPTION

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 20 000 Hz and for resonance frequency searches up to 40 000 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), which is made up of the 68357 Calibration Controller and the 28978 Vibration Controller module. AACS is a complete automated system, and its advanced software and signal conditioning that makes maximum use of the 2911.

In addition, ENDEVCO recommends 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, $k=2$)

Equipment used: 2911

±1.2%	100.0 Hz Sensitivity
±1.5 %	20.0 < 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

北京汇润科贸有限公司

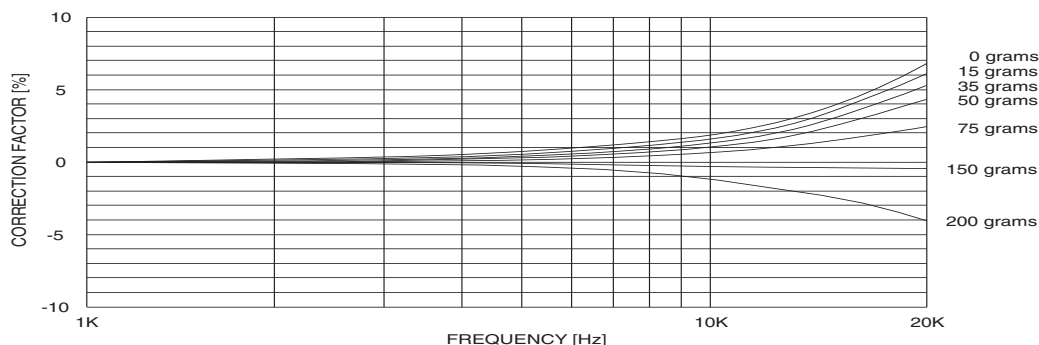
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TYPICAL FREQUENCY RESPONSE AND RELATIVE MOTION



Vibration Standard-Shaker

SPECIFICATIONS

All specifications at 75°F (24°C), referenced at 100 Hz and conform to ISA-RP 37.2 (1-64) unless otherwise indicated.

DYNAMIC CHARACTERISTICS

	Model 2270M18 Built-in Standard	
CHARGE SENSITIVITY	18-22 mV/g	20 mV/g typical
FREQUENCY RANGE		
Calibration	2 to 20 000 Hz	
Resonant Frequency Search	to 40 000 Hz	
MASS LOADING EFFECT (1)	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	
AMPLITUDE LINEARITY	Sensitivity increases approximately 0.03% per 100 g up to 250 g	
TEMPERATURE RESPONSE	0.019%/°F (0.034%/°C) typical	

ELECTRICAL CHARACTERISTICS

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

ARMATURE CHARACTERISTICS

	Armature Assembly
WEIGHT	7 oz. (200 gm) typical
MATERIAL	Beryllium alloy
COIL RESISTANCE	3Ω typical
CONTINUOUS COIL CURRENT	5 A rms without cooling
TEST TRANSDUCER MOUNTING (2)	1/4-28 UNF thread, .38 deep
ARMATURE RESONANCE	60 KHz typical

SHAKER CHARACTERISTICS

	Model 2911 Shaker Assembly	
MAGNETIC FIELD	Permanent magnet	
CURRENT SENSITIVITY	2 lb/ampere (0.9 kgf/ampere)	
ACCELERATION DISTORTION (3)	2%	
TRANSVERSE MOTION (4)	5% maximum	
SIZE	Approximately 6.25" high x 7.2" x 7.2" (159 cm X 183 cm x 183 cm)	
WEIGHT	Shaker	40 lbs (18 kg)
	Shipping Weight	60 lbs (27 kg) approximately
AIR SUPPLY	Inlet	1/8-27 pipe thread
	Nipple Supplied	1/8-27 pipe thread to 1/4" OD tube
	Pressure	20 to 40 psig

ENVIRONMENTAL CHARACTERISTICS

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

CALIBRATION DATA

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

ACCESSORIES

15071	ADAPTER STUD, 1/4-28 UNF to 10-32 UNF
14159-1	ADAPTER BUSHING, 10-32 UNF
14159-2	ADAPTER BUSHING, 6-32 UNC
14159-4	ADAPTER BUSHING, 2-56 UNC
34699	SHAKER ISOLATOR KIT

OPTIONAL/SPARES

14159-3	ADAPTER BUSHING, 4-40 UNC
14159-5	ADAPTER BUSHING, 4-48 UNF
14159-6	ADAPTER BUSHING, 8-32 UNC
14159-7	ADAPTER BUSHING, M3x0.5
EHX 268	ACOUSTIC COUPLANT

NOTES:

1. Estimated accuracy of correction factor from curves showing typical response is ±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 800-982-6732 for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.

Continued product improvement necessitates that Endevco reserve the right to modify these specifications without notice. Endevco maintains a program of constant surveillance over all products to ensure a high level of reliability. This program includes attention to reliability factors during product design, the support of stringent Quality Control requirements, and compulsory corrective action procedures. These measures, together with conservative specifications have made the name Endevco synonymous with reliability.

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