APS 113-AB ELECTRO-SEIS®

Long stroke shaker with linear air bearings



Applications

- ✓ calibration and test for seismic instruments
- ✓ seismic simulation for components
- ✓ determination of natural mode frequencies, shapes, damping ratios and stress distributions

Range of use

- ✓ optimized for measuring decay rates in very lightly damped structures
- ✓ calibration and evaluation of accelerometers and other motion transducers

Features

- ✓ force: 133 N (30 lbf)
- ✓ stroke: 158 mm (6 inch)
- ✓ frequency range: DC…200 Hz
- ✓ adjustable armature re-centering
- ✓ horizontal and vertical operation
- ✓ rugged standard armature and air bearing guidance system
- ✓ sine wave, swept sine wave, random or impulse force waveforms

Specification

The APS 113-AB ELECTRO-SEIS® air bearing shaker is a long stroke, electrodynamic force generator specifically designed to be used for calibration and evaluation of accelerometers and other motion transducers. It provides excellent properties for low frequency excitation of such devices. Furthermore it is optimized for measuring decay rates in very lightly damped structures.

Technical data

Force rating[1) 2)]	133 N (30 lbf)
Displacement (peak – peak)	158 mm (6 in)
Frequency range	DC … 200 Hz
Direction of excitation	horizontal or vertical
Moving table (weight)	2.55 kg / 5.6 lbs
Overhung load at armature attachment point, max.	1.5 kg (3 lbs)
DC coil resistance	4.4 Ω or 1.1 Ω
Air pressure required	4 bar … 5 bar (60 psig … 70 psig)
Air flow required	500 l/h (0.3 cfm)
Air quality	ISO 8573.1 Class 3
Weight (net weight)	38 kg (84 lbs)
Dimensions L × W × H	526 mm × 213 mm × 168 mm (20.7 in × 8.4 in × 6.6 in)
Temperature range (in operation)	+5 °C … +40 °C, ±2 K (+41 °F … +104 °F, ±2 K)

1) Sine peak

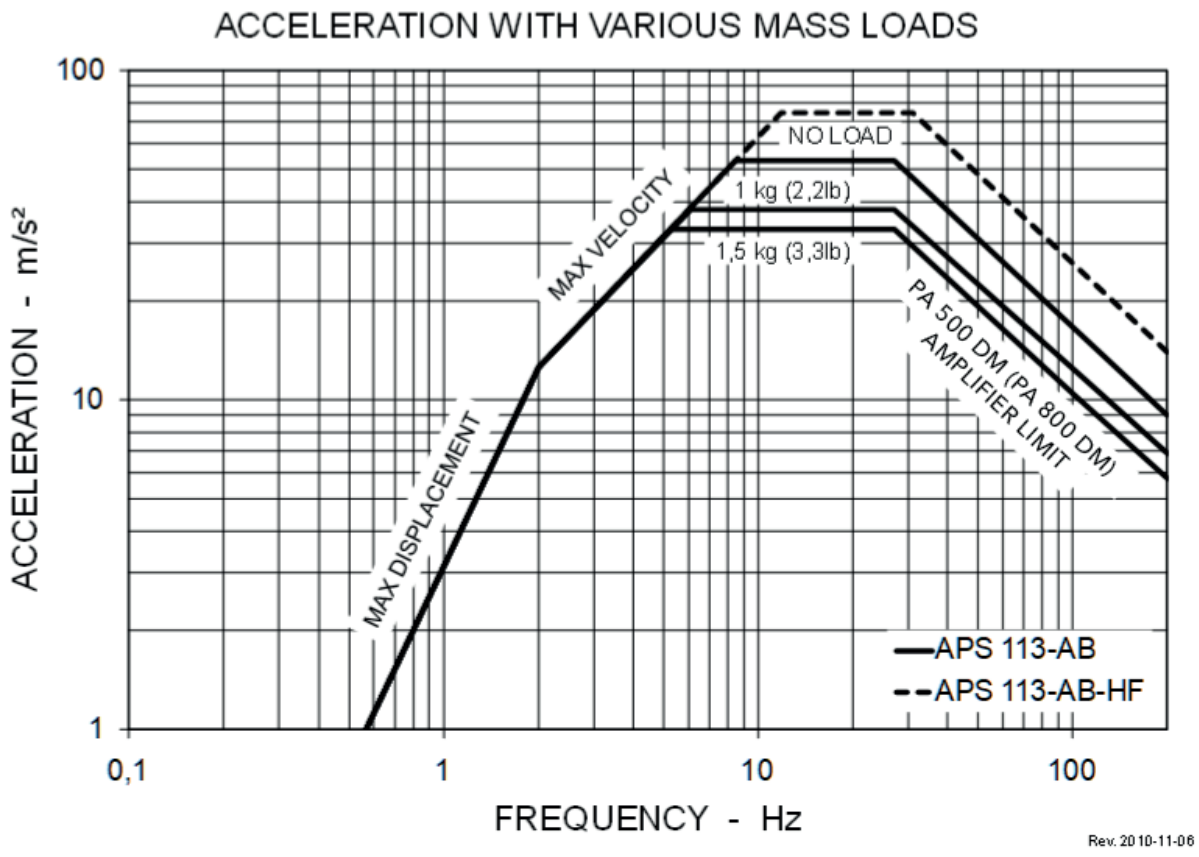
2) Interval mode of operation

Accessories (optional)

Power amplifier	PA 500 DM / PA 800 DM
System interconnect cable	APS 0082-6E
Carrying handles	APS 0108
Zero position controller	APS 0109
Vertical mounting kit	APS 0162
Overtravel switch	APS 8543

Performance

Acceleration performance of the APS 113-AB shaker with various mass loads is shown in the lower graph.



Description and characteristics

The APS 113-AB ELECTRO-SEIS® shaker, the air bearing version of the APS 113 ELECTRO-SEIS® shaker, is a long stroke, electrodynamic force generator, designed for calibration and evaluation of accelerometers and other motion transducers.

Air lubricated bushings replace the linear ball bearings used in the basic ELECTRO-SEIS® armature guidance system. In addition an air distribution system, tie down and leveling base are provided.

The near zero friction of the air bushings is an essential feature for measuring resonance decay rates in very lightly damped structures.

The unit employs a permanent magnet and is configured such that the armature coil remains in a uniform magnetic field over the entire stroke range. This feature, along with the air bearings, assures a high degree of force linearity and absence of armature guidance induced noise and distortion. Drive power for the shaker is obtained from a low frequency power amplifier, such as the PA 500 DM power amplifier.

Modes of operation requiring high bearing loads (table mode and APS 0112 - reaction mass mode), permissible with the standard linear ball bushing version, are not permitted with the APS 113-AB shaker. Since the suspension system need not support the armature and test load weight when used in the horizontal mode, a soft suspension may be used, minimizing non-linearity effects. The maximum overhung load that may be used is 1.5 kg (3 lbs) concentrated at the mounting point.

The shaker may be used with various optional accessory items to extend the areas of application:

APS 0108 - CARRYING HANDLES AND TIE-DOWN BARS - improve the portability feature of the shaker.

APS 0109 - ZERO POSITION CONTROLLER - automatically controls the zero position of a shaker irrespective of its load.

APS 0162 - VERTICAL MOUNTING KIT - permits vertical orientation of the shaker, either free-standing or rigid bench attachment.



APS 113-AB with APS 0162 vertical mounting kit

Optional configurations

APS 113-AB-HF

All features of the basic APS 113-AB shaker are retained. The drive coil is made for 40 % increase in force with a 50 % duty cycle (30 min cycle).