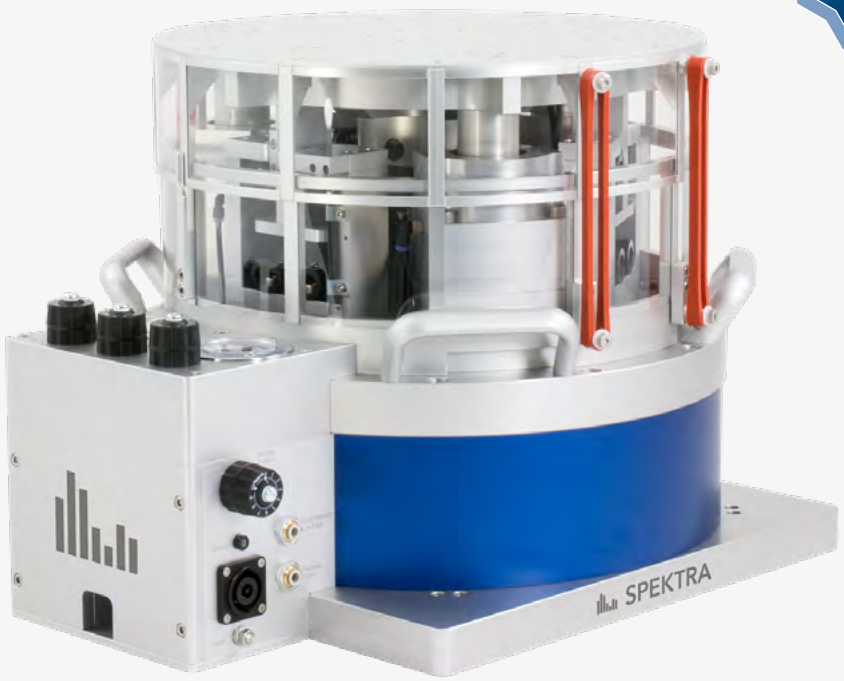
SE-13

Calibration vibration exciter

PATENTED



Applications

- primary calibration of low frequency accelerometers (ISO 16063-11)
- secondary calibration of low frequency accelerometers (ISO 16063-21)
- seismic simulation of components
- calibration of reference sensors

Typical DUT

- heavy seismic sensors (seismometers, geophones)
- sensors for measurement of vibration immission (DIN 45669)

Features

- force: 500 N (112 lbf)
- frequency range: DC…400 Hz
- unique frictionless support system carries up to 50 kg (110 lbs) payload
- large mounting surface: Ø 350 mm
- efficient electrodynamic drive for sine, random or transient signals
- air bearing guidance provides excellent waveform
- very low transverse motion according to ISO 16063-21

Specification

The SE-13 was designed for the calibration of heavy vibration sensors such as seismic sensors or geophones. The patented combination of air bearings and frictionless load compensation allows devices under test (DUTs) with a weight of up to 50 kg (110 lbs) to be excited very precisely without significant lateral vibrations. Depending on the reference sensor, the SE-13 can be used at frequencies far below 0.1 Hz as well as in the range up to 400 Hz. As a reference sensor, an exchangeable internal acceleration sensor or optionally a laser vibrometer can be used.

Technical data

Force rating [1) 2)]	500 N (112 lbf)
Frequency range	DC (0.2 Hz)[4)] … 400 Hz
Displacement[3)]**, max.**	25 mm (1 in)
Velocity[1)]**, max.**	300 mm/s
Acceleration (bare table) [1) 2)]**, max.**	60 m/s² (6 g_n)
Rated current [2)]**, max.**	9 A RMS
Direction of excitation	vertical
Moving table weight	8 kg (18 lbs)
Payload, max.	50 kg (110 lbs)
Table Size	Ø 350 mm (Ø 14 in)
Air pressure (required)	4.0 bar … 4.2 bar
Air flow (required)	800 l/h (0.48 cfm)
Air quality	ISO 8573.1 Class 3
Total weight	70 kg (154 lbs)
Temperature range (in operation)	+23 °C, ±2 K (+73 °F, ±2 K)
Temperature range (storage)	-25 °C …+55 °C (-13 °F …+131 °F)
Connectors	
Vibration exciter: drive	8-pin Speakon® plug
Vibration exciter: compressed air	air pipe Ø 6 mm (0.24 in)
Attachment of device under test (DUT)	thread holes M6 on 100 mm centers

1) Peak sine

2) Interval mode of operation

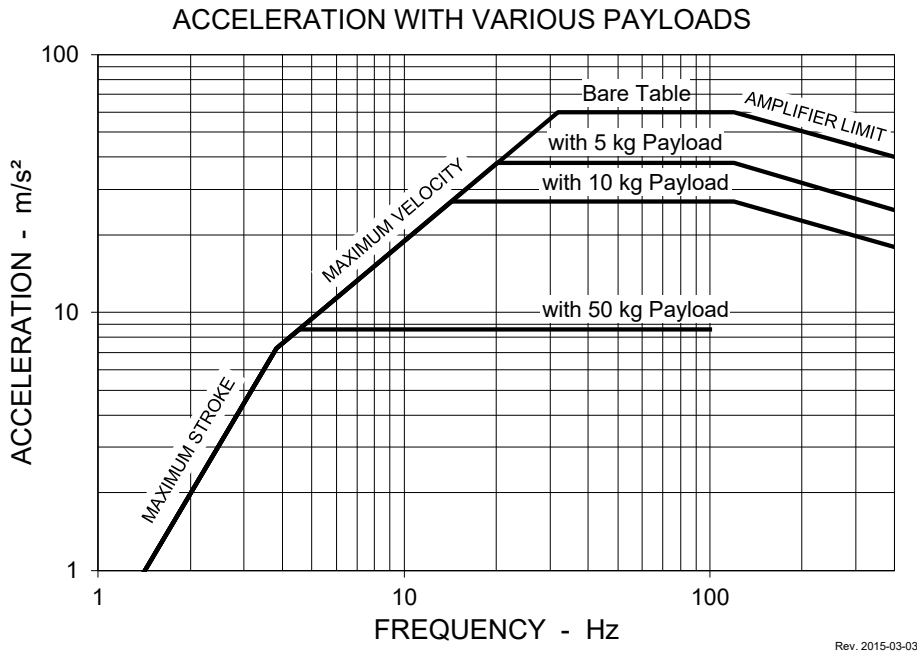
3) Recommended operation range peak-peak; mechanical stop at 32 mm (1.3 in)

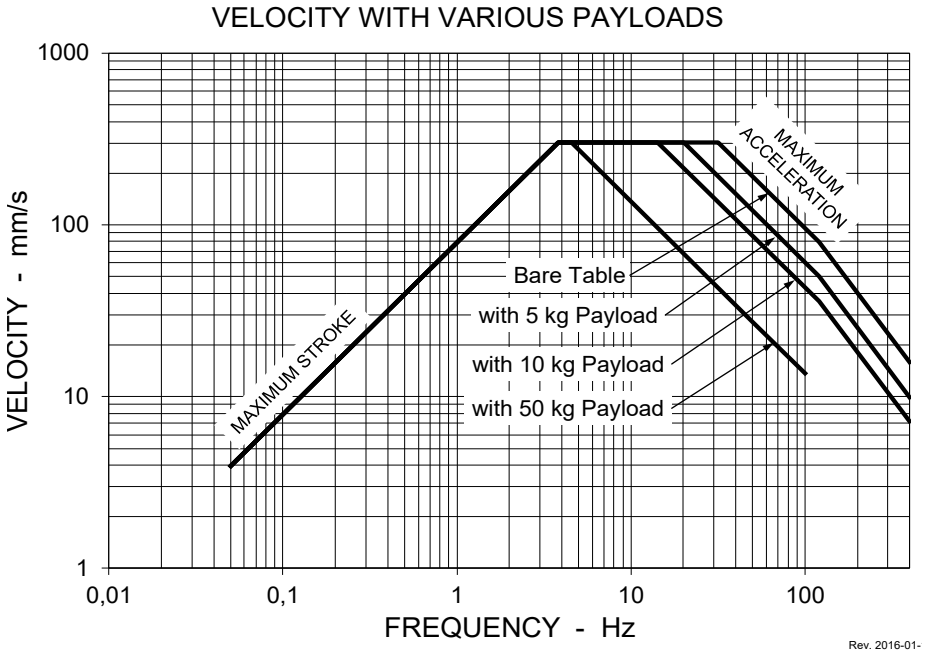
4) With the optional internal reference standard accelerometer

Performance

The SE-13 was designed to drive DUTs with a weight up to 50 kg (110 lbs) to velocity amplitudes typical of those found in seismic specifications. As part of a CS Q-LEAP™ calibration system such DUTs can be excited down to a 0.05 Hz with a well-controlled amplitude. On the other hand the SE-13 allows to excite geophones and similar transducers for the measurement of vibration immissions precisely up to high frequencies (e.g. 315 Hz) with a sufficient vibration velocity amplitude due to the high rated force (500 N) of the exciter.

Typical performance diagrams of the SE-13 vibration exciter are exemplified in the graphs below. These diagrams represent the maximum velocity and acceleration for various payloads that can be achieved on the table.





Accessories (optional)

Recommended power amplifier	APS 125
Standard mechanical adapter	081100001_02 (incl. magnetic field shield)
Customized mechanical adapter	On request

Application examples

The vibration exciter SE-13 allows for different seismometers to be calibrated. Therefore, adapters are sometimes needed to ensure safe and correct mounting on the vibration exciter. SPEKTRA offers various adapters on request.

Calibration of a typical seismic sensor using the SE-13: Seismowave CP ZM-500, 11 kg, 0.1 Hz …100 Hz

Examples of different adapters to ensure safe and correct mounting on the SE-13. (left to right: Nanometrics Trillium Compact, Guralp CMG-3T, Nanometrics Trillium Horizon, Kinemetrics Episensor ES-DH Borehole, Kinemetrics Episensor ES-T)