HOP - MS

Calibration Exciter Medium-g-Shock

Adjustable
Signal Shape, Amplitude,
Pulse Width

Patented

Applications

- **Secondary calibration** of shock transducers as well as complete measuring instruments in form of a measuring chain, with very high precision and efficiency, according to **ISO 16063-22** (calibration by the comparison method)
- Secondary calibration of **shock accelerometer reference standards**
- **Shock Testing** of small assemblies / parts

Range of Use

- **Accredited calibration laboratories**
- Departments of **measuring instrument verification** in research and development particular in the aviation and space travel or in the military industry
- **Quality assurance** in sensor manufacturing
- **National metrology laboratories** as highest measurement authorities

Features

- **Traceable** to **P**hysikalisch **T**echnische **B**undesanstalt (**PTB**) Braunschweig by the accredited SPEKTRA Calibration-Laboratory D-K-15183-01-00
- **Broad amplitude range** from **20 g_n ... 4.000 g_n**
- Type of excitation: **sinusoidal shock, adjustable signal shape or burst**
- **Independent control** of amplitude and pulse width (within certain ranges, see table)
- **Excellent repeatability** of shock
- Position of DUT: **horizontal**
- Sensor mass (DUT) up to **30 gram**
- Realization of **fully automatic calibrations** according to own test regime (up to 1 shock/s)

HOP - MS

Shock Exciter Medium-g-Shock

The SPEKTRA HOP-MS shock exciter is determined for testing and calibrating acceleration sensors as well as for environmental testing of small assemblies and parts. It is specified to provide sine multi period shock excitations. The HOP-MS works according to the Hopkinson-bar principle. It makes use of the propagation and reflection characteristics of a mechanical wave in a slender bar. The Hopkinson-bar is excited by a piezoelectric actuator.

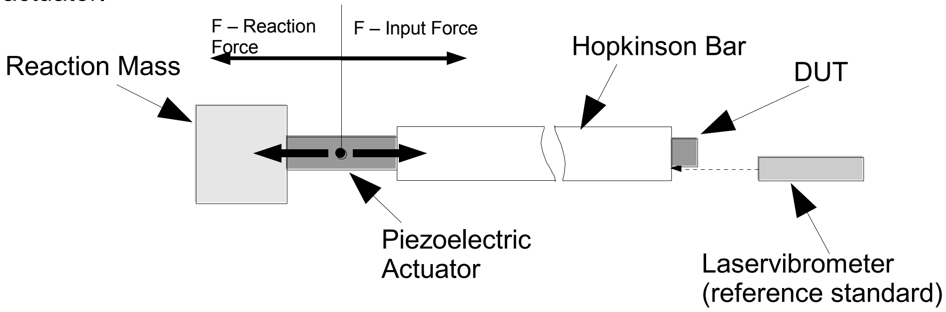
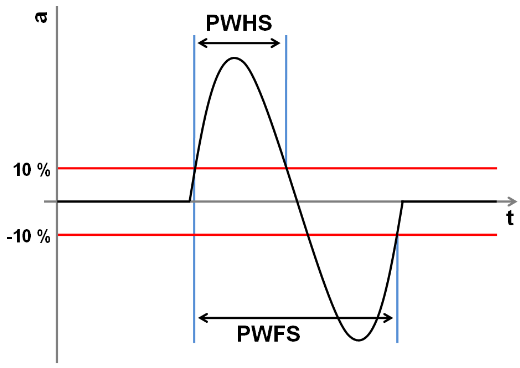


Figure 1 Schematic of the HOP-MS

In Figure 1 a schematic of the HOP-MS is shown. The main parts are: the Hopkinson Bar, Piezoelectric actuator, reaction mass, DUT and the reference standard (in this example a Laser vibrometer). If ones apply a driving voltage to the actuator, the Piezo stack changes its length. Due to the reaction mass and Newton's 2nd law a reaction force will be created. The same force will act as input force on the Hopkinson Bar. Since the driving voltage can be controlled nearly arbitrary also the reaction force and thus the acceleration at the end of the bar is determined.

Components

- Shock exciter **SE-220 HOP-MS**
- Reference standard **BN-02**
- **PA 14-500** power amplifier



Performance Specification[1)]

Shock Amplitude	PWHS [2)]	PWFS [2)]
20 g_n … 250 g_n	180 µs	360 µs
20 g_n … 500 g_n	125 µs	250 µs
20 g_n … 1,000 g_n	70 µs	140 µs
20 g_n … 4,000 g_n	40 µs	80 µs

[1)] All data for environmental conditions: temperature 23°C (± 2°C) and relative humidity 30 % ... 75 %
[2)] PWHS = Pulse Width Half Sine Wave; PWFS = Pulse Width Full Sine Wave

Dimensions Hopkinson Bar	Length	approx. 2.5 m
	Height	approx. 1.3 m
	Width	approx. 0.5 m

All data are subject to change without notice

November 2013