HOP - VHS
Calibration Exciter Very-High-g-Shock

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

Features
- Type of excitation: sinusoidal shock
- Shock amplitudes up to $200,000 \, g$
- Excellent repeatability of shock
- Position of DUT: horizontal
- Sensor mass (DUT) up to 15 gram
- Realization of all automatic calibrations according to own test regime (up to 20 shocks/minute)

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
The SPEKTRA HOP-VHS High-g shock exciter is determined for testing and calibrating acceleration sen-
sors. It is specified to provide sinusoidal one period shock excitations. The HOP-VHS 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 HOP-VHS consists of a shock exciter barrel and a Hopkinson-bar made of Tit-
anium. Both are mounted on an aluminum beam. Within the barrel a projectile is accelerated pneumatically,
hitting the end of the bar in an adjustable distance thus exciting the strain pulse within the bar. A pneumatic
control allows to retract the projectile after each shot by applying a negative pressure. While the air pres-
sure is kept constantly, the kinetic energy of the projectile can be controlled by a motor driven mechanical
stop that allows a precise adjustment of the projectiles starting position and thus of the distance over which
it is accelerated. Thus the HOP-VHS allows a good and all electric control of the shock amplitude. All me-
chanical parts are build from wear resistant materials allowing best stability of the shock exciter and provid-
ing a good repeatability of shocks.

Components
- Pneumatically driven pulse generator
- Reference standard strain gauge BN-19
- Control box with 5V TTL and serial (RS232) I/O-
interfæce

Performance Specification

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shock Acceleration</td>
<td>10,000 $g_h$ ... 200,000 $g_h$</td>
</tr>
<tr>
<td>Pulse Width PWFS / PWHS</td>
<td>typical 40 µs / 20 µs</td>
</tr>
<tr>
<td>Sensor Mass (DUT)</td>
<td>max. 15 gram</td>
</tr>
</tbody>
</table>

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
3) Determined according to GUM (ISO Guide to the expression of uncertainty in measurement, 1995) with $k = 2$ (coverage factor)

Air Supply
- 4 bar

Dimensions Hopkinson Bar
- Length: approx. 3.5 m
- Height: 0.8 m ... 1.2 m
- Width: approx. 1 m

All data are subject to change without notice