

VIBSIST-20H

CODED-Impact Seismic Source

DESCRIPTION

The VIBSIST-20H is a swept-impact, time-distributed seismic source designed for use on steeply inclined surfaces in mine galleries, tunnels, rock construction and dam sites.

The seismic signals are generated by an electric hammer, which produces a rapid sequence of impacts according to a pre-programmed time function.

The VIBSIST-20H is a non-destructive alternative that does not create environmental pollution such as chemicals and sound. Legal risks frequently associated with using explosives are eliminated.



The VIBSIST-20H Controller.



The VIBSIST-50H with Hand Cart and Impact Rod and Coupling Plate for P-S waves.

KEY FEATURES

The VIBSIST-20H is portable, safe and versatile. It allows jobs to be done fast in very demanding conditions, from

- imaging ahead of and around tunnels, to
- ore delineation in underground and open-pit mines, to
- integrity checking of dams and large concrete structures.

APPLICATIONS

The VIBSIST-20H is primarily intended for detailed seismic P/S and surface/tunnel wave surveys in hard and semi-hard geological formations and materials.

The typical penetration range up to 500 m, in reflection mode.

The fields of use include:

- *tunnel prediction*
- *foundation engineering*
- *roadbed and dam inspection*
- *placer exploration*
- *ground water exploration*
- *ore delineation*
- *research and education*

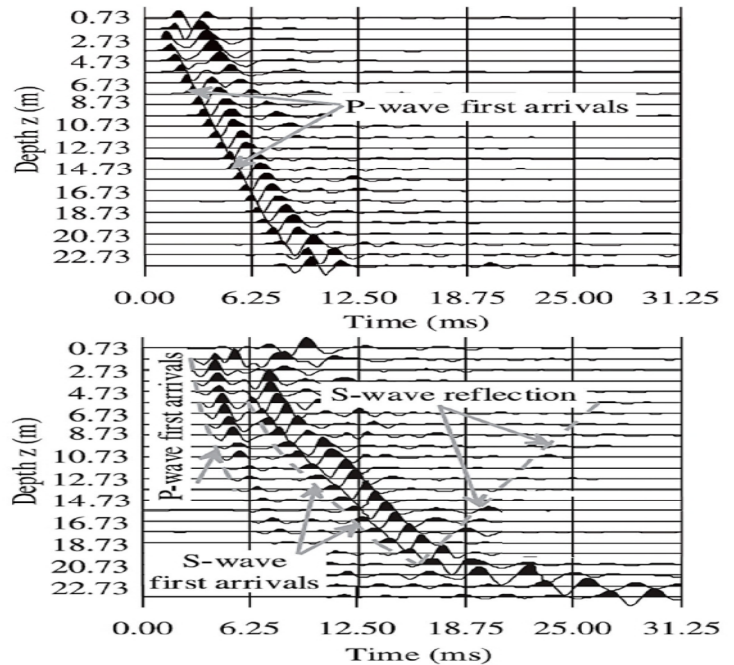


High-Resolution portable Seismic Source

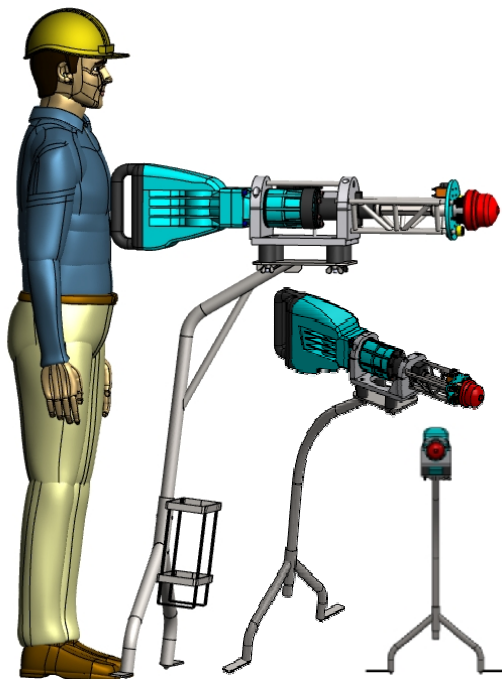
HIGHER RESOLUTION AND DATA QUALITY

The VIBSIST-20H achieves equivalent or better data quality than would sledge hammers and accelerated drop-weights, especially in noisy environments. The improvement is obtained by accumulating higher impact energy over a period of time. A signal energy of 22 kJ is produced over a period of 25 seconds at an average rate of 25 impacts per second. The build-up of individually low energy impacts leads to significant depth penetration while conserving the high frequency component and leading to higher resolution surveys. All types of noise - cultural, natural, and instrumental - are canceled by the swept impact technique.

ASSESSING DYNAMIC PROPERTIES OF ROCKS



P-wave first arrivals recorded with a vertical accelerometer Z (top) and of the S-wave arrivals recorded with the horizontal accelerometer X (bottom) at 1 m depth interval and for 24 receiver positions with depth.



Computerized design of the VIBSIST-20 H



The VIBSIST-20 H used on a vertical rock surface for tomographic imaging to assess the integrity and stability of a steep outcrop.



SYSTEM MODULES

The impact assembly is a rugged sequence of aluminum, steel and composite plastics. Computer dynamic simulation is used to maximize the efficiency of the VIBSIST-20H on rock surfaces and hard materials. It is possible to customize the VIBSIST-20H for specific applications and ground or rock conditions.

The Electric impact hammer operates in accordance with the coded sequence, produced by the instrument controller. A power source such as a gas/Diesel generator is needed to power the hammer. The seismic response recorded by the controller processor of the source is conveyed to the recording station by cable or optionally by a coded radio signal. A variety of seismographs can be used, which include all industry-standard recording systems.

SOFTWARE

- Control Software used to program and operate the sweep control sequence
- Sweep Decoder; correlates the sweeps. This module can either be used for fast on-line monitoring or elaborate off Line processing
- Signal Conditioning, includes a collection of filters used for processing of the records before and/or after correlation
- Signal Display Interface allows the operator to visualize the data conveniently and flexibly.

The VIBSIST can be used all WINDOWS seismographs and a number of UNIX/LINUX seismographs. A dedicated correlator is included with the VIBSIST software.

SPECIFICATIONS

Power supply:

115 V / 230 V 50 Hz / 60 Hz 15 A

Repetition rate: programmable

between 10 to 25 impacts per second

Impact energy:

approximately 35 J / impact

Sweep time adjustment: 2.5 to 30

seconds (possibly limited by the maximum number of samples per channel of the recorder).

Controller

Dimensions: 300 x 120 x 60 mm

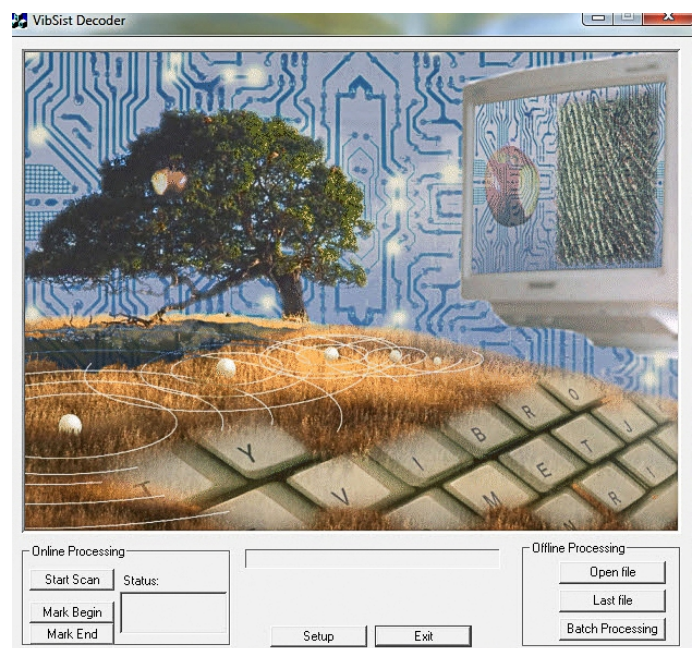
Weight: 2.5 kg

Complete hammer assembly

Length: 1000 mm

Height: 1500 mm (adjustable)

Weight: 48kg



ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE



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VIBSIST-20H Seismic Source

The data quality is also increased because the VIBSIST-20H is not dependent on the force or skill of the operator using a sledge-hammer or on setup variations of other impulsive sources.

Compared with frequency swept vibrators, a wide bandwidth is achieved with the VIBSIST-20H even when the coupling to the rock or ground is relatively poor.

With the VIBSIST-20H, you can finish the job quite sooner than with alternative methods.

The VIBSIST-20H source can be used in urban and noisy environments, as well as in working mine conditions.



The VIBSIST-50H with Impact Rod and impact head for hard rock coupling.

