

VIBROMETRIC

SPH64C—TIME-DISTRIBUTED MULTI-IMPACT BOREHOLE SEISMIC SOURCE

APPLICATIONS

- Mining and tunneling surveys
- Mineral exploration
- Ore body delineation
- Hydrogeological studies
- Geologic storage site characterization
- Rock engineering
- Mapping fractured zones and faults
- Monitoring excavation works
- Assessing the constructability of the rock and earth

KEY FEATURES

- Coherent and reliable
- Excellent source for high-resolution single-hole and cross-hole seismic surveys
- Generates wideband seismic signals
- Environmentally friendly
- Investigation range: more than 150m in a working mine conditions
- Intrinsic resolution: better than one meter

DESCRIPTION

The VIBSIST-SPH64C uses the Swept Impact Seismic Technique, whereas seismic signals are produced as a rapid sequence of pulses, according to a programmed monotonic time function. This borehole piezo-electric source is intended for borehole investigations to depths up to 2000m. The seismic signals are produced by applying high voltage (6000 V) to a stack of piezoelectric crystals. The minimum borehole diameter is 76mm. The frequency band is 500 - 3500Hz.

The tools consist of two down-hole modules, the piezoelectric actuator and the high voltage supply, and the out-of-the-hole controller. The piezoelectric actuator is equipped with a motor-driven borehole clamping mechanism.

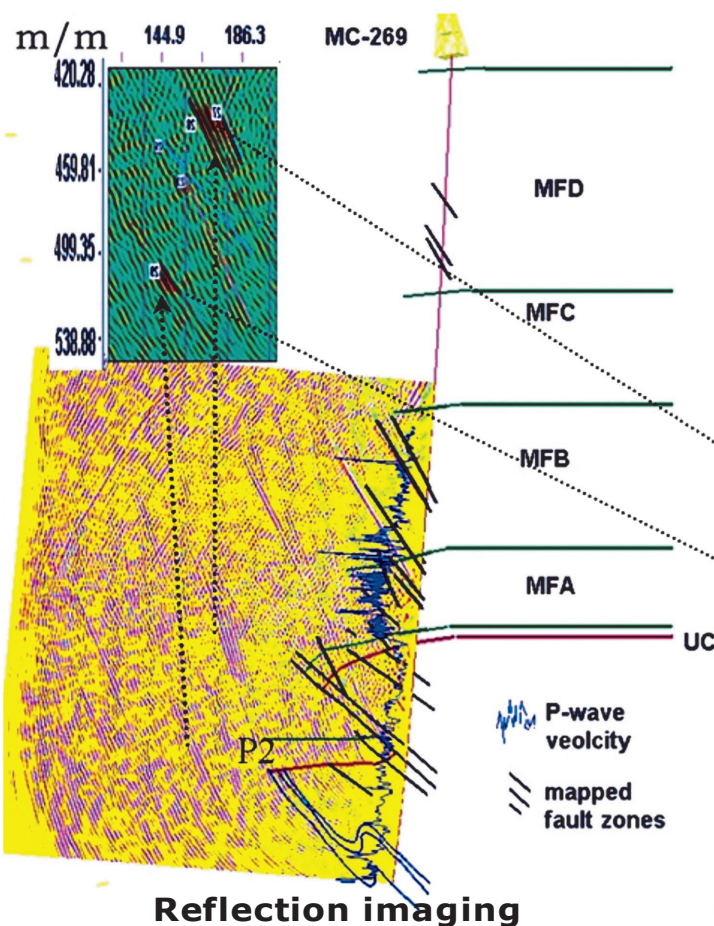
The VIBSIST-SPH64C should preferably be used with a seismograph able to record at least 64k-samples and with a sampling speed of 1/8 ms or faster.



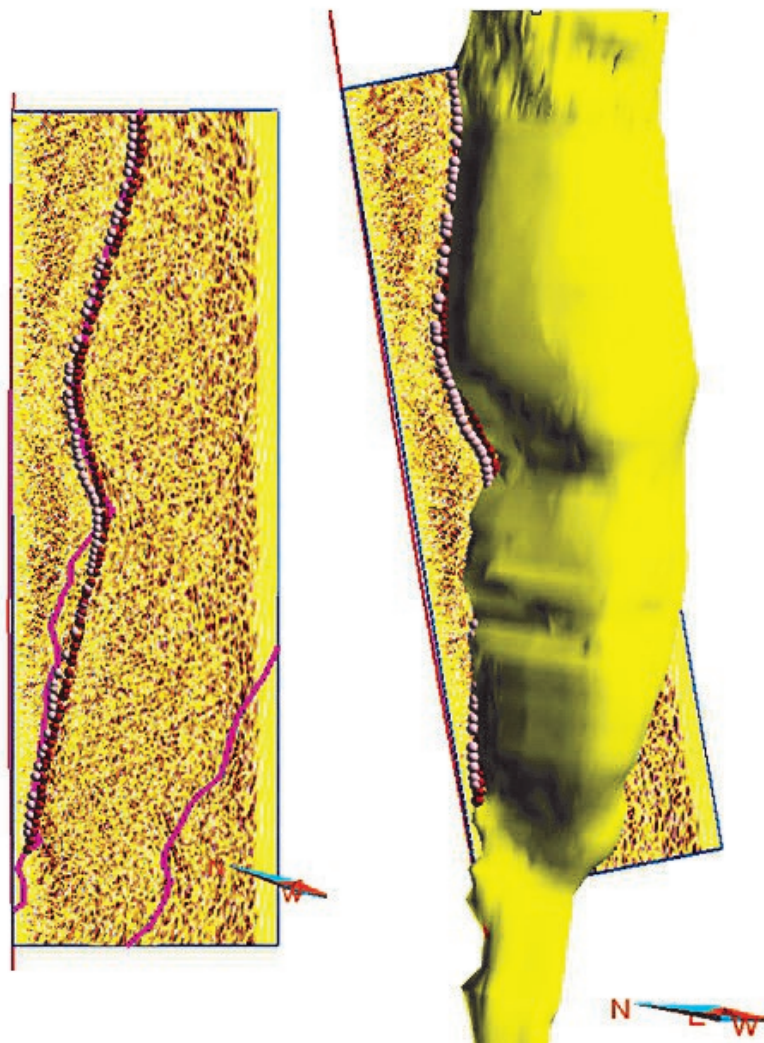
WIDE-BAND, HIGH ENERGY

Borehole Side-Scan Seismic methods were successful in delineating the kimberlite-country rock contact and uranium mineralization zones in tens of surveys at various mines, in Canada, South Africa and Botswana.

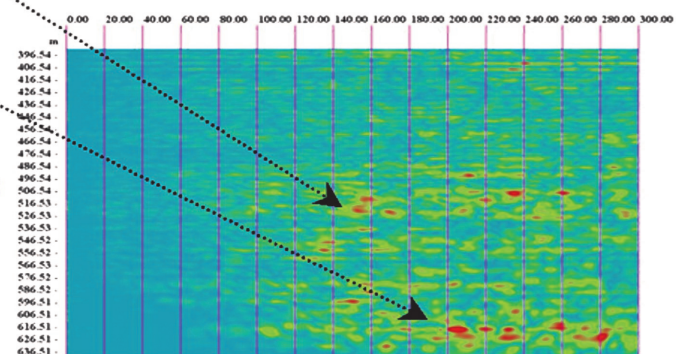
Example of side-scan migrated section for kimberlite delineation at the Diavik Diamond Mine in Northwest Territories, Canada



Reflection imaging



Example of side-scan migrated section for structural delineation at the McArthur River Mine in Saskatchewan, Canada



Diffraction imaging

BOREHOLE SEISMIC SOURCE

SYSTEM MODULES

The **controller** transfers to the piezoelectric actuator the sweep control sequence provided by the computer

2. The down-hole **power generator** feeds the piezoelectric actuator with the very high voltage needed, which is produced near the actuator, rather than being conveyed from surface through the cable thus adding to the operational security.

3. The **piezoelectric actuator** generates the seismic signal according to the programmed sweep sequence.

4. A borehole **tripod mount assembly** can be used for positioning, fixing and clamping accessories.

SOFTWARE

Four software modules are included with the VIBSIST-SPH64C system, these are:

- **Controller interface**, an enhanced facility to access to the controller resources.
- **Signal Decoder**, performs the deconvolution of the long sweeps. It may be used for On Line monitoring or Off Line batch processing.
- **Signal Conditioning**, includes a collection of filtering routines used for signal processing before or after deconvolution
- **Signal Display Interface** allows the operator to visualize the data.

SPECIFICATIONS

Power supply: 115V / 60Hz - 230V / 50Hz

Maximum consumption: 3.5/7A

Maximum operating depth: 2000m

Sweep characteristics

Repetition rate: programmable between 2ms to 70ms

Impact energy: approximately 4-6 J/impact

Impact frequency band: approximately 100 to 3500 Hz

Programmed sweep characteristics: computer programmed (linear shape) or preset sweep.

Pause between sweeps: 100ms ... 60s

Max no of sweeps: 100

Sweep time adjustment: 2 to 70 seconds (this is restricted by the number of samples available per channel).

Synchronization signal: rectangular +0.5V

Controller

Dimensions: 300 x 120 x 60 mm

Weight: 7 kg

Electronic module

Weight: 5Kg

Operating module

Weight: 18 Kg

Lead in cable

Length: upon request up to 2000m

Dimensions

L5000 x **W**2250 x **H**2500mm



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