

## Borehole Sparker Pulse



Borehole sparker **Pulse** is developed for generating high frequency pressure (P) waves in water-filled wells of up to 1000 m deep during crosshole seismic testing or tomography ([CST](#)), vertical seismic profiling (VSP) and other acquisition techniques with borehole source. The generation of polarized shear waves (SH and SV) is provided by sources [SHock](#) and [GeoSV](#). All these sources require pulsed power supply [Jack](#).

Jack energy source generates a short high-voltage electric pulse of considerable energy, which is transferred to the electrode group of the sparker ensuring the formation of ionized high-pressure gas-vapor cavities. With explosive expansion of the cavity, the pressure in it rapidly decreases, resulting in a drop in the temperature, vapor

condensation, and subsequent collapse of the cavity, which does not generate parasitic pulsations.

We have developed special type of electrodes from unique material that prevents tips from wearing and provides exceptionally stable signature over a long period of time. The design of the sparker **Pulse** provides easy replacement of electrode groups including for controlling the source signature. Multi-electrode versions are necessary to generate high frequency seismic pulses. Special versions with a small number of electrodes provide a decrease in the signal frequency and a significant increase in the signal-to-noise ratio at long source to receiver distances in high attenuation medium. The standard diameters of the containers 36 / 60 / 80 mm allow to operate in wells with diameters starting from 40 mm.

Sparkers **Pulse** are supplied on geophysical reels equipped with high-voltage slip rings. Thus, one does not need to disconnect the source from the energy source while winding / unwinding the cable. The convenience and safety of work in deep wells are ensured by specialized winches [BGW](#) and [BGW light](#).

#### **Pulse application areas:**

- Borehole seismic surveys on land and in water areas using cross-hole seismic testing and tomography (CST), vertical seismic profiling (VSP), high-resolution VSP, reverse VSP, and vertical seismoacoustic profiling (VSaP)
- Engineering surveys for the construction of highly sensitive facilities
- Search for karsts, fractured and deconsolidated zones, and mine geophysics
- Geotechnical monitoring of the soil foundation and determination of its load-bearing capacity, including in accordance with the ASTM D4428 / D4428M standard
- Cracks location in concrete hydroelectric dams
- Mineral exploration

#### **Delivery set:**

- Sparker Pulse with one electrode group and container
  - HV cable
  - Reel with high-voltage slip ring
  - Energy source Jack connection cable
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**In addition to sparker Pulse the following items can be purchased:**

- Winches [BGW](#) and [BGW light](#)
- Additional electrode groups and containers
- Energy source [Jack](#) with remote control JackPad
- Borehole hydrophone array [WellStreamer](#)
- Single and multi-level 3C borehole probes with spring ([GStreamer](#)), pneumatic ([GStreamer-P](#)), and electromechanical ([GStreamer-E](#)) anchoring system
- High frequency seismic stations [Sigma 4+](#) and [DAQlink 4](#)
- Borehole sources of shear S-waves of horizontal ([SHock](#)) and vertical ([GeoSV](#)) polarization
- Borehole inclinometers [INCLIS](#)
- Downhole pulley

Specialized [freshwater](#) and [marine](#) [sparkers](#), as well as electrodynamic [boomers](#) powered by specialized energy sources [MultiJack](#) which support the latest shooting technologies are available for marine high-resolution seismic surveys.

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