



# Geo-Spark 1000 - 1500 - 2000

## Solid State Pulsed Power Supplies



### Applications

- Very high resolution seismic acquisition  
e.g. site & route surveys  
Is typically combined with:
- Geo-Source 200-400-tip sparkers (marine and fresh water)
- Geo-Boomer 300-500 Joules
- Borehole Sparkers
- Pulsed power projects & research

### 100 % Safety Features

All possible features have been integrated into the systems to safeguard against potential human error.

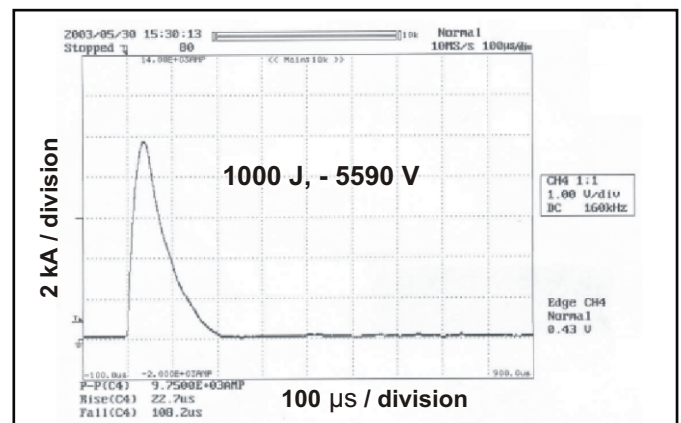
- To open and gain access to the high voltage (HV) connection box, the 230 V mains CE-form connector must first be physically removed.
- High voltage can only be activated when the HV connection box is completely closed.
- If the HV connection box is opened, even partially, during operation, the HV will automatically switch off and the unit will generate a final trigger to discharge the capacitors.
- Similarly, when the HV is switched off normally by pushing the red stop button, an automatic final trigger will discharge the capacitors.
- When the HV connection box has been opened completely, both poles (zero and negative) will automatically be shorted.
- The systems contain internal bleed-off resistors to eliminate any possibility of unwanted charging effects.
- A power lock limits the output to Geo-Boomer to 300 J.

### Operational Features

- 100 to 1000-1500-2000 J real power
- No electrical oscillations
- User-friendly & 100 % safe
- Modular internal design

### Cutting-Edge Pulsed Power Technology

The Geo-Spark 1000 -1500 - 2000 are revolutionary high voltage (HV) power supplies based on cutting-edge 'pulsed power' technology. The systems use an extremely reliable, state-of-the-art thyristor switch that can generate very short (60 - 200  $\mu$ s) high voltage pulses of up to 10 kA at -5.6 kV.



### Preserving Electrode Mode

These pulsed power supplies are fundamentally different from any other HV power supplies. They have been designed specifically to power the Geo-Source range of multi-tip sparkers in our patented 'Preserving Electrode Mode'. In this mode the electrodes have a negative potential with respect to the source frame (= ground), thereby reducing electrode wear to almost zero.

### Negative Electric Discharge Pulse

There is no other unit commercially available that allows you to generate a negative high voltage pulse with such a high dI/dt ratio.

### No Electrical Oscillations

The pulse output has NO electrical oscillations, which affect the acoustic signature. The integrated capacitor bank consists of two (1000 PPS), three (1500) or four (2000 PPS) indestructible 32  $\mu$ F capacitors rated for more than 200 million ( $= 2 \times 10^8$ ) discharges. For example, a  $\frac{1}{4}$  second discharge rate would give continuous work for  $1\frac{1}{2}$

### Low Power Consumption

The Geo-Spark 1000 -1500 - 2000 PPS can be operated from an ordinary 230 V/16 A mains socket or from a portable 230 V/3.5 kVA generator.

The systems do not draw excessive peak currents.



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### Safe and Intuitive Operation

All connections, command buttons, switches and status LEDs are front-mounted to ensure direct safe access and intuitive operation.

### Flexible Energy Output

The systems feature a very flexible energy output, ranging from 100 to 2000 J (in steps of 100 J), that can be modified while online.

This is achieved by:

- varying the operating voltage (selectable from -2000 V to -5600 V);
- varying the capacitance (selectable from 32  $\mu$ F to 64 or 128  $\mu$ F).

### Microprocessor Control

All internal initialising and safety procedures are microprocessor-controlled and the current system status can be monitored via a comprehensive series of LEDs. This provides an easy and straightforward system operation that is basically limited to the following actions:

- switching on/off the control unit (230 V/50-60 Hz single phase);
- selecting the capacitance and voltage;
- activating/deactivating the HV generation.

### Triggering

Remote triggering of the unit is implemented by a TTL pulse, which is internally converted into a fibre-optic signal to the thyristor trigger device. There is no need for any external opto-isolator on the trigger line. During standby between survey lines, the unit will NOT trip - it will slowly bleed off but will remain ready for the next line.

### USB connection on front

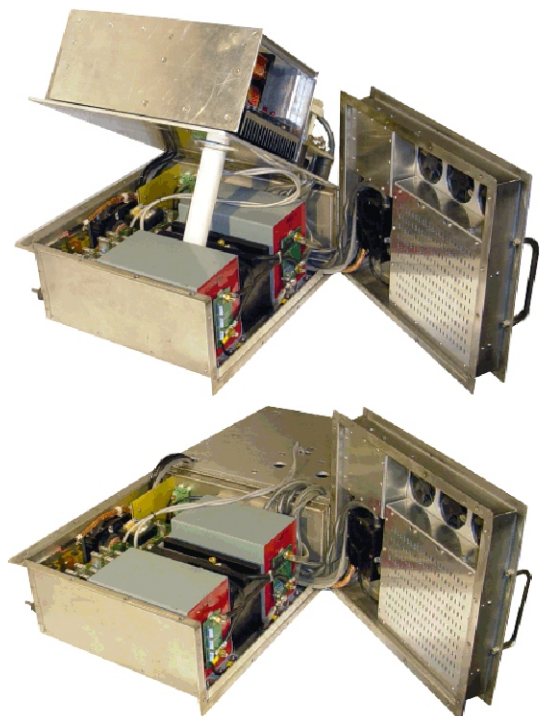
This new feature allows to connect a PC and provides direct access to the control software. You can check the usage data and the system functionality. It also allows customise the control software and internal configuration.

### Modular Internal Architecture

The pictures below give an idea of the advanced modular architecture that allows the opening and inspection of the systems without disconnecting any units.

The internal construction comprises three main individual compartments:

- upper compartment with pulsed HV module, thyristor stack and relay/opto-control PCB;
- lower compartment with the pulse capacitors, capacitor switch, etc.
- front compartment with line filter, mains breaker, HV connection box, main control PCB and cooling fans.



### Quality Built to Last

These pulsed power supplies are built to last, electronically and mechanically. Ten rubber shock absorbers in a sturdy, high quality polyester flight case support the compact inner housing that contains the actual unit.

Additionally, rubber shock absorbers support each vibration-sensitive component inside the inner housing.

Phone: + 31 10 41 55 755  
Fax: +31 10 41 55 351  
E-mail: [info@geosurveysystems.nl](mailto:info@geosurveysystems.nl)  
Website: [www.geo-spark.com](http://www.geo-spark.com)

GEO Marine Survey Systems b.v.  
Cairostraat 4  
3047 BC Rotterdam  
The Netherlands