8kW HIGH VOLTAGE POWER SUPPLIES
SERIES OL8000

FEATURES
- 8kW of output power
- Output voltages from 80kV to 200kV
- Positive or negative polarity
- Robust IGBT converter design
- Low stored energy
- High stability
- High reliability
- Low ripple
- Arc and short circuit protected
- CE Marked

APPLICATIONS
- Ion implantation
- Ion vapour deposition
- Chemical vapour deposition
- Electron beam welding
- Electron guns
- High voltage testing
- Particle accelerators
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DESCRIPTION

The Series OL8000 is a range of high reliability products designed to meet the rigorous requirements of Ion and Electron Beam systems within a compact assembly. The design utilises Insulate Gate Bipolar Transistor (IGBT) technology operating at 20 kHz to provide superior performance, coupled with an unrivalled resistance to damage from surges and arcs. The power converter uses a unique NON-DISSIPATIVE snubber which keeps the main power IGBTs cool, enhancing their long-term reliability. The high voltage modules within the system are based on HiTek Power’s proprietary DISC technology proven over many years and thousands of modules to achieve the ultimate performance and reliability in high voltage generators.

Each system consists of two units: the converter, housed in a 4U (7”) 19” rack mounting unit and the HV unit, which is a separate high voltage multiplier assembly.

Operation:

The unit can be run in either LOCAL or REMOTE mode, switch selectable from the front panel. The HV output is taken from the top of the high voltage unit where screw termination is available.

In LOCAL mode full control of the power supply is available at the front panel of the converter unit. A switch selects high voltage ON or OFF, and maximum levels of output voltage and current can then be set by two, independent, 10-turn controls. Depending on load conditions at the output of the supply, one or other of these levels will be achieved and, in current limit mode, maintained. On altering the control settings, or in the event of a load change, crossover between current and voltage control is automatically performed with negligible ‘glitch’. Actual levels of output voltage and current are displayed on front panel analogue meters, located adjacent to their respective function controls.

In current TRIP mode the unit operates in voltage control until the pre-set current is reached and maintained for a predetermined period of time. At this point the unit goes into a trip condition and the high voltage output is disabled. A front panel indicator illuminates to show this condition. This condition is reset by returning HV ON/OFF to OFF.

The REMOTE mode allows control of the power supply to be transferred to the rear panel mounted, user interface, D-type connector. Provided the 3 phase circuit breaker is in the ON position and power is applied, then all other functions are available via this interface connector. Application of 0 to 10V to the voltage and current control lines programmes the unit for 0 to 100% of rated output. Similarly 0 to 10V signals provide monitors of the output voltage and current. HV ON/OFF is obtained by shorting two terminals and status lines are provided by open collector outputs. A pair of wires is provided for an enable system. These must be shorted together for operation in either LOCAL or REMOTE mode; if not, a TRIP will be indicated and it will not be possible to switch on the high voltage output.

Protection:

The units are fully protected against over voltage, over current, over temperature, load arcing and output short circuit. The external enable may be used to provide system protection.

Safety:

These units are designed to satisfy the requirements of European Standard EN60950. All materials used meet or exceed the requirements of UL94-V1 for flammability. The power supplies described in this data sheet must be installed so as to protect users from contact or close proximity and should only be used by personnel who have received the appropriate training and who are fully aware of the hazards that exist.

SPECIFICATION

Input: 48Hz to 62Hz 3-phase and earth. 187V to 229V AC rms at 34A rms per phase.

Output Power: 8kW.

Output Voltage: See table opposite.

Polarity: Positive or negative.

Minimum Voltage: 5% of rated output voltage. The unit may be turned down below this but the specifications are not guaranteed.

Line Regulation: 0.02% if rated output voltage for 10% variation in supply voltage.

Load Regulation: 0.05% of rated output of 1% to 100% change in load current. Where 100% is the rated current at rated voltage.

Ripple: Standard unit: 0.2% peak to peak of rated output voltage. Filtered Unit: (F) 0.14% peak to peak of rated output voltage.

Recovery Time: To within 1% of rated voltage from set within 100ms after output short is removed.
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Overshoot: Less than 5% of rated voltage.

Efficiency: Greater than 80% at full load and rated output voltage.

Temperature Coefficient: 200ppm/°C max. Typically better than 100ppm.

Operating Temperature: 0°C to +40°C.

Storage Temperature: -20°C to +50°C.

Humidity: 85% maximum relative humidity. Non-condensing.

Altitude: Sea level to 2000 metres (6500 feet).

Local Controls/Indicators: AC Supply 3 pole circuit breaker, AC on indicator, HV ON/OFF switch, HV ON indicator, Local/Remote switch, Trip indicator, Voltage Control and Current Control indicators, 10-turn voltage control potentiometer, analogue output voltage meter, analogue output current meter.

Remote Controls: Connections are made via a 25-way D-type connector situation on the rear panel.
HV ON/OFF Control, HV ON status, HV OFF status, User Interlock, Trip status.
Voltage Demand: 0 to +10V for 0 to 100%.
Current Demand: 0 to +10V for 0 to 100%.
Voltage Reference: +10V at 5mA maximum load.
Voltage Monitor: 0 to 10V for 0 to 100%, 1% accuracy, 100R source.
Current Monitor: 0 to 10V for 0 to 100%, 2% accuracy, 100R source.
Voltage Demand Monitor: 0 to 10V for 0 to 100%, 1% accuracy, 100R source.

Mechanical Specification:
Dimensions: See outline drawing.
Weight: See table below.
Connections: All connectors are mounted on the rear panel.
Mains Input: Via high current connector supplied.
HV Output: M5 bush provided on HV unit.

OUTPUTS & ORDERING INFORMATION:

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OUTPUT VOLTAGE (Rated kV max)</th>
<th>OUTPUT CURRENT (Rated mA max)</th>
<th>SURGE CURRENT mA @ &lt;5% kV (see note 2)</th>
<th>HV UNIT</th>
<th>WEIGHT kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>OL8000/803</td>
<td>80</td>
<td>100</td>
<td>-</td>
<td>35</td>
<td>37</td>
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<td>OL8000/204</td>
<td>200</td>
<td>40</td>
<td>-</td>
<td>62</td>
<td>NA</td>
</tr>
</tbody>
</table>

Notes:
1. Power converter for all models weighs 37kg.
2. Consult factory for surge capability.

Once a model number has been chosen, please add either P for positive polarity or N for negative polarity.

Higher voltages are available to special order but at a reduced output power. Please contact our sales department for further details.

Once a model number has been chosen, please add:
A Analogue meters
D Digital meters
B Blank panel - remote control only
P Positive polarity
N Negative polarity
E Encapsulated

Ordering Example:
OL8000 A P E

Model Meter Choice Output Polarity Encapsulated

These component power supplies meet the requirements of EC Directive 73/23/EEC (LVD)
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Outline Dimensions Of OL8000 Converter And HV Stack
(Filtering And Standard, Shortdown and Non-Shortdown)

Outline Drawing