

# HITEK POWER OL1K SERIES

## HIGH VOLTAGE POWER SUPPLY



The HiTek Power® OL1K Series range of single output high voltage power supplies meets the exacting requirements found in electron and ion beam systems, ion implantation and X-ray equipment. Designed using the latest power switching IGBTs to ensure efficient and reliable operation over the full operating range, the OL1K Series will give excellent performance in the most severe of electrical environments.

### PRODUCT HIGHLIGHTS

- 1kW of output power
- Output voltages from 1kV to 60kV
- Positive or Negative polarity to order
- Analogue meter or blank front panel options
- IGBT switch mode technology
- Local or remote operation
- Marked for EU LV Directive 73/23/EEC

## ELECTRICAL SPECIFICATIONS

|                          |  |
|--------------------------|--|
| Output Power             | 1kW maximum at full rated output voltage and current   |
| Output Voltage           | Units available with maximum output voltages from 1kV to 60kV  |
| Output Current           | Up to 1A for 1kV and 16mA for 60kV, see table  |
| Input Voltage            | 187VAC to 255VAC 47-63Hz single phase plus protective earth  |
| Input Current            | Less than 12A  |
| Polarity                 | Positive or negative to order  |
| Specification Range      | Specifications apply above 5% of rated output voltage. The output can be controlled down to less than 0.25% of rated output voltage.   |
| Recovery Time            | Less than 500ms to within 0.1% of previous operating level following a short circuit or arc. Maximum overshoot 2% of rated output voltage.   |
| Temperature Coefficient  | Less than 200ppm/°C  |
| Drift                    | Less than 0.02% per hour after 1 hour warm up  |
| Operating Temperature    | 0°C to +40°C   |
| Storage Temperature      | -20°C to +70°C   |
| Humidity                 | 80% maximum relative humidity up to 31°C, reducing linearly to 50% at 40°C. Non-condensing (ref BS EN61010-1)  |
| Altitude                 | Sea level up to 2000 metres (6500 feet)  |
| Installation Category    | II (BS EN61010-1)  |
| Pollution Degree         | 2 (BS EN61010-1)   |
| Usage                    | Indoor use only  |
| Protection               | The units are fully protected against over-temperature and overcurrent, peak arc current is resistively limited.   |
| Arc Count and Extinguish | Each time the ACE system detects an arc it blanks the supply off for a brief period to extinguish the arc. The unit is then allowed to recover. If more arcs occur they are counted to determine the arc rate; if this exceeds a safe level the power supply is shut down. The parameters are factory set to 25 arcs in any 5 second period. |
| Cooling                  | Fan assisted, air is drawn in via side panel vents and exits at the rear of the unit. Minimum airflow required is 3m/s. Ambient air around the unit must not exceed 40°C.  |
| Safety                   | The Series OL1K meets the requirements of the Low Voltage Directive, 2006/95/EC, by complying with BS EN61010-1:2001 when installed as a component part of compliant equipment. It is CE marked accordingly.   |
| Safety Class             | Equipment Class 1  |
| EMC <sup>1</sup>         | EN55022 Class B for conducted and radiated emissions   |
|                          | EN61000-4-2 ESD - levels ±4kV contact, ±8kV air discharge  |
|                          | EN61000-4-4 Fast transients on mains input - levels ±2kV   |
|                          | EN61000-4-5 surges - levels ±2kV line to earth, ±1kV line to line  |
|                          | EN61000-4-8 magnetic fields - levels 30A/m at 50/60Hz  |
|                          | EN61000-4-11 voltage dips, interruptions   |
| RoHS                     | The OL1K is currently built to non-RoHS standard. This unit can, however, be configured to meet the requirements of RoHS where significant customer demand requires it, although please note that this will have an impact on delivery timescales.   |

<sup>1</sup> The Series OL1K is intended for installation as a component of a system and is designed to meet these requirements. The unit will not trip and recovers to normal operation after a disturbance as defined in SEMI F47-0706. The EMC performance of the power supply can only be fully assessed when installed within, and as a part of, the final system.

**ELECTRICAL SPECIFICATIONS (CONTINUED)**

| <b>Voltage Ripple</b>     |  |
|---------------------------|--|
| Voltage Mode              | Less than 0.1% of rated output voltage +2V, peak to peak                               |
| Current Mode              | Less than 0.5% of rated output voltage peak to peak                                    |
| <b>Voltage Regulation</b> |  |
| Line                      | Less than 0.05% +1V change in output voltage for a 10% change in line voltage          |
| Load                      | Less than 0.05% +1V change in output voltage for a 0 to 100% change in load current.   |
| <b>Current Regulation</b> |  |
| Line                      | Less than 0.5% of rated output current for a 10% change in line voltage                |
| Load                      | Less than 0.5% change of rated output current for a 0 to 100% change in output voltage |

**MECHANICAL SPECIFICATIONS**

|              |   |
|--------------|---|
| Dimensions   | See outline drawing   |
| Weight       | 14kg  |
| Connections  | All connections are mounted on the rear panel                           |
| Mains        | IEC320  |
| Safety earth | M6 stud   |
| HV output    | Proprietary coaxial connector, 2m cable provided                        |
| Front panel  | Stoving enamel trinite full gloss S60/6 colour cream R87177 as standard |



**INTERFACE**

**Remote Control Interface Connections:**

The Series OL1K is fitted with an analogue remote control interface, controlled via a 25-way female D-type connector:

|                           |    |    |                           |
|---------------------------|----|----|---------------------------|
| V STATUS INDICATOR        | 1  | 14 | HV OUTPUT CURRENT MONITOR |
| I STATUS INDICATOR        | 2  | 15 | HV OFF INDICATOR          |
| HV OUTPUT VOLTAGE MONITOR | 3  | 16 | REMOTE INDICATOR          |
| TRIP INDICATOR            | 4  | 17 | RESERVED                  |
| LOCAL INDICATOR           | 5  | 18 | +10V REFERENCE VOLTAGE    |
| HV ON INDICATION          | 6  | 19 | RESERVED                  |
| PROGRAM VOLTAGE MONITOR   | 7  | 20 | RESERVED                  |
| HV ON Lo                  | 8  | 21 | ENABLE Lo                 |
| HV ON Hi                  | 9  | 22 | ENABLE Hi                 |
| PROGRAM VOLTAGE Hi        | 10 | 23 | CURRENT PROGRAM 0V        |
| PROGRAM VOLTAGE Lo        | 11 | 24 | CURRENT PROGRAM           |
| 0V                        | 12 | 25 | RESERVED                  |
| 0V                        | 13 |    |                           |

All logical indicators are open collector outputs rated at 16V (max) in the off state. An internal 100Ω resistor is connected in series with the open collector transistor. The pull down voltage is 0.9V plus the internal resistor drop.

All analogue Voltage and Current Monitors are 0V to +10V ±0.5% ±20mV, with respect to pin 13, representing 0 to rated output. Signal impedance is less than 100Ω and minimum external load resistance is 2kΩ.

All analogue Voltage and Current Inputs are 0V to +10V on the Hi input with respect to the Lo input, representing 0V to rated output ±0.2% of setting ±0.1% of rating. Input impedance is greater than 50kΩ.

**ORDERING INFORMATION**

| Model                    | Output Voltage | Output Current |
|--------------------------|----------------|----------------|
| OL1K/102 <sup>1</sup>    | 1kV            | 1A             |
| OL1K/202 <sup>1</sup>    | 2kV            | 500mA          |
| OL1K/502 <sup>1</sup>    | 5kV            | 200mA          |
| OL1K/103 <sup>1</sup>    | 10kV           | 100mA          |
| OL1K/203 <sup>1</sup>    | 20kV           | 50mA           |
| OL1K/303 <sup>1</sup>    | 30kV           | 33mA           |
| OL1K/403 <sup>1</sup>    | 40kV           | 25mA           |
| OL1K/503 <sup>1</sup>    | 50kV           | 20mA           |
| OL1K/603 <sup>1, 2</sup> | 60kV           | 16mA           |

**1** Please add the required suffixes to the part number:  
 P Positive polarity  
 N Negative polarity  
 A Analogue meters  
 B Blank front panel  
 eg order part number OL1K/102PA for a 1kV positive polarity unit with analogue meters.

**2** 60kV unit has an encapsulated HV assembly.

For voltages not listed in the output table, please contact our sales team.



For international contact information,  
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## ABOUT ADVANCED ENERGY

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PRECISION | POWER | PERFORMANCE



**CAUTION:**  
High Voltage

Read and understand all documentation before you install, operate, or maintain Advanced Energy high voltage power supplies. Follow all safety instructions and precautions to protect against property damage and serious or possibly fatal bodily injury. Never defeat safety interlocks or grounds.

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