

HITEK POWER OLH10K SERIES

10KW HIGH VOLTAGE POWER SUPPLIES



The HiTek Power[®] OLH10K Series is a range of high reliability single output high voltage power supplies designed to meet the rigorous requirements of ion and electron beam systems, ion implantation and X-ray equipment.

The systems consist of two units: a rack mounting power converter through which both local and remote controls can be facilitated, and a separate HV unit employing a modular disc construction. Numerous features are incorporated to ensure system integrity is maintained during adverse operating conditions, including Advanced Energy's unique Arc Count and Extinguish (ACE) system for managing systems where load arcing is endemic.

PRODUCT HIGHLIGHTS

- 10 kW of output power
- Output voltages from 60 to 300 kV available with customer-defined derivatives upon request
- Robust IGBT converter design
- Exceptional reliability
- High Stability
- Arc Count and Extinguish (ACE)
- Full Local and Remote control and monitoring
- Analogue or RS232 remote control
- Voltage or current control
- RoHS compliant to EU Directive 2002/95/EC
- Custom options available
- CE Marked

ELECTRICAL SPECIFICATIONS

| | |
|--------------------------------|--|
| Output Power | 10 kW maximum at full rated output voltage and current |
| Output Voltage | Units available with maximum output voltages from 60 to 300 kV |
| Output Current | Up to 166 mA for 60 kV and 10 mA for 500 kV |
| Input Voltage | OLH10K: 208 VAC $\pm 10\%$ (187 VAC to 229 VAC) 47 to 63 Hz 3 phase plus protective earth |
| | OLH10KC: 380 VAC $\pm 10\%$ (342 VAC to 418 VAC) 47 to 63 Hz 3 phase plus protective earth |
| | OLH10KE: 400 VAC $\pm 10\%$ (360 VAC to 440 VAC) 47 to 63 Hz 3 phase plus protective earth |
| Polarity | Positive or negative to order |
| Minimum Voltage | 5% of rated output voltage. The unit may be turned down below this but the specifications are not guaranteed below this level. |
| Calibration | Calibration between Voltage Demand, Output Voltage and Voltage Monitor $\pm 0.2\%$ of setting or $\pm 0.05\%$ of rating, whichever is greater |
| Recovery Time | Less than 200 ms 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 100 ppm/ $^{\circ}\text{C}$ |
| Drift | Less than 0.01% per hour after 1 hour's warm up, typically less than 0.02% per 8 hours after 1 hour's warm up, at constant load, line and temperature |
| Operating Temperature | 0 $^{\circ}\text{C}$ to +40 $^{\circ}\text{C}$ ambient and air intake |
| Storage Temperature | -20 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$ |
| Humidity | 80% maximum relative humidity up to 31 Deg C, reducing linearly to 50% at 40 Deg C. Non-condensing (ref BS EN61010-1) |
| Altitude | Sea level to 2000 meters (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 voltage, over current, over temperature, load arcing and output short circuits. |
| Arc Count and Extinguish (ACE) | 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. |
| Safety | The OLH10K high voltage power supplies meet the requirements of the Low Voltage Directive, LVD, 2006/95/EC by complying with BS EN61010-1:2001 when installed as a component part of other equipment. They are CE marked accordingly. |
| Safety Class | Equipment Class 1 |
| EMC ¹ | EN55022 class B for conducted and radiated emissions |
| | EN61000-4-2 ESD - levels ± 4 kV contact, 8 kV air discharge |
| | EN61000-4-4 fast transients on mains input - levels ± 2 kV |
| | EN61000-4-5 surges - levels ± 2 kV line to earth, ± 1 kV line to line |
| | EN61000-4-8 magnetic fields - levels 30A/m at 50/60 Hz |
| | EN61000-4-11 voltage dips, interruptions |
| RoHS | The Series OLH10K meets the requirements of EU Directive 2002/95/EC on the Restriction of use of Certain Hazardous Substances in electrical and electronic equipment (RoHS). |

ELECTRICAL SPECIFICATIONS (CONTINUEUD)

| Voltage Ripple | |
|--------------------|---|
| Voltage Mode | Less than 0.1% of rated voltage +2 V, peak to peak or less than 0.02% of rated voltage +1 V, rms |
| Current Mode | Less than 0.5% of rated voltage peak to peak or less than 0.1% of rated voltage rms |
| Voltage Regulation | |
| Line | Less than 0.01% +0.5 V change in output voltage for a 10% change in line voltage |
| Load | Less than 0.01% +0.5 V change in output voltage for 0 to 100% change in load current |
| Current Regulation | |
| Line | Less than 0.5% of rated current for a ±10% change in line voltage |
| Load | Less than 0.5% of rated current for 0 to 100% change in output voltage |
| Cooling | |
| Converter | <p>The unit utilizes forced air cooling. Air is drawn in via the front panel slotted opening and through side panel vents. Ensure that within the rack there is a free air opening with a minimum effective area of 195cm² directly in front of the unit front panel slots. An additional free air opening with a minimum effective area of 195m² is required for the side vents. Air flow from this additional free air opening to the side vents of the power converter must not be restricted. The expected air flow for each opening is approximately 50 Litres per second. The maximum temperature of the air entering the units must not exceed 40°C (104°F).</p> <p>The unit can dissipate up to 1 kW, therefore provision must be made to extract the exhaust air from the rack in order to prevent possible overheating.</p> |
| HV Unit | <p>The HV Unit may be mounted in any orientation, but at least 150 mm of free space should be allowed around the HV base for air intake/exhaust from the fans. The side panel grilles must not be obstructed. The maximum temperature of air entering the HV base must not exceed 40°C (104°F).</p> <p>Adequate clearance must be allowed around the HV discs to take account of the high voltage output.</p> <p>The HV unit can dissipate up to 1 kW, therefore provision must be made to extract air/cool the oil in the HV enclosure in order to prevent possible overheating.</p> |

¹ The Series OLH10K is intended for installation as a component of a system and is designed to meet 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 part of, the final system.

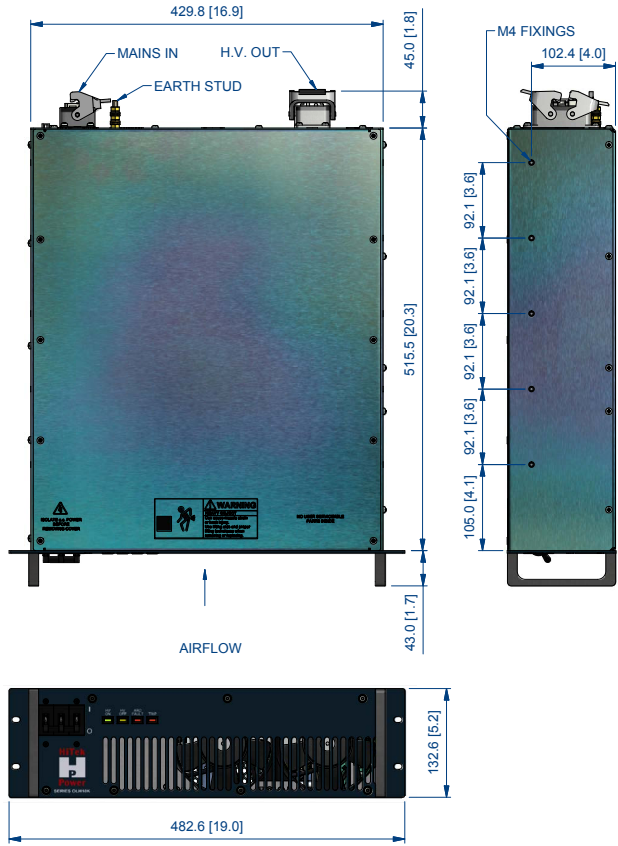
HITEK POWER OLH10K SERIES

MECHANICAL SPECIFICATIONS

Please contact the Sales Team for 400 kV and 500 kV mechanical outline details and weights.

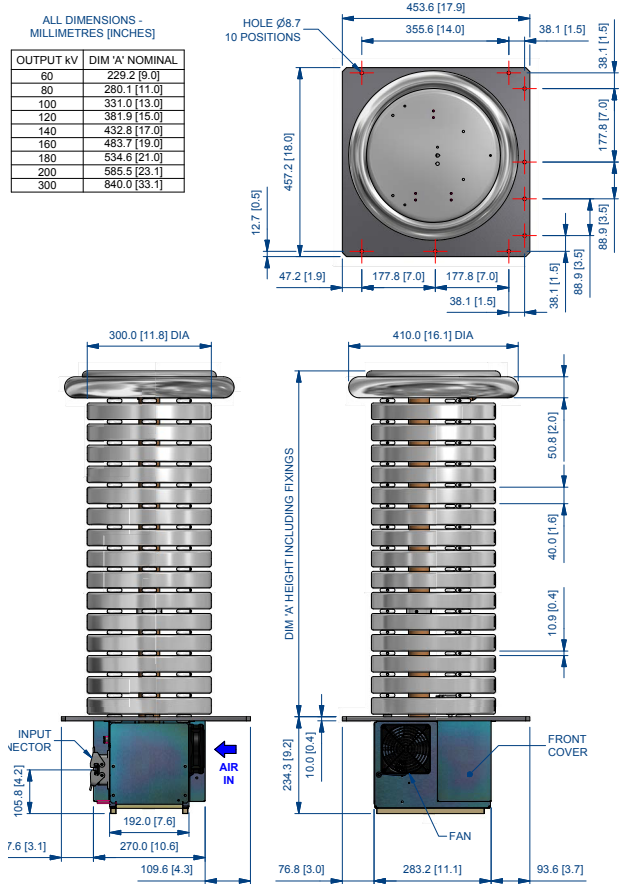
| | | |
|------------------------|---|------------------------|
| Dimensions | 60 to 300 kV models - see outline drawings attached | |
| Connections | All connections are mounted on the rear panel | |
| Mains | Harting Han C (mating part provided) | |
| Safety Earth | M6 stud on both the converter and HV unit | |
| HV Output | Direct connection to the top of the HV unit | |
| Front Panel | Stoving enamel trimite full gloss S60/9 colour blue RAL5011 as standard | |
| | Blank front panel available to order (see below) | |
| Weight | | |
| 60 to 300 kV Converter | 27 kg | |
| 60 to 300 kV Stacks | Output Voltage Variant | HV Stack Weight |
| | 60 kV | 31 kg |
| | 80 kV | 36 kg |
| | 100 kV | 41 kg |
| | 120 kV | 46 kg |
| | 140 kV | 51 kg |
| | 160 kV | 56 kg |
| | 180 kV | 61 kg |
| | 200 kV | 66 kg |
| | 300 kV | 91 kg |

MECHANICAL SPECIFICATIONS (CONTINUED)



ALL DIMENSIONS - MILLIMETRES [INCHES]

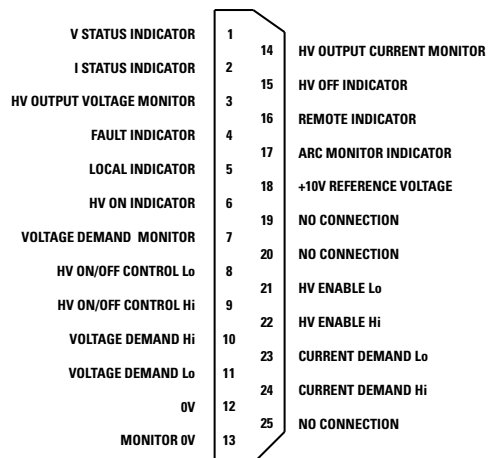
| OUTPUT KV | DIM 'A' NOMINAL |
|-----------|-----------------|
| 60 | 229.2 [9.0] |
| 80 | 280.1 [11.0] |
| 100 | 331.0 [13.0] |
| 120 | 381.9 [15.0] |
| 140 | 432.8 [17.0] |
| 160 | 483.7 [19.0] |
| 180 | 534.6 [21.0] |
| 200 | 585.5 [23.1] |
| 300 | 840.0 [33.1] |



INTERFACE

Remote Control Interface Connections:

The Series OLH10K is fitted with an analogue remote control interface as standard, control is via a 25-way female D-type connector:



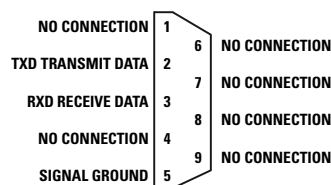
All logical indicators are open collector outputs rated at 16 V (max) in the off state. An internal 100 Ω resistor is connected in series with the open collector transistor. The pull down voltage is 0.9 V plus the internal resistor drop.

All analogue Voltage and Current Monitors are 0 V to +10 V ±0.5% ±20 mV, with respect to pin 13, representing 0 to rated output. Signal impedance is

less than 100 Ω and minimum external load resistance is 2 kΩ.

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

Digital RS232 Remote Control 9-way female D-type connector:



The Series OLH10K is configured as a DCE device. To connect to a PC or other DTE device, use a 'pin-pin' DB9 female to male serial cable.

The communication is set to 9,600 Baud, one start bit, one stop bit and no parity. The connector shell can be connected to earth and cable screen. A comprehensive set of commands is available for the control and monitoring of the power supply.

ORDERING INFORMATION

For ordering information and to find a solution for your exact requirements, please contact your local Advanced Energy sales representative.



For international contact information,
visit advancedenergy.com.

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ABOUT ADVANCED ENERGY

Since 1981, Advanced Energy (AE) has perfected how power performs for its customers. For both end users and OEMs, AE's comprehensive portfolio of standard and custom high voltage components precisely match system specifications to deliver unparalleled energy, quality, and performance. Through close customer collaboration, design expertise, application insight, and world-class support, AE creates successful partnerships and enables customers to push the boundaries of innovation and stay ahead of evolving market needs.

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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