



FEATURES

- 10kW of output power
- Output voltages from 60kV to 500kV
- Robust IGBT converter design
- Exceptional reliability
- High Stability
- Arc Count and Extinguish (ACE)
- Full Local & Remote control and monitoring
- Analogue or RS232 remote control
- Voltage or current control
- RoHS compliant to EU Directive 2002/95/EC
- Custom options available
- C€ Marked

DESCRIPTION

The Series OLH10K 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.

There are three different input voltage variants available to order: the OLH10K (208VAC), the OLH10KC (380VAC) and the OLH10KE (400VAC).

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 HiTek Power's unique Arc Count and Extinguish (ACE) system for managing systems where load arcing is endemic.

If none of the models listed below suit your requirements, please contact our Sales Team to discuss a custom version.

Output Power:

10kW maximum at full rated output voltage and current.

Output Voltage:

Units available with maximum output voltages from 60kV to 500kV.

Output Current:

Up to 166mA for 60kV and 10mA for 500kV.

Input Voltage:

OLH10K:

208VAC $\pm 10\%$ (187VAC to 229VAC) 47-63Hz 3 phase plus protective earth.

OLH10KC: 380VAC ±10% (342VAC to 418VAC) 47-63Hz 3 phase

plus protective earth.

OLH10KE: 400VAC ±10% (360VAC to 440VAC) 47-63Hz 3 phase

plus protective earth.

Input Current:

OLH10K: Less than 36A per phase.
OLH10KC: Less than 22A per phase.
OLH10KE: Less than 22A per phase.

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.

Voltage Ripple:

Voltage Mode: Less than 0.1% of rated voltage +2V, peak to peak

or less than 0.02% of rated voltage +1V, 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% +0.5V change in output voltage for a 10%

change in line voltage.

Load: Less than 0.01% +0.5V 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.

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 200ms 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 100ppm/°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°C to +40°C ambient and air intake.

Storage Temperature:

-20°C to +85°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 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 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.

Cooling:

Converter:

The unit utilises 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).

The unit can dissipate up to 1kW, therefore provision must be made to extract the exhaust air from the rack in order to prevent possible overheating.

HV Unit:

The HV Unit may be mounted in any orientation, but at least 150mm 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).

Adequate clearance must be allowed around the HV discs to take account of the high voltage output.

The HV unit can dissipate up to 1kW, therefore provision must be made to extract air/cool the oil in the HV enclosure in order to prevent possible overheating.

EMC

The Series OLH10K is intended for installation as a component of a system and is designed to meet:

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

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.

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).

Mechanical Specification:

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

Dimensions: 60kV-300kV models - see outline drawings attached.



Weight: 60kV-300kV Converter: 27kg

60kV-300kV Stacks:

Output Voltage Variant	HV Stack Weight
60kV	31kg
80kV	36kg
100kV	41kg
120kV	46kg
140kV	51kg
160kV	56kg
180kV	61kg
200kV	66kg
300kV	91kg

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 \$60/9 colour blue

RAL5011 as standard.

Blank front panel available to order (see below).

Outputs and Ordering Information:

Model No 208VAC input	Model No 380VAC input	Model No 400VAC input	Output Voltage	Output Current
OLH10K-603*	OLH10KC-603*	OLH10KE-603*	60kV	166mA
OLH10K-803*	OLH10KC-803*	OLH10KE-803*	80kV	120mA
OLH10K-104*	OLH10KC-104*	OLH10KE-104*	100kV	100mA
OLH10K-124*	OLH10KC-124*	OLH10KE-124*	120kV	80mA
OLH10K-144*	OLH10KC-144*	OLH10KE-144*	140kV	65mA
OLH10K-164*	OLH10KC-164*	OLH10KE-164*	160kV	55mA
OLH10K-184*	OLH10KC-184*	OLH10KE-184*	180kV	45mA
OLH10K-204*	OLH10KC-204*	OLH10KE-204*	200kV	40mA
OLH10K-304*	OLH10KC-304*	OLH10KE-304*	300kV	15mA
OLH10K-404*	OLH10KC-404*	OLH10KE-404*	400kV	10mA
OLH10K-504*	OLH10KC-504*	OLH10KE-504*	500kV	10mA

* Please add the required suffix to the part number:

P Positive polarity

N

Negative polarity Blank front panel (remote control only) R

RS232 control interface

eg order part number OLH10K-803PB for an 80kV positive polarity unit with blank front panel.

For voltages not listed above, please contact our sales team.

PLEASE NOTE:

The attached outline drawings are only applicable to 60kV-300kV model variants. Please contact our Sales Team for mechanical information on the 400kV and 500kV models.

See separate datasheet on our Series OLH10KD for dual voltage range capability with accurate control and low ripple down to 1% of maximum rated output. Other voltages and combinations are available to special order.

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:

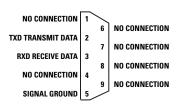
	$\overline{}$	\	
V STATUS INDICATOR	1	``	
I STATUS INDICATOR	2	14	HV OUTPUT CURRENT MONITOR
TOTATOO INDICATOR	-	15	HV OFF INDICATOR
HV OUTPUT VOLTAGE MONITOR	3	16	REMOTE INDICATOR
FAULT INDICATOR	4	10	REMIDTE INDICATOR
	_	17	ARC MONITOR INDICATOR
LOCAL INDICATOR	5	18	+10V REFERENCE VOLTAGE
HV ON INDICATOR	6		
VOITAGE DEMAND MONITOR	7	19	NO CONNECTION
VOLIAGE DEMIAND MONITOR	′	20	NO CONNECTION
HV ON/OFF CONTROL Lo	8		
HV ON/OFF CONTROL Hi	9	21	HV ENABLE Lo
		22	HV ENABLE Hi
VOLTAGE DEMAND Hi	10	23	CURRENT DEMAND Lo
VOLTAGE DEMAND Lo	11	20	
nv	12	24	CURRENT DEMAND Hi
UV	12	25	NO CONNECTION
MONITOR OV	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.

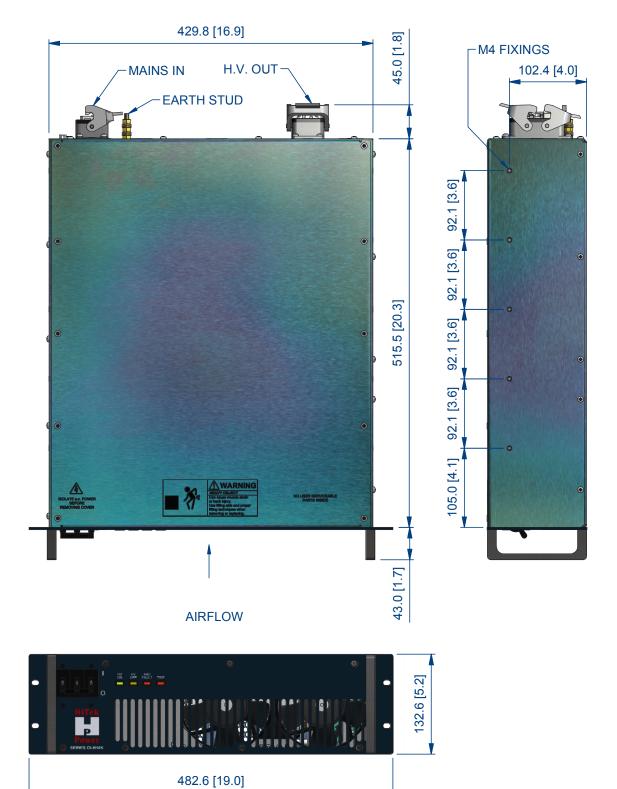
All analogue Voltage and Current Inputs are 0V to +10V on the Hi input with respect to the Lo input representing OV to rated output ±0.2% of setting $\pm 0.1\%$ of rating. Input impedance is better than $50k\Omega$.

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.



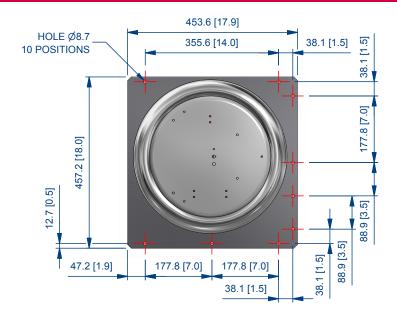


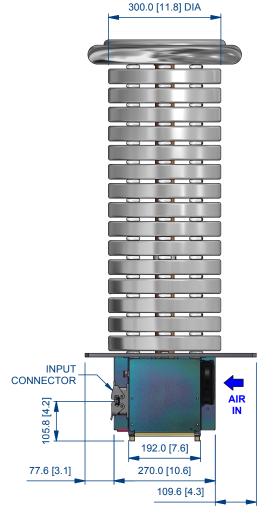
Drawing dimensions are in mm (inches) Design developments may result in specification changes

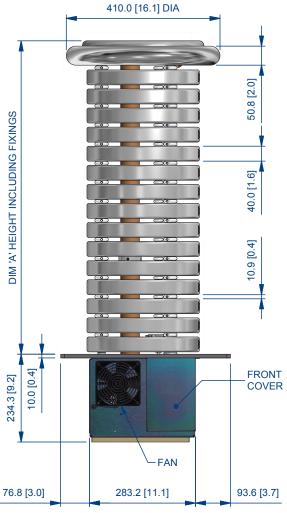


ALL DIMENSIONS - MILLIMETRES [INCHES]

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]









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