Advanced Energy®

HITEK POWER® OLS10K SERIES

10 KW HIGH-VOLTAGE POWER SUPPLIES

AC-to-HVDC single-output rack-mount high-voltage power supplies

The OLS10K series range of single-output high-voltage power supplies meets the exacting requirements found in electron beam, ion beam, and x-ray systems, as well as ion and chemical vapor deposition, electrostatic precipitation, and other 24/7 production processes.

Features

- High packing density: 10 kW output power in 6 U rack mounted chassis
- Output voltages from 1 to 80 kV
- Parallel option to give 20 to 100 kW
- High stability
- Exceptional reliability in severe electrical environments
- Arc Count and Extinguish (ACE)
- Full local and remote control and monitoring
- Analog or RS232 remote control
- Voltage or current control
- CE marked for EU LV directive 2006/95/EC
- RoHS compliant to EU directive 2011/65/EU
- Custom options available

Typical Applications

- Electron beam
- Ion beam
- X-ray
- Lasers
- HV pulse generator bias
- HV amplifier bias
- Electrostatic precipitation
- Chemical purification

Designed using the latest power-switching IGBTs to ensure efficient and reliable operation over the full operating range, the OLS10K will give exemplary performance in the most severe of electrical environments. The OLS10K series achieves an exceptionally high packing density for high-voltage power supplies of this power level, giving 169 W per Liter, 2.7 W per inch^3. The 6 U construction allows operation at full power when close mounted in a standard equipment rack, giving significant savings in rack space in large systems. Featuring a proprietary Arc Count and Extinguish (ACE) system for managing systems where load arcing is endemic, the OLS10K series protects both itself and the load from damage that may be caused by excessive arcing while allowing normal operation to continue. The OLS10K series features both analog and remote control (optional RS232) interfaces. A full set of commands is available over the optional RS232 interface to control and monitor the operation of the power supply.

PHYSICAL SPECIFICATIONS

Output Power	10 kW max at full rated output voltage and current		
Output Voltage	Units available with max output voltages from 1 to 80 kV		
Output Current	Up to 10 A for 1 kV and 125 mA for 80 kV (see table)		
Model	OLS10K	OLS10KC	OLS10KE
Input Voltage	208 VAC ±10% (187 to 229 VAC) 47 to 63 Hz 3 phase plus protective earth	380 VAC ±10% (342 to 418 VAC) 47 to 63 Hz 3 phase plus protective earth	400 VAC ±10% (360 to 440 VAC) 47 to 63 Hz 3 phase plus protective earth
Input Current	< 36 A per phase	< 22 A per phase	< 22 A per phase
Voltage Ripple: Voltage Mode	< 0.05% of rated voltage +2 V, peak to peak or < 0.01% of rated voltage +1 V_{rms}	< 0.1% of rated voltage +2 V, peak to peak or < 0.02% of rated voltage +1 V_{rms}	< 0.1% of rated voltage +2 V, peak to peak or < 0.02% of rated voltage +1 V_{rms}
Voltage Ripple: Current Mode	< 0.5% of rated voltage peak to peak or < 0.1% of rated voltage rms	< 0.5% of rated voltage peak to peak or < 0.1% of rated voltage rms	< 0.5% of rated voltage peak to peak or < 0.1% of rated voltage rms
Line Voltage Regulation	< 0.01% +0.5V change in output voltage for a 10% change in line voltage		
Load Voltage Regulation	< 0.01% +0.5 V change in output voltage for 0 to 100% change in load current		
Line Current Regulation	< 0.5% of rated current		
Load Current Regulation	< 0.5% of rated current for 0 to 100% change in output		
Polarity	Positive or negative to order		
Specification Range	Specifications apply above 5% of rated output voltage. The output can be controlled down to < 0.25% of rated output voltage.		
Calibration	Calibration between voltage demand, output voltage, and voltage monitor ±0.2% of setting or ±0.05% of rating, whichever is greater		
Recovery Time	< 200 ms to within 0.1% of previous operating level following a short circuit or arc. Max overshoot 2% of rated output voltage.		
Temperature Coefficient	< 100 ppm/°C		
Drift	< 0.01% per hour after 1 h warmup, typically < 0.02% per 8 h after 1 h warmup, at constant load, line and temperature		
Operating Temperature	0 to +40°C (32 to 140°F)		
Storage Temperature	-20 to +70°C (-4 to 158°F)		
Humidity	80% max relative humidity up to 31°C (88°F), reducing linearly to 50% at 40°C (104°F). Non-condensing		
Altitude	Sea level to 2000 m (6500')		
Installation Category	II (BS EN61010-1)		
Pollution Degree	2 (BS EN61010-1)		
Usage	Indoor use only		
Metering	Provided as part of an alpha-numeric display. Voltages are displayed with a resolution of > 0.5% of rated output. Current is displayed with a resolution of > 1.5% of rated output. Voltage and current set values can be displayed by pressing the relevant control potentiometer.		
Status Indication	Uses the alpha-numeric display to show the reason for any trip condition		
Protection	The units are fully protected against over voltage, over temperature, fan failure, and current limit. Peak arc current is resistively limited.		
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 OLS10K series meets the requirements of the Low Voltage Directive (LVD), 2006/95/EC, by complying with BS EN61010-1 when installed as a component part of other equipment. The units are CE marked accordingly. Designed to meet the general requirements of SEMI S2 for electrical safety.		
Safety Class	Equipment Class 1		

PHYSICAL SPECIFICATIONS

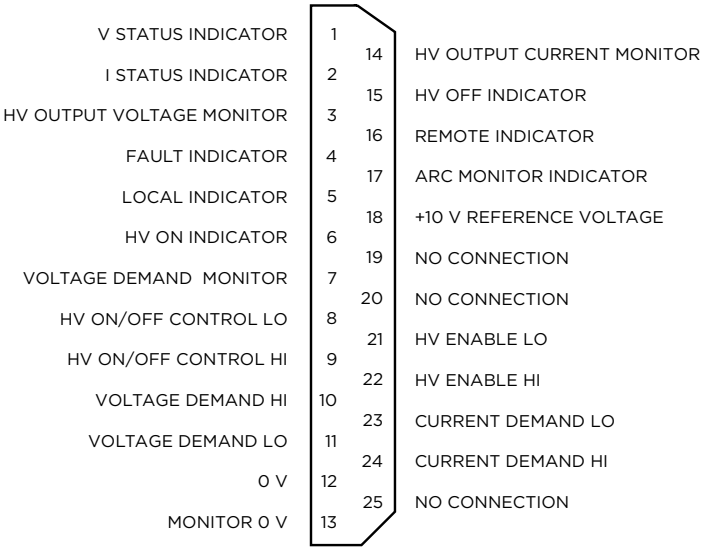
Cooling	The unit utilizes forced air cooling. Air is drawn in via the front panel slotted opening and through side panel vents. Ensure that within the rack there is a free air opening with a minimum effective area of 195 cm^2 directly in front of the unit front panel slots. An additional free air opening with a minimum effective area of 195 cm^2 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 liters per second. The maximum temperature of the air entering the unit must not exceed 40°C. The unit can dissipate up to 2 kW, therefore provision must be made to extract the exhaust air from the rack in order to prevent possible overheating.
EMC	Intended for installation as a component of a system and designed to meet:
	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 30 A/m at 50/60 Hz
	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 OLS10K series meets the requirements of EU Directive 2011/65/EU on the Restriction of use of certain Hazardous Substances (RoHS) in electrical and electronic equipment.

Mechanical Specifications

Dimensions	See outline drawing
Weight	45 kg (99 lb)
Connections	All connections are mounted on the rear panel
Mains	Harting HAN C, 3 m cable provided
Safety Earth	M6 stud
HV Output	Proprietary coaxial connector, 3 m cable provided
Front Panel	Stoving enamel trimite full gloss S60/9 color blue RAL5011 as standard
	Blank front panel available to order (see below)

REMOTE CONTROL INTERFACE CONNECTIONS:

The OLS10K series is fitted with an analog remote control interface as standard, control is via a 25-way female D-type connector:

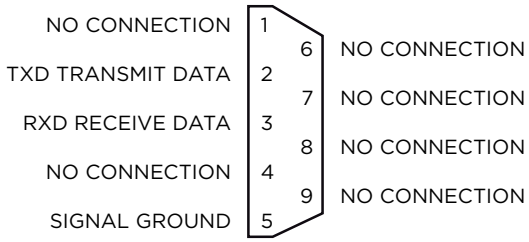


All logical indicators are open collector outputs rated at 16 V (max) in the off state. An internal 100 Ω resistor is connected in series with the open collector transistor. The pull down voltage is 0.9 V plus the internal resistor drop.

All analog voltage and current monitors are 0 to +10 V ±0.5% ±20 mV, with respect to pin 13, representing 0 to rated output. Signal impedance is < 100 Ω and minimum external load resistance is 2 kΩ.

All analog voltage and current inputs are 0 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:



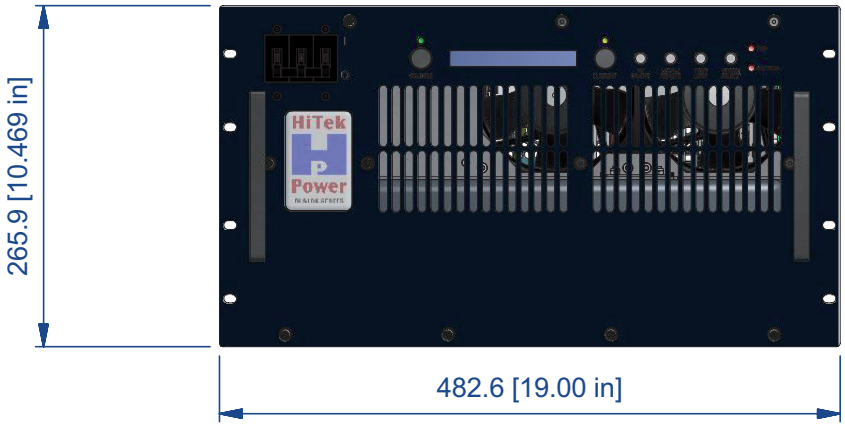
The OLS10K series is configured as a DCE device. To connect to a PC or other DTE device, use a pin to pin DB9 female to male serial cable.

The communication is set to 9600 Baud, one start bit, one stop bit, and no parity.

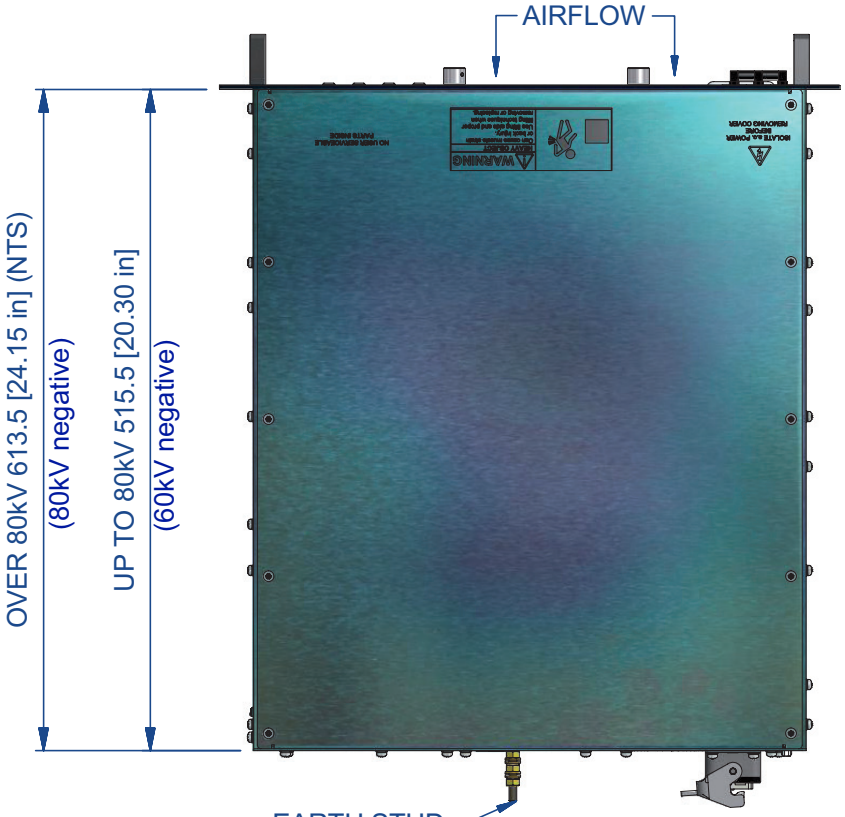
The connector shell can be connected to earth and cable screen.

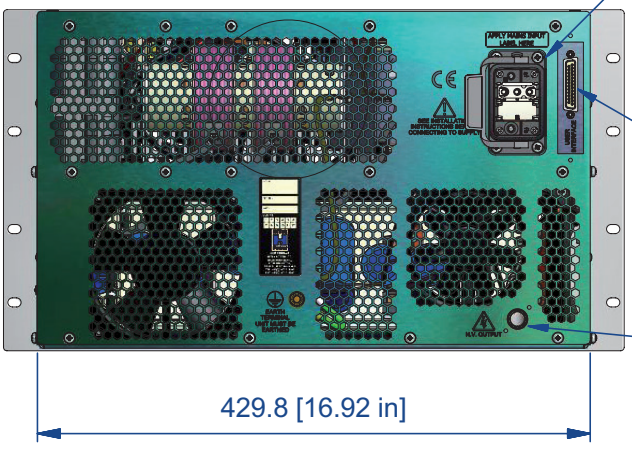
A comprehensive set of commands is available for the control and monitoring of the power supply.

CE These component power supplies meet the requirements of EC Directive 2006/95/EC (LVD).



Note: Drawing dimensions are in mm (")





OUTPUT AND ORDERING INFORMATION

MODEL NO 208 VAC INPUT	MODEL NO 380 VAC INPUT	MODEL NO 400 VAC INPUT	OUTPUT VOLTAGE	OUTPUT CURRENT
OLS10K-102*	OLS10KC-102*	OLS10KE-102*	1 kV	10 A
OLS10K-202*	OLS10KC-202*	OLS10KE-202*	2 kV	5 A
OLS10K-502*	OLS10KC-502*	OLS10KE-502*	5 kV	2 A
OLS10K-103*	OLS10KC-103*	OLSK10E-103*	10 kV	1 A
OLS10K-203*	OLS10KC-203*	OLS10KE-203*	20 kV	500 mA
OLS10K-303*	OLS10KC-303*	OLS10KE-303*	30 kV	333 mA
OLS10K-403*	OLS10KC-403*	OLS10KE-403*	40 kV	250 mA
OLS10K-503*	OLS10KC-503*	OLSK10E-503*	50 kV	200 mA
OLS10K-603*	OLS10KC-603*	OLSK10E-603*	60 kV	166 mA
OLS10K-803*	OLS10KC-803*	OLS10KE-803*	80 kV	125 mA
A1040958-3M0	OLS10K 3M HV Cables			
A1040958-5M0	OLS10K 5M HV Cables			
A1040958-10M	OLS10K 10M HV Cables			

** Please choose the input voltage required, then add the required suffixes to the appropriate model number (in the order given) to indicate polarity and type of front panel required, as well as whether RS232 control is required:*

- *P Positive polarity*
- *N Negative polarity (80 kV maximum)*
- *B Blank front panel (remote control only)*
- *C RS232 control interface*

e.g. OLS10KC-203PBC for a 380 VAC input voltage unit with 20 kV positive polarity with no display or front panel controls (blank front panel), with an RS232 interface.

See separate datasheet on our OLS10KD series 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.

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

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For international contact information, visit
advanced-energy.com.

ENG-HV-OLS10K-230-02 2.17