HITEK POWER OL400W SERIES

400 W HIGH VOLTAGE POWER SUPPLIES

The HiTek Power® OL400W range of single-output high voltage power supplies meets the exacting requirements found in a wide variety of precision systems. The OL400W is also suitable for use in ion implantation, ion and chemical vapor deposition, and general laboratory use.

Designed using the latest power switching IGBTs to ensure efficient and reliable operation over the full operating range, the OL400W series gives excellent performance in the most severe electrical environments. The OL400W utilizes air as the primary insulation medium for voltages up to 60 kV, achieving a high packing density for high voltage supplies giving 65 W per l (1 W per in^3). The 1 U construction (2 U for 80 kV units) 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 possible, the OL400W series protects both itself and the load from damage that may be caused by excessive arcing while allowing normal operation to continue.

PRODUCT HIGHLIGHTS

- Output voltages from 1 to 80 kV
- High packing density: 400 W in 1 U (80 kV 2 U)
- Exceptional reliability
- Complies with SEMI F47 standard
- High stability
- Arc Count and Extinguish (ACE)
- Marked for EU LV Directive 2006/95/EC
- RoHS compliant to EU Directive 2011/65/EU
- Full local and remote control monitoring
- Voltage or current control
- Custom options available

TYPICAL APPLICATIONS

- Ion implantation
- Electron microscopes
- Insulation testing

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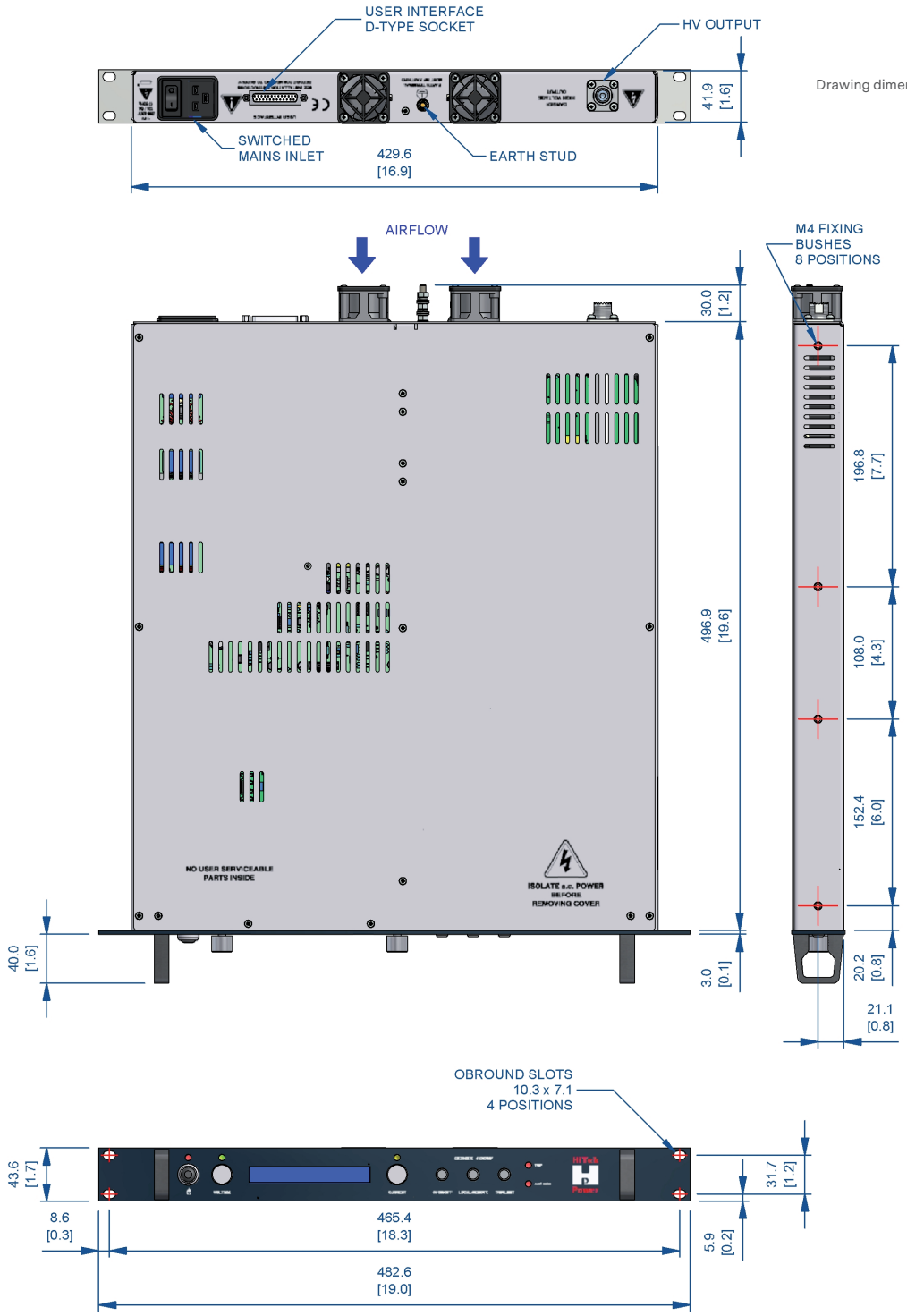
ELECTRICAL SPECIFICATIONS

Specifications	
Output Power	400 W 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 400 mA for 1 kV and 5 mA for 80 kV
Input Voltage	185 to 255 VAC or 103 to 127 VAC (auto range selection)
	Range does not change after power up. 47 to 63 Hz single phase and earth.
Input Current	Not exceeding 5 Arms (185 to 255 VAC)
	Not exceeding 10 Arms (103 to 127 VAC)
Polarity	Positive or negative to order
Specification Range	Specifications apply above 5% of rated output voltage
Voltage Ripple	Voltage mode: < 0.1% of rated output voltage + 2 V, peak to peak or < 0.02% of rated output voltage +0.5 Vrms
	Current mode: < 0.5% of rated output voltage + 2 V, peak to peak or < 0.1% of rated output voltage +0.5 Vrms
Voltage Regulation	Line: < 0.05% ±0.5 V change in output voltage for a 10% change in line voltage
	Load: < 0.05% ±0.5 V change in output voltage for 0 to 100% change in load current
Current Regulation	Line: < 0.5% of rated output current for a 10% change in line voltage
	Load: < 0.5% of rated output current for 0 to 100% change in output voltage
Recovery Time	< 500 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 per °C
Drift	< 0.1% in 8 h after 3 h warmup at constant load, line, and temperature
Efficiency	> 75%
Protection	Over temperature
	Over voltage
	Fan failure
	Current limit
	Series output resistance
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.
Operating Temperature	0 to 40°C (32 to 104°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 (ref. BS EN61010-1)
Altitude	Sea level to 2000 m (6500')
Safety	Meets the requirements of the Low Voltage Directive, 2006/95/EC, by complying with BS EN61010-1 when installed as a component part of compliant equipment and is CE marked accordingly.
Safety Class	Equipment Class 1
Usage	Indoor use only
Installation Category	II (BSEN61010)
Pollution Degree	2 (BSEN61010)
Portability	Non-portable

ELECTRICAL SPECIFICATIONS (CONTINUED)

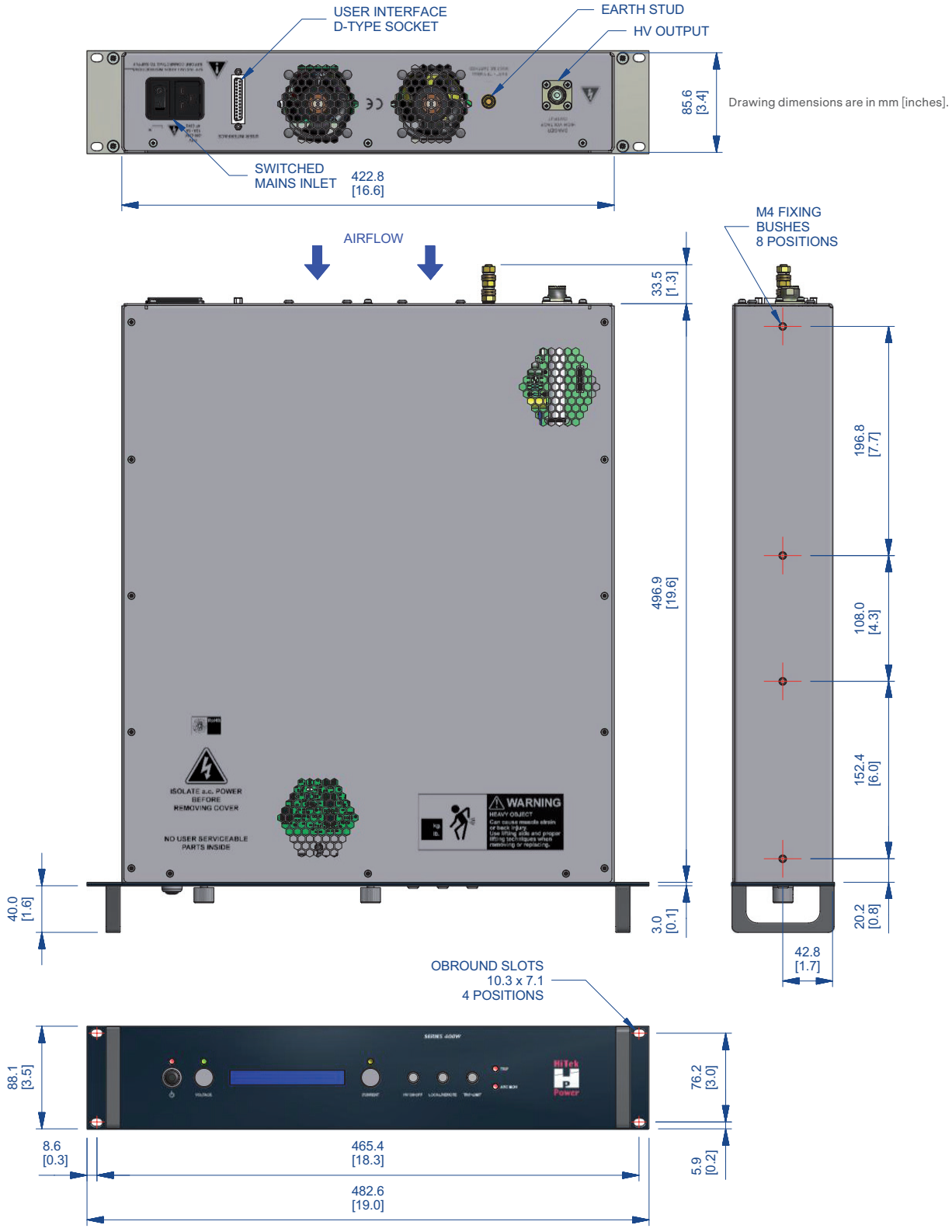
Specifications	
EMC	Intended for installation as a component of a system. Designed to meet:
	EN55022 Class B for conducted and radiated emissions
	EN61000-4-2 ESD: levels ±4 kV contact, ±8 kV air discharge
	EN61000-4-4 Fast transients on mains input: levels ±2 kV
	EN61000-4-5 Surges: levels ±2 kV line 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.
	The EMC performance of the power supply can only be fully assessed when installed within, and as part of, the final system.
RoHS	Meets the requirements of EU Directive 2011/65/EU on the Restriction of use of certain Hazardous Substances in electrical and electronic equipment (RoHS).
Metering	Provided as part of an alphanumeric display. Voltages are displayed with a resolution > 0.5% of rated output. Current is displayed with a resolution > 1.5% of rated output. Voltage and current set values can be displayed by pressing the relevant control potentiometer.
Status Indication	Uses the alphanumeric display to show the reason for any trip condition.
Cooling	Fan assisted with fan fail detection. Air inlets at the rear of the unit, exhaust on the side panels and top cover. Min air flow required is 3 m per sec at the input to the fan.
	For slide mounting a 15 mm gap shall be provided above the unit for air exhaust if the side air vents are blocked.
	For shelf mounting no gap is required above or below the unit provided the side air vents are clear by at least 15 mm.

MECHANICAL SPECIFICATIONS



Drawing dimensions are in mm [inches].

MECHANICAL SPECIFICATIONS (CONTINUED)

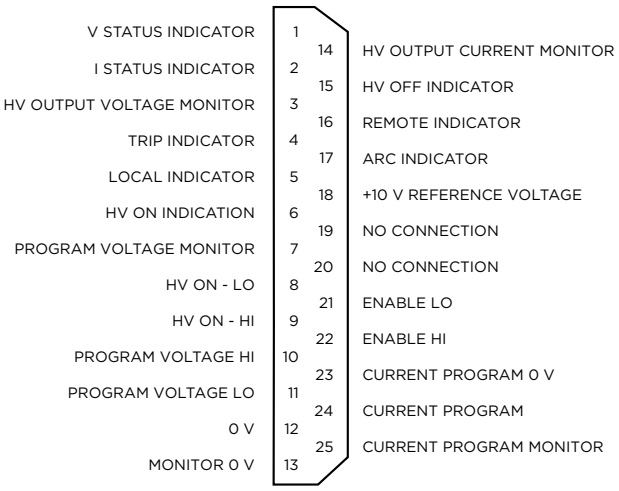


MECHANICAL SPECIFICATIONS (CONTINUED)

Dimensions	See outline drawing
Weight	6.5 kg for units up to 60 kV
	8 kg for the 80 kV unit
Connections	All connections are mounted on the rear panel.
Mains	IEC320-C20 16 A with integrated two pole switch
Safety Earth	M5 stud
HV Output	Proprietary coaxial connector
Front Panel	Stoving enamel trimite full gloss S60/9 color blue RAL5011 as standard

INTERFACE

Remote control 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. The rated current is 10 mA.

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 < 100 Ω and min 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 > 50 kΩ.

ORDERING INFORMATION

Model	Output Voltage	Output Current
OL400W-102*	1 kV	400 mA
OL400W-502*	5 kV	80 mA
OL400W-103*	10 kV	40 mA
OL400W-203*	20 kV	20 mA
OL400W-303*	30 kV	13.3 mA
OL400W-403*	40 kV	10 mA
OL400W-503*	50 kV	8 mA
OL400W-603*	60 kV	6.7 mA
OL400W-803*	80 kV**	5 mA

* Add P for a positive polarity unit or N for a negative polarity unit. e.g.: part number for a 20 kV positive unit: OL400W-203P

** 80 kV unit utilizes an encapsulated HV section and is housed within a 2U chassis.

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

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.

Advanced Energy

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