# 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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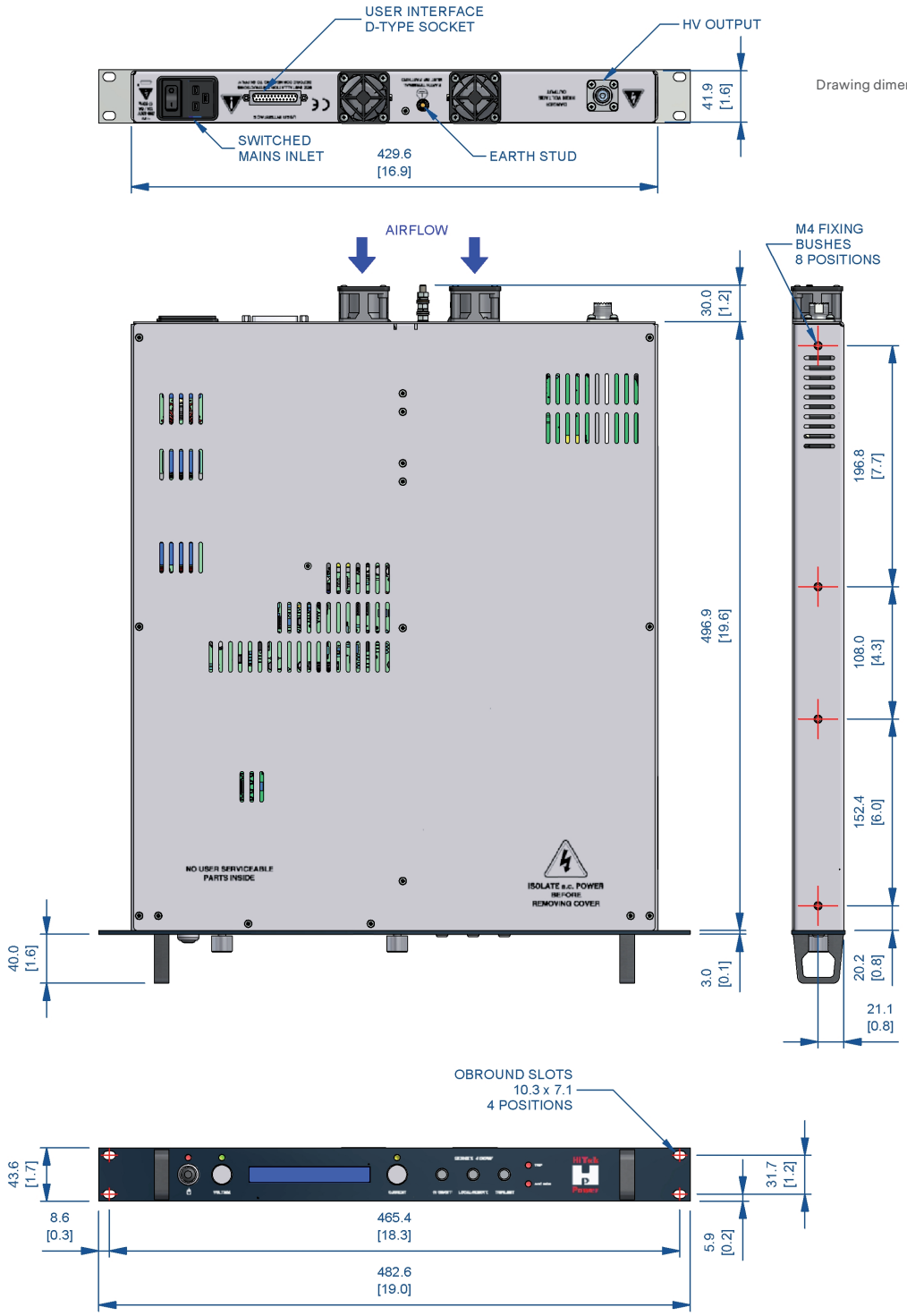
## ELECTRICAL SPECIFICATIONS

| 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)

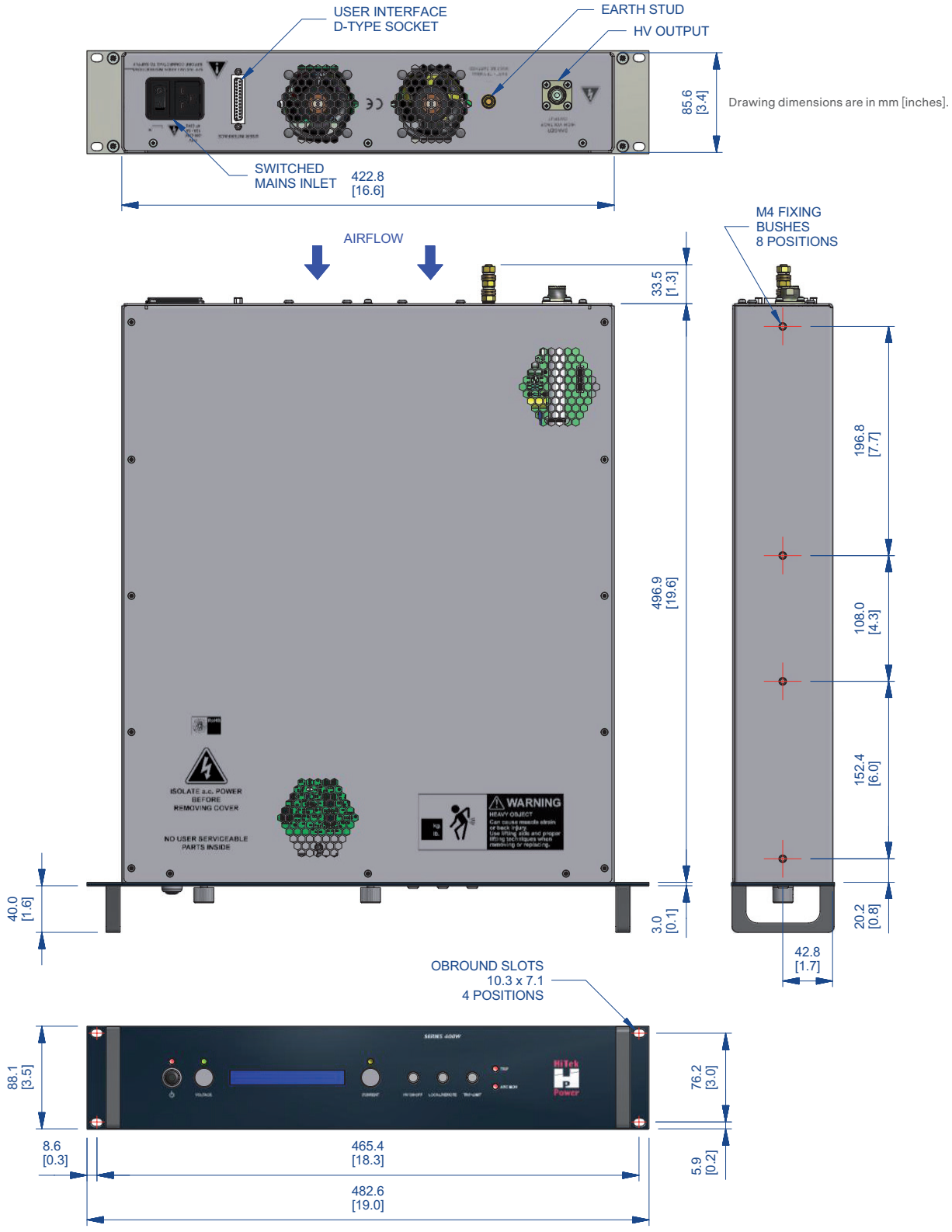
| Specifications | |
|---|---|
| EMC | Intended for installation as a component of a system. Designed to meet: |
| | EN55022 Class B for conducted and radiated emissions |
| | EN61000-4-2 ESD: levels ±4 kV contact, ±8 kV air discharge |
| | EN61000-4-4 Fast transients on mains input: levels ±2 kV |
| | 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)

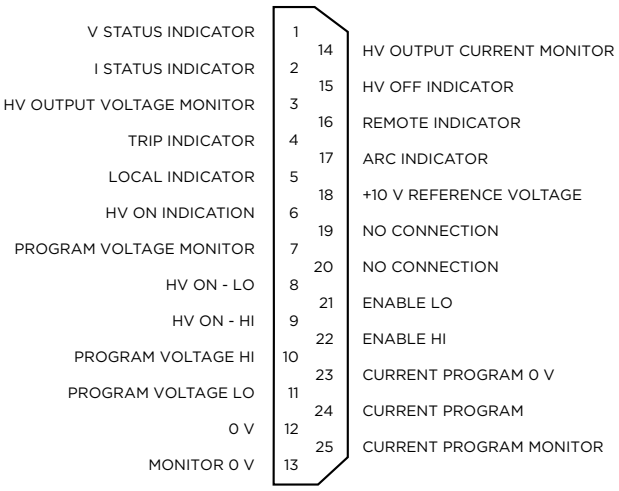


## MECHANICAL SPECIFICATIONS (CONTINUED)

| | |
|---|---|
| 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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