GENERAL DESCRIPTION

The OL400/502/36 has been designed to function in tandem with the OL8000/104/30 power supply, offering a superior ripple and noise performance at output levels below 5kV. In this capacity, both units may be controlled via the OL400 remote control port.

The OL400/502/36 high voltage power supply is a custom derivative of the proven OL400 series, incorporating the latest switch mode technology to achieve a high performance and excellent reliability within a compact and lightweight assembly.

The design utilises high frequency MOSFET switching techniques incorporating low RDS(ON) MOSFETs switched at 50kHz, combined with non-dissipative snubbing to achieve a high power to volume ratio. This results in cooler operation and thus increased reliability.

The OL8000/104/30 power supply described is a custom derivative of the OL8000 range of high voltage products.

It has been designed to offer a continuous output of 100kV at 60mA, with a surge of up to 275mA for no more than 1 second with a high level of stability in the noisy and arduous ion implanter environment.

The power supply comprises two units; a rack mounting power converter unit through which both local and remote controls are facilitated, and a separate HV unit employing a modular disc construction that mounts within the implanter. Two cable assemblies, one for a.c. power drive to the HV unit and one for feedback and monitoring, connect these two units.

OL400/502/36 SPECIFICATION

INPUT VOLTAGE: 187 to 229Vac 50/60Hz single phase
INPUT CURRENT: Less than 6A RMS.
OUTPUT VOLTAGE: 5kV
POLARITY: Positive
CALIBRATION: Calibration between Voltage Demand, Output Voltage and Voltage Monitor +/- 0.5% or 7.5V whichever is greater.
OUTPUT CURRENT: 100mA
LINE REGULATION: Less than 2.5V for 10% line change.
LOAD REGULATION: Less than 2.5V for 0 to 100% change in current.
RECOVERY TIME: 0.5 seconds to within 0.1% of set voltage.
RIPPLE: Less than 5V peak to peak.
OPERATIONAL TEMPERATURE: 0°C to 40°C
STORAGE TEMPERATURE: -40°C to +70°C
OL400/502/36 SPECIFICATION

HUMIDITY: Up to 85% relative humidity non-condensing.
ALTITUDE: Sea level to 2000 metres.
EMC: Designed to satisfy the requirements of EN50081-1 and FCC47 CFR Part 1 and for emissions, and EN50082-1 for immunity.
EFFICIENCY: Greater than 80% at full power.
TEMPERATURE COEFFICIENT < 300ppm/°C (0 to +50°C).

OL8000/104/30 SPECIFICATION

INPUT VOLTAGE 187 to 229Vac 50/60Hz three phase
INPUT CURRENT Not exceeding 30A per phase
OUTPUT VOLTAGE 0 to 100kV DC
POLARITY Positive
CALIBRATION Calibration between Voltage Demand, Output Voltage and Voltage Monitor +/- 0.5% or 100V whichever is greater.
OUTPUT CURRENT 0 to 60mA. For a period not exceeding one second, a maximum peak current of 275mA maybe drawn.
LINE REGULATION Less than 0.05% change in output voltage for +10% change in line voltage at 100kV, increasing to 0.2% at 5kV.
LOAD REGULATION Less than 0.05% change in output voltage for a change in current between 10mA and 60mA at 100kV, increasing to 0.2% at 5kV.
RECOVERY TIME 0.5 seconds to within 0.5% of set voltage.
RIPPLE Less than 100V peak to peak at 100kV. Less than 50V peak to peak at 10kV.
DRIFT (AT CONSTANT TEMPERATURE) Less than 0.05%/8 hours. (After 3 hour warm up time excluding temperature load and line change).
TEMPERATURE CO-EFFICIENT Less than 300 ppm/°C.
OPERATING TEMPERATURE RANGE 0°C to +40°C.
STORAGE TEMPERATURE RANGE -40°C to +70°C.
HUMIDITY 85% maximum relative humidity.
ALTITUDE Sea level to 2000 metres.
REMOTE CONTROLS AND INDICATORS

Via connector "User Interface" on the rear panel of the OL400 unit. See Table 1 overleaf for pin allocation.

HV ON
Connecting together the 'HV ON' high and low commands with a pulse >0.1 seconds, switches on the HV output.

HV OFF
Connecting together the 'HV OFF' high and low commands with a pulse >0.1 seconds, switches off the HV output.

OVERLOAD RESET
Connecting together the 'OVERLOAD RESET' high and low commands with a pulse >0.1 seconds, resets the supply after an overload fault has occurred.

HV ON LAMP
A voltage >10V is present on 'HV ON LAMP (HIGH)' with respect to 'HV ON LAMP (LOW)' when 'HV ON' is enabled.

HV OFF LAMP
A voltage >10V is present on 'HV OFF LAMP (HIGH)' with respect to 'HV OFF LAMP (LOW)' when 'HV ON' is disabled.

OVERLOAD LAMP
A voltage >10V is present on 'OVERLOAD LAMP (HIGH)' with respect to 'OVERLOAD LAMP (LOW)' when the supply has shut down due to an overload.

INTERLOCKS 1 AND 2
Connecting together interlocks 1 and 2 to the interlock return with a pulse >0.1 second enables the HV on and HV off controls.

RANGE SELECT
Connecting together the 'RANGE SELECT' high and low commands, enables control of the OL8000, leaving these two pins unconnected enables control of the OL400.

PROGRAMMING VOLTAGE
A positive voltage on 'PROGRAMMING VOLTAGE HIGH' with respect to 'PROGRAMMING VOLTAGE LOW' will increase or decrease the output voltage between 0 and 100kV in high range, and between 0 and 5kV in low range, where 10V = FSD.

OUTPUT VOLTAGE MONITOR
A voltage signal proportional to HV output voltage. This is scaled such that 10V represents 100kV in high range and 5kV in low range.

OUTPUT CURRENT MONITOR
A voltage signal proportional to output current. This is scaled such that 10V represents 100mA.

NOTE:
The momentary action controls, 'HV ON', 'HV OFF' and OVERLOAD RESET' must not be held in the ON state.