

High voltage power supply required for use in femtosecond laser surgery system

**INDUSTRY**

**Medical Treatments –
Laser Eye Surgery**

SOLUTION

UltraVolt HVA Series

EQUIPMENT

**Laser Surgery
Systems**

CHALLENGE

A leader in innovative eye care was developing a new laser surgery system that would provide a more precise lens cutting method than the excimer laser. Originally, the excimer laser was the state-of-the-art at the height of its usage, but “collateral damage” to other portions of the eye drove a need to develop a more precise method. This drive gave rise to the femtosecond laser.

This new technology required a fast-reversing 6 kV power supply that could sink and source current for the new femtosecond ocular laser surgery system. The power supply must reliably and repeatably control an external Pockels cell placed in series with the system’s CO₂ laser. The laser energy must be tightly controlled, with extremely short bursts of relatively high laser energy being delivered to the patient’s ocular lens during the procedure. Sudden or unexpected downtime of the high voltage power supply, while always undesirable, could be catastrophic were it to occur during one of these procedures.

SOLUTION

Advanced Energy’s UltraVolt® HVA series of precise, fast-switching DC-DC modular high voltage power supplies designed to operate reliably in a demanding medical applications proved to be the ideal solution.

The UltraVolt 6HVA24-P1 served as an excellent choice for this application, which required the powering of the system’s external energy modulator. By working closely with the customer and utilizing Advanced Energy’s expertise in high voltage power supply design, manufacturing, and applications, we were able to successfully satisfy all the requirements.



RESULT

The UltraVolt HVA series enabled the customer to launch their new system (the first of its kind at the time) rapidly and ahead of the competition at a favorable price point. Extremely high reliability, repeatability, and precise control of the proposed solution were key factors in the customer's selection process.

CONCLUSION

Advanced Energy's UltraVolt HVA series of DC-DC amplifiers is designed for applications that require precise control of fixed or fast-changing high voltage outputs. By choosing the UltraVolt HVA series, the customer was able to satisfy their extremely precise control requirement of their laser energy intensity.

Additionally, Advanced Energy's historically high reliability in continuous-use applications and our ability to produce this complex product with low lead-times (even at high volume) enabled rapid development and deployment of the customer's beta systems. Working closely with the customer and utilizing our expert knowledge of high voltage and fast-switching applications, the team was able to satisfy all of the unique requirements needed by the customer. All of these efforts helped bring their device through testing and agency approvals and allowed them become a market leader for femtosecond laser eye surgery.