

The use of high reliability high voltage power supplies in a demanding biological research equipment application

INDUSTRY

Biological research –
Analytical
Instrumentation

SOLUTION

For HV DC/DC:
UltraVolt A Series & for
AC/DC: Artesyn iMP

EQUIPMENT

Flow Cytometry
System

CHALLENGE

The customer was looking for a high voltage power supply biasing the photodiodes for a laser in his genetic-mapping flow cytometry system, where the high voltage power supply will be housed within the laser module. This module used in the flow cytometry system requires very high reliability as well as high stability and low noise/ripple.

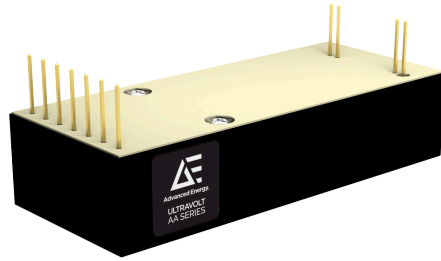
At the same time the end customer also needed an AC/DC source - with multiple DC outputs - to power the high voltage power supply, a thermoelectric module, the logic controller, motors and pumps.

The thermoelectric module (housing the AC/DC power supply) is a very critical component as the fluid being examined must be kept at a specific temperature. Since the customer previously already has had excellent experience with UltraVolt solutions from AE and wanted to minimize vendor risk, they selected UltraVolt for the new systems again so they would benefit from the same performance. By enabling multiple tests with a single-reaction volume their new systems would provide ground-breaking capabilities to the field.



SOLUTION

The multiple solutions presented by AE to the end customer were for the high voltage power supply, the UltraVolt A series and the Artesyn iMP Series was suggested for low voltage power supply.



The UltraVolt A series was an excellent choice for this application due in large part to these attributes

- High reliability the customer experienced on UltraVolt power supplies they have used previously on similar platforms.
- Very low high voltage output ripple and high stability, which increased stability of their instrument.
- Ease of access to our engineering resources when required.
- Quick delivery and historically low lead-times.
- Advanced Energy stayed on top of the customer's project along the path toward deployment, which they found very impressive.



Key features of the iMP series which lead to its inclusion in the end system were

- Full medical approval to EN6061-1 Type B.
- Intelligent I2C control monitoring of voltage, current & temperature.
- Six types of power module – including single, dual & triple output units.
- 25 standard output voltages, from 2 Vdc to 60 Vdc.
- Advanced PMBus™ digital monitoring & control functions.
- Programmable voltage, current limit, and inhibit/enable via I2C.

RESULT

This customer was confident in choosing new models of Advanced Energy's power supplies due to previous satisfactory experience with AEI. This allowed them to eliminate the need to search for an alternate vendor, saving cost and time. The UltraVolt A Series allows the customer to precisely control and monitor high voltage output and current with one of several available analog interfaces which allows it to meet specific application needs with customizable mechanical and electrical performance options. Today's short design-to-manufacture timescales, narrow market windows and whole-life cost reduction goals demand flexibility at all levels, the iMP™ series configurable power supplies are designed specifically to help. All iMP series configurable power supplies are fully digitally programmable. The end customer could configure the power supply to precisely match their application requirements.

CONCLUSION

The COVID-19 pandemic has driven significant changes in the life science industry, with many trends focused on digitalization, speed, efficiency and portability. In this dynamic environment, Advanced Energy has been collaborating with our customers early in the design process and engaging strategic partners to bring products to market quickly.

Today's short design-to-manufacture timescales, narrow market windows and whole-life cost reduction goals demand flexibility at all levels – especially in system power provision. By choosing Advanced Energy, the customer was able to address all these issues and obstacles in one location. Having one power supply partner minimized system integration of the power solutions utilizing AE's lab-based system characterization. Additionally, Advanced Energy's historically low lead-time equated to more rapid development and deployment of beta systems than would not have been possible had they chosen the competition. Their ability to seek engineering assistance very rapidly facilitated a more seamless development path. Advanced Energy's high reliability in the customer's system gave them the confidence they needed to select our product for the sensitive laser portion of the instrument.



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