CoolX-G Power Supplies for Next Generation Biomedical Analyser

INDUSTRY	SOLUTION	EQUIPMENT
Life Science Equipment	CoolX®1800-G option	Biomedical Analyzer

CHALLENGE

A leading Life science OEM required a power supply for their next generation biomedical analyser. The overall system power requirements were:

- 48 V at 700 W (peak 800 W) for motors
- 24V at 250 W for conveyor system
- 12 V at 200 W for system electronics and industrial PC
- 5 V at 7 A micro controllers
- 12 V at 3 A for a system fan.
- always on 5 V/3 A for system standby power and control.
- Requirement to conduct the 4kVAC and 5.6KVDC primary to secondary Hi-Pot isolation test on a complete system and on complete power supply as part of their safety agency approvals, particularly for approval for use in China.

The customer had the requirement to conduct this test on production units as part of their final inspection.

This test is often performed as a “type” test where a power supply is modified purely for the safety agency testing. This usually involves removing the power supply from any metal housing or chassis and removing Y-Caps. This power supply is often quite different in terms of appearance and implementation as to how the power supply will look when installed as part of production equipment. This can create significant delays in completing system compliance testing at safety agencies.

Furthermore, conducting this test on complete power supplies and systems, can often damage them (as it is can be a destructive test). Modifying the system simply for this single production test, and subsequently restoring it to its original set up, is a timely and costly exercise, and particularly onerous in terms of documentation and quality assurance controls.

SOLUTION

The solution proposed by the AE team was the CoolX1800-G option. The solution allows customers and safety agencies to carry out the full 4kVAC and 5.6 kVDC primary to secondary isolation test on complete power supply, exactly as it will be used and installed in their system. No modification or “special” instructions are needed. The CoolX1800 is fully certified to IEC60601-1 safety agency approvals. This high-power density modular solution allowed the customer to combine all power needs into one compact power supply, greatly simplifying system integration.

RESULT

The product AE provided for testing and safety agency approvals is identical to the product which will be used in production. This greatly simplified the customers safety agency approval for all international markets and ensured access to the Chinese market from the immediate launch of their system. The system testing in production could be carried out to the higher isolation level, reducing the need for application related testing, therefore reducing the product time. The CoolX 1800 high power density, combined with 1U compact size allowed the customer to have a single power supply for all systems.

CONCLUSION

Advanced Energy were able to deliver initial samples within one week to the customer. The applications support from Advanced Energy’s locally based expert Field Applications engineering team ensured the customers initial testing and integration was conducted without delay, including introducing the system engineers to the PMBus Digital Communications and control capabilities on the CoolX. During their system development, the customer used the PMBus Digital communications to monitor the power supply parameters under various operating conditions.

By monitoring and logging the output voltage and current, they observed that a particular start sequence of several motors, could draw more current from the 48 V output than was expected. Repeated operation under this mode would have damaged the long-term reliability of the system. This prompted the customer to qualify different motors for longer life. The compact nature of the CoolX and its power rating at low line operation (100 VAC) also ensured that the system could be marketed to its full potential in all markets including Japan.

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