

# Achieving EFT Compliance: A Case Study in Fluid Metering

**INDUSTRY****Fluid Metering****SOLUTION****CNS650-MU****APPLICATION****Peristaltic metering pump****CHALLENGE**

A customer in the fluid metering industry faced a significant challenge when their fixture failed the IEC/EN 61000-4-4 EFT Level 2 – 1 kV test with a competitor's product. The failure was characterized by the pump motor stopping during the test, displaying error codes on the screen, and requiring power cycling to recover normal operation. The internal power supply needed an output of 48 V at approximately 550 W, handling the pump motor's loading pattern and low-temperature operating conditions. The power supply also needed to qualify for EFT (Electrical Fast Transient) without compromising on other parameters such as leakage and EMI (Electromagnetic Interference).

**SOLUTION**

The engineering team at Advanced Energy's (AE) Customer Experience Center (CEC) located in Sharon, MA sprang into action. AE's USA CNS658-MU power supplies were chosen for experimentation with the customer's system. Through multiple iterations of testing and troubleshooting, it was discovered that the floating USB shields on the customer's controller board were the root cause of the EFT failures. After receiving authorization from the customer, the control board was reworked to connect the USB shields to their ground plane.



## RESULT

As a result, the customer's system now passes the IEC/EN 61000-4-4 EFT Level 3 – 2 kV test at both 5 kHz and 100 kHz without requiring additional changes to the power supply. By conducting EMI and EMC pre-compliance testing at the CEC, the customer received a quick and cost-efficient solution. The fast turnaround time of two weeks with passing results also instilled confidence in AE's application support capabilities. The customer is now looking to switch all the power supplies into their wide range of metering pumps.

## CONCLUSION

In conclusion, the EFT failures were not related to the power supply but to the customer's system. Grounding the USB shields improved return path integrity, enhancing EFT and potentially radiated emissions as well. The customer's system now passes the IEC/EN 61000-4-4 EFT Level 3 test at both 5 kHz and 100 kHz, with the USB remaining stable under test conditions and no error codes displayed. The fix was repeatable and passed over multiple test cycles.

The Customer Experience Center (CEC) engineering team at Advanced Energy demonstrated exceptional expertise and dedication in addressing complex challenges within the fluid metering industry. Their work on achieving EFT compliance for a customer's peristaltic metering pump is a testament to their problem-solving capabilities and commitment to delivering high-quality solutions.

Partnering with Advanced Energy offers numerous benefits, including quick, cost-efficient solutions and comprehensive EMI and EMC pre-compliance test capabilities. This collaborative approach strengthens relationships and positions AE as a reliable industry partner.



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