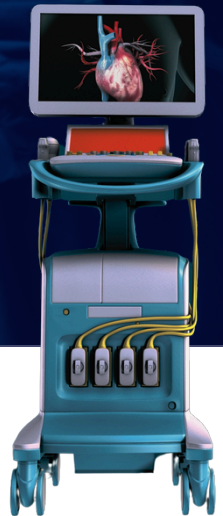


CASE STUDY:

MEDICAL-GRADE ISOLATION TRANSFORMER FOR ENDOSCOPIC EVALUATION AND SURGICAL PROCEDURES



AT A GLANCE *Requirements*

- ✓ Compact, lightweight 600VA isolation transformer.
- ✓ Meet IEC 60601-1 and safety certifications (TUV, cTUV, CE).
- ✓ Leakage current under 100 μ A.
- ✓ Reliable, no overheating.
- ✓ Low EMI and noise for sensitive devices.
- ✓ Support 100V, 120V, 230V, and 240V.

Benefits

- ✓ Ultra-Low Leakage: <100 μ Amp for patient safety.
- ✓ High Reliability: Continuous operation with overload protection.
- ✓ Energy Efficient: 95%+ efficiency, lowers energy costs.
- ✓ Compact: 25–30% smaller, saves space.
- ✓ Noise-Free Power: Advanced EMI shielding.
- ✓ Multi-Voltage: Works with 100V, 120V, 230V, 240V.
- ✓ Thermal Protection: Built-in cooling to prevent overheating.
- ✓ Surge Protection: Shields against power surges.
- ✓ Certified: Meets IEC 60601-1, TUV, cTUV, CE, CB.



OVERVIEW

Astrodyne TDI (ATDI) has partnered with a top-tier medical device manufacturer to enhance the safety and reliability of medical devices, specifically in the area of gastrointestinal endoscopic evaluations and surgical procedures. In the medical field, power supply safety is of paramount importance. Medical-grade isolation transformers play a crucial role by providing electrical isolation between medical devices and the power grid, ensuring both patient safety and optimal device performance.

POWER CHALLENGES

The goal was to design a compact, lightweight isolation transformer capable of delivering 600 VA of power while meeting strict regulatory and safety standards. Key challenges included ensuring the transformer's size and weight were suitable for space-constrained medical equipment, complying with rigorous standards like IEC60601-1, and obtaining certifications such as TUV, cTUV, and CE Mark. It also had to minimize leakage current to below 100 μ A to prevent electrical hazards, ensure reliable continuous operation without overheating, and reduce electromagnetic interference (EMI) and noise for sensitive medical devices. Additionally, the transformer needed to support multiple voltage levels (100V, 120V, 230V, 240V) to accommodate diverse medical settings.

ASTRODYNE TDI'S SOLUTION

The Isolation Station Transformer was designed to meet strict medical standards with features like reinforced insulation, shielding, and leakage current reduction to under 100 μ A. It ensures reliable, continuous operation with minimal heat, thanks to a high-quality core, overload protection, and thermal management. Its compact, toroidal core design reduces size by up to 30%, making it ideal for space-limited environments. The transformer also supports multiple voltages (100V, 120V, 230V, 240V) for international use, while offering over 95% efficiency and minimizing electromagnetic interference to provide stable, clean power.