

Applications and Advantages of Medical Power Supplies: A Comprehensive Guide



With technological advancements and the continuous development of medical equipment, many precise surgical procedures can now be monitored in real-time through AI and instrumental devices. This ensures normal operation, avoids unnecessary negative impacts on patients undergoing treatment, and achieves the expected therapeutic effects.

These devices require stable and reliable power supply, making the importance of medical power supplies evident in the healthcare industry. This article will introduce the applications and trends of medical power supplies, guiding readers to deeply understand the differences and advantages of various products.

What is a Medical Power Supply?

A medical power supply is a power device specifically designed for medical equipment. As medical devices must meet the strictest safety and performance standards to ensure stable power supply under various conditions, avoiding equipment shutdowns or data loss due to power failures. Medical power supplies are typically used in various medical devices such as surgical equipment, diagnostic instruments, and monitoring devices, providing stable and reliable power support.

Differences Between Medical Power Supplies and General Power Supplies

Compared to general power supplies, medical power supplies must meet higher safety and reliability standards. Medical power supplies need to comply with medical equipment standards, such as IEC 60601-1, which strictly regulates the electromagnetic compatibility (EMC) of medical power supplies. Since most medical equipment is used in combination through various serial connections, effective filtering technology and reliable power supply materials can reduce electromagnetic interference (EMI). When searching for "Medical power supply" on foreign websites, we find that overseas manufacturers require even stricter power protection measures, such as overvoltage protection, overcurrent protection, and short-circuit protection, to ensure safe operation under any circumstances and avoid harm to patients and equipment. Therefore, only manufacturers that can meet various safety inspections and have long-term expertise in advanced power supply technology can enter the medical application field.

Four Major Advantages of Medical Power Supplies

High Reliability

Medical power supplies focus on high reliability in design, ensuring stable power supply under any circumstances. Medical power supplies need to ensure high yield and stability during manufacturing, reducing the risk of equipment shutdown or data loss due to power failures.

Even in the rare event of a power failure, there should be corresponding measures in place. Medical equipment such as surgical robots and monitoring devices require stable power sources to ensure continuous operation and avoid potential harm to patients.

Electromagnetic Compatibility

Medical equipment is often used alongside other electronic devices, so medical power supplies must have good electromagnetic compatibility to reduce electromagnetic interference (EMI). This not only protects the normal operation of the medical equipment itself but also prevents malfunctions in surrounding devices due to electromagnetic interference.

High-quality medical power supplies can effectively isolate electromagnetic noise interference, ensuring the stability of multi-device collaborative work.

High Efficiency

While providing stable power, medical power supplies also feature high efficiency, reducing energy loss and lowering operating costs. As medical institutions need to maintain power equipment operation around the clock, high-efficiency power supplies can improve overall operational efficiency and reduce cost pressures due to energy waste.

Safety

Safety is a core consideration in the design of medical power supplies. These supplies are equipped with various protective functions, including overvoltage protection, overcurrent protection, and short-circuit protection, to prevent accidents. These features ensure that medical equipment can operate safely even under extreme conditions, protecting the safety of patients and medical personnel.

Applications of Medical Power Supplies



Da Vinci Robotic System

The Da Vinci Robotic system requires stable and reliable power supply to ensure precise operation of the robot during surgery, reducing surgical risks and improving the success rate of surgeries and patient recovery speed. FSP's FSP260M-P35-B24 is designed for medical robotic arm systems with high power output, adopting an open architecture, 3x5 inch PCB packaging, 24V output voltage, maximum output power of 260W, and passing EMC medical standard certification and other medical certifications.



Medical Bed

Modern medical beds are often equipped with electric adjustment functions, such as height adjustment, back and leg support adjustments. These functions require stable power supply to ensure patient comfort and ease of operation for nursing staff. FSP has developed the [FSP500M-K47-24B](#) power supply for electric beds, complying with IEC 60601-1 certification, with a packaging size of 4x7x1.7 inches, output voltages of 24V and +5V standby power, and maximum output power of 30CFM, 500W with forced air cooling or 400W with convection cooling. The device is built on a printed circuit board with U-shaped brackets or in an enclosed form for mechanical support and heat dissipation.



CT Scanner

CT scanners require high-performance power supplies to provide stable voltage and current, ensuring that the equipment is not affected by power fluctuations during high-precision image scanning, providing accurate diagnostic results. FSP's medical power supply product [FSP700M-70PB](#) complies with an input range of 90-264 VAC, equipped with overvoltage/overcurrent/short-circuit protection. This product is a PS2-sized PC power supply measuring 165×150×86mm, with a maximum output power of 700W and 80 PLUS Gold-certified.



MRI (Magnetic Resonance Imaging)

MRI equipment has very high power requirements, needing strong magnetic fields and stable power supply to ensure imaging quality and patient safety, and to avoid equipment failures due to power instability. FSP's medical power supply product [FSP900M-60PJ](#) is a medical ATX power supply, providing a standard 1U form factor of 240 x 100 x 41 mm, with a total power capacity of up to 900 watts. The product complies with EN55011 Class B emission limits, suitable for imaging equipment such as CT, ultrasound, X-ray display, and endoscopy.



Respirator

Respirators are one of the most important pieces of equipment for maintaining patients' lives, especially in intensive care units and operating rooms. Stable power supplies ensure that respirators can maintain stable operation and ensure respirator safety, preventing dangers caused by power interruptions. FSP's medical power supply product [FSP060M-DAC3](#) provides a 90-264 VAC voltage range, complies with DOE energy efficiency Level VI, and has a power consumption of $\leq 0.21\text{W}$. The product uses an IEC 320/C8 AC inlet, with an output voltage of 24V and a maximum output power of 60W.

Conclusion

Medical power supplies play a crucial role in the modern healthcare industry. Medical equipment has extremely high demands for power stability and safety, and medical power supplies are designed to meet these needs. By providing power support with high reliability, electromagnetic compatibility, high efficiency, and safety, medical power supplies ensure the stable operation of various medical equipment.

FSP will provide you with the most professional services and solutions, and offer the most comprehensive product line for customers to choose from!

FSP Medical Power Supplies



FSP500M-K47

- Certified Medical Safety IEC 60601-1
- Input Voltage Range 90-264 VAC
- Low Leakage Current
- Operating Altitude 5,000M
- Over Voltage/ Over Current/ Short Circuit/ Over Temperature Protections
- Compliant with RoHS requirement

FSP700M-70PB



- Certified Medical Safety IEC 60601-1
- Full Range Input 90-264 VAC
- Active PFC Circuit
- Meet 80 PLUS Gold efficiency
- Over Voltage/ Over Current/ Short Circuit Protections

FSP900M-60PJ



- 900W output power
- 1U size with 240 x 100 x 41 mm
- IEC 60601-1 & IEC 62368-1 Certified
- Intel ATX12V V3.0 compliance
- Meet 80 Plus Gold efficiency
- Meet EN55011 Class B
- BF class isolation
- High altitude 5000M operation

FSP060M-DAC3



- Certified Medical Safety IEC 60601-1
- Input Voltage Range 90-264 VAC
- DOE Energy Efficiency Level VI
- No Load Power Consumption $\leq 0.21W$
- Operating Altitude 5,000M