

MORNSUN Medical Power Supplies Ensure System Reliability of IVDs Equipment

In vitro diagnostics (IVDs) are medical devices that use biological samples, such as blood or tissue to test for diseases, conditions, and infections. IVDs range from simple glucose meters for diabetics to sophisticated devices such as those used in clinical labs for complex diagnostics.

Over the past few years the IVD market has been driven by the growing number of people with chronic and infectious diseases, the continuous development of IVD test technology and the increasing awareness of personalized medicine. In vitro diagnostics has become one of the most dynamic and fastest-growing segments of the healthcare market. According to a recent market study, the global market for in vitro diagnostic devices is expected to reach \$144.7 billion by 2027.

Fig.1 IVDs global market is expected to reach \$144.7 billion by 2027



The internal detection system of in vitro diagnostic instruments is very complex. It includes a variety of subsystems such as sample flow control subsystems, detection subsystems, signal processing subsystems, power supply subsystems, and so on. Therefore, the internal electromagnetic environment of IVDs is very complex. The power supply subsystems, as the basic system for reliable operation of other subsystems in IVDs, has high-reliability requirements. The power converter is the heart of the power supply subsystem and its reliability and stability are critical.

What technologies and designs are used in MORNSUN's medical power supplies to ensure high reliability? Let's have a look!

MORNSUN medical power supplies are designed to guarantee system reliability

1. Semi-digital control solution

The advantages of using a semi-digital control solution are as follows:

1) Fewer peripheral components reduce the risk of device failure and the number of hidden problems, the product can be made thinner and smaller. The production process is also simpler and more reliable.

2) Stronger start-up capability. Under the precise control of the digital chip, the entire process, from pre-start circuit state detection, PFC circuit start-up, LLC circuit start-up, to final entry into a stable working state, operates in order, greatly improving low-temperature start-up capability and power supply safety.

Semi-digital master control Chip Better low-temperature starting and safety power supply

Fig.2 The advantages of using a semi-digital control solution



Semi-digital master control Chip

With fewer peripherals, products are more reliable.

Higher control accuracy and less product variation.

Better low-temperature starting and safety power supply.

2. Patented transformers with innovative design

The benefits of using patented transformers with innovative designs are as follows:

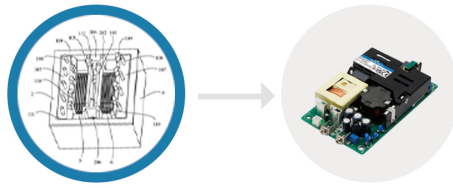
The innovative design of the transformer bobbin resulted in a smaller product size. At the same time, the transformer is manufactured in an automated process, providing greater reliability and consistency.

3. No-flying-wire design

The power supply meets medical approvals (including safety distance). It also adopts a no-flying-wire design for improved aesthetics and reliability.

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Fig.3 The benefits of using patented transformers with innovative designs



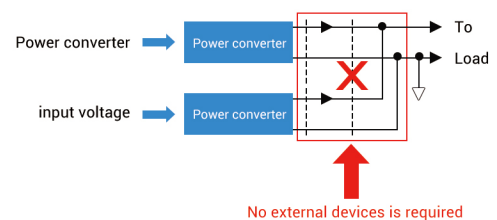
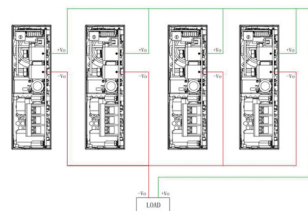
Innovative design of the transformer

- Smaller size, easier and more reliable production
- Safety distance meets medical standards
- No flying wire design, more reliable and beautiful

4. Can be used in 3+1 parallel redundancy system with current sharing

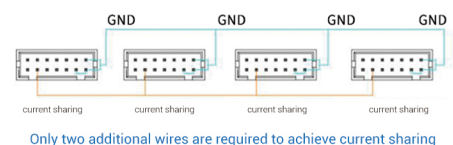
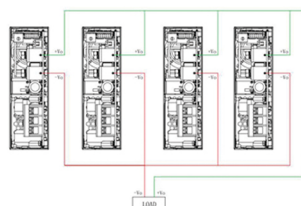
MORNSUN medical power supplies are available for 3+1 parallel redundancy applications when the system needs to be designed for redundancy to improve reliability: The failure of any one power supply in parallel does not affect the work of the others. The product uses an internal ORing circuit, only their output lines need to be connected in parallel, and no external device is required.

Fig.4 Only needs to connect output lines in parallel to achieve 3+1 parallel redundancy applications



1) MORNSUN medical power supply can be applied in parallel to increase high power and realize current sharing. When the power supplies are connected in parallel, there is an active current sharing circuit inside to ensure that the current between each module is balanced. This ensures safe and reliable operation. And only two additional wires are required to achieve current sharing, in addition to the parallel connection of the output wires.

Fig.5 Only two additional wires are required to achieve current sharing



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5. Additional: fast delivery guaranteed

MORNSUN has a complete supply chain and strong production capacity to ensure on-time delivery to our customers as always. We will continue to work hard to provide better quality products and services to our customers.

Fig.6 Fast delivery guaranteed



Ensure on-time delivery

- Stock up on raw materials in advance
- Complete supply chain
- Strong production capacity

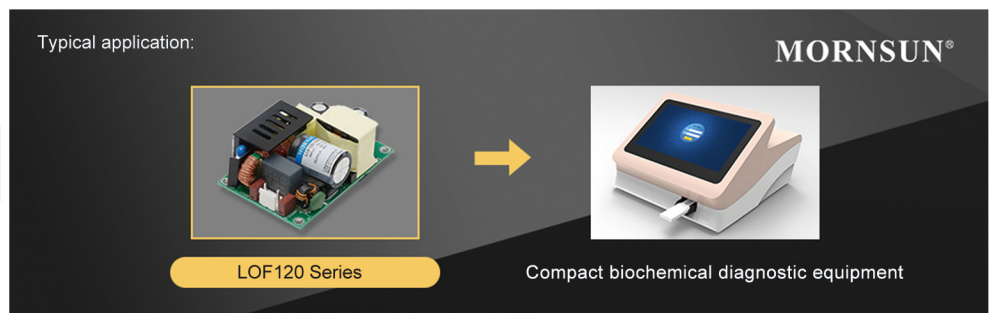
Solutions for in vitro diagnostic equipment

Although in vitro diagnostic equipment is usually not as stringent as therapeutic equipment in terms of safety certification. However, it has a variety of load types. These include inductive loads such as motors and valves, and dynamic loads such as heating and cooling. There are relatively high requirements for product stability and shock resistance.

1) Compact biochemical diagnostic equipment

The LOF120 series is recommended for compact biochemical diagnostic equipment with limited size. LOF120 series features a small size and ultra-low leakage current, meets the requirements of medical standards and complies with 2 MOPP.

Fig.7 Typical application of LOF120 series: Compact biochemical diagnostic equipment



2) Large-scale PCR machine

In large-scale PCR systems, the sample volume is large, as is the amount of data processing. It also has various loads, such as heating and cooling equipment and a large number of motors. The LMF1000 series is recommended as the primary power source and can provide 1000W of power. Other sensitive parts with low power consumption can be isolated using a wide input DC/DC converter URB series, which reduces interference and also improves voltage stability.

Fig.8 Typical application of LMF1000 series: Large-scale PCR machine



For the large amount of interference generated by inductive loads such as motors, causing the system's EMI to fail to meet the requirements of medical standards, you can use MORNSUN's FC-L06W filter for filtering processing. It can effectively deal with system-level EMI problems and also address the problem of irrational wiring.

Summary

As a professional power supply manufacturer, MORNSUN is committed to keeping pace with the development of the medical equipment industry. After years of continuous efforts and excellence, MORNSUN has become one of the industry leaders in providing 1-1500W stable performance and high reliability medical power supplies. As a loyal partner to customers, MORNSUN will continue to innovate and provide customers with even better medical power modules and services.