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Applications of High-Reliability Industrial DIN Rail Power Supplies — XDR Series

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With the rapid development of industrial automation, smart manufacturing, and new energy systems, the requirements for power supply stability and reliability in control systems have significantly increased. As a critical component inside control cabinets, DIN rail power supplies not only affect the operation of individual devices but also directly impact the stability of the entire system.

In practical applications, DIN rail power supplies are often required to operate continuously under harsh conditions such as:

- Wide temperature ranges (cold start at low temperatures and full-load operation at high temperatures)
- High humidity and polluted environments (e.g., condensation or dust)
- High inrush currents caused by inductive loads
- Derating conditions at high altitudes
- Long-term continuous operation (24/7 reliability requirements)

In addition, with the digitalization and intelligence of industrial systems, power supplies are evolving from “passive power components” into “monitorable and manageable system elements,” requiring communication capabilities for remote monitoring, predictive maintenance, and system integration.

Therefore, modern DIN rail power supply design must meet the following technical requirements:

- Environmental adaptability
- Transient load response capability
- System-level protection and redundancy design
- Communication and monitoring capabilities

To address the above industrial requirements, MEAN WELL has introduced the high-end XDR series DIN rail power supplies, optimized for environmental adaptability, load response, and system integration. Key features include:

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1. Wide Temperature Range & Environmental Adaptability

The XDR series operates within a temperature range of -40°C to +85°C, making it suitable for both high-temperature enclosed control cabinets and low-temperature outdoor environments.

The circuit boards are treated with moisture-resistant coating, ensuring stable operation in high-humidity environments or applications such as semiconductor processing equipment.

The design complies with OVC III overvoltage category and supports stable operation at altitudes up to 5,000 meters.

2. Peak Power & Inrush Current Capability

To handle high transient loads commonly found in industrial equipment, the XDR series supports:

- 200% peak power capability
- 600% inrush current capability

With optimized control architecture and power component design, the power supply can respond rapidly to load changes, reducing the risk of startup failure or controller reset.

3. Intelligent Communication & Remote Monitoring

As industrial systems become increasingly digitalized, power supplies are now integral to system monitoring.

Models rated 240W and above in the XDR series feature built-in MODBus communication, enabling real-time monitoring of voltage, current, temperature, and other operating parameters, as well as remote data acquisition and fault alerts.

Additionally, the entire series supports Remote ON/OFF control, facilitating automated system management.

4. Built-in Oring-FET Protection

The XDR series includes an integrated Oring-FET circuit, enabling automatic isolation between power supplies.

If one unit fails, reverse current is blocked, preventing impact on other modules in the system.

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5. Long-Term Reliability Assurance

The XDR series comes with a 5-year warranty, offering a longer service assurance period compared to entry-level DIN rail power supplies, helping reduce maintenance costs and total lifecycle costs.

Peak Function Application Notes

In industrial systems, motors or inductive loads often generate large inrush currents during startup. If the power supply cannot withstand these surges, system startup may fail.

The XDR series supports 200% peak power and 600% peak current, allowing millisecond-level response to load changes, improving startup success rate and overall system stability.

When designing systems, the following factors should be considered:

- Duration of peak current
- Frequency of peak events
- Staggered startup design for multiple loads
- Selection of upstream circuit breakers

Proper system design ensures optimal use of peak capabilities while avoiding unintended protection triggering.

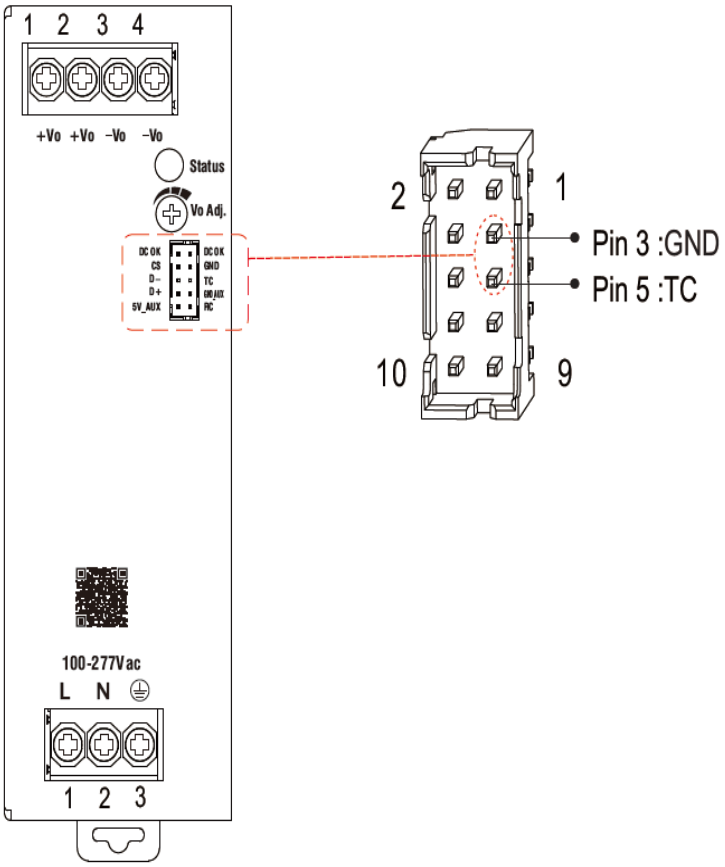
Usage Notes

The XDR series enables peak power and inrush current functions by default. When operating in parallel mode or constant current mode (such as battery charging applications), ensure that the TC PIN and GND PIN are disconnected to disable the peak function.

Otherwise, OLP (Overload Protection) may be triggered, causing the power supply output to shut down.

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In industrial automation systems, DIN rail power supplies not only provide power but also play a critical role in system stability and reliability.

For complex industrial environments and high transient load demands, power supplies with wide temperature design, peak load capability, redundant power architecture, and intelligent communication functions can significantly enhance system performance.

The MEAN WELL XDR series is specifically optimized for industrial environments and provides reliable power solutions for new energy equipment, semiconductor machinery, and industrial automation systems.

For related products and application needs, please contact MEAN WELL distributors or technical personnel. You are also welcome to follow MEAN WELL's online exhibition hall for more product information and solution courses.

