

Low-noise UPS power supply systems for IDC Internet Data Center server rooms



Overview

In the low-voltage world, ABB provides a wide range of single- and three-phase UPSs that suit every need.

Key Takeaways

Low-noise UPS systems for data centers combine online double-conversion technology, modular design, and high efficiency to provide uninterrupted, clean power while minimizing acoustic impact. Key Features for Low-Noise Data Center UPS



1. **Online Double-Conversion Technology** For mission-critical server rooms, online double-conversion UPS systems are preferred because they continuously convert incoming AC to DC and back to AC, ensuring zero switchover time and clean, stable power for sensitive IT equipment (Delta Amplon RT, Tescom TEOS+ 300) . This technology also helps reduce electrical noise and harmonics, which can indirectly reduce audible noise from connected equipment.

2. **Modular and Scalable Design** Modular UPS systems allow flexible deployment and maintenance without downtime. Units like Eaton's modular UPS and Tescom MTW1000 offer hot-swappable modules, enabling capacity scaling from 100 kVA to over 1 MW while maintaining low operational noise . Parallel configurations (N+1 or 2N redundancy) ensure reliability and allow individual modules to operate at lower load, which reduces fan speed and noise levels.

3. **High Efficiency and Intelligent Cooling** High-efficiency UPS systems reduce heat generation, which in turn lowers the need for aggressive cooling and fan operation, contributing to quieter operation. Features like intelligent sleep mode, smart charge management, and high input power factor (Tescom MTW1000) optimize energy use and minimize acoustic output .

4. **Compact, Rack-Mountable Options** For server rooms with space constraints, rack-type UPS units (Delta Amplon RT 5-20 kVA, Tescom TEOS+ 300) provide high power density in a 2U or 3U form factor. Smaller enclosures reduce fan noise and allow placement closer to server racks without excessive acoustic impact .

5. **Battery Technology** Lithium-ion battery cabinets, as offered in Delta RT series, allow hot-swappable battery replacement and lower cooling requirements compared to traditional VRLA batteries, further reducing noise . DC-UPS units with integrated monitoring (CBI60W/CBI600W) also support low-noise operation in micro-module data centers .

Recommendations

- Delta Amplon RT Series (5-20 kVA): Online double-conversion, compact 2U form factor, lithium-ion battery support, parallelable for redundancy, low acoustic footprint .
- Tescom MTW1000 Modular UPS: 3-level DSP technology, low THD, high input power factor, hot-swappable modules, intelligent sleep function for noise reduction .
- Eaton Modular Data Center UPS: Flexible deployment, scalable capacity, high efficiency, and quiet operation suitable for sensitive server environments .
- DirectIndustry Multi Power/Protect Plus M600: Modular, high-efficiency, compact footprint, suitable for small to medium server rooms with low-noise requirements .

Conclusion

For IDC server rooms, low-noise UPS systems should combine online double-conversion, modular scalability, high efficiency, and intelligent cooling. Rack-mountable or compact modular designs with lithium-ion batteries are particularly effective in minimizing acoustic impact while ensuring uninterrupted, clean power for high-density server environments. Choosing systems with parallel operation and N+1 redundancy further enhances reliability without increasing noise levels.

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