High-efficiency UPS system with low-temperature resistance for subway applications

Article Overview

The Wohrle WP2-R and SmartOnline SV Series UPS systems offer high efficiency, modularity, and reliable operation in low-temperature environments, making them suitable for subway applications.

Key Features for Subway Applications

1. High Efficiency: Modern UPS systems like the Wohrle WP2-R achieve 97.6% efficiency in online double conversion mode and 99.4% in ECO mode, reducing energy losses and heat generation, which is critical in confined subway environments with limited cooling capacity (Wohrle SVS) . High efficiency also lowers operational costs and extends the lifespan of components. 2. Low-Temperature Operation: UPS systems designed for low-temperature environments, such as the SmartOnline SV Series, include features like heaters and low-speed fans to maintain stable operation even in cold conditions, ensuring reliable startup and continuous power delivery (GlobalSpec) . The Wohrle WP2-R supports a wide operating temperature range from 0 to +40?C, suitable for subway tunnels and stations . 3. Modularity and Scalability: Both Wohrle and SmartOnline SV Series UPS systems offer modular designs, allowing operators to scale capacity according to load requirements. This avoids oversizing, reduces energy consumption, and enables flexible deployment in subway infrastructure with varying power demands . 4. Battery Technology: The WP2-R pairs with lithium iron phosphate (LiFePO4) batteries, which provide long service life (10-15 years), high safety, and stable performance under temperature fluctuations. LiFePO4 batteries are more resistant to thermal stress compared to traditional NMC or lead-acid batteries, making them ideal for subway applications . 5. Reliability and Redundancy: These UPS systems integrate redundancy at multiple levels, ensuring uninterrupted power even if a battery string or module fails. Active monitoring of individual cell voltages, temperature, and current enhances operational safety and minimizes downtime . 6. Compact Footprint and Cooling Efficiency: High power density and flat efficiency curves reduce heat generation, allowing for smaller cooling systems and compact installation in subway control rooms or equipment cabinets . Low-speed fans and optimized airflow maintain stable operation without excessive noise or vibration.

Recommended Systems

o Wohrle WP2-R Modular UPS: High efficiency, LiFePO4 battery integration, wide temperature range, modular scalability, long service life, and low energy losses .
o SmartOnline SV Series (60-120 kVA): 3-phase, online double-conversion UPS with low-temperature support, modular design, and high operational reliability .
o ABB Modular UPS Solutions: Offer decentralized parallel architecture, high availability, and flexibility for industrial and transport applications, including subways .

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Conclusion

For subway applications requiring high-efficiency, low-temperature UPS systems, the Wohrle WP2-R and SmartOnline SV Series are excellent choices. They combine energy efficiency, modularity, low-temperature resilience, and reliable battery technology, ensuring uninterrupted power in challenging underground environments while minimizing operational costs and maintenance requirements.

The Asia-Pacific region dominates the Urban Rail Transit UPS Market, driven by massive infrastructure investments

Extreme Temperature Network UPS system is specially designed for applications in very low or high

Power solutions designed for extreme temperatures Unlike indoor network environments, the temperature in outdoor and remote

An experimental investigation was conducted using a 600 kW SOCOMEC UPS to identify the thermal behaviour of the

INTRODUCTION The circulation of UPS systems generally originates from an increasing dependence on electricity and the need to

This transformer-based IUPS incorporates the latest designs and operates at high efficiency while providing galvanic isolation. For

We offer complete system-level solutions and high-quality products for diverse UPS applications. Equipped with our semiconductors,

This paper proposes a novel energy management strategy (EMS) of an onboard supercapacitor (SC) for subway

This white paper explores the internal design of UPS systems, examining the sub-circuits and component technologies that enable

R. STAHL"s modular UPS systems are designed specifically for critical operations in challenging and hazardous environments. Our

VertivTM UPS have introduced new ways of efficiency improvement to the market which have proven to be

the premium UPS

Supercaps can absorb and release energy quickly compared to conventional batteries and have a longer life and more

01 ABB UPS systems pro-vide power protection solutions and low-volt-age backup power for crucial rail applications, such as

Uninterruptible power supplies (UPS) are widely used to provide quality and reliable power for critical loads. In recent

A cooling system of air-conditioning terminal surface cooler in series, i.e. large temperature difference series cooling system, is

Data center uninterruptible power supply (UPS) systems are evolving. New technologies are enabling various

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