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Energy Management with Modular Battery Storage Systems

Battery storage systems stabilize the power supply, providing almost lossless storage of renewable energy.

Challenge

Sufficient and appropriate capacities for power generation and distribution must be available in order to secure the energy supply around the clock. The grid infrastructure must therefore be adjusted on all voltage levels in order to integrate the growing proportion of renewable energy sources into the energy system: in its current state the network is insufficiently designed for the large transfers of power involved and for feedback from the distribution network into the transmission grid.

With local storage systems featuring lithium-ion technology and dynamic algorithms implemented in a battery management system, it is possible to accommodate peak demands in real time. Nearly lossless buffering of renewable energies and high-grade demand-oriented energy supply prevent inefficient locking out of green electricity. The battery storage system closes the gaps between “generation – distribution – consumption” and enhances reliability of supply.

Solution

Several high-voltage batteries from the automotive sector are used. These are interconnected in parallel groups. The so-called traction batteries in their packs are integrated into a battery storage tank. A long-term agreement has been concluded with a major automobile supplier in order to ensure a reliable supply of batteries from electric vehicles.

Battery voltages range between 250 V and 800 V DC depending on the types of batteries used. The desired capacity of, say, 2 MW can be made available to balance out power deficits on the grid for a defined period of time – from a few minutes to several hours. This power is previously stored in the battery at times of excess power generation and electricity supply.

Despite volatile energy sources, the high availability of stored energy creates security of supply in cities, buildings, infrastructure and industry.

Battery storage system in a 40’ container

Power electronics switchboard

Customer benefits

- Safe and reliable energy supply for your city, building, infrastructure and industrial processes
- A modular, expandable container- or building-based concept
- Forward-looking technology, suitable for further technical development
- A turnkey solution from an experienced partner

Your performance
is **our** everyday **commitment**

Experience and expertise

Our decades of experience with electronic and mechanical components and their control in the most challenging of safety-related environments facilitate safe operation of the storage system in the public domain.

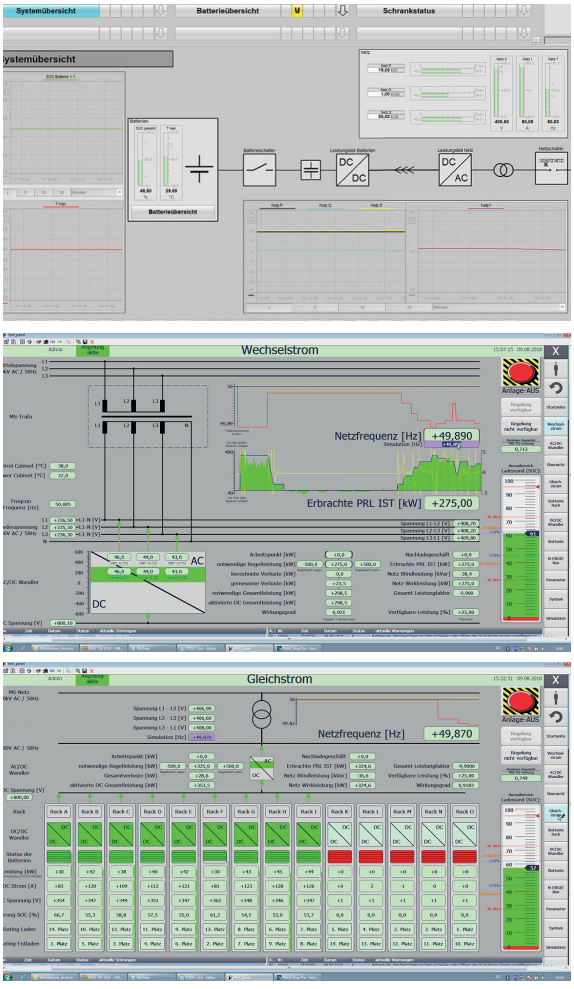
We offer:

- Analysis, planning, engineering, manufacture, installation and servicing
- Demand-oriented configurable power and capacity ranges for a wide scope of application
- Safety systems from energy and power plant technology paired with reliable high-performance cells from the automotive sector
- Modern power electronics and proven, versatile and replaceable lithium-ion batteries
- 60 years of technical expertise in the energy sector.

Control cabinet

Technical information

- Each battery module is connected to a separate terminal of a DC/DC converter and can consequently be run independently from the others. The power loss can therefore be reduced to a minimum.
- The DC/DC converters and the inverters are bidirectional. Five inverters are used, each with a capacity of 550 kW. This configuration meets the n+1 criterion thus ensuring high reliability and low failure probability of the system as a whole.



User interface for battery storage system controls

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