Lithium-Battery Pack with Active Battery Management System (BMS)

The special designed **LITHIUM-BATTERY PACK** and with an in-house developed intelligent BMS (Battery Management Systems) system. The system can handle a minimum storage capacity of 20 Kw and a maximum of 500 MW/unit. It is an intelligent, unique control system that helps to charge the batteries with saving battery life ("peak" method) the result is an extremely long lifetime (min. 30 years) It can tolerate the extreme high temperature and big temperature differences very well (from -40 to +80 Celsius) thus adaptable to every geographical need.

The system operates fully automatically, the operation of the system can be continuously checked by smart devices. The system is suitable for both on-grid and off-grid applications. It is possible to install it in various sizes of containers and in buildings as well.

ADVANTAGES:

- Efficient and safe
- Low investment cost
- The system doesn't require constant human maintenance
- It can be transported anytime, installed anywhere and rented or leased
- Has no negative impact on the ecosystem
- Adaptable directly for green energy storage (wind, sun, water, steam)
- It is able to charge from direct current
- Small size and high performance
- Can be adapted for individual needs
- Can store high volume of energy from power plants (water, steam, gas)

APPLICATION AREAS:

- The system is a perfect solution for disaster areas, condominiums, eco-houses, electric charging stations, schools and small communities since it is able to provide electricity as an uninterruptible power supply.
- Its small size and compactness makes it also great for electric vehicle charging stations alongside the highways and already existing gas stations.

CONTAINER SPECIFICATIONS:

Configuration: 20 feet standard maritime container equipped with Robust air-conditioning, Fire protection, Safety and Security systems.

Storage: 652.800 Wh: 204 pieces of WB 1000 AHCLYP cells with intelligent BMS for each cell.

Cycle and lifetime: up to 10.000 cycles, up to 25 years az 0.3 charge and 0.5 discharge current (1 cycle/day)

Bi-dierctional converter: 320 kVA

Weight: 13.400 kg

BATTERY SPECIFICATIONS:

Type: WB-LYP 1000 AHC 3,2 Voltage

Operation voltage: Charge: 4.0V/cell Discharge: 2,8V/cell max. discharge current: constant current less than 3 CA impulse current less than 10 CA standard charge/discharge current 500A (0,5 CA)

Cycle and lifetime: up to 10.000 cycles, up to 25 years at 0.3 charge and 0.5 discharge current (1 cycle/day)

Operation temperature: from – 45 Celsius to + 85 Celsius (best capacity at 55Celsius)

BMS (Battery Management System):

- A cell-by-cell monitoring system that ensures that the current flowing to the battery bank is flowing in the correct amount and direction
- The system keeps the voltage values of each cell between the preset minimum and maximum cell voltage values
- The system monitors temperature values and provides protection against overheating
- Indicates any failed cells. Thus, it is sufficient to replace it while the entire battery bank can remain intact.

Basic types:

- On-Grid
- Off-Grid
- On-grid and Off-Grid functions

Configurations:

By varying the different capacities of wind generators, solar panels, battery banks, it is possible to create systems with different configurations. This allows all types of systems to be assembled, from minimal household-sized systems to multi-megawatt systems.

- battery pack – connected to the mains power
- battery pack + PV solar system
- battery pack + vertical axis wind generator
- battery pack + vertical axis wind generator + PV solar system (Hibrid system)

Size range:

Min. capacity: 8 kW (Household)

Max. capacity: 4.000 kW – 40 foot container (inverter in a separate room) (Industrial)

System integrations, battery packs can be connected:

- to the grid (network)
- to solar systems
- to wind generators
- to aggregators,
- to any other production unit
- Charging heads for charging electric cars

The main components of the battery pack:

- Li-Yttrium ion battery cells
- BMS system (cell-mounted battery monitoring system)
- Control system
- Wiring and cabling system
- Relays
- Inverters
- Mobile applications
- IOT system
- Lightning protection

Main operating conditions:

- Should be in the temperature range from -40 to +60 degrees
- Approx. 30 years of service life (calculating with: 1x charging / draining per day)
- Minimum 10,000 charging / draining cycles
- Less than 5% efficiency loss in 10 years
- 99.5% storage efficiency of generated electricity
- Charging and draining speed: 3C (a 1,000 kW battery bank can be charged and drained with a maximum of 300 kW power generation system)
- Approx. 80% of the nominal storage capacity of a battery bank is usable/recoverable. Cells should not be drained to 0%, not below 20%.

Design / Sizing Guide:

1. The total capacity of the expected consumer equipment must be given

2. You need to know what the maximum consumption is under an hour

3. It is necessary to know how many hours a day a given consumer needs to be supplied with electricity

4. Can the system be connected to a network?

5. What is the current maximum required voltage (e.g. starting a 5 kW machine requires 5 kW of power for a few seconds.)

If you are interested, please respond to:

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