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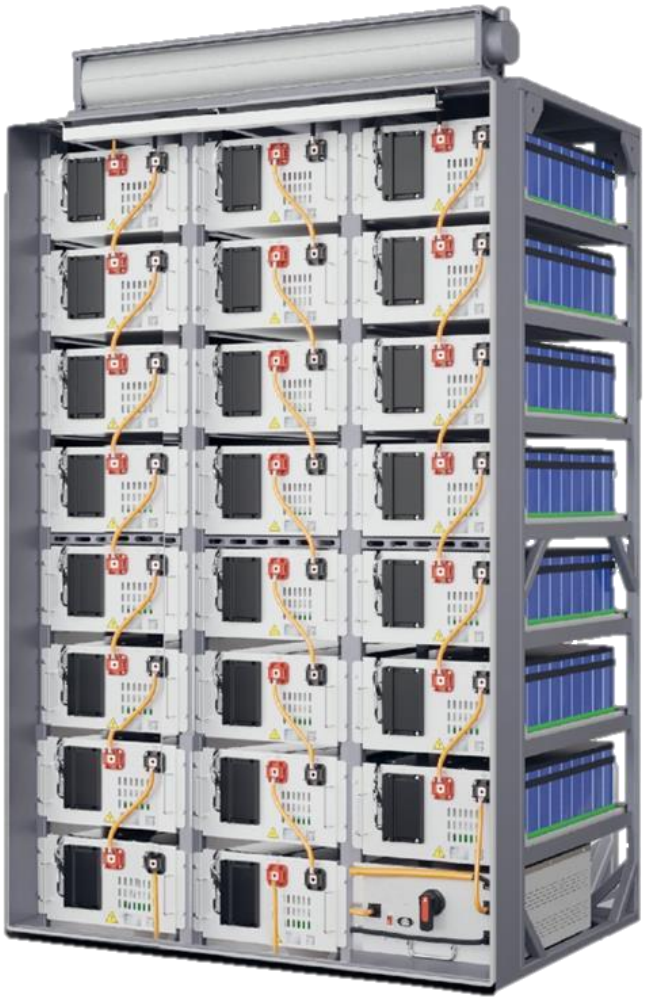
# Industrial and commercial energy storage systems of 215kWh

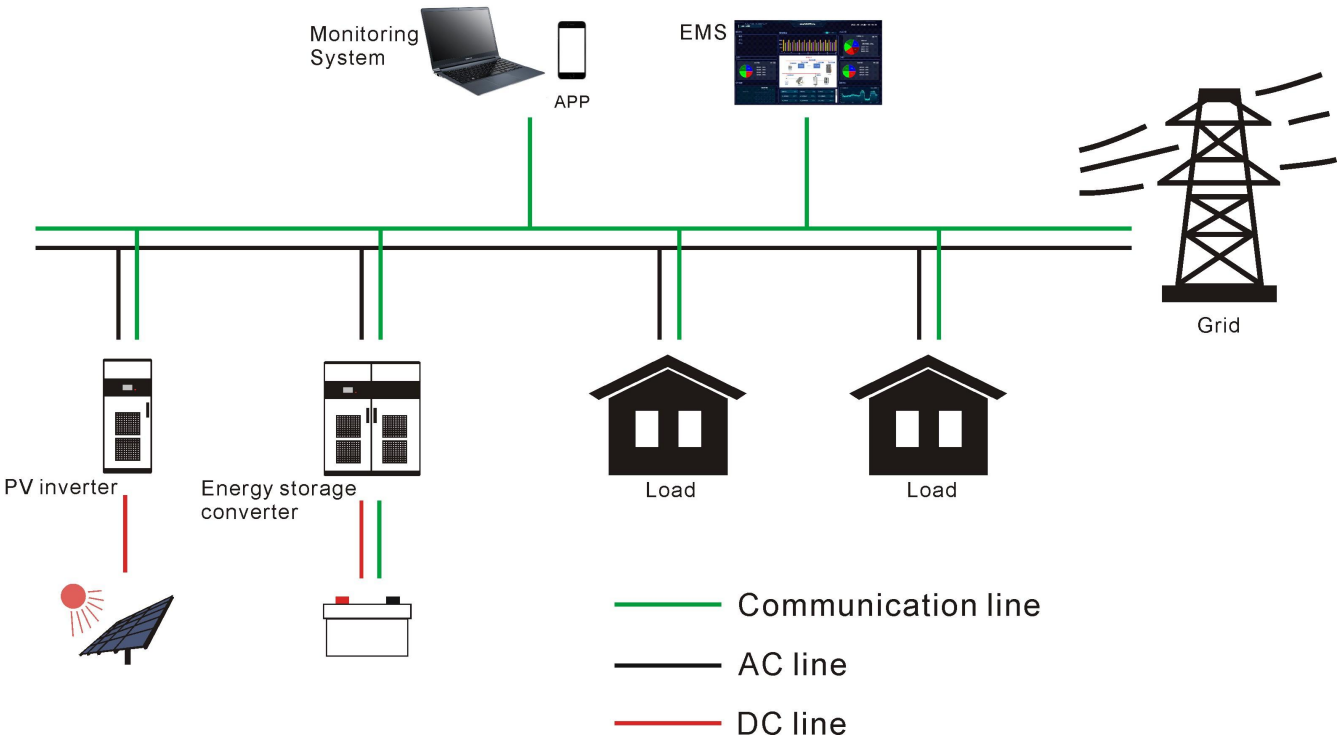


## 1. General description

The object of this proposal is the energy storage system solution which is packed into an outdoor cabinet.

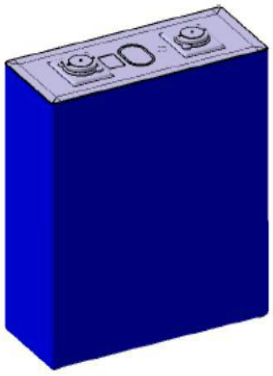
This solution has integrated almost everything needed for an On-Grid ESS solution, including battery system、power convertor system and energy management system.

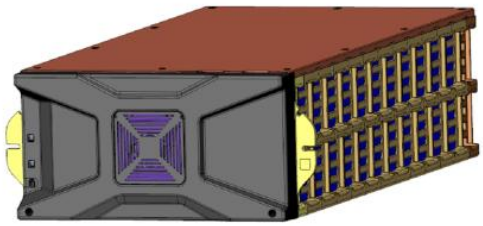
System schematic design drawing：

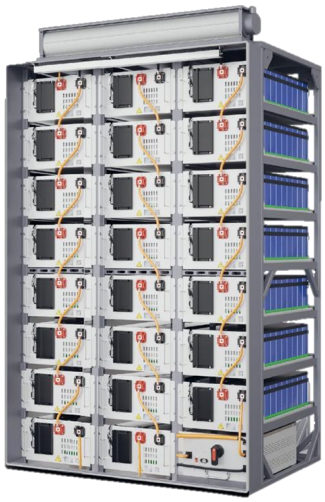


## 2. Key Components inside the cabinet

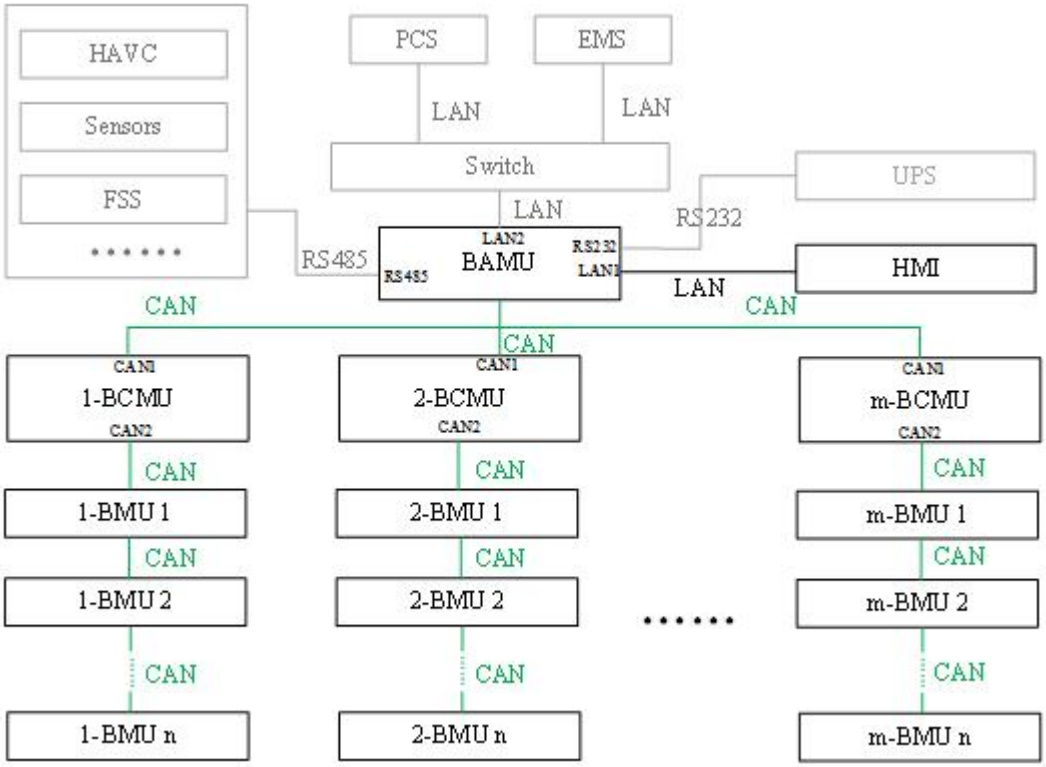
### 2.1 Battery configuration

| Cell Basic Parameters | | |
|---|---|---|
| Type | LFP |  |
| Rated Capacity [Ah] | 280 | |
| Rated Voltage [V] | 3.2 | |
| Voltage Range [V] | 2.8~3.55 | |
| Charge current [A] | 140 | |
| Discharge current [A] | 140 | |
| Dimensions [mm] | 72*174*207(T*W*H) | |

| Module Basic Parameters | | |
|---|---|---|
| Configuration | 1P24S |  |
| Rated Capacity [Ah] | 280 | |
| Rated Voltage [V] | 76.8 | |
| Voltage Range [V] | 67.2~85.2 | |
| Rated Energy [kWh] | 21.504 | |
| Dimensions [mm] | 981*490*231 mm<br>（D*W*H） | |
| Weight [kg] | 138±3kg | |

| Rack Basic Parameters | | |
|---|---|---|
| Rated Capacity [Ah] | 280Ah |  |
| Rated Voltage [V] | 768V | |
| Rated Energy [kWh] | 215kWh | |
| Configuration | 10 | |
| Optimum Operating Temperature Range | 25 ± 5 ℃ | |
| Operating Altitude | 3000 m(＞3000m 降额) | |
| Weight [kg] | 2200 kg | |
| Ambient relative humidity | 0~85% RH | |

## 2.2 Battery Management System (BMS)




the battery management system is a 3-layer architecture composed of BMU, BCMU and BAMU. The BMS has functions such as high-precision analog signals detection and reporting, fault alarm, uploading and storage, battery protection, parameters setting, passive balancing, battery SOC calibration and information interaction with other devices.

The BMS includes a first-level system main controller BAMU, a second-level battery String management module BCMU, and a third-level battery monitoring unit BMU.

**2.3 Power Converter System (PCS)**

| Specification | | |
|---|---|---|
| Utility-interactive Mode | | |
| Battery voltage range | 630~900V | |
| DC max current | 175A | |
| AC voltage | 380V/400V (-15%~10%) Vac | |
| Nominal power | 100kVA | |
| AC frequency | 50/60Hz(±2.5Hz) | |
| THDi | ≤3% | |
| AC PF | Listed: 0.8~1 leading or lagging (Controllable) | |
| | Actual: 0.1~1 leading or lagging (Controllable) | |
| Physical | | |
| Cooling | Forced air cooling | |
| Noise | 75dB | |
| Enclosure | IP20 | |
| Max elevation | 3000m/10000feet (> 2000m/6500feet derating) | |
| Operating ambient temperature | -20°C to 60°C (De-rating over 50°C） | |
| Humidity | 0~95% (No condensing) | |
| Size (W×H×D) | 485×220×680mm | |
| Other | | |
| Peak efficiency | 99% | |
| AC connection | 3-Phase 3-Wire | |
| Communication | RS485,CAN,Ethernet | |
| Isolation | Non-isolation | |

## 2.4 Fire Suppression System

The fire suppression system is designed according to the outdoor cabinet size, and the fire extinguishing material is aerosol. The system includes fire detectors, audible and visual alarm, emergency start/stop button, controller, etc.

## 2.5 Heating Ventilation Air Conditioning

The air conditioner's running is controlled automatically according to the temperature inside the cabinet. The controller controls the compressor or fan's work by comparing the cabinet return air temperature detected by the internal cycle temperature sensor with the fixed temperature point and making judgment.

Cooling

Cooling startup point = cooling point + cooling sensitivity. When the temperature inside the cabinet exceeds the cooling startup point, the cooling will start; when the temperature inside the cabinet is lower than the cooling point, the cooling will stop.

| Parameter | Default value | Setting range | Unit | Setting point description |
|---|---|---|---|---|
| Cooling point | 25 | [15 ~ 50] | ℃ | The temperature point of the cooling stop |
| Cooling sensitivity | 10 | [1–10] | ℃ | The sensitivity of the temperature control |

Heating

Heating startup point = heating point - heating sensitivity. When the temperature inside the cabinet is lower than the heating startup point, the heating will start; when the temperature inside the cabinet is higher than the heating point, the heating will stop.

| Parameter | Default value | Setting range | Unit | Setting point description |
|---|---|---|---|---|
| Heating point | 15 | [-15~25] | ℃ | The temperature point of the heating stop |
| Heating sensitivity | 10 | [1 –10] | ℃ | The sensitivity of the temperature control |

Dehumidification

Dehumidification Start Point = Dehumidification Point + Sensitivity, when the ambient temperature inside the cabinet is higher than the Dehumidification start point, the dehumidifier will work; when the ambient temperature inside the cabinet is lower than the Dehumidification point, the dehumidifier stops working.

| Parameter | Default value | Setting range | Unit | Setting point description |
|---|---|---|---|---|
| Dehumidification Point | 60 | [40 ~90] | % | The point when the dehumidifier stops working |
| Sensitivity | 10 | [1 ~30] | % | Sensitivity of Controlling the humidity |

## 3. System Main Component lists

| NO. | ITEM | Specification | Qty |
|---|---|---|---|
| 1 | Battery System | | |
| 1.1 | Battery Management System | BMU+BCMU+Cable | 1 |
| 1.2 | Battery String | 215kWh include rack | 1 |
| 1.3 | High Voltage Box | | 1 |
| 2 | Electrical System | | |
| 2.1 | PCS | 100kW | 1 |
| 2.2 | EMS | EMS | 1 |
| 3 | Outdoor Cabinet | | 1 |
| 4 | FSS | Aerosol Fire Suppression system | 1 |
| 5 | HAVC | 3kW cooling power | 1 |