



### ◎ SAFE

- ★ Top quality lithium iron phosphate battery cells.
- ★ Voltage and temperature are collected for each battery cell for more detailed management.
- ★ 2-stage BMS design for modules and battery clusters, with multiple status monitoring and hierarchical linkage.

### ◎ INTELLIGENT

- ★ Intelligent air-cooled design for long system life and smooth operation.
- ★ In the event of a power outage, the energy storage system switches to an off-grid system within 20ms and continues to supply power to the loads.
- ★ Integrated energy billing components, anti-reverse flow components, dynamic real-time monitoring, data summarization.
- ★ Cloud platform online operation and maintenance, convenient function parameter settings, remote monitoring and maintenance, intelligent and worry-free.

### ◎ CONVENIENCE

- ★ Modular design for easy maintenance and installation
- ★ All-in-one design for rapid deployment and on-the-go use

### ◎ EFFICIENT

- ★ 20kW PCS + 100kWh battery, efficient charging and discharging.
- ★ Covering an area of 0.96 square meters, small size, installation more space-saving.
- ★ Split design, pcs in a separate compartment, low power consumption, more balanced heat dissipation.
- ★ Three-level control technology for high efficiency and power quality.



20kW-107.52kWh  
OUTDOOR AIR-COOLED LITHIUM  
BATTERY ENERGY STORAGE SYSTEM



# 20kW-107.52kWh

## SUMMARIZE

The energy storage system adopts integrated box design, integrating lithium battery storage system, PCS system, EMS, air conditioning system and fire protection system. Professional temperature control design ensures safe, stable and long-term operation of the product.

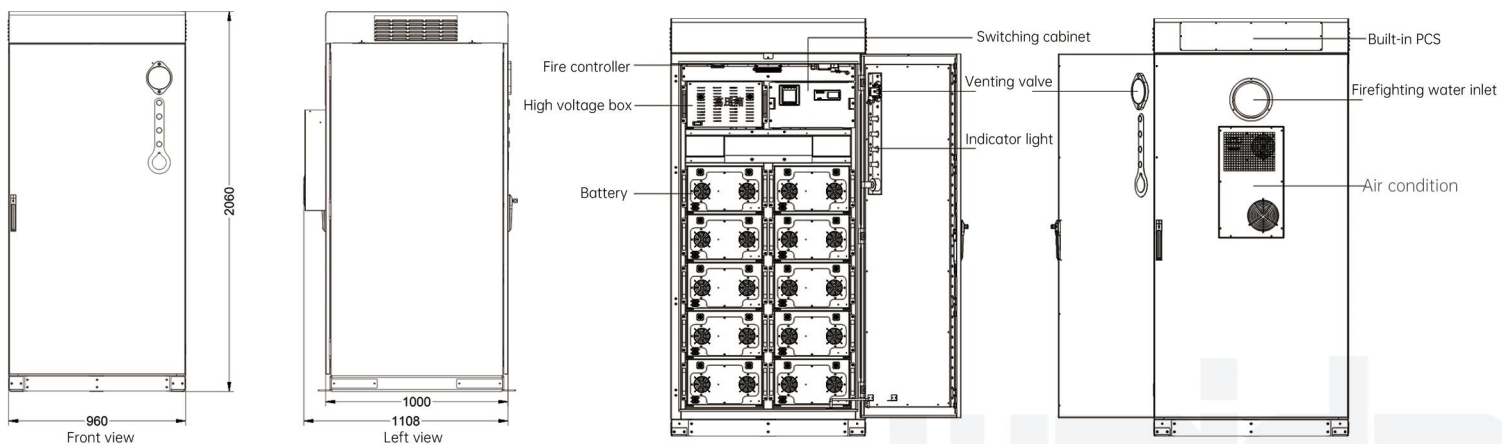
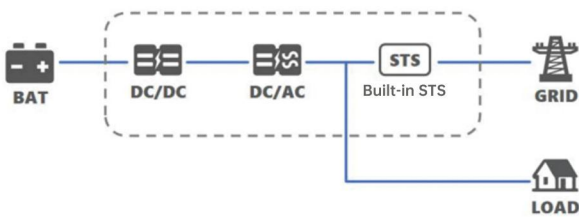
The product has IP54 protection level, mobility, easy lifting and transportation, shorter disassembly cycle, applied to industrial and commercial energy storage, integrated design, intelligent control, whole system monitoring, historical status record and other functions.

## CONFIGURATION LIST

| Item                                       | Specification  | Quantity |
|--|--|----------|
| Cabinet                                    | 960*1000*2060mm (W*D*H)<br>(excluding air-conditioner protruding size)<br>960*1108*2060mm (W*D*H)<br>(including air-conditioner protruding size) | 1        |
| Lithium battery storage system             | 107.52kWh (384V280Ah)  | 1        |
| Battery management system                  | BMS  | 1        |
| Energy management system                   | EMS  | 1        |
| Bidirectional variable flow control system | PCMZ20   | 1        |
| Air condition                              | 600W   | 1        |
| Fire-fighting                              | Perfluorohexanone  | 1        |
| Billing components                         | Billing meters + current transformers  | 1        |
| Anti-backflow components                   | Anti-reverse current meter + current transformer   | 1        |
| Auxiliary distribution system              |  | 1        |



## SYSTEM TOPOLOGY



\*For reference only, subject to actual deliverables

## PCS parameters

### PCS parameters

|                               |                             |  |
|-------------------------------|-----------------------------|--|
| Battery interface parameters  | Voltage range               | 180 ~ 530Vdc   |
|                               | Maximum current             | 70A  |
|                               | Full load range             | 300 ~ 530Vdc   |
| Built-in bypass parameters    | Input line system           | 3W+N+PE  |
|                               | Rating                      | 30kW (Meets 10kW charging while carrying 20kW)   |
|                               | Allowable Voltage           | 380 (-20% ~ 10%) Vac   |
|                               | Rated current               | 45.5A  |
| PCS AC grid parameters        | Tracking frequency          | 50 (-4.5 ~ 4.5) Hz   |
|                               | Output line system          | 3W+N+PE  |
|                               | Power (output)              | 20kW   |
|                               | Allowable voltage           | 380 (-25% ~ 20%) Vac   |
|                               | Rated current               | 30.3A  |
| AC off-grid parameters        | Permissible frequency       | 50 (-2 ~ 2) Hz   |
|                               | Output harmonics            | ≤3% (Rated power)  |
|                               | Output line system          | 3W+N+PE  |
|                               | Power (output)              | DC300V ~ DC530V Full load 20kW; DC180V ~ DC300V Plan the configuration in advance according to the maximum of 70A on the battery side. |
|                               | Rated voltage               | Rated voltage 380Vac   |
|                               | Rated frequency             | 50Hz   |
|                               | Rated current               | 30.3A  |
|                               | Voltage accuracy            | 1% (Balanced load test)  |
| Environment                   | Frequency accuracy          | ±0.2Hz   |
|                               | Output voltage harmonics    | ≤3% Linear full load   |
|                               | Overload capacity           | ≤105%: Long-term operation; (105,110] : Running time ≥10min  |
|                               | Operating temperature       | -20°C ~ 75°C (Derating above 55°C)   |
|                               | Storage temperature         | -40°C ~ 70°C   |
| Communications and management | Relative humidity           | 0%RH ~ 95%RH, Non-condensing   |
|                               | Working altitude            | 45°C, 2000m; 2000m ~ 4000m Derated use   |
|                               | Static (in a signal)        | < 70dB   |
|                               | Communications interface    | CAN and RS485  |
| Communications and management | Communication protocols     | CAN2.0 / ModBus RTU  |
|                               | IO interface                | Feedback Signal from Service Bypass Circuit Breaker: Normally Closed Contacts EPO:Normally closed contact                              |
|                               | Monitor display interface   | Commissioning reserved for   |
|                               | Query and upgrade interface | Commissioning reserved for   |

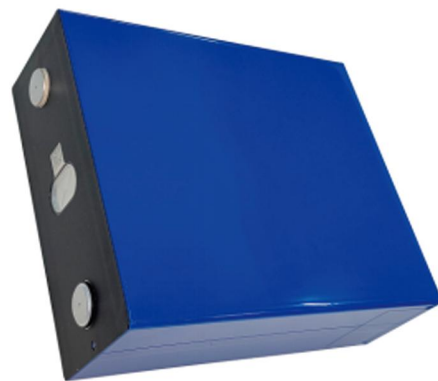
## Energy storage parameters

| Model grade               | 20kW/107.52kWh                    |  |
|---------------------------|-----------------------------------|--|
| Energy storage parameters |                                   |  |
| Basic parameters          | Energy storage capacity           | 107.52kWh  |
|                           | Energy storage configuration      | 1 x 384V 280AH Lithium battery storage system  |
|                           | System voltage                    | 384V   |
|                           | Operating voltage range           | DC336V ~ DC438V (2.8V ~ 3.65V)   |
|                           | Battery type                      | LFP  |
|                           | Number of cycles                  | > 6000 times (100%DOD, 70% Remaining, 0.5C)  |
|                           | Remaining power at end of year 10 | > 75kWh (70%)  |
| Cycle life                | Total equipment life cycle        | 10 years (based on 2 charges and 2 releases per day (300 days per year))   |
| Others                    | Communication method              | CAN/RS485  |
|                           | Isolation method                  | Null   |
|                           | Protection class                  | IP54   |
|                           | Cooling method                    | Air condition  |
|                           | Fire-fighting                     | Perfluorohexanone fire extinguishers   |
|                           | Weight                            | 1450kg   |
| Size                      | Size                              | 960*1000*2060mm (W*D*H, excluding air-conditioner protruding size)<br>960*1108*2060mm (W*D*H, including air-conditioner protruding size) |

## Electric Cells

Adopting 3.2V 280Ah single cell, the cells are designed with square aluminum shells, which avoids the possibility of the surface of the cells being damaged by machinery and resulting in the internal damage of the cells, and improves the safety performance of the product. A film-shaped explosion-proof valve is installed on all the battery cells, which also ensures that under any extreme conditions (such as internal short circuit, battery overcharge and overdischarge, etc.), a large amount of gases rapidly gathered inside the battery cells can be discharged through the riot valve, which can ensure that the battery cells will not explode, so the selection and design of the battery cells have been made with full consideration of the safety of the battery cells and the system.

| Item  | Parameters  | Prerequisite  |
|---|---|---|
| Cell type   | Lithium iron phosphate cells  | N.A.  |
| Cell model  | LFP71173207/280Ah   | N.A.  |
| Overall dimensions  | 71.65*174.7*207.11mm  |   |
| Cell weight   | 5.43±0.20kg   | Protective film (covering sth. with a blue layer)                       |
| Factory internal resistance(1kHz)                           | 0.18±0.05mΩ   | 27%SOC, Based on in-line test data                                      |
| Rated (nominal) capacity                                    | 280Ah   | (25±2)°C, Standard charge/discharge                                     |
| Nominal voltage   | 3.2V  | (25±2)°C, Standard charge/discharge                                     |
| Rated energy  | 896Wh   | (25±2)°C, Standard charge/discharge                                     |
| Operating voltage   | 2.5~3.65V 2.0~3.65V   | Temperature T > 0°C Temperature T ≤ 0°C                                 |
| Shipment voltage range                                      | 3.28~3.30V  | (25±2)°C, 27%SOC Core open circuit voltage                              |
| Energy density  | ≥160Wh/kg   | (25±2)°C, Standard charge/discharge                                     |
| Recommended SOC usage window                                | 10%~90%   | N.A.  |
| Monthly self-discharge                                      | ≤3.0%   | Three months after shipment, standard charge to 27% SOC, 25±2°C storage |
| Charging power  | 0.5P  |   |
| Discharge power   | 0.5P  |   |
| Discharge temperature range                                 | -30~60°C  | N.A.  |
| Charging temperature range                                  | 0~60°C  | N.A.  |
| Guaranteed operating conditions for the life of the product | (25±5)°C  | N.A.  |
| Number of cycles  | 6000 times; 25±2°C, standard charging and discharging test until the capacity decreases to 70% of the nominal capacity cutoff |   |
| Energy efficiency   | > 90%   |   |



## Battery Module

Adopting 12 3.2V280Ah single lithium iron phosphate cells, 12 series and 1 parallel (12S1P) to form a 38.4V280Ah battery module.



Battery module parameters

|  |   |
|--|---|
| Cell type                              | Energy cell   |
| Component                              | 12Cells, BMU  |
| Combinatorial approach                 | 12S1P   |
| Nominal capacity                       | 280Ah   |
| Nominal voltage                        | 38.4V   |
| Weight (kg)                            | 87kg  |
| Working voltage                        | 33.6V ~ 43.8V   |
| Maximum continuous discharge power(kW) | 5.376 (0.5C)  |
| Terminal output                        | Connectors  |
| Dimension mm (W*D*H)                   | 372*640*226mm(without lug puller)<br>420*674*226mm(with lug puller) |
| Communication method                   | CAN   |

## Outdoor Battery Cabinet

The batteries in this solution are integrated into a protective enclosure with protection class IP54 and are equipped with a specialized BMS battery management system.

| Item  | Parameters   | Prerequisite                  |
|---|--|-------------------------------|
| Cell capacity   | 280Ah  | Standard charge and discharge |
| Serial-parallel method                                      | 1P120S   | N.A.                          |
| Nominal voltage   | 384V   | Standard charge and discharge |
| Nominal capacity  | 107.52kWh  | Standard charge and discharge |
| Overall size(W*D*H)   | 960*1000*2060mm (W*D*H)<br>(Excluding air-conditioner protruding size)<br>960*1108*2060mm (W*D*H)<br>(Including air-conditioner protruding size) | see drawing                   |
| Discharge cutoff voltage                                    | 336V or either battery cluster Monoblock to 2.8V   | T > 0°C                       |
| Charge cut-off voltage                                      | 438V or either battery cluster Monoblock to 3.65V  | N.A.                          |
| Rated charge/discharge current                              | 140A   | (25±2)°C                      |
| Operating temperature range                                 | -20~50°C (Discharge) 0~50°C (Charge)   | N.A.                          |
| Storage temperature range                                   | -20~50°C   | N.A.                          |
| Communication method  | CAN  | N.A.                          |
| Shipment SOC (%)  | 30~50  | (25±2)°C                      |
| Guaranteed operating conditions for the life of the product | (25±5)°C   | N.A.                          |