# TB 250/500 liquid cooling solution Introduction

Bill 15/11/2024


# Chapter 1

## Brochure Overview

# STORION-TB250/500

250/500 kW | 630 ~ 2090 kWh

- AC-Coupled and DC-Coupled solutions are both available
- Liquid-cooling solution: higher safety and extended lifespan
- On/Off-grid switching time≤ 20ms
- Flexible capacity configuration

  209 kWh per cabinet, up to 10 cabinets in parallel

  Battery capacity range: 630 ~ 2090kWh
- DC coupled solution up to 160% PV oversizing
- Various working modes for different application scenarios


AC Container (PCS included)


Liquid-cooling Battery Cabinet

STORION-TB250/500 is an AlphaESS liquid-cooling C&I product for large-scale C&I application,the container has EMS, PCS, STS, transformer, air conditioner, fire extinguishing devices and other equipment. Customers can choose different power range according to their application scenarios.

- **Easy Installation**

  Devices and batteries are pre-assembled at the factory

  Only external wiring at first installation

- **Safety**

  Constant temperature control at 23±2°C, air-conditioning system self-checking & EMS cell-level detection.

  Smoke & temperature detection, automatic alarm system.

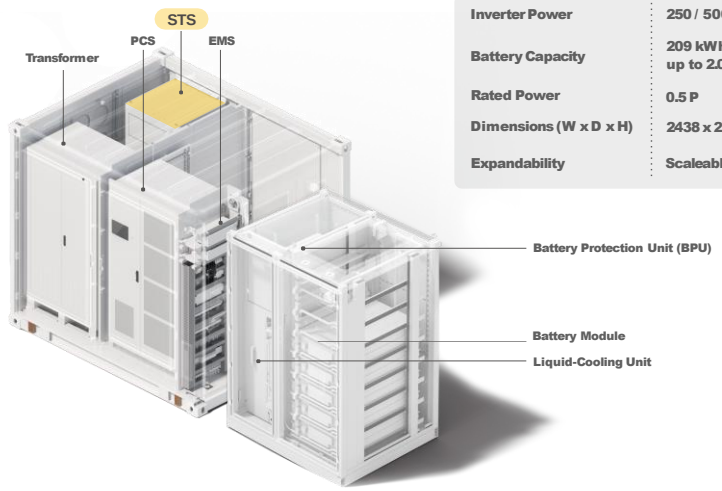
- **Expanable Capacity**

  AC-coupled solution supports a maximum of 4 systems in parallel, reaching a maximum of 2MW power and 8MWh battery capacity

## SOLUTIONS

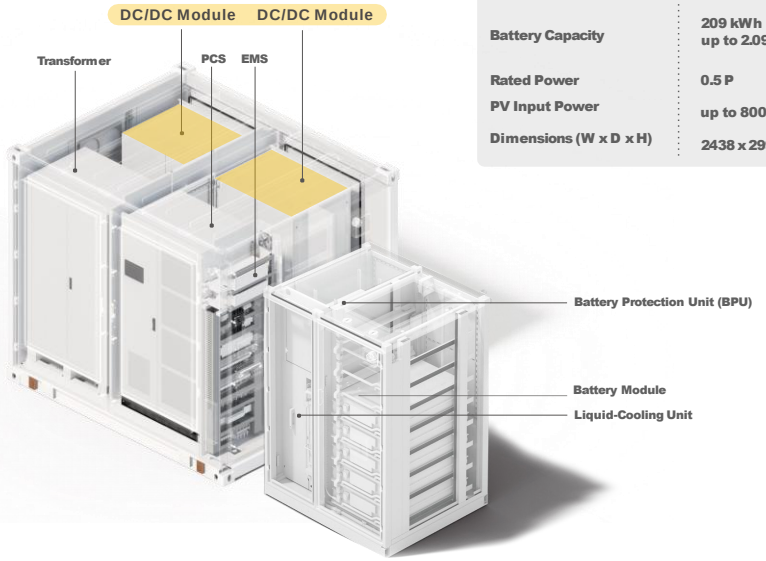
*STS is optional for clients who want to separate loads into grid and backup

**AC-Coupled**




| | |
|---|---|
| Inverter Power | 250 / 500 kW |
| Battery Capacity | 209 kWh per cabinet, up to 2.09 MWh |
| Rated Power | 0.5 P |
| Dimensions (W x D x H) | 2438 x 2991x 2591mm |
| Expandability | Scaleable |

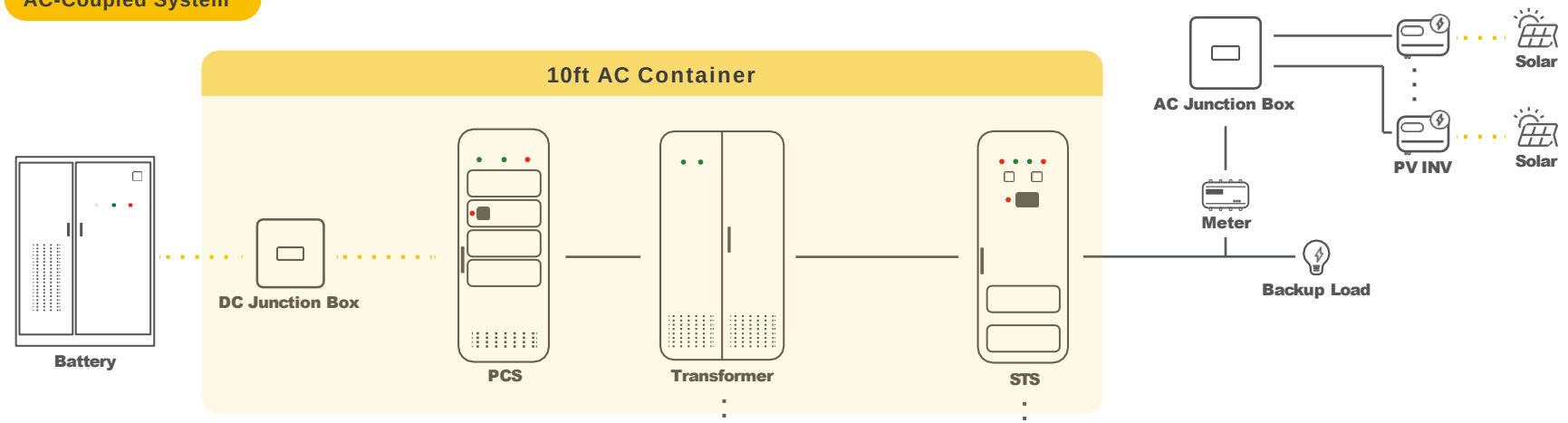
**DC-Coupled**

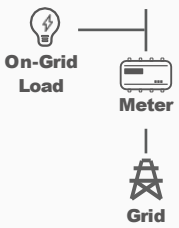



| | |
|---|---|
| Inverter Power | 250 / 500 kW |
| Battery Capacity | 209 kWh per cabinet, up to 2.09 MWh |
| Rated Power | 0.5 P |
| PV Input Power | up to 800 kWp |
| Dimensions (W x D x H) | 2438 x 2991x 2591mm |

# SOLUTIONS

## AC-Coupled System




### SCENARIO 1

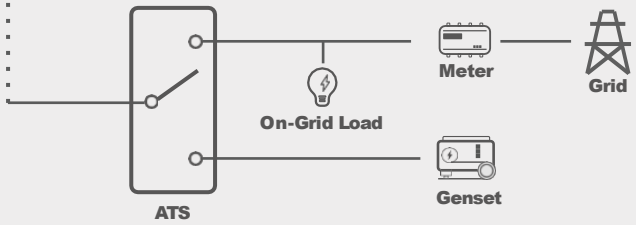
#### On-Grid System

By integrating grid, solar, and battery sources, our system allows customers to select various operating modes. In the event of a grid outage, the on-grid load will be disconnected, and the system will automatically switch to supplying backup load, keeping you unaffected by power disruptions.


### SCENARIO 2

#### Off-Grid System

The generator is managed by the EMS via dry contact, allowing users to control its operation based on preset schedules, battery SOC, or manually. This setup ensures continuous operation of either the generator or the STORION system at any given time. Both the diesel generator and the STORION system work together seamlessly, guaranteeing a reliable power supply for customers residing in remote off-grid areas.



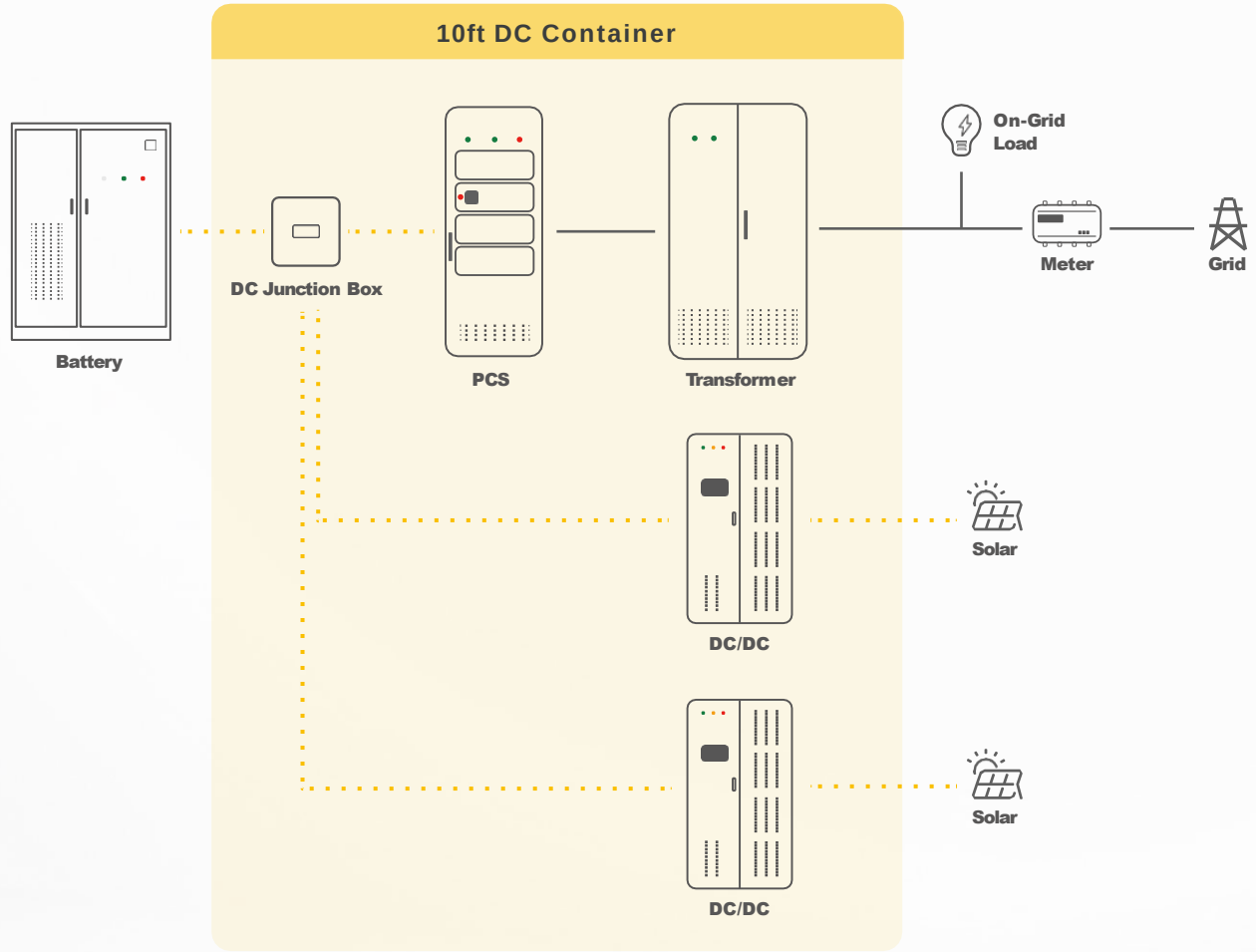

### SCENARIO 3

#### Dual Power Supply System

This solution requires an additional ATS device for seamless power source switching. In the event of a grid outage, the ATS will automatically switch to the generator side. The EMS controls the generator's operation, ensuring continuous power supply. This setup ensures that either the generator or the STORION system is always operational, guaranteeing uninterrupted backup power for essential loads.

# SOLUTIONS

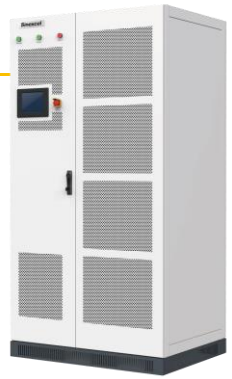
## DC-Coupled System




- For some scenarios with PV oversizing requirements
  - Need extra DC/DC modules
  - Support Max. two DC/DC modules in parallel
  - Each DC/DC module has 8 MPPTS
  - Adapt to multi-orientation PV arrays to maximize energy output
- Maximum 160% PV oversizing
- Integrated DC/DC modules in containers, saves space and installation time

# COMPONENTS

## DC / DC Module



· 400kVA, 8MPPTs
· Max. 2 Modules in Parallel Operation

**The DC/DC module can be integrated into the TB series configuration to enable a DC-coupled solution. This module consists of eight 50kW DC/DC converters, each equipped with 8 MPPTs, and supports two units connected to TB series PCS in parallel. For TB500, up to 160% DC oversizing is attainable, optimizing energy utilization. During sunny conditions, part of the electricity output can be directed to supply the load while the other part charges the battery, effectively maximizing the self-consumption rate.**

## STS 800kVA

· On/Off-Grid Switching Time ≤ 20ms

**STS is responsible for switching between on-grid and off-grid states. When the system detects a grid abnormality, the STS can switch to off-grid mode within 20ms. This ensures that the electronic equipment connected to the system is not affected by a power outage. A rated power of 800kW ensures circuit safety during switching.**

**The TB series three-phase battery inverter is one of the best products on the market today. It has six power options to match different customer needs, and the product has a modular design with modular STS and Transformer for easy installation and lining up.**

## PCS TB250/500 Battery Inverter

· 4/8 × 62.5kVA PCS
· 340 ~ 460V , 50/60Hz, 3L/N/PE

**PCS is an important component of a microgrid. It can bidirectional invert DC and AC, and adjust the current waveform to be consistent with the grid, to realize the interaction with the grid. It supports a range of voltages up to 460V, so multiple batteries and PV arrays can be connected in series or parallel.**

## Transformer 500kVA

· Isolation and Transfer from Delta Grid to Star Grid

**The transformer has a maximum input voltage of 380V and a maximum output voltage of 400V. In addition, it supports switching between star and delta circuits to isolate the grid and the devices connected to the system, thus maximizing the protection of the system from grid fluctuations.**

# COMPONENTS

## BATTERY CLUSTER SYSTEM

### Battery Module

| | |
|---|---|
| **Module** | **M166280-S** |
| **Nominal Capacity** | 46.5kWh |
| **Max. Charging/Discharging Current** | 140 A |
| **Depth of Discharge** | 98%(On-Grid), 90%(Off-Grid) |

### Configuration Rack

| | |
|---|---|
| **BLMU** | **HV1500250-II** |
| **Rated Voltage** | Max. 1500V |
| **Rated Current** | Max. 250A |
| **Operation Temperature** | -30～50 ℃ |
| **Dimensions (W x D x H)** | 526×650×250mm |
| **Weight** | 30 kg |

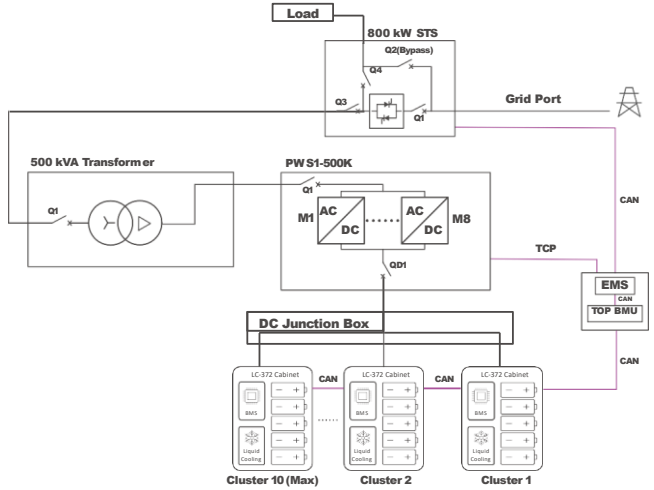
### Battery Cabinet

| | |
|---|---|
| **Module** | **STORION-LC372** |
| **Nominal Capacity** | 209.6 kWh |
| **Number of Cabinet** | 3～10 |
| **Dimensions (W x D x H)** | 810 x 1110x 237.5mm |
| **Ingress Protection** | IP 55 |
| **Operating Temperature Range** | -30 ℃～50 ℃ |

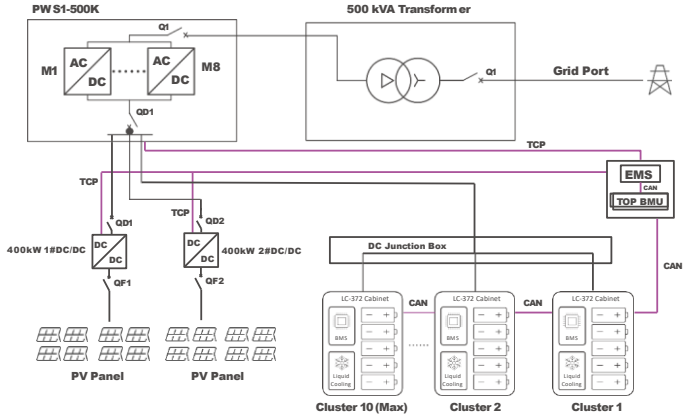


# WIRING DIAGRAM

## AC-COUPLED SOLUTION




## DC-COUPLED SOLUTION

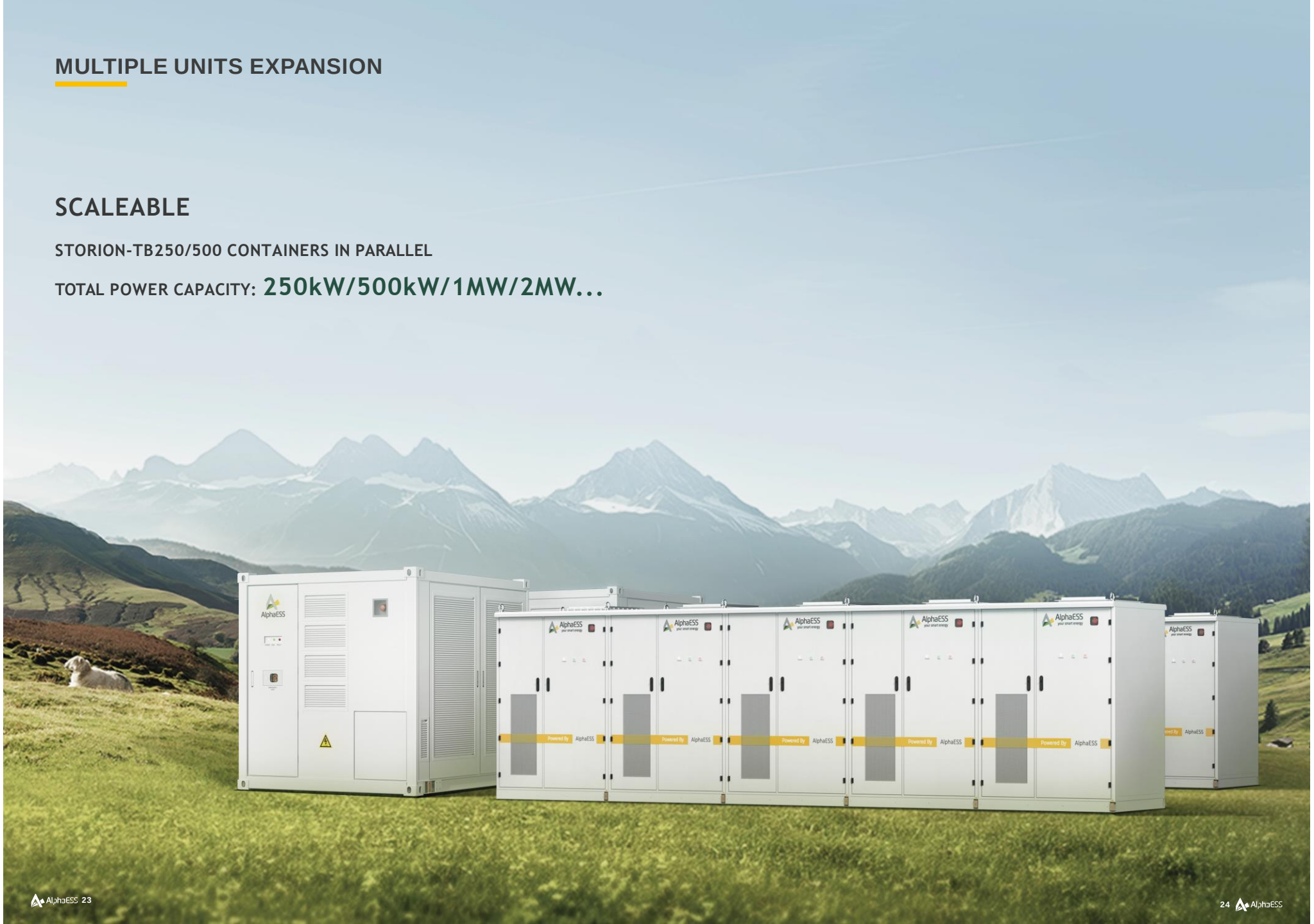


# MULTIPLE UNITS EXPANSION

## SCALEABLE

STORION-TB250/500 CONTAINERS IN PARALLEL

TOTAL POWER CAPACITY: **250kW/500kW/1MW/2MW...**




# Chapter 2

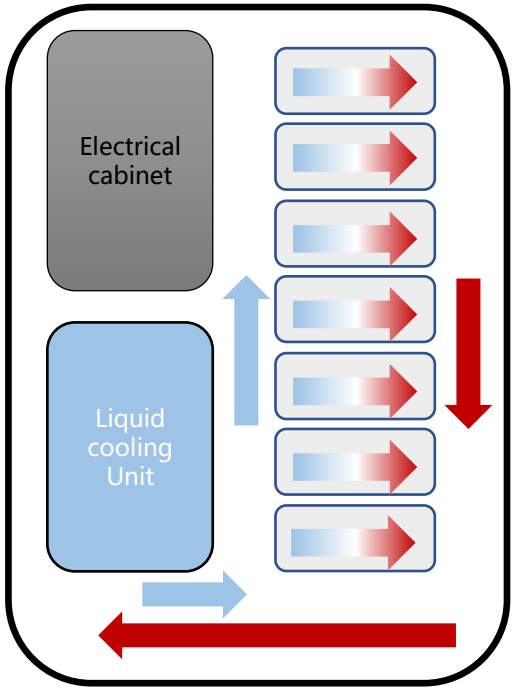
Details of LC372 Cabinet

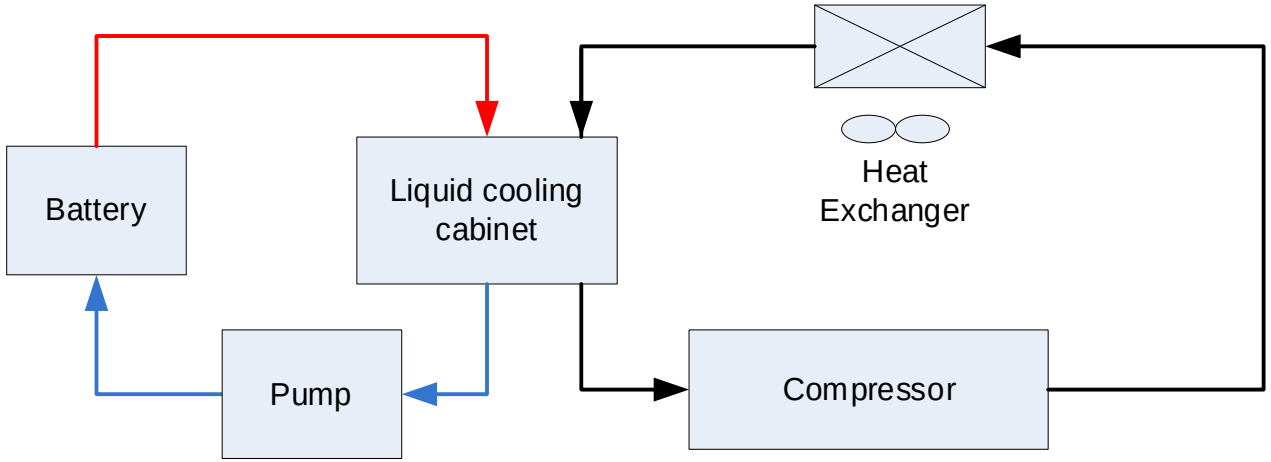
# Temperature Control

## Liquid-Cooling system


Liquid in

Liquid out

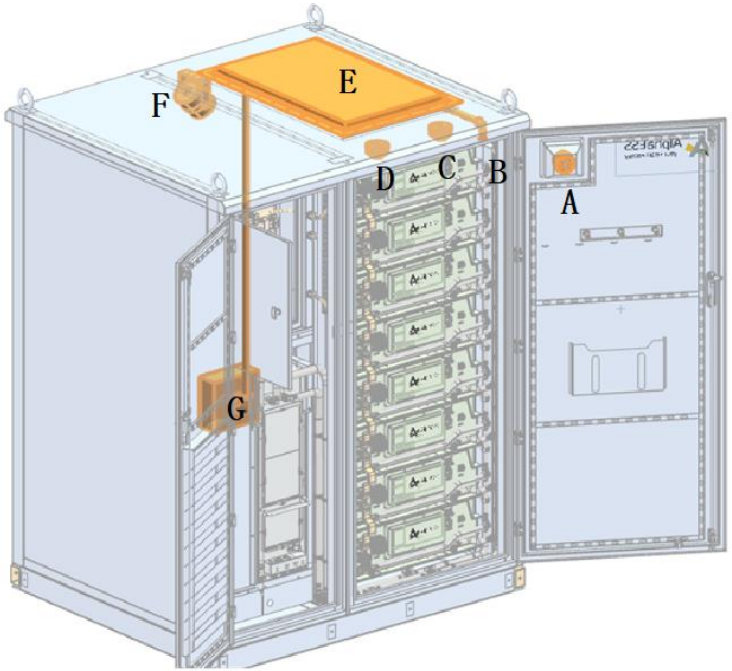


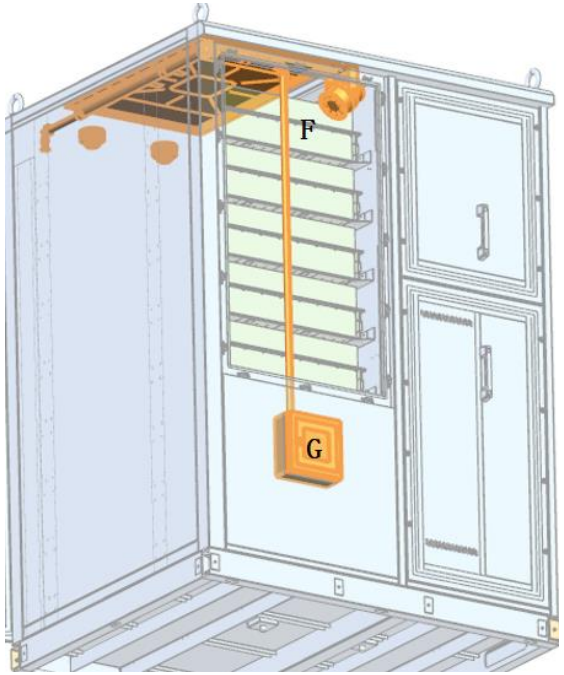




Cooling liquid: water + Ethylene glycol

Liquid-cooling pipes inside the battery constantly circulate cooling liquid through the system

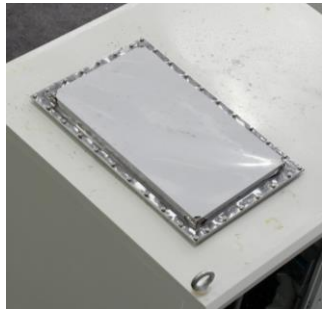
# Fire protection system




**A**

**E**



**F**

**G**

| | Description |
|---|---|
| A | Audible and visual alarm |
| B | Water sprinklers |
| C | Smoke detector |
| D | Temperature probe |
| E | Pressure Relief Valve |
| F | Aresol |
| G | Water inlet, German standard Storz-NOK 81-65 connection |

# Parameters of LC 372-5

Only **5** battery modules inside,
The top battery module is only **half full** of cells

Voltage range of battery module M166280-S: 140.4 ~ 187.2V

Voltage range of PCS: 600 ~ 900V

Maximum number of M166280-S: 187.5V * 4.5 = 843.5V

Capacity: 46.6 kWh * 4.5 = 209.7 kWh

# Thank You

Scan the QR to learn more

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