



START CE

Outdoor liquid-cooled
energy storage containers



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Product Overview

STAR T Outdoor liquid-cooled energy storage containers

- Max up to 4Mwh



Ultimate Safety

Ultra-strong Protection Top-tier Configuration

IP67/54
(Enclosure/Cabinet)
Cell-pack-cabinet-compartment protection

CATL LFP 280Ah
High safety | Long lifespan

Insulation Assurance

Full-time DC-side insulation safety monitoring

3 Fire Safety Protection

Detection, pressure relief, water connectors, F120

Precision Addressing

Firefighting addressability
Accurate problem localization



Superior Performance

Independent Operation

Grid-forming capability
(Delta PCS integration, 1-6.4MW)

Full-cell Temp Monitoring

Monitor the temperature of 50% of the cells (Only applicable to 4MWh products).

Intelligent Temperature Control

Operating temperature difference of $\leq 4^{\circ}\text{C}$.

Rapid Frequency Modulation

1P continuous charge - discharge (Only applicable to 3.79MWh products).

High - efficiency System

System efficiency of $\geq 93\%$ at 0.5P operation.

Flexible Configuration

2MWh~8MWh

intelligent control

Cloud Platform Real-time Status Monitoring

Data Black Box
Local data storage within 7 days
No fear of data loss

Application Scenarios

Peak shaving
valley filling



FR
voltage regulation



Capacity
Expansion/Augmentation

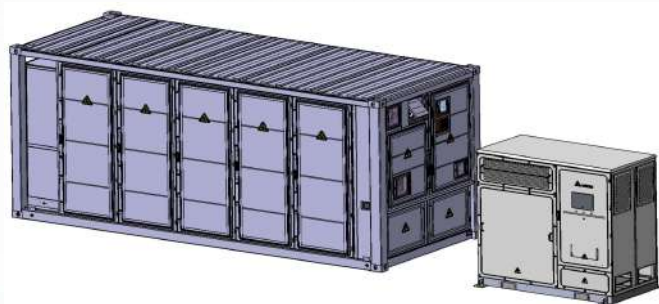
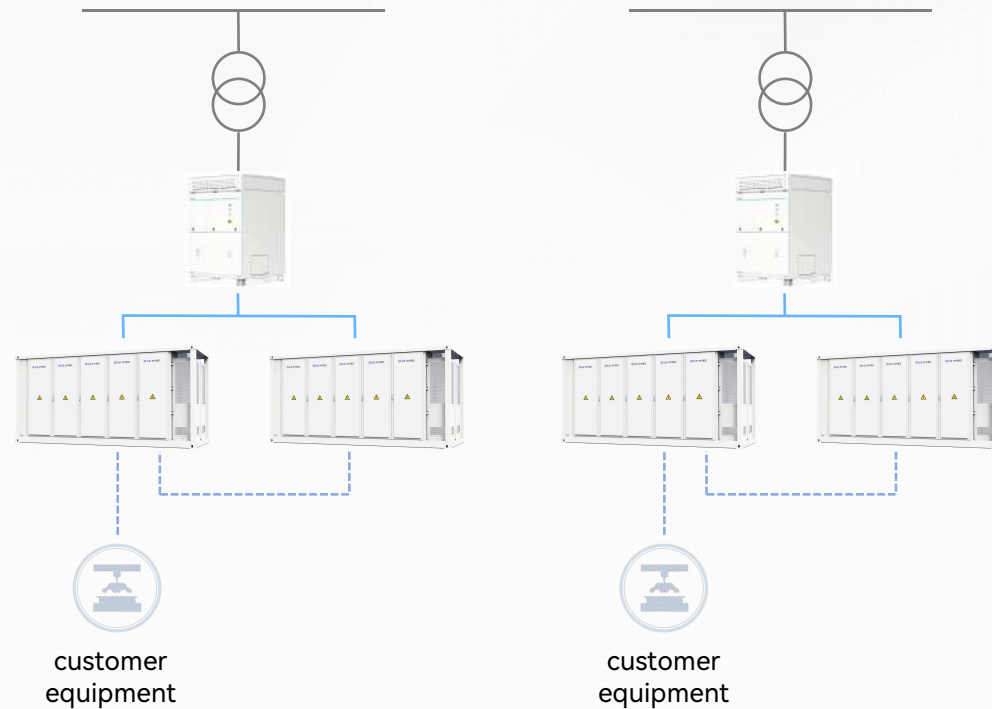


Product Composition

Infinite Scalability Architecture



Master-slave (up to 2 sets)

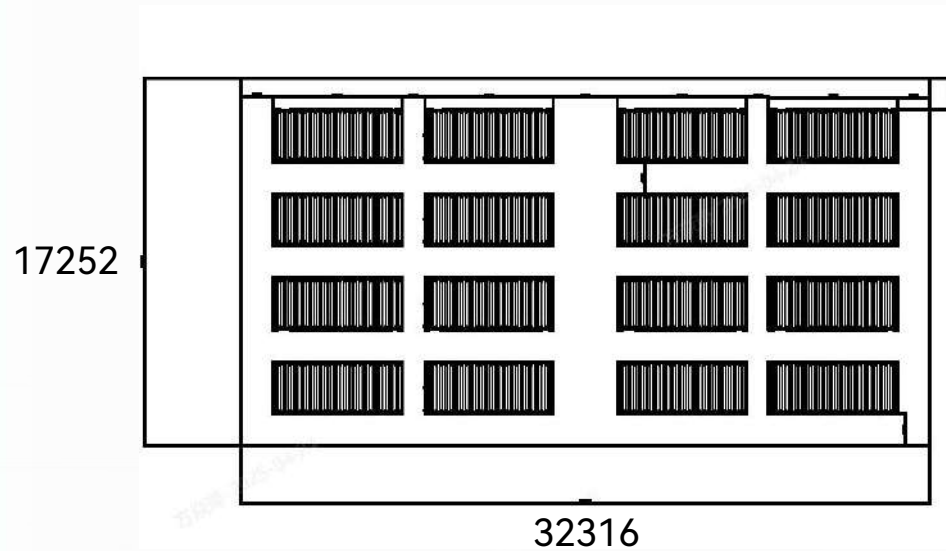


— AC HV
 — DC HV
 - - - Communication

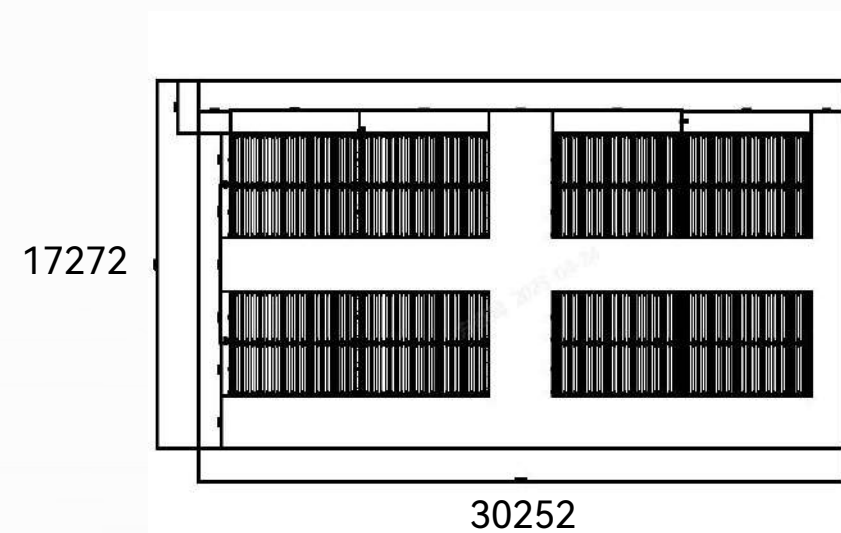
Key Highlights

Side by side with 4MWH
Mirrored counterattack strategy

4MWh with maintenance clearance, 64MWh total



4MWh side-by-side & back-to-back, 64MWh total



Key Highlights **Top-tier cell configuration**

CATL Original Pack

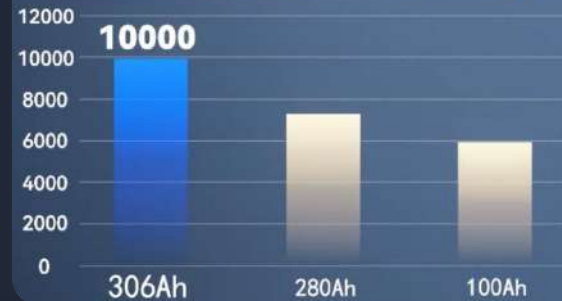
LFP Cells



CATL

LFP 306Ah LFP

Cycle Life



Capacity (kWh)



CATL Cell

- 306Ah Cell**

The 306Ah battery offers significant advantages in cycle life, capacity configuration, and overall cost.

Integrated cabinet benefits

- Safer and simpler**

Fewer welds, no parallel risks, lower cost, fire-ready

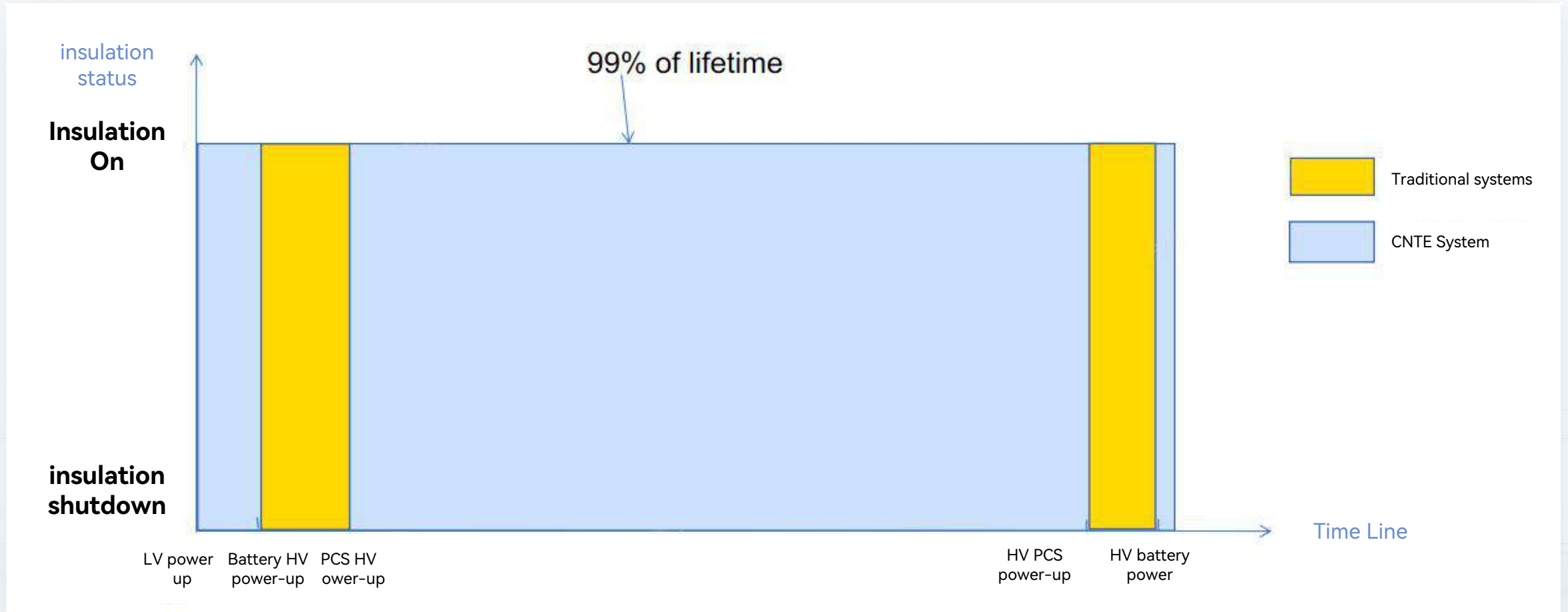


Key Highlights

Full-time insulation monitoring

24-hour

Real-time insulation ensures lifelong protection.



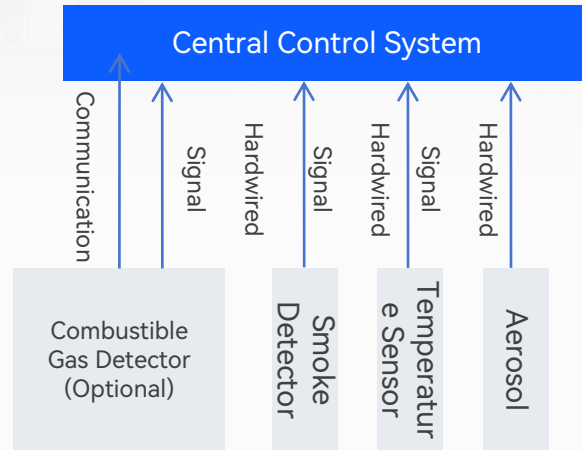
Note: Others check insulation only at startup, not continuously.



Key Highlights

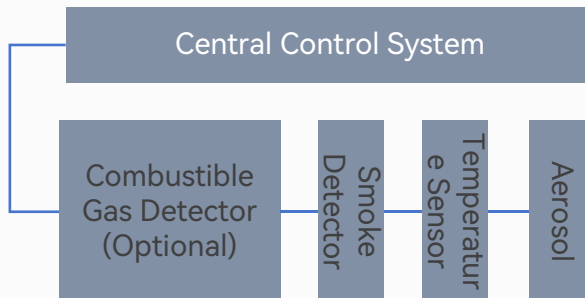
Safety before spark

Precise fire location warning



Each detector has a dedicated circuit for accurate identification of triggered units, preventing issues from damage or false alarms.

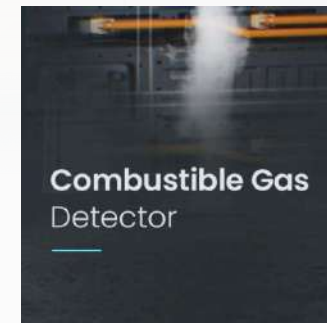
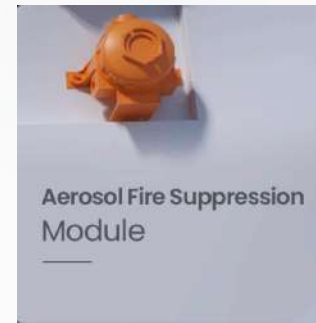
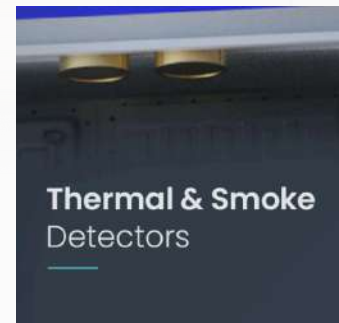
VS



Connected in series

Four Layers of Fire Protection

Pressure Relief · Explosion Venting · Fire Suppression · Isolation



Relief & Venting

Relief valves and vent panels to prevent gas buildup and secondary damage

Water Flooding

Quickly floods cabinet to stop heat spread

Aerosol Suppressant

F240 Fire Rating

4h fire resistance with structural integrity



Key Highlights

Ultimate Protection

Cells Packs Cabinets Systems Multi-Protection



System design will be verified for dynamic and thermal stability to reduce risk

Before

Equipped with temperature/humidity/gas monitor and water immersion device All key components are tested for reliability



Cabinet

During

Real-time leakage and extinction green detection during SC protection

After

More than 4 hours of fire-resistant high-temperature waterproofing system verified by 3S protection

Before

Real-time current monitoring via DC through various safety verifications 3-layer HIL simulation verification



RACK

During

Real-time current monitoring through DC collection Temperature through various safety verifications Triple HIL simulation verification

Before

BMS real-time monitoring
IP67
Validated by two-layer HIL simulation with OV/UV/SC and thermal runaway testing



PACK

Before

LFP battery cell
Protected against OV/UV/SC/OL
No fire or explosion risk



CELL

Key Highlights

Full-range temp monitoring

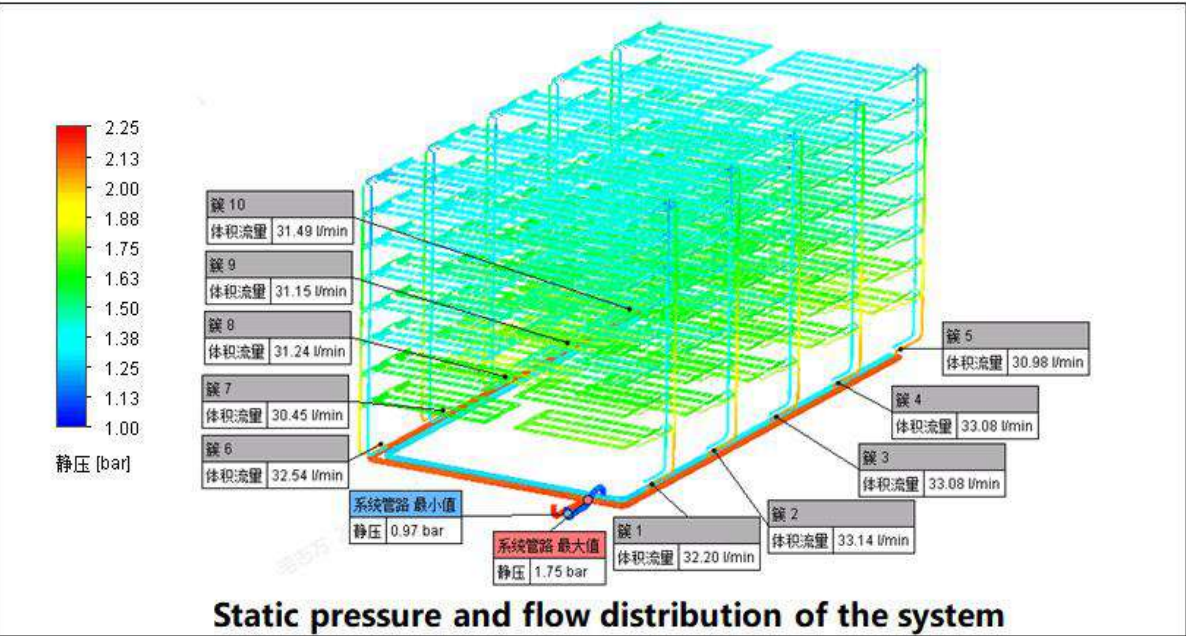
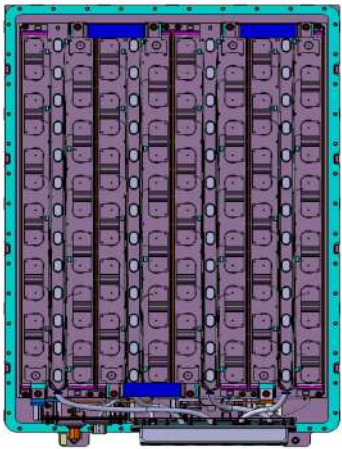
Temp. points: 28 (cells) + 2 (electrodes)

Conclusion:

■When the inlet flow rate of the chiller is 320L/min, the flow rate of each battery rack is evenly distributed, the minimum flow rate is 30.45L/min which meets the thermal performance.

Case	Boundary	Rack Number	Rack 1	Rack 2	Rack 3	Rack 4	Rack 5	Rack 6	Rack 7	Rack 8	Rack 9	Rack 10
Result	Flow Distribution	Flow L/min	32.20	33.14	33.08	33.08	30.98	32.54	30.45	31.24	31.15	31.49
		Diff with the average value	0.8%	3.8%	3.6%	3.6%	-3.0%	1.9%	-4.7%	-2.2%	-2.5%	-1.4%

LFP 306Ah LFP



Smart temp.
control,
operating $\Delta T \leq 4^{\circ}\text{C}$



Key Highlights

Fast frequency response

1P charge/discharge, all-environment adaptable

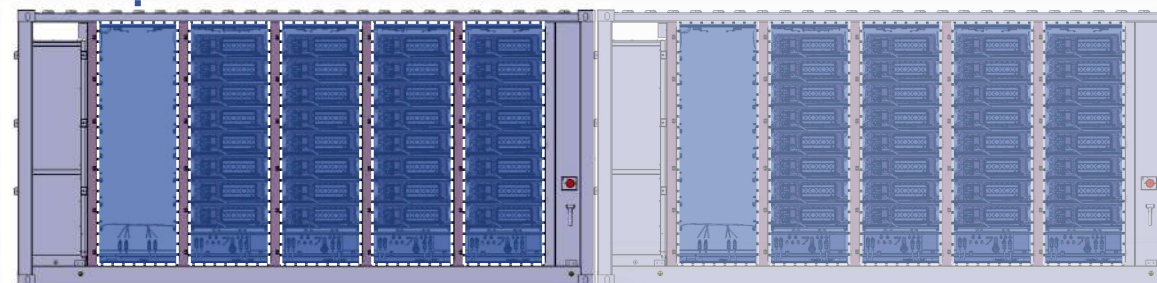
2×40kW liquid-cooled units,
support 55°C 1P container
use



Flexible Configuration

2MWh~8MWh

Supports 5–10 cluster reduction; 2
containers parallel for 2–8MWh system

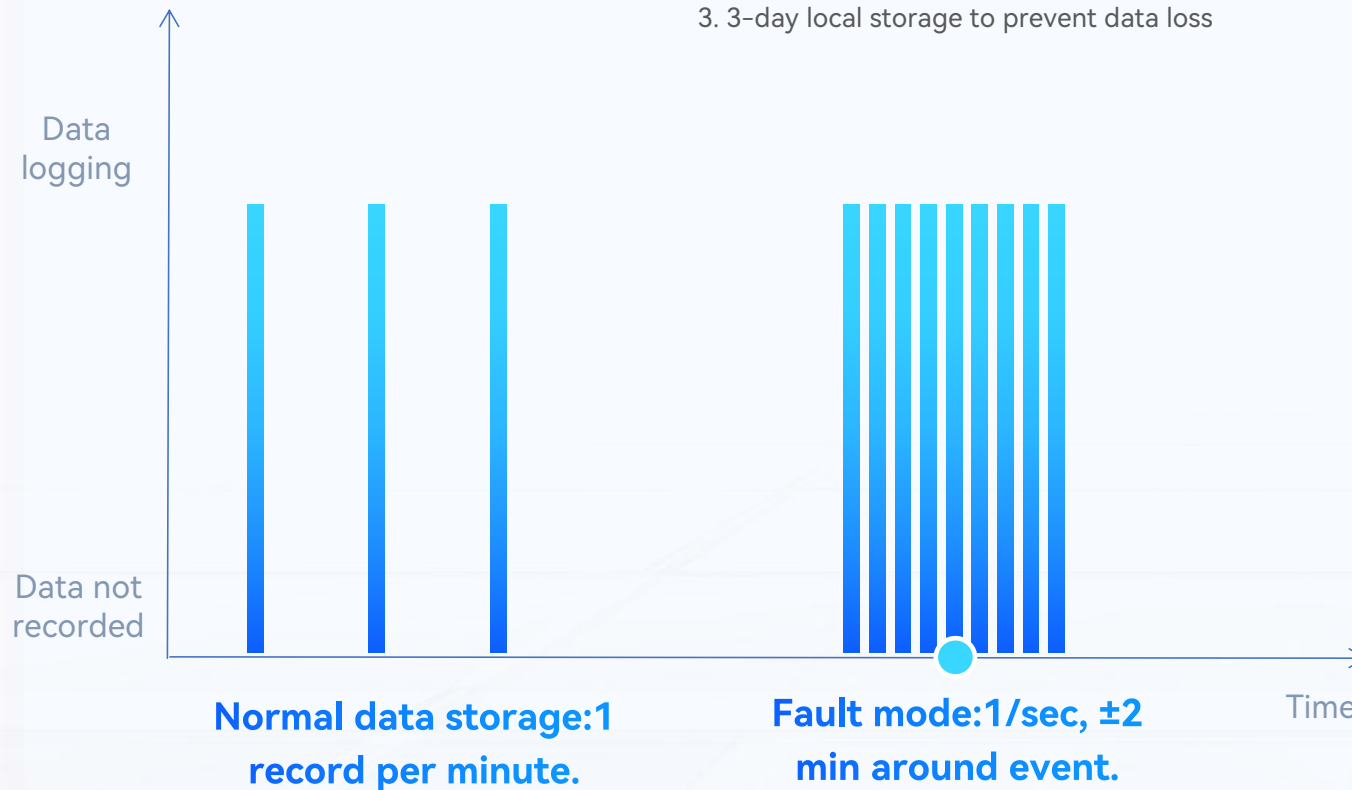


Key Highlights

Built-in 1TB hard disk as a data black box

Local storage of data within 3 days,
no fear of data loss

1. Fast, accurate fault detection with full analysis window
2. Complete data capture for reliable analysis
3. 3-day local storage to prevent data loss



Energy Management Controller

EMU - AL100

EMS/MBMU/PCS control for energy scheduling, BMS management, and load balancing.



Product Advantages

High Performance

Dual cores (compute + control), 12 - core heterogeneous architecture for high - speed control/computing.

Multi-functional Software

Configurable for diverse energy storage scenarios
End-to-end energy management solutions

High Integration

Integrated MBMU, PLC, serial server, and IO modules
Reduces system complexity by 50%

High Reliability

IP55-rated protection
Stable operation in 65°C high-temperature environments

Key Highlights

Fast frequency regulation1P Continuous charge/discharge.

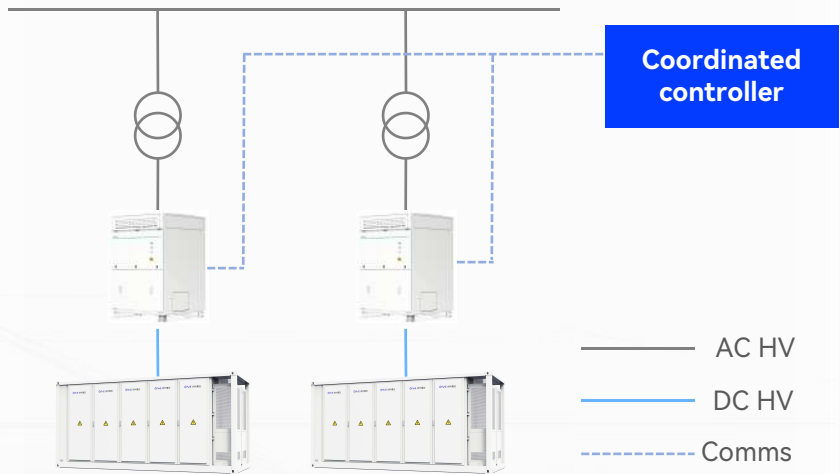
1P full-power mapping table
Only the 3.79 MWh container supports 1P functionality

T Soc	<0	0	5	10	20	30	40	50	60	70	80	90	95	100	>100
<-30℃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-30℃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-25℃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-20℃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-15℃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-10℃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-5℃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0℃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5℃	0	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0
10℃	0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0
15℃	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0
20℃	0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0
25℃	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0
30℃	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0
35℃	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0
40℃	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0
45℃	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0
50℃	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0
55℃	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0
60℃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65℃	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Independent operation

capable of forming its own grid as a grid-forming system.

Available only with Delta PCS, power range: 1MW–6.4MW.



Key Highlights

Real-Time Status Monitoring for Cloud Platforms

0 distance operation and maintenance



Real-time equipment monitoring

Energy Dispatch

Operational Analysis

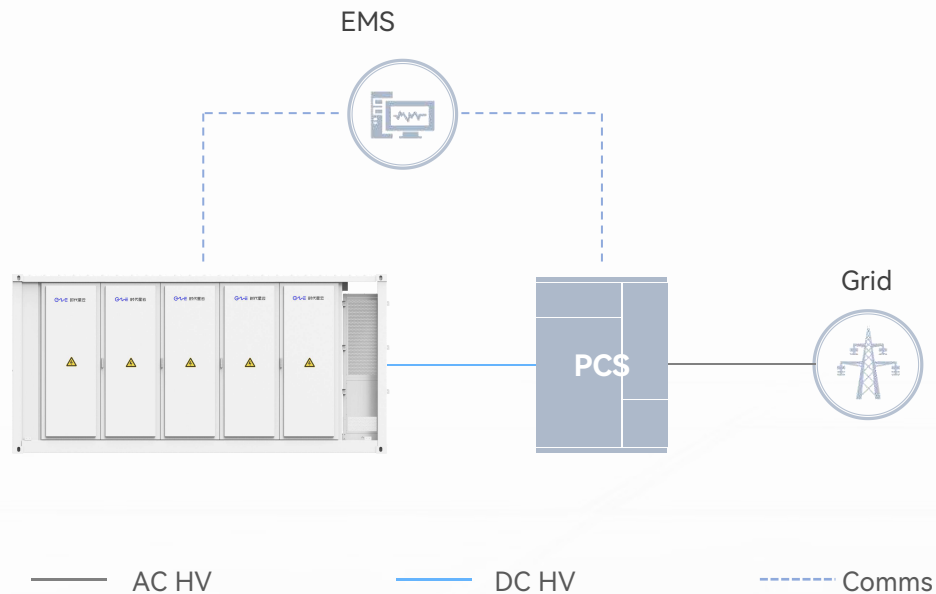
Fault Alarm and Diagnosis

Visual report statistics

Key Highlights STAR T Solution – Supports peak shaving, frequency and voltage regulation.

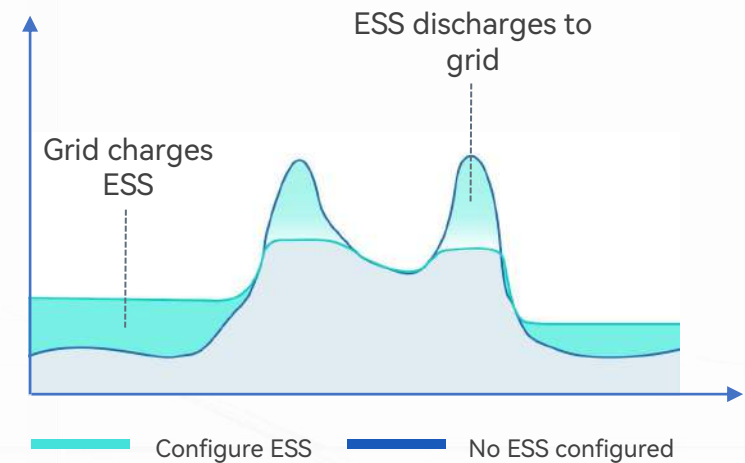
Freq & volt regulation

Container + PCS enables fast response to grid dispatch, ensuring power quality and stability.



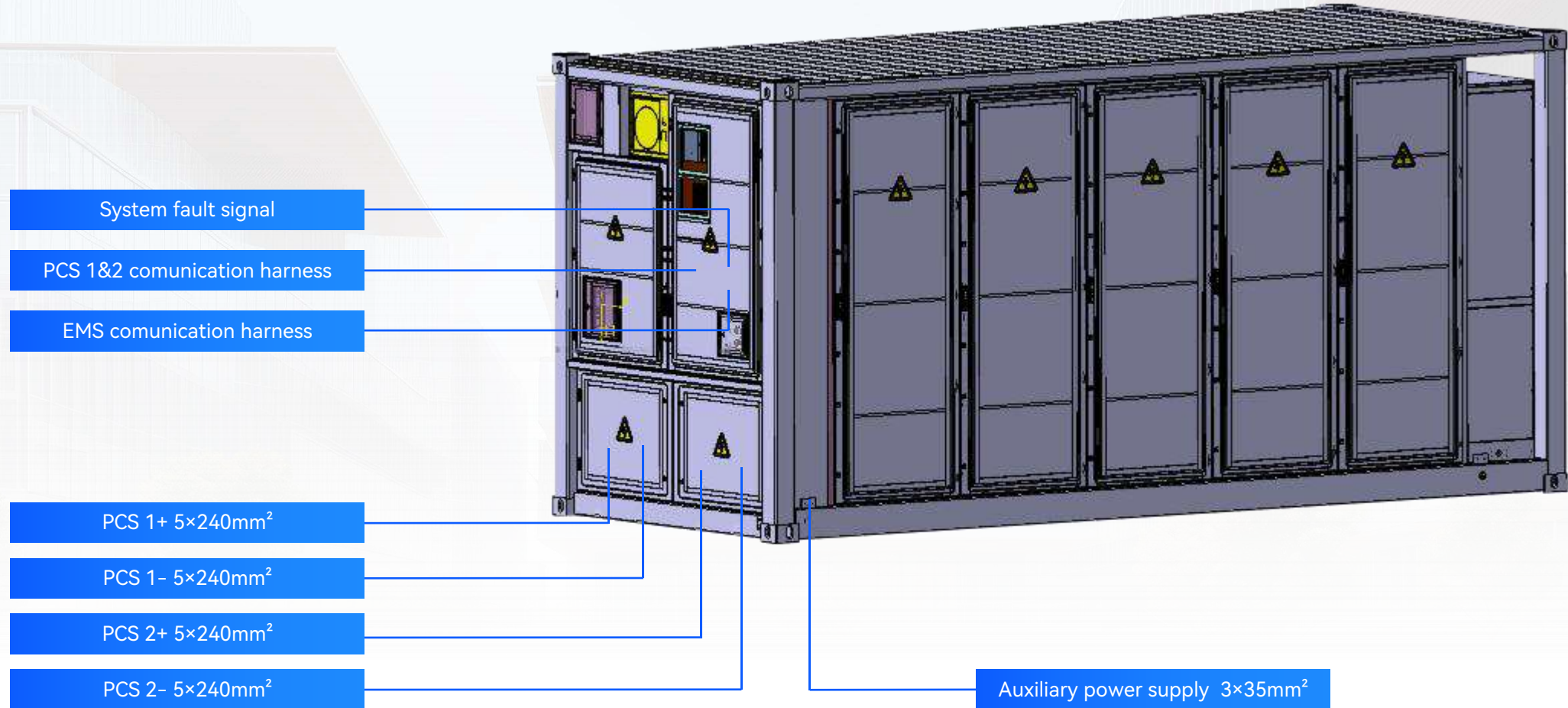
Freq & volt regulation

Charge/discharge schedule and power can be set via EMS. The system discharges during peak pricing and charges during off-peak, cutting grid usage and reducing energy costs through peak-valley arbitrage.

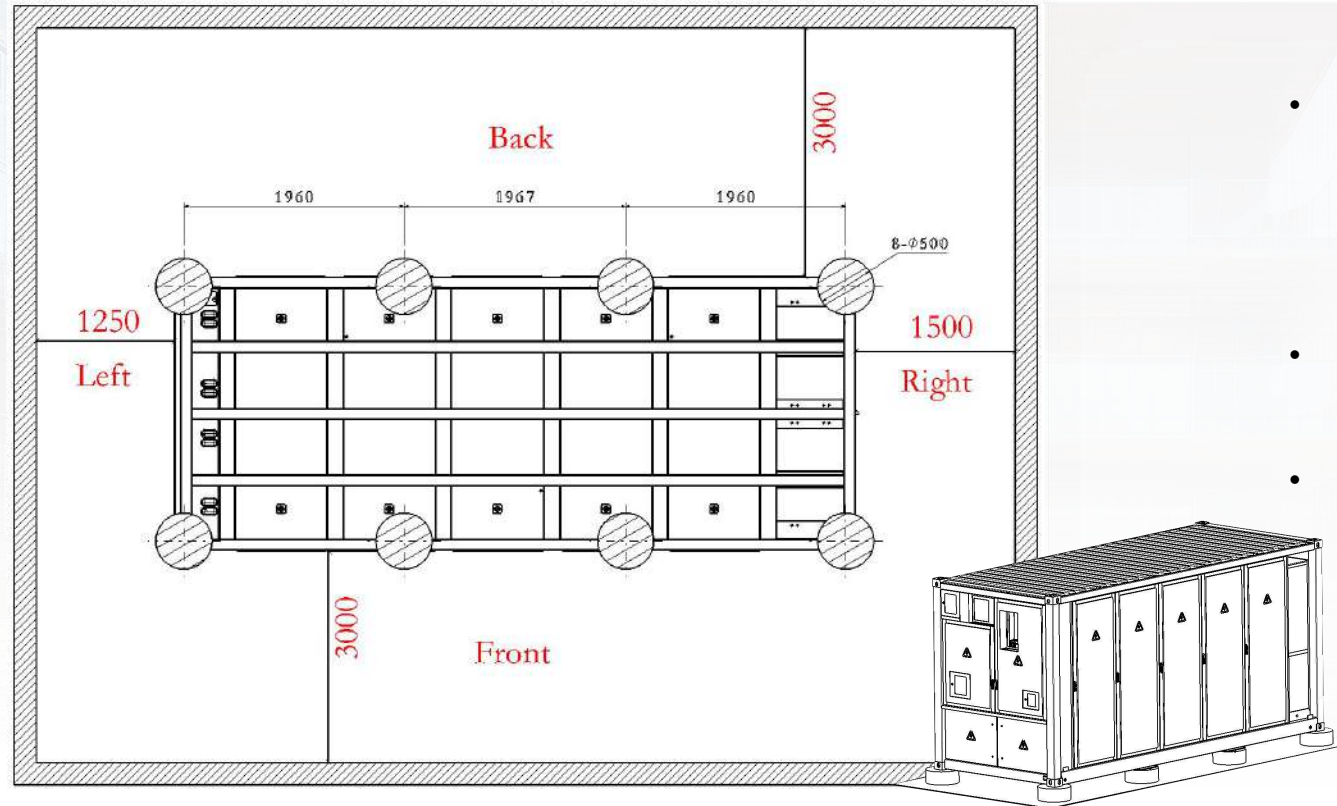


Scene Schematic

STAR T Installation Wiring Requirements



Scene Schematic STAR T Installation Wiring Requirements



- Base level: installation surface deviation $\pm 10\text{mm}$; support surface deviation $\pm 4\text{mm}/2\text{m}$; contact surface flatness $\pm 3\text{mm}$
- Support pillars: 8 pillars, each $\geq 6\text{T}$ load; total support $\geq 40\text{T}$
- Space: maintenance and cooling clearance reserved around system as per diagram

Product Specs: STAR T Noise Test

Hardware Version	N/A
Grouping Method	10P416S
Single-cell Voltage Range	2.8-3.6
Sample Voltage Range	1164.8-1497.6
Sample No.	1
Photo	

test environment

ambient temperature	23°C	relative humidity	70%
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test data

Test point location	P1	P2	P3	P4
Test data (dB (A))	77.1	80.5	82.1	77.5
Background noise (dB (A))	49.5	50.1	49.7	48.8



Special Accessories Introduction

NO.	Q	A
1	Flexible Configuration	1. Supports 5-10 clusters 2. Centralized/string-based options 3. Dual-system for 1P (standalone operation), single/dual for 0.5P
2	System Noise	< 85dB
3	External Connections	AC/DC power lines & communication lines (refer to harness manual)
4	Certifications	EN 602933-5-2:2020 EN 62477-1:2012+A11+A1+A12 EN IEC 61000-6-4:2019, EN IEC 61000-6-2:2019 IEC 62619: 2022, EN IEC 62619: 2022 IEC 63056: 2020 UL9540A UN38.3
5	Isolation Transformer	Required for high-power PCS integration
6	Thermal Management	1. Water chiller: 1P 40kW×2 / 0.5P 40kW×1 2. Dehumidifier: 3 units (battery room)
7	Fire Protection	1. Aerosol suppression 2. H ₂ /CO detectors (2 units) 3. Explosion vent fan 4. Water system (interfaces/piping)



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THANKS