



EMPOWERING A SUSTAINABLE FUTURE

HyperStrong Proposal for
3.45MW/ 10MWh BESS Project

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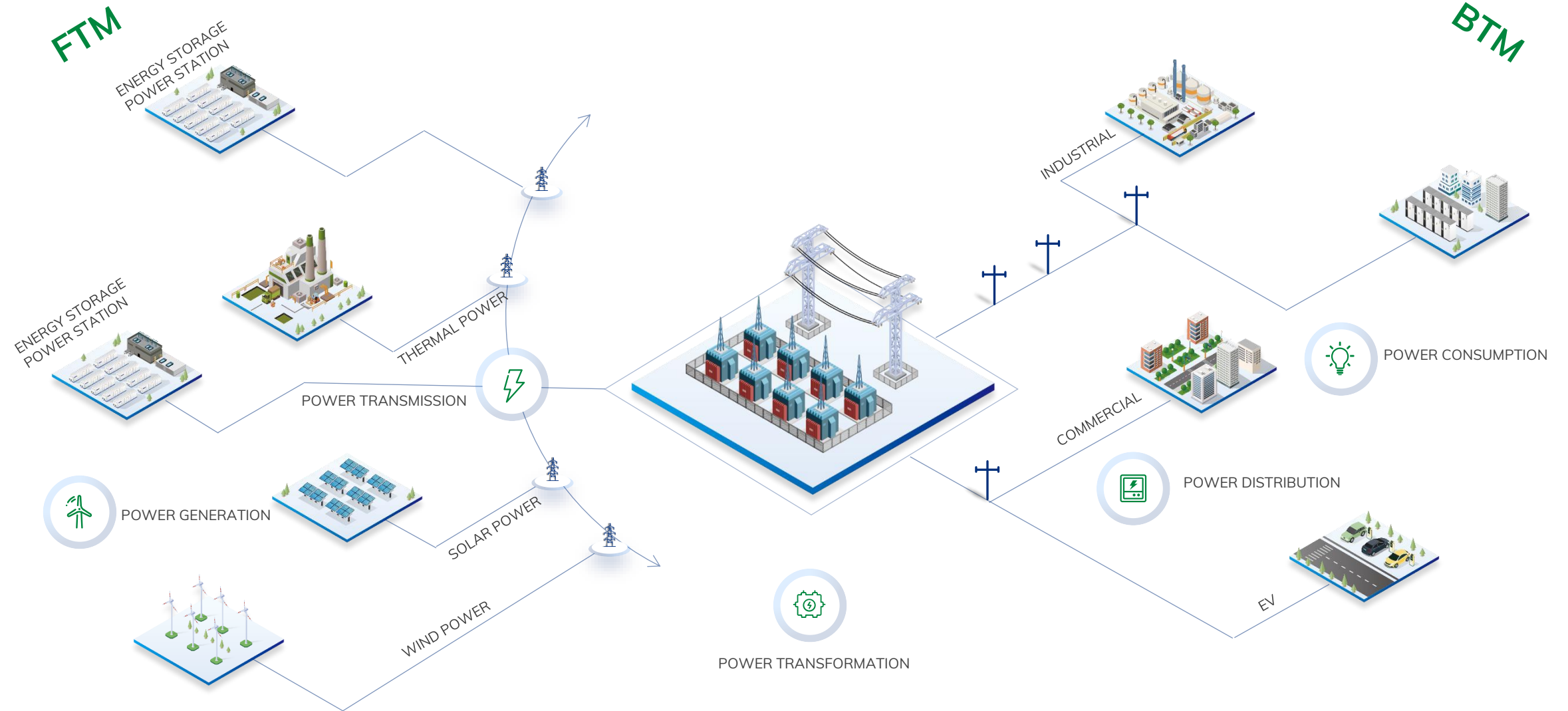
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WARRANTY & SERVICE

01 PRODUCT INTRODUCTION

SOLUTIONS FOR ALL SENARIOS





Wind farm

The combination of wind farms and energy storage ensures continuous power supply and addresses the issue of unstable wind energy production, enhancing reliability.



Solar farm

Photovoltaic power plants paired with energy storage are vital for stabilizing energy production and ensuring reliable electricity supply.



Thermal power plant

Combining energy storage with a thermal power plant enhances energy production flexibility, addresses peak demand fluctuations, and strengthens grid stability.



Other renewable energy power plants

Apart from wind and solar power, the integration of energy storage with other forms of renewable energy generation helps balance unstable sources and ensure reliable electricity supply.

Utility ESS

Wind farm

Solar farm

Balancing power supply

Thermal power plant

Load management

Enhance grid stability

Improve power quality

Peak shaving

Hyper-Block III



Highly Integrated

- Up to 5MWh capacity, 34.5% increase in energy density
- Adopting the integrated design of battery rack, PDU, and string PCS
- Compared with the traditional BESS system, the footprint is reduced by more than 5m², and the commissioning time by more than 4h
- Single-side opening design enables back-to-back container installation to optimize space utilization and reduce O&M workload



Safe and Reliable

- The Battery dispatching mechanism optimizes battery degradation and controls cell temperature difference within 3°C
- Both pack and system meet UN38.3 vibration and safety requirements, as well as more than 10 other global certifications
- "Intelligent O&M Key V2.0", an intelligent and user-friendly software designed by HyperStrong for the whole life cycle and all application scenarios
- Ensures more than 20 years of safe and stable operation



Outstanding Adaptability

- IP Rating: Container IP55 and Pack IP65
- Intelligent thermal management system guarantees system optimal performance
- Extensive environmental options and intelligent fault preventions ensures continuous system operation



Highly Secure

- Multi-dimensional sensors enable intelligent sensing of potential thermal runaway
- Multi-level intelligent AI control, unit-level UL9540A, UL9540 and cabin-level aerosols ensure the overall safety of the BESS



Standalone ESS

Renewable Energy with ESS

Frequency Regulation

C&I ESS

MAIN PRODUCTS | Liquid-cooling ESS

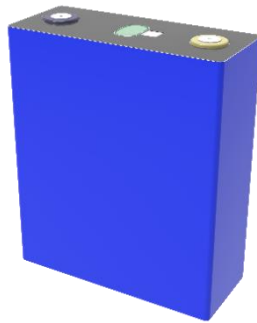


Hyper-Block III DC Block

Product Specifications			
Model name	HSL37001-05015	Operating Humidity	0~95%RH (Non-condensing)
Battery Type	LFP-314Ah	Operating Temperature(°C)	-30~55°C (> 45°C Derating)
Configuration	12P416S	Altitude(m)	≤3000
Rated Energy (kWh)	5015.96	Auxiliary Power Supply	480Vac 60Hz /400Vac 50Hz
Rated Voltage (Vdc)	1331.2	Communication Protocol	Modbus TCP, Modbus RTU
Voltage Range (Vdc)	1123.2~1476.8	Cooling Method	Smart liquid cooling
Rated Power	≤2500kW	Fire Suppression System	Cabin level aerosol(automatic), Ventilation system & Deflagration panel (optional)
Dimension (W*D*H) (mm)	6058*2438*2896	Certificate and Compliance	UL1973, IEC62619, UL9540A, CE, UL9540, NFPA855
Weight (kg)	≤45000	IP Rating	Pack-IP65/PDU-IP55/Container-IP55/PCS-IP66

Battery cell

The cell is a standard 314Ah lithium iron phosphate (LFP) prismatic cell produced by CATL, which is a tier-1 battery cell vendor. The battery is in high safety with long lifespan and great performance (cycle, charge and discharge).



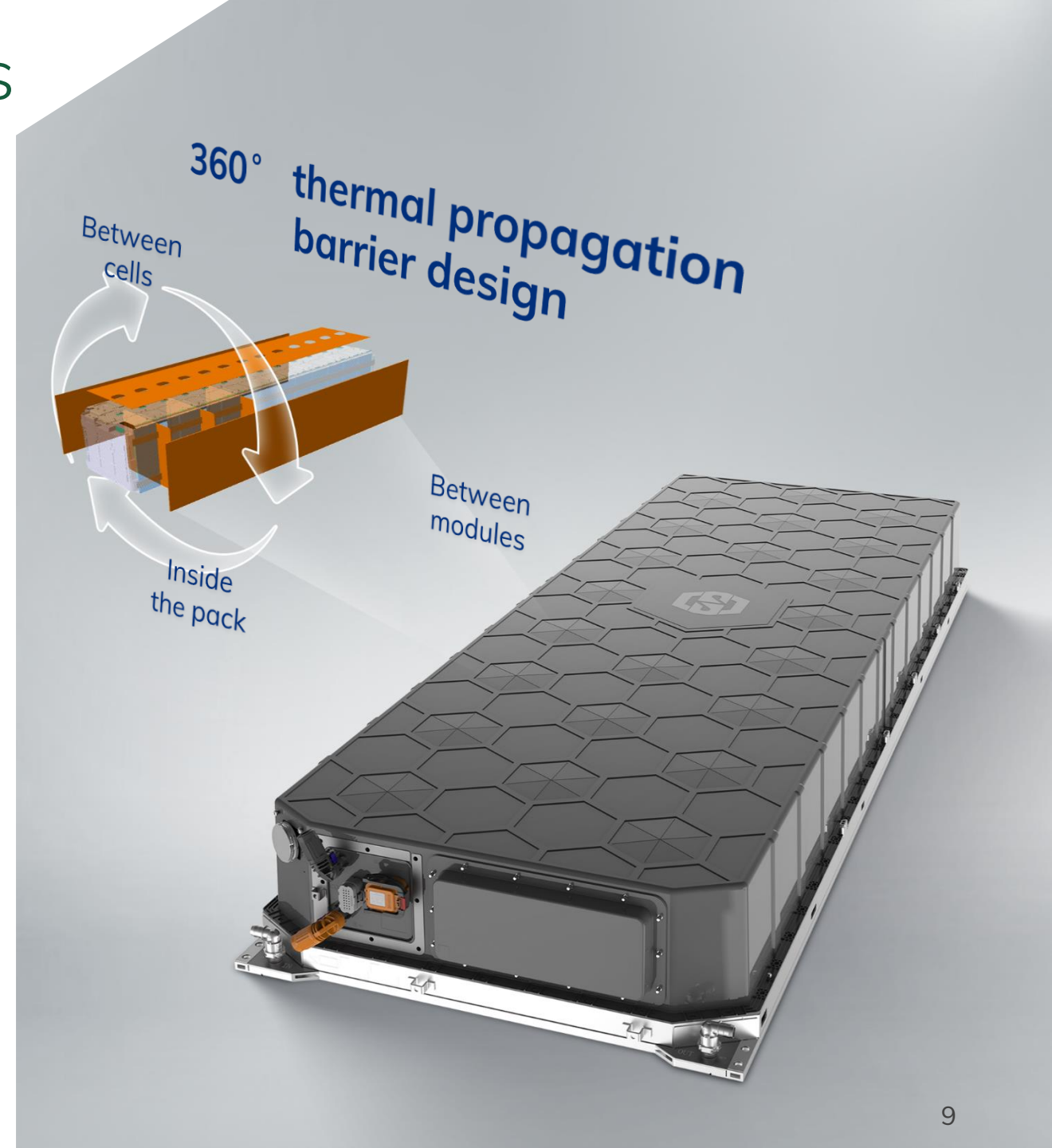
Cell	Item	Unit	Spec.
	Rated Capacity	Ah	314
	Rated Energy	Wh	1004.8
	Rated Voltage	V	3.2
	Rated Current	A	157
	Voltage Range	V	2.5-3.65
	Size (W*H*D)	mm	174.26*207.01*71.55
	Weight	kg	5.49±0.3
	Resistance	mΩ	0.18±0.05
	Operating Temp.	°C	0~60°C (Charge) -20~60°C (Discharge)

MAIN PRODUCTS | Liquid-cooling ESS

Battery module

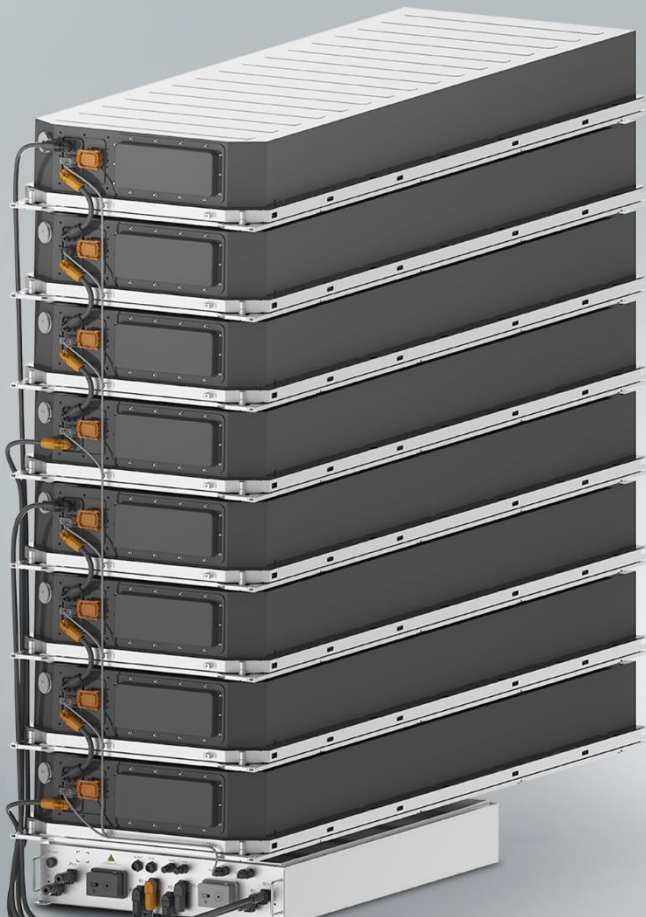
The battery module is composed of 104 battery cells in series and auxiliary parts (such as housing, terminals, acquisition circuit, BMU, etc.).

Item	Unit	Spec.
Cell	-	LFP-314Ah CATL
Configuration	-	1P104S
Rated Capacity	Ah	314
Rated Energy	kWh	104.50
Rated Voltage	V	332.8
Rated Power	kW	≤52.25
Voltage Range	V	260V ~ 379.6V
Size (W*D*H)	mm	790*2190*245
Cooling mode		Liquid cooling
Weight	kg	690±10



Battery rack

Battery rack
2-rack layout



Item	Unit	Spec.
Cell	-	LFP-314Ah
Configuration	-	1P104S
Rated Capacity	Ah	314
Rated Energy	kWh	104.499
Rated Power	kW	≤ 52.249
Rated Voltage	V	332.8
Voltage Range	V	260-379.6 V
IP Rating	-	IP65
Operating Temperature	°C	Charge: 0-55 Discharge: -20 to 55
Storage Temperature	°C	-35 to 60
Operating Humidity	-	0-95%RH
Altitude	m	3000
Communication Mode	-	Daisy Chain
Size (W*D*H)	mm	(790±5)*(2190±15)*(245±5)
Weight	kg	665±10
Pack Acquisition	-	Voltage Acquisition: 104 pcs

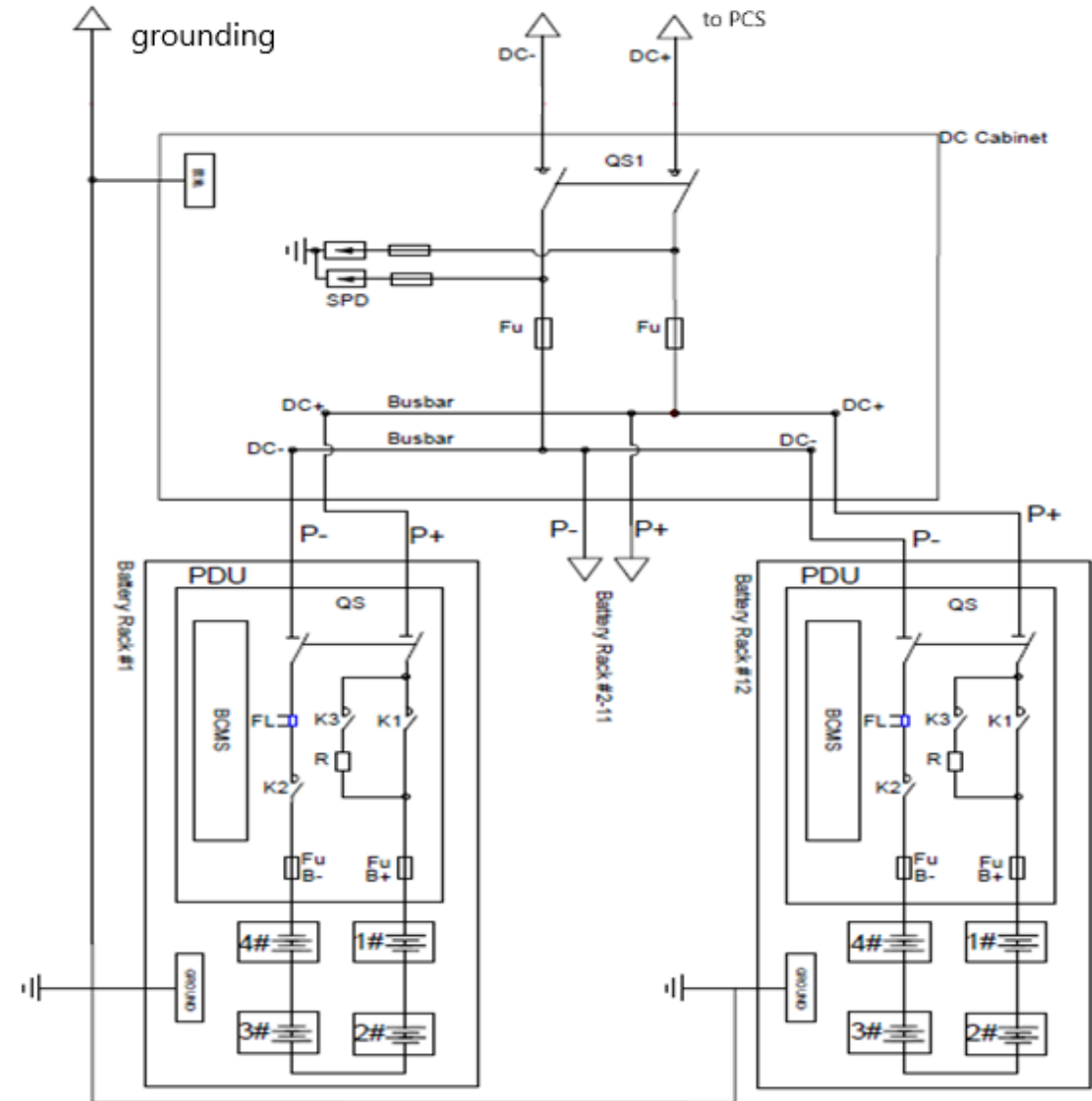
MAIN PRODUCTS | Liquid-cooling ESS

Primary system circuit diagram-DC Block

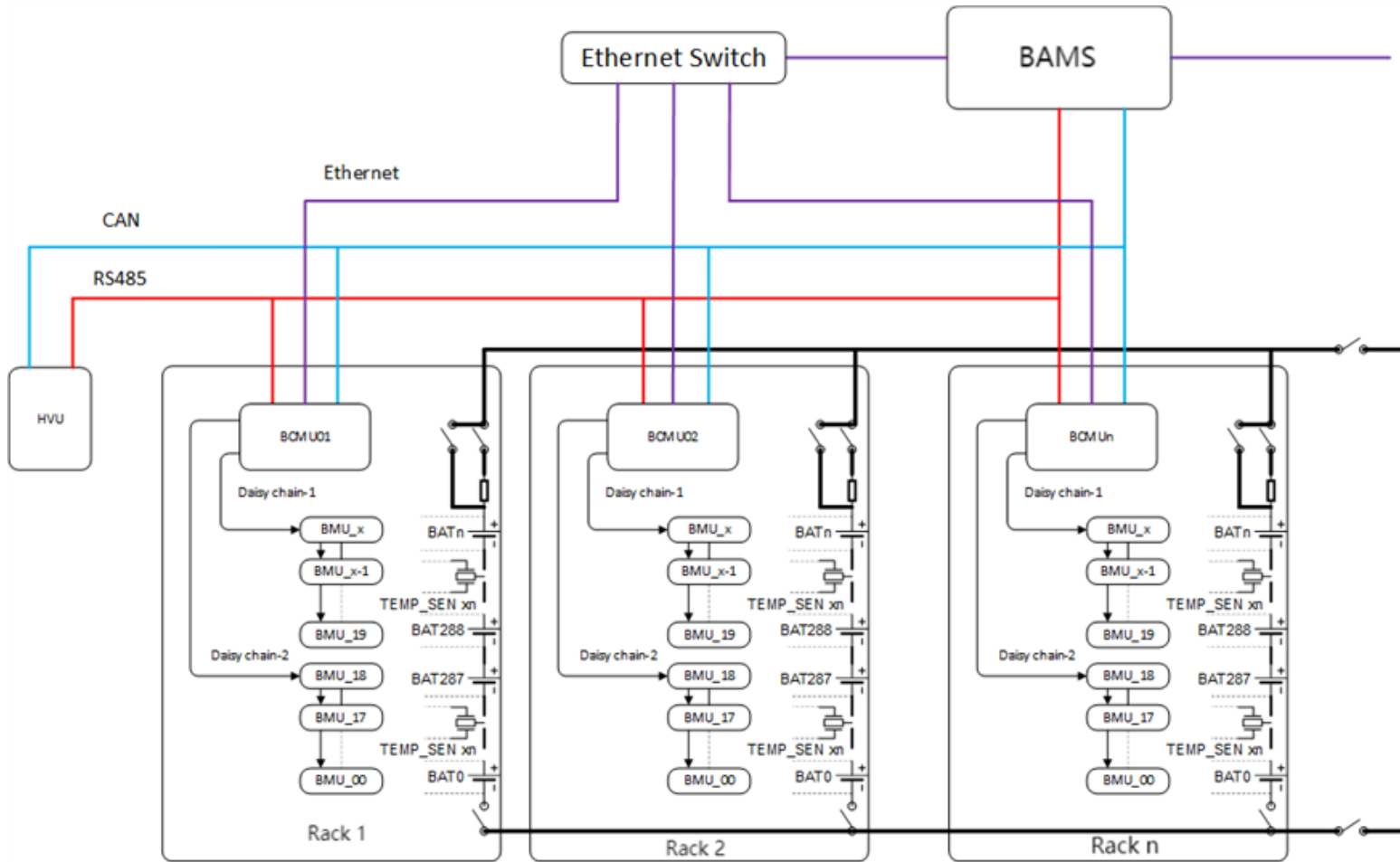
BCP(Control cabinet)



Battery rack*12



Communication Scheme



» BAMS

function

- Battery system control and protection
- Communication with PCS and EMS

» BCMS

function

- Data analysis
- Capacity evaluation
- SOC evaluation
- Troubleshoot
- Safety control protocol

» BMU

function

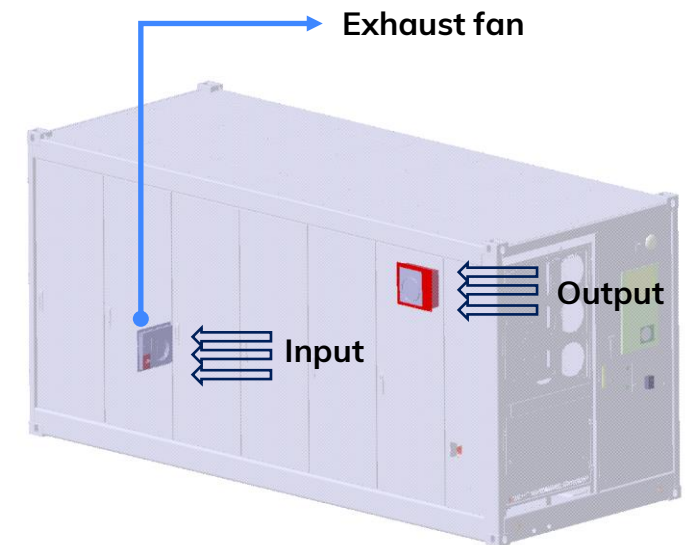
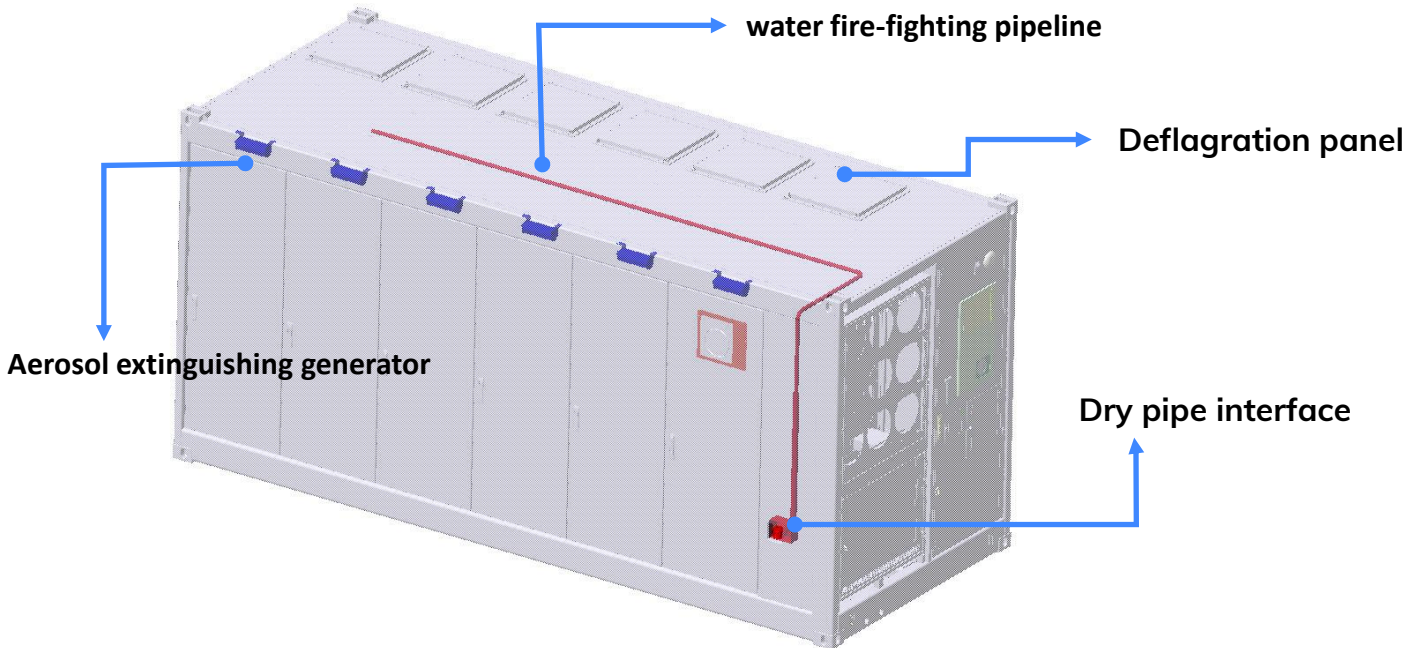
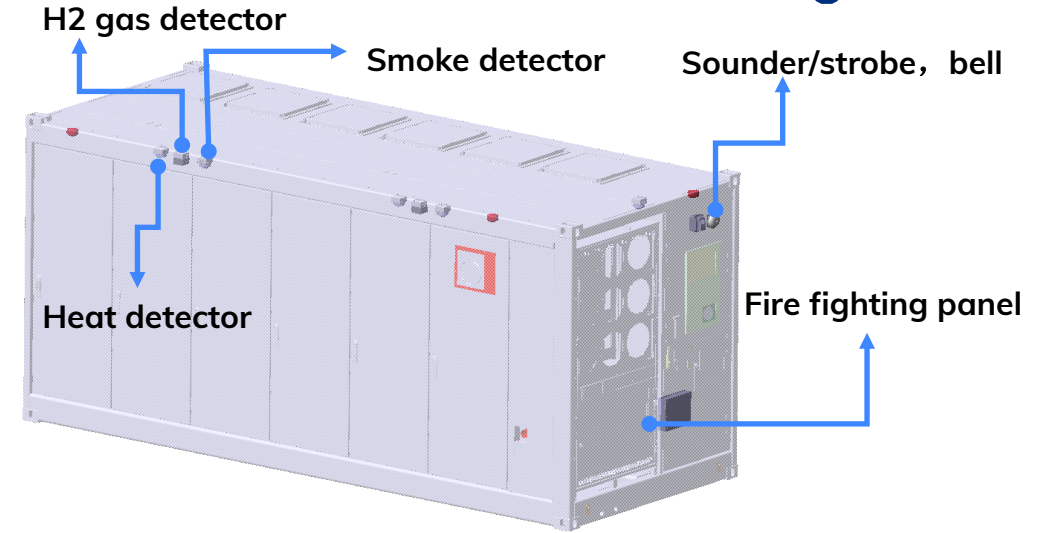
- Cell level operation data collection

MAIN PRODUCTS | Liquid-cooling ESS

Fire suppression system

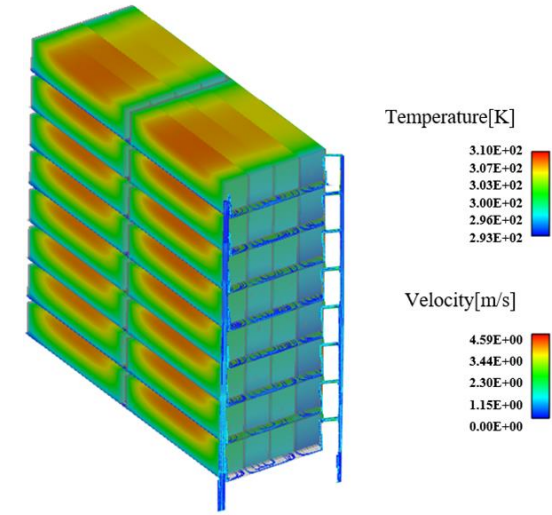
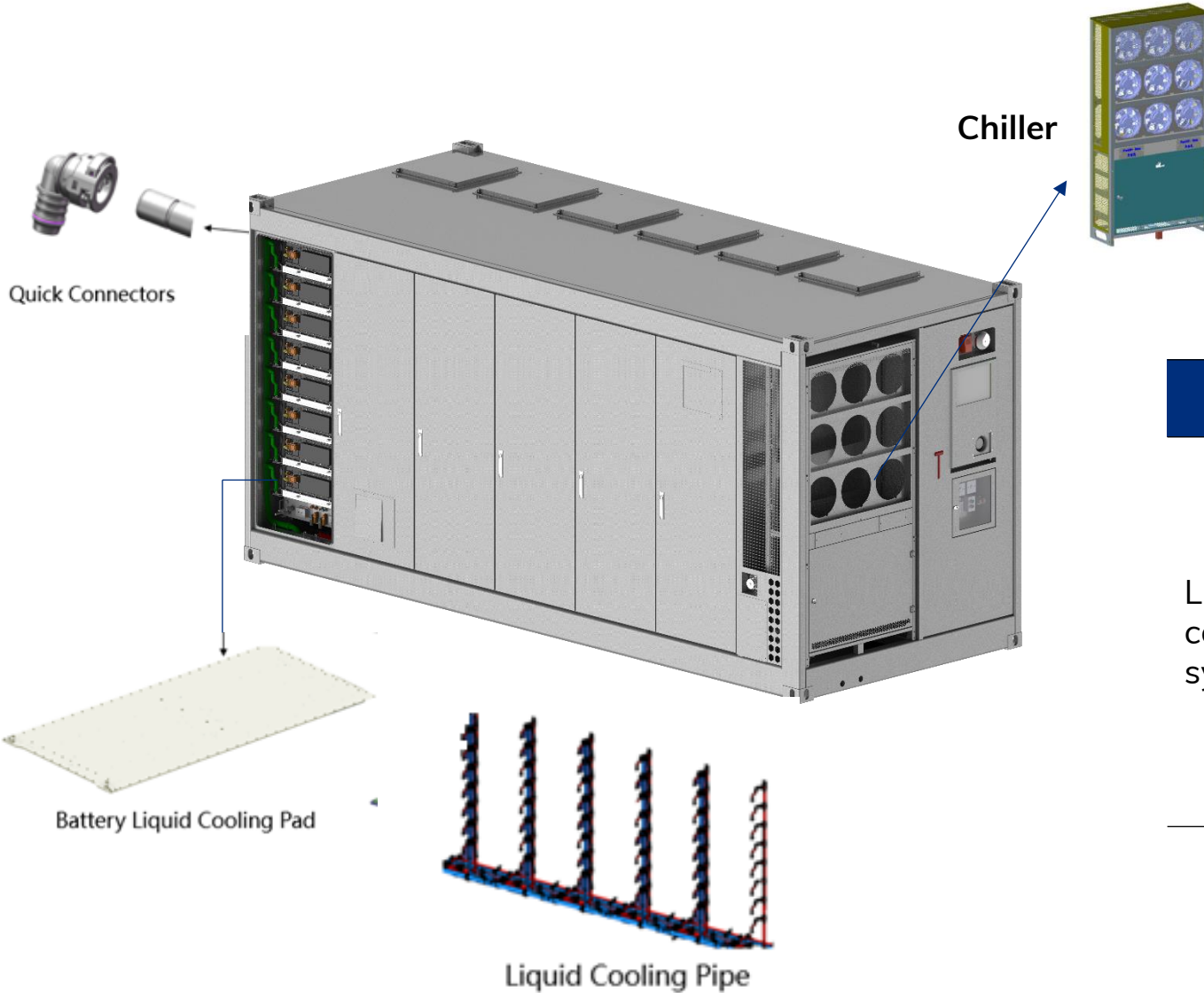
Fire suppression system

- Detection & control system
- Aerosol plus dry-pipe fire suppression system
- Venting system & Deflagration panel design



MAIN PRODUCTS | Liquid-cooling ESS

Thermal management system-DC Block



System	Item	Function
Liquid cooling system	Thermal Management Type	Liquid cooling/heating
	Cooling Capacity	60kW
	Heating Capacity	24kW
	Noise Level	≤80dB
	Battery Temperature performance	System temperature difference ≤ 3 °C

EMS - Fractal



APPLICATION STACKING

Fractal EMS provides applications that are customizable and stackable. Applications can respond to market or sensor inputs. Through the UI, applications can operate concurrently (stacks) and be prioritized (e.g., perform application 2 only if application 1 is not active). Applications can also be configured to use a certain percentage of the asset (application 1 has access to 60% of the BESS rated power, Application 2 has access to 40% of BESS rated power). Applications can be scheduled to operate during certain hours of the day.

MERCHANT SERVICES



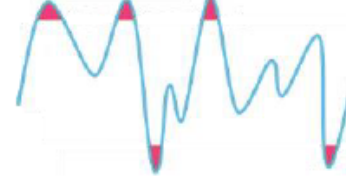
- Energy Arbitrage
- Frequency Regulation
- Spinning Reserves
- Non-Spin
- Fast Frequency
- Ramp Support
- EIM

PEAK SHAVING



- Coincident Peak Shaving
- Demand Charge Mitigation
- TOU Energy Shifting
- Congestion Relief
- Load Leveling

RELIABILITY



- Resource Adequacy
- Capacity
- Volt / Var Support
- Blackstart
- T&D Deferral
- SOC Balancing

RENEWABLES



- Shifting
- Smoothing
- Firming
- Clip Charging
- PV Self Consumption

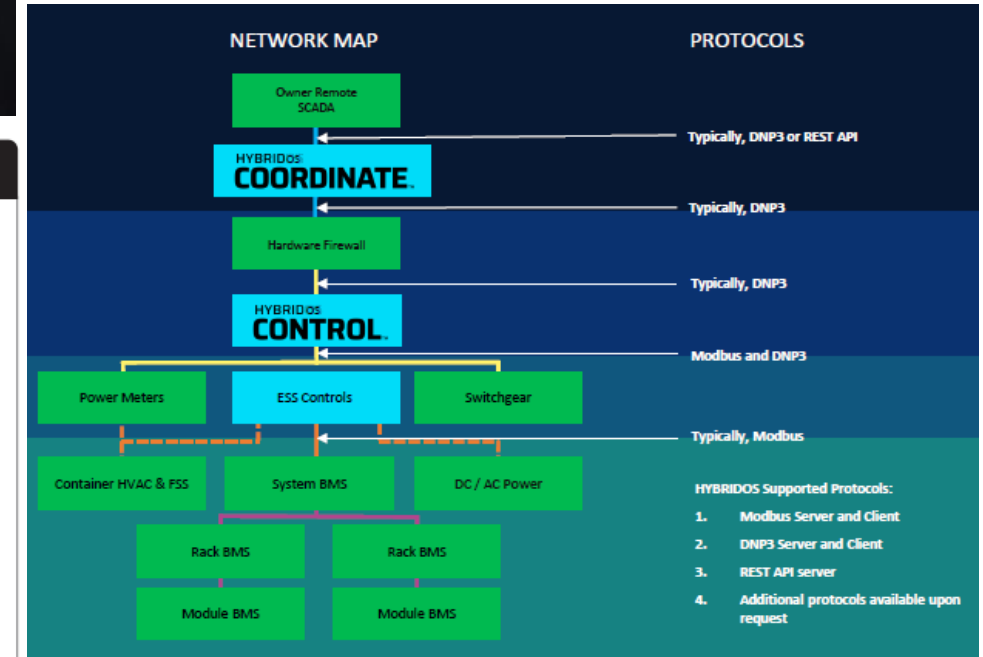
MAIN PRODUCTS | EMS

EMS – Flexgen



HYBRIDOS **CONTROL.**

<h3>ESS BLOCK</h3> <h4>BATTERY CONTROL</h4> <ul style="list-style-type: none"> ✓ Asset Control <ul style="list-style-type: none"> ✓ Maintenance Mode ▣ Calibration and Capacity Testing 	<h3>STORAGE</h3> <h4>POWER DISPATCH</h4> <ul style="list-style-type: none"> ▣ Active Power <ul style="list-style-type: none"> ✓ Active Power Setpoint ✓ Active Power POI Limits ▣ Energy Arbitrage ▣ Target SOC ▣ Reactive Power <ul style="list-style-type: none"> ✓ Reactive Power Setpoint ▣ Power Factor Mode ▣ Watt-Var Mode ▣ Reactive Closed Loop Control ▣ Loss Compensation <ul style="list-style-type: none"> ✓ Feed-forward Control ✓ Closed Loop Control <h4>GRID STABILIZATION</h4> <ul style="list-style-type: none"> ▣ Voltage Regulation <ul style="list-style-type: none"> ✓ Automatic Voltage Regulation ▣ Frequency Regulation <ul style="list-style-type: none"> ✓ Frequency Response Mode <h4>SITE SCHEDULING</h4> <ul style="list-style-type: none"> ▣ Scheduler <ul style="list-style-type: none"> ✓ Peak Shaving ✓ Day Ahead ✓ Weekly and Monthly Recurring Events ✓ Time of Use 	<h3>MERCHANT</h3> <h4>US MARKET PARTICIPATION</h4> <ul style="list-style-type: none"> ● ERCOT <ul style="list-style-type: none"> ✓ Regulation Services ✓ Response Reserve Services ✓ Frequency Response Services ● CAISO* <ul style="list-style-type: none"> ✓ CAISO ADS ● ISONE* ● PJM* ● MISO* ● SPP* 	<h3>RENEWABLES</h3> <h4>RENEWABLE INTEGRATION</h4> <ul style="list-style-type: none"> ▣ Solar Features <ul style="list-style-type: none"> ✓ Solar Curtailment ✓ Selective Solar Charging ▣ Direct Asset Dispatch ▣ Solar Shed ▣ AC PV Clipping Capture <h4>DC COUPLED</h4> <ul style="list-style-type: none"> ▣ DC Coupled Integration <ul style="list-style-type: none"> ✓ DC-coupled Battery ✓ DC PV Clipping Capture ▣ DC-coupled Solar
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HYBRIDOS **COORDINATE.**

<h4>FLEET MANAGEMENT</h4> <ul style="list-style-type: none"> ▣ Multi-site Oversight <ul style="list-style-type: none"> ✓ Fleet-Level Dashboard ▣ Real-time Dispatch <ul style="list-style-type: none"> ✓ Overrides ✓ Verbal Dispatch 	<h4>FLEET SCHEDULING</h4> <ul style="list-style-type: none"> ▣ Scheduler <ul style="list-style-type: none"> ✓ Multi-site Dispatch
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HYBRIDOS **ANALYZE.**

<h4>BASIC MONITORING</h4> <ul style="list-style-type: none"> ▣ Site Activity <ul style="list-style-type: none"> ✓ Key Metric Data Visualizations ✓ Digital Twin Performance Index ▣ Reporting <ul style="list-style-type: none"> ✓ Monthly Performance Report ✓ Standard Alerting ▣ Warranty Tracking <ul style="list-style-type: none"> ✓ OEM Compliance & Equipment Health 	<h4>PREMIUM PERFORMANCE INSIGHTS</h4> <ul style="list-style-type: none"> ▣ Predictive Site Analytics <ul style="list-style-type: none"> ✓ Proactive Optimization Recommendations ✓ Underperformance & Failure Identification ✓ Customized Alerts, Alarms and Reporting ▣ 24/7 ROC Support & Troubleshooting (Lifecycle Services sold separately)
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02 TECHNICAL PROPOSAL

Project Design for the DC Block Solution

Project BESS configuration

Item	Value
Usable capacity @BOL	3.45MW/10MWh
Installed nameplate capacity @BOL	10.03MWh
BESS Configuration	2*5.015MWh BESS

The initial supply of this project is 2 sets of 5.015MWh BESS unit, and total initial installation capacity is 10.03MWh.

Each 5.015MWh BESS unit includes the following components:

- 2 sets of 5.015MWh BESS battery containers, each of which integrates 12 battery strings, BMS, liquid cooling system, fire protection system, control cabinet, etc.
- EMS suppliers could be selected by the customer. HyperStrong recommends Flexgen, Fractal, Fluence, Wartsila, etc.

Project Design for the DC Block Solution



Scope of supply

No.	Device	Specification	Qn.	Unit	Remark
1	Hyper-Block III DC Block 12-rack	5.015MWh Liquid-cooling BESS container	2	set	Each system consists of 1.1~1.6
1.1	Battery rack	1P416S,1040V~1500V,Rated energy: 418kWh Cell : ≥314Ah@25°C,0.25P,BOL	12	pcs	Cell from CATL
1.2	BMS	HyperBMS V2.1	1	set	/
1.3	Liquid-cooling system	>50kW liquid cooling machine & self-design double ring cooling pipes	1	set	/
1.4	Fire Suppression System	Smoke detection; Water dry pipe; Heat detection; Flammable gas detection; Venting system; Aerosol fire suppression.	1	set	Compliant to NFPA855
1.5	BCP	Include control, distribution and communication area, AC switch box	1	pcs	/
1.6	20ft Container	6058*2438*2896mm	1	pcs	/
2	EMS	Energy management system	1	set	/

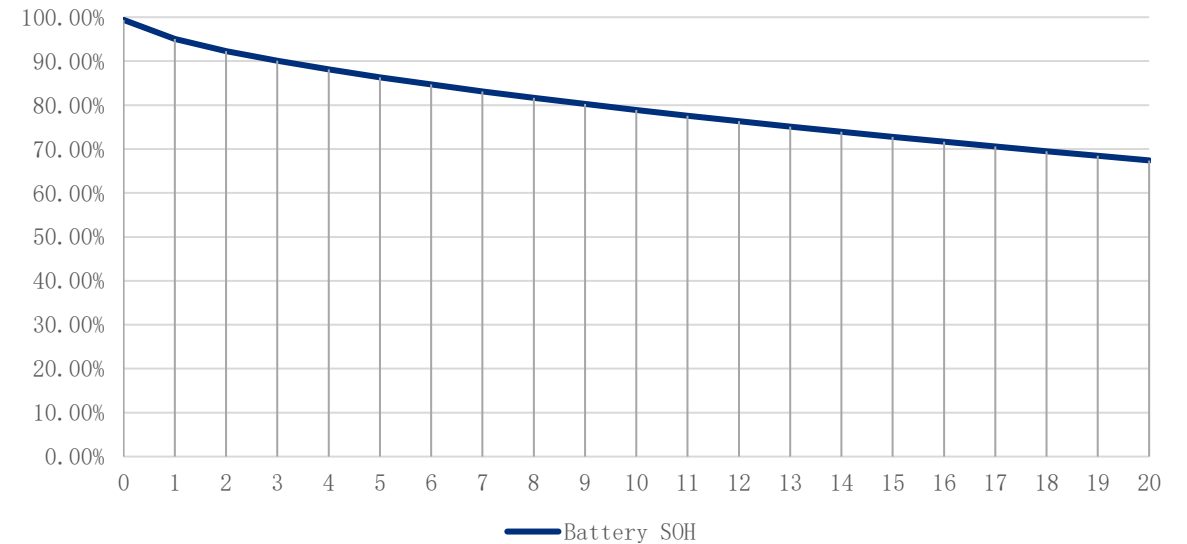
Project Design for the DC Block Solution



Performance & Degradation

Working conditions:
 25±5°C
 ≤0.33P
 100%DOD
 365 cycles/year

Battery Degradation Curve



Year	0	1	2	3	4	5	6	7	8	9	10
SOH	99.39%	95.02%	92.31%	90.08%	89.12%	86.33%	84.68%	83.12%	81.65%	80.24%	78.89%
Year	11	12	13	14	15	16	17	18	19	20	
SOH	77.60%	76.34%	75.12%	73.94%	72.79%	71.66%	70.56%	69.49%	68.44%	67.41%	

Project Design for the DC Block Solution

Performance & Degradation

The total usable capacity at POC at the end of each year during the project lifecycle is shown in the table on the right side.

Parameters used during the design:

- DOD: 100%
- DC Cable Efficiency: 99.9%
- Auxiliary Loss Plus BOP loss: 1.5%
- MV Transformer Efficiency: 99%
- PCS efficiency: 98.5%

<i>Year</i>	<i>Total usable capacity @POC(MWh)</i>
0	9.27
1	8.85
2	8.59
3	8.38
4	8.19
5	8.02
6	7.86
7	7.71
8	7.57
9	7.44
10	7.31
11	7.19
12	7.07
13	6.95
14	6.84
15	6.73
16	6.62
17	6.52
18	6.41
19	6.32
20	6.22

03 WARRANTY & SERVICE

Supply, Warranty & Service

Product Warranty, qualification & after-sales service

Warranty

Standard warranty is 5 years. From year 6 to 20, warranty service is available with extra cost.

Battery

HyperStrong integrates batteries from CATL. The nominal capacity is 314Ah in the proposal. The battery system is compliant with UL certification and IEC certification.
Including but not limited to UL1973/IEC62619/UL9540A/UL9540/UL1741 certificates

	Client	HyperStrong	Scope	Support Level
Service Level 1	√ (after Training)		Easy repairs.	Remote
Service Level 2		√	Replacement of consumables, spare parts	Local
Service Level 3		√	Complex troubleshooting	Local
	Client	HyperStrong	Scope	Support Level
Preventative Maintenance	√ (after Training)	√	One every 6-month maintenance intervention by HyperStrong, one by customer every 3 months	Local

We address key concerns and create the diverse long-term value for clients

Technical Expertise

More than a decade dedicated to ESS with founders' technological expertise
All-scenario solution for the energy 3.0 era empowered by AI technology



Safe & Reliability

Large-scale applications exceeding 40GWh
Tested and proven reliable products through practical application with zero safety issues
More accurate SOX calculation based on massive Hyper-cloud data.



**3.0
AI Era**

Customization

Integration solutions incorporating multiple cell types, PCS, and EMS to meet diverse customized demands




Support & Service


Long-term commitment to the global market with local O&M capabilities




Making energy storage simple

Learn more about HyperStrong

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