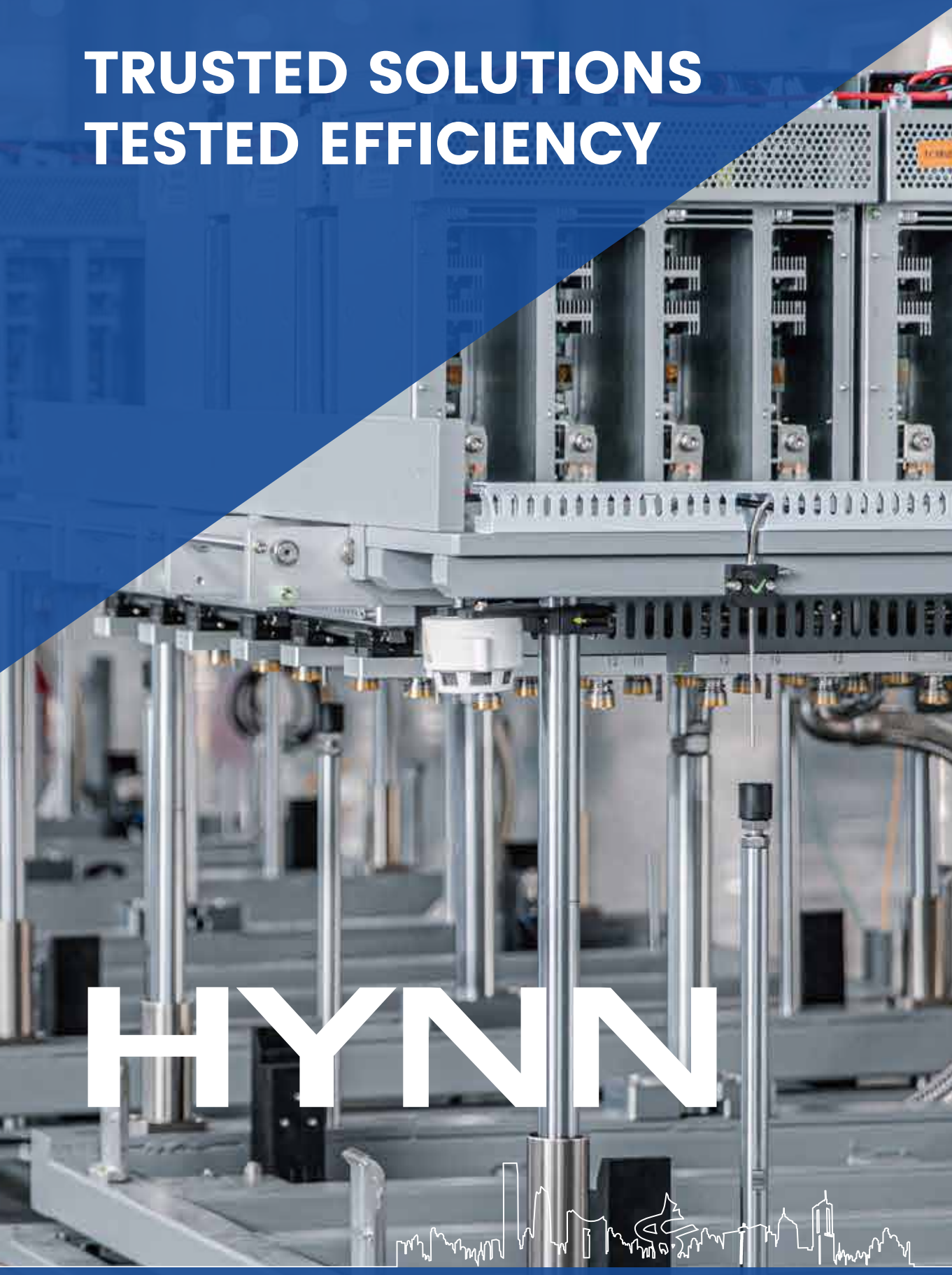
HYNN TECHNOLOGY

TRUSTED SOLUTIONS
TESTED EFFICIENCY



HYNN

Guangdong Hynn Technology Co., Ltd.

HYNN TECHNOLOGY

Top Supplier for Battery Manufacturing Solutions

HYNN TECHNOLOGY

TOP SUPPLIER FOR BATTERY POST-PROCESSING

SMART INTEGRATED ENERGY SOLUTIONS FOR GLOBAL CLIENTS

Over 19 Years of Experience in Li-ion Cell Intelligent Manufacturing Equipment

500+GWh
Accumulated Delivery

100,000+㎡
Office and Factory Area

2000+
Global Staff

500+
R&D Staff and Technicians

10+
Delivery to Overseas Countries

7+
Foreign Subsidiaries

Established in 2006, HYNN TECHNOLOGY has been committed to providing intelligent production lines, full life cycle testing lines and smart integrated energy solutions for all scenarios, and has become one of the tier–one suppliers in global market.

The company has more than 2,000 employees, distributed in China, Germany, France, Sweden, Japan, South Korea, The United States, etc., has an R&D and technician team of more than 500 people.

To date, HYNN has delivered cell production and testing lines to 10 countries and more than 42 domestic cities in China mainland, accumulated over 500 GWh.

Under the intense challenges of mass production lines, HYNN acquired rich tech and project experience, hence has grown into a core supplier of the world's leading battery manufacturers, car makers, ESS integrators, etc.

HYNN

OUR VISIONS AND MISSIONS

To be a global tier–one equipment and solution supplier in new energy industry.

Enhance the competitiveness of customers through our innovation.

Maximizing our customers value is to realize HYNN's value.

Improve manufacturing efficiency.

Make energy greener, safer and more affordable.

OUR VALUES

1

INNOVATION

Next generation cell
Next generation process
Next generation factory

2

SUSTAINABLE

High efficiency, less consumption

3

EXPERTISE

Through focus and efforts, pursuing greatness

HONOR AND QUALIFICATION

ISO9001: 2015 Certified
ISO45001: 2018 Certified
ISO14001: 2015 Certified

CE Certified

UL Certified

VDA Certified

Chinese National High-tech Company Certificate

10+ International PCTs, **200+** Chinese Patents

CUSTOMERS AND PARTNERS

CATL
ACC Automotive Cells Co
Panasonic
NOVO A joint venture between northvolt | VOLVO
PowerCo
Mercedes-Benz
BMW
saft
SIEMENS
EVE
REPT
GREAT POWER
SVOLT
HTHIUM
PetroChina
SERMATEC
LISHEN
Gotion
BASQUEVOLT
BEYONDER

* Only parts of the clients. Names not listed in order

Application Scenarios

Application Scenarios

LiB Cell Finishing Line

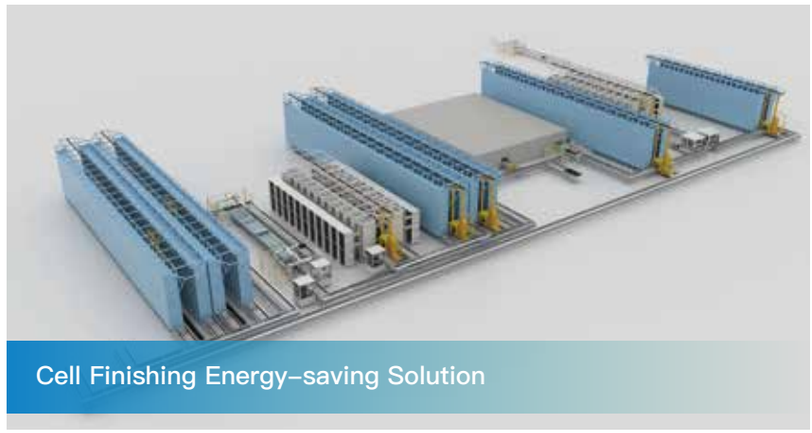
Energy System Matched Solutions

Module & PACK Testing Solutions

Software System

Product Category

LiB Cell Manufacturing & Testing



Cell Finishing Energy-saving Solution

Industrial & Commercial Parks

Micro-grid Energy-saving D-bus Solution

Solar Storage Station

Energy Storage System Solution

Charging & Swapping Station

Solar, Storage, Charging and Testing Integrated Solution

Cell Formation & Test

Energy-saving Testing Solution

Lab

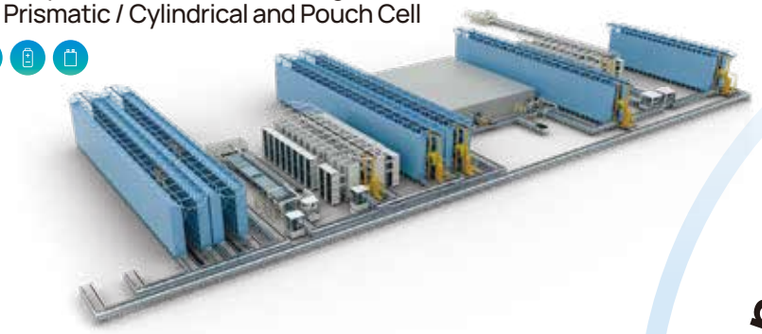
Lab Testing Solution

Business Panorama

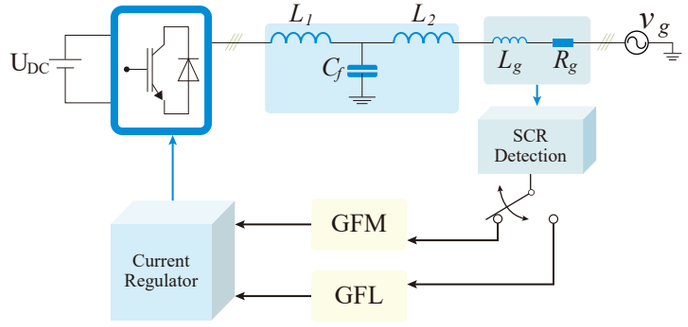
Renewable Energy Full Life-Cycle Applications

Cell Formation & Test

Turnkey Automated Cell Finishing Solutions
for Prismatic / Cylindrical and Pouch Cell



Comprehensive & Reliable Power Electronics Technology



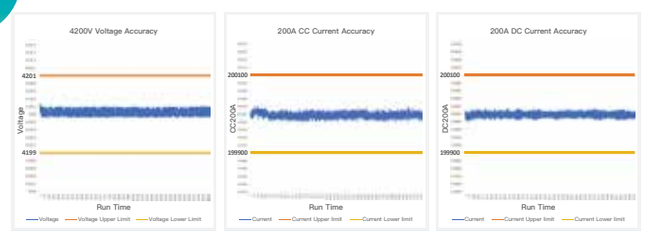
Module PACK Test & Application

PACK Test

Charging / Swapping Station

Energy Storage Battery Test

Cell-Level Control Technology



High Precision and Stability Voltage Control

High Precision and Stability Current Control

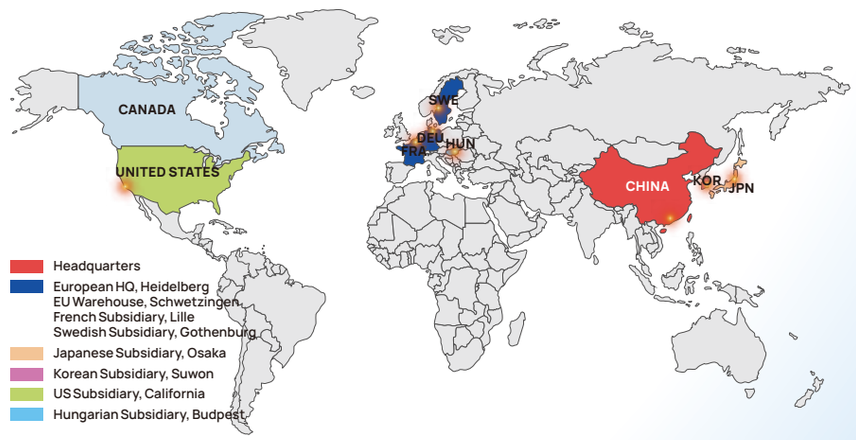
High Precision and Stability Current Control

Energy Storage Products & Solutions

Renewable Power Station

Micro-Grid

Global Turnkey Delivery Experience

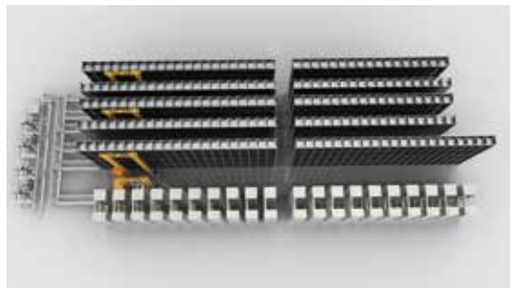


Application Scenarios

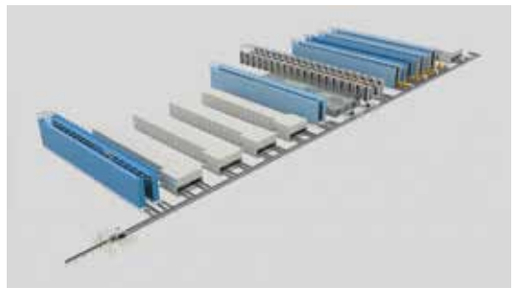
Core Advantages

TOP SUPPLIER FOR BATTERY MANUFACTURING SOLUTIONS

Post-processing line prismatic cell



Post-processing line cylindrical cell



Post-processing line pouch cell

Overview

HYNN supplies the overall solution of battery formation and grading, from 1st filling to sorting & packaging. We offer the most appropriate systematic proposal based on customer's condition, such as battery production process, equipment construction, logistics planning, production management systems and so on. We provide a variety of customized functions and offer tailored high-yield production lines.

Application Scope

The lithium battery production post processing: code scanning, tray loading, hot-pressing formation, high-temperature standing (or soaking), room temperature standing, grading (or aging), OCV/IR, DCIR, and sorting and packaging.

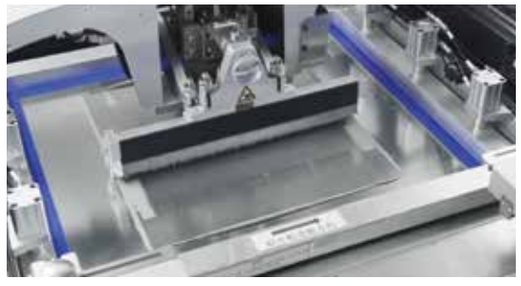
System Characteristics

With the tray as carrier, the three-dimensional racks, lane stacker cranes, exit/entrance working station, robot arms, barcode scanning systems, automatic conveyor systems, MES and WCS systems constitute a complete and closed loop of power battery production automation logistics system.

Functional Characteristics

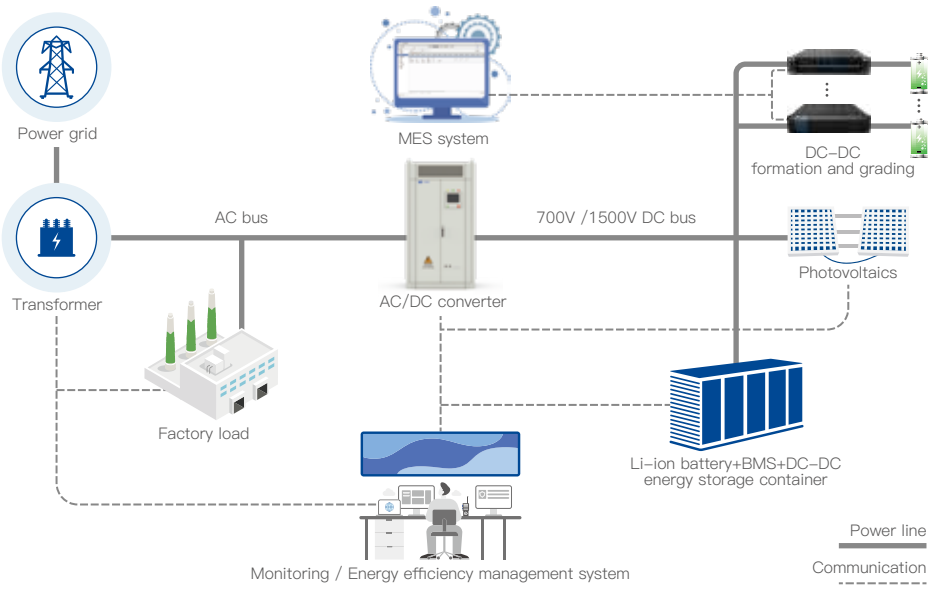
The battery formation & grading line use trays as the carrier, with cells are placed on the tray and transferred to various process stations for testing. Barcode is adopted to monitor and track product information in real-time. The system is highly integrated and automated, with significant production efficiency.

The line is integrated with equipment, automated mechanical logistics, and production and manufacturing execution management software, all process stations are connected into a large system. Through technological management, worker can achieve on-site unmanned production as long as they operate on the screen, which is suitable for large-scale and consistent production, and has the advantages of saving manpower, improving efficiency, and stabilizing production capacity.



SOLUTION HIGHLIGHTS

Energy-Storage-System (ESS) D-Bus Solution



Design Principle

AC/DC converters, energy storage containers, and DC/DC formation and grading are electrically connected through 700V/1500V DC bus coupling. The plant energy can be dispatched in real time by the EMS energy management system.

Advantages

20%

Energy Saving

Compared with the traditional format, the DC bus voltage is high, the current is small, the cable loss is relatively reduced and the overall efficiency of the system is improved.

10%

Overall Cost

Compared with the traditional solution, AC/DC adopts high–power all–in–one machine, and the overall cost can be reduced by more than 10%.

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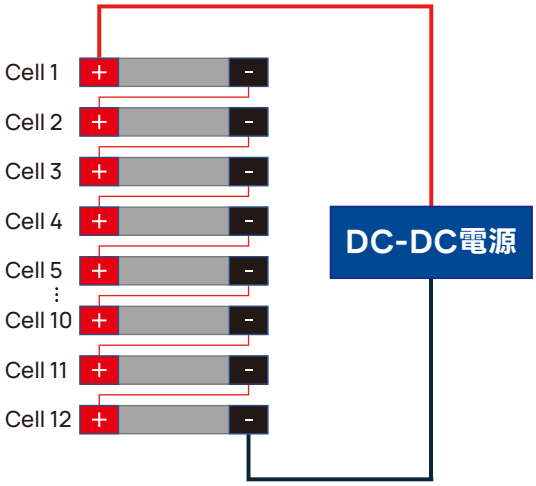
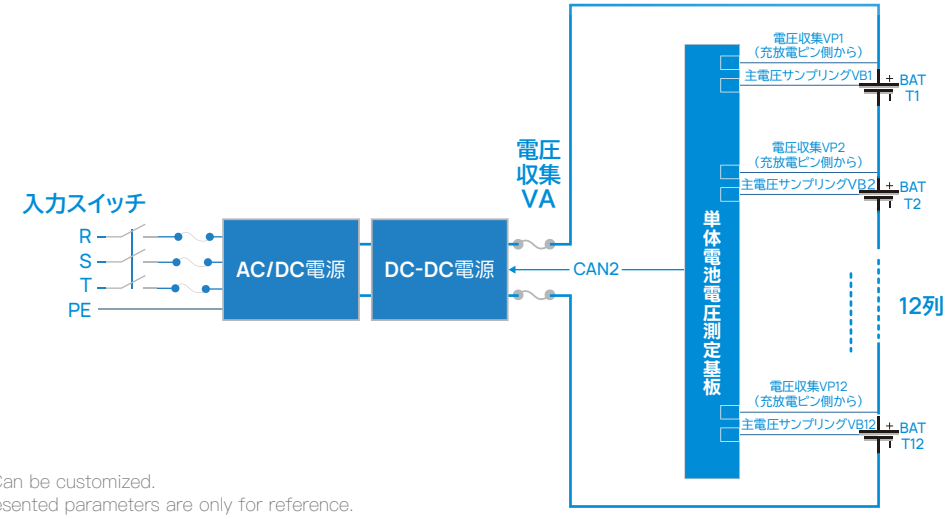
Serial Formation Solution





* Can be customized.
Presented parameters are only for reference.

Design Principle

12 cells are connected in series, and each cell is equipped with a bypass switch board (optional). When any cell in the series reaches the cut–off condition, it will be cut out in order of priority until the last cell in the same serial connection.

Advantages

Energy Saving **Overall Cost**

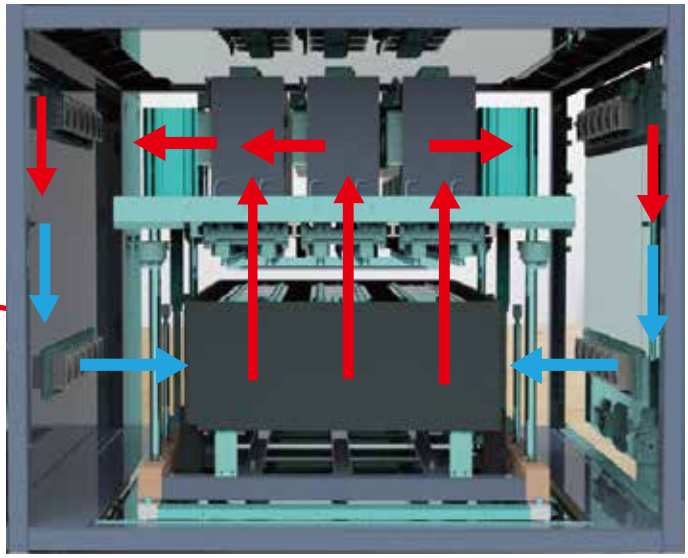
The series formation solution is mature and stable, with high efficiency, low heat generation, and evident energy saving effect.

Compared with traditional way, the energy saving efficiency is increased by 30%, and the cost can be reduced by more than 15%.

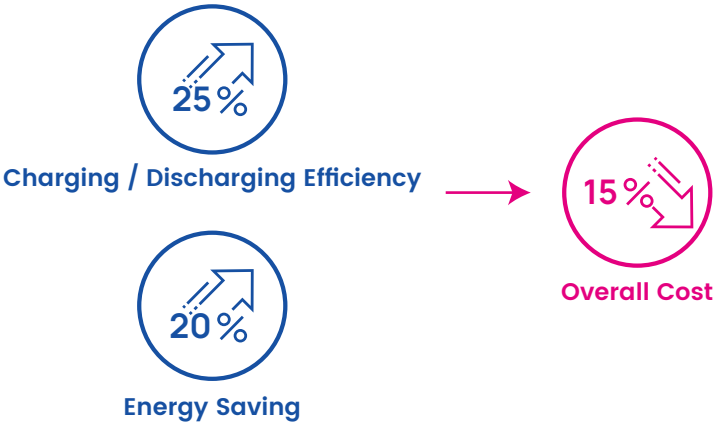
All-in-One Grading Machine

Design Principle

The power module is integrated in the chamber, and the temperature is controlled by water cooling system.



Advantages



Temperature consistency is well controlled, and the temperature uniformity can reach ±2℃. The cable is shorter, therefore, the energy loss and heat generation will be less.

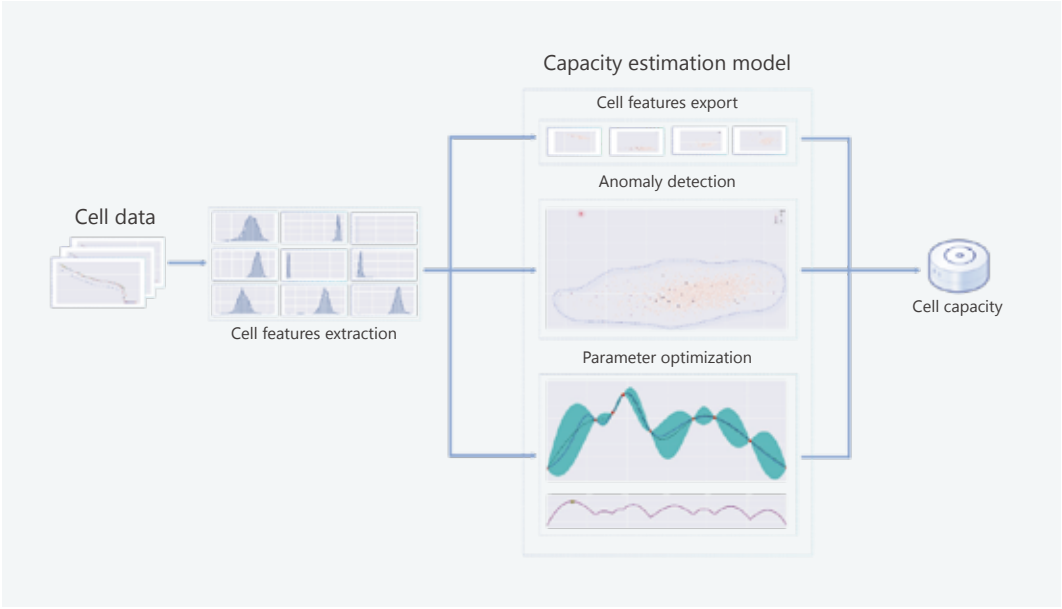
Capacity Estimation System

Chinese Patent: ZL.2017111488436

International Patent: PCT/CN2017/111651

US Patent: 15/847,959

Winner of China Patent Award



Design Principle

By adopting the charge and discharge curve of the cell capacity and based on the AI big data, the complete charge and discharge curve of the cell capacity can be estimated. The system includes cell feature data export, offline big data training modeling, online reconstruction prediction, iterative optimization model, etc.

Estimation Accuracy

Average Prediction Error Value ⩽0.2%

Maximum Prediction Error Value of Single Cell ⩽0.5%

Advantages

1/3

Capacity Process Time

Capacity Equipment Configuration

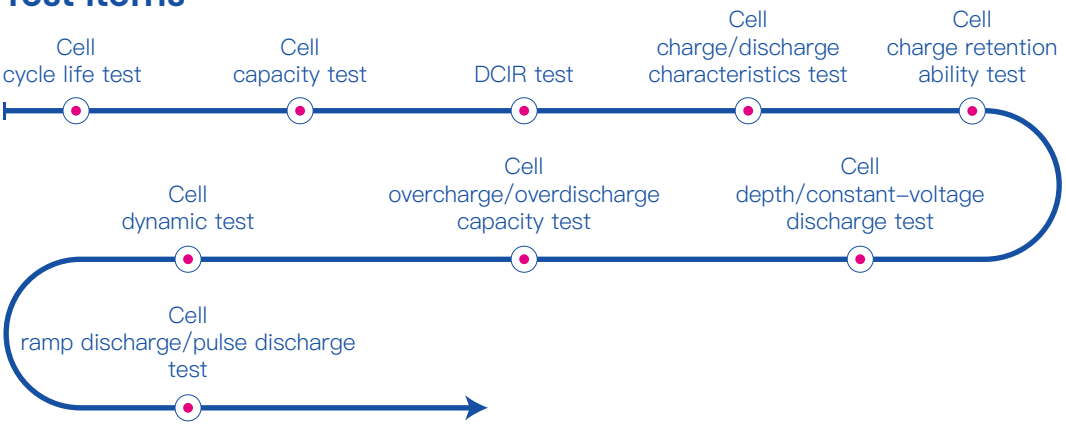
Footprint and Energy Consumption of Plant Capacity Equipment

FEATURED EQUIPMENT

5V Power Cabinet

Suitable for Prismatic/ Cylindrical/ Pouch Cell

Test Items



System Features

- Save energy effectively by feeding discharging energy back to power system, with little energy heat produced.
- Reliable, ultra-high precision testing with 0.05% accuracy and 5ms/time for sampling rate.
- Independent channel with configurable parameter and condition setting for each individual channel.
- Multi network integrated management, centralized control in one computer.
- Complete input and output, software and hardware protection, reverse connection protection, power make and break function.
- No impact current when starting the channel. The CC/CV transition is perfectly done without voltage and current surge.
- Modular design is convenient for maintenance.
- Comprehensive data covering all aspects, and data uploads to MES system in real time.

Equipment Parameters

Model		ECT0530A	ECT0560A	ECT05100A	ECT05200A	ECT05400A
Number of main channels		96CH/Cabinet	48CH/Cabinet	24CH/Cabinet	12CH/Cabinet	6CH/Cabinet
Voltage	Precision	± (0.05%FS+0.05%RD)				
	Resolution	0.1mV				
Current	Precision	± (0.05%FS+0.05%RD)				
	Resolution	0.1mA				

Negative Pressure Formation Equipment

For Prismatic Battery

—

Negative pressure formation chamber adopts a six-sided protection design. It is equipped with dual fire protection (water & gas).

System Features

Modular Design

Tray unit and subcomponents are well designed for high-speed test and large-scale production, convenient for installation, replacement and maintenance.

Dust Proof

No direct contact between metals in a mechanical unit parts to effectively prevent dust during collision.

Dual Cylinder

Adopts 2-cylinder mode to make the movement process more stable and improve the contact performance.

Tray Positioning Mechanism

Tray will be positioned two times. 1st position for mechanical unit, 2nd accurate position by diagonal locating pin.

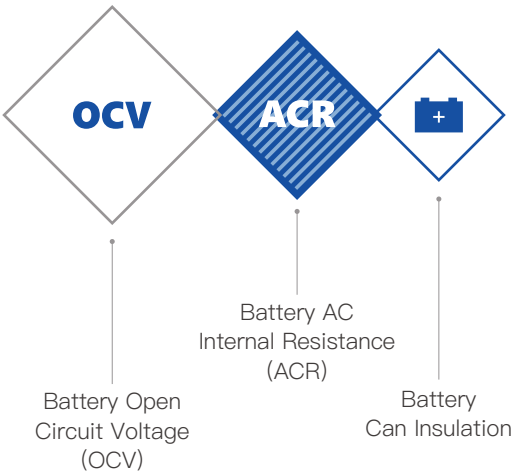
Multiple Safety Protection Device

Dual monitoring method: smoke sensor + temperature control can effectively ensure test safety.

Each layer is isolated with stainless steel plate and fire-proof rock wool.

OCV Tester

Test Items



OCV Tester

System Features

- The equipment can be made flexibly matched outside the output line or bridged inside the output line.
- Embedded design is applied to the HMI. The display height and operation platform are designed in accordance with the ergonomic requirement.
- High precision testing instrument ensures stable and reliable performance.
- OCV test device, with the independent research and development of intellectual property rights, can smoothly connect with automatic logistics system and process equipment in the previous and post procedures, which guarantees a high precision and reliable performance.

Equipment Parameters

S/N	Item	Specification
1	Voltage test range	0~6V
2	Internal resistance test range	0~300mΩ
3	Voltage test accuracy	±0.01%rdg. ±3dgt (V)
4	Internal resistance test accuracy	±0.5%rdg. ±5dgt.
5	Test instrument	Agilent 34461A (Voltage) HIOKI 3562 (Internal Resistance) can be customized
6	Applicable power supply	AC 220V 3∅ 50Hz

DCIR Tester

Test Items

Battery DC Internal Resistance

DCIR Tester

Functional Characteristics

- Estimation of DCIR is based on BSEN61960, which adopts 2nd loading current test, calculates DCIR value by voltage difference of current changing, much close to the actual resistant effect by cell continuous current, therefore power battery or high–power type battery should go over the estimation of DCIR test.
- Cabinet testing machine switch response time less than 15ms, pulse width less than 100ms, can catch the minor curve of current and voltage instantaneously, which offer more accurate and high precision testing hardware platform; software calculating method follows HPPC standard testing for development, closer to response battery characteristic features.
- Contacting probe adopts alloy metal, contacting impedance minimize more than double compared to same level beryllium cooper probe, current overflowing temperature rise less than 6℃ under 45℃ high temperature surrounding.
- Using big current for battery impacting test, adopting the method of voltage difference and ex–current difference, calculates Cell's DCIR, DCIR tester can select NG cell in advance.

Equipment Parameters

Item		Specification
Voltage	Measurement and control precision of voltage	±(0.05%FS+0.05%RD)
	Measurement range (mV)	0~5,000
Current	Test precision	±(0.05%FS+0.05%RD)
	Measurement range (mA)	0~500,000
	Test procedure	Can be customized

Formation and Grading Chamber

+
Formation
and Grading
Chamber

Test Items

- Formation test
- Capacity test

Functional Characteristics

Tray position adopts two times confirmation. The 1st positioning is for the guiding blocks around the tray. The 2nd one is for the accurate positioning by the diagonal positioning pin.

Each chamber would be installed with two smoke sensors. Each cell is corresponding to one temperature sensor, which monitors real–time temperature, this way will ensure efficient and safe testing.

Probe adopts probe module or coaxial probes, which consist of current probe and voltage probe, probe head is jagged, beryllium copper plating, tiny contact resistant, current temperature rise less than 10℃ to guarantee the flowing current accuracy and voltage sampling precision.

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Hot Press Pressure Formation Machine

System Features

- Cell would be heated up during formation, which improve the fluidity of electrolyte, strengthen the viscosity of electrolyte, with homogeneously spread of electrolyte, SEI would be formed easily, cycle life could be extended; Cooling compression could cool down the cell temperature quickly, under this format cell would be in good performance, low bulge rate and long cycle life, etc.
- Solution adopts compression in horizontal way, clamping tools adopts server rod, pressure distributes in uniformity, pressure control deviation ⩽10kgf.
- Clamping tool for compression tray be heated by electricity, and the temperature could be flexibly adjusted, maximum temperature tolerance can reach 90℃.
- Clamping tools are compatible for tabs on each side and tabs on same side, and realize quick changeover.

Equipment Parameters

Item	Specification
Voltage measurement range	0~5V for charge, 1.5~5V for discharge, resolution ratio of 0.1mV
Current measurement range	20mA~60A, resolution ratio of 0.1mA
Current and voltage accuracy	±(0.05%FS+0.05%RD)
Pressure uniformity between laminates	≤100kgf
Pressure control accuracy	≤±20kgf
Temperature uniformity of each battery cell	≤±2℃
Communication method	Ethernet
Channel utilization	≥99.9%

Grading Chamber

For Pouch Cell

Test Items

Performance test of charge/discharge

Cycle life test

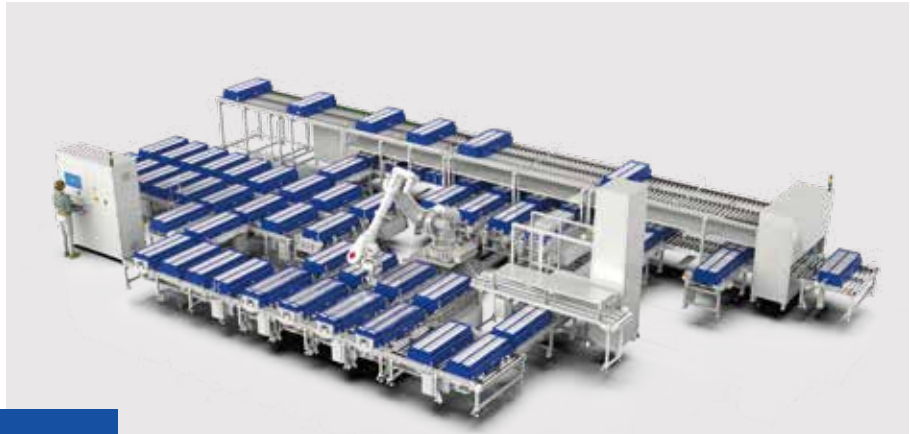
Self–discharge capacity test

Grading Chamber–For Pouch Cell

Functional Characteristics

- HYNN capacity test chamber can make one–off compressing contact for full tray, which enhances production efficiency. After testing, chamber automatically cut off process flow and upload test data, which connect previous and post process flows.
- Tray position method: Tray will be positioned two times. 1st position for mechanical unit surrounding guide block oriented, 2nd accurate position by diagonal locating pin.
- Action method: probe driven mechanism for cell tab pressing contact, rod adjustment can modify the pressing contact depth, after position testing and pressing contact, system would launch instruction for cell charging and discharging.

Sorting System



Sorting System

Test Items

1. Conditional classification of open circuit voltage of battery
2. Conditional classification of battery discharging capacity
3. Conditional classification of K value of battery
4. Conditional classification of battery platform capacity
5. Comprehensive classification of battery parameters
6. NG cell sort out

System Features

0.2%

Failure Rate

The failure rate is less than 0.2%, which can realize multi-gear design, and the stalls can be customized.

The scanning mechanism can automatically scan the barcode and the QR code of the single cell. If fails, it will immediately alarm and remind manual handling.

Functional Characteristics

- Available types for grading: Voltage, ACIR, DCIR, K value, Capacity, etc.
- Sorting gripper has cell clamping position testing function. Once abnormal situation occurred, machine will immediately stop operating and release alarm.
- Same kind of products would be selected for placing in another tray, automatic selection can avoid human caused errors.

Equipment Parameters

Item	Specification
Equipment power	10kW
Ranking	Can be customized
Applicable power supply	AC 380V 3∅ 50Hz
Cell input and output	The tray automatically flows in, when this process step is done, then empty tray automatically flows out
Rankings could be programmable	Based on Voltage, ACIR, DCIR, K value, Capacity, etc.

SOFTWARE SYSTEM

MES (Manufacturing Execution Systems)

HYNN · Blue Whale (IIoT) · Battery Testing Platform

C-SSO (Cloud-Single Sign On)

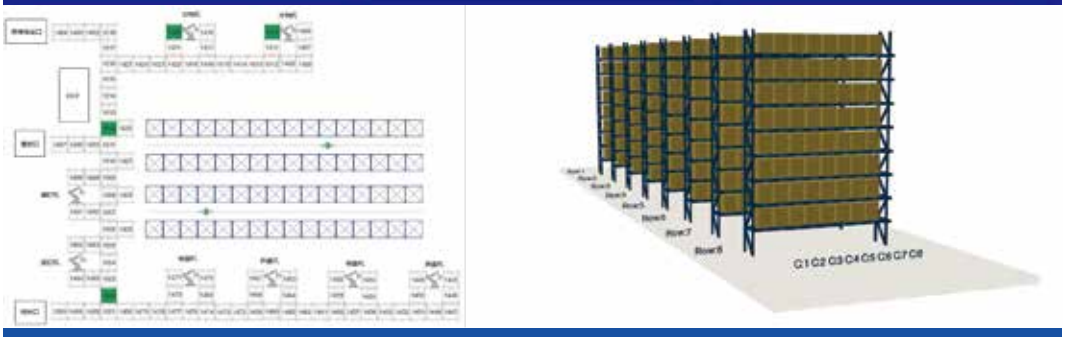
Smart Logistics Platform

FMS (Formation Management System)

Digital Twin		AI (Cell Capacity Prediction System)			
Smart Logistics		C-BTS (Cloud-Battery Test System)			
C-WMS (Cloud-Warehouse Management System)		Formation	Capacity Grading	DCIR	OCV
C-WCS (Cloud-Warehouse Control System)		Pre-formation	.....	.....	.....

Cell Testing Data Platform

C-WCS: Cloud-Warehouse Control System



By using intelligent scheduling algorithms to achieve intelligent control and scheduling of equipment, the connection between various business modules is improved, thereby optimizing job efficiency.

Global monitoring – → **Dynamic process** – → **Rules engine** – → **Intelligent scheduling** –

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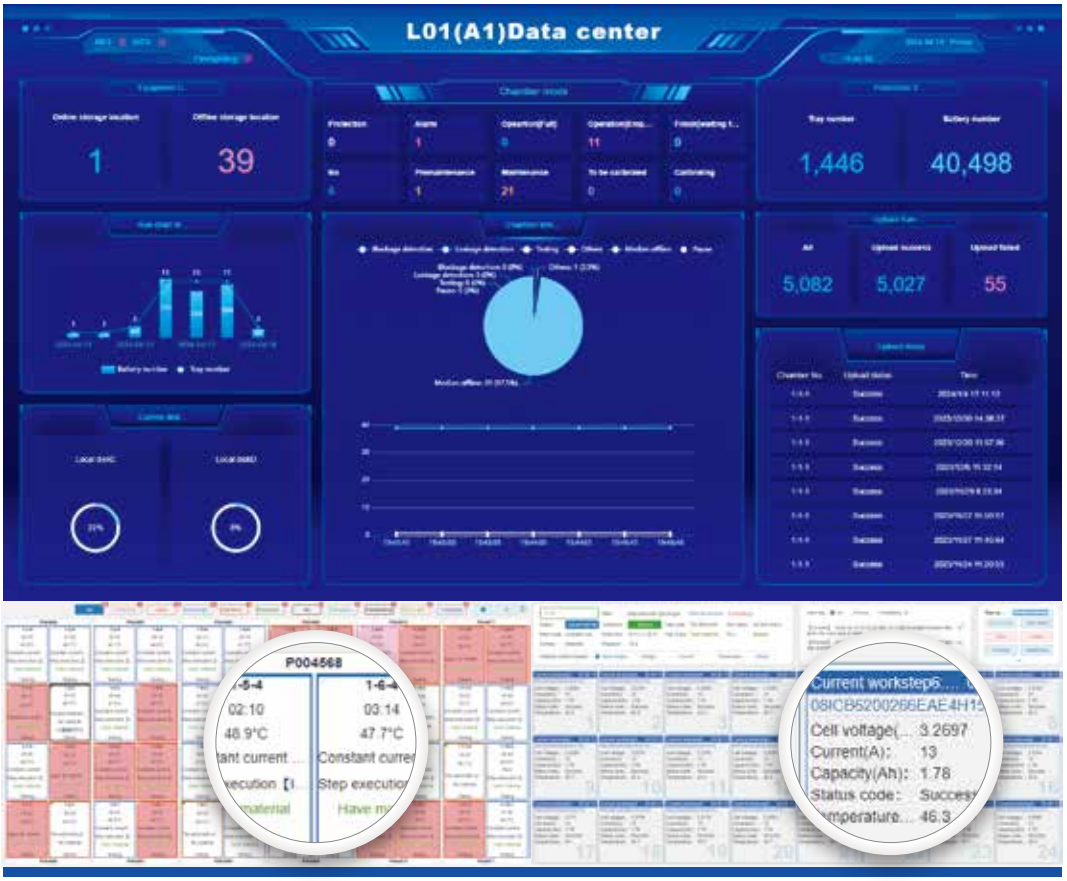
C-BTS: Cloud-Battery Test System



Fragmented data to Platform management

HYNN provides customers with one–stop services and comprehensive empowerment, accelerating the integration, internationalization, and digital upgrading of industry software, and creating a new benchmark in the battery intelligent testing software industry.

Integration **Internationalization** **Digitalization**

PROJECT SITE
















Cell / Battery PACK & Cluster Testing System

5V High Precision Battery Testing Lab Equipment

High Power Density

DC/DC uses third–generation semiconductor device to increase switching frequency and reduce power supply size.

AC/DC uses single transistor instead of IGBT module to increase switching frequency and reduce cost.

High Efficiency

The use of 750V and 15V secondary common bus bar makes the power cycle more efficient.

LLC soft–switching technology to achieve high–frequency isolation and improve efficiency.

Product Features

High Reliability

AC/DC uses three–level technology to reduce harmonic components and common–mode interference.

Using interleaving technology to reduce the output current ripple.

Full fill safety standards: EN62477–1.

EMC compliance: EN61000–6–2/EN61000–6–4.

High Performance

Modular design, cross–module parallel support 3000A.

Support CC, CV, DC, DV, Pulse, simulation etc.

Using CANFD Communication.

High–precision sampling ADC: 24bit.

1ms high speed sampling.

Current grade (patent no. CN202323053472.7)

Current dynamic response 1ms.

HYNN

Parameters

DECT05300A **DECT05600A** **DECT051200A**

DECT052400A **DECT053000A**

Model
DECT5300A-3000A

Channel quantity
1~32CH or Adjustable

Voltage accuracy
±0.02%FS

Voltage resolution
0.1mV

Current accuracy
±0.05%FS (Grading: 75A/Grade)

Current resolution
0.1mA

Charging output voltage range
0~5V

Dis-charging input voltage range
1.5~5V (0V Adjustable)

Current response
2ms (10%~90%)

High speed sampling
1ms

Charging peak efficiency
83%

Dis-charging peak efficiency
78%

Auxiliary channels
Voltage / Temperature / Pressure Sensor

Auxiliary channels voltage sampling board
Sampling voltage 0V~+6V, Deviation ≤±2mV, Resolution rate 0.01mV

Auxiliary channels temperature sampling board
Range -40℃~120℃, Deviation ≤±1℃, Resolution 0.1℃

Device input voltage
380V3P

Equipment working environment temperature
-10℃~35℃

Regenerative Digital Battery Tester
(with Energy Feedback Function)

Features

1. High precision
2. Excellent data statistics, analysis, and report functions
3. Easy to program and operate
4. System channels can be used in parallel, Broden device usage range
5. Wide DC voltage input range, improves system efficiency
6. Advanced multi-level technology

Parameters

20V10A-24H	30V30A-24H	60V60A-24H
100V120A-8H	100V300A-2H	200V800A-1H

AC input voltage range **380VAC ±10%, three-phase five-wire system**	Input power frequency range **50±2Hz**	Maximum AC input power **5.5~180kW**
Power range **4.8~160kW**	Power factor **›0.99 (Rated power)**	Charging efficiency **≥90%**
Grid current (THD) **≤5% (Rated power)**	Discharge efficiency **≥90%**	Power accuracy **2‰**
Number of Output Channels **1~24CH**	Output DC voltage range **20~200V**	Output DC current range **10~800A**
Output voltage control accuracy **±0.3%FS**	Output current control accuracy **±0.3%FS**	Voltage rise/Fall response time **≤10ms (10%~90%)**
Battery voltage range **20~200V**	Maximum battery current input **10~800A**	Battery voltage display resolution **0.1mV**
Battery current display resolution **0.1mA**	Data acquisition period **10ms**	Data upload and recording period **100ms**
Communication interface **LAN/CAN2.0/RS 485/SMBUS**	Protection rating **IP 20**	Operating temperature range **-10°C~+45°C**
Humidity range **0~90% (Non-condensing)**	Size (W*D*H) **800*800*2200mm**	Auxiliary power supply **Voltage ±5V, temperature -40°C~+200°C**

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High Power BESS/Battery PACK/Cluster Testing System

▶ Applicable to 2500V high voltage complex environment

- High-quality energy feedback, maximum efficiency ⩾96%
- High power factor value, >0.99
- Total harmonic content of grid-tied current ⩽5%
- I-type three-level technology, wide voltage range output, small ripple

Test Items

- Short circuit, insulation, withstand voltage
- Working condition simulation, capacity, cycle life
- Pulse charge & discharge characteristics
- ACIR, DCIR, BMS performance
- Charge & Discharge Efficiency
- Consistency test evaluation
- Overcharge and over-discharge endurance

Product Features

- Multi-level authorization
- MES data access
- BMS two-way communication, customize BMS values as control / protection parameters
- Working condition simulation
- System channels can be used in parallel
- DSP full digital control
- Anti-reverse connection, Data security protection

Parameters

0-200V 10-300kW	0-1000V 50-800kW	0-2500V 1000kW-6.3MW
Current up/down reaction time **‹5ms**	Charge/discharge switch time **‹10ms**	Voltage accuracy **±0.03%FS**
Voltage resolution **0.1mV**	Current accuracy **±0.03%FS**	Current resolution **0.1mA**

6MW level BESS Testing System Project

Pioneer in Industry

6.3MW energy storage container test system is customized and designed according to customer needs. All energy storage equipment and distributed systems uniformly interact with MES through the dispatching system to realize the integration of equipment and upstream and downstream systems.

Project Features

Control strategy for paralleling multiple devices to achieve flexible configuration

Complete multi-level protection mechanism to achieve reliable operation

Excellent software, hardware and system design, high precision and high reliability

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Innovating Energy Storage & Energy Saving Solutions
Products, Solutions and Service
Partner with your Cell Testing Expert

Energy Storage System Qualification

CQC Certified

VDE Certified

SAA Certified

CEC Certified

FCC Certified

CE Certified

UL Certified

CSA Certified

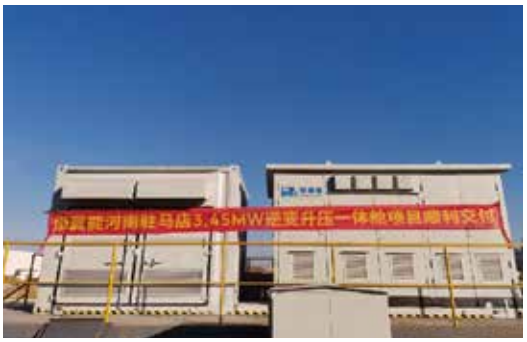
Project Reference

Containerized testing system for BESS
Battery manufacturer, multiple projects in China

Energy–saving testing for PV station
Energy group, Jiangsu, China

Containerized testing system for BESS
Energy group, France

D–BUS energy saving solutions Battery manufacturer, France



Inverter + step–up boost system Energy group, Henan, China

Inverter + step–up boost system Energy group, Inner Mongolia, China

Inverter + step–up boost system Energy group, Jiangsu, China

Solar, Storage, Charging and Testing Integrated Solution Municipal investment Group, Guangdong, China

BESS Energy group, Heilongjiang, China

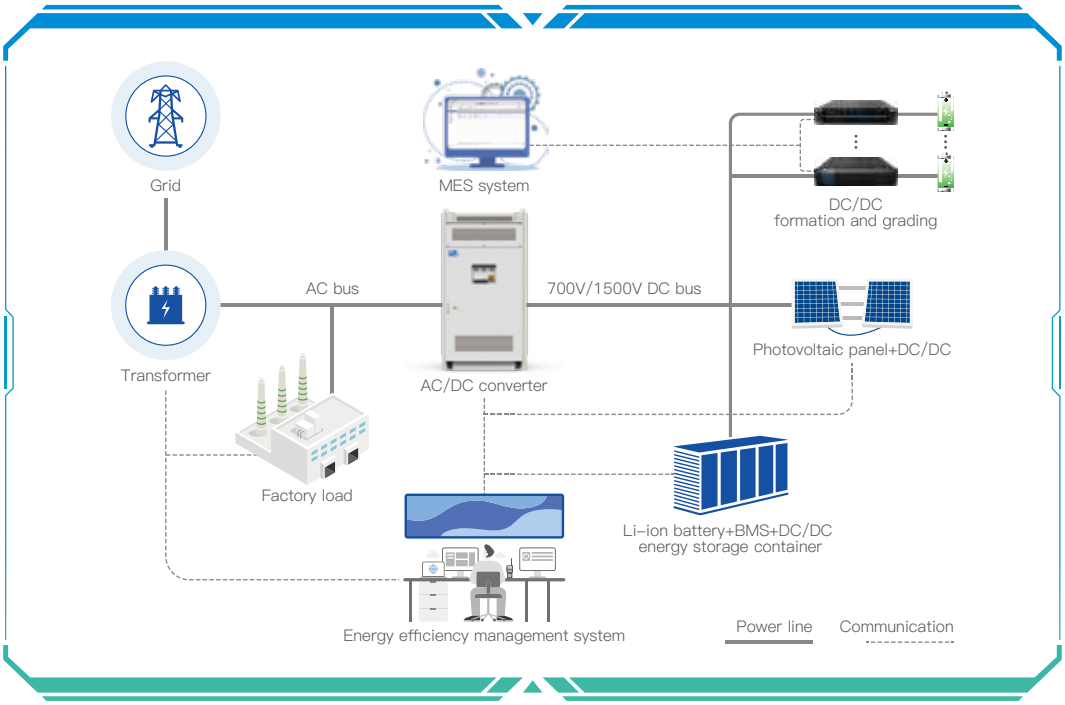
Fishing & PV complementary power Station Municipal investment group, Guangdong, China

Temporary Power Supply Solution for Construction Site (Middle East Region)

Temporary Energy Supply MW–Level Solution for Electric Heavy Truck (European Customer)

Solution Highlights

Micro-Grid Energy Saving Solution



Design Principle

AC/DC converters, energy storage containers, and DC/DC power modules connected through 700V/1500V DC bus coupling. The energy in the factory can be dispatched in real time by the EMS energy efficiency management system.

Solution Advantages

Multiple converters in parallel
AC/DC hybrid integrated

20%

Energy Saving Effect

Compared to the traditional fomation and grading scheme, the DC bus voltage is higher, the current is lower, and the wire loss is smaller. The overall energy-saving efficiency will be improved by 20%.

10%

Overall Cost

Compared to the traditional formation and grading scheme, AC/DC adopts a high-power all-in-one machine, which can save 10% of the overall cost.

15%

Stability Performance

Achieve ACDC non-isolated parallel control of multiple PCS. Through common-mode voltage suppression strategy, circulating current suppres-sion tech and multi-machine parallel resonance suppres-sion algorithm, the system efficiency is increased by more than 15%.

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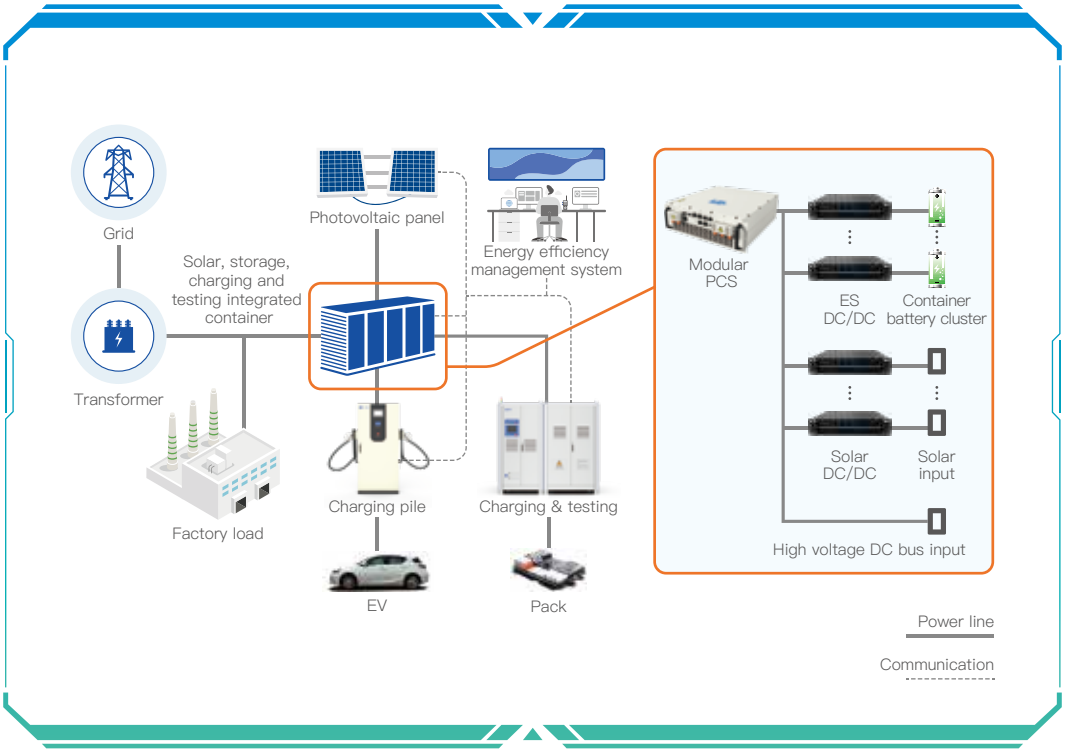
Solar, Storage, Charging and Testing Integrated Solution



Design Principle

The system consists of a PCS, an integrated solar–storage container, a charging station, testing equipment, and an intelligent energy management system.

The energy management system enables real–time, optimal scheduling of energy flows for improved efficiency.

Solution Advantages

10%

Energy Efficiency Improvement

Multi energy complementary, mitigating the impact of charging load fluctuations and improving energy efficiency by 10%.

10%

Overall Cost

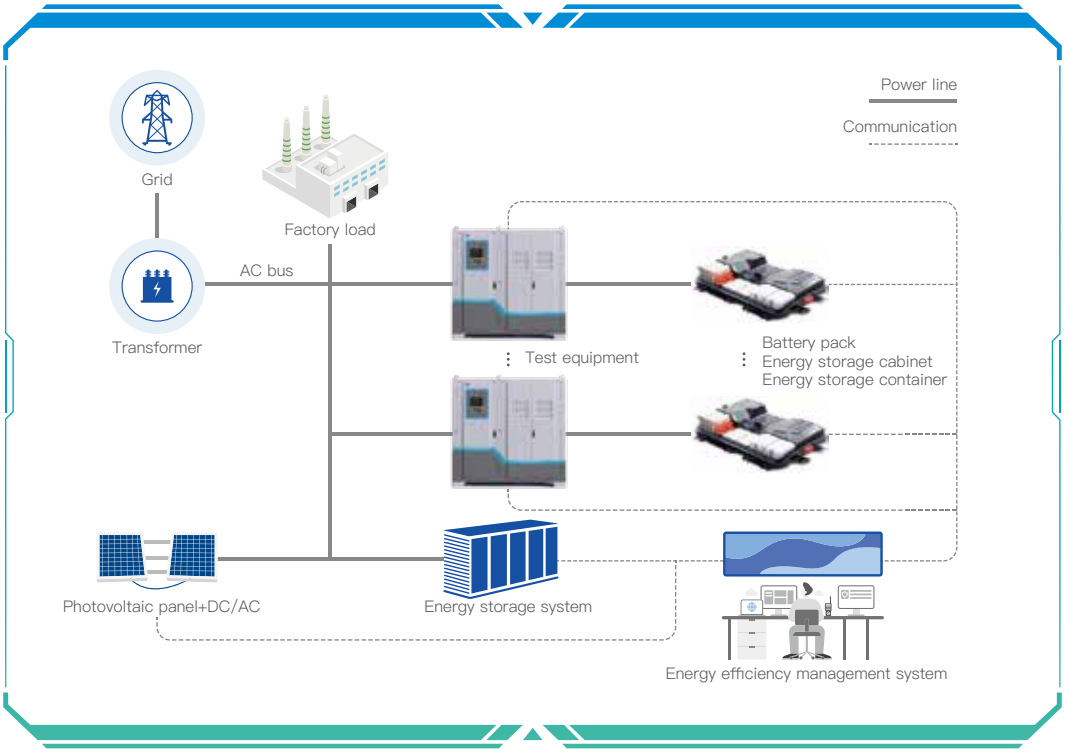
Flexible configuration, high system conversion efficiency, high–voltage DC bus scheme, overall cost reduction of 10%.

15%

Safety Improvement

Multi channel signal acquisition, real–time monitoring, abnormal fluctuation warning, system safety performance increased by 15%.

Energy-saving Testing Solution for Power Battery



Design Principle

The system consists of power battery testing equipment, photovoltaic power generation system, energy storage container, electric vehicle pack, and supporting intelligent energy efficiency management system. The factory energy can be dispatched and distributed in real-time by the energy efficiency management system.

Solution Advantages

15%

Energy-saving Improvement

The system has been optimized by the energy efficiency management system, achieving multiple complementary functions and increasing the energy-saving effect by 15%.

50%

Efficiency Improvement

Based on partial charge and discharge data, predict the complete charge and discharge curve of the battery, shorten the testing process, and improve the testing efficiency by 50%.

20%

Safety Improvement

Multi level software and hardware fuse protection, high security protection for data recording, and 20% improvement in security performance.

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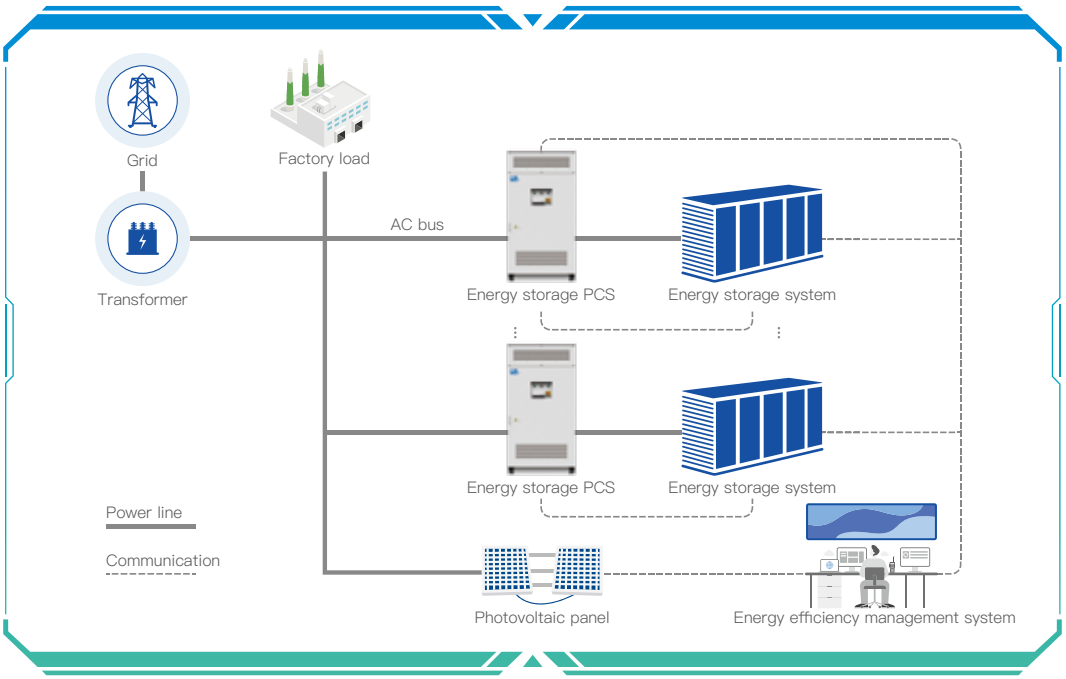
Energy Storage System Solution



Design Principle

The system includes a PCS, a photovoltaic power generation system, an energy storage container, and an intelligent energy management system. Each unit is connected via an AC bus. The energy management system enables real-time optimization and scheduling for improved overall efficiency.

Solution Advantages

Energy Saving

Based on power output prediction and energy storage discharge scheduling, intermittent and fluctuating renewable energy generation output can be smoothly controlled to meet grid connection needs.

Efficiency Improvement

The energy storage system enables peak shaving and valley filling, and rapid frequency regulation to ensure power quality and safe and system stablility. The energy management system improves efficiency through managing multi-parallel PCS units.

Electricity Cost

Charging the energy storage system at low electricity prices and discharging the at high prices can achieve peak-valley arbitrage, self-use backup and other demands.

Featured Equipment

PCS

Efficient

Three-level control, the maximum conversion efficiency reaches 99%.

Easy O&M

Higher Safety
Higher protection level
Multi-level AC/DC fuse protection

Product Features

All-Scenarios

Equipped with VSG, VF, PQ, black start and other functions suitable for power generation side, grid side, user side and etc.

Grid Support

Comply with CE, GB/T34120, GB/T34133 standards.
Support high/low voltage and frequency ride-through.
Enhanced power grid adaptability.
Fast response.

Parameters

PCS Series

PCS1100-1000TA **PCS1250-1500TA**

PCS1725-1500TA **PCS2500-1500TA**

Rated AC power **1100/1250/1725/2500kW**	AC overload capacity **1210/1375/1895/2750kW**	Rated grid voltage **400/690Vac**
Rated grid frequency **50/60Hz**	DC voltage range **650~1000/1000~1500Vdc**	Maximum DC current **1861/1375/1895/2750A**
Maximum conversion efficiency **99%**	Communication protocols **IEC104/IEC61850/MODBUS TCP**	

PCS Module

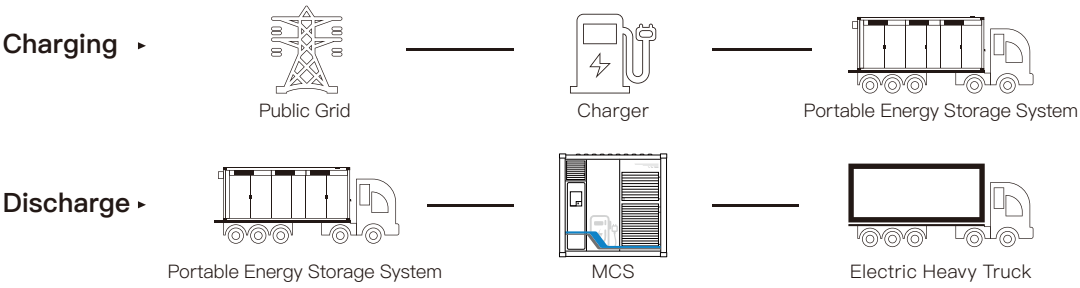
PCS0125-1500MA **PCS0215-1500MA**

PCS0215-1500MS **PCS0430-1500MS**

Rated AC power **125/215/430kW**	Communication overload capacity **137.5/237/473kW**	Rated grid voltage **400/690Vac**
Rated grid frequency **50/60Hz**	DC voltage range **650~1000/1000~1500Vdc**	Maximum DC current **212/237/473A**
Maximum conversion efficiency **99%**	Communication protocols **IEC104/IEC61850/MODBUS TCP**	Protection level **IP 65**

Mobile Energy Storage

Mobile Energy Storage for Grid Applications



Product Features

Higher Flexibility, Quick Setup

Off–grid power supply, place anywhere you need.

No extra setup required, plug in and power up.

Highly flexible to meet the sudden power demands.

High Capacity, High Power

Equipped with high–energy density power batteries.

2MWh per cabinet, supporting parallel connection.

1.8MW charge/discharge power, boosting production efficiency.

Wide Applications

Configurable charging connector based on different application scenarios.

Applications including mobile EV charging station, outdoor events, rural and remote areas, construction sites, logistics parks, industrial production, mining areas, and etc.

Secure, Stable, and Smart Management

24/7 smart monitoring with real time battery status evaluation.

Multi–level and all–round protection from components, modules, to system.

Smart monitoring enables optimal charging/discharging strategy.

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Application Scenarios for the Mobile Energy Storage


Mobile EV Charging Station


Agriculture and Remote Areas


Outdoor Activity and Exhibition


Charging for Mining Truck


Emergency and Rescue


Industry and Construction Site

Project Reference

Temporary Power Supply Solution for Construction Site (Middle East Region)

Temporary Energy Supply MW–Level Solution for Electric Heavy Truck (European Customer)

Parameters

Parameters for Battery Cabinet

Battery type **LFP**	Nominal voltage **614.4Vdc**
Rated storage energy **1836kWh**	Battery string **3*3P192S**
System safety standards **GB/T38031/UN3536/UN38.3**	Thermal management approach **Liquid cooling**
IP protection level **IP 65**	Permitted running temperature **-30°C~+50°C**
Container dimension **3020(L)*2438(W)*2896(H)mm**	

Parameters for Charging Cabinet

Rated output power **1500kW**	Rated output voltage **1000Vdc**
Rated output current **1500A**	Output voltage range **200~1000Vdc**
Charging port interface **MCS/CCS1/CCS2 (Optional)**	Cooling approach **Intelligent air-cooling**
IP protection level **IP 54**	Permitted running temperature **-30°C~+50°C**
Container dimension **3020(L)*2438(W)*2896(H)mm**	

Integrated Inverter Step-up Transformer System

Product Features

Highly Integrated

Modular design improves space utilization

Pre-installed and pre-engineered to reduce on-site work

Easy to install and transport

Efficient & Reliable

IP 54 protection level, adapt to vairous environments

Inverter and transformer unit optimized to improve system effciency

Energy Saving Cost Down

Three level topology, with maximum conversion efficiency of 98.5%

High integration and small footprint. Easy to transport and install, reducing on-site construction costs

Grid-tied

Equipped with LVRT and HVRT

Equipped with active and reactive four-quadrant adjustment function

Fast power response (<10ms)

Parameters

IBC-1500V-5MW	IBC-1500V-6.25MW	IBC-1500V-6.9MW
Max DC power **3450/5000/5160kW**	DC voltage range **1000~1500V**	Max DC current **1897A*2/1375A*4/236A*24**
DC input channels **2/4/24**	Precision of current & voltage regulation **±1%**	Max AC power **3795/5500kW**
Rated AC current **1588A*2/1150A*4/198A*24**	Rated AC voltage **690V**	AC voltage range **586~759V**
Grid frequency range **50/60Hz**	Output current (THD) **‹3% (Rated power)**	Power factor and adjustable range **≥0.99 / -1~1**
Transformer type **Dry/Oil**	Rated power **3500/5100kVA**	Voltage transformation ratio **37/0.69kV**
Max efficiency **99%**	Protection level **IP 54**	Allowable environment temperature **-35℃~+60℃**

Energy Efficiency Management System

By predicting the power demand of the industrial park/station micro–grid , the charge and discharge ratio is adjusted to achieve optimal DC bus charge and discharge balance control, hence to realize real–time optimal energy management and reduce power consumption. Supports a variety of application scenarios, such as frequency and peak regulation, smooth output, black start after islanded system, peak shaving etc.

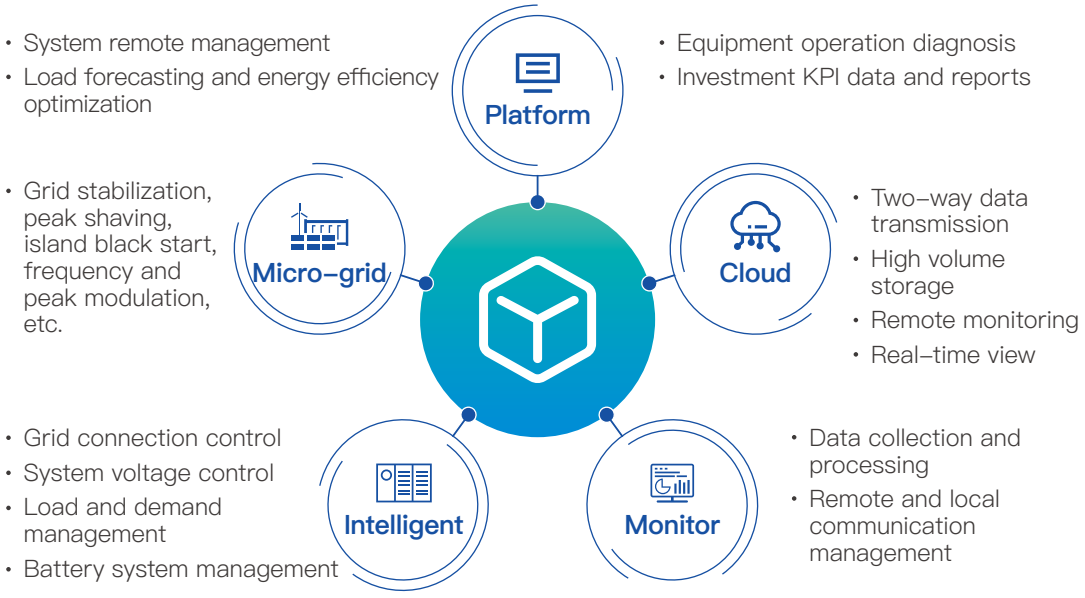
Advantages

Increase **19%** Energy Efficiency

Decrease **28%** Energy Cost

Reduce **30%** Investment Payback Perid

Features



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Guangdong Hynn Technology Co., Ltd.
+86-769-26627730 / +86-400-166-7608
www.hynn.com
business@hynn.com.cn / info@hynn.com.cn
No.8 Nanyuan Road, Songshan Lake Zone, Dongguan City, Guangdong, China

Hynn Technology Europe GmbH (Europe Headquarters)
+49 (0) 621 7187 9019
business@hynn.com.cn / info@hynn.com.cn
Langer Anger 7-9, 69115 Heidelberg, Germany

Hynn Technology Japan, Inc.
03-4530-0370
business@hynn.com.cn / info@hynn.com.cn
304 sakurabashi 1st building, 2-5-13 umeda, kita-ku, osaka-shi, Osaka 530-0001, Japan

US subsidiary
Silicon Valley, California

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