HYNN TECHNOLOGY

SMART INTEGRATED ENERGY SOLUTIONS FOR GLOBAL CLIENTS

Products, Solutions and Services

HYNN

Guangdong Hynn Technology Co., Ltd.

HYNN TECHNOLOGY

Pioneer with Innovative Solutions

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+
Overseas Delivery 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.

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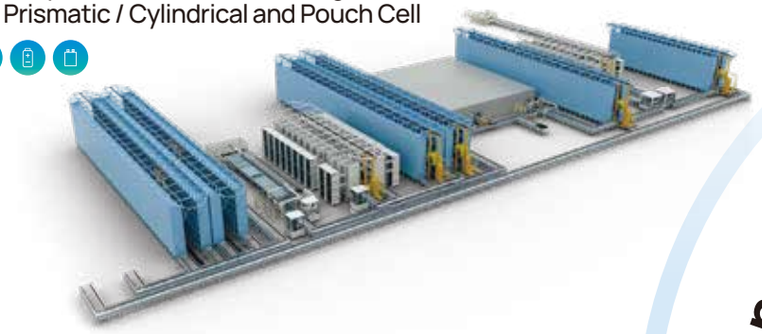
Business Panorama

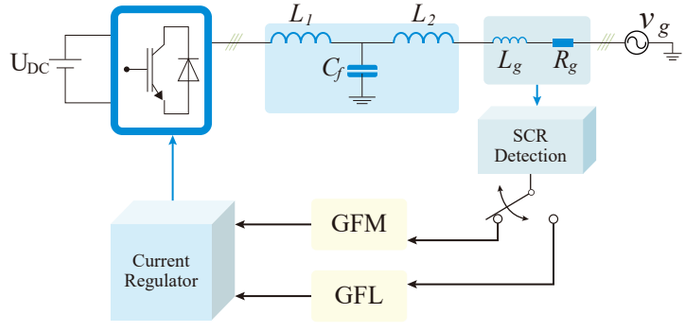
Renewable Energy Full Life-Cycle Applications

Cell Formation & Test

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



Comprehensive & Reliable Power Electronics Technology



Module PACK Test & Application


200V Test Equipment


1650V Test Equipment

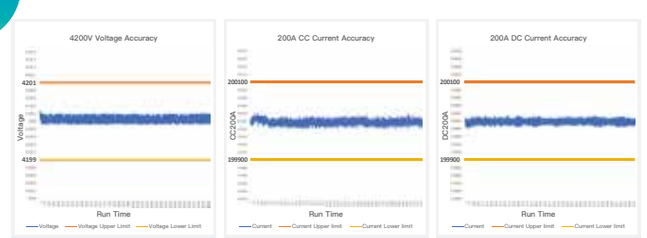

2500V Test Equipment


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

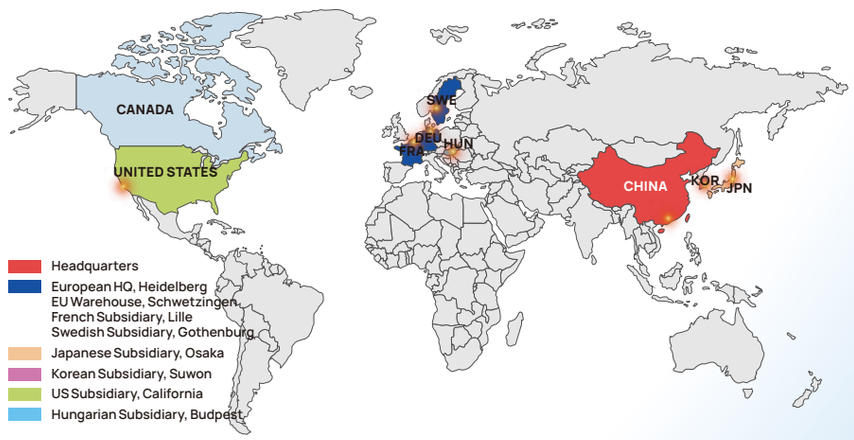

PCS


Integrated Inverter Step-up Transformer System


Renewable Power Station


Micro-Grid

Global Turnkey Delivery Experience

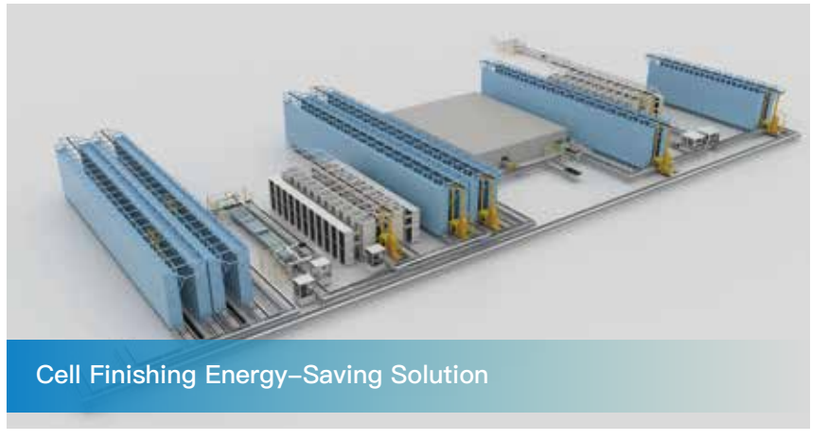


Application Scenarios

Core Advantages

Application Scenarios

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

Customers

CATL
ACC AUTOMOTIVE CELLS Co
SAFT
HITHIUM
PetroChina
EVE
prime planet energy & solutions
GREAT POWER
SERMATEC
REPT
ATL
中国平煤神马 CHINA PINGMEI SHENMA
shoto
GanfengLithium
AlphaESS
Dax-Tech

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

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

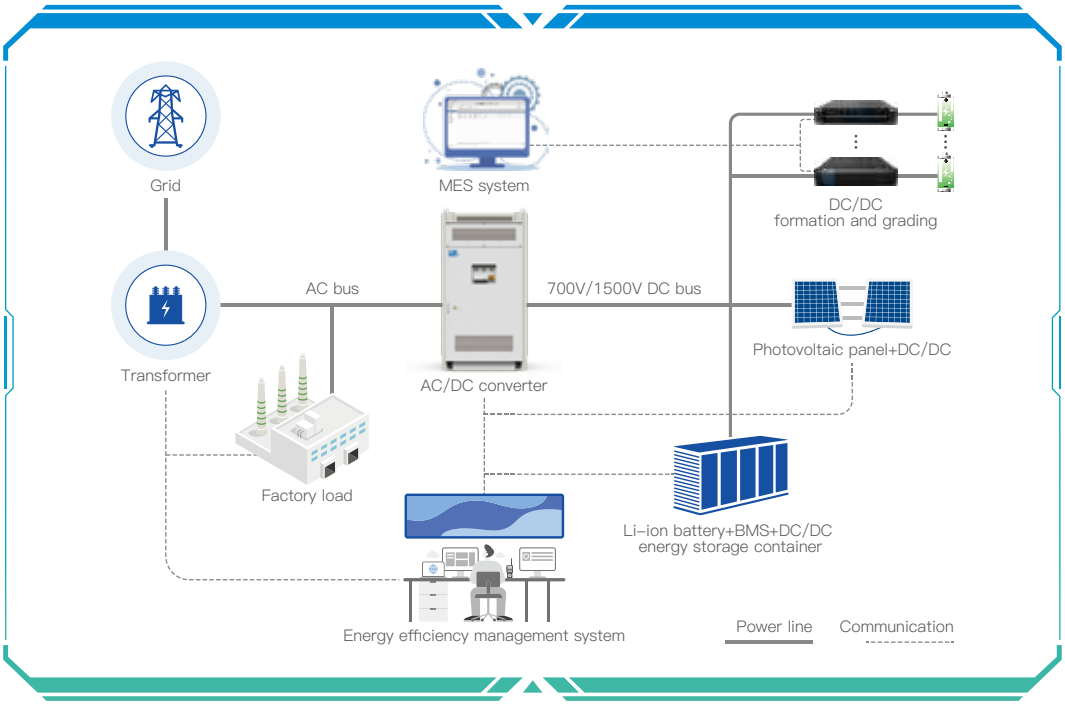
Fishing & PV complementary power Station Municipal investment Group, Guangdong, China

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

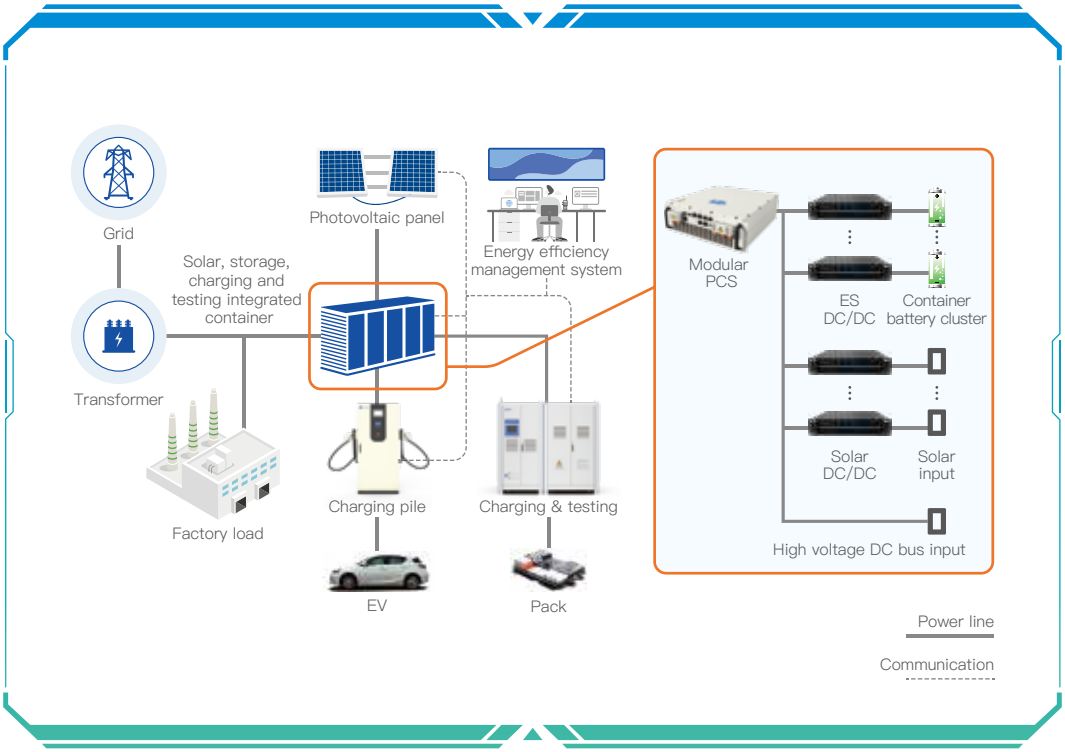
Compared to the traditional formation and grading scheme, AC/DC adopts a high-power all-in-one machine, which can save 10% of the overall cost.

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%.

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

Energy Efficiency Improvement

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

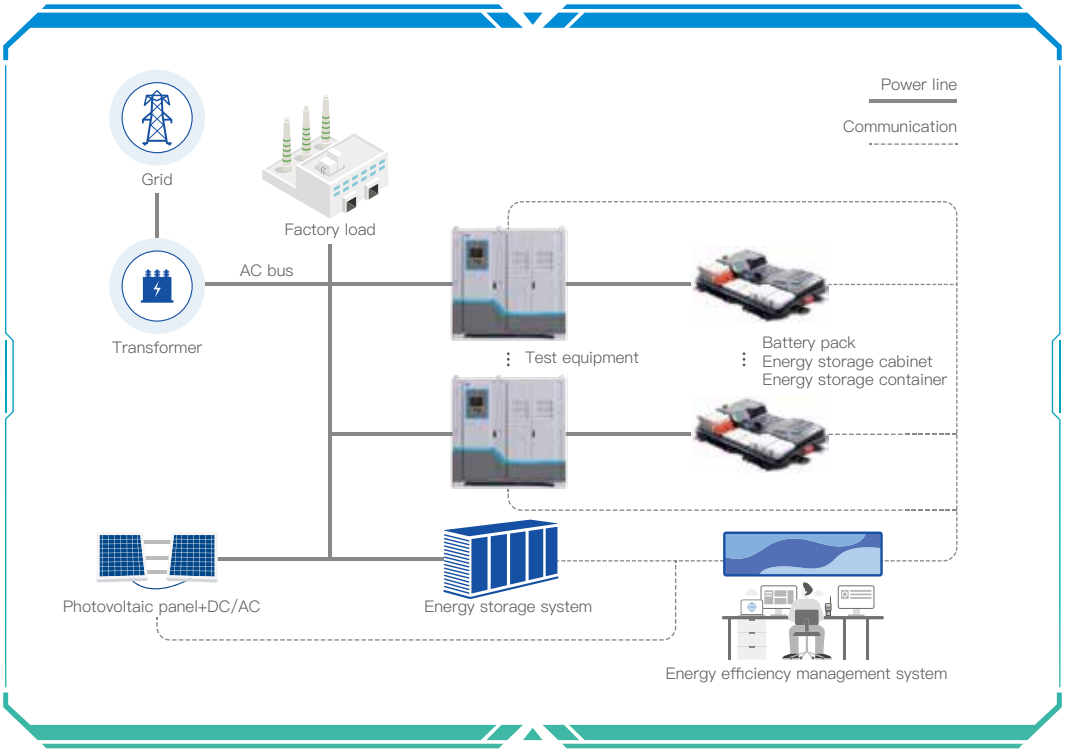
Overall Cost

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

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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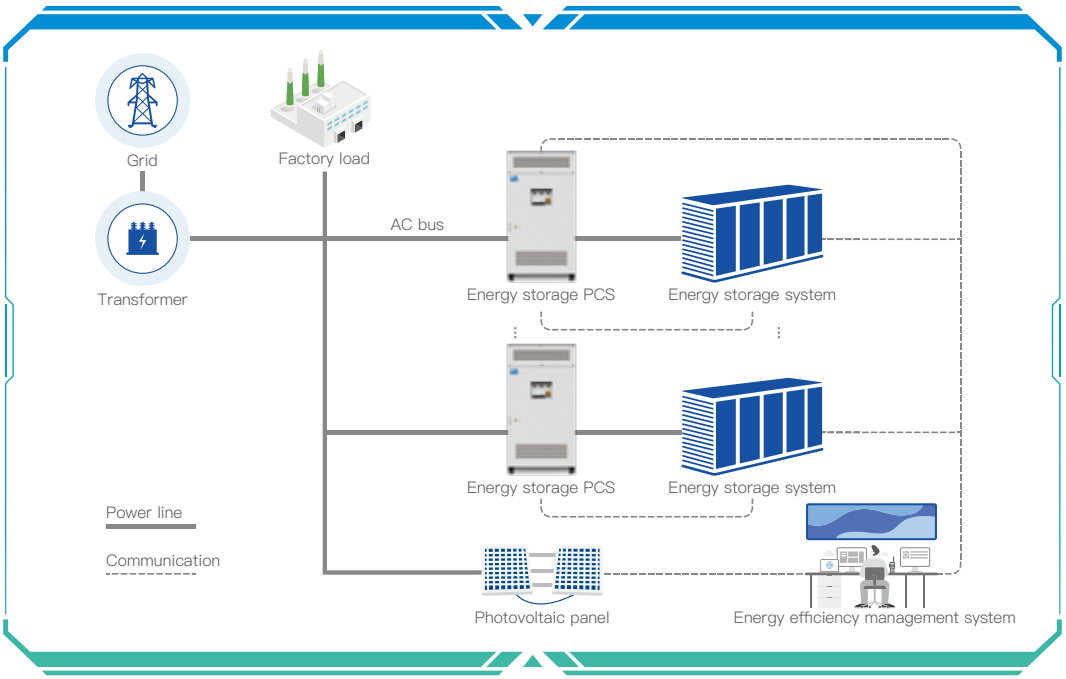
Energy Storage System Solution



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

10%

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.

5%

Efficiency Improvement

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

20%

Electricity Cost

Charging the energy storage system at low electricity prices and discharging the at hig h 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

Charging ▸ Public Grid — Charger — Portable Energy Storage System

Discharge ▸ Portable Energy Storage System — MCS — Electric Heavy Truck

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**	

Cell / Battery PACK & Cluster Testing System

5V High Precision Battery Testing Lab Equipment

Product Features

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.

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.

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 **±0.03%FS**	Output current control accuracy **±0.03%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**

High Power Energy Storage Container / Battery Cluster Testing Equipment

▶ 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**

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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℃**

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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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.

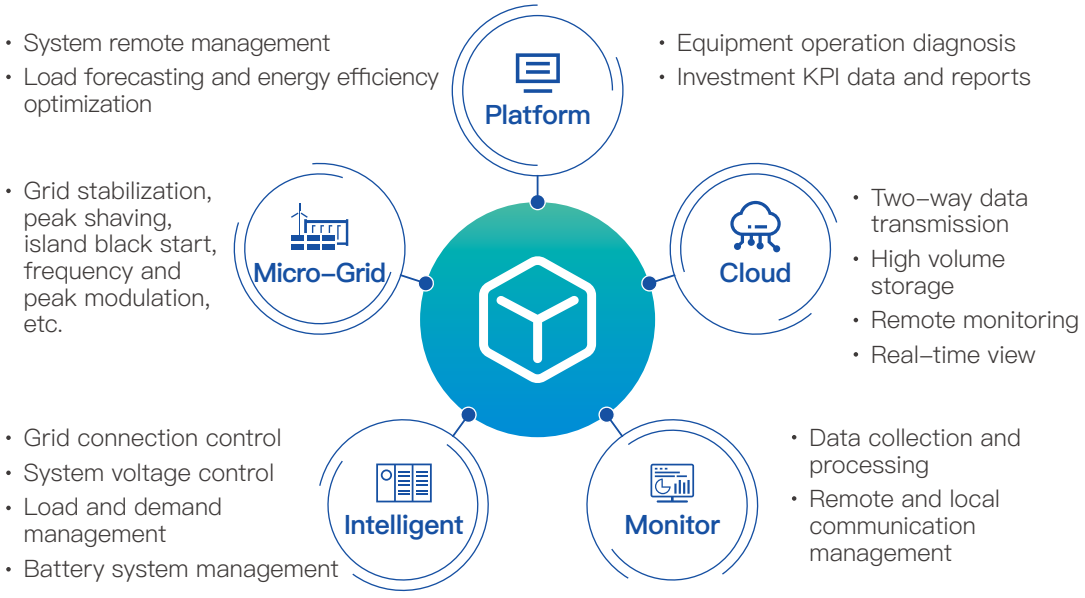
Advantages

Increase **19%** Energy Efficiency

Decrease **28%** Energy Cost

Reduce **30%** Investment Payback Perid

Features



HYNN TECHNOLOGY

With the aim of maximizing customers' value, we achieve the maximization of our enterprise value.

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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