

Zenbess H400 Introduction



H400

Supported Power/Energy Configure :

1. 105kW/241kWh
2. 210kW/482kWh
3. 105kW/482kWh

Features



SAFE

- ✓ Automotive BMS, Top Safety
- ✓ One-On-One String Mgmt., No Battery In Parallel
- ✓ TÜV SÜD Certified



DURABLE

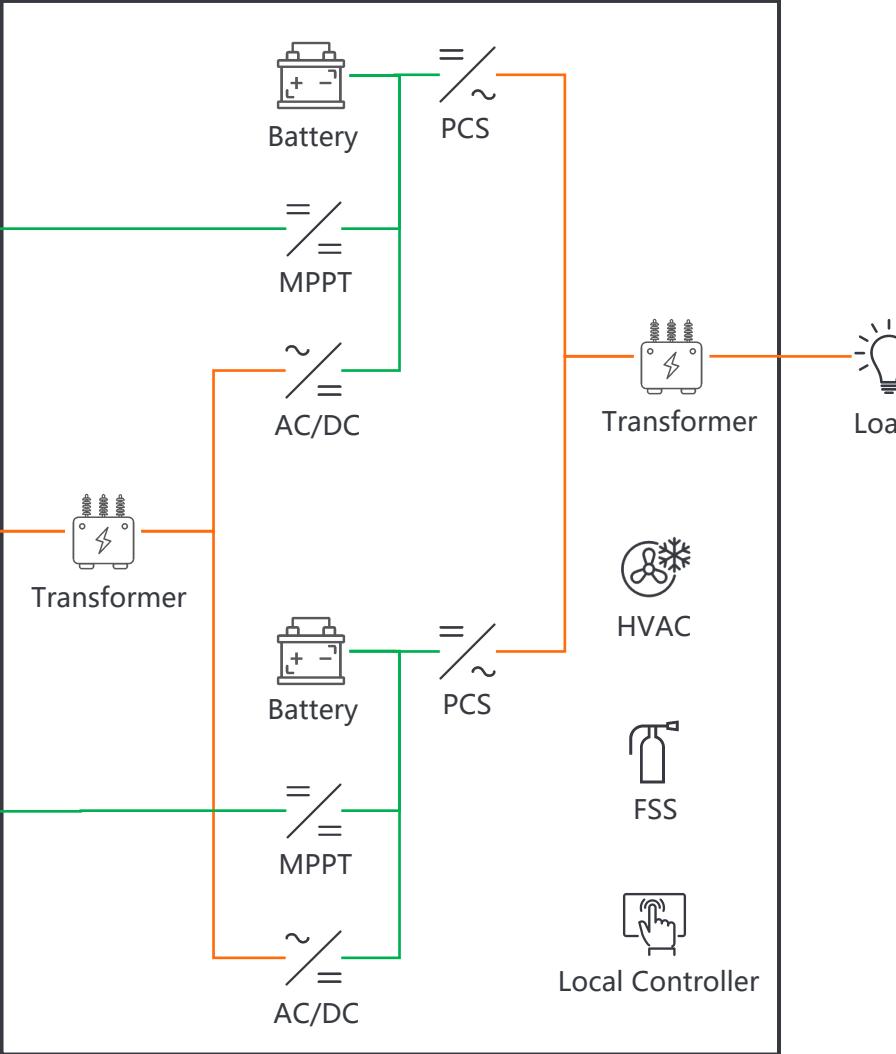
- ✓ Robust Container Structure
- ✓ Advanced Battery Diogasis Tech, 21% Increase Of Life Expectancy
- ✓ Support DC Couple For Solar Panels



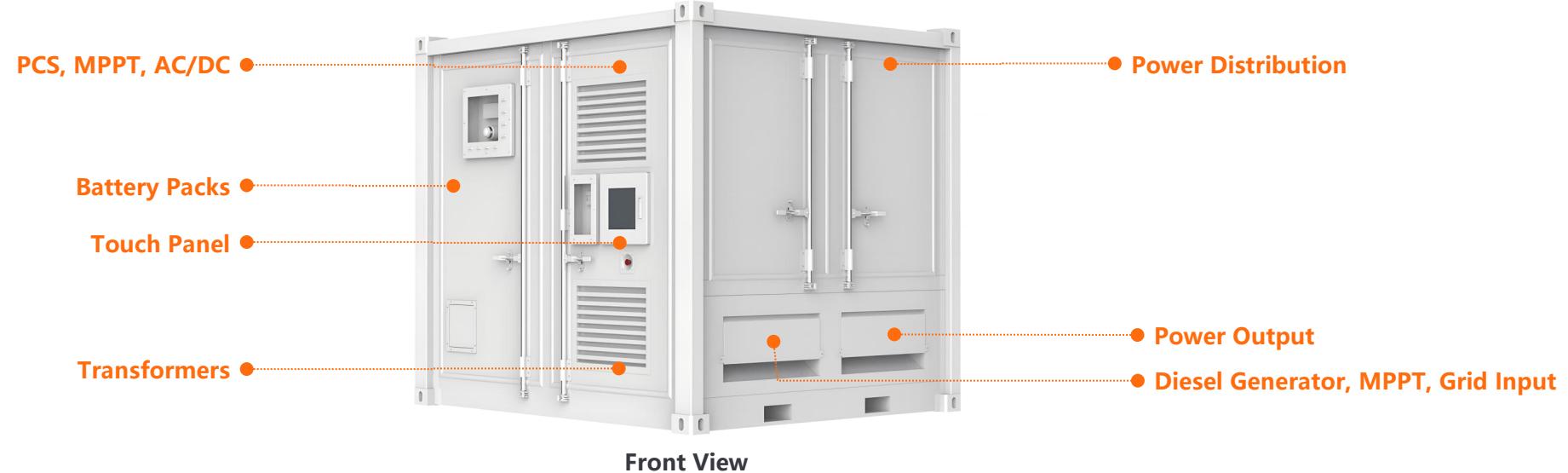
EASY

- ✓ All-In-One Design, Effortless To Own
- ✓ Modular Design, Support Multi-configuration
- ✓ Small Battery Pack, Easy To Handle
- ✓ 10.1' Inch Friendly Touch Panel



Block Diagram	Specifications				
 <pre> graph LR SP1[Solar Panels] --> MPPT1[MPPT] DG[Diesel Generator] --> T1[Transformer] G[Grid] --> T1 SP2[Solar Panels] --> MPPT2[MPPT] MPPT1 --> ACDC1[AC/DC] ACDC1 --> PCS1[PCS] PCS1 --> T1 MPPT2 --> ACDC2[AC/DC] ACDC2 --> PCS2[PCS] PCS2 --> T1 T1 --> L[Loads] T1 --> HVAC[HVAC] T1 --> FSS[FSS] T1 --> LC[Local Controller] </pre>	Nominal Energy 482 kWh Rated AC Power(via PCS) 210 kW MPPT Quantity 2 Max. PV Input Power 100 kW Max. PV Voltage 1,000 V PV Input Voltage Range 200 - 850 V Grid-tied AC Connection AC Bus 400 Vac (360 ~ 440 Vac settable) Operating Temperature Range <table border="0"> <tr> <td>Charge</td> <td>0°C - 45°C</td> </tr> <tr> <td>Discharge</td> <td>-20°C - 55°C</td> </tr> </table> Cell Chemistry Lithium Iron Phosphate (LiFePO4) Dimensions (L x W x H) 2,991 x 2,438 x 2,591 mm Weight (Approx.) 9,100 Kg Enclosure 10' GP container IP54 Containerized System Includes Battery, PCS, MPPT, HVAC, FSS, Local Controller, Transformer, Lighting & DC Power Meter	Charge	0°C - 45°C	Discharge	-20°C - 55°C
Charge	0°C - 45°C				
Discharge	-20°C - 55°C				

System Layout



Off-grid Mode

Max. 3 units for the number of parallel connection



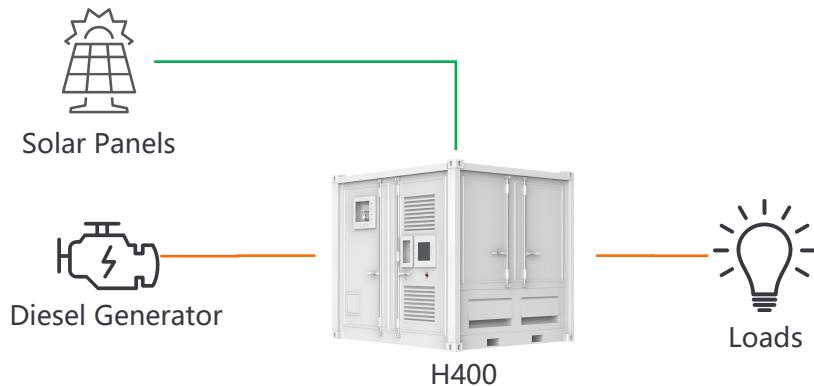
On-grid Mode

No limit for the number of parallel connection



Off-grid Power System Option-1

With DC couple solar panels and backup diesel generator



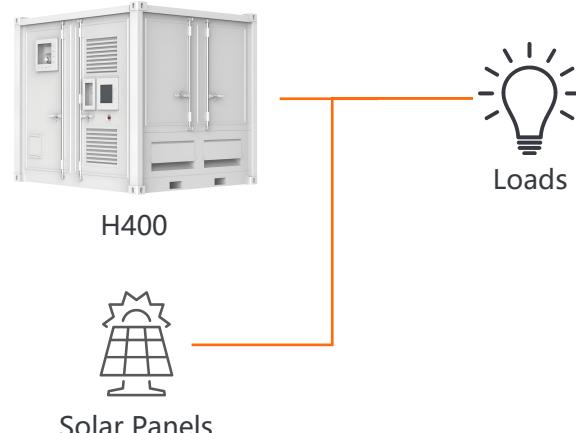
Off-grid Power System Option-2

With DC couple solar panels



Off-grid Power System Option-3

With AC couple solar panels, for situations where solar inverter already exists.



Off-grid Power System Option-4

If you already have a diesel generator, you can replace it with a much smaller one. Or, let the battery reduce the existing generator's running time, thereby decreasing fuel requirements, wear and maintenance costs.



On-grid Option-1

Uses battery storage systems to cover consumers' electricity demand when the existing grid connection is inadequate



On-grid Option-2

- ✓ Time of use
- ✓ power arbitrage
- ✓ power shifting
- ✓ Ancillary services
- ✓ Self-consumption optimisation
- ✓ Peak shaving



Key Components : Battery Cell, Module, Rack

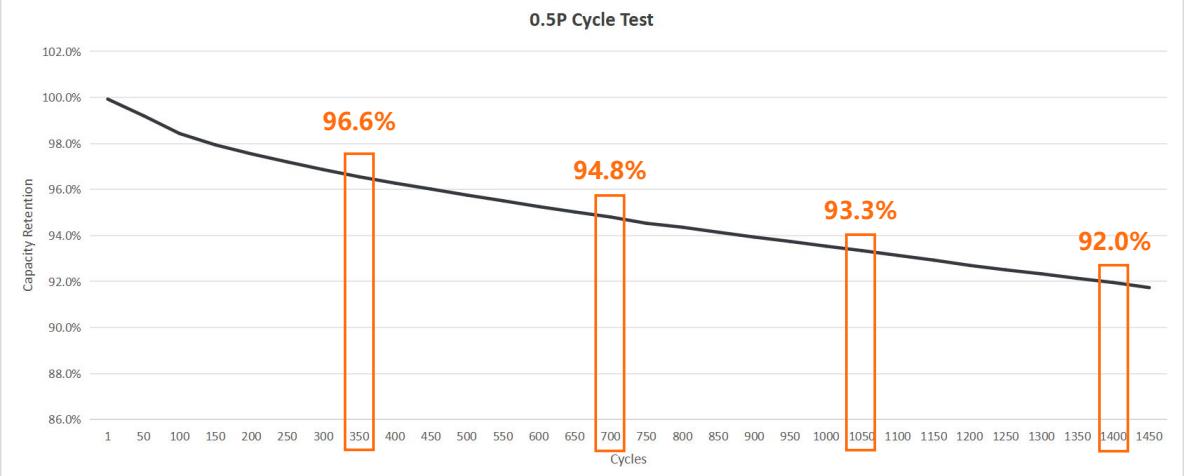
Cell



L173F314 Specifications

Chemical System	LFP + Gr
Product Size	174.4 x 71.4 x 207.2 mm
Nominal Capacity	314 Ah
Nominal Voltage	3.2 V
Nominal Energy	1004.8 Wh
Max. Continuous Charge	157A @ 0.5C
Max. Continuous Discharge	157A @ 0.5C
Operating Voltage	2.5 ~ 3.65V
Operating Temperature Range	-30 ~ 65°C
Weight	5.56 kg
Cycle Life	>12000 times up to 20 years of service life

Cell Capacity Retention Test Of 1450 Cycles



Module



M16 Specifications

Cell Configuration	16S1P
Nominal Energy	16.08 kWh
Nominal Capacity	314 Ah
Nominal Voltage	51.2 V
Voltage Range	44.8 ~ 56.8 V
BMU	Included
Max. Continuous Charge	157A @ 0.5C
Max. Continuous Discharge	157A @ 0.5C
Air Cooled	Included
Weight	130kg

Rack



R240 Specifications

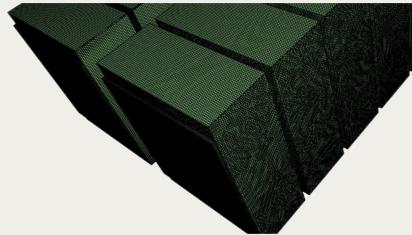
Cell Configuration	240S1P
Number Of Modules	15
Nominal Energy	241 kWh
Nominal Capacity	314 Ah
Nominal Voltage	768 V
Voltage Range	672 V ~ 852 V
BMU	Included
Max. Continuous Charge	157A @ 0.5C
Max. Continuous Discharge	157A @ 0.5C
HVU	Included
Communication	CAN, RS485
Air Cooled	Included
Dimensions(W x D x H)	2106 x 843 x 1998 mm
Weight	130kg

Thermal Management Of Battery Module

Mesher Process And Boundary conditions

Preprocess

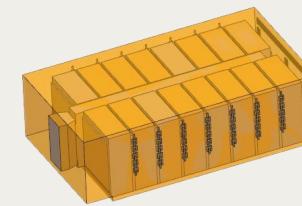
- Use polyhedral meshing method
- 10 Million Meshers



Material	Density (kg·m ⁻³)	Specific heat (J·kg ⁻¹ ·K ⁻¹)	Material Attribute
			Thermal conductivity (W·m ⁻¹ ·K ⁻¹)
Cell	2158	1000	W:10.6, D:1.27, H:14.88
Air	1184	1003	0.02

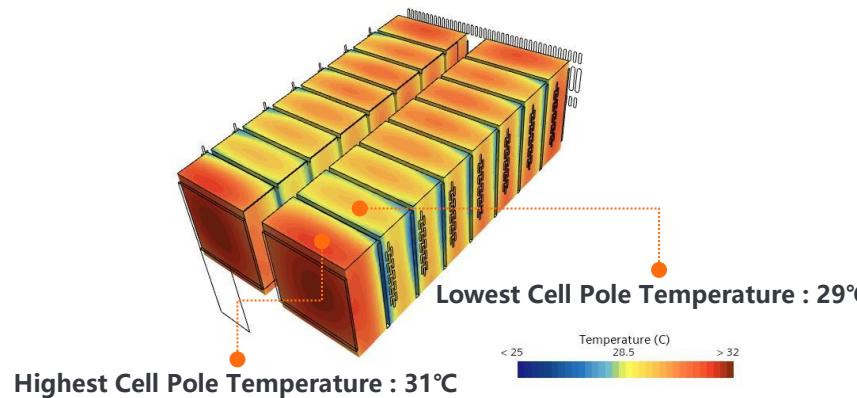
Boundary Attribute

1. Cell charge thermal power @0.5C : 13.81W
2. Cell discharge thermal power @0.5C : 14.54W
3. Fan outlet volume : 200CFM

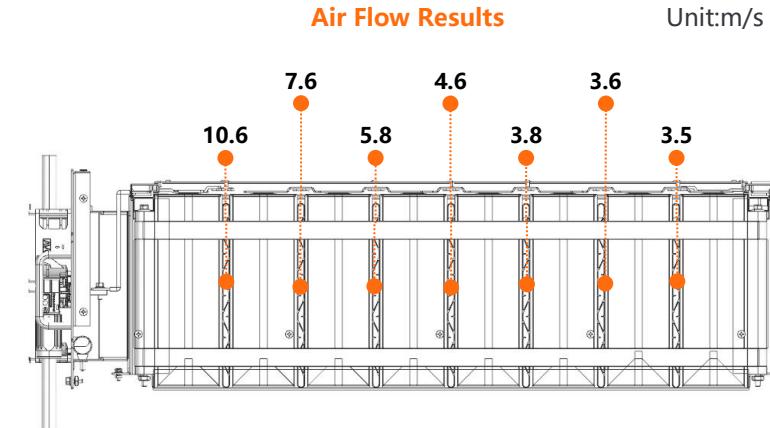


Simulation Results

Temperature Results



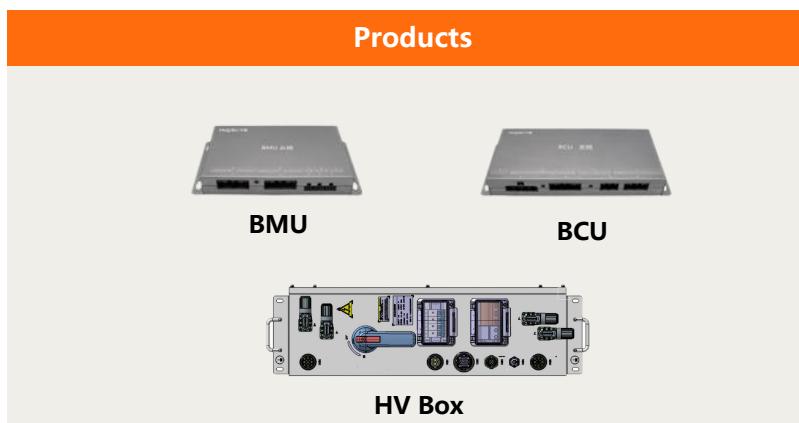
Air Flow Results



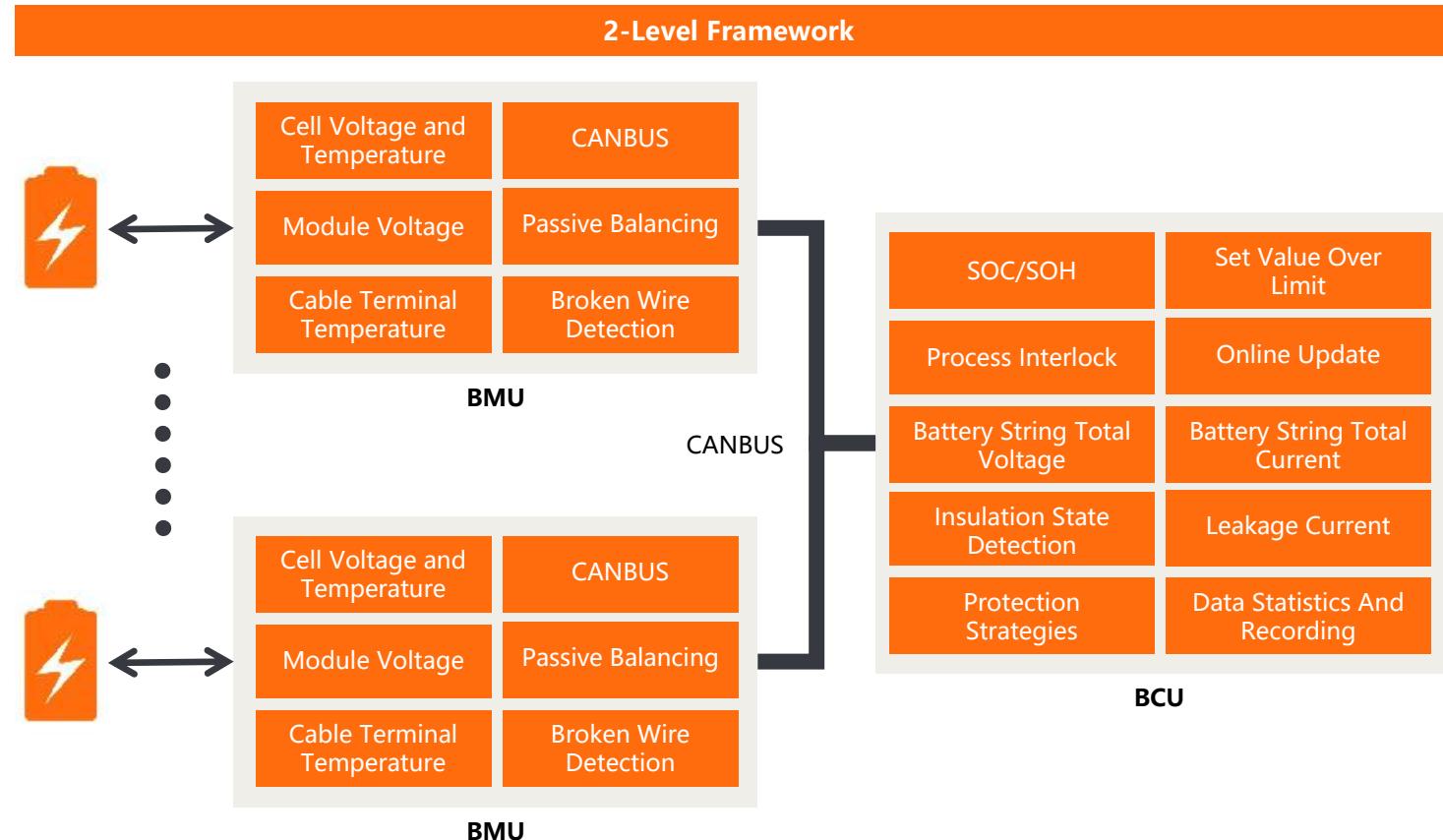
Conclusions

Maximum Cell Temperature Difference is less than 2°C

Key Components : Automotive Level BMS (Battery Management System)



Core Parts List		
Part	Vender	Part Number
AFE(Analog Front End)		MC33771
BMU MCU		FS32K144
BCU MCU		S32K344
Communication isolation		ADM3053

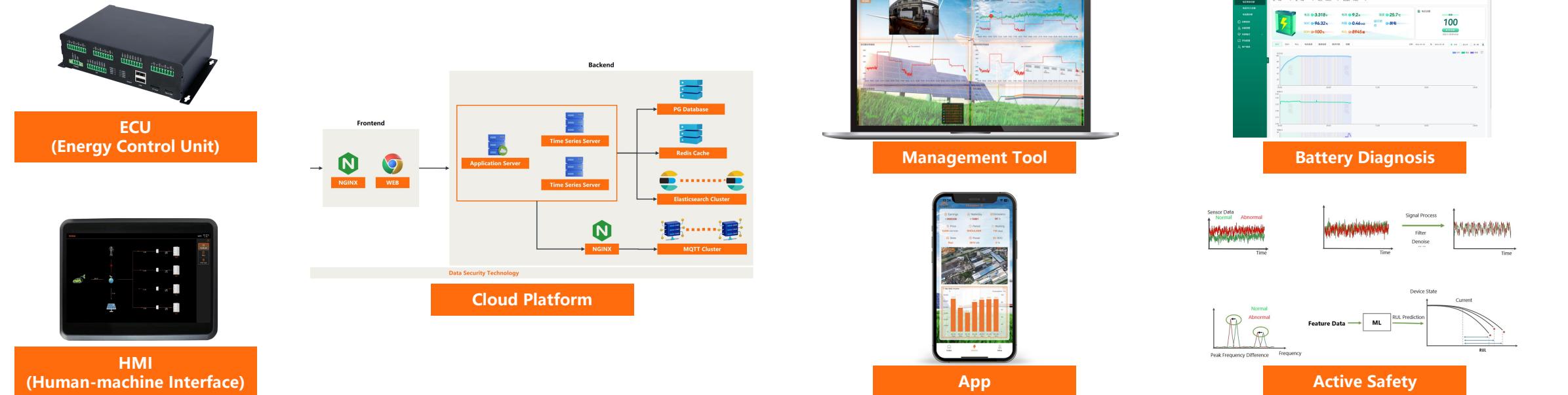


Key Components : Professional C&I BESS EMS (Energy Management System)



Features	Applications	
	Time Of Use	Charge low and discharge high to save money
	Self-consumption Optimisation	Use more energy from renewable sources and minimise feed-in
	Off-grid	Create your own power grid independently of energy suppliers
	Peak Shaving	Shave consumption demand peaks to cut demand rate costs
	Charging Station Control	Avoid expensive grid connection expansion, save money by time of use
	Back-up Power	Storage system immediately takes over the power supply in the event of a power outage
	Ancillary Services	Including FFR and FCR-D services, to get benefit for participating in the up/down frequency regulations
	PV-diesel-hybrid Optimisation	Decreasing fuel requirements, wear and maintenance costs
	Micro-grid	Cover consumers' electricity demand when the existing grid connection is inadequate
	Zero Feed-in	Allow consumers in areas with a weak grid infrastructure to meet their high demand from their own electricity supply
	Direct Marketer Interface	Enables the facility operator to offer their electricity through a marketer

EMS Products Family



App And Mgmt. Tool



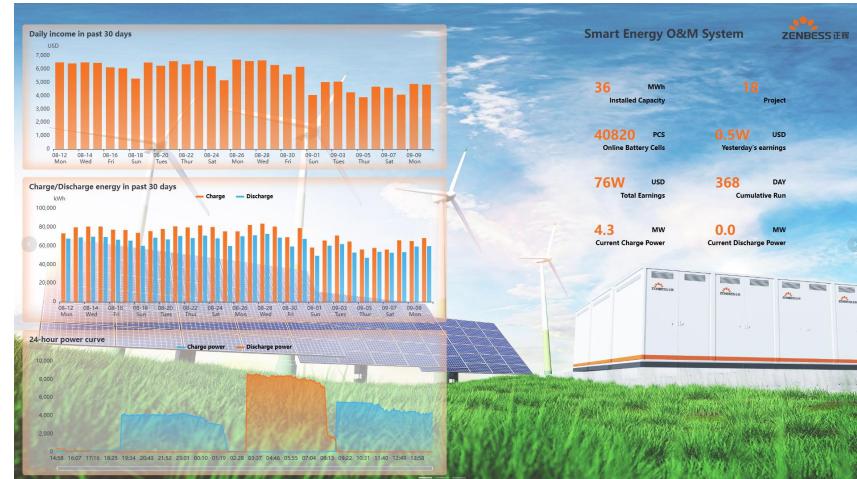
APP

- ✓ Real-time Data Monitoring
- ✓ Remote Control
- ✓ Service Call
- ✓ Support iPhone and android



MGMT. TOOL

- ✓ User/Project/Device/Data Mgmt.
- ✓ Data Center
- ✓ Report Tools



Smart Energy O&M System									
Operational Project List									
Project Name*	Income(CNY)*	Yest. Income(CNY)*	Yest. Consumption Rate *	Installed Capacity(kWh)*	Status*	Real-time Power(kW)*	SOC(%)*	SOH(%)*	
Zhenghai Charging sta...	13,419	1,676	9%	466	Run	1	81.0	100	
Yuxing CO.,LTD Tongzhi...	30,918	2,392	96	2330	Run	5	98.0	100	
Yuxing CO.,LTD	84,570	3,956	92	3728	Run	208	71.0	100	
Xi'atong	85,932	2,531	10%	2300	Run	5	98.0	100	
Xinjiang	22,041	1,684	94	912	Run	116	72.0	100	
Tianjin	107,995	380	73	466	Run	1	69.0	100	
Tieling	145,397	447	92	466	Run	103	99	100	
SHI Feixiang Industry 2	77,857	5,379	97	466	Run	152	4.0	100	
SHI Feixiang Industry 1	10,040	5,113	96	466	Run	163	1.0	100	
Guangzhou Special Bearing...	21,628	4,773	93	466	Run	1	96.0	100	
Longhai Charging Station	27,405	102	45	213	Run	-35	63.0	100	
HLL Optic-electric	172,435	4,359	89	466	Run	103	89.0	100	
Duolengke	204,971	215	69	213	Run	51	92.0	100	
Changping Evaporator	67,187	2,669	61	302	Run	324	46.0	100	
Changwei NBR	32,797	1,392	91	132	Run	4	100.0	100	
Changhe 2	19,220,018	9,804	96	140,02	Run	2,254	61.0	100	
Changhe 3	76,405	6,422	97	6994	Run	1,132	81.0	100	
Chi Changzhou Huayu	40,936	6,601	41	2138	Run	5	62.0	100	

Key Components : HVAC And Fire Suppression System

HVAC

The HVAC inside the ESS adopts precision heating, ventilation and air conditioning designed to ensure ideal internal temperature whether discharging, charging or on standby.

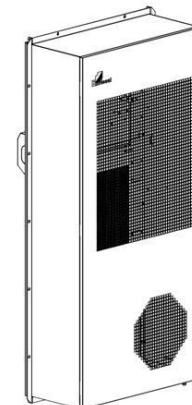
The operation of the HVAC is fully automatic and responds to the internal temperature of the container. It is a highly reliable system and has a number of easy to use functions.

Features

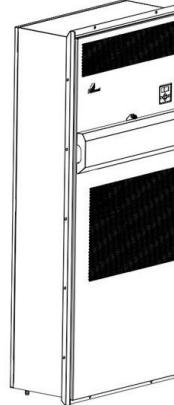
- Professional humidity design, effectively control relative humidity
- Self-start when power restart
- Provide varieties of alarm reports and protection
- Environmentally friendly – R134a and RoHS compliant
- Lifetime >10 years
- Full front maintenance

MC50HDNC1A

Cooling Capacity	5000W(L35 L35)
Heating Capacity	3700W(L5)
Refrigerant	R134a
Operating Temperature Range	-40 ~ +55°C



Outdoor Unit



Indoor Unit

Suppression System

The fire suppression system is designed according to the container size, and the fire extinguishing gas is discharged from the extinguishing gas cylinders to the main pipeline and then to branch pipelines and sprayed from nozzles. The system includes fire detectors, audible and visual alarm, emergency start/stop button, gas release indicator, gas extinguishing controller, etc., and follows European standards.

Extinguishes electrical, liquid and solid substance fires Auto start, manual start and mechanical emergency start Effectively prevents accidental discharge caused by chronic leakage Configured to prevent accidental startEvent logging function



Our service team will support you with all matters relating to your Zenbess storage solutions. As a reliable partner, we'll be at your side from installation to maintaining of your system components. With our comprehensive service portfolio, we guarantee a high level of economic availability for your equipment. Our experienced and competent service team members work in a customer-focused and goal-oriented manner, so you can concentrate completely on your core business.



Remote and on-site service

Our experts provide rapid remote diagnostics and on-site support for your storage solutions. Qualified staff ensure stable operation of your systems through maintenance and rapid troubleshooting.



Service agreement

Efficient remote maintenance, comprehensive protection and guaranteed availability. High-quality spare parts availability ensures long-term functionality. Extend your warranty by up to seven years.



Training

Our customised training enables your team to troubleshoot, maximises equipment availability and provides immediately applicable expertise on operation, installation, commissioning, safety and maintenance.



Spare parts

Top quality and fast availability: Zenbess delivers original spare parts for your equipment on time. You benefit from solution-oriented consulting, tailor-made packages and ultra-fast worldwide delivery.

Smart Energy Solution Provider

2012
Founded

300+
Projects

150+
Employees

200,000+ m²
Factory Size



World Leading, Global Powering

R&D, Production, Sales, Operation



Smart Energy Solution Provider



Energy Storage System



Photovoltaic Station



Smart Microgrid



Charging Station



Power Trading



Virtual Power Plant

Product and Service



BATTERY ENERGY STORAGE SYSTEM

Fully integrated Battery, Power Electronics and EMS



ENERGY MANAGEMENT SYSTEM

ZenBess's best in class EMS optimizes and controls all your energy storage assets



TURNKEY

Customized solution with financial support



OPERATION

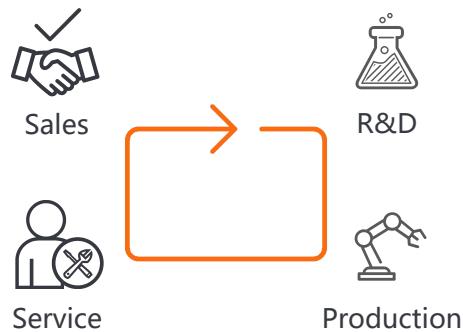
EMS software, remote support, operational support and preventative maintenance



DEVELOPMENT

By case analysis, ESS sizing and configuration, ODM/OEM

Closed Loop Ability



 **50 MWh**
BESS In Operation

Tech Drive Team

 **30+**
Experienced Engineers
 **20+**
Invention Patents

Quality Management System



CALB
Trust Efficient Win-Win



KELONG
科华技术

Envicool

Partner

THANK YOU

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