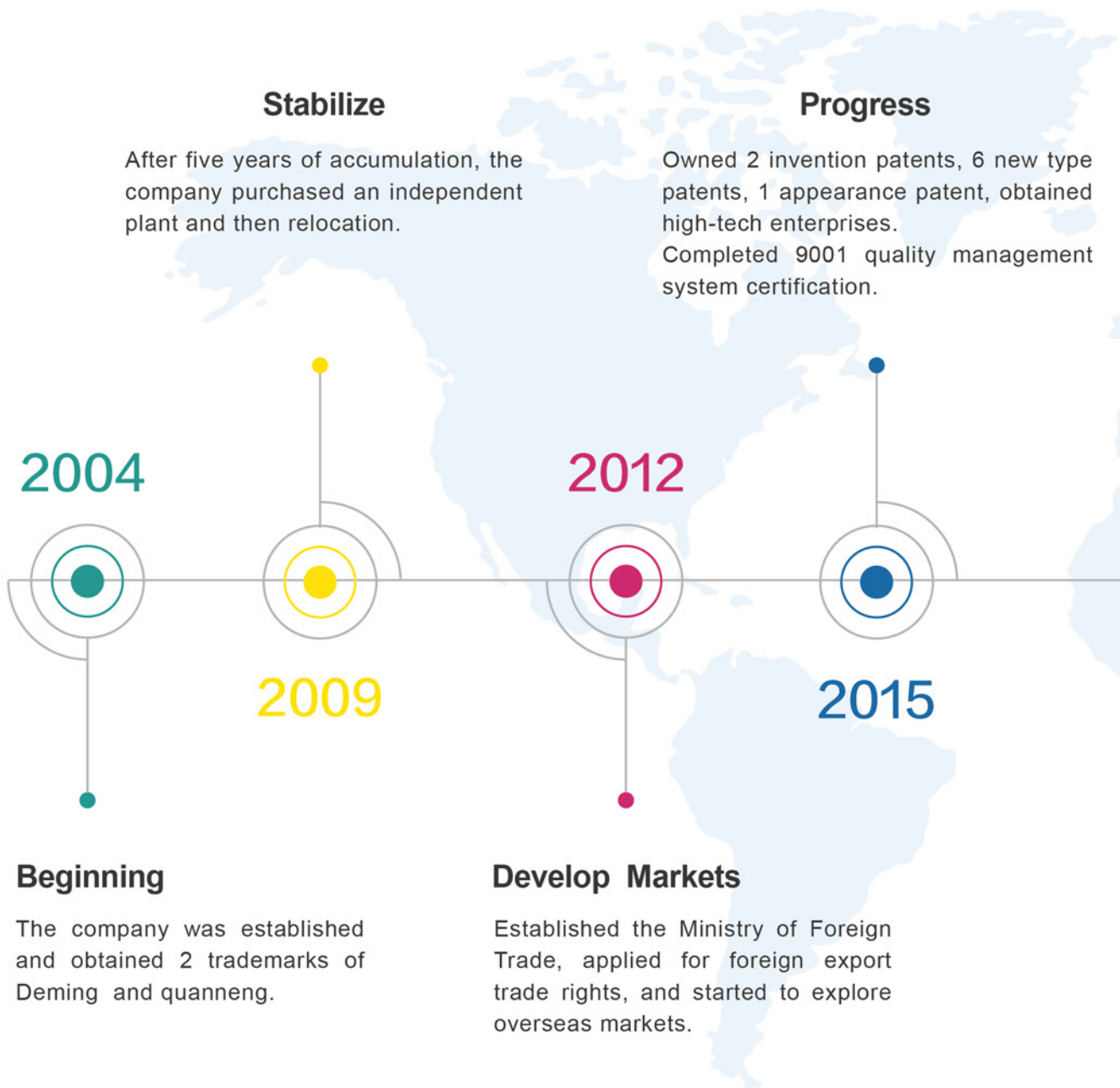


**Power Conversion System (PCS)**  
**Bidirectional Inverter**  
**Bidirectional DC Converter**

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# DEVELOPMENT COURSE



## Dare To Blaze New Trails

It has 3 invention patents and 6 utility model patents, and has been recognized as a high-tech enterprise for the third time. Won the title of "Specialized and special new" small and medium-sized enterprise in Jinan City.

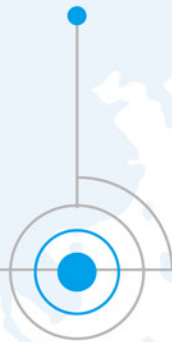
2018



### Innovation

Possess 4 invention patents, 11 new patents, 2 software registration rights, complete the implementation of corporate intellectual property standards.

2021



### Future

Deming is committed to the cause of green energy conservation. Carry forward the craftsmanship. Based on the market, paying attention to customers, providing high-quality products, and jointly meeting new challenges.

# COMPANY PROFILE

| Jinan, China

Jinan Deming Power Equipment Co., Ltd. is a high-tech enterprise focusing on research, production, sales and service of renewable energy power products such as wind energy and solar energy. With a high reputation in the Association and participates in the formulation of international standards for small wind turbines. It is a designated product for state aid for foreign projects and 80% of products are exported.

The company was established in 2004 and acquired two registered trademarks of "Deming" and "Quanneng" in the same year. After five years of accumulation in 2009, the company gradually matured steadily. The company purchased factory buildings with independent property rights, and the company relocated to start a new journey. In 2012, the Ministry of Foreign Trade was established to open up markets and begin to expand foreign markets. In 2015, the company achieved rapid development, with 2 invention patents, 6 utility model patents, 1 appearance patents, obtained the "high-tech enterprise certificate" recognition, and obtained the ISO 9001 quality management system certification. In 2018, the company continued to innovate, with four invention patents, six utility model patents, and two software registration rights, and again successfully recognized high-tech enterprises. On July 10, 2019, it passed the certification of intellectual property management system. In 2020, three patents for invention and six patents for utility models were applied for. In 2021, it was recognized as a high-tech enterprise for the third time and won the title of "Specialized and special new" small and medium-sized enterprise in Jinan City.

The main products of Deming are: Power Conversion System, Bidirectional DCDC Converter, Optical Storage Machine, On Grid Wind Turbine Controller, Solar Charge Controller, Wind Turbine Solar Hybrid Controller, Wind Turbine Solar Hybrid Street Lamp Controller, On Grid Inverter, Off Grid Inverter, Wind Power Converter, Hydropower Converter, AC Power Source, Stabilized Voltage and Frequency Power Supply, etc.

With first-class manufacturing technology, advanced technology and equipment, strong technical force, perfect testing means and personnel management, Deming has carried out 17 research and development projects in the last three years, completed 16 transformation of scientific and technological achievements, and invested all by itself to implement the transformation, averaging 5.3 transformation of scientific and technological achievements each year.

Deming takes technological innovation as the basis of enterprise development, annual R&D cost is not less than 20% of sales revenue, and continuously explores advanced technologies in the field of new energy power sources, such as electromagnetic control technology for wind turbines, MPPT technology, yaw wind turbines control technology, wind and solar complementary system Internet of Things monitoring, etc. Now it has five national invention patents for core technologies, twelve utility model patents, and the control technology for wind turbines has reached the advanced international level.

Deming has a complete product quality assurance system and 9001 certification. Perform comprehensive quality control, rigorous test one by one, each performance is superior to the relevant national standards, all products have passed the EU CE certification. Ensure user safety and reliable use. Now the company's products have been the preferred supporting products for the well-known domestic manufacturers. The products export to more than 120 countries and regions, such as Germany, Japan, the United States, the United Kingdom, Canada, Australia, Egypt, Brazil, Saudi Arabia, and have established a good image in the domestic and foreign markets.

We are based on the market, pay attention to customers, provide high-quality products, adhere to technological progress, scientific management and standardized operation are the key to our success. We will jointly meet the challenges of the new century, shape a good image outside, and construct the blueprint of a modern enterprise in an all-round and three-dimensional way.



# ABOUT US

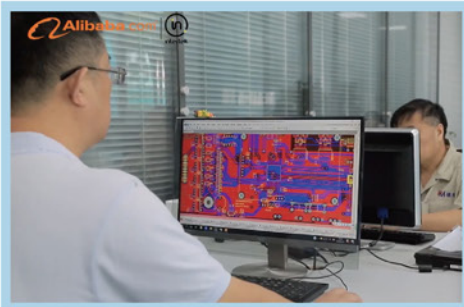


## Professional Technical Team

Founded in 2004, Deming is an early manufacturer specializing in the research, development, production and sales of wind solar control systems in China. We have a professional technical team with rich theoretical and practical experience.

## Craftsmanship Spirit

Each component is strictly tested before production and each product must pass aging quality test before delivery.



## Customize

Deming has an excellent technical team, which can customize various power supplies according to the needs and different application scenarios.

## Integrated System Specialist

Deming is an early professional manufacturer of small and medium-sized wind turbine controllers in China. We cooperate with many excellent wind turbine factories. So we can provide high quality Hybrid wind solar system.



# ENTERPRISE HONOR



High-Tech Enterprise Certificate



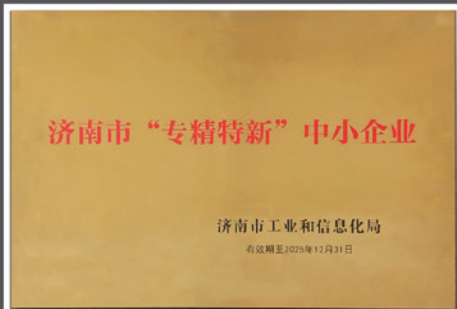
ISO9001 Certification



Integration of Informatization and Industrialization Certificate



CE Certification



Specializing in Special New Certificate



Utility Model Patent Certificate and Computer Software Copyright Registration Certificate



Patent for Invention Certificate

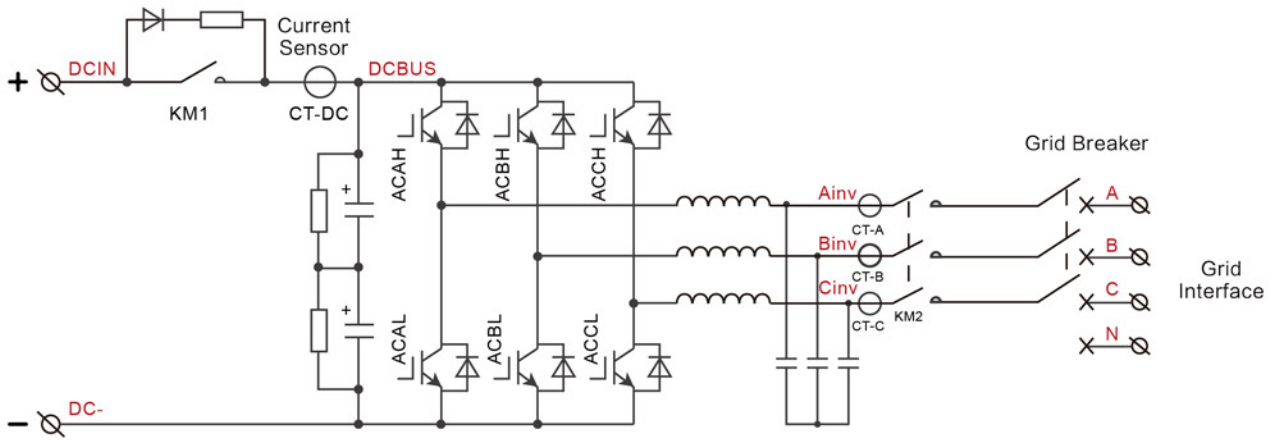


## Power Conversion System (Bidirectional Inverter ) Performance Characteristics And Specifications

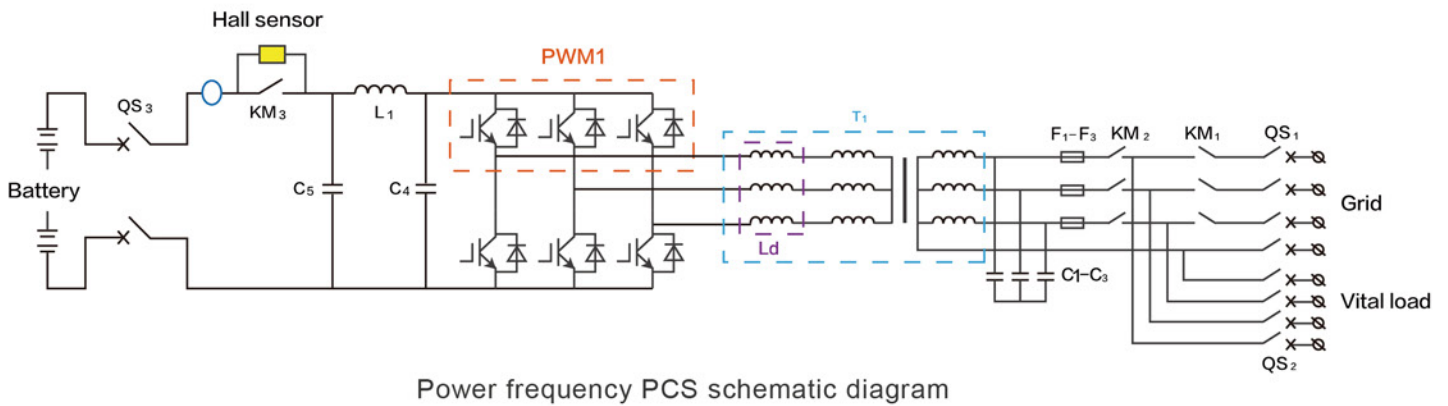
Energy storage converter (PCS) can control the charging and discharging process of batteries to transform AC and DC, and can directly supply power to AC loads without grid. PCS consists of DC/AC bi-directional converters and control units, etc. PCS controller receives background control instruction through communication, and controls the converter to charge or discharge the battery according to the symbol and size of power instruction, so as to adjust the active and reactive power of the grid. The PCS controller communicates with the BMS through the CAN interface to obtain the battery group status information, which can realize the protective charge and discharge of the battery to ensure the safe operation of the battery.

### Functions And Applications Of PCS

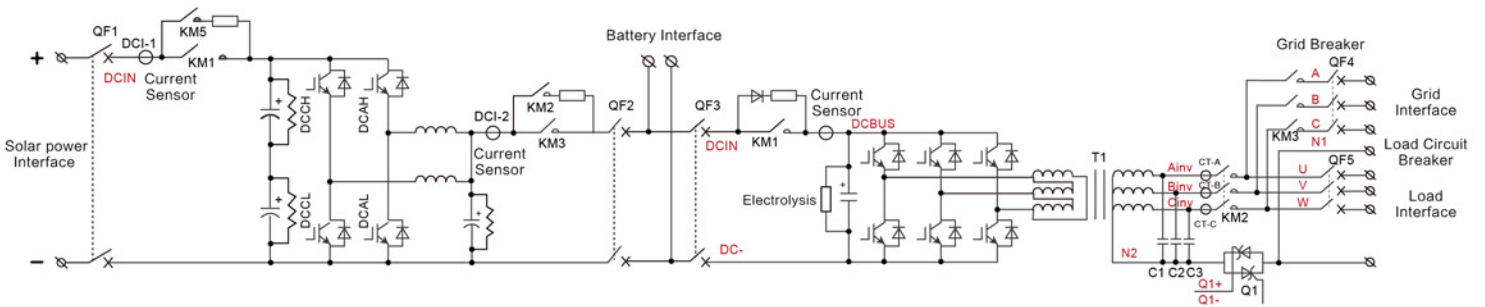
- Specially designed for smart grid and smart micro-grid, accepting grid dispatching, peak cutting and valley filling;
- It has a wide application range, can connect with different energy storage batteries such as lead-acid battery, lithium battery, super capacitor and vanadium battery, etc.  
For vanadium flow battery, 0V charging and 0V discharging functions are added to meet the charging and discharging characteristics of vanadium flow battery.
- Bidirectional inverter, a variety of battery charging and discharging modes optional;
- It has the function of setting working mode in time period, can set reasonable working mode according to the characteristics of local power grid;
- Integrated EMS management system, in the solar energy storage system, can set the priority of solar, battery and grid (optional)
- It has two operation modes: grid-connected (charge-discharge) operation and independent isolated network operation. It can control active power and reactive power output according to the instructions of the grid dispatching department, and has four-quadrant full capacity operation;
- RS485, CAN bus and other communication interface are optional, standard MODBUS\_RTU communication protocol, remote monitoring;



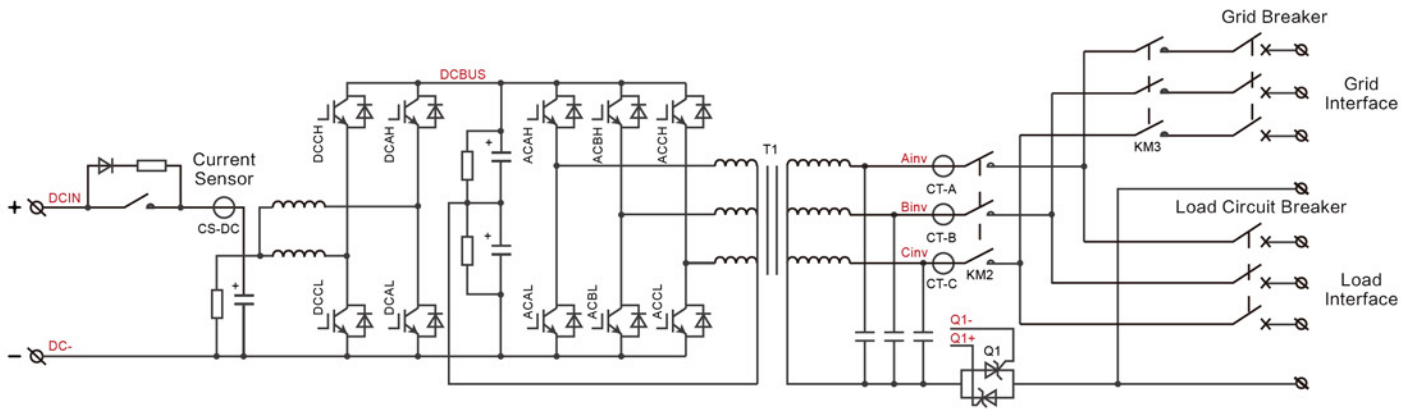
High frequency PCS schematic diagram



Power frequency PCS schematic diagram

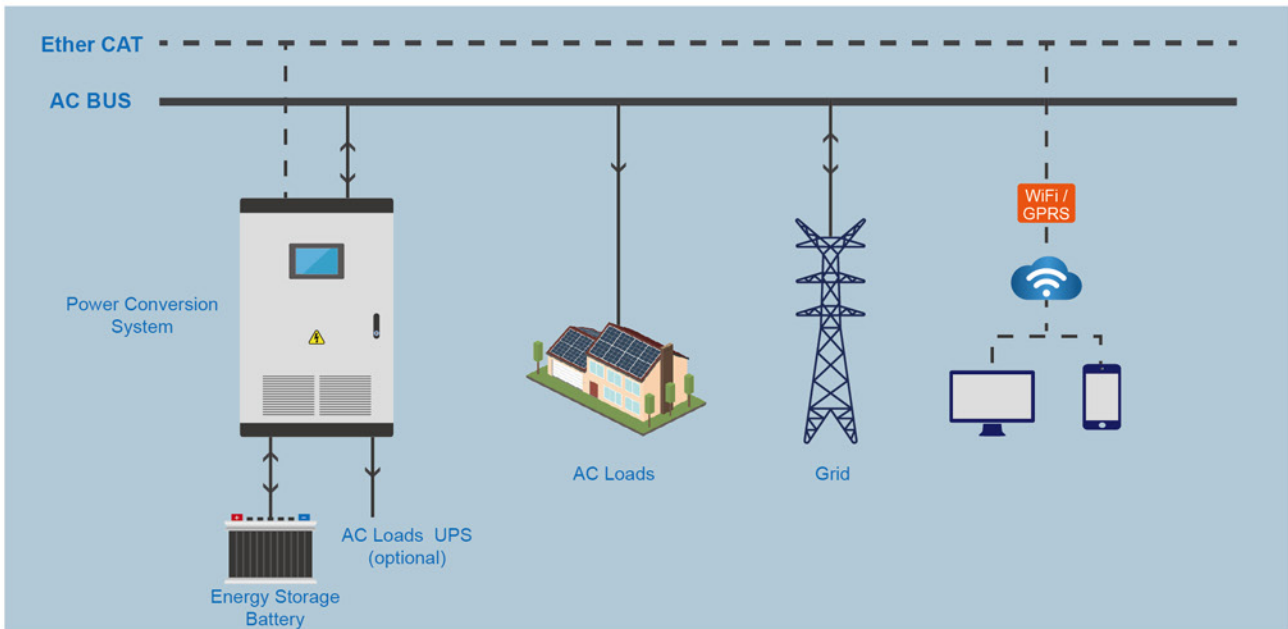


Hybrid inverter schematic diagram



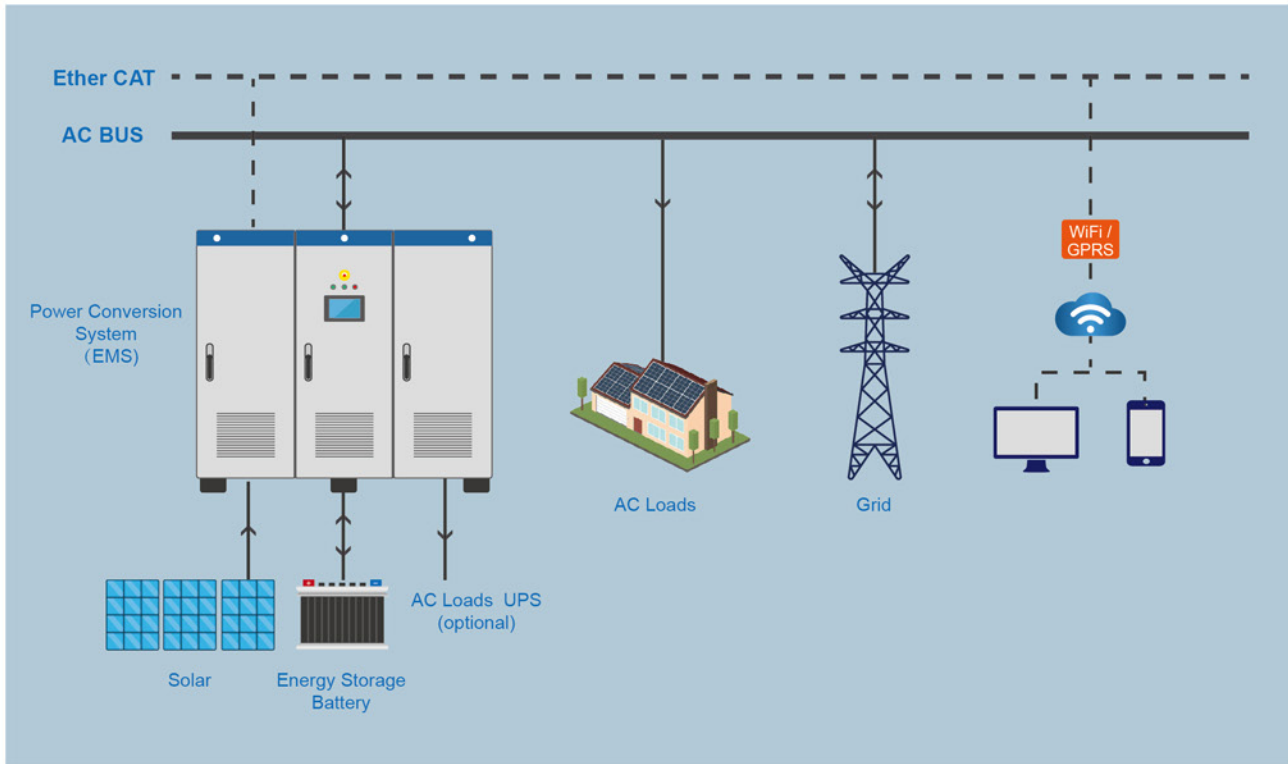
Power frequency energy storage converter (built-in DCDC) schematic diagram

## PCS Schematic Diagram



(Charge and discharge system of PCS)

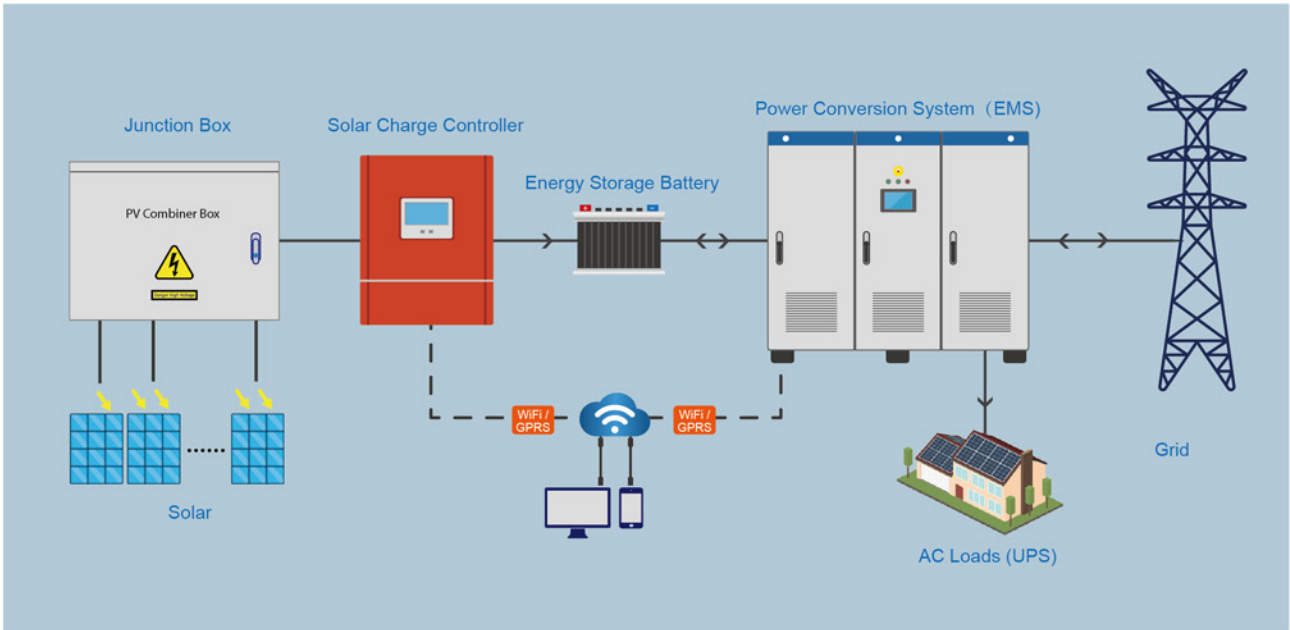
The system consists of battery, PCS and grid, which is the most basic application scenario. It is often used for peak-load shifting. There are two operating modes, manual and automatic (setting charging and discharging time and power).



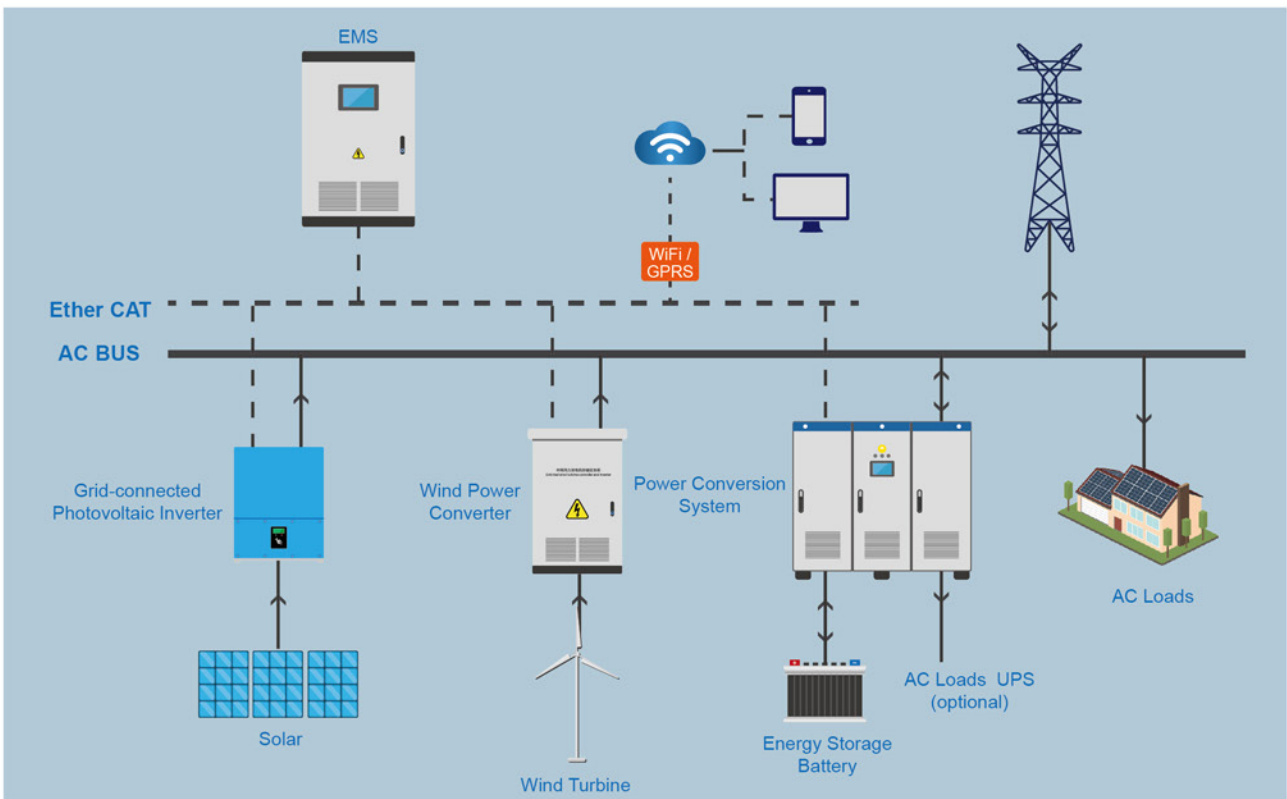
Solar energy storage system(PV charging controller and PCS integrated)

The PCS in this system, is built-in MPPT solar charging module, integrated EMS management system. It can realize that the solar panels provide power to the load preferentially through PCS, and the excess electricity is used to charge the battery. When the battery is fully charged, the electricity from the solar panels is fed into the grid through PCS.

- When the solar panel power is insufficient, the battery is discharged to supply power to the load.
- When the battery power is insufficient to support the load, the battery and the grid power supply the load at the same time. As the battery power varies from 100% to the battery under voltage protection value (can be set), the corresponding grid power supplies the load from 0% to 100%.
- The PCS has a load port. This port has the UPS function to meet the load uninterrupted power supply.



Solar energy storage system(PV charging controller and PCS separated)



New energy intelligent micro grid system

This system consists of photovoltaic panel, photovoltaic grid-connected inverter, wind turbine, wind power converter, energy storage battery, energy storage converter, EMS management system.

EMS management system realizes the centralized management and scheduling of BMS and PCS of energy storage power stations, photovoltaic power generation and wind power generation.

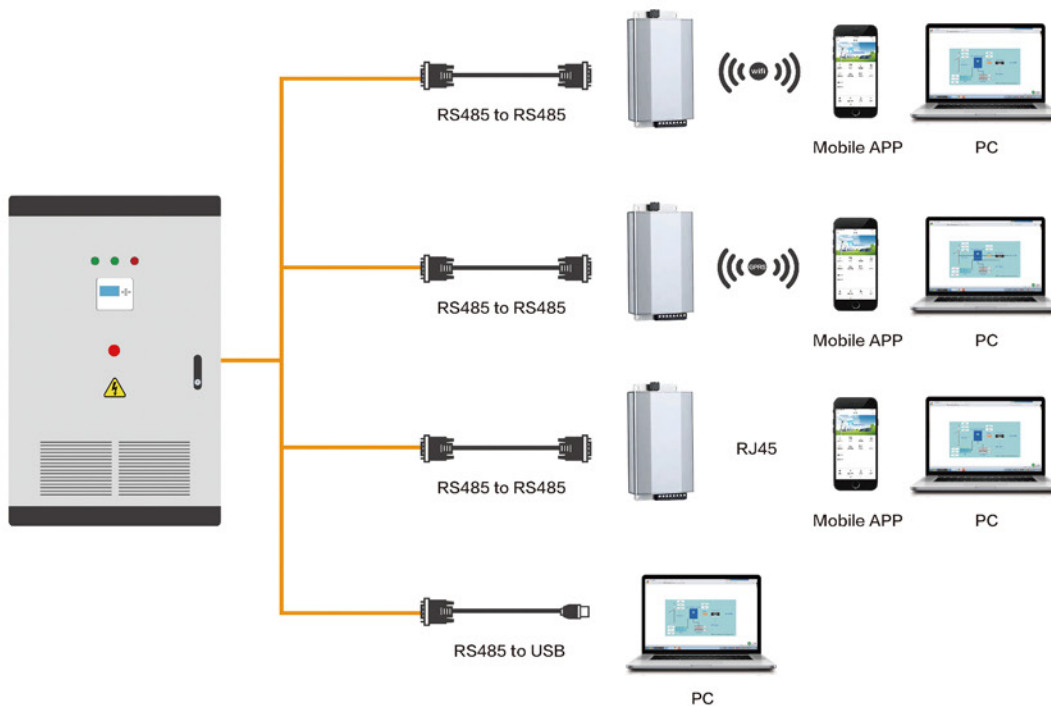
## Technical Characteristics

- With high conversion efficiency, the maximum efficiency of power frequency topology is not less than 95%, and the maximum efficiency of high frequency topology is not less than 98%.
- The default communication interface is RS485 port, can also customize CAN port and can communicate with the monitoring system, EMS management system, and BMS management system.
- **Response characteristics when frequency is abnormal**  
Have some tolerance ability of system frequency abnormal.
- **Active power control function**  
The active power output can be controlled according to the instructions of the monitoring system. In order to realize the active power regulation function, the battery energy storage system should be able to receive and track the active power control signal sent by the monitoring system in real time, and automatically adjust the active power output according to the grid-connected side voltage frequency, control instructions of the monitoring system and other signals to ensure that the maximum output power does not exceed the given value.
- **Isolated island operation**  
In addition to the grid-connected operation mode, there is an isolated island operation mode, that is, it is separated from the main grid according to the set conditions, and provides part of the load within the capacity range to meet the power quality requirements of the grid.
- **Protection function**  
It has DC overvoltage protection, undervoltage protection, overcurrent protection, input reverse connection protection, AC undervoltage/overvoltage protection, overload protection, overheating protection, over/under frequency protection, three-phase unbalance protection and alarm, AC reverse phase sequence protection and alarm functions.
- **DC side power quality requirements**  
Charging the battery meets the power quality requirements of the battery. When charging at constant current, the accuracy of current stabilization is less than 1%FS (at 20%-100% of rated output current).
- **AC side voltage unbalance**  
After access to the grid, the three-phase voltage unbalance degree of the public connection point shall not exceed the limits specified in GB/T15543-2008 "Three-phase Voltage Unbalance of power quality", and the negative sequence voltage unbalance degree of the public connection point shall not exceed 2%.
- **Operational state visualization**  
Touch screen as the man-machine interface. Real-time operation data, real-time fault data, and historical fault data can be clearly displayed through touch operation.
- With AC input manual break switch, emergency stop operation switch.

## Performance Characteristics

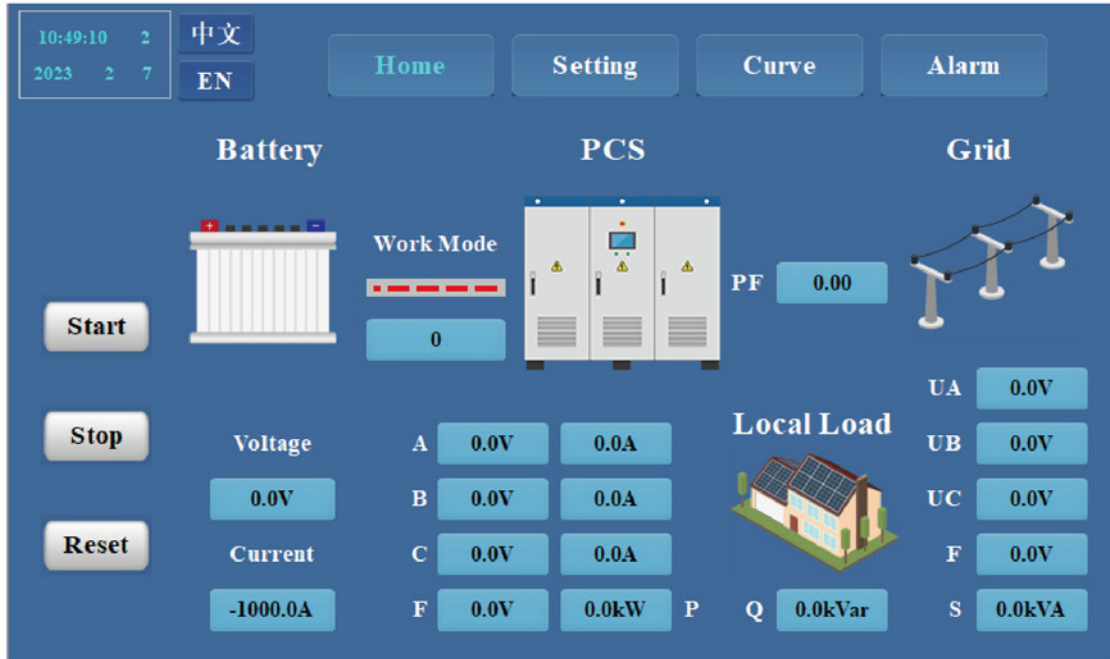
- The 32-bit DSP (Digital Processor TI 2812) +ARM (Touch Screen Master Chip) platform is used for touch screen display and operation, which facilitates field operation and parameter setup. The core driver of DSP control and ARM realize peripheral functions such as display and communication to improve power reliability.
- It has a full range of power protection schemes and perfect self-detection and protection functions. In the event of system failure will stop working to protect system safety; Power supply with overheating, overload, overcurrent, short circuit, drive protection and other protection functions, to ensure reliable and stable operation of power supply.
- The whole system of modular power unit design, simple and fast replacement, can quickly trouble-shoot, does not affect the whole system, at the same time with excellent electromagnetic compatibility, can meet the various occasions of reliable application.
- Support RS485, Ethernet communication, optional CAN to meet customer remote monitoring and other functions; It can display AC and DC side voltage, current, working mode, running state, fault information, etc., and can upload the relevant data to the remote upper computer through the communication interface, and can start and stop the power supply through the upper computer, parameter setting and other operations.

## Multiple Communication Methods



# Power Conversion System Liquid Crystal Screen Operation And Display

## ▼ Operation home page - Home page



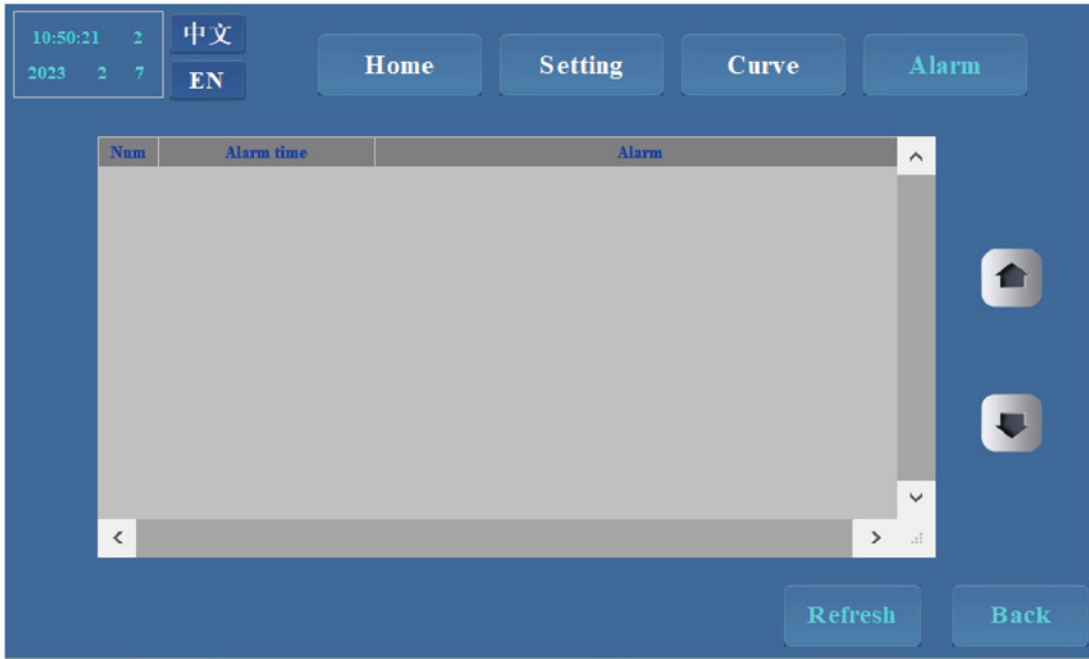
## ▼ The alarm page



When a fault occurs, the corresponding indicator box changes from green to red.



History: Click to view historical alarm records, the interface is as follows:



Refresh: Click to update the history.

### ▼ Setting up child pages



Three operating modes:

---

## Manual control

- **Grid-connected mode:**

In this mode, the grid-connected port of the inverter is connected to the grid to supply power to the grid and output AC power. Working mode is DC input to AC output. The charging and discharging power can be set. Positive value is discharge, the battery enters the power grid through the inverter. Negative value is charging, the grid power enters the battery through the inverter.

- **Off-grid mode:**

In this mode, the battery passes through the power supply to the load and supplies power to the load. Working mode is from DC input to AC output.

## Automatic control

- **Automatic control mode:**

Select automatic control, input the power value of charging period and discharging period, input the start time and end time. After confirmation, it will automatically start charging and discharging.

- **Charging period:**

Input from the grid side, output DC to charge the battery .

- **Discharge period:**

Input from DC side and output AC power to the power grid through the power supply.

- **User parameter setting:**

Click the white input box on the right of user rights, enter the password "1", and click OK to enter.

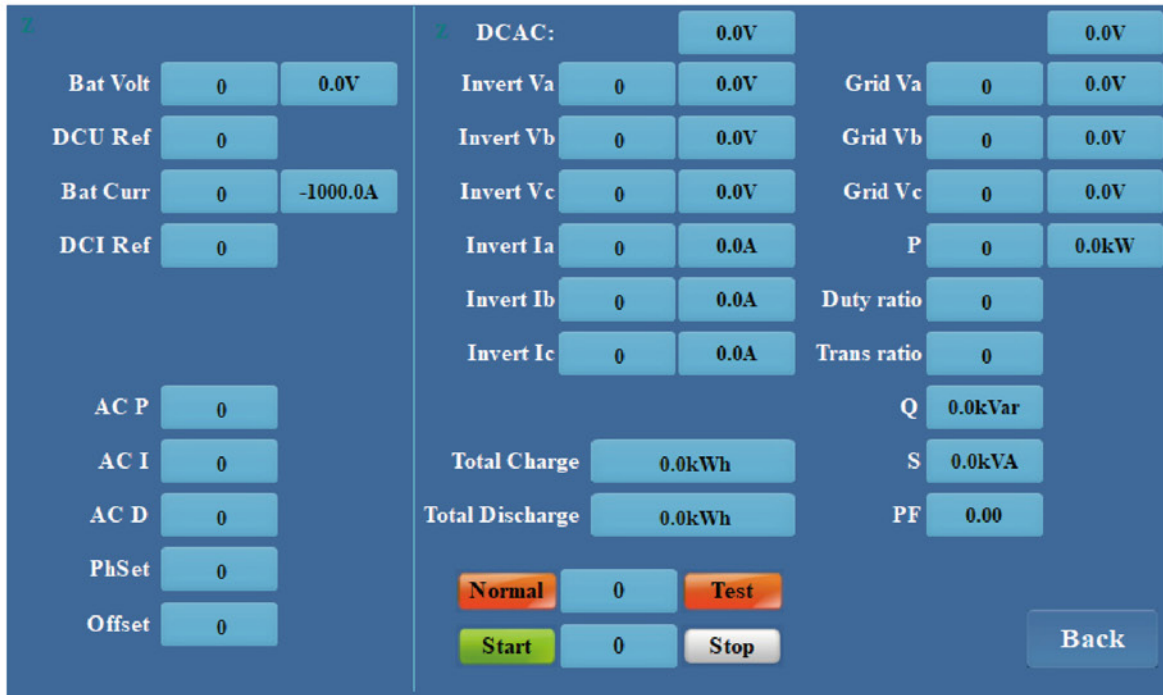
- **Manufacturer permission page:**

According to the load characteristics, the Settings of the manufacturer have been solidified before delivery, and there is no need to enter the page during normal use.

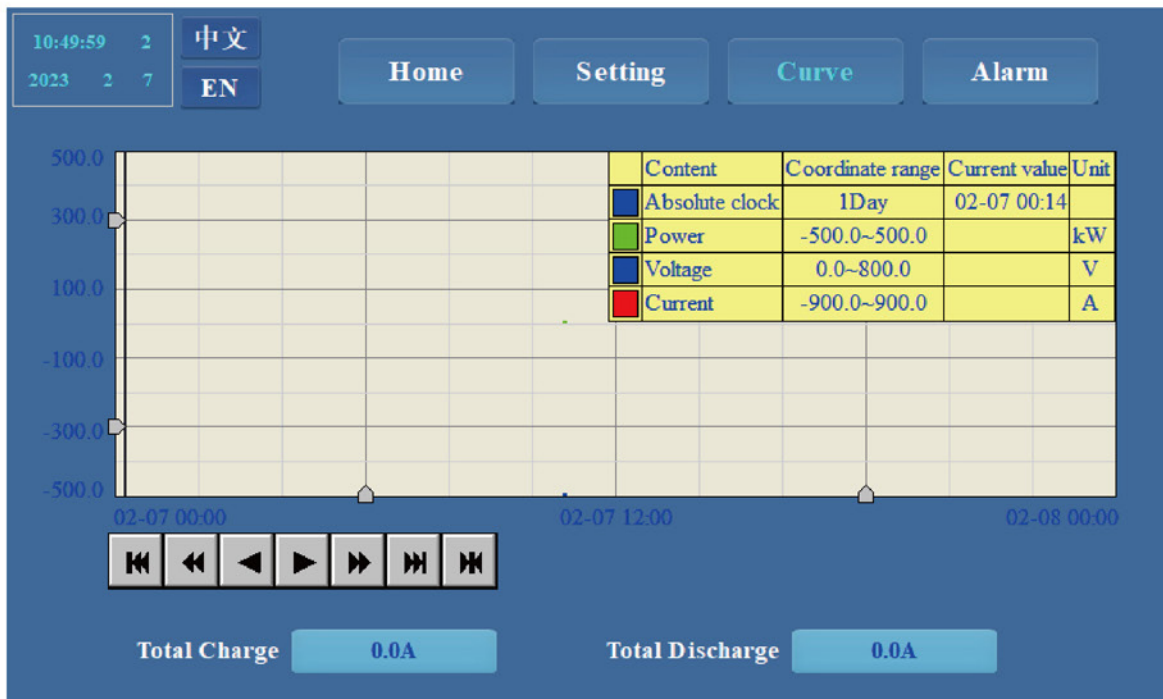
**EMS mode, applied to photovoltaic energy storage system, can set the priority of solar, battery and grid.**

- PV power:**  
 Indicates photovoltaic charging power;
- Mains power:**  
 Indicates the mains power, which is a signed number. The value is + when using power from grid, and - when sending power to the grid.
- Battery floating charging voltage:**  
 Set the floating charging voltage < the floating charging voltage of the controller. After charging to the preset floating charging voltage, the solar power is preferentially sent to the grid. When the battery is less than the floating charging voltage, the solar power gives priority to charging the battery and supplying power to the load.
- Minimum battery voltage:**  
 After setting the minimum battery voltage, when the battery is close to the preset minimum voltage, the load uses more power from the grid.





▼ Power curve sub-page



The power generation is shown in chart form.

## Product Type And Specifications



30KW-100KW Technical parameters of PCS (High Frequency)

### 30KW-100KW Technical parameters of PCS (High Frequency)

AC Side parameters			
AC wiring mode	Three phase three wire / Three phase four wire		
Rated output power	30KW	50KW	100KW
Output overload capacity	33KW	55KW	110KW
Rated grid voltage ( AC )	220V / 380V / 440V	220V / 380V / 440V	220V / 380V / 440V
Grid voltage range	±20%	±20%	±20%
Rated grid frequency	50Hz / 60Hz	50Hz / 60Hz	50Hz / 60Hz
Grid frequency range	±10%	±10%	±10%
Rated power ( THD )	<3% (Standard grid)		
Power factor	0.8leading-1-0.8lagging, adjustable		
DC Battery Side Parameters			
Maximum DC power	33KW	55KW	110KW
DC voltage range	600-900Vdc	600-900Vdc	600-900Vdc
Voltage/Steady flow accuracy	±1%	±1%	±1%
DC current ripple	<1% Irms	<1% Irms	<1% Irms
System Parameters			
Operating Mode	Manual Mode , Auto Mode , *EMS Mode		
Charging and discharging mode	Constant current, Constant voltage, Constant power		
Max. conversion efficiency	98.5%		
Noise	<60dB		
Protection Degree	IP21		
Working Temperature	- 25°C ~ +60°C		
Cooling method	Intelligent Air cooling		
Working humidity	0 ~ 95%		
Working altitude	≤6000m, ( Reduced usage for more than 2000m )		
Emergency stop	Yes (via emergency stop button)		
Display	Touch screen		
Communication mode	RS485, WIFI, GPRS, Ethernet, CAN Support BMS, EMS		
Communication protocol	Modbus RTU/TCP		
Multiple parallel	Support		
Dimensions	482*700*370mm	482*700*400mm	482*700*550mm
Weight	75KG	90KG	150KG

\*Indicates optional

Above parameter only for reference. Could be custom made to user specifications.

## Product Type And Specifications



200KW-1000KW Technical parameters of PCS (High Frequency)

## 200KW-1000KW Technical parameters of PCS (High Frequency)

AC Side parameters				
AC wiring mode	Three phase three wire / Three phase four wire			
Rated output power	200KW	300KW	500KW	1000KW
Output overload capacity	220KW	330KW	550KW	1100KW
Rated grid voltage ( AC )	220V / 380V / 440V			
Grid voltage range ( AC )	±20%	±20%	±20%	±20%
Rated grid frequency	50Hz / 60Hz	50Hz / 60Hz	50Hz / 60Hz	50Hz / 60Hz
Grid frequency range	±10%	±10%	±10%	±10%
Rated power ( THD )	<3% ( Standard grid )			
Power factor	0.8leading-1-0.8lagging, adjustable			
DC Battery Side Parameters				
Maximum DC power	220KW	330KW	550KW	1100KW
DC voltage range Vdc	600-900Vdc	600-900Vdc	600-900Vdc	600-900Vdc
* DC voltage customization	600-1200Vdc	600-1200Vdc	600-1200Vdc	600-1200Vdc
Voltage/Steady flow accuracy	±1%	±1%	±1%	±1%
DC current ripple	<1% Irms	<1% Irms	<1% Irms	<1% Irms
* Independent inverter mode				
Rated output voltage ( AC )	220V / 380V / 440V±1%			
Output voltage distortion	<3% ( resistive load)			
Rated output frequency	50Hz / 60Hz ±1%			
Voltage transition range	<10% (Resistance load 0% <=>100%)			
System Parameters				
Operating Mode	Manual Mode , Auto Mode , *EMS Mode			
Charging and discharging mode	Constant current, Constant voltage, Constant power			
Max. conversion efficiency	98.5%			
Noise	<60dB			
Protection Degree	IP20			
Working Temperature	- 25°C ~ +60°C			
Cooling method	Intelligent Air cooling			
Working humidity	0~95%			
Working altitude	≤6000m, ( Reduced usage for more than 2000m )			
Emergency stop	Yes (via emergency stop button)			
Display	Touch screen			
通讯接口 Communication mode	RS485, WIFI, GPRS, Ethernet, CAN Support BMS, EMS			
通讯协议 Communication protocol	Modbus RTU/TCP			
尺寸 Dimensions (mm)	1100*700*1700	1200*800*1820	1400*900*1900	2400*1000*2100
重量 Weight (KG)	420KG	560KG	800KG	1300KG

\*Indicates optional

Above parameter only for reference. Could be custom made to user specifications.



## Product Type And Specifications



10KW-30KW Technical parameters of PCS

## 10KW-30KW Technical parameters of PCS

AC Side parameters			
AC wiring mode	Three phase three wire / Three phase four wire		
Rated output power	10KW	20KW	30KW
Output overload capacity	11KW	22KW	33KW
Rated grid voltage ( AC )	220V / 380V / 440V	220V / 380V / 440V	220V / 380V / 440V
Grid voltage range	±20%	±20%	±20%
Rated grid frequency	50Hz / 60Hz	50Hz / 60Hz	50Hz / 60Hz
Grid frequency range	±10%	±10%	±10%
Rated power ( THD )	<3% (Standard grid)		
Power factor	0.8leading-1-0.8lagging, adjustable		
DC Battery Side Parameters			
Maximum DC power	11KW	22KW	33KW
DC voltage range	350-750Vdc	350-750Vdc	350-750Vdc
*DC voltage customization	48-1500Vdc	48-1500Vdc	48-1500Vdc
Recommended battery nominal voltage	240V / 384V / 420V / 480V		
Voltage/Steady flow accuracy	±1%	±1%	±1%
DC current ripple	<1% Irms	<1% Irms	<1% Irms
*DC Solar Panels Side Parameters			
Solar Panels Power	10KWp	20KWp	30KWp
Solar Panel Vmp	≥290V / ≥470V / ≥500V / ≥580V		
Solar Maximum Voc	<850V	<850V	<850V
Independent inverter mode			
Rated output voltage ( AC )	220V / 380V / 440V±1%		
Output voltage distortion	<3% ( resistive load)		
Rated output frequency	50Hz / 60Hz ±1%		
Voltage transition range	<10% (Resistance load 0% <=> 100%)		
System Parameters			
Operating Mode	Manual Mode , Auto Mode , *EMS Mode		
Charging and discharging mode	Constant current, Constant voltage, Constant power		
On/off grid switching time	0ms		
Max. conversion efficiency	95% ( Include isolation transformer )		
Noise	<60dB		
Protection Degree	IP21		
Working Temperature	- 25°C ~ +60°C		
Cooling method	Intelligent Air cooling		
Working humidity	0 ~ 95%		
Working altitude	≤6000m, ( Reduced usage for more than 2000m )		
Emergency stop	Yes (via emergency stop button)		
Display	Touch screen		
Communication mode	RS485, WIFI, GPRS, Ethernet, CAN Support BMS, EMS		
Communication protocol	Modbus RTU/TCP		
Dimensions	600*600*1110mm	600*600*1250mm	600*600*1360mm
Weight	190KG	220KG	240KG

\*Indicates optional

Above parameter only for reference. Could be custom made to user specifications.

## Product Type And Specifications



50KW-200KW Technical parameters of PCS

## 50KW-200KW Technical parameters of PCS

AC Side parameters			
AC wiring mode	Three phase three wire / Three phase four wire		
Rated output power	50KW	100KW	200KW
Output overload capacity	55KW	110KW	220KW
Rated grid voltage ( AC )	220V / 380V / 440V	220V / 380V / 440V	220V / 380V / 440V
Grid voltage range ( AC )	±20%	±20%	±20%
Rated grid frequency	50Hz / 60Hz	50Hz / 60Hz	50Hz / 60Hz
Grid frequency range	±10%	±10%	±10%
Rated power ( THD )	<3% ( Standard grid )		
Power factor	0.8leading-1-0.8lagging, adjustable		
DC Battery Side Parameters			
Maximum DC power	55KW	110KW	220KW
DC voltage range	350-750Vdc	350-750Vdc	350-750Vdc
*DC voltage customization	48-1500Vdc	96-1500Vdc	150-1500Vdc
Recommended battery nominal voltage	384V/420V/480V	420V/480V	480V
稳压/稳流精度 Voltage/Steady flow accuracy	±1%	±1%	±1%
直流电流纹波 DC current ripple	<1% Irms	<1% Irms	<1% Irms
* DC Solar Panels Side Parameters			
Solar Panels Power	50KWp	100KWp	200KWp
Solar Panel Vmp	≥470V ≥510V ≥580V	≥510V ≥580V	≥580V
Solar Maximum Voc	<850V	<850V	<850V
Independent inverter mode			
Rated output voltage ( AC )	220V / 380V / 440V±1%		
Output voltage distortion	<3% (resistive load)		
Rated output frequency	50Hz / 60Hz±1%		
Voltage transition range	<10% (Resistance load 0% <=>100%)		
System Parameters			
Operating Mode	Manual Mode , Auto Mode , *EMS Mode		
Charging and discharging mode	Constant current, Constant voltage, Constant power		
On/off grid switching time	0ms		
Max. conversion efficiency	95% ( Include isolation transformer )		
Noise	<60dB		
Protection Degree	IP20		
Working Temperature	- 25°C ~ +60°C		
Cooling method	Intelligent Air cooling		
Working humidity	0 ~ 95%		
Working altitude	≤6000m, ( Reduced usage for more than 2000m )		
Emergency stop	Yes (via emergency stop button)		
Display	Touch screen		
Communication mode	RS485, WIFI, GPRS, Ethernet, CAN Support BMS, EMS		
Communication protocol	Modbus RTU/TCP		
Dimensions	700*700*1550mm	800*900*1700mm	1400*900*1800mm
Weight	380KG	560KG	760KG

\*Indicates optional

Above parameter only for reference. Could be custom made to user specifications.

## Product Type And Specifications



300KW-1000KW Technical parameters of PCS

## 300KW-1000KW Technical parameters of PCS

AC Side parameters			
AC wiring mode	Three phase three wire / Three phase four wire		
Rated output power	300KW	500KW	1000KW
Output overload capacity	330KW	550KW	1100KW
Rated grid voltage ( AC )	220V / 380V / 440V	220V / 380V / 440V	220V / 380V / 440V
Grid voltage range ( AC )	±20%	±20%	±20%
Rated grid frequency	50Hz / 60Hz	50Hz / 60Hz	50Hz / 60Hz
Grid frequency range	±10%	±10%	±10%
Rated power ( THD )	<3% ( Standard grid )		
Power factor	0.8leading-1-0.8lagging, adjustable		
DC Battery Side Parameters			
Maximum DC power	330KW	550KW	1100KW
DC voltage range Vdc	400-850Vdc	400-850Vdc	500-850Vdc
*DC voltage customization	200-1500Vdc	250-1500Vdc	300-1500Vdc
Recommended battery nominal voltage	480V	600V	600V
Voltage/Steady flow accuracy	±1%	±1%	±1%
DC current ripple	<1% Irms	<1% Irms	<1% Irms
*DC Solar Panels Side Parameters			
Solar Panels Power	300KWp	500KWp	1000KWp
Solar Panel Vmp	≥580V	≥725V	≥725V
Solar Maximum Voc	<850V	<1050V	<1050V
Independent inverter mode			
输出电压 Rated output voltage ( AC )	220V / 380V / 440V±1%		
输出电压失真度 Output voltage distortion	<3% (resistive load)		
输出频率 Rated output frequency	50Hz / 60Hz ±1%		
电压过渡变动范围 Voltage transition range	<10% (Resistance load 0% <=>100%)		
System Parameters			
Operating Mode	Manual Mode , Auto Mode , *EMS Mode		
Charging and discharging mode	Constant current, Constant voltage, Constant power		
On/off grid switching time	0ms		
Max. conversion efficiency	95% ( Include isolation transformer )		
Noise	<60dB		
Protection Degree	IP20		
Working Temperature	- 25°C ~ +60°C		
Cooling method	Intelligent Air cooling		
Working humidity	0 ~ 95%		
Working altitude	≤6000m, ( Reduced usage for more than 2000m )		
Emergency stop	Yes (via emergency stop button)		
Display	Touch screen		
Communication mode	RS485, WIFI, GPRS, Ethernet, CAN Support BMS, EMS		
Communication protocol	Modbus RTU/TCP		
Dimensions	1950*1125*2020mm	2400*1250*2100mm	4000*1250*2000mm
Weight	1.6t	2.8t	4t

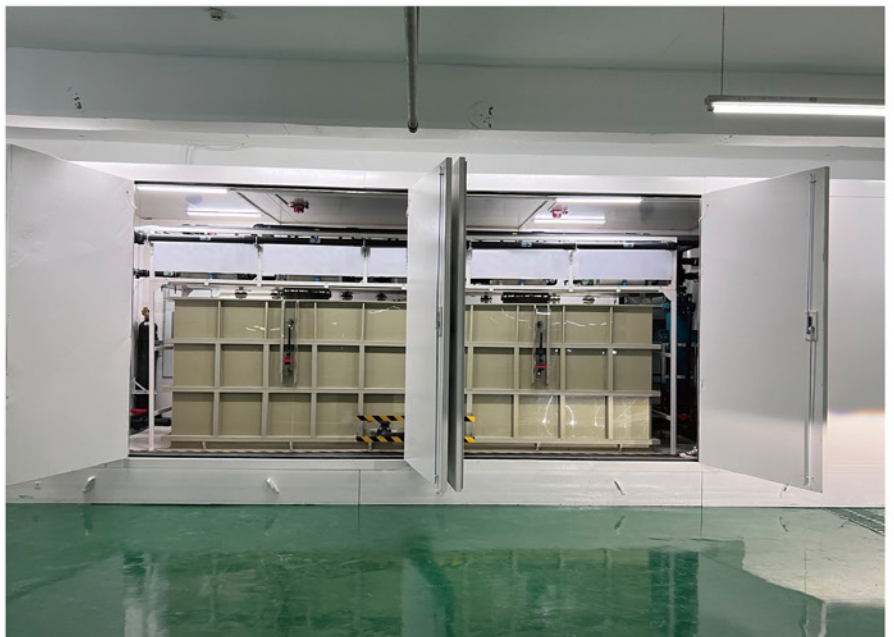
\*Indicates optional

Above parameter only for reference. Could be custom made to user specifications.

## PCS Case



▲ 2MW bi-directional  
DC/DC converter  
Singapore



50KW PCS ▶  
Sichuan



▲ 10KW Energy Storage Converter



◀ 500KW PCS

Anhui





**350KW Energy Storage Converter ▲**

Xiangyang, Hubei

**▼ 30KW vehicle energy storage converter**

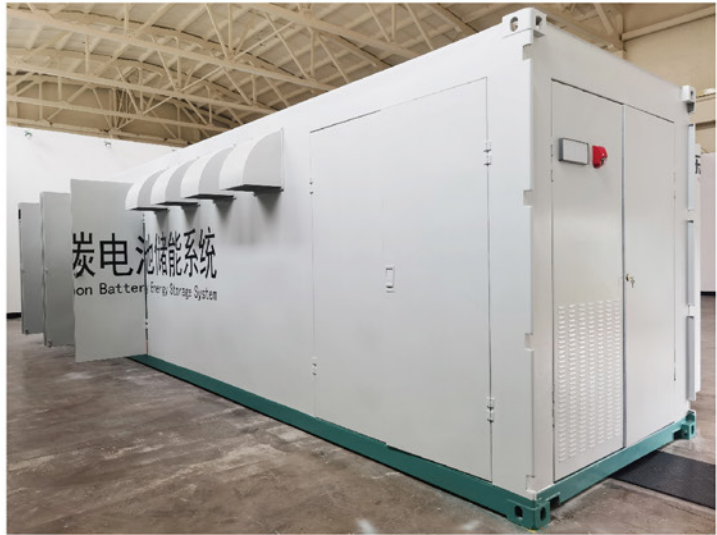
Singapore





▲ 300KW PCS      Shanxi

▶ 1.5WMH Lead-carbon battery energy storage system  
Qingdao, Shandong



▼ 500KW Lithium phosphate battery energy storage system  
Zibo, Shandong





◀ 1MWH Vanadium battery energy storage system  
Hunan

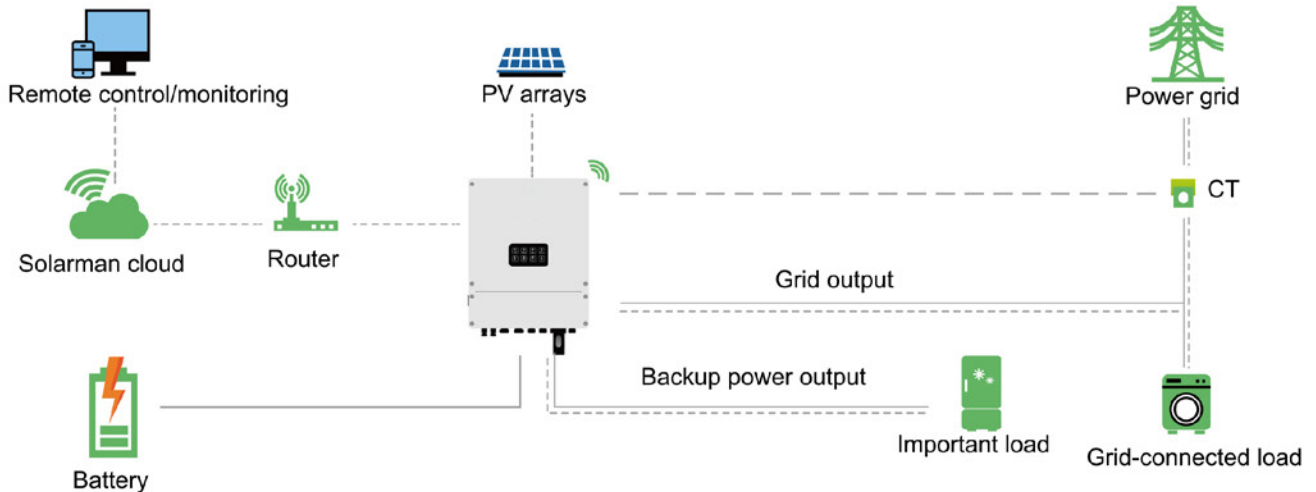


▲ 240KWH PCS  
Jilin

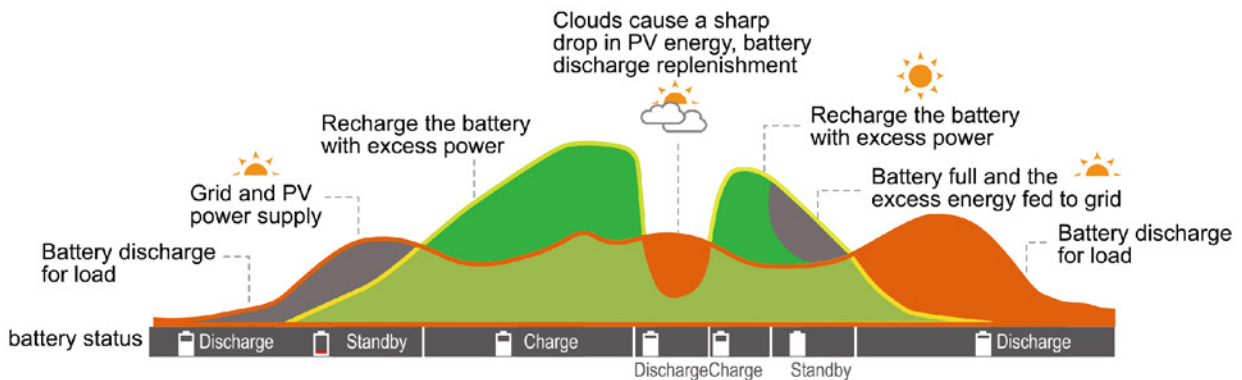
◀ 100KW PCS  
Xian, Shanxi

# Household Smart Photovoltaic Inverter

## Smart Energy Solutions



## Self-use Mode



### Self-use mode (With PV)

Energy generated by PV panels will be firstly used for local load, the remaining energy used to charge batteries, the rest power fed to the grid.



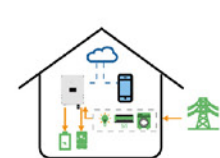
### Self-use mode (Without PV)

When no PV, the energy stored in the battery will be firstly support local load. When battery energy is insufficient, the grid will supply power to load at the same time.



### Back-up

When grid fails, the system automatically switches to back-up mode. The Back-up load can be supported by PV and battery.

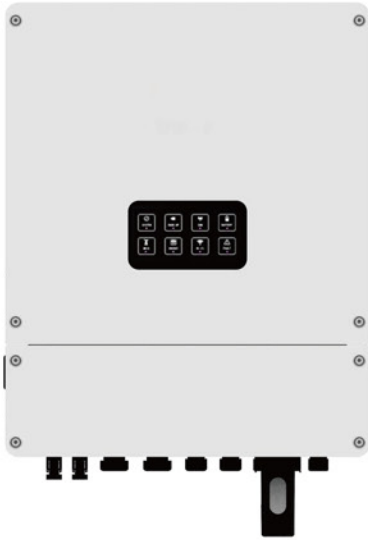







### Economic mode

The grid can charge the battery. Charging time and power are adjustable.

## Product Type And Specifications

### DMEP---3KS/3K6S/ 4KS/ 4K6S/51S/6KS48P



-  The battery charge and discharge current up to 120A.
-  Off-grid peak power can reach twice of rated power(15S).
-  High control precision in Self - use mode
-  Battery side high frequency transformer isolation, safe and reliable.
-  10ms switching

Model	DMEP-3KS48P	DMEP-3K6S48P	DMEP-4KS48P	DMEP-4K6S48P	DMEP-5KS48P	DMEP-6KS48P
<b>Battery Input Parameter</b>						
Battery type	Lithium or lead acid battery					
Rated battery voltage (V)	48					
Maximum charging voltage (V)	≤60(configurable)					
Maximum charge/discharge current (A)	120					
<b>PV Input Parameter</b>						
Maximum DC input power (kw)	3.9	4.68	5.2	5.98	6.5	7.8
Maximum DC input voltage (V)	500					
MPPT Operating voltage range (V)	100~500					
Starting voltage (V)	125					
Maximum input current (A)	18	18/18	18/18	18/18	18/18	18/18
MPPT number	1	2	2	2	2	2
<b>AC Output Parameters (On-Grid)</b>						
Maximum output apparent power (W)	3300	3960	4400	5060	5000	6000
Rated output voltage (V)	230					
Rated output frequency (Hz)	50/60					
Maximum output current (A)	15	18	19	22	25	27
Output power factor	~1(-0.8 leading ~+0.8 lagging)					

Model	DMEP-3KS48P	DMEP-3K6S48P	DMEP-4KS48P	DMEP-4K6S48P	DMEP-5KS48P	DMEP-6KS48P
<b>AC Output Parameters (Off-Grid)</b>						
Rated output apparent power (VA)	3000	3600	4000	4600	5000	6000
Maximum output apparent power (VA)	6000,15sec	7200,15sec	8000,15sec	9200,15sec	10000,15sec	10000,15sec
Rated output voltage (V)	230(±2%)					
Rated output frequency (Hz)	50/60(±0.2%)					
Maximum output current (A)	15	18	19	22	25	27
<b>Efficiency</b>						
Maximum efficiency (PV)	97.6%					
Maximum efficiency (Battery)	94.5%					
Europe efficiency	97%					
<b>Protection</b>						
DC reverse-polarity protection	Yes					
Short circuit protection	Yes					
Output over current protection	Yes					
Output over voltage protection	Yes					
Insulation resistance monitoring	Yes					
Residual current detection	Yes					
Surge protection	Yes					
Grid monitoring	Yes					
Islanding protection	Yes					
Temperature protection	Yes					
Integrated DC switch	Yes					
<b>Basic Parameter</b>						
Operating temperature (°C)	-25~60					
Storage temperature (°C)	-30~65					
Relative humidity	0~95%					
Working altitude (m)	≤4000					
Cooling	Air cooling					
Noise (dB)	< 25					
Weight (kg)	19					
Size (width × height × depth) (mm)	424*555*197mm					
Protection class	IP66					
Topology	HF Isolation (Battery Side)					






\*Indicates optional

Above parameter only for reference. Could be custom made to user specifications.

## Product Type And Specifications

### DMEP---8 /10 /12KS48P3



-  The battery charge and discharge current up to 240A
-  Off-grid peak power can reach twice of rated power(15S).
-  High control precision in Self - use mode
-  Battery side high frequency transformer isolation, safe and reliable.
-  Support 3 phase unbalanced output

Model	DMEP-8KS48P3	DMEP-10KS48P3	DMEP-12KS48P3
<b>Battery Input Parameter</b>			
Battery type	Lithium or lead acid battery		
Rated battery voltage (V)	48		
Maximum charging voltage (V)	≤60(configurable)		
Maximum charge/discharge current (A)	190	210	240
<b>PV Input Parameter</b>			
Maximum DC input power (kw)	10.4	13	15.6
Maximum DC input voltage (V)	1000		
MPPT Operating voltage range (V)	150~800		
Starting voltage (V)	150		
Maximum input current (A)	18/18	36/18	36/18
MPPT number	2	2	2
<b>AC Output Parameters (On-Grid)</b>			
Maximum output apparent power (W)	8800	11000	13200
Rated output voltage (V)	400		
Rated output frequency (Hz)	50/60		
Maximum output current (A)	13.3	16.7	20
Output power factor	~1(-0.8 leading ~+0.8 lagging)		

Model	DMEP-8KS48P3	DMEP-10KS48P3	DMEP-12KS48P3
<b>AC Output Parameters (Off-Grid)</b>			
Rated output apparent power (VA)	8000	10000	12000
Maximum output apparent power (VA)	16000,15sec	20000,15sec	24000,15sec
Rated output voltage (V)	400(±2%)		
Rated output frequency (Hz)	50/60(±0.2%)		
Maximum output current (A)	13.3	16.7	20
<b>Efficiency</b>			
Maximum efficiency (PV)	98%		
Maximum efficiency (Battery)	94.5%		
Europe efficiency	97.5%		
<b>Protection</b>			
DC reverse-polarity protection	Yes		
Short circuit protection	Yes		
Output over current protection	Yes		
Output over voltage protection	Yes		
Insulation resistance monitoring	Yes		
Residual current detection	Yes		
Surge protection	Yes		
Grid monitoring	Yes		
Islanding protection	Yes		
Temperature protection	Yes		
Integrated DC switch	Yes		
<b>Basic Parameter</b>			
Operating temperature (°C)	-25~60		
Storage temperature (°C)	-30~65		
Relative humidity	0~95%		
Working altitude (m)	≤4000		
Cooling	Air cooling		
Noise (dB)	< 25		
Weight (kg)	35		
Size (width × height × depth) (mm)	475*683*256mm		
Protection class	IP66		
Topology	HF Isolation (Battery Side)		

\*Indicates optional

Above parameter only for reference. Could be custom made to user specifications.



## Product Type And Specifications



### DMEP--Single Phase Energy Storage Machine

3 / 3.6 / 4 / 4.6 / 5 / 6 kW

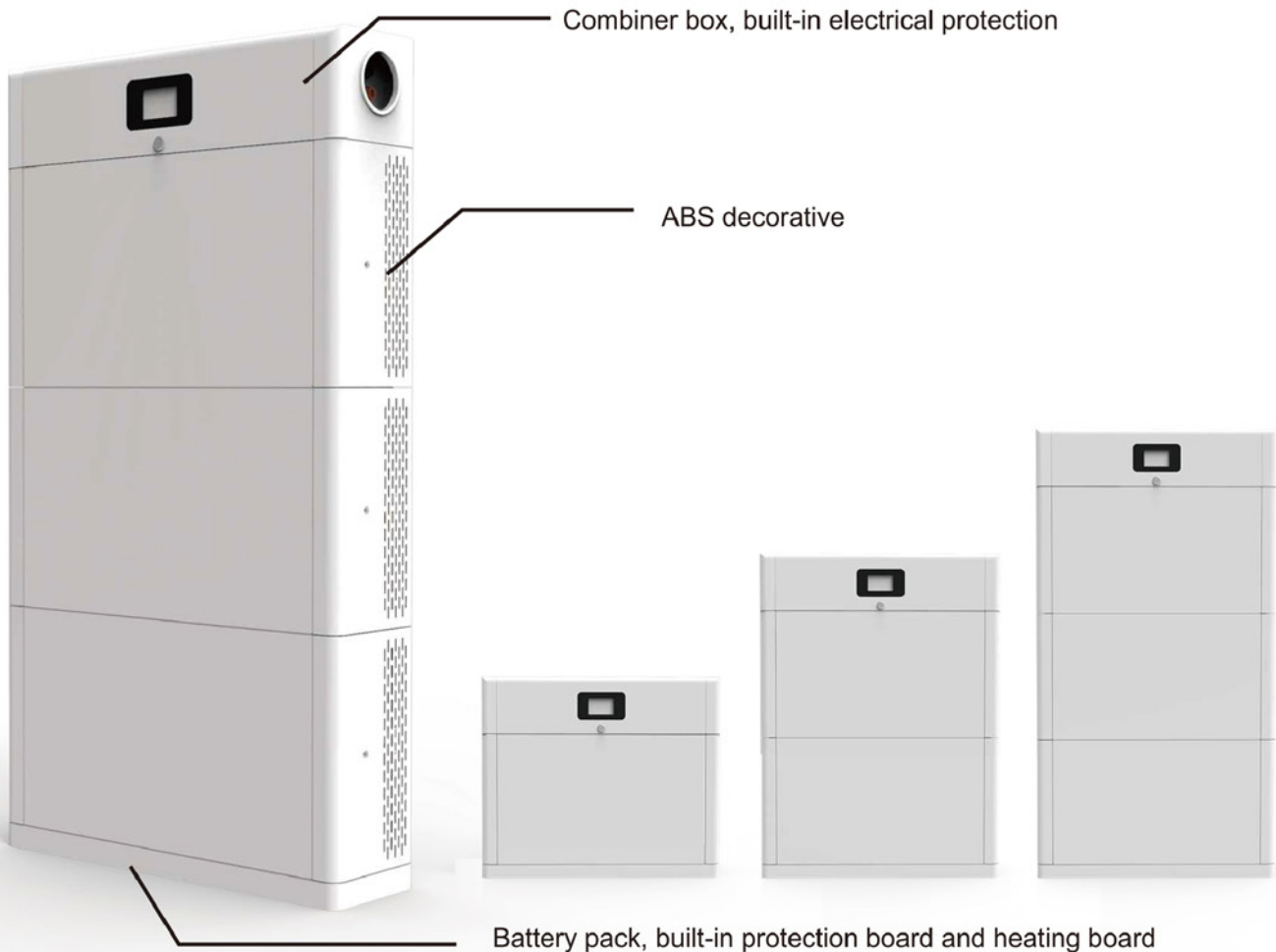
5 / 10 / 15 kWh

- Multiple protection and high security
- IP66 outdoor protection class
- Modular integrated design
- Maximum current 18A  
Better match with high-power components
- $\leq 10\text{ms}$  Seamless switching
- WiFi wireless communication  
APP Remote Management

Model	DMEP-5KS48P-5kWh		DMEP-5KS48P-10kWh		DMEP-5KS48P-15kWh	
Inverter Module	DMEP-3KS48P	DMEP-3K6S48P	DMEP-4KS48P	DMEP-4K6S48P	DMEP-5KS48P	DMEP-6KS48P
Cell type	100Ah , LFP					
Number of modules (pc)	1		2		3	
Maximum available power (kW)	2.5		5		5	
Rated capacity (kWh)	5.12		10.24		15.36	
Rated voltage (Vdc)	51.2					
Maximum current (A)	50		100		100	
Operating temperature (°C )	-20~50					
Protection class	IP66					
Cooling	Natural cooling					
Cycling life (time)	>6000					
Size (height x width x depth mm)	860*670*205		1219*670*205		1578*670*205	
Weight (kg)	80		140		200	
Installation method	Ground -mounted					
Installation location	Indoor/Outdoor					
<b>PV Input Parameter</b>						
Maximum DC input voltage (V)	500					
MPPT Operating voltage range (V)	100~500					
Starting voltage (V)	125					
Maximum input current (A)	18	18/18	18/18	18/18	18/18	18/18
MPPT number	1	2	2	2	2	2
<b>AC Output Parameters (On-Grid)</b>						
Maximum output apparent power (VA)	3300	3960	4400	5060	5500	6000
Rated output voltage (V)	230					
Rated output frequency (Hz)	50/60					
Maximum output current (A)	15	18	19	22	25	27
Output power factor	~1(0.8 leading ~0.8 lagging)					
<b>AC Output Parameters (Off-Grid)</b>						
Rated output apparent power (VA)	3000	3600	4000	4600	5000	6000
Maximum output apparent power (VA)	6000,15sec	7200,15sec	8000,15sec	9200,15sec	10000,15sec	10000,15sec
Rated output voltage (V)	230(±2%)					
Rated output frequency (Hz)	50/60(±0.2%)					
Maximum output current (A)	15	18	19	22	25	27
<b>Efficiency</b>						
Maximum efficiency (PV)	97.6%					
Maximum efficiency (Battery)	94.5%					
Europe efficiency	97%					
<b>Protection</b>						
DC reverse-polarity protection	Yes					
Short circuit protection	Yes					
Output over current protection	Yes					
Output over voltage protection	Yes					
Insulation resistance monitoring	Yes					
Residual current detection	Yes					
Surge protection	Yes					
Grid monitoring	Yes					
Islanding protection	Yes					
Temperature protection	Yes					
Integrated DC switch	Yes					
<b>Basic Parameter</b>						
Operating temperature (°C )	-25~60					
Storage temperature (°C )	-30~65					
Relative humidity	0~95%					
Working altitude (m)	≤4000					
Noise (dB)	< 25					
Topology	HF Isolation (Battery Side)					

## Product Type And Specifications

### Residential Power Storage Battery



#### **IP66 PROTECTION**

High protection degree  
No fear water spattering  
Supporting outdoor placement



#### **STRONG COMPATIBILITY**

Compatible with inverters from  
different brands  
Supporting customization  
Debugging development



#### **HIGH SECURITY**

Multiple protections include  
battery Intrinsic safety,  
module process, outer case  
protection, circuit protection,  
supporting fire fighting, and others



## EASY TO USE

One-key to waken  
 One-key to switch on/off  
 Improving users' experience feeling




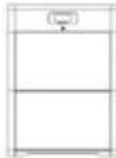

## MODULARIZED STACKING DESIGN

Stacked installation  
 Easy and convenient  
 Up to 3 battery packs are supported for parallel use



## EFFICIENT FILTERING

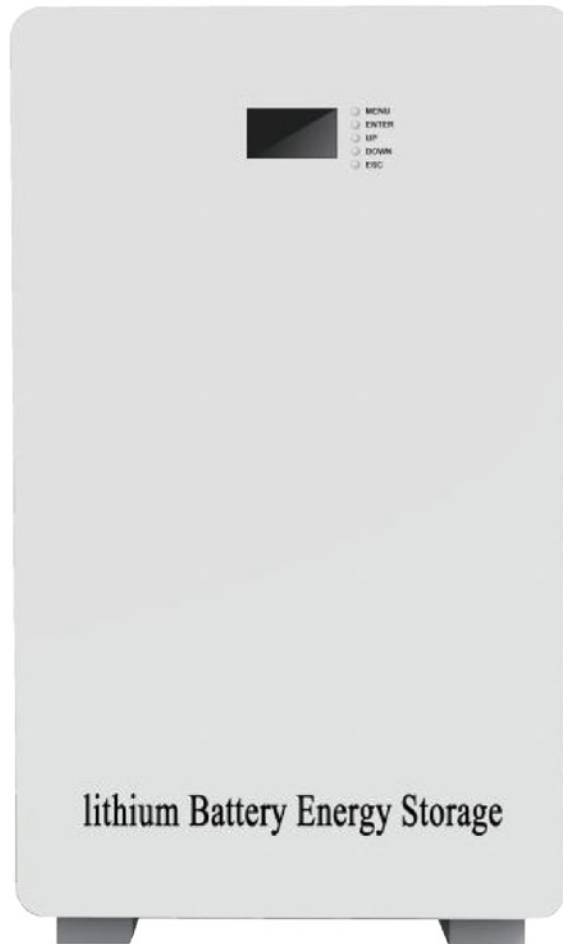
Kalman filtering algorithm  
 More precise SOC estimation in long time domain range  
 Extended service life

Model	DMEP-48V-5kWh	DMEP-48V-10kWh	DMEP-48V-15kWh
Product appearance			
Cell type	100Ah , LFP		
Number of modules (pc)	1	2	3
Maximum available power (kW)	2.5	5	5
Rated capacity (kWh)	5.12	10.24	15.36
Rated voltage (Vdc)	51.2		
Maximum current (A)	100		
Operating temperature (°C )	-20~50		
Communication method	CAN/RS485		
Dimensions (WxHxD mm)	670*567*205	670*926*205	690*1285*205
Weight	50kg	95kg	140kg
Protection class	IP65		
Cooling	Natural cooling		
Cycling life (time)	>6000		
Display	4.3" display (SOC, voltage, current, operating status)		
Installation method	Ground-mounted		
Installation location	Indoor/Outdoor		
Qualification	UN38.3, IEC62619, EMC, CDE2510		

\*Indicates optional

Above parameter only for reference. Could be custom made to user specifications.

## Product Type And Specifications



### DMEP--Integrated Energy Storage Battery

- 100% discharge depth
- Wall-mounted or floor mounted, save installation time and cost
- The safest lithium iron phosphate battery
- Integrated design for easy installation
- Cycle life > 6000 times

Model	DMEP-48V-5kWh-Y	DMEP-48V-10kWh-Y
Rated voltage	51.2V	51.2V
Rated capacity	5.12kWh	10.24kWh
Weight	60kg	96kg
Dimensions (length x width x depth mm)	620*450*140mm	760*450*240mm
Cell type	lithium iron phosphate	
Life (25°C)	10 years	
Cycling life (80% DOD , 25°C)	>6000 times	
Maximum charging voltage	57.6V	
Cut-off discharge voltage	44.8V	
Constant charging current	50A	100A
Constant discharge current	50A	100A
Peak charging current	55A(3S)	110A(3S)
Peak discharge current	55A(3S)	110A(3S)
Maximum parallel quantity	15	
Communication method	CAN/RS232/RS485	
Lithium battery standard	UN38.3,MSDS,EN55032,EN55024,EN61000-3-2,EN61000-3-3	
Charging temperature range	0 ~ 45°C	
Discharge temperature range	-10~45°C	
Cooling	Natural cooling	
Operating environment	Indoor	

\*Indicates optional

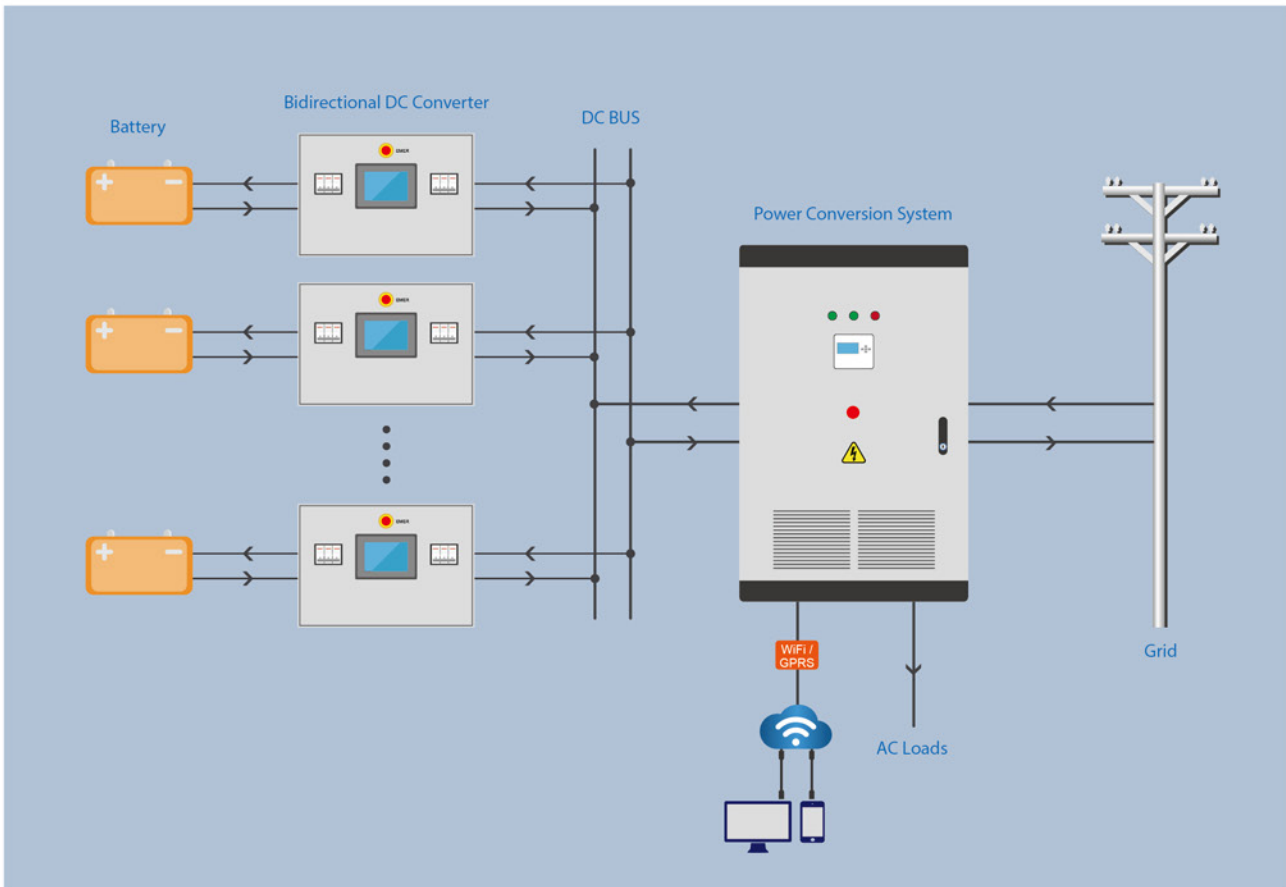
Above parameter only for reference. Could be custom made to user specifications.

## Bidirectional DC Converter

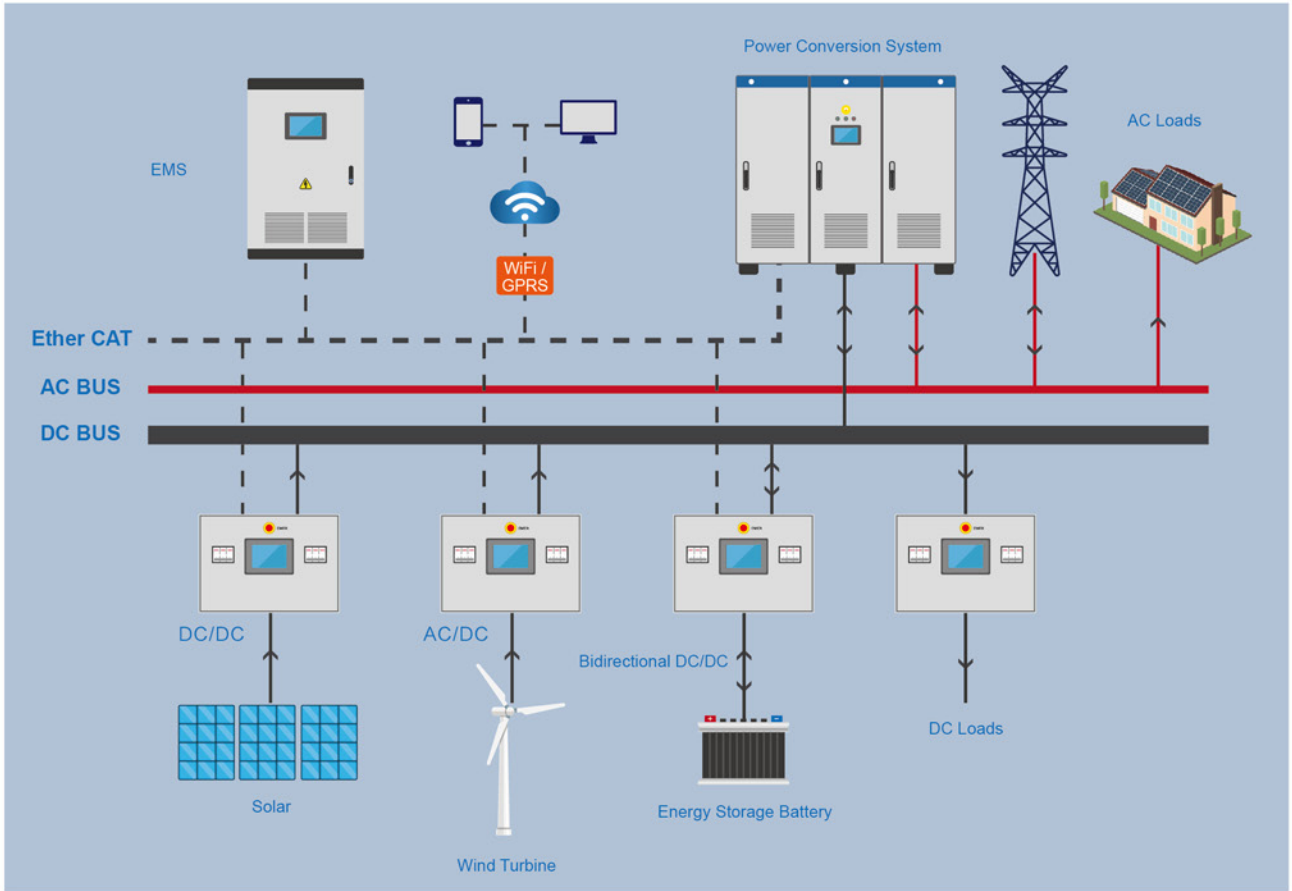
Programmable bidirectional DCDC converter is a device to realize the bidirectional flow of DC energy, which is mainly used in hybrid electric vehicles, DC uninterrupted power supply system, new energy, automotive motors, electronic control testing, power battery pack charging and discharging testing, power electronics testing and other fields.

The bidirectional DCDC converter adopts the classic BUCK/BOOST circuit topology and has the function of bidirectional switching of up and down voltage, namely the up and down chopper circuit. When the energy flows from C1 to C2, the DC converter works in BOOST mode to realize the boost function. When the energy flows from C2 to C1, the DC converter works in BUCK mode to realize the buck function.

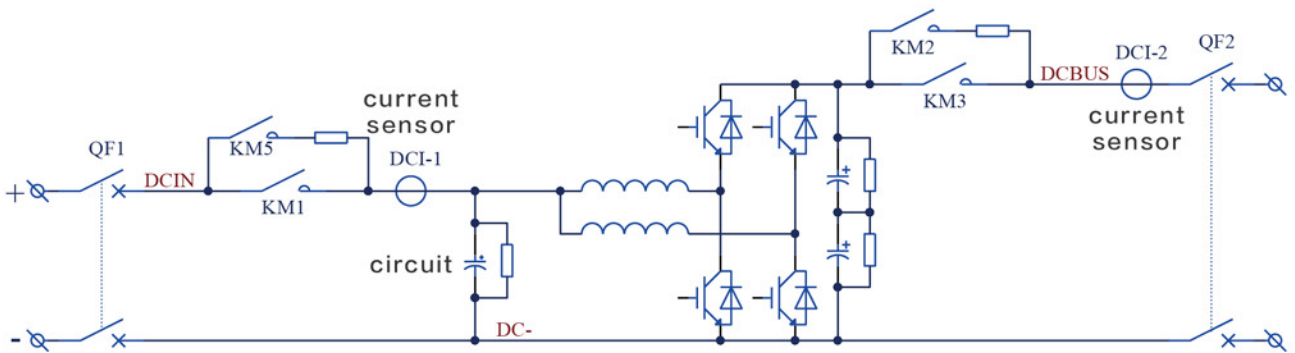
Bidirectional DCDC converter is the dual quadrant operation of DC-DC converter, its input and output voltage polarity is unchanged, but the direction of the input and output current can be changed. The output state of the converter can be changed in the first and second quadrants of the  $V_o-I_o$  plane. The converter input and output port exchange can still complete the voltage conversion function, power can flow from the input end to the output end, and can also flow from the output end to the input end. According to various basic converter topologies, bidirectional energy flow can be realized by replacing unidirectional switch with bidirectional switch.



(Energy storage converter system with bidirectional DC/DC)

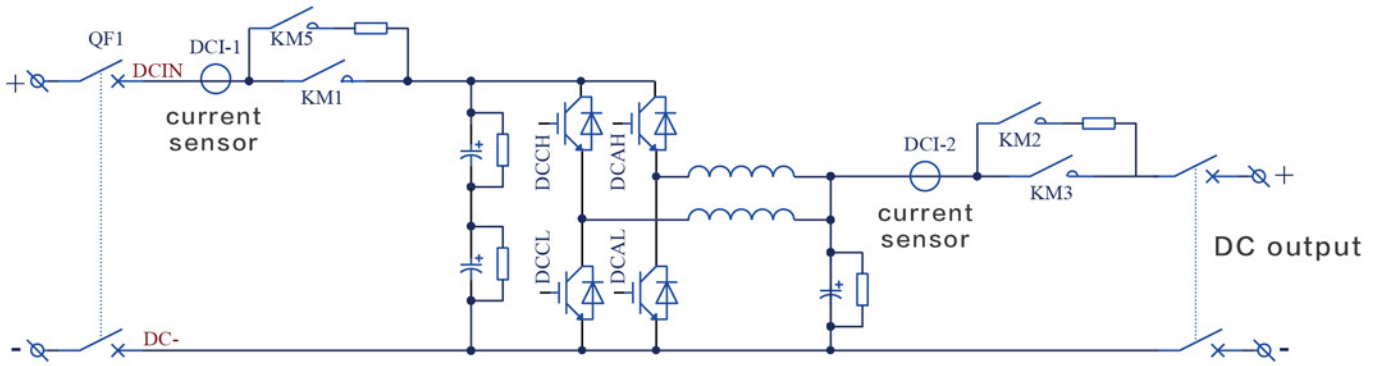


(New energy intelligent micro grid system)

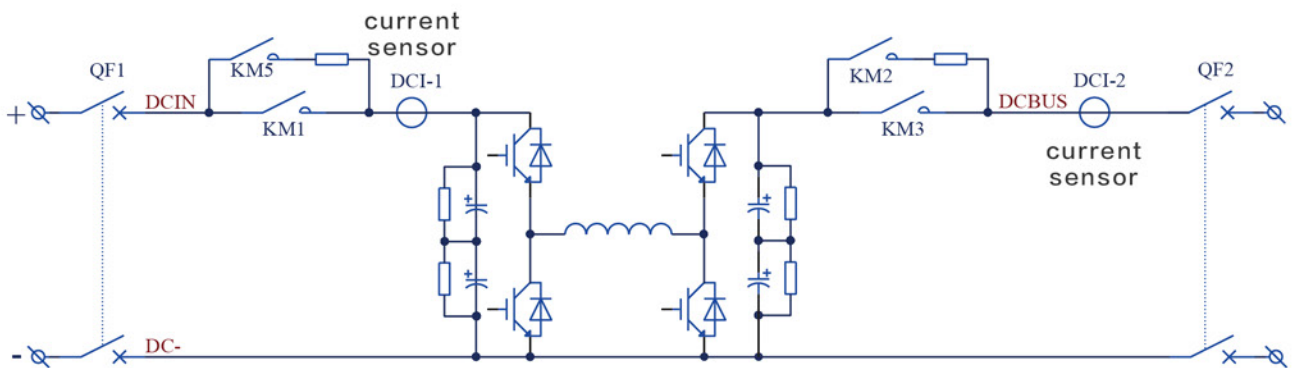


Schematic diagram of DC-DC BOOST circuit

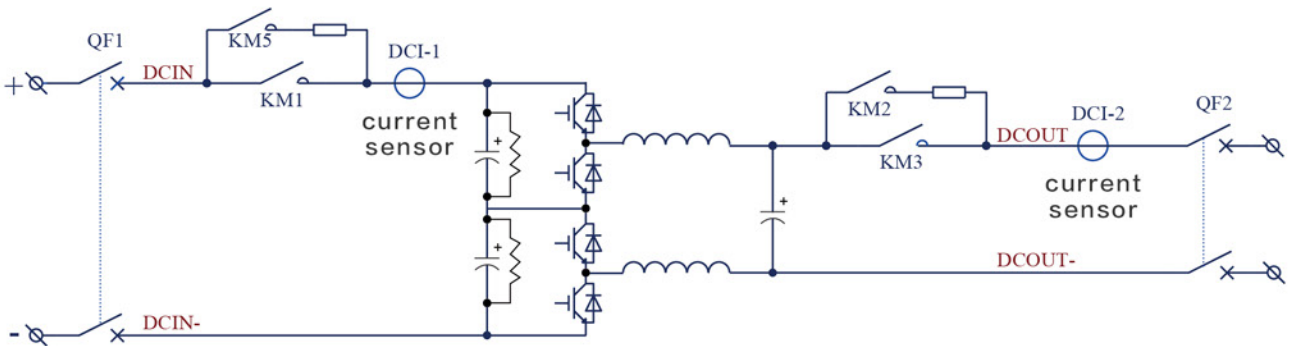




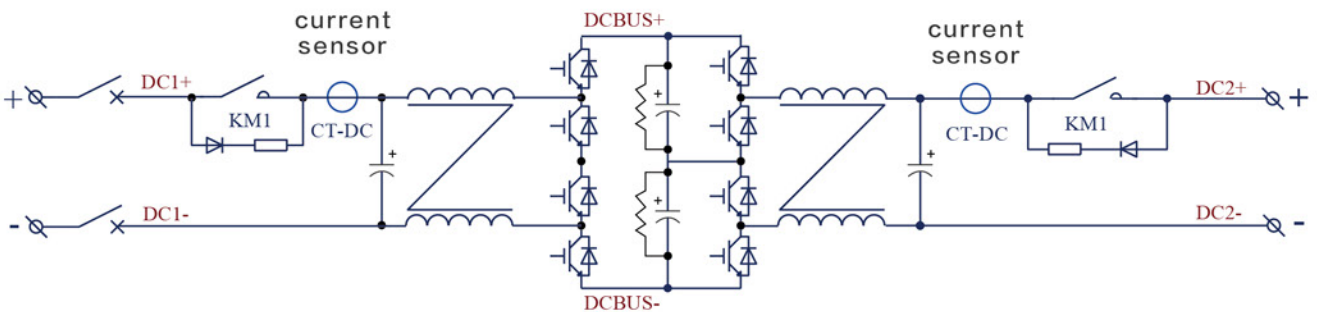
Schematic diagram of DC-DC BUCK circuit



Schematic diagram of DC-DC BUCK-BOOST circuit



Principle of three-level step-down DCDC circuit



Principle of three-level buck-boost DCDC circuit

## Technical Features

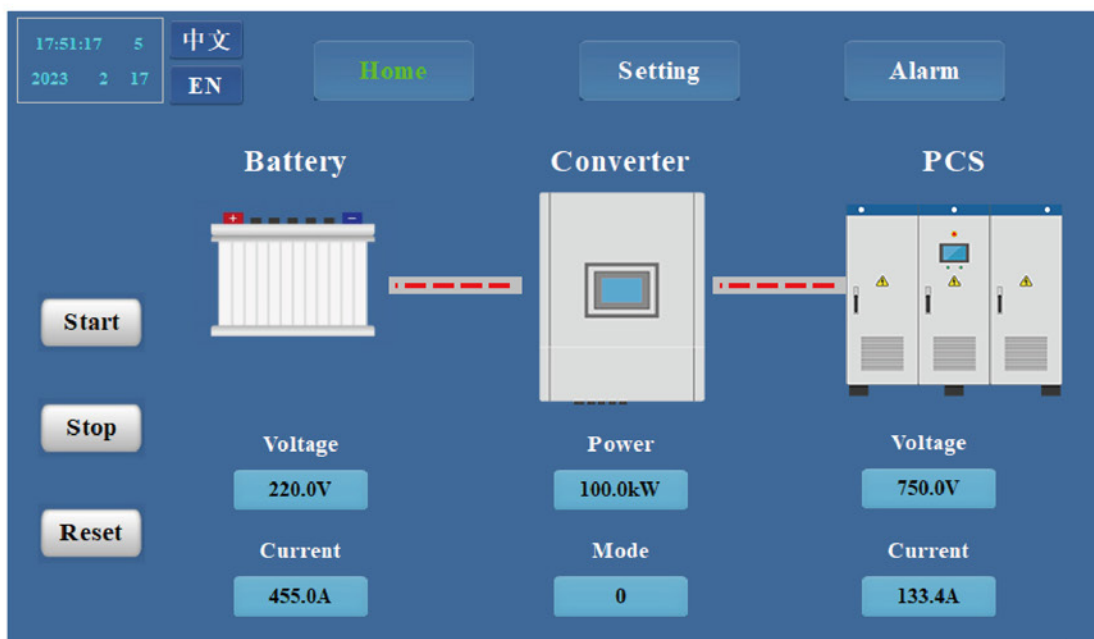
- Constant voltage charge, discharge and conversion, constant power charge, discharge and conversion, etc.
- Two-way boost-buck of battery side and DC bus side; Compatible with different battery configurations and models.
- Multi-converter parallel operation control function .
- The bidirectional DCDC converter has DC overvoltage protection, undervoltage protection, overcurrent protection, input reverse polarity protection, AC undervoltage protection, overvoltage protection, overload protection, overheating protection.
- The operation state of bidirectional DCDC converter is highly visible. As a man-machine interface, the touch screen can clearly display real-time operation data, real-time fault data, historical fault data, etc.
- Bidirectional DCDC converter has input manual break switch, emergency stop operation switch.

## LCD Screen Operation Interface

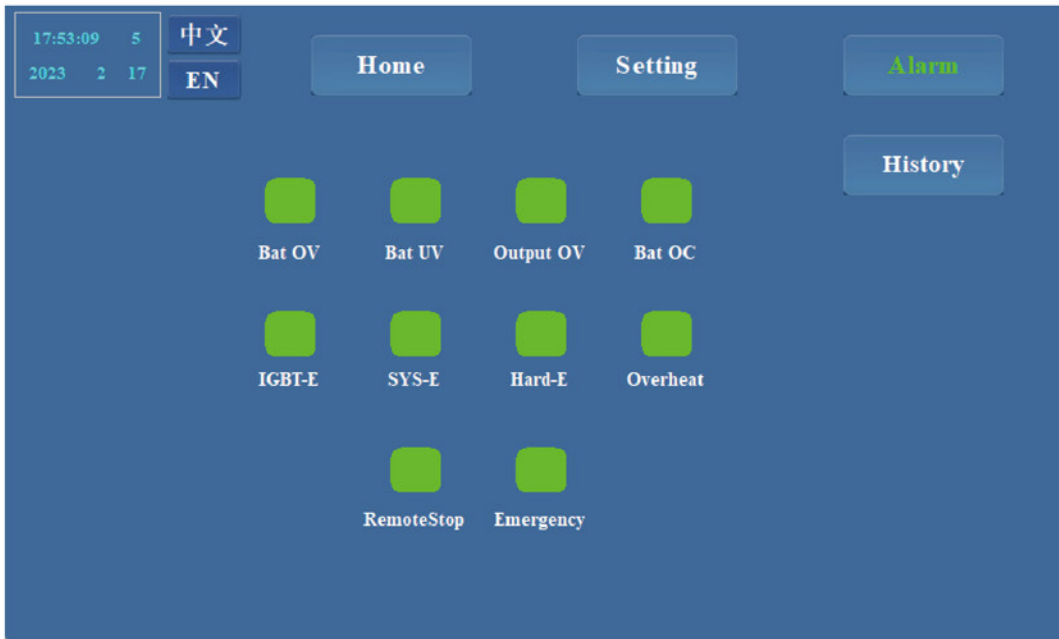
This page shows running data, error status, power curve. On this page, you can view the operating status and stop or start the device. When starting the device, press the reset or stop button to clear the error. Then press the start button.

Press the button below to enter the interface.

### ▼ Operation Main Page - Home Page



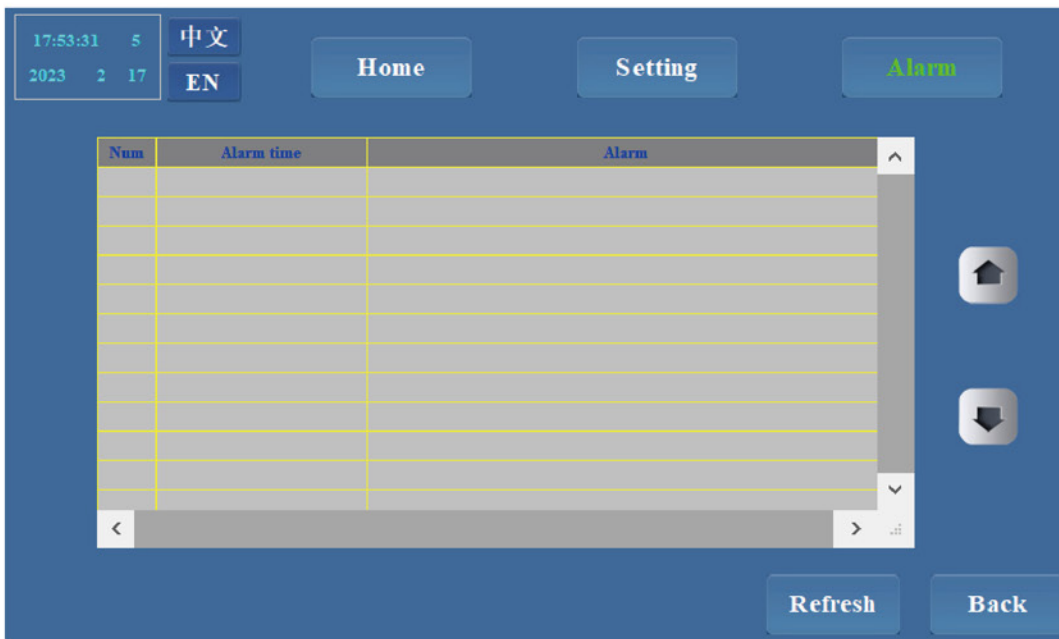
### ▼ The alarm page



When a fault occurs, the corresponding indicator box changes from green to red.

### ▼ Historical fault: Click to view the historical alarm record

The interface is as follows:



Refresh: Click to update the history.

## ▼ Parameter setting



**Constant voltage mode:** This mode cannot be manually selected. When the battery voltage reaches the charging float voltage or discharge cutoff voltage, the current will be slowly lowered and automatically switched to constant voltage mode.

**Constant current mode:** Click the box labeled Constant current. The red arrow points to the box, indicating that the battery bank is running in constant current mode. Click the input box in the rear, the positive value indicates battery discharge, and the negative value indicates battery charging. Input the current value and click "OK", the system storage box below the input box will change to the current input value, indicating that the input is successful, and the power will run at constant current according to this current value.

**Bus constant voltage:** Click the "bus constant voltage" label box and the red arrow points to this box, indicating that the battery pack is running in the bus constant voltage mode. Click the input box in the rear, enter the voltage value, and click "OK". The system storage box below the input box will change to the current input value, indicating that the input is successful. The power supply will run at constant voltage according to the bus bar of this voltage value.

**Note: Constant voltage mode is battery self-maintenance mode, which can only be operated by our approved professional personnel.**

Automatic stop after charging complete: click the "automatic stop after charging complete" label box, "check" on the left of the label box, indicating that this function has been switched on. You can input the minimum charging current and set the charging countdown time. When the battery is charging, the battery voltage reaches the floating charge voltage and the current is less than the minimum charging current. After the set countdown time, the power supply will automatically stop.

Click the white input box on the right of administrator rights, enter the password, and click OK to enter the page.



On the user permission setting screen, you can set the input overvoltage, input undervoltage, output overvoltage, battery overcurrent, constant voltage, battery float charging voltage, startup time, 485 communication address, and Ethernet IP address (communication address).

**Manufacturer permission:** It is the interface for the manufacturer. The factory parameters have been proofread. If you need help, please call.

### ▼ Electric quantity accumulation



On this screen, you can set the battery nominal voltage, rated current, and initial SOC value of the battery bank (percentage of the initial battery bank capacity), and view the total charging capacity and discharge capacity after the device runs. Click the "empty power" box below to empty the total charge/discharge power, and set the initial SOC of the battery bank only after the empty power.

## DeMing APP

Deming APP is intelligent terminal for hybrid wind solar power, PV power station monitoring and management person. It help user master power station running status at anytime and anywhere, realize remote data monitoring of hybrid wind solar power and PV power station, ensure convenient management and monitoring timeliness. System displays hybrid wind solar power station and PV power station running data by visual table, includes power station power generation, benefit, CO2 emission reduction benefit, equipment running status, equipment real-time data, history data query, power generation comparison, equipment performance comparison. As fashion and intelligent application, it can let user demonstrate his hybrid wind solarpower station and PV power station at any occasion, user has intuitive feeling, enhance user confidence.

- Various data output interface, support Android、iphone、ipad、windows、 macOS
- Delicate and precise data, easy to operate, download and install, Wechat binded, real-time monitoring, data synchronization
- 24-hour monitoring
- Low maintenance cost
- Power station information sharing function



## Optional Parts



1. RS485 to WIFI



2. RS485 to GPRS



3. RS485 to Ethernet



4. RS485 to USB



JINAN DEMING POWER EQUIPMENT CO.,LTD



<http://www.demingpower.com>



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