LC Series Bidirectional Programmable Feedback DC Source
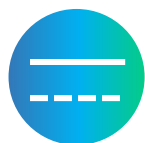
目录 | CONTENTS

Overview

The LC Series is a programmable regenerative DC power supply based on third-generation **SiC technology**. It integrates both source and load functions and can **feed energy back** to the grid.

Unlike traditional power supplies and loads that experience brief discontinuities and jumps when switching between positive and negative currents, the LC Series DC Power Supply, as a standard high-speed bidirectional power supply, can achieve rapid and seamless switching between source and load modes. This ensures fast and continuous transitions between outputting and absorbing current, effectively **preventing voltage or current overshoots**.

The product not only offers general DC power supply functions such as constant voltage, constant current, constant power, and load resistance modes, but also includes photovoltaic module simulation, battery simulation, waveform generation, LIST programming, and other features. These capabilities make it suitable for a wide range of applications.

The product is widely used in industries such as photovoltaic power generation, energy storage, electric vehicles, and charging stations. It is a **highly stable, high-performance, and versatile** DC power supply.

Features

★ **3U/30KW high power density**

★ **0.02%FS high accuracy**

★ **100-µs dynamic response of voltage and current**

★ **Adopting SiC technology, high-frequency isolation technology**

★ **Master/parallel mode, scalability without compromising resolution**

★ **Adopting a connector design, making integration and use more convenient**

★ **Strong adaptability to power grid that supports normal operation of weak power grid**

★ **Large aspect ratio touchscreen for direct control without the need for a host computer**
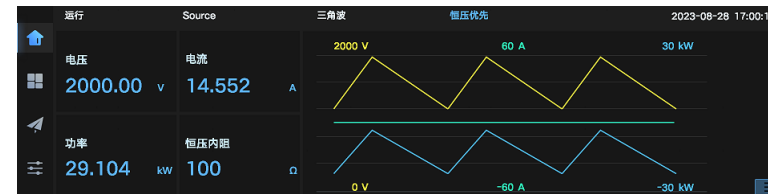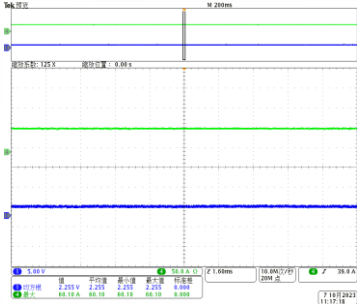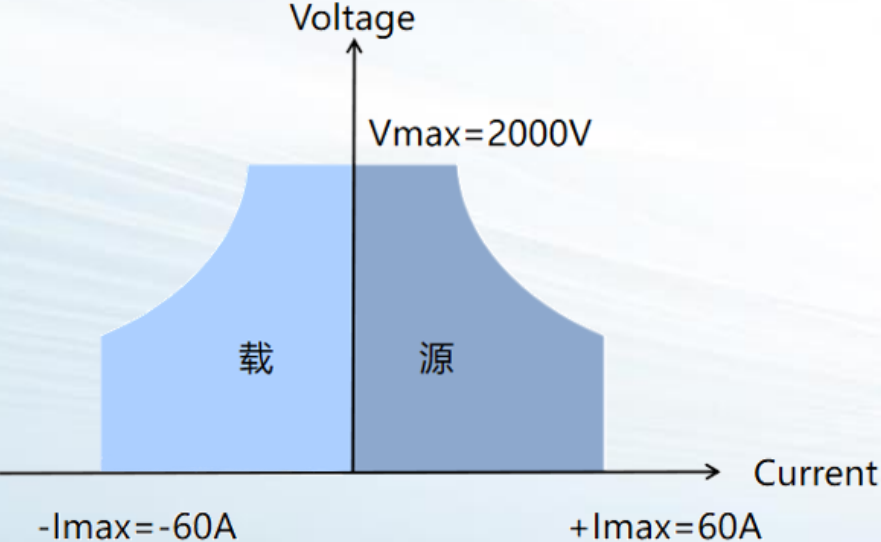
Advantages

High Power Density：3U/30kW

The LC Series DC Power Supply has a higher power density compared to similar products on the market. It can achieve a power output of up to 30kW within a 3U form factor, with a weight of only 35kg, making it easy to transport. This significantly reduces the testing floor space and meets the weight-bearing and power distribution requirements of office buildings.

## Large aspect ratio touchscreen

The front panel features an 8.8-inch high-resolution TFT capacitive touch display, which offers strong anti-interference capabilities, sensitive touch response, and fast operation. The device can be quickly and conveniently controlled without the need for a host computer, saving space and costs while improving work efficiency.
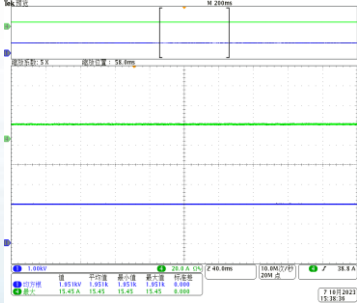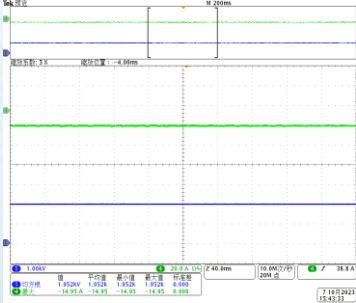
Advantages

Ultra-Wide Voltage Output
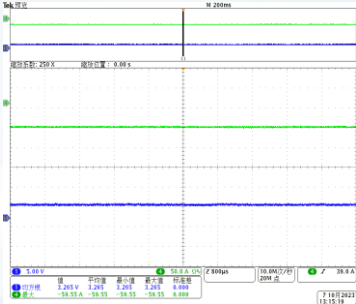
Source 2V/60A

Load3V/60A

Source 2000V/15A
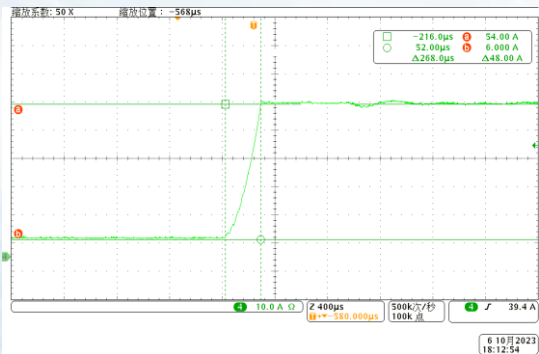
Load 2000V/15A
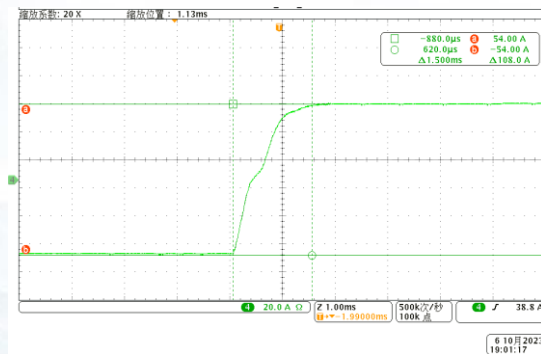
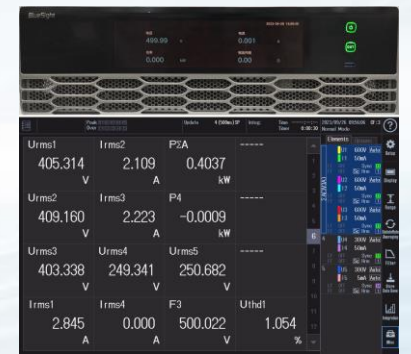Low Voltage Full Current, High Voltage Constant Power

Advantages

Current10-90%with response time 268 us

Current switching -90％ ~ +90%, response time 1.5ms


Current accuracy 0.02% FS

Voltage accuracy 0.02% FS

Hundred Microsecond Level Dynamic Response

High Voltage & Current Accuracy

Function-Common DC Source

The LC Series DC Power Supply can automatically switch between Constant Current (CC), Constant Voltage (CV), and Constant Power (CP) modes based on the formula P = UI. This means that when any one of the output parameters—voltage, current, or power—first reaches its limit, the power supply will operate in the corresponding mode. This ensures the safety of both the equipment and personnel.
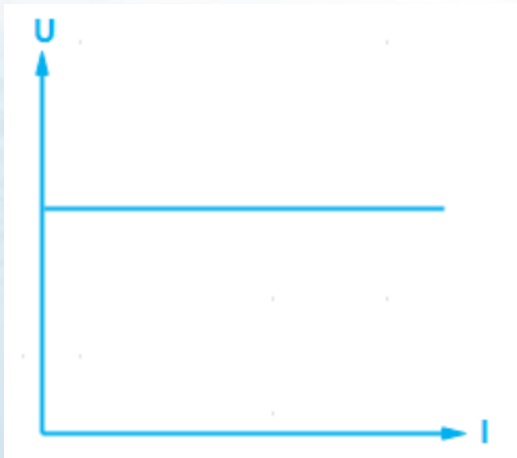
CV
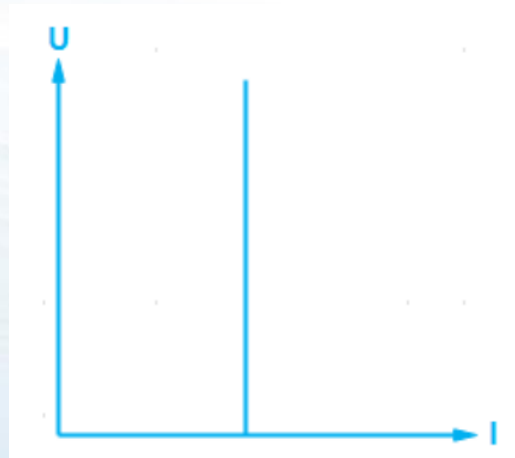
CC

CP
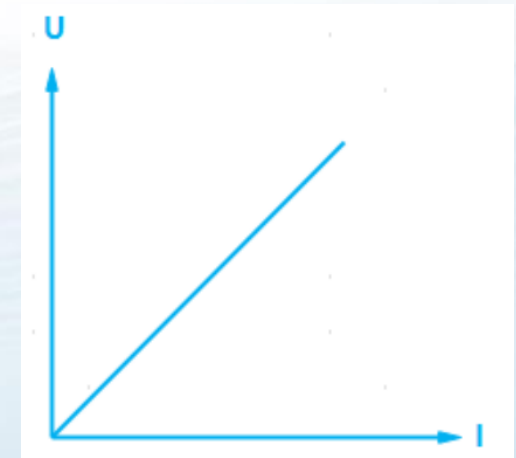
CR

Function-Waveform Generation

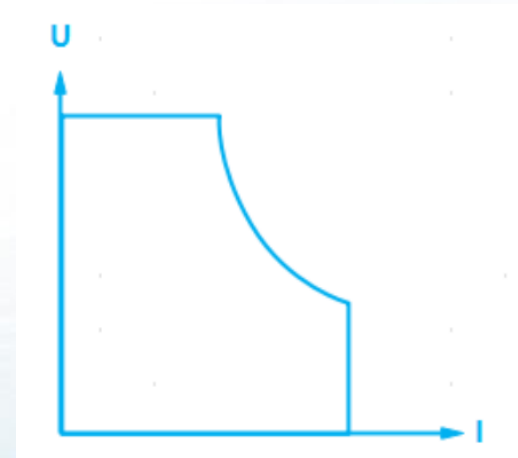The LC Series DC Power Supply can generate various waveforms such as sine waves, triangular waves, rectangular waves, and trapezoidal waves by setting parameters such as peak/valley values, peak/valley duration, rise/fall time, and cycle time. This capability meets the personalized testing needs for multiple application scenarios, including R&D testing, regulatory certification, and production line testing.
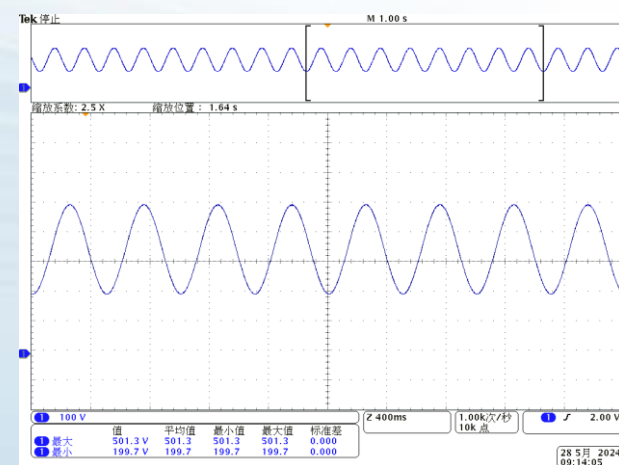
sine waves
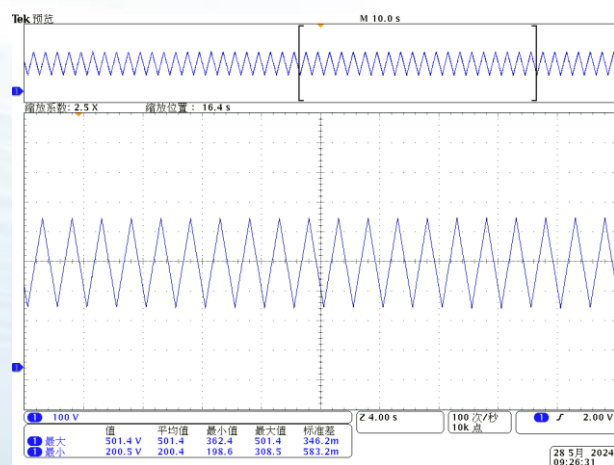
triangular waves
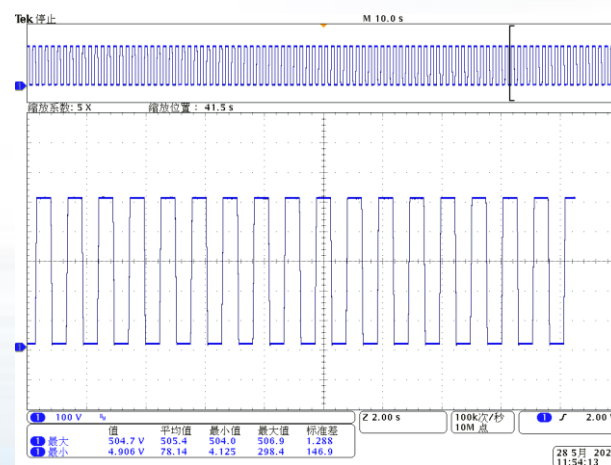
rectangular waves
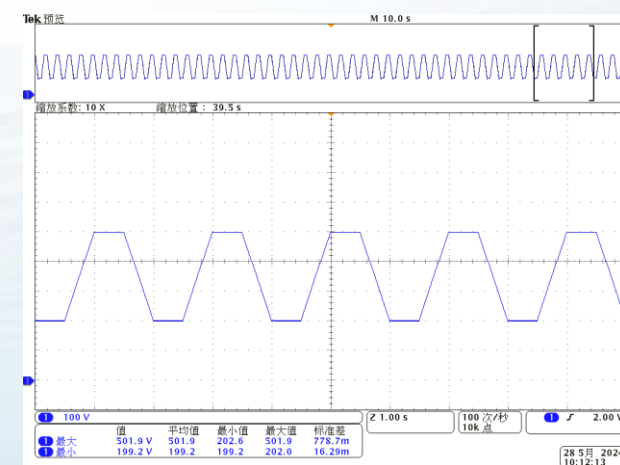
trapezoidal waves

Function- Function Editing

The LC Series DC Power Supply features function programming capabilities, including LIST and WAVE modes. Users can customize and edit these functions to generate time-varying curves for current, voltage, and power. The slope of the changes can be set as needed. This functionality meets the testing requirements for various applications, including dynamic electronic load simulation.
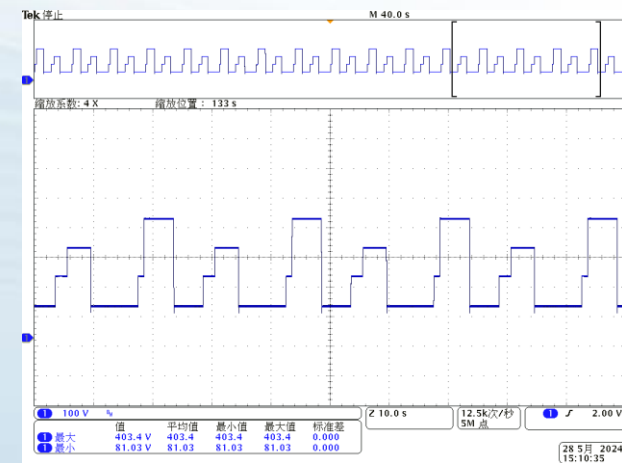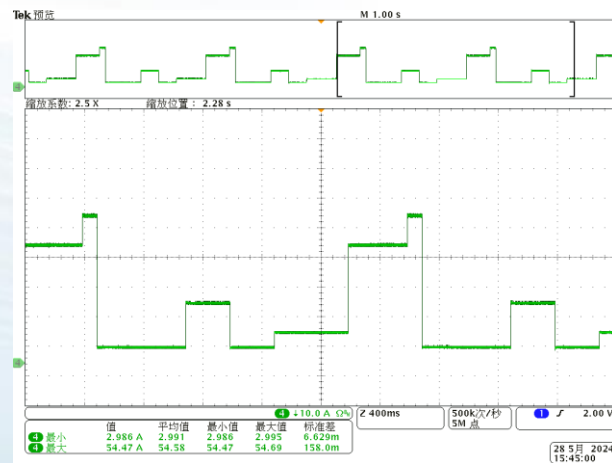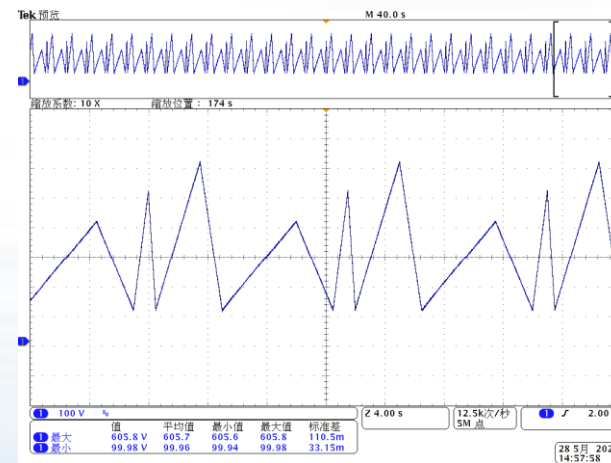
| LIST CV | LIST CC | WAVE Voltage Dynamic Change | WAVE Current Dynamic Change |
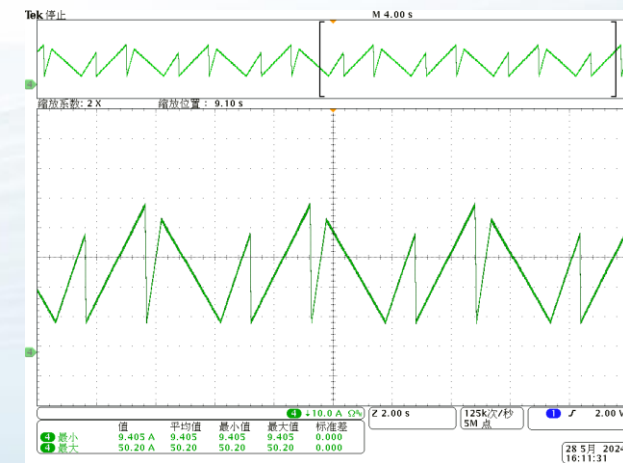
Function-Battery Simulator

The LC Series DC Power Supply can generate battery pack characteristic parameters by setting parameters such as individual cell capacity, initial SOC (State of Charge), number of series-connected cells, and number of parallel-connected cells. It can simulate the charge and discharge characteristics of various types of battery packs, including lithium iron phosphate (LFP), ternary lithium, and lead-acid batteries. This functionality meets the testing requirements for various applications, including energy storage converters, photovoltaic and energy storage systems, DC charging stations, and electric vehicles.
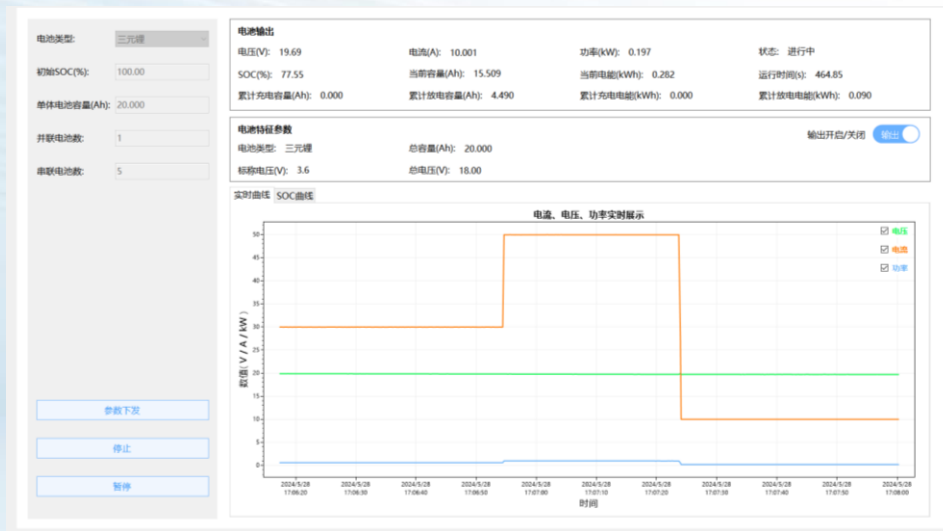
Real-Time Voltage, Current, and Power Curves
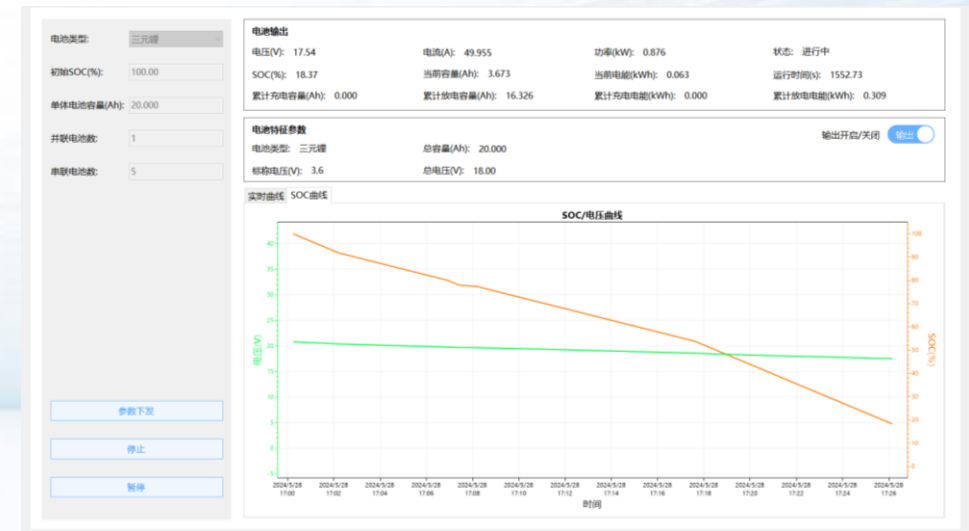
Real-Time Battery Discharge SOC Curve

PVFunction-PV Curve

BLUESiGHT
蓝点数源

The LC Series DC Power Supply can simulate the output P-V (Power-Voltage) curve characteristics of photovoltaic modules under different temperatures and irradiance levels. It includes built-in models such as EN50530 and the Sandia Array Performance Model (SAPM). Additionally, it supports user-defined settings, allowing manual input of the fill factor to generate P-V curves.
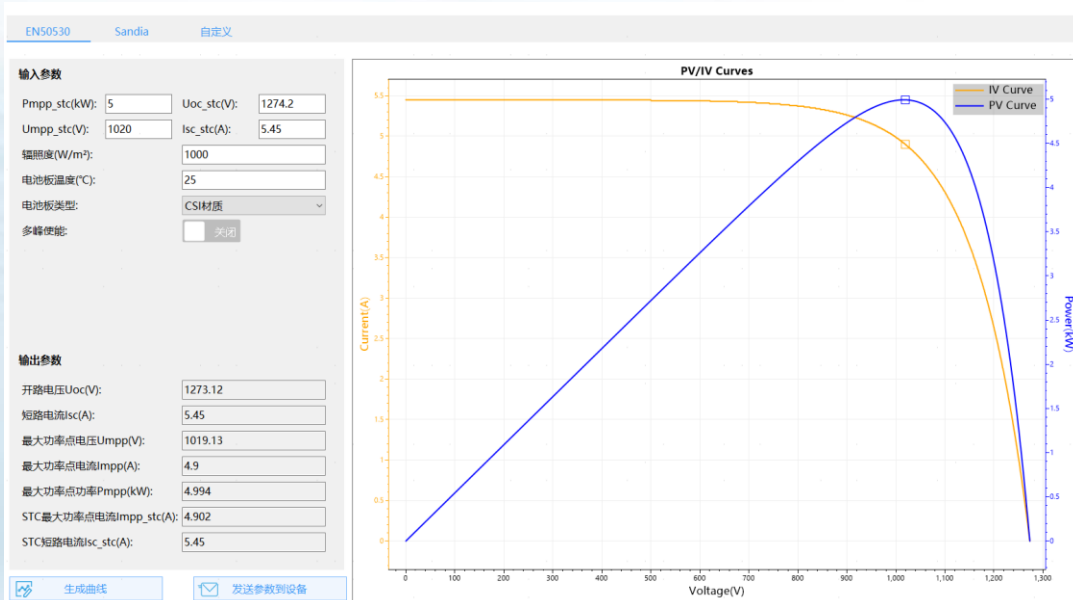
EN50530
P-V
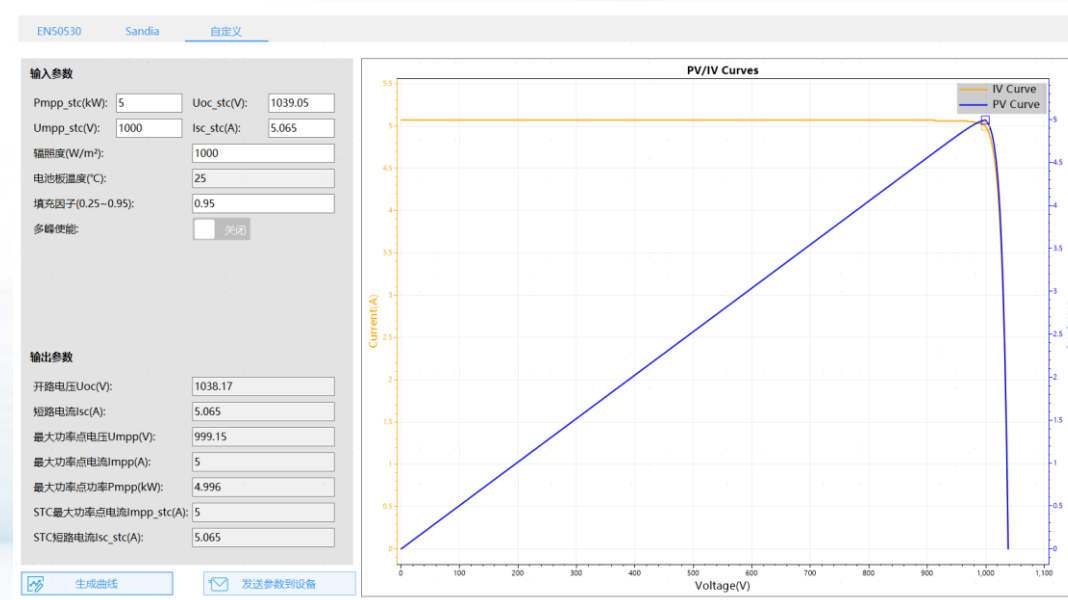
Self-defined
P-V

MPPT Function-MPPT Efficiency Test

The LC Series DC Power Supply includes built-in dynamic and static MPPT test programs according to multiple standards, such as EN50530, NB/T 32004, and CGC/GF035. These test programs can be easily accessed with a single button press, automatically generating test results, test logs, and test reports. This meets the comprehensive testing requirements for the development and testing of photovoltaic inverters.
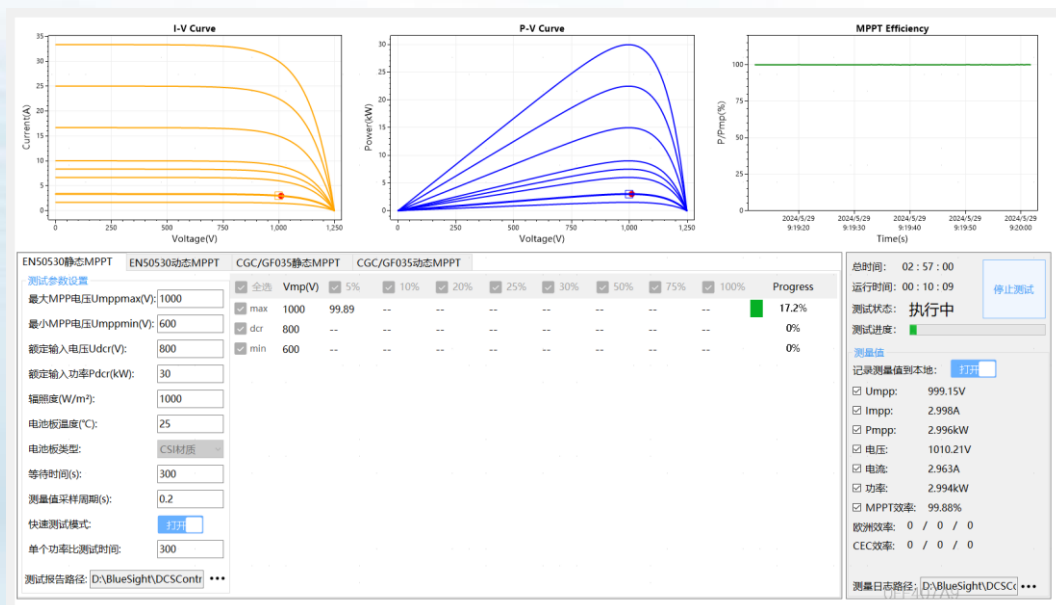
EN50530
Static MPPT Test
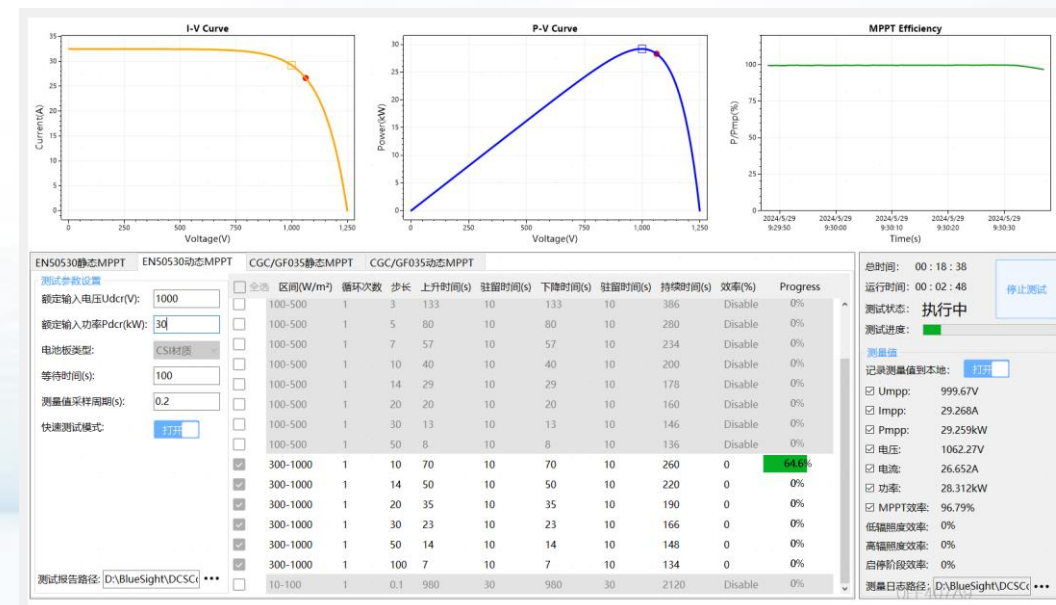
EN50530
Dynamic MPPT Test

MPPT Function-MPPT Efficiency Test

CGC/GF035
Static MPPT Test

CGC/GF035
Dynamic MPPT Test
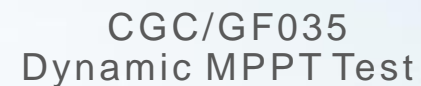
Function-Shadow Shading & Cloud Drift

Shadow shading: This feature simulates the multi-peak characteristics of the P-V curve when photovoltaic modules are partially shaded.

Cloud drift: This feature simulates the dynamic multi-peak P-V curve output when photovoltaic modules are intermittently shaded by moving clouds.
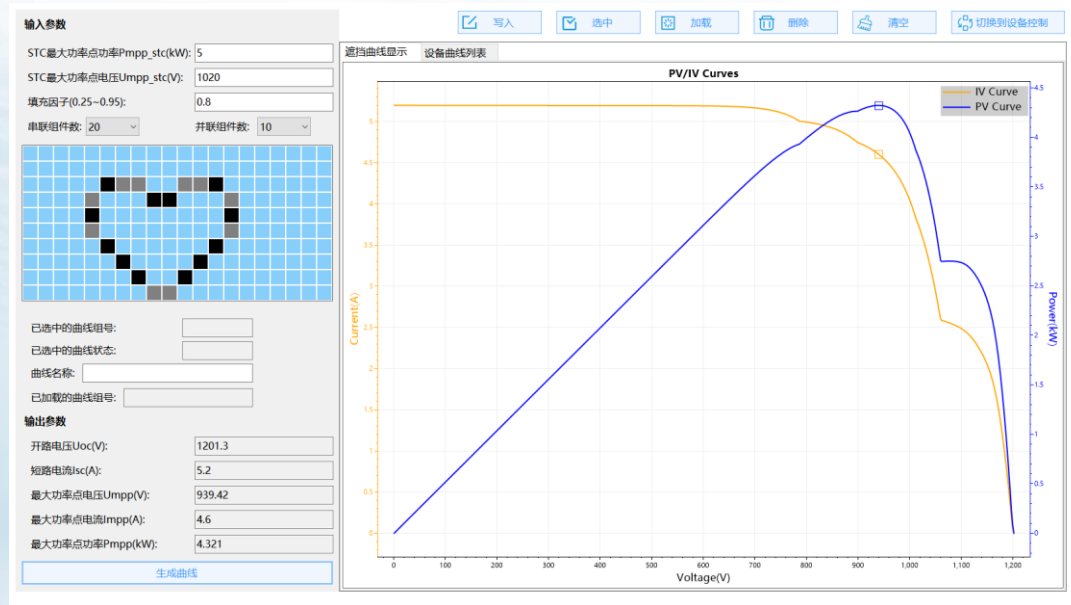
Shadow shading multi-peak
P-V curve
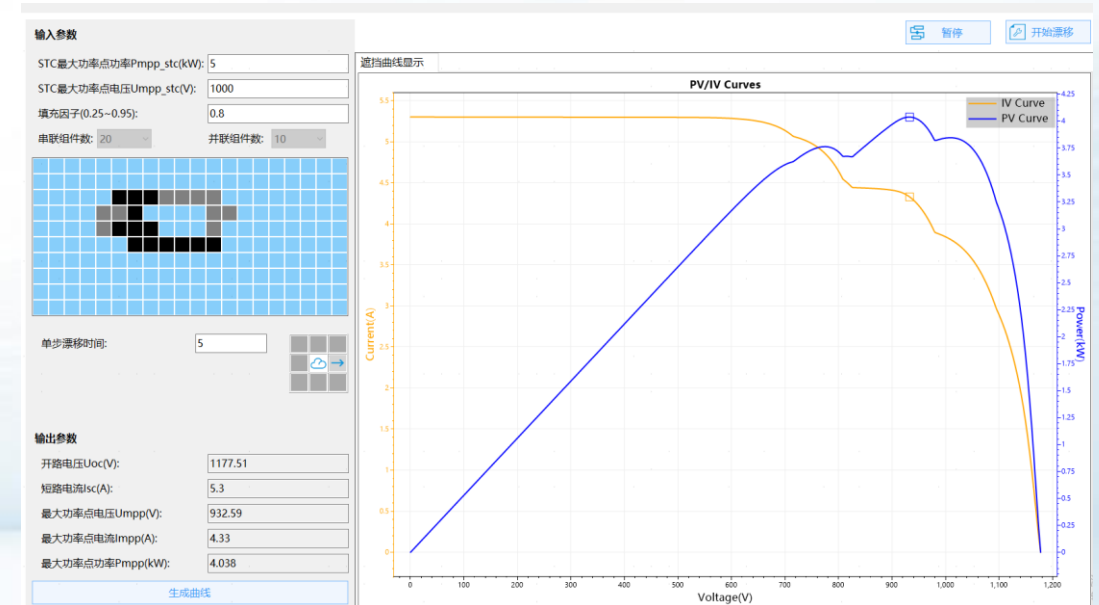
Cloud drift dynamic
multi-peak P-V curve

Outline Size

Power density： 30kW/0.039m³

671.5mm
440mm
132mm
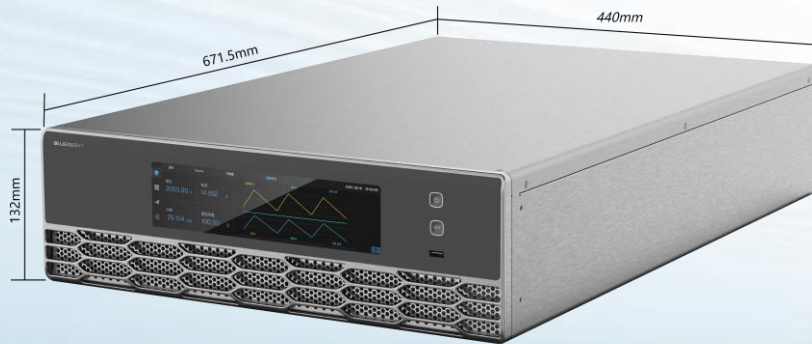
440 x 132 x 671.5 (W*H*D/mm)

180kW Power density： 208.33 kW/m³

600mm
800mm
1800mm

600 x 1800 x 800 (W*H*D/mm)

Front Panel Introduction
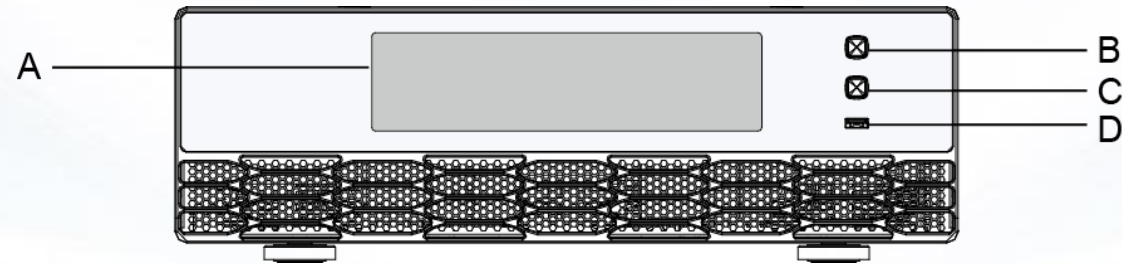
No.	Name	Instruction
A	Touchscreen	Set parameters
B	Power Button	Press 3s to turn it on; short press to turn it off
C	Output Button	Short press to start output or end output
D	USB Interface	External docs import

Rear Panel Introduction
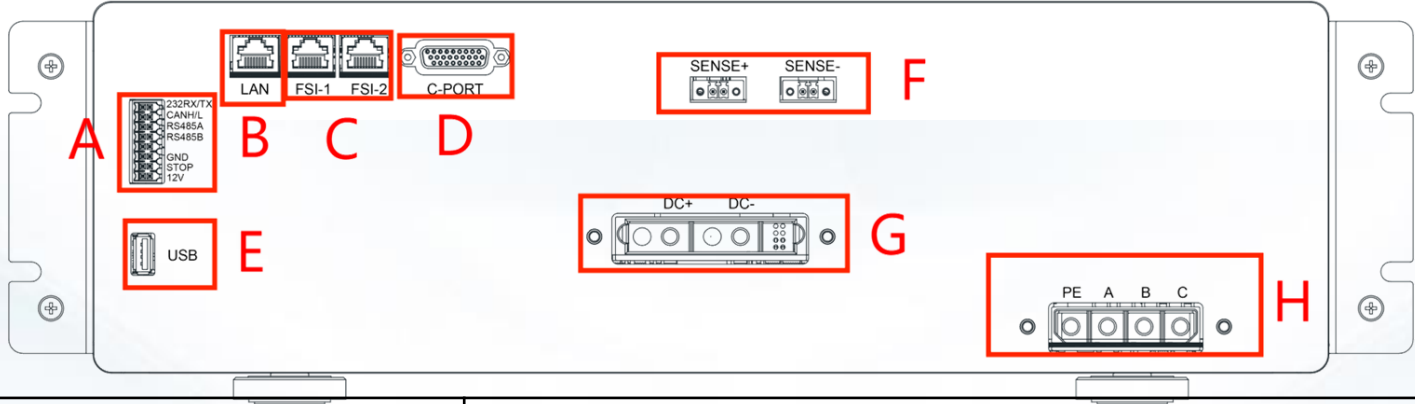
No.	Name	Instruction
A	Multi-functional communication interface	Emergency Stop Signal Interface: for external control of rapid shutdown. CAN Interface: for communication with the device under test. RS485 Interface: for communication with host computer software. RS232 Interface: Reserved for internal debugging.
B	Interface	For Communication with Host Computer Software
C	Fast Serial Interface	For Multi-Unit Parallel Operation
D	DB26 Female Connector	Reserved Debugging Interface
E	USB	For LCD Screen Software Upgrade
F	Voltage Compensation Port	Compensate for Voltage Drop on the Line from the Output to the External Load
G	DC Output Port	For DC Output
H	AC Input Port	For AC Input

Product Models

Models	Power（kW）	Voltage（V）	Current（A）
LC15-750-180	15	750	180
LC15-1500-60		1500	60
LC15-2000-60		2000	60
LC20-750-180	20	750	180
LC20-1500-60		1500	60
LC20-2000-60		2000	60
LC30-750-180	30	750	180
LC30-1500-60		1500	60
LC30-2000-60		2000	60
...	...	...	...
LC1020-750-6120	1020	750	6120
LC1020-1500-2040		1500	2040
LC1020-2000-2040		2000	2040

Note: Units of the Same Model Can Be Used in Parallel.

Application
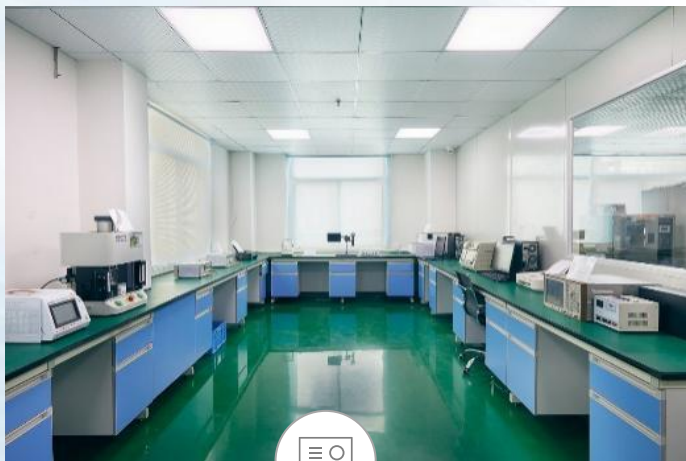
General Programming

- Stepwise Experimentation and R&D Testing
- Lab General Programming and Function Generation

PV Test

- Static Curves and Curve Scanning
- MPPT Efficiency Testing, Temperature, and Irradiance Variation

Energy Storage Test

- Energy Storage Converter
- Energy Storage Battery Test

Application

Electrical Vehicles

- Power Supply for Controller, Driver, and OBC R&D Testing
- Component Certification
- Battery Simulation & Test

Production Line Aging

- Regenerative Load, Programming Verification
- Automated Production Equipment, Aging and Calibration

Calibration Measurement

- Calibration of Low-Precision Equipment
- High-Precision High-Voltage Source and Load

PV Inverter Test Solution

The main platform of the PV inverter test system consists of a **photovoltaic simulator** and control system software, enabling the functional and performance tests on PV inverters.

	AC		DC		AC	
Power Grid		PV Simulator		PV Inverter		Power Grid

PV Inverter Test System Topology

High-frequency solution: **Compact size and lightweight design; Capacity expansion through parallel operation of multiple units, making maintenance convenient**; Suitable for **independent MPPT testing of inverters**.

Can meet the testing requirements for functions, performance, accuracy, and protection of PV inverters.
PV Simulator: Accurately simulates dynamic MPPT tracking and rapid changes in partial shading conditions. One-click invocation of dynamic and static MPPT efficiency regulatory test programs.

Energy Storage Converter Test Solution

The main platform of the energy storage converter test system consists of **a battery simulator**, and control system software, enabling the functional and performance tests on energy storage converters.

AC   DC   AC

Power Grid   Grid Simulator   EES Converter   Power Grid

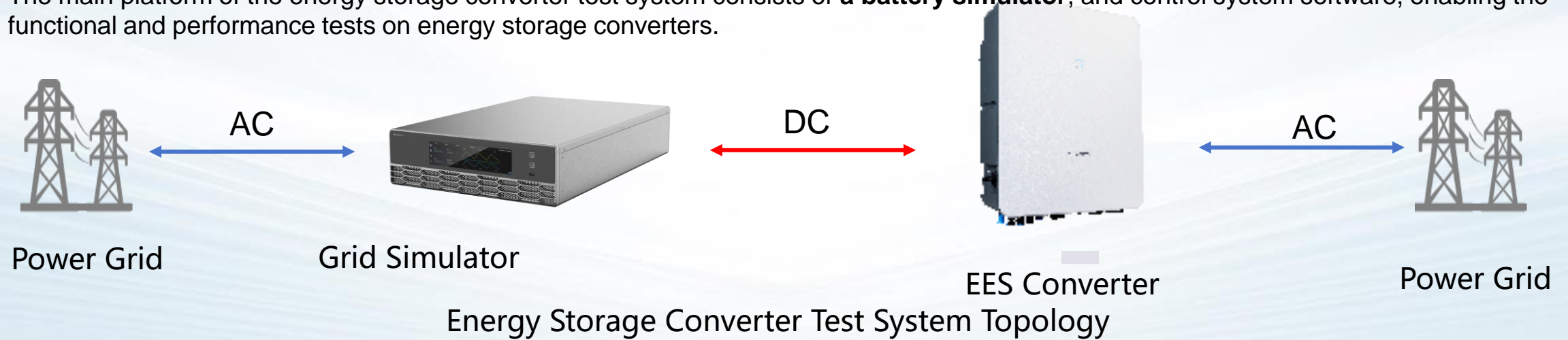### Energy Storage Converter Test System Topology

Strength：

High-frequency solution: **Compact size and lightweight design; Capacity expansion through parallel operation of multiple units, making maintenance convenient.**

Function：

Can meet the testing requirements for functions, performance, accuracy, and protection of Energy storage converters
Battery Simulator: Capable of performing charge and discharge tests on the converter; having the ability to switch quickly, smoothly, and seamlessly.   Voltage is up to 2000V, meeting the trend towards high-voltage applications in energy storage converters.

Electrical Control Test Solution

BLUESiGHT
蓝点数源

The main platform of the electrical control testing system consists of **a battery simulator** and control system software, enabling the functional and performance tests on motor controllers.

AC

DC

Power Grid

Battery Simulator

Motor Controller

Electrical Control Test System Topology

Strength:

High-frequency solution: **Compact size and lightweight design; fast response times and high feedback efficiency.**

Function:

Can meet the testing requirements for functions, performance, and protection of motor controllers.

The electrical control testing system is equipped with a variety of battery characteristic curves, allowing it to simulate different types of batteries under varying environmental temperatures and depths of discharge. It fulfills the one-stop battery simulation needs from small-power battery modules to high-power drive batteries and features seamless switching capabilities.

Parameters

规格型号	LC30-2000-60		
输出电压	2000V	IV曲线模拟功能	
输出电流	±60A	开路电压范围	10-2000V
输出功率	±30kW	短路电流设置	0A-60A
能量反馈	支持能量反馈	光伏板类型	CSi、TF、SCMC、HEC、自定义
隔离功能	输入、输出电气隔离	填充因子	0.25~0.95
交流特性		IV曲线功能	PV扫描、跟踪效率测试、PV曲线（含多峰）生成、动静态MPPT测试、阴影遮挡、云层漂移
额定电压	400Vac	支持标准	EN50530、Sandia、NB/T 32004、CGC/GF035、CGC/GF004
电压范围	360Vac-440Vac	编程功能	
额定频率	50Hz/60Hz	编程步数	300步
频率范围	47Hz-63Hz	编程方式	可通过工步步数、循环次数、执行方式、工步跳转等，组合成多序列复杂的输出模式，满足复杂工况的测试，可应用于电压、电流、功率多种参数的编程测试
接线方式	三相三线+PE	编辑方式	支持导入、导出
直流电压\电流		触发方式	自动、手动、外部
电压调节范围	0～2000Vdc	工作模式	恒压、恒流、恒功率、支持编程、电池模拟、IV曲线可设
电压精度	≤0.02%FS	效率	~95%
源调整率	0.01%FS	功率因数	0.99
载调整率	0.01%FS	谐波thd	≤3%
远端补偿	≤40V	保护功能	过压、过流、欠压、过温、风扇故障等
电压纹波（20Hz-20MHz）	<2400mVpp/RMS 400mV	通讯接口	USB、RS485、CAN、LAN、DB-26接口等
电流调节范围	-60A~60A	控制方式	触摸屏、上位机
电流精度	≤0.02%FS	散热方式	强制风冷
电流上升时间	300us（10%-90%）	工作温度	-10℃～50℃（高于40℃降额）
电流切换时间	1.5ms（-90%-90%）切换	存储温度	-20℃～70℃
电池模拟功能		相对湿度	≤80%（不凝露）
电池类型	可模拟磷酸铁锂、三元锂、铅酸电池等不同电池类型	结构尺寸（W*H*D）	440mm*132mm*671.5mm
设置参数	电池类型、串、并联数、SOC、单体电池容量等参数	重量	35KG
显示参数	实时SOC曲线、当前容量、当前电能、累计充放电能量、累计充放电电能、运行时间等参数	海拔	≤2000m