BLITZPower

# High Power DC Source & Load
## DCB series
## 12V to 2000V, 300kW to 10MW

Programmable Bidirectional DC Power Supply

blitz-power.com

# HIGH POWER CAPACITY WITH PARALLEL OPERATION

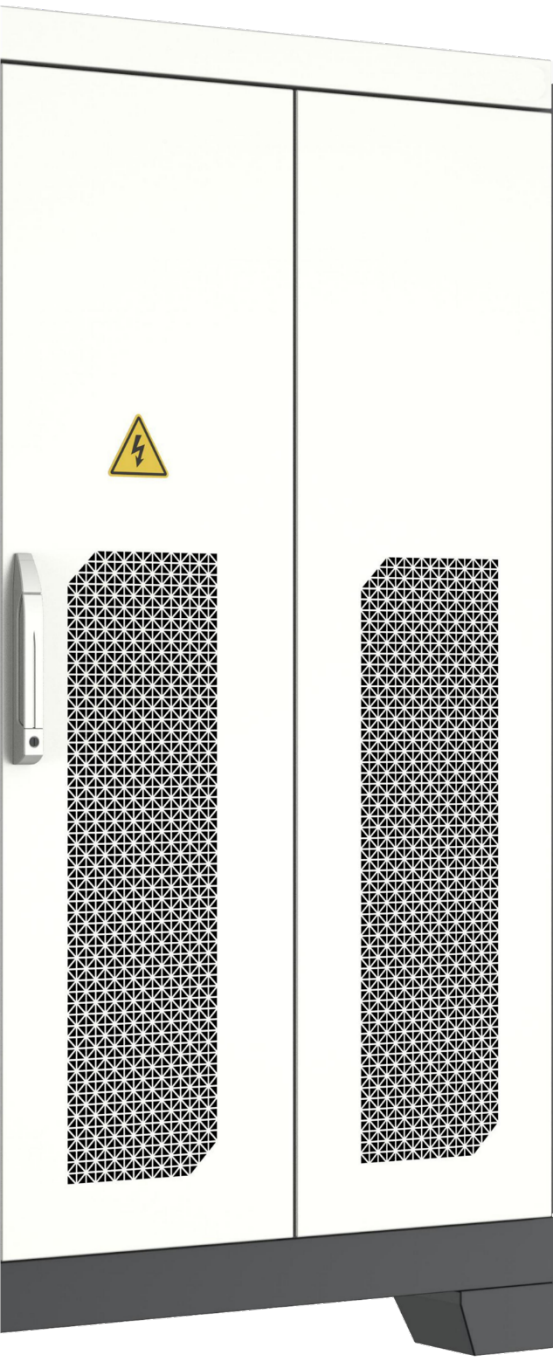
With 300kW - 1MW of unit capacity, the total capacity can be expanded up to 10MW by parallel connections.

**2000V**
**MAXIMUM DC OUTPUT VOLTAGE**

**10MW**
**MAXIMUM DC OUTPUT POWER**

**MULTI-**
**OUTPUT MODE**

Multiple DC power supply cabinets can individually operate in single mode to configure multi-channel output, or in Master/Slave mode to configure single-channel output with combined capacity.



# SIMULATION FUNCTION WITH HIGH PERFORMANCE

DCB series provide real-time battery and PV simulation function with fast response time of less than 1 ms.

**BATTERY**
**SIMULATION**

**PV**
**SIMULATION**

**ELEC-TRONIC**
**LOAD**

DCB series provide grid-regenerative DC electronic load function, which is applicable for testing fuel cell stack or fuel cell engine system, etc.

# Ratings, types and voltages

## DCB series Battery Simulator

| Model | Power [kW] | Output Voltage [V] | Output Current [A] | Size (WHD) [mm] | Weight [kg] |
|---|---|---|---|---|---|
| DCB1K21K0L | ±300 | 12-1200 | ±1000 | 2010x1955x1200 | 2,640 |
| DCB1K21K0M | ±400 | 12-1200 | ±1000 | 2010x1955x1200 | 2,850 |
| DCB1K21K2N | ±500 | 12-1200 | ±1250 | 2010x1955x1200 | 3,020 |
| DCB1K21K2O | ±600 | 12-1200 | ±1250 | 2410x1955x1200 | 3,500 |
| DCB2K0400L | ±300 | 20-2000 | ±400 | 1610x1955x1200 | 1,900 |
| DCB2K0600M | ±400 | 20-2000 | ±600 | 1610x1955x1200 | 2,430 |
| DCB2K0700N | ±500 | 20-2000 | ±700 | 2010x1955x1200 | 2,670 |
| DCB2K0800O | ±600 | 20-2000 | ±800 | 3410x1955x1200 | 3,500 |
| DCB2K01K0Q | ±750 | 20-2000 | ±1000 | 3410x1955x1200 | 4,390 |
| DCB2K01K4R | ±1000 | 20-2000 | ±1400 | 3410x1955x1200 | 4,940 |

# Technical data

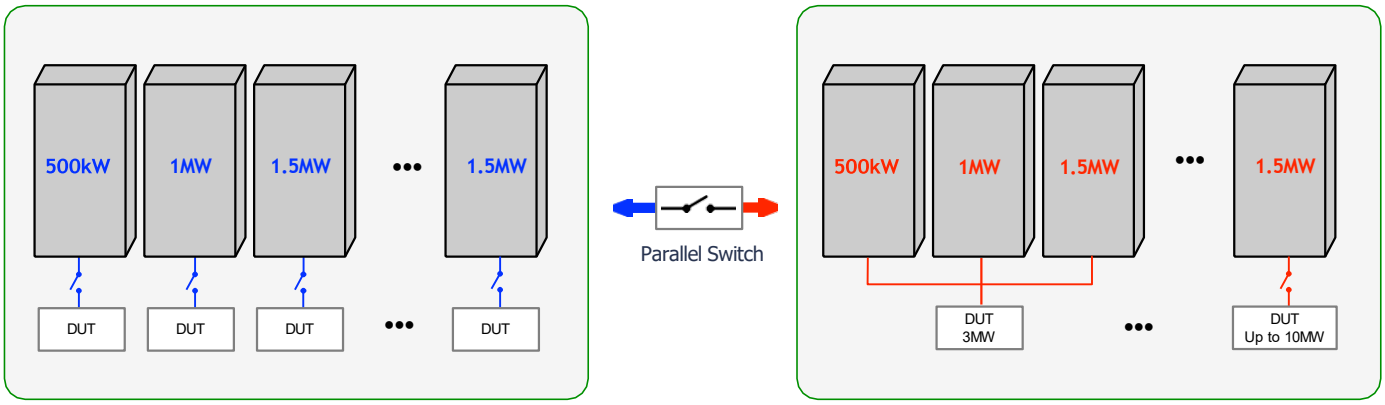
| DCB series | Specification |
|---|---|
| **AC Input** | |
| Voltage, Phases | 380V±15%, 3ph+PE |
| Frequency | 47Hz to 63Hz |
| Power factor | 0.99 @ full load |
| Efficiency | Model of 300kW and above : >94%, others: >90% |
| Harmonic current | ≤3% |
| **DC Output Voltage** | |
| Accuracy | ±0.1% F.S. |
| Resolution | 0.01V |
| Ripple(RMS) | 0.1% F.S. (resistive load) |
| Slew rate | 200V/ms |
| **DC Output Current** | |
| Accuracy | ±0.1% F.S. |
| Resolution | 0.01A |
| Ripple(RMS) | 0.1% F.S. (resistive load) |
| Slew rate | 500A/ms |
| Rise time | ≤2ms (10%~90% rated current) |
| Switching time | ≤4ms (switching from -09% to +90%) |
| Peak time | 60s (1200V type) |
| **Measurement** | |
| Voltage accuracy | ±0.1% F.S. |
| Voltage resolution | 0.001V |
| Current accuracy | ±0.1% F.S. |
| Current resolution | 0.001A |
| Power accuracy | ±0.2% F.S. |
| Power resolution | 1W |
| **Protective Functions** | |
| OVP | Over-voltage protection, adjustable 0 - 110% $U_{Nominal}$ (±1% F.S.) |
| OCP | Over-current protection, Adjustable 0V- ±110% $I_{Nominal}$ (±1% F.S.) |
| OPP | Over-power protection, range 0V ~ ±110% $P_{Nominal}$ (±1% F.S.) |
| OT | Overt-temperature protection |

# Technical data

| DCB series | Specification |
|---|---|
| **Battery Simulation** | |
| Battery type | Different battery types such as lithium manganate, lithium cobaltate, lithium iron phosphate, nickel-hydrogen, ternary lithium, lithium titanate, and lead-acid batteries can be simulated<br>User-defined battery types and open first, second and third-order RC battery models are supported |
| Parameter | Number of batteries in series connection, number of batteries in parallel connection, initial SOC, initial temperature, internal resistance, cell capacity and other parameters |
| Interface | Import of CSV user-defined model is supported |
| Real-time performance | 1ms command refresh rate |
| **Interface** | |
| Ethernet, CAN, RS485 | |
| **Device Configuration** | |
| Parallel operation | Up to 10MW |
| **Insulation and Withstanding Voltage** | |
| 10MΩ/DC500V；3600VAC(5000VDC)/1min | |
| **Environmental Conditions** | |
| Operating temperature | -10 to 40°C |
| Storage temperature | -20 to 70°C |
| Relative humidity | 10 to 90% RAH |
| Altitude | ≤2000m without derating, Above 2000m please contact ACTIONPOWER |
| **Cooling Method** | |
| Air-cooled | Dry clean air |
| **Option** | |
| Discharging resistor cabinet | Under abnormal operating conditions of the system, energy will be safely dissipated through the bleeder resistor cabinet to protect the DUT |
| Capacitance compensation | Voltage drop caused by cable impedance and the voltage ripple of the DUT |

# High Power Scalable Design

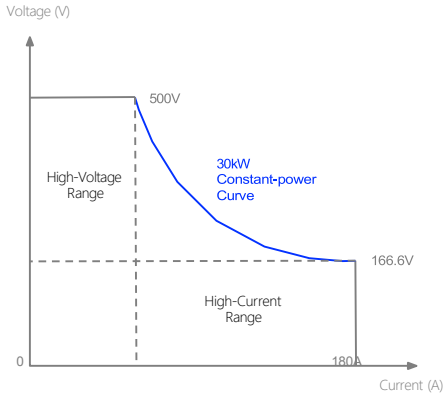
DCB series support multi-unit parallel operation and adopts high-speed fiber optic communication technology, featuring strong anti-interference capability and zero latency. The system supports expansion up to 10MW by connecting in parallel in 1MW increments from 300kW minimum. It enables multi-position, high-capacity, and multi-voltage level test setups, significantly improving testing efficiency for customers. In particular, the parallel-connected panels can be used in multi-output mode by separating the outputs according to the user's needs, allowing multiple test equipment to be tested at the same time, maximizing user convenience and saving a lot of costs.



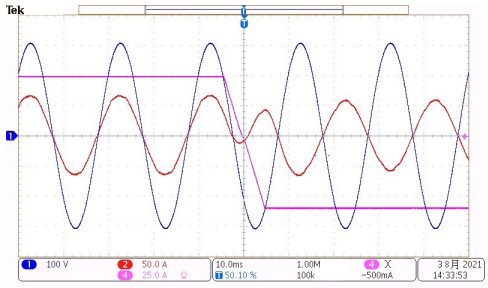

Multi-Output Mode

Parallel Mode

# Auto Ranging




The auto ranging function automatically controls voltage and current through the programmable DC power supply to maintain the rated output over a wide operating range. That is the higher voltage is available at lower current, and vice versa, allowing the DUT to be tested under different voltage/current conditions with a single DC power supply.




In addition, it supports smooth and ultra-fast automatic switching with the bidirectional Automatic “source” & “load” function. The overshoot of voltage or current can be effectively controlled without any delay in the transition between the two states of source and load.

# CV/CC Priority Setting Function

CV (constant voltage) priority / CC (constant current) priority mode can be selected and set.

**Suppression of Overshoot with CC Priority Mode**

With the DCB series power supply, the CC priority mode can effectively respond to load variations. This mode suppresses momentary current spikes when the load suddenly changes its resistance, thus ensuring stable protection for sensitive loads.

Configuring the power supply in CC priority mode allows for voltage adjustment according to load changes, maintaining a stable current. This effectively protects sensitive loads such as high-power laser diodes and minimizes the risk of damage due to overshoot.

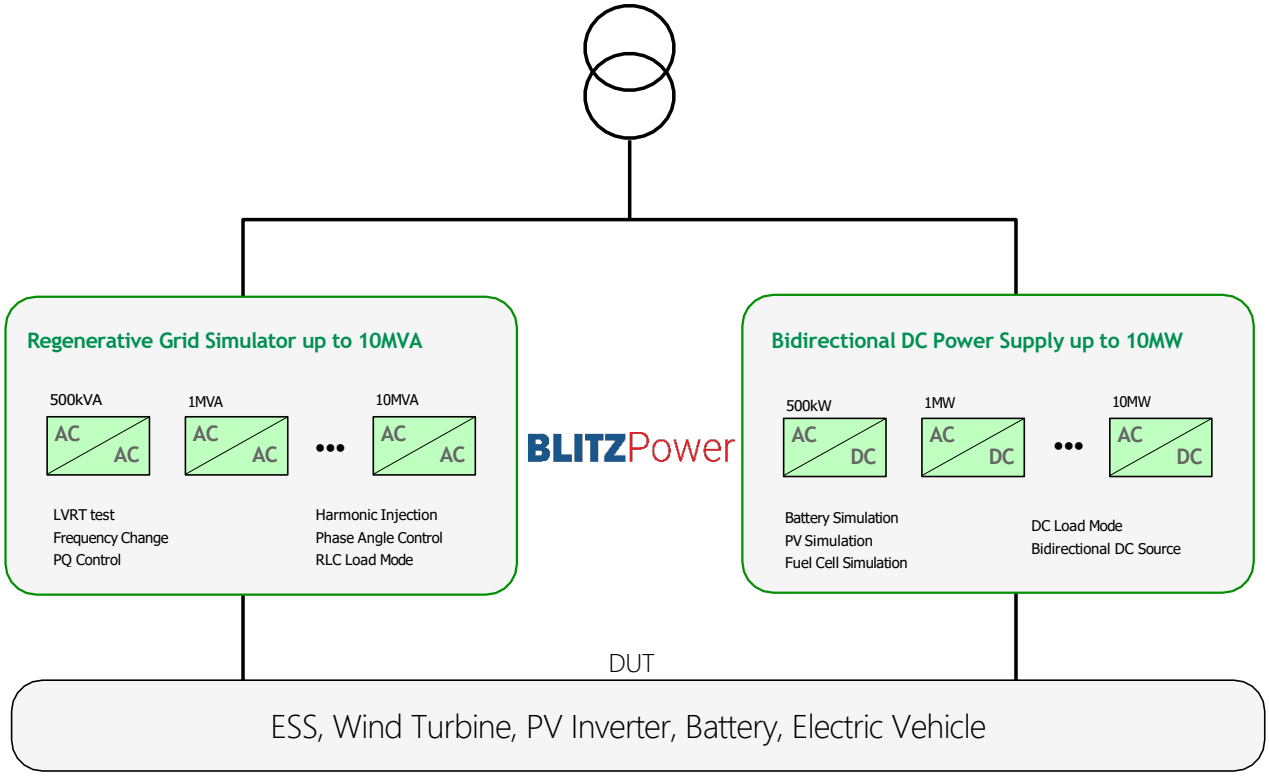
**Current Overshoot in CV Priority Mode**

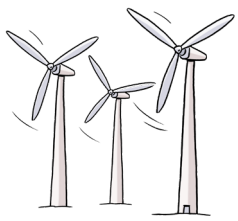
In CV priority mode, the power supply prioritizes maintaining a constant output voltage. However, sudden load variations can cause momentary current spikes, posing a risk of damage to sensitive loads.

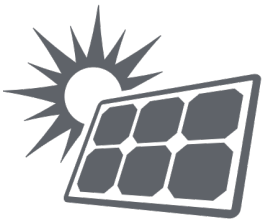
Therefore, configuring the DCB series power supply in CC priority mode enhances load stability and prevents damage caused by overshoot.

# Application

Blitz power's high-capacity bi-directional DC power supplies are innovative products that are used in a variety of applications based on unique technology and optimal performance. Blitz power products can act as regenerative electronic load while providing bi-directional DC power, which is applicable of long-term reliability test applications such as electric vehicle DC charging stations, automotive battery charge and discharge tests, fuel cell discharge tests, ESS charge and discharge tests, and other applications requiring very fast response time, such as simulating electric vehicle driving patterns.



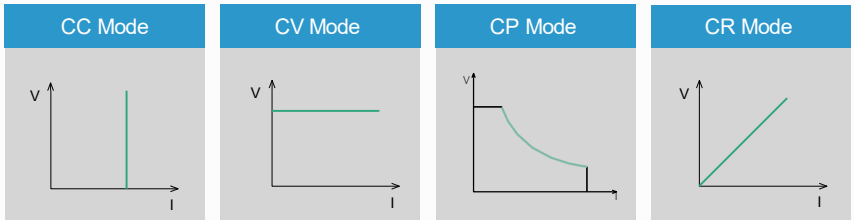





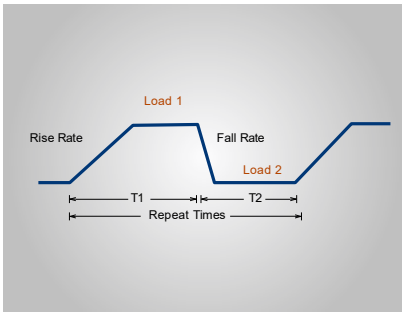

# Powerful Software

## Provides Diverse Simulation Modes

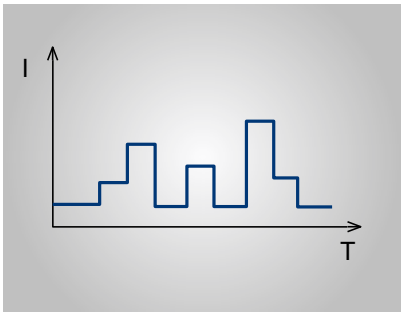
### Basic Mode




### Dynamic Mode




### Programmable Sequences

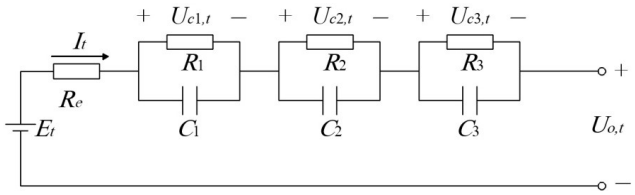



## KEY FEATURES

- **Battery Simulation**
  LiMn204, LiCoO2, LiFePO4, NiMH, Ternary LI, LiTiO2 and PbO2 batteries
- **PV Simulation**
  Static curves, Curve programming, Static MPPT, Dynamic MPPT, Weather Simulation, Shading of photovoltaic panels
- **Electronic Load Function**
- **Programming Waveform**

# Comprehensive Battery Simulation

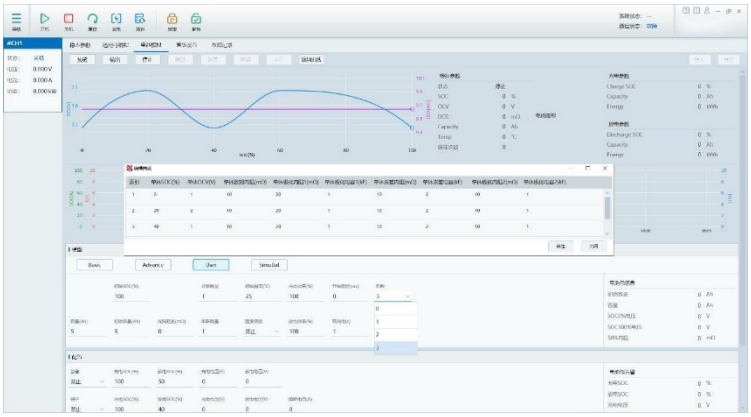
It can simulate the output and charge/discharge characteristics of various battery packs such as lithium manganate, lithium cobalt, lithium iron phosphate, nickel-hydrogen, ternary lithium, lithium titanate and lead-acid batteries, and can set the parameters such as serial/parallel quantity, temperature, SOC, internal resistance and single battery capacity to simulate the output characteristics of the whole battery pack. The power supply opens first, second and third-order RC battery models and supports user-defined battery parameters and import of CSV user-defined model; the power supply has high real-time performance and the command refresh rate is as high as 1kHz, so as to comprehensively simulate the characteristics of the battery pack.



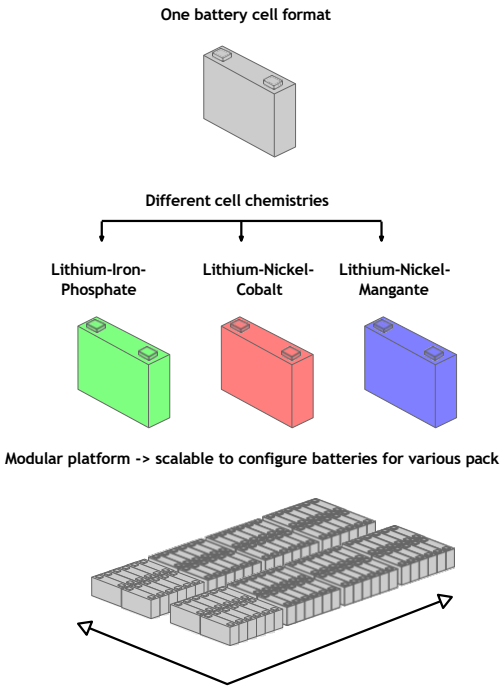

RCR Equivalent Circuit Model

| | |
|---|---|
| Architecture | 400 V |
| Nominal battery capacity | 33.2 kWh |
| Usable battery capacity | 27.2 kWh |
| Pack layout | 96s1p (8 serially connected 12s1p modules) |
| Number of Li-ion cells | 96 |
| Rated cell voltage | 3.7 V |
| Capacity per cell | 94 Ah |
| Cell chemistry | NCM333 |

User-defined battery parameters



Battery Simulation Interface

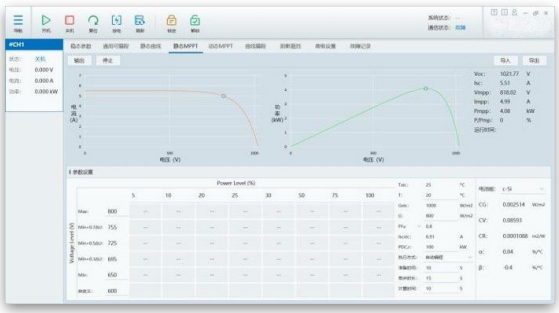



## KEY FEATURES

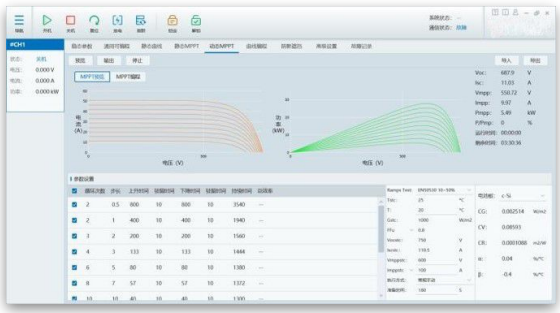
- DC Output Voltage : 12-2000Vdc
- Parallel Connection : up to 10MW
- Battery Simulation
  LiMn204, LiCoO2, LiFePO4, NiMH, Ternary LI, LiTiO2 and PbO2
- High Dynamic : <2ms (10~90%)
- Voltage Slew Rate : 200V/ms
- ESS, UPS, EVE, etc. testing

# PV Simulation

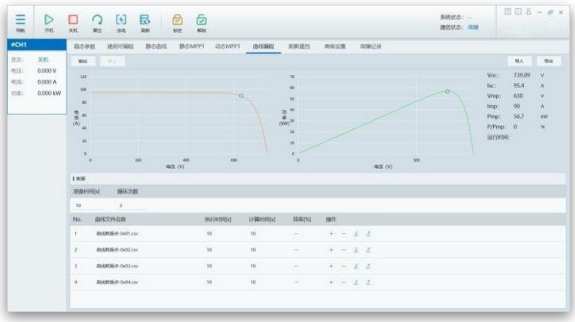
DCB PV simulator is a DC power supply featuring high precision, high dynamics and high-speed switching. With the complete I-V curve simulation function, it can simulate the output characteristics of various VP panels, and provide various kinds of user- defined curves, static and dynamic I-V curves and shadow occlusion simulations. The programming function can simulate different waveform outputs through three programming modes like Step, List and Wave, in order to fulfill the test requirements of various industries. The power supply can not only provide standard power supply environment for electrical equipment, but also receive the energy from load and feed ti back to the grid, with feedback efficiency of above 94%, to save energy and improve the test environment.



Static MPPT Interface

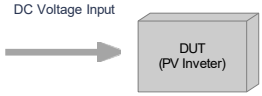


Dynamic MPPT Interface

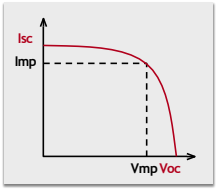


Curve Programming Interface

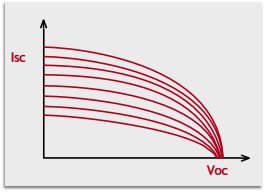
Shadow I-V Interface




Solar Array Simulator




SAS Mode




I-V Program Mode

| Point | 1 | 2 | … |
|---|---|---|---|
| V | 0 | 30 | … |
| I | 11 | 10 | … |

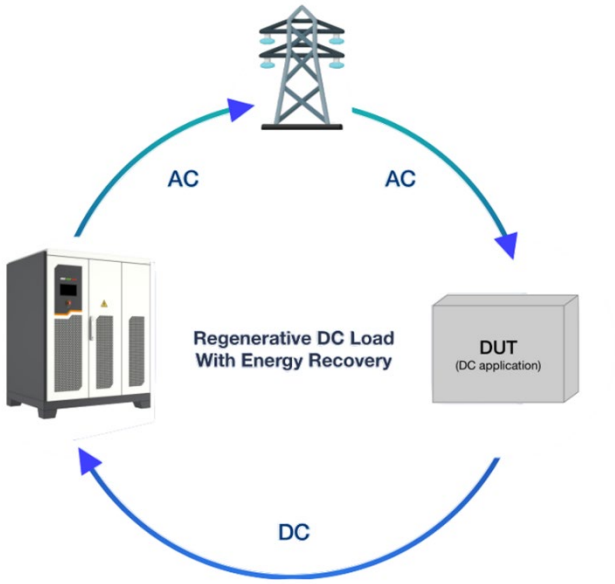
User-define curve

## KEY FEATURES

- DC Output Voltage : 12-2000Vdc
- Parallel Connection : up to 10MW
- Complete I-V Curve Simulation
- High Dynamics : <2.5ms (10~90%)
- Voltage Slew Rate : 200V/ms
- Fast I-V Curve Switching : <100ms
- Shadow I-V curve simulation
- Built-in dynamic MPPT test profile Sandia, EN50530, CGC/GF004

# Electronic Load

The DCB series feedback DC electronic load is different from the traditional consumption load. It feeds back the absorbed electric energy to the power grid after transformation to save energy and improve the test environment. The product adopts full digital control technology, and has characteristics such as step-less adjustment, high accuracy, high dynamic performance and high reliability. It meets the requirements of low voltage and high current test, and can be applied to test scenarios such as fuel cell stack and fuel cell engine system.




The DCB series is regenerative DC electronic loads capable of absorbing current and efficiently feeding it back into the power grid. The DCB series achieves an impressive efficiency of up to 94%. The returned electrical energy can be reused by other equipment within the facility, resulting in savings in overall energy consumption and carbon emissions, reducing the environmental impact.

## KEY FEATURES

- DC Output Voltage : 1200Vdc
- High Dynamics : <5ms (10~90%)
- Output slow start
- Low Harmonic Current: <3% F.S.
- Anti-revers function
- Online insulation impedance monitoring
- Discharging resistor
- Capacitance compensation