
# RBS-Series

## Regenerative Bidirectional DC Source

## FEATURES

- Bidirectional Power Supply, Integrating Power Supply and Load Functions
- Voltage Output: 100 V, 500 V, 750 V, 1000 V, 1500 V, 2250 V
- Power Output: High power density 5 kW/10 kW/15 kW @ 3U Height
- Maximum Output Current: 510 A
- Standard SAS Function, Battery Simulation Function, Battery Charge/ Discharge Function and Sequence Programming Function
- Simple Master-Slave Parallel Connection, up to 10 Units of the Same Model Can be Connected in Parallel, With a Maximum Parallel Power of 150 kW
- Complete Protection Mechanism: including OVP, OCP, OPP, OTP and Input Over-voltage and Under-voltage Protection
- Intuitive Touch Panel Human-machine Operation Interface
- Standard Dedicated PC Control Software
- Interface Options: 4-in-1 Interface (USB, RS-232/RS-485, LAN, CAN) or GPIB Interface

GW INSTEK
Simply Reliable

The RBS Series regenerative bidirectional DC source is a versatile, programmable power solution with both power (source) and load (sink) absorption capabilities. It is specifically designed for testing power conversion devices and energy storage components in the new energy sector. Widely used in the development and production testing of electric vehicles, energy storage systems, and related products, The RBS series supports energy recovery, enabling enterprises to "implement ESG from the equipment selection stage" and incorporate energy-saving performance indicators into their ESG reports.

The RBS series regenerative bidirectional DC source features built-in SAS (EN50530, Sandia), SAS2, and customizable models. It also supports static/dynamic MPPT testing as well as complex solar irradiation simulations, such as cloud shading and cloud movement.

The RBS series is capable of simulating battery characteristics in practical applications, including charging and discharging behaviors, to assist with various tests. the RBS series has 8 fixed battery models + one custom battery model. (models are based on relevant research papers and test data published domestically and internationally): lithium manganate (LMO), lithium cobalt oxide (LCO), lithium iron phosphate (LFP), ternary lithium (NCM), lithium titanate (LTO), lead-acid (Pb), nickel-metal hydride (NiMH), and nickel-cadmium (NiCd) batteries.

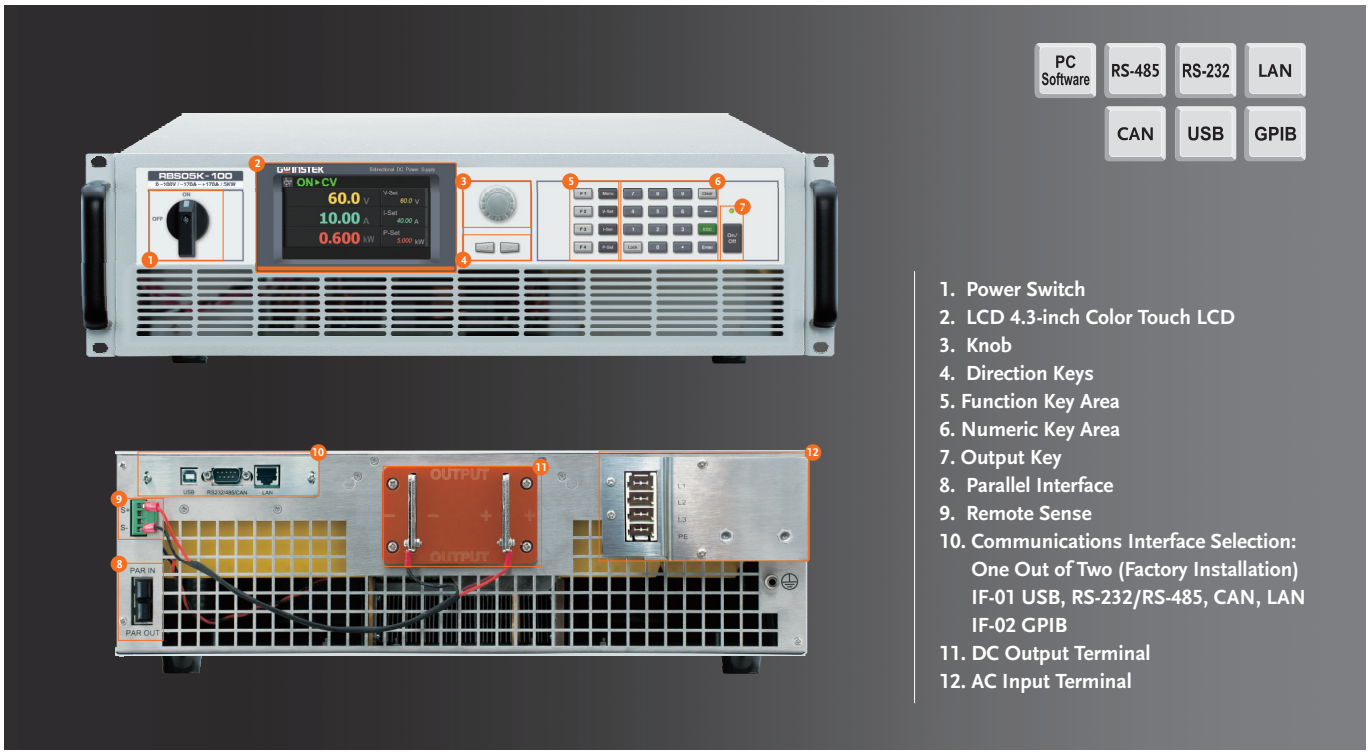
In traditional motor driver testing setups, a conventional DC power supply typically requires an external diode at the output to prevent reverse current flow, and an additional electronic load is needed to consume the regenerative current generated during motor braking or downhill operation. However, the RBS Series can function both as a DC power source and as a DC electronic load. This dual functionality simplifies configuration, saves space, and is ideal for motor driver testing. Moreover, it can feed the regenerative energy back into the grid, enhancing energy efficiency.

The RBS series is positioned as a high-performance power testing solution, purpose-built for testing power equipment in both R&D and manufacturing processes. Its market focus centers on new energy applications, including photovoltaic (PV) power generation systems, electric vehicle charging modules, and battery testing. Featuring high-precision bidirectional power capability, energy regeneration, and fast transient response, the RBS series addresses the demands of high power density and green energy efficiency. It is ideal for laboratory testing, product development, and quality assurance, delivering highly flexible and reliable test support for customers.

| Model | Output Power | Output Voltage | Output Current | Input Voltage (3P3W) |
|---|---|---|---|---|
| RBS05K-100*1 | 5 kW | 100 V | -170 A to +170 A | 342 Vac to 510 Vac |
| RBS10K-100*1 | 10 kW | 100 V | -340 A to +340 A | 342 Vac to 510 Vac |
| RBS15K-100*1 | 15 kW | 100 V | -510 A to +510 A | 342 Vac to 510 Vac |
| RBS05K-500 | 5 kW | 500 V | -40 A to +40 A | 342 Vac to 510 Vac |
| RBS10K-500 | 10 kW | 500 V | -80 A to +80 A | 342 Vac to 510 Vac |
| RBS15K-500 | 15 kW | 500 V | -120 A to +120 A | 342 Vac to 510 Vac |
| RBS05K-750 | 5 kW | 750 V | -25 A to +25 A | 342 Vac to 510 Vac |
| RBS10K-750 | 10 kW | 750 V | -50 A to +50 A | 342 Vac to 510 Vac |
| RBS15K-750 | 15 kW | 750 V | -75 A to +75 A | 342 Vac to 510 Vac |
| RBS10K-1000 | 10 kW | 1000 V | -40 A to +40 A | 342 Vac to 510 Vac |
| RBS15K-1500 | 15 kW | 1500 V | -40 A to +40 A | 342 Vac to 510 Vac |
| RBS15K-2250 | 15 kW | 2250 V | -25 A to +25 A | 342 Vac to 510 Vac |

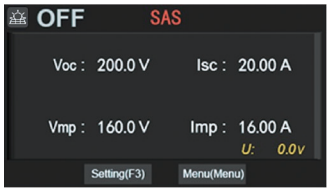
*1 SAS (Solar Array Simulation) function: Applicable to models with 500 V and above

## PANEL INTRODUCTION

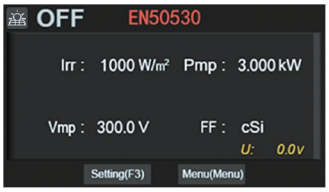



1. Power Switch
2. LCD 4.3-inch Color Touch LCD
3. Knob
4. Direction Keys
5. Function Key Area
6. Numeric Key Area
7. Output Key
8. Parallel Interface
9. Remote Sense
10. Communications Interface Selection:
    One Out of Two (Factory Installation)
    IF-01 USB, RS-232/RS-485, CAN, LAN
    IF-02 GPIB
11. DC Output Terminal
12. AC Input Terminal

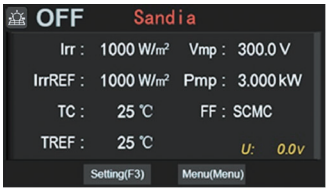
## A. PHOTOVOLTAIC FUNCTION: APPLICABLE TO MODELS 500V AND ABOVE



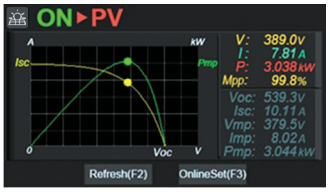

PV SAS Mode




PV EN50530 Mode




PV Sandia Mode

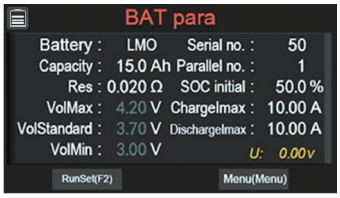



PV Operation Interface

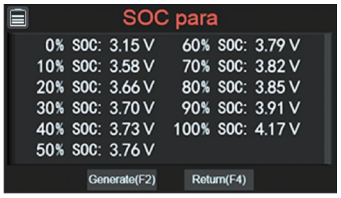
The power supply's photovoltaic (PV) mode can simulate a solar panel or a solar panel array via computer software, enabling testing of PV inverter characteristics and performance.

The software also allows simulation of complex irradiance conditions, including standard static MPPT testing, dynamic MPPT testing, cloud shading, and cloud movement.

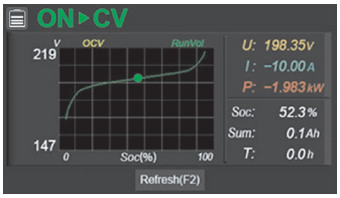
## B. BATTERY SIMULATION FUNCTION



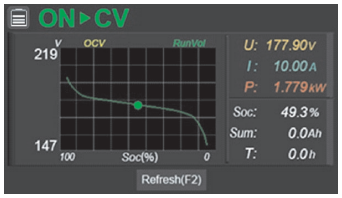

Battery Parameter Interface-lmo Battery




SOC Parameter Interface




Battery Simulation Operation-charging Display

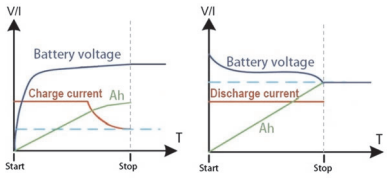



Battery Simulation Operation-discharge Display

The RBS Series is capable of simulating battery characteristics in practical applications, including charging and discharging behaviors, to assist with various tests.

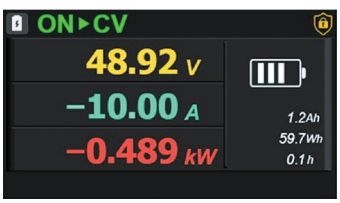
The RBS series has 8 fixed battery models + one custom battery model. (models are based on relevant research papers and test data published domestically and internationally): lithium manganate (LMO), lithium cobalt oxide (LCO), lithium iron phosphate (LFP), ternary lithium (NCM), lithium titanate (LTO), lead-acid (Pb), nickel-metal hydride (NiMH), and nickel-cadmium (NiCd) batteries.

## C. BATTERY CHARGING AND DISCHARGING MODE

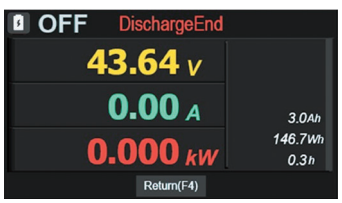



Battery Charging and Discharging Status Diagram


Battery Charge/Discharge Setting Interface



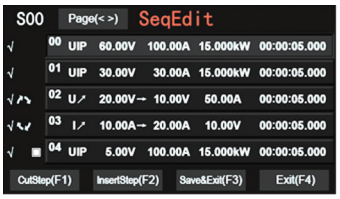

Battery Charge/Discharge Operation Interface



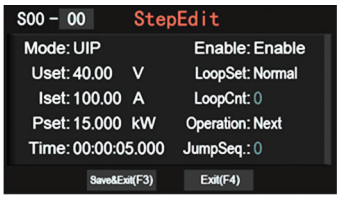

Battery Operation End-discharge Display

The RBS series features a battery charge and discharge operating mode and can be connected to battery type loads to perform charging and discharging operations.

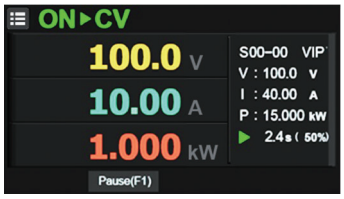
## D. SEQUENCE FUNCTION




**Sequence Editing**

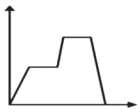



**Step Editing**




**Sequence Operation Interface**

| No. | Mode | Para1 | Para2 | Para3 | Time | Enable | Loop Set | Operation |
|---|---|---|---|---|---|---|---|---|
| 0 | U ramp | 0V | 40V | 510A | 2s | Enable | Normal | Next |
| 1 | UIP | 40V | 510A | 15kW | 3s | Enable | Normal | Next |
| 2 | U ramp | 40V | 70V | 510A | 1s | Enable | Normal | Next |
| 3 | UIP | 70V | 510A | 15kW | 3s | Enable | Normal | Next |
| 4 | U ramp | 70V | 0V | 510A | 2s | Enable | Normal | Stop |



**Example**

In serial test mode, users can set a series of voltage or voltage change values, current or converter change values, power levels, operation modes, time durations, and other parameters. The series automatically outputs these settings in defined steps to better support applications such as automatic testing and aging.

The list test feature can store up to 50 sequences (sequence numbers 0 to 49), with each sequence containing 20 steps (step numbers 0 to 19). Each step can be configured independently, including settings for enable, loop, ramp mode output, and other control functions.

## E. LOAD MODE


**Load Standby State**

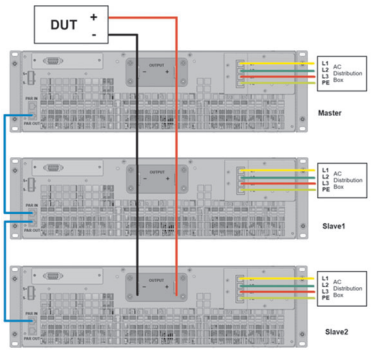

**Load Working Mode Operation Interface**

Load operating modes: A total of 8 modes are supported, including Constant Current (CC), Constant Voltage (CV), Constant Power (CP), Constant Resistance (CR), as well as composite modes CV→CC, CV→CR, CC→CR, and AUTO mode.

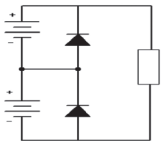
In load mode, there will be an output voltage of about 1 V after startup. To ensure that the load mode works normally, the external power supply should have an output of more than 1 V to ensure normal operation of the load mode.

When the resistance is set to 0 ohms, it means that the power supply CR function is turned off, and only the CC function and CP function are valid.

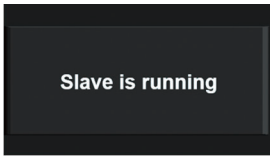
## F. SERIES-PARALLEL CONNECTIONS




Parallel Connection Diagram



Series Connection Diagram




Slave Panel Display

**Supports 10 Units in Parallel :**

- For more than 10 units, please contact GW Instek
- 100 V models can connect two units in series (voltage does not exceed 300 V)

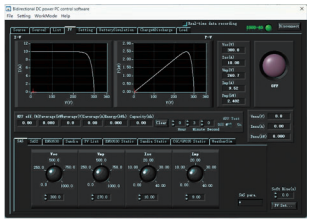
**Series and Parallel Operation Steps :**

- Change the connection setting to master or slave
- Connect the parallel control cable and output cabl

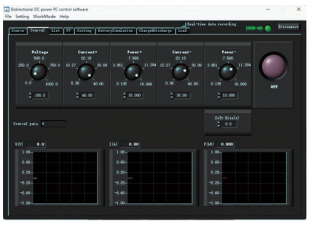
## G. SOFTWARE INTERFACE

Source Mode

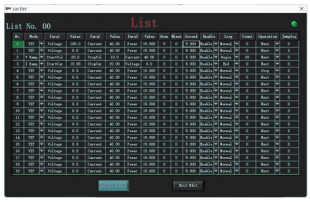
List Mode



PV Mode



Source Sink Mode



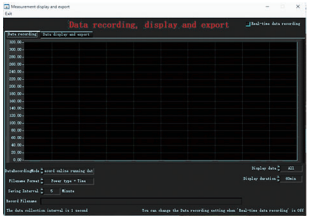

List Edit

PV Inverter Mppt Auto Test

Battery Simulation

Charge Discharge Mode

Load Mode




Data Recording

The main interface contains all the main functions of the bidirectional ower supply, as shown in above Figure.

## SPECIFICATIONS

| Model | | | RBS05K-100 | RBS10K-100 | RBS15K-100 |
|---|---|---|---|---|---|
| **Output Rating** | | | | | |
| Rated power | | | ± 5000 W | ± 10000 W | ± 15000 W |
| Rated voltage (source) | | | 0 V to 100 V | | |
| Operating voltage (sink) | | | 5 V to 100 V | | |
| Rated current | | | ± 170 A | ± 340 A | ± 510 A |
| **Output Voltage** | | | | | |
| Maximum settable voltage | | | 100 V | | |
| Setting accuracy | | | 0.05 %+0.05 % FS | | |
| Setting resolution | | | 0.1 V | | |
| Load regulation CV | | | 0.05 % FS | | |
| Line regulation CV | | | 0.015 % FS | | |
| Temperature coefficient CV | | | 100 ppm | | |
| Remote sensing (compensation voltage) | | | 5 V | | |
| Source only | Transient response(*1) | | 2 ms | | |
| | Ripple noise | p-p(*2) | 500 mV | | |
| | | rms(*3) | 35 mV | | |
| | Rise time(*4) | Full load | 60 ms | | |
| | | No load | 15 ms | | |
| | Fall time(*5) | Full load | 15 ms | | |
| | | No load | 30 ms | | |
| **Output Current** | | | | | |
| Settable maximum source current | | | 170 A | 340 A | 510 A |
| Settable maximum sink current | | | -170 A | -340 A | -510 A |
| Setting accuracy | | | 0.4 %+0.4 % FS | | |
| Setting resolution | | | 0.01 A | | |
| Load regulation CC | | | 0.2 % FS | | |
| Line regulation CC | | | 0.05 % FS | | |
| Ripple and noise(*6) | | rms(*3) | 0.1 % FS | | |
| Temperature coefficient CC | | | 200 ppm | | |
| **Output Power** | | | | | |
| Settable maximum source power | | | 5000 W | 10000 W | 15000 W |
| Settable maximum sink power | | | -5000 W | -10000 W | -15000 W |
| Setting accuracy | | | 0.5 %+0.5 % FS | | |
| Setting resolution | | | 1 W | | |
| **DC Output Resistor** | | | | | |
| Resistance range | | | 0 Ω to 100 Ω | | |
| Setting accuracy(*7) | | | ≤ 5 % Rmax(0 % to 10 % Rmax) ; ≤ 10 % Rmax(10 % to Rmax) | | |
| Setting resolution | | | 0.01 Ω | | |
| **Protective Functions** | | | | | |
| OVP | | Range | 0 % FS to 110 % FS | | |
| | | Accuracy | 0.1 %FS | | |
| OCP | | Range | 0 % FS to 110 % FS | | |
| | | Accuracy | 0.2 % FS | | |
| OTP | | | √ | √ | √ |
| Vsense reverse protection | | | √ | √ | √ |
| Input voltage protection (OVP, UVP) | | | √ | √ | √ |
| **Display Accuracy** | | | | | |
| Voltage | | Accuracy | 0.05 %+0.05 % FS | | |
| | | Resolution | 0.1 V | | |
| Current | | Accuracy | 0.4 %+0.4 % FS | | |
| | | Resolution | 0.01 A | | |
| Power | | Accuracy | 0.5 %+0.5 % FS | | |
| | | Resolution | 0.001 kW | | |
| **Interfaces Digital** | | | | | |
| All-in-One(USB,RS-232/RS-485,CAN,LAN)(*8) | | | All-in-On / GPIB | | |
| GPIB(*8) | | | All-in-On / GPIB | | |
| **400 V Three-phase Three-wire Input** | | | | | |
| Nominal input rating | | | 380 Vac to 460 Vac | | |
| Input voltage range | | | 342 Vac to 510 Vac | | |
| Input frequency range | | | 47 Hz to 63 Hz | | |
| Output Power | | | 5000 W | 10000 W | 15000 W |
| Input current (MAX) | | at 342 Vac | 9.2 A | 18.4 A | 27.6 A |
| Input power (MAX) | | | 5.5 kVA | 11 kVA | 16.5 kVA |
| Power factor (TYP) | | | 0.99 | | |
| Leakage current | | | 5 mA | | |
| Efficiency sink/source (up to) | | | 93 % | | |
| **General Specifications** | | | | | |
| Environmental conditions | Operating temperature | | 0 °C to 40 °C | | |
| | Operating humidity | | 20 % to 90 % RH | | |
| | Storage temperature | | -10 °C to 70 °C | | |
| | Storage humidity | | 20 % to 90 % RH | | |
| | Altitude | | 1000 m | | |
| Withstand voltage | AC input to case (PE) | | DC 2300 V | | |
| Insulation resistance | Between output and GND | | DC 500 V | | |
| Mechanical construction | Dimensions (W x H x D) mm | | 482 mm x 133.3 mm x 790 mm | | |
| | Weight | | 24 kg | 32 kg | 40 kg |
| Parallel operation | | | √ | √ | √ |

*1. When the load changes from 50 % to 100 %, or from 100 % to 50 %, the voltage returns to within 0.75 % of the rating.
*2. Measurement frequency bandwidth is 20 Hz to 20 MHz.
*3. Measurement frequency bandwidth is 20 Hz to 2 MHz.
*4. First set the 0 V output, from 10 % to 90 % of the rated output voltage, with pure resistance.
*5. Rated voltage output, then set to 0 V,from 90 % to 10 % of rated output voltage, with pure resistance.
*6. The ripple is measured at 20 % to 100 % output voltage and full output current. Source mode is 0.1 % FS,Sink and Load mode is 0.2 % FS.
*7. When the input voltage is within 10 % to 100 % of the RBS voltage range and the load current is within 10 % to 100 % of the RBS current range.
*8. Communication interface: one of two, factory-installed.

## SPECIFICATIONS

| Model | | | RBS05K-500 | RBS10K-500 | RBS15K-500 |
|---|---|---|---|---|---|
| **Output Rating** | | | | | |
| Rated power | | | ± 5000 W | ± 10000 W | ± 15000 W |
| Rated voltage (source) | | | 0 V to 500 V | | |
| Operating voltage (sink) | | | 10 V to 500 V | | |
| Rated current | | | ± 40 A | ± 80 A | ± 120 A |
| **Output Voltage** | | | | | |
| Maximum settable voltage | | | 500 V | 500 V | 500 V |
| Setting accuracy | | | 0.05 %+0.05 % FS | | |
| Setting resolution | | | 0.1 V | | |
| Load regulation CV | | | 0.03 % FS | | |
| Line regulation CV | | | 0.015 % FS | | |
| Temperature coefficient CV | | | 100 ppm | | |
| Remote sensing (compensation voltage) | | | 25 V | | |
| Source only | Transient response(*1) | | 2 ms | | |
| | Ripple noise | p-p(*2) | 600 mV | | |
| | | rms(*3) | 95 mV | | |
| | Rise time(*4) | Full load | 30 ms | | |
| | | No load | 15 ms | | |
| | Fall time(*5) | Full load | 15 ms | | |
| | | No load | 30 ms | | |
| **Output Current** | | | | | |
| Settable maximum source current | | | 40 A | 80 A | 120 A |
| Settable maximum sink current | | | -40 A | -80 A | -120 A |
| Setting accuracy | | | 0.15 %+0.15 % FS | | |
| Setting resolution | | | 0.01 A | | |
| Load regulation CC | | | 0.1 % FS | | |
| Line regulation CC | | | 0.05 % FS | | |
| Ripple and noise(*6) | | rms(*3) | 0.1 % FS | | |
| Temperature coefficient CC | | | 200 ppm | | |
| **Output Power** | | | | | |
| Settable maximum source power | | | 5000 W | 10000 W | 15000 W |
| Settable maximum sink power | | | -5000 W | -10000 W | -15000 W |
| Setting accuracy | | | 0.5 %+0.5 % FS | | |
| Setting resolution | | | 1 W | | |
| **DC Output Resistor** | | | | | |
| Resistance range | | | 0 Ω to 500 Ω | | |
| Setting accuracy(*7) | | | ≤ 5 % Rmax(0 % to 10 % Rmax) ; ≤ 10 % Rmax(10 % to Rmax) | | |
| Setting resolution | | | 0.01 Ω | | |
| **Protective Functions** | | | | | |
| OVP | | Range | 0 % FS to 110 % FS | | |
| | | Accuracy | 0.1 %FS | | |
| OCP | | Range | 0 % FS to 110 % FS | | |
| | | Accuracy | 0.2 % FS | | |
| OTP | | | √ | √ | √ |
| Vsense reverse protection | | | √ | √ | √ |
| Input voltage protection (OVP, UVP) | | | √ | √ | √ |
| **Display Accuracy** | | | | | |
| Voltage | | Accuracy | 0.05 %+0.05 % FS | | |
| | | Resolution | 0.1 V | | |
| Current | | Accuracy | 0.15 %+0.15 % FS | | |
| | | Resolution | 0.01 A | | |
| Power | | Accuracy | 0.5 %+0.5 % FS | | |
| | | Resolution | 0.001 kW | | |
| **Interfaces Digital** | | | | | |
| All-in-One(USB,RS-232/RS-485,CAN,LAN)(*8) | | | All-in-On / GPIB | | |
| GPIB(*8) | | | All-in-On / GPIB | | |
| **400 V Three-phase Three-wire Input** | | | | | |
| Nominal input rating | | | 380 Vac to 460 Vac | | |
| Input voltage range | | | 342 Vac to 510 Vac | | |
| Input frequency range | | | 47 Hz to 63 Hz | | |
| Output Power | | | 5000 W | 10000 W | 15000 W |
| Input current (MAX) | | at 342 Vac | 9.2 A | 18.4 A | 27.6 A |
| Input power (MAX) | | | 5.5 kVA | 11 kVA | 16.5 kVA |
| Power factor (TYP) | | | 0.99 | | |
| Leakage current | | | 5 mA | | |
| Efficiency sink/source (up to) | | | 93 % | | |
| **General Specifications** | | | | | |
| Environmental conditions | Operating temperature | | 0 °C to 40 °C | | |
| | Operating humidity | | 20 % to 90 % RH | | |
| | Storage temperature | | -10 °C to 70 °C | | |
| | Storage humidity | | 20 % to 90 % RH | | |
| | Altitude | | 1000 m | | |
| Withstand voltage | AC input to case (PE) | | DC 2300 V | | |
| Insulation resistance | Between output and GND | | DC 500 V | | |
| Mechanical construction | Dimensions (W x H x D) mm | | 482 mm x 133.3 mm x 790 mm | | |
| | Weight | | 24 kg | 32 kg | 40 kg |
| Parallel operation | | | √ | √ | √ |

*1. When the load changes from 50 % to 100 %, or from 100 % to 50 %, the voltage returns to within 0.75 % of the rating.
*2. Measurement frequency bandwidth is 20 Hz to 20 MHz.
*3. Measurement frequency bandwidth is 20 Hz to 2 MHz.
*4. First set the 0 V output, from 10 % to 90 % of the rated output voltage, with pure resistance.
*5. Rated voltage output, then set to 0 V, from 90 % to 10 % of rated output voltage, with pure resistance.
*6. The ripple is measured at 20 % to 100 % output voltage and full output current. Source mode is 0.1 % FS,Sink and Load mode is 0.2 % FS.
*7. When the input voltage is within 10 % to 100 % of the RBS voltage range and the load current is within 10 % to 100 % of the RBS current range.
*8. Communication interface: one of two, factory-installed.

## SPECIFICATIONS

| Model | | | RBS05K-750 | RBS10K-750 | RBS15K-750 |
|---|---|---|---|---|---|
| **Output Rating** | | | | | |
| Rated power | | | ± 5000 W | ± 10000 W | ± 15000 W |
| Rated voltage (source) | | | 0 V to 750 V | | |
| Operating voltage (sink) | | | 10 V to 750 V | | |
| Rated current | | | ± 25 A | ± 50 A | ± 75 A |
| **Output Voltage** | | | | | |
| Maximum settable voltage | | | 750 V | | |
| Setting accuracy | | | 0.05 %+0.05 % FS | | |
| Setting resolution | | | 0.1 V | | |
| Load regulation CV | | | 0.03 % FS | | |
| Line regulation CV | | | 0.015 % FS | | |
| Temperature coefficient CV | | | 100 ppm | | |
| Remote sensing (compensation voltage) | | | 37.5 V | | |
| Source only | Transient response(*1) | | 2 ms | | |
| | Ripple noise | p-p(*2) | 900 mV | | |
| | | rms(*3) | 100 mV | | |
| | Rise time(*4) | Full load | 30 ms | | |
| | | No load | 15 ms | | |
| | Fall time(*5) | Full load | 15 ms | | |
| | | No load | 30 ms | | |
| **Output Current** | | | | | |
| Settable maximum source current | | | 25 A | 50 A | 75 A |
| Settable maximum sink current | | | -25 A | -50 A | -75 A |
| Setting accuracy | | | 0.15 %+0.15 % FS | | |
| Setting resolution | | | 0.01 A | | |
| Load regulation CC | | | 0.1 % FS | | |
| Line regulation CC | | | 0.05 % FS | | |
| Ripple and noise(*6) | | rms(*3) | 0.1 % FS | | |
| Temperature coefficient CC | | | 200 ppm | | |
| **Output Power** | | | | | |
| Settable maximum source power | | | 5000 W | 10000 W | 15000 W |
| Settable maximum sink power | | | -5000 W | -10000 W | -15000 W |
| Setting accuracy | | | 0.5 %+0.5 % FS | | |
| Setting resolution | | | 1 W | | |
| **DC Output Resistor** | | | | | |
| Resistance range | | | 0 Ω to 750 Ω | | |
| Setting accuracy(*7) | | | ≤ 5 % Rmax(0 % to 10 % Rmax) ; ≤ 10 % Rmax(10 % to Rmax) | | |
| Setting resolution | | | 0.01 Ω | | |
| **Protective Functions** | | | | | |
| OVP | | Range | 0 % FS to 110 % FS | | |
| | | Accuracy | 0.1 %FS | | |
| OCP | | Range | 0 % FS to 110 % FS | | |
| | | Accuracy | 0.2 % FS | | |
| OTP | | | √ | √ | √ |
| Vsense reverse protection | | | √ | √ | √ |
| Input voltage protection (OVP, UVP) | | | √ | √ | √ |
| **Display Accuracy** | | | | | |
| Voltage | | Accuracy | 0.05 %+0.05 % FS | | |
| | | Resolution | 0.1 V | | |
| Current | | Accuracy | 0.15 %+0.15 % FS | | |
| | | Resolution | 0.01 A | | |
| Power | | Accuracy | 0.5 %+0.5 % FS | | |
| | | Resolution | 0.001 kW | | |
| **Interfaces Digital** | | | | | |
| All-in-One(USB,RS-232/RS-485,CAN,LAN)(*8) | | | All-in-On / GPIB | | |
| GPIB(*8) | | | All-in-On / GPIB | | |
| **400 V Three-phase Three-wire Input** | | | | | |
| Nominal input rating | | | 380 Vac to 460 Vac | | |
| Input voltage range | | | 342 Vac to 510 Vac | | |
| Input frequency range | | | 47 Hz to 63 Hz | | |
| Output Power | | | 5000 W | 10000W | 15000W |
| Input current (MAX) | | at 342 Vac | 9.2 A | 18.4A | 27.6A |
| Input power (MAX) | | | 5.5 kVA | 11 kVA | 16.5 kVA |
| Power factor (TYP) | | | 0.99 | | |
| Leakage current | | | 5 mA | | |
| Efficiency sink/source (up to) | | | 93 % | | |
| **General Specifications** | | | | | |
| Environmental conditions | Operating temperature | | 0 °C to 40 °C | | |
| | Operating humidity | | 20 % to 90 % RH | | |
| | Storage temperature | | -10 °C to 70 °C | | |
| | Storage humidity | | 20 % to 90 % RH | | |
| | Altitude | | 1000 m | | |
| Withstand voltage | AC input to case (PE) | | DC 2300 V | | |
| Insulation resistance | Between output and GND | | DC 500 V | | |
| Mechanical construction | Dimensions (W x H x D) mm | | 482 mm x 133.3 mm x 790 mm | | |
| | Weight | | 24 kg | 32 kg | 40 kg |
| Parallel operation | | | √ | √ | √ |

*1. When the load changes from 50 % to 100 %, or from 100 % to 50 %, the voltage returns to within 0.75 % of the rating.
*2. Measurement frequency bandwidth is 20 Hz to 20 MHz.
*3. Measurement frequency bandwidth is 20 Hz to 2 MHz.
*4. First set the 0 V output,from 10 % to 90 % of the rated output voltage,with pure resistance.
*5. Rated voltage output, then set to 0 V,from 90 % to 10 % of rated output voltage,with pure resistance.
*6. The ripple is measured at 20 % to 100 % output voltage and full output current.Source mode is 0.1 % FS,Sink and Load mode is 0.2 % FS.
*7. When the input voltage is within 10 % to 100 % of the RBS voltage range and the load current is within 10 % to 100 % of the RBS current range.
*8. Communication interface: one of two, factory-installed.

## SPECIFICATIONS

| Model | | | RBS10K-1000 | RBS15K-1500 | RBS15K-2250 |
|---|---|---|---|---|---|
| **Output Rating** | | | | | |
| Rated power | | | ± 10000 W | ± 15000 W | ± 15000 W |
| Rated voltage (source) | | | 0 V to 1000 V | 0 V to 1500 V | 0 V to 2250 V |
| Operating voltage (sink) | | | 10 V to 1000 V | 10 V to 1500 V | 10 V to 2250 V |
| Rated current | | | ± 40 A | ± 40 A | ± 25 A |
| **Output Voltage** | | | | | |
| Maximum settable voltage | | | 1000 V | 1500 V | 2250 V |
| Setting accuracy | | | 0.05 %+0.05 % FS | | |
| Setting resolution | | | 0.1 V | | |
| Load regulation CV | | | 0.03 % FS | | |
| Line regulation CV | | | 0.015 % FS | | |
| Temperature coefficient CV | | | 100 ppm | | |
| Remote sensing (compensation voltage) | | | 50 V | 75 V | 112.5 V |
| Source only | Transient response(*1) | | 2 ms | | |
| | Ripple noise | p-p(*2) | 1700 mV | 2000 mV | 6000 mV |
| | | rms(*3) | 295 mV | 300 mV | 400 mV |
| | Rise time(*4) | Full load | 30 ms | | |
| | | No load | 15 ms | | |
| | Fall time(*5) | Full load | 15 ms | | |
| | | No load | 30 ms | | |
| **Output Current** | | | | | |
| Settable maximum source current | | | 40 A | 40 A | 25 A |
| Settable maximum sink current | | | -40 A | -40 A | -25 A |
| Setting accuracy | | | 0.15 %+0.15 % FS | 0.15 %+0.15 % FS | 0.2 %+0.2 % FS |
| Setting resolution | | | 0.01 A | | |
| Load regulation CC | | | 0.1 % FS | | |
| Line regulation CC | | | 0.05 % FS | | |
| Ripple and noise(*6) | | rms(*3) | 0.1 % FS | | |
| Temperature coefficient CC | | | 200 ppm | | |
| **Output Power** | | | | | |
| Settable maximum source power | | | 10000 W | 15000 W | 15000 W |
| Settable maximum sink power | | | -10000 W | -15000 W | -15000 W |
| Setting accuracy | | | 0.5 %+0.5 % FS | 0.5 %+0.5 % FS | 1 %+1 % FS |
| Setting resolution | | | 1 W | | |
| **DC Output Resistor** | | | | | |
| Resistance range | | | 0 Ω to 1000 Ω | 0 Ω to 1500 Ω | 0 Ω to 2250 Ω |
| Setting accuracy(*7) | | | ≤ 5 % Rmax(0 % to 10 % Rmax) ; ≤ 10 % Rmax(10 % to Rmax) | | |
| Setting resolution | | | 0.01 Ω | | |
| **Protective Functions** | | | | | |
| OVP | | Range | 0 % FS to 110 % FS | | |
| | | Accuracy | 0.1 %FS | | |
| OCP | | Range | 0 % FS to 110 % FS | | |
| | | Accuracy | 0.2 % FS | | |
| OTP | | | √ | √ | √ |
| Vsense reverse protection | | | √ | √ | √ |
| Input voltage protection (OVP, UVP) | | | √ | √ | √ |
| **Display Accuracy** | | | | | |
| Voltage | | Accuracy | 0.05 %+0.05 % FS | | |
| | | Resolution | 0.1 V | | |
| Current | | Accuracy | 0.15 %+0.15 % FS | 0.15 %+0.15 % FS | 0.2 %+0.2 % FS |
| | | Resolution | 0.01 A | | |
| Power | | Accuracy | 0.5 %+0.5 % FS | 0.5 %+0.5 % FS | 1 %+1 % FS |
| | | Resolution | 0.001 kW | | |
| **Interfaces Digital** | | | | | |
| All-in-One(USB,RS-232/RS-485,CAN,LAN)(*8) | | | All-in-On / GPIB | | |
| GPIB(*8) | | | All-in-On / GPIB | | |
| **400 V Three-phase Three-wire Input** | | | | | |
| Nominal input rating | | | 380 Vac to 460 Vac | | |
| Input voltage range | | | 342 Vac to 510 Vac | | |
| Input frequency range | | | 47 Hz to 63 Hz | | |
| Output Power | | | 10000 W | 15000 W | 15000 W |
| Input current (MAX) | | at 342 Vac | 18.4 A | 27.6 A | 27.6 A |
| Input power (MAX) | | | 11 kVA | 16.5 kVA | 16.5 kVA |
| Power factor (TYP) | | | 0.99 | | |
| Leakage current | | | 5 mA | | |
| Efficiency sink/source (up to) | | | 93 % | | |
| **General Specifications** | | | | | |
| Environmental conditions | Operating temperature | | 0 °C to 40 °C | | |
| | Operating humidity | | 20 % to 90 % RH | | |
| | Storage temperature | | -10 °C to 70 °C | | |
| | Storage humidity | | 20 % to 90 % RH | | |
| | Altitude | | 1000 m | | |
| Withstand voltage | AC input to case (PE) | | DC 2300 V | | |
| Insulation resistance | Between output and GND | | DC 500 V | | |
| Mechanical construction | Dimensions (W x H x D) mm | | 482 mm x 133.3 mm x 790 mm | | |
| | Weight | | 32 kg | 40 kg | 40 kg |
| Parallel operation | | | √ | √ | √ |

*1. When the load changes from 50 % to 100 %, or from 100 % to 50 %, the voltage returns to within 0.75 % of the rating.
*2. Measurement frequency bandwidth is 20 Hz to 20 MHz.
*3. Measurement frequency bandwidth is 20 Hz to 2 MHz.
*4. First set the 0 V output, from 10 % to 90 % of the rated output voltage, with pure resistance.
*5. Rated voltage output, then set to 0 V, from 90 % to 10 % of rated output voltage, with pure resistance.
*6. The ripple is measured at 20 % to 100 % output voltage and full output current. Source mode is 0.1 % FS, Sink and Load mode is 0.2 % FS.
*7. When the input voltage is within 10 % to 100 % of the RBS voltage range and the load current is within 10 % to 100 % of the RBS current range.
*8. Communication interface: one of two, factory-installed.

## ORDERING INFORMATION

| | | |
|---|---|---|
| **RBS05K-100** | 5 kW/100 V | Regenerative Bidirectional DC Power Supply |
| **RBS10K-100** | 10 kW/100 V | Regenerative Bidirectional DC Power Supply |
| **RBS15K-100** | 15 kW/100 V | Regenerative Bidirectional DC Power Supply |
| **RBS05K-500** | 5 kW/500 V | Regenerative Bidirectional DC Power Supply |
| **RBS10K-500** | 10 kW/500 V | Regenerative Bidirectional DC Power Supply |
| **RBS15K-500** | 15 kW/500 V | Regenerative Bidirectional DC Power Supply |
| **RBS05K-750** | 5 kW/ 750 V | Regenerative Bidirectional DC Power Supply |
| **RBS10K-750** | 10 kW/750 V | Regenerative Bidirectional DC Power Supply |
| **RBS15K-750** | 15 kW/750 V | Regenerative Bidirectional DC Power Supply |
| **RBS10K-1000** | 10 kW/1000 V | Regenerative Bidirectional DC Power Supply |
| **RBS15K-1500** | 15 kW/1500 V | Regenerative Bidirectional DC Power Supply |
| **RBS15K-2250** | 15 kW/2250 V | Regenerative Bidirectional DC Power Supply |

## ACCESSORIES

AC input connector, output terminal cover, power cord, factory test report, M4x10 Screw x 4 Pcs, 3U handle x 2, packing list

## OPTION

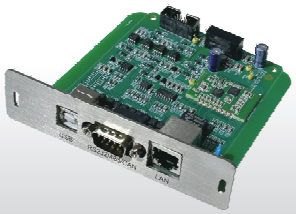
| | |
|---|---|
| **RBS-IF01** | USB, RS-232/RS-485, CAN, LAN Interface |
| **RBS-IF02** | GPIB Interface |

## OPTIONAL ACCESSORIES

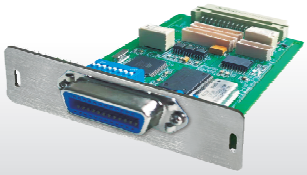
| | |
|---|---|
| **GTL-133** | Load cable, 1.5 m, 100 A |
| **GTL-218** | Load cable, 1.5 m, 200 A |
| **GTL-219** | Load cable, 3 m, 200 A |
| **GTL-220** | Load cable, 1.5 m, 300 A |
| **GTL-221** | Load cable, 3 m, 300 A |
| **GTL-222** | Load cable, 1.5 m, 400 A |
| **GTL-223** | Load cable, 3 m, 400 A |
| **GPW-021** | Input power cord, 10 AWG/4C, 3 m, UL/CSA |

Specifications subject to change without notice. RBS-Series_GD1BH

**RBS-IF01** USB, RS-232/RS-485, CAN, LAN Interface



**RBS-IF02** GPIB Interface

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