

➤ BriPower RLC Loads

The BriPower RLC AC Load is a precision detection apparatus designed specifically for new energy equipment, such as gridconnected Photovoltaic (PV) inverters, Energy Storage Power Conversion Systems (PCS), and wind power converters. By precisely adjusting the parameters of Resistive (R), Inductive (L), and Capacitive (C) components, the device accurately simulates the resonant state of a local grid. It is primarily used to verify that the Equipment Under Test (EUT) can detect islanding effects and disconnect from the grid within a specified time in the event of a grid power failure. It is an essential device for gridconnected certification, type testing, and factory acceptance testing.



➤ Application Scenarios

Precise Resonance Simulation: Capable of automatically or manually matching R, L, and C parameters based on the output power of the inverter. It adjusts the load Quality Factor (Q-value) to meet standard requirements (e.g., $Q=1$), simulating realistic load resonance conditions.

Anti-Islanding Protection Verification: Complies with grid-connection standards such as GB/T 19964, IEEE 1547, and VDE-AR-N 4105. It validates the tripping time of the inverter during grid power loss, ensuring the safety of grid maintenance personnel.

Automated Testing Workflow: When paired with host computer software, it enables automatic execution of loading, resonance point adjustment, parameter logging, and report generation, significantly improving detection efficiency.

➤ Key Functions and Features

- **Independent RLC Precision Control**

Three-Phase Independent Adjustment: The resistive, inductive, and capacitive loads for Phases A, B, and C can be independently engaged and adjusted. This supports the simulation of anti-islanding effects under both three-phase balanced and unbalanced load conditions.

High-Resolution Stepping: The minimum stepping increment can reach 0.01 kW / 0.01 kvar, allowing for extremely fine approximation of the resonance point, strictly satisfying the stringent load matching requirements of testing standards.

Versatile Mode Combination: Supports loading in purely resistive, purely inductive, purely capacitive, or mixed modes. The power factor can be arbitrarily set within the range of -1 to +1.

- **Intuitive Resonance Point Display**

Direct Panel Readout: The control panel directly displays the numerical values of Inductive Current and Capacitive Current for all three phases. Users do not need additional calculations; they can simply observe whether the inductive current equals the capacitive current (i.e., the resonance point) to quickly complete loading settings.

Resonance Status Indication: The device features a resonance status indicator to help on-site testing personnel rapidly determine if the load is currently in the optimal resonant state.

- **Intelligent Protection and Thermal Management**

Multiple Protection Mechanisms: Equipped with comprehensive protection features including over-temperature, over-voltage/under-voltage, fan failure, and short-circuit protection, ensuring the safety of both personnel and equipment during testing.

Forced Air Cooling Design: Adopts an optimized air duct structure (e.g., top-air exhaust designed for high-humidity and salt-spray environments), making it suitable for the harsh outdoor environments typical of PV power stations.

Long-Life Components: Utilizes proprietary dry-type alloy resistors and low-loss inductors. These components offer high power density, excellent thermal stability, no visible red-hot state (safe operation), and an extended service life.

- **Comprehensive Data Measurement and Analysis**

High-Precision Metering: Measurement accuracy for voltage, current, active power, and reactive power is as high as $\pm 0.5\%$ (up to $\pm 0.2\%$ for specific models).

Harmonic Analysis: Features a built-in high-precision sampling module supporting analysis of harmonic content up to the 50th order, evaluating the output power quality of the inverter.

Transient Capture: Includes waveform recording capabilities to capture voltage/current waveforms during the moment of grid connection, allowing for analysis of the inverter's grid-connected inrush current.

➤ Typical Technical Specifications

Example Model		AC 400V-100KW-RLC
Rated Voltage		3P+N, AC 400VLL or Single phase, AC 230VLN
Rated Frequency		50Hz
Wiring Method		3P4W (Y-connection): Four terminals: A, B, C, N; 1P2W (Single-phase): Two terminals: "A, N" or "B, N" or "C, N"
Rated Power		Resistive load(R): 102.33kW; Inductive load(L): 102.33kvar; Capacitive load(C): 102.33kvar
Ranges (@AC400VLL/50Hz)		R: Independent three-phase control: Total power of three phases: 102.33kW (34.11kW/ph); Ranges: 0.001-0.01kW, 0.01-0.1kW, 0.1-1kW, 1, 1, 2, 2, 2, 5, 10, 10kW; Resolution: 0.001kW L: Independent three-phase control: Total power of three phases: 102.33kvar (34.11kvar/ph); Ranges: 0.001-0.01kvar, 0.01-0.1kvar, 0.1-1kvar, 1, 1, 2, 2, 2, 5, 10, 10kvar; Resolution: 0.001kvar C: Independent three-phase control: Total power of three phases: 102.33kvar (34.11kvar/ph); Ranges: 0.001-0.01kvar, 0.01-0.1kvar, 0.1-1kvar, 1, 1, 2, 2, 2, 5, 10, 10kvar; Resolution: 0.001kvar Note: When the input voltage < rated voltage, the rated powers change according to Ohm's law.
Power Factor		Adjustment range: $\pm 0.3-1$. Full load: $\pm 0.7-1$
Load Accuracy		$\pm 5\%$ (each range). $\pm 3\%$ (whole system)
Voltage measurement range		0-300V (L-N)
Current measurement range		0-400A
Frequency measurement range		45-65Hz
Voltage accuracy		voltage measurement accuracy: $\pm 0.2\%$. resolution: 0.1V
Current accuracy		current measurement accuracy: $\pm 0.2\%$. resolution: 0.1A
Power accuracy		power measurement accuracy: $\pm 0.5\%$. resolution: 0.01kW
Frequency resolution		0.1Hz
Control Power Supply		Auxiliary power supply: Single phase, AC220V/50Hz, about 2KW
Wiring method		RLC Load power supply input - Copper bars; Control power supply input - terminal blocks.
Communication Interface		RS485, RS232
Insulation Class		F
Operation Mode		Continuous operation
Workplace		Indoor
Cooling		Forced air cooling. (Side air inlet and Top air outlet)
Cabinet structure		Load-bearing rings at the top of the cabinet, casters and forklift holes at the bottom
Transportation		Forklift or hoisting.
Color		Gray (RAL7035) or user specified color
Dimension (W*D*H mm)		1500*1700*1950 (W*D*H,mm) (excluding caster height)
Weight		About 1200kg
Working environment parameters		
Operation Temperature		-20°C ~ +50°C
Relative Humidity		$\leq 95\%$ (None Condensing)
Altitude		$\leq 2500\text{m}$
Atmospheric Pressure		86 ~ 106 kPa

Notes:

1. The model and parameters listed in the table are for reference as a single example within the product series and do not represent all available specifications.
2. This product series is highly customizable. Key parameters including power rating (kVA), voltage rating (VAC), frequency range, and specific functions can be tailored to requirements.
3. The adjustable ranges for Resistance (R), Inductance (L), and Capacitance (C) will be optimally matched based on the final customized power and voltage ratings.
4. Extended functionalities (e.g., special communication protocols, higher measurement accuracy) and installation requirements for high-power models can be confirmed during the solution design phase.