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5000W High-Frequency Inverter Stabilizer Specification

Product Model：ZR220B-5K0W

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1.Scope of application

This specification applies to ZR220B_5K0W 5000W high-frequency AC-AC inverter stabilizer manufactured by Fujian Geekey Technology Co., Ltd. It fully defines the electrical indicators, voltage stabilization performance, functions, operation specifications, safety requirements and measured performance boundaries of the product.

This equipment is a high-frequency isolated AC-AC inverter integrated stabilizer, self-adaptive wide grid voltage, pure sine stabilized output; suitable for industrial equipment, household high-power loads, photovoltaic matching, outdoor high-power equipment, UPS uninterruptible voltage regulation scenarios. Compatible with all types of resistive, inductive and electrical loads.

2.Product model

ZR220B_5K0W is a wide-range AC-AC high-frequency isolated inverter stabilizer that outputs stable 220VAC pure sine AC under fluctuating 90~310VAC grid. The "product" refers exclusively to this 5000W stabilizer:

ⅰ: 1 letter, "Z" is the abbreviation of the company name, representing Zhenge Technology Co., Ltd.

ⅱ: 1 letter, "R" Wide-range adaptive AC-AC stabilizer series code

ⅲ: 3 digits, "220" nominal rated output voltage 220VAC, compatible with domestic single-phase civil & industrial power grid

ⅳ: 1 letter,“B”indicates the output voltage RMS value is 220VAC, where“A”is 120VAC and “B”is 220VAC

ⅴ: 4 characters, "5K0W" rated input power 5000W

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3.Specifications

Category	Parameter	Value
General Parameters	Product Name	5000W High-Frequency Inverter Stabilizer
	Rated Output Power	4500W
	Rated Input Voltage	220VAC
	Rated Output Voltage	220VAC
	Phases	Single Phase
	Efficiency	≥93%
	Power Factor	≥0.99
	No-Load Consumption	≤40W
Input Characteristics	Input Voltage Range	90~310VAC (Wide Voltage Adaptive)
	Input Frequency Range	43~57Hz (Rated 50Hz)
	Max Input Current	27A
	Overload Derating	Linear derating 90~310VAC, input current ≤27A, output current ≤23A
	Start-up Mode	Soft Start

*数据来源于：臻格实验室 *Data source: Geekey Lab

Category	Parameter	Value
Output Characteristics	Output Voltage Accuracy	220VAC±5VAC
	Output Frequency	50Hz
	Output Waveform	Pure Sine Wave
	THD	≤3% (pure resistive load)
	Max Output Current	23A
	Regulation Response	<5ms (Real-time)
Protection Functions	Input Under-Voltage	< 85VAC: Protection Activated
	Input Over-Voltage	> 310VAC: Protection Activated
	Output Overload	180VAC output / Triggers within 2s
	Over-Current	> 27A: Protection Activated
	Short Circuit	<120μs Fast Shutdown
	Over-Temperature	>85℃ Auto Shutdown
Physical & Environmental	Operating Temp	-10℃ ~ +50℃
	Storage Temp	-25℃ ~ +55℃
	Humidity	20% ~ 90% （ Non-condensing）
	Cooling	Forced Air Cooling
	Noise	≤55dB (1m distance, full load)
	IP Rating	IP20

*数据来源于：臻格实验室 *Data source: Geekey Lab

Category	Parameter	Value
Communication & EMC	Communication	RS485 (Modbus Protocol)
	EMC Standard	IEC 61000 Class B (Emission + Immunity)
	HF Interference Immunity	150kHz ~ 80MHz (IEC 61000)

4.Functional characteristics

4.1Isolation Voltage Stabilization Integrated Topology

Adopt high-frequency power conversion architecture . It realizes wide grid adaptive voltage stabilization, locking standard 220VAC output under grid fluctuation of 90~310VAC, suitable for remote low-voltage power grids and unstable industrial high-voltage grids.

4.2Low-Distortion Pure Sine Wave Output

Optimized sine wave modulation algorithm achieves THD < 3% with pure resistive loads. It prevents harmonic damage to industrial control and precision medical devices, and supports compatibility with all civilian and industrial loads.

4.3Three-Stage Soft-Start Mechanism

3~5s soft-start is activated during power-on, sudden heavy load switching and voltage fluctuation recovery, which greatly suppresses surge peak current and protects front circuit breakers, rear loads and internal power devices of the equipment.

4.4Intelligent Linear Derating Control for Low Input Voltage

Built-in current closed-loop limiting algorithm. Constant current with voltage reduction is implemented within the 90~310VAC operating range. Overload protection triggers below 180VAC to prevent input overcurrent from damaging transformers, inductors and power devices, extending the service life of the complete unit.

4.5Full-Range Graded Hardware Protection

Multiple protections including ultra-fast short-circuit shutdown, overvoltage/undervoltage, overfrequency/underfrequency, overload and overtemperature. It adopts graded fault response: minor faults recover automatically, while severe faults activate latch-up protection.

4.6Intelligent Temperature-Controlled Cooling System

High-power heatsink paired with a temperature-controlled fan. The fan automatically starts and runs at full speed when the load reaches 1000W, or the temperature reaches/exceeds the 50° C threshold. It quickly removes heat, keeps steady-state temperature rise within a safe range, and effectively reduces the risk of component aging during long-term operation.

4.7 RS485 Remote Monitoring

Standard Modbus communication protocol. The host computer can read input voltage, output voltage, current, power, internal heatsink temperature and fault codes in real time.

5. Instructions for use

5.1Power-On & Voltage Stabilizing Operation：

1. Verify the wire gauge of the AC input cable matches the unit’s maximum 27A input current; ensure all wiring connections are tight and free of looseness.

2. Connect AC loads to the unit’ s AC OUT output terminals. Short circuits and damaged cable insulation are strictly prohibited.

3. Close the unit’ s input circuit breaker. The equipment will perform a 3 – 5 second soft start, with the display showing a stabilized 220VAC output voltage in real time.

4.Monitor real-time voltage, power and temperature readings on the unit’ s display during operation. For continuous full-load operation, shut down the unit for 10 minutes of cooling every 2 hours.

5.2Operation Specifications for Loaded Startup：

The device supports direct power-on with load across the full input voltage range. At the minimum input of 90VAC, the recommended load ≤2000W; under standard 220VAC input, it can start directly with loads up to 5000W.

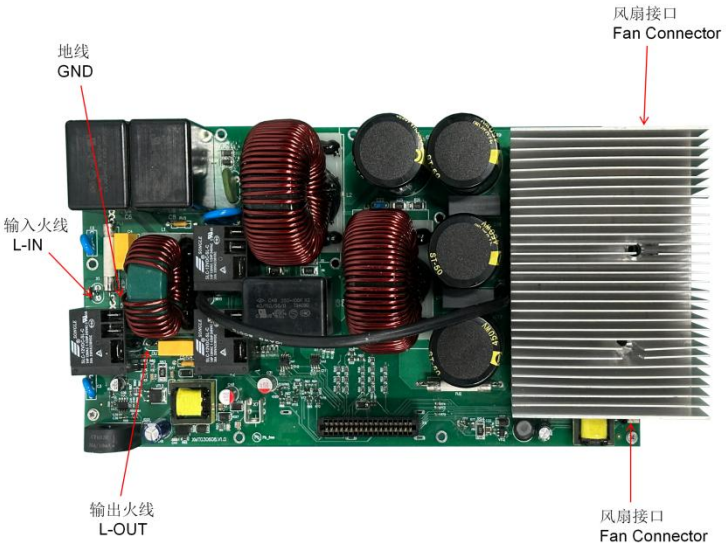
5.3Interlock Prohibitions for Modes & Switches：

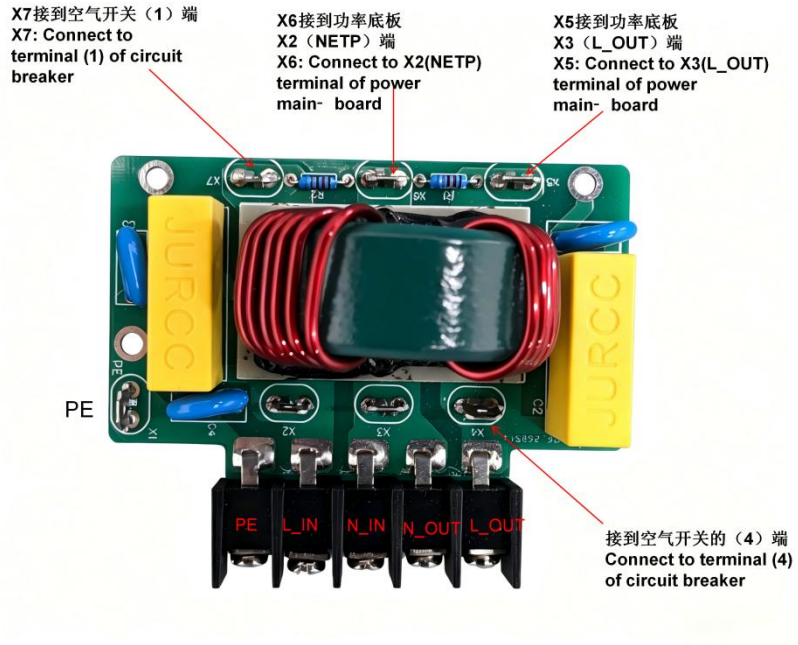
It is strictly forbidden to close the AC input circuit breaker and bypass circuit breaker of the unit simultaneously. Simultaneous conduction of both circuits will cause short-circuit of the internal busbar and burn out power devices instantly. Reduce the output power of the unit first before switching loads; cutting off the input power directly under full power is prohibited.

5.4 RS485 Communication Control Instructions

Connect the communication terminals to the upper computer with correct A/B wiring sequence, and firmly ground the shielding layer.

5.5 Unit Interface Definition


风扇接口
Fan Connector
地线
GND
输入火线
L-IN
输出火线
L-OUT
风扇接口
Fan Connector


X7接到空气开关（1）端
X7: Connect to terminal (1) of circuit breaker
X6接到功率底板
X2（NETP）端
X6: Connect to X2(NETP) terminal of power main- board
X5接到功率底板
X3（L_OUT）端
X5: Connect to X3(L_OUT) terminal of power main- board
PE
PE
L_IN
N_IN
N_OUT
L_OUT
接到空气开关的（4）端
Connect to terminal (4) of circuit breaker



6.Safety Guidelines

6.1 Basic Precautions

1.Disconnect the AC input circuit breaker before disassembling, maintaining or replacing components, and wait for 5 minutes to fully discharge the internal high-voltage capacitors.

2.The unit shall be horizontally installed in a dry, ventilated and dust-free area with a heat dissipation clearance of at least 15 cm around all sides.

3.Do not touch high-temperature and high-voltage components such as PCB power boards, inductors and capacitors while the equipment is running.

4.Tighten all AC wiring terminals once a year to avoid fire hazards caused by loose connections and overheating.

6.2Prohibited Hazardous Operations

1.Disassembly of the main power board is forbidden for personnel without electrical operation qualifications.

2.AC input/output cables with insufficient wire gauge or damaged insulation shall not be used.

3.Do not cover the cooling air outlets of the unit with cloth, cartons or other items.

4.Long-term operation in flammable and explosive workshops is prohibited.

5.Closing the input circuit breaker and bypass circuit breaker at the same time is strictly forbidden.

6.3Safety warning

1.Electric Shock Hazard Warning: Large-capacity internal capacitors retain high voltage after power cut. Leave the unit powered off for at least 5 minutes before maintenance.

2.Power Supply Matching Warning: The unit only supports 90~310VAC input. Overvoltage will cause permanent damage to internal components.

3.Fire & Explosion Hazard: Cut off power and stop operation immediately if burnt odor is detected, then contact after-sales service.

Appendix

Product Display

