

# BriPower ZGX Series

## AC/DC Power Source & Load

### Features

- Compact modular design, 22.5KVA in 4U
- Bi-directional design
- Output: AC, DC, AC+DC
- Single unit: maximum 22.5KW, 450V L-N, 35A/ph, DC-1KHz output
- Power expansion by master/slave paralleling(using single mode fiber, SMF)
- Single phase, 3-phase, split phase, and multi-channel output
- Various modes: Regenerative AC/DC source, regenerative AC/DC load, BiPolar DC source
- Regenerative RLC load in full frequency range
- True current source in CC mode
- Up to 100th harmonics waveform generation, inter-harmonic generation
- Soft start: effectively restrain the impulse current when power on
- Trigger out, TTL signal output for voltage or frequency change
- Error locating function
- LAN interface
- MOD-bus /SCPI protocols
- 24 months warranty



### Overview

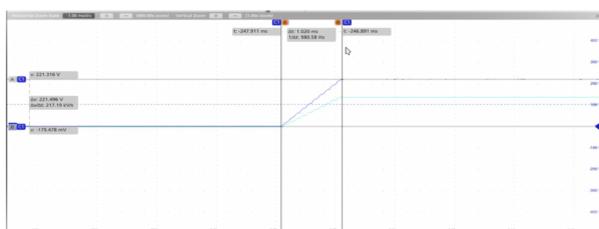
The ZGX series is a compact modular design power supply with SiC PWM technology, providing full functions of grid simulator, regenerative AC/DC load, bipolar DC source, and RLC/RCD load. The 22.5KVA bidirectional power supply is designed in a 4U chassis, and can be upgraded by master/slave paralleling. The maximum output of each unit is AC 450V L-N, 35A/ph, DC~1KHz or DC 636V, 105A.

### Operation Modes ----- Bi-Directional AC/DC Source

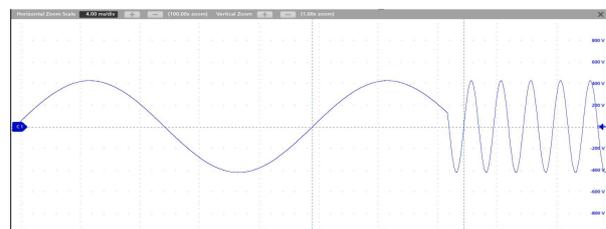
ZGX series is comprehensive, fast dynamic grid simulator for distributed generation system testing, such as the electrical characteristics of energy storage PCS, PV inverter, etc. The simulation functions include voltage and frequency fluctuation, voltage drop, high voltage ride through, low/zero voltage drop, three-phase unbalance, harmonic and inter-harmonic etc. The ZGX series meets the requirements of grid tied DG regulations testing, such as: grid voltage abnormality test, grid frequency abnormality test, high voltage ride through test, low/zero voltage ride through test, anti-islanding test, etc. ZGX series provides GUI software to simulate various real-world power grid operating conditions.

#### • Voltage/frequency sequence programming

The ZGX series provides voltage and frequency sequence programming function. The parameters such as output voltage, frequency, slew rate, ON/ OFF output phase angle, duration time, switching time are programmable, and three phases are independent for settings.



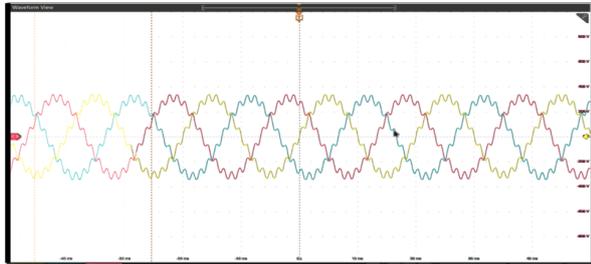
DC voltage and current rise waveform



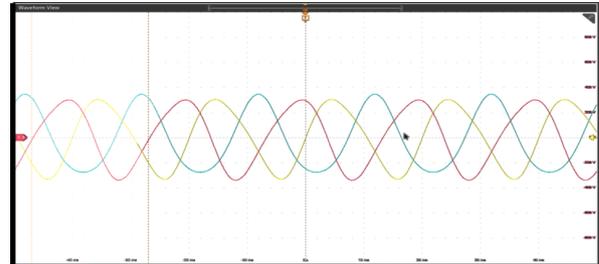
Frequency change waveform

- **Harmonic and inter-harmonic waveforms**

Dual DSP+FPGA technology are use in ZGX series to generate up to 100th harmonic. ZGX series supports inter-harmonics editing. Users can program the phase angle and amplitude of the harmonic through the GUI, allowing generate three-phase harmonic/inter-harmonic waveforms independently.



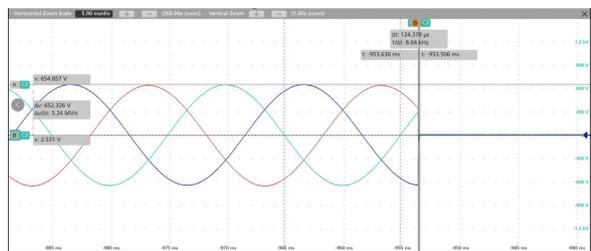
Harmonic waveform



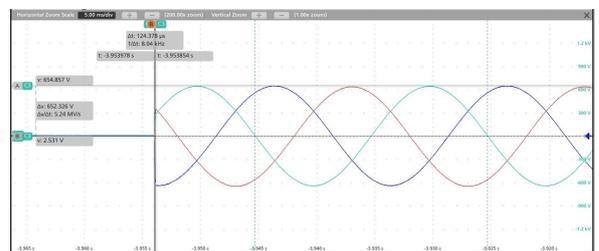
Inter-harmonic waveform

- **Voltage drop simulation (LVRT test)**

ZGX series provides firmware and software support for low/zero voltage ride through tests.



Voltage drop waveform



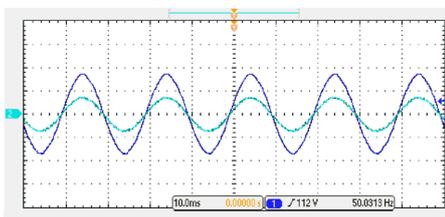
Voltage rise waveform

ZGX series has also DC output mode and works as regenerative DC source/load.

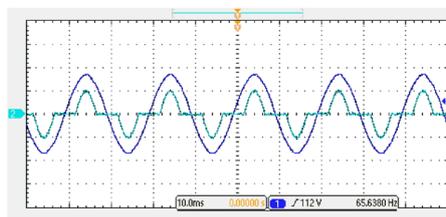
**Note:** above test waveforms were measured under resistive load.

### Operation Modes ----- AC/DC Load

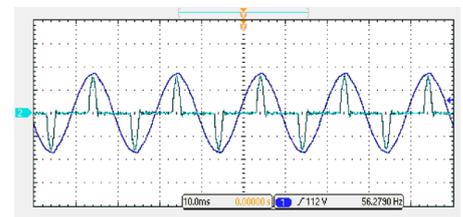
In the regenerative AC load mode, CR mode, Rectifier mode, and CC/CP phase lead/lag mode are available. CR mode is used to simulate three-phase resistive loads, the CR mode and three-phase resistance parameters can be set through the panel and can realize the program of resistance sequence. Rectifier mode can be used to simulate non-linear loads, the CC/CP mode and CF (setting range: 1.414~3) parameters can be set through the panel. CC/CP phase lead/lag mode can simulate sinusoidal current, Constant current CC and constant power CP modes are available to adjust load current or power, phase angle can be set from 90° to -90° simulating the voltage and current conditions under inductive and capacitive loads.



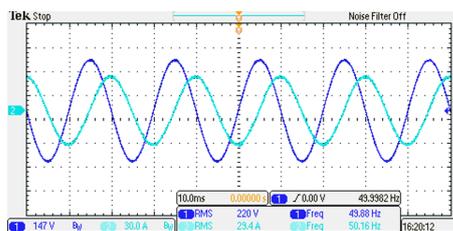
CF=1.414



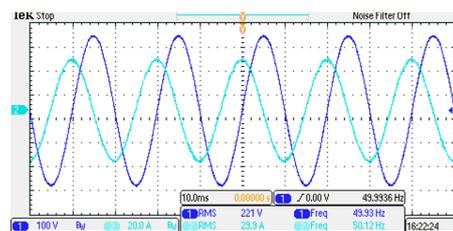
CF=2



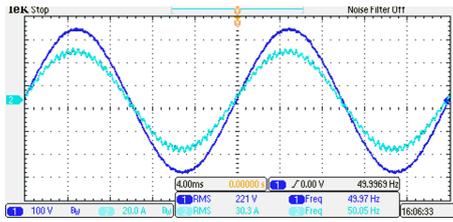
CF=3



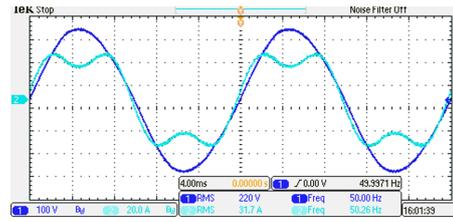
Angle=+90°



Angle=-90°



High harmonics



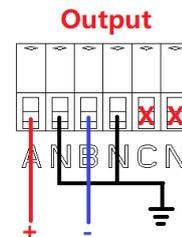
Low harmonics

Regenerative DC electronic load mode is also available with the ZGX series, which provides CV, CC, CP, and CR operation modes.

### Operation Modes ----- Bi-Polar (-BP option)

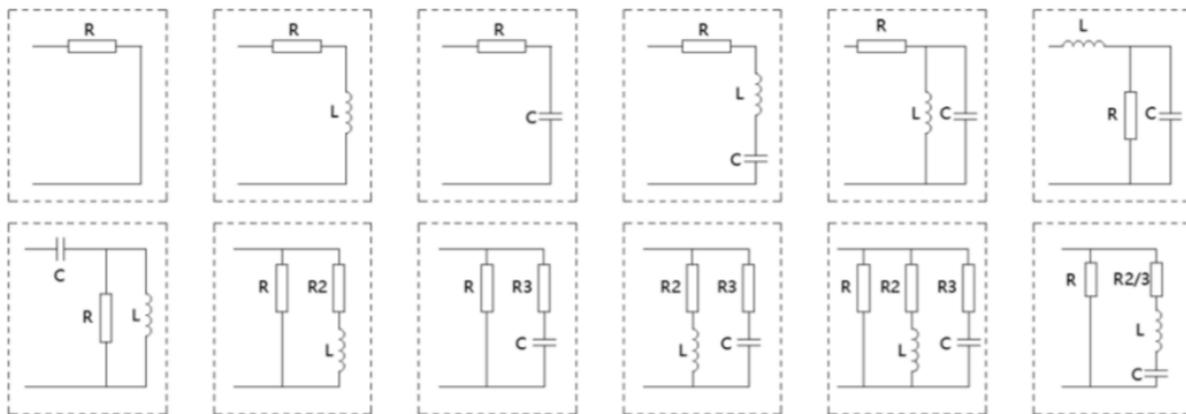
The ZGX series also provides bipolar DC output, and in this mode, phase A is used as POS+ output, phase B is used and NEG- output, the Neutral terminals of phase A and B are shorted and used as PE.

The output power is 15KW in bipolar output mode, and the voltage range is +/-636V, the current range is +/-35A.



### Operation Modes ----- RLC Load

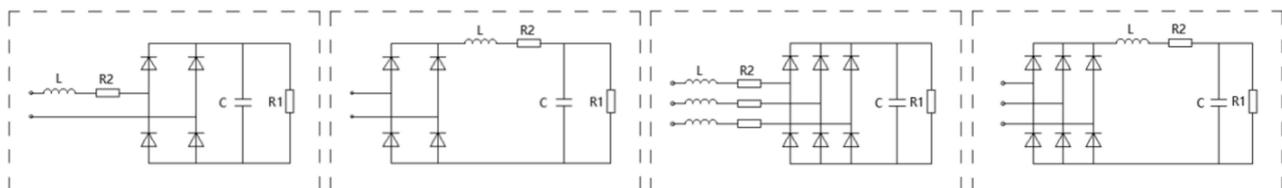
The ZGX series provides RLC load simulation mode, which simulates the impedance of the combinations of R, L and C components. The three phases are independently programmable, and the R, L, C values can be set respectively.



Complex Impedance Combinations of ZGX-RLC

### Operation Modes ----- RCD Load

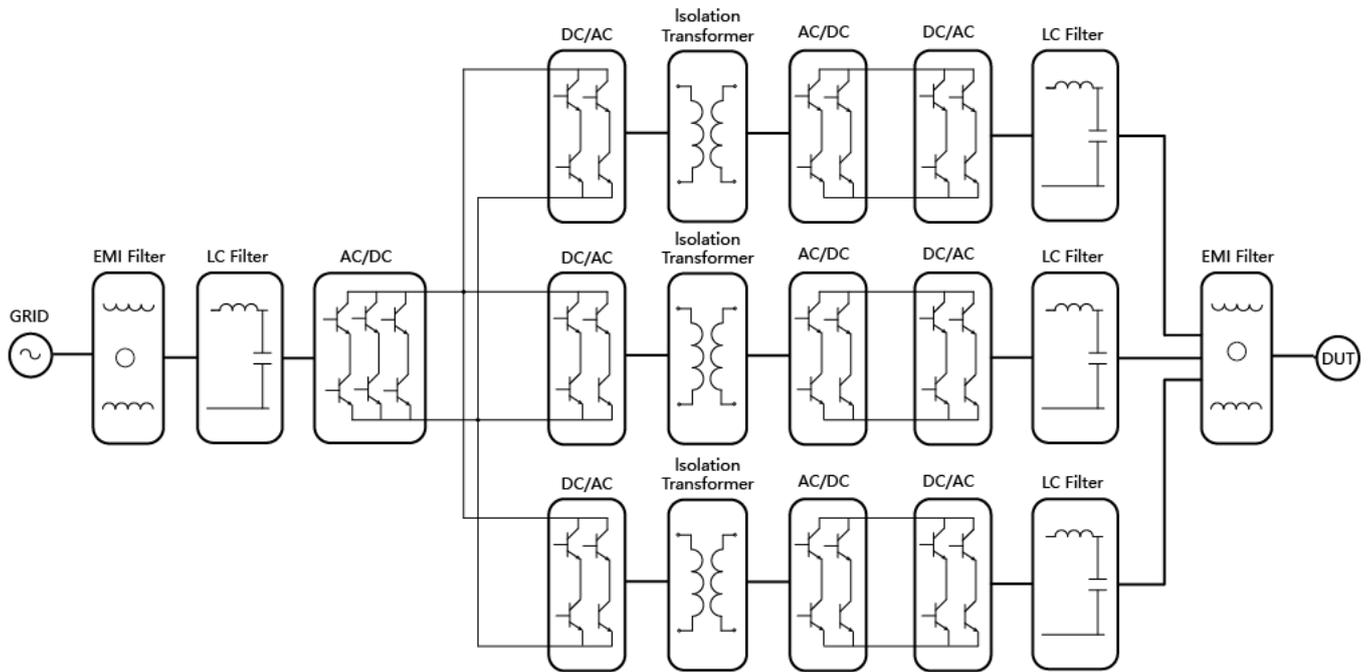
The ZGX series provides RCD non-linear load simulation function for testing UPS power supplies, inverters, etc. The ZGX has four built-in RCD electrical topologies, 3-phase independently programmable, with individually programmable R, L and C parameter values.



### Application ----- Avionics Power Line Simulation

The ZGX series has an output frequency range of DC~1KHz, which meets the requirements of avionics bus simulation, including conditions of normal working, power interruption (conversion), abnormal power supply, emergency power supply, startup, power failure, etc.

## Block Diagram



## General Specification

<b>Model No.</b>	<b>ZGX 22.5</b>
<b>AC input</b>	
Provide pre-charge circuit. Effectively restrain the impulse current when power on	
Voltage <sup>1</sup>	380VLL±10%/3P+PE, 400VLL±10%/3P+PE, 220VLN±10%/L+N+PE
Frequency	47-63Hz
Efficiency	≥85%
Power Factor @ Rated Power	>0.99
THDi	<1%
Input Current	35A/ph
<b>Output</b>	
Output Modes	AC, DC, or AC+DC
Power Level	22.5KW
Load Regulation	0.1%FS
Line Regulation	0.1%
<b>AC Output</b>	
Voltage Range (L-N)	0~450V L-N @ 0.01~70Hz; 0~300V L-N @ 70~1kHz

<sup>1</sup> When the AC input of ZGX 22.5 is single-phase 220V L-N, the total output power of the three-phase is 7.5KW.

Current Range	35A/ph (3-phase) or 105A (single phase)
Frequency Range	0.01 ~ 1000Hz
Phase Angle Range	Phase B/C relative to phase A, 0.0~360.0°
THD	<0.5% @DC~400Hz (measured at 250VL-N, Resistive Load) <1% @400~1000Hz (measured at 250VL-N, Resistive Load)
Harmonic waveform Generation	Up to 100th
Voltage Slew Rate	3V/us
Current Slew Rate	0.5A/us
Small signal bandwidth	10kHz
Power Accuracy	0.2%FS
Voltage Accuracy	0.1%FS
Current Accuracy	0.4%FS(<30Hz); 0.2%FS(30~350Hz); 0.3%FS(350.01~500Hz); 0.3%+(0.7%*kHz)FS(500.01~1000Hz)
Frequency Accuracy	0.01%+0.01Hz
Phase Angle Accuracy	<1° (@50Hz)
Power Resolution	0.001kW
Voltage Resolution	0.1V
Current Resolution	0.01A
Frequency Resolution	0.01Hz (~100Hz), 0.05Hz (>100Hz)
Phase Angle Resolution	<0.1°
<b>DC Output</b>	
Voltage Range	0-636V
Current Range	35A/ch (3-channel) or 105A (single channel)
Voltage Accuracy	0.1%FS
Voltage Resolution	0.1V
Current Accuracy	0.1%FS
Current Resolution	0.01A
Voltage Ripple	0.1%FS
<b>AC+DC Mode</b>	<b>Max Power, Voltage and Current are the same as DC Mode</b>
AC Power Measurement Accuracy	0.2%FS
AC Voltage Measurement Accuracy	0.1%FS
AC Current Measurement Accuracy	0.1%FS(<30Hz); 0.2%FS(30~350Hz); 0.1%+0.3%FS(350.01~500Hz); 0.3%+(0.7%*kHz)FS(500.01~1000Hz)
DC Voltage Measurement Accuracy	0.1%FS
DC Current Measurement Accuracy	0.1%FS
Frequency Measurement Accuracy	0.01%+0.01Hz
<b>RLC/RCD Load Simulation <sup>2</sup></b>	
R	Range: 0.1~1000Ω. Resolution: 0.1Ω. Accuracy: ±0.1%FS
L	Range: 0.01~500mH. Resolution: 0.01mH. Accuracy: ±0.1%FS
C	Range: 0.001~50mF. Resolution: 1uF. Accuracy: ±0.1%FS

<sup>2</sup> The accuracy measured at 50/60Hz.

<b>Others</b>	
Standard Interface	LAN
Protection	OVP, OCP, OPP, OTP
IP Ingress protection	IP21
Cooling	Forced Air Cooling
Temperature	Operating: 0~40°C Storage: -20~85°C
Operating Humidity	20-90%RH (None Condensing)
Dimension (W*D*H, mm)	440*670*178
Weight (kg)	About 50KG
Shipping Dimension (W*D*H, mm)	570*830*350
Shipping Weight (kg)	About 57.5KG

## Options

-S Slave Unit without Controller (same specification as ZGX 22.5)

## AC Input Configuration

Please specify the input voltage:

/380, Input Voltage 380VLL±10%, 3P+PE

/400, Input Voltage 400VLL±10%, 3P+PE

/220, Input Voltage 220VLN±10%, 1P+N+PE

## Model Configuration

**ZGX 22.5-AAA/BBB**

AAA: Option

BBB: Input configuration

## About BriPower

Bridge Technology is a company focusing on business of power supplies and test systems for new energy applications. We are devoted to providing high quality products and solutions for customers.

Bridge Technology has a top-class R&D team in China, works on modularization and standardization power supplies and systems. We have sales, technical support, R&D and manufacture in Shanghai, Nanjing and Chengdu.

Nanjing Bridge New Energy Technology was founded on Jan 12th, 2016, focusing on R&D and manufacturing BriPower brand power systems, including bi-directional AC sources for grid simulation, bi-directional DC sources for battery simulation, and regenerative loads. The BriPower AC&DC power systems are widely used in new energy and related fields. BriPower is valuable to customer especially high Power and High Voltage.

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**Sales Company:** Shanghai Bridge Electronic Technology Co., Ltd

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