

# BriPower ZGX Series

## AC/DC Power Supply & Load

### Features

- Compact modular design, 15KVA in 4U
- Bi-directional design
- Output: AC, DC, AC+DC
- Single unit: maximum 15KW, 450V L-N, 30A/ph, DC-1KHz output
- Power expansion to 960KVA 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
- Grid simulation, battery simulation, PV simulation
- 24 months warranty



### Overview

The ZGX series is a compact modular design power supply with SiC PWM technology, providing full functions of grid simulator, battery simulator, PV simulator, regenerative AC/DC load, bipolar DC source and RLC/RCD load. The 15KVA bidirectional power supply is designed in a 4U chassis, and can be upgraded to 960KVA system by master/slave paralleling. The maximum output of each unit is AC 450V L-N, 30A/ph, DC~1KHz or DC 636V, 90A.

### General Specification

<b>Model No.</b>	<b>ZGX 15</b>
<b>AC input</b>	
Provide pre-charge circuit. Effectively restrain the impulse current when power on	
Voltage	3P+N+PE, 380VLL±10% (std)
Frequency	47-63Hz
Efficiency	≥85%
Power Factor @ Rated Power	>0.99
THDi	<1%
<b>Output</b>	
Output Modes	AC, DC, or AC+DC
Power Level	15KW
Load Regulation	0.1%FS
Line Regulation	0.1%FS

<b>AC Output</b>	
Voltage Range (L-N)	300V L-N, DC~1000Hz 450V L-N, DC~70Hz
Current Range	30A/ph (3-phase) or 90A (single phase)
Frequency Range	0.01 ~ 1000Hz
Phase Angle Range	Phase B/C relative to phase A, 0.0~360.0°
THD	<0.5%FS @DC~400Hz (measured at 250VL-N, Resistive Load) <1%FS @400~1000Hz (measured at 250VL-N, Resistive Load)
Harmonic waveform Generation	Up to 100 <sup>th</sup>
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	0.2%FS
Frequency Accuracy	0.01%FS+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	30A/ch (3-channel) or 90A (single channel)
Voltage Accuracy	0.1%FS

Current Accuracy	0.1%FS
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	0.2%FS
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>1</sup></b>	
R	Range: 0.1~1000Ω. Resolution: 0.1Ω. Accuracy: ±0.1%FS
L	Range: 0.1~5000mH. Resolution: 0.5mH. Accuracy: ±0.1%FS
C	Range: 0.001~5mF. Resolution: 0.1mF. Accuracy: ±0.1%FS
<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
Conformity	CE & Rohs are expected to get around Nov, 2023
Operating Humidity	20-90%RH (None Condensing)
Dimension (W*D*H, mm)	440*670*178
Weight (kg)	About 42.5KG
Shipping Dimension (W*D*H, mm)	600*800*300
Shipping Weight (kg)	About 50KG

<sup>1</sup> The accuracy measured at 50/60Hz

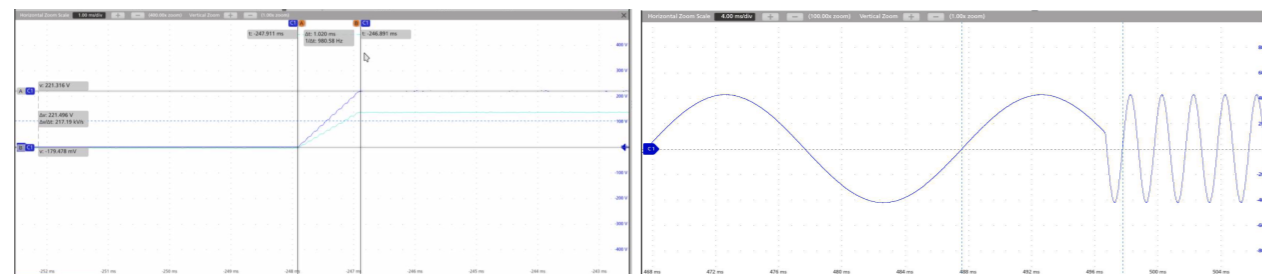
# OPERATION MODES

## 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.

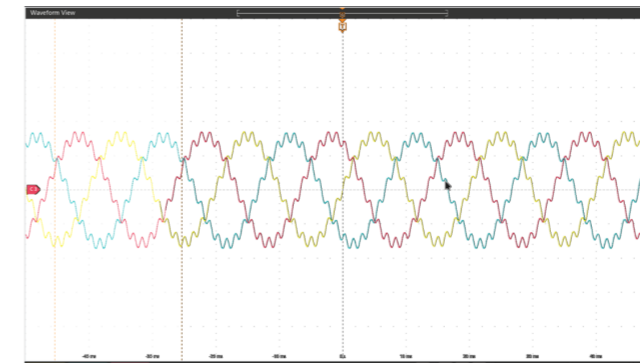


DC voltage and current rise waveform

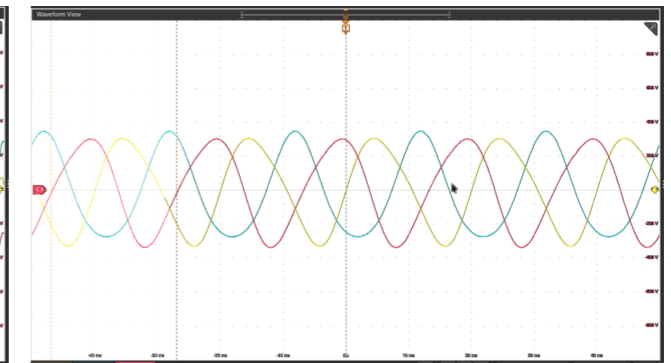
Frequency change waveform

- **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.



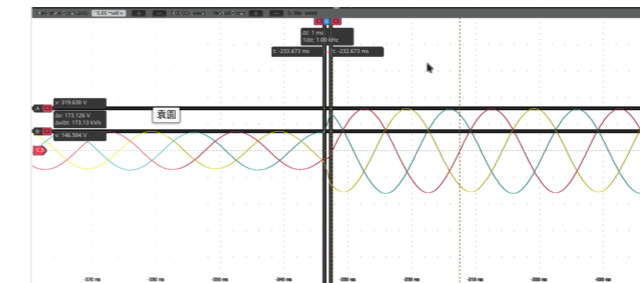
Harmonic waveform



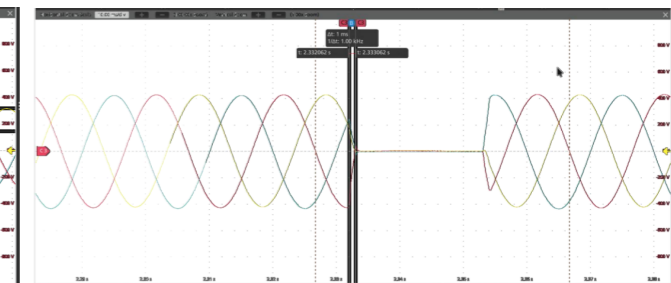
Inter-harmonic waveform

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

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



Voltage drop waveform

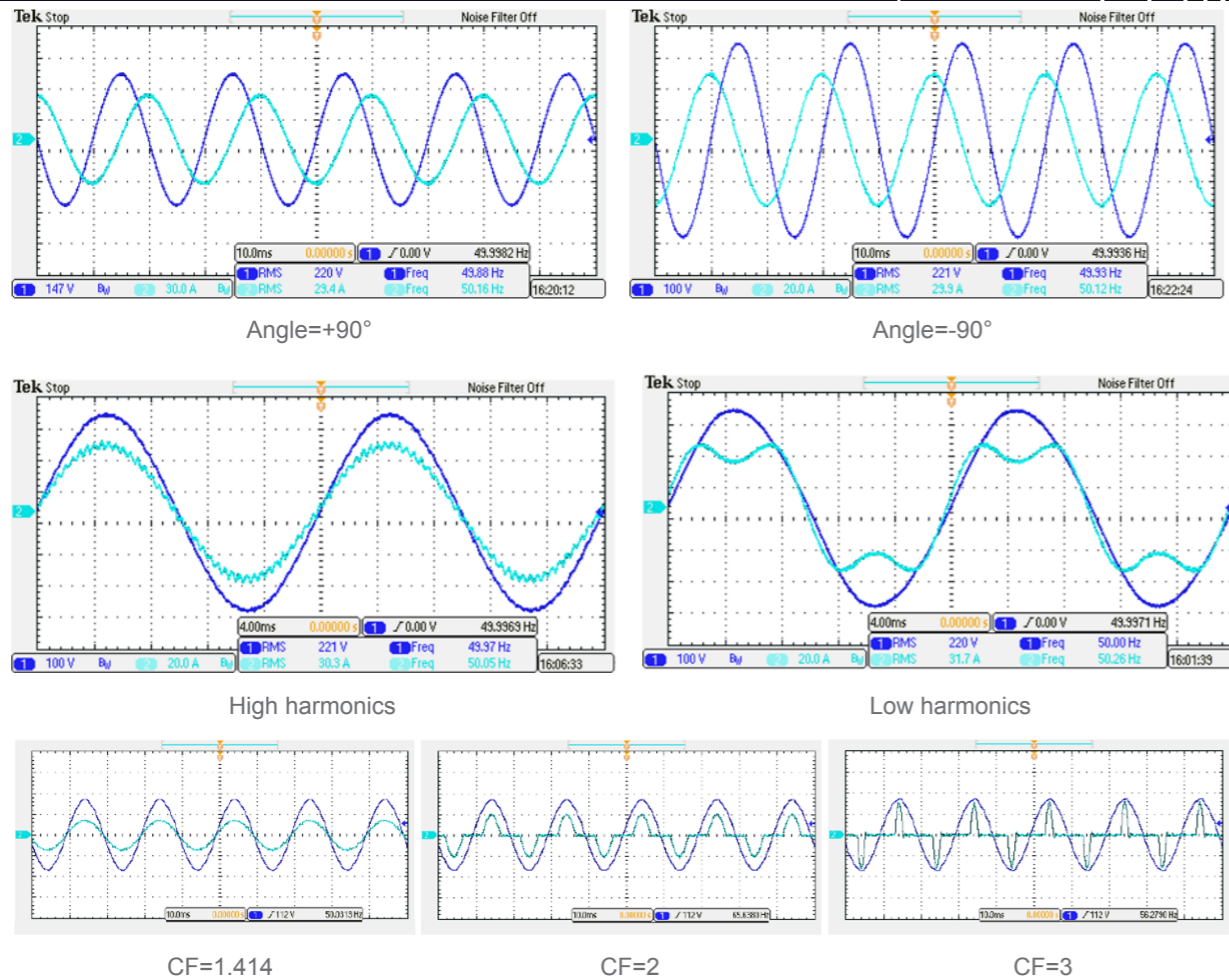


Zero voltage ride waveform

ZGX series has also DC output mode and works as regenerative DC source for battery testing, battery simulation etc.

## 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.

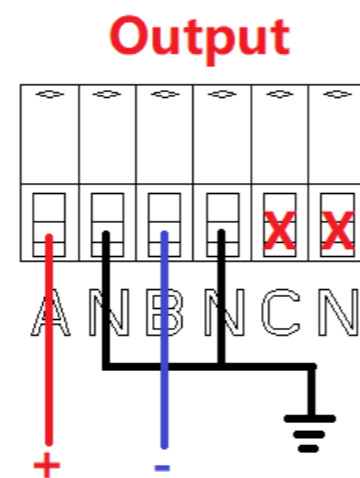


Regenerative DC electronic load mode is also available with the ZGX series, which provides CV, CC, CP, and CR operation modes.

## Bi-Polar (-BP option)

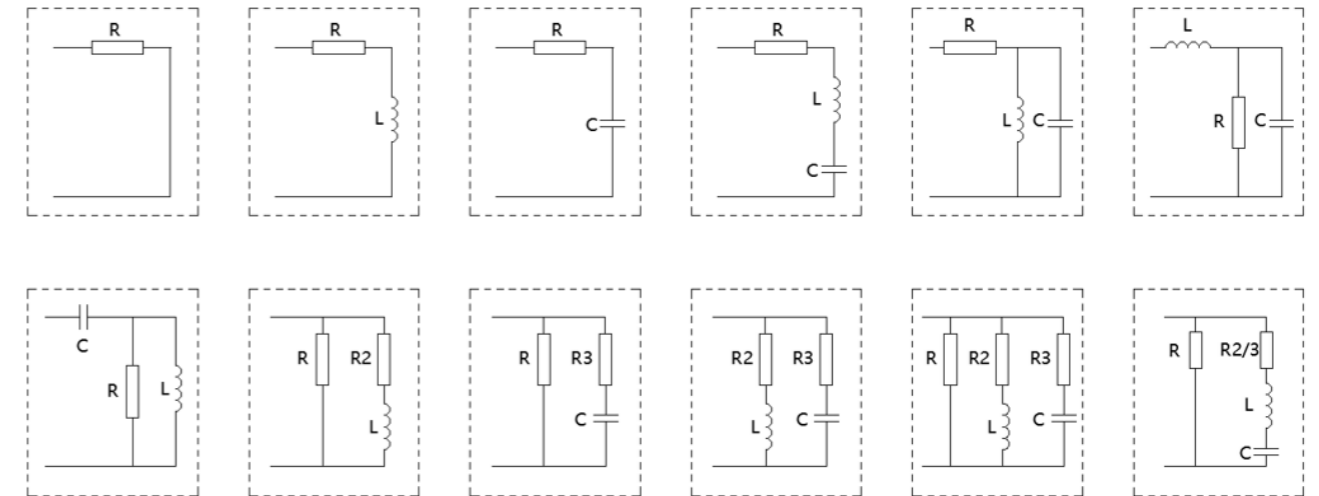
The ZGX series also provides bipolar DC output, and in this mode, phase A is used as POS+ output, phase B is used and NEG- output, the Neutral terminals of phase A and B are shorted and used as PE.

The output power is 10KW in bipolar output mode, and the voltage range is +/-636V, the current range is +/-30A.



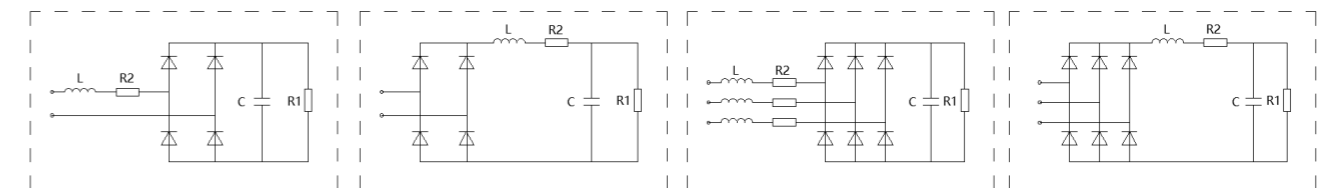
## RLC Load

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.



## 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.

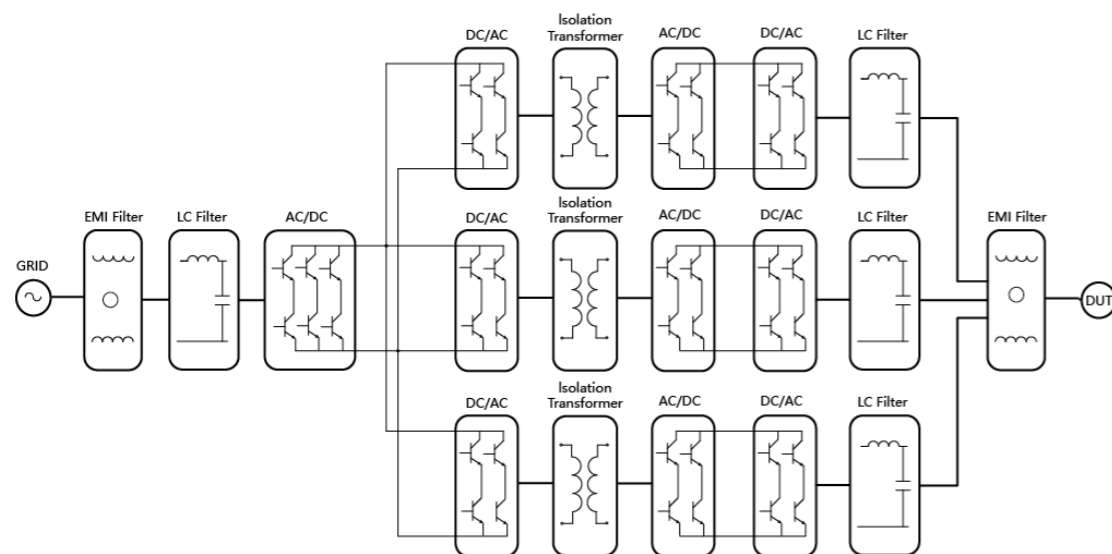
## PV Simulation (-PV option)

The ZGX GUI software also provides function of PV simulation to simulate IV curves of various solar panels, under various temperature and irradiance condition, and conduct static and dynamic MPPT tests according to EN 50530: 2010.

## Battery Simulation (-BSS option)

The ZGX series provides GUI software to simulate the charging and discharging characteristics of the power battery pack/package and it provides battery simulation software, which can simulate different types of batteries, lithium-ion batteries, etc., supporting multiple parameter settings, including: battery capacity, the number of cells in series and parallel, the state of charge, etc.

## Block Diagram



## AC Input Configuration

Please specify the input voltage (L-L)

/380, Input Voltage 380V±10%, 3-phase

/400, Input Voltage 400V±10%, 3-phase

## 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.

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