Bidirectional Grid Simulation Power Supply
## ANBGS(F) Series

Product Introduction

The ANBGS(F) series energy regenerative type grid simulation power is specially developed for new energy industries such as photovoltaic and wind energy, suitable for inverter testing and verification. The power supply has the function of energy regenerative type grid and can operate in four quadrants, saving energy consumption with low operating costs; FPGA digital control technology is adopted for smart inverter test process; with sine wave output and multi harmonic superposition output, single-phase, two-phase or three-phase High/Low (zero) Voltage Ride-Through (H/LVRT), which can simulate various abnormal conditions of power grid, and cooperate to achieve test of over/under-voltage, over/under-frequency, unbalance and anti-islanding protection, meeting test requirements in relevant regulations.

Features

- FPGA digital control, intelligent inverter test process;
- With function of energy regenerative type grid, operating in four quadrants
- Input power factor correction.

- High-performance High/Low (zero) Voltage Ride-Through (H/LVRT), step, sag, flicker and other test functions, ride-through test within 1ms;
- Complex programming for voltage/frequency setting, easy over/under-voltage and over/under-frequency test;
- Three-phase unbalanced, adjustable three-phase voltage and phase difference separately, or direct setting of three-phase unbalance;
- 2-50th harmonic and inter-harmonic output;
- Test complying with NBT 32004-2018, IEC 61000-4-11/13/14/28 and other standard and regulations;
- Complete measurements: voltage, current, current peak, frequency, active power, apparent power, power factor, voltage crest factor;
- Online monitoring: monitor IGBT temperature, transformer temperature, fan speed, input voltage and other parameters in output state;
- Operating data recorders: keep the record of power supply status and alarm code automatically during alarming, save the maintenance time.
- Lock key, user-friendly design, automatically locking without operation for 5 minutes to prevent from operation mistakes.
- Combined cabinet for chassis, 8" large-screen color LCD; Standard RS485, Ethernet interface, synchronous signal interface, optional RS232/GPIB interface.

Safety Analyzer

AC Power Supply

DC Power Supply

Bidirectional DC Power Supply

Power Analyzer

Motor Test Scheme

Electronic Load

Applications

■ **HVRT/LVRT:** Programmed output mode for photovoltaic industries, to simulate the process of grid voltage sags and recovery and can simulate multiple modes such as zero voltage ride through (ZVRT), low voltage ride through (LVRT), high voltage ride through (HVRT), and Combined HVRT/LVRT etc., and the voltage, holding time, ride through angle, recovery voltage etc. can be set.
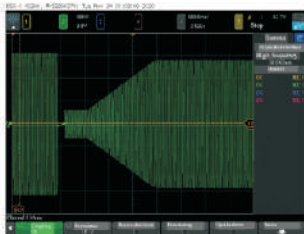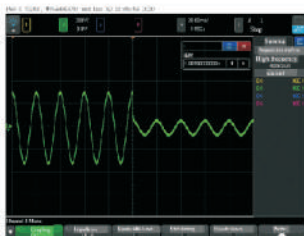

Zero Voltage Ride-Through (ZVRT)
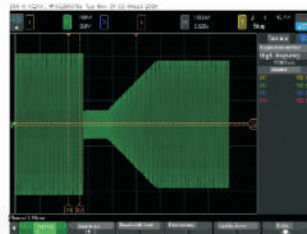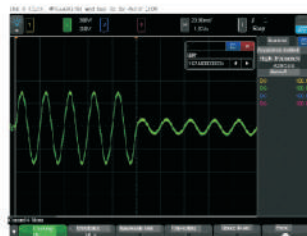

Low Voltage Ride-Through (LVRT)

High Voltage
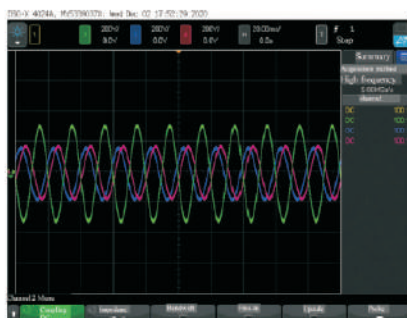Ride-Through (HVRT)

High/Low Voltage
Ride-Through (H/LVRT)

90° Ride-Through

0° Ride-Through

■ **Unbalance:** setting of U/V/W phase and voltage individually, direct setting of unbalance.

■ **Sag:** An output mode simulating short-time changes to voltage, 1ms Zero Voltage Ride-Through test.
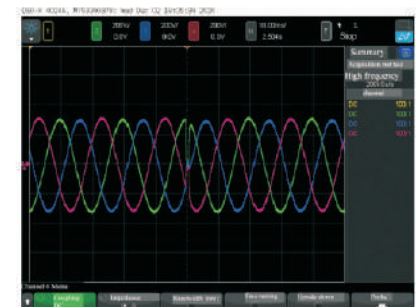
1ms Ride-Through

■ **Programming:** General programmable settings, voltage/frequency/phase are transformed by single-step setting, setting of trigger phase and cycle times, setting of parameters separately for three-phase output, sag/ride-through test in any phase.

Voltage Ramp + voltage jump + frequency jump Frequency 0° jump

90° to 270°

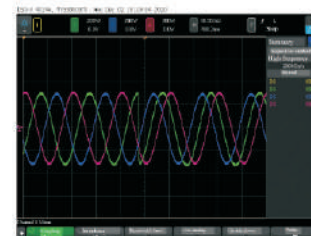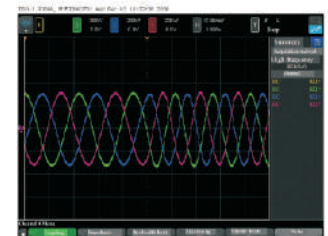**Harmonic:** Harmonic editing (2-50th), various harmonics of various orders superposed on standard sine wave, setting of component and angle of each harmonic. The single harmonic can reach 30%, unlimited total harmonic content and harmonic superposition times. 50 sets of harmonic storage groups for fast calling.
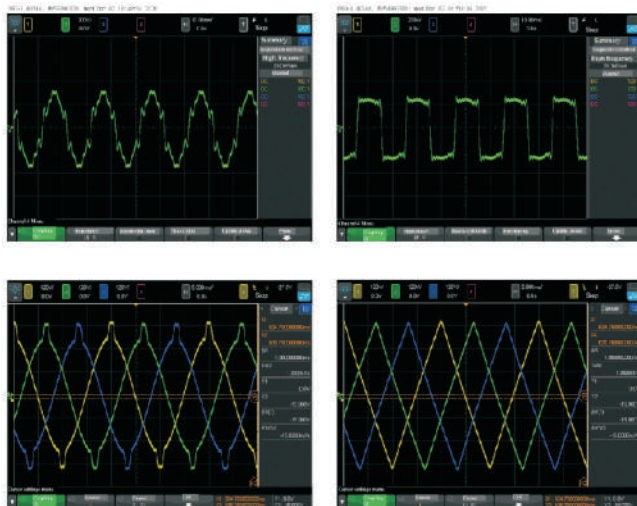
Interharmonics: Interharmonic editing, interharmonics superposed on standard sine waves, setting of interharmonic trigger angle, frequency, component and scanning time; frequency of interharmonic: 16-2500Hz.
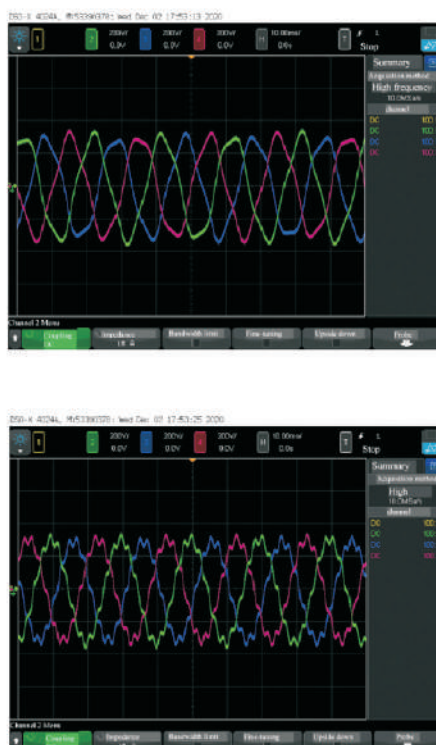
Flicker: Simulate the flicker characteristics of power grid to conduct the flicker adaptability test of DUT.

Large-size color LCD, numeric key input, knob operation.

PC control software

Specifications

Model	ANBGS 015TL(F)	ANBGS 030TL(F)	ANBGS 045TL(F)	ANBGS 060TL(F)	ANBGS 090TL(F)	ANBGS 120TL(F)	ANBGS 150TL(F) / ANBGS 150TH(F)	ANBGS 200TL(F) / ANBGS 200TH(F)	ANBGS 300TL(F) / ANBGS 300TH(F)	ANBGS 400TL(F) / ANBGS 400TH(F)
Capacity	15kVA	30kVA	45kVA	60kVA	90kVA	120kVA	150kVA	200kVA	300kVA	400kVA

Input

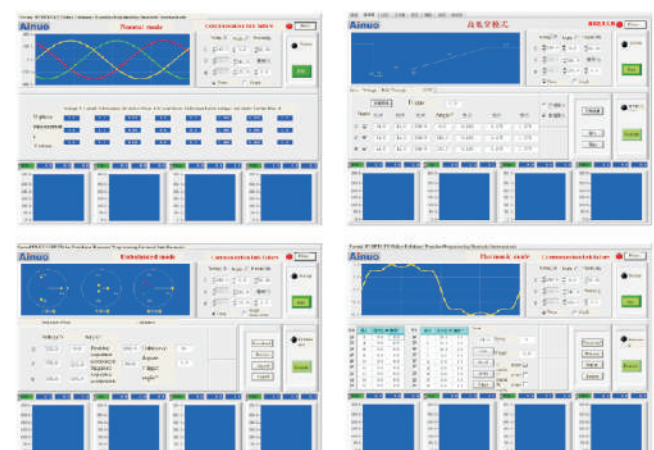|		
Voltage	3-phase 4-wires + PE, Phase voltage: 220V±33V, line voltage: 380V±57V, frequency 50/60Hz±3Hz
Feedback function	With energy feedback grid function
Input power factor	>0.99(input rated voltage and input 50%-100% of rated current)
Input current distortion	<3% (at rated condition)

Output

Output mode		Three-phase standard mode, three-phase unbalanced mode								
Voltage, frequency	L version	Phase voltage: 0.0～350.0V; frequency: 40.00～70.00Hz								
	H version	Phase voltage: 0.0～700.0V; frequency: 40.00～70.00Hz								
Rated current	L version 220V	22.7A	45.4A	68.1A	90.9A	136.4A	181.8A	227.2A	303.0A	454.5A	606.0A
	H version 440V	-	-	-	-	-	-	113.6A	151.5A	227.2A	303.0A
Setting accuracy	Voltage	Resolution: 0.01V, Accuracy: 0.1%×full scale value								
	Frequency	Resolution: 0.001Hz, Accuracy: 0.01%								
Testing accuracy	Voltage	Resolution: 0.01V, Accuracy: 0.1%×full scale value								
	Frequency	Resolution: 0.001Hz, Accuracy: 0.01%								
	Current	Resolution: 0.1A/1A, Accuracy: 0.2%×full scale value								
	Power	Resolution: 0.1kW/0.01kW/0.001kW, Accuracy: 0.3%×full scale value								
Frequency stability		≤0.01%								
Voltage distortion		Linear load＜1%								
Transient recovery time		1ms								
3 phase phase difference		3-phase standard mode: 120°±2°; 3 phase unbalanced mode: 0.0°～359.9°, 0.1°Adjusted								
Crest factor		1.41±0.1								
Source voltage effect		≤0.02%								
Load effect		≤0.02%								
Overload capacity		105%<Output≤110% the output will be stopped within 600s; 110%<Output≤150% the output will be stopped within 60s; 150%<Output≤200% the output will be stopped within 2s; 200%<Output the output will be stopped immediately								
Protection mode		IGBT overheat, IGBT over current, Transformer overheat, Input under voltage, Input over voltage, bus anti-recharge, Output under voltage, Output over voltage, Output lack phase, Output over current, Output over load, Output short circuit								

Function

Display	8" LCD, resolution: 800*600
Output waveform	Sine wave, harmonic (superimposed 2~50th harmonic), interharmonic
Transient mode	Yes, Voltage steps (sag) from high voltage to low voltage or low voltage to high voltage
Flicker mode	Yes, call of any group of flicker parameters from Group 1~39.
HVRT/LVRT mode	Yes, the standard curve can be called or customized as required for the user
Unbalanced mode	Yes, adjustable three-phase voltage/phase difference separately, or direct setting of three-phase unbalance;
Programming mode	200 steps of 999999 cycles, voltage/frequency/phase angle programmed freely for output
Soft-start time	0.0~99.9Sec.
Online adjustment function	Online adjusting of output voltage/frequency and switch of wave in normal mode
Memory	Power down memory function, memory last output mode and parameters.
Communication	RS485 (standard), Ethernet (standard), synchronous signal (standard), RS232 (optional), GPIB (optional)

Environment

Temp./Humidity	0~40℃, 20~90%RH
Dimensions W × H × D (mm)	800×1790 (including caster height 190)×800 / 800×1700 (including base height 100)×800 1000×1900 (including caster height 190)×1000 / 1000×1900 (including base height 100)×1000 1500×1900 (including base height 100)×1000 2000×1900 (including base height 100)×1150

Specifications

Model		ANBGS 500TL(F) / ANBGS 500TH(F)	ANBGS 600TL(F) / ANBGS 600TH(F)	ANBGS 800TL(F) / ANBGS 800TH(F)	ANBGS 1000TL(F) / ANBGS 1000TH(F)	ANBGS 1200TL(F) / ANBGS 1200TH(F)	ANBGS 1500TL(F) / ANBGS 1500TH(F)	ANBGS 2000TL(F) / ANBGS 2000TH(F)
Capacity		500kVA	600kVA	800kVA	1000kVA	1200kVA	1500kVA	2000kVA
Input	Voltage	3-phase 4-wires + PE, Phase voltage: 220V±33V, line voltage: 380V±57V, frequency 50/60Hz±3Hz						
	Feedback function	With energy feedback grid function						
	Input power factor	>0.99(input rated voltage and input 50%-100% of rated current)						
	Input current distortion	<3% (at rated condition)						
Output	Output mode	Three-phase standard mode, three-phase unbalanced mode						
	Voltage, frequency — L version	Phase voltage：0.0～350.0V；frequency：40.00～70.00Hz						
	Voltage, frequency — H version	Phase voltage：0.0～700.0V；frequency：40.00～70.00Hz						
	Rated current — L version 220V	757.5A	909.0A	1212A	1515A	1818A	2272A	3030A
	Rated current — H version 440V	378.7A	454.5A	606.0A	757.5A	909.0A	1136A	1515A
	Setting accuracy — Voltage	Resolution：0.01V，Accuracy：0.1%×full scale value						
	Setting accuracy — Frequency	Resolution：0.001Hz，Accuracy：0.01%						
	Testing accuracy — Voltage	Resolution：0.01V，Accuracy：0.1%×full scale value						
	Testing accuracy — Frequency	Resolution：0.001Hz，Accuracy：0.01%						
	Testing accuracy — Current	Resolution：0.1A/1A，Accuracy：0.2%×full scale value						
	Testing accuracy — Power	Resolution：0.1kW/0.01kW/0.001kW，Accuracy：0.3%×full scale value						
	Frequency stability	≤0.01%						
	Voltage distortion	Linear load：THD＜1%						
	Transient recovery time	1ms						
	3 phase phase difference	3-phase standard mode：120°±2°; 3 phase unbalanced mode：0.0°～359.9°，0.1°Adjusted						
	Crest factor	1.41±0.1						
	Source voltage effect	≤0.02%						
	Load effect	≤0.02%						
	Overload capacity	105%<Output≤110% the output will be stopped within 600s; 110%<Output≤150% the output will be stopped within 60s; 150%<Output≤200% the output will be stopped within 2s; 200%<Output the output will be stopped immediately						
	Protection mode	IGBT overheat, IGBT over current, Transformer overheat, Input under voltage, Input over voltage, bus anti-recharge, Output under voltage, Output over voltage, Output lack phase, Output over current, Output over load, Output short circuit						
Function	Display	8" LCD, resolution: 800*600						
	Output waveform	Sine wave, harmonic (superimposed 2~50th harmonic), interharmonic						
	Transient mode	Yes, Voltage steps (sag) from high voltage to low voltage or low voltage to high voltage						
	Flicker mode	Yes, call of any group of flicker parameters from Group 1~39.						
	HVRT/LVRT mode	Yes, the standard curve can be called or customized as required for the user						
	Unbalanced mode	Yes, adjustable three-phase voltage/phase difference separately, or direct setting of three-phase unbalance;						
	Programming mode	200 steps of 999999 cycles, voltage/frequency/phase angle programmed freely for output						
	Soft-start time	0.0~99.9Sec.						
	Online adjustment function	Online adjusting of output voltage/frequency and switch of wave in normal mode						
	Memory	Power down memory function, memory last output mode and parameters.						
	Communication	RS485 (standard), Ethernet (standard), synchronous signal (standard), RS232 (optional), GPIB (optional)						
Environment	Temp./Humidity	0~40℃，20~90%RH						
	Dimensions W × H × D (mm)	3000×1900 (including the base height 100)×1200		4000×1900 (including the base height 100)×1200	4400×2100 (including the base height 100)×1400		5600×2100 (including the base height 100)×1400	6400×2100 (including the base height 100)×1400