

## Bidirectional Grid Simulator ANBG(S) Series



### Product Introduction

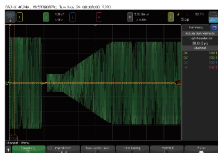
The ANBG(S) series Regenerative AC Power Supply is specially developed for new energy industries such as photovoltaic and wind energy, suitable for inverter testing and verification. The power supply has the function of energy regenerative type grid and can operate in four quadrants, saving energy consumption 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

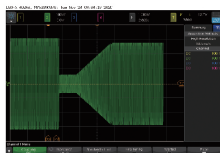
- FPGA digital control, intelligent inverter test process;
- With function of energy regenerative type grid, operating in four quadrants
- Input power factor correction.
- High-performance High/Low (zero) Voltage Ride-Through (H/LVRT), step, sag, flicker and other test functions, ride-through test within 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.

### 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)



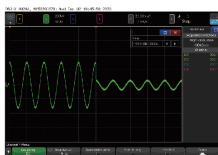
Low Voltage Ride-Through (LVRT)



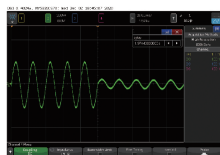
High Voltage Ride-Through (HVRT)



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

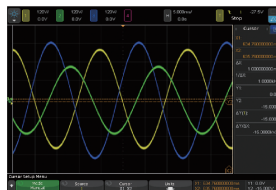
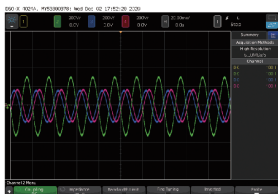


90° Ride-Through

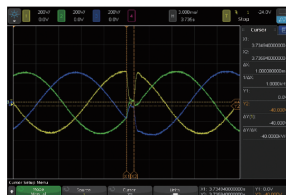
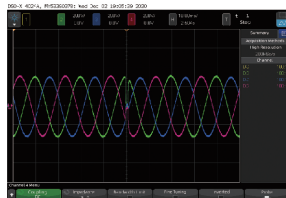


0° Ride-Through

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

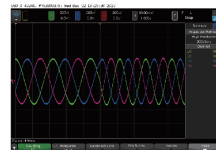


**Sag:** An output mode simulating short-time changes to voltage, 1ms Zero Voltage Ride-Through test.

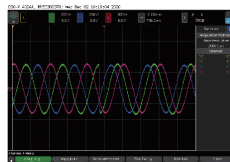


1ms Ride-Through

**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.

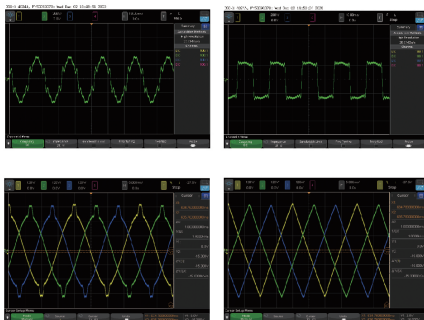


Voltage Ramp + voltage jump + frequency jump Frequency 0° jump

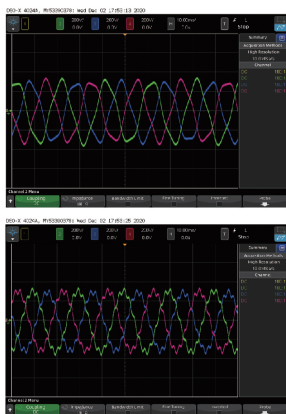


90° to 270°

**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.



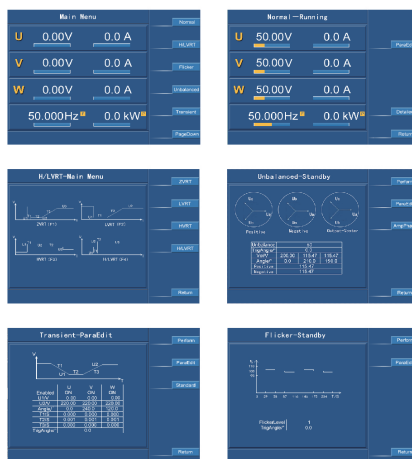
**Interharmonics:** Interharmonic editing, interharmonics superposed on standard sine waves, setting of interharmonic trigger angle, frequency, component and scanning time; frequency of interharmonic: 16-2500Hz.



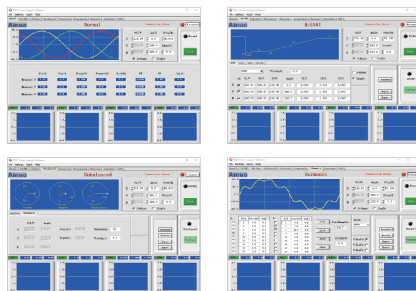
**Flicker:** Simulate the flicker characteristics of power grid to conduct the flicker adaptability test of DUT.



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) 150TH(F)	ANBGS 200TL(F) 200TH(F)	ANBGS 300TL(F) 300TH(F)	ANBGS 400TL(F) 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%<Outputs≤110% the output will be stopped within 600s; 110%<Outputs≤150% the output will be stopped within 60s; 150%<Outputs≤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			1000×1900 (including caster height 190)×1000			1500×1900 (including base height 100)×1000		2000×1900 (including base height 100)×1150		
		800×1700 (including base height 100)×800			1000×1900 (including base height 100)×1000							

Any changes to the above parameter specifications will not be notified separately.



## Specifications

Model		ANBGS	ANBGS	ANBGS	ANBGS	ANBGS	ANBGS	ANBGS	
		500TL(F)	600TL(F)	800TL(F)	1000TL(F)	1200TL(F)	1500TL(F)	2000TL(F)	
		ANBGS	ANBGS	ANBGS	ANBGS	ANBGS	ANBGS	ANBGS	
		500TH(F)	600TH(F)	800TH(F)	1000TH(F)	1200TH(F)	1500TH(F)	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						
		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
		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						
		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: 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%<Outputs≤110% the output will be stopped within 600s; 110%<Outputs≤150% the output will be stopped within 60s; 150%<Outputs≤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.						
Environment	Communication		RS485 (standard), Ethernet (standard), synchronous signal (standard), RS232 (optional), GPIB (optional)						
	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	5000×2100 (including the base height 100)×1400		7500×2100 (including the base height 100)×1400	5000×2100 (including the base height 100)×1400×2 parallel machines	

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