Regenerative Grid Simulator
ANRGS(F) Series

Product Introduction

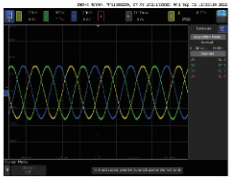
The ANRGS(F) Series Regenerative Grid Simulator adopts advanced SPWM technology, FPGA digital processing technology and high-power switching power supply technology, and it can output AC, DC, and AC+DC power supply, providing precise power input for AC load, DC load, rectifier load, etc. The power supply has the function of 100% rated power feedback to the grid, enabling four-quadrant operation and significant energy savings to reduce operating costs. It can set waveform switch-on and switch-off angles for testing surge current and output maintenance time. It can also set the rate of change of voltage and frequency to scan the range of power input specifications for the object to be tested. The power supply can simulate abnormal instantaneous rise, drop, short circuit, jitter and other phenomena in the power grid, stimulate distortion of the mains power waveform and provide accurate and fast measurement of power parameters. The ANRGS Series Regenerative Grid Simulator adopts advanced SPWM technology with excellent power output quality, widely used in laboratories and production lines in the photovoltaic, new energy vehicle, and other industries.

Features

- It has advanced SPWM technology and FPGA digital processing technology and high-power switching power supply technology with high power density.
- It has output modes include AC, DC, and AC+DC.
- It has 100% rated power feedback to the grid, and the power supply can operate in all four quadrants.
- It can realize three-phase and single-phase parallel operation, and the single-phase output after parallel connection can reach the maximum capacity of the whole unit.
- It has harmonic synthesis function for 2-50 times interharmonics with a synthesis bandwidth of 3,000Hz.
- It has three programming functions: sequence, pulse, and step, which simulate the interference in the actual grid, with a minimum programming step size of 1ms.
- It has a 5-inch LCD, which is small in size, light in weight and 4U in height, meeting the installation requirements of standard cabinets.
- It is equipped with RS485 and Ethernet communication interfaces as standard, with optional RS232 and GPIB communication interfaces.
- It comes with upper computer software, which can import and export arbitrary waveforms and set parameters through the upper computer.

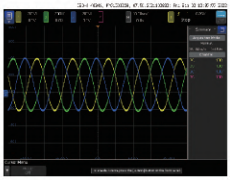
Applications

AC+DC output mode: Three output modes: AC, DC, and AC+DC

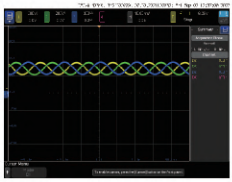


AC mode

DC mode

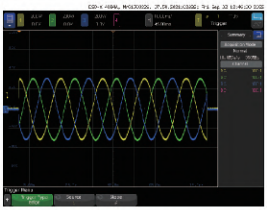


AC+DC mode



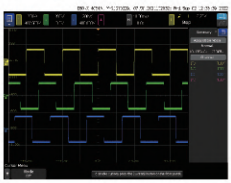
AC+DC mode

Start-stop angle: In the conventional mode, the start-stop angles of the waveform can be set to facilitate surge current tests.

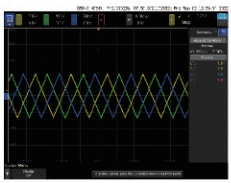


U-phase starts at 90° and stops at 270° waveform

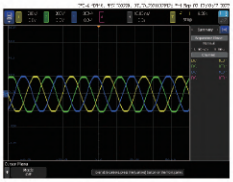
Output waveform options: The three-phase output waveform can be independently set to select sine wave, square wave, triangular wave, clipped sine wave, 30 sets of built-in waveforms, and 6 sets of user-defined waveforms.



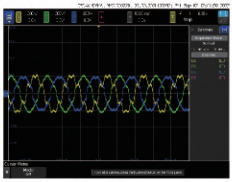
Square wave



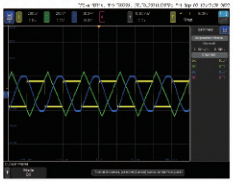
Triangular wave



Clipped sine wave

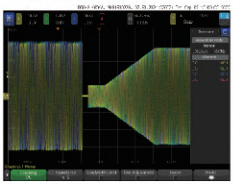


Built-in waveform

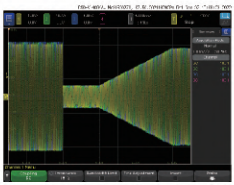


Different waveforms set for three phases

Sequence mode: It has universally programmable settings, where each phase of AC voltage, DC voltage, frequency, phase, waveform, and time can be independently set according to single-step settings. Trigger phase and loop count can be set, and parameters of three-phase outputs can be separately configured. Any phase abrupt change/crossing test can be achieved. Rich sequence combinations with high degree of freedom in parameter settings. By setting different combined sequence parameters, high and low voltage crossing tests can be completed. Minimum programming setting time is 1ms, capable of completing a 1ms stop test. Each sequence in each phase can independently set one of the 6 waveforms.

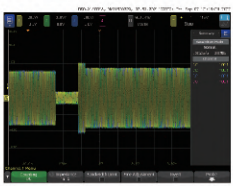


Zero voltage crossing test



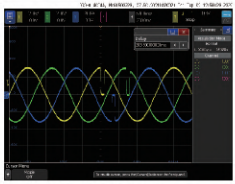
Low voltage crossing test

High voltage crossing test

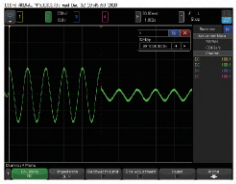


High and low voltage crossing tests

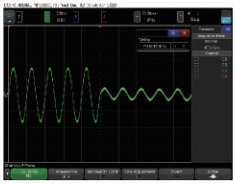
Different waveforms can be selected during testing



Each phase stops within 1ms at 90°

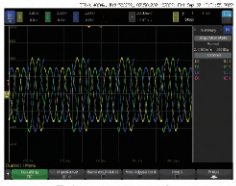


90° crossing

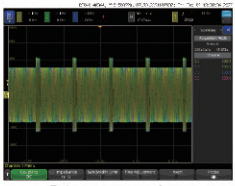


0°crossing

Pulse mode: it periodically changes the output state, where the power output will cyclically vary between regular power supply and pulse voltage. Each phase of AC voltage, DC voltage, frequency, angle, waveform, time, etc. can be independently set.

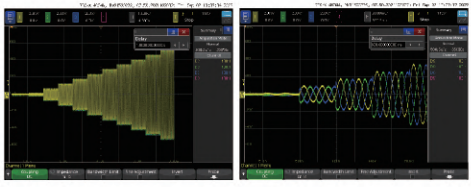


Pulse output waveform



Pulse output waveform

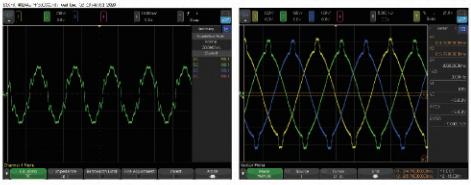
Step mode: also known as staircase mode, where the output voltage gradually increases or decreases according to the set step size from the initial value. Each phase's AC voltage, DC voltage, and frequency can be independently set for initial value and change amount. Angle, waveform, step count, and step time for each phase can also be set independently.



Step output waveform

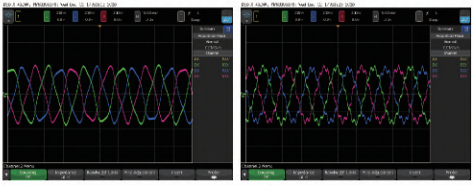
Harmonic synthesis: the power supply has harmonic editing function (2-50 times), and various harmonic components can be added to the standard sine wave.

It has 3 sets of percentage harmonic storage groups and 3 sets of amplitude harmonic storage wave voltage, harmonic content, angle, etc., of each phase can be independently set. Under the percentage mode, the content and angle of each harmonic can be set, with a single harmonic up to 30%, no limit on total harmonic content, and no limit on thenumber of harmonic superimpositions. Under the amplitude mode, specific voltage values can be set for harmonic components, without any percentage relationship with fundamental wave voltage.



Harmonic output waveform

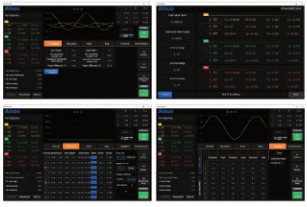
Interharmonic synthesis: the power supply has interharmonic editing function, allowing addition of interharmonic components to the standard sine wave. Interharmonic trigger angle, start-stop frequencies, content, and scan time can be set, with an interharmonic frequency range of 16-3,000Hz.



Interharmonic output waveform

Operation: 5-inch color capacitive touch screen and knobs can be used to set the voltage and frequency in the conventional mode, with buttons responsible for starting and stopping the conventional mode.

Upper computer: It is equipped with the standard upper computer software, with a graphical user interface for convenient and efficient operation.



Selection List

Model	Complete machine Power	Output phase number	AC voltage	Frequency	DC voltage	Per-phase current	Overall Dimensions W×H×D(mm)
ANRGS003S-350(F)	3kVA	Single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	35A	432×175×700
ANRGS005S-350(F)	5kVA	Single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	35A	432×175×700
ANRGS006S-350(F)	6kVA	Single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	35A	432×175×700
ANRGS010S-350(F)	10kVA	Single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	60A	432×175×735
ANRGS012S-350(F)	12kVA	Single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	70A	432×175×700
ANRGS015S-350(F)	15kVA	Single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	70A	432×175×700
ANRGS020S-350(F)	20kVA	Single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	120A	432×175×735
ANRGS006A-350(F)	6kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	35A	432×175×700
ANRGS009A-350(F)	9kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	35A	432×175×700
ANRGS012A-350(F)	12kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	35A	432×175×700
ANRGS015A-350(F)	15kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	35A	432×175×700
ANRGS018A-350(F)	18kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	35A	432×175×700
ANRGS020A-350(F)	20kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	60A	432×175×735
ANRGS025A-350(F)	25kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	60A	432×175×735
ANRGS030A-350(F)	30kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	60A	432×175×735
ANRGS050B-350(F)	50kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	120A	600×1230×1000
ANRGS060B-350(F)	60kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	120A	600×1230×1000
ANRGS075B-350(F)	75kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	180A	600×1230×1000
ANRGS090B-350(F)	90kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	180A	600×1230×1000
ANRGS100B-350(F)	100kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	240A	600×1230×1000
ANRGS120B-350(F)	120kVA	Three-phase & single-phase	0～350.00V	30.000～100.000Hz	-495.00～495.00V	240A	600×1230×1000

Specifications

Model			ANRGS 003S -350(F)	ANRGS 005S -350(F)	ANRGS 006S -350(F)	ANRGS 010S -350(F)	ANRGS 012S -350(F)	ANRGS 015S -350(F)	ANRGS 018A -350(F)
Power supply capacity			3000VA	5000VA	6000VA	10000VA	12000VA	15000VA	20000VA
AC input	Voltage		Line voltage: 342V-480V; 3-phase 3-wire+ PE						
	Current (@342V)		15A Max	22A Max	25A Max	39A Max	40A Max	50A Max	65A Max
	Frequency		47～63Hz						
	Power factor *1		≥0.98						
AC output	Phase number		Single-phase	Single-phase	Single-phase	Single-phase	Single-phase	Single-phase	Single-phase
	Power		3000VA	5000VA	6000VA	10000VA	12000VA	15000VA	20000VA
	Voltage	Range	0.00～350.00V						
		Resolution	0.01V						
		Accuracy	0.1%F.S.						
		Distortion *2	0.3%@50/60Hz; 1%@30-100Hz						
		Source effect *3	≤0.02%						
		Load effect *4	≤0.02%						
	Current /phase	Effective value range	35A	35A	35A	60A	70A	120A	120A
		Peak value range	105A	105A	105A	180A	210A	360A	360A
	Frequency	Range	30.000～100.000Hz						
		Resolution	0.001Hz						
		Accuracy	0.01%						
	Power	Range	3000W	5000W	6000W	10000W	12000W	15000W	20000W

Model			ANRGS 003S -350(F)	ANRGS 005S -350(F)	ANRGS 006S -350(F)	ANRGS 010S -350(F)	ANRGS 012S -350(F)	ANRGS 015S -350(F)	ANRGS 018A -350(F)
DC output	Voltage	Range	-495.00～495.00V						
		Resolution	0.01V						
		Accuracy	0.1%F.S.						
	Current	Range	35A	35A	35A	60A	70A	120A	120A
Measurement accuracy	Voltage	Range	AC: 350.00V; DC: 495.00V						
		Resolution	0.01V						
		Accuracy *5	0.1%F.S.						
	Current	Range Effective value	35A	35A	35A	60A	70A	120A	120A
		Range Peak value	105A	105A	105A	180A	210A	360A	360A
		Resolution	0.01A						
		Effective value accuracy*6	0.2%F.S.						
		Peak value accuracy*6	0.5%F.S.						
	Power	Resolution	0.01W						
		Accuracy *7	0.3%F.S.						
Measurement accuracy	Display		5-inch color touch screen LCD						
	Waveform selection		Sine wave, triangle wave, square wave, clipped sine wave, 30 sets of built-in waveforms, and 6 sets of custom waveforms						
	Start-stop angle		0-359.9°						
	Knob function		Knob adjustment available for conventional mode voltage and frequency settings						
	Parallel operation function		Can achieve parallel operation of multiple units						
	Harmonics		2-50 times						
	Harmonic and interharmonic simulation bandwidth		3000Hz						
	Sequence mode		200 steps with 9,999 loops. Voltage, frequency, and phase angle can be programmatically outputted						
	Pulse mode		9,999 loops. Cyclic changes in voltage amplitude, frequency, and angle						
	Step mode		9,999 loops. Change the voltage frequency according to the set voltage and frequency step values						
	Online regulation function		Under the conventional mode, the output voltage and frequency can be adjusted online, and the waveform can be switched online						
	Line drop compensation		The device has Sense terminals that allow remote sampling compensation						
	Communication interface		RS485 (standard), Ethernet (standard), synchronous signal (standard), RS232 (optional) and GPIB (optional)						
	Remote control		None						
Working environment	Temperature		0～40℃						
	Humidity		30～90%RH						
Efficiency *8			≥92%						
Protection			Input abnormality, bus overvoltage, output overvoltage and undervoltage, output overcurrent, output overload, and module overheating						
Shape	Height		4U						
	Dimensions (W×H×D mm)		432×175×700	432×175×700	432×175×700	432×175×735	432×175×700	432×175×735	432×175×735
			The width of 432mm is the standard 19-inch chassis size without handles, with handles the width is 480mm. The height of 175mm is without feet, with feet the height is 188mm. The feet are detachable. The depth of 700mm/735mm is the front and rear panel size excluding terminals and protective parts, the depth including terminals is 779mm/814mm.						
Weight (Kg)			≤25	≤25	≤25	≤26	≤35	≤38	≤38

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

Model				ANRGS 006A -350(F)	ANRGS 009A -350(F)	ANRGS 012A -350(F)	ANRGS 015A -350(F)	ANRGS 018A -350(F)	ANRGS 020A -350(F)	ANRGS 025A -350(F)	ANRGS 030A -350(F)
Power supply capacity				6000VA	9000VA	12000VA	15000VA	18000VA	20000VA	25000VA	30000VA
AC input	Voltage			Line voltage: 342V-480V; 3-phase 3-wire+ PE							
	Current (@342V)			20A Max	25A Max	30A Max	35A Max	40A Max	45A Max	55A Max	65A Max
	Frequency			47～63Hz							
	Power factor *1			≥0.98							
	Phase number			Three-phase & single-phase							
AC output	Power	Total Power		6000VA	9000VA	12000VA	15000VA	18000VA	20000VA	25000VA	30000VA
		Power per phase		2000VA	3000VA	4000VA	5000VA	6000VA	6667VA	8333VA	10000VA
	Voltage	RRange		0.00～350.00V							
		Resolution		0.01V							
		Accuracy		0.1%F.S.							
		Distortion *2		0.3%@50/60Hz; 1%@30-100Hz							
		Source effect *3		≤0.02%							
		Load effect *4		≤0.02%							
	Current /phase	Effective value range	Three-phase mode	35A	35A	35A	35A	35A	60A	60A	60A
		Effective value range	Single-phase mode	105A	105A	105A	105A	105A	180A	180A	180A
		Peak value range	Three-phase mode	105A	105A	105A	105A	105A	180A	180A	180A
		Peak value range	Single-phase mode	315A	315A	315A	315A	315A	540A	540A	540A
	Frequency	Range		30.000～100.000Hz							
		Resolution		0.001Hz							
		Accuracy		0.01%							
	Power	Total Power		6000W	9000W	12000W	15000W	18000W	20000W	25000W	30000W
		Power per channel		2000W	3000W	4000W	5000W	6000W	6667W	8333W	10000W
DC output	Voltage	Range		-495.00～495.00V							
		Resolution		0.01V							
		Accuracy		0.1%F.S.							
	Current	Range	Single channel	35A	35A	35A	35A	35A	60A	60A	60A
			Parallel connection	105A	105A	105A	105A	105A	180A	180A	180A
Measurement accuracy	Voltage	Range		AC: 350.00V; DC: 495.00V							
		Resolution		0.01V							
		Accuracy *5		0.1%F.S.							
	Current	Range	Effective value	105A	105A	105A	105A	105A	180A	180A	180A
			Peak value	315A	315A	315A	315A	315A	540A	540A	540A
		Resolution		0.01A							
		Effective value accuracy*6		0.2%F.S.							
		Peak value accuracy*6		0.5%F.S.							
	Power	Resolution		0.01W							
		Accuracy *7		0.3%F.S.							
Function	Display			5-inch color touch screen LCD							
	Waveform selection			Sine wave, triangle wave, square wave, clipped sine wave, 30 sets of built-in waveforms, and 6 sets of custom waveforms							
	Start-stop angle			0-359.9°							
	Knob function			Knob adjustment available for conventional mode voltage and frequency settings							
	Parallel operation function			Can achieve parallel operation of multiple units							
	Harmonics			2-50 times							
	Harmonic and interharmonic simulation bandwidth			3000Hz							
	Sequence mode			200 steps with 9,999 loops. Voltage, frequency, and phase angle can be programmatically outputted							
	Pulse mode			9,999 loops. Cyclic changes in voltage amplitude, frequency, and angle							
	Step mode			9,999 loops. Change the voltage frequency according to the set voltage and frequency step values							
	Online regulation function			Under the conventional mode, the output voltage and frequency can be adjusted online, and the waveform can be switched online							
	Line drop compensation			The device has Sense terminals that allow remote sampling compensation							
	Communication interface			RS485 (standard), Ethernet (standard), synchronous signal (standard), RS232 (optional) and GPIB (optional)							
	Remote control			None							
Working environment	Temperature			0～40℃							
	Humidity			30～90%RH							
Efficiency *8				≥92%							
Protection				nput abnormality, bus overvoltage, output overvoltage and undervoltage, output overcurrent, output overload, and module overheating							
Shape	Height			4U							
	Dimensions W×H×D(mm)			432×175×700	432×175×700	432×175×700	432×175×700	432×175×700	432×175×735	432×175×735	432×175×735
				The width of 432mm is the standard 19-inch chassis size without handles, with handles the width is 480mm.							

Specifications

Model			ANRGS 050B-350(F)	ANRGS 060B-350(F)	ANRGS 075B-350(F)	ANRGS 090B-350(F)	ANRGS 100B-350(F)	ANRGS 120B-350(F)
Power supply capacity			50KVA	60kVA	75kVA	90kVA	100kVA	120kVA
AC input	Voltage		Line voltage: 342V-480V: 3-phase 3-wire+PE					
	Current (@342V)		110A Max	130A Max	165A Max	195A Max	220A Max	260A Max
	Frequency		47-63Hz					
	Power factor *1		≥0.98					
AC output	Number of phase		Three-phase & single-phase					
	Power	Total power	50kVA	60kVA	75kVA	90kVA	100kVA	120kVA
		Power per phase	16.66kVA	20kVA	25kVA	30kVA	33.33kVA	40kVA
	Voltage	Range	0.00-350.00V					
		Resolution	0.01V					
		Accuracy	0.1%F.S.					
		Distortion *2	0.3%@50/60Hz: 1%@30-100Hz					
		Source effect *3	≤0.02%					
		Load effect *4	≤0.02%					
	Current	Effective value range (three-phase mode)	120A	120A	180A	180A	240A	240A
		Effective value range single-phase mode)	360A	360A	540A	540A	720A	720A
		Peak value range (three-phase mode)	360A	360A	540A	540A	720A	720A
		Peak value range single-phase mode)	1080A	1080A	1620A	1620A	2160A	2160A
	Frequency	Range	30.000-100.000Hz					
		Resolution	0.001Hz					
		Accuracy	0.01%					
DC output	Power	Total Power	50kW	60kW	75kW	90kW	100kW	120kW
		Power per channel	16.66kW	20kW	25kW	30kW	33.33kW	40kW
	Voltage	Range	-495.00-495.00V					
		Resolution	0.01V					
		Accuracy	0.1%F.S.					
	Current range	Single channe	120A	120A	180A	180A	240A	240A
		Parallel connection	360A	360A	540A	540A	720A	720A
Measurement accuracy	Voltage	Range	AC: 350V: DC: 495.00V					
		Resolution	0.01V					
		Accuracy *5	0.1%F.S.					
	Current	Range: Effective value	360A	360A	540A	540A	720A	720A
		Range: Peak value	1080A	1080A	1620A	1620A	2160A	2160A
		Resolution	0.01A					
		Effective value accuracy*6	0.2%F.S.					
		Peak value accuracy*6	0.5%F.S.					
	Power	Resolution	0.01W					
		Accuracy *7	0.3%F.S..					
Function	Display		5-inch color touch screen LCD					
	Waveform selection		Sine wave, triangle wave, square wave, clipped sine wave, 30 sets of built-in waveforms, and 6 sets of custom waveforms					
	Start-stop angle		0-359.9					
	Knob function		Knob adjustment available for conventional mode voltage and frequency settings					
	Parallel operation function		None					
	Harmonics		2-50 times					
	Harmonic and interharmonic simulation bandwidth		3000Hz					
	Sequence mode		200 steps with 9999 loops. Voltage, frequency, and phase angle can be programmatically outputted					
	Pulse mode		9999 loops. Cyclic changes in voltage amplitude, frequency, and angle					
	Step mode		9999 loops. Change the voltage frequency according to the set voltage and frequency step values					
	Online adjustment function		Under the conventional mode, the output voltage and frequency can be adjusted online, and the waveform can be switched online					
	Line drop compensation		The device has Sense terminals that allow remote sampling compensation					
	Communication interface		RS485 (standard), Ethernet (standard), synchronous signal (standard), RS232 (optional) and GPIB (optional)					
	Remote control		None					
Working environment	Temperature/ humidity		0-40℃ 30-90%RH					
Efficiency *8			≥92%					
Protection			Input abnormality, bus overvoltage, output overvoltage and undervoltage, output overcurrent, output overload, and module overheating					
Shape	Dimensions(W×H×D mm)		600×1230 (the height with casters is 118)×1000					
Weight (Kg)			≤330	≤330	≤380	≤380	≤440	≤440

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