PROGRAMMABLE AC POWER SOURCE
MODEL 61511/61512/61611/61612

The global market for AC power testing has created demand for a more sophisticated, high performance AC power source that is capable of simulating a wide range of AC line conditions. The Chroma 61500/61600 series programmable AC sources are the solution to meet this demand. These sources provide the ability to simulate various AC line input conditions as well as the measurement of critical characteristics for products under test. These features make the 61500/61600 series ideal for commercial, power electronics, avionics, military, and regulation test applications from bench-top R/D design verification to quality assurance and mass production.

Using state of the art PWM technology, the 61511/61512/61611/61612 models can deliver a maximum output voltage of up to 300Vac and an output frequency from 15Hz to 1500Hz. The AC+DC modes extend the abilities by not only providing pure AC voltage, but also a DC component for DC offset testing in the laboratory.

The 61511/61512/61611/61612 AC sources are capable of delivering up to 4 times the peak current compared to the maximum rated current which makes it ideal for inrush current tests. All models possess the ability to generate a pure sine waveform output with typical distortion of less than 0.3% at 50/60Hz.

The Chroma 61500/61600 series are able to provide precision measurements such as RMS voltage, RMS current, true power, power factor, current crest factor and more. By applying advanced DSP technology, the 61511/61512 models can easily simulate power line disturbance (PLD) through LIST, PULSE and STEP modes.

The Chroma 61500/61600 series allow users to compose different harmonic components to synthesize various harmonic distorted waveforms. By applying this advanced feature, users can program a sweeping frequency component incorporated with the fundamental voltage for finding resonance points of the UUT, thus providing the user with in depth analysis results.

To simulate the natural waveform, the 61500/61600 series include an external analog input used to amplify the analog signal generated from an arbitrary signal generator. Users can implement this feature to duplicate any unique waveform observed in the field.

The user friendly interface allows user quick access to the 61511/61512/61611/61612 AC source' s functions through a large LCD display on the front panel, with a clearly indicated keypad. GPIB (IEEE488.2), RS-232, USB, and Ethernet interfaces are available for remote control of the AC source.

RS-232 Ethernet USB GPIB CE RoHS2 Compliant

MODEL 61511/61512
61611/61612

KEY FEATURES

- Power rating:
  61511/61611: 12KVA
  61512/61612: 18KVA
- Voltage range: 0~150V/0~300V/auto
- Frequency: DC, 15Hz~1500Hz
- Single phase or three phase output selectable
- Programmable slew rate setting for changing voltage and frequency
- Programmable voltage and current limit
- High output current crest factor, ideal for inrush current testing
- Turn on, turn off phase angle control
- TTL signal which indicates output transient
- LIST, PULSE, STEP mode functions for testing power line disturbance (PLD) simulation
- Voltage dips, short interruption and voltage variation simulation
- Harmonics, inter harmonics waveform synthesizer
- Comprehensive measurement capability, including current harmonics
- Analog programmable interfaces
- Remote interface: GPIB, RS 232, USB, and Ethernet
- Capable of delivering power output up to 90KVA by implementing master slave parallel operation

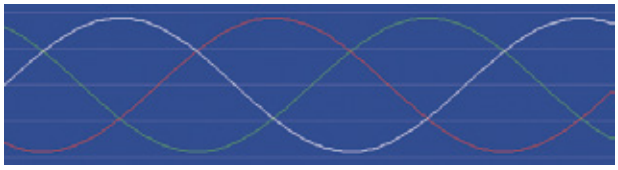
Chroma

ADVANCED PWM TECHNOLOGY

The Chroma 61500/61600 series AC power sources are able to provide the highest power density through an advanced high speed PWM mode design. The modularized power stage design offers outstanding performance and high reliability. This design also allows service personnel to identify trouble spots more efficiently and minimize downtime. With no transformer at the output stage, it not only reduces output impedance, but also allows the 61500/61600 series to be able to program a DC component for simulating AC voltage with a DC offset condition. This function allows users to simulate test conditions for unbalanced input currents for rectified loads.

SINGLE-PHASE AND THREE-PHASE OUTPUT

Model 61511/61512/61611/61612 AC sources are capable of delivering either single or three-phase output depending on the application. Users can select these output modes easily through front panel or via remote control. Model 61511/61512/61611/61612 AC sources are able to provide full power output without derating even with the output configured as single phase.

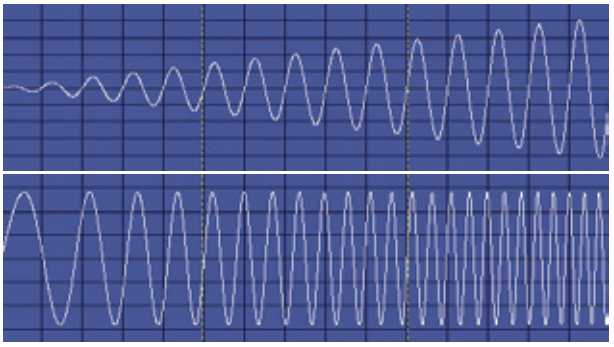


Phase Waveform

Panel

SLEW RATE SETTING FOR VOLTAGE AND FREQUENCY

Model 61511/61512/61611/61612 AC sources let users set the slew rate for voltage and frequency. It will follow the slew rate to reach the final setting when the output voltage or frequency is changed. This function can help users verify the operation range of input power. For example, a user can implement this feature to sweep the voltage gradually from 90V to 264V, instead of only checking several points like 90V, 115V, 230V and 264V. Slew rate can also be used to reduce the inrush current during motor startup or power on of multiple UUT.



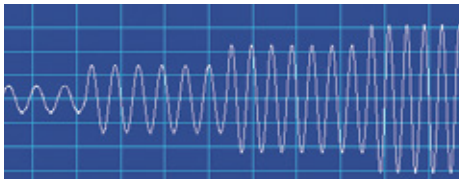
COMPREHENSIVE MEASUREMENTS

The Chroma model 61500/61600 AC power sources have a built in 16-bit measurement circuit and firmware utilities for measuring true RMS voltage, current, true power, VA (apparent power), VAR (reactive power), power factor, current crest factor, peak repetitive current, and inrush current. Using the advanced DSP technology, 61500 series can measure THD and up to 40 orders of current harmonics. This makes the 61500 series not only a sophisticated power source, but also a powerful electrical analyzer.

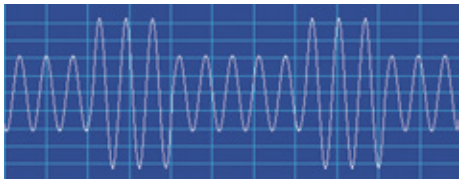
POWER LINE DISTURBANCE SIMULATION (61500 SERIES)

In addition to steady output voltage and frequency programming, Chroma AC power source 61500 series provides powerful functions to simulate a variety of power line disturbance conditions. The STEP and PULSE modes offer an easy and convenient method to execute either single step or continuous output changes. These changes may be triggered by either internal or external events. With this capability, it is easy to simulate power line disturbances like cycle dropouts, transient spikes, brown outs, and more.

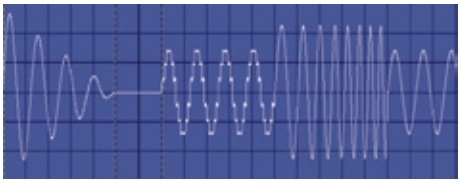
The LIST Mode extends these functions for more complex waveform generation needs. With up to 100 sequences of different start-end conditions, the source can perform almost any waveform possible for AC and DC components. In this way, the Chroma AC power source 61500 series is capable of simulating all sorts of voltage dips, interruptions, and variation waveforms for IEC 61000-4-11, IEC 61000-4-14, and IEC 61000-4-28 compliance tests. It also allows users to synchronize external events and measurement devices with output changes.



STEP Mode



PULSE Mode

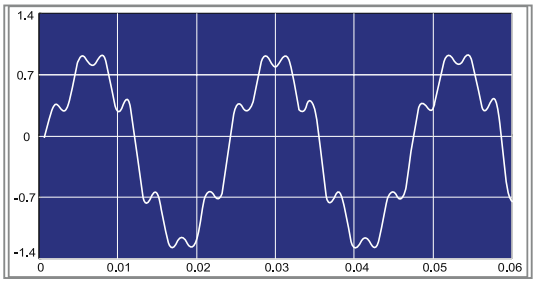


LIST Mode

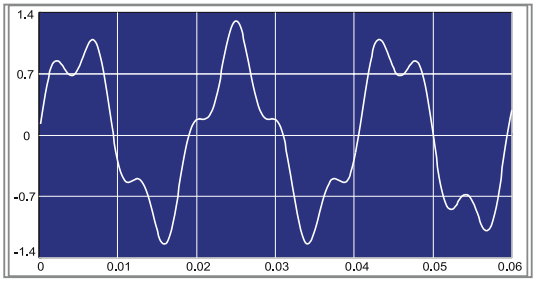
DISTORTION WAVEFORM, HARMONICS, INTERHARMONICS SYNTHESIS (61500 SERIES)

Traditional types of AC sources only provide an output voltage with a sine waveform, and this type of AC source is unable to meet and keep up with the latest test requirements for simulating input voltage abnormal conditions with distortion waveforms. The WAVEFORM function allow user to set square, clipped-sine wave and 30 stored distortion waveforms.

The 61500 series allows users to composite up to 40 orders of harmonic components based on a 50Hz or 60Hz fundamental. The output will be a periodic harmonics distorted waveform. It also provides a sweeping interhamonics function. This means that the fundamental frequency will incorporate with a frequency sweeping component between harmonic frequencies. It can help to find the resonance or the weakest points of a UUT. The Chroma AC source 61500 series uses advanced DSP technology to synthesize the harmonic and interharmonics waveforms. Therefore it is capable of generating a periodic harmonic and non-periodic harmonic distorted waveform to perform IEC 61000-4-13 compliance tests.



Harmonic Waveform



Interharmonics Waveform

PROGRAMMABLE OUTPUT IMPEDANCE (61500 SERIES)

The Chroma AC source 61500 series allows users to program output impedance. A current feedback control circuit causes the output voltage to change with the load. This feature is suitable for IEC 61000-3-3 Flicker tests, or other test conditions with a particular output impedance requirement. It provides users a convenient and cost effective way to implement the reference impedance.

AC SOURCE - MASTER - SLAVE - PARALLEL OPERATION

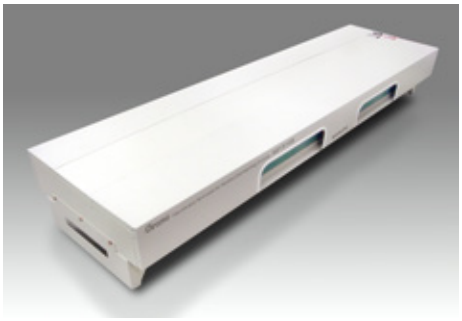
The 61511/61512/61611/61612 AC source models provide Master-Slave parallel operation, which allows users to extend the AC source power output capability by connecting multiple AC sources in parallel. The maximum allowable number of AC sources that can be implemented in parallel operation is 5 units. Users can achieve a maximum power output up to 90KVA by combining 5 units of assorted AC source of 18KVA in Master-Slave parallel operation. The user could also use the A615103 Power Stage as an alternative cost effective solution for parallel operation, by implementing it as slave unit. Please refer to the following figures to setup for parallel operation of AC source models 61511/61512/61611/61612.


Master Mode Slave Mode

Combine two units of Model 61512 for obtaining 36KVA power output or combine AC source models 61512 + 61511 for obtaining 30KVA power output


Master Mode Slave Mode Slave Mode

Combine AC source Model 61512 with two units of A615103 (18KVA) for obtaining 54KVA power output

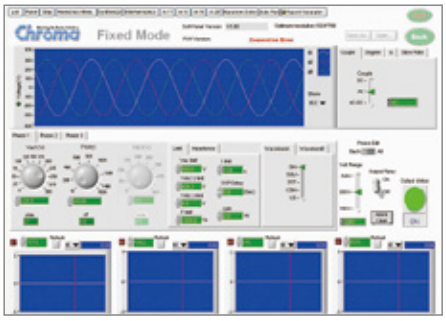


A615104: Input/Output terminal fixture for connecting 2 parallel AC source units.

To reduce the hassle of arranging the input and output wiring of multiple AC sources connected for parallel operation, users can implement the Chroma input/output terminal fixture (A615104/A615105) designed specifically to make the wiring simple.

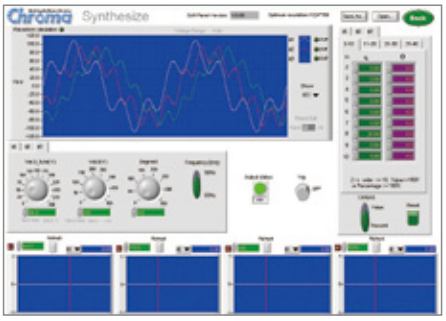
THE 61500/61600 SERIES SOFTPANEL*

The Chroma Softpanel is a graphical user interface which provides extraordinary capability and convenience to users for remote control and operation of the unit. The 61500/61600 series Softpanel is designed specifically for offering users control of the AC source by applying a user friendly interface in a graphical, instrument like setting. The self-explanatory graphical interface makes configuration of the extensive functions of the AC source easy with just few clicks of the mouse. Users are able to perform online and offline waveform editing with the implementation of the Softpanel. The Softpanel is also designed with data recording functions so that multiple measurements can be recorded simultaneously. One of the most powerful features of the Softpanel is the availability of a test environment configured specifically for conducting IEC regulation tests like IEC 61000-4-11, IEC 61000-4-13, IEC 61000-4-14, and IEC 61000-4-28.



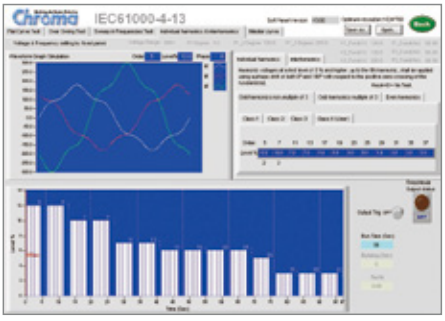
Main Operation Menu

Transient Voltage Programming

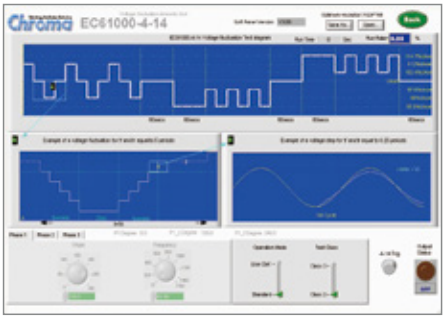


Distorted Waveform Editor

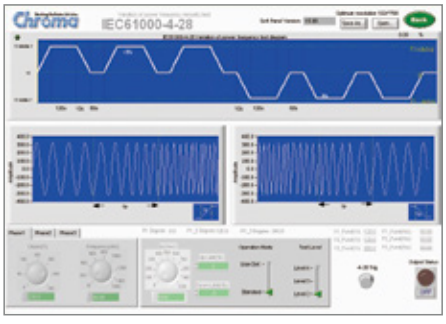
Voltage DIP, Short Interruption, Variation Regulation Test



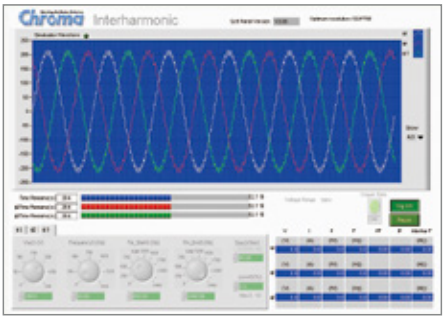
Voltage Harmonic & Interharmonic Test



Voltage Fluctuation Test



Frequency Variation Test



Interharmonic Test

Recording Function

* Softpanel support functions are actually depending on the AC Source model being implemented. For instance, Softpanel will not provide support for LIST mode function if 61600 series AC Source is implemented.

SPECIFICATIONS

Model	61511	61611	61512	61612	61511+A615103	61611+A615103	61512+A615103	61612+A615103
Output Phase	1 or 3 selectable							
Output Rating-AC								
Power	12kVA		18kVA		30kVA		36kVA	
Each Phase	4kVA		6 kVA		10kVA		12kVA	
Voltage								
Range	0~150V/0~300V							
Accuracy	0.1%+0.2%F.S.							
Resolution	0.1 V							
Distortion *1	0.3% @ 50/60Hz , 1% @ 15~1kHz,1.5% @ >1kHz							
Line Regulation	0.1%							
Load Regulation *2	0.2%							
Temp. Coefficient	0.02% per degree from 25˚C							
Max Current (1-phase mode)								
RMS	96A / 48A		144A / 72A		240A / 120A		288A / 144A	
Peak (CF=4)	384A / 192A		576A / 288A		960A / 480A		1152A / 576A	
Max Current (each phase in 3-phase mode)								
RMS	32A / 16A		48A / 24A		80A / 40A		96A / 48A	
Peak (CF=4)	128A / 64A		192A / 96A		320A / 160A		384A / 192A	
Frequency								
Range	DC, 15~1.5kHz							
Accuracy	0.01%							
Resolution	0.01 Hz							
Phase								
Range	0 ~ 359.9˚							
Resolution	0.3˚							
Accuracy	<0.8˚ @ 50/60Hz							
DC Output (1-phase mode)								
Power	6kW		9kW		15kW		18kW	
Voltage	212V / 424V		212V / 424V		212V / 424V		212V / 424V	
Current	48A / 24A		72A / 36A		120A / 60A		144A / 72A	
DC Output (3-phase mode)								
Power	2kW		3kW		5kW		6kW	
Voltage	212V / 424V		212V / 424V		212V / 424V		212V / 424V	
Current	16A / 8A		24A / 12A		40A / 20A		48A / 24A	
Input AC Power (each phase)								
AC type	3-phase, Delta or Y connecting							
Voltage Operating Range *3	3Ø 200~240V±10%V_{LN} (Delta: L-L ; Y: L-N)							
Frequency Range	47-63 Hz							
Max. Current	Delta: 80A ; Y: 70A*6		Delta: 120A ; Y: 90A *6		Delta: 200A ; Y: 160A *6		Delta: 240A ; Y: 180A *6	
Measurement								
Voltage								
Range	150V / 300V							
Accuracy	0.1%+0.2%F.S.							
Resolution	0.1 V							
Current								
Range	128/32/8 A peak		192/48/12 A peak		320/80/20 A peak		384/96/24 A peak	
Accuracy (RMS)	0.4%+0.3%F.S.							
Accuracy (peak)	0.4%+0.6%F.S.							
Resolution	0.1 A							
Power								
Accuracy	0.4%+0.4% F.S							
Resolution	0.1 W							
Others								
Power Line Distortion Simulation	LIST/PULSE/ STEP functions	--	LIST/PULSE/ STEP functions	--	LIST/PULSE/ STEP functions	--	LIST/PULSE/ STEP functions	--
Waveform Synthesis	40 orders @ 50/60Hz	--	40 orders @ 50/60Hz	--	40 orders @ 50/60Hz	--	40 orders @ 50/60Hz	--
Harmonic Measurement	Voltage/Current 40 orders @50/60Hz	--	Voltage/Current 40 orders @50/60Hz	--	Voltage/Current 40 orders @50/60Hz	--	Voltage/Current 40 orders @50/60Hz	--
Programmable Impedance	0Ω+200μH ~ 1Ω+1mH	--	0Ω+200μH ~ 1Ω+1mH	--	0Ω+200μH ~ 1Ω+1mH	--	0Ω+200μH ~ 1Ω+1mH	--
Efficiency *4	0.75 (Typical)							
Protect	UVP, OCP, OPP, OTP, FAN							
Interface	GPIB, RS-232, USB, Ethernet (standard)							
Temperature								
Operating	0˚C ~40˚C							
Storage	-40˚C~85˚C							
Humidity	30 %~90 %							
Safety & EMC	CE (include EMC & LVD)							
Dimension (H x W x D)	1163 x 546 x 700 mm / 45.78 x 21.5 x 27.56 inch *5				1163 x 546 x 700 mm / 45.78 x 21.5 x 27.56 inch x 2 units *5			
Weight	229.4 kg / 505.29 lbs		242.4 kg / 533.92 lbs		480 kg / 1057.27 lbs		495 kg / 1090.31 lbs	

Note*1 : Maximum distortion is tested on output 125VAC (150V RANGE) and 250VAC (300V RANGE) with maximum current to linear load.
Note*2 : Load regulation is tested with sine wave and remote sense.
Note*3 : Models with 277V_{LN}/480V_{LL}(5 Wires) AC input voltage are available upon request.
Note*4 : Efficiency is tested on input voltage 230V.
Note*5 : Dimension (H X W X D) with wheelsets : 1246x546x700 mm / 49.05x21.5x27.56 inch
Note*6 : Maximum current on input neutral line
All specifications are subject to change without notice.

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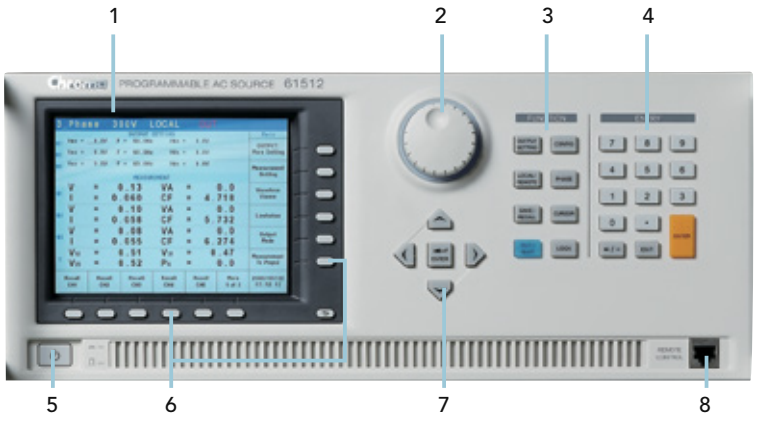
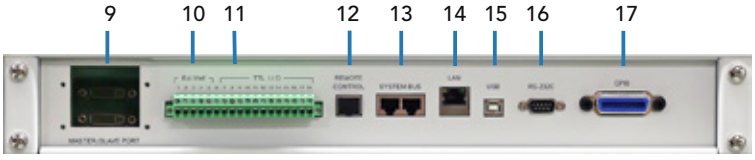
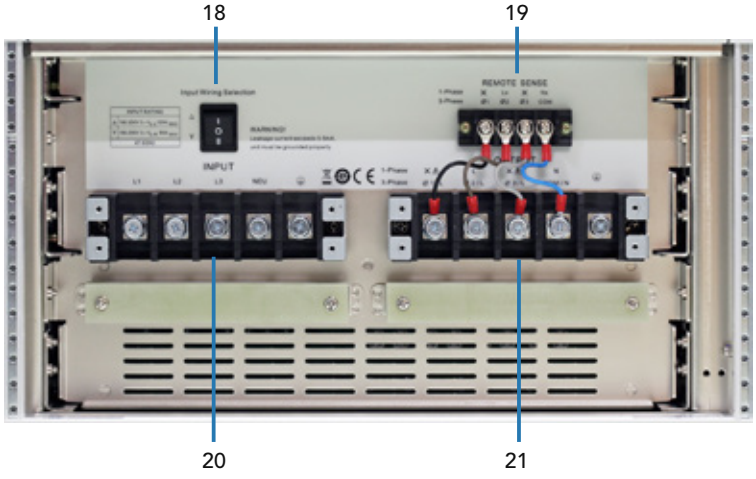
PANEL DESCRIPTION

FRONT PANEL OVERVIEW



REAR PANEL OVERVIEW





1. LCD Display :
   6.5 inches graphic LCD display for settings and measurements read back
2. Rotary Knob
   Use to adjust the voltage, frequency and parameters setting
3. Function key
   Hot keys for quick parameter setting
4. Numeric key
   For data setting
5. Power Switch
6. Soft Keys
   The soft-keys adjacent to the command block display on the LCD that provides users a menu driven interface to control the AC source operation
7. Cursor Key
   For cursor movement
8. Remote Control Port
9. Master/Slave Port
   For Master-Slave parallel operation
10. External V reference
    External analog signal for voltage control
11. TTL I/O
    Signals for system integration
12. Remote Control Port
13. System Bus
14. Ethernet Interface
15. USB Interface
16. RS-232 Interface
17. GPIB Interface
18. Input Power Selection Switch
    △ or Y 3-phase connection selection
19. Remote Sense
    Use to compensate the line drop between AC source and testing point
20. Input Terminal
21. Output Terminal

ORDERING INFORMATION

61511: Programmable AC Source 0~300V, 15~1.5KHz/12KVA, 1ø/3ø
61512: Programmable AC Source 0~300V, 15~1.5KHz/18KVA, 1ø/3ø
61611: Programmable AC Source 0~300V, 15~1.5KHz/12KVA, 1ø/3ø
61612: Programmable AC Source 0~300V, 15~1.5KHz/18KVA, 1ø/3ø

* Option for 277V_{LN}/480V_{LL}(5 Wires) AC input voltage are available with 61511/61512/61611/61612/A615103 models. Please contact with local sales representative for ordering information.

A615007: Softpanel for 61500/61600 Series
A615103: Parallable power stage unit 18KVA, 1ø/3ø
A615104: Input/Output terminals for parallel connecting (2 units)
A615105: Input/Output terminals for parallel connecting (3 units)
A615106: Reverse Current Protection Unit for 61511/61512/61611/61612

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