LXinstruments GmbH
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71154 Nufringen
Germany

TECHNICAL PRODUCT INFORMATION

Test & measurement instruments

- high - quality
- moderate prices
- excellent precision

Your contact:

Technical support, services, demo & rental equipment, price information & quotes, consulting:

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Mail: sales@lxinstruments.com
Web: www.lxinstruments.com
Shop: www.lxinstruments.com/shop

APM Technologies

SP-300 Series Single-phase Programmable AC Power Supply

- High Stability
- High Precision
- High Efficiency

SP-300 Series Single-phase Programmable AC Power Supply

(2U)600W~1500W

(3U)2000W

(4U)3000W~5000W

Output			Model	Size	Standard Interface	Optional Information	Certificates
Voltage	Current	Power					
150V/300V	5.6A/2.8A	600W	SP300VAC600W	2U ❶	RS232/RS485/USB	(1) (2) (3)	CE/UL/CSA/FCC
150V/300V	9.2A/4.6A	1000W	SP300VAC1000W	2U ❶	RS232/RS485/USB	(1) (2) (3)	CE/UL/CSA/FCC
150V/300V	13.8A/6.9A	1500W	SP300VAC1500W	2U ❶	RS232/RS485/USB	(1) (2) (3)	CE/UL/CSA/FCC
150V/300V	16A/8A	2000W	SP300VAC2000W	3U ❷	RS232/RS485/USB	(4) (5) (6)	CE/UL/CSA/FCC
150V/300V	27.6A/13.8A	3000W	SP300VAC3000W	4U ❸	RS232/RS485/USB	(4) (5) (6)	CE/UL/CSA/FCC
150V/300V	32A/16A	4000W	SP300VAC4000W	4U ❸	RS232/RS485/USB	(4) (5) (6)	CE/UL/CSA/FCC
150V/300V	46A/23A	5000W	SP300VAC5000W	4U ❸	RS232/RS485/USB	(4) (5) (6)	CE/UL/CSA/FCC

* When the frequency is below 200Hz, the output voltage can reach 320V (only applicable to 3U and 4U models)

Dimensions & Weight

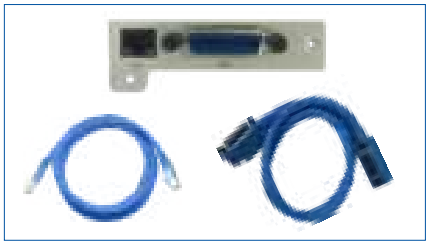
❶ 423.0x87.0x520.0 mm & 15.9kg

❷ 423.0x133.0x520.0 mm & 21.4kg

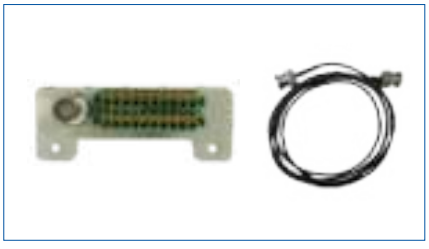
❸ 423.0x177.0x520.0 mm & 29kg

Optional Information

(1) LAN & GPIB interface card & cables



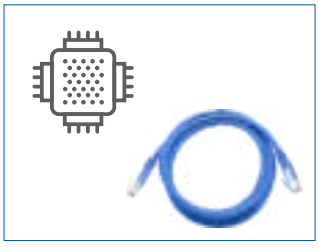
(2) Analog I/O interface card & cable



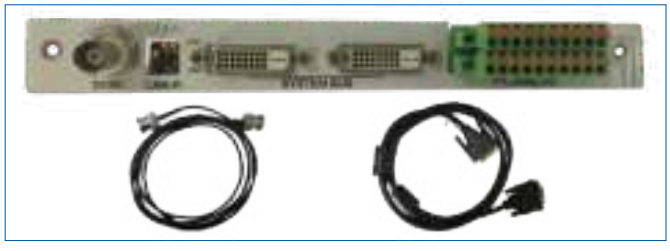
(3) Multiphase link card & cable

(4) GPIB interface card & cable

(5) LAN interface card & cable



(6) Analog I/O & multiphase link card & cables



Features

- Large color touch screen with intuitive interface, easy to operate
- Features AC, DC, AC+DC output modes, AC+DC output mode for voltage DC offset simulation
- Turn on, turn off phase angle control, 0-359.9°
- Output frequency: 15-1200Hz, programmable slew rate setting for changing voltage and frequency
- High output current crest factor which is ideal for inrush current testing
- Built-in power meter function, can real-time measure 15 electrical parameters such as RMS voltage, current, power, apparent power and etc. This series AC source can measure up to 40 orders of the voltage or current harmonics. Support LIST/PULSE/STEP modes to simulate all kinds of power line disturbance conditions
- Triac Dimmer function for dimming/governor simulation function
- Sweep function for efficiency testing and shows voltage and frequency value at max power
- Multiple current range to make current measurement more accurate
- Front panel USB interface supports CSV format to import waveform
- OCP/OVP/OPP/OTP/reverse current protection/short circuit protection
- Programmable voltage and current limit, support CC mode
- Support up to 2 units in series, 4 units in parallel
- Support three phase power output, can simulate three phase unbalanced output
- Support external analog input control and TTL electrical level output
- Two versions to meet the cost performance and different applications

Difference between Advanced Version and Professional Version

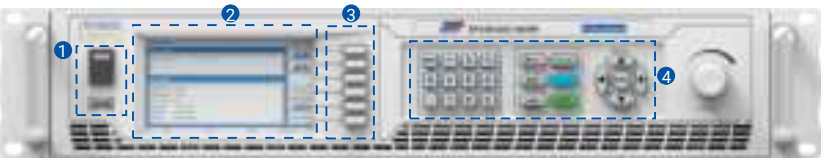
Function description	Advanced Version	Professional Version
Output frequency range	15~1000Hz	15~1200Hz
Built-in IEC standards	IEC 61000-4-11	IEC 61000-4-11; IEC 61000-4-13; IEC 61000-4-14; IEC 61000-4-28
Programmable output impedance	Not supported	Support, meet IEC 61000-3-2/ IEC 61000-3-3 output impedance test requirements
Harmonic/inter-harmonic generation simulation and measurement function	Not supported	Support, the harmonic components can be up to 40 orders

Panel Introduction

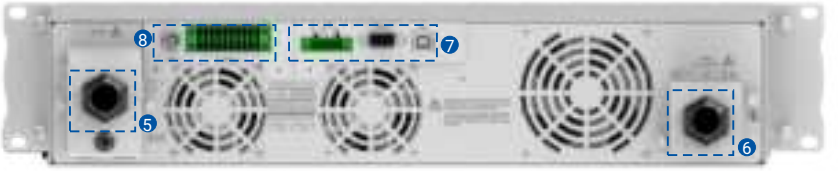
0.6 - 1.5kVA

1. Power Switch (Up), USB Interface (Down)
2. Color Touch Screen
3. Multifunctional Keys
4. Numeric and Functional Keys
5. Output Terminal
6. AC Input Terminal
7. RS485/RS232/USB Communication Interface (LAN & GPIB Interface Card is Optional)
8. Analog I/O Interface Card (Optional)

■ Front Panel Introduction



■ Rear Panel Introduction

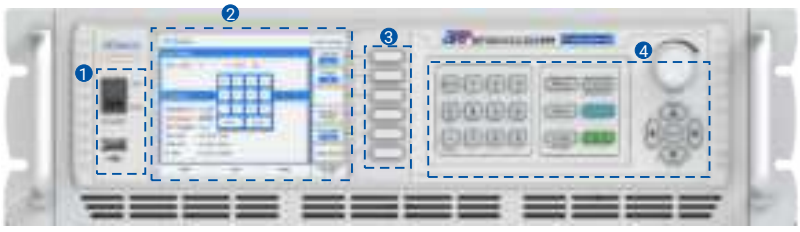


Note: If the LAN&GPIB communication card is selected, it will replace RS485/RS232/USB to be installed in the same position;
If parallel/multiphase interface card is selected, it will replace remote I/O interface card to be installed in the same position.

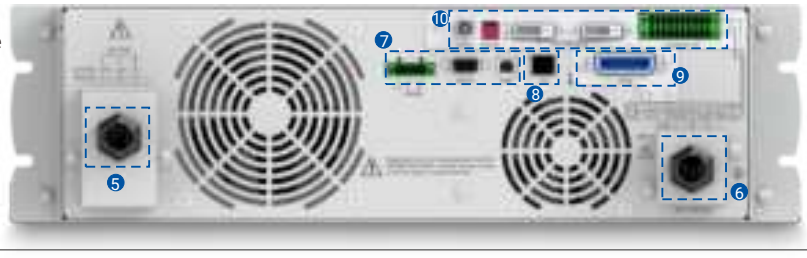
2 - 5kVA

1. Power Switch (Up), USB Interface (Down)
2. Color Touch Screen
3. Multifunctional Keys
4. Numeric and Functional Keys
5. Output Terminal
6. AC Input Terminal
7. RS485/RS232/USB Communication Interface
8. LAN Communication Interface (optional)
9. GPIB Communication Interface (optional)
10. Analog I/O & multiphase link card (optional)

■ Front Panel Introduction



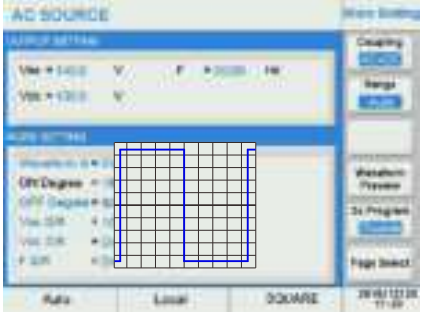
■ Rear Panel Introduction



Function Introduction

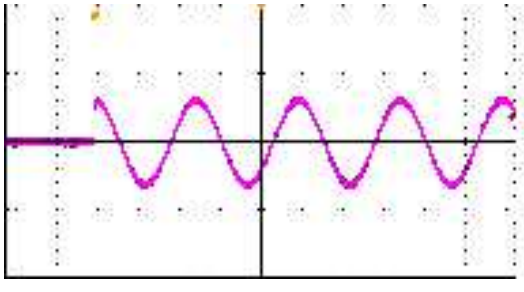
Graphical User Interface

The large color touch screen provides simple and fast operation for customers, real-time update of display output data and power status, and graphical display makes it more intuitive.



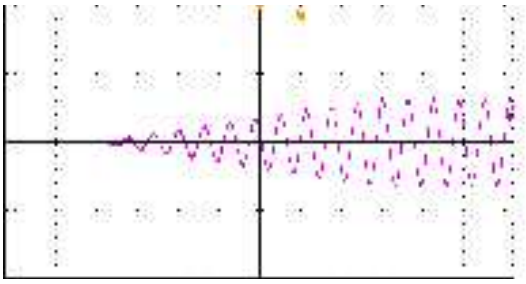
Settable ON/OFF Phase Angle of Output Waveform

This series of AC power supply can set the ON phase and OFF phase of sinusoidal output waveform, suitable for the output test of switching power supply. Set the ON angle to 90 degrees for surge current testing, the power supply will show the measured value of surge current. Users can set when start to measure the surge current and the duration of the measurement.



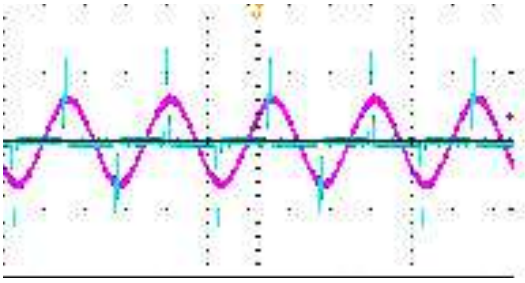
Slew Rate Setting For Voltage and Frequency

This series AC power supply let users set the slew rate of voltage and frequency, in such application in order to reduce the inrush current during motor or compressor startup.



High Output Crest Factor

This series AC power supply deliver up to 5~6 times of peak current from its RMS current, so it is suitable for testing switching power supplies and motor with high inrush current issue.

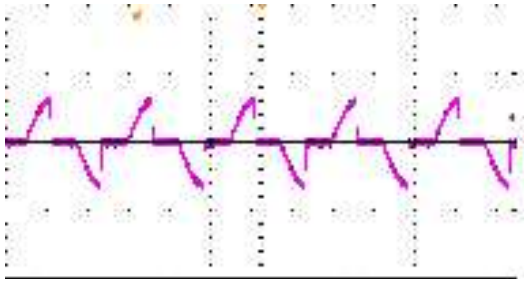


Power Sweep Function

This series AC power supply can test the efficiency of switching power supply and capturing the voltage, current, power and frequency at the maximum power operating point, the measurements will be displayed at the end of the sweep.

Triac Dimmer Function

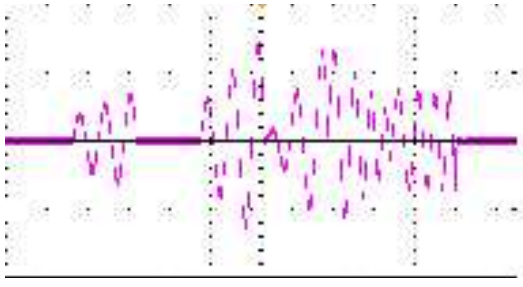
This series AC power supply built-in triac dimmer function, which is used to do dimming and speed regulating test for lamp or electric motor to ensure the products work well both in R&D and production testing.



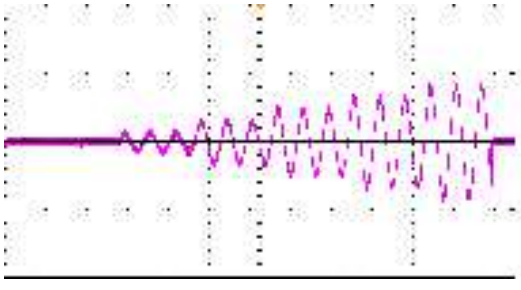
Power Line Disturbance Simulation

This series AC power supply provides powerful function to simulate all kinds of power line disturbance conditions such as cycle dropout, transient spike, brown out and etc. This feature make this series AC power supply ideal for R&D labs, universities and certification labs.

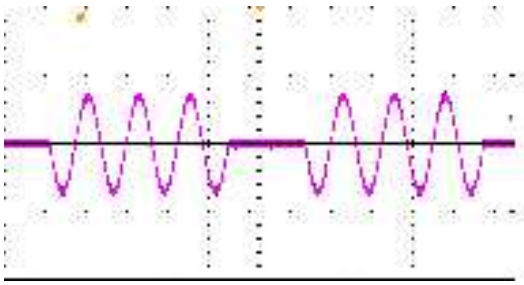
LIST Mode



STEP Mode

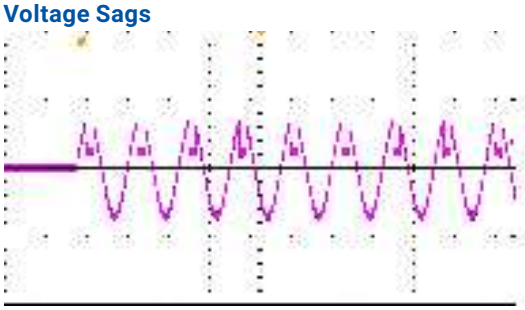


PULSE Mode

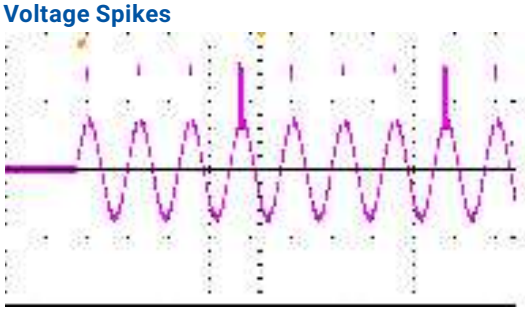


Voltage Sags/Voltage Spikes

Voltage Sags

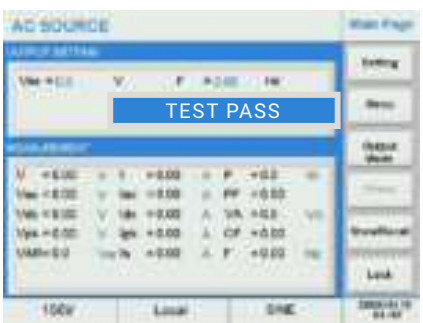


Voltage Spikes



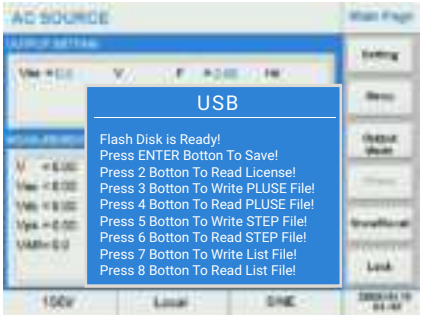
Test Mode

The test mode compares measurement values against a user defined set of measurement limits and shows a PASS or FAIL result in one or more measurement are out of range. The user can set when start of the measurement and duration of the test.



File Save and Recall Via The USB Interface

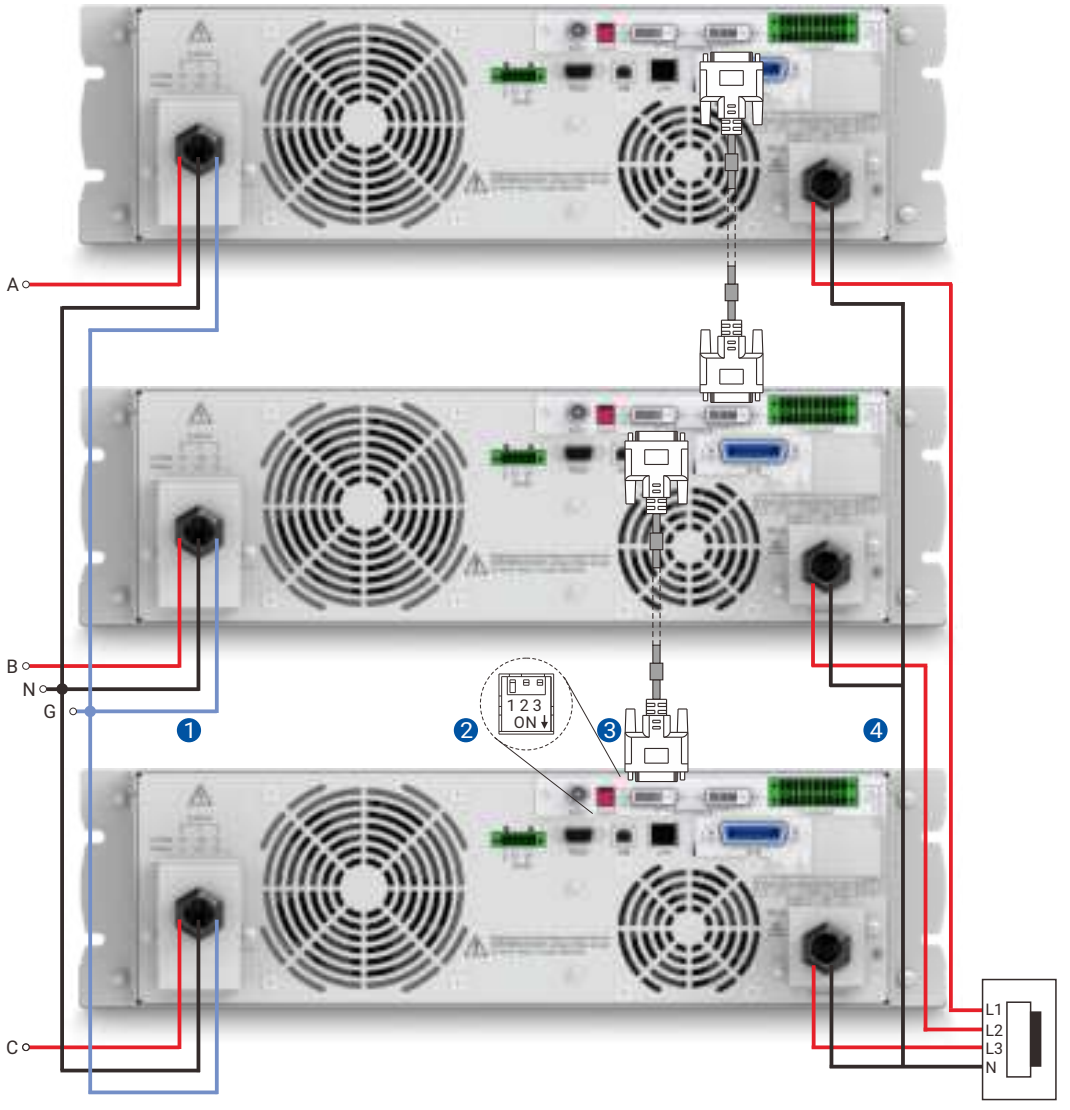
The user can save the screenshot via the USB interface in the front panel. The user can import a CSV file via the USB interface to generate waveform output.



Parallel/Series/3-Phase Mode

This series AC power source can be used in parallel or series to provide more power, the maximum current up to 184A and the voltage up to 600V. In 3-phase mode, the Master unit is always phase A, Slave 1 is always phase B and Slave 2 is always phase C. The phase difference between phase A and B is always 120° and between phase A and C is always 240°. The output voltage of phase B and C will be set to the same setting as that for phase A (Master) if the Voltage Mode is set to COM. Or if the Voltage Mode is set to Multi, phase B and C output voltage can be set individually to simulate 3-phase unbalance system. The output of 3-Phase system can be connected for three-phase, four wire (Delta configuration) loads or for three-phase, five wire (Wye configuration) according to the application requirement.

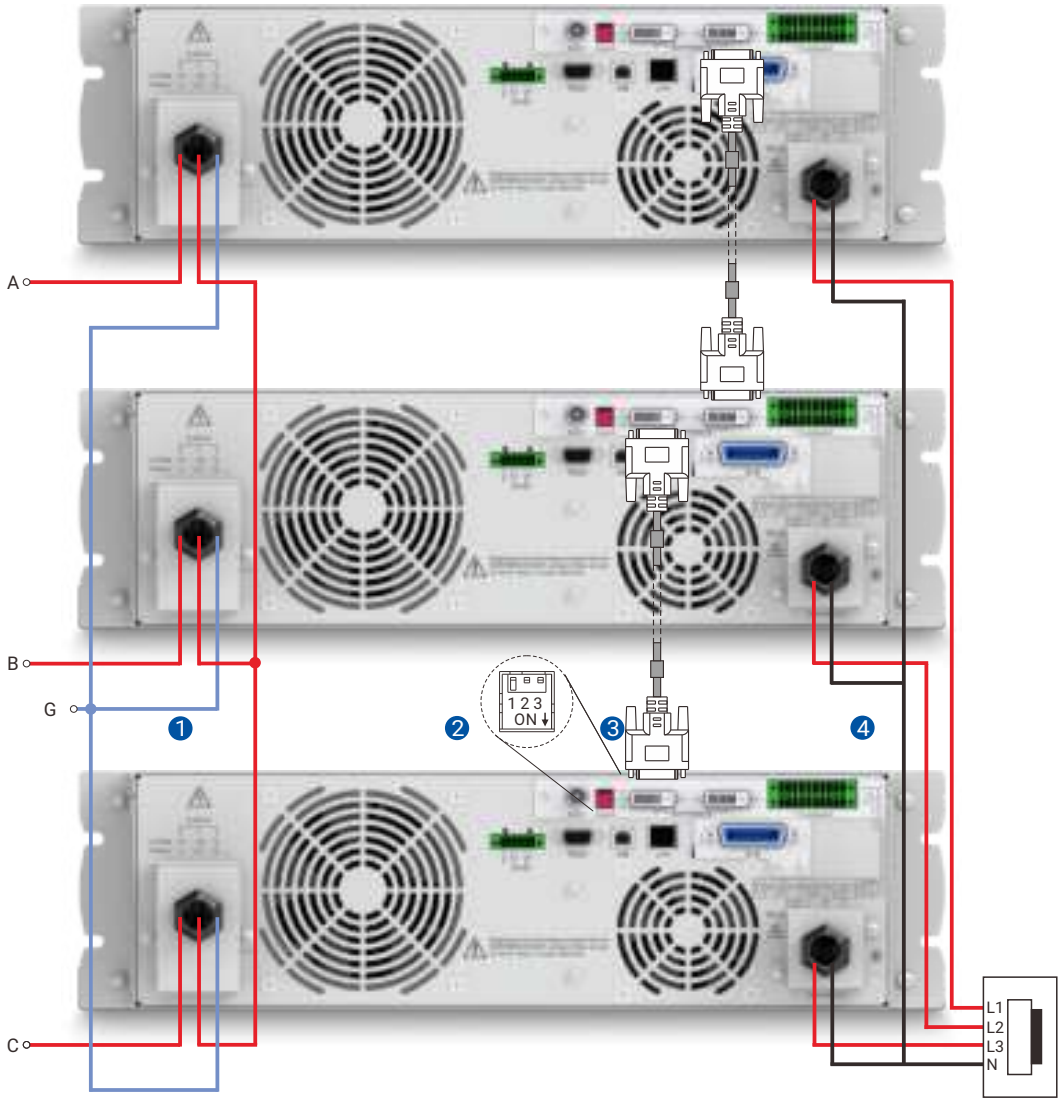
Three-phase five-wire connection (Wye type)



1. Output connections
2. Terminal resistance CAN-R, flip Dip switch 1 to ON position (Down)
3. System bus communication cable.
4. Only support three-phase five-wire connection

The output voltage range of three-phase five-wire (Wye type) connection is 0 ~ 300V.

Three-phase four-wire connection (Delta type)



1. Output connections
2. Terminal resistance CAN-R, flip Dip switch 1 to ON position (Down)
3. System bus communication cable.
4. Only support three-phase five-wire connection

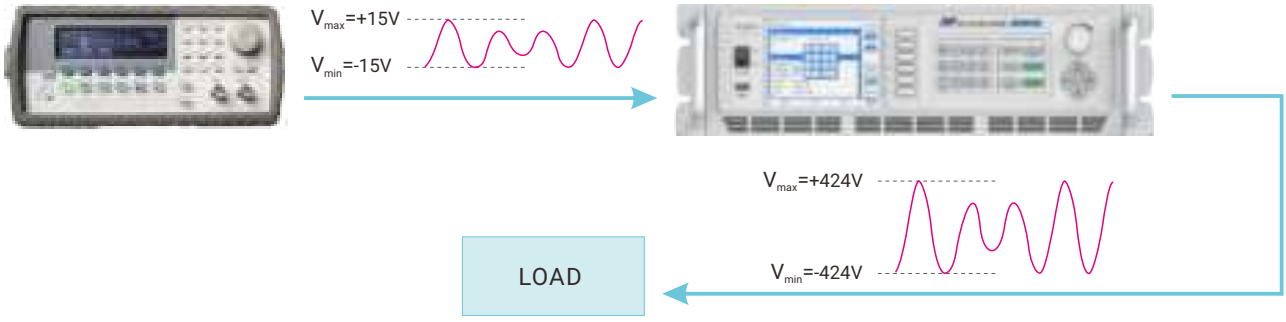
The output voltage range of three-phase four-wire (Delta type) connection is 0 ~ 519V

External Control Function

By selecting Analog I/O card to achieve below function:

1) Amplifier Mode

In Amplifier mode, the power source acts as a power amplifier, taking a low-level analog signal and amplifying it by a fixed amount of gain.



2) External Control Instruction

Pin No.	Reference	Type	Description	Maximum
Pin1	ON/OFF	EXT.V	Control input for output on/off, low level (0~0.5V) disables the output, high level (4.5~5.5V) enables the output	6Vdc
Pin2	KEEP OFF[1]	EXT.V	Keep OFF function, low level (0-0.5V) disables the function, high level (4.5-5.5V) enables the function	
Pin3	RESET	EXT.V	High level (4.5 ~ 5.5V) will enable alarm clear function	
Pin4	CALL 1	EXT.V	0=low electrical level (0-0.5V), 1= high electrical level (4.5 ~ 5.5V)	
Pin5	CALL 2	EXT.V	0=low electrical level (0-0.5V), 1= high electrical level (4.5 ~ 5.5V)	
Pin6	CALL 3	EXT.V	0=low electrical level (0-0.5V), 1= high electrical level (4.5 ~ 5.5V)	
Pin7	N/A	EXT.V	Not Used	–
Pin8-10	⏚	EXT.V	GND	–

[1] If the KEEP OFF signal keeps high (enable) there will be always no output.

3) TLL Signal Instruction

Pin No.	Reference	Type	Description	Maximum	Electrical Parameters
Pin1-2	RELAY1-PASS	TTL	These two pins will connected internally when the unit passed the test mode	250VAC 3Amp/ 30VDC 3Amp	These pins without positive andnegative polarity, do not share the ground netither.
Pin3-4	RELAY2-FAIL	TTL	These two pins will connected internally when the unit failed the test mode		
Pin5-6	RELAY3-RUN	TTL	These two pins will connected internally when the unit is running		
Pin7-8	RELAY4	TTL	Not Used	–	–
Pin9-10	⏚	TTL	GND	–	–

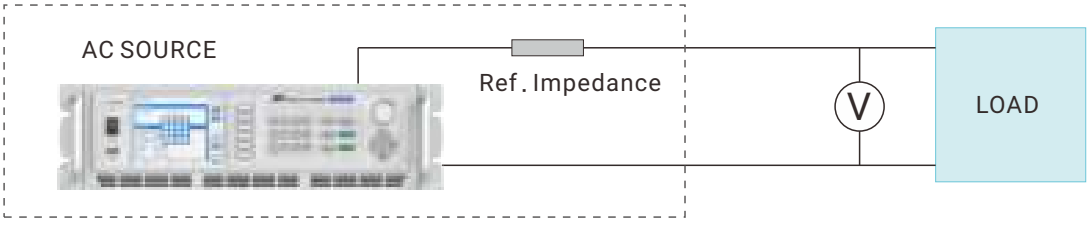
Firmware Upgrade

This series AC power source supports firmware upgrade. The DSP firmware can be upgraded via RS232 communication, the display and remote firmware can be upgraded via the USB interface in the front panel. The upgrade process is very easy to operate. The upgrade feature keeps the latest software function supported by the power supply.

Professional Version Power Supply Function

Programmable Output Impedance Function

The low output impedance and low voltage harmonics of this series power supply make it ideal for IEC61000-3-2 standard testing. A current feedback control circuit makes the output voltage changed with load. This feature is suitable for IEC61000-3-3 Flicker tests. The user can set the resistance and inductance value according to the test requirement.



More Built-in IEC Standard Test Waveforms

Professional version supports more built-in IEC standard test waveforms

IEC 61000-4-11，Testing and measurement techniques-Voltage dips, short interruptions and voltage variations immunity tests (AC,<16A)

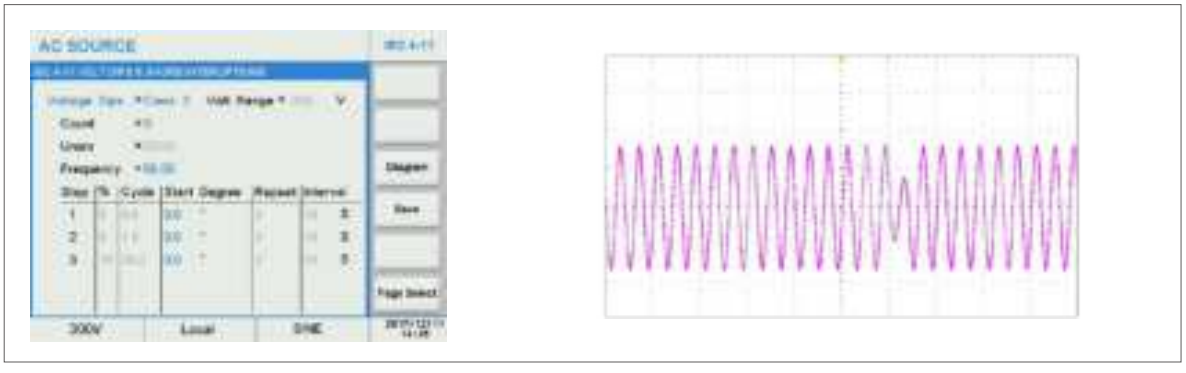
IEC 61000-4-13，Testing and measurement techniques-Harmonics and inter-harmonics including mains signaling at AC power port, low frequency immunity tests

IEC 61000-4-14，Testing and measurement techniques-Voltage fluctuation immunity test

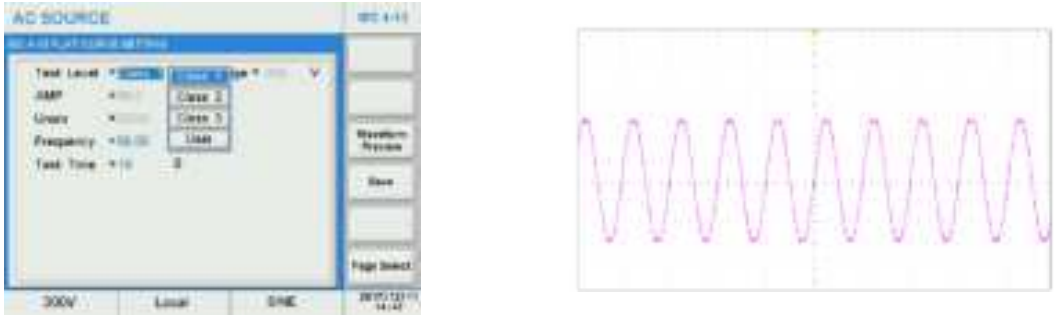
IEC 61000-4-28，Testing and measurement techniques-Variation of power frequency, immunity test for equipment with input current not exceeding 16 A per phase

The above standards can meet the power immunity test for products exported to Europe.

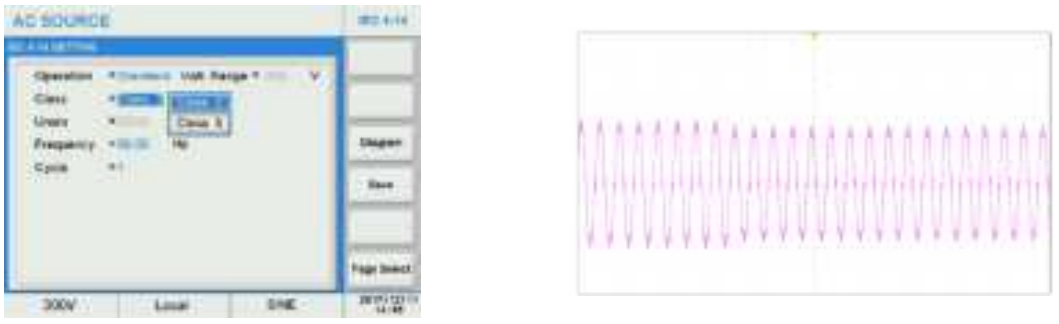
IEC 61000-4-11



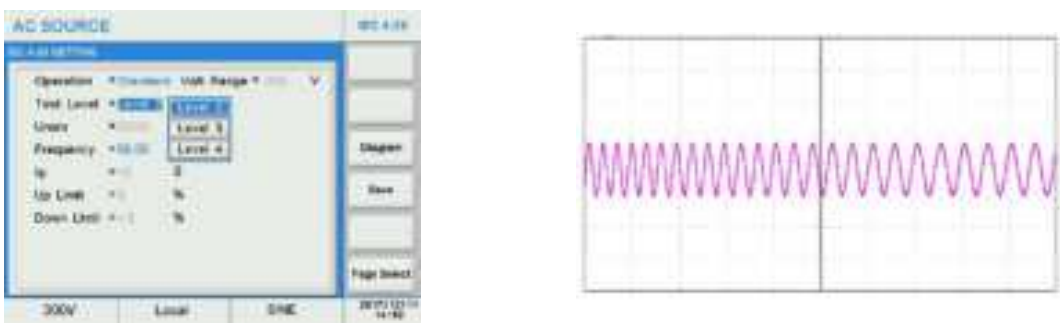
IEC 61000-4-13



IEC 61000-4-14

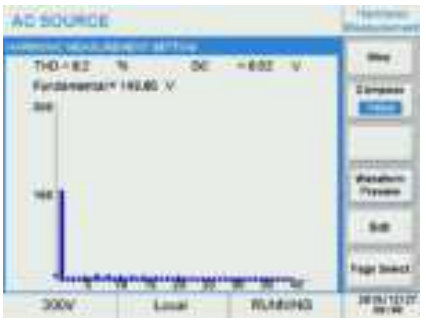


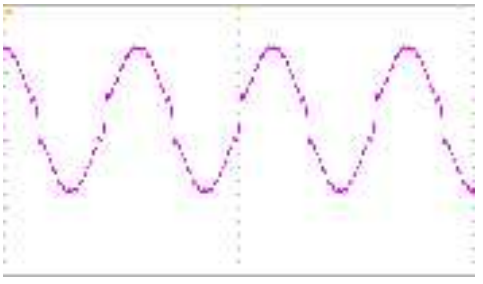
IEC 61000-4-28



Harmonic/inter-harmonic Generation Simulation and Measurement Function

Support creating waveforms made up of a series of harmonics frequencies, amplitudes and phase shifts, up to 40 orders harmonics of 50Hz or 60Hz. The harmonics measurement function measures total harmonic distortion (THD), DC voltage and current and fundamental voltage and current for output settings of 50Hz or 60Hz. The measurement of 2~40 orders can be displayed in absolute values or in percent of the fundamental, the harmonics measurement will be displayed with a graphical representation.





Monitoring Software

AC Waveform Simulation Panel is a graphical user interface that provides extraordinary capabilities and convenience by delivering control of the unit remotely, which covers all functions of panel operation.

Login Interface

Basic mode(Main interface)

IEC61000 4-11 interface

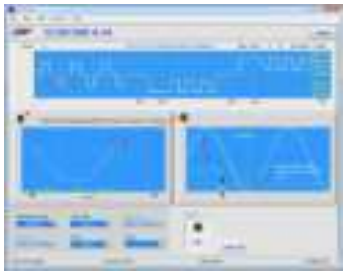
List mode interface

Pulse mode interface

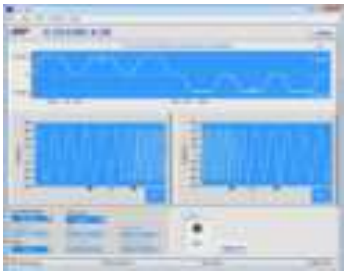
Step mode interface

IEC61000 4-13 interface

IEC61000 4-14 interface



IEC61000 4-28 interface

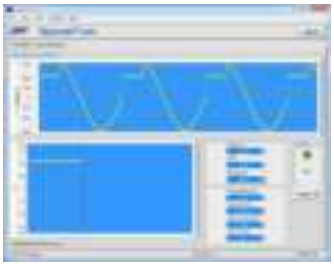


Synthesis mode interface

Harmonics Measure mode interface

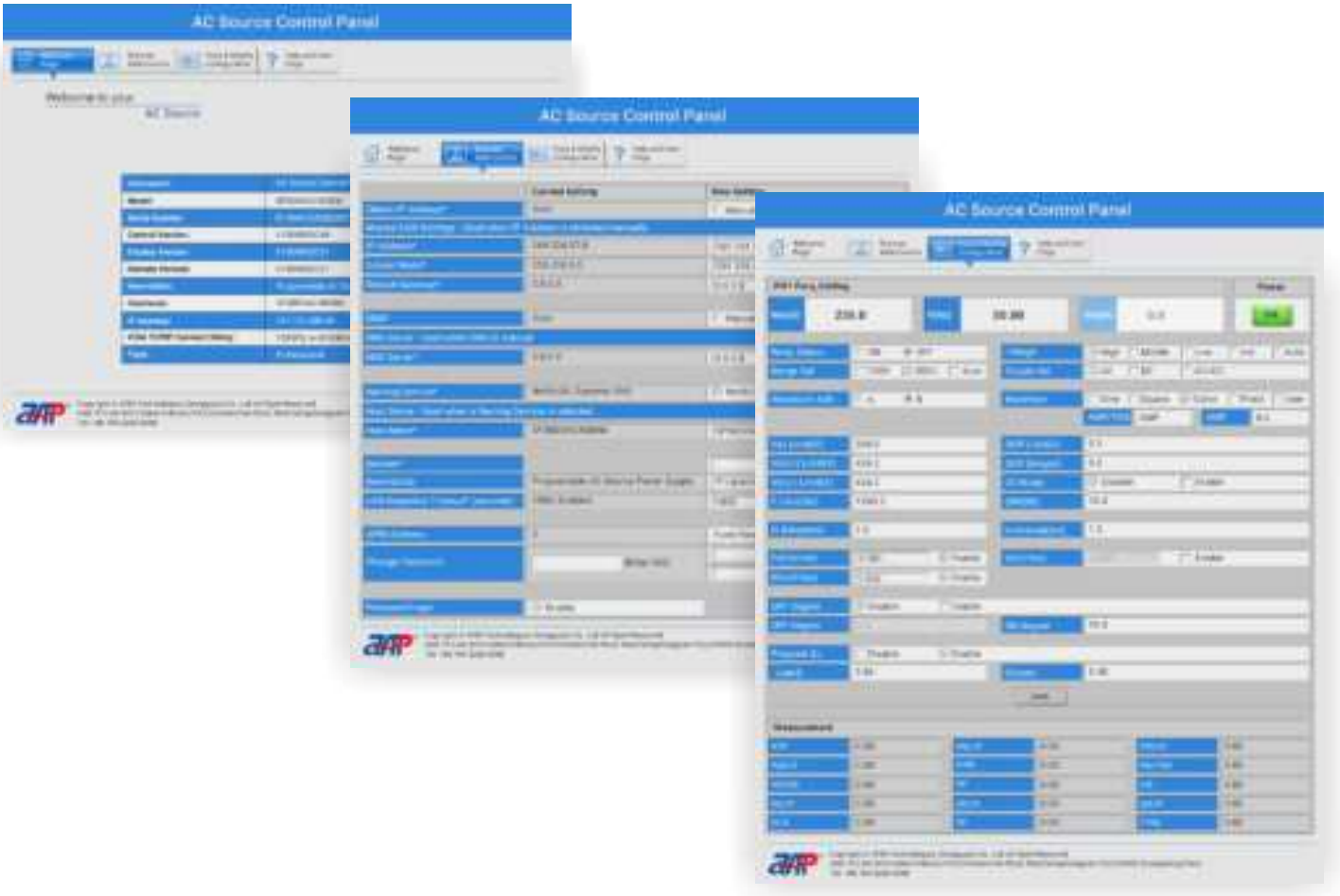
Auto run mode interface

Special Func interface



Web Server Function

This series AC power supply provides a built-in web server interface, then the user can configure and monitor the settings from the PC's Web browser.



SP-300 Series Single-phase Programmable AC Power Supply

Model		SP300VAC600W	SP300VAC1000W	SP300VAC1500W
Input				
Voltage		90~265VAC	90~265VAC	100~265VAC
Frequency		47~63Hz		
Phase		1 Phase, 2Wire+Groud		
Max. Current		10A	15A	19A
Power Factor at 220VAC Input, Full Load		≥ 0.91 Active PFC	≥ 0.95 Active PFC	≥ 0.97 Active PFC
Efficiency		> 82%(Peak) > 80% at 220VAC, 50Hz input/230VAC, 50Hz output, Full Load	> 86%(Peak) > 84% at 220VAC, 50Hz input/230VAC, 50Hz output, Full Load	> 87%(Peak) > 86% at 220VAC, 50Hz input/230VAC, 50Hz output, Full Load
Output				
AC Power		600VA	1000VA	1500VA
Max. Current (r.m.s)	0~150V(L)	5.6A	9.2A	13.8A
	0~300V(H)	2.8A	4.6A	6.9A
Max. Current (Peak)	0~150V(L)	32.4A	55.2A	82.8A
	0~300V(H)	16.2A	27.6A	41.4A
Phase		1 Phase		
Total Harmonic Distortion (THD)		<0.5% (Resistive Load) at 15.0~70.0Hz and output voltage within 80~140VAC at Low Range or 160~280VAC at High Range. <1% (Resistive Load) at 70.1~500Hz and output voltage within 80~140VAC at Low Range or 160~280VAC at High Range. <1% (Resistive Load) at 501~1000Hz and output voltage within 100~140VAC at Low Range or 160~280VAC at High Range. <2% (Resistive Load) at 1001~1200Hz and output voltage within 100~140VAC at Low Range or 160~280VAC at High Range. Note: 1001~1200Hz only available to Professional Version Models.		
Crest Factor (CF)		< 6		
Load Regulation		± 0.1%F.S. @15~70Hz (Resistive Load) ± 0.5%F.S. @Others Freq. (Resistive Load)		
Line Regulation		± 0.1V		
Rise/Fall Time (DC)		< 250us		
Voltage (AC)	Range	0~300VAC , 150V/300V/Auto		
	Resolution	0.1V		
	Accuracy	0.2% of setting + 0.2%F.S.		
Phase Angle (Starting / Ending)	Range	0~359.9°		
	Resolution	0.1°		
	Accuracy	± 1°@45~65Hz		
Voltage (DC)	Range	0~424VDC		
	Resolution	0.1V		
	Accuracy	0.2% of setting + 0.2%F.S.		
	Max. Power	600W	1000W	1500W
	Max. Current (L/H Range)	L 3.96A	L 6.5A	L 9.76A
		H 1.89A	H 3.3A	H 4.88A
	Ripple & Noise (r.m.s)	L <700mVrms @Bandwidth 20Hz to 1MHz		
		H <1100mVrms @Bandwidth 20Hz to 1MHz		
	Ripple & Noise (Peak)	<4000mVp-p @Bandwidth 20Hz to 1MHz		
Current CC Fold Mode	Resolution	0.01A		
	Accuracy	0.5% of setting + 1.0%F.S.		
	Response Time	<1400ms		
Frequency	Range[1]	15~1200Hz Full Range ADJ		
	Resolution	0.1Hz (15.0~99.9Hz), 1Hz (100~1000Hz), 5Hz (1001~1200Hz)		
	Accuracy	0.03% of setting		
Programmable Output Impedance[2]		0Ω+0mH~1Ω+1mH		
Harmonics & Inter-harmonics Simulation[3]		2400Hz		
Measurement				
Voltage	Range	AC 0~300VAC		
		DC 0~424VDC		
	Resolution	0.1V		
	Accuracy	0.2% of setting + 0.2%F.S.		
Frequency	Range[1]	15~1200Hz		
	Resolution	0.1Hz(15.0~99.9Hz),1Hz(100~1000Hz), 5Hz(1001~1200Hz)		
	Accuracy	0.1% of setting		
Current (r.m.s)	Range	H 0.15A~5.6A	H 0.15A~9.2A	H 0.15A~13.8A
		M –	M –	M –
		L 0.1A~3A	L 0.1A~3A	L 0.1A~3A
		mA –	mA –	mA –
	Resolution	0.01A		
	Accuracy	0.4%+1.0%F.S.		H 0.4%+1.0%F.S. L 0.4%+1.5%F.S.
Current (Peak)	Range	0~32.4A	0~55.2A	0~82.8A
	Resolution	0.01A		
	Accuracy	H 0.4%+1.0%F.S.		
		L 0.4%+1.5%F.S.		

Model		SP300VAC600W	SP300VAC1000W	SP300VAC1500W
Power	Range	0~600W	0~1000W	0~1500W
	Resolution	0.1W		
	Accuracy	0.4% of setting + 1.0% F.S. at PF>0.2, Voltage>5V		
Power Apparent (VA)	Range	0~612VA	0~1020VA	0~1530VA
	Resolution	0.1VA		
	Accuracy	Voltage*Irms, Calculated value		
Power Resistive (VAR)	Range	0~612VAR	0~1020VAR	0~1530VAR
	Resolution	0.1VAR		
	Accuracy	$\sqrt{(VA)^2-(W)^2}$, Calculated value		
Power Factor (PF)	Range	0.00~1.00		
	Resolution	0.01		
	Accuracy	W/VA, Calculated value		
Harmonic	Range[4]	2~40 orders		
Extra Function				
Remote Sense	Range	5V(rms), Max. Total power less than rated power.		
Slew Rate	Range	AC Voltage 0.001~1200.000V/ms and Disable		
		DC Voltage 0.001~1000.000V/ms and Disable		
		Frequency 0.001~1600.000Hz/ms and Disable		
Transient Generator (only for 15~70Hz)	Range	Trans-Start: 0.0~66.5ms @ 15Hz, Resolution: 0.1ms		
		Trans-Volt: -212V~+212V(L), -424V~+424V(H), Resolution: 0.1V		
		Trans-Time: 0.0~66.5ms @ 15Hz, Resolution: 0.1ms		
		Trans-Count: 0~9999, Constant		
Calibration		Firmware-based calibration through the digital interface or front panel		
Test Function		Yes		
Parallel Output for 1 Phase		Yes, 4 Units Max. (Option: Multiphase Link Card)		
Series Output for 1 Phase		Yes, 2 Units Max. (Option: Multiphase Link Card)		
Link Output for 3 Phase		Yes, (Option: Multiphase Link Card)		
General				
Graphic Display		4.3" Color touch LCD		
Operation Key Feature		Soft key, Numeric key, Rotary Knob, USB port for transfer and upgrading firmware		
Rack mount Handles		Yes		
FAN		Temperature Control		
Protection Circuits		OCP,OVP,OPP,OTP,RCP, PRI_UVP,PRI_OVP, PRI_OTP, PRI_OCP, USB_OCP		
Interface		Standard USB, RS-485, RS-232; GPIB & LAN is Optional		
Remote Control Input/Output Signal Characteristics (Option)				
Remote Input Signal		Signal input for external trigger for execution of programmed value Signal: ON/OFF, RESET, KEEP OFF, Recall program memory 1 through 7		
Remote Output Signal		Signal output indicating that a test mode is present Signal: PASS, FAIL, TEST-IN-PROCESS		
External Signal Waveform Input		Signal input for output voltage waveform programming by external analog reference via BNC type. Between the sync signal and the output wave will be 0.5ms time difference		
Environment				
Operating Temperature		0°C ~ 40°C		
Storage Temperature		-40°C ~ 85°C		
Fan Noise		73dBA Max.		
Altitude		2000m		
Relative Humidity		5%~95%, non-condensing		
Temperature Coefficient		100ppm/°C at Voltage, 300ppm/°C at Current, 100ppm/°C at Frequency		
Mechanical				
Dimensions (W*H*D)		423.0x87.0x520.0 mm		
Package Dimensions (W*H*D)		594.0x241.0x 744.0 mm		
Unit Weight		15.9kg		
Shipping Weight		19kg		
Regulatory Compliance				
EMC		CE marked for EMC Directive 2014/30/EU/EN61326-1: 2013 Class A for emissions and immunity standard as required for EU CE Mark. FCC Verification of conformity for CFR 47 Part 15 of the FCC Rules.		
Safety		CE marked for LVD Directive 2014/35/EU/EN61010-1-third edition as required for EU CE Mark.		
CE Mark		Installation Overvoltage Category II; Pollution Degree 2; Class II equipment; indoor use only.		
Isolation Voltage		3000VAC,input to output; 1500VAC,input to chassis.		
RoHS		Meet to EU Directive 2011/65/EU for restriction of hazardous substances in Electrical and Electronic Equipment.		

[1] Only Professional Version units support 15.00~1200.00Hz.
[2] Only Professional Version units support Programmable Output Impedance function.
[3] Only Professional Version units support Harmonics & Inter-harmonics Simulation function.
[4] Only Professional Version units support Harmonics function.

All specifications are subject to change without notice.

SP-300 Series Single-phase Programmable AC Power Supply

Model		SP300VAC2000W	SP300VAC3000W	SP300VAC4000W	SP300VAC5000W
Input					
Voltage		190~265VAC			
Frequency		47~63Hz			
Phase		1 Phase, 2Wire+Groud			
Max. Current		14A	20A	25A	30A
Power Factor at 220VAC Input, Full Load		≥0.99，ActivePFC	≥0.98，ActivePFC	≥0.99，ActivePFC	≥0.99，ActivePFC
Efficiency		> 87%(Peak) > 86% at 220VAC, 50Hz input 230VAC,50Hz output, Full Load	> 86%(Peak) > 85% at 220VAC, 50Hz input 230VAC,50Hz output, Full Load	> 87%(Peak) > 86% at 220VAC, 50Hz input 230VAC,50Hz output, Full Load	> 87%(Peak) > 86% at 220VAC, 50Hz input 230VAC,50Hz output, Full Load
Output					
AC Power		2000VA	3000VA	4000VA	5000VA
Max. Current (r.m.s)	0~150V(L)	16A	27.6A	32A	46A
	0~300V(H)	8A	13.8A	16A	23A
Max. Current (Peak)	0~150V(L)	80A	165.6A	160A	184A
	0~300V(H)	40A	82.8A	80A	92A
Phase		1 Phase			
Total Harmonic Distortion (THD)		<0.5% (Resistive Load) at 15.0~70.0Hz and output voltage within 80~140VAC at Low Range or 160~280VAC at High Range. <1% (Resistive Load) at 70.1~500Hz and output voltage within 80~140VAC at Low Range or 160~280VAC at High Range. <1% (Resistive Load) at 501~1000Hz and output voltage within 100~140VAC at Low Range or 160~280VAC at High Range. <2% (Resistive Load) at 1001~1200Hz and output voltage within 100~140VAC at Low Range or 160~280VAC at High Range. Note: 1001~1200Hz only available to Professional Version Models.			
Crest Factor (CF)		≤5	≤6	≤5	≤4
Load Regulation		±0. 1%F.S. @15~70Hz (Resistive Load) ±0. 5%F.S. @Others Freq. (Resistive Load)			
Line Regulation		±0.1V			
Rise/Fall Time (DC)		<180us			
Voltage (AC)	Range	0~300VAC，150V/300V/Auto			
	Resolution	0.1V			
	Accuracy	0.2% of setting + 0.2%F.S.			
Phase Angle (Starting / Ending)	Range	0~359.9°			
	Resolution	0.1°			
	Accuracy	±1°@45~65Hz			
Voltage (DC)	Range	0~424VDC			
	Resolution	0.1V			
	Accuracy	0.2% of setting + 0.2%F.S.			
	Max. Power	2000W	3000W	4000W	5000W
	Max. Current (L/H Range)	L 11.3A	L 19.6A	L 22.6A	L 32.6A
		H 5.65A	H 9.8A	H 11.3A	H 16.3A
	Ripple & Noise (r.m.s)	L <700mVrms @Bandwidth 20Hz to 1MHz			
		H <1100mVrms @Bandwidth 20Hz to 1MHz			
	Ripple & Noise (Peak)	<4000mVp-p @Bandwidth 20Hz to 1MHz			
Current CC Fold Mode	Resolution	0.01A			
	Accuracy	0.5% of setting + 1.0%F.S.			
	Response Time	<1400ms			
Frequency	Range[1]	15~1200Hz Full Range ADJ			
	Resolution	0.1Hz (15.0~99.9Hz), 1Hz (100~1000Hz), 5Hz (1001~1200Hz)			
	Accuracy	0.03% of setting			
Programmable Output Impedance[2]		0Ω+0mH~1Ω+1mH			
Harmonics & Inter-harmonics Simulation[3]		2400Hz			
Measurement					
Voltage	Range	AC 0~300VAC			
		DC 0~424VDC			
	Resolution	0.1V			
	Accuracy	0.2% of setting + 0.2%F.S.			
Frequency	Range[1]	15~1200Hz			
	Resolution	0.1Hz(15.0~99.9Hz), 1Hz(100~1000Hz), 5Hz(1001~1200Hz)			
	Accuracy	0.1% of setting			
Current (r.m.s)	Range	H 0.15A~20A	H 0.3A~27.6A	H 0.3A~32A	H 0.3A~46A
		M –	M 0.2A~20A	M 0.2A~20A	M 0.2A~20A
		L 0.1A~5A	L 0.1A~5A	L 0.1A~5A	L 0.1A~5A
		mA 0.02A~1.5A	mA 0.02A~1.5A	mA 0.02A~1.5A	mA 0.02A~1.5A
	Resolution	0.01A			
	Accuracy	H/M 0.4%+1.0%F.S.	H/M 0.4%+0.6%F.S.		
		L/mA 0.4%+1.0%F.S.	L/mA 0.4%+1.0%F.S.		
Current(Peak)	Range	0~81.5A	0~168.6A	0.05~163A	0.05~188A
	Resolution	0.01A			
	Accuracy	H/M 0.4%+1.5%F.S. L/mA 0.4%+1.5%F.S.			

Model		SP300VAC2000W	SP300VAC3000W	SP300VAC4000W	SP300VAC5000W
Power	Range	0~2040W	0~3060W	0~4080W	0~5100W
	Resolution	0.1W			
	Accuracy	0.4% of setting + 1.0% F.S. at PF>0.2, Voltage>5V			
Power Apparent (VA)	Range	0~2040VA	0~3060VA	0~4080VA	0~5100VA
	Resolution	0.1VA			
	Accuracy	Voltage*Irms, Calculated value			
Power Resistive (VAR)	Range	0~2040VAR	0~3060VAR	0~4080VAR	0~5100VAR
	Resolution	0.1VAR			
	Accuracy	$\sqrt{(VA)^2-(W)^2}$, Calculated value			
Power Factor (PF)	Range	0.00~1.00			
	Resolution	0.01			
	Accuracy	W/VA, Calculated value			
Harmonic	Range[4]	2~40 orders			
Extra Function					
Remote Sense	Range	5V(rms), Max. Total power less than rated power.			
Slew Rate	Range	AC Voltage 0.001~1200.000V/ms and Disable			
		DC Voltage 0.001~1000.000V/ms and Disable			
		Frequency 0.001~1600.000Hz/ms and Disable			
Transient Generator (only for 15~70Hz)	Range	Trans-Start: 0.0~66.5ms @ 15Hz, Resolution: 0.1ms			
		Trans-Volt: -212V~+212V(L), -424V~+424V(H), Resolution: 0.1V			
		Trans-Time: 0.0~66.5ms @ 15Hz, Resolution: 0.1ms			
		Trans-Count: 0~9999, Constant			
Calibration		Firmware-based calibration through the digital interface or front panel			
Test Function		Yes			
Parallel Output for 1 Phase		Yes, 4 Units Max. (Option: Remote I/O & Parallel, Multiphase Link Card)			
Series Output for 1 Phase		Yes, 2 Units Max. (Option: Remote I/O & Parallel, Multiphase Link Card)			
Link Output for 3 Phase		Yes, (Option: Remote I/O & Parallel, Multiphase Link Card)			
General					
Graphic Display		5.6" Color touch LCD			
Operation Key Feature		Soft key, Numeric key, Rotary Knob, USB port for transfer and upgrading firmware			
Rack mount Handles		Yes			
FAN		Temperature Control			
Protection Circuits		OCP,OVP,OPP,OTP,RCP,PRI_UVP,PRI_OVP,PRI_OTP,PRI_OCP,USB_OCP			
Interface		Standard USB, RS-485, RS-232; GPIB & LAN is Optional			
Remote Control Input/Output Signal Characteristics (Option)					
Remote Input Signal		Signal input for external trigger for execution of programmed value Signal: ON/OFF, RESET, KEEP OFF, Recall program memory 1 through 7			
Remote Output Signal		Signal output indicating that a test mode is present Signal: PASS, FAIL, TEST-IN-PROCESS			
External Signal Waveform Input		Signal input for output voltage waveform programming by external analog reference via BNC type. Between the sync signal and the output wave will be 0.5ms time difference			
Environment					
Operating Temperature		0°C ~ 40°C			
Storage Temperature		-40°C ~ 85°C			
Fan Noise		73dBA Max.			
Altitude		2000m			
Relative Humidity		5%~95%, non-condensing			
Temperature Coefficient		100ppm/°C at Voltage, 300ppm/°C at Current, 100ppm/°C at Frequency			
Mechanical					
Dimensions (W*H*D)		423.0x133.0x520.0 mm	423.0x177.0x520.0 mm		
Package Dimensions (W*H*D)		643.0x278.5x802.0 mm	643.0x323.0x802.0 mm		
Unit Weight		21.4kg	29.0kg		
Shipping Weight		24.4kg	32.0kg		
Regulatory Compliance					
EMC		CE marked for EMC Directive 2014/30/EU/EN61326-1: 2013 Class A for emissions and immunity standard as required for EU CE Mark. FCC Verification of conformity for CFR 47 Part 15 of the FCC Rules.			
Safety		CE marked for LVD Directive 2014/35/EU/EN61010-1-third edition as required for EU CE Mark.			
CE Mark		Installation Overvoltage Category II; Pollution Degree 2; Class II equipment; indoor use only.			
Isolation Voltage		3000VAC,input to output; 1500VAC,input to chassis.			
RoHS		Meet to EU Directive 2011/65/EU for restriction of hazardous substances in Electrical and Electronic Equipment.			

[1] Only Professional Version units support 15.00~1200.00Hz.
[2] Only Professional Version units support Programmable Output Impedance function.
[3] Only Professional Version units support Harmonics & Inter-harmonics Simulation function.
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