APM Technologies

MOMENTUM

400S/H Series

SINGLE/THREE PHASE PROGRAMMABLE AC POWER SUPPLY

INTEGRATE INNOVATION · WISDOM LEADS THE FUTURE

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MOMENTUM

400S/H SERIES SINGLE/THREE PHASE PROGRAMMABLE AC POWER SUPPLY

Reversible Touch Screen

Multi-machine Parallel 768kVA

Wide range adjustable 0~820V 10~5000Hz

Global universal input voltage World

Momentum 400S/H series single/three phase programmable AC power supply use high frequency isolation and active PFC technology for efficient AC/DC output. New UI touch design, combined with the software's strong testing function, easily complete complex programming. Global universal input voltage, multiple output modes one-click switch, applicable to various test scenarios. Innovative and compact topology, modular design of centralized control, the high power density (3U/6kVA, 5kHz) to meet the market, the expansion needs of 768kVA can be met through high-speed fiber optic technology. The high-precision power meter and oscilloscope function provide precise measurement function, save the test cost and operation time.

Product Features

- Full touch panel design, humanized UI interactive experience.
- Output frequency: 10~5000Hz. The output slope of voltage, DC current and frequency is adjustable.
- Voltage specification: 420VAC, 820VAC.
- Output mode: AC, DC, AC+DC.
- Seamless transition of voltage gears, current multiplication output.
- Support Global universal input voltage.
- Support single-phase, three-phase, reverse phase, multi-channel output mode, can simulate three-phase unbalance, three-phase harmonic unbalance, phase missing, phase sequence reverse connection and other tests.*1
- Optical fiber parallel technology, strong anti-interference, near-zero delay, supports up to 768kVA expansion.*2
- Working mode: constant voltage (CV), constant current (CC).
- Settable ON/OFF Phase Angle of Output Waveform, 0~359.9°.
- High output crest factor to meet surge testing.
- Power sweep function.
- Built-in oscilloscope function, real-time monitoring waveform curve. (Coming soon)
- Built-in high-precision power meter, real-time measurement of electrical parameters.
- Power Line Disturbance Function(PLD).
- DDS arbitrary function generator.*3
- Harmonic/inter-harmonic generation simulation and measurement function.*3
- Support external analog input control and TTL electrical level output(Optional).
- Built-in Aviation Regulatory Test Standards & Marine Electrical Equipment Test Standards.*4
- OCP/OVP/OPP/OTP/Reentry transition protection function
- Standard USB, RS232, RS485 communication interface, optional GPIB&LAN or CAN.
- Three functional versions, the best cost-effective to meet the needsof different application fields.

*1 MS420 units only support single phase
*2 650W units is not support
*3 Only professional version/Professional-HF version supports
*4 Only Professional-HF version supports

Quick Models Selection

400S Series

Models	Input Mode & Voltage	Max Input Current	Output Voltage	Output Current*1	Output Phase	Output Power	Height
MS420VAC650W	1Φ: 100~300Vac	1Φ: 9.4A	210V/420V	1Φ: 6A/3A	1Φ	650VA	1/2 2U
MS420VAC1050W	1Φ: 100~300Vac	1Φ: 14.5A	210V/420V	1Φ: 10A/5A	1Φ	1050VA	2U
MS420VAC2100W	1Φ: 100~300Vac	1Φ: 27.6A	210V/420V	1Φ: 21A/10.5A	1Φ	2100VA	2U
MS420VAC3100W	1Φ: 100~132Vac	1Φ: 21.7A	210V/420V	1Φ: 30A/15A	1Φ	1550VA	3U
	1Φ: 187~300Vac					3100VA	
MS420VAC4100W	1Φ: 100~132Vac	1Φ: 27.6A	210V/420V	1Φ: 39A/19.5A	1Φ	2050VA	3U
	1Φ: 187~300Vac					4100VA	
MS420VAC6000W	1Φ: 100~132Vac 3Φ(Y): 187~300Vac	1Φ: 41A 3Φ: 23.6A	210V/420V	1Φ: 60A/30A	1Φ	3000VA	3U
	1Φ: 187~300Vac 3Φ(Y): 340~460Vac					6000VA	
MST420VAC2100W	1Φ: 100~300Vac 3Φ(Y): 187~460Vac	1Φ: 28.5A 3Φ: 16.4A	210V/420V	1Φ: 21A/10.5A 3Φ: 7A/3.5A	1Φ/3Φ	2100VA	3U
MST420VAC3000W	1Φ: 100~300Vac 3Φ(Y): 187~460Vac	1Φ: 38A 3Φ: 21.9A	210V/420V	1Φ: 30A/15A 3Φ: 10A/5A	1Φ/3Φ	3000VA	3U

400S Series

Models	Input Mode & Voltage	Max Input Current	Output Voltage	Output Current*1	Output Phase	Output Power	Height
MST420VAC4500W	1Φ: 100~132Vac 3Φ(Y): 187~300Vac	1Φ: 31.8A 3Φ: 18.3A	210V/420V	1Φ: 43.2A/21.6A 3Φ: 14.4A/7.2A	1Φ/3Φ	2250VA	3U
	1Φ: 187~300Vac 3Φ(Y): 340~460Vac					4500VA	
MST420VAC6000W	1Φ: 100~132Vac 3Φ(Y): 187~300Vac	1Φ: 41A 3Φ: 23.6A	210V/420V	1Φ: 60A/30A 3Φ: 20A/10A	1Φ/3Φ	3000VA	3U
	1Φ: 187~300Vac 3Φ(Y): 340~460Vac					6000VA	
MST420VAC9000W	3Φ(Y): 187~300Vac	3Φ: 35.5A	210V/420V	1Φ: 90A/45 3Φ: 30A/15A	1Φ/3Φ	4500VA	6U
	3Φ(Y): 340~460Vac					9000VA	
MST420VAC12000W	3Φ(Y): 187~300Vac	3Φ: 47.4A	210V/420V	1Φ: 120A/60A 3Φ: 40A/20A	1Φ/3Φ	6000VA	6U
	3Φ(Y): 340~460Vac					12000VA	
MST820VAC12000W	3Φ(Y): 187~300Vac	3Φ: 47.4A	420V/820V	1Φ: 60A/30A 3Φ: 20A/10A	1Φ/3Φ	6000VA	6U
	3Φ(Y): 340~460Vac					12000VA	
MST420VAC15000W	3Φ(Y): 187~300Vac	3Φ: 59.2A	210V/420V	1Φ: 142.8A/71.4A 3Φ: 47.6A/23.8A	1Φ/3Φ	7500VA	9U
	3Φ(Y): 340~460Vac					15000VA	
MST420VAC18000W	3Φ(Y): 187~300Vac	3Φ: 71A	210V/420V	1Φ: 165.6A/82.8A 3Φ: 55.2A/27.6A	1Φ/3Φ	9000VA	9U
	3Φ(Y): 340~460Vac					18000VA	

*1 The current is the maximum current in the rated voltage range.

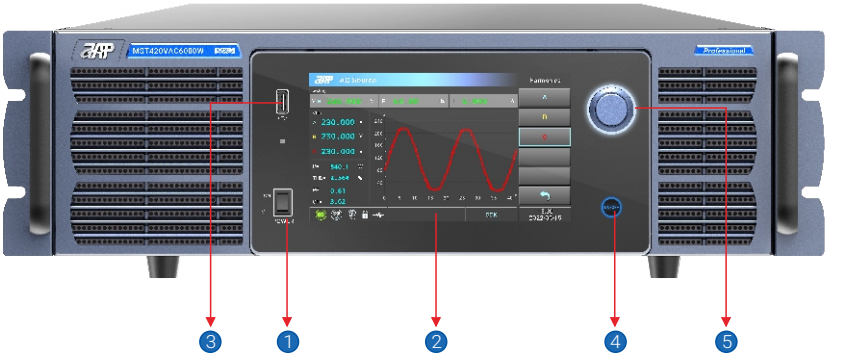
Version Difference

Function Description	Advanced Version	Professional Version	Professional-HF Version
Output Frequency Range	10~2500Hz	10~2500Hz	10~5000Hz
Programmable Output Impedance Function	Not Supported	Standard,it meets IEC61000-3-3 test requirements	Standard,it meets IEC61000-3-3 test requirements
Harmonic/Inter-harmonic Generation Simulation and Measurement Function	Not Supported	Harmonic components can be up to 50 orders	Harmonic components can be up to 50 orders
Built-in IEC standards	IEC61000-4-11	IEC61000-4-11; IEC61000-4-13; IEC61000-4-14; IEC61000-4-17; IEC61000-4-28; IEC61000-4-29; IEC61000-4-34	IEC61000-4-11; IEC61000-4-13; IEC61000-4-14; IEC61000-4-17; IEC61000-4-28; IEC61000-4-29; IEC61000-4-34
DDS Waveform Generation Function	Not Supported	Standard	Standard
Marine Electrical Equipment Test Standards	Not Supported	Not Supported	1399(MIL-STD-1399-300B)
Aviation Regulatory Test Standards	Not Supported	Not Supported	DO160 (RTCA-DO160 E/F/G) 704 (MIL-STD 704 A/B/C/D/E/F) A380 (Airbus ADB100.1.8 D/E) A350 (Airbus ADB100.1.8.1 B/C) A400M (Airbus AMD24C) B787 (Boeing 787B3-0147 A/B/C)

Panel Introduction

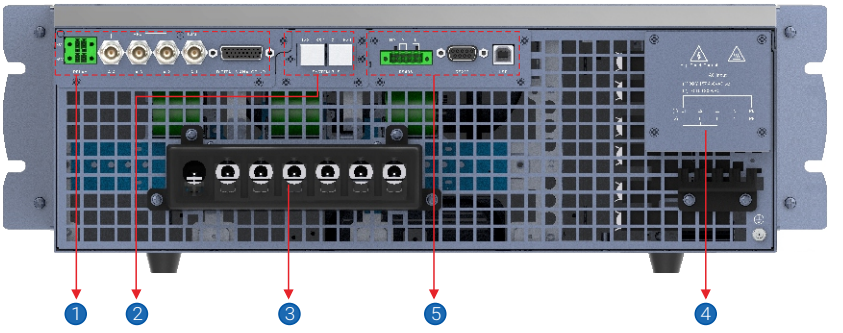
Front Panel Description

1. Power switch
2. Color touch screen
3. USB port, for data transfers and firmware
4. Output switch
5. Press knob



Rear Panel Description

1. Analog I/O Interface Card (optional)
2. SYSTEM BUS optical fiber interface (optional)
3. Power Output Terminal
4. AC power input terminal
5. RS485/RS232/USB communication interface, LAN & GPIB Interface Card (optional), CAN Interface Card (optional)*



* If LAN&GPIB or CAN communication is selected, the communication interface card will be installed in the same position instead of the standard one.

Features and Advantages

Clear, Intuitive, Convenient, Humanized

Adopting a new generation of human-machine control interface, paired with a full touch panel design, a simple UI operation interface, combined with a rotary knob design to easily complete parameter settings and professional programming functions, supporting USB data loading and unloading on the front panel.The entire series of products support the front panel flipping function, making it easy to operate anduse.

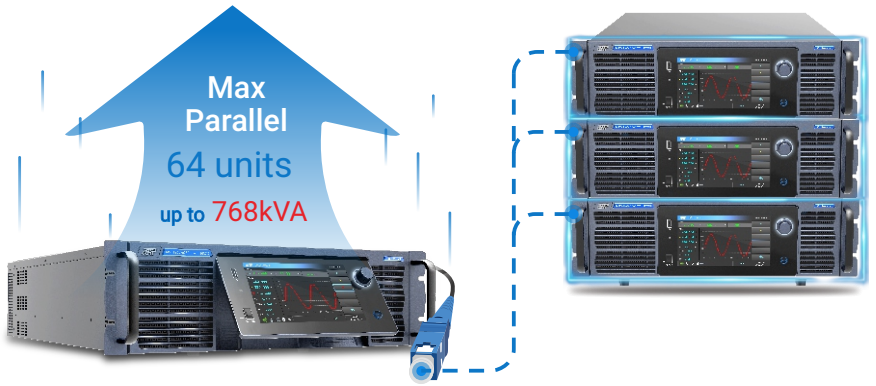
Global Input Voltage to Meet Different Test Environments

This series of power supply is configured with multiple input phase options, which can meet the single-phase: 100 ~ 132V_{LN}/ 187 ~ 300V_{LN}, three-phase: 187 ~ 300V_{LL}/340 ~ 460V_{LL} and other electrical environments, some models support single/three-phase input at the same time, can be used in any electrical system range.

Industry Technology Frontier, Fiber High-Speed Parallel

When there is a higher power demand, the master-slave parallel function can be used to improve the output current and power capacity, and up to 64 single units can be realized in parallel up to 768kVA. The parallel machine adopts optical fiber high-speed communication capability to achieve near-zero transmission delay, which ensures the synchronization of the parallel machine and ensures the synchronous flow sharing output of multiple modules. It supports synchronization of all functions without performance degradation, and perfectly presents the operating experience as a stand-alone test.

* 650W Units is not support this function.



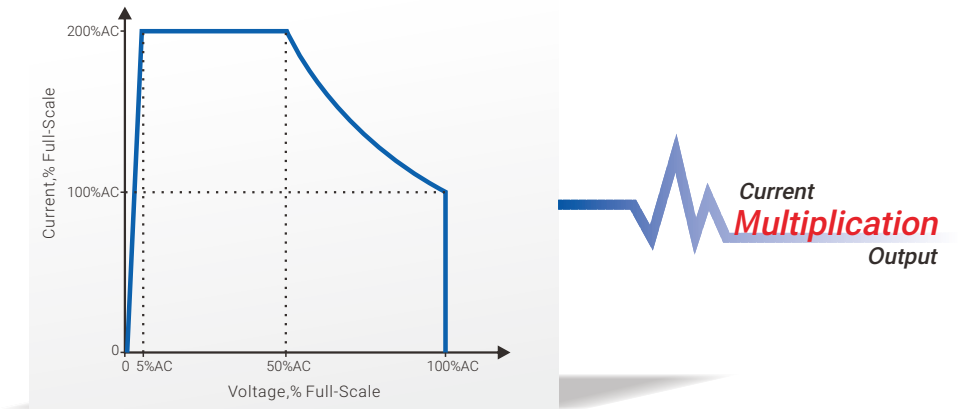
Multi Channel Test Function

This series can meet the testing requirements of up to three channels without additional configuration. Parameters can be set independently and output can be controlled. At the same time, synchronous/delay output can be set according to testing requirements. If you purchase an MST420VAC6000W, it is equivalent to obtaining three additional single-phase 2000W models. One machine for multiple uses, with extremely high cost performance.

* MS series do not support this function.

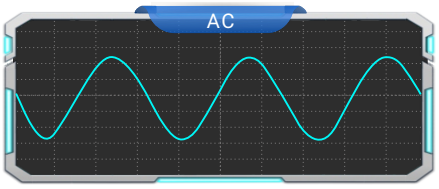
Seamless Voltage Transition, Current Multiplication Output

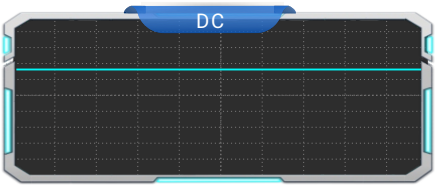
Seamless transition of voltage gears reduces the impact on output when switching voltage gears. Up to 2 times current output on the basis of traditional rated current. When the voltage is reduced from the rated value to 50%, the technology linearly increases the output current to twice the current corresponding to the rated voltage, while ensuring full power output over the widest voltage range. This eliminates the need for users to purchase overpowered power supplies to meet high current demands.

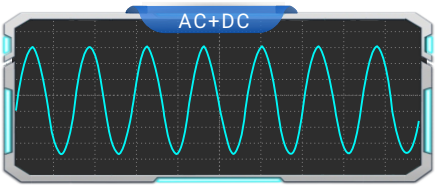


Diversified Output Modes for Easy One Click Switching

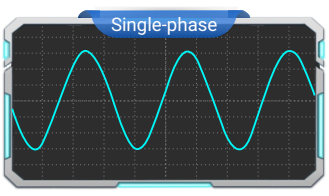
The three coupling modes of AC, DC, and AC+DC can not only achieve stable AC/DC output, but also cover experiments such as AC signal superimposed DC bias and ripple injection through the AC+DC output mode.

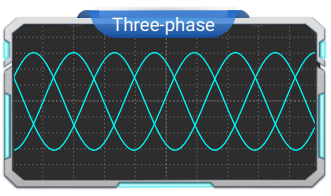


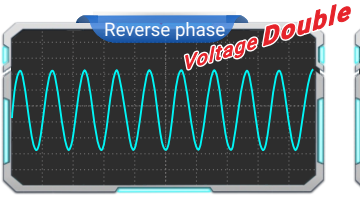


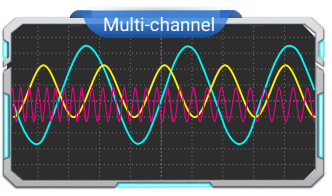


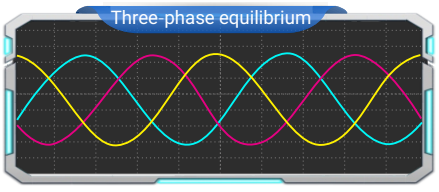
Support single-phase, three-phase, reverse phase, multi-channel output mode. Support Y-type/Delta type wiring mode in three-phase mode, can simulate three-phase unbalance, three-phase harmonic unbalance, phase missing, phase sequence reverse connection and other tests. The reverse phase mode can provide up to twice the output voltage, and the multi-channel mode meets the independent testing of up to three single phase objects simultaneously.

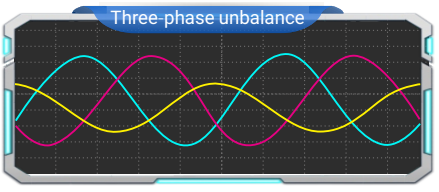






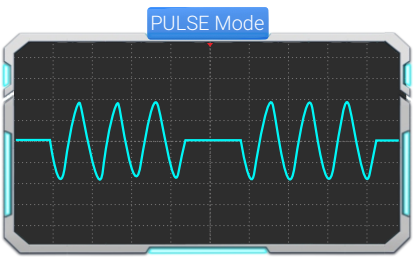






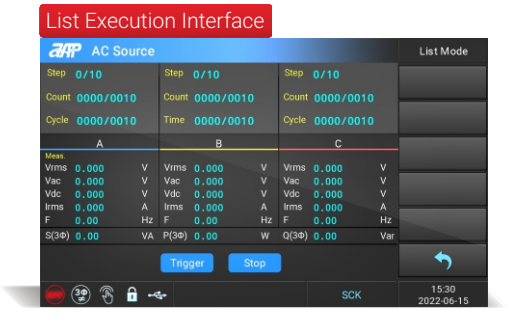
Power Line Disturbance Function(PLD)

This series of power supplies provides multiple waveform editing modes to simulate various power grid interference conditions and regulatory certification projects, such as periodic power outages, dips, instantaneous spikes, or more complex waveform outputs. It is widely used in research and development laboratories, universities, and certification laboratories.



List Editing Interface

List Execution Interface



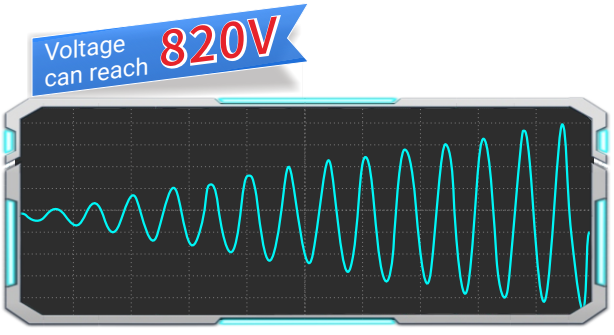
Power Sweep Function

This function can automatically find out the maximum power point of the material to be tested under various voltage conditions, by setting the start/end voltage value, step voltage value and single step test time, the control voltage is changed step by step. After the test, the voltage, current and power data of the maximum power point can be displayed.

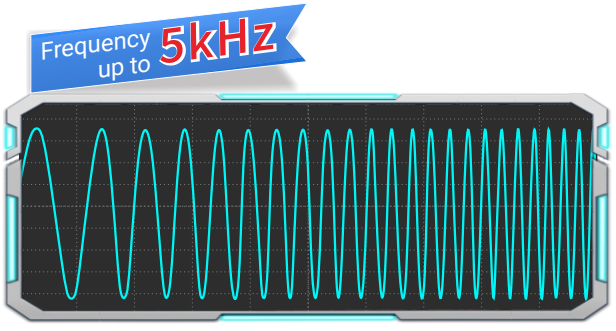
Voltage and Frequency Output Variable Rate is Adjustable

The output voltage can reach 820V, and the output frequency range is 10~5000Hz. The soft start of voltage and frequency can be achieved by slope setting, effectively reducing the surge current generated when the motor or compressor is started.

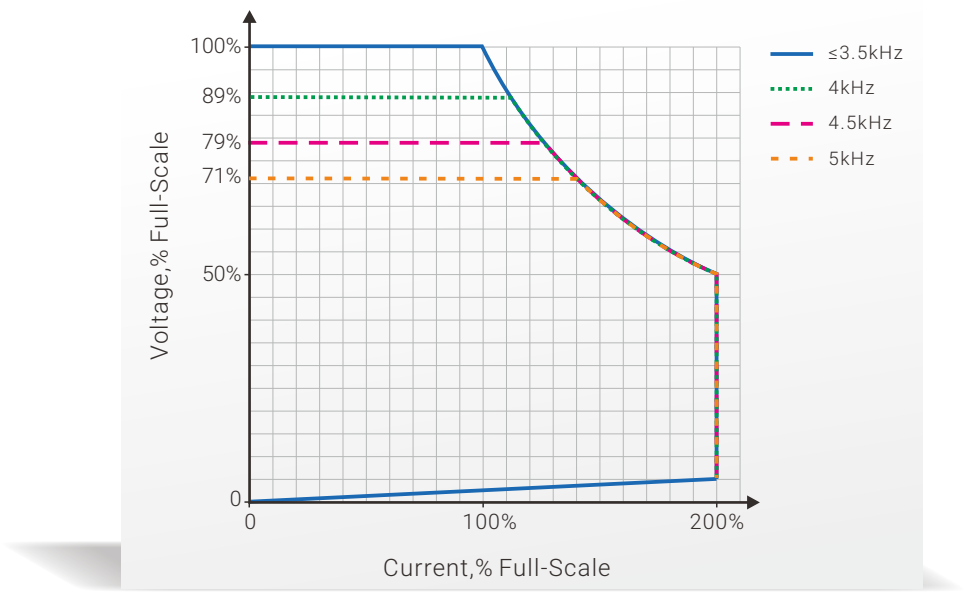
* Professional Version/Advanced Version:10~2500Hz; Professional-HF Version:10~5000Hz



Voltage adjustable



Frequency adjustable



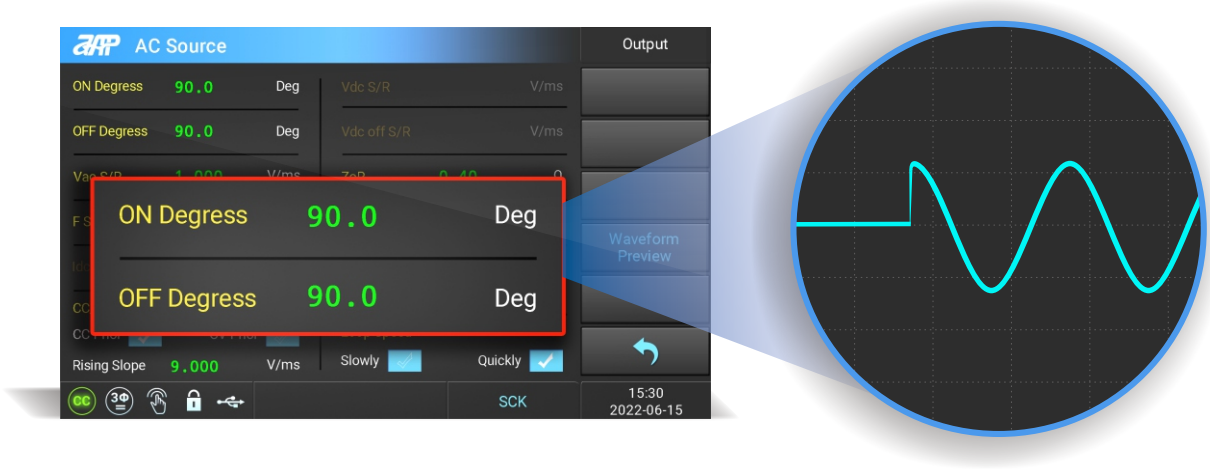
High frequency derating curve

Built-in High Precision Power Meter

It can measure 24 electrical parameters, accurately and quickly view the real-time data of each data value, open custom display sorting, easy to grasp the condition of the object to be measured, no need to connect complex lines and additional power meters, saving test time and equipment costs.

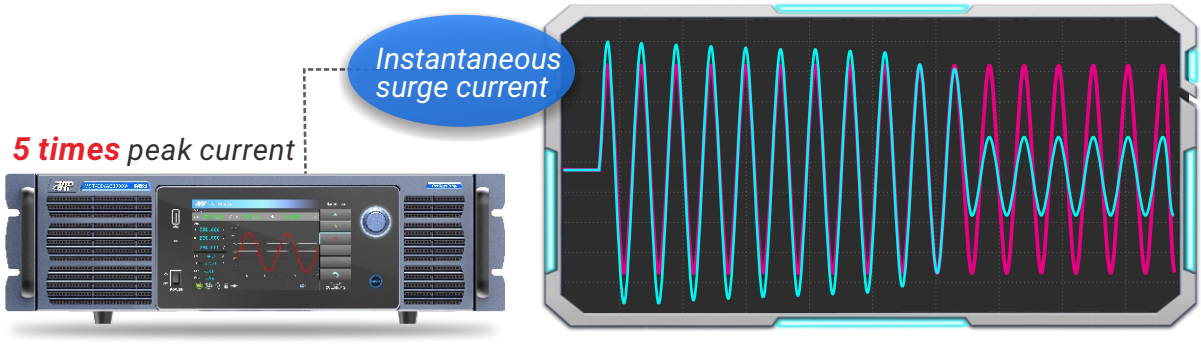
Settable ON/OFF Phase Angle of Output Waveform

The power can be set on/off Angle, suitable for switching power supply output test. Set the power Angle to 90° to test the input inrush current amplitude, the power supply will display the measured inrush current amplitude. Users can customize the start time and duration of the inrush current test.



High Output Crest Factor

The power supply provides a peak current of 5 times the rated current and is suitable for rectified loads or circuits with instantaneous surge current, such as motors.



Oscilloscope Function (Coming soon)

Provide waveform display function based on sampling data without an oscilloscope, which can summarize the output status. The waveform display interface includes vertical axis and horizontal axis.

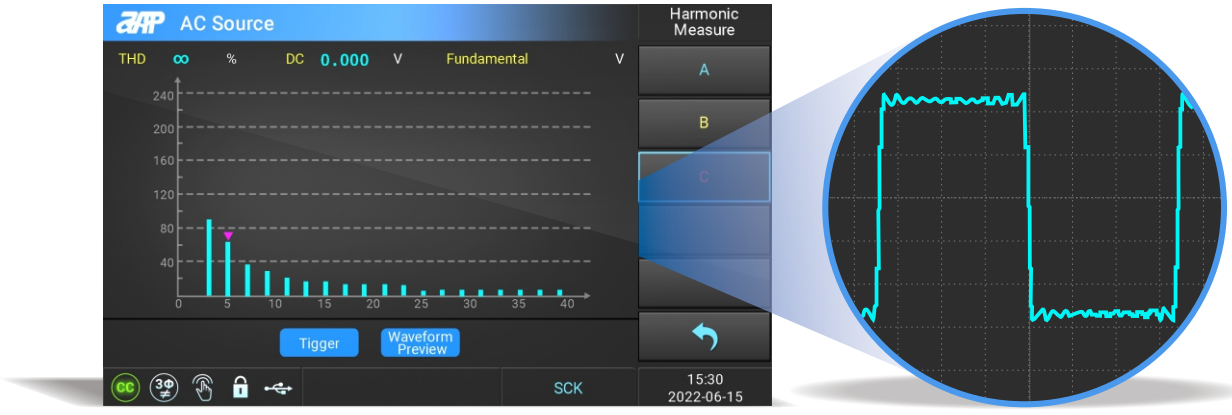
External Analog Control & Monitoring(Optional)

The series products provides a rich range of trigger input/output signals. When theamplitude/frequency is transformed, a trigger signal can be generated to capture the current waveform of the object to be measured synchronously. Zero to full scale output voltage or current can be programmed by connecting an external voltage (0-5V/0-10V) or an external resistor (5-10K), while the current output voltage and current can be monitored by the simulation quantity monitoring function (0-5V/0-10V).

Professional Version Function

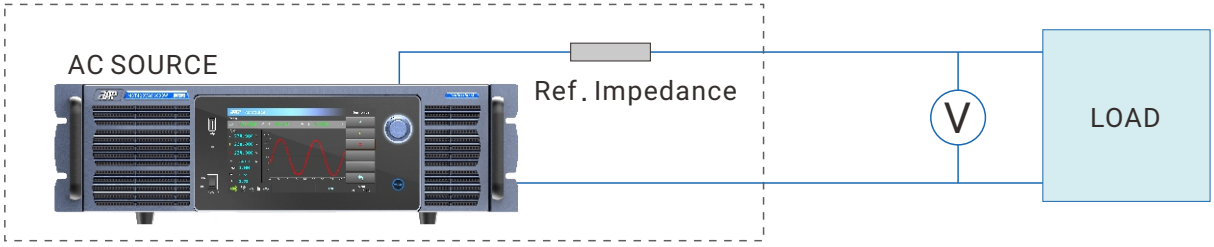
Harmonic/Inter-Harmonic Generation Simulation and Measurement Function

Support waveform synthesis editing, harmonic components up to 50 orders, base frequency of 50Hz or 60Hz. It supports the synthesis and editing of interharmonics, and superposes another voltage component with variable frequency on the original basic voltage output, which is suitable for anti-interference simulation test. Supports the measurement of total harmonic distortion (THD) at 50Hz or 60Hz base frequency, DC current, output current and output voltage base frequency. It can measure the amplitude of 2 to 50 harmonics or the percentage based on the fundamental frequency voltage, and can graphically preview the distribution of harmonic components.



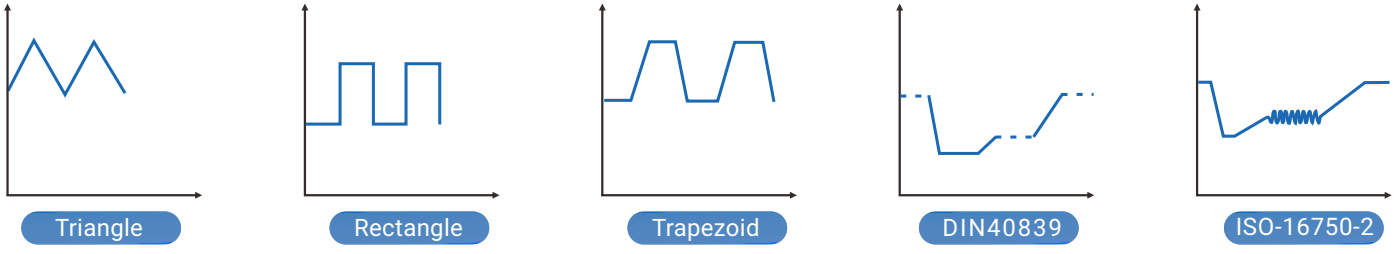
Programmable Output Impedance Function

The low output impedance and low voltage harmonics of this series of power supply make it conform to IEC61000-3-2 standard, and provide programmable output impedance function, the output voltage is controlled by the load current feedback circuit, which can be suitable for IEC61000-3-3 standard test. Users can set output resistance and inductance parameters according to test requirements to simulate specific test conditions.



DDS Arbitrary Function Generator

This series of power supply has built-in triangular wave, rectangular wave, trapezoidal wave, DIN40839 and ISO-16750-2 and other typical waveform setting interface, which is convenient for customers to edit and call. In addition to the above standard functions, you can also edit the output of any complex functions that can be used for research and development and production tests.



Aviation Regulatory Testing & Marine Electrical Equipment Testing (Coming soon)

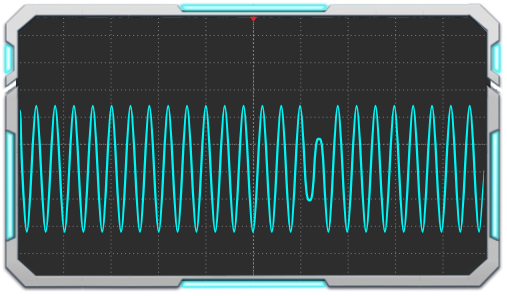
Built-in standard test curves corresponding to regulations. Users only need to select the applicable regulatory standard and test number to initiate testing. Accelerates the power supply compatibility verification process for aircraft and marine electrical equipment. Significantly reduces test editing and configuration time for engineers.

* Only Professional-HF Version Supports.

Built-in IEC Standard Test Waveforms

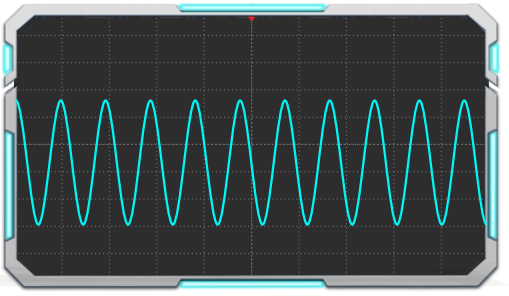
IEC 61000-4-11

Immunity tests for voltage dips, short interruptions and voltage changes.



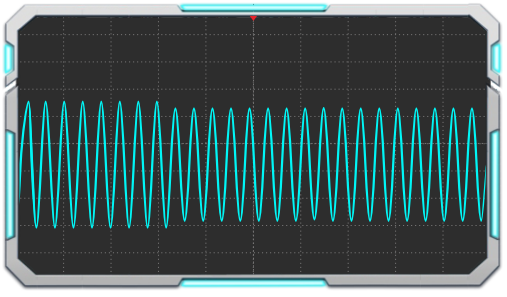
IEC 61000-4-13

Harmonic and interharmonic low frequency immunity test.



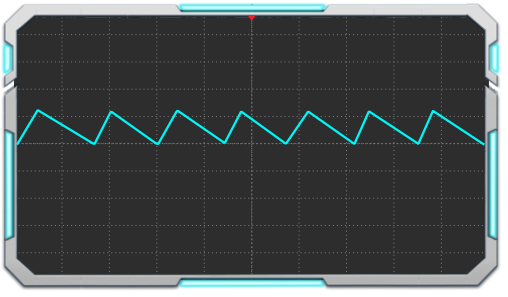
IEC 61000-4-14

Voltage fluctuation immunity test.



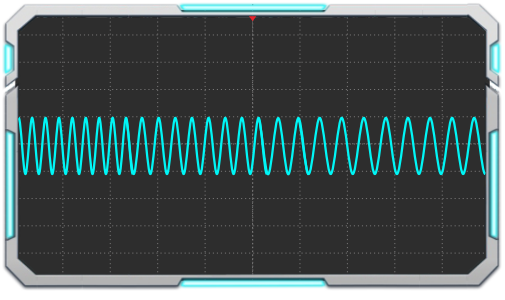
IEC 61000-4-17

Direct current ripple immunity test.



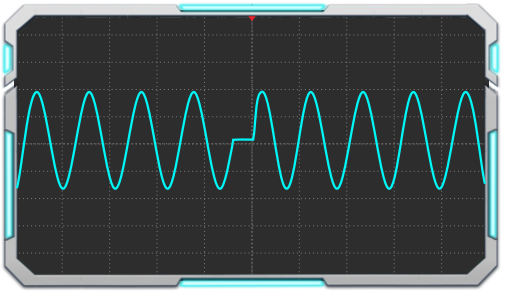
IEC 61000-4-28

Power frequency change immunity test.



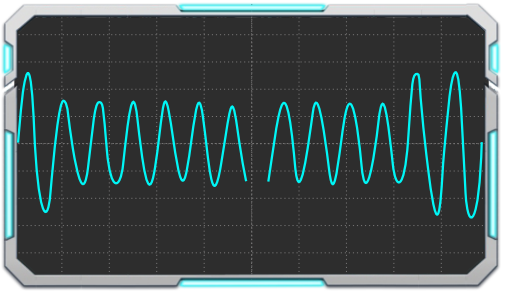
IEC 61000-4-29

Voltage drop (drop), transient outage and voltage change test.



IEC61000-4-34

Voltage dig,short interruptions and voltage change interference rejection test of device which current by phase of main power is higher than 16A.



Model		MS420VAC650W	MS420VAC1050W
Input			
Voltage	1 Phase	100~132Vac 187~300Vac	
Current	1 Phase	Max. 9.4A(L-N)	Max. 14.5A(L-N)
Connection	1 Phase	L, N, PE	
Frequency		45~65Hz	
Fuse (Internal)		2* T10A	2* T15A
Power Factor		>0.97 (Rate Input Voltage, Full Load)	>0.98 (Rate Input Voltage, Full Load)
Input Power		Max. 780VA	Max. 1.35kVA
Efficiency (Full Load, 50~5000Hz/DC)		>68.8% (Rate: 110Vac) >69.6% (Rate: 220Vac)	>79.0% (Rate: 110Vac) >80.0% (Rate: 220Vac)
AC Output			
AC Output Power		650VA	1050VA
Phase		1 Phase	
Voltage (AC/AC+DC)	Range [1]	L: 0~210Vac H: 0~420Vac AUTO	
	Resolution	≤0.02V (AC and AC+DC mode)	
	Accuracy	0.05%F.S. @ 10~100Hz, AC mode 0.1% of actual + 0.1%F.S. @ DC mode 0.1% of actual + 0.1%F.S. @ 101~500Hz, AC mode 0.1% of actual + 0.2%F.S. @ 101~500Hz, AC+ DC mode 0.1% of actual + 0.2%F.S. @ 501~1000Hz, AC mode 0.1% of actual + 0.3%F.S. @ 501~1000Hz, AC+ DC mode 0.1% of actual + 0.4%F.S. @ 1001~2000Hz, AC mode 0.1% of actual + 0.5%F.S. @ 1001~2000Hz, AC+ DC mode 0.1% of actual + 0.6%F.S. @ 2001~3000Hz, AC mode 0.1% of actual + 0.7%F.S. @ 2001~3000Hz, AC+ DC mode 0.1% of actual + 0.8%F.S. @ 3001~4000Hz, AC mode 0.1% of actual + 0.9%F.S. @ 3001~4000Hz, AC+ DC mode 0.1% of actual + 1%F.S. @ 4001~5000Hz, AC mode 0.1% of actual + 1.1%F.S. @ 4001~5000Hz, AC+ DC mode Valid from 5% of full-scale to 210VAC(RMS)/270VDC in low-range and 420VAC(RMS)/540VDC in high-range; with sense leads connected.	
	Display Bits	0.001V	
Max. Current (r.m.s)	0~210V (L)	6A	10A
	0~420V (H)	3A	5A
	Display Bits	0.0001A	
	Resolution	L: 0.5mA, H: 0.25mA	L: 1mA, H: 0.5mA
Max. Current (Peak)	0~210V (L)	30Apk	50Apk
	0~420V (H)	15Apk	25Apk
Frequency	Range	Advanced Version: 10~2500Hz Professional Version: 10~2500Hz Profession-HF Version: 10~5000Hz	
	Resolution	0.01Hz @ 10~81.99Hz; 0.05Hz @ 82~819.99Hz; 0.1Hz @ 820~ 5000Hz;	
	Accuracy	0.01% of actual + 0.005Hz @10~81.99Hz 0.01% of actual + 0.025Hz @ 82~819.99Hz 0.01% of actual + 0.05Hz @ 820~1000Hz 0.1% of actual + 0.05Hz @ 1001~5000Hz Frequency set specifications valid for output voltage >5% of full-scale. Note: 4.2V <Vout< 10.5V (L range) can be extended 1.5 times, Less Than 4.2V, no range. 8.4V <Vout< 21.0V (H range) can be extended 1.5 times, Less Than 8.4V, no range.	
Total Harmonic Distortion (THD)		<0.3% @ 10~100Hz, 50~210Vac/100~420Vac (Resistive Load) <0.5% @ 101~500Hz, 50~210Vac/100~420Vac (Resistive Load) <1% @ 501~1000Hz, 50~210Vac/100~420Vac (Resistive Load) <2% @ 1001~2000Hz, 50~210Vac/100~420Vac (Resistive Load) <3% @ 2001~3000Hz, 50~210Vac/100~420Vac (Resistive Load) <4% @ 3001~4000Hz, 50~210Vac/100~420Vac (Resistive Load) <5% @ 4001~5000Hz, 50~210Vac/100~420Vac (Resistive Load) Note: 25V <Vout< 50V (L range) can be extended 1.5 times, Less Than 25V, no range. Note: 50V <Vout< 100V (H range) can be extended 1.5 times, Less Than 30V, no range.	

Model		MS420VAC650W	MS420VAC1050W
Crest Factor (CF)		≤5	
Load Regulation(ALC=ON)		0.1% of actual+0.1%F.S. @10~1000Hz, AC mode 0.1% of actual+0.2%F.S. @10~1000Hz, AC+ DC mode 0.1% of actual+0.3%F.S. @1001~2000Hz, AC mode 0.1% of actual+0.4%F.S. @1001~2000Hz, AC+ DC mode 0.1% of actual+0.5%F.S. @2001~3000Hz, AC mode 0.1% of actual+0.6%F.S. @2001~3000Hz, AC+ DC mode 0.1% of actual+0.7%F.S. @3001~4000Hz, AC mode 0.1% of actual+0.8%F.S. @3001~4000Hz, AC+ DC mode 0.1% of actual+0.9%F.S. @4001~5000Hz, AC mode 0.1% of actual+1.0%F.S. @4001~5000Hz, AC+ DC mode Valid from 5% to 100% of full-scale with sense leads connected.	
Line Regulation	ALC=ON	0.05%F.S. @ 1Φ100-132Vac/ 3ΦY187-300Vac； 0.025%F.S. @ 1Φ187-300Vac/ 3ΦY340-460Vac； Input voltage change in ±10%, DC output or 10Hz~5000Hz AC output.	
	ALC=OFF	0.1%F.S. @ 1Φ100-132Vac/ 3ΦY187-300Vac； 0.05%F.S. @ 1Φ187-300Vac/ 3ΦY340-460Vac； Input voltage change in ±10%, DC output or 10Hz~800Hz AC output.	
Phase Angle (Starting / Ending)	Range	0~360°	
	Resolution	0.4 º	
	Accuracy	1º @ 10~100Hz; 2º @ 101~1200Hz; 3º @ 1201~2200Hz; 4º @ 2201~3200Hz; 5º @ 3201~4200Hz; 6º @ 4201~5000Hz;	
Current CC Fold Mode	Range	5~200%F.S. (AC Output Voltage: Low-Range 50~210Vac, High-Range 100~420Vac) 7~200%F.S. (DC Output Voltage: Low-Range 50~270Vdc, High-Range 100~540Vdc)	
	Resolution	10mA	20mA
	Accuracy	0.3% of actual + 0.5%F.S. @ DC mode 0.3% of actual + 0.5%F.S. @ 10~500Hz, AC mode 0.3% of actual + 0.6%F.S. @ 10~500Hz, DC + AC mode Valid from 5% of full scale to 100% of full-scale. 0.3% of actual + 0.6%F.S. @ 501Hz~1200Hz, AC mode 0.3% of actual + 0.7%F.S. @ 501Hz~1200Hz, DC + AC mode Valid from 5% of full-scale to 200% of full-scale. Note: Above 1.2KHZ, No Rang, only for refernce.	
	Response Time	<180mS	
Noise Level, Typical (r.m.s)		450mV, Low-range; 700mV, High-range; at ≥40Hz outputfrequency; bandwidth, 20kHz to 1MHZ;	
DC Output			
DC Output Power		650W	1050W
Voltage (DC)	Range	Low-range: ±270Vdc High-range: ±540Vdc AUTO	
	Resolution	20mV	
	Accuracy	±(0.1% of actual + 0.1% of full-scale); valid in low-range from 5% of full-scale to 270VDC, and in high-range from 5% of full-scale to 540VDC; with sense leads connected.	
Max. Current (DC)	0~270V (L)	4.8A	8.4A
	0~540V (H)	2.4A	4.2A
	Accuracy	±(0.25% of actual + 0.25% of full-scale); valid from 5% of full-scale to 100% of full-scale.	
DC Offset Voltage, Typical		20mVDC, ≥40Hz	
Ripple&Noise(r.m.s)/ (Pk-Pk)	Low-Range	400mV(r.m.s), 2V(Pk-Pk) bandwidth, 10Hz to 1MHz	
	High-Range	700mV(r.m.s), 4V(Pk-Pk)high-range bandwidth, 10Hz to 1MHz.	
Programmable Output Impedance[2]		0Ω + 200μH ~ 1Ω + 1mH	
Harmonics & Inter-harmonics Simulation[2]		10Hz to 5kHz; 2nd to 50th harmonic, 48KHz BW max[3]	
Measurement			
Voltage (AC + DC)	Range	AC 0~420Vac DC 0~540Vdc AC + DC 0-540V(RMS)	
	Resolution	20mV	
	Accuracy (r.m.s)	0.1% of actual+ 0.1%F.S. @ 10~1000Hz, AC mode 0.1% of actual+ 0.2%F.S. @ 10~1000Hz, AC+ DC mode 0.1% of actual+ 0.3%F.S. @ 1001~2000Hz, AC mode 0.1% of actual+ 0.4%F.S. @ 1001~2000Hz, AC+ DC mode 0.1% of actual+ 0.5%F.S. @ 2001~3000Hz, AC mode 0.1% of actual+ 0.6%F.S. @ 2001~3000Hz, AC + DC mode 0.1% of actual+ 0.7%F.S. @ 3001~4000Hz, AC mode 0.1% of actual+ 0.8%F.S. @ 3001~4000Hz, AC + DC mode 0.1% of actual+ 0.9%F.S. @ 4001~5000Hz, AC mode 0.1% of actual+ 1.0%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% to 100% of full-scale with sense leads connected.	

Model		MS420VAC650W	MS420VAC1050W
Voltage (DC)	Range	DC 0~540Vdc	
	Resolution	20mV	
	Accuracy	±(0.1% of actual + 0.1% of full-scale); valid in low-range from 5% of full-scale to 270VDC, and in high-range from 5% of full-scale to 540VDC; with sense leads connected.	
Frequency	Range	10~5000Hz	
	Resolution	0.01Hz @ 10~81.99Hz; 0.05Hz @ 82~819.99Hz; 0.1Hz @ 820~5000Hz;	
	Accuracy	0.01% of actual + 0.005Hz @ 10~81.91Hz 0.01% of actual + 0.025Hz @ 82~819.1Hz 0.01% of actual + 0.05Hz @ 820~1000Hz 0.1% of actual + 0.05Hz @ 1001~5000Hz Frequency measurement specifications valid for output voltage >5% of full-scale. Note: 4.2V <Vout< 10.5V (L range) can be extended 1.5 times, Less Than 4.2V, no range. 8.4V <Vout< 21.0V (H range) can be extended 1.5 times, Less Than 8.4V, no range.	
Current (r.m.s)	Range	0~110% F.S. (H: F.S.=100% Irms, L: F.S.=25% Irms)	
	Resolution	L: 0.5mA, H: 0.25mA	L: 1mA, H: 0.5mA
	Accuracy	0.3% of actual + 0.3%F.S. @ 10~1000Hz, AC mode 0.3% of actual + 0.4%F.S. @ 10~1000Hz, AC + DC mode 0.3% of actual + 0.4%F.S. @ 1001~2000Hz, AC mode 0.3% of actual + 0.5%F.S. @ 1001~2000Hz, AC + DC mode 0.3% of actual + 0.5%F.S. @ 2001~3000Hz, AC mode 0.3% of actual + 0.6%F.S. @ 2001~3000Hz, AC + DC mode 0.3% of actual + 0.6%F.S. @ 3001~4000Hz, AC mode 0.3% of actual + 0.7%F.S. @ 3001~4000Hz, AC + DC mode 0.3% of actual + 0.7%F.S. @ 4001~5000Hz, AC mode 0.3% of actual + 0.8%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% of full-scale to 100% of full-scale.	
Current (Peak)	Range	0~110% F.S. (H: F.S.=100% Ipeak, L: F.S.=25% Ipeak)	
	Resolution	L: 2.5mA, H: 1.25mA	L: 5mA, H: 2.5mA
	Accuracy	0.4% of actual + 0.6%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 0.8%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 1.0%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 1.1%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 1.2%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 1.3%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 1.4%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 1.5%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% of full-scale to 100% of full-scale.	
Power (Watts)	Range	0~650W	0~1050W
	Resolution	0.25W	0.5W
	Accuracy	0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 1.1%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 1.3%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 1.5%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 1.7%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 1.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 2.1%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 2.3%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 2.5%F.S. @ 4001~5000Hz, AC + DC mode	
Power Apparent (VA)	Range	0~650VA	0~1050VA
	Resolution	0.25VA	0.5VA
	Accuracy	0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 1.1%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 1.3%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 1.5%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 1.7%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 1.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 2.1%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 2.3%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 2.5%F.S. @ 4001~5000Hz, AC + DC mode	

Model		MS420VAC650W	MS420VAC1050W
Power Resistive (VAR)	Range	0~650VAR	0~1050VAR
	Resolution	0.25VAR	0.5VAR
	Accuracy	$\sqrt{(VA)^2-(W)^2}$, Calculated value	
Power Factor (PF)	Range	0~1.000	
	Resolution	0.001	
	Accuracy	2%F.S.	
Phase	Range	0~360.0°	
	Resolution	0.4 º	
	Accuracy	1º @ 10~100Hz; 2º @ 101~1200Hz; 3º @ 1201~2200Hz; 4º @ 2201~3200Hz; 5º @ 3201~4200Hz; 6º @ 4201~5000Hz;	
Harmonic [2]		2~50 orders	
Extra Function			
Remote Sense		5V(rms), Max. Total power less than rated power.	
Slew Rate	Range	AC Voltage: 0.001-10000.00V/mS and Disable	
		DC Voltage: 0.001-10000.00V/mS and Disable	
		Frequency: 0.001-1600.000Hz/ms and Disable	
Transient Generator (only for 15~70Hz)	Range	Trans-Start: 0.0~66.5ms/10Hz, Resolution: 0.1ms	
		Trans-Volt: -270V ~ +270V(L), -540V ~ +540V(H), Resolution: 0.1V	
		Trans-Time: 0.0~66.5ms/10Hz, Resolution: 0.1ms	
		Trans-Count: 0~9999, Constant	
Calibration Function		Built-in calibration function	
Multi-operation [4]	Parallel Output	Max. 64 Units (Option: Optical fiber parallel card)	
	Series Output	Max. 2 Units (Option: Optical fiber parallel card)	
General			
Graphic Display		5" Color touch LCD	
Operation Key Feature		Switch key, Rotary Knob, USB port for transfer and upgrading firmware	
Rack mount Handles		Yes	
FAN		Temperature Control	
Protection Circuits		OVP, OCP, OPP, OFP, RMP	
Interface		USB, RS232, RS485 (Standard) ; GPIB&LAN, CAN (Optional)	
Remote Control Input/Output (Option)			
Analog input		Set A/B/C phase voltage RMS, set current limit.	
Analog output		A/B/C phase output voltage RMS value monitoring, output power monitoring.	
Digital input		Single/three output mode selection, external control function enable selection, power output ON/OFF state control, enable analog input control, stored data recall, output suppression (OFF/LIVE/LATCHING), phase/frequency synchronization signal, List file run trigger.	
Digital output		Power output ON/OFF status indicator, fault status indicator, List file output/output status change/parameter change indicator.	
Environment			
Operating Temperature		0°C~50°C	
Storage Temperature		-20°C~70°C	
Fan Noise		60dB Max	70dB Max
Altitude		2000m	
Relative Humidity		<95%, non-condensing≤45°C; <80%, non-condensing≤50°C	
Temperature Coefficient		≤100ppm/°C F.S. (Voltage); ≤20 ppm/°C F.S. (Current); 10ppm/ºC.F.S. (Frequency)	
Mechanical			
Dimensions (W*H*D)		211.5 x 88 x 440 mm	423 x 88 x 585 mm
Package Dimensions (W*H*D)		384 x 229 x 641 mm	638 x 303 x 875 mm
Unit Weight		7kg	17kg
Shipping Weight		9.8kg	-
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		It meets the safety requirements of EU EN 61010-1:2010 for electrical equipment used in measurement, control and laboratories.	
CE Mark		Installation Overvoltage Category II; Pollution Degree 2; Class II equipment; indoor use only.	
Isolation Voltage		2828VDC, AC output to chassis; 2828VDC, AC input to chassis; 4242VDC, AC input to AC output	
RoHS		Meet to EU Directive 2011/65/EU for restriction of hazardous substances in Electrical and Electronic Equipment.	

[1] According to the output frequency, the AC output voltage will be reduced, and the rated voltage can be output within 3500Hz;
At low level, the maximum output voltage is 187.5V at 4000Hz, and the maximum output voltage is 150V at 5000HZ. The calculation formula is: output voltage =750000/ output frequency.
At high level, the maximum output voltage is 375V at 4000Hz, and the maximum output voltage is 300V at 5000HZ. The calculation formula is: output voltage =1500000/ output frequency.
[2] Only professional version/Professional-HF version support these functions.
[3] According to the output frequency, the number of harmonics will be reduced, up to 50 timeswithin 960Hz, up to 16 times at 3000Hz, up to 9 times at 5000Hz,
the calculation formula is : harmonic number =48000/ output frequency.
[4] It is suggest to derate to 90% output in parallel connection.
All specifications are subject to change without notice.

Model		MS420VAC2100W	MS420VAC3100W	MS420VAC4100W	MS420VAC6000W
Input					
Voltage	1 Phase	100~132Vac 187~300Vac	100~132Vac, Derating to 50% of rated power 187~300Vac		
	3 Phase	Not supported	Not supported	Not supported	187~300Vac, Derating to 50% of rated power 340~460Vac
Current	1 Phase	Max. 27.6A(L-N)	Max. 21.7A(L-N)	Max. 27.6A(L-N)	Max. 41A(L-N)
	3 Phase	Not supported	Not supported	Not supported	Max. 23.6A(L-L)
Connection	1 Phase	L, N, PE	L, N, PE	L, N, PE	L, N, PE (need to short-circuit all L1-L3 and then input as L)
	3 Phase	Not supported	Not supported	Not supported	L1,L2,L3, N,PE; Only for 3-Phase 4 Wire Y type/Neutral Required
Frequency		45~65Hz			
Fuse (Internal)		4* T15A	4* T15A	4* T20A	6* T20A
Power Factor		>0.97 (Rate Input Voltage, Full Load)	>0.98 (Rate Input Voltage, Full Load)	>0.98 (Rate Input Voltage, Full Load)	>0.98 (Rate Input Voltage, Full Load)
Input Power		Max. 3.3kVA	Max. 4.2kVA	Max. 4.8kVA	Max. 7.2kVA
Efficiency (Full Load, 50~5000Hz/DC)		>80% (Rate: 110Vac) >81.0% (Rate: 220Vac)	>73.4% (Rate: 110Vac) >82.3% (Rate: 220Vac)	>76.6% (Rate: 110Vac) >83.8% (Rate: 220Vac)	>72.5% (Rate: 110Vac) >83.4% (Rate: 220Vac)
AC Output					
AC Output Power		2100VA	3100VA	4100VA	6000VA
Phase		1 Phase			
Voltage (AC/AC+DC)	Range [1]	L: 0~210Vac H: 0~420Vac AUTO			
	Resolution	≤0.02V (AC and AC+DC mode)			
	Accuracy	0.05%F.S. @ 10~100Hz, AC mode 0.1% of actual + 0.1%F.S. @ DC mode 0.1% of actual + 0.1%F.S. @ 101~500Hz, AC mode 0.1% of actual + 0.2%F.S. @ 101~500Hz, AC+ DC mode 0.1% of actual + 0.2%F.S. @ 501~1000Hz, AC mode 0.1% of actual + 0.3%F.S. @ 501~1000Hz, AC+ DC mode 0.1% of actual + 0.4%F.S. @ 1001~2000Hz, AC mode 0.1% of actual + 0.5%F.S. @ 1001~2000Hz, AC+ DC mode 0.1% of actual + 0.6%F.S. @ 2001~3000Hz, AC mode 0.1% of actual + 0.7%F.S. @ 2001~3000Hz, AC+ DC mode 0.1% of actual + 0.8%F.S. @ 3001~4000Hz, AC mode 0.1% of actual + 0.9%F.S. @ 3001~4000Hz, AC+ DC mode 0.1% of actual + 1%F.S. @ 4001~5000Hz, AC mode 0.1% of actual + 1.1%F.S. @ 4001~5000Hz, AC+ DC mode Valid from 5% of full-scale to 210VAC(RMS)/270VDC in low-range and 420VAC(RMS)/540VDC in high-range; with sense leads connected.			
	Display Bits	0.001V			
Max. Current (r.m.s)	0~210V (L)	21A	30A	39A	60A
	0~420V (H)	10.5A	15A	19.5A	30A
	Display Bits	0.001A			
	Resolution	L: 2.5mA, H: 1.25mA		L: 5mA, H: 2.5mA	
Max. Current (Peak)	0~210V (L)	105Apk	150Apk	195Apk	300Apk
	0~420V (H)	52.5Apk	75Apk	97.5Apk	150Apk
Frequency	Range	Advanced Version: 10~2500Hz Professional Version: 10~2500Hz Profession-HF Version: 10~5000Hz			
	Resolution	0.01Hz @ 10~81.99Hz; 0.05Hz @ 82~819.99Hz; 0.1Hz @ 820~5000Hz;			
	Accuracy	0.01% of actual + 0.005Hz @ 10~81.99Hz 0.01% of actual + 0.025Hz @ 82~819.99Hz 0.01% of actual + 0.05Hz @ 820~1000Hz 0.1% of actual + 0.05Hz @ 1001~5000Hz Frequency set specifications valid for output voltage >5% of full-scale. Note: 4.2V <Vout< 10.5V (L range) can be extended 1.5 times, Less Than 4.2V, no range. 8.4V <Vout< 21.0V (H range) can be extended 1.5 times, Less Than 8.4V, no range.			
Total Harmonic Distortion (THD)		<0.3% @ 10~100Hz, 50~210Vac/100~420Vac (Resistive Load) <0.5% @ 101~500Hz, 50~210Vac/100~420Vac (Resistive Load) <1% @ 501~1000Hz, 50~210Vac/100~420Vac (Resistive Load) <2% @ 1001~2000Hz, 50~210Vac/100~420Vac (Resistive Load) <3% @ 2001~3000Hz, 50~210Vac/100~420Vac (Resistive Load) <4% @ 3001~4000Hz, 50~210Vac/100~420Vac (Resistive Load) <5% @ 4001~5000Hz, 50~210Vac/100~420Vac (Resistive Load) Note: 25V <Vout< 50V (L range) can be extended 1.5 times, Less Than 25V, no range. Note: 50V <Vout< 100V (H range) can be extended 1.5 times, Less Than 30V, no range.			

Model		MS420VAC2100W	MS420VAC3100W	MS420VAC4100W	MS420VAC6000W
Crest Factor (CF)		≤5			
Load Regulation(ALC=ON)		0.1% of actual+0.1%F.S. @10~1000Hz, AC mode 0.1% of actual+0.2%F.S. @10~1000Hz, AC+ DC mode 0.1% of actual+0.3%F.S. @1001~2000Hz, AC mode 0.1% of actual+0.4%F.S. @1001~2000Hz, AC+ DC mode 0.1% of actual+0.5%F.S. @2001~3000Hz, AC mode 0.1% of actual+0.6%F.S. @2001~3000Hz, AC+ DC mode 0.1% of actual+0.7%F.S. @3001~4000Hz, AC mode 0.1% of actual+0.8%F.S. @3001~4000Hz, AC+ DC mode 0.1% of actual+0.9%F.S. @4001~5000Hz, AC mode 0.1% of actual+1.0%F.S. @4001~5000Hz, AC+ DC mode Valid from 5% to 100% of full-scale with sense leads connected.			
Line Regulation	ALC=ON	0.05%F.S. @ 1Φ100-132Vac/ 3ΦY187-300Vac； 0.025%F.S. @ 1Φ187-300Vac/ 3ΦY340-460Vac； Input voltage change in ±10%, DC output or 10Hz~5000Hz AC output.			
	ALC=OFF	0.1%F.S. @ 1Φ100-132Vac/ 3ΦY187-300Vac； 0.05%F.S. @ 1Φ187-300Vac/ 3ΦY340-460Vac； Input voltage change in ±10%, DC output or 10Hz~800Hz AC output.			
Phase Angle (Starting / Ending)	Range	0~360°			
	Resolution	0.4 º			
	Accuracy	1º @ 10~100Hz; 2º @ 101~1200Hz; 3º @ 1201~2200Hz; 4º @ 2201~3200Hz; 5º @ 3201~4200Hz; 6º @ 4201~5000Hz;			
Current CC Fold Mode	Range	5~200%F.S. (AC Output Voltage: Low-Range 50~210Vac, High-Range 100~420Vac) 7~200%F.S. (DC Output Voltage: Low-Range 50~270Vdc, High-Range 100~540Vdc)			
	Resolution	35mA	35mA	70mA	70mA
	Accuracy	0.3% of actual + 0.5%F.S. @ DC mode 0.3% of actual + 0.5%F.S. @ 10~500Hz, AC mode 0.3% of actual + 0.6%F.S. @ 10~500Hz, DC + AC mode Valid from 5% of full scale to 100% of full-scale. 0.3% of actual + 0.6%F.S. @ 501Hz~1200Hz, AC mode 0.3% of actual + 0.7%F.S. @ 501Hz~1200Hz, DC + AC mode Valid from 5% of full-scale to 200% of full-scale. Note: Above 1.2KHZ, No Rang, only for refernce.			
	Response Time	<180mS			
Noise Level, Typical (r.m.s)		450mV, Low-range; 700mV, High-range; at ≥40Hz outputfrequency; bandwidth, 20kHz to 1MHz;			
DC Output					
DC Output Power		2100W	3100W	4100W	6000W
Voltage (DC)	Range	Low-range: ±270Vdc High-range: ±540Vdc AUTO			
	Resolution	20mV			
	Accuracy	±(0.1% of actual + 0.1% of full-scale); valid in low-range from 5% of full-scale to 270VDC, and in high-range from 5% of full-scale to 540VDC; with sense leads connected.			
Max. Current (DC)	0~270V (L)	16.2A	24A	31.2A	46.8A
	0~540V (H)	8.1A	12A	15.6A	23.4A
	Accuracy	±(0.25% of actual + 0.25% of full-scale); valid from 5% of full-scale to 100% of full-scale.			
DC Offset Voltage, Typical		20mVDC, ≥40Hz			
Ripple&Noise(r.m.s)/ (Pk-Pk)	Low-Range	400 mV(r.m.s), 2V(Pk-Pk) bandwidth, 10Hz to 1MHz			
	High-Range	700mV(r.m.s), 4V(Pk-Pk)high-range bandwidth, 10Hz to 1MHz.			
Programmable Output Impedance[2]		0Ω + 200μH ~ 1Ω + 1mH			
Harmonics & Inter-harmonics Simulation[2]		10Hz to 5kHz; 2nd to 50th harmonic, 48KHz BW max[3]			
Measurement					
Voltage (AC + DC)	Range	AC 0~420Vac DC 0~540Vdc AC + DC 0-540V(RMS)			
	Resolution	20mV			
	Accuracy (r.m.s)	0.1% of actual+ 0.1%F.S. @ 10~1000Hz, AC mode 0.1% of actual+ 0.2%F.S. @ 10~1000Hz, AC+ DC mode 0.1% of actual+ 0.3%F.S. @ 1001~2000Hz, AC mode 0.1% of actual+ 0.4%F.S. @ 1001~2000Hz, AC+ DC mode 0.1% of actual+ 0.5%F.S. @ 2001~3000Hz, AC mode 0.1% of actual+ 0.6%F.S. @ 2001~3000Hz, AC + DC mode 0.1% of actual+ 0.7%F.S. @ 3001~4000Hz, AC mode 0.1% of actual+ 0.8%F.S. @ 3001~4000Hz, AC + DC mode 0.1% of actual+ 0.9%F.S. @ 4001~5000Hz, AC mode 0.1% of actual+ 1.0%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% to 100% of full-scale with sense leads connected.			

Model		MS420VAC2100W	MS420VAC3100W	MS420VAC4100W	MS420VAC6000W
Voltage (DC)	Range	DC 0~540Vdc			
	Resolution	20 mV			
	Accuracy	±(0.1% of actual + 0.1% of full-scale); valid in low-range from 5% of full-scale to 270VDC, and in high-range from 5% of full-scale to 540VDC; with sense leads connected.			
Frequency	Range	10~5000Hz			
	Resolution	0.01Hz @ 10~81.99Hz; 0.05Hz @ 82~819.99Hz; 0.1Hz @ 820~5000Hz;			
	Accuracy	0.01% of actual + 0.005Hz @ 10~81.91Hz 0.01% of actual + 0.025Hz @ 82~819.1Hz 0.01% of actual + 0.05Hz @ 820~1000Hz 0.1% of actual + 0.05Hz @ 1001~5000Hz Frequency measurement specifications valid for output voltage >5% of full-scale. Note: 4.2V <Vout< 10.5V (L range) can be extended 1.5 times, Less Than 4.2V, no range. 8.4V <Vout< 21.0V (H range) can be extended 1.5 times, Less Than 8.4V, no range.			
Current (r.m.s)	Range	0~110% F.S. (H: F.S.=100% Irms, L: F.S.=25% Irms)		0~110% F.S. (H: F.S.=100% Irms, M: F.S.=25% Irms, L: F.S.=5% Irms)	
	Resolution	L: 3mA, H: 1.5mA		L: 6mA, H: 3mA	
	Accuracy	0.3% of actual + 0.3%F.S. @ 10~1000Hz, AC mode 0.3% of actual + 0.4%F.S. @ 10~1000Hz, AC + DC mode 0.3% of actual + 0.5%F.S. @ 1001~2000Hz, AC mode 0.3% of actual + 0.6%F.S. @ 1001~2000Hz, AC + DC mode 0.3% of actual + 0.7%F.S. @ 2001~3000Hz, AC mode 0.3% of actual + 0.8%F.S. @ 2001~3000Hz, AC + DC mode 0.3% of actual + 0.9%F.S. @ 3001~4000Hz, AC mode 0.3% of actual + 1.0%F.S. @ 3001~4000Hz, AC + DC mode 0.3% of actual + 1.1%F.S. @ 4001~5000Hz, AC mode 0.3% of actual + 1.2%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% of full-scale to 100% of full-scale.			
Current (Peak)	Range	0~110% F.S. (H: F.S.=100% Ipeak, L: F.S.=25% Ipeak)		0~110% F.S. (H: F.S.=100% Ipeak, M: F.S.=25% Ipeak, L: F.S.=8% Ipeak)	
	Resolution	L: 12.5mA, H: 6.25mA		L: 30mA, H: 15mA	
	Accuracy	0.4% of actual + 0.6%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 0.7%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 0.8%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 0.8%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 0.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 1.0%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 1.0%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 1.1%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% of full-scale to 100% of full-scale.			
Power (Watts)	Range	0~2100W	0~3100W	0~4100W	0~6000W
	Resolution	1.5W	1.5W	3W	3W
	Accuracy	0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 1.1%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 1.3%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 1.5%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 1.7%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 1.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 2.1%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 2.3%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 2.5%F.S. @ 4001~5000Hz, AC + DC mode			
Power Apparent (VA)	Range	0~2100VA	0~3100VA	0~4100VA	0~6000VA
	Resolution	1.5VA	1.5VA	3VA	3VA
	Accuracy	0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 1.1%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 1.3%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 1.5%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 1.7%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 1.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 2.1%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 2.3%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 2.5%F.S. @ 4001~5000Hz, AC + DC mode			

Model		MS420VAC2100W	MS420VAC3100W	MS420VAC4100W	MS420VAC6000W
Power Resistive (VAR)	Range	0~2100VAR	0~3100VAR	0~4100VAR	0~6000VAR
	Resolution	1.5VAR	1.5VAR	3VAR	3VAR
	Accuracy	$\sqrt{(VA)^2-(W)^2}$, Calculated value			
Power Factor (PF)	Range	0~1.000			
	Resolution	0.001			
	Accuracy	2%F.S.			
Phase	Range	0~360.0°			
	Resolution	0.4 °			
	Accuracy	1° @ 10~100Hz; 2° @ 101~1200Hz; 3° @ 1201~2200Hz; 4° @ 2201~3200Hz; 5° @ 3201~4200Hz; 6° @ 4201~5000Hz;			
Harmonic[2]		2~50 orders			
Extra Function					
Remote Sense		5V(rms), Max. Total power less than rated power.			
Slew Rate	Range	AC Voltage: 0.001-10000.00V/ms and Disable			
		DC Voltage: 0.001-10000.00V/ms and Disable			
		Frequency: 0.001-1600.000Hz/ms and Disable			
Transient Generator (only for 15~70Hz)	Range	Trans-Start: 0.0~66.5ms/10Hz, Resolution: 0.1ms			
		Trans-Volt: -270V ~ +270V(L), -540V ~ +540V(H), Resolution: 0.1V			
		Trans-Time: 0.0~66.5ms/10Hz, Resolution: 0.1ms			
		Trans-Count: 0~9999, Constant			
Calibration Function		Built-in calibration function			
Multi-operation[4]	Parallel Output	Max. 64 Units (Option: Optical fiber parallel card)			
	Series Output	Max. 2 Units (Option: Optical fiber parallel card)			
General					
Graphic Display		5" Color touch LCD	7" Color touch LCD		
Operation Key Feature		Switch key, Rotary Knob, USB port for transfer and upgrading firmware			
Rack mount Handles		Yes			
FAN		Temperature Control			
Protection Circuits		OVP, OCP, OPP, OFP, RMP			
Interface		USB, RS232, RS485 (Standard) ; GPIB&LAN, CAN (Optional)			
Remote Control Input/Output (Option)					
Analog input		Set A/B/C phase voltage RMS, set current limit.			
Analog output		A/B/C phase output voltage RMS value monitoring, output power monitoring.			
Digital input		Single/three output mode selection, external control function enable selection, power output ON/OFF state control, enable analog input control, stored data recall, output suppression (OFF/LIVE/LATCHING), phase/frequency synchronization signal, List file run trigger.			
Digital output		Power output ON/OFF status indicator, fault status indicator, List file output/output status change/parameter change indicator.			
Galvanic Isolation to the Device		2121VDC			
Environment					
Operating Temperature		0°C~50°C			
Storage Temperature		-20°C~70°C			
Fan Noise		70dB Max	72.8dB Max	72.8dB Max	72.8dB Max
Altitude		2000m			
Relative Humidity		<95%, non-condensing≤45°C; <80%, non-condensing≤50°C			
Temperature Coefficient		≤100ppm/°C F.S. (Voltage); ≤200ppm/°C F.S. (Current); 10ppm/°C.F.S. (Frequency)			
Mechanical					
Dimensions (W*H*D)		423 x 88 x 585 mm	423 x 133 x 585 mm	423 x 133 x 585 mm	423 x 133 x 585 mm
Package Dimensions (W*H*D)		638 x 303 x 875 mm	638 x 347 x 875 mm	638 x 347 x 875 mm	638 x 347 x 875 mm
Unit Weight		19.5kg	28.5kg	33.2kg	36kg
Shipping Weight		-	-	-	44.5kg
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		It meets the safety requirements of EU EN 61010-1:2010 for electrical equipment used in measurement, control and laboratories.			
CE Mark		Installation Overvoltage Category II; Pollution Degree 2; Class II equipment; indoor use only.			
Isolation Voltage		2828VDC, AC output to chassis; 2828VDC, AC input to chassis; 4242VDC, AC input to AC output			
RoHS		Meet to EU Directive 2011/65/EU for restriction of hazardous substances in Electrical and Electronic Equipment.			

[1] According to the output frequency, the AC output voltage will be reduced, and the rated voltage can be output within 3500Hz;
At low level, the maximum output voltage is 187.5V at 4000Hz, and the maximum output voltage is 150V at 5000HZ. The calculation formula is: output voltage =750000/ output frequency.
At high level, the maximum output voltage is 375V at 4000Hz, and the maximum output voltage is 300V at 5000HZ. The calculation formula is: output voltage =1500000/ output frequency.
[2] Only professional version/Professional-HF version support these functions.
[3] According to the output frequency, the number of harmonics will be reduced, up to 50 timeswithin 960Hz, up to 16 times at 3000Hz, up to 9 times at 5000Hz,
the calculation formula is : harmonic number =48000/ output frequency.
[4] It is suggest to derate to 90% output in parallel connection.
All specifications are subject to change without notice.

Model		MST420VAC2100W	MST420VAC3000W	MST420VAC4500W	MST420VAC6000W
Input					
Voltage	1 Phase	100~132Vac 187~300Vac		100~132Vac, Derating to 50% of rated power 187~300Vac	
	3 Phase	187~300Vac 340~460Vac		187~300Vac, Derating to 50% of rated power 340~460Vac	
Current	1 Phase	Max. 28.5A(L-N)	Max. 38A(L-N)	Max. 31.8A(L-N)	Max. 41A(L-N)
	3 Phase	Max. 16.4A(L-L)	Max. 21.9A(L-L)	Max. 18.3A(L-L)	Max. 23.6A(L-L)
Connection	1 Phase	L, N, PE (need to short-circuit all L1-L3 and then input as L)			
	3 Phase	Not supported		L1,L2,L3, N,PE; Only for 3-Phase 4 Wire Y type/Neutral Required	
Frequency		45~65Hz			
Fuse (Internal)		6* T15A	6* T20A	6* T20A	6* T20A
Power Factor		>0.98 (Rate Input Voltage, Full Load)	>0.97 (Rate Input Voltage, Full Load)	>0.97 (Rate Input Voltage, Full Load)	>0.98 (Rate Input Voltage, Full Load)
Input Power		Max.3.2kVA	Max.4kVA	Max.5.8kVA	Max.7.2kVA
Efficiency (Full Load, 50~5000Hz/DC)		>74.5% (Rate: 110Vac) >74.8% (Rate: 220Vac)	>79.0% (Rate: 110Vac) >80.3% (Rate: 220Vac)	>72.5% (Rate: 110Vac) >81.8% (Rate: 220Vac)	>72.5% (Rate: 110Vac) >83.4% (Rate: 220Vac)
AC Output					
AC Output Power		2100VA	3000VA	4500VA	6000VA
Phase		1 Phase / 3Phase			
Voltage (AC/AC+DC)	Range[1]	L: 0~210Vac H: 0~420Vac AUTO			
	Resolution	≤0.02V (AC and AC+DC mode)			
	Accuracy	0.05%F.S. @ 10~100Hz, AC mode 0.1% of actual + 0.1%F.S. @ DC mode 0.1% of actual + 0.1%F.S. @ 101~500Hz, AC mode 0.1% of actual + 0.2%F.S. @ 101~500Hz, AC+ DC mode 0.1% of actual + 0.2%F.S. @ 501~1000Hz, AC mode 0.1% of actual + 0.3%F.S. @ 501~1000Hz, AC+ DC mode 0.1% of actual + 0.4%F.S. @ 1001~2000Hz, AC mode 0.1% of actual + 0.5%F.S. @ 1001~2000Hz, AC+ DC mode 0.1% of actual + 0.6%F.S. @ 2001~3000Hz, AC mode 0.1% of actual + 0.7%F.S. @ 2001~3000Hz, AC+ DC mode 0.1% of actual + 0.8%F.S. @ 3001~4000Hz, AC mode 0.1% of actual + 0.9%F.S. @ 3001~4000Hz, AC+ DC mode 0.1% of actual + 1%F.S. @ 4001~5000Hz, AC mode 0.1% of actual + 1.1%F.S. @ 4001~5000Hz, AC+ DC mode Valid from 5% of full-scale to 210VAC(RMS)/270VDC in low-range and 420VAC(RMS)/540VDC in high-range; with sense leads connected.			
	Display Bits	0.001V			
Max. Current (r.m.s)	0~210V (L)	3 Phase: 7A 1 Phase: 21A	3 Phase: 10A 1 Phase: 30A	3 Phase: 14.4A 1 Phase: 43.2A	3 Phase: 20A 1 Phase: 60A
	0~420V (H)	3 Phase: 3.5A 1 Phase: 10.5A	3 Phase: 5A 1 Phase: 15A	3 Phase: 7.2A 1 Phase: 21.6A	3 Phase: 10A 1 Phase: 30A
	Display Bits	0.001A			
	Resolution	3 Phase: 1mA(L), 0.5mA(H) 1 Phase: 3mA(L), 1.5mA(H)		3 Phase: 2mA(L), 1mA(H) 1 Phase: 6mA(L), 3mA(H)	
Max. Current (Peak)	0~210V (L)	3 Phase: 35Apk 1 Phase: 105Apk	3 Phase: 50Apk 1 Phase: 150Apk	3 Phase: 72Apk 1 Phase: 216Apk	3 Phase: 100Apk 1 Phase: 300Apk
	0~420V (H)	3 Phase: 17.5Apk 1 Phase: 52.5Apk	3 Phase: 25Apk 1 Phase: 75Apk	3 Phase: 36Apk 1 Phase: 108Apk	3 Phase: 50Apk 1 Phase: 150Apk
Frequency	Range	Advanced Version: 10~2500Hz Professional Version: 10~2500Hz Profession-HF Version: 10~5000Hz			
	Resolution	0.01Hz @ 10~81.99Hz; 0.05Hz @ 82~819.99Hz; 0.1Hz @ 820~5000Hz;			
	Accuracy	0.01% of actual + 0.005Hz @10~81.99Hz 0.01% of actual + 0.025Hz @ 82~819.99Hz 0.01% of actual + 0.05Hz @ 820~1000Hz 0.1% of actual + 0.05Hz @ 1001~5000Hz Frequency set specifications valid for output voltage >5% of full-scale. Note: 4.2V <Vout< 10.5V (L range) can be extended 1.5 times, Less Than 4.2V, no range. 8.4V <Vout< 21.0V (H range) can be extended 1.5 times, Less Than 8.4V, no range.			
Total Harmonic Distortion (THD)		<0.3% @ 10~100Hz, 50~210Vac/100~420Vac (Resistive Load) <0.5% @ 101~500Hz, 50~210Vac/100~420Vac (Resistive Load) <1% @ 501~1000Hz, 50~210Vac/100~420Vac (Resistive Load) <2% @ 1001~2000Hz, 50~210Vac/100~420Vac (Resistive Load) <3% @ 2001~3000Hz, 50~210Vac/100~420Vac (Resistive Load) <4% @ 3001~4000Hz, 50~210Vac/100~420Vac (Resistive Load) <5% @ 4001~5000Hz, 50~210Vac/100~420Vac (Resistive Load) Note: 25V <Vout< 50V (L range) can be extended 1.5 times, Less Than 25V, no range. Note: 50V <Vout< 100V (H range) can be extended 1.5 times, Less Than 30V, no range.			

Model		MST420VAC2100W	MST420VAC3000W	MST420VAC4500W	MST420VAC6000W
Crest Factor (CF)		≤5			
Load Regulation(ALC=ON)		0.1% of actual+0.1%F.S. @10~1000Hz, AC mode 0.1% of actual+0.2%F.S. @10~1000Hz, AC+ DC mode 0.1% of actual+0.3%F.S. @1001~2000Hz, AC mode 0.1% of actual+0.4%F.S. @1001~2000Hz, AC+ DC mode 0.1% of actual+0.5%F.S. @2001~3000Hz, AC mode 0.1% of actual+0.6%F.S. @2001~3000Hz, AC+ DC mode 0.1% of actual+0.7%F.S. @3001~4000Hz, AC mode 0.1% of actual+0.8%F.S. @3001~4000Hz, AC+ DC mode 0.1% of actual+0.9%F.S. @4001~5000Hz, AC mode 0.1% of actual+1.0%F.S. @4001~5000Hz, AC+ DC mode Valid from 5% to 100% of full-scale with sense leads connected.			
Line Regulation	ALC=ON	0.05%F.S. @ 1Φ100-132Vac/ 3ΦY187-300Vac； 0.025%F.S. @ 1Φ187-300Vac/ 3ΦY340-460Vac； Input voltage change in ±10%, DC output or 10Hz~5000Hz AC output.			
	ALC=OFF	0.1%F.S. @ 1Φ100-132Vac/ 3ΦY187-300Vac； 0.05%F.S. @ 1Φ187-300Vac/ 3ΦY340-460Vac； Input voltage change in ±10%, DC output or 10Hz~800Hz AC output.			
Phase Angle (Starting / Ending)	Range	0~360°			
	Resolution	0.4 º			
	Accuracy	1º @ 10~100Hz; 2º @ 101~1200Hz; 3º @ 1201~2200Hz; 4º @ 2201~3200Hz; 5º @ 3201~4200Hz; 6º @ 4201~5000Hz;			
Current CC Fold Mode	Range	5~200%F.S. (AC Output Voltage: Low-Range 50~210Vac, High-Range 100~420Vac) 7~200%F.S. (DC Output Voltage: Low-Range 50~270Vdc, High-Range 100~540Vdc)			
	Resolution	3 Phase: 15mA 1 Phase: 45mA	3 Phase: 15mA 1 Phase: 45mA	3 Phase: 25mA 1 Phase: 75mA	3 Phase: 25mA 1 Phase: 75mA
	Accuracy	0.3% of actual + 0.5%F.S. @ DC mode 0.3% of actual + 0.5%F.S. @ 10~500Hz, AC mode 0.3% of actual + 0.6%F.S. @ 10~500Hz, DC + AC mode Valid from 5% of full scale to 100% of full-scale. 0.3% of actual + 0.6%F.S. @ 501Hz~1200Hz, AC mode 0.3% of actual + 0.7%F.S. @ 501Hz~1200Hz, DC + AC mode Valid from 5% of full-scale to 200% of full-scale. Note: Above 1.2KHZ, No Rang, only for refernce.			
	Response Time	<180mS			
Noise Level, Typical (r.m.s)		450mV, Low-range; 700mV, High-range; at ≥40Hz outputfrequency; bandwidth, 20kHz to 1MHz;			
DC Output					
DC Output Power		2100W	3000W	4500W	6000W
Voltage (DC)	Range	Low-range: ±270Vdc High-range: ±540Vdc AUTO			
	Resolution	20mV			
	Accuracy	±(0.1% of actual + 0.1% of full-scale); valid in low-range from 5% of full-scale to 270VDC, and in high-range from 5% of full-scale to 540VDC; with sense leads connected.			
Max. Current (DC)	0~270V (L)	5.4A (Every phase)	8.0A (Every phase)	11.6A (Every phase)	15.6A (Every phase)
	0~540V (H)	2.7A (Every phase)	4.0A (Every phase)	5.8A (Every phase)	7.8A (Every phase)
	Accuracy	±(0.25% of actual + 0.25% of full-scale); valid from 5% of full-scale to 100% of full-scale.			
DC Offset Voltage, Typical		20mVDC, ≥40Hz			
Ripple&Noise(r.m.s)/ (Pk-Pk)	Low-Range	400mV(r.m.s), 2V(Pk-Pk) bandwidth, 10Hz to 1MHz			
	High-Range	700mV(r.m.s), 4V(Pk-Pk)high-range bandwidth, 10Hz to 1MHz.			
Programmable Output Impedance [2]		0Ω + 200μH ~ 1Ω + 1mH			
Harmonics & Inter-harmonics Simulation [2]		10Hz to 5kHz; 2nd to 50th harmonic, 48KHz BW max [3]			
Measurement					
Voltage (AC + DC)	Range	AC 0~420Vac DC 0~540Vdc AC + DC 0-540V(RMS)			
	Resolution	20mV			
	Accuracy (r.m.s)	0.1% of actual+ 0.1%F.S. @ 10~1000Hz, AC mode 0.1% of actual+ 0.2%F.S. @ 10~1000Hz, AC+ DC mode 0.1% of actual+ 0.3%F.S. @ 1001~2000Hz, AC mode 0.1% of actual+ 0.4%F.S. @ 1001~2000Hz, AC+ DC mode 0.1% of actual+ 0.5%F.S. @ 2001~3000Hz, AC mode 0.1% of actual+ 0.6%F.S. @ 2001~3000Hz, AC + DC mode 0.1% of actual+ 0.7%F.S. @ 3001~4000Hz, AC mode 0.1% of actual+ 0.8%F.S. @ 3001~4000Hz, AC + DC mode 0.1% of actual+ 0.9%F.S. @ 4001~5000Hz, AC mode 0.1% of actual+ 1.0%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% to 100% of full-scale with sense leads connected.			

Model		MST420VAC2100W	MST420VAC3000W	MST420VAC4500W	MST420VAC6000W
Voltage (DC)	Range	DC 0~540Vdc			
	Resolution	20mV			
	Accuracy	±(0.1% of actual + 0.1% of full-scale); valid in low-range from 5% of full-scale to 270VDC, and in high-range from 5% of full-scale to 540VDC; with sense leads connected.			
Frequency	Range	10~5000Hz			
	Resolution	0.01Hz @ 10~81.99Hz; 0.05Hz @ 82~819.99Hz; 0.1Hz @ 820~ 5000Hz;			
	Accuracy	0.01% of actual + 0.005Hz @ 10~81.91Hz 0.01% of actual + 0.025Hz @ 82~819.1Hz 0.01% of actual + 0.05Hz @ 820~1000Hz 0.1% of actual + 0.05Hz @ 1001~5000Hz Frequency measurement specifications valid for output voltage >5% of full-scale. Note: 4.2V <Vout< 10.5V (L range) can be extended 1.5 times, Less Than 4.2V, no range. 8.4V <Vout< 21.0V (H range) can be extended 1.5 times, Less Than 8.4V, no range.			
Current (r.m.s)	Range	0~110% F.S. (H: F.S.=100% Irms, L: F.S.=25% Irms)		0~110% F.S. (H: F.S.=100% Irms, M: F.S.=25% Irms, L: F.S.=5% Irms)	
	Resolution	3 Phase: 1mA(L), 0.5mA(H) 1 Phase: 3mA(L), 1.5mA(H)		3 Phase: 2mA(L), 1mA(H) 1 Phase: 6mA(L), 3mA(H)	
	Accuracy	0.3% of actual + 0.3%F.S. @ 10~1000Hz, AC mode 0.3% of actual + 0.4%F.S. @ 10~1000Hz, AC + DC mode 0.3% of actual + 0.5%F.S. @ 1001~2000Hz, AC mode 0.3% of actual + 0.6%F.S. @ 1001~2000Hz, AC + DC mode 0.3% of actual + 0.7%F.S. @ 2001~3000Hz, AC mode 0.3% of actual + 0.8%F.S. @ 2001~3000Hz, AC + DC mode 0.3% of actual + 0.9%F.S. @ 3001~4000Hz, AC mode 0.3% of actual + 1.0%F.S. @ 3001~4000Hz, AC + DC mode 0.3% of actual + 1.1%F.S. @ 4001~5000Hz, AC mode 0.3% of actual + 1.2%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% of full-scale to 100% of full-scale.			
Current (Peak)	Range	0~110% F.S. (H: F.S.=100% Ipeak, L: F.S.=25% Ipeak)		0~110% F.S. (H: F.S.=100% Ipeak, M: F.S.=25% Ipeak, L: F.S.=8% Ipeak)	
	Resolution	3 Phase: 5mA(L), 2.5mA(H) 1 Phase: 15mA(L), 7.5mA(H)		3 Phase: 10mA(L), 5mA(H) 1 Phase: 30mA(L), 15mA(H)	
	Accuracy	0.4% of actual + 0.6%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 0.7%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 0.8%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 0.8%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 0.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 1.0%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 1.0%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 1.1%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% of full-scale to 100% of full-scale.			
Power (Watts)	Range	0~2100W	0~3000W	0~4500W	0~6000W
	Resolution	3 Phase: 0.5W 1 Phase: 1.5W	3 Phase: 0.5W 1 Phase: 1.5W	3 Phase: 1W 1 Phase: 3W	3 Phase: 1W 1 Phase: 3W
	Accuracy	0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 1.1%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 1.3%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 1.5%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 1.7%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 1.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 2.1%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 2.3%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 2.5%F.S. @ 4001~5000Hz, AC + DC mode			
Power Apparent (VA)	Range	0~2100VA	0~3000VA	0~4500VA	0~6000VA
	Resolution	3 Phase: 0.5VA 1 Phase: 1.5VA	3 Phase: 0.5VA 1 Phase: 1.5VA	3 Phase: 1VA 1 Phase: 3VA	3 Phase: 1VA 1 Phase: 3VA
	Accuracy	0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 1.1%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 1.3%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 1.5%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 1.7%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 1.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 2.1%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 2.3%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 2.5%F.S. @ 4001~5000Hz, AC + DC mode			

Model		MST420VAC2100W	MST420VAC3000W	MST420VAC4500W	MST420VAC6000W
Power Resistive (VAR)	Range	0~2100VAR	0~3000VAR	0~4500VAR	0~6000VAR
	Resolution	3 Phase: 0.5VAR 1 Phase: 1.5VAR	3 Phase: 0.5VAR 1 Phase: 1.5VAR	3 Phase: 1VAR 1 Phase: 3VAR	3 Phase: 1VAR 1 Phase: 3VAR
	Accuracy	$\sqrt{(VA)^2-(W)^2}$, Calculated value			
Power Factor (PF)	Range	0~1.000			
	Resolution	0.001			
	Accuracy	2%F.S.			
Phase	Range	0~360.0°			
	Resolution	0.4 °			
	Accuracy	1° @ 10~100Hz; 2° @ 101~1200Hz; 3° @ 1201~2200Hz; 4° @ 2201~3200Hz; 5° @ 3201~4200Hz; 6° @ 4201~5000Hz;			
Harmonic[2]		2~50 orders			
Extra Function					
Remote Sense		5V(rms), Max. Total power less than rated power.			
Slew Rate	Range	AC Voltage: 0.001-10000.00V/ms and Disable			
		DC Voltage: 0.001-10000.00V/ms and Disable			
		Frequency: 0.001-1600.000Hz/ms and Disable			
Transient Generator (only for 15~70Hz)	Range	Trans-Start: 0.0~66.5ms/10Hz, Resolution: 0.1ms			
		Trans-Volt: -270V ~ +270V(L), -540V ~ +540V(H), Resolution: 0.1V			
		Trans-Time: 0.0~66.5ms/10Hz, Resolution: 0.1ms			
		Trans-Count: 0~9999, Constant			
Calibration Function		Built-in calibration function			
Multi-operation[4]	Parallel Output	Max. 64 Units (Option: Optical fiber parallel card)			
	Series Output	Max. 2 Units (Option: Optical fiber parallel card)			
General					
Graphic Display		7" Color touch LCD			
Operation Key Feature		Switch key, Rotary Knob, USB port for transfer and upgrading firmware			
Rack mount Handles		Yes			
FAN		Temperature Control			
Protection Circuits		OVP, OCP, OPP, OFP, RMP			
Interface		USB, RS232, RS485 (Standard) ; GPIB&LAN, CAN (Optional)			
Remote Control Input/Output (Option)					
Analog input		Set A/B/C phase voltage RMS, set current limit.			
Analog output		A/B/C phase output voltage RMS value monitoring, output power monitoring.			
Digital input		Single/three output mode selection, external control function enable selection, power output ON/OFF state control, enable analog input control, stored data recall, output suppression (OFF/LIVE/LATCHING), phase/frequency synchronization signal, List file run trigger.			
Digital output		Power output ON/OFF status indicator, fault status indicator, List file output/output status change/parameter change indicator.			
Environment					
Operating Temperature		0°C~50°C			
Storage Temperature		-20°C~70°C			
Fan Noise		72.8dB Max	72.8dB Max	72.8dB Max	72.8dB Max
Altitude		2000m			
Relative Humidity		<95%, non-condensing≤45°C; <80%, non-condensing≤50°C			
Temperature Coefficient		≤100ppm/°C F.S. (Voltage); ≤200ppm/°C F.S. (Current); 10ppm/°C.F.S. (Frequency)			
Mechanical					
Dimensions (W*H*D)		423 x 133 x 585 mm			
Package Dimensions (W*H*D)		638 x 347 x 875 mm			
Unit Weight		34kg	34kg	36kg	36kg
Shipping Weight		-	-	44.5kg	44.5kg
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		It meets the safety requirements of EU EN 61010-1:2010 for electrical equipment used in measurement, control and laboratories.			
CE Mark		Installation Overvoltage Category II; Pollution Degree 2; Class II equipment; indoor use only.			
Isolation Voltage		2828VDC, AC output to chassis; 2828VDC, AC input to chassis; 4242VDC, AC input to AC output			
RoHS		Meet to EU Directive 2011/65/EU for restriction of hazardous substances in Electrical and Electronic Equipment.			

[1] According to the output frequency, the AC output voltage will be reduced, and the rated voltage can be output within 3500Hz;
At low level, the maximum output voltage is 187.5V at 4000Hz, and the maximum output voltage is 150V at 5000HZ. The calculation formula is: output voltage =750000/ output frequency.
At high level, the maximum output voltage is 375V at 4000Hz, and the maximum output voltage is 300V at 5000HZ. The calculation formula is: output voltage =1500000/ output frequency.
[2] Only professional version/Professional-HF version support these functions.
[3] According to the output frequency, the number of harmonics will be reduced, up to 50 timeswithin 960Hz, up to 16 times at 3000Hz, up to 9 times at 5000Hz,
the calculation formula is : harmonic number =48000/ output frequency.
[4] It is suggest to derate to 90% output in parallel connection.
All specifications are subject to change without notice.

Model		MST420VAC9000W	MST420VAC12000W	MST420VAC15000W	MST420VAC18000W
Input					
Voltage	3 Phase	187~300Vac, Derating to 50% of rated power 340~460Vac			
Current	3 Phase	Max. 35.5A(L-L)	Max. 47.4A(L-L)	Max. 59.2A(L-L)	Max. 71A(L-L)
Connection	3 Phase	L1,L2,L3, N,PE; Only for 3-Phase 4 Wire Y type/Neutral Required			
Frequency		45~65Hz			
Fuse (Internal)		12* T15A	12* T20A	18* T15A	18* T20A
Power Factor		>0.97 (Rate Input Voltage, Full Load)	>0.98 (Rate Input Voltage, Full Load)	>0.97 (Rate Input Voltage, Full Load)	>0.98 (Rate Input Voltage, Full Load)
Input Power		Max. 10.8kVA	Max. 14.4kVA	Max. 18kVA	Max. 21.6kVA
Efficiency (Full Load, 50~5000Hz/DC)		>72.5% (Rate: 110Vac) >81.8% (Rate: 220Vac)	>72.5% (Rate: 110Vac) >83.4% (Rate: 220Vac)	>72.5% (Rate: 110Vac) >81.8% (Rate: 220Vac)	>72.5% (Rate: 110Vac) >83.4% (Rate: 220Vac)
AC Output					
AC Output Power		9000VA	12000VA	15000VA	18000VA
Phase		1 Phase / 3Phase			
Voltage (AC/AC+DC)	Range[1]	L: 0~210Vac H: 0~420Vac AUTO			
	Resolution	≤0.02V (AC and AC+DC mode)			
	Accuracy	0.05%F.S. @ 10~100Hz, AC mode 0.1% of actual + 0.1%F.S. @ DC mode 0.1% of actual + 0.1%F.S. @ 101~500Hz, AC mode 0.1% of actual + 0.2%F.S. @ 101~500Hz, AC+ DC mode 0.1% of actual + 0.2%F.S. @ 501~1000Hz, AC mode 0.1% of actual + 0.3%F.S. @ 501~1000Hz, AC+ DC mode 0.1% of actual + 0.4%F.S. @ 1001~2000Hz, AC mode 0.1% of actual + 0.5%F.S. @ 1001~2000Hz, AC+ DC mode 0.1% of actual + 0.6%F.S. @ 2001~3000Hz, AC mode 0.1% of actual + 0.7%F.S. @ 2001~3000Hz, AC+ DC mode 0.1% of actual + 0.8%F.S. @ 3001~4000Hz, AC mode 0.1% of actual + 0.9%F.S. @ 3001~4000Hz, AC+ DC mode 0.1% of actual + 1%F.S. @ 4001~5000Hz, AC mode 0.1% of actual + 1.1%F.S. @ 4001~5000Hz, AC+ DC mode Valid from 5% of full-scale to 210VAC(RMS)/270VDC in low-range and 420VAC(RMS)/540VDC in high-range; with sense leads connected.			
	Display Bits	0.001V			
Max. Current (r.m.s)	0~210V (L)	3 Phase: 30A 1 Phase: 90A	3 Phase: 40A 1 Phase: 120A	3 Phase: 47.6A 1 Phase: 142.8A	3 Phase: 55.2A 1 Phase: 165.6A
	0~420V (H)	3 Phase: 15A 1 Phase: 45A	3 Phase: 20A 1 Phase: 60A	3 Phase: 23.8A 1 Phase: 71.4A	3 Phase: 27.6A 1 Phase: 82.8A
	Display Bits	0.001A			
	Resolution	3 Phase: 4mA(L), 2mA(H) 1 Phase: 12mA(L), 6mA(H)		3 Phase: 6mA(L), 3mA(H) 1 Phase: 18mA(L), 9mA(H)	
Max. Current (Peak)	0~210V (L)	3 Phase: 150Apk 1 Phase: 450Apk	3 Phase: 200Apk 1 Phase: 600Apk	3 Phase: 238Apk 1 Phase: 714Apk	3 Phase: 276Apk 1 Phase: 828Apk
	0~420V (H)	3 Phase: 75Apk 1 Phase: 225Apk	3 Phase: 100Apk 1 Phase: 300Apk	3 Phase: 119Apk 1 Phase: 357Apk	3 Phase: 138Apk 1 Phase: 414Apk
Frequency	Range	Advanced Version: 10~2500Hz Professional Version: 10~2500Hz Profession-HF Version: 10~5000Hz			
	Resolution	0.01 Hz @ 10~81.99 Hz; 0.05 Hz @ 82~819.99 Hz; 0.1Hz @ 820~5000Hz;			
	Accuracy	0.01% of actual + 0.005Hz @10~81.99Hz 0.01% of actual + 0.025Hz @ 82~819.99Hz 0.01% of actual + 0.05Hz @ 820~1000Hz 0.1% of actual + 0.05Hz @ 1001~5000Hz Frequency set specifications valid for output voltage >5% of full-scale. Note: 4.2V <Vout< 10.5V (L range) can be extended 1.5 times, Less Than 4.2V, no range. 8.4V <Vout< 21.0V (H range) can be extended 1.5 times, Less Than 8.4V, no range.			
Total Harmonic Distortion (THD)		<0.3% @ 10~100Hz, 50~210Vac/100~420Vac (Resistive Load) <0.5% @ 101~500Hz, 50~210Vac/100~420Vac (Resistive Load) <1% @ 501~1000Hz, 50~210Vac/100~420Vac (Resistive Load) <2% @ 1001~2000Hz, 50~210Vac/100~420Vac (Resistive Load) <3% @ 2001~3000Hz, 50~210Vac/100~420Vac (Resistive Load) <4% @ 3001~4000Hz, 50~210Vac/100~420Vac (Resistive Load) <5% @ 4001~5000Hz, 50~210Vac/100~420Vac (Resistive Load) Note: 25V <Vout< 50V (L range) can be extended 1.5 times, Less Than 25V, no range. Note: 50V <Vout< 100V (H range) can be extended 1.5 times, Less Than 30V, no range.			

Model		MST420VAC9000W	MST420VAC12000W	MST420VAC15000W	MST420VAC18000W
Crest Factor (CF)		≤5			
Load Regulation(ALC=ON)		0.1% of actual+0.1%F.S. @10~1000Hz, AC mode 0.1% of actual+0.2%F.S. @10~1000Hz, AC+ DC mode 0.1% of actual+0.3%F.S. @1001~2000Hz, AC mode 0.1% of actual+0.4%F.S. @1001~2000Hz, AC+ DC mode 0.1% of actual+0.5%F.S. @2001~3000Hz, AC mode 0.1% of actual+0.6%F.S. @2001~3000Hz, AC+ DC mode 0.1% of actual+0.7%F.S. @3001~4000Hz, AC mode 0.1% of actual+0.8%F.S. @3001~4000Hz, AC+ DC mode 0.1% of actual+0.9%F.S. @4001~5000Hz, AC mode 0.1% of actual+1.0%F.S. @4001~5000Hz, AC+ DC mode Valid from 5% to 100% of full-scale with sense leads connected.			
Line Regulation	ALC=ON	0.05%F.S. @ 1Φ100-132Vac/ 3ΦY187-300Vac； 0.025%F.S. @ 1Φ187-300Vac/ 3ΦY340-460Vac； Input voltage change in ±10%, DC output or 10Hz~5000Hz AC output.			
	ALC=OFF	0.1%F.S. @ 1Φ100-132Vac/ 3ΦY187-300Vac； 0.05%F.S. @ 1Φ187-300Vac/ 3ΦY340-460Vac； Input voltage change in ±10%, DC output or 10Hz~800Hz AC output.			
Phase Angle (Starting / Ending)	Range	0~360°			
	Resolution	0.4 º			
	Accuracy	1º @ 10~100Hz; 2º @ 101~1200Hz; 3º @ 1201~2200Hz; 4º @ 2201~3200Hz; 5º @ 3201~4200Hz; 6º @ 4201~5000Hz;			
Current CC Fold Mode	Range	5~200%F.S. (AC Output Voltage: Low-Range 50~210Vac, High-Range 100~420Vac) 7~200%F.S. (DC Output Voltage: Low-Range 50~270Vdc, High-Range 100~540Vdc)			
	Resolution	3 Phase: 50mA 1 Phase: 150mA	3 Phase: 50mA 1 Phase: 150mA	3 Phase: 75mA 1 Phase: 225mA	3 Phase: 75mA 1 Phase: 225mA
	Accuracy	0.3% of actual + 0.5%F.S. @ DC mode 0.3% of actual + 0.5%F.S. @ 10~500Hz, AC mode 0.3% of actual + 0.6%F.S. @ 10~500Hz, DC + AC mode Valid from 5% of full scale to 100% of full-scale. 0.3% of actual + 0.6%F.S. @ 501Hz~1200Hz, AC mode 0.3% of actual + 0.7%F.S. @ 501Hz~1200Hz, DC + AC mode Valid from 5% of full-scale to 200% of full-scale. Note: Above 1.2KHZ, No Rang, only for refernce.			
	Response Time	<180mS			
Noise Level, Typical (r.m.s)		450mV, Low-range; 700mV, High-range; at ≥40Hz outputfrequency; bandwidth, 20kHz to 1MHz;			
DC Output					
DC Output Power		9000W	12000W	15000W	18000W
Voltage (DC)	Range	Low-range: ±270Vdc High-range: ±540Vdc AUTO			
	Resolution	20mV			
	Accuracy	±(0.1% of actual + 0.1% of full-scale); valid in low-range from 5% of full-scale to 270VDC, and in high-range from 5% of full-scale to 540VDC; with sense leads connected.			
Max. Current (DC)	0~270V (L)	31.2A (Every phase)	31.2A (Every phase)	36.6A (Every phase)	42A (Every phase)
	0~540V (H)	15.6A (Every phase)	15.6A (Every phase)	18.3A (Every phase)	21A (Every phase)
	Accuracy	±(0.25% of actual + 0.25% of full-scale); valid from 5% of full-scale to 100% of full-scale.			
DC Offset Voltage, Typical		20mVDC, ≥40Hz			
Ripple&Noise(r.m.s)/ (Pk-Pk)	Low-Range	400mV(r.m.s), 2V(Pk-Pk) bandwidth, 10 Hz to 1 MHz			
	High-Range	700mV(r.m.s), 4V(Pk-Pk)high-range bandwidth, 10Hz to 1MHz.			
Programmable Output Impedance [2]		0Ω + 200μH ~ 1Ω + 1mH			
Harmonics & Inter-harmonics Simulation [2]		10Hz to 5kHz; 2nd to 50th harmonic, 48KHz BW max [3]			
Measurement					
Voltage (AC + DC)	Range	AC 0~420Vac DC 0~540Vdc AC + DC 0-540V(RMS)			
	Resolution	20mV			
	Accuracy (r.m.s)	0.1% of actual+ 0.1%F.S. @ 10~1000Hz, AC mode 0.1% of actual+ 0.2%F.S. @ 10~1000Hz, AC+ DC mode 0.1% of actual+ 0.3%F.S. @ 1001~2000Hz, AC mode 0.1% of actual+ 0.4%F.S. @ 1001~2000Hz, AC+ DC mode 0.1% of actual+ 0.5%F.S. @ 2001~3000Hz, AC mode 0.1% of actual+ 0.6%F.S. @ 2001~3000Hz, AC + DC mode 0.1% of actual+ 0.7%F.S. @ 3001~4000Hz, AC mode 0.1% of actual+ 0.8%F.S. @ 3001~4000Hz, AC + DC mode 0.1% of actual+ 0.9%F.S. @ 4001~5000Hz, AC mode 0.1% of actual+ 1.0%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% to 100% of full-scale with sense leads connected.			

Model		MST420VAC9000W	MST420VAC12000W	MST420VAC15000W	MST420VAC18000W
Voltage (DC)	Range	DC 0~540Vdc			
	Resolution	20mV			
	Accuracy	±(0.1% of actual + 0.1% of full-scale); valid in low-range from 5% of full-scale to 270VDC, and in high-range from 5% of full-scale to 540VDC; with sense leads connected.			
Frequency	Range	10~5000Hz			
	Resolution	0.01Hz @ 10~81.99Hz; 0.05Hz @ 82~819.99Hz; 0.1Hz @ 820~ 5000Hz;			
	Accuracy	0.01% of actual + 0.005Hz @ 10~81.91Hz 0.01% of actual + 0.025Hz @ 82~819.1Hz 0.01% of actual + 0.05Hz @ 820~1000Hz 0.1% of actual + 0.05Hz @ 1001~5000Hz Frequency measurement specifications valid for output voltage >5% of full-scale. Note: 4.2V <Vout< 10.5V (L range) can be extended 1.5 times, Less Than 4.2V, no range. 8.4V <Vout< 21.0V (H range) can be extended 1.5 times, Less Than 8.4V, no range.			
Current (r.m.s)	Range	0~110% F.S. (H: F.S.=100% Irms, M: F.S.=25% Irms, L: F.S.=5% Irms)			
	Resolution	3 Phase: 4mA(L), 2mA(H) 1 Phase: 12mA(L), 6mA(H)		3 Phase: 6mA(L), 3mA(H) 1 Phase: 18mA(L), 9mA(H)	
	Accuracy	0.3% of actual + 0.3%F.S. @ 10~1000Hz, AC mode 0.3% of actual + 0.4%F.S. @ 10~1000Hz, AC + DC mode 0.3% of actual + 0.5%F.S. @ 1001~2000Hz, AC mode 0.3% of actual + 0.6%F.S. @ 1001~2000Hz, AC + DC mode 0.3% of actual + 0.7%F.S. @ 2001~3000Hz, AC mode 0.3% of actual + 0.8%F.S. @ 2001~3000Hz, AC + DC mode 0.3% of actual + 0.9%F.S. @ 3001~4000Hz, AC mode 0.3% of actual + 1.0%F.S. @ 3001~4000Hz, AC + DC mode 0.3% of actual + 1.1%F.S. @ 4001~5000Hz, AC mode 0.3% of actual + 1.2%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% of full-scale to 100% of full-scale.			
Current (Peak)	Range	0~110% F.S. (H: F.S.=100% Ipeak, M: F.S.=25% Ipeak, L: F.S.=8% Ipeak)			
	Resolution	3 Phase: 20mA(L), 10mA(H) 1 Phase: 60mA(L), 30mA(H)		3 Phase: 30mA(L), 15mA(H) 1 Phase: 90mA(L), 45mA(H)	
	Accuracy	0.4% of actual + 0.6%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 0.7%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 0.8%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 0.8%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 0.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 1.0%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 1.0%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 1.1%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% of full-scale to 100% of full-scale.			
Power (Watts)	Range	0~9000W	0~12000W	0~15000W	0~18000W
	Resolution	3 Phase: 2W 1 Phase: 6W	3 Phase: 2W 1 Phase: 6W	3 Phase: 4W 1 Phase: 12W	3 Phase: 4W 1 Phase: 12W
	Accuracy	0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 1.1%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 1.3%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 1.5%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 1.7%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 1.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 2.1%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 2.3%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 2.5%F.S. @ 4001~5000Hz, AC + DC mode			
Power Apparent (VA)	Range	0~9000VA	0~12000VA	0~15000VA	0~18000VA
	Resolution	3 Phase: 2VA 1 Phase: 6VA	3 Phase: 2VA 1 Phase: 6VA	3 Phase: 4VA 1 Phase: 12VA	3 Phase: 4VA 1 Phase: 12VA
	Accuracy	0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 1.1%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 1.3%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 1.5%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 1.7%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 1.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 2.1%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 2.3%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 2.5%F.S. @ 4001~5000Hz, AC + DC mode			

Model		MST420VAC9000W	MST420VAC12000W	MST420VAC15000W	MST420VAC18000W
Power Resistive (VAR)	Range	0~9000VAR	0~12000VAR	0~15000VAR	0~18000VAR
	Resolution	3 Phase: 2VAR 1 Phase: 6VAR	3 Phase: 2VAR 1 Phase: 6VAR	3 Phase: 4VAR 1 Phase: 12VAR	3 Phase: 4VAR 1 Phase: 12VAR
	Accuracy	$\sqrt{(VA)^2-(W)^2}$, Calculated value			
Power Factor (PF)	Range	0~1.000			
	Resolution	0.001			
	Accuracy	2%F.S.			
Phase	Range	0~360.0°			
	Resolution	0.4 °			
	Accuracy	1° @ 10~100Hz; 2° @ 101~1200Hz; 3° @ 1201~2200Hz; 4° @ 2201~3200Hz; 5° @ 3201~4200Hz; 6° @ 4201~5000Hz;			
Harmonic [2]		2~50 orders			
Extra Function					
Remote Sense		5V(rms), Max. Total power less than rated power.			
Slew Rate	Range	AC Voltage: 0.001-10000.00V/ms and Disable			
		DC Voltage: 0.001-10000.00V/ms and Disable			
		Frequency: 0.001-1600.000Hz/ms and Disable			
Transient Generator (only for 15~70Hz)	Range	Trans-Start: 0.0~66.5ms/10Hz, Resolution: 0.1ms			
		Trans-Volt: -270V ~ +270V(L), -540V ~ +540V(H), Resolution: 0.1V			
		Trans-Time: 0.0~66.5ms/10Hz, Resolution: 0.1ms			
		Trans-Count: 0~9999, Constant			
Calibration Function		Built-in calibration function			
Multi-operation [4]	Parallel Output	Max. 64 Units (Option: Optical fiber parallel card)			
	Series Output	Max. 2 Units (Option: Optical fiber parallel card)			
General					
Graphic Display		7" Color touch LCD			
Operation Key Feature		Switch key, Rotary Knob, USB port for transfer and upgrading firmware			
Rack mount Handles		Yes			
FAN		Temperature Control			
Protection Circuits		OVP, OCP, OPP, OFP, RMP			
Interface		USB, RS232, RS485 (Standard) ; GPIB&LAN, CAN (Optional)			
Remote Control Input/Output (Option)					
Analog input		Set A/B/C phase voltage RMS, set current limit.			
Analog output		A/B/C phase output voltage RMS value monitoring, output power monitoring.			
Digital input		Single/three output mode selection, external control function enable selection, power output ON/OFF state control, enable analog input control, stored data recall, output suppression (OFF/LIVE/LATCHING), phase/frequency synchronization signal, List file run trigger.			
Digital output		Power output ON/OFF status indicator, fault status indicator, List file output/output status change/parameter change indicator.			
Environment					
Operating Temperature		0°C~50°C			
Storage Temperature		-20°C~70°C			
Fan Noise		74.2dB Max	74.2dB Max	76.8dB Max	76.8dB Max
Altitude		2000m			
Relative Humidity		<95%, non-condensing≤45°C; <80%, non-condensing≤50°C			
Temperature Coefficient		≤100ppm/°C F.S. (Voltage); ≤200ppm/°C F.S. (Current); 10ppm/°C.F.S. (Frequency)			
Mechanical					
Dimensions (W*H*D)		423 x 265 x 585 mm	423 x 265 x 585 mm	423 x 399 x 585 mm	423 x 399 x 585 mm
Package Dimensions (W*H*D)		553 x 536 x 785 mm	553 x 536 x 785 mm	553 x 668 x 785 mm	553 x 668 x 785 mm
Unit Weight		82.5kg	82.5kg	104kg	104kg
Shipping Weight		-	-	-	-
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		It meets the safety requirements of EU EN 61010-1:2010 for electrical equipment used in measurement, control and laboratories.			
CE Mark		Installation Overvoltage Category II; Pollution Degree 2; Class II equipment; indoor use only.			
Isolation Voltage		2828VDC, AC output to chassis; 2828VDC, AC input to chassis; 4242VDC, AC input to AC output			
RoHS		Meet to EU Directive 2011/65/EU for restriction of hazardous substances in Electrical and Electronic Equipment.			

[1] According to the output frequency, the AC output voltage will be reduced, and the rated voltage can be output within 3500Hz;
At low level, the maximum output voltage is 187.5V at 4000Hz, and the maximum output voltage is 150V at 5000HZ. The calculation formula is: output voltage =750000/ output frequency.
At high level, the maximum output voltage is 375V at 4000Hz, and the maximum output voltage is 300V at 5000HZ. The calculation formula is: output voltage =1500000/ output frequency.
[2] Only professional version/Professional-HF version support these functions.
[3] According to the output frequency, the number of harmonics will be reduced, up to 50 timeswithin 960Hz, up to 16 times at 3000Hz, up to 9 times at 5000Hz,
the calculation formula is : harmonic number =48000/ output frequency.
[4] It is suggest to derate to 90% output in parallel connection.
All specifications are subject to change without notice.

Model		MST820VAC12000W
Input		
Voltage	3 Phase	187~300Vac, Reduced to 50% rated power 340~460Vac
Current	3 Phase	Max.47.4A(L-L)
Connection	3 Phase	L1,L2,L3, N,PE; Only for 3-Phase 4 Wire Y type/Neutral Required
Frequency		45~65Hz
Fuse (Internal)		12* T20A
Power Factor		>0.98 (Rate Input Voltage, Full Load)
Input Power		Max. 14.4kVA
Efficiency (Full Load, 50~5000Hz/DC)		>72.5% (Rate: 110Vac) >83.4% (Rate: 220Vac)
AC Output		
AC Output Power		12000VA
Phase		1 Phase / 3Phase
Voltage (AC/AC+DC)	Range[1]	L: 0~420Vac H: 0~820Vac AUTO
	Resolution	≤0.04V (AC and AC+DC mode)
	Accuracy	0.05%F.S. @ 10~100Hz, AC mode 0.1% of actual + 0.1%F.S. @ DC mode 0.1% of actual + 0.1%F.S. @ 101~500Hz, AC mode 0.1% of actual + 0.2%F.S. @ 101~500Hz, AC+ DC mode 0.1% of actual + 0.2%F.S. @ 501~1000Hz, AC mode 0.1% of actual + 0.3%F.S. @ 501~1000Hz, AC+ DC mode 0.1% of actual + 0.4%F.S. @ 1001~2000Hz, AC mode 0.1% of actual + 0.5%F.S. @ 1001~2000Hz, AC+ DC mode 0.1% of actual + 0.6%F.S. @ 2001~3000Hz, AC mode 0.1% of actual + 0.7%F.S. @ 2001~3000Hz, AC+ DC mode 0.1% of actual + 0.8%F.S. @ 3001~4000Hz, AC mode 0.1% of actual + 0.9%F.S. @ 3001~4000Hz, AC+ DC mode 0.1% of actual + 1%F.S. @ 4001~5000Hz, AC mode 0.1% of actual + 1.1%F.S. @ 4001~5000Hz, AC+ DC mode Valid from 5% of full-scale to 420VAC(RMS)/540VDC in low-range and 820VAC(RMS)/1080VDC in high-range; with sense leads connected.
	Display Bits	0.001V
Max. Current (r.m.s)	0~420V (L)	3 Phase: 20A 1 Phase: 60A
	0~820V (H)	3 Phase: 10A 1 Phase: 30A
	Display Bits	0.001A
	Resolution	3 Phase: 2mA(L), 1mA(H) 1 Phase: 6mA(L), 3mA(H)
Max. Current (Peak)	0~420V (L)	3 Phase: 100Apk 1 Phase: 300Apk
	0~820V (H)	3 Phase: 50Apk 1 Phase: 150Apk
Frequency	Range	Advanced Version: 10~2500Hz Professional Version: 10~2500Hz Profession-HF Version: 10~5000Hz
	Resolution	0.01 Hz @ 10~81.99 Hz; 0.05 Hz @ 82~819.99 Hz; 0.1Hz @ 820~ 5000Hz;
	Accuracy	0.01% of actual + 0.005Hz @10~81.99Hz 0.01% of actual + 0.025Hz @ 82~819.99Hz 0.01% of actual + 0.05Hz @ 820~1000Hz 0.1% of actual + 0.05Hz @ 1001~5000Hz Frequency set specifications valid for output voltage >5% of full-scale. Note: 4.2V <Vout< 10.5V (L range) can be extended 1.5 times, Less Than 4.2V, no range. 8.4V <Vout< 21.0V (H range) can be extended 1.5 times, Less Than 8.4V, no range.
Total Harmonic Distortion (THD)		<0.3% @ 10~100Hz, 100~420Vac/200~820Vac (Resistive Load) <0.5% @ 101~500Hz, 100~420Vac/200~820Vac (Resistive Load) <1% @ 501~1000Hz, 100~420Vac/200~820Vac (Resistive Load) <2% @ 1001~2000Hz, 100~420Vac/200~820Vac (Resistive Load) <3% @ 2001~3000Hz, 100~420Vac/200~820Vac (Resistive Load) <4% @ 3001~4000Hz, 100~420Vac/200~820Vac (Resistive Load) <5% @ 4001~5000Hz, 100~420Vac/200~820Vac (Resistive Load) Note: 50V <Vout< 100V (L range) can be extended 1.5 times, Less Than 50V, no range. Note: 100V <Vout< 200V (H range) can be extended 1.5 times, Less Than 100V, no range.

Model		MST820VAC12000W
Crest Factor (CF)		≤5
Load Regulation(ALC=ON)		0.1% of actual+0.1%F.S. @10~1000Hz, AC mode 0.1% of actual+0.2%F.S. @10~1000Hz, AC+ DC mode 0.1% of actual+0.3%F.S. @1001~2000Hz, AC mode 0.1% of actual+0.4%F.S. @1001~2000Hz, AC+ DC mode 0.1% of actual+0.5%F.S. @2001~3000Hz, AC mode 0.1% of actual+0.6%F.S. @2001~3000Hz, AC+ DC mode 0.1% of actual+0.7%F.S. @3001~4000Hz, AC mode 0.1% of actual+0.8%F.S. @3001~4000Hz, AC+ DC mode 0.1% of actual+0.9%F.S. @4001~5000Hz, AC mode 0.1% of actual+1.0%F.S. @4001~5000Hz, AC+ DC mode Valid from 5% to 100% of full-scale with sense leads connected.
Line Regulation	ALC=ON	0.05%F.S. @ 1Φ100-132Vac/ 3ΦY187-300Vac； 0.025%F.S. @ 1Φ187-300Vac/ 3ΦY340-460Vac； Input voltage change in ±10%, DC output or 10Hz~5000Hz AC output.
	ALC=OFF	0.1%F.S. @ 1Φ100-132Vac/ 3ΦY187-300Vac； 0.05%F.S. @ 1Φ187-300Vac/ 3ΦY340-460Vac； Input voltage change in ±10%, DC output or 10Hz~800Hz AC output.
Phase Angle (Starting / Ending)	Range	0~360°
	Resolution	0.4 º
	Accuracy	1º @ 10~100Hz; 2º @ 101~1200Hz; 3º @ 1201~2200Hz; 4º @ 2201~3200Hz; 5º @ 3201~4200Hz; 6º @ 4201~5000Hz;
Current CC Fold Mode	Range	5~200%F.S. (AC Output Voltage: Low-Range 100~420Vac, High-Range 200~820Vac) 7~200%F.S. (DC Output Voltage: Low-Range 100~540Vdc, High-Range 200~1080Vdc)
	Resolution	3 Phase: 25mA 1 Phase: 75mA
	Accuracy	0.3% of actual + 0.5%F.S. @ DC mode 0.3% of actual + 0.5%F.S. @ 10~500Hz, AC mode 0.3% of actual + 0.6%F.S. @ 10~500Hz, DC + AC mode Valid from 5% of full scale to 100% of full-scale. 0.3% of actual + 0.6%F.S. @ 501Hz~1200Hz, AC mode 0.3% of actual + 0.7%F.S. @ 501Hz~1200Hz, DC + AC mode Valid from 5% of full-scale to 200% of full-scale. Note: Above 1.2KHZ, No Rang, only for refernce.
	Response Time	<180mS
Noise Level, Typical (r.m.s)		900mV, Low-range; 1400mV, High-range; at ≥40Hz outputfrequency; bandwidth, 20kHz to 1MHz;
DC Output		
DC Output Power		12000W
Voltage (DC)	Range	Low-range: ±540Vdc High-range: ±1080Vdc AUTO
	Resolution	40mV
	Accuracy	±(0.1% of actual + 0.1% of full-scale); valid in low-range from 5% of full-scale to 540VDC, and in high-range from 5% of full-scale to 1080VDC; with sense leads connected.
Max. Current (DC)	0~540V (L)	15.6A (Every phase)
	0~1080V (H)	7.8A (Every phase)
	Accuracy	±(0.25% of actual + 0.25% of full-scale); valid from 5% of full-scale to 100% of full-scale.
DC Offset Voltage, Typical		40mVDC, ≥40Hz
Ripple&Noise(r.m.s)/ (Pk-Pk)	Low-Range	800mV(r.m.s), 4V(Pk-Pk) bandwidth, 10Hz to 1MHz
	High-Range	1400mV(r.m.s), 8V(Pk-Pk) bandwidth, 10Hz to 1MHz
Programmable Output Impedance [2]		0Ω + 200μH ~ 1Ω + 1mH
Harmonics & Inter-harmonics Simulation [2]		10Hz to 5 kHz; 2nd to 50th harmonic, 48KHz BW max [3]
Measurement		
Voltage (AC + DC)	Range	AC 0~820Vac DC 0~1080Vdc AC + DC 0-1080V(RMS)
	Resolution	40mV
	Accuracy (r.m.s)	0.1% of actual+ 0.1%F.S. @ 10~1000Hz, AC mode 0.1% of actual+ 0.2%F.S. @ 10~1000Hz, AC+ DC mode 0.1% of actual+ 0.3%F.S. @ 1001~2000Hz, AC mode 0.1% of actual+ 0.4%F.S. @ 1001~2000Hz, AC+ DC mode 0.1% of actual+ 0.5%F.S. @ 2001~3000Hz, AC mode 0.1% of actual+ 0.6%F.S. @ 2001~3000Hz, AC + DC mode 0.1% of actual+ 0.7%F.S. @ 3001~4000Hz, AC mode 0.1% of actual+ 0.8%F.S. @ 3001~4000Hz, AC + DC mode 0.1% of actual+ 0.9%F.S. @ 4001~5000Hz, AC mode 0.1% of actual+ 1.0%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% to 100% of full-scale with sense leads connected.

Model		MST820VAC12000W
Voltage (DC)	Range	DC 0~1080Vdc
	Resolution	40mV
	Accuracy	±(0.1% of actual + 0.1% of full-scale); valid in low-range from 5% of full-scale to 540VDC, and in high-range from 5% of full-scale to 1080VDC; with sense leads connected.
Frequency	Range	10~5000Hz
	Resolution	0.01Hz @ 10~81.9 Hz; 0.05Hz @ 82~819.99Hz; 0.1Hz @ 820~5000Hz;
	Accuracy	0.01% of actual + 0.005Hz @ 10~81.91Hz 0.01% of actual + 0.025Hz @ 82~819.1Hz 0.01% of actual + 0.05Hz @ 820~1000Hz 0.1% of actual + 0.05Hz @ 1001~5000Hz Frequency measurement specifications valid for output voltage >5% of full-scale. Note: 4.2V <Vout< 10.5V (L range) can be extended 1.5 times, Less Than 4.2V, no range. 8.4V <Vout< 21.0V (H range) can be extended 1.5 times, Less Than 8.4V, no range.
Current (r.m.s)	Range	0~110% F.S. (H: F.S.=100% Irms, M: F.S.=25% Irms, L: F.S.=5% Irms)
	Resolution	3 Phase: 2mA(L), 1mA(H) 1 Phase: 6mA(L), 3mA(H)
	Accuracy	0.3% of actual + 0.3%F.S. @ 10~1000Hz, AC mode 0.3% of actual + 0.4%F.S. @ 10~1000Hz, AC + DC mode 0.3% of actual + 0.5%F.S. @ 1001~2000Hz, AC mode 0.3% of actual + 0.6%F.S. @ 1001~2000Hz, AC + DC mode 0.3% of actual + 0.7%F.S. @ 2001~3000Hz, AC mode 0.3% of actual + 0.8%F.S. @ 2001~3000Hz, AC + DC mode 0.3% of actual + 0.9%F.S. @ 3001~4000Hz, AC mode 0.3% of actual + 1.0%F.S. @ 3001~4000Hz, AC + DC mode 0.3% of actual + 1.1%F.S. @ 4001~5000Hz, AC mode 0.3% of actual + 1.2%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% of full-scale to 100% of full-scale.
Current (Peak)	Range	0~110% F.S. (H: F.S.=100% Ipeak, M: F.S.=25% Ipeak, L: F.S.=8% Ipeak)
	Resolution	3 Phase: 10mA(L), 5mA(H) 1 Phase: 30mA(L), 15mA(H)
	Accuracy	0.4% of actual + 0.6%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 0.7%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 0.8%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 0.8%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 0.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 1.0%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 1.0%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 1.1%F.S. @ 4001~5000Hz, AC + DC mode Valid from 5% of full-scale to 100% of full-scale.
Power (Watts)	Range	0~12000W
	Resolution	3 Phase: 2W 1 Phase: 6W
	Accuracy	0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 10~1000Hzz, AC + DC mode 0.4% of actual + 1.1%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 1.3%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 1.5%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 1.7%F.S. @ 2001~3000Hzz, AC + DC mode 0.4% of actual + 1.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 2.1%F.S. @ 3001~4000Hzz, AC + DC mode 0.4% of actual + 2.3%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 2.5%F.S. @ 4001~5000Hzz, AC + DC mode
Power Apparent (VA)	Range	0~12000VA
	Resolution	3 Phase: 2VA 1 Phase: 6VA
	Accuracy	0.4% of actual + 0.7%F.S. @ 10~1000Hz, AC mode 0.4% of actual + 0.9%F.S. @ 10~1000Hz, AC + DC mode 0.4% of actual + 1.1%F.S. @ 1001~2000Hz, AC mode 0.4% of actual + 1.3%F.S. @ 1001~2000Hz, AC + DC mode 0.4% of actual + 1.5%F.S. @ 2001~3000Hz, AC mode 0.4% of actual + 1.7%F.S. @ 2001~3000Hz, AC + DC mode 0.4% of actual + 1.9%F.S. @ 3001~4000Hz, AC mode 0.4% of actual + 2.1%F.S. @ 3001~4000Hz, AC + DC mode 0.4% of actual + 2.3%F.S. @ 4001~5000Hz, AC mode 0.4% of actual + 2.5%F.S. @ 4001~5000Hz, AC + DC mode

Model		MST820VAC12000W
Power Resistive (VAR)	Range	0~12000VAR
	Resolution	3 Phase: 2VAR 1 Phase: 6VAR
	Accuracy	$\sqrt{(VA)^2 - (W)^2}$, Calculated value
Power Factor (PF)	Range	0.~1.000
	Resolution	0.001
	Accuracy	2%F.S.
Phase	Range	0~360.0°
	Resolution	0.4 º
	Accuracy	1º @ 10~100Hz; 2º @ 101~1200Hz; 3º @ 1201~2200Hz; 4º @ 2201~3200Hz; 5º @ 3201~4200Hz; 6º @ 4201~5000Hz;
Harmonic [2]		2~50 orders
Extra Function		
Remote Sense		10V(rms), Max. Total power less than rated power.
Slew Rate	Range	AC Voltage: 0.001-10000.00V/ms and Disable
		DC Voltage: 0.001-10000.00V/ms and Disable
		Frequency: 0.001-1600.000Hz/ms and Disable
Transient Generator (only for 15~70Hz)	Range	Trans-Start: 0.0~66.5ms/10Hz, Resolution: 0.1ms
		Trans-Volt: -540V~ + 540V(L), -1080V~+1080V(H), Resolution: 0.2V
		Trans-Time: 0.0~66.5ms/10Hz, Resolution: 0.1ms
		Trans-Count: 0~9999, Constant
Calibration Function		Built-in calibration function
Multi-operation [4]	Parallel Output	Max. 10 Units (Option: Optical fiber parallel card)
	Series Output	Not supported
General		
Graphic Display		7" Color touch LCD
Operation Key Feature		Switch key, Rotary Knob, USB port for transfer and upgrading firmware
Rack mount Handles		Yes
FAN		Temperature Control
Protection Circuits		OVP, OCP, OPP, OFP, RMP
Interface		USB, RS232, RS485 (Standard) ; GPIB&LAN, CAN (Optional)
Remote Control Input/Output (Option)		
Analog input		Set A/B/C phase voltage RMS, set current limit.
Analog output		A/B/C phase output voltage RMS value monitoring, output power monitoring.
Digital input		Single/three output mode selection, external control function enable selection, power output ON/OFF state control, enable analog input control, stored data recall, output suppression (OFF/LIVE/LATCHING), phase/frequency synchronization signal, List file run trigger.
Digital output		Power output ON/OFF status indicator, fault status indicator, List file output/output status change/parameter change indicator.
Environment		
Operating Temperature		0°C~50°C
Storage Temperature		-20°C~70°C
Fan Noise		74.2dB Max
Altitude		2000m
Relative Humidity		<95%, non-condensing≤45°C; <80%, non-condensing≤50°C
Temperature Coefficient		≤100ppm/°C F.S. (Voltage); ≤200ppm/°C F.S. (Current); 10ppm/ºC.F.S. (Frequency)
Mechanical		
Dimensions (W*H*D)		423 x 265 x 585 mm
Package Dimensions (W*H*D)		553 x 536x 784 mm
Unit Weight		82.5kg
Shipping Weight		-
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		It meets the safety requirements of EU EN 61010-1:2010 for electrical equipment used in measurement, control and laboratories.
CE Mark		Installation Overvoltage Category II; Pollution Degree 2; Class II equipment; indoor use only.
Isolation Voltage		3500VDC, AC output to chassis; 2828VDC, AC input to chassis; 5040VDC, AC input to AC output
RoHS		Meet to EU Directive 2011/65/EU for restriction of hazardous substances in Electrical and Electronic Equipment.

[1] According to the output frequency, the AC output voltage will be reduced, and the rated voltage can be output within 3500Hz;
At low level, the maximum output voltage is 187.5V at 4000Hz, and the maximum output voltage is 150V at 5000HZ. The calculation formula is: output voltage =750000/ output frequency.
At high level, the maximum output voltage is 375V at 4000Hz, and the maximum output voltage is 300V at 5000HZ. The calculation formula is: output voltage =1500000/ output frequency.
[2] Only professional version/Professional-HF version support these functions.
[3] According to the output frequency, the number of harmonics will be reduced, up to 50 timeswithin 960Hz, up to 16 times at 3000Hz, up to 9 times at 5000Hz,
the calculation formula is : harmonic number =48000/ output frequency.
[4] It is suggest to derate to 90% output in parallel connection.
All specifications are subject to change without notice.

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