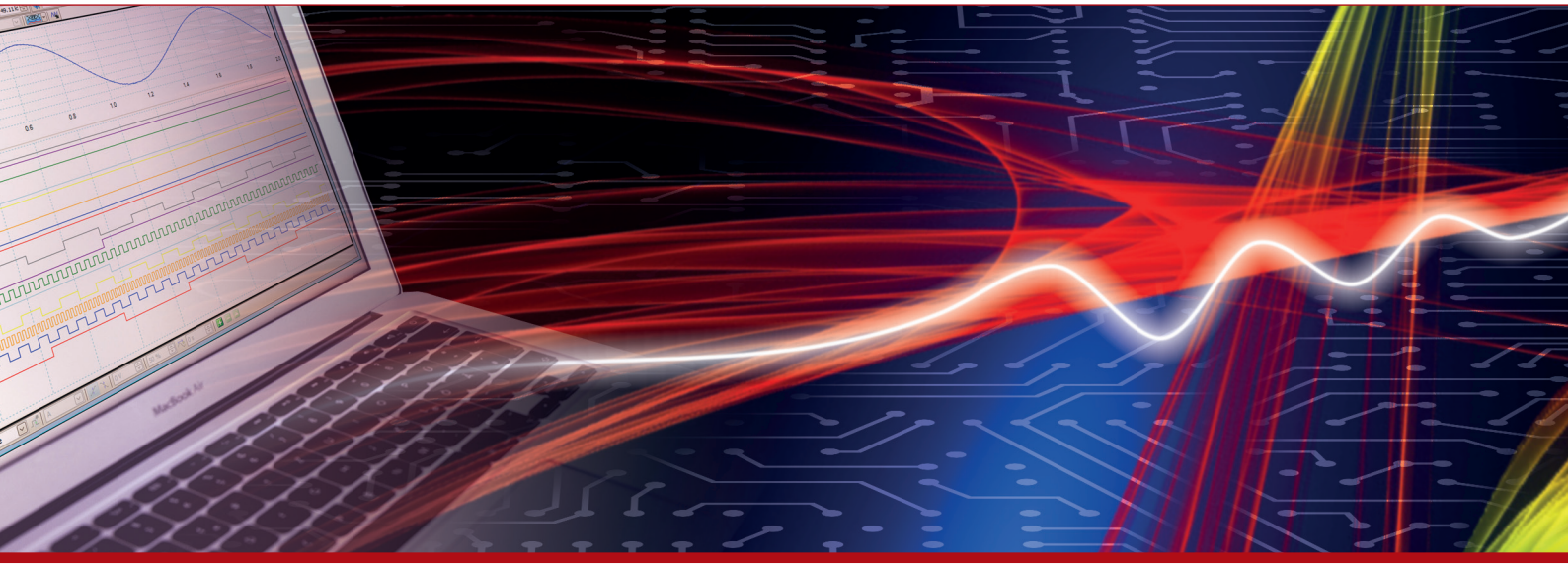
Product Datasheet - Technical Specifications



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ITECH

YOUR POWER TESTING SOLUTION

Product

IT8900A/E Series High Power DC Electronic Load

IT8900A/E Series High Power DC Electronic Load

APPLICATIONS

- Industry
- Server power supply
- Communication power supply
- Energy storage system
- Military & Aerospace
- Car charger
- Battery pack
- Charging station

Your Power Testing Solution

IT8900A/E Series
High Power DC Electronic Load

IT8900A/E series high performance high power DC electronic load provides three voltage ranges 150V/600V/1200V, stand-alone power from 2kW to 54kW. IT8900A/E series, with ultra-wide voltage and current range, controlled by an independent master unit. The power expands to 600kW by master-slave paralleling. Ultra-high power density, 6kW is with only 4U height.

IT8900A/E series has eight (A series) / four (E series) working modes, faster loop response and current rising and falling speed, as well as dynamic mode, OCP test, OPP test, automatic test and battery test functions. Built-in CAN, LAN, GPIB, USB, RS232 and analog interfaces, etc., IT8900A/E series has comprehensive protection function, which can be applied to power battery discharge, DC charging station, on-board charger (OBC), power electronics and other power electronics products.

Features

- Stand-alone input power: 2kW, 4kW, 6kW, 12kW, 18kW, 24kW, 30kW, 36kW, 42kW, 48kW, 54kW
- Voltage range: 150V, 600V, 1200V
- Current range: up to 600A for 4u modules (up to 2400A for 27u racks)
- Master/slave paralleling control, maximum power expands to 600kW
- Multiple operating modes: CC, CV, CR, CP, CC+CV, CV+CR, CR+CC, CP+CC*1
- Transient over-power loading capability
- Adjustable CV loop speed, match different power supplies
- 30kHz high-speed dynamic mode, adjustable current rising and falling time*2
- 500kHz high-speed voltage and current sampling rate
- Time measurement, battery discharge test function
- Short circuit simulation, automatic test function
- Soft start and soft stop prevent voltage fluctuations at on/off
- Timing control list programming
- I-monitor
- Built-in LAN, USB, RS232, GPIB, CAN, external analog control interface
- OCP/OPP test function
- High-precision voltage and current measurement
- Protection functions: OVP, OCP, OPP, OTP, current oscillation protection, limited current protection, limited power protection, reverse alarm protection etc.
- Up to 100 groups' memories, with power off memory function
- Independent master unit control for easy maintenance installation

*1 IT8900E only supports CC, CV, CR, CP operation mode *2 30kHz is only suitable for 150V model *2 Only IT8900A have

Input parameter	150V	600V	1200V	Height
2kW	IT8902A/E-150-200	IT8902A/E-600-140	IT8902A/E-1200-80	4u
4kW	IT8904A/E-150-400	IT8904A/E-600-280	IT8904A/E-1200-160	4u
6kW	IT8906A/E-150-600	IT8906A/E-600-420	IT8906A/E-1200-240	4u
12kW	IT8912A/E-150-1200	IT8912A/E-600-840	IT8912A/E-1200-480	8u
18kW	IT8918A/E-150-1800	IT8918A/E-600-1260	IT8918A/E-1200-720	15u
24kW	IT8924A/E-150-2400	IT8924A/E-600-1680	IT8924A/E-1200-960	27u
30kW	IT8930A/E-150-2400	IT8930A/E-600-2100	IT8930A/E-1200-1200	27u
36kW	IT8936A/E-150-2400	IT8936A/E-600-2400	IT8936A/E-1200-1440	27u
42kW	IT8942A/E-150-2400	IT8942A/E-600-2400	IT8942A/E-1200-1680	37u
48kW	IT8948A/E-150-2400	IT8948A/E-600-2400	IT8948A/E-1200-1920	37u
54kW	IT8954A/E-150-2400	IT8954A/E-600-2400	IT8954A/E-1200-2160	37u

Application

- DC charging station, car charger, power electronics and other tests
- Fuse and relay aging test
- Power battery, lead battery, fuel cell discharge test
- Intelligent manufacturing, industrial motor safety testing (such as AGV, robots, etc.)
- Virtual load testing of natural energy (solar battery array, wind power generation)
- Server power, high voltage UPS, communication power test
- A/D power supply and other power electronic components test


Industry (motors)


Energy storage system


High voltage UPS


Civil aviation


Electronic component


Car charger


Battery pack

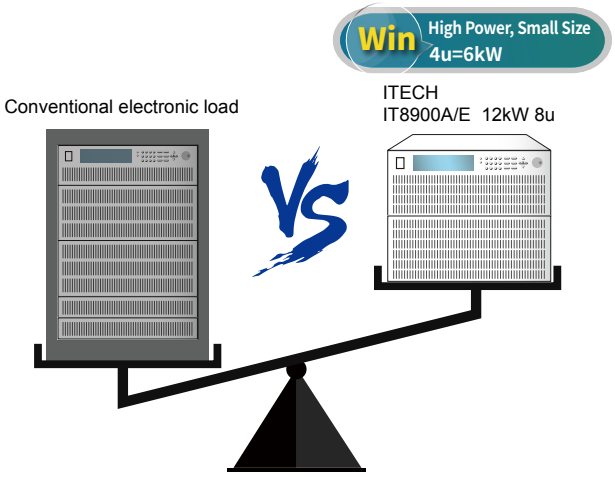

Server power supply


DC charging station


Automotive electronics

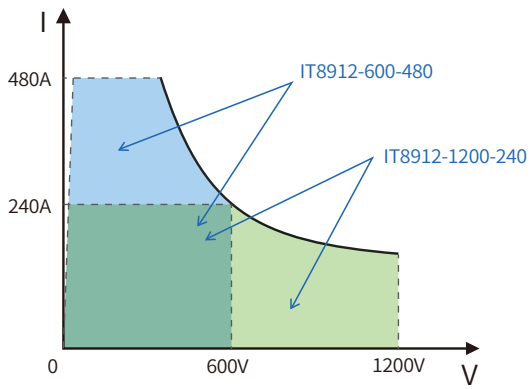
High power density, small size

IT8900A/E series adopts high power density design, the size is half of the conventional electronic load, and the weight is 1/3 of the conventional electronic load.



Ultra-wide voltage and current input range

IT8900A/E series has ultra-wide voltage and current input range, covering a variety of existing models, meeting the requirements of high current, low voltage or high voltage, low current.



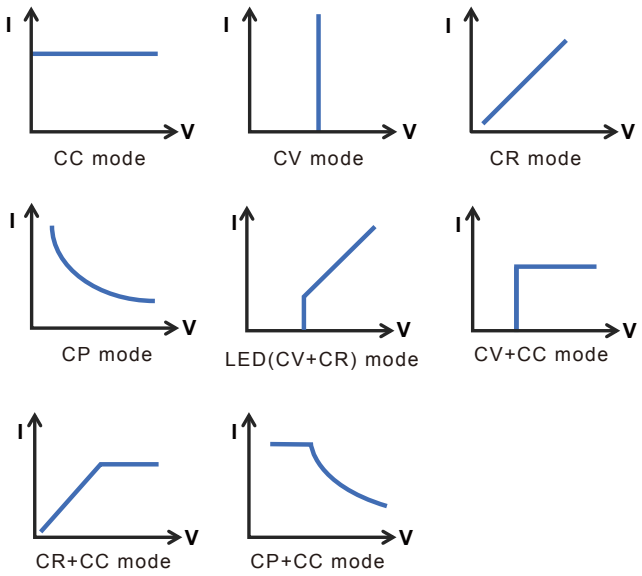
Wide Range Input

Your Power Testing Solution

IT8900A/E Series High Power DC Electronic Load

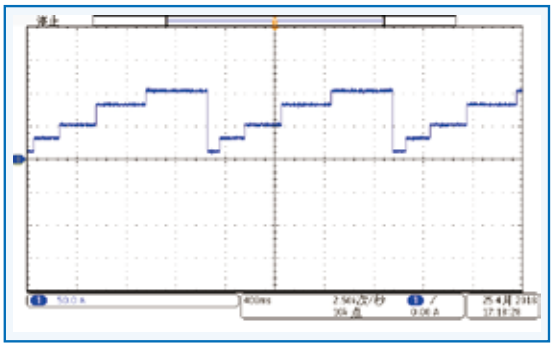
Eight working modes

IT8900A series provides eight kinds of working modes such as CC, CV, CR, CP, CV+CC, CV+CR, CR+CC, CP+CC, which can adapt to the test requirements of various occasions. Among them, the CP mode is often used to UPS battery test, simulate the current change when the battery voltage is decaying. It can also be used to simulate the characteristics of the inputs of DC-DC converters and inverters. The CV+CC mode can be applied to the load simulation battery and test the charging station or the car charger. When the CV is working, the maximum loading current is limited. CR+CC mode is commonly used in the testing of voltage limiting, current limiting characteristics, constant voltage accuracy, and constant current accuracy of on-board chargers, which prevents over-current protection of on-board chargers.



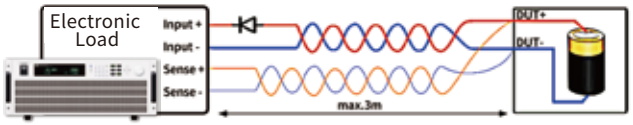
Dynamic and List function

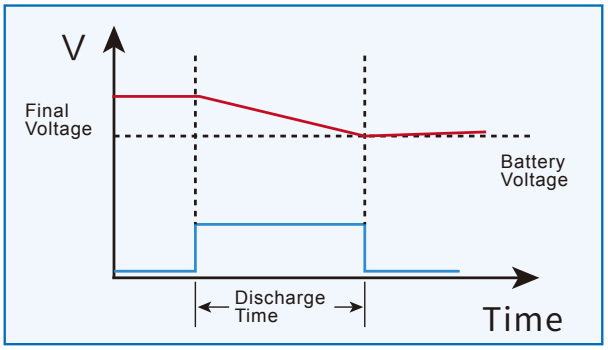
The dynamic mode and list mode of the IT8900A/E series can all be performed in the CC mode. By editing the step width and slope of each step, a variety of complex sequences can be generated, allowing the user to complete various tests with loading waveforms. And under CC mode, IT8900A/E can set the rising and falling speed.



Battery discharge function

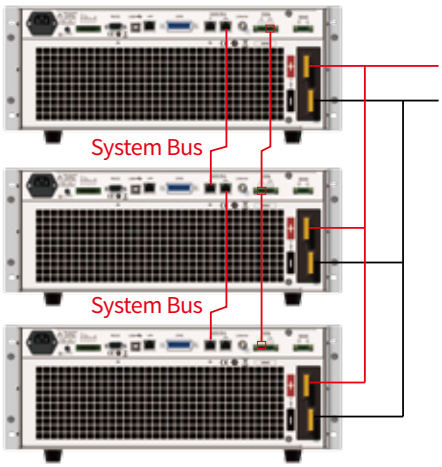
IT8900A/E series electronic load has battery discharge function, and can perform discharge test under CC, CR, or CP mode. IT8900A/E can set 3 battery stop conditions: voltage, capacity and time. Whenever met any condition, it will automatically stop test. During the test, users can observe battery's voltage, time and already-discharged-capacity.





Master-slave paralleling, flexible power configuration

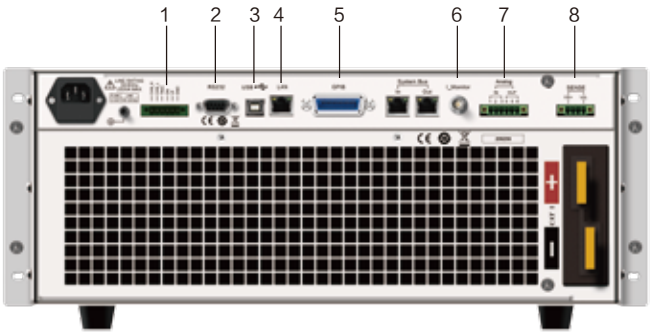
IT8900A/E series have master-slave paralleling and equalized current. IT8900A/E series support cabinet paralleling under different power and same voltage. After paralleling, all functions of the stand-alone can be realized, including working in CV mode, maximum paralleling up to 384kW. The stand-alone can also work independently and the power configuration is more flexible. The paralleling machine adopts analog and digital wiring separately, and the performance of the paralleling machine is more stable.



Built-in communication interface

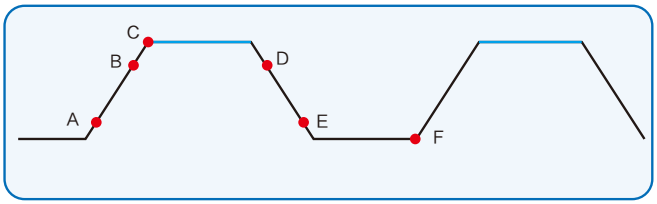
IT8900A/E series electronic load is built-in LAN, USB, RS232, CAN, GPIB, analog interface, supports SCPI protocol. It is suitable for power expansion, computer or PLC remote control, system building and so on.

1、CAN 2、RS232 3、USB
4、LAN 5、GPIB 6、i-monitor
7、Analog interface 8、SENSE



Measure function

IT8900A/E series provides the measurement of rising and falling time of voltage and current. The measurement accuracy is up to 10μs, which is comparable to the high precision oscilloscope. IT8900A/E series can be applied to measure the start-up and shutdown of power modules, holding time, and fuse blowing time. Measurement time is measured by the PC software.



Remarks: from above graph, A and B are arbitrary points of the rising stage, C is one point on the green stage, D and E are arbitrary points of the falling stage.

Dynamic mode up to 30kHz

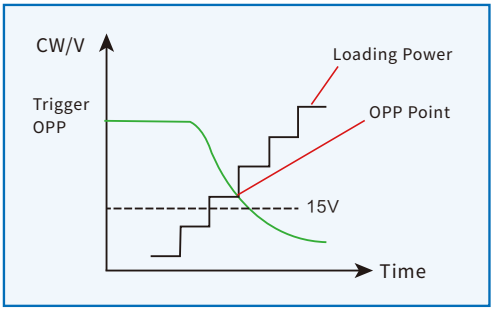
IT8900A series electronic load (150V model) has dynamic mode* with up to 30kHz, the upgrade of the integrated internal structure has greatly improved the loop response and stability. IT8900A can be applied to the transient response test of switching power supplies and can also test transient high current tolerance of DC-DC converters and batteries.

* IT8900E dynamic response is 10 kHz

IT8906A-1200-240
5 kHz dynamic loading 0A-50A

OCP, OPP Tests

OCP and OPP are mainly applied in over-current and over-power point tests of the lithium-battery protection board and power modules. For power supplies, OCP and OPP are designed to guarantee the user's safety and to reduce damage rate. IT8900A/E series can automatically judge the test result according to the set specifications, so the users can save much time in verification of design and production system.



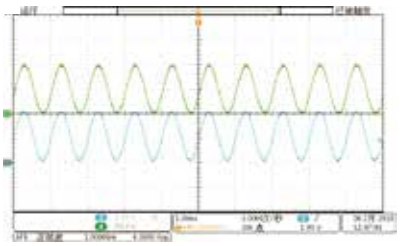
OPP Protection Test

Your Power Testing Solution

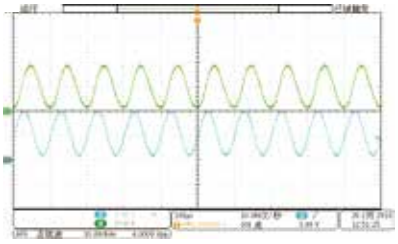
IT8900A/E Series High Power DC Electronic Load

External analog control function

IT8900A/E series electronic load has analog control interface, which can be used for industrial control or expanding load power by paralleling.
When IT8900A/E is used for industrial control, using PLC output 0~10V to control the 0~100% full scale change of CC/CV of the load. Compared with the real-time control from PC, the response time is faster and up to 10μs, step time is <10ms, accuracy can reach 1%. At the same time, IT8900A/E also has the advantage that the number of steps is not limited. The right picture shows the 0-4.2V sine wave input analog interface, which controls the dynamic loading of the IT8900A 0-100A. The waveform amplitude and phase reduction below 10 kHz are higher. It can be applied to battery tests of all kinds of complicated waveforms, and can also be used for impedance analysis test of fuel cells.
When used to paralleling load power expansion, the analog interface can be used for parallel differential analog control interface, which is more stable and reliable than the traditional independent LAN interface parallel communication.



1 kHz sine wave



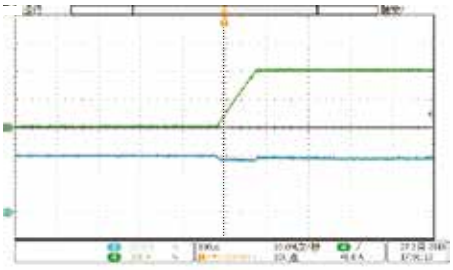
10 kHz sine wave

Full protection

To avoid instrument damages by incorrect operations or abnormal ambient surroundings, IT8900A/E provides soft start, soft stop, current oscillation protection, OVP, OCP, OPP, OTP, current limit protection, power limit protection, and etc. When any abnormal situation, IT8900A/E will immediately stop working to ensure the DUT and personnel safety.

Transient over power loading capability

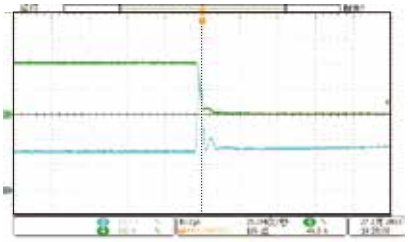
IT8900A has 2x transient over power capability, which makes load to take over power loading capability in short time. Users can select models as per rated working power of power supply or battery products, instead of maximum power value, and it can extremely save cost. IT8900A/E can simulate motor start-up features, test power supply's transient over load features, and also test the transient high power discharge characteristics of the power battery, ignition battery, etc.



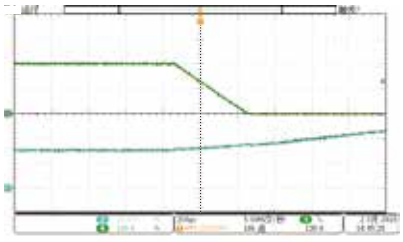
IT8906A-600-420 rated power 6kW transiently withstand 8kW loading

Soft start, soft stop function

IT8900A is with soft start and soft stop function, which can prevent the load from loading too fast, transiently pull down the power supply voltage, or transiently turning off the load to cause power supply voltage surge, that is, the settable on slope, openable off slope function.



No soft stop function, voltage overshoot



With soft stop function, voltage without overshoot

Model		IT8902A-1200-80		IT8904A-1200-160		IT8906A-1200-240	
Rated (0~40℃)	Voltage	0~1200V		0~1200V		0~1200V	
	Current	0~8A	0~80A	0~16A	0~160A	0~24A	0~240A
	Power*5	2kW		4kW		6kW	
	Minimum operating voltage	1.2V/8A	12V/80A	1.2V/16A	12V/160A	1.2V/24A	12V/240A
CV mode	Range	0.1~120V	0.1~1200V	0.1~120V	0.1~1200V	0.1~120V	0.1~1200V
	Resolution	10mV	100mV	10mV	100mV	10mV	100mV
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)
CC mode	Range	0~8A	0~80A	0~16A	0~160A	0~24A	0~240A
	Resolution	0.1mA	1mA	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)
CR mode*1	Range	0.2Ω~10Ω	10Ω~7.5KΩ	0.1Ω~10Ω	10Ω~7.5KΩ	0.1Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
CP mode*3	Range	2kW		4kW		6kW	
	Resolution	0.1W		0.1W		0.1W	
	Accuracy	0.2%+0.2%FS		0.2%+0.2%FS		0.2%+0.2%FS	
Dynamic mode*4 CC mode	T1&T2	20uS~3600S /Res:1 us/10ms/100ms		20uS~3600S /Res:1 us/10ms/100ms		20uS~3600S /Res:1 us/10ms/100ms	
	Accuracy	5uS±100ppm		5uS±100ppm		5uS±100ppm	
	Rising/falling slope	0.0001~0.1A/μS	0.001~1 A/μS	0.001~0.2A/μS	0.01~2 A/μS	0.001~0.3A/μS	0.01~3 A/μS
	Minimum rising time	≒30 μS	≒30 μS	≒30 μS	≒30 μS	≒30 μS	≒30 μS
Readback Voltage	Range	0~120V	0~1200V	0~120V	0~1200V	0~120V	0~1200V
	Resolution	10mV	100mV	10mV	100mV	10mV	100mV
	Accuracy	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)	±(0.025%+0.025%FS)
Readback Current	Range	0~8A	0~80A	0~16A	0~160A	0~24A	0~240A
	Resolution	0.1mA	1mA	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)	±(0.05%+0.1%FS)
Readback Power*2	Range	2kW		4kW		6kW	
	Resolution	0.1W		0.1W		0.1W	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
OPP		≒2.02KW		≒4.04kW		≒6.05KW	
OCP		≒8.8A	≒88A	≒17.6A	≒176A	≒25.2A	≒252A
OVP		≒1250V		≒1250V		≒1250V	
OTP		≒85℃		≒85℃		≒85℃	
Short circuit	Current（CC）	≒8.8A	≒88A	≒17.6A	≒176A	≒25.2A	≒252A
	Voltage（CV）	0V		0V		0V	0V
	Resistance（CR）	≒150mΩ		≒75mΩ		≒50mΩ	≒50mΩ
Input terminal impedance		≒1.8MΩ		≒1.8MΩ		≒1.6MΩ	
Height		4U		4U		4U	
Weight		28.8Kg		34.7Kg		40 Kg	
AC input	Voltage	100~240Vac		100~240Vac		100~240Vac	
	Frequency	50/60Hz		50/60Hz		50/60Hz	
	Power	150VA max		200VA max		250VA max	

*1 Voltage/Current is not less than 10%FS (FS is full range)

*2 Readback resistance range: (1/(1/R+(1/R)*0.01%+0.08),1/(1/R-(1/R)*0.01%-0.08))

*3 Voltage/Current is not less than 10%FS

*4 Loading current value is not less than 4%FS_CCH

*5 The curve between rated input power and input voltage of 1200V model is shown in the right figure

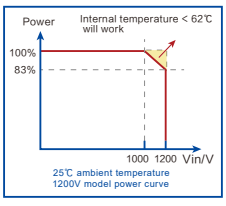


Figure 1