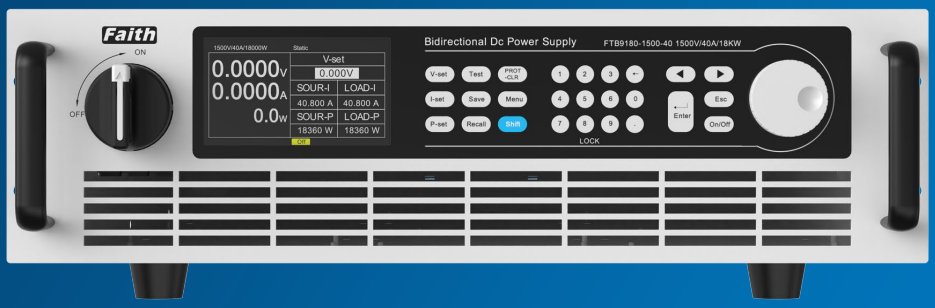
FTP9000 Power Supply(5kW...180kW)

High-power Programmable DC Power Supply



FTP9150 15 kW/80V/510A (3U)

- Output voltage: 80 V up to 2250 V;
- Output current: 20 A up to 6120 A;
- Output power: standalone 5 kW up to 180 kW, parallel up to 1800 kW;
- Wider voltage and current output range with constant power;
- Master-slave parallel up to 10 identical units, with current automatically shared;
- 0.02%+0.02%F.S. and 0.1%+0.1%F.S. accuracy for voltage and current measurement respectively;
- 10 user programmable sequence files, each support up to 100 steps;
- 2ms typical transient response, Voltage & current slew rate control;
- CV / CC priority start (prevents voltage or current overshoot with output ON);
- Voltage ramp function, internal resistance simulating;
- Voltage remote sense compensation;
- **High voltage isolated, digital/analog composite signal monitoring&controlling port (optional);**
- **Equipped with photovoltaic cell array simulation function (optional);**
- ±OVP, ±OCP, ±OPP, OTP, ±LVP, as well as voltage / current / power limit;
- Standard LAN, USB (serial), optional RS485, GPIB or CAN ports;
- SCPI and ModBus RTU protocol;

General

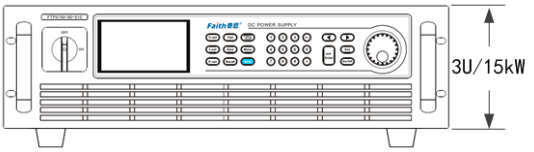
FTP9000 series DC power supplies provide wider voltage and current output range at full power, this means both low voltage/high current and high voltage/low current devices can be tested using a single power supply. The FTP9000 series offer a high power density, with 15 kW in a 3U chassis. The standalone power ranges from 5 kW to 180 kW, voltage ranges from 80 V to 2250 V, and current up to 6120 A. For ultra-high-power applications, FTP9000 series allow for master-slave parallel up to 10 identical units, maximum output 1.8 MW, with current automatically shared.

The FTP9000 series provide accurate output, fast transient response, low ripple noise, excellent line and load regulation, fast and precise programmability. With 4.3-inch color TFT screen, full keypad and rotary knob, convenient for benchtop users. In addition, this series offer standard LAN and USB (serial) interfaces support both SCPI and Modbus protocol, which is ideal for automated test systems.

Furthermore, the FTP9000 series come standard with user programmable sequence, CV or CC priority start and built-in test routines for battery internal resistance simulation, voltage ramp test, etc., to name a few.

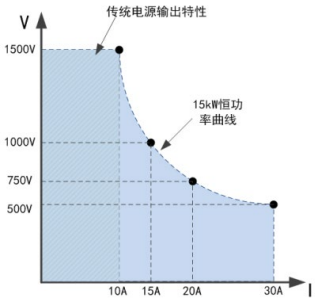
AC input

All models are provided with an active Power Factor Correction (PFC) circuit and operates in three-phase 340 VAC ~ 460 VAC input, power factor 0.99, power supply efficiency is larger than 93%.



15kW/3U high power density

The FTP9000 series provides a high power density of 15kW/3U, with features such as accurate output, fast response, and low ripple noise.

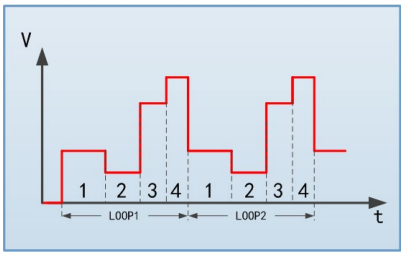


Wide operating region with constant power

All models provides wide range of output voltage & current within the power rating of the power supply, this means both low voltage/high current and high voltage/low current DUTs can be tested using a single supply avoiding the need for multiple power supplies.

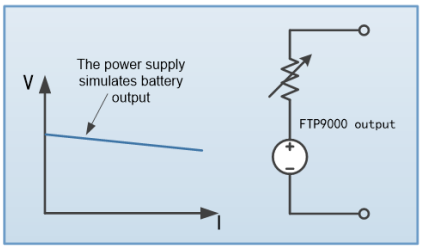
Programmable sequence

All models provides users with a programmable sequence function, which can simulate power supply interruptions, instantaneous drops, and other voltage and current changes. The sequence feature allows users to program a list of steps to the power supply's internal memory and execute them. A total of 100 steps can be allocated to each internal memory location, up to a maximum of 10 locations (sequences). The test sequence can be programmed locally through the keypad and rotary knob. Test sequences can be linked, as well as configured for single or repeated execution. Each steps' settings include voltage, current, duration, the duration time range 1ms...86400 s.



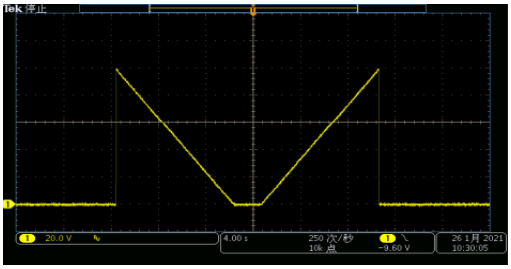
Internal resistance simulating

All models can simulate the output characteristic of battery by setting the internal resistance. When the output current of the power supply increases, the output voltage will be adjusted automatically according to the preset internal resistance value.



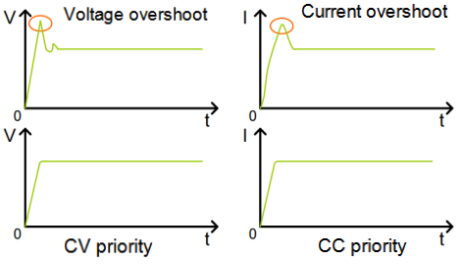
Voltage ramp function

FTP9000 series support voltage ramp-up and ramp-down, which can slowly increase the output voltage from a low level to a high level, or make the output voltage slowly drop from a high level to a low level.



CV / CC priority

When power supply is connected to an inductive or capacitive load, it will cause voltage or current overshoot, which may trigger the protection of the device under test, or even cause the device under test to be damaged in severe cases. This series power supply provides CC priority and CV priority function, which forces the power supply to operate in CC or CV mode at the



moment the output is turned on, effectively avoids the current or voltage overshoot resulted from capacitive or inductive load.

Optional analog programming and monitoring interface

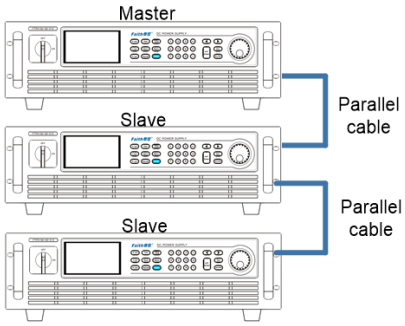
In addition to front panel and remote interface control, there is a galvanically isolated analog interface terminal, located on the rear of the device. It offers analog inputs to set voltage, current, power from 0...100% through control voltages of 0 V...5 V. To monitor the output voltage and current, there are analog outputs with 0 V...5 V. Also, several inputs and outputs are available for controlling and monitoring the device status. The controlling speed of analog programming is 1000 points per second.

Protective features

For protection of the equipment connected, the series provide programmable protection functions such as OVP, OCP, OPP and LVP. Moreover, there are built-in hardware protection functions OV, OC, OP and OTP. If a protection is triggered, the DC output will be shut off immediately and a status signal will be prompt on the display and via the interfaces. The power supply is also able to detect abnormally AC input and shut off DC output when this condition occurs.

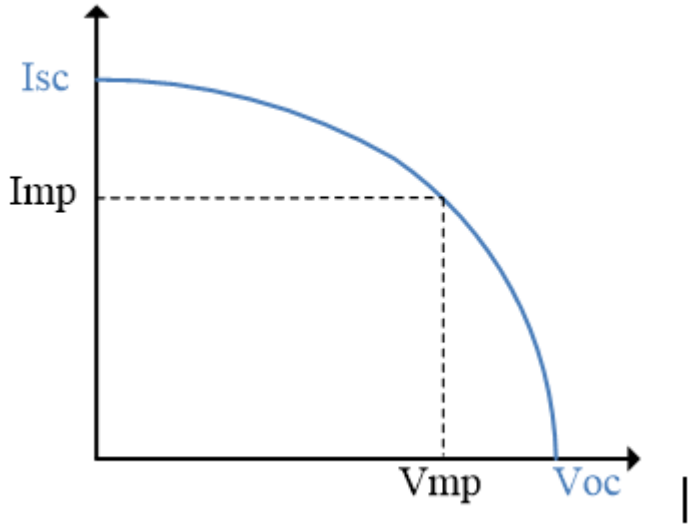
Master-slave parallel

FTP9000 series power supply allows for master-slave parallel of up to 10 identical units. In parallel operation, slave units download parameters from master unit and current are shared automatically. FTP9000 series power supply does not support master-slave serial operation



Digital interfaces

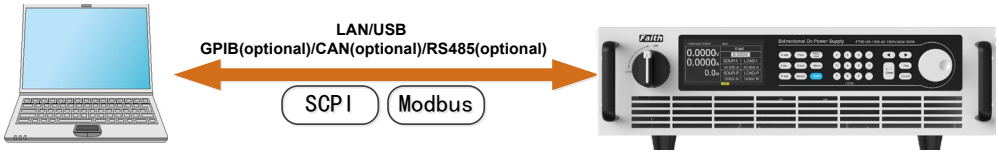
ł LAN and USB (optional RS485, GPIB, CAN interface).
ıge commands or ModBus RTU protocol, while with GPIB



ɔ set the I-V characteristics of the PV cell (Voc, Isc, Vmp,
inverter to test its static MPPT performance.

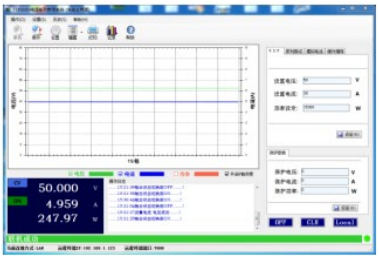
Multi-interface and multi-protocol

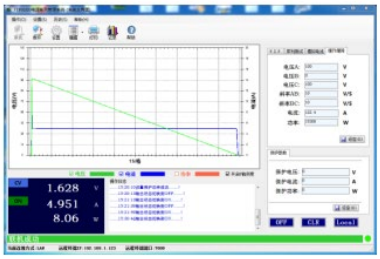
FTP9000 series provide a control software for Windows PCs, which can read test data, generate images, export reports, print reports, etc. in real time, it is convenient for customers to use.



Computer graphical operation software

FTP9000 series provides a host computer software with virtual instrument function, which can read test data in real time, generate images, export reports, print reports, etc., which is convenient for customers to use.





Options

Graphical visualization of the actual values;

Digital interface modules for GPIB, CAN, RS485, CANopen;

Analog programming and monitoring interface (PRO-INT interface on the rear)

Model options

Voltage	Model	Current	Power	Voltage	Model	Current	Power
80V	FTP9050-80-170	170A	5kW	200V	FTP9150-200-210	210A	15kW
	FTP9100-80-340	340A	10kW		FTP9300-200-420	420A	30kW
	FTP9150-80-510	510A	15kW		FTP9450-200-630	630A	45kW
	FTP9300-80-1020	1020A	30kW		FTP9600-200-840	840A	60kW
	FTP9450-80-1530	1530A	45kW		-	-	-
	FTP9600-80-2040	2040A	60kW		-	-	-
	FTP9750-80-2550	2550A	75kW		-	-	-
	FTP9900-80-3060	3060A	90kW		-	-	-
Voltage	Model	Current	Power	Voltage	Model	Current	Power
300V	FTP9060-300-75	75A	6kW	400V	FTP9150-400-120	120A	15kW
	FTP9120-300-150	150A	12kW		FTP9300-400-240	240A	30kW
	FTP9180-300-225	225A	18kW		FTP9450-400-360	360A	45kW
	FTP9360-300-450	450A	36kW		FTP9600-400-480	480A	60kW
	FTP9540-300-675	675A	54kW		-	-	-
	FTP9720-300-900	900A	72kW		-	-	-
	FTP9900-300-1125	1125A	90kW		-	-	-
Voltage	Model	Current	Power	Voltage	Model	Current	Power
500V	FTP9060-500-40	40A	6kW	800V	FTP9060-800-25	25A	6kW
	FTP9120-500-80	80A	12kW		FTP9120-800-50	50A	12kW
	FTP9180-500-120	120A	18kW		FTP9180-800-75	75A	18kW
	FTP9360-500-240	240A	36kW		FTP9360-800-150	150A	36kW
	FTP9540-500-360	360A	54kW		FTP9540-800-225	225A	54kW
	FTP9720-500-480	480A	72kW		FTP9720-800-300	300A	72kW
	FTP9900-500-600	600A	90kW		FTP9900-800-375	375A	90kW
	FTP9150-500-90	90A	15kW		FTP9150-800-75	75A	15kW
	FTP9300-500-180	180A	30kW		FTP9300-800-150	150A	30kW
	FTP9450-500-270	270A	45kW		FTP9450-800-225	225A	45kW
	FTP9600-500-360	360A	60kW		FTP9600-800-300	300A	60kW
Voltage	Model	Current	Power	Voltage	Model	Current	Power
1000V	FTP9120-1000-40	40A	12kW	1200V	FTP9150-1200-40	40A	15kW
	FTP9240-1000-80	80A	24kW		FTP9300-1200-80	80A	30kW
	FTP9360-1000-120	120A	36kW		FTP9450-1200-120	120A	45kW
	FTP9480-1000-160	160A	48kW		FTP9600-1200-160	160A	60kW
Voltage	Model	Current	Power	Voltage	Model	Current	Power
1500V	FTP9120-1500-25	25A	12kW	2250V	FTP9180-2250-25	25A	18kW
	FTP9240-1500-50	30A	24kW		FTP9360-2250-50	50A	36kW
	FTP9180-1500-40	40A	18kW		FTP9540-2250-75	75A	54kW
	FTP9360-1500-80	80A	36kW		FTP9720-2250-100	100A	72kW
	FTP9540-1500-120	120A	54kW		FTP9900-2250-125	125A	90kW
	FTP9720-1500-160	160A	72kW		-	-	-
	FTP9900-1500-200	200A	90kW		-	-	-

name	Model&spec	Instruction
Computer graphical operation software	FTP9000 FaithPower	FTP9000 upper computer software
GPIB interface	Suffix G	
CAN+485 port	Suffix R	
Composite signal port	Suffix F	
Photovoltaic array simulation	Suffix P	
Anti-backflow device *	Suffix D	Applied to prevent battery load current backflow

* The anti-irrigation device of 5kW, 6kW, 10kW and 12kW models is built-in installation, and the anti-irrigation device of other models is external installation.

Optional parts-2 Dissipative selection table

Dissipator type	Spec	volume	Size（mm）W*H*D
FT-R301X	80V/3kW	3U	440*130*620
FT-R302X	200V/3kW		
FT-R303X	400V/3kW		
FT-R304X	500V/3kW		
FT-R305X	800V/3kW		
FT-R306X	1000V/3kW		
FT-R601X	80V/6kW	3U	
FT-R602X	200V/6kW		
FT-R603X	400V/6kW		
FT-R604X	500V/6kW		
FT-R605X	800V/6kW		
FT-R606X	1000V/6kW		

Optional accessories table 2: High current test cable matching table

Specification	DC2-2P15M	DC16-2P20M	DC25-2P25M	DC50-2P20M	DC50-2P40M	DC120-2P20M	DC150-2P20M
Max voltage	750V						
Max current	10A	60A	100A	200A	200A	300A	400A
Terminal	M8/Alligator	M8/M8	M8/M8	M8/M8	M8/M8	M8/M8	M10/M10
Cross-sectional area	4.0mm²	16mm²	25mm²	50mm²	50mm²	120mm²	150mm²
Length	~1.5m	~2m	~2m	~2m	~4m	~2m	~2m
Shape							

Optional parts-4 AC input cable selection table

Wire specification	AC6-3P20M	AC6-4P20M	AC6-4P40M	AC16-4P20M	AC16-4P40M	AC35-4P30M
Corresponding model	Single-phase models less than 6.5kW	Three-phase 15kW and below models	Three-phase 15kW and below models	Three-phase 20-30kW and below models	Three-phase 20-30kW and below models	Three-phase 30-60kW and below models
terminal	O type M4/None	O type M4/None	O type M4/None	O type M5/None	O type M5/None	O type M8/None
Length	About 2m	About 2m	About 4m	About 2m	About 4m	About 3m

General specification

Voltage rise slew rate	
Maximum slew rate	6000V/s
Voltage fall time	
No load	＜2s
Full load	≤30ms
Transient response	Typical 2ms
Parallel	Parallel up to 10 identical units through master-slave mode for max 1800W output
Protection	OVP, OCP, OPP, OTP, LVP etc..
Interface	Standard LAN、USB(serial) (optional GPIB、CAN、RS485)
Protocol	SCPI、MODBUS、CAN-Open protocols
Input characteristics	
Input voltage	340VAC～460VAC, 47Hz～63Hz
Power factor	0.99 (Typical)
Efficiency	＞93% (Typical)
Operation environment	
Working temp	0℃～40℃
Storage temp	-20℃～70℃
Altitude	＜2000m
Cooling	Air cooling

Specification table 1

Model	FTP9050-80-170	FTP9050-200-70	FTP9050-400-40	FTP9050-500-30	FTP9050-800-25
Voltage	0～80V	0～200V	0～400V	0～500V	0～800V
Current	0～170A	0～70A	0～40A	0～30A	0～25A
Power	0～5kW				
Model	FTP9100-80-340	FTP9100-200-140	FTP9100-400-80	FTP9100-500-60	FTP9100-800-50
Voltage	0～80V	0～200V	0～400V	0～500V	0～800V
Current	0～340A	0～140A	0～80A	0～60A	0～50A
Power	0～10kW				
Model	FTP9150-80-510	FTP9150-200-210	FTP9150-400-120	FTP9150-500-90	FTP9150-800-75
Voltage	0～80V	0～200V	0～400V	0～500V	0～800V
Current	0～510A	0～210A	0～120A	0～90A	0～75A
Power	0～15kW				
Model	FTP9300-80-1020	FTP9300-200-420	FTP9300-400-240	FTP9300-500-180	FTP9300-800-150
Voltage	0～80V	0～200V	0～400V	0～500V	0～800V
Current	0～1020A	0～420A	0～240A	0～180A	0～150A
Power	0～30kW				
Model	FTP9600-80-2040	FTP9600-200-840	FTP9600-400-480	FTP9600-500-360	FTP9600-800-300
Voltage	0～80V	0～200V	0～400V	0～500V	0～800V
Current	0～2040 A	0～840A	0～480A	0～360A	0～300A
Power	0～60kW				
Model	FTP9900-80-3060	FTP9900-200-1260	FTP9900-400-720	FTP9900-500-540	FTP9900-800-450

Voltage		0～80V	0～200V	0～400V	0～500V	0～800V
Current		0～3060 A	0～1260A	0～720A	0～540A	0～450A
Power		0～90kW				
Model		～	FTP91200-200-1680	FTP91200-400-960	FTP91200-500-720	FTP91200-800-600
Voltage		～	0～200V	0～400V	0～500V	0～800V
Current		～	0～1680A	0～960A	0～720A	0～600A
Power		0～120kW				
Voltage programming①						
Resolution		16bits				
Accuracy		0.02%+0.02%F.S.				
Current programming①						
Resolution		16bits				
Accuracy		0.1%+0.1% F.S.				
Power programming①						
Accuracy		1%F.S.				
External analog programming①						
Control voltage		0～5V corresponds to 0～100%F.S.				
Voltage accuracy		0.5%F.S.				
Current accuracy		0.5%F.S.				
Line regulation②						
Voltage		0.02%F.S.				
Current		0.05%F.S.				
Power		0.05%F.S.				
Load regulation③						
Voltage		0.05%F.S.				
Current		0.15%F.S.				
Power		0.75%F.S.				
Voltage measurement①						
Resolution		16bits				
Accuracy		0.02%+0.02%F.S.				
Current measurement①						
Resolution		16Bits				
Accuracy		0.1%+0.1% F.S.				
Power measurement①						
Accuracy		1%F.S.				
Ripple noise④						
Ripple Vpp	5kW	160mV	300mV	550mV	450mV	800mV
	10kW	320mV	300mV	550mV	450mV	800mV
	15kW	320mV	300mV	550mV	450mV	800mV
Ripple Vrms	5kW	16mV	40mV	65mV	70mV	200mV
	10kW	25mV	40mV	65mV	70mV	200mV
	15kW	25mV	40mV	65mV	70mV	200mV
Size（W x H x D）		5kW～15kW: 482.6mm x 132.5mm x 702.0mm, includes output protection cover				
		20kW～30kW: 482.6mm x 266mm x 738.0mm, includes protection cover, excludes casters				
Weight		5kW≈17kg, 10kW≈24kg, 15kW≈30kg, 30kW≈65kg				

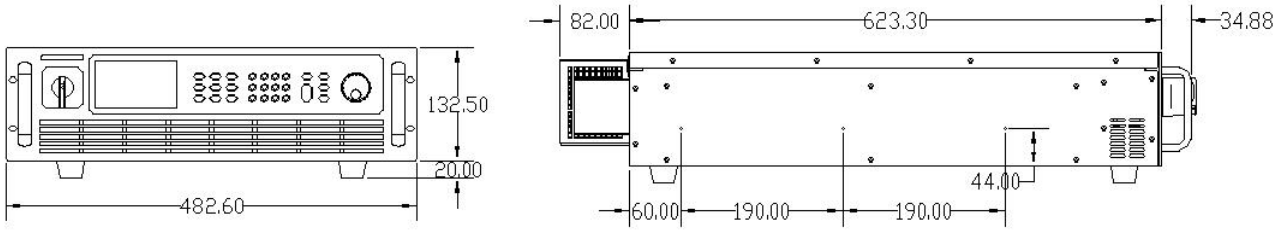
Specification table 2

Model	FTP9100-1000-30	-	FTP9100-1500-25	-
Voltage	0～1000V	-	0～1500V	-
Current	0～30A	-	0～25A	-
Power	0～10kW			
Model	FTP9150-1000-40	FTP9150-1200-40	FTP9150-1500-30	FTP9150-2250-25
Voltage	0～1000V	0～1200V	0～1500V	0～2250V
Current	0～40A	0～40A	0～30A	0～25A
Power	0～15kW			
Model	FTP9200-1000-60	-	FTP9200-1500-50	
Voltage	0～1000V	-	0～1500V	
Current	0～60A	-	0～50A	
Power	0～20kW			
Model	FTP9300-1000-80	FTP9300-1200-80	FTP9300-1500-60	FTP9300-2250-50
Voltage	0～1000V	0～1200V	0～1500V	0～2250V
Current	0～80A	0～80A	0～60A	0～50A
Power	0～30kW			
Model	FTP9400-1000-120	-	FTP9400-1500-100	-
Voltage	0～1000V	-	0～1500V	-
Current	0～120A	-	0～100A	-
Power	0～40kW			
Model	FTP9600-1000-180	FTP9600-1200-160	FTP9600-1500-120	FTP9600-2250-100
Voltage	0～1000V	0～1200V	0～1500V	0～2250V
Current	0～180A	0～160A	0～120A	0～100A
Power	0～60kW			
Model	FTP9800-1000-240	FTP9900-1200-240	FTP9900-1500-180	FTP9900-2250-150
Voltage	0～1000V	0～1200V	0～1500V	0～2250V
Current	0～240A	0～240A	0～180A	0～150A
Power	0～80kW		0～90kW	
Model	FTP91000-1000-300	FTP91200-1200-320	FTP91200-1500-240	FTP91200-2250-200
Voltage	0～1000V	0～1200V	0～1500V	0～2250V
Current	0～300A	0～320A	0～240A	0～200A
Power	0～100kW		0～120kW	
Voltage programming①				
Resolution	16bits			
Accuracy	0.02%+0.02%F.S.			
Current programming①				
Resolution	16bits			
Accuracy	0.1%+0.1% F.S.			
Power programming①				
Accuracy	1%F.S.			
External analog programming①				
Control voltage	0～10V corresponds to 0～100%F.S.			
Voltage accuracy	0.5%F.S.			
Current accuracy	0.5%F.S.			

Line regulation②					
Voltage		0.02%F.S.			
Current		0.05%F.S.			
Power		0.05%F.S.			
Load regulation③					
Voltage		0.05%F.S.			
Current		0.15%F.S.			
Power		0.75%F.S.			
Voltage measurement①					
Resolution		16bits			
Accuracy		0.02%+0.02%F.S.			
Current measurement①					
Resolution		16Bits			
Accuracy		0.1%+0.1% F.S.			
Power measurement①					
Accuracy		1%F.S.			
Ripple noise④					
Ripple Vpp	10kW	1600mV		-	-
	15kW	2000mV	2000mV	2400mV	3600mV
Ripple Vrms	10kW	350mV		-	-
	15kW	350mV	350mV	400mV	400mV
Size（W x H x D）		5kW～15kW: 482.6mm x 132.5mm x 702.0mm, includes output protection cover			
		20kW～30kW: 482.6mm x 266mm x 738.0mm, includes protection cover, excludes casters			
Weight		5kW≈17kg, 10kW≈24kg, 15kW≈30kg, 30kW≈65kg			

Dimension

5kW～15kW model dimension



20kW～30kW model dimension