

The New Generation of High Power DC Source with Upgraded Performance, Intuitive Control and High Precision

ADG⁺ Series

Upgraded!



High Power Programmable DC Power Supply

Preen's ADG+ series is an upgraded high power DC power supply, featuring low ripple, high accuracy and fast response. It can simulate various characteristic of solar array with the optional I-V curve function. Its output power can reach up to 300kW with the patented modularized design and easy master-slave parallel operation, and output voltage can be up to 2000V, making it the ideal choice for applications like EV motor, DC/DC converters, ESS and inverters.

High Output Power
30kW-300kW
(parallel operation)

Low Ripple $\leq 0.05\%$
High Precision $\leq 0.1\%$

Solar Array Simulation
IV Curve
(Built-in EN50530 Formula)





The wide application of ADG+ series cover various industry that required high precision or sophisticated power applications, such as renewable industry, switching power supply, electric vehicle, national defense, medical equipment, etc.

ADG⁺ series

RoHS
Compliant



Output Power

30kW~300kW

Interfaces

Standard

RS-232

RS-485

USB

Ethernet

Analog

Option

GPIO

Applications

- ☐ DC/DC, DC/AC Testing
- ☐ Inverter
- ☐ Switching Supply / Connectors
- ☐ Passive Element
- ☐ Semiconductor Test Equipment
- ☐ Laboratory/Certification Bureau
- ☐ Electric Vehicles
- ☐ Power Battery
- ☐ Electrolytic Deposition, Sputtering, Surface Coating
- ☐ Aerospace & Defense
- ☐ Medical Industry
- ☐ Communication Industry
- ☐ Renewable Energy
- ☐ IT / SMT Production Line
- ☐ Automated Testing System

High Power Programmable DC Power Supply

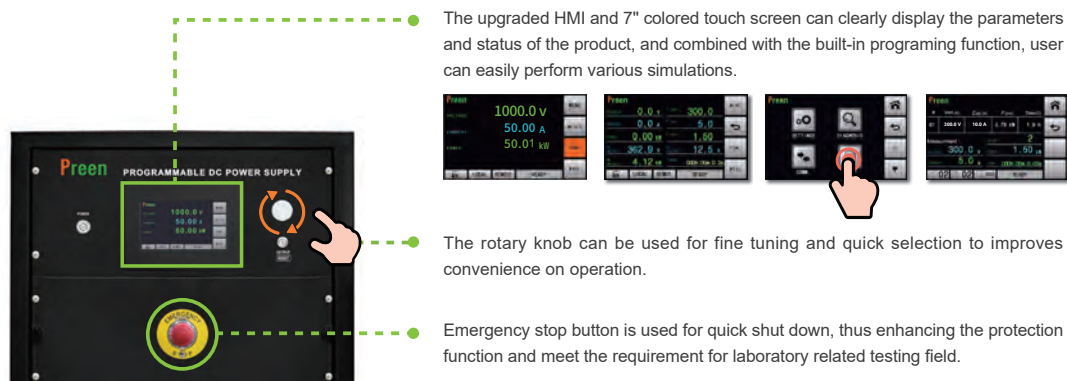
Preen's newly released ADG⁺ series is a high-power-density programmable DC power supply. With the design of DSP control, it offers a great response time and high accuracy. The self-developed high power module enhances stability and heat dissipation, thus improving product quality. The output mode of CV, CC and CP are fully equipped. This series' single-unit power ranges from 30kW to 100kW, and with wide range of output voltage / current, it can reach up to 2000V, and can also provide up to 2500A in low-voltage high-current models. The output voltage and current can even be further expanded via parallel operation and series operation. The ADG⁺ series is ideal for testing EV-type motor/compressor, server power supply, fuse, circuit breaker, contactor and PV inverter.

For communication interface, the user can select the standard RS-485, RS-232, Analog Control, Ethernet USB and optional GPIB. The product also equips with remote control software for user to control with ease via PC. The product is CE and RoHS certified.

Product Features

- Wide range of output voltage up to 2000V.
- Designed with high power density, output power up to 100kW in single unit.
- Simple master-slave operation, output power can up to 300kW via parallel connection.
- Output mode: CV / CC / CP.
- Low ripple $\leq 0.05\%$ and high accuracy $\leq 0.1\%$.
- Fast response $\leq 2 \sim 12\text{ms}$
- Optional I-V curve function for Solar Array Simulation (built-in EN50530 mathematical formula).
- Large 7" touch screen and rotary knob for easy operation and measurement display.
- Ideal for renewable energy and EV testing applications.
- Time setting resolution 0.01S for fast response programming testings.
- Adopted with patented modular design: compact, smaller size, high power density and easy maintenance.
- Capable of simulating all kinds of load testing conditions: step or consecutive voltage variation can be set via STEP & Gradual function.
- Suitable for all kinds of applications: 12 voltage segments and a total of 41 models are available.
- Remote Sensing Compensation.
- Complimentary remote control software (Preen Program).
- Equipped with emergency stop button, which meets the requirement for laboratory related testing field.
- I-V curve remote control software (opt.).

Intuitive Touch Screen and Rotary Knob



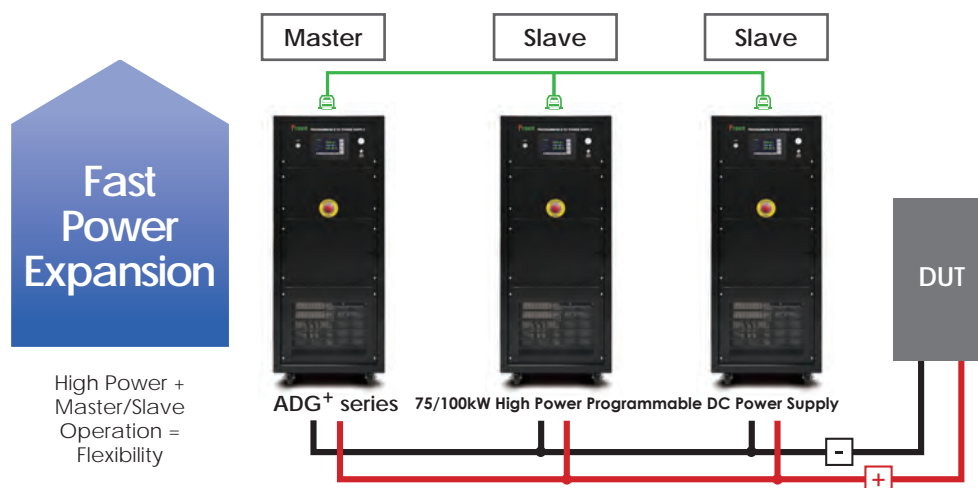
UPGRADED

Upgraded HMI with Intuitive Design for Easier and Safer Operatin

The ADG⁺ series employs 7" touch screen and rotary knob to provide intuitive and easy-to-use control and display. The built-in programming function has been upgraded, so not only can complex sequences be set from the PC, but also from the touch screen. Emergency stop button is equipped for quick shut down, thus enhancing the product safety.

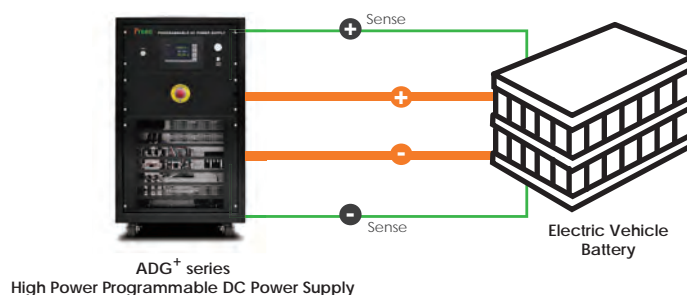
Users can quickly access output settings and measurements, including voltage, current and power.

Master/Slave Parallel Operation



The output power of the ADG⁺ series is up to 100kW per unit, which can be expanded to 300kW through simple master-slave operation (max. 3 units). User can simply operate the master unit, the slave unit will receive and reply the data accordingly and equally share the load current. ADG⁺ series is one of the few high-power DC power supply with parallel feature on the market. The availability for single-unit and parallel operation provides greater flexibility for application.

Remote Sensing Compensation



In the factory or laboratory, there is often a certain distance in the configuration of power and load. The Remote Sensing of ADG⁺ series is able to compensate the voltage drop caused by the cable length, so the user can avoid the inconvenience of adjusting the voltage.

Solar Array Simulation (opt.)

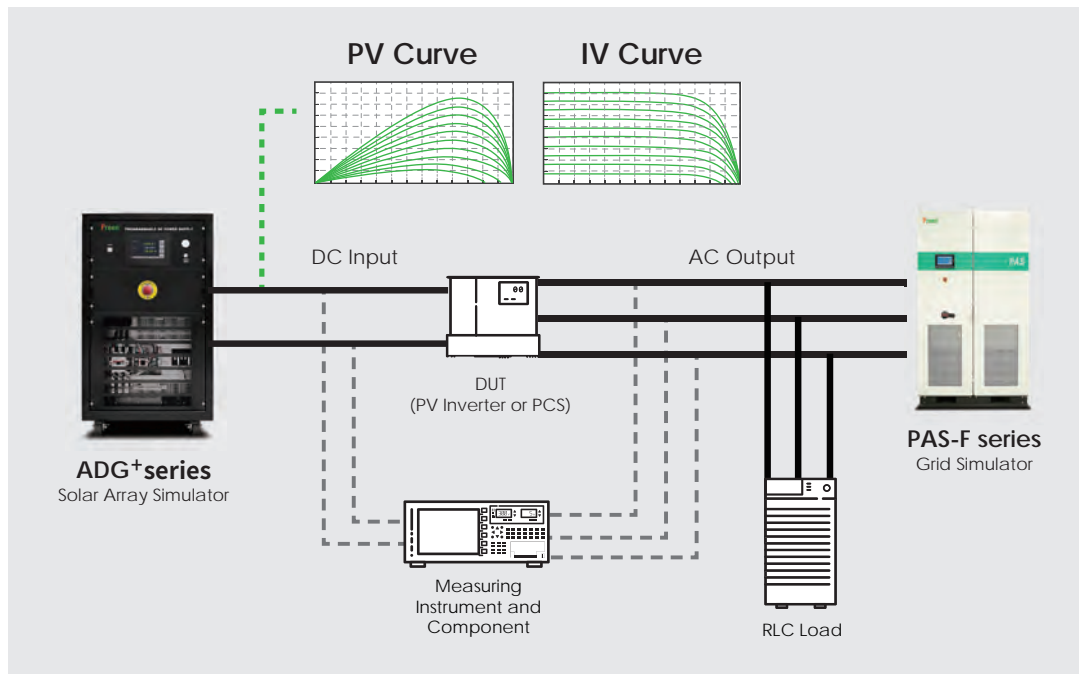
ADG⁺ series high power programmable DC power supply options solar array simulation function, which can be programmed from the front panel without a need for a controller. Using built-in SAS mode, only four input parameter are needed to establish an I-V curve, which simulates solar panels under different irradiation and temperature.

Using built-in EN50530 mode, the I-V curve is established according to the solar cell material (C-Si or thin film), and the user can program the output according to the irradiation and temperature; in addition, the user can also define I-V curves based on different material characteristic to simulate various solar cell materials.

UPGRADED

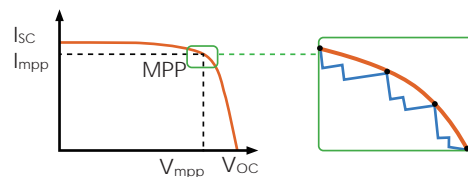
Complete solar array simulation and easy static & dynamic MPP Tefficiency validation.

- Static & dynamic MPPT efficiency test (with optional remote control software).
- Simulation of I-V curve under different irradiation and temperature.
- Complied with standard SAS, EN50530, Sandia test regulation.
- IV curve can be user-defined and edited via remote control software.
- Simulation of output characteristic of various solar cell (S-CI and thin film).
- Accurate voltage and current measurement.



■ SAS Testing Mode

Using SAS mode, user can set V_{oc} , I_{sc} , V_{mpp} and I_{mpp} according to the spec of PV inverter, then the DSP control system performs P-V and I-V curve calculation accordingly. The dynamic irradiation adjustment is also available during output.



- V_{oc} open circuit voltage
- V_{mp} voltage at the peak power point on the curve
- I_{sc} short circuit current
- I_{mp} current at the peak power point on the curve

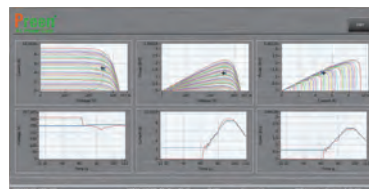
■ EN50530 Testing Mode

Mainly used for grid-tie inverters, the EN50530 Testing Mode features solar cell model of C-Si/thin-film and the feature of dynamic irradiances/temperature adjustment, user can verify the performance of the inverters: static & dynamic MPPT tracking efficiency, conversion efficiency and overall efficiency.

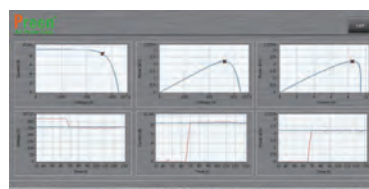
Solar Array Simulation Control Software (opt.)

ADG⁺ series options I-V curve remote control software with parameter setting and output waveform display to verify Dynamic & Static MPPT Efficiency of SAS mode and EN50530 test regulations.

■ Dynamic MPPT Efficiency

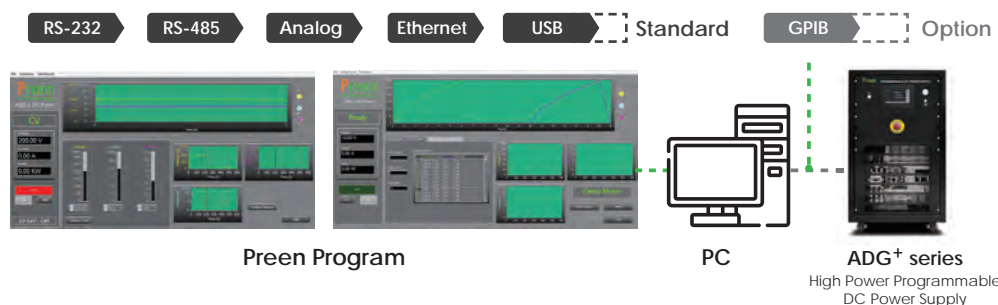


■ Static MPPT Efficiency

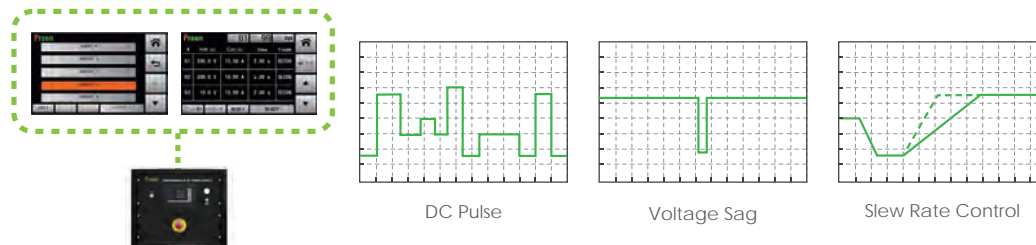


Complimentary Control Software and Various Communication Interfaces

The ADG⁺ series offers complimentary remote control software, Preen Program. This graphical user interface provides easy settings and user-friendly configurations for users to fully control the unit. The Preen Program includes GENERAL mode or PROGRAMMABLE mode with STEP and RAMP features available. The preview waveform and report functions also greatly enhance convenience for on review parameters and results before or after testing.



Programming Sequences and Simulations



The built-in programming function of the ADG⁺ series is consisted of GROUPs and STEPs. Users can set output voltage, output current and time to generate step or consecutive voltage/current changes, and set different rise/fall time according to their requirement. This built-in function and the ADG⁺ series control software allow users to create complex DC waveform with sophisticated coding. Making programming the DC power supply an easy task.

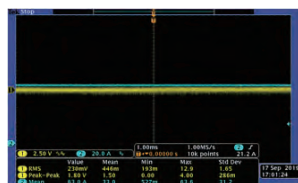
Device Protection

The ADG⁺ series has multiple levels of protection to safeguard your device. These include over-voltage, over-current, over-power, over-temperature, line-drop-compensation over-voltage, input under/over-voltage and phase fail to shut down the power supply output to prevent fault conditions and further damages.

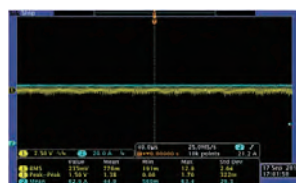
Industry-Leading Performance

As an unique high-power single-unit programmable DC power supply, ADG⁺ series has a wide range of output voltage and current, which reach up to 1600V and 2500A continuously adjustable. Its single unit output is up to 100kW and provides customized parallel operation to expand capacity up to 300kW. It features high power with excellent programming function, fast response and high stability. For communication interface, it has standard RS-485, RS-232, Ethernet, Analog Control, USB and optional GPIB. The STEP & Gradual modes allow easy setup on test sequence and depending on CV/CC/CP settings and load conditions, ADG⁺ series can operate as a current or voltage source.

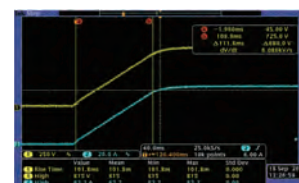
Low Ripple



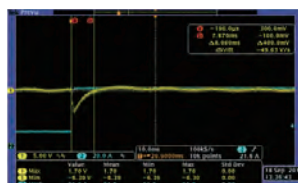
Low Noise



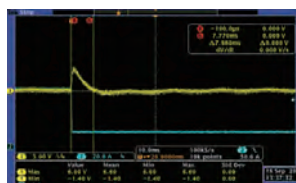
Fast Rise Time



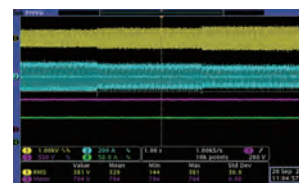
Fast Transient Response When Added Load



Fast Transient Response When Removed Load



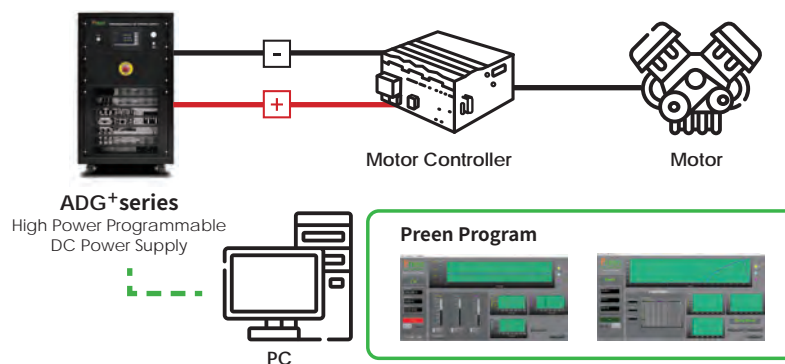
High Stability



EV Testing applications

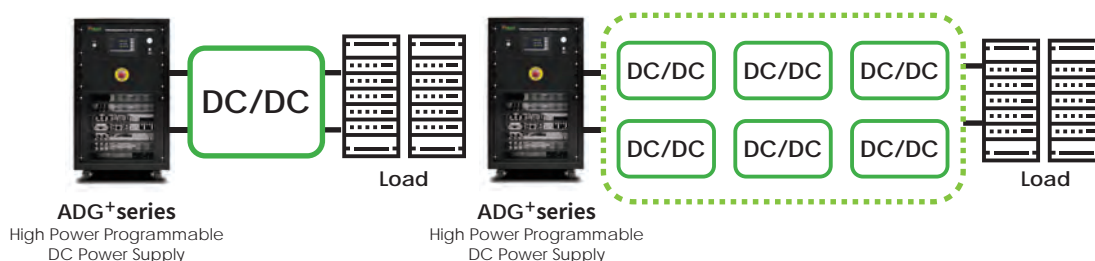
EV Motor Controlling

Motor controlling, as the core component of electric vehicle, controls the initiation, speed, movement and direction of the motor drive, and converts the electrical energy of power battery and provide to the motor drive. ADG⁺ series has many high voltage models to simulate power battery of EV for motor controlling verification or aging testing.



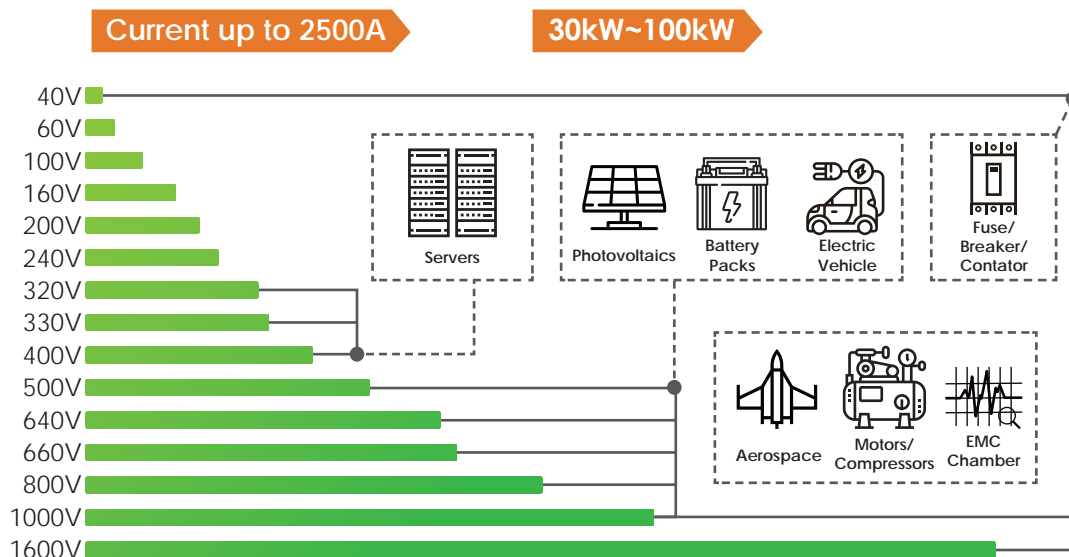
DC/DC Converters

Power batteries of electric vehicle convert DC high voltage to DC low voltage through DC/DC converters, such as 12V/24V of car lamp, wiper and car stereo. Featuring high power and high voltage, ADG⁺ series is suitable to simulate power batteries on different working conditions, such as voltage dip(sag), as voltage ramp or missing. From R&D verification to HALT/HASS Accelerated Life Testing, ADG⁺ series is an ideal choice for DC power supply.



Variety of Applications

ADG⁺ series has many output voltage ranges suitable for different market applications. Models over 400V output voltage are applicable for renewable energy, EV, and lithium battery industries. When it comes to circuit breakers, contactors or fuses that require high voltage or current, models with 2000A or 1600V can fulfill the power demands of this type of component testing. The 400V or 320V models can be applied to server related applications due to the increased needs for high voltage DC in data centers.



ORDERING INFORMATION

ADG⁺ Series (30kW - 100kW)

Model Number	Description
ADG-PLUS-40-1250	Programmable DC Power Supply (50kW/40V/1250A)
ADG-PLUS-60-834	Programmable DC Power Supply (50kW/60V/834A)
ADG-PLUS-100-500	Programmable DC Power Supply (50kW/100V/500A)
ADG-PLUS-200-250	Programmable DC Power Supply (50kW/200V/250A)
ADG-PLUS-240-208	Programmable DC Power Supply (50kW/240V/208A)
ADG-PLUS-320-156	Programmable DC Power Supply (50kW/320V/156A)
ADG-PLUS-400-125	Programmable DC Power Supply (50kW/400V/125A)
ADG-PLUS-500-100	Programmable DC Power Supply (50kW/500V/100A)
ADG-PLUS-640-78	Programmable DC Power Supply (50kW/640V/78A)
ADG-PLUS-800-63	Programmable DC Power Supply (50kW/800V/63A)
ADG-PLUS-1000-50	Programmable DC Power Supply (50kW/1000V/50A)
ADG-PLUS-1600-31	Programmable DC Power Supply (50kW/1600V/31A)
ADG-PLUS-40-750	Programmable DC Power Supply (30kW/40V/750A)
ADG-PLUS-60-500	Programmable DC Power Supply (30kW/60V/500A)
ADG-PLUS-100-300	Programmable DC Power Supply (30kW/100V/300A)
ADG-PLUS-200-150	Programmable DC Power Supply (30kW/200V/150A)
ADG-PLUS-240-125	Programmable DC Power Supply (30kW/240V/125A)
ADG-PLUS-320-94	Programmable DC Power Supply (30kW/320V/94A)
ADG-PLUS-400-75	Programmable DC Power Supply (30kW/400V/75A)
ADG-PLUS-500-60	Programmable DC Power Supply (30kW/500V/60A)
ADG-PLUS-640-47	Programmable DC Power Supply (30kW/640V/47A)
ADG-PLUS-800-38	Programmable DC Power Supply (30kW/800V/38A)
ADG-PLUS-1000-30	Programmable DC Power Supply (30kW/1000V/30A)
ADG-PLUS-1600-18	Programmable DC Power Supply (30kW/1600V/18A)

Model Number	Description
ADG-PLUS-40-1875	Programmable DC Power Supply (75kW/40V/1875A)
ADG-PLUS-60-1250	Programmable DC Power Supply (75kW/60V/1250A)
ADG-PLUS-100-750	Programmable DC Power Supply (75kW/100V/750A)
ADG-PLUS-320-234	Programmable DC Power Supply (75kW/320V/234A)
ADG-PLUS-640-117	Programmable DC Power Supply (75kW/640V/117A)
ADG-PLUS-1000-75	Programmable DC Power Supply (75kW/1000V/75A)
ADG-PLUS-1600-47	Programmable DC Power Supply (75kW/1600V/47A)
ADG-PLUS-40-2500	Programmable DC Power Supply (100kW/40V/2500A)
ADG-PLUS-60-1666	Programmable DC Power Supply (100kW/60V/1666A)
ADG-PLUS-100-1000	Programmable DC Power Supply (100kW/100V/1000A)
ADG-PLUS-320-312	Programmable DC Power Supply (100kW/320V/312A)
ADG-PLUS-640-156	Programmable DC Power Supply (100kW/640V/156A)
ADG-PLUS-1000-100	Programmable DC Power Supply (100kW/1000V/100A)
ADG-PLUS-1600-63	Programmable DC Power Supply (100kW/1600V/63A)
ADG-PLUS-001	GPIO Interface Converter
ADG-PLUS-002	Cable for RS-485 (10m)
ADG-PLUS-003	200V/208 Input Voltage (30~50kW)
ADG-PLUS-004	480V Input Voltage (30~50kW)
ADG-PLUS-005	200V/208 Input Voltage (100kW)
ADG-PLUS-006	480V Input Voltage (30~50kW)
ADG-PLUS-007	I-V Curve Simulation
ADG-PLUS-008	I-V Curve Remote Control Software

SPECIFICATIONS

ADG⁺ series (30kW - 50kW)

Model												
30kW	ADG-PLUS-40-750	ADG-PLUS-60-500	ADG-PLUS-100-300	ADG-PLUS-200-150	ADG-PLUS-240-125	ADG-PLUS-320-94	ADG-PLUS-400-75	ADG-PLUS-500-60	ADG-PLUS-640-47	ADG-PLUS-800-38	ADG-PLUS-1000-30	ADG-PLUS-1600-18
50kW	ADG-PLUS-40-1250	ADG-PLUS-60-834	ADG-PLUS-100-500	ADG-PLUS-200-250	ADG-PLUS-240-208	ADG-PLUS-320-156	ADG-PLUS-400-125	ADG-PLUS-500-100	ADG-PLUS-640-78	ADG-PLUS-800-63	ADG-PLUS-1000-50	ADG-PLUS-1600-31
AC Input												
Voltage	3Ø3W+G 380VAC ± 15% (Option 200VAC/208VAC/400VAC /415VAC/440VAC/480VAC)						3Ø3W + G 380 VAC ± 15% (Option 200VAC/208VAC/400VAC /415VAC/440VAC/480VAC)					
Frequency	47-63Hz						47-63Hz					
Power Factor	≥ 90% at maximum power						≥ 90% at maximum power					
DC Output												
Voltage	40V	60V	100V	200V	240V	320V	400V	500V	640V	800V	1000V	1600V
Current(30kW)	750A	500A	300A	150A	125A	94A	75A	60A	47A	38A	30A	18A
Current(50kW)	1250A	834A	500A	250A	208A	156A	125A	100A	78A	63A	50A	31A
Line Regulation	≤ 0.05%			≤ 0.05%			≤ 0.05%					
Load Regulation ^{*1}	≤ 0.1%			≤ 0.1%			≤ 0.1%			≤ 0.034%	≤ 0.02%	≤ 0.05%
Voltage Ripple (RMS) ^{*2}	≤ 0.4%			≤ 0.1%			≤ 0.1%				≤ 0.05%	
Voltage Slew Rate ^{*3}	≤ 50ms			≤ 60ms	≤ 85ms		≤ 100ms	≤ 100ms	≤ 100ms	≤ 115ms	≤ 120ms	≤ 120ms
Transient Response ^{*4}	≤ 2-10ms						≤ 4-10ms					
Measurement												
Voltage Accuracy	0.5% F.S.						0.1% F.S					
Voltage Resolution	≤ 100V@ 0.01V ,> 100V@0.1V											
Current Accuracy	0.5% F.S.											
Current Resolution	≤ 100A@ 0.01A,>100A@0.1A											
General												
MODE	CC/CV/CP											
Efficiency	≥ 87% at maximum power			≥ 90% at maximum power			≥ 90% at maximum power					
Interfaces	Ethernet/RS-232&RS-485/USB/Analog Control(0-5V) Option : GPIB						Ethernet/RS-232&RS-485/USB/Analog Control(0-5V) Option : GPIB					
Remote Sense Limits	5% maximum voltage drop from product output to load			3% maximum voltage drop from product output to load						2% maximum voltage drop from product output to load		
Protections	OVP 、 OCP 、 OPP 、 OTP 、 Vin OV 、 Vin UV 、 LDC OV, Vin LV 、 Phase Fail						OVP 、 OCP 、 OPP 、 OTP 、 Vin OV 、 Vin UV 、 LDC OV, Vin LV 、 Phase Fail					
OVP Range	0 - 110% F.S.						0 - 110% F.S.					
OCP Range	0 - 110% F.S.						0 - 110% F.S.					
Operational Temperature	0°C-40°C						0°C-40°C					
Storage Temperature	-20°C-70°C						-20°C-70°C					
Humidity	0-90%(Non condensing)						0-90%(Non condensing)					
Isolation	Input to Enclosure : 2000VAC						Input to Enclosure : 2000VAC					
Dimension(H×W×D)	380VAC Input: 1050×600×800 mm/41.5×23.6×31.5 inch						380VAC Input: 1050×600×800 mm/41.5×23.6×31.5 inch					
	200VAC/208VAC/400VAC/415VAC/440VAC/480VAC Input: 1368×600×800 mm/53.9×23.7×31.5 inch						200VAC/208VAC/400VAC/415VAC/440VAC/480VAC Input: 1368×600×800 mm/53.9×23.7×31.5 inch					
Weight	380VAC Input: approx. 225kg/497lbs			380VAC Input: approx. 187kg/413lbs			380VAC Input: approx. 187kg/413lbs					
	200VAC/208VAC/400VAC /415VAC/440VAC/480VAC Input: approx. 412kg/909lbs			200VAC/208VAC/400VAC /415VAC/440VAC/480VAC Input: approx. 367kg/810lbs			200VAC/208VAC/400VAC/415VAC/440VAC/480VAC Input: approx. 367kg/810lbs					

*1. Load changes from 5% to 100% under nominal AC input

*2. Full Scale

*3. Measured from 10% to 90% of the output voltage change - resistive load, typical

*4. Under nominal AC input, recovers to ±1% of full-scale output voltage for a 50% to 100% or 100% to 50% load change

* Above specifications are under output voltage over 1% F.S.

** All specifications are subject to change without notice.

SPECIFICATIONS

ADG⁺ series (75kW - 100kW)

Model							
75kW	ADG-PLUS-40-1875	ADG-PLUS-60-1250	ADG-PLUS-100-750	ADG-PLUS-320-234	ADG-PLUS-640-117	ADG-PLUS-1000-75	ADG-PLUS-1600-47
100kW	ADG-PLUS-40-2500	ADG-PLUS-60-1666	ADG-PLUS-100-1000	ADG-PLUS-320-312	ADG-PLUS-640-156	ADG-PLUS-1000-100	ADG-PLUS-1600-63
AC Input							
Voltage	3Ø3W+G 380VAC ±15% (Option 200VAC/208VAC/400VAC/415VAC/440VAC/480VAC)						
Frequency	47-63Hz						
Power Factor	≥ 90% at maximum power						
DC Output							
Voltage	40V	60V	100V	320V	640V	1000V	1600V
Current(75kW)	1875A	1250A	750A	234A	117A	75A	47A
Current(100kW)	2500A	1666A	1000A	312A	156A	100A	63A
Line Regulation	≤ 0.05%						
Load Regulation ^{*1}	≤ 0.1%	≤ 0.1%	≤ 0.1%	≤ 0.05%	≤ 0.05%	≤ 0.05%	≤ 0.05%
Voltage Ripple (RMS) ^{*2}	≤ 0.5%	≤ 0.5%	≤ 0.4%	≤ 0.1%		≤ 0.1%	≤ 0.1%
Voltage Slew Rate ^{*3}	≤ 50ms			≤ 90ms	≤ 120ms	≤ 120ms	≤ 120ms
Transient Response ^{*4}	≤ 10-20ms						
Measurement							
Voltage Accuracy	0.5% F.S				0.1% F.S		
Voltage Resolution	≤ 100V@ 0.01V,> 100V@0.1V						
Current Accuracy	0.5% F.S						
Current Resolution	≤ 100A@ 0.01A ,> 100A@0.1A						
General							
MODE	CC/CV/CP						
Efficiency	≥ 87% at maximum power			≥ 90% at maximum power			
Remote Sense Limits	5% maximum voltage drop from product output to load			3% maximum voltage drop from product output to load		2% maximum voltage drop from product output to load	
Interfaces	Ethernet/RS-232&RS-485/USB/Analog Control(0-5V) Option : GPIB						
Protections	OVP、OCP、OPP、OTP、Vin OV、Vin UV、LDC OV, Vin LV、Phase Fail						
OVP Range	0 - 110% F.S.						
OCP Range	0 - 110% F.S.						
Operational Temperature	0°C-40°C						
Storage Temperature	-20°C-70°C						
Humidity	0-90%(Non condensing)						
Isolation	Input to Enclosure : 2000VAC						
Dimension(H×W×D)	380VAC Input: 1520×600×800 mm/59.9×23.6×31.5 inch						
	200VAC/208VAC/400VAC/415VAC/440VAC/480VAC Input: 1838×600×800 mm/72.4×23.7×31.5 inch						
Weight	380VAC Input: approx. 294kg/648.3lbs						
	200VAC/208VAC/400VAC/415VAC/440VAC/480VAC Input: approx. 574kg/1265.7lbs						

*1. Load changes from 5% to 100% under nominal AC input

*2. Full Scale

*3. Measured from 10% to 90% of the output voltage change - resistive load, typical

*4. Under nominal AC input, recovers to ±1% of full-scale output voltage for a 50% to 100% or 100% to 50% load change

* Above specifications are under output voltage over 1% F.S.

** All specifications are subject to change without notice.