

## Programmable DC Power Supply

### MODEL 62000H SERIES

#### Key Features :

- Power range: 5KW / 10KW / 15KW
- Voltage range: 0 ~ 1000V
- Current range: 0 ~ 375A
- High power density (15KW in 3U)
- Easy master / slave parallel & series operation up to 150KW
- Precision V&I Measurements
- High-speed programming
- Voltage & Current slew rate control
- Digital encoder knobs, keypad and function keys
- Current sharing operation
- Voltage ramp function (time range: 10 ms ~ 99 hours)
- Auto sequencing programming: 10 programs / 100 sequences
- OVP, current limit, thermal protection
- Standard analog programming interface
- Standard USB / RS232 / RS485 interface
- Optional GPIB / Ethernet interface
- Remote output ON / OFF (I / P)
- Remote sense line drop compensation
- LabView and Labwindows
- Solar array simulation function
- Shade I-V curve simulation
- I-V curve programming: 10 program / 100 I-V files
- CE certified



## PROGRAMMABLE DC POWER SUPPLY MODEL 62000H SERIES

Chroma's new 62000H Series of programmable DC power supplies offer many unique advantages for telecom, automated test system & integration, industrial, battery charge & simulation for hybrid cars and solar panel simulation. These advantages include high power density of 15KW in 3U, precision readback of output current and voltage, output trigger signals as well as the ability to create complex DC transient waveforms to test device behavior for spikes, drops, and other voltage deviations.

The 62000H Series includes 14 different models ranging from 5KW to 15KW, with current range up to 375A and voltage range up to 1000V. The 62000H can easily parallel up to ten units capable of 150KW with current sharing for bulk power applications, for example, battery bank simulation of 450V/150A/67.5KW for electric vehicle and military use.

There are 100 user programmable input status on the front panel for automated test

application and life cycle ON/OFF test. In addition, the 62000H has a 16 bit digital control with bright vacuum fluorescent display readout.

The 62000H series DC power supplies are very easy to operate either from the front panel keypad or from the remote controller via USB / RS232 / RS485 / APG (Standard) and GPIB & Ethernet (optional). Its compact size with 3U only can be stacked on a bench in a standard rack without any difficulty.

Another unique capability of the 62000H supplies is their ability to create complex DC transient waveforms. This capability allows devices to be tested to DC voltage dropouts, spikes and other voltage variations making them an ideal choice for aerospace device testing, inverter testing and other devices which will experience voltage interrupts. Applications include DC/DC converter & inverter voltage drop test, engine start-up simulation, battery automated charging, electronic product life cycle test, etc.



# Chroma



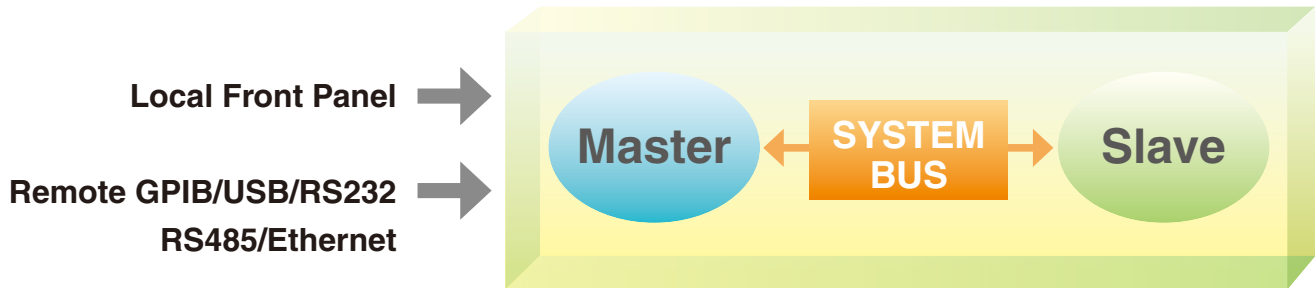
## HIGH POWER DENSITY 15KW IN 3U PROGRAMMABLE DC POWER SUPPLY

The 62000H Series supplies offer a high power density envelop of maximum 15KW in 3U, deliver low output noise and ripple, excellent line and load regulation, and fast transient response, with wide range of voltage (30V~1000V), current (375A~25A) combinations, suitable for every part of your manufacturing process from design to production testing.



## MASTER / SLAVE PARALLEL & SERIES OPERATION UP TO 150KW

When high power is required, it is common to connect two or more power supplies in parallel or series. The 62000H Series supplies have a smart Master / Slave control mode making series/parallel operation fast and simple. In this mode, the master scales values and downloads data to slave units so programming is simple and current sharing automatic.



## SOLAR ARRAY SIMULATION FUNCTION \*

Model 62150H-600S/1000S provides a unique feature to simulate the output characteristics of a solar array. This function is useful for MPPT performance evaluation on solar inverter device. User can easily edit the I-V curve, testing and monitor the PV inverter via softpanel, see the right Figure A & B.

\*Call for availability



Figure A : IV Curve Edit Table Mode

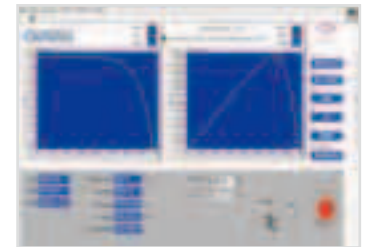
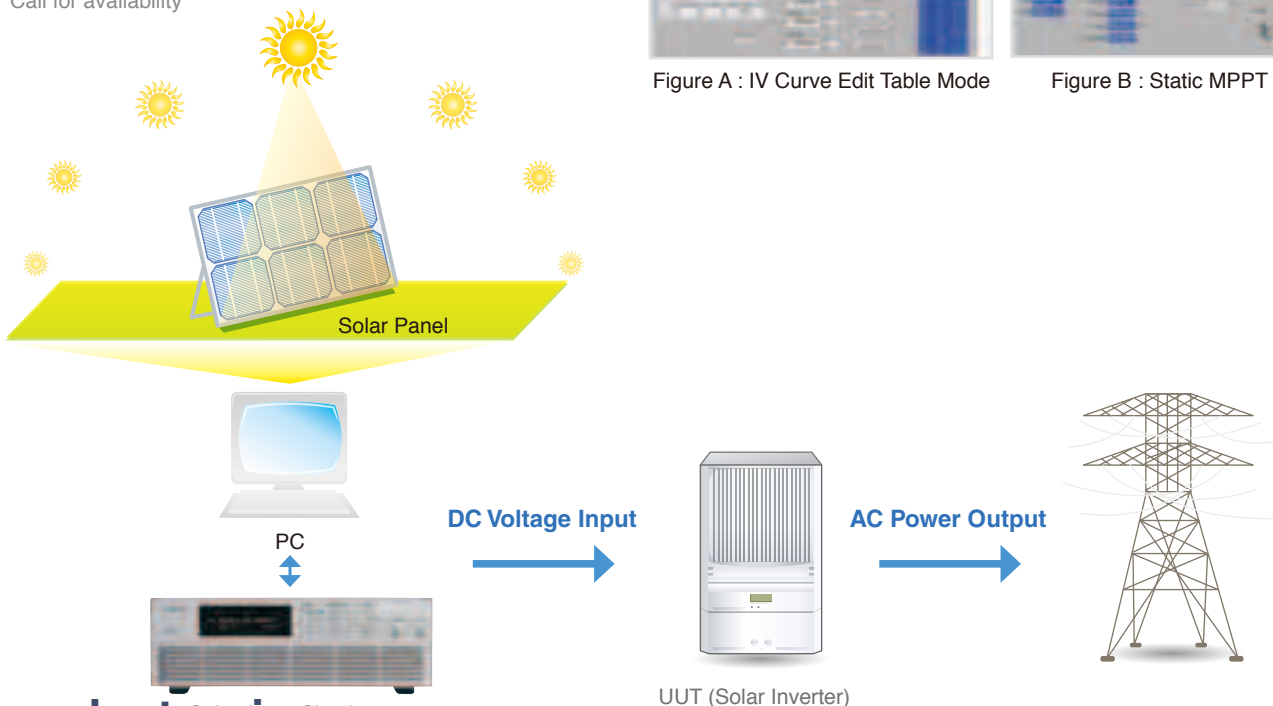
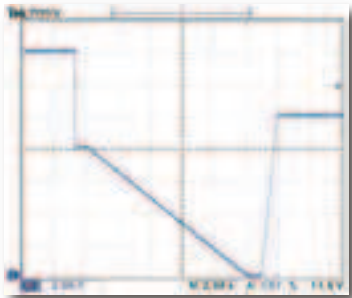
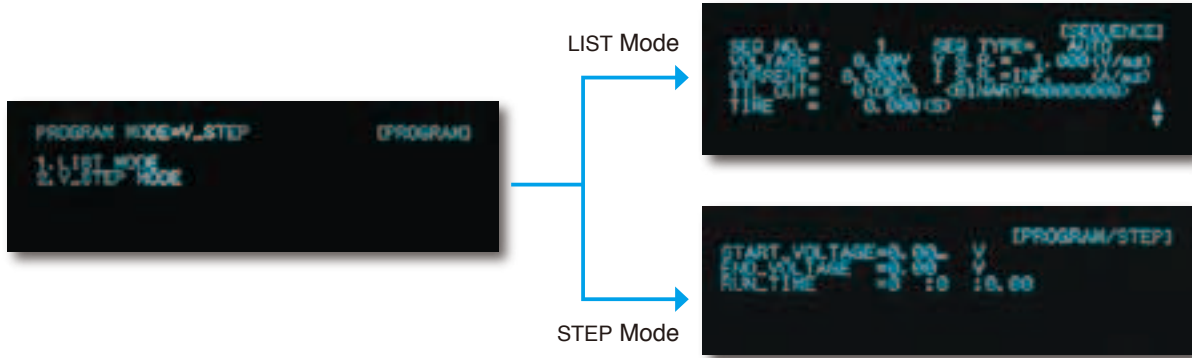


Figure B : Static MPPT Test

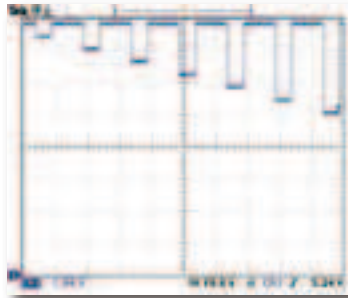


## PROGRAMMING SEQUENCES APPLICATIONS

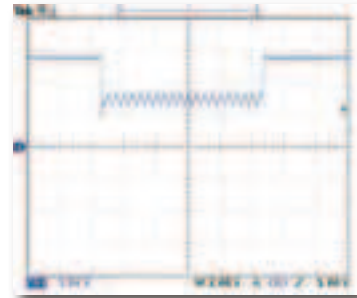
The 62000H Series supplies' LIST and STEP modes allow for auto sequencing function. The LIST mode allows for 100 user programmable sequences with time settings ranging from 5ms to 15000s and voltage / current slew rate control. The STEP mode allows for setting start, end voltage and run time of 10ms to 99 hours for automated test applications. Applications include DC/DC Converter & Inverter voltage dropout testing, engine start-up simulation, battery automated charging, battery voltage dropout simulation, product life cycle testing and avionics testing.



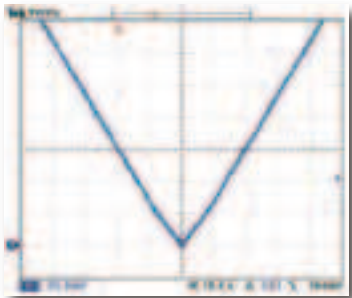
Battery Voltage Dropout



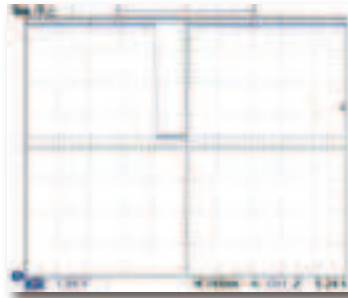
Reset Behavior at Voltage Drop of ISO 16750-2



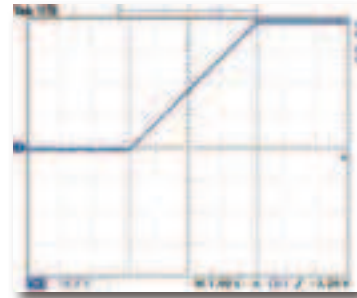
Engine Starting Profile of ISO 16750-2



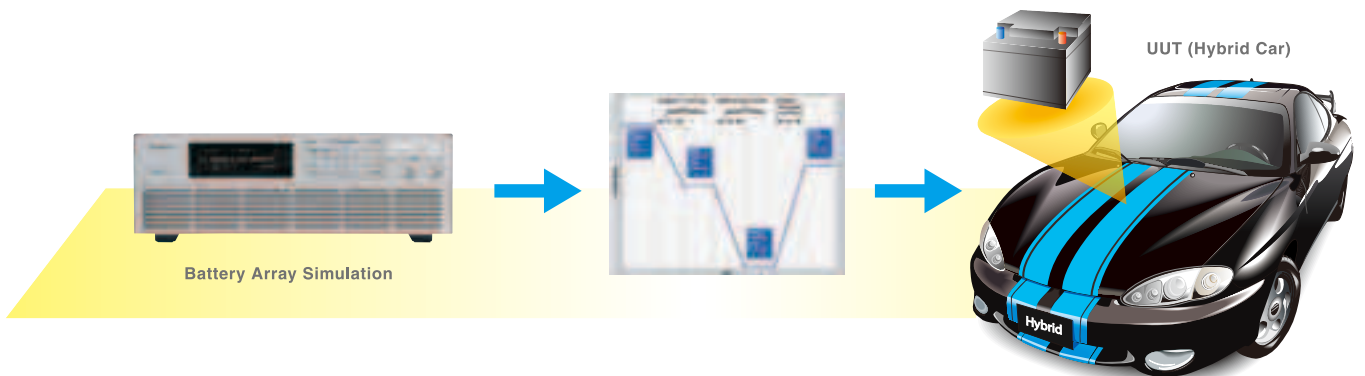
Battery Voltage Slow Decrease & Decrease profile



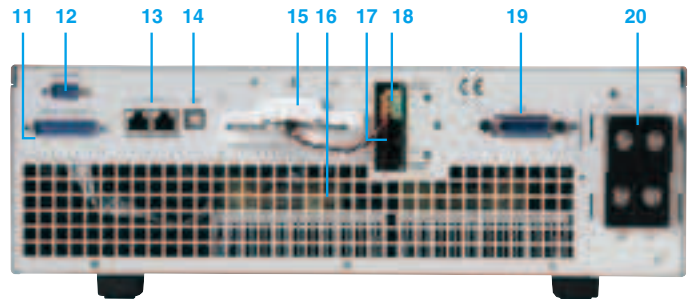
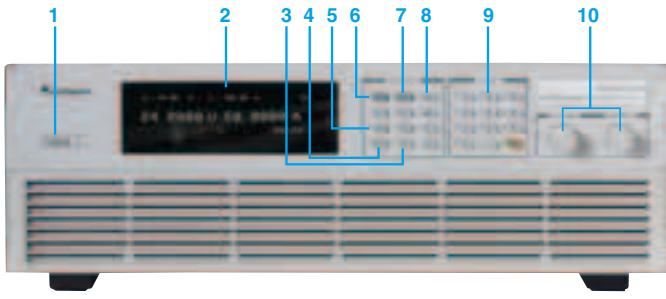
Telecom Converter Sag Testing



Output Voltage Slew Rate Control



## PANEL DESCRIPTION



**1. POWER Switch**

**2. VFD Display**

Display setting, readings and operating status

**3. LOCK Key**

Lock all settings

**4. OUTPUT Key**

Enable or disable the output

**5. CONFIG Key**

Set the system configuration

**6. VOLTAGE Key**

Set the output voltage

**7. CURRENT Key**

Set the output current

**8. PROG Key**

Program the sequence

**9. NUMERIC Key**

Set the data

**10. ROTARY Key**

Adjust the V&I and set the parameter

**11. Analog programming interface**

For analog level to program and monitor output voltage & current

**12. RS-232 or RS-485 Interface (alternative)**

**13. System Bus**

For master/slave parallel and series control

**14. USB Interface**

**15. OUTPUT Terminal**

Connect the output cable to a UUT

**16. System Fan**

With fan speed control

**17. Current Sharing Terminal**

Connect the cable to slave unit

**18. Sense Terminal**

Connect the UUT for voltage compensation

**19. GPIB or ETHERNET Interface (optional)**

**20. AC Input Terminal**

## ORDERING INFORMATION

Power Rating	62000H Series Programmable DC Power Supply
5KW	62050H-40 : Programmable DC Power Supply 40V/125A/5KW
	*62050H-450 : Programmable DC Power Supply 450V/11.5A/5KW
	62050H-600 : Programmable DC Power Supply 600V/8.5A/5KW
10KW	62075H-30 : Programmable DC Power Supply 30V/250A/7.5KW
	62100H-30 : Programmable DC Power Supply 30V/375A/11KW
	62100H-40 : Programmable DC Power Supply 40V/250A/10KW
	*62100H-450 : Programmable DC Power Supply 450V/23A/10KW
	62100H-600 : Programmable DC Power Supply 600V/17A/10KW
	*62100H-600S: Programmable DC Power Supply 600V/17A/10KW with Solar Array Simulation
15KW	62150H-40 : Programmable DC Power Supply 40V/375A/15KW
	62150H-450 : Programmable DC Power Supply 450V/34A/15KW
	62150H-600 : Programmable DC Power Supply 600V/25A/15KW
	62150H-600S : Programmable DC Power Supply 600V/25A/15KW with Solar Array Simulation
	*62150H-1000S: Programmable DC Power Supply 1000V/15A/15KW with Solar Array Simulation
Options	GPIB Interface for 62000H Series (Factory installed)
	Ethernet Interface for 62000H Series (Factory installed)
	Rack Mounting Kit for 62000H Series

**Note :**

Please specify the input voltage level at time of order.

GPIB or Ethernet Interface (alternative). Please specified at time of order.

\*Call for Availability.

## ELECTRICAL SPECIFICATIONS -1

Model	62075H-30	62050H-40	62050H-450	62050H-600	62100H-30	62100H-40
<b>Output Ratings</b>						
Output Voltage	0-30V	0-40V	0-450V	0-600V	0-30V	0-40V
Output Current	0-250A	0-125A	0-11.5A	0-8.5A	0-375A	0-250A
Output Power	7500W	5000W	5000W	5000W	11250W	10000W
<b>Line Regulation</b>						
Voltage	±0.01% F.S.					
Current	±0.05% F.S.					
<b>Load Regulation</b>						
Voltage	±0.02% F.S.					
Current	±0.1% F.S.					
<b>Voltage Measurement</b>						
Range	6V / 30V	8V / 40V	90V / 450V	120V / 600V	6V / 30V	8V / 40V
Accuracy	0.05% + 0.05% F.S.					
<b>Current Measurement</b>						
Range	50A / 250A	25A / 125A	2.3A / 11.5A	1.7A / 8.5A	75A / 375A	50A / 250A
Accuracy	0.1% + 0.1% F.S.					
<b>Output Noise &amp; Ripple</b>						
Voltage Noise (P-P)	60mV	60mV	300mV	350mV	60mV	60mV
Voltage Ripple (rms)	15mV	15mV	450mV	600mV	15mV	15mV
Current Ripple (rms)	100mA	50mA	20mA	15mA	150mA	100mA
<b>OVP Adjustment Range</b>						
Range	0-110% programmable from front panel or digital					
Accuracy	±1% of full-scale output					
<b>Programming Response Time</b>						
Rise Time: Full Load	6ms	8ms	60ms	60ms	6ms	8ms
Rise Time: No Load	6ms	8ms	60ms	60ms	6ms	8ms
Fall Time: Full Load	6ms	8ms	60ms	60ms	6ms	8ms
Fall Time: 10% Load	100ms	100ms	250ms	250ms	100ms	100ms
Fall Time: No Load	1s	1s	2.5s	2.5s	1s	1s
<b>Slew Rate Control</b>						
Voltage slew rate range	0.001V/ms - 5V/ms	0.001V/ms - 5V/ms	0.001V/ms - 7.5V/ms	0.001V/ms - 10V/ms	0.001V/ms - 5V/ms	0.001V/ms - 5V/ms
Current slew rate range	0.001A - 1A/ms, or INF	0.001A - 1A/ms, or INF	0.001A - 0.1A/ms, or INF	0.001A - 0.1A/ms, or INF	0.001A - 1A/ms, or INF	0.001A - 1A/ms, or INF
Minimum transition time	0.5ms					
<b>Transient Response Time</b>	Recovers within 1ms to +/- 0.75% of steady-state output for a 50% to 100% or 100% to 50% load change(1A/us)					
Efficiency	0.87(Typical)					
<b>Drift (30 minutes)</b>						
Voltage	0.04% of Vmax					
Current	0.06% of Imax					
<b>Drift (8 hours)</b>						
Voltage	0.02% of Vmax					
Current	0.04% of Imax					
<b>Temperature Coefficient</b>						
Voltage	0.04% of Vmax/°C					
Current	0.06% of Imax/°C					

All specifications are subject to change without notice. Please visit our website for the most up to date specifications.



## ELECTRICAL SPECIFICATIONS -2

Model	62100H-450	62100H-600	62150H-40	62150H-450	62150H-600
<b>Output Ratings</b>					
Output Voltage	0-450V	0-600V	0-40V	0-450V	0-600V
Output Current	0-23A	0-17A	0-375A	0-34A	0-25A
Output Power	10000W	10000W	15000W	15000W	15000W
<b>Line Regulation</b>					
Voltage	±0.01% F.S.				
Current	±0.05% F.S.				
<b>Load Regulation</b>					
Voltage	±0.02% F.S.				
Current	±0.1% F.S.				
<b>Voltage Measurement</b>					
Range	90V/450V	120V/600V	8V/40V	90V/450V	120V/600V
Accuracy	0.05% + 0.05%F.S.				
<b>Current Measurement</b>					
Range	4.6A/23A	3.2A/17A	75A/375A	6.8A/34A	5A/25A
Accuracy	0.1% + 0.1%F.S.				
<b>Output Noise &amp; Ripple</b>					
Voltage Noise(P-P)	300mV	350mV	60mV	300mV	350mV
Voltage Ripple(rms)	450mV	600mV	15mV	450mV	600mV
Current Ripple(rms)	40mA	30mA	150mA	60mA	45mA
<b>OVP Adjustment Range</b>					
Range	0-110% programmable from front panel or digital				
Accuracy	±1% of full-scale output				
<b>Programming Response Time</b>					
Rise Time:Full Load	60ms	60ms	8ms	60ms	60ms
Rise Time:No Load	60ms	60ms	8ms	60ms	60ms
Fall Time: Full Load	60ms	60ms	8ms	60ms	60ms
Fall Time: 10% Load	250ms	250ms	100ms	250ms	250ms
Fall Time: No Load	2.5s	2.5s	1s	2.5s	2.5s
<b>Slew Rate Control</b>					
Voltage slew rate range	0.001V/ms - 7.5V/ms	0.001V/ms - 10V/ms	0.001V/ms - 5V/ms	0.001V/ms - 7.5V/ms	0.001V/ms - 10V/ms
Current slew rate range	0.001A - 0.1A/ms, or INF	0.001A - 0.1A/ms, or INF	0.001A - 1A/ms, or INF	0.001A - 0.1A/ms, or INF	0.001A - 0.1A/ms, or INF
Minimum transition time	0.5ms				
<b>Transient Response Time</b>	Recovers within 1ms to +/- 0.75% of steady-state output for a 50% to 100% or 100% to 50% load change(1A/us)				
<b>Efficiency</b>	0.87(Typical)				
<b>Drift (30 minutes)</b>					
Voltage	0.04% of Vmax				
Current	0.06% of Imax				
<b>Drift (8 hours)</b>					
Voltage	0.02% of Vmax				
Current	0.04% of Imax				
<b>Temperature Coefficient</b>					
Voltage	0.04% of Vmax/°C				
Current	0.06% of Imax/°C				

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## GENERAL SPECIFICATIONS

Programming & Measurement Resolution				
Voltage (Front Panel )	10 mV			
Current (Front Panel)	10 mA			
Voltage (Digital Interface)	0.002% of Vmax			
Current (Digital Interface)	0.002% of Imax			
Voltage (Analog Interface )	0.04% of Vmax			
Current (Analog Interface )	0.04% of Imax			
Remote Interface				
Analog programming	Standard			
USB	Standard			
RS232	Standard			
RS485	Standard			
GPIB	Optional			
Ethernet	Optional			
System bus(CAN)	Standard for master/slave control			
Programming Accuracy				
Voltage (Front Panel and Digital Interface )	0.1% of Vmax			
Current (Front Panel and Digital Interface )	0.3% of Imax			
Voltage (Analog Interface)	0.2% of Vmax			
Current (Analog Interface)	0.3% of Imax			
GPIB Command Response Time				
Vout setting	GPIB send command to DC source receiver <20ms			
Measure V&l	Under GPIB command using Measure <25ms			
Analog Interface (I/O)				
Voltage and Current Programming inputs (I/P)	0-10Vdc / 0-5Vdc / 0-5k ohm / 4-20 mA of F.S.			
Voltage and Current monitor output (O/P)	0-10Vdc / 0-5Vdc / 4-20mA of F.S.			
External ON/OFF (I/P)	TTL:Active Low or High(Selective)			
DC_ON Signal (O/P)	Level by user define. ( Time delay = 1 ms at voltage slew rate of 10V/ms.)			
CV or CC mode Indicator (O/P)	TTL Level High=CV mode ; TTL Level Low= CC mode			
OTP Indicator (O/P)	TTL: Active Low			
System Fault indicator(O/P)	TTL: Active Low			
Auxiliary power supply(O/P)	Nominal supply voltage : 12Vdc / Maximum current sink capability: 10mA			
Safety interlock(I/P)	Time accuracy: <100ms			
Remote inhibit(I/P)	TTL: Active Low			
<b>Series &amp; Parallel Operation*1</b>	Master / Slave control via CAN for 10 units up to 150KW. (Series: two units / Parallel: ten units )			
Auto Sequencing(List Mode)				
Number of program	10			
Number of sequence	100			
Dwell time Range	5ms - 15000S			
Trig. Source	Manual / Auto / External			
Auto Sequencing (Step Mode)				
Start voltage	0 to Full scale			
End voltage	0 to Full scale			
Run time	10ms - 99hours			
Input Specification				
AC input voltage 3phase , 3 wire + ground	208/220 Vac(operating range 187 -242 Vac) *2 380/400 Vac(operating range 342 - 440 Vac) 440/480 Vac(operating range 396 - 528 Vac) *2			
AC frequency range	47-63 Hz			
Max Current(each phase)	208/220 Vac	5KW Model:39A	10KW Model:66A	15KW Model:91A
	380/400 Vac	5KW Model:22A	10KW Model:37A	15KW Model:50A
	440/480 Vac	5KW Model:19A	10KW Model:32A	15KW Model:44A
General Specification				
Maximum Remote Sense Line Drop Compensation	<100V model: 5% of full scale voltage per line(10% total) >100V model :2% of full scale voltage per line (4% total)			
Operating Temperature Rage	0°C ~ 50°C			
Storage Temperature Rage	-40°C ~ +85°C			
Dimension (HxWxD)	132.8 x 428 x 610 mm / 5.23 x 16.85 x 24.02 inch			
Weight	5KW Model : Approx. 23 kg / 50.66 lbs			
	10KW Model : Approx. 29 kg / 63.88 lbs			
	15KW Model : Approx. 35 kg / 77.09 lbs			

All specifications are subject to change without notice. Please visit our website for the most up to date specifications.

**Note\*1** : To parallel more than 5 units, please contact factory.

**Note\*2** : Call for availability.

# ELECTRICAL SPECIFICATIONS - Solar Array Simulator Model

MODEL	62100H-600S*1	62150H-600S	62150H-1000S*1
<b>Output Ratings</b>			
Output Voltage	0-600V	0-600V	0-1000V
Output Current	0-17A	0-25A	0-15A
Output Power	10000W	15000W	15000W
<b>Line Regulation</b>			
Voltage	+/- 0.01% F.S.		
Current	+/- 0.05% F.S.		
<b>Load Regulation</b>			
Voltage	+/- 0.05% F.S.		
Current	+/- 0.1% F.S.		
<b>Voltage Measurement</b>			
Range	120V / 600V	120V / 600V	200V / 1000V
Accuracy	0.05% + 0.05%F.S.		
<b>Current Measurement</b>			
Range	6.8A / 17A	10A / 25A	6A / 15A
Accuracy	0.1% + 0.1%F.S.		
<b>Output Noise&amp;Ripple</b>			
Voltage Noise(P-P)	1500 mV	1500 mV	2550 mV
Voltage Ripple(rms)	650 mV	650 mV	1950 mV
Current Ripple(rms)	300 mA	450 mA	90mA
<b>OVP Adjustment Range</b>			
Range	0-110% programmable from front panel, remote digital inputs.		
Accuracy	+/- 1% of full-scale output		
<b>Programming Response Time</b>			
Rise Time: 50%F.S. CC Load	30ms	30ms	25ms
Rise Time: No Load	30ms	30ms	25ms
Fall Time: 50%F.S. CC Load	30ms	30ms	25ms
Fall Time: 10%F.S. CC Load	100ms	100ms	80ms
Fall Time: No Load	1.2s	1.2s	3s
<b>Slew Rate Control</b>			
Voltage Slew Rate Range	0.001V/ms - 20V/ms	0.001V/ms - 20V/ms	0.001V/ms - 40V/ms
Current Slew Rate Range	0.001A/ms - 0.1A/ms, or INF	0.001A/ms - 0.1A/ms, or INF	0.001A/ms - 0.1A/ms, or INF
Minimum Transition Time	0.5ms		
<b>Transient response time</b>	Recovers within 1ms to +/- 0.75% of steady-state output for a 50% to 100% or 100% to 50% load change(1A/us)		
<b>Efficiency</b>	0.87(Typical)		
<b>Programming &amp; Measurement Resolution</b>			
Voltage (Front Panel)	10 mV	10 mV	100mV
Current (Front Panel)	1mA	1mA	1mA
Voltage (Digital Interface)	0.002% of Vmax		
Current (Digital Interface)	0.002% of Imax		
Voltage (Analog Interface)	0.04% of Vmax		
Current (Analog Interface)	0.04% of Imax		
<b>Programming Accuracy</b>			
Voltage (Front Panel and Digital Interface)	0.1% of Vmax		
Current (Front Panel and Digital Interface)	0.3% of Imax		
Voltage (Analog Interface)	0.2% of Vmax		
Current (Analog Interface)	0.3% of Imax		
<b>Series &amp; Parallel Operation*2</b>	Master / Slave control via CAN for 10 units up to 150KW. (Series: two units / Parallel: ten units )		
<b>Auto Sequencing(I-V program)</b>			
Number of program	10		
Number of sequence	100		
Dwell time Range	1s - 15,000S		
Trig. Source	Manual / Auto		
<b>General Specification</b>			
Maximum Remote Sense Line Drop Compensation	2% of full scale voltage per line (4% total)		
Operating Temperature Range	0°C ~ 40°C		
Storage Temperature Range	-40°C ~ +85°C		
Dimension (HxWxD)	132.8 mm x 428 mm x 610 mm / 5.23 x 16.85 x 24.02 inch		
Weight	Approx. 29 kg / 63.88 lbs	Approx. 35 kg / 77.09 lbs	Approx. 35 kg / 77.09 lbs
Approval	CE	CE	CE(Optional)*1

All specification are subject to change without notice.

**Note\*1** : Call for Availability.

**Note\*2** : To parallel operation more than 5 units, please contact factory. There is parallel mode for DC power supply when the I-V curve function is enabled.

Developed and Manufactured by :

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