

## 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



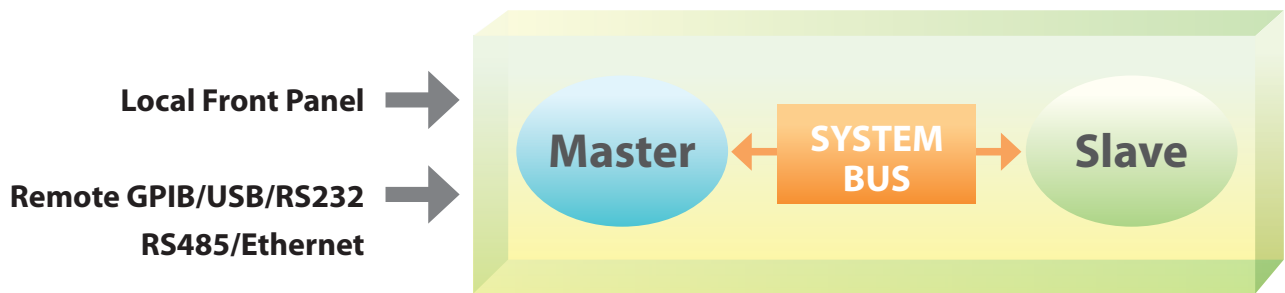
## HIGH POWER DENSITY 15KW IN 3U PROGRAMMABLE DC POWER SUPPLY

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

\* Please see the solar array simulator brochure for more informations.

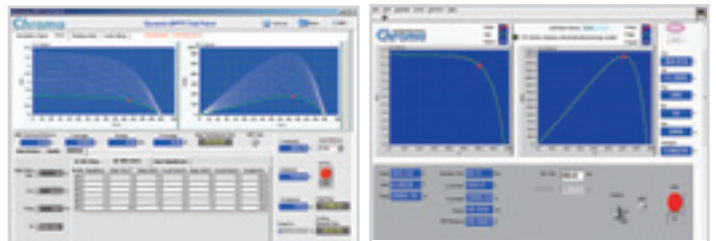
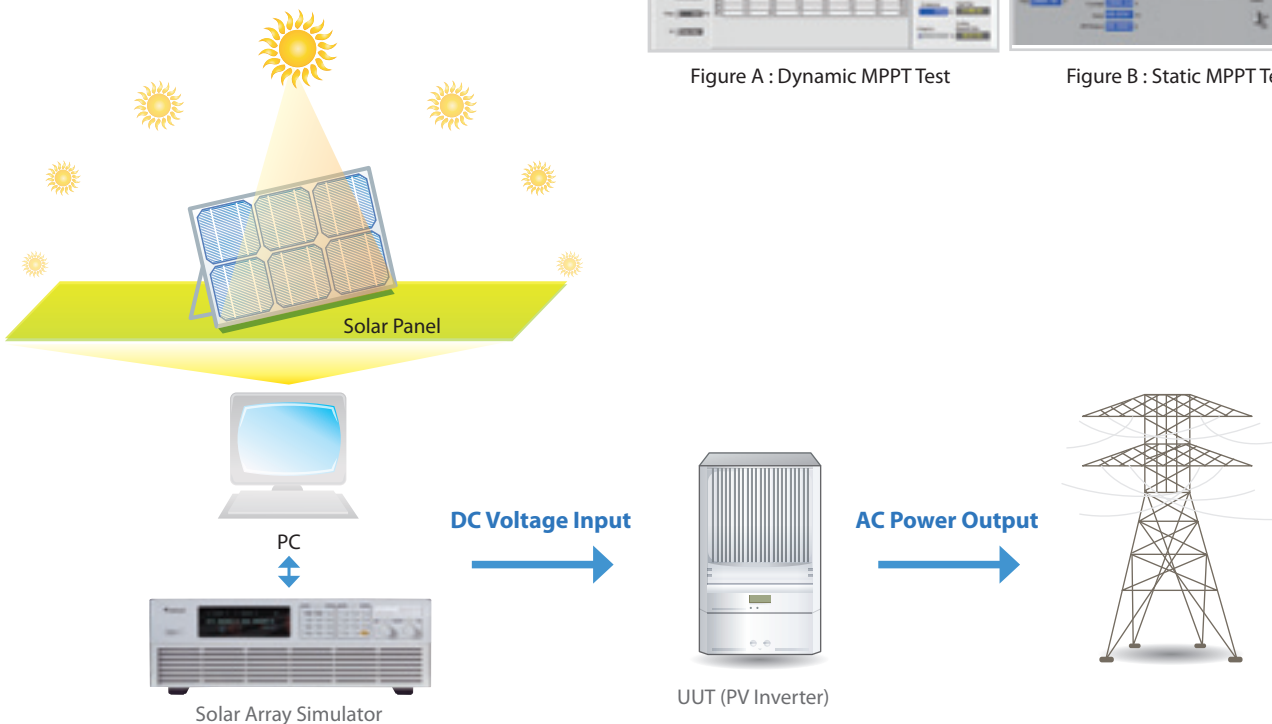


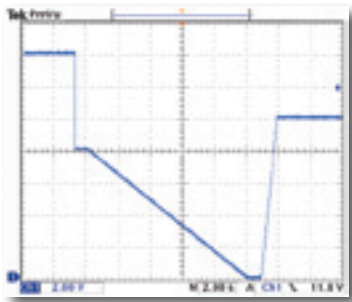
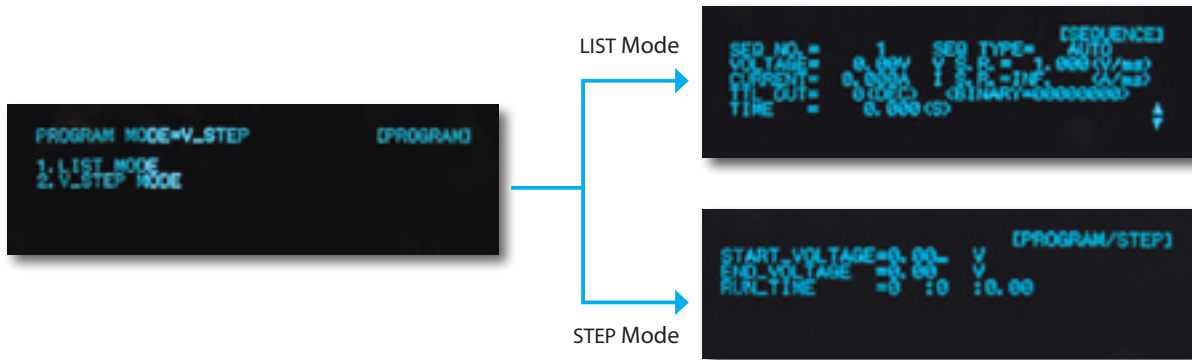
Figure A : Dynamic MPPT Test

Figure B : Static MPPT Test

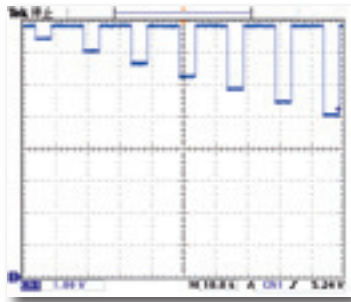


## PROGRAMMING SEQUENCES APPLICATIONS

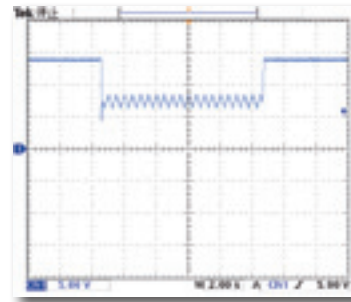
The 62000H Series supplies' LIST and STEP modes allows for auto sequencing function. The LIST mode allows for 100 user programmable sequences with time settings ranging from 5ms to 15000s and voltage / current slew rate control. The STEP mode allows for setting start, end voltage and run time of 10ms 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.



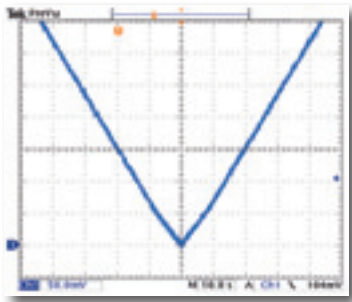
Battery Voltage Dropout



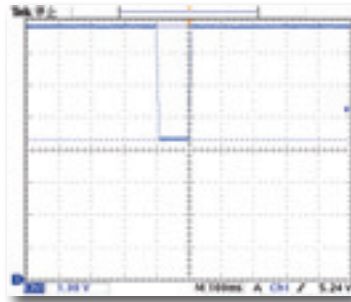
Reset Behavior at Voltage Drop of ISO 16750-2



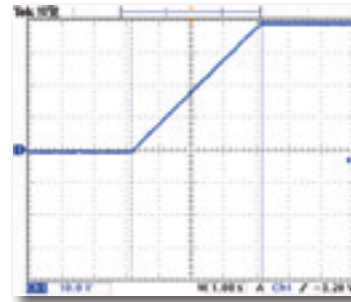
Engine Starting Profile of ISO 16750-2



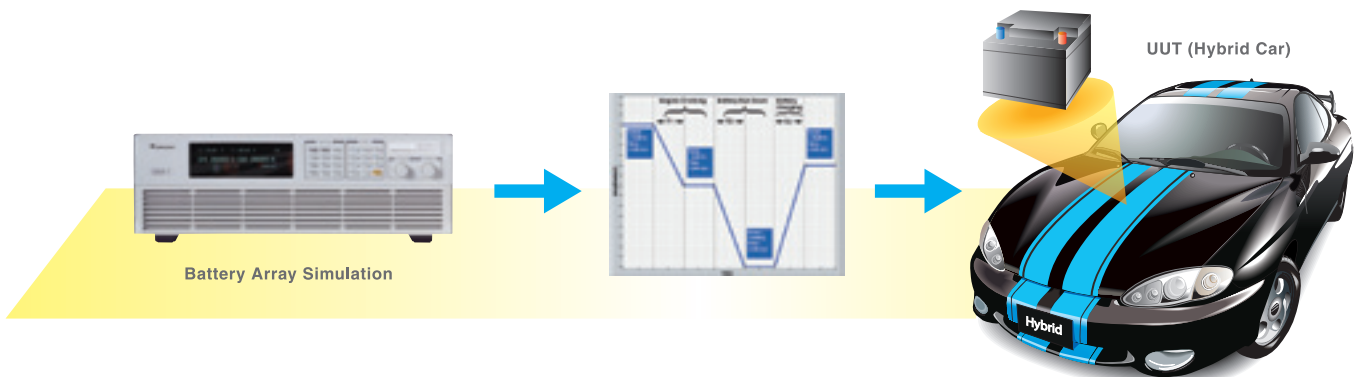
Battery Voltage Slow Decrease & Increase



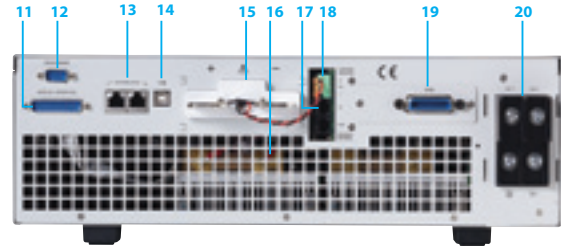
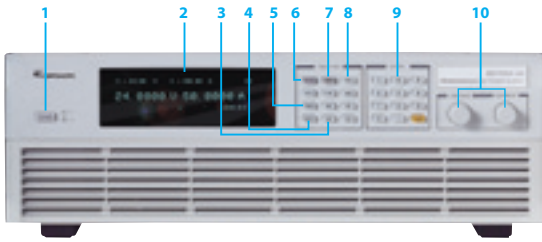
Telecom Converter Sag Testing



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&l 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
	62050H-600S : Programmable DC Power Supply 600V/8.5A/5KW with Solar Array Simulation
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
	62100H-1000 : Programmable DC Power Supply 1000V/10A/10KW
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-1000 : Programmable DC Power Supply 1000V/15A/15KW
	62150H-1000S : Programmable DC Power Supply 1000V/15A/15kW with Solar Array Simulation
Options	A620024 : GPIB Interface for 62000H series (Factory installed)
	A620025 : Ethernet Interface for 62000H series (Factory installed)
	A620026 : Rack Mounting kit for 62000H series

**Note 1 :** Please specify GPIB or Ethernet Interface(alternative) at time of order

**Note 2 :** All models output power are available for 380/400Vac line voltage

**Note 3 :** Call for availability (30V/40V/450V for 200/220 Vac line voltage)

## ELECTRICAL SPECIFICATIONS -1

Model	62075H-30	62050H-40	62050H-450	62050H-600	62100H-30	62100H-40	62100H-450
<b>Output Ratings</b>							
Output Voltage	0-30V	0-40V	0-450V	0-600V	0-30V	0-40V	0-450V
Output Current	0-250A	0-125A	0-11.5A	0-8.5A	0-375A	0-250A	0-23A
Output Power	7500W	5000W	5000W	5000W	11250W	10000W	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	90V/450V
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	4.6A/23A
Accuracy	0.1% + 0.1% F.S.						
<b>Output Noise &amp; Ripple</b>							
Voltage Noise (P-P)	60mV	60mV	300mV	350mV	60mV	60mV	300mV
Voltage Ripple (rms)	15mV	15mV	450mV	600mV	15mV	15mV	450mV
Current Ripple (rms)	100mA	50mA	20mA	15mA	150mA	100mA	40mA
<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: Full Load	6ms	8ms	60ms	60ms	6ms	8ms	60ms
Rise Time: No Load	6ms	8ms	60ms	60ms	6ms	8ms	60ms
Fall Time: Full Load	6ms	8ms	60ms	60ms	6ms	8ms	60ms
Fall Time: 10% Load	100ms	100ms	250ms	250ms	100ms	100ms	250ms
Fall Time: No Load	1s	1s	2.5s	2.5s	1s	1s	2.5s
<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	0.001V/ms ~ 7.5V/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	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/μs)						
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						

## ELECTRICAL SPECIFICATIONS - 2

Model	62100H-600	62100H-1000	62150H-40	62150H-450	62150H-600	62150H-1000
<b>Output Ratings</b>						
Output Voltage	0-600V	0-1000V	0-40V	0-450V	0-600V	0-1000V
Output Current	0-17A	0-10A	0-375A	0-34A	0-25A	0-15A
Output Power	10000W	10000W	15000W	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.	± 0.05% F.S.	± 0.02% F.S.	± 0.02% F.S.	± 0.02% F.S.	± 0.05% F.S.
Current	± 0.1% F.S.					
<b>Voltage Measurement</b>						
Range	120V/600V	200V/1000V	8V/40V	90V/450V	120V/600V	200V/1000V
Accuracy	0.05% + 0.05%F.S.					
<b>Current Measurement</b>						
Range	3.2A/17A	4A/10A	75A/375A	6.8A/34A	5A/25A	6A/15A
Accuracy	0.1% + 0.1%F.S.					
<b>Output Noise &amp; Ripple</b>						
Voltage Noise(P-P)	350mV	2550mV	60mV	300mV	350mV	2550mV
Voltage Ripple(rms)	600mV	1500mV	15mV	450mV	600mV	1500mV
Current Ripple(rms)	30mA	180mA	150mA	60mA	45mA	270mA
<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:Full Load	60ms	25ms(50% F.S. CC Load)	8ms	60ms	60ms	25ms(50% F.S. CC Load)
Rise Time:No Load	60ms	25ms	8ms	60ms	60ms	25ms
Fall Time: Full Load	60ms	25ms(50% F.S. CC Load)	8ms	60ms	60ms	25ms(50% F.S. CC Load)
Fall Time: 10% Load	250ms	80ms(10% F.S. CC Load)	100ms	250ms	250ms	80ms(10% F.S. CC Load)
Fall Time: No Load	2.5s	3s	1s	2.5s	2.5s	3s
<b>Slew Rate Control</b>						
Voltage slew rate range	0.001V/ms~10V/ms	0.001V/ms~40V/ms	0.001V/ms~5V/ms	0.001V/ms~7.5V/ms	0.001V/ms~10V/ms	0.001V/ms~40V/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	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/μs)					
<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					

## GENERAL SPECIFICATIONS

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#### Programming & Measurement Resolution

Voltage (Front Panel)	10mV / 100mV (Model 62000H-1000)
Current (Front Panel)	10 mA / 1mA (Model 62000H-1000)
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
RS-232	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 & I	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

#### Series & Parallel Operation

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	3Ø 200~220Vac ± 10% V <sub>LL</sub> *1 ; 3Ø 380~400Vac ± 10% V <sub>LL</sub>			
AC frequency range	47-63 Hz			
Max Current (each phase)	200/220 Vac	5KW Model : 39A	10KW Model : 69A	15KW Model : 93A
	380/400 Vac	5KW Model : 22A	10KW Model : 37A	15KW Model : 50A

#### 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 Range	0°C ~ 50°C *2
Storage Temperature Range	-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 *3 15KW Model : Approx. 35 kg / 77.09 lbs

**Note\*1** : Call for availability

**Note\*2** : The operating temperature range is 0°C ~ 40°C for Model 62100H-1000/62150H-1000

**Note\*3** : The weight is approx. 35kg/77.09 lbs for Model 62100H-1000

## ELECTRICAL SPECIFICATIONS WITH SOLAR ARRAY SIMULATION

MODEL	62020H-150S *1	62050H-600S	62100H-600S	62150H-600S	62150H-1000S
<b>Output Ratings</b>					
Output Voltage	0-150V	0-600V	0-600V	0-600V	0-1000V
Output Current	0-40A	0-8.5A	0-17A	0-25A	0-15A
Output Power	2000W	5000W	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	60V / 150V	120V / 600V	120V / 600V	120V / 600V	200V / 1000V
Accuracy	0.05% + 0.05%F.S.				
<b>Current Measurement</b>					
Range	16A / 40A	3.4A / 8.5A	6.8A / 17A	10A / 25A	6A / 15A
Accuracy	0.1% + 0.1%F.S.				
<b>Output Noise&amp;Ripple</b>					
Voltage Noise(P-P)	150 mV	1500 mV	1500 mV	1500 mV	2550 mV
Voltage Ripple(rms)	15 mV	650 mV	650 mV	650 mV	1950 mV
Current Ripple(rms)	30 mA	150 mA	300 mA	450 mA	270mA
<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	10ms	30ms	30ms	30ms	25ms
Rise Time: No Load	10ms	30ms	30ms	30ms	25ms
Fall Time: 50%F.S. CC Load	10ms	30ms	30ms	30ms	25ms
Fall Time: 10%F.S. CC Load	83ms	100ms	100ms	100ms	80ms
Fall Time: No Load	300ms	1.2s	1.2s	1.2s	3s
<b>Slew Rate Control</b>					
Voltage Slew Rate Range	0.001V/ms - 15V/ms	0.001V/ms - 20V/ms	0.001V/ms - 20V/ms	0.001V/ms - 20V/ms	0.001V/ms - 40V/ms
Current Slew Rate Range	0.001A/ms - 1A/ms, or INF	0.001A/ms - 0.1A/ms, or INF	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				
Transient response time	200us	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>Programming &amp; Measurement Resolution</b>					
Voltage (Front Panel)	10 mV	10 mV	10 mV	10 mV	100mV
Current (Front Panel)	1mA	1mA	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>Parallel Operation*2</b>					
Master / Slave control via CAN for 10 units up to 150KW. (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				

**Note\*1** : Preliminary specification for 62020H-150S

**Note\*2** : There is parallel mode for DC power supply when the I-V curve function is enabled.

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

Developed and Manufactured by :

### CHROMA ATE INC.

致茂電子股份有限公司

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