



HIGH SPEED REGENERATIVE DC LOAD SYSTEM MODEL 63700H SERIES

The 63700H High Speed Regenerative DC Load System is specifically designed for testing AI server power supply equipment such as power racks and rack-mounted power systems. Available in two voltage versions, the 63700H Series supports both HVDC and DC-to-DC power system applications.

The 63700H Series delivers excellent dynamic current response to meet the demands of Peak Power and EDPP (Electrical Design Peak Power) testing, while also delivering up to 80% energy recovery efficiency in steady-state mode feeding power back to the grid. This significantly reduces heat generation in the test environment, lowers air-conditioning power consumption, cuts electricity costs associated with power conversion, and supports energy conservation and sustainability goals.

The 63700H Series has a rack-based architecture and is available in 80V and 1,000V models. The high-voltage 1,000V model further provides two voltage ranges suitable for 400V and 800V sidecar testing. The

system delivers up to 120kW in steady state, with maximum current up to 2,650A per rack. Through synchronous dynamic master/slave control, configurations of up to ten 80V racks* or ten 1,000V racks* can be achieved with total maximum power up to 1,200kW.

The 63700H provides users with 256 programmable load sequences, supporting EDPP testing with multiple peak power profiles and including precise voltage and current measurement. The dedicated SoftPanel software provides an intuitive graphical interface for straightforward operation and setup.

The 63700H incorporates multiple safety mechanisms for AI server power testing, including over-current, over-power, and over-temperature protections as well as an over-voltage alarm. These safeguards enhance overall system reliability, making the 63700H a trusted solution for engineering validation and automated test system integration.



MODEL 63700H SERIES

KEY FEATURES

- Rated power: 80kW & 120kW
- Voltage range: 80V & 1,000V
- Current range: up to 2,650A
- Constant Current operating mode
- Synchronous dynamic master/slave control, up to 10 racks*
- Peak power capability:
160% of rated power (CCD) sustained for 1 ms; 140% for 50 ms; 120% for 30 sec.
- Current slew rate: up to 40 A/μs
- Energy recovery efficiency up to 80% (steady state)
- Dual voltage ranges on 1,000V models for 400V and 800V sidecar testing
- Programmable mode suitable for EDPP testing
- Smart fan control
- Protection functions: over-current, over-temperature, over-power protection, over-voltage alarm
- Standard LAN interface
- Applications: AI server Power Shelf, Power Rack, and BBU Shelf testing

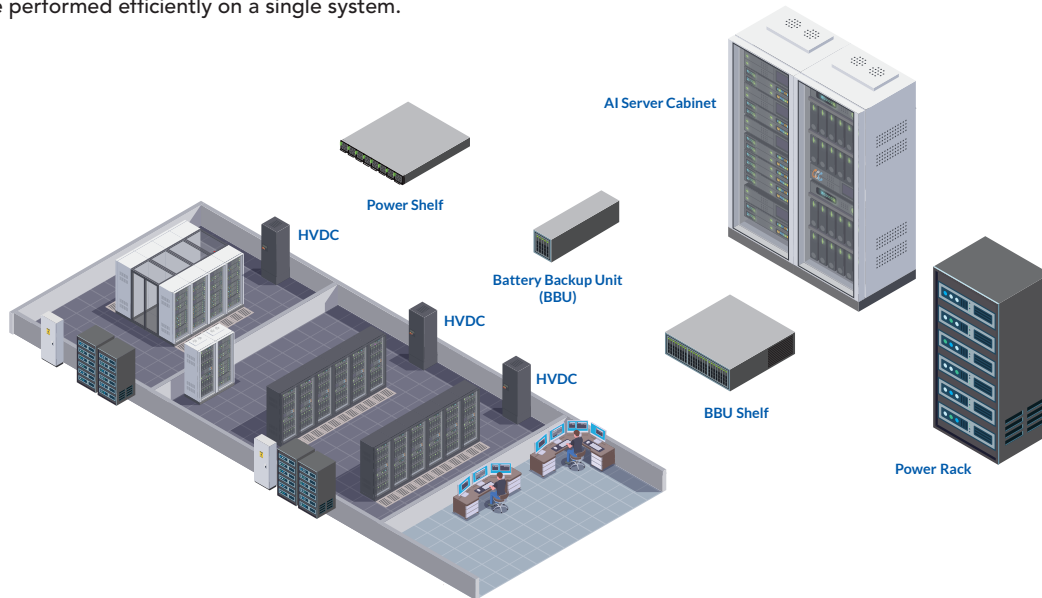
* For details, please contact your local Chroma office.



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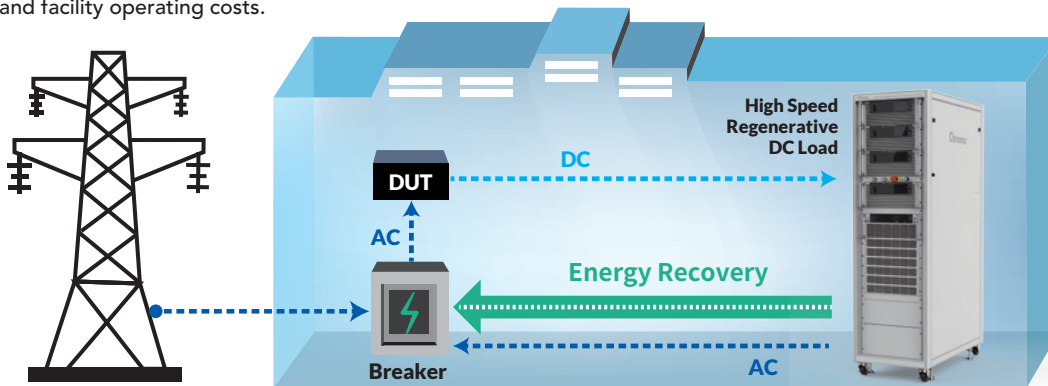
APPLICATIONS

The 63700H Series is specifically designed for testing AI server power equipment such as Power Shelf, Power Rack, and BBU Shelf systems, where transient response testing is a basic requirement. In the past, such testing typically relied on traditional linear loads, which dissipate absorbed power directly as heat and therefore place strict demands on installation space and temperature control. By combining high-speed dynamic response with energy regeneration capability, the 63700H enables both dynamic performance testing and long-duration reliability testing to be performed efficiently on a single system.



ENERGY RECOVERY

The 63700H converts the absorbed DC load current and feeds it back to the facility grid as alternating current, with steady-state efficiency greater than 80%. The recovered energy can be reused by other equipment within the facility, reducing overall energy consumption and carbon emissions. This also effectively reduces heat generation from the electronic load, which in turn lowers air conditioning power consumption and facility operating costs.



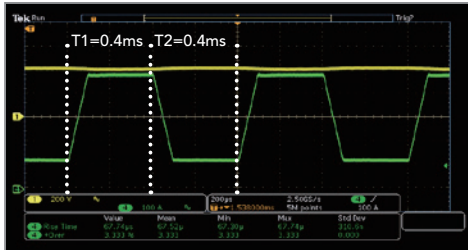
SYNCHRONOUS DYNAMIC MASTER/SLAVE CONTROL

To keep pace with the rapid evolution of AI power systems, both power supplies and BBUs continue to scale upward in capacity. Power Shelves now exceed 100kW, and Power Racks can reach MW levels. To address these demands, the 63700H is built into a 41U system rack and features synchronous dynamic master/slave control. Multiple racks of the same model can be configured to operate as a single load. Users simply set test conditions via SoftPanel or command control, and the programmed load profile is automatically distributed to each rack for streamlined operation.

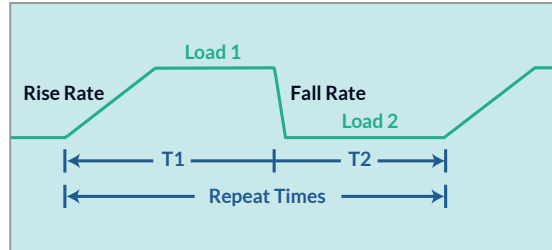


DYNAMIC LOAD MODE

Transient response testing is a fundamental requirement for power supply validation. Sudden load changes can cause output voltage overshoot or undershoot, leading to abnormal downstream system behavior or even component damage. To address this, the 63700H provides a programmable dynamic current load (CCD) mode with a current slew rate of up to 40 A/ μ s and a minimum current rise response time of 25 μ s. Programmable parameters include high/low current levels, T1/T2 timing, rise/fall slew rates, and run count. Repetition over a defined interval can also be set from 1 to 65,535 cycles. In addition, the 63700H 80V rack supports 160% @ 1ms, reaching 128kW, while the 1,000V rack supports 160% @ 1ms, reaching up to 192kW, making it ideal for simulating the instantaneous load capability of power supplies.



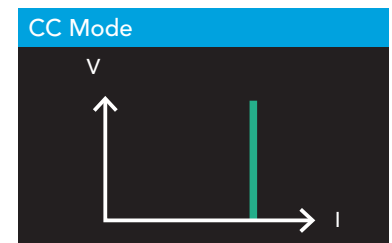
Test Parameters: 400V, 480A-120A, SR=4A/ μ s



Programmable Parameters

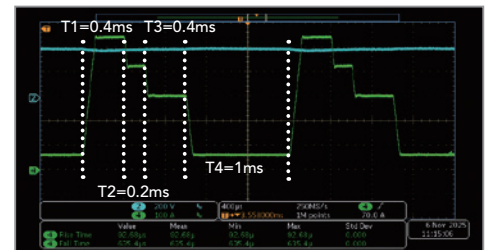
CONSTANT CURRENT LOAD MODE

The 63700H provides a Constant Current mode to satisfy basic test requirements. CC mode is commonly used for testing power supplies and DC-DC converters. By simulating real load conditions, it verifies whether the device under test can maintain stable output voltage under different load conditions, making it well suited for long-duration steady-state testing.



PROGRAMMABLE LOAD SEQUENCE FUNCTION

The 63700H series comes with 256 built-in programmable load sequences. With parameters such as program number, repetition count, dwell time, and current settings, users can simulate a wide range of dynamic load current profiles, including multi-level dynamic current simulation with two or more current levels. This also supports Electrical Design Peak Power (EDPP) testing derived from GPU-level demands scaling to AI server workloads, including repetitive multi-step dynamic profiles (shown on the right) and one-shot load simulation.



Test Parameters: 400V, 540A-420A-300A-60A, SR=4A/ μ s

SOFTPANEL GRAPHICAL CONTROL SOFTWARE

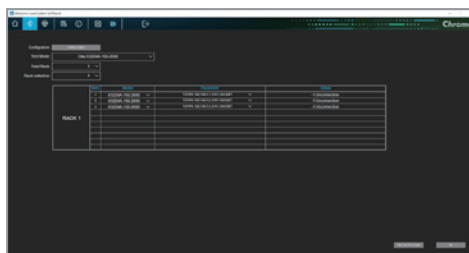
The 63700H is equipped with a LAN interface for remote control. Users can operate the system through SoftPanel, Chroma's dedicated control software which is easy to learn and use. Remote control is also supported via DLL (Dynamic Link Library; supports CANoe, Python, C#, and other environments), allowing users to develop their own control programs and choose the operating method that best fits their workflow.



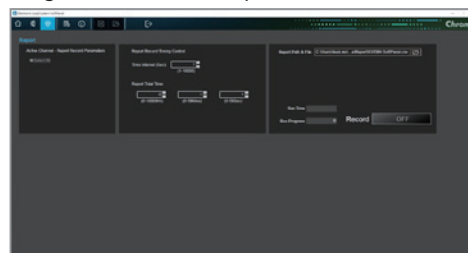
Constant Current Mode



Programmable Load Sequence



System Setup



Report Output Parameter Settings

SPECIFICATIONS-1 (80V/1,000V Models)

Models ^{*1 *10}	63700H High Speed Regenerative DC Load System (80kW / 80V / 2,650A)	63700H High Speed Regenerative DC Load System (120kW / 1,000V / 710A & 235A)
Voltage ^{*2}	10 to 80V	65 to 650V / 150 to 1,000V
Current	2,650A	710A / 235A
Power	80kW	120kW
160% Peak Power for 1ms	Yes (128kW)	Yes (192kW)
140% Peak Power for 50ms	Yes (114kW)	Yes (168kW)
120% OCP/OPP test for 30s	Yes (96kW)	Yes (144kW)
Min. Operating Voltage ^{*3}	10V @ 2,650A	65V @ 710A / 150V @ 235A
Static Mode		
Constant Current Mode		
Range	0 to 2,650A	0 to 710A / 0 to 235A
Resolution	40mA	10mA
Accuracy	0.08% + 0.08%F.S.	0.1% + 0.1%F.S.
Temperature Coefficient	100ppm/°C	100ppm/°C
Dynamic Mode		
Min. Operating Voltage	40V ^{*4}	100V / 200V ^{*5}
Current ^{*6}	0 to 2,700A	0 to 720A / 0 to 240A
T1 & T2	20μs to 99.999ms / 100ms to 99,999ms	20μs to 99.999ms / 100ms to 99,999ms
Resolution	1μs / 1ms	1μs / 1ms
Accuracy	1μs+100ppm	1μs+100ppm
Slew Rate	40mA/μs to 40A/μs	2mA/μs to 16A/μs / 2mA/μs to 8A/μs
Resolution	40mA/ms	10mA/ms
Accuracy	5% ± 10μs	5% ± 10μs
Min. Rise Time	25μs (Typical) ^{*4 *7}	25μs (Typical) ^{*5 *8}
Program Mode		
Operation Mode	CC	CC
Sequence No.	256 / Program	256 / Program
Dwell / SEQ	0.1ms to 30s (Resolution: 0.1ms)	0.1ms to 30s (Resolution: 0.1ms)
Measurement		
Voltage Read Back		
Range	0 to 80V	0 to 650V / 0 to 1,000V
Resolution	2mV	20mV
Accuracy	0.05% + 0.08%F.S.	0.02% + 0.06%F.S.
Current Read Back		
Range	0 to 2,700A	0 to 720A
Resolution	40mA	10mA
Accuracy	0.075% + 0.075%F.S.	0.05% + 0.08%F.S.
Power Read Back		
Range	80kW	120kW
Resolution	100mW	100mW
Accuracy ^{*9}	0.25% + 0.25%F.S.	0.5% + 0.5%F.S.
Protection		
DC Side		
Over Current	Yes	Yes
Over Power	Yes	Yes
Over Temperature	Yes	Yes
Over Voltage Alarm	Yes	Yes
Reverse Alarm	Yes	Yes
AC Side		
Voltage Range Error	Out of the voltage range	Out of the voltage range
Frequency Range Error	Out of the 47Hz to 63Hz range	Out of the 47Hz to 63Hz range
Open Phase	When one of the three phases is missing	When one of the three phases is missing

SPECIFICATIONS-2 (80V/1,000V Models)

Models ^{*1 *10}	63700H Speed Regenerative DC Load System (80kW/80V/2,650A)	63700H Speed Regenerative DC Load System (120kW/1,000V/710A & 235A)
Interface		
LAN (LXI)	Standard	Standard
Input Specification		
Line Voltage (AC input voltage 3phase, 3wire + ground)	3 Φ 380Vac $\pm$ 10% w/o neutral	3 Φ 380Vac $\pm$ 10% w/o neutral
AC Frequency	47 to 63 Hz	47 to 63 Hz
Power Factor ^{*11}	PF>0.95 @ 380Vac	PF>0.99 @ 380Vac
AC Regen. Power	70kW	110kW
AC Regen. Current	110A/phase	170A/phase
General		
Voltage Noise (P-P) ^{*12}	50mV	850mV / 2,000mV
Voltage Noise (RMS) ^{*12}	10mV	200mV / 350mV
Current Noise (RMS)	450mA	135mA / 75mA
Short Function	N/A	N/A
Von control (Load On Standby)	N/A	N/A
Sync. Capability ^{*13}	Max. 10 units	Max. 10 units
Power Regen. Efficiency ^{*11}	>80% (Static state @ 50V)	>80% (Static state @ 400V & 800V)
Input Cap.	32 μ F+0.1ohm	26.4 μ F+0.1ohm
Dimensions (HxWxD)	1,940 x 600 x 1,100 mm / 76.38 x 23.62 x 43.31 inch	1,940 x 600 x 1,100 mm / 76.38 x 23.62 x 43.31 inch
Weight	647kg / 1,426lbs	615kg / 1,356lbs
Operating Temperature	0 to 40°C ^{*14}	0 to 40°C
Storage Temperature	-25 to +70°C	-25 to +70°C
Max. Air Flow	2,010 CFM	2,300 CFM

* All specifications are subject to change without notice.

Note *1: All specifications are guaranteed at ambient operating temperature of 25 $\pm$ 5°C.

Note *2: Operating above 1.05 times the rated voltage will cause permanent damage to the equipment.

Note *3: Minimum operating voltage under steady-state current.

Note *4: Minimum operating voltage under dynamic current. Inductance between DUT and load must be less than 50nH.

Please refer to the manual for detailed instructions.

Note *5: Minimum operating voltage under dynamic current. Inductance between DUT and load must be less than 150nH.

Please refer to the manual for detailed instructions.

Note *6: Maximum dynamic current is 2,700A (80V), 720A (1,000V), and 240A (1,000V); duration must not exceed 1ms.

Note *7: Minimum load current must be greater than 6% F.S.

Note *8: Minimum load current in Low range must be greater than 6% F.S.; minimum load current in High range must be greater than 15% F.S.

Note *9: Power F.S. is defined as voltage range F.S. multiplied by current range F.S.; i.e., Power F.S. = Vrange F.S. $\times$ Irange F.S.

Note *10: In CV sink mode, discharge time to 0V is approximately 800ms when DUT protection is triggered.

Note *11: Tested at full power.

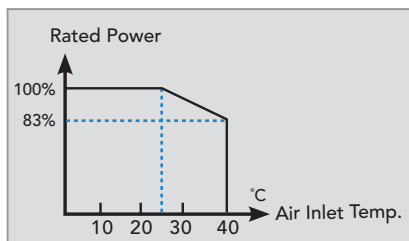
Note *12: Peak-to-peak noise is measured from 20Hz to 20MHz; RMS noise is measured from 20Hz to 300kHz.

(Measurements taken at 80V load terminals using 1 μ F and 330 μ F capacitor fixtures, and at 1,000V load terminals using 44nF and 104.7 μ F capacitor fixtures.)

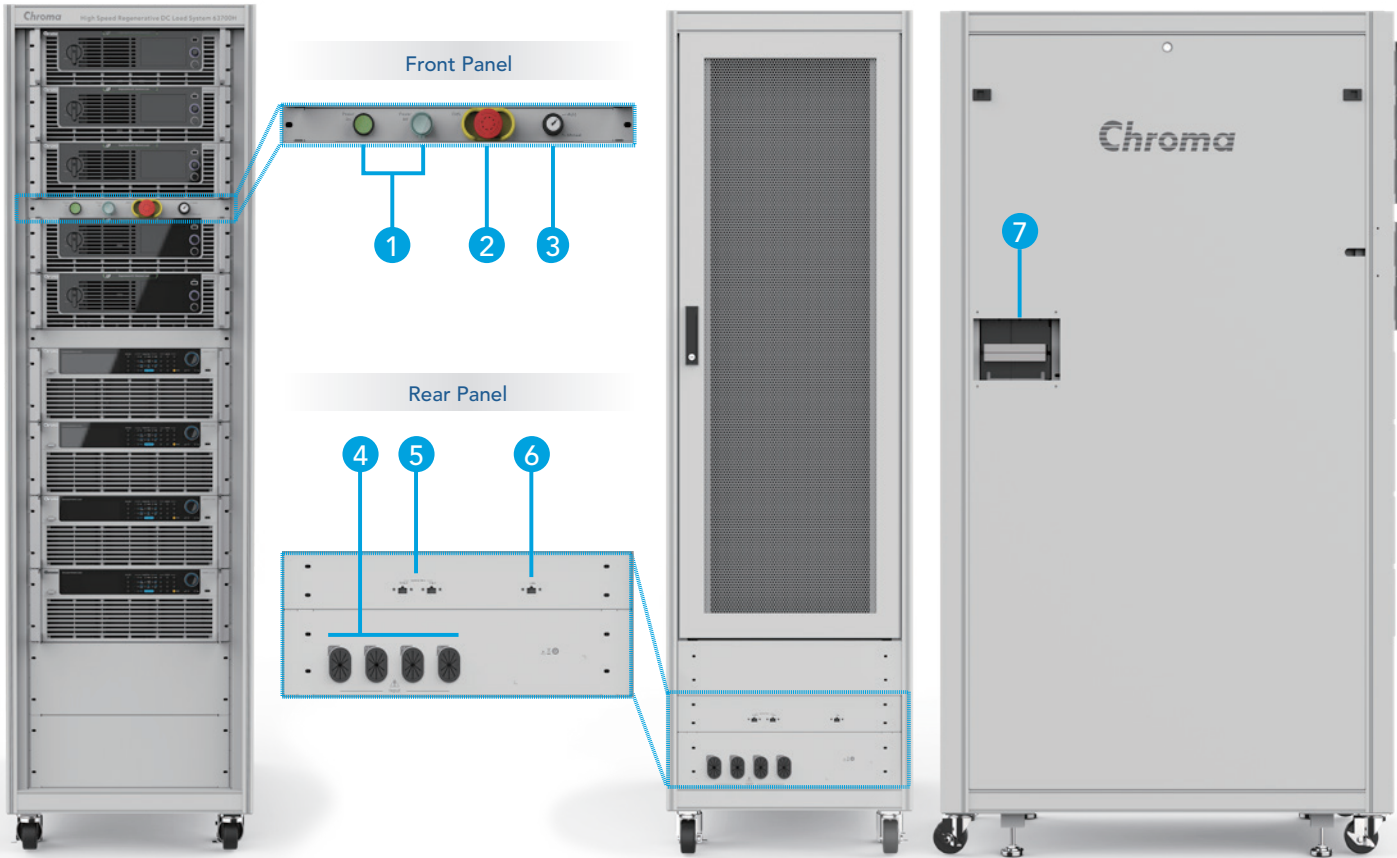
Note *13: Refer to Chapter 3, Rack Parameter Settings, in the User's Manual.

Note *14: The rated power specification for the 80V rack applies when the air inlet temperature is 25°C.

Power derating is shown in the figure below.



PANEL DESCRIPTION



1. Power Switch

Press once to turn on/off entire rack
2. Emergency Stop Button
3. Door interlock

In Auto mode, opening the rear panel door will trigger a trip;
In Manual, power continues operating when rear panel door is open
4. AC Input
5. System Bus for master/slave control
6. LAN Interface
7. Positive and Negative Load Terminals

ORDERING INFORMATION

63700H High Speed Regenerative DC Load System			
Model	Voltage	Current	Power
63700H-80	80V	2,650A	80kW *
63700H-1000	1,000V	710A / 235A	120kW

* Note: For systems with 3 or more racks, please contact your local Chroma office.
* Note: For Power Shelf test busbar fixture requirements, please contact your local Chroma office.

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