

Preliminary



REGENERATIVE BATTERY PACK TEST SYSTEM MODEL 17020

Chroma 17020 System is a high precision integrated solution specifically designed for secondary battery module and pack tests. Accurate source and measurement ensure the test quality that is suitable for performing exact, reliable testing crucial for battery module / pack incoming or outgoing inspection as well as capacity, performance, production and qualification testing.

Chroma 17020 System architecture offers regenerative discharge energy design to recycle the electric energy sourced by the battery module / pack to channels in the system performing a charging function or back to the utility mains in the most energy efficient manner. This feature saves electricity, reduces the facilities thermal foot print and provides a green solution by reducing the environmental impact on our planet.

Chroma 17020 System, equipped with multiple independent channels, to support dedicated charge / discharge tests on multiple battery modules / packs each with discrete test characteristics. Channels may be easily paralleled to support higher current requirements. This feature provides the ultimate flexibility between high channel count and high current testing.

Advanced driving hardware can create seamless transitions between a maximum charge to maximum discharge (or maximum discharge to maximum charge) with a rapid 10mS conversion. This feature allows for charge/discharge modes simulating real world scenarios.

Chroma 17020 System has flexible programming functions and may be operated with Chroma's powerful "Battery Pro" Software. Battery Pro utilizes the system to create cycling tests from basic charge or discharge to complex drive cycle testing for each channel or channel groups. Thermal chamber control can be integrated into a profile and triggered by time or test results yielding a dynamic profile. Battery Pro's features allow quick and intuitive test development eliminating the need of tedious scripting or programming by a software engineer.

Multiple safety features are standard including Battery Polarity Check, Over Voltage Protection, Over Current Protection check and Over Temperature Protection to ensure protected charge / discharge testing. In the unlikely event of power or computer communication loss, data is securely stored in system non-volatile memory protecting against potential data loss and allowing for continuous flow after restart.

Regenerative Battery Pack Test System

Model 17020

Features:

- Regenerative Battery Energy Discharge
 - Energy saving
 - Environment protection
 - Low heat output
- Charge / discharge mode
 - Constant Current
 - Constant Voltage
 - Constant Power
- Channels paralleled for higher Currents
- Thermal Chamber Control
- Battery module / pack surface temperature monitoring
- Data recovery protection (after power failure)
- Total harmonic distortion: less than 5% of rated power

Model 69206-60-8

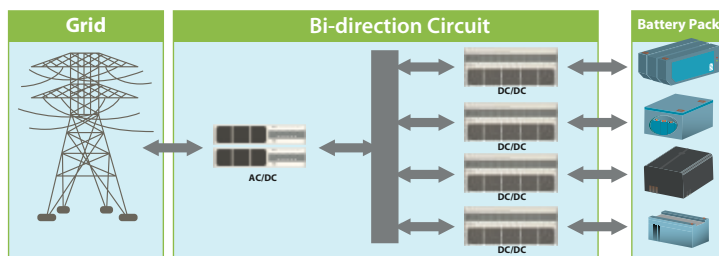
- Voltage range: 10V~60V
- Current range: 0~12A (parallel)
- High Precision Control:
 - Current: 0.1% setting.+0.05% F.S.
 - Voltage: 0.1% setting.+0.05% F.S.
 - Power: 0.2% setting.+0.1% F.S.
- High Precision Measurement:
 - Current: 0.05% rdg.+0.05% rng.
 - Voltage: 0.02% rdg.+0.02% F.S.
 - Power: 0.08% rdg.+0.08% F.S.
- <10ms charge/discharge switching time
- Slew rate 2.4A / pre ms



Chroma

MODEL 17020 REGENERATIVE BATTERY MODULE / PACK TEST SYSTEM

- During battery discharge, energy is recycled back to the grid providing a return efficiency of up to 85% transfer efficiency at full load condition.
- Greater recycling efficiency is achieved when battery discharge is transferred to adjacent channels operating in charge mode.
- The Regenerative Energy design reduces the thermal print
- Cost saving by reducing air-conditioning load and the waste of power exhausted through power electronics as heat during discharge mode.
- Channels may be operated discretely for high channel count or paralleled for high current yielding the utmost flexibility.
- Provide multiple applications from design, development, factory production and laboratory verification.



APPLICATION AREAS & INDUSTRIES

- Power battery pack learning test
- Life cycle test
- Battery pack endurance test
- Battery pack capacity test
- Battery pack reliability test
- EV battery module
- Electric scooter/bike
- Electric gardening tools
- Energy storage battery
- Power tools

SYSTEM ARCHITECTURE

Chroma 17020 Regenerative Module / Battery Pack Test System uses bi-directional AC-DC converter and bi-directional DC tester with battery charge/discharge controller is composed of the three standalone units featured below:



Model 69200-1
Charge/Discharge Controller

- Simple charge or discharge setting
- 60 channels with independent control
- Up to 10ms data to be retrieved from a single channel
- Save up to 30 min. data when PC is down
- Remote access via Ethernet interface and control



Model A691101
DC/AC Bi-direction Converter

- Convert battery energy to AC source
- Discharge energy conversion rate up to 95%
- Total Harmonic Distortion less than 5% of rated power
- Power factor higher than 0.9 of rated power



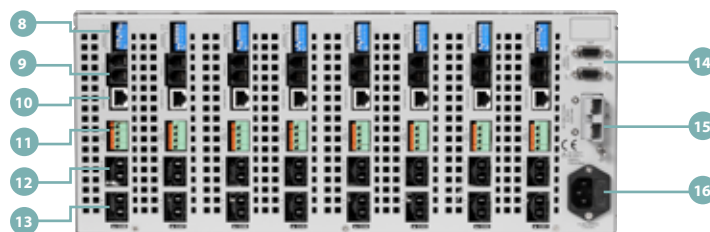
Model 69206-60-8
Regenerative Charge/Discharge Tester

- 8 channels @ 12A / 600W or in parallel up to 96A / 4800W
- Support 10V to 60V charge/discharge range
- Charge/Discharge Mode: CC / CV / CP
- Supply dynamic current waveforms
- Less than 10ms for charge/discharge current switch
- 4 sets of measurement per channel to measure battery surface temperature

MODEL 69206-60-8 REGENERATIVE CHARGE/DISCHARGE TESTER



-
- 1. Channel No
 - 2. Charge Status Indicator
 - 3. Discharge Status Indicator
 - 4. UUT Connection Indicator
 - 5. Parallel Indicator
 - 6. Failure Indicator



- 7. Power Switch
- 8. Channel DIP Switch
- 9. Parallel Connector
- 10. Temperature Meas. Terminal
- 11. Voltage Meas. Terminal
- 12. Charge/Discharge Output/ Input Connector
- 13. Charge Output Connector
- 14. Controller Connector
- 15. DC BUS Terminal
- 16. AC Input

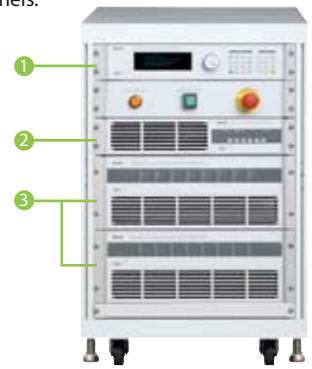
FLEXIBLE SYSTEM CONFIGURATION

17020 Regenerative Battery Pack Test System can be configured to specified requirements and expandable to 60 channels.



8 channels

- 1. Model 69200-1 : Charge/Discharge Controller
- 2. Model A691101 : DC/AC Bi-direction Converter
- 3. Model 69206-60-8 : Regenerative Charge/Discharge Tester



16 channels

REGENERATIVE BATTERY PACK TEST SYSTEM SOFTWARE

17020 Test system is specifically designed to meet the various requirements for testing secondary battery packs with high safety and stability. Charge and discharge protection aborts tests when abnormal conditions are detected. Data loss, storage and recovery are protected against power failure.

Independent Channel Control :

- 60 channels with independent control
- Real-time multi channel battery pack status browse
- Full Environmental Chamber Control
- Trigger charge/discharge condition when environment is at the defined test condition
- Supports 8 thermal monitors in parallel mode

Test Sequence Programming :

- Edit various charge/ discharge conditions (CV/CC/CP)
- 256 charge/discharge conditions
- Loop function to 9999 loops
- Able to edit dynamic charge/ discharge waveform with 10ms current switching speed
- Multiple cut-off conditions (time, current, capacity, cut-off voltage, cut-off current, etc.)

Report & Curve :

- Real-time browsing test report of each channel
- Diversified reports & charts: Real-time report, Cut-off report, X-Y scatter chart report

Safety Protection :

- Channel monitoring icon: empty, contact checking, contact check failed, reverse polarity, standby, running, pause, finish, communication error, etc
- Save 30 min. data when PC is down or disconnected
- Save the test settings to resume after the power failure is recovered



17020 Main Menu



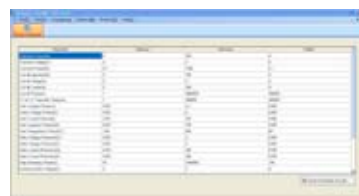
Diversified Reports



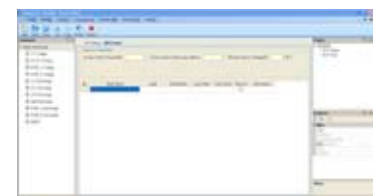
Complete Data



Real-time Multi Channel Monitor



UUT Parameters Setting Screen

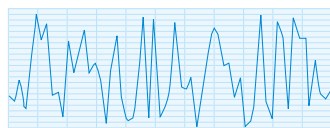


Program Editing Screen

SYSTEM FEATURES

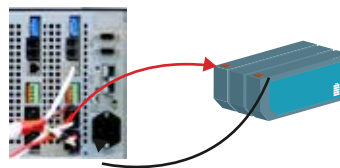


Parallel channel, with a communications jumper cable.



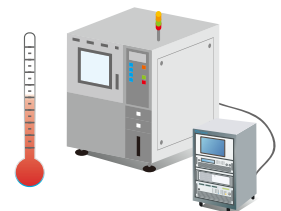
Import dynamic charge/discharge waveforms to simulate DRIVE CYCLE or the actual application.

A brief 10ms is required for converting the maximum charge/discharge current.



For battery pack design, if the charge and discharge connectors are separate.

The 17020 is one channel with separate charge/discharge connector that facilitates this kind of application.



Integrates to Thermal Chambers.

Full environment control per charge/discharge profile or results.

Charge/Discharge profile triggered once set environment is reached.

SPECIFICATION

Regenerative Charge/Discharge Tester		69206-60-8
Channel		8
Charge / Discharge Mode	Voltage Range	10-60Vdc
	Maximum Current	12A
	Max Power	600W
	CC Mode Accuracy	0.1% setting.+0.05% F.S.
	Current Resolution	1mA
	CV Mode Accuracy	0.1% setting.+0.05% F.S.
	Voltage Resolution	1mV
	CP Mode Accuracy	0.2% setting.+0.1% F.S.
	Power Resolution	0.1W
Measurement	Voltage Range	60V
	Voltage Accuracy	0.02% rdg.+0.02% F.S.
	Voltage Resolution	1mV
	Current Range	4.8A / 12A
	Current Accuracy	0.05% rdg.+0.05% rmg.
	Current Resolution	1mA
	Power Range	288W/600W
	Power Accuracy	0.08% rdg.+0.08% F.S.
	Power Resolution	0.1W
Others	Temperature Range	0-90°C
	Temperature Accuracy	± 2°C
	Temperature Resolution	0.1°C
	Protection	OVP, UVP, OTP, OCP, OTP, Reverse
Temperature Coefficient	Voltage / Current	90%
Input AC Power	Voltage Range	50ppm / °C
Dimension (H x W x D)		90V – 250V, <120VA
Weight		177 x 428 x 600.7mm / 6.9 x 16.9 x 23.6inch
		38.6kg / 85lbs
DC/AC Bi-Direction Converter		A691101
Phase		Single Phase
Regenerative Bi-Direction Power	In/Out Voltage Range	190-250Vac
	In/Out Current Range	45A
	In/Out Power Range	10KVA
	In/Out Power Factor	> 0.9 at Related Power
	In/Out Current THD	< 5% at Related Power
Input AC Power	Voltage range	90V – 250V, <120VA
Others	Protection	UVP, OCP, OPP, OTP, FAN, Short
	Efficiency (Typical)	90%
Dimension (H x W x D)		83.94 x 425.8 x 696 mm / 3.3 x 16.8 x 27.4 inch
Weight		25kg / 55.2lbs
Battery Charge/Discharge Controller		69200-1
Function	Data Storage time for Recovery	30min
	Data Acquisition Rate	10ms (1CH) : 600ms(60CH)
Input AC Power	Voltage Range	90V – 250V , <120VA
Others	Control Channel of 69200 Tester	Max 60ch
	Contact Interface with PC	Ethernet
Dimension (H x W x D)		88.1 x 428 x 420mm / 3.46 x 16.9 x 16.5inch
Weight		9.4kg / 21lbs
Common Spec		
Temperature	Operation	0°C ~ 40°C
	Storage	-40°C ~ 85°C
Safety & EMC		CE

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

ORDERING INFORMATION

17020: Regenerative Battery Pack Test System

69200-1: Charge/Discharge Controller

69206-60-8: Regenerative Charge/Discharge Tester

A691101: DC/AC Bi-direction Converter

A692003: Thermal Sensor (0-90°C)+ Thermal Sensor Cable (30cm)

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