

Programmable Charge/ Discharge Tester

MODEL 17200

Feature:

- High-accuracy current output & measurement up to 0.02%
- Linear circuit design, low ripple current
- Long term stability suitable for life cycle testing
- Independent channels
- Parallel channels for higher current applications
- CC/CV/CP charge, discharge models
- High sampling rate
 - Battery mode - 100ms
 - EDLC mode - 10ms
- Discharge down to 0V
- Real time data acquisition and log (Q, Vt, It, time) and steptermination status (Q, V_end, I_end, time)
- Real-time outer loop resistance monitoring
- Compatible with reliable, redundant, hot swappable DC Source assuring continuous operation during life cycle tests.
- Modular design for easy installation and maintenance
- Build-in two DCIR test functions make DCIR test easier ($DCIR=R_o+R_e$, $ACIR\approx R_o$)

Function:

- Battery cell capacity test
- DC internal resistance (DCIR) test

Application:

- Charge / Discharge life cycle test
- IQC (Incoming Quality Control)
- OQC (Outgoing Quality Control)
- Battery characteristic analysis
- Material performance evaluation
- Production test
- Battery cell voltage level processing



Programmable Charge/Discharge Tester Model 17200 Series

Chroma 17200 series is a precision charge/discharge test instrument specifically designed for Lithium-ion secondary battery. High accuracy output and measurement channels ensure long term repetitive test results. It is capable of supporting various charge/discharge test modes such as CV (Constant Voltage), CC (Constant Current) and CP (Constant Power). These optimized features are typically required to perform cell reliability verification (such as battery cycle life test), the study of material properties, product research and development, production incoming / outgoing inspection or balancing, quality control, and safety evaluation.

The modularized multi-channels architecture offers both flexibility and expandability, catering to cycle test requirements. The Chroma 17200 series is composed of a mainframe with 5 two-channel plug-in modules that may operate independently or paralleled offering the most flexibility between high current and high channel count testing making it a versatile solution for laboratory testing. This modularity yields several advantages including a small footprint, improved and incremental power densities, and ease of hardware maintenance or expansion.

Each module has an embedded CPU that allows isolated instruction execution per channel. Once a test profile is created and transferred from the programming console, each channel can discretely operate and back up the test results locally or uploaded via Ethernet to an external computer. Therefore, an overloaded network or a power outage will not compromise data transfer. When used with the Chroma BatteryPro software, flexible functions and programming allows the rapid creation of test recipes for individual or a

group of channels and as a single independent channel or as a high current paralleled channel set. The application field covers varied Lithium-ion battery or battery module characteristic tests which were formulated to meet the versatile test requirements for laboratory and manufacturing environments.

The internal resistance of a battery while sinking current is measured by the DC Internal resistance Method (DCIR). DCIR is the result of the physical conduction resistance and the chemical resistance characteristic. The Chroma 17200 features two DCIR test functions which can be configured to fit a cell's characteristics. On $R = \Delta V / \Delta I$ methods, the system automatically performs high precision DCIR calculations to maximize the test accuracy and avoid manual calculation errors.

For safety, several protection features such as, cell polarity check, over voltage, over current, over capacity and loop (contacts and current path) resistance monitoring are provided to safeguard each cell and its surroundings.

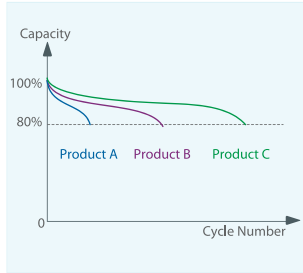
To ensure the continuity of extended duration analysis such as life cycle testing, the 17200 can be paired with redundant DC Power Supplies -Chroma 62000B-. This innovative design assures the stability and continuity of each test. The 62000B was crafted for work stations that are sensitive to power failures, such as system servers, burn-in, life-test or longevity testing that cannot be interrupted. In the unlikely event of a power supply failure, the parallel N+1 redundancy architecture assures continuous operation. A power module is easily hot-swappable eliminating down time.



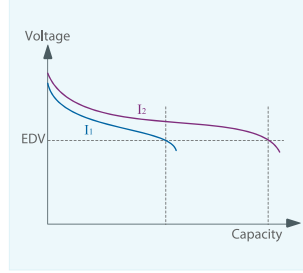
Chroma

BATTERY RELIABILITY TEST APPLICATIONS

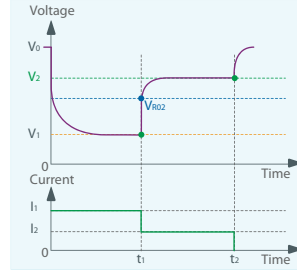
Cycle Life Testing



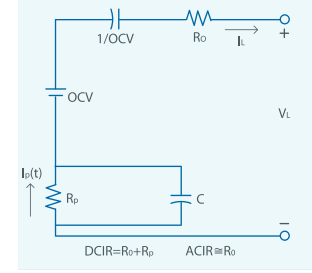
Capacity Measurement



DCIR Testing



Lumped Parameter Model Circuit Diagram



CHARGE/DISCHARGE MODULE SPECIFICATIONS

Item	Specifications	
Frame	17200-5-10	
Module	17202-5-20	
Maximum Voltage / Current	5V/20A	
Maximum Channel	2 ch / module, 10 ch / frame	
Control Method	CC/CV/CP charge, discharge models	
Voltage		
Setting Range	0 mV ~ 5000 mV, resolution 1 mV	
Reading Range	0.0 mV ~ +5199.9 mV, resolution 0.1 mV	
Accuracy	± (0.02% of reading+0.02% of F.S.)	
Current		
Setting Range	3A	1mA ~ 3A , resolution 1mA
	20A	0.01A ~ 20A , resolution 0.01A
Reading Range	3A	0.0 mA ~ 3150.0 mA, resolution 0.1 mA
	20A	0.000A ~ 21.000 A, resolution 1 mA
Accuracy	3A	± (0.02% of reading +0.02% of F.S.)
	20A	± (0.03% of reading +0.03% of F.S.)
Power		
Setting Range	10 mW ~ 100 W, resolution 1 mW	
Reading Range	0.1 mW ~ 104 W, resolution 0.1 mW	
Accuracy	± (0.05% of reading+0.05% of F.S.)	
General Specifications		
Recipe Edit Capability	Max. step number in one recipe : 500 steps Max. cycle number : 999999 steps	
Data Storage	100ms~60min	
Dynamic Data Acquisition	Time, Voltage, Current	
Power Requirement	DC 23.8 ~ 24.5V, 2KW (Chroma 62000B)	
Frame Dimension (H x W x D)	222 mm x 428 mm x 643 mm	
Weight (Full module)	Approx. 63 Kg	



17011 Battery Charge & Discharge Test System



62000B Modular DC Power Supply *optional

ORDERING INFORMATION

Model 17200-5-10 : 17200 Mainframe for 5 Modules

Model 17202-5-20 : Programmable Charge/Discharge Tester Module 5V/20A 2 channels

DC Power Supply : Refer to Model 62015B-24-62, 24V/62.5A/1500W *optional

Developed and Manufactured by :

CHROMA ATE INC.
致茂電子股份有限公司
HEADQUARTERS
No. 66, Hwa-Ya 1st Rd.,
Hwa-Ya Technology Park,
Kuei-Shan Hsiang, 33383
Taoyuan County 33383
Taiwan
Tel: +886-3-327-9999
Fax: +886-3-327-8898
<http://www.chromaate.com>
E-mail: info@chromaate.com

CHINA
CHROMA ELECTRONICS
(SHENZHEN) CO., LTD.
8F, No.4, Nanyou Tian An
Industrial Estate, Shenzhen,
China PC: 518052
Tel: +86-755-2664-4598
Fax: +86-755-2641-9620

JAPAN
CHROMA JAPAN CORP.
472, Kohoku-ku Yokohama city
Ntupa 223-0057 Japan
Tel: +81-045-542-1118
Fax: +81-045-542-1080
<http://www.chroma.co.jp>
E-mail: info@chromaate.com

U.S.A.
CHROMA ATE INC. (U.S.A.)
7 Chrysler Irvine, CA 92618
Tel: +1-949-421-0355
Fax: +1-949-421-0353
Toll Free: +1-800-478-2026
<http://www.chromaus.com>
E-mail: info@chromaus.com

EUROPE
CHROMA ATE EUROPE B.V.
Morsestraat 32, 6716 AH Ede,
The Netherlands
Tel: +31-318-648282
Fax: +31-318-648288
<http://www.chromaeu.com>
E-mail: sales@chromaeu.com

Distributed by:

Worldwide Distribution and Service Network
17200-E-201208-1000