High Current Testing Solutions

A multiple independent channel test station fine-tuned for testing batteries, supercapacitors, and other energy storage devices. The 0 to 5V, High Current Series provides individual voltage clamp safety limits to help prevent damage to devices being tested. Includes a PC preloaded with our MITS Pro and Data Watcher software for writing test schedules, monitoring real-time data, and reviewing and plotting test results.

BT-5HC

High Current Series

Voltage Range of 0 to 5V

Current Ranges from 25A to 2,000A

Primary Applications:

- Lithium, Lead-acid, Nickel, & Alkaline Battery Testing
- Cylindrical and Prismatic Cells
- Small Battery Packs
- Primary and Secondary Battery Testing
- Supercapacitor Testing

Key Features

- Multiple channels, where each channel functions independently to run various experiments simultaneously
- Channels can be operated in parallel for increased current-handling capacity
- Each channel come with three current ranges with 16 bit resolution
- Advanced software package, MITS Pro (Multiple Integrated Testing System, professional version), provides flexible scheduling, user-friendly interface, distributed system control and data acquisition
- Software provides easy data analysis and plotting based in Data Watcher or Microsoft Excel
- On-the-fly test schedule modification allows changes to be made to a test while it is running, without the need to stop or pause the test

Individual Voltage Clamp

A hardware based voltage clamp is available for additional safety protection and to provide a smooth current to voltage mode transition. Each channel in the test station is controlled by its own voltage clamp value. This value is set by the user within the software and is then applied at the hardware level. The system provides options for setting low and high voltage clamp values. Once set, the system will not allow the voltage to go above or below the set clamp values on all channels to keep batteries within the safety settings.

BT-5HC

Hardware Specifications

MODEL NUMBER	5V—25A	5V—50A	5V—100A
Bipolar Linear Circuit Type	Provides zero switching time between charge and discharge circuit board:		
	2243-2		SCT200
Voltage Range (max/min)	0V to 5V		
Accuracy of Voltage Control & Reading	±5mV, 0.05% Full Scale Accuracy		
Current Ranges Provided 0.05% Full Scale Accuracy	High: 25A ± 25mA Medium: 5A ± 5mA Low: 100mA ± 100uA	High: 50A ± 50mA Medium: 5A ± 5mA Low: 100mA ± 100uA	High: 100A ± 100mA Medium: 10A ± 10mA Low: 1A ± 1mA
Minimum V at Maximum Current	0V @ 25A	0V @ 50A	0V @ 100A
Maximum Continuous Power Output/Channel	125 W	250 W	500 W
Voltage Measurements Input Impedance	~10GΩ		
Current Rise Time	100-150μS	100-150μS	100-250μS
	Time required for current output to get from 10%-90% of requested value		
Current and Voltage Resolution	16 bit		
Voltage Clamp	Individual / Channel Based Voltage Clamp		
Connection for Batteries	Standard 6 ft. cables with alligator clips. Arbin can also provide different battery holder options to allow easy engagement of the device to the test station.		
Connection to Computer	TCP/IP		
Ventilation Method	Air cooled, front-to-rear airflow		
Room Operating Temperature	10 to 35 degrees C		
Computer Specifications	PC with 22" flat-screen monitor is included, preloaded with our MITS Pro testing software		
CHASSIS SIZE OPTIONS	**Number of Channels—Available Options**		
11U: 15" X 30" X 25"	2	2	2
20.5U: 30" X 30" X 45"	8	8	4
30U: 30" X 30" X 65"	16	16	10
37UL: 40" X 40" X 77"	32	32	16
37UL: 40" X 40" X 77"	40	40	20

BT-5HC

Hardware Specifications

MODEL NUMBER	5V—200A	5V—300A	5V—500A
Bipolar Linear Circuit Type	Provides zero switching time between charge and discharge circuit board:		
	SCT200		
Voltage Range (max/min)	0V to 5V		
Accuracy of Voltage Control & Reading	±5mV, 0.05% Full Scale Accuracy		
Current Ranges Provided 0.05% Full Scale Accuracy	High: 200A ± 200mA Medium: 20A ± 20mA Low: 5A ± 5mA	High: 300A ± 300mA Medium: 30A ± 30mA Low: 5A ± 5mA	High: 500A ± 400mA Medium: 50A ± 40mA Low: 5A ± 5mA
Minimum V at Maximum Current	0V @ 200A	0V @ 300A	0V @ 500A
Maximum Continuous Power Output/Channel	1,000 W	1,500 W	2,000 W
Voltage Measurements Input Impedance	~10GΩ		
Current Rise Time	250-500µS	400-600µS	500-700µS
	Time required for current output to get from 10%-90% of requested value		
Current and Voltage Resolution	16 bit		
Voltage Clamp	Individual / Channel Based Voltage Clamp		
Connection for Batteries	Standard 6 ft. cables with alligator clips. Arbin can also provide different battery holder options to allow easy engagement of the device to the test station.		
Connection to Computer	TCP/IP		
Ventilation Method	Air cooled, front-to-rear airflow		
Room Operating Temperature	10 to 35 degrees C		
Computer Specifications	PC with 22" flat-screen monitor is included, preloaded with our MITS Pro testing software		
CHASSIS SIZE OPTIONS	**Number of Channels—Available Options**		
30U: 30" X 30" X 65"	5	2	N/A
37U: 30" X 40" X 77"	10	4	2
37UL: 40" X 40" X 77"	N/A	8	4

Arbin can provide input power options of 110V or 220V Single Phase, or 208V, 380V or 480V Three Phase System power input options are determined by customer site and system power required.

∗For additional auxiliary channels, must upgrade to next largest size chassis.

BT-5HC

Hardware Specifications

MODEL NUMBER	5V—600A	5V—1000A	5V—1500A
Bipolar Linear Circuit Type	Provides zero switching time between charge and discharge circuit board:		
	SCT200		
Voltage Range (max/min)	0V to 5V		
Accuracy of Voltage Control & Reading	±5mV, 0.05% Full Scale Accuracy		
Current Ranges Provided 0.05% Full Scale Accuracy	High: 600A ± 500mA Medium: 50A ± 50mA Low: 5A ± 5mA	High: 1000A ± 1A Medium: 100A ± 100mA Low: 10A ± 10mA	High: 1500A ± 1.5A Medium: 150A ± 150mA Low: 15A ± 15mA
Minimum V at Maximum Current	0V @ 600A	0V @ 1000A	0V @ 1500A
Maximum Continuous Power Output/Channel	2,500 W	5,000 W	7,500 W
Voltage Measurements Input Impedance	~10GΩ		
Current Rise Time	550-725μS	600-750μS	700-900μS
	Time required for current output to get from 10%-90% of requested value		
Current and Voltage Resolution	16 bit		
Voltage Clamp	Individual / Channel Based Voltage Clamp		
Connection for Batteries	Standard 6 ft. cables with alligator clips. Arbin can also provide different battery holder options to allow easy engagement of the device to the test station.		
Connection to Computer	TCP/IP		
Ventilation Method	Air cooled, front-to-rear airflow		
Room Operating Temperature	10 to 35 degrees C		
Computer Specifications	PC with 22" flat-screen monitor is included, preloaded with our MITS Pro testing software		
CHASSIS SIZE OPTIONS	**Number of Channels—Available Options**		
30U: 30" X 30" X 65"	1	N/A	N/A
37U: 30" X 40" X 77"	N/A	1	N/A
37UL: 40" X 40" X 77"	N/A	2	1

Arbin can provide input power options of 110V or 220V Single Phase, or 208V, 380V or 480V Three Phase System power input options are determined by customer site and system power required.

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Software Control Specifications

Current[†] (A)	Outputs constant current to the cell or battery at the value specified Positive current refers to charge and negative current refers to discharge
Voltage[†] (V)	Outputs constant voltage to the cell or battery at the value specified
C-Rate[†]	C-Rate is a method for indicating the discharge as well as the charge current of a battery. It can be expressed as I=M∗C where I=current A; C=battery capacity; M is the C-rate value.
Rest[†]	The battery is disconnected from the charge/discharge circuit but remains connected to the voltage measurement circuit to enable open-circuit voltage measurement
Power[†] (W)	Outputs constant power to the cell of battery at the value specified.
Load[†] (Ohm)	Applies a constant resistance load to the battery at the value specified. The load control type will always produce a negative current.
Set Variables[†]	Change test related variables including channel capacity, energy and all test counter variables.
Current Ramp[†] Voltage Ramp	Generates a current/voltage ramp with a positive scan rate for increasing current/voltage, and negative scan rate generates decreasing current/voltage ramp.
Current Staircase[†] Voltage Staircase	Generates a current/voltage staircase with increasing current/voltage, and negative decreasing current/voltage staircase with adjustable step amplitude.
Voltage Cycle V	This mode, commonly called Cyclic Voltammetry, permits the user to create linear sweeps in one step, eliminating the need to jump steps to reverse sweep directions
Current and Power Simulation[†]	Non-standard time-domain functions may be inputted from external sources such as ASCII data streams and used as control parameters for repetitive tests
DC Internal Resistance	This function applies a 10-pulse train with 1ms pulse width of the specified magnitude following a constant-current charge or discharge step
CCCV[†]	Allows users to implement a constant current-constant voltage charge regime in one step. Users specify the charge rate (CC) and the voltage limit (CV); with a specified current or time limit termination value.
Formula[†]	Equips the user to control and limit schedule steps according to dynamic mathematical equations in addition to constants or instantaneous channel data
End Conditions	Time, Voltage, Current, Capacity, Energy, ΔV, DV/dt, formula, meta-variables, and other combinations
Channel Paralleling	Channels may be operated in parallel for increased current-handling capabilities. NOTE: Control types marked with (†) are available in parallel mode.
Data Logging Rate	During a standard step: 40-150 data points per second, per PC
Network Capabilities	Provide TCP/IP access for networking
Data Result File	Imported into Microsoft Excel; Arbin's Excel Data Pro macro included for easy data manipulation
Data File Content	Channel data; test time, step time, voltage, current, capacity, energy, first/second derivative of I or V, auxiliary input data (optional). Statistical data: cycle #, cycle capacity/energy, max voltage, etc.

Control types marked with (†) are available in parallel mode

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Auxiliary Options & Accessories

Arbin Instruments provides a wide variety of auxiliary modules for expanding the capability of the main I, V control circuitry. Each module plugs securely to the bus board. These auxiliary modules are classified as input, input/output, and control modules.

Input Modules: Auxiliary inputs can be used to record desired data as well as to terminate or regulate charge and discharge processes based upon measured conditions. Selectable inputs are of V (voltage), T (temperature), and P (pressure).

Input/Output Modules Digital I/O is an integrated peripheral on/off control. The output commonly is used to control valves and switches. The input allows an external control signal to control testing procedure.

Control Modules: Arbin provides control modules for Auto-Calibration, Smart Battery Testing, External Charger, Temperature Chamber Interface, and AC Impedance Measurement.

For more information please visit: www.arbin.com/products/accessories/auxiliaries.htm

Safety & UPS Features

Several safety provisions are provided in every Arbin system. There are multiple levels of fusing provided inside the system for further protection at the channel/board and power supply levels. The software also has several safety functions with which the user can avoid over charging the cells, over discharging, overheating, etc.

Smart UPS: (optional) This option uses a small Smart UPS to back up power to the computer only. This allows the system to automatically resume tests after a stop due to brief power interruption. There is provision for the user to intervene if desired before the channels resume. This is an essential component for any user with an unreliable power source unless the entire facility is on backup power.

Arbin INSTRUMENTS

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