CHEN TECH
ELECTRIC

MCE A Series

Eco Series-Battery Production Equipment

▪ Saving the Future with Green ▪

| Worldwide Battery Testing Expert

Highlight Features

Mass production of power batteries

Designed exclusively for the requirements of the battery production line, can be integrated with automated production processes to satisfy pricing, performance, and quality requirements.

Energy conservation and environmental protection

By introducing the discharging energy recovery function to increase the conversion rate of green energy, energy and costs associated with battery production have been reduced effectively. While raising product competitiveness, the company's eco-friendly image is also protected.

Low maintenance

When the equipment experiences an error, the modularized design and easy to assemble system structure allow the client to troubleshoot the problem quickly. Furthermore, a damaged module can be replaced easily to effectively control the impact of equipment errors on the production line, minimize downtime, and increase equipment turnover rates.

Efficient operation and control

By introducing a middle-layer controller into the battery testing system architecture, a computer is able to control over 2,000 channels simultaneously. During production, the equipment does not have to be connected to a computer to continue the execution of the production process and record related data.

Doubling the production capacity

With the innovative mechanical design, the amount of space taken up by the equipment is reduced by 50%. Clients are able to effectively raise their overall production capacities within the limited factory space.

Product Applications

- Energy Storage System
- Electric Bike
- Electric Motorcycle
- Electric Vehicle
- Electric Bus

Applied Tests

- AGE Life Cycle Test
- Capacity Test
- DCIR DCIR Measurement
  - ISO 12405
  - IEC 61960
- ACIR ACIR Measurement
- Formation
- Grading
- Drive Simulation
  - FUDS
  - DST

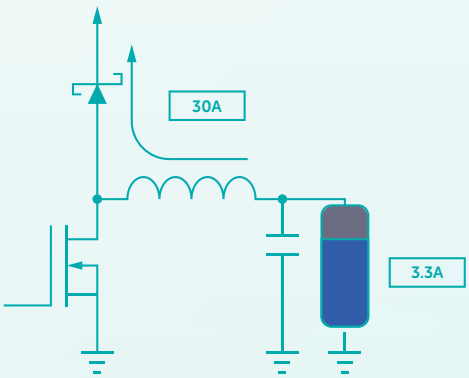
Technical Features

High-frequency PWM control

Uses the PWM (100kHz) Buck / Boost technology, which can significantly increase charging/discharging efficiency, streamline the design of the substrate by reducing its size, and eliminate high frequency noises while ensuring the quality of the factory's power supply.

Discharge Energy Recycling

By using the Boost technology, energy released during the testing process is recharged to the DC BUS, which is then used to charge other batteries. Excess energy is returned to the AC power grid to save energy costs. The recycling efficiency of the battery cell production equipment can reach up to 60%, and the battery pack production equipment can reach an even higher value of 85%. This is in line with the current trends of implementing solutions which are eco-friendly as well as cost effective.



Comprehensive Protection Mechanism

Equipped with a number of protection mechanisms, including overvoltage (OV) and overcurrent (OC). When a battery experiences an error during the testing process, detection is made immediately and the battery is protected. At the same time, a buzzer will sound to notify personnel on the production line to handle the incident so that potential injuries and property damage can be prevented.

Drive Simulation*

Equipped with FUDS, DST, and other international drive simulation test standards, also supports customized drive simulation test modes. A customized test process can be created by importing a .TXT file, making each test a reproduction of a real scenario. Under customized drive simulation mode, the minimum step time supported is 100ms. Constant current and constant power operating modes are also supported.

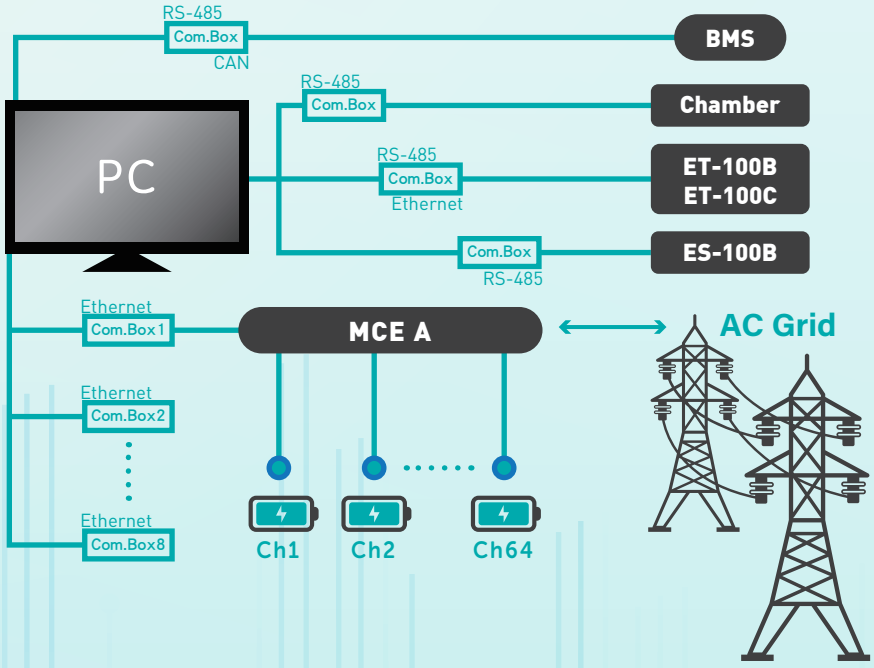
DCIR Measurement*

Equipped with ISO12405 and IEC61960 DC resistance measurement standards. Customized measurement methods set up by the user is also supported. The internal resistance experienced by the battery during charge/discharge process can be measured to significantly enhance the efficiency of the battery's quality screening process.

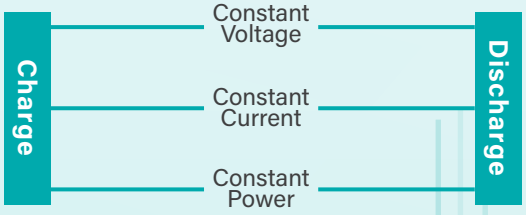
BMS Communication*

Supports a wide range of popular battery pack BMS interfaces including CAN, ModBus, and RS485. Importing CAN Bus DBC files is also supported. The user is free to configure battery test equipment behavior and BMS parameters to be recorded during the test. Confidential BMS parameter data will not be leaked and the client do not have to wait for software development. The overall user experience is safe and unrestricted.

System Architecture



Operating Mode



● Drive Simulation* ● ● ACIR* ● ● DCIR* ●

*Option

5V Series Specifications

Model			MCE A 5V/20A	MCE A 5V/30A	MCE A 5V/60A	MCE A 5V/100A	MCE A 5V/200A	MCE A 5V/400A
Number of Channels Per Unit			16	16	8	4	2	1
Charge/ Discharge Spec			5V/±20A	5V/±30A	5V/±60A	5V/±100A	5V/±200A	5V/±400A
Charge Output	Constant Voltage	Range	0~5V					
		Resolution	0.1mV					
		Accuracy	±5mV (±0.1%)					
	Constant Current	Range	0.02~20A	0.03~30A	0.06~60A	0.1~100A	0.2~200A	0.4~400A
		Resolution	10mA			100mA		
		Accuracy	±0.02A (±0.1%)	±0.03A (±0.1%)	±0.06A (±0.1%)	±0.1A (±0.1%)	±0.2A (±0.1%)	±0.4A (±0.1%)
	Constant Power	Range	0.1~100W	0.15~150W	0.3~300W	0.5~500W	1~1000W	2~2000W
		Resolution	0.1W			1W		
		Accuracy	±0.2W (±0.2%)	±0.3W (±0.2%)	±0.6W (±0.2%)	±1W (±0.2%)	±2W (±0.2%)	±4W(±0.2%)
Discharge Output	Constant Voltage	Range	2~5V (Option：0~5V)*					
		Resolution	0.1mV					
		Accuracy	±5mV (±0.1%)					
	Constant Current	Range	0.02~20A	0.03~30A	0.06~60A	0.1~100A	0.2~200A	0.4~400A
		Resolution	10mA			100mA		
		Accuracy	±0.02A (±0.1%)	±0.03A (±0.1%)	±0.06A (±0.1%)	±0.1A (±0.1%)	±0.2A (±0.1%)	±0.4A (±0.1%)
	Constant Power	Range	0.1~100W	0.15~150W	0.3~300W	0.5~500W	1~1000W	2~2000W
		Resolution	0.1W			1W		
		Accuracy	±0.2W (±0.2%)	±0.3W (±0.2%)	±0.6W (±0.2%)	±1W (±0.2%)	±2W (±0.2%)	±4W(±0.2%)
Measurement	Voltage	Range	0V~5.5V					
		Resolution	0.01mV					
		Accuracy	5mV(0.1%)					
	Current	Range	0~22A	0~33A	0~66A	0~110A	0~220A	0~440A
		Resolution	1mA			10mA		
		Accuracy	0.02A (0.1%)	0.03A (0.1%)	0.06A (0.1%)	0.12A (0.1%)	0.18A (0.1%)	0.48A (0.1%)
	Temperature	Range	-50°C ~ 150.0°C					
		Resolution	0.1°C					
		Accuracy	± 1°C					
Time		Data Recording Time	1s (Option：100ms)					
		Charge/ Discharge Switch Time(-90%→90%)	100ms					
Ambient Condition		Temperature	23°C ± 2°C					
		Humidity	20 ~ 90 HR					
AC Power		Voltage	220V ± 15% (Customized According To Client Needs)					
		Frequency	50/60 Hz (Customized According To Client Needs)					
		Phase	1Φ (Customized According To Client Needs)					
		Current	13A	19A				
Power Factor			Max 0.99					
Max. Energy Recycling Efficiency		Charge	60%					
		Discharge	50%					
Communication Protocol			CANBus (Ethernet to PC)					
Dimension (W*H)			585*223mm					
Weight			33 kg		36 kg			
Optional Feature			Drive Simulation, DCIR Measurement, ACIR Measurement, BMS Data Collection, Chamber Integration, Automatic / Semi-automatic Start					
Optional Accessory			BMS Data Collector, Auxiliary Voltage, Auxiliary Temperature, Chamber, Customized Fixture, Auto-Calibrator, Barcode Scanner					

*Measurements within standard 3m cable

60V Series Specifications

Model			MCE A 60V/50A	MCE A 60V/80	MCE A 60V/120A	MCE A 60V/160A	MCE A 60V/240A	MCE A 60V/320A
Number of Channels Per Unit			4	2	1			
Charge/ Discharge Spec			60V/±50A	60V/±80A	60V/±120A	60V/±160A	60V/±240A	60V/±320A
Charge Output	Constant Voltage	Range	0~60V					
		Resolution	1mV					
		Accuracy	±60mV (±0.1%)					
	Constant Current	Range	0.05~50A	0.08~80A	0.12~120A	0.16~160A	0.24~240A	0.32~320A
		Resolution	10mA			100mA		
		Accuracy	±0.05A (±0.1%)	±0.08A (±0.1%)	±0.12A (±0.1%)	±0.16A (±0.1%)	±0.24A (±0.1%)	±0.32A (±0.1%)
	Constant Power	Range	3~3000W	4.8~4800W	7.2~7200W	9.6~9600W	14~14400W	19.2~19200W
		Resolution	0.1W			1W		
		Accuracy	±6W (±0.2%)	±9.6W (±0.2%)	±14.4W (±0.2%)	±19.2W (±0.2%)	±28W (±0.2%)	±38.4W (±0.2%)
Discharge Output	Constant Voltage	Range	8~60V*					
		Resolution	1mV					
		Accuracy	±60mV (±0.1%)					
	Constant Current	Range	0.05~50A	0.08~80A	0.12~120A	0.16~160A	0.24~240A	0.32~320A
		Resolution	10mA			100mA		
		Accuracy	±0.05A (±0.1%)	±0.08A (±0.1%)	±0.12A (±0.1%)	±0.16A (±0.1%)	±0.24A (±0.1%)	±0.32A (±0.1%)
	Constant Power	Range	3~3000W	4.8~4800W	7.2~7200W	9.6~9600W	14~14400W	19.2~19200W
		Resolution	0.1W			1W		
		Accuracy	±6W (±0.2%)	±9.6W (±0.2%)	±14.4W (±0.2%)	±19.2W (±0.2%)	±28W (±0.2%)	±38.4W (±0.2%)
Measurement	Voltage	Range	0~66V					
		Resolution	1mV					
		Accuracy	±60mV (±0.1%)					
	Current	Range	0~55A	0~88A	0~132A	0~176A	0~264A	0~352A
		Resolution	10mA			100mA		
		Accuracy	±0.05A (±0.1%)	±0.08A (±0.1%)	±0.12A (±0.1%)	±0.16A (±0.1%)	±0.24A (±0.1%)	±0.32A (±0.1%)
	Temperature	Range	-50°C ~ 150.0°C					
		Resolution	0.1°C					
		Accuracy	± 1°C					
Time		Data Recording Time	1s (Option：100ms)					
		Charge/ Discharge Switch Time(-90%→90%)	30ms					
Ambient Condition		Temperature	23°C ± 2°C					
		Humidity	20 ~ 90 HR					
AC Power		Voltage	220V ± 15% (Customized According To Client Needs)					
		Frequency	50/60 Hz (Customized According To Client Needs)					
		Phase	3Φ (Customized According To Client Needs)					
		Current	38A				58A	78A
Power Factor			Max 0.99					
Max. Energy Recycling Efficiency		Charge	85%					
		Discharge	85%					
Communication Protocol			CANBus (Ethernet to PC)					
Dimension (W*H)			585*312mm				585*578mm	
Weight			43 kg				73 kg	85 kg
Optional Feature			Drive Simulation, DCIR Measurement, ACIR Measurement, BMS Data Collection, Chamber Integration, Automatic / Semi-automatic Start					
Optional Accessory			BMS Data Collector, Auxiliary Voltage, Auxiliary Temperature, Chamber, Customized Fixture, Auto-Calibrator, Barcode Scanner					

*Measurements within standard 3m cable

iBest Software

Upgraded User Experience

Configuration ---- Execution ---- Analysis ---- Within One Click

iBest software + Data analyzer

Program Configuration

Easy

Set up test program with few easy steps.
Can be easily operated.

Comprehensive

- Provide a variety of test program options to meet different kinds of testing needs.

Test modes	Constant current (CC), Constant current-Constant voltage (CC-CV), Constant power (CP), User defined/ Imported Drive Simulation, ACIR*, DCIR*.
Step Cutoff Conditions	Time, EV, EC, mAh, Wh, END mAh , Total mAh, Total Wh, SoC*, END SoC*, BMS conditions*, Chamber conditions*
Protection Mechanism	OC, LC, OV, LV, Cerr

- Support a variety of international standardized testpatterns. No need to be edited manually.

Drive simulation*	FUDS, DST
DCIR measurement*	ISO 12405, IEC 61960

Customization

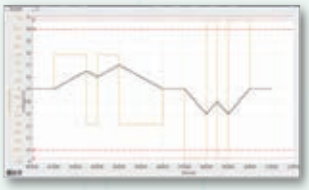
Introduce variable setting functions; supports diverse charging/discharging test patterns and data recording. Test programs can be configured freely.

Integration*

Control a variety of plug-in modules such as chamber, Gas Gauge/ BMS data collector, auxiliary voltage, and auxiliary temperature, eliminating the tedious operation of separate control.

Smart

Multiple convenient current configuration methods such as C-rate are provided to speed up the test program editing phase.



▲ (Fig. 1) Pre-test Simulation

Safety

Test curves can be previewed after completing the test program setting. Set protection criteria for the batteries to avoid any human error that might cause accident. (Fig. 1)

Confidential*

Supports .dbc file import for CANBus communication protocols used for power battery BMS. BMS data can be collected easily during testing without revealing the confidential information to CTE.

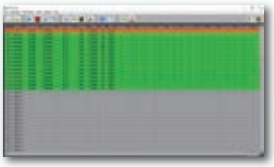
Control

Includes account management mechanisms, supports multi-role access restrictions.

*Option

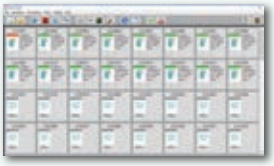
Program Execution

Personalization Provides multiple displays of channel status as well as color choices, which can be configured based on personal preferences and the execution status of the test program. (Fig. 2, 3, 4)



▲ (Fig. 2)
Default status display panel

Easy to understand The main display provides clear information about each testing channel's current status. Additional data can be shown on other display panels based on the personal preference of the operator, no crucial data will be missed.



▲ (Fig. 3)
32 Channels status display panel

Real Time Test data can be viewed in real time. The program can be adjusted dynamically during the test to rectify any unexpected issue. (Fig. 5)

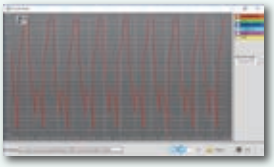
▲ (Fig. 4)
4 Channels status display panel

Flexible Supports prescheduled pause functionality; test program can be halted during specific points in time for personnel inspection and analysis, no more waiting around.

Efficient Throughout the testing process, it is not necessary to link the equipment to a PC for data logging, enhancing equipment efficiency.

Assurance

Following an interruption, unfinished testing can be continued by connecting to another channel.

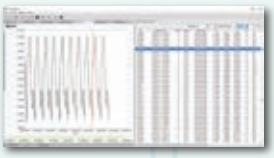


▲ (Fig. 5) Real time test curve

Data Analysis*

Time - saving A variety of test data presentations that can be adjusted according to the needs of researchers, saving data processing time.

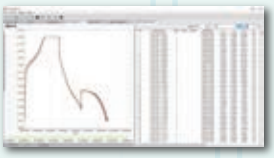
Graphs zoom-in and zoom-out | Text and graphical reports | Self-defined X and Y-axis parameters on graphs



▲ (Fig. 6) Test curve and report

Convenient

- Users will be able to choose from a selection of templates for data tables and curve charts available in the system, or create a brand new template based on their requirements.
- Testing graphics and raw data can be displayed simultaneously, cross-reference data mechanisms are also provided. (Fig. 6)
- Data retrieval tools allow users to quickly browse important test data.



▲ (Fig. 7)
Cycle test curve and report

Professional Easily analyze the data from cycle tests. Superimpose the data from each cycle, draw them into charts and produce a lifecycle test report. Help researchers to quickly evaluate the results of lifecycle tests. (Fig. 7, 8)

▲ (Fig. 8)
Life test curve and report

Compatible Test data can be exported in .csv format and manipulated in the third-party software that clients are familiar with, improving the data usability.

Optional Accessories

Auxiliary Voltage ES 100B

During serial/parallel battery pack testing, the voltage of each cell/module is measured and recorded. The safety of the battery can be monitored, and the data obtained can be used as the condition for program step change or providing protection.

1. Each module contains 24 measurement points. A data recording frequency of 100ms.
2. Measurement range: ±8V or ±32V; accuracy ±0.02% F.S.

Auxiliary Temperature ET 100B

During battery testing, the temperature of each battery is measured and recorded. The safety of batteries can be monitored, and the data obtained can be used as the condition for program step change or providing protection.

1. Each module contains 24 measurement points. A data recording frequency of 100ms.
2. Supports Thermoistor as temperature sensors. Measurement range: -50˚C~150˚C; accuracy ±1˚C (-40˚C~90˚C).

Auxiliary Temperature ET 100C

During battery testing, the temperature of each battery is measured and recorded. The safety of batteries can be monitored, and the data obtained can be used as the condition for program step change or providing protection.

1. Each module contains up to 16 measurement points. A data recording frequency of 4s.
2. Supports various mainstream temperature sensors available on the market, such as: Thermocouple, Thermistor, RTD, and Diode (can be selected according to customer specifications). Measurement range is vast, and accuracy can reach ±1˚C.

BMS Data Collector

During battery pack testing, the BMS data is retrieved and recorded. The data obtained can be used as the condition for program step change or providing protection.

1. Supports CAN .dbc file editing and import.

Automated/semi-automated activation

Supports a variety of automated/semi-automated activation methods to accelerate production flow and facilitate battery production history tracking.

1. Barcode activation: Scan the corresponding channel and the battery's barcode to start the production process automatically.
2. Auto activation upon battery detection: Connect the battery to the equipment and the system will automatically start the production process once battery voltage is detected.
3. BMS activation: Connect the battery to the equipment and the BMS data collector, the system will automatically start the production process once BMS data is obtained.

Chamber/ Third-party Chamber Control

The synchronous control of chambers can be achieved during the testing processes. Temperature and humidity levels can be adjusted to simulate different environments for measuring the battery's performance.

Auto-Calibrator

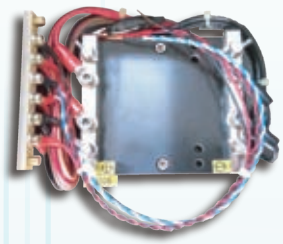
Uses fully-automated methods to perform voltage and current calibration for the equipment channels to maintain accurate measurements and output, as well as to reduce the human resource costs, time costs, and errors caused by performing manual calibration

1. Customizable reports.
2. The flexible and scalable design is capable of calibrating mutiple channels simultaneously.

Fixtures

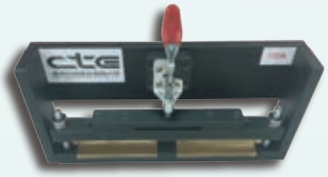
The following fixtures can be used along with the MCE A Series

Applicable to cylindrical batteries with nickel strips on positive/negative terminals; output current of 100 A or less.

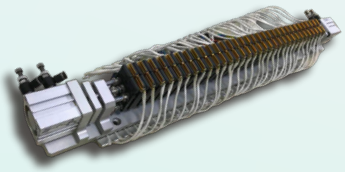


Applicable to cylindrical and rectangular batteries; output current of 30A or less.

Applicable to polymer batteries; output current of 100 A or less.



Applicable to polymer batteries; output current of 5A/ 3A or less.



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