

50V 500A Lithium Battery Tester

Item Number: DC04



Introduction

50V 500A lithium battery tester provides 25kW charge discharge control precision measurement pulse profiles DCIR analysis and networked data management for demanding battery development validation and production workflows with robust protection and configurable auxiliary monitoring options included.

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Application	Description	Key Benefit
Large-format cell cycle-life testing	Run programmed charge and discharge sequences on lithium battery cells within the specified voltage and current ranges.	Produces consistent electrical records for long-duration cycling studies.
Battery module validation	Evaluate module behavior using constant-current, constant-power, and constant-resistance discharge modes.	Supports controlled comparison of performance across test samples.
High-rate charge and discharge characterization	Apply up to 500 A testing to investigate rate behavior, voltage response, and capacity under elevated current demand.	Combines high-current capability with four-wire sensing and 24-bit resolution.
DCIR pulse testing	Create pulse sequences and select calculation points for direct-current internal-resistance analysis.	Links resistance assessment to configurable electrical pulse conditions.
Drive-cycle and load-profile simulation	Download operating-condition programs with current or power charge and discharge steps.	Accommodates extensive profile definitions with up to 1 million downloaded lines.
Thermal observation during electrical testing	Monitor cell surface or tab temperature using the optional thermistor or thermocouple auxiliary channels.	Binds temperature information to the main test record and permits temperature-based control or protection.
Incoming-cell qualification and traceability	Associate test histories with scanned battery barcodes and centrally managed database records.	Simplifies retrieval and review of historical test data.
Battery BMS communication studies	Use optional CAN, RS485, and BMS communication with DBC configuration where required.	Extends the test environment for communication-aware battery evaluation.

Parameter	Specification
Site-facing identifier	DC04
Channel count per cabinet	1
Channel type	Main channel
Channel control mode	Independent control
Channel parallel connection	Supports up to 4 channels in parallel; pulse and simulation testing are not supported after parallel connection
CC-CV source architecture	Dual closed-loop structure for constant-current and constant-voltage sources
Input power supply	AC380V+/-15% 50/60+/-5Hz
Input wiring method	Three-phase five-wire
Power factor	>=99% (full load)
THDi	<=5% (full load)

Parameter	Specification
Input impedance	$\geq 1\text{M}\Omega$
Input power	29.4KW
Input current	44.7A/per phase
Maximum complete-unit efficiency	90%
Noise	$\leq 65\text{dB}$
Voltage and current detection sampling	Four-wire connection (same port for charge and discharge)
Power control module type	MOSFET
Input-side protection	Surge protection, anti-islanding, over/under-frequency, over/under-voltage, phase-loss protection, and others
Charge voltage measurement range per channel	0V~50V
Discharge voltage measurement range per channel	3V~50V
Minimum discharge voltage	3V
Voltage accuracy	$\pm 0.02\%$ of FS
Voltage resolution	24bit
Current measurement range per channel	2.5A~500A
Current accuracy, independent range	$\pm 0.05\%$ of FS
Constant-voltage cutoff current	500mA
Current resolution	24bit
Single-channel output power	25KW
Complete-unit output power	25KW
Current response time	$\leq 3\text{ms}$
Current transition time	$\leq 6\text{ms}$
Minimum process-step time	0.1s
Charging modes	Constant-current charge, constant-voltage charge, constant-current constant-voltage charge, constant-power charge
CC-CV transition	Smooth constant-current to constant-voltage transition to prevent current spikes and large-current impact on the battery
Discharging modes	Constant-current discharge, constant-voltage discharge, constant-power discharge, constant-resistance discharge
Charge/discharge cutoff conditions	Voltage, current, relative time, capacity, $-\Delta V$
Operating-condition simulation charge modes	Current, power
Operating-condition simulation discharge modes	Current, power
Operating-condition simulation switching	Supports continuous charge/discharge switching
Operating-condition simulation cutoff conditions	Time, line number
Maximum operating-condition download	1 million lines
Pulse charge modes	Current, power
Pulse discharge modes	Current, power
Minimum pulse width	100ms
Pulses per pulse step	One pulse step supports 32 different pulses
Pulse charge/discharge switching	One pulse step can continuously switch from charging to discharging
Pulse cutoff conditions	Voltage, relative time
DCIR test	Supports user-defined sampling points for DCIR calculation
Software protection	Power-failure data protection and offline testing function; configurable lower voltage, upper voltage, lower current, upper current, and delay time

Parameter	Specification
Hardware protection	Reverse-connection protection, overvoltage protection, overcurrent protection, overtemperature protection, and others
Process-step setting method	Table editing
Minimum data-recording time interval	10ms (100ms when auxiliary channels are connected)
Minimum data-recording voltage interval	0.1V
Minimum data-recording current interval	1A
Recording frequency	100Hz (10Hz when auxiliary channels are connected)
Database	MySQL database for centralized management of test data
Data export formats	Excel, Txt
Curve type	Customizable plotting, 4 Y axes
Barcode scanning	Supported; enables historical-data management and traceability using battery barcode
Host-computer communication protocol	TCP/IP
Communication interface	Ethernet
Lower-computer communication baud rate	1M bandwidth
Host-computer communication baud rate	10M~100M adaptive
Networking method	Local-area network through switch and router
Optional communication expansion	CAN, RS485, and BMS communication with DBC configuration function
Operating temperature	-10C~40C (measurement accuracy guaranteed within 25+/-10C; accuracy drift 0.005%ofFS/C)
Storage temperature	-20C~50C
Operating relative humidity	<=70%RH (no water-vapor condensation)
Storage relative humidity	<=80%RH (no water-vapor condensation)
Equipment dimensions WDH	6008001300(mm)
Weight	Approximately 185.3KG
Optional thermistor temperature range	-30C~120C
Optional thermocouple temperature range	-200C~260C
Optional temperature accuracy	+/-1C (within 2m cable length)
Optional temperature resolution	0.1C
Optional auxiliary voltage range	0V~5V
Optional auxiliary voltage accuracy	+/-0.1%ofFS
Optional auxiliary voltage resolution	0.1mV
Auxiliary system function	Monitors battery surface and tab temperature; binds auxiliary data to main voltage and current data; temperature may be used as a process-step control and protection condition