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Battery Testing Equipment Catalog

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KINTEK SOLUTION

COMPANY PROFILE

>>> About Us

KINTEK Solution is a technology-driven innovator specializing in comprehensive laboratory equipment for battery R&D and advanced materials research. Our portfolio spans the entire cell fabrication workflow—from mixing, coating, and precision pressing (automatic, heated, isostatic) to cell assembly and testing. Also essential in ceramics and powder metallurgy, our systems prioritize precision, safety, and repeatability, empowering researchers and industrial labs to achieve groundbreaking results.



5V 10Ma Coin Cell Battery Tester 8 Channel Battery Testing Equipment

Item Number: DC01



Introduction

5V 10mA coin cell battery tester with 8-channel for electrode research battery performance testing formation grading pulse studies DCIR analysis and reliable small-scale battery evaluation across multiple chemistries with programmable charge discharge control and precise independent channel regulation

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Application	Description	Key Benefit
Electrode Material Research	Evaluate new cathode, anode, conductive additive, binder, and coating formulations in laboratory coin cells using programmable charge and discharge profiles.	Produces controlled electrical data for comparing material formulations and development batches.
Lithium Ion Coin Cell Testing	Characterize small lithium-ion cells through formation, cycling, capacity measurement, rate evaluation, and voltage-based cutoff control.	Provides repeatable multi-channel testing for early-stage cell chemistry development.
Nickel Metal Hydride Cell Evaluation	Test Ni-MH coin cells with constant-current, constant-power, or customized cycling procedures.	Supports chemistry-specific performance screening with flexible operating modes.
Zinc Manganese Watch Battery Testing	Evaluate zinc-manganese watch batteries and other small primary cells under controlled low-current conditions.	The low-current ranges help improve control when testing miniature batteries.
Small Scale Battery Formation	Apply programmable constant-current, constant-voltage, or constant-current constant-voltage formation sequences to newly assembled cells.	Enables consistent formation procedures across multiple samples at the same time.
Capacity Grading and Batch Comparison	Run repeated charge and discharge cycles with capacity, energy, voltage, and current cutoff conditions for cell sorting.	Helps identify variation between cells and supports research-scale quality screening.
Battery Pack and Cell Group Testing	Perform coordinated laboratory tests on individual cells or small battery groups using defined cycling and protection parameters.	Provides structured comparative data before larger-scale pack development.
Pulse and DCIR Characterization	Apply customized current or power pulses and calculate DCIR from user-defined measurement points.	Reveals transient response and resistance behavior relevant to power capability analysis.

Category	Parameter	Specification
Identification	Model	DC01
Channels	Total equipment channels	8
Input	Input power supply	AC 220V $\pm$ 10% / 50Hz
Input	Input active power	25W
Resolution	AD resolution	16bit
Resolution	DA resolution	16bit
Measurement	Input impedance	$\geq$ 1G Ω
Voltage	Constant-voltage control range	25mV~5V
Voltage	Minimum discharge voltage	-5V
Voltage	Accuracy	$\pm$ 0.05% of FS

Category	Parameter	Specification
Voltage	Stability	$\pm 0.05\%$ of FS
Current	Output range per channel Range 1	5 μ A~1mA
Current	Output range per channel Range 2	1mA~5mA
Current	Output range per channel Range 3	5mA~10mA
Current	Accuracy	$\pm 0.05\%$ of FS
Current	Constant-voltage cutoff current Range 1	2 μ A
Current	Constant-voltage cutoff current Range 2	0.01mA
Current	Constant-voltage cutoff current Range 3	0.02mA
Current	Stability	$\pm 0.05\%$ of FS
Power	Maximum output power per channel	0.05W
Power	Stability	$\pm 0.1\%$ of FS
Response	Current response time	<500 μ s (10%FS~90%FS)
Time	Step time range	$\leq (365 \times 24)$ hours/step
Time	Supported time format	00:00:00:00 (h, min, s, ms)
Data Recording	Minimum time interval	100ms
Data Recording	Minimum voltage interval	10mV
Data Recording	Minimum current interval Range 1	2 μ A
Data Recording	Minimum current interval Range 2	0.01mA
Data Recording	Minimum current interval Range 3	0.02mA
Data Recording	Recording frequency	10Hz
Charging	Charging modes	Constant-current charging, constant-voltage charging, constant-current constant-voltage charging, constant-power charging
Charging	Cutoff conditions	Voltage, current, relative time, capacity, energy, $-\Delta V$
Discharging	Discharging modes	Constant-current discharging, constant-power discharging, constant-resistance discharging, constant-voltage discharging, constant-current constant-voltage discharging
Discharging	Cutoff conditions	Voltage, current, relative time, capacity, energy
Pulse Mode	Charging modes	Constant-current mode, constant-power mode
Pulse Mode	Discharging modes	Constant-current mode, constant-power mode
Pulse Mode	Minimum pulse width	500ms
Pulse Mode	Maximum pulses per pulse step	32 different pulses
Pulse Mode	Continuous charge discharge switching	One pulse step can switch continuously from charging to discharging
Pulse Mode	Cutoff conditions	Voltage, relative time
DCIR	DCIR testing	Supports customized sampling points for DCIR calculation
Cycling	Cycle test range	1~65535 cycles
Cycling	Steps per single cycle	254
Cycling	Nested loop function	Maximum 3 levels of nested loops
Protection	Power-failure data protection	Supported

Category	Parameter	Specification
Protection	Offline testing	Supported
Protection	User-defined safety conditions	Voltage upper limit, voltage lower limit, current upper limit, current lower limit, capacity upper limit, delay time
Enclosure	IP protection rating	IP20
Channel Design	Current and voltage source architecture	Dual-loop structure
Channel Control	Channel control mode	Independent control
Measurement Connection	Voltage and current detection sampling	Four-wire connection
Noise	Operating noise	<45dB
Database	Test data management	Centralized management using MySQL database
Host Communication	Communication protocol	TCP/IP based
Server Operating System	Supported operating system	Windows 7
Data Export	Output formats	EXCEL2003,2010, TXT
Storage	Server disk configuration	500GB
Communication Interface	Interface	Network port
Leakage	Leakage current	0.005μA
Operating Environment	Working temperature range	0°C~40°C
Operating Environment	Measurement accuracy condition	Within 25±10°C, accuracy drift 0.005% of FS /°C
Storage Environment	Storage temperature range	-10°C~50°C
Operating Environment	Working relative humidity	≤70% RH (without water vapor condensation)
Storage Environment	Storage relative humidity	≤80% RH (without water vapor condensation)
Fixture	Fixture type	Upper and lower fixtures
Accessories	Available accessories	Tester fixture, alligator fixture, polymer fixture, cable lug
Dimensions	Each unit chassis dimensions W×D×H	1U (19"), 48331048 mm

Laptop Battery Tester 24V 15A Eight Channel Smbus Battery Analyzer

Item Number: DC06



Introduction

Eight-channel laptop battery tester with 24V, 15A charging and discharging, SMBUS and I2C communication, precise data logging, cycling, protection, and efficient energy management

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Application	Description	Key Benefit
Laptop Battery Pack Testing	Charge, discharge, and cycle laptop battery packs using programmable voltage, current, capacity, energy, and time limits.	Supports repeatable qualification and comparative performance testing across multiple packs.
Smart Battery and BMS Development	Read battery-management variables through SMBUS or I2C while synchronizing communication data with electrical test records.	Correlates battery behavior with intelligent electronics data during development and troubleshooting.
Battery Pack Production Verification	Run standardized charge and discharge programs across independent channels for incoming inspection, process validation, or final testing.	Increases throughput while maintaining channel-level control and traceable results.
Battery Capacity and Endurance Evaluation	Use configurable cycling programs with up to 65,535 cycles, defined cutoff conditions, and multi-level loop structures.	Enables long-duration durability studies and automated endurance protocols.
Battery Protection and Fault Analysis	Apply voltage, current, capacity, energy, slope, delay, and auxiliary protection conditions to investigate abnormal behavior.	Helps identify electrical faults and verify protective responses under controlled conditions.
Portable and Consumer Electronics Research	Adapt charging and discharging profiles for smart batteries used in portable electronics and compact energy systems.	Provides flexible protocol control for varied battery architectures and operating requirements.
Academic and Advanced Materials Research	Record high-frequency electrical data while testing experimental cells, packs, materials, or battery-management strategies.	Combines programmable operation, offline storage, and exportable data for laboratory analysis.

Category	Parameter	Specification
Identification	Equipment model	DC06
Identification	Reference equipment code	CE-5008-24V15A-SMB
Electrical Input	Input power supply	AC 220V $\pm$ 10% / 50Hz
Electrical Input	Input power	2400W
Measurement	AD resolution	16bit
Measurement	DA resolution	16bit
Measurement	Input impedance	$\geq$ 1M Ω
Voltage	Charging output range per channel	2.5V~24V
Voltage	Discharging output range per channel	2.5V~24V
Voltage	Accuracy	$\pm$ 0.02% of range

Category	Parameter	Specification
Voltage	Stability	0.01%
Current	Charging output range per channel	30mA~15A
Current	Discharging output range per channel	30mA~15A
Current	Accuracy	± 0.03% of range
Current	Stability	0.015%
Power	Single-channel output power	360W
Power	Stability	0.05%
Time	Current response time	Hardware response time ≤ 20ms from 10% to 90% or 90% to 10%
Time	Step duration range	1~65535 minutes per step
Time	Supported time format	00:00:00 (hh:mm:ss)
Data Recording	Time recording condition	Δt: 0.01s~60000s
Data Recording	Voltage recording condition	ΔU: 5mV~24V
Data Recording	Current recording condition	ΔI: 5mA~15A
Data Recording	Recording frequency	100Hz
Charging	Charging modes	Constant current, constant voltage, constant-current constant-voltage, constant power, constant-power constant-voltage
Charging	Charging cutoff conditions	Voltage, current, relative time, capacity
Discharging	Discharging modes	Constant current, constant power, constant-current constant-voltage
Discharging	Discharging cutoff conditions	Voltage, current, relative time, capacity
Cycling	Cycling test range	1~65535 cycles
Cycling	Steps per cycle	255
Cycling	Nested cycling	Maximum 4 levels of nested loops; supports jumping across loops to any step
Protection	Safety and abnormal-condition protection	Power-loss data protection; upper and lower voltage limits; upper and lower current limits; capacity limit; energy limit; control-parameter deviation protection; current and voltage fluctuation protection; voltage-slope protection; delay protection; auxiliary voltage protection; auxiliary temperature protection
Protection	Hardware protection	Reverse-connection protection; input overvoltage protection; output overvoltage protection; input overcurrent protection; output overcurrent protection; overheating protection; overload protection; output no-load protection
Channel Design	Energy management	Energy-saving inverter technology enables local energy circulation between channels
Channel Design	Control architecture	Independent dual closed-loop structure for constant-current and constant-voltage sources
Channel Design	Control mode	Independent control per channel
Channel Design	Voltage and current sampling	Four-wire connection
Channel Design	Sampling speed	High-speed 100Hz sampling
Channel Design	Offline storage	1GB per-channel offline operation storage capacity
Channel Design	Conversion technology	Automotive-grade main control solution with 200kHz high-frequency conversion
Channel Design	Noise	<80dB
Communication	Host-computer communication	TCP/IP
Communication	Communication interface	Ethernet 100M
Data Output	Output formats	EXCEL, TXT, charts
Channel Capacity	Channels per unit	8

Category	Parameter	Specification
Environment	Operating temperature	25°C±10°C
Environment	Storage temperature	0°C~45°C
Environment	Operating relative humidity	30%~80% RH, without condensation
Environment	Storage relative humidity	30%~90% RH, without condensation
Mechanical	Fixture type	Selected according to customer requirements
Mechanical	Unit chassis dimensions W×D×H	500 × 480 × 86 mm
Mechanical	Cabinet dimensions W×D×H	606 × 800 × 1800 mm
SMBUS and I2C	Hardware compatibility	Compatible with SMBUS and I2C communication protocols; supports 400kHz high-speed mode
SMBUS and I2C	Software compatibility	Compatible with standard field information commands defined by Smart Battery Data Specification Revision 1.1; users can edit DBC files to support different chip protocols
SMBUS and I2C	Channel operation	Eight channels operate independently; each channel can set a different SMBUS parameter list
SMBUS and I2C	Parameter reading	Each parameter can be configured for dynamic real-time refresh or one-time reading to reduce bus occupation
SMBUS and I2C	Bus reading rate	All channels can read at the configured bus rate of 100kHz~400kHz
SMBUS and I2C	Refresh performance	More than 10 refreshes per second can be achieved when each channel reads only a small number of parameters
SMBUS and I2C	Variable storage	Users can define the variable list saved for each test
SMBUS and I2C	Record synchronization	SMBUS variables are recorded synchronously with the main electrical test parameters

100V 1000A Battery Test System

Item Number: DC07



Introduction

High power 100V 1000A battery test system with two independent channels energy regeneration precision measurement fast dynamic response and flexible cycling for demanding battery development validation and manufacturing research programs.

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Application	Description	Key Benefit
High-power lithium-ion cell validation	Characterize charge acceptance, discharge capability, capacity, and pulse behavior of large-format cells at controlled current and voltage limits.	High current and fine measurement resolution support detailed cell-performance evidence.
Battery module development	Evaluate module capacity, internal resistance, charge-discharge efficiency, and temperature-dependent behavior across repeated cycles.	Independent channels enable parallel but separately programmed module tests.
Electric vehicle duty-cycle simulation	Import DBC-format operating-condition files and reproduce communication-protocol-based current profiles for traction battery research.	Application-relevant profiles improve correlation between laboratory testing and field duty.
BMS validation and communication testing	Connect BMS hardware through CAN, CANFD, RS485, RS232, or Ethernet while exercising battery-side protection and operating limits.	Broad interfaces support coordinated validation of control logic and battery response.
Pulse and DCIR characterization	Apply controlled current pulses, ramps, and DCIR procedures to examine transient voltage response and resistance behavior.	Fast response and 100 ms pulse capability capture short-duration electrical behavior.
Cycle-life and durability studies	Run nested, condition-based programs for up to 65535 cycles with capacity, energy, temperature, and expression-based transitions.	Sophisticated sequencing reduces manual intervention in long-duration reliability testing.
Production quality and consistency assessment	Compare capacity, internal resistance, charge-discharge characteristics, and cell voltage or temperature behavior across samples.	Consistent control and high-resolution recording improve test-to-test comparability.
Environmental and auxiliary-system test setups	Coordinate battery cycling with a chamber, chiller, insulation monitor, balancing device, auxiliary voltage source, or adjustable power supply.	External-device linkage supports more complete test-station automation.

Parameter	Specification
Site-facing identifier	DC07
Main channel quantity	2
Maximum voltage	100V
Maximum current	1000A
ADC sampling resolution	24 Bit
Control mode	Constant-current and constant-voltage modes use a dual closed-loop structure; each channel is independently controlled
Energy regeneration	Full-power energy regeneration; recovered energy is used by local loads first and surplus energy is returned to the grid

Grid-side parameter	Specification
Voltage range	400Vac/480Vac $\pm 10\%$
Frequency range	50Hz/60Hz $\pm 5\%$

Grid-side parameter	Specification
Maximum power	235.3kW
Power factor (PF)	>0.99
Total harmonic current distortion (THDi)	<5%
Wiring method	3W+PE
Isolation method	Low-frequency isolation

Channel voltage parameter	Specification
Charge voltage range	0~100V
Discharge voltage range	3V~100V (with accessory, discharge to 0V is available)
Voltage ranges, optional	3 Scales (100V, 60V, 30V)
Voltage accuracy	±0.05% F.S
Voltage resolution	1mV
Voltage ripple	±0.5% F.S

Channel current parameter	Specification
Independent-channel current range	-1000A~1000A
Combined-channel current range, optional	2CH: -2000A~2000A
Independent-channel current ranges, optional	4 Scales (1000A, 600A, 360A, 180A)
Current accuracy	±0.05% F.S
Current resolution	1mA
Minimum cutoff current	±0.2% F.S (can be reduced according to requirements)

Channel power parameter	Specification
Independent-channel maximum power	100kW
Combined-channel maximum power	200kW
Power accuracy	±0.1% F.S
Power resolution	1W

Charge and discharge parameter	Specification
Current response time	≤10ms (10%~90%)
Charge-discharge switching time	≤20ms (-90%~+90%)
Minimum pulse width	100ms
Charge modes	Constant current, constant voltage, constant-current constant-voltage, constant power, current ramp, pulse, and more
Discharge modes	Constant current, constant-current constant-voltage, constant power, constant resistance, current ramp, pulse, DCIR, and more
Cutoff and transition conditions	Voltage, current, time, temperature, capacity, energy, -ΔV, expression function, and more

Cycle and duty-cycle simulation parameter	Specification
Cycle test range	1~65535 cycles
Editable step count	254 steps
Cycle nesting	Supports 3 levels
Programming feature	Multiple exits per step with goto function and arbitrary transitions

Cycle and duty-cycle simulation parameter	Specification
Operating-condition file	DBC-format operating-condition files can be imported and edited according to the communication protocol
Row limit	1 million rows
Switching time	100ms

Protection parameter	Specification
Grid-side protection	Overvoltage, overcurrent, phase loss, overheating, overload, short circuit, communication interruption, emergency stop, and more
Battery-side protection	Overvoltage, overcurrent, power interruption, reverse connection, communication heartbeat, overcapacity, sensing-line dropout, and more
Full-load conversion efficiency	>85%

Host software and data parameter	Specification
Communication method	TCP/IP protocol
Supported test projects	Operating-condition simulation, capacity, internal resistance, cycle life, charge-discharge characteristics, pulse charge-discharge characteristics, state-of-charge retention, charge-discharge efficiency, overcharge and over-discharge tolerance, individual-cell temperature characteristics, individual-cell voltage characteristics, consistency evaluation, and more
Software step operations	Cut and paste steps, forced step transition, conditional transition, cycle testing, and more
Minimum data-recording time interval	10ms
Minimum data-recording voltage interval	0.1mV
Minimum data-recording current interval	0.1mA
Data protection	Power-loss data protection
Offline testing	Safety protection conditions can be configured, including upper voltage limit, lower voltage limit, upper current limit, lower current limit, and delay time
Software and system integration	Database, MES system, LIMS system, and more

External linkage parameter	Specification
Communication interfaces	RS485, RS232, CAN2.0A, CAN2.0B, CANFD, Ethernet, and more
Supported external equipment	BMS, auxiliary voltage, auxiliary temperature, environmental test chamber, water chiller, insulation monitoring, adjustable power supply, balancing equipment, and more

Physical and environmental parameter	Specification
Equipment dimensions	WDH: 400010701980(mm)
Weight	≈ 3000kg
Protection rating	IP20
Cooling method	Air cooling
Noise	<75dB
Storage temperature	-30°C~70°C
Operating temperature	-10°C~45°C
Humidity	<85%(non-condensing)
Altitude	≤2000m

Optional accessory	Specification
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Computer	i5 8G 1T integrated graphics, 21-inch display, Windows10 Chinese operating system, mouse; customizable
DC cables	Normal-temperature RV cable, silicone flexible cable, and more; customizable
Fixtures	Polymer fixture, alligator clip, OT terminal, toggle fixture, and more
Battery rack	Designed according to battery dimensions and channel quantity; insulated shelves and bottom casters; customizable
Auxiliary channels	Designed according to maximum voltage, temperature range, thermocouple type, and channel quantity
Discharge-to-0V module	Designed according to channel quantity
Separate charge-discharge port module	Designed according to maximum voltage, maximum current, and channel quantity
Negative-voltage discharge module	Designed according to maximum voltage, maximum current, and channel quantity
Distribution box, DC or AC	Designed according to maximum voltage and maximum current
Power transformer	Designed according to maximum voltage and maximum power

20V 10A Battery Testing Equipment

Item Number: DC10



Introduction

20V 10A battery testing equipment delivers independent eight-channel charge discharge cycling, 200W per channel output, 100Hz recording, SMBUS compatibility, and protected precision measurements for battery research validation and production testing.

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Application	Description	Key Benefit
Lithium-ion cell cycle-life evaluation	Runs repeated charge and discharge sequences using configurable current, voltage, time, and capacity cutoffs.	Supports long-duration cycle programs up to 65,535 cycles with power-loss data protection.
Smart battery pack validation	Reads supported smart-battery information through SMBUS, HDQ, or I2C-compatible hardware and compatible software commands.	Brings electrical test control and smart-battery data access into one laboratory workflow.
Battery formation process research	Applies constant-current, constant-voltage, or combined CC-CV charging profiles to investigate formation behavior.	Independent channels allow multiple samples or conditions to be evaluated simultaneously.
High-power cell discharge characterization	Performs constant-current or constant-power discharge within the 2.5V to 20V and 20mA to 10A per-channel ranges.	200W per-channel output enables meaningful loading across the stated operating range.
Electrode and materials development	Compares cells made from different electrode formulations, separators, or processing conditions through consistent electrical protocols.	Four-wire sensing and stated full-scale accuracy support comparable data across samples.
Quality assurance sampling	Executes standardized incoming, in-process, or final battery tests with defined cutoff and protection settings.	Programmable limits, repeatable steps, and EXCEL, TXT, or chart output simplify traceable review.
Academic battery research	Supports teaching and research projects involving capacity, charge-discharge behavior, rate studies, and cycling methods.	Broad program ranges and detailed recording parameters accommodate evolving experimental designs.
Engineering fault and protection studies	Uses configurable upper and lower voltage/current limits plus abnormal-condition criteria during controlled tests.	Hardware reverse-connection protection and settable exception protection help protect test operations.

Parameter	DC10 Specification
Input power supply	AC: 220V +/-10% / 50Hz
Input power	1800W
AD resolution	16bit
DA resolution	16bit
Input impedance	>=1MOhm
Channels per unit	8
Per-channel charging voltage output range	2.5V~20V
Per-channel discharging voltage output range	2.5V~20V
Voltage accuracy	+/- 0.05% of range (full scale)
Voltage stability	0.025%

Parameter	DC10 Specification
Per-channel charging current output range	20mA~10A
Per-channel discharging current output range	20mA~10A
Current accuracy	+/- 0.05% of range (full scale)
Current stability	0.025%
Per-channel output power	200W
Power stability	0.05%
Current response time	Hardware response time to 10A current: 20ms
Step time range	1~65535 minutes/step
Supported time format	00:00:00 (h, min, s)
Data recording condition: time delta t	0.01s~60000s
Data recording condition: voltage delta U	10mV~20V
Data recording condition: current delta I	5mA~10A
Recording frequency	100Hz
Charging modes	Constant-current charging, constant-voltage charging, constant-current constant-voltage charging
Charging cutoff conditions	Voltage, current, relative time, capacity
Discharging modes	Constant-current discharging, constant-power discharging
Discharging cutoff conditions	Voltage, current, relative time, capacity
Cycle test range	1~65535 cycles
Steps per cycle	255
Cycle nesting	Nested cycle function; maximum 4 nested layers
Safety protection settings	Voltage upper and lower limits, current upper and lower limits, delay time
Exception protection settings	Maximum current fluctuation during constant-current charge/discharge; current rise during constant-voltage charging; voltage drop during constant-current charging; voltage rise during constant-current discharging
Power-loss data protection	Supported
Hardware protection	Reverse-connection protection and reverse-connection prompt
Channel architecture	Constant-current source and constant-voltage source use independent dual closed-loop structure
Channel control mode	Independent control
Voltage and current detection sampling	Four-wire connection
Noise	<80dB
Host computer communication method	TCP/IP
Data output formats	EXCEL, TXT, charts
Communication interface	Ethernet 10/100M
Operating temperature range	10C~40C
Storage temperature range	10C~45C
Operating relative humidity range	30% ~ 80% RH (no water vapor condensation)
Storage relative humidity range	30% ~ 90% RH (no water vapor condensation)
Fixture type	Selected according to customer requirements
Per-unit chassis dimensions (WD H)	480 * 660 * 130 (mm)

Parameter	DC10 Specification
Cabinet dimensions (WDH)	606 * 800 * 1800 (mm)
SMBUS hardware compatibility	Compatible with SMBUS, HDQ, I2C communication protocols
SMBUS software compatibility	Compatible with standard field-information commands defined by Smart Battery Data Specification Revision 1.1
Smart battery data reading frequency	1S

Battery Constant Temperature Testing System

Item Number: DC14



Introduction

Battery constant temperature testing system for precise charge discharge evaluation of coin pouch prismatic and cylindrical cells with 0 to 60°C control stable uniform conditions and standards aligned testing for research manufacturing quality assurance and product validation applications

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Application	Description	Key Benefit
Battery Research and Development	Evaluate charge and discharge performance of coin, pouch, prismatic, and cylindrical cells under controlled temperatures during cell chemistry and design development.	Produces comparable environmental test data across development batches and cell formats.
Battery Manufacturing Inspection	Apply controlled-temperature screening to verify battery performance and identify process variation during production quality control.	Supports repeatable inspection workflows with defined temperature limits and stable chamber conditions.
Consumer Electronics and Electrical Products	Test batteries and related components used in electronics, electrical appliances, communications equipment, and instrumentation.	Helps assess performance consistency under representative operating temperatures.
Vehicle and Energy Technology Testing	Provide controlled thermal conditions for battery-related evaluation in vehicle, energy technology, and storage applications.	Supports structured performance comparison before system integration or product release.
Materials and Industrial Product Quality Testing	Test plastics, metals, chemicals, construction materials, food products, medical products, and other goods requiring controlled temperature exposure.	Extends the equipment beyond battery work for general product quality and environmental testing.
Aerospace and Defense Environmental Evaluation	Conduct temperature-related testing aligned with applicable environmental test methods for aerospace and defense-related products.	Provides a controlled chamber platform for standardized low- and high-temperature evaluation.

Parameter	Specification
Site-facing identifier	DC14
Nominal volume	162 L
Inner chamber dimensions W × D × H	460 mm × 400 mm × 880 mm
Overall dimensions W × D × H	570 mm × 570 mm × 1530 mm
Weight	90 kg
Power supply	220 V, 2 kW
Applicable test environment	Ambient temperature +5°C to +40°C; relative humidity ≤85%; chamber without specimens
Test method references	GB/T 5170.2-2008 temperature test equipment; GB/T 5170.5-2008 damp-heat test equipment
Temperature range	0°C to +60°C
Temperature fluctuation	≤0.5°C; when expressed according to GB/T5170.2-1996, fluctuation is ≤±0.25°C
Temperature deviation	±1°C
Temperature uniformity	≤±1°C
Average heating rate	3°C/min
Average cooling rate	0.5°C/min

Parameter	Specification
Load condition for stated test performance	Load not exceeding 35 kg/m ³ based on steel heat capacity; no active damp or heat load during damp-heat testing
Insulation exterior material	High-quality matte stainless steel plate
Insulation interior material	High-quality mirror stainless steel plate
Door-seal temperature range and service life	-100°C to +300°C; service life 10 years
Chamber insulation material	Glass fiber (as specified in the reference material)
Air circulation fan	Multi-wing centrifugal circulation fan with aluminum-alloy rotating blades for high- and low-temperature operation
Airflow method	FLOW THROW; horizontal diffusion and vertical heat-exchange arc circulation
Observation window	One transparent electrically heated hollow tempered-glass window located on the door
Cable ports	Five ports, $\phi 45$ mm, located on the left side of the chamber
Interior lighting	High-efficiency, long-life energy-saving lamp
Casters	Four mobile casters
Sample rack	Stainless steel sample-tray rack, five levels, five pairs of guide rails
Rack distributed load	10 kg per level
Maximum total sample load	80 kg maximum accumulated load inside the chamber
Door configuration	Single-opening hinged door; right-side hinge when facing the chamber; includes observation window and lighting
Control panel	Controller display, power switch, and status indicator lights
Mechanical compartment	Refrigeration unit and drain hole; condenser fan and condenser air inlet
Electrical control cabinet	Integrated circuit board, air circuit breaker, and push-button switch
Heater type	Nickel-chromium alloy resistance heating tube
Heater control	Non-contact periodic pulse-width modulation using SSR solid-state relay
Heater power	1.4 kW
Power cable and drain-hole location	Lower rear side of the chamber
Refrigeration operating mode	Single-stage compression
Refrigeration compressor	Fully enclosed, low-noise rotary compressor
Evaporator	Finned-tube heat exchanger, also used as dehumidifier
Condenser	Air-cooled finned-tube heat exchanger
Expansion device	Expansion valve plus capillary tube
Plate heat exchanger	Stainless steel brazed plate heat exchanger
Refrigeration control	The control system automatically adjusts compressor operation for an optimal energy-saving condition according to test conditions
Evaporator cooling control	Control system drives solenoid-valve switching
Compressor return-gas cooling	Return-gas cooling circuit provided
Refrigerant	R134a; ozone depletion potential is 0. R23 is used for cascade refrigeration systems as specified in the reference material
Controller manufacturer and type	Shanghai Jiutu controller
Display	JTSH200, 5-inch display
Operating modes	Program mode and constant-value mode
Setting interface	JTSH200 Chinese menu, freely selectable, with button-screen input
Program capacity	JTSH200; maximum 1 program, maximum 1 segment, unlimited cycles
Setting range	Temperature adjusted according to the equipment temperature operating range
Resolution	Temperature: 0.1°C; time: 1 min; humidity: 0.1% RH for temperature-and-humidity test equipment
Temperature input and measurement	PT100 platinum resistance thermometer

Parameter	Specification
Temperature control method	Anti-integral-saturation PID; BTC balanced temperature control + DCC intelligent cooling-capacity control + DEC intelligent electrical control for temperature test equipment
Additional control functions	Fault alarm with cause and handling prompts; power-failure protection; upper- and lower-limit temperature protection
Applicable low-temperature method	GB/T2423.1-2008, IEC60068-2-1:2007, low-temperature test method Ab
Applicable high-temperature method	GB/T2423.2-2008, IEC60068-2-2:2007, high-temperature test method Bb
Additional low-temperature method	GJB150.4-1986 low-temperature test
Additional high-temperature method	GJB150.3-1986 high-temperature test
Constant damp-heat method	GB/T2423.3-2006, IEC60068-2-78:2007, constant damp-heat test method Cab
Alternating damp-heat method	GB/T2423.4-2008, IEC60068-2-30:2005, alternating damp-heat test method Db
Additional damp-heat method	GJB150.9-1986 damp-heat test, Figure 1 and Figure 2
Listed temperature-change and environmental references	GB/T2423.1-2008 low-temperature chamber test method; GB/T2423.22-2002 temperature-change test method; GB/T2423.2-2008 high-temperature chamber test method; IEC60068-2-2.1974 high-temperature chamber test method; IEC60068-2-1.1990 low-temperature chamber test method
Refrigeration safety protection	Compressor overheat, compressor overcurrent, compressor overpressure, and condenser-fan overheat protection
Chamber safety protection	Adjustable overtemperature protection, air-circulation-channel limit overtemperature protection, and fan-motor overheat protection
Electrical safety protection	Total power phase-sequence and phase-loss protection for three-phase power; overload and short-circuit protection
Power cable configuration	220 V, 2 kW
Main power switch	CHINT residual-current protection
Transportation configuration	Integrated test chamber transported as a complete unit
Installation site requirements	Level floor, good ventilation, no strong vibration, no strong electromagnetic field, no flammable, explosive, corrosive materials or dust, and adequate operating and maintenance clearance
Environmental operating conditions	Temperature: 5°C to 40°C; relative humidity: ≤85%; atmospheric pressure: 86 kPa to 106 kPa
Prohibited specimens	Corrosive substances; specimens with strong electromagnetic emissions; radioactive substances; highly toxic substances; and specimens that may explode or volatilize during testing or storage

Battery Internal Resistance Tester

Item Number: DC16



Introduction

High precision battery internal resistance tester measures AC IR and DC voltage with four wire accuracy, 10 microohm resolution, 66 readings per second, programmable sorting, and automation ready SCPI Modbus connectivity for lithium, storage, production, and research testing.

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Application	Description	Key Benefit
Lithium battery cell R&D	Measure AC internal resistance and DC voltage on lithium battery samples during product development and electrical characterization.	Simultaneous dual-parameter testing supports faster comparison of cell samples.
Dry-cell incoming inspection	Screen dry batteries before use in manufacturing, laboratory evaluation, or quality-control workflows.	Four-wire resistance measurement supports consistent low-resistance evaluation.
Cylindrical and pouch cell production	Test cylindrical cells and pouch cells at manual stations or within automated handling equipment.	Fast sampling up to 66 times/s and Handler I/O support higher-throughput test operations.
Power battery pack verification	Check resistance and voltage characteristics of power battery packs used in battery manufacturing and service inspection.	The 30 Ohm resistance range and 20 V voltage range cover relevant electrical test values.
Energy-storage battery testing	Evaluate energy-storage batteries and accumulators for research, production, or inspection processes.	Comparator sorting provides structured Hi/IN/Lo classification for repeatable decisions.
Button-cell quality control	Inspect button cells with fine resistance resolution and controlled measurement current.	The 300 mOhm range offers 10 microohm resolution for detailed screening.
Nickel-metal hydride and nickel-cadmium battery testing	Measure rechargeable NiMH and NiCd batteries during product validation or routine quality checks.	Automatic or manual resistance ranging simplifies testing across varying resistance levels.
Supercapacitor ESR measurement	Measure the ESR AC impedance of supercapacitor batteries using the instrument's AC resistance capability.	A dedicated 1 kHz AC source provides a defined test condition for comparative evaluation.

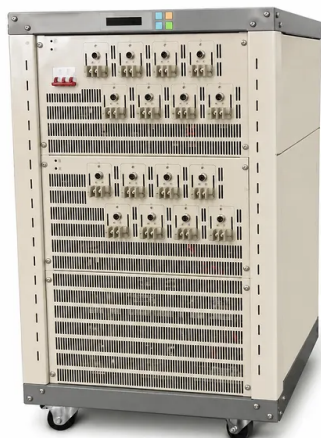
Parameter	DC16 Specification
Product type	Battery Meter
System composition	Main tester and test leads
Measurement parameters	AC internal resistance (AC-IR), DC voltage (DC-V)
Resistance display range	0.01mOhm-310hm
Voltage display range	1mV-20V
Display	3.5 inch TFT color LCD
Signal source	1kHz+/-0.2Hz AC
AC-IR resistance ranges	300mOhm; 30hm; 300hm
300mOhm range maximum reading	310.00
30hm range maximum reading	3.1000
300hm range maximum reading	31.000

Parameter	DC16 Specification
300mOhm range resolution	10microOhm
30hm range resolution	100microOhm
300hm range resolution	1mOhm
300mOhm range measurement current	10mA
30hm range measurement current	1mA
300hm range measurement current	100microA
AC-IR accuracy	+/-0.5%rdg. +/-0.02FS; add +/-2dgt at medium/fast (M/F); add +/-3dgt at extra-fast (EX.F)
Resistance range selection	Three ranges; automatic and manual
DC-V range	20V
DC-V maximum reading	+/-20.000V
DC-V resolution	1mV
DC-V accuracy	+/-0.05%rdg. +/-0.002FS; add +/-0.001FS at medium/fast; add +/-0.002FS at extra-fast
Sampling rate, slow (S)	3 times/s
Sampling rate, medium (M)	10 times/s
Sampling rate, fast (F)	30 times/s
Sampling rate, extra-fast (EX.F)	66 times/s
Correction	Full-range short-circuit zeroing
Comparator records	30 programmable records
Comparator sorting	10-grade sorting; grade counting
Comparator judgment	Resistance and voltage Hi/IN/Lo; combined judgment; interface display; indicator light; beeper; external I/O output signal
Beeper	GD/NG/OFF
Trigger modes	Internal trigger, manual trigger, external trigger, auto trigger, BUS
Communication interfaces	RS232 / RS485 / LAN (optional) / Handler (I/O)
Communication protocols	SCPI / MODBUS
RS232 and RS485 protocol support	Compatible with SCPI and Modbus
Optional LAN protocol support	SCPI
Power supply voltage	AC 100V-240V
Power supply frequency	47Hz-63Hz
Maximum power	<15VA
Dimensions	325mm x 215mm x 80mm (LWH)
Dimensions with foot pads	325mm x 215mm x 96.5mm (LWH)
Weight	3kg

5V 30A Lithium Ion Battery Supercapacitor Testing Equipment

Battery Tester

Item Number: DC12



Introduction

High precision 5V 30A battery tester for lithium ion batteries and supercapacitors delivers independent 16 channel charge discharge cycling pulse and DCIR testing with 10Hz recording robust protection and centralized data management.

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Application	Description	Key Benefit
Lithium-ion cell R&D	Execute charge, discharge, capacity, rate, and cycle-life protocols on development cells within the stated 5 V and 30 A channel limits.	Independent channels enable parallel comparison of cell formulations and operating conditions.
Supercapacitor characterization	Apply constant-current, constant-power, pulse, and DCIR sequences to assess energy-storage behavior and resistance trends.	Fast recording and custom DCR points support time-resolved performance analysis.
Battery incoming inspection	Verify charge acceptance, discharge response, capacity-related cutoff behavior, and protection-limit compliance for incoming cells.	Repeatable programmable conditions support consistent supplier and lot evaluation.
Cell manufacturing validation	Run defined cycling and pulse procedures on pilot-line or production-validation samples.	Up to 65,535 cycles and nested programs support long-duration verification plans.
Materials research laboratories	Compare electrochemical cell behavior after changes in electrode, electrolyte, separator, or assembly parameters.	Multiple charge and discharge modes allow protocols to match research objectives.
Quality and reliability testing	Subject cells to controlled high-current operation and monitor voltage, current, time, and capacity cutoff conditions.	Configurable safety limits and power-loss data protection improve test continuity and control.
Academic electrochemistry programs	Teach and conduct structured battery and supercapacitor testing with networked data collection.	Centralized database storage and common file exports simplify result review.
Terminal and pouch-cell evaluation	Select alligator, polymer, or ring-terminal fixtures according to the tested cell connection requirement.	Appropriate fixture selection supports practical contact arrangements for different samples.

Parameter	Specification
Site-facing identifier	DC12
Input power supply	AC 380V $\pm$ 10% / 50Hz
Input active power	4253 W
AD resolution	16bit
DA resolution	16bit
Input impedance	$\geq$ 1M Ω
Total channels	16
Channel control mode	Independent control
Constant-current and constant-voltage source structure	Dual closed-loop structure
Voltage and current detection sampling	Four-wire connection

Parameter	Specification
Noise	<85dB
Leakage current	0.005mA
IP protection rating	IP20
Communication interface	Network port
Host computer communication	Based on TCP/IP protocol
Database	MySQL database centralized management of test data
Data output	EXCEL2003,2010, TXT
Server disk configuration	500GB
Server operating system	Windows 7
Per-unit chassis dimensions (WDH)	18U (19"), 6006001000 mm
Compatibility note	Not compatible with batteries using protection boards with a soft-start function

Electrical Control Category	Parameter	Specification
Voltage	Constant-voltage range control	0.025V~5V
Voltage	Minimum discharge voltage	2.5V
Voltage	Accuracy	± 0.1% of FS
Voltage	Stability	± 0.1% of FS
Current	Output range per channel	0.15A~30A
Current	Accuracy	± 0.1% of FS
Current	Constant-voltage cutoff current	0.06A
Current	Stability	± 0.1% of FS
Power	Maximum output power per channel	150W
Power	Stability	± 0.2% of FS
Time	Current response time	Maximum current rise time 20ms (10% to 90% or 90% to 10%)
Time	Step time range	≤(365*24) hours/step; time format supports 00:00:00.000 (h, min, s, ms)

Data Recording Category	Parameter	Specification
Data recording conditions	Minimum time interval	100ms
Data recording conditions	Minimum voltage interval	10mV
Data recording conditions	Minimum current interval	60mA
Data recording	Recording frequency	10Hz

Test Function	Mode or Parameter	Specification
Charge	Charge modes	Constant-current charging, constant-voltage charging, constant-current constant-voltage charging, constant-power charging
Charge	Cutoff conditions	Voltage, current, relative time, capacity, $-\Delta V$
Discharge	Discharge modes	Constant-current discharge, constant-power discharge, constant-resistance discharge, constant-voltage discharge, constant-current constant-voltage discharge
Discharge	Cutoff conditions	Voltage, current, relative time, capacity
Pulse mode charge	Modes	Constant-current mode, constant-power mode
Pulse mode discharge	Modes	Constant-current mode, constant-power mode

Test Function	Mode or Parameter	Specification
Pulse mode	Minimum pulse width	500ms
Pulse mode	Pulse count	A single pulse step supports 32 different pulses
Pulse mode	Charge/discharge continuous switching	One pulse step can continuously switch from charge to discharge
Pulse mode	Cutoff conditions	Voltage, relative time
DCIR test	DCR calculation	Supports customized sampling points for DCR calculation
Cycling	Cycle test range	1~65535 times
Cycling	Steps per single cycle	254
Cycling	Cycle nesting	Nested cycle function; maximum support for 3 nesting levels

Protection and Operating Environment	Parameter	Specification
Protection	Power-loss data protection	Included
Protection	Offline testing function	Included
Protection	Configurable safety protection conditions	Voltage upper limit, voltage lower limit, current upper limit, current lower limit, capacity upper limit, delay time
Protection	Reverse-connection protection	Included
Operating environment	Operating temperature range	0°C~40°C (within 25±10°C range, measurement accuracy is guaranteed: accuracy drift 0.005% of FS /°C)
Operating environment	Storage temperature range	-10°C~50°C
Operating environment	Operating relative humidity range	≤70% RH (no water vapor condensation)
Operating environment	Storage relative humidity range	≤80% RH (no water vapor condensation)

Fixture Category	Specification
Fixture type	Alligator fixture
Available fixture options	Alligator fixture, polymer fixture, ring-terminal fixture
Fixture selection note	Select one of the above fixtures per unit; images are for reference only and the actual product prevails

5V 20Ma Coin Cell Battery Tester Battery Testing Equipment

Item Number: DC02



Introduction

Eight channel 5V 20mA coin cell battery testing equipment delivers programmable charge discharge cycling pulse and DCIR analysis for electrode research formation grading and reliable small battery performance evaluation.

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Application	Description	Key Benefit
Lithium-ion coin cell formation	Apply controlled constant-current, constant-voltage, or combined charge sequences to newly assembled laboratory coin cells.	Eight independently controlled channels allow multiple formation recipes to run in parallel.
Electrode material screening	Compare small cells made with candidate cathode, anode, binder, conductive additive, or electrolyte formulations.	Low-current ranges beginning at 5uA support controlled electrochemical testing of research-scale cells.
Capacity grading	Execute repeatable charge-discharge routines and terminate on voltage, capacity, energy, current, or time conditions.	Programmable cutoff logic supports consistent grading criteria across a test batch.
Cycle-life evaluation	Run long-term cycling protocols for coin cells under defined operating windows and step sequences.	Up to 65535 cycles, 254 steps per cycle, and three levels of nesting support sophisticated cycle plans.
DCIR characterization	Use custom selected data points to calculate DCIR during battery evaluation.	Integrated DCIR calculation capability supports structured resistance analysis without separating the workflow.
Pulse-power testing	Assess cell response through constant-current or constant-power charge and discharge pulses.	500ms minimum pulse width and 32 distinct pulses per pulse step support controlled transient studies.
Ni-MH and Zn-Mn watch battery testing	Evaluate compatible nickel-metal hydride and zinc-manganese watch batteries with appropriate programmed charge and discharge methods.	The 25mV to 5V constant-voltage control range accommodates small-cell test requirements.
Academic teaching and laboratory validation	Run managed multi-cell practical experiments, verification routines, and battery-performance studies.	Centralized database management, Ethernet communication, and standard data export simplify result review.

Parameter	Specification
Site-facing identifier	DC02
Equipment type	8-channel coin cell battery testing equipment
Input power supply	AC 220V $\pm$ 10% / 50Hz
Input active power	25W
AD resolution	16bit
DA resolution	16bit
Input impedance	$\geq$ 1G Ω
Total channels	8
IP protection rating	IP20
Noise	<45dB
Leakage current	0.005 μ A
Channel control mode	Independent control
Channel architecture	Constant-current source and constant-voltage source use dual closed-loop structure

Parameter	Specification
Voltage and current detection sampling	Four-wire connection
Constant-voltage control range	25mV~5V
Minimum discharge voltage	-5V
Voltage accuracy	± 0.05% of FS
Voltage stability	± 0.05% of FS
Per-channel current output range, range 1	5uA~1mA
Per-channel current output range, range 2	1mA~10mA
Per-channel current output range, range 3	5mA~20mA
Current accuracy	± 0.05% of FS
Current stability	± 0.05% of FS
Constant-voltage cutoff current, range 1	2μA
Constant-voltage cutoff current, range 2	0.02mA
Constant-voltage cutoff current, range 3	0.04mA
Maximum output power per channel	0.1W
Power stability	± 0.1% of FS
Current response time	<500μs (10%FS~90%FS)
Work-step time range	≤(365*24) hours/step
Supported time format	00□ 00□ 00□ 00(h□ min□ s□ ms)
Minimum data-recording time interval	100ms
Minimum data-recording voltage interval	10mV
Minimum data-recording current interval, range 1	2uA
Minimum data-recording current interval, range 2	0.02mA
Minimum data-recording current interval, range 3	0.04mA
Recording frequency	10Hz
Charge modes	Constant-current charging, constant-voltage charging, constant-current constant-voltage charging, constant-power charging
Charge cutoff conditions	Voltage, current, relative time, capacity, energy, -ΔV
Discharge modes	Constant-current discharge, constant-power discharge, constant-resistance discharge, constant-voltage discharge, constant-current constant-voltage discharge
Discharge cutoff conditions	Voltage, current, relative time, capacity, energy
Pulse charge modes	Constant-current mode, constant-power mode
Pulse discharge modes	Constant-current mode, constant-power mode
Minimum pulse width	500ms
Pulses per single pulse work step	Supports 32 different pulses
Charge-discharge switching	One pulse work step can continuously switch from charging to discharging
Pulse cutoff conditions	Voltage, relative time
DCIR test	Supports custom point selection for DCIR calculation
Cycle test range	1~65535 cycles
Work steps per single cycle	254
Cycle nesting	Nested-cycle function; maximum 3 levels of nesting
Power-loss protection	Data protection on power failure
Offline testing	Supported

Parameter	Specification
Configurable safety protection conditions	Voltage upper limit, voltage lower limit, current upper limit, current lower limit, capacity upper limit, delay time
Database	MySQL database for centralized test-data management
Host-computer communication	Based on TCP/IP protocol
Server operating system	Windows 7
Data output	EXCEL2003,2010 TXT
Server disk configuration	500GB
Communication interface	Ethernet port
Operating temperature range	0°C~40°C 25±10°C 0.005% of FS /°C
Storage temperature range	-10°C~50°C
Operating relative humidity range	≤70% RH
Storage relative humidity range	≤80% RH
Fixture type	Upper and lower fixture
Available test-instrument accessories	Test instrument fixture, alligator fixture, polymer fixture, wire lug
Fixture and accessory image note	Images are for reference only; actual product shall prevail
Per-unit chassis size (WDH)	1U 19" 48331048 mm
Equipment image note	Images are for reference only; actual product shall prevail

20V 10A Battery Tester Battery Testing Equipment

Item Number: DC09



Introduction

20V 10A battery tester and battery testing equipment with 8 independent channels, precise charge discharge control, cycling, SMBUS compatibility, safety protection, and exportable data for demanding battery development and validation programs worldwide in laboratories.

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Application	Description	Key Benefit
Lithium-Ion Cell Research	Apply programmable constant-current, constant-voltage, constant-current/constant-voltage charging, and controlled discharge profiles to rechargeable cells.	Produces repeatable electrical data for chemistry screening, electrode evaluation, and cell-performance comparison.
Battery Formation and Aging	Configure long-duration charge, discharge, and cycle sequences with up to 1~65535 cycles and 255 steps per cycle.	Supports structured formation, capacity retention, cycle-life, and degradation studies.
Battery Quality Control	Use defined voltage, current, capacity, and relative-time cutoff conditions to verify incoming cells or production samples.	Improves test consistency and provides exportable records for quality review and traceability.
High-Current Performance Testing	Deliver up to 10A per channel with a 20ms hardware response to 10A for load and response evaluations.	Enables controlled investigation of current capability and dynamic electrical behavior.
Battery Management Communication Validation	Use SMBUS compatibility with HDQ and I2C communication protocols, plus compatibility with standard fields and commands defined by Smart Battery Data Specification Revision 1.1.	Helps engineers assess smart battery communication and validate data exchange behavior.
Advanced Materials Research	Evaluate experimental electrodes, cells, and energy-storage materials using configurable electrical profiles and condition-based recording.	Connects material development with measurable charge, discharge, and cycling performance.
Academic and Laboratory Testing	Run independent test programs across eight channels and export results as EXCEL, TXT, or charts.	Makes parallel experiments easier to organize, compare, analyze, and document.

Specification Category	Parameter	Specification
Identification	Product Item Number	DC09
Electrical Performance	Input power supply	AC□ 220V ±10% / 50Hz
Electrical Performance	Input power	1800W
Electrical Performance	Resolution	AD□ 16bit□ DA□ 16bit
Electrical Performance	Input impedance	≥1MΩ
Voltage	Per-channel charging output range	2.5V~20V
Voltage	Per-channel discharging output range	2.5V~20V
Voltage	Accuracy	± 0.05% of range□□□□

Specification Category	Parameter	Specification
Voltage	Stability	0.025%
Current	Per-channel charging output range	20mA~10A
Current	Per-channel discharging output range	20mA~10A
Current	Accuracy	± 0.05% of range□□□□
Current	Stability	0.025%
Power	Single-channel output power	200W
Power	Stability	0.05%
Time	Current response time	Hardware response time to 10A is 20ms
Time	Step time range	1~65535 minutes/step
Time	Supported time format	00□ 00□ 00 (h□ min□ s)
Data Recording	Time change condition	$\Delta t_{\square\square}$ 0.01s~60000s□
Data Recording	Voltage change condition	$\Delta U_{\square\square}$ 10mV~20V□
Data Recording	Current change condition	$\Delta I_{\square\square}$ 5mA~10A□
Data Recording	Recording frequency	100Hz
Charging	Charging modes	Constant-current charging; constant-voltage charging; constant-current/constant-voltage charging
Charging	Cutoff conditions	Voltage, current, relative time, capacity
Discharging	Discharging modes	Constant-current discharge; constant-power discharge
Discharging	Cutoff conditions	Voltage, current, relative time, capacity
Cycling	Cycle test range	1~65535 cycles
Cycling	Steps per cycle	255
Cycling	Nested cycling	Supports nested cycles with a maximum of 4 nesting levels
Protection	Safety protection settings	Configurable voltage upper and lower limits, current upper and lower limits, and delay time
Protection	Abnormal-condition protection	Configurable maximum constant-current charge/discharge fluctuation amplitude, current-rise amplitude during constant-voltage charging, and voltage-drop amplitude during constant-current charging
Protection	Additional abnormal-condition monitoring	Voltage-rise amplitude during constant-current discharging
Protection	Power-loss data protection	Supported
Protection	Hardware protection	Reverse-connection protection and reverse-connection alert
Channel Design	Current and voltage source structure	Independent dual closed-loop structure for constant-current and constant-voltage sources
Channel Design	Channel control mode	Independent control
Channel Design	Voltage and current detection sampling	Four-wire connection
Channels	Channels per unit	8
Noise	Noise level	<80dB
Communication	Host-computer communication	TCP/IP
Communication	Communication interface	Ethernet 10/100M
Data Output	Output formats	EXCEL, TXT, charts
Working Environment	Operating temperature range	10°C~40°C
Working Environment	Operating relative humidity range	30% ~ 80% RH□ without condensation□

Specification Category	Parameter	Specification
Storage Environment	Storage temperature range	10°C~45°C
Storage Environment	Storage relative humidity range	30% ~ 90% RH□ without condensation□
Fixture	Fixture type	Selected according to customer requirements
Dimensions	Unit cabinet dimensions (WDH)	480 * 660 * 130 (mm)
Dimensions	Cabinet dimensions (WDH)	606 * 800 * 1800 (mm)
SMBUS	Hardware compatibility	Compatible with SMBUS, HDQ, and I2C communication protocols
SMBUS	Software compatibility	Compatible with standard specification field information commands defined by Smart Battery Data Specification Revision 1.1
SMBUS	Data reading frequency	1S

5V 5A Lithium Ion Battery Testing Equipment Battery Tester

Item Number: DC13



Introduction

5V 5A lithium ion battery testing equipment with four channels, high precision current control, fast sampling, DCIR measurement, pulse testing, and secure data management for advanced research applications

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Application	Description	Key Benefit
Lithium-Ion Cell Development	Characterize prototype cells through controlled formation, capacity testing, rate testing, and repeated charge-discharge cycling.	Generates consistent electrochemical data for cell design decisions and formulation comparison.
Battery Materials Research	Evaluate electrodes, separators, electrolytes, and material modifications under programmed electrical conditions.	Supports accurate comparison of material performance across multiple test channels.
DCIR and Pulse Response Testing	Apply short, controlled current pulses to examine dynamic resistance, voltage response, and transient behavior.	Provides high-speed response data useful for power capability and model development.
Cell Quality Control	Run repeatable verification procedures for incoming cells, pilot production, or finished battery components.	Improves test consistency and creates traceable records for quality review.
Academic and Institutional Research	Conduct programmable experiments involving cycling, pulse loads, capacity limits, and energy measurements.	Offers broad test-method flexibility for changing research requirements.
Battery Pack and Power-System Evaluation	Assess cell behavior under constant-power, constant-resistance, and application-relevant current profiles.	Helps researchers understand performance under realistic operating conditions.

Parameter	Specification
Product item number	DC13
Device main channel quantity	4
Input power supply	AC 220V +10% / -20%, 50Hz
Input power	300W
AD resolution	16bit
DA resolution	16bit
Input impedance	≥ 500MQ in power-on state; leakage current is 100uA when powered off
Channel characteristics	Four ranges; wide dynamic range; high-speed sampling; high precision
Fixture type	Universal fixture
Server operating system	Windows 7 / Windows10
Communication method	TCP/IP protocol, 100M Ethernet
Communication interface	Ethernet port
Database	MySQL database for test data management
Data output formats	EXCEL2003, 2010, TXT

Parameter	Specification
Voltage range per channel	Charge: -5 ~ +5V; discharge: +5 V ~ -5V
Voltage accuracy	± 0.02% of FS
Voltage stability	±0.005% of FS
Single-channel output power	25W
Power stability	± 0.01% of FS
Current response time	≤ 100μs (10% to 90% or 90% to 10%)
Minimum step time	≥ 10ms
Current range 1	0.1μA---150μA
Current range 2	[1]50μA---5mA
Current range 3	5mA---150mA
Current range 4	150mA---5000mA
Current accuracy	± 0.02% of FS
Current accuracy, range 1	± 30nA
Current accuracy, range 2	± 1μA
Current accuracy, range 3	± 30μA
Current accuracy, range 4	± 1mA
Current stability	±0.005% of FS
Data recording condition, time interval	Time Δt: ≥ 1ms
Data recording condition, voltage interval	Voltage ΔU: ≥ 1mV
Data recording condition, current interval	Current ΔI: ≥ 100nA
Recording frequency	1000Hz in continuous charge-discharge mode; individual pulse recording in GSM pulse mode
Charge modes	Constant-current charge; constant-current/constant-voltage charge; constant-voltage charge; constant-power charge; constant-power/constant-voltage charge; constant-resistance charge
Charge cutoff conditions	Voltage, current, relative time, capacity, energy, power
Discharge modes	Constant-current discharge; constant-power discharge; constant-resistance discharge; pulse discharge; constant-current/constant-voltage discharge
Discharge cutoff conditions	Voltage, current, relative time, capacity
Pulse charge mode	Constant-current mode
Pulse discharge mode	Constant-current mode
Minimum pulse width	400μs
Pulse segments per pulse step	16 different pulse segments
Pulse cutoff conditions	Voltage, pulse quantity, step time
DCIR testing	Supports DCIR measurement steps
Cycle measurement range	1~65535 cycles
Steps per single cycle	255
Nested cycle function	Supports nested cycles, maximum 4 levels of nesting
Software protection	Power-failure data protection; offline testing capability; configurable safety protection conditions
Configurable safety limits	Upper voltage limit; lower voltage limit; upper current limit; lower current limit; upper capacity limit protection; voltage fluctuation protection; current fluctuation protection
Voltage and current detection sampling	Four-wire connection
Barcode scanning	Software-supported; scanner configuration enables test data binding to barcodes; scanner not included
Operating temperature, accuracy-guaranteed range	25±5°C

Parameter	Specification
Operating temperature, limit-use range	25±20°C
Storage temperature range	0~60°C
Operating relative humidity	≤70% RH, without water vapor condensation
Storage relative humidity	≤80% RH, without water vapor condensation

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

5V 50mA Coin Cell Battery Testing Equipment Battery Tester

Item Number: DC03



Introduction

5V 50mA Coin Cell Battery Testing Equipment and Battery Tester for Precise Eight Channel Charge Discharge Cycling Pulse and DCIR Analysis with Flexible Controls Reliable Data Management and Export for Research Laboratories and Advanced Materials Development

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Application	Description	Key Benefit
Coin Cell Formation and Screening	Run controlled constant-current, constant-voltage, constant-current constant-voltage, or constant-power procedures on newly assembled coin cells.	Produces repeatable formation records across multiple samples and operating conditions.
Lithium Battery Electrode Evaluation	Compare electrode materials, active material loadings, binders, and formulations through controlled charge discharge cycling.	Enables direct performance comparison using consistent voltage, current, capacity, and time conditions.
Battery Cycle Life Research	Configure repeated charge and discharge sequences with up to 65,535 cycles and nested loop routines.	Supports long-term degradation studies and automated endurance testing.
Pulse Performance and Power Response	Apply multi-step current or power pulses, including continuous charge-to-discharge transitions, to study transient behavior.	Generates time-resolved response data for dynamic performance analysis.
DCIR Characterization	Define custom measurement points and calculate direct current internal resistance during selected test procedures.	Helps researchers track resistance changes associated with aging, materials, and operating conditions.
Academic and Advanced Materials Research	Operate independent channels for parallel experiments involving novel battery chemistries, separators, coatings, and cell components.	Improves laboratory throughput while preserving separate control of each experimental condition.
Battery Quality and Process Verification	Use configurable safety conditions, structured records, and Excel or TXT output for laboratory verification and reporting.	Strengthens traceability and simplifies data review across development and quality workflows.

Category	Parameter	Specification
Identification	Product item number	DC03
Power	Input power	AC 220 V $\pm$ 10% / 50 Hz
Power	Input active power	25 W
Resolution	AD resolution	16 bit
Resolution	DA resolution	16 bit
Measurement	Input impedance	$\geq$ 1 G Ω
Voltage	Constant-voltage control range	25 mV to 5 V
Voltage	Minimum discharge voltage	-5 V
Voltage	Accuracy	$\pm$ 0.05% of FS
Voltage	Stability	$\pm$ 0.05% of FS
Current	Channel output range one	5 μ A to 1 mA
Current	Channel output range two	1 mA to 25 mA
Current	Channel output range three	25 mA to 50 mA

Category	Parameter	Specification
Current	Accuracy	±0.05% of FS
Current	Constant-voltage cutoff current range one	2 µA
Current	Constant-voltage cutoff current range two	50 µA
Current	Constant-voltage cutoff current range three	100 µA
Current	Stability	±0.05% of FS
Power output	Maximum single-channel output power	0.25 W
Power output	Stability	±0.1% of FS
Time response	Current response time	<500 µs from 10% FS to 90% FS
Time control	Step time range	≤365 × 24 hours per step
Time control	Supported time format	00:00:00:00 (h, min, s, ms)
Data recording	Minimum time interval	100 ms
Data recording	Minimum voltage interval	10 mV
Data recording	Minimum current interval range one	2 µA
Data recording	Minimum current interval range two	50 µA
Data recording	Minimum current interval range three	100 µA
Data recording	Recording frequency	10 Hz
Charging	Charging modes	Constant-current charging; constant-voltage charging; constant-current constant-voltage charging; constant-power charging
Charging	Cutoff conditions	Voltage, current, relative time, capacity, -ΔV
Discharging	Discharging modes	Constant-current discharge; constant-voltage discharge; constant-current constant-voltage discharge; constant-power discharge; constant-resistance discharge
Discharging	Cutoff conditions	Voltage, current, relative time, capacity
Pulse	Charging pulse modes	Constant-current mode; constant-power mode
Pulse	Discharging pulse modes	Constant-current mode; constant-power mode
Pulse	Minimum pulse width	500 ms
Pulse	Pulse quantity	Up to 32 different pulses per pulse step
Pulse	Continuous charge discharge switching	One pulse step supports continuous switching from charging to discharging
Pulse	Cutoff conditions	Voltage, relative time
DCIR	DCIR calculation	Supports user-defined measurement points for DCIR calculation
Cycling	Cycle test range	1 to 65,535 cycles
Cycling	Steps per single cycle	254
Cycling	Nested loop capability	Maximum three levels of nested loops
Protection	Power-failure data protection	Supported
Protection	Offline testing	Supported
Protection	Configurable safety conditions	Voltage upper limit, voltage lower limit, current upper limit, current lower limit, capacity upper limit, delay time
Enclosure	IP protection rating	IP20
Channel design	Current and voltage source structure	Dual closed-loop structure
Channel control	Control mode	Independent control

Category	Parameter	Specification
Sampling	Voltage and current detection	Four-wire connection
Noise	Operating noise	<45 dB
Database	Data management	MySQL database for centralized test data management
Communication	Host computer communication	TCP/IP protocol
Server	Operating system	Windows 7
Data output	Export formats	EXCEL 2003, EXCEL 2010, TXT
Server storage	Disk configuration	500 GB
Interface	Communication interface	Ethernet port
Leakage	Leakage current	0.005 μ A
Capacity	Total equipment channel count	8
Operating environment	Working temperature range	0°C to 40°C
Operating environment	Measurement accuracy condition	Within 25 $\pm$ 10°C, accuracy drift is 0.005% of FS /°C
Storage environment	Storage temperature range	-10°C to 50°C
Operating environment	Working relative humidity	$\leq$ 70% RH, without water vapor condensation
Storage environment	Storage relative humidity	$\leq$ 80% RH, without water vapor condensation
Fixture	Fixture type	Upper and lower fixtures
Fixture accessories	Included or available fixture accessories	Tester fixture, alligator fixture, polymer fixture, wire lug
Dimensions	Each unit chassis dimensions W $\times$ D $\times$ H	1U, 19 in, 483 $\times$ 310 $\times$ 48 mm
Equipment presentation	Fixture and equipment images	Images are for reference only; actual delivered equipment shall prevail

5V12A Battery Tester 64 Channel Battery Test System

Item Number: DC05



Introduction

5V12A battery tester with 64 independent channels, 12A output, 60W per channel, precision voltage and current control, flexible cycling, safety protection, database management and export for battery research laboratories and pilot production workflows with reliable repeatability across demanding test programs.

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Application	Description	Key Benefit
Lithium Ion Cell Research	Run controlled formation, capacity, rate capability, and cycle-life protocols on laboratory-scale lithium-ion cells across 64 independent channels.	High parallel capacity improves sample throughput and supports statistically meaningful comparisons.
Polymer Battery Development	Apply constant-current constant-voltage charging, voltage limits, current limits, and optional temperature monitoring to polymer battery prototypes.	Flexible modes and configurable protection support controlled development of sensitive cell designs.
Battery Material Evaluation	Evaluate electrodes and experimental materials through repeatable charge-discharge, constant-power, constant-resistance, and cycling procedures.	Consistent electrical control helps isolate material performance differences from test variation.
Quality Control and Incoming Inspection	Compare production cells, incoming materials, or assembled batteries against defined voltage, current, capacity, and time criteria.	Independent channels enable parallel verification with centralized records and exportable results.
Academic and Advanced Materials Research	Build multistep test programs for university and research institute projects involving new chemistries, formats, and electrochemical behavior.	Nested cycles and up to 254 steps per cycle accommodate complex experimental protocols.
Long Duration Reliability Testing	Operate extended test sequences with step durations of up to 365 days while recording data at defined time, voltage, and current intervals.	Long-term automation supports repeatable endurance studies with reduced operator intervention.

Parameter	Specification
Site-facing identifier	DC05
Input power supply	AC 380V $\pm 10\%$ / 50Hz
Input active power	5486W
Resolution	AD: 16bit; DA: 16bit
Input impedance	$\geq 100k\Omega$
Constant-voltage control range	0.025V~5V
Minimum discharge voltage	0V
Voltage accuracy	$\pm 0.05\%$ of FS
Voltage stability	$\pm 0.05\%$ of FS
Per-channel output current range	0.06A~12A
Current accuracy	$\pm 0.05\%$ of FS
Constant-voltage cutoff current	0.024A
Current stability	$\pm 0.05\%$ of FS

Parameter	Specification
Maximum single-channel output power	60W
Power stability	± 0.1% of FS
Current response time	Maximum current rise time 20ms (10% to 90% or 90% to 10%)
Channel source architecture	Constant-current source and constant-voltage source use a dual closed-loop structure
Channel control mode	Independent control
Voltage and current detection sampling	Four-wire connection
Energy-saving efficiency	>65% (compared with conventional equipment)
Noise	<85dB

Category	Parameter	Specification
Time	Step time range	≤(365*24) hours/step; time format supports 00:00:00.000 (h, min, s, ms)
Data recording	Data recording conditions	Minimum time interval: 1s; minimum voltage interval: 10mV; minimum current interval: 24mA
Data recording	Recording frequency	1Hz
Charging	Charging modes	Constant-current charging, constant-voltage charging, constant-current constant-voltage charging, constant-power charging
Charging	Cutoff conditions	Voltage, current, relative time, capacity, -ΔV
Discharging	Discharge modes	Constant-current discharge, constant-power discharge, constant-resistance discharge, constant-voltage discharge, constant-current constant-voltage discharge
Discharging	Cutoff conditions	Voltage, current, relative time, capacity
Cycling	Cycle test range	1~65535 times
Cycling	Steps per single cycle	254
Cycling	Nested cycling	Nested cycling supported, maximum 3 levels

Parameter	Specification
Power-loss data protection	Included
Offline testing	Supported
User-defined safety protection	Supported; configurable parameters include upper voltage limit, lower voltage limit, upper current limit, lower current limit, upper capacity limit, and delay time
Anti-reverse-connection protection	Included
Database	MySQL database for centralized test data management
Host-computer communication	Based on TCP/IP protocol
Data output formats	EXCEL 2003, EXCEL 2010, TXT
Server disk configuration	500GB
Server operating system	Windows 7
Communication interface	Ethernet port

Parameter	Specification
Operating temperature range	0°C~40°C; within 25±10°C, measurement accuracy is guaranteed with accuracy drift of 0.005% of FS /°C
Storage temperature range	-10°C~50°C
Operating relative humidity	≤70% RH, without water vapor condensation
Storage relative humidity	≤80% RH, without water vapor condensation

Parameter	Specification
Total equipment channels	64
Fixture type	Alligator fixture
Available fixture options	Alligator fixture, polymer fixture, lug fixture; one fixture selected from these options
Single-unit chassis dimensions WDH	18U (19"), 6006001000mm
Fixture reference	Test instrument fixture images are for reference only; actual product shall prevail
Fixture selection note	Accessory fixture images are for reference only; actual configuration shall prevail

Parameter	Specification
Auxiliary channel types	Temperature, voltage
Temperature range with thermistor	-25°C~120°C
Temperature range with thermocouple	-200°C~260°C
Temperature accuracy	±1°C
Temperature resolution	0.1°C
Auxiliary voltage range	0V~5V
Auxiliary voltage accuracy	± 0.1% of FS
Temperature auxiliary channels per channel	Configurable as required, maximum 248 temperature auxiliary channels
Voltage auxiliary channels per channel	Configurable as required, maximum 248 voltage auxiliary channels
Auxiliary channel protection conditions	Configurable upper temperature limit, lower temperature limit, upper voltage limit, lower voltage limit, and single-cell voltage difference
Compatibility note	Not compatible with battery packs using protection boards with a soft-start function

5V 30A Battery Tester With Host Computer Connection

Item Number: DC08



Introduction

5V 30A battery tester with host computer connection delivers independent eight-channel charge discharge cycling pulse and DCIR testing, precise 16-bit measurement, centralized MySQL data management, and configurable safety protection for laboratory cell evaluation applications and research workflows demanding.

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Application	Description	Key Benefit
Lithium-ion cell charge-discharge characterization	Run independent constant-current, constant-voltage, constant-power, or constant-resistance profiles on multiple cells to assess charge and discharge response.	Eight independently controlled channels increase parallel laboratory throughput.
Cycle-life evaluation	Program repeated charge and discharge sequences using up to 65,535 cycles, 254 steps per cycle, and up to three nested cycle layers.	Supports long-duration life studies with structured, repeatable test logic.
DCIR measurement	Define custom data-sampling points during pulse testing to calculate DCIR under selected current and timing conditions.	Provides a configurable method for resistance analysis within the test workflow.
Pulse-power response testing	Apply constant-current or constant-power charge and discharge pulses with widths from 500 ms and up to 32 different pulses in one pulse step.	Captures transient cell response and enables controlled charge-to-discharge switching.
Battery R&D protocol development	Compare multiple cell designs, materials sets, or operating conditions using separate channel programs and detailed 10 Hz data recording.	Enables concurrent method development without requiring identical channel schedules.
Materials and electrode research	Evaluate electrochemical performance of research cells through controlled voltage, current, capacity, and relative-time cutoffs.	Helps relate formulation or processing changes to measured electrical behavior.
BMS communication studies	Use the optional CAN communication module to communicate with a BMS and acquire BMS data during testing.	Adds a path for correlating tester records with available BMS information.
Laboratory data consolidation	Store test data in the centralized MySQL database and export results for analysis on supported Windows-based server environments.	Improves traceability and accessibility of multi-channel test results.

Parameter	Specification
Site-facing identifier	DC08
Input power supply	AC 220V $\pm 10\%$ / 50Hz
Input active power	1.71 KW
Total channels	8
AD resolution	16bit
DA resolution	16bit
Input impedance	$\geq 100k\Omega$
Constant-voltage control range	0.025V~5V
Minimum discharge voltage	0V
Voltage accuracy	$\pm 0.05\%$ of FS

Parameter	Specification
Voltage stability	± 0.05% of FS
Output current range per channel, range 1	0.03A~6A
Output current range per channel, range 2	6A~30A
Current accuracy	± 0.05% of FS
Constant-voltage cutoff current, range 1	0.012A
Constant-voltage cutoff current, range 2	0.06A
Current stability	± 0.05% of FS
Maximum output power per channel	150 W
Power accuracy	±0.1% of FS
Power stability	±0.1% of FS
Maximum current rise time	20ms (10% to 90% or 90% to 10%)
Step time range	≤(365*24) hours/step
Time format	00:00:00 (h, min, s)
Minimum data-recording time interval	100ms (recording frequency 10Hz)
Minimum voltage recording interval	10mV
Minimum current recording interval, range 1	0.012A
Minimum current recording interval, range 2	0.06A
Charge modes	Constant-current charging, constant-voltage charging, constant-current constant-voltage charging, constant-power charging
Charge cutoff conditions	Main channel: voltage, current, relative time, capacity, -ΔV
Discharge modes	Constant-current discharge, constant-power discharge, constant-resistance discharge, constant-voltage discharge
Discharge cutoff conditions	Main channel: voltage, current, relative time, capacity
Pulse charge modes	Constant-current mode, constant-power mode
Pulse discharge modes	Constant-current mode, constant-power mode
Minimum pulse width	500ms
Pulses per pulse step	A single pulse step supports 32 different pulses
Charge-discharge switching	One pulse step can continuously switch from charging to discharging
Pulse cutoff conditions	Voltage, relative time
DCIR test	Supports customized sampling points for DCIR calculation
Channel paralleling	Up to 4 adjacent channels can be paralleled; pulse testing is not supported after paralleling
Cycle test range	1~65535 times
Steps per single cycle	254
Cycle nesting	≤3 layers
Power-loss data protection	Offline testing function available
Configurable safety protection	Upper voltage limit, lower voltage limit, upper current limit, lower current limit, delay time
Reverse-connection protection	Available
Energy-saving efficiency	>65% (compared with conventional equipment)
IP protection rating	IP20
Channel architecture	Constant-current source and constant-voltage source use a dual closed-loop structure
Channel control mode	Independent control
Voltage and current detection sampling	Four-wire connection
Noise	<75dB (measured at 1m)
Database	MySQL database for centralized management of test data

Parameter	Specification
Host computer communication	Based on TCP/IP protocol
Server disk configuration	500GB
Data output	EXCEL2003, 2010, TXT
Server operating systems	Windows 7, Windows10
Communication interfaces	Network port; optional CAN communication module supports BMS communication and BMS data acquisition
Operating temperature range	0°C~40°C (within 25±5°C, measurement accuracy is guaranteed: accuracy drift 0.005% of FS /°C)
Storage temperature range	-10°C~50°C
Operating relative humidity range	≤70% RH (no water vapor condensation)
Storage relative humidity range	≤80% RH (no water vapor condensation)
Fixture type	Optional
Available fixture examples	Polymer fixture; terminal lug fixture; select one fixture; images are for reference only and the actual product prevails
Compatibility note	Not compatible with batteries using protection boards with soft-start function

Integrated Constant Temperature Test Chamber For Battery Research And Materials Testing

Item Number: DC15



Introduction

Integrated constant temperature test chamber for pouch polymer and coin cell batteries delivers stable 0 to 60°C testing, rapid thermal transitions, PID control, Ethernet connectivity, and four-level insulated sample storage for reliable laboratory and production quality evaluation workflows.

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Application	Description	Key Benefit
Pouch Polymer Battery Testing	Maintains controlled temperatures for constant-temperature testing of new-energy pouch polymer batteries during research, process development, and performance evaluation.	Provides repeatable thermal conditions for comparing battery behavior and test results.
Coin Cell Battery Testing	Supports four-level placement of coin cells, with each shelf accommodating up to 40 cells under the specified arrangement.	Increases sample capacity while keeping test organization structured and electrically insulated.
Electronics and Semiconductor Manufacturing	Tests non-flammable and non-explosive electronic, electrical, instrumentation, materials, and semiconductor products at controlled temperatures.	Helps production and quality teams evaluate product response under defined thermal conditions.
Materials Research	Provides a stable environment for material screening, process studies, and controlled-temperature experiments in laboratory and advanced materials settings.	Improves consistency when assessing temperature-dependent material behavior.
Water Analysis and Environmental Research	Supports constant-temperature work related to water analysis in environmental laboratories, research institutes, and production organizations.	Delivers controlled conditions for more consistent analytical workflows.
Microbiology and Biological Culture	Used for bacteria and mold culture, microorganism cultivation, and preservation where a stable temperature is required.	Supports controlled biological procedures across routine and research applications.
Plant Cultivation and Breeding	Provides constant-temperature conditions for plant cultivation and breeding trials in agricultural, academic, and research environments.	Helps researchers maintain repeatable thermal conditions across growth experiments.
Livestock and Aquatic Research	Supports controlled-temperature testing and research activities in livestock, aquatic, agricultural, and related institutions.	Provides a versatile thermal platform for varied biological and production studies.

Parameter	Specification
Model	DC15
Nominal interior volume	200 L
Interior dimensions	W500 mm × D500 mm × H800 mm
Overall dimensions	W700 mm × D1200 mm × H1500 mm
Net equipment weight	Approximately 220 kg
Transport configuration	Integrated whole-unit transportation
Maximum transport dimensions without packaging	Refer to overall dimensions

Parameter	Specification
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Test environment conditions	Ambient temperature +25°C, relative humidity ≤85%, no specimen inside the chamber, unloaded condition
Temperature range	0 to 60°C
Temperature fluctuation	≤1°C, unloaded and temperature stabilized
Temperature deviation	±2.0°C, unloaded and temperature stabilized
Heating time	25°C to 60°C in ≤30 minutes
Cooling time	25°C to 0°C in ≤50 minutes

Component	Specification
Outer wall material	Quality cold-rolled steel plate with surface spray coating and baked-paint treatment
Inner wall material	SUS304 stainless steel plate
Insulation material	Polyurethane foam
Insulation thickness	50 mm
Air-conditioning passage	Axial-flow fan, heater, and evaporator
Cable access ports	Four ø50 mm ports with soft rubber plugs, located at the rear of the chamber
Casters	Four casters with brakes
Sample rack	Four-level electrically insulated sample rack
Sample rack load capacity	10 kg per level, evenly distributed
Lighting	LED lighting lamp
Control panel	Touch-control buttons
Heater	Stainless steel heating tube
Sample rack material	Electrically insulated Bakelite material
Battery types	Coin cells or pouch batteries
Battery placement	Four levels; each level can accommodate up to 40 coin cells
Sample rack customization	Available according to requirements
Battery fixing method	Sample rack configuration and fixation for coin cells and pouch batteries according to the required setup

Parameter	Specification
Heater control method	Contactless periodic pulse-width modulation using an SSR solid-state relay
Refrigeration compressor	Fully enclosed piston compressor
Cooling method	Air-cooled
Throttling device	Capillary tube
Refrigerant	R134a
Welding process	Nitrogen-protected welding
Controller	LED digital display with touch-key controller
Setting method	Touch keys
Temperature control method	Forced-circulation ventilation with balanced temperature regulation
Control logic	The control system automatically calculates PID output from the set temperature and adjusts heater output to achieve dynamic balance
Communication method	Standard Ethernet interface
Temperature control module	Independently developed module tested for high-low temperature impact, vibration, EMC, and related reliability performance

Connected System Component	Capacity or Configuration
Battery testing equipment	Up to 20 units with a total of 160 channels

Connected System Component	Capacity or Configuration
Host computer	Up to two units
Network switch	One unit

Parameter	Specification
Chamber safety protection	Leakage protection, short-circuit protection, and abnormal circulation-fan operation protection
Power cable	One single-phase plus protective-earth cable
Main power protection	Single-phase plus protective-earth leakage circuit breaker
Rated power supply	AC (220 ± 22)V, (50 ± 0.5)Hz, single-phase plus protective-earth line
Required protective-earth resistance	Less than 4Ω
Power capacity	6 kW
Maximum current	30 A
Site power arrangement	The user must provide an air or power switch of suitable capacity at the installation site; the switch must be dedicated exclusively to this equipment

Category	Requirement
Installation floor	Level floor with flatness ≤5 mm per 2 m
Ventilation	Good ventilation required
Vibration environment	No strong vibration around the equipment
Electromagnetic environment	No strong electromagnetic field affecting the equipment
Surrounding materials	No flammable, explosive, corrosive substances, or dust around the equipment
Maintenance clearance	Appropriate operating and maintenance space must be provided
Door clearance	Sufficient space must be available in front of the chamber for the door to open and close normally in any required position; no other object may be placed directly in front of the chamber door
Ambient temperature	5°C to 35°C
Ambient relative humidity	≤85%
Atmospheric pressure	86 kPa to 106 kPa
Door-opening effect	Opening the chamber door during a test will cause temperature fluctuation inside the chamber

Battery Testing Temperature Control System

Item Number: DC19



Introduction

Battery testing temperature control system provides a 240L stable 5C to 70C environment for accurate charging and discharging evaluation of coin pouch prismatic and cylindrical cells across research production and quality testing applications.

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Application	Description	Key Benefit
Coin cell charge-discharge evaluation	Test coin cells in a controlled 5C to +70C environment during research or routine performance assessment.	Supports comparison of electrical behavior under a defined thermal condition.
Polymer pouch cell testing	Place polymer pouch cells in the chamber for charging and discharging tests representing normal-use environmental conditions.	Provides a documented internal space and shelf geometry for test planning.
Prismatic battery quality testing	Evaluate prismatic batteries during production quality checks where temperature-controlled charging and discharging data are required.	Helps establish consistent chamber conditions through stated fluctuation, deviation, and uniformity values.
Cylindrical battery research	Use the system for controlled-temperature investigation of cylindrical cells during battery R&D.	Covers a specified 5C to +70C operating range stable from 5C.
Energy technology product testing	Assess battery-containing products used in energy technology under controlled environmental temperature conditions.	Enables defined heating and cooling sequences using stated average rates.
Vehicle-related battery evaluation	Conduct battery performance tests for vehicle-related products within a temperature-controlled chamber environment.	Supports use cases where battery charging and discharging data must be obtained under repeatable conditions.
Electronics and communications product quality testing	Evaluate batteries used in electronic, electrical, communications, or instrumentation products.	Gives quality teams a standards-referenced temperature test equipment basis.
Medical and aerospace product testing	Apply controlled battery testing to products for medical and aerospace sectors listed in the applicable fields.	Provides a specified chamber capacity, power requirement, and installation footprint for test-lab review.

Item	Specification
Site-facing identifier	DC19
Equipment type	Battery constant-temperature test system
Nominal volume	240L
Internal dimensions	Width 688mm x Depth 400mm x Height 882mm
External dimensions	Width 810mm x Depth 570mm x Height 1540mm
Shelf dimensions	Length 665mm x Width 400mm x Thickness 15mm
Height between shelf layers	120mm
Weight	120KG
Power supply	220V
Maximum power	2.5KW
Test environment	Ambient temperature +5~+40C, relative humidity <=85%, with no sample in the test chamber

Item	Specification
Test method	GB/T 5170.2-2008 Temperature test equipment
Test method	GB/T 5170.5-2008 Damp heat test equipment
Temperature range	5C~+70C (Stable from 5C)
Temperature fluctuation	$\leq 1C$ (Note: expressed according to GB/T5170.2-1996, fluctuation is $\leq \pm 0.5C$)
Temperature deviation	$\pm 1C$
Temperature uniformity	Less than or equal to $\pm 1C$
Heating time	4C/min (average heating rate)
Cooling time	0.5C/min (average cooling rate)
Applicable battery types	Coin cells, polymer pouch batteries, prismatic batteries, cylindrical batteries
Applicable fields	Energy technology, electronics, electrical appliances, communications, instrumentation, vehicles, plastic products, metal products, food, chemicals, building materials, medical products, aerospace products

Battery Tester Internal Resistance Voltage Temperature Measurement

Item Number: DC17



Introduction

Portable battery tester **DC17** measures internal resistance terminal voltage and temperature with four wire AC testing USB connectivity wireless expansion and reliable field performance for battery maintenance production inspection and laboratory evaluation workflows and quality control teams worldwide.

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Application	Description	Key Benefit
Stationary backup battery maintenance	Check internal resistance and DC terminal voltage of individual batteries in standby power systems during scheduled maintenance.	Helps identify batteries or terminal paths requiring closer inspection before service reliability is affected.
Battery manufacturing incoming inspection	Evaluate received cells or battery assemblies before they enter production or assembly operations.	Provides repeatable resistance, voltage, and temperature data for documented supplier-quality decisions.
Battery module assembly verification	Inspect cell connections, terminals, and assembled module electrical condition after joining operations.	Microohm-level resolution supports detection of small resistance changes in critical current paths.
Research laboratory cell evaluation	Compare electrical resistance, terminal voltage, and test temperature during controlled battery research workflows.	Brings three relevant parameters into one portable measurement process.
Electric mobility service operations	Perform DC battery terminal checks during maintenance of low-voltage battery systems and related assemblies.	The plus or minus 60 V DC measurement range supports practical service-side voltage verification.
Telecommunications power-system inspections	Assess battery condition in communications backup installations using scheduled field checks.	Battery-powered operation and USB communication support portable, traceable inspection routines.
Industrial UPS maintenance	Measure battery electrical condition and surface or connection temperature in uninterruptible power system service programs.	Supports condition-based maintenance decisions using resistance, voltage, and temperature evidence.
Battery pack repair and refurbishment	Screen candidate batteries and repaired connections before returning packs or subassemblies to service.	Range selection from mOhm through Ohm-scale measurements accommodates varied diagnostic tasks.

Parameter	Specification
Site-facing identifier	DC17
Intended use location	Indoor use; pollution degree 2; altitude 2000 m or less
Operating temperature	0 C to 40 C
Operating humidity	80% RH or less, non-condensing
Storage temperature	-10 C to 50 C
Storage humidity	80% RH or less, non-condensing
Applicable safety standard	EN 61010
Applicable EMC standard	EN 61326
Power supply	AA alkaline batteries (LR6) x 8; rated supply voltage DC 1.5 V x 8; maximum rated power 3 VA
Rechargeable battery compatibility	Nickel-metal hydride batteries may be used; battery remaining-capacity indication is not supported

Parameter	Specification
Continuous operating time without wireless module	Approximately 8.3 hours
Continuous operating time with wireless module and wireless communication	Approximately 8.2 hours
Operating-time reference condition	Standard supplied alkaline batteries, backlight OFF, 23 C reference value; actual time varies with conditions
Backup battery life	Approximately 10 years at 23 C reference value
Interface	USB
USB communication speed	USB 2.0
USB communication class	CDC class
USB connector	USB mini-B
Wireless communication	Available when the optional wireless communication module is installed; remove the factory-fitted protective cover before installation
External dimensions	Approximately 199 W x 132 H x 60.6 D mm, with protective case installed
Weight	Approximately 960 g, including batteries and protective case
Product warranty	3 years
Internal fuse	One internal fuse; 250 V / F 630 mA
Accessories	Refer to accessory information in the supplied reference documentation, page 2
Options	Refer to option information in the supplied reference documentation, page 3
Display	FSTN monochrome LCD
Measurement items	Battery internal resistance; battery terminal voltage, DC voltage only; temperature
Resistance measurement range	0.000 mOhm to 3.100 Ohm; four ranges
Voltage measurement range	0.000 V to plus or minus 60.00 V; two ranges
Temperature measurement range	-10.0 C to 60.0 C; one range
Maximum input voltage	DC 60 V between positive and negative measurement terminals; AC input is not permitted
Maximum rated voltage to earth	DC 60 V; no measurement category
Expected transient overvoltage	330 V between all measurement terminals and earth
Resistance measurement method	AC four-terminal test method; open-terminal voltage 5 V maximum peak
Resistance measurement current	1.6 mA to 160 mA, fixed by resistance range
Temperature sensing method	Platinum temperature sensor, 500 Ohm at 25 C
A/D conversion method	Delta-sigma type
Display update rate	3 times/s; resistance, voltage, and temperature are treated as one group
Resistance and voltage terminals	Banana-plug terminals
Resistance and voltage terminal maximum input	DC plus or minus 60 V maximum; AC input is not permitted
Resistance and voltage terminal input resistance	20 kOhm or more
Temperature input terminal	Headphone-jack type, phi 3.5 mm
Switch input terminal	Headphone-jack type, phi 2.5 mm
Measurement time	100 ms
Response time	Approximately 1.6 s
Accuracy guarantee period	1 year
Accuracy guarantee period after adjustment	1 year
Accuracy guarantee temperature and humidity	23 C plus or minus 5 C; 80% RH or less
Warm-up time	None required
Temperature characteristic	Add test accuracy x 0.1/C within the operating temperature range outside 18 C to 28 C
Resistance measurement-current accuracy	Plus or minus 10%

Parameter	Specification
Resistance measurement-current frequency	1 kHz plus or minus 30 Hz
Resistance test frequency with noise-frequency avoidance ON	1 kHz plus or minus 80 Hz

Resistance range	Maximum display	Resolution	Test accuracy	Measurement current
3 mOhm	3.100 mOhm	1 microohm	Plus or minus 1.0% of reading plus or minus 8 digits	160 mA
30 mOhm	31.00 mOhm	10 microohm	Plus or minus 0.8% of reading plus or minus 6 digits	160 mA
300 mOhm	310.0 mOhm	100 microohm	Plus or minus 0.8% of reading plus or minus 6 digits	16 mA
3 Ohm	3.100 Ohm	1 mOhm	Plus or minus 0.8% of reading plus or minus 6 digits	1.6 mA

Voltage range	Maximum display	Resolution	Test accuracy
6 V	Plus or minus 6.000 V	1 mV	Plus or minus 0.08% of reading plus or minus 6 digits
60 V	Plus or minus 60.00 V	10 mV	Plus or minus 0.08% of reading plus or minus 6 digits

Temperature configuration	Measurement range	Maximum display	Resolution	Test accuracy
Clamp-type temperature test lead	-10 C to 60 C	60.0 C	0.1 C	Plus or minus 1.0 C
1.5 m temperature probe	-10 C to 60 C	60.0 C	0.1 C	Add plus or minus 0.5 C to the above test accuracy
0.1 m temperature probe	-10 C to 60 C	60.0 C	0.1 C	Add plus or minus 0.5 C to the above test accuracy
Approximate-input temperature measurement	-10 C to 60 C	60.0 C	0.1 C	Plus or minus 0.5 C

Resistance accuracy note	Specification
Zero-adjustment influence on the 3 mOhm range	When zero adjustment has not been performed, add the stated reference influence to measurement accuracy: compatible clip lead plus or minus 5 digits; compatible lead plus or minus 6 digits; compatible pin lead plus or minus 1 digit; compatible clamp-type temperature lead plus or minus 16 digits; compatible temperature lead plus or minus 5 digits.
Zero-adjustment method	Use the supplied zero-adjustment board or the compatible optional zero-adjustment board when zero adjusting the compatible clip, lead, and pin-lead configurations.
Non-specified test leads or extension leads	Accuracy is guaranteed only after zero adjustment when using non-specified test leads or extension leads. Accuracy and operation are not guaranteed when using test leads outside the specified compatible configurations.

Universal Rechargeable Battery Internal Resistance Tester For Battery Internal Resistance Testing

Item Number: DC18



Introduction

Universal rechargeable battery internal resistance tester measures cell resistance voltage and temperature with 1 microohm resolution, adaptive noise avoidance, pass warning fail evaluation, data storage, USB export, and Bluetooth connectivity for dependable battery inspection.

[Learn More](#)

Application	Description	Key Benefit
Rechargeable cell incoming inspection	Measure internal resistance and voltage of received cells before they enter laboratory, production, or assembly processes.	Supports consistent acceptance checks using defined resistance and voltage criteria.
Battery cell matching	Compare resistance, voltage, and measured temperature among cells selected for a common pack or test group.	Helps technical teams identify electrical variation within a candidate cell population.
Battery pack maintenance	Assess accessible battery terminals and connections during service inspections, alongside voltage and temperature checks.	Brings multiple condition indicators together in a portable measurement workflow.
Cell manufacturing quality control	Apply preset PASS, WARNING, and FAIL thresholds during process inspection or final quality assessment.	Provides a repeatable decision framework for screening and segregation.
Battery R&D characterization	Record resistance, voltage, and temperature data while evaluating rechargeable cell designs or test conditions.	Enables detailed comparison with 1 $\mu\Omega$ resistance and 1 mV voltage resolution.
Module and interconnect evaluation	Check low-resistance conductive paths, tabs, busbars, and accessible pack-level connections using the four-terminal method.	Reduces lead-resistance influence in low-resistance measurements.
Field service and audit work	Perform portable checks at service locations, pilot lines, laboratories, or customer sites, then upload stored results.	Battery operation, automatic storage, USB export, and Bluetooth support practical data capture.
Research laboratory measurement	Use one instrument for resistance, voltage, and NTC temperature measurement during battery-related experimental work.	Consolidates essential electrical and thermal measurements in a compact unit.

Parameter	Specification
Product Item Number	DC18
Functions	Battery internal resistance measurement, battery voltage measurement, temperature measurement
Noise avoidance frequency	Yes; automatic variable-frequency range 920Hz~1080Hz
Accuracy-guaranteed temperature and humidity	23°C $\pm$ 5°C, 75%rh or less
Power supply	DC 3.7V lithium battery
Resistance resolution	1 $\mu\Omega$
Voltage resolution	1 mV
Temperature resolution	0.1°C
Internal resistance measurement range	0.000m Ω ~3.100 Ω (composed of 4 ranges)

Parameter	Specification
Voltage measurement range	0.000V~±71.00V (composed of 2 ranges)
Temperature measurement range	-10.0°C~60.0°C (single range)
Maximum input voltage	DC 70V (between + measurement terminal and - measurement terminal); AC input is not permitted
Internal resistance measurement method	1KHz AC 4-terminal test method; open-terminal voltage 3V max; measurement current 2.0mA~200mA (measurement current differs by range)
Temperature measurement method	NTC temperature sensor (10KΩ at 26°C)
A/D conversion method	Successive approximation type
Display update frequency	5 times/second
Response time	200ms
Measurement time	Approximately 2 seconds
LCD size	70.1mm×52.6mm / 3.5 inches (320*240 resolution, 16-bit true color screen)
Instrument dimensions	Length × width × height: 190mm×121mm×51mm
USB interface	Available; stored data can be uploaded to a computer for saving and printing
Bluetooth connection	Available
Hold and storage functions	Manual hold and storage; automatic hold and storage
Measurement judgment function	PASS, WARNING, and FAIL judgment thresholds can be preset
Battery status display	Five-level battery display; reminder to recharge when battery voltage is low
Automatic shutdown	Approximately 15 minutes after power-on with no operation; can be disabled in settings
Power consumption	300mA MIN / 500mA MAX
Mass	Instrument: 480g (including battery)
Operating temperature and humidity	-10°C~40°C; 80%RH or less
Storage temperature and humidity	-20°C~60°C; 70%RH or less
Insulation resistance	20MΩ or more (between circuit and enclosure at 500V)
Withstand voltage	AC 3700V/RMS (between circuit and enclosure)
External magnetic field	≤ 40A/m
External electric field	≤ 1V/m
Applicable safety standard	IEC 61010



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