PBT 2000 Series

Eco Series – Power Battery Pack Test Equipment

• The Largest Power Ever •

1000V /2000A

CTE | Worldwide Battery Testing Expert

Highlight Features

A high-powered testing machine
With technical specifications up to 1000kW/1000V/2000A Everything from electric vehicles to railway systems are supported. It is the ultimate choice for testing high power batteries.

With almost zero delay in current response (1.5ms) and charging/ discharging switching (2ms)
Elevate the overall testing flexibility with the responsive switching speeds.

Brand new battery simulation function*
Allows one equipment to be used for battery and motor testing, providing a jump start to your R&D efficiency.

Equipped with the discharging energy recycling function with up to 97% effectiveness
Fulfilling all of your green energy, energy onservation, and environmental protection demands all at once.

The upgraded touch interface
Makes it easy to operate and adjust test settings

Two current ranges combined with industry-leading precision*
Voltage selection can reach up to 0.05%F.S. to fully satisfy the stringent professional testing requirements.

Product Applications

Energy Storage System

Starting Batteries for Vehicles

Electric Vehicle

Electric Bus

Railway System

Applied Tests

AGE Life Cycle Test

ACIR ACIR Measurement

Capacity Test

Ongoing Reliability Test

HPPC

Drive Simulation
• FUDS
• DST

DCIR DCIR Measurement
• ISO 12405
• IEC 61960

Pulse Charge/ Discharge

Technical Features

Advanced Specifications

Highest rated power 500kW, charging and discharging specifications 1000V/1000A (can be connected in parallel to increase current output), max. voltage accuracy up to 0.05%F.S., two current ranges with accuracy 0.1%F.S., combined with a data recording frequency of 10ms, the specifications of the PBT 2000 have reached a new height in the next era of professional-grade high power battery testers.

Discharged Energy Recycle

Energy which was wasted during discharging can be recycled and returned to the factory's power network at an efficiency level of up to 97%. Renewable energy is produced with the least amount of energy depletion, and the power factor can reach 99% or higher. Recycling energy also does not affect the quality of the factory's power quality. Thus, the energy consumed by the air conditioning system as well as the environmental burden of the factory can all be reduced. The discharging process is no longer a mandatory cost of testing, but the perfect realization of green energy and protecting the environment.

DCIR*

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

BMS Communication*

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

Safety

The PBT 2000 has passed the EN ISO 13849-1 international standards and satisfies the requirements of Safety Performance Level D. Three different colors of warning lights are built-in for the user to configure his/ her own protective/reminder mechanisms (such as: overcharge and overdischarge) to prevent accidents caused by human errors. In addition, an emergency stop dry-contact switch, which can be installed anywhere inside the factory, has also been provided to act as a remote control mechanism for added protection.
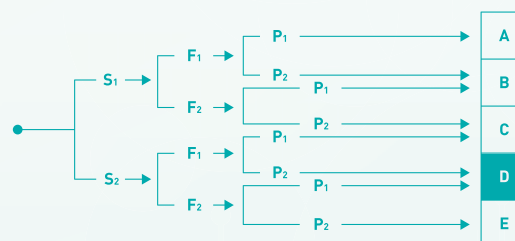
S: Severity of injury

P: Frequency and/or exposure to hazard

F: Possibility of avoiding hazard or limiting harm

S1: Slight

P1: Possible under specific conditions

S2: Serious (such as irreversible injuries and death)

P2: Scarcely possible

F1: Seldom-to-less-often and/or exposure time is short

F2: Frequent-to-continuous and/or exposure time is long

* Optional

Technical Features

Current Ramping

Automatic scanning function within a given current range, which is extremely convenient during linear system identification; can be combined with the Lissajous Plot to confirm the system's linearity under specific operating conditions. As the track of the Lissajous Plot comes closer to the curve, it means that the system is closer to becoming a linear system.
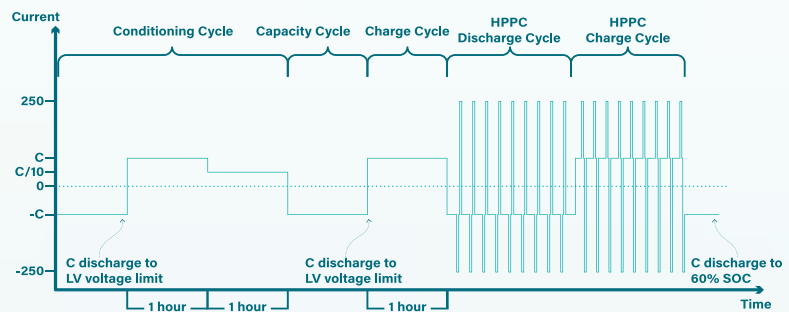
Lissajous Plot
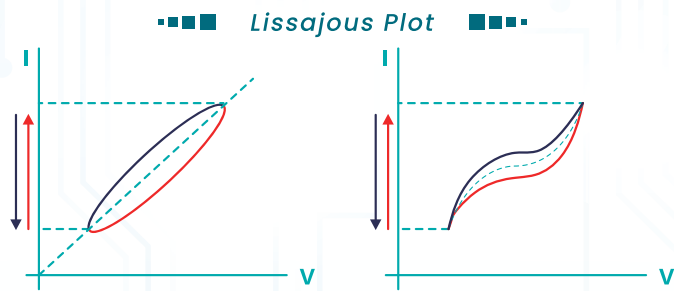
Dynamic waveform simulation

With a current rise time of 1ms (10% to 90%) and a charging/discharging switch time of 5ms (-90% to 90%), international drive simulation standards such as FUDS and DST can be fully realized with the BT 2000. Supports customized drive simulation test modes, and the import of Excel files to create customized testing processes. Each simulation is the reproduction of a real scenario. Under customized drive simulation mode, the minimum step time supported is 100ms. Constant current and constant power operating modes are also supported.
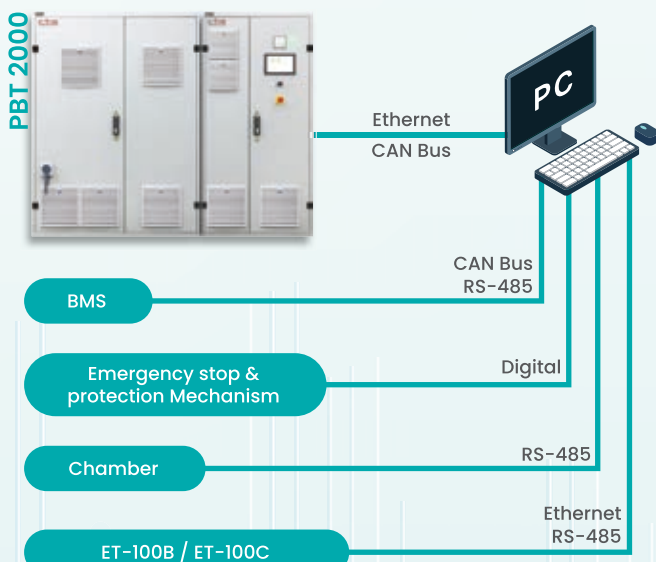
FUDS　　*DST*

The Hybrid Pulse Power Characteristic

The Hybrid Pulse Power Characteristic (HPPC) is mainly used for testing characteristics of power batteries such as the power during charging and discharging cycles, open circuit voltage, and DC resistance. In addition to ensuring that all assembled batteries meet specifications, these parameters can also be used as battery BoL (Beginning of Life) test benchmarks to guarantee product quality. Chen Tech Electric provides appropriate equipment, combined with software functions to perform automatic calculations and record of key test parameters, to produce reports/tables that meet customer requirements as well as save configuration time for customers.

System Architecture

PBT 2000

Ethernet
CAN Bus

PC

CAN Bus
RS-485

BMS

Emergency stop &
protection Mechanism

Digital

Chamber

RS-485

ET-100B / ET-100C

Ethernet
RS-485

Operating Mode

Charge

Constant Voltage

Constant Current

Constant Power

Constant* Resistance
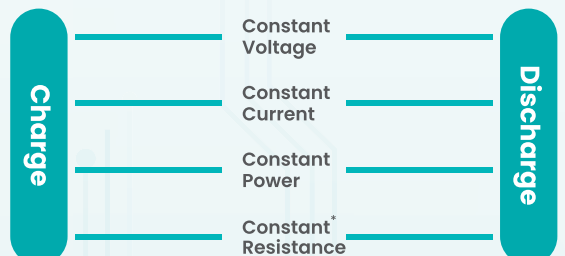
Discharge

• Battery Simulation* •

• Dynamic waveform simulation •

• 50Hz Pulse Charge/Discharge •

• ACIR* •　• DCIR* •

• Current Ramping •

• Current Ramping •

* Optional

Specifications

Model	PBT 2000 60kW/300V/200A	PBT 2000 60kW/300V/600A	PBT 2000 60kW/300V/1000A	PBT 2000 100kW/300V/600A	PBT 2000 100kW/300V/1000A	PBT 2000 100kW/600V/200A	PBT 2000 100kW/600V/600A
Number of Channels Per Unit	1						
Charge/ Discharge Spec (Capacity, Voltage, Current)	60kW/300V/200A	60kW/300V/600A	60kW/300V/1000A	100kW/300V/600A	100kW/300V/1000A	100kW/600V/200A	100kW/600V/600A
Output — Constant Voltage — Range	5~300V					5~600V	
Output — Constant Voltage — Accuracy	±0.3V (±0.1% F.S.)					±0.6V (±0.1% F.S.)	
Output — Constant Current — Range	0~±200A	0~±600A	0~±1000A	0~±600A	0~±1000A	0~±200A	0~±600A
Output — Constant Current — Multiple Ranges (Option)	2 (100%, 10%)						
Output — Constant Current — Accuracy	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)
Measurement — Voltage — Range	0~300V					0~600V	
Measurement — Voltage — Resolution	16 bit						
Measurement — Voltage — Accuracy	±0.3V (±0.1% F.S.)					±0.6V (±0.1% F.S.)	
Measurement — Current — Range	0~±200A	0~±600A	0~±1000A	0~±600A	0~±1000A	0~±200A	0~±600A
Measurement — Current — Multiple Ranges (Option)	2 (100%, 10%)						
Measurement — Current — Resolution	16 bit (15bit + pre-sign)						
Measurement — Current — Accuracy	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)
Time — Data Recording Time	100ms (option: 10ms)						
Time — Current Rise Time (10% → 90%)	<1ms						
Ambient Conditions — Temperature	0~40℃						
Ambient Conditions — Humidity	5~85 HR						
AC Power — Voltage	380V/400V/440V*/480V*, 3Φ						
AC Power — Frequency	50Hz/60Hz						
AC Power — Current	108A@400V		113A@400V	209A@400V	213A@400V	171A@400V	172A@400V
Power Factor	>0.99						
Max. Energy Recycling Efficiency	90.3%	89.8%	88.0%	93.7%	92.0%	93.9%	95.5%
Communication Protocol	CANBus (USB to PC)						
Dimension (W*D*H)	(1000+1000)*800*2000 mm		(1000+1200)*800*2000 mm	(1000+1000)*800*2000 mm	(1000+1200)*800*2000 mm	(1000+1000)*800*2000 mm	
Weight	800+500kg	800+560kg	800+1150kg	1000+560kg	1000+1150kg	950+560kg	
Optional Feature	Constant Resistance, DCIR Measurement, ACIR Measurement,BMS Data Collection, Chamber Integration, Data Analyzer.						
Optional Accessory	BMS Data Collector, Auxiliary Voltage, Auxiliary Temperature, Chamber, Battery Connecting Cable, Parallel Connection Module, Power Distribution Switch Box, Power Distribution Unit.						

Model	PBT 2000 100kW/600V/1000A	PBT 2000 100kW/800V/200A	PBT 2000 100kW/800V/600A	PBT 2000 100kW/800V/1000A	PBT 2000 100kW/1000V/200A	PBT 2000 100kW/1000V/600A	PBT 2000 100kW/1000V/1000A
Number of Channels Per Unit	1						
Charge/ Discharge Spec (Capacity, Voltage, Current)	100kW/600V/1000A	100kW/800V/200A	100kW/800V/600A	100kW/800V/1000A	100kW/1000V/200A	100kW/1000V/600A	100kW/1000V/1000A
Output — Constant Voltage — Range	5~600V	5~800V			5~1000V		
Output — Constant Voltage — Accuracy	±0.6V (±0.1% F.S.)	±0.8V (±0.1% F.S.)	±0.8V (±0.1% F.S.)		±1V (±0.1% F.S.)		
Output — Constant Current — Range	0~±1000A	0~±200A	0~±600A	0~±1000A	0~±200A	0~±600A	0~±1000A
Output — Constant Current — Multiple Ranges (Option)	2 (100%, 10%)						
Output — Constant Current — Accuracy	±1A (±0.1% F.S.)	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)
Measurement — Voltage — Range	0~600V	0~800V			0~1000V		
Measurement — Voltage — Resolution	16 bit						
Measurement — Voltage — Accuracy	±0.6V (±0.1% F.S.)	±0.8V (±0.1% F.S.)	±0.8V (±0.1% F.S.)		±1V (±0.1% F.S.)		
Measurement — Current — Range	0~±1000A	0~±200A	0~±600A	0~±1000A	0~±200A	0~±600A	0~±1000A
Measurement — Current — Multiple Ranges (Option)	2 (100%, 10%)						
Measurement — Current — Resolution	16 bit (15bit + pre-sign)						
Measurement — Current — Accuracy	±1A (±0.1% F.S.)	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)
Time — Data Recording Time	100ms (option: 10ms)						
Time — Current Rise Time (10% → 90%)	<1ms				<1.3ms		
Ambient Conditions — Temperature	0~40℃						
Ambient Conditions — Humidity	5~85 HR						
AC Power — Voltage	380V/400V/440V*/480V*, 3Φ						
AC Power — Frequency	50Hz/60Hz						
AC Power — Current	177A@400V	171A@400V	174A@400V	179A@400V	173A@400V	175A@400V	180A@400V
Power Factor	>0.99						
Max. Energy Recycling Efficiency	94.8%	97.5%	95.7%	94.9%	93.3%	95.5%	94.8%
Communication Protocol	CANBus (USB to PC)						
Dimension (W*D*H)	(1000+1200)*800*2000 mm	(1000+1000)*800*2000 mm			(1000+1200)*800*2000 mm		
Weight	950+610kg	950+560kg		950+1150 kg	950+1080kg		950+1150kg
Optional Feature	Constant Resistance, DCIR Measurement, ACIR Measurement,BMS Data Collection, Chamber Integration, Data Analyzer.						
Optional Accessory	BMS Data Collector, Auxiliary Voltage, Auxiliary Temperature, Chamber, Battery Connecting Cable, Parallel Connection Module, Power Distribution Switch Box, Power Distribution Unit.						

* Optional

Model	PBT 2000 160kW/600V/600A	PBT 2000 160kW/600V/1000A	PBT 2000 160kW/800V/200A	PBT 2000 160kW/800V/600A	PBT 2000 160kW/800V/1000A	PBT 2000 160kW/1000V/200A	PBT 2000 160kW/1000V/600A
Number of Channels Per Unit	1						
Charge/ Discharge Spec (Capacity, Voltage, Current)	160kW/600V/600A	160kW/600V/1000A	160kW/800V/200A	160kW/800V/600A	160kW/800V/1000A	160kW/1000V/200A	160kW/1000V/600A
Output — Constant Voltage — Range	5~600V		5~800V			5~1000V	
Constant Voltage — Accuracy	±0.6V (±0.1% F.S.)		±0.8V (±0.1% F.S.)			±1V (±0.1% F.S.)	
Constant Current — Range	0~±600A	0~±1000A	0~±200A	0~±600A	0~±1000A	0~±200A	0~±600A
Constant Current — Multiple Ranges (Option)	2 (100%, 10%)						
Constant Current — Accuracy	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)
Measurement — Voltage — Range	0~600V		0~800V			0~1000V	
Voltage — Resolution	16 bit						
Voltage — Accuracy	±0.6V (±0.1% F.S.)		±0.8V (±0.1% F.S.)			±1V (±0.1% F.S.)	
Current — Range	0~±600A	0~±1000A	0~±200A	0~±600A	0~±1000A	0~±200A	0~±600A
Current — Multiple Ranges (Option)	2 (100%, 10%)						
Current — Resolution	16 bit (15bit + pre-sign)						
Current — Accuracy	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.2A (±0.1% F.S.)	±0.6A (±0.1% F.S.)
Time — Data Recording Time	100ms (option: 10ms)						
Current Rise Time (10% → 90%)	<1ms					<1.3ms	
Ambient Conditions — Temperature	0~40℃						
Humidity	5~85 HR						
AC Power — Voltage	380V/400V/440V*/480V*, 3Φ						
Frequency	50Hz/60Hz						
Current	271A@400V	276A@400V	270A@400V	272A@400V	277A@400V	272A@400V	275A@400V
Power Factor	>0.99						
Max. Energy Recycling Efficiency	95.6%	94.8%	98.4%	95.9%	95.3%	94.6%	95.3%
Communication Protocol	CANBus (USB to PC)						
Dimension (W*D*H)	(1200+1000)*800*1000 mm	(1200+1200)*800*1000 mm	(1200+1000)*800*2000 mm		(1200+1200)*800*2000 mm		
Weight	1050+560kg	1050+610kg	1050+560kg		1050+1150kg	1050+1080kg	
Optional Feature	Constant Resistance, DCIR Measurement, ACIR Measurement,BMS Data Collection, Chamber Integration, Data Analyzer.						
Optional Accessory	BMS Data Collector, Auxiliary Voltage, Auxiliary Temperature, Chamber, Battery Connecting Cable, Parallel Connection Module, Power Distribution Switch Box, Power Distribution Unit.						

Model	PBT 2000 160kW/1000V/1000A	PBT 2000 250kW/600V/600A	PBT 2000 250kW/600V/1000A	PBT 2000 250kW/800V/600A	PBT 2000 250kW/800V/1000A	PBT 2000 250kW/1000V/600A	PBT 2000 250kW/1000V/1000A
Number of Channels Per Unit	1						
Charge/ Discharge Spec (Capacity, Voltage, Current)	160kW/1000V/1000A	250kW/600V/600A	250kW/600V/1000A	250kW/800V/600A	250kW/800V/1000A	250kW/1000V/600A	250kW/1000V/1000A
Output — Constant Voltage — Range	5~1000V	5~600V		5~800V		5~1000V	
Constant Voltage — Accuracy	±1V (±0.1% F.S.)	±0.6V (±0.1% F.S.)		±0.8V (±0.1% F.S.)		±1V (±0.1% F.S.)	
Constant Current — Range	0~±1000A	0~±600A	0~±1000A	0~±600A	0~±1000A	0~±600A	0~±1000A
Constant Current — Multiple Ranges (Option)	2 (100%, 10%)						
Constant Current — Accuracy	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)
Measurement — Voltage — Range	0~1000V	0~600V		0~800V		0~1000V	
Voltage — Resolution	16 bit						
Voltage — Accuracy	±1V (±0.1% F.S.)	±0.6V (±0.1% F.S.)	±0.6V (±0.1% F.S.)	±0.8V (±0.1% F.S.)	±0.8V (±0.1% F.S.)	±1V (±0.1% F.S.)	±1V (±0.1% F.S.)
Current — Range	0~±1000A	0~±600A	0~±1000A	0~±600A	0~±1000A	0~±600A	0~±1000A
Current — Multiple Ranges (Option)	2 (100%, 10%)						
Current — Resolution	16 bit (15bit + pre-sign)						
Current — Accuracy	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)
Time — Data Recording Time	100ms (option: 10ms)						
Current Rise Time (10% → 90%)	<1.3ms	<1ms				<1.3ms	
Ambient Conditions — Temperature	0~40℃						
Humidity	5~85 HR						
AC Power — Voltage	380V/400V/440V*/480V*, 3Φ						
Frequency	50Hz/60Hz						
Current	279A@400V	421A@400V	426A@400A	421A@400V	426A@400V	424A@400V	429A@400V
Power Factor	>0.99						
Max. Energy Recycling Efficiency	94.8%	96.6%	95.9%	96.1%	95.5%	96.6%	95.8%
Communication Protocol	CANBus (USB to PC)						
Dimension (W*D*H)	(1200+1200)*800*2000 mm	(1400+1000)*800*2000 mm	(1400+1200)*800*1000 mm	(1400+1000)*800*2000 mm	(1400+1200)*800*2000 mm		
Weight	1050+1150kg	1500+560kg	1500+610kg	1500+560kg	1500+1150kg	1500+1080kg	1500+1150kg
Optional Feature	Constant Resistance, DCIR Measurement, ACIR Measurement,BMS Data Collection, Chamber Integration, Data Analyzer.						
Optional Accessory	BMS Data Collector, Auxiliary Voltage, Auxiliary Temperature, Chamber, Battery Connecting Cable, Parallel Connection Module, Power Distribution Switch Box, Power Distribution Unit.						

			PBT 2000 320kW/600V/600A	PBT 2000 320kW/600V/1000A	PBT 2000 320kW/800V/600A	PBT 2000 320kW/800V/1000A	PBT 2000 320kW/1000V/600A	PBT 2000 320kW/1000V/1000A	PBT 2000 400kW/600V/1000A
Model			PBT 2000 320kW/600V/600A	PBT 2000 320kW/600V/1000A	PBT 2000 320kW/800V/600A	PBT 2000 320kW/800V/1000A	PBT 2000 320kW/1000V/600A	PBT 2000 320kW/1000V/1000A	PBT 2000 400kW/600V/1000A
Number of Channels Per Unit			1						
Charge/ Discharge Spec (Capacity, Voltage, Current)			320kW/600V/600A	320kW/600V/1000A	320kW/800V/600A	320kW/800V/1000A	320kW/1000V/600A	320kW/1000V/1000A	400kW/600V/1000A
Output	Constant Voltage	Range	5~600V	5~600V	5~800V	5~800V	5~1000V	5~1000V	5~600V
		Accuracy	±0.6V (±0.1% F.S.)	±0.6V (±0.1% F.S.)	±0.8V (±0.1% F.S.)	±0.8V (±0.1% F.S.)	±1V (±0.1% F.S.)	±1V (±0.1% F.S.)	±0.6V (±0.1% F.S.)
	Constant Current	Range	0~±600A	0~±1000A	0~±600A	0~±1000A	0~±600A	0~±1000A	0~±1000A
		Multiple Ranges (Option)	2 (100%, 10%)						
		Accuracy	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±1A (±0.1% F.S.)
Measurement	Voltage	Range	0~600V	0~600V	0~800V	0~800V	0~1000V	0~1000V	0~600V
		Resolution	16 bit						
		Accuracy	±0.6V (±0.1% F.S.)	±0.6V (±0.1% F.S.)	±0.8V (±0.1% F.S.)	±0.8V (±0.1% F.S.)	±1V (±0.1% F.S.)	±1V (±0.1% F.S.)	±0.6V (±0.1% F.S.)
	Current	Range	0~±600A	0~±1000A	0~±600A	0~±1000A	0~±600A	0~±1000A	0~±1000A
		Multiple Ranges (Option)	2 (100%, 10%)						
		Resolution	16 bit (15bit + pre-sign)						
		Accuracy	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±1A (±0.1% F.S.)
Time	Data Recording Time		100ms (option: 10ms)						
	Current Rise Time (10% → 90%)		<1ms					<1.3ms	<1ms
Ambient Conditions	Temperature		0~40℃						
	Humidity		5~85 HR						
AC Power	Voltage		380V/400V/440V*/480V*, 3Φ						
	Frequency		50Hz/60Hz						
	Current		537A@400V	542A@400V	538A@400V	543A@400V	541A@400V	546A@400V	675A@400V
Power Factor			>0.99						
Max. Energy Recycling Efficiency			96.7%	96.6%	96.1%	95.5%	96.7%	96.6%	96.6%
Communication Protocol			CANBus (USB to PC)						
Dimension (W*D*H)			(1400+1000)*800*2000 mm	(1400+1200)*800*2000 mm	(1400+1000)*800*2000 mm	(1400+1200)*800*2000 mm	(1400+1200)*800*2000 mm	(1400+1200)*800*2000 mm	(1200+1200+1200) *800*1200 mm
Weight			1600+560kg	1600+610kg	1600+560kg	1600+1150kg	1600+1080kg	1600+1150kg	1800+720+610kg
Optional Feature			Constant Resistance, DCIR Measurement, ACIR Measurement, BMS Data Collection, Chamber Integration, Data Analyzer.						
Optional Accessory			BMS Data Collector, Auxiliary Voltage, Auxiliary Temperature, Chamber, Battery Connecting Cable, Parallel Connection Module, Power Distribution Switch Box, Power Distribution Unit.						

			PBT 2000 400kW/800V/1000A	PBT 2000 400kW/1000V/600A	PBT 2000 400kW/1000V/1000A	PBT 2000 500kW/600V/1000A	PBT 2000 500kW/800V/1000A	PBT 2000 500kW/1000V/600A	PBT 2000 500kW/1000V/1000A
Model			PBT 2000 400kW/800V/1000A	PBT 2000 400kW/1000V/600A	PBT 2000 400kW/1000V/1000A	PBT 2000 500kW/600V/1000A	PBT 2000 500kW/800V/1000A	PBT 2000 500kW/1000V/600A	PBT 2000 500kW/1000V/1000A
Number of Channels Per Unit			1						
Charge/ Discharge Spec (Capacity, Voltage, Current)			400kW/800V/1000A	400kW/1000V/600A	400kW/1000V/1000A	500kW/600V/1000A	500kW/800V/1000A	500kW/1000V/600A	500kW/1000V/1000A
Output	Constant Voltage	Range	5~800V	5~1000V	5~1000V	5~600V	5~800V	5~1000V	5~1000V
		Accuracy	±0.8V (±0.1% F.S.)	±1V (±0.1% F.S.)	±1V (±0.1% F.S.)	±0.6V (±0.1% F.S.)	±0.8V (±0.1% F.S.)	±1V (±0.1% F.S.)	±1V (±0.1% F.S.)
	Constant Current	Range	0~±1000A	0~±600A	0~±1000A	0~±1000A	0~±1000A	0~±600A	0~±1000A
		Multiple Ranges (Option)	2 (100%, 10%)						
		Accuracy	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±1A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)
Measurement	Voltage	Range	0~800V	0~1000V	0~1000V	0~600V	0~800V	0~1000V	0~1000V
		Resolution	16 bit						
		Accuracy	±0.8V (±0.1% F.S.)	±1V (±0.1% F.S.)	±1V (±0.1% F.S.)	±0.6V (±0.1% F.S.)	±0.8V (±0.1% F.S.)	±1V (±0.1% F.S.)	±1V (±0.1% F.S.)
	Current	Range	0~±1000A	0~±600A	0~±1000A	0~±1000A	0~±1000A	0~±600A	0~±1000A
		Multiple Ranges (Option)	2 (100%, 10%)						
		Resolution	16 bit (15bit + pre-sign)						
		Accuracy	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)	±1A (±0.1% F.S.)	±1A (±0.1% F.S.)	±0.6A (±0.1% F.S.)	±1A (±0.1% F.S.)
Time	Data Recording Time		100ms (option: 10ms)						
	Current Rise Time (10% → 90%)		<1ms	<1.3ms	<1.3ms	<1ms	<1ms	<1.3ms	<1.3ms
Ambient Conditions	Temperature		0~40℃						
	Humidity		5~85 HR						
AC Power	Voltage		380V/400V/440V*/480V*, 3Φ						
	Frequency		50Hz/60Hz						
	Current		675A@400V	674A@400V	679A@400V	841A@400V	841A@400V	839A@400V	844A@400V
Power Factor			>0.99						
Max. Energy Recycling Efficiency			95.2%	96.7%	96.6%	96.0%	95.5%	96.0%	96.0%
Communication Protocol			CANBus (USB to PC)						
Dimension (W*D*H)			(1200+1200+1200)*800*2000mm			(1400+1200+1200)*800*2000mm			
Weight			1800+550+1150 kg	1800+550+1080 kg	1800+550+1150 kg	1900+720+610 kg	1900+720+1150 kg	1900+720+1080 kg	1900+720+1150 kg
Optional Feature			Constant Resistance, DCIR Measurement, ACIR Measurement, BMS Data Collection, Chamber Integration, Data Analyzer.						
Optional Accessory			BMS Data Collector, Auxiliary Voltage, Auxiliary Temperature, Chamber, Battery Connecting Cable, Parallel Connection Module, Power Distribution Switch Box, Power Distribution Unit.						

* Optional

iBest Software

UPGRADED USER EXPERIENCE

iBEST SOFTWARE + DATA ANALYZER

PROGRAM CONFIGURATION

Simple
Provides different test program configuration interfaces for beginners and experts to satisfy different needs. Easy to configure, intuitive operation, and no need for an instruction manual.

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

Test modes
Constant current (CC), Constant current-Constant voltage (CC-CV), Constant power (CP), Constant power-Constant voltage (CP-CV), Constant resistance (CR), Pulse, Waveform, ACIR, DCIR, Current Ramp, Voltage Ramp

Step Cutoff Conditions
Time, EV, EC, ET, mAh, Wh, END mAh , Total mAh, Total Wh, SoC, END SoC, Ni-MH conditions, Gauge conditions, BMS conditions, CHamber conditions, ΔI, Capacity Decay

Protection Mechanism
OC, LC, OV, LV, OT, Verr, Cerr, CC Time, CV Time, ΔI, Cell Voltage Unbalance, Temperature Unbalance

Data Recording Interval
Δt, Δ V, ΔI, ΔT

▼ Support a variety of international standardized test patterns. No need to be edited manually.

Pulse
Intel Turbo Boost, GSM, PWM

Dynamic waveform
FUDS, DST, HPPC

DCIR measurement
ISO 12405, IEC 61960

Battery performance testing
UL, IEC, SAE International and GB Standards

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

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

Smart
Provides multiple convenient ways to configure test program, such as custom variables, C-rate, and current ramp, are provided to speed up program editing.

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

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

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

PROGRAM EXECUTION

Personalization
Multiple displays of channel status as well as color choices, parameters displayed can be customized, and can be adjusted based on personal preferences and the execution status of the test program. (Fig. 2, 3, 4)

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

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

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

Assurance
▼ Dual OV and OT detection mechanism; an independent program monitors the voltage and temperature of batteries being tested, and suspends equipment operations when the system is abnormal.

▼ Abnormal channel status detection; continuously matches the process and channel status, and issues a warning or suspends equipment if it is inconsistent.

▼ Extra and independent monitoring mechanism; uses third party hardware attached to the equipment to monitor battery voltage and temperature at all times, and directly cuts off equipment power when there are any abnormalities.

▼ External monitoring of power values; the external smart meter records various power related values, and the data is used for abnormalities tracking and comparison.

DATA ANALYSIS *

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

Text and graphical reports

Graphs zoom-in and zoom-out

Self-defined X and Y-axis parameters on graphs

Convenient
▼ Users will be able to choose from a selection of templates for data tables and curve charts available in the system, or create a brand new template based on their requirements.

▼ Testing graphics and raw data can be displayed simultaneously, cross-reference data mechanisms are also provided. (Fig. 6)

▼ Data retrieval tools allow users to quickly browse important test data.

Professional
Multiple advanced analytics tools are introduced to assist battery researchers learn battery characteristics in an efficient way.

Report Step Report **Charts** Cycle life

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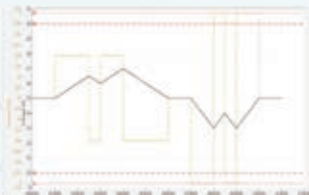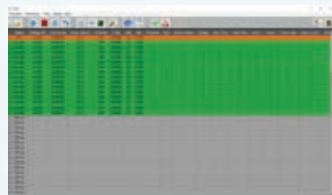

Fig. 1 Pre-test Simulation
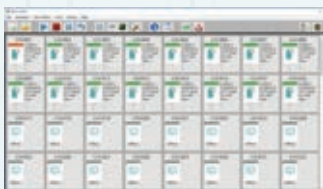

Fig. 2 Default status display panel

Fig. 3 32 Channels status display panel

Fig. 4 4 Channels status display panel
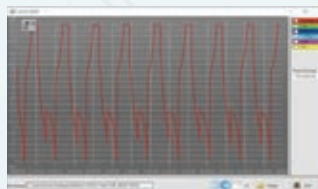

Fig. 5 Real time test curve
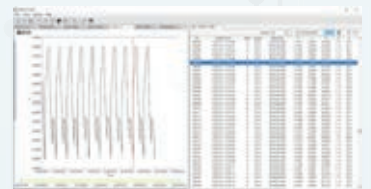

Fig. 6 Test curve and report

* Optional

Optional Accessories

Auxiliary Voltage ES-100B

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

1. Each module contains 24 measurement points. A data recording frequency of 100ms.
2. Measurement range: $\pm$8V, $\pm$32V or $\pm$64V; accuracy $\pm$0.02% F.S.

Auxiliary Temperature ET-100B/ ET-100C

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

ET-100B

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

ET-100C

1. Each module contains up to 8~16 measurement points. A data recording frequency of 4s.
2. Supports various mainstream temperature sensors available on the market, such as:
   Thermocouple, Thermistor, RTD, and Diode (can be selected according to customer specifications).
   Measurement range is vast, and accuracy can reach $\pm$0.1oC.

BMS Data Collector

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

Supports CAN .dbc file editing and import.

Parallel Connection Module

Supports two channnles connected in parallel to increase current output.

Power Distribution Switch Box

Allows user to connect/ remove batttery while running test on the other battery, which imprves battery test efficiency.

Power Distribution Unit

Can extend the distance between the equipment and the object to be tested.
Space utilization can be improved based on the client's facility requirements.

Chamber

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

Battery Connecting Cable

Customized battery connection cables can be made according to the requirements of the client's testing environment.

www.chentech.com.tw/eindex for further information

■ **Headquarter, Taiwan**
1F., No.27, Ln.61, Sec.1, Guangfu Rd., Sanchong Dist., New Taipei City 24158
✉ sales@chentech.com.tw
☎ +886-2-2278-3825
🖨 +886-2-2278-3926

■ **Suzhou, China**
☎ +86-512-62531842
■ **Tokyo, Japan**
☎ +81-90-3693-8453
■ **Osaka, Japan**
☎ +81-90-8168-4607

■ **Seoul, Korea**
☎ +82-2-3453-7185
■ **Washington, USA**
☎ +1-888-998-3963

■ **Bangkok, Thailand**
☎ +66-2-540-1667-69
■ **Dhaka, Bangladesh**
☎ +880-2-5861028

PRODUCT INFORMATION

All specs are subject to change, please contact our sales representative for latest information