

Regenerative type DC power supply, Battery charge / discharge system

pCUBE®

A power supply and a regenerative electronic load are available in a single unit.
They realize bidirectional operation at 1000 V max. or ±1000 A max.
As the packaged system for evaluating the battery performance,
you can also use the pCUBE as a charge / discharge system.

Combined freely according to the test object
Wide range from 10 kW to 240 kW

Freely connected in series-parallel
×
Regenerative type DC power supply



Regenerative type DC power supply
pCUBE®

Battery charge / discharge system

Two models

Maximum 1000 A input and output when parallel-connected
MWBFP3-1008-J02 80 V version (80V/±250A/±10kW)
Maximum 1000 V input and output when series-connected
MWBFP3-1250-J02 500 V version (500V/±35A/±11.5kW)

Two models

Maximum 1000 A input and output when parallel-connected
MWCDS-1008-J02 80 V version (80V/±250A/±10kW)
Maximum 1000 V input and output when series-connected
MWCDS-1250-J02 500 V version (500V/±35A/±11.5kW)

* pCUBE is a registered trademark of the Myway Plus Corporation.

⚠ Safety precautions

In order to use the system correctly, be sure to read the instruction manual before use.
Do not install the unit in a place where there is much water, humidity, steam, or oil smoke, for example. They may cause a fire, electric shock or breakdown, resulting in death or serious injury.

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Myway Plus website

www.myway.co.jp

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Regenerative type DC power supply

Available for series & parallel connection. Large capacity 10 kW regenerative DC power supply.

Regenerative type DC power supply

pCUBE®

* pCUBE is a registered trademark of Myway Plus.

Two models to choose from

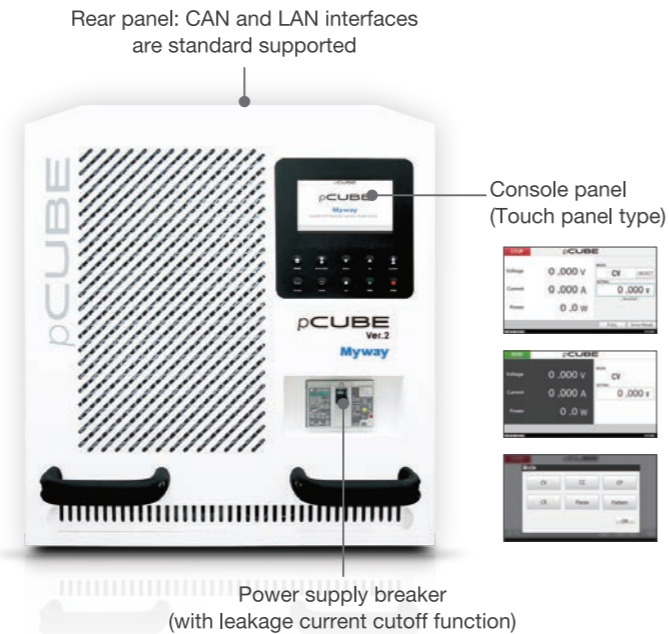
Maximum 1000 A input and output when parallel-connected
MWBF3-1008-J02 80 V version (80V/±250A/±10kW)
 Maximum 1000 V input and output when series-connected
MWBF3-1250-J02 500 V version (500V/±35A/±11.5 kW)

The series and parallel connections of the pCUBE regenerative type DC power supply units can be changed freely by the user himself, thus enabling the system to cope flexibly with changes in the test target. As the top runner of regenerative power supplies, this model realizes high-speed current response and highly accurate program operation due to our high-efficiency control technology, while realizing compactness and high efficiency (regeneration efficiency 86% *)

*1: During rated operation

Applications

- EV/HEV batteries (modules / packs) for a charge / discharge tests
- As a drive inverter power supply for motors and ISG (Integrated Starter Generator)
- As a battery simulation power supply, or as a PV simulation power supply (*Optional software must be purchased separately.)



The highly efficient regeneration function permits reuse of electricity, saving of electric power, and space conservation

The regenerative efficiency is 86% (MWBF3-1008-J02) as an electronic load at discharge, thus greatly reducing heat generation. Cooling facilities for eliminating heat are unnecessary. This realizes power saving, space saving, and cost reduction, and solves issues attendant to large capacity power supplies.

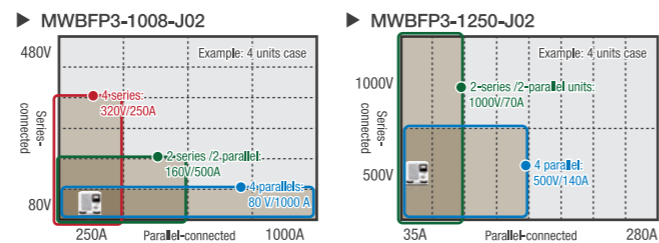


A unique circuit method is employed, realizing seamless, high-speed response

Voltage : <10ms on 1-99%. Current : <3ms on -99% - +99%
 The high-speed response between positive and negative current is seamlessly realized on the unique circuit method. Supports a variety of applications for inverter drive to charge / discharge of lithium-ion batteries.

Likes batteries, series and/or parallel combinations is available, thus realizing high current and high voltage

The customer himself can use several units of the same model, and connect them freely in series and/or parallel. With 80 V version units in series-parallel, the system can be extended to a maximum of 480 V/±1000 A. With 500 V version units in series-parallel, the system can be expanded to a maximum of 1000 V/±280 A. Connections can be changed according to the particular application.



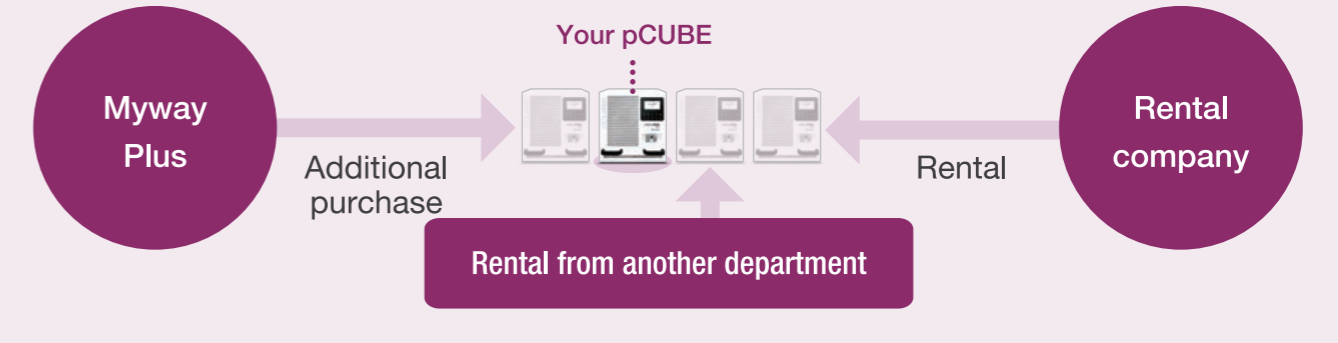
By using a CAN interface, 10 ms high-speed monitoring can be carried out

Two types of communication, CAN & LAN interfaces are available. In the case of CAN communication, 10 ms intervals of the monitoring can be collected. You can use your own sequencer and operate the pCUBE as a built-in power supply.

pCUBE is a portable extensible power supply.

Units can be connected in series and parallel. So the capacity can be constructed quickly and easily. pCUBE is a compact power supply, so it can be carried about freely instead of fixed one.
 The multifarious needs and applications, including batteries, are continually

changing, and cost much money. First, the minimum voltage, current and capacity are introduced, and expanded as necessary by rental, for example. This enables an efficient test environment to be efficiently maintained and operated, without creating superfluous facilities.



Application Examples of the pCUBE

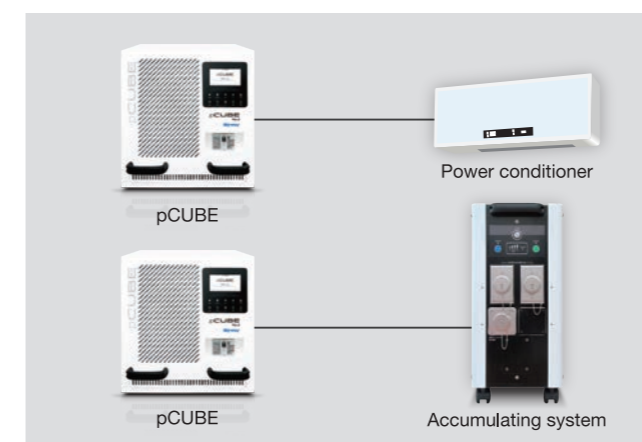
Battery charge / discharge test



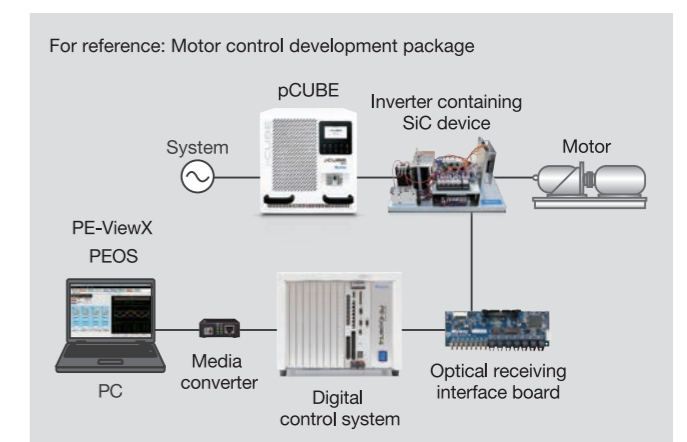
Motor, inverter drive, DC/DC converter drive



PCS evaluation (PV simulation), ESS evaluation (battery simulation)



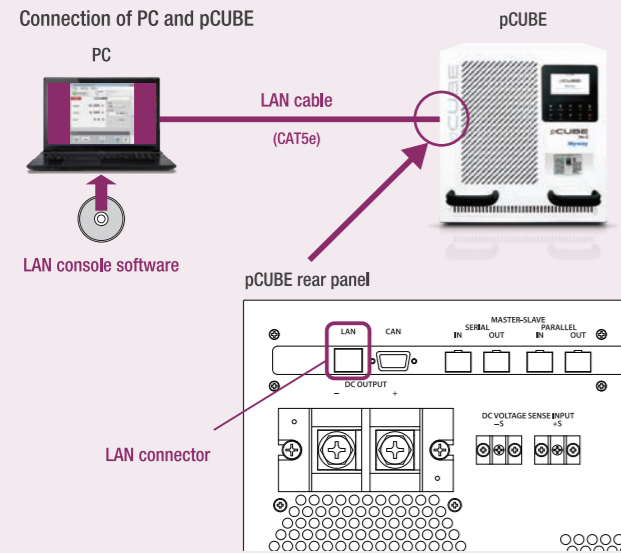
Research and development of inverter



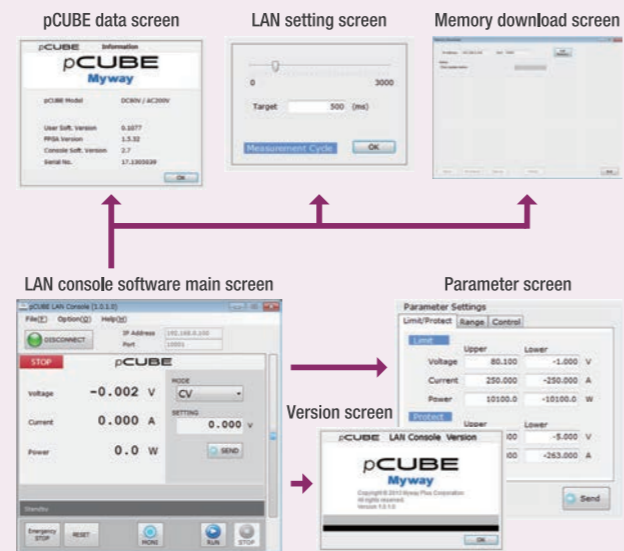
Optional software

PC Operation from a remote location Easy to-use LAN console software (standard option)

The pCUBE supports LAN and CAN communication. It can be connected to the customer's upper layer controller. By using standard option LAN console software, pCUBE operation can be stopped from a remote location, and also the operation mode or the settings of command values and protection values



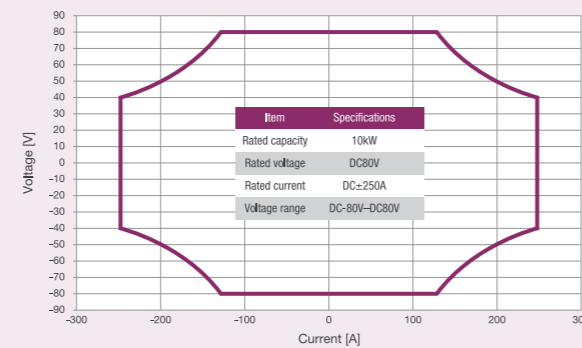
can be changed, even without preparing an upper layer controller. This software also supports data downloading to the memory and its execution. The use of a PC enables the pCUBE to be operated easily.



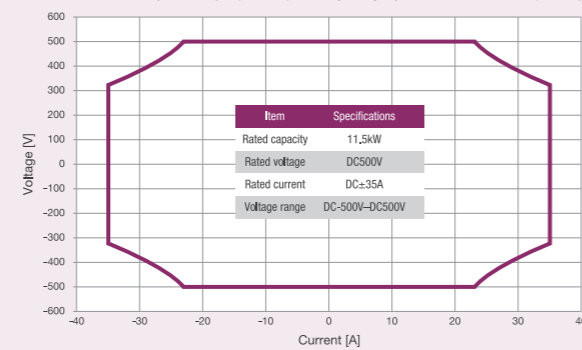
Support for a negative voltage (customization) by using a bipolar power supply

The pCUBE supports between -1 V and 80 V (in the case of MWBFP3-1008-J02). The ability to operate at the maximum current without derating, even at 0 V, is one of the features of the pCUBE. By customizing, a bipolar power supply that supports negative voltages can be made to order. Lately, demands have arisen for power supplies that can be discharged down to a negative voltage during a forced discharge test of a battery. In the case of a bipolar pCUBE, you can perform large capacity and large current charge / discharge while reducing the voltage to a negative value. By utilizing memory operation, the unit can be pulse-driven within the range of response speed.

▶ MWBFP3-1008-J02 (10 kW) bipolar operating range (Customization is required.)



▶ MWBFP3-1250-J02 (11.5 kW) bipolar operating range (Customization is required.)



Example: When MWBFP3-1008-J02 is made bipolar

Item	Specifications	Item	Specifications
Rated capacity	10kW	Rated capacity	10kW
Rated voltage	DC80V	Rated voltage	DC80V
Rated current	DC±250A	Rated current	DC±250A
Voltage range	DC-1V~DC80V	Voltage range	DC-80V~DC80V

On smart grids and power conditioner circuits, it's the best choice for evaluating operation and analyzing problems.

Optional software for the pCUBE

PV simulation software

MWBFP3-PVS

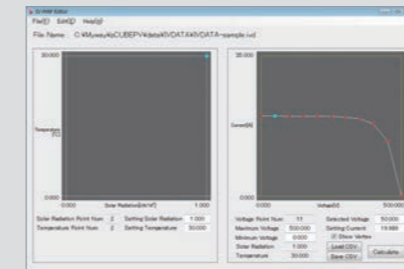
Recommended operating environment

OS: Microsoft Windows7 (32 bit), CPU: Intel Core2 Due 2 GHz or higher
Memory: 2 GB or more, HDD: 40 GB or more
Display resolution: 1024×768 dot resolution

By connecting a LAN to your PC in which software for simulating the pCUBE regenerative power supply and the PV (photovoltaic battery) has been installed, you can operate the pCUBE as a solar panel. Not only are the actual IV characteristics simulated, but also the current IV characteristics, operating points, sunlight intensity and temperature are

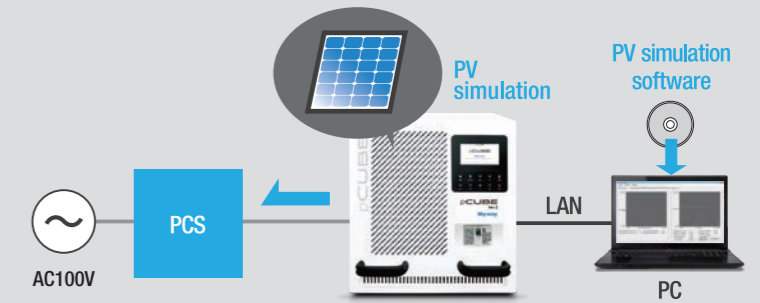
By 4 specifications input, All range PV simulation can be realized

The necessary IV characteristics for carrying out PV simulation change according to the sunlight intensity and the temperature. By setting 4 types of IV characteristics consisting of the minimum and maximum values of the temperatures used for simulation, and also the minimum and maximum values of sunlight intensity, the software interpolates the data and simulates it.



Real time monitoring on a PC for the operating conditions clearly

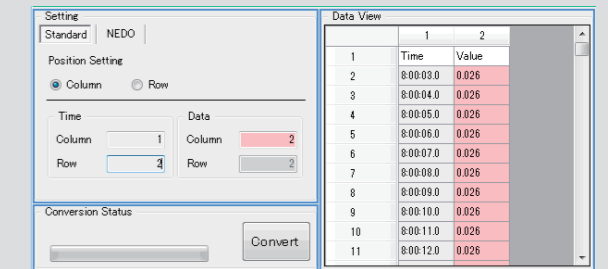
The simulation condition can be displayed in real time using a characteristics monitor when operating the pCUBE connected to a PC. This monitor displays not only current, voltage and electric power, but also the situation presently being output, either as an IV characteristics graph or a PV characteristics graph.



also monitored in real time, enabling the system to perform a circuit evaluation of a smart grid or power conditioner, and also to analyze problems. The pCUBE also features the ability to be connected in series-parallel. It is thus suitable for series-parallel connection of panels as well.

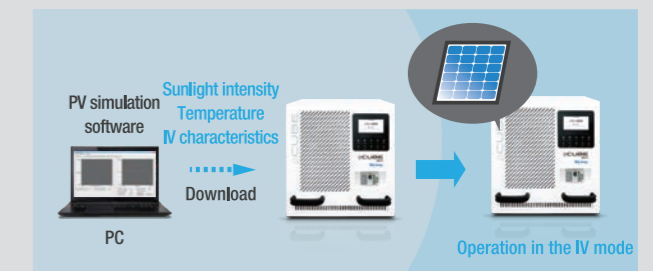
Utilization of CSV files makes it easier to input complex IV characteristics, temperature, and sunlight intensity

Reading of CSV files is now supported in order to make it easier to input the IV characteristics compared to the use of an editor. The relationship between sunlight intensity and temperature for each hour can also be read easily using the CSV files. Consequently, if there exists CSV data for PV to be simulated, PV simulation will start immediately.



pCUBE can be operated independently, once the IV characteristics are downloaded.

A PC is necessary until the IV characteristics are downloaded to the pCUBE. After downloading, the pCUBE can be operated independently. The IV characteristics do not disappear even after the power has been switched OFF.



On storage battery systems, BMU, and in-vehicle inverters, it's the best choice for evaluating operation and analyzing problems.

pCUBE Option Software

Battery simulation software

MWBFP3-BTS

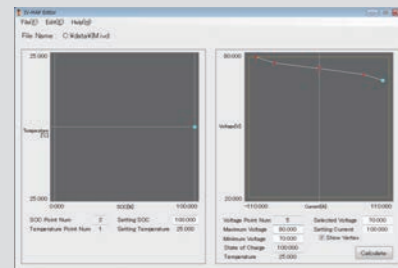
Recommended operating environment

OS: Microsoft Windows7 (32 bit), CPU: Intel Core2 Duo 2 GHz or higher
Memory: 2 GB or more, HDD: 40 GB or more
Display resolution: 1024×768 dots or more

By using a LAN to connect a pCUBE to your PC in which battery simulation software has been installed, you can use the pCUBE as a simulated battery. This software not only simulate the characteristics of an actual battery, but also monitors the current IV characteristics, operation points and the state of charge (SOC).

Easy creation of battery characteristics to be simulated using a dedicated editor

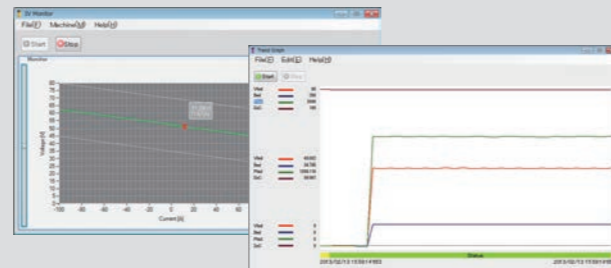
The battery IV characteristics are registered for each state of charge (SOC) using a dedicated IV-MAP editor. If the two points SOC 0% and SOC 100% and also the maximum capacity (Ah) of the batteries are set as the IV characteristics, the software will automatically start the simulation process.



Consequently it can be used for circuit evaluation and problem analysis of a storage battery system or a charger for an electric vehicle. It also supports series-parallel connections, which is a feature of the pCUBE DC, it is suitable for simulating large capacity batteries as well.

The trend graph function for the voltage, current, power, and charge (SOC) with time

The trend graph function displays the change along with time of the voltage, current, power, and the state of charge (SOC) output from the pCUBE, as a graph. The right side of the graph shows the latest data as the change of the various kinds of data concerning the battery.



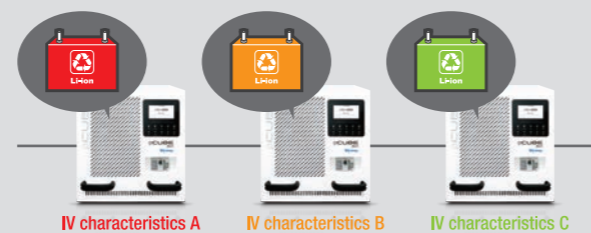
pCUBE can be operated independently, once the IV characteristics are downloaded.

A PC is necessary until the IV characteristics are downloaded to the pCUBE. After the download, pCUBE can be operated independently. The IV characteristics do not disappear even after the power has been switched OFF.



Good reproducibility in case of various batteries are connected together

By connecting multiple pCUBE units that have different IV characteristics downloaded, the behavior in the case where different modules are connected can be validated. Optimum for the design and evaluation for BMU.



On battery SOC adjustment, safety tests and cycle tests, it's optimum for various applications.

pCUBE option software

Charge & discharge applications

MWBFP3-CDA

Recommended operating environment

OS: Microsoft Windows7 (32 bit), CPU: Intel Core2 Duo 2 GHz or higher
Memory: 2 GB or more, HDD: 40 GB or more
Display resolution: 1024×768 dots or more

By using a LAN to connect a pCUBE to your PC in which charge / discharge applications have been installed, you can use the pCUBE as a programmable charge / discharge power supply.

Easy creation of a charge / discharge program using a dedicated editor

This program contains the basic CC, CV and CP charge / discharge commands which are necessary for performing charge / discharge operations. In addition, Memory, Pause, Continue, Loop and other charge / discharge command are available. A program can consist of up to 100 steps. In addition to time, transit conditions such as current, voltage and power can be set. For example, a CC-CV operation is also available by combining these conditions as various charge / discharge tests.

Operation program example

Step	Mode	CH	Reference	Judge	Time[ms]	Shift Mode	Shift Cond.	Loe[ms]
1	CC (A)		10.0	Mode	0.0	Voltage Up. (V)	25.0	0
2	Continue			Mode	0.0	Current Lo. (A)	1.0	0
3	CC (A)		-10.0	Time	1.00.00.0			0

↑ CC charge at 10 A and changes to CV operation when 25 V. When falls to 1 A, changes to 10 A discharge.

Memory operation function for performing complex operations

Using the CSV format, you can save a charge / discharge pattern created in a pCUBE, and execute it. You can save up to 12 sets of CSV data consisting of a maximum of 64512 points, and set the switchover time (1–1000 msec) between points. This function is effective for realizing complex patterns, such as actual vehicle running patterns that cannot be expressed using various steps.

Memory data examples



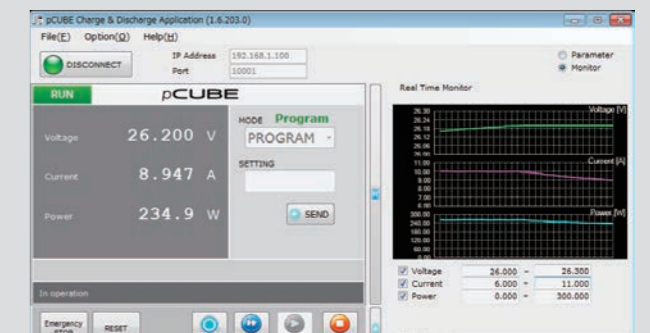
↑ Image representing 1–5 A instruction in the CC operation mode, and a switchover time of 1000 msec



You can perform complex patterns of operation that cannot be realized by a stand-alone power supply, and also battery charge / discharge tests under various conditions determined by user settings. It has the safety operation that is control from a parted place.

CSV data from the pCUBE can be saved and can monitor the operating in real time.

Voltage, current and power can be saved as csv data at minimum intervals of 100 msec. You can arrange the data easily without connection to measuring instruments. You can also monitor the present operating situation in real time.



Comparison with the MWCDS series charge / discharge system

	MWBFP3-CDA	MWCDS series
Power supply series-parallel expansion	✓	✓
Number of steps	100	99 (program) × 99 (pattern) × (steps)
Charge / discharge commands	7 types	15 types
Memory operation mode	✓	✓
Transition conditions	4 types	14 types
Shutdown conditions (protection)	Power supply main unit	Power supply main unit, software
Step execution time	Shortest 100 msec	Shortest 10 msec
Logging function	Shortest 100 msec	Shortest 10 msec
Data logger	None	Voltage 15 ch-, Temperature 30 ch-

Simulation of the BMU (battery management unit) and evaluation of PCS is realized by software.

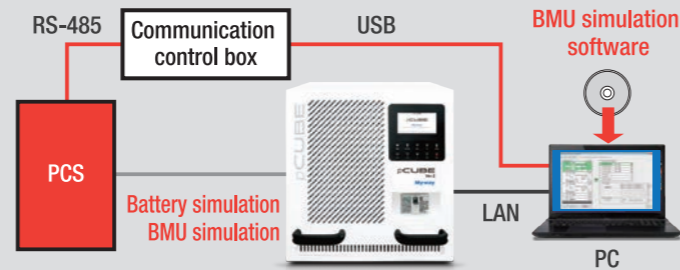
Optional software for the pCUBE regenerative DC power supply

BMU simulation software (Under development)

Recommended operating environment

OS: Microsoft Windows7 (32 bit), CPU: Intel Core2 Duo 2 GHz or higher
Memory: 2 GB or more, HDD: 40 GB or more
Display resolution: 1024×768 dots or more

By using a LAN to connect a pCUBE to your PC in which BMU simulation software has been installed, you can use the pCUBE as a battery, and carry out a simulation of a system consisting of the BMU and the battery. It is essential that the inverter for a storage battery system is cooperated



with the BMU.

The cooperation function enables to evaluate the interconnection as a total system, even without an actual battery or a BMU.

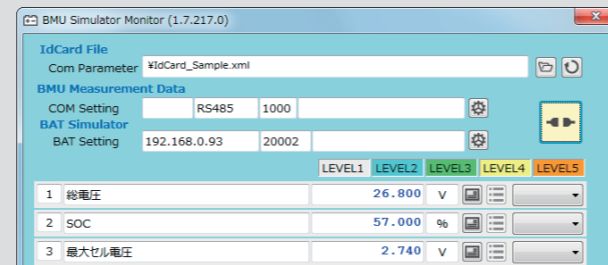
Realization of various kinds of pCUBE operation control according to the set values

The total voltage and the threshold values of the overvoltage and voltage drop of the cell are set by the BMU simulation software BMU. The current and temperature can be also set. If the set value is exceeded, the pCUBE automatically stops just as if it is controlled by the BMU.

Function	Details
Battery Cell voltage	The cell voltage is set by the control PC. The simulator judges an alarm and a serious fault from overvoltage or voltage drop.
Total Battery voltage	The total battery voltage is set by the control PC. The simulator judges a fault and an alarm from overvoltage or voltage drop.
Battery current monitoring	The current value is set by the control PC. The simulator judges an alarm and a serious fault from the charge / discharge directions and overcurrent. In case of a fault judgment, the operation of the pCUBE is stopped.
Battery temperature monitoring	The temperature is set by the control PC. The simulator judges an alarm and a serious fault from temperature high/low.

System control according to the status of the BMU Even in the event of a PCS fault

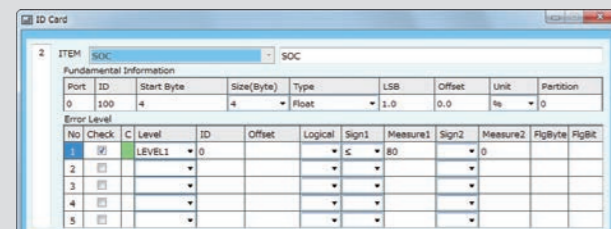
The values measured using the BMU simulator not only control the pCUBE, but also enable commands for measured data and status to be sent to PCS. Monitoring the BMU status from the PCS, it can control charge / discharge of the battery and also signals can be input when a fault occurs. Commands from the PCS side can also be received, enabling the pCUBE to be stopped in the event of a PCS fault.



No need to change the BMU setting, even if the communication ID changes with each inverter

ID registration can be performed for each item of data. Even though the communication ID is different for each PCS, communication with the PCS can be performed by simply changing the ID on the simulation software side. There is no need to change the communication specifications on the PSC side.

* It is necessary to customize the software according to the communication specifications.



More sophisticated system tests can be realized with the pCUBE battery simulation software

By the pCUBE with the battery simulation software (MWBFP3-BTS), more sophisticated system tests can be performed. By using the simulation battery and simulation BMU, system tests can be performed just as if an actual battery were connected.



Specifications

List of specifications

Regenerative type DC power supply			
Model		MWBFP3-1008-J02	MWBFP3-1250-J02
Rated output	Voltage	-1~80V	-2~500V
	Current	±250A	±35A
	Power	±10kW	±11.5kW
Output accuracy	Voltage	±0.1% of F.S.	
	Current	±0.2% of F.S.	
	Power	±0.3% of F.S.	
Ripple	Voltage	±0.1%rms of 80V	±0.1%rms of 500V
	Current	±0.2%rms of 250A	±0.2%rms of 35A
	Power	3 msec or less (-99% → 99%) (the resistive load)	
Response speed	Voltage	10 msec or less (1% → 99%) (the resistive load)	
	Current	3 msec or less (-99% → 99%)	
	Power	86% → 80%	
Regenerative efficiency		86%	80%
Power supply rate capacity		12.5kVA	14.5kVA
Power supply voltage		200 VAC±10% (3-phase, 3-wire type) *1	
Power factor		0.98 or higher	
External communication IF		LAN, CAN	
Working temperature and humidity range		0~40°C, 20~80%	
External dimensions		430mm (W)×440mm (H)×750mm (D)	
Mass		Approx. 125 kg	

*1 For overseas specifications: 380 VDC±10% (3-phase, 4-wire)

● For detailed specifications, please make a separate inquiry.

● The pCUBE can also be customized to make a bipolar power supply that can output negative voltages.

Lineup

Regenerative type DC power supply		
Product name	Model No.	Remarks
pCUBE	MWBFP3-1008-J02	Domestic specifications
pCUBE	MWBFP3-1250-J02	Domestic specifications
pCUBE	MWBFP3-1008-C02	Overseas specifications
pCUBE	MWBFP3-1250-C02	Overseas specifications

Option to be separately purchased

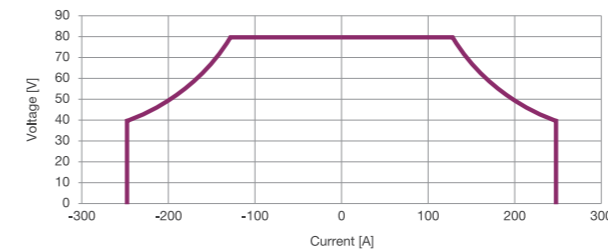
Option		
Product name	Model No.	Remarks
Battery simulation software	MWBFP3-PVS	
Battery simulation software	MWBFP3-PVS	
Charge / discharge applications	MWBFP3-PVS	
BMU simulation software	Under development	
Dedicated rack (for one unit)	MWBFP3-PVS	pCUBE 1-set mounting specifications
Dedicated rack (for two units)	MWBFP3-PVS	pCUBE 2-set mounting specifications
Dedicated dolly	MWBFP3-DOLLY	Flexible type container dolly, 6-wheel type

● For detailed specifications, please make a separate inquiry.

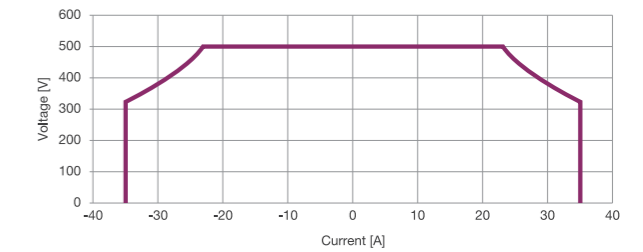
● For overseas specifications of optional software, please consult us separately.

Operating range (for one pCUBE)

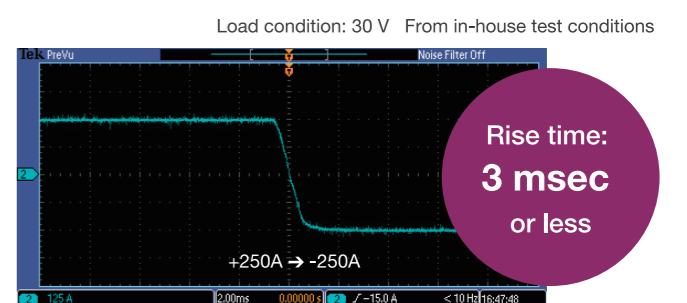
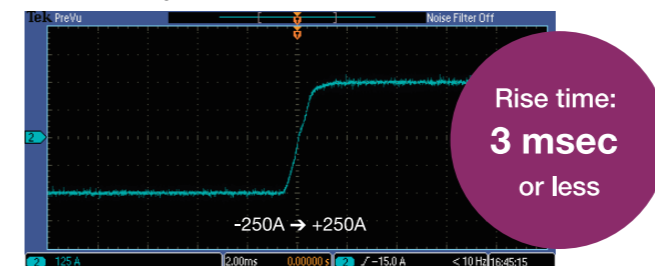
▶ MWBFP3-1008-J02 (10 kW) operating range



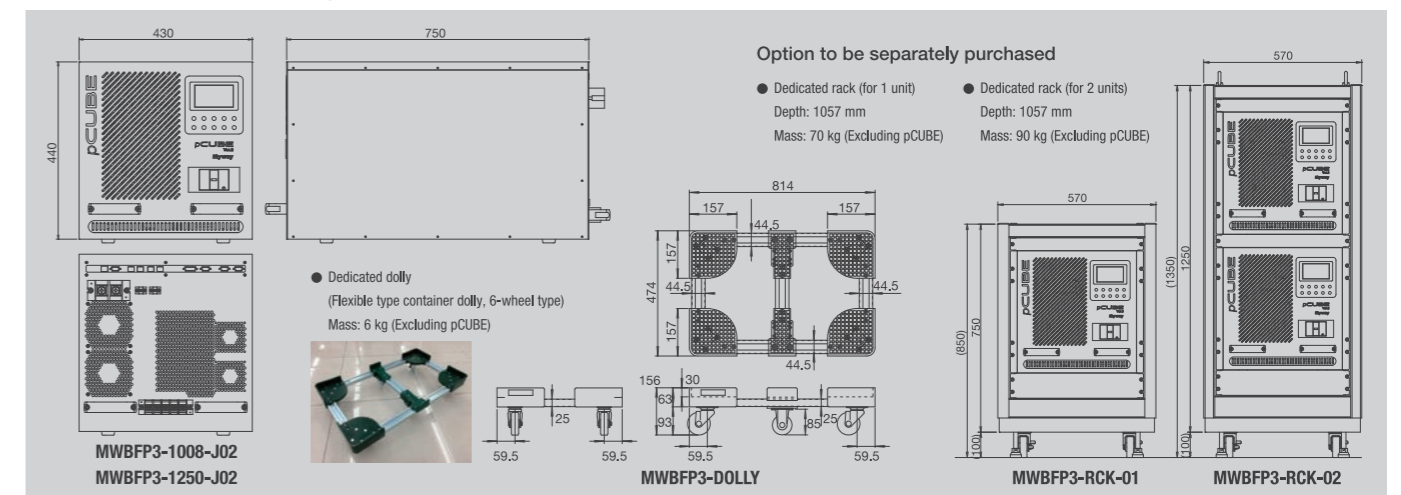
▶ MWBFP3-1250-J02 (11.5 kW) operating range



Current response waveform



Outside dimensional diagram



Battery charge / discharge system

New standard for charge / discharge system for modules/packs batteries

Battery charge / discharge system

pCUBE®

* pCUBE is a registered trademark of Myway Plus.

Two models to choose from

Maximum 1000 A input and output when parallel-connected
MWCDS-1008-J02 80 V version (80V/±250A/±10kW)
 Maximum 1000 V input and output when series-connected
MWCDS-1250-J02 500 V version (500V/±35A/±11.5kW)

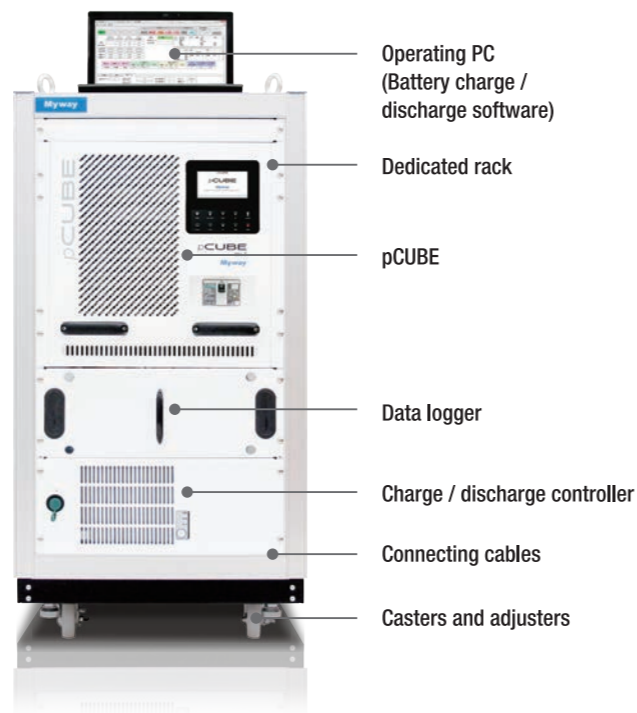
The system incorporates a pCUBE which capacity (voltage and current) can be expanded by series-parallel connections, like a battery. This compact unit is of a basic composition that enables the maximum performance to be obtained (high performance controller, charge / discharge software, and a data logger for measuring cell voltage and temperature). It is installed in a 19-inch rack, and is completely standardized. pCUBE By additionally expanding the 80 V version and the 500 V version of the pCUBE, it is possible to cover the development and production of prototypes, and also their evaluation using a roadmap for batteries which are becoming increasingly large in capacity. Amid the advancement toward the standardization of test standards for batteries, we will continue to offer the latest standards concerning test equipment as well.

Typical applications

- On Li-ion batteries as a system for evaluating and testing the charge / discharge

Easy creation of patterns by grouping despite complex combinations of charge / discharge tests

One test program consists of four levels: Program, pattern, step, and command. By grouping steps or patterns in which multiple commands are registered, complex combinations can also be easily created. No special training is required.
 * Maximum configuration: Programs (99) × Patterns (99) × Steps (99)



Wide variety of 15 basic commands in icons. To be combined freely

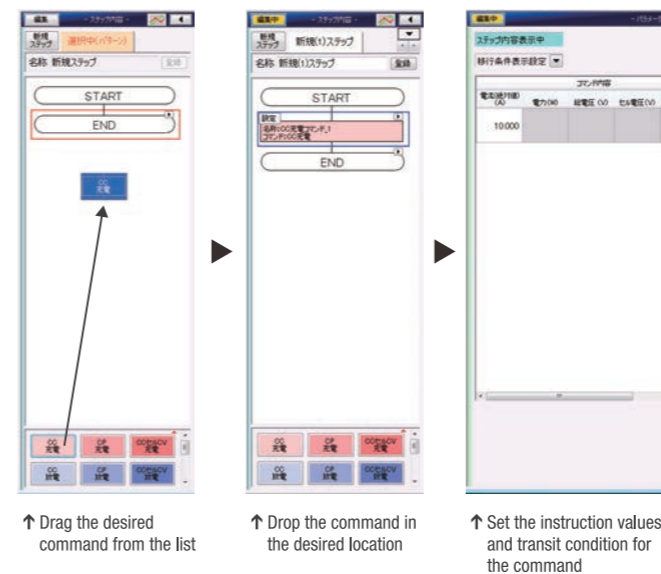
All of the 15 basic commands used in a charge / discharge program are displayed as icons. "CC cell CV command" which performs fixed voltage control after one of the cells has reached the specified value, and "memory operation" (cycle test, pulse discharge CC or CP can be performed) which permits high-speed (1-1000 msec) switchover between charge / discharge, are also provided as standard features.



↑ 15 kinds of basic commands

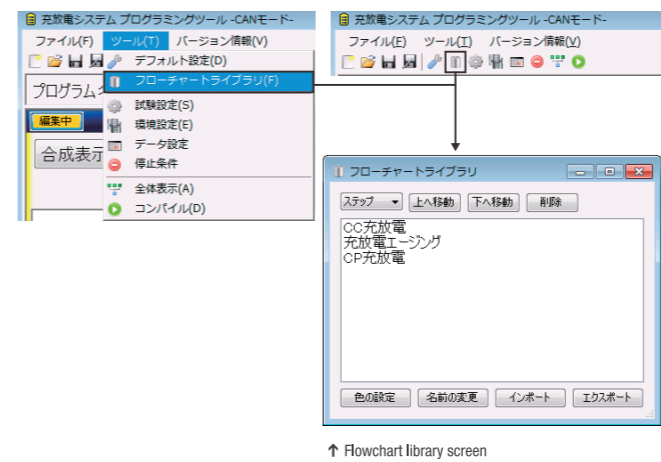
16 sets wide judgements. Easily input of command and transit conditions

The charge / discharge commands which are displayed as icons have a very good reputation. By simply clicking these icons on the PC, you can easily and intuitively create the desired test program. There is no need whatever to input data to a conventional spreadsheet such as Excel. Various transit conditions can also be easily input.



In the CSV format, data can be saved, enabling past programs to be edited and reused

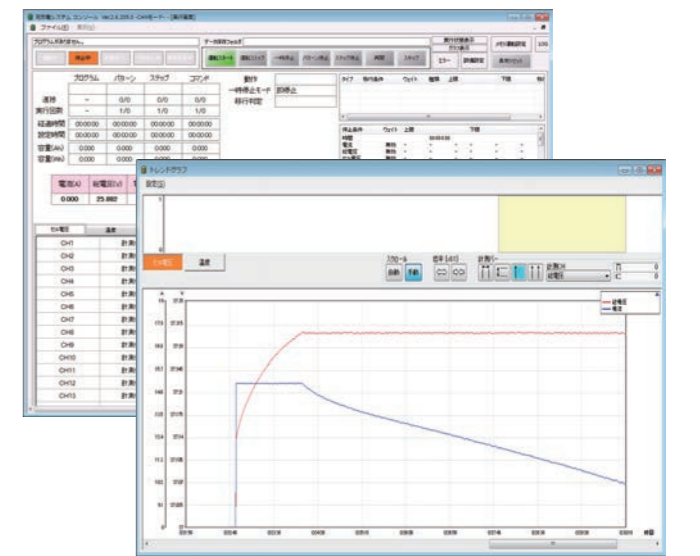
By selecting a saved data item, you can leave only the necessary data in the file. You can edit in the CSV format by using a spreadsheet such as Excel. You can carry out data division every 60,000 lines, and in addition carry it out at each stage of the charge / discharge pattern. Supports file saving to network drive. The flowchart library enables you to reuse and edit programs that had been previously created.



↑ Flowchart library screen

Monitors the operating conditions in real time, the state of the program, and the voltage and temperature of each cell

The operating condition transition, program progress situation, and operating mode, and also the voltage and temperature of each cell to be measured using a data logger, can be viewed in real time. It continually monitors the deviations in voltage and temperature between each cell.



For safe tests, four-step protection by hardware, software, compiler, and system.

By using charge / discharge software, you can set stop conditions of a program in advance, so that when the voltage or temperature reaches an abnormal level, the program automatically stop the voltage. We provide protection by the hardware (pCUBE power supply main unit), compiler input protection for preventing abnormal values, and also protection of the entire system, thus ensuring a safe testing environment.



↑ Stop condition setting screen

Application Examples

For module batteries (Standard package)

Combination composition

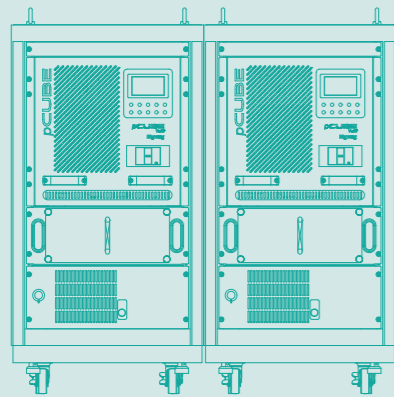
- Charge / discharge systems
MWDCS-1008-J02 (80 V / ±250A): 2 systems

Combination composition

- Development and performance evaluation of module batteries that have various capacity and performance
- Tests related to transportation of lithium-ion batteries stipulated in the UN recommendations

Series/parallel switching pattern

- ① 80V/±250A (1 series, 1 parallel) 2ch
- ② 80V/±500A (1 series, 2 parallel) 2ch
- ③ 160V/±250A (2 series, 1 parallel) 1ch



For a large variety of module/pack batteries

Combination composition

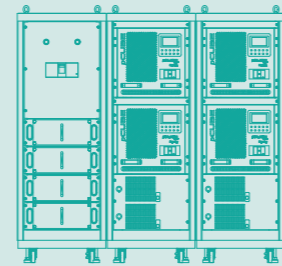
- Charge / discharge system
MWDCS-1008-J02 (80 V / ±250A): 4 systems
- Series/parallel switchover equipment

Combination composition

- Development of multiple module batteries that have various capacity and performance
- Tests related to transportation of lithium-ion batteries stipulated in the UN recommendations
- Cold cranking large current charge / discharge tests for ISG

Series/parallel switching pattern

- ① 80V/±250A (1 series, 1 parallel) 4ch
- ② 80V/±500A (1 series, 2 parallel) 2ch
- ③ 160V/±250A (2 series, 1 parallel) 2ch
- ④ 320V/±250A (4 series, 1 parallel) 1ch
- ⑤ 80V/±1000A (1 series, 4 parallel) 1ch



For module batteries (Standard package)

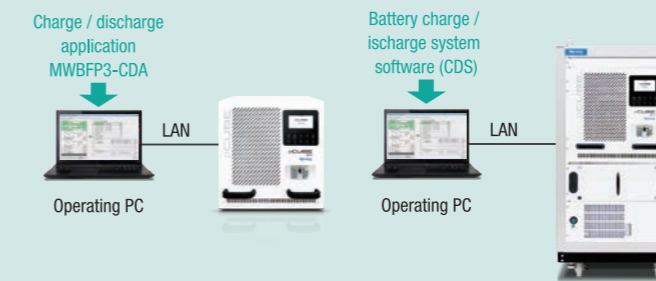
The mounted pCUBE can also operate as a bipolar power supply by customizing. The pCUBE can be used in forced discharge tests down to a negative voltage. Not only a simple CC operation, the pCUBE also supports forced discharge tests by programmable operation on the system or application for a charge / discharge.

Features

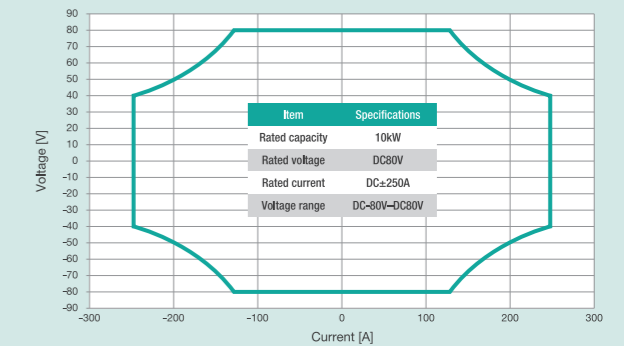
- Negative voltages below 0 V is available
- Rated current is available even if on a negative voltage.
- Capacity can be expanded by series-parallel connections.

Applications

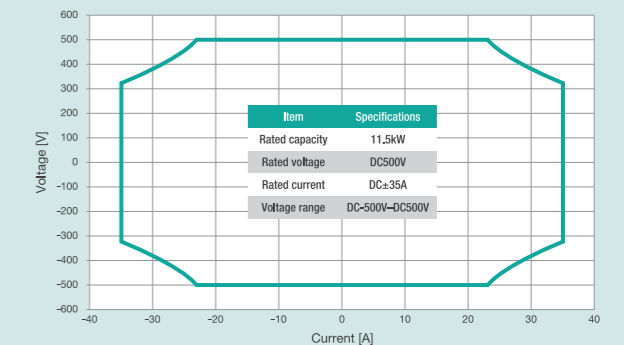
- Forced discharge test
- Over-discharge test
- Polarity inversion test



► MWBF3-1008-J02 (10 kW) bipolar operating range (Customization is necessary.)



► MWBF3-1250-J02 (11.5kW) bipolar operating range (Customization is necessary.)



For EV/PHV battery

Combination composition

- Charge / discharge system
MWDCS-1250-J02 (500 V / ±35 A): 2 system
- Regenerative type DC power supply
MWBF3-1250-J02 (500 V / ±35 A): 4 systems
- Series/parallel switchover equipment

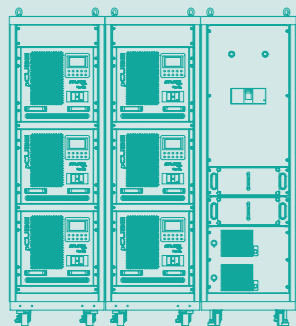
Combination composition

- Charge / discharge tests aimed at the development of battery packs for EV and PHV
- SOC adjustment and pre-shipping inspection tests on battery packs for EV and PHV

Series/parallel switching pattern

- ① 500V/±210A /69kW (1 series, 6 parallel) 1ch
- ② 500V/±105A /34.5kW (1 series, 3 parallel) 2ch

* It can also be used as 500 V ±35A (11.5 kW): 6 systems.



For large capacity accumulator system

Combination composition

- Charge / discharge system
MWDCS-1250-J02 (500 V / ±35 A): 1 system
- Regenerative type DC power supply
MWBF3-1250-J02 (500 V / ±35 A): 17 systems
- Series/parallel switchover equipment

Combination composition

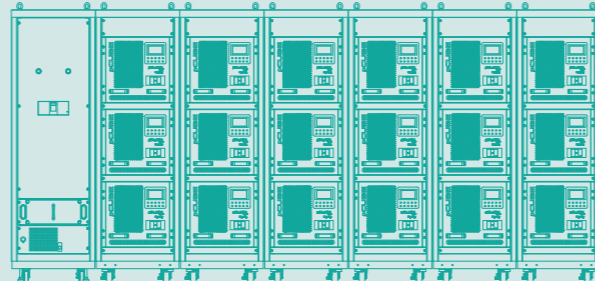
- Battery/BMU charge / discharge test for a large capacity storage battery system
- Development of a large capacity storage battery system for overseas use

Series/parallel switching pattern

- ① 500V/±630A /207kW (1 series, 18 parallel) 1ch
- ② 1000V/±315A /207kW (2 series, 9 parallel *1) 1ch
- ③ 1500V/±210A /207kW (3 series, 6 parallel *2) 1ch

* 1: Special order for 9 parallel connections.

* 2: Special order for 3 series connections.



Thermostatic chamber interlock

Linking with the thermostatic chamber (RS485 communication), and change the temperature and humidity, it is possible to carry out a discharge test by customizing the charge / discharge software.

Features

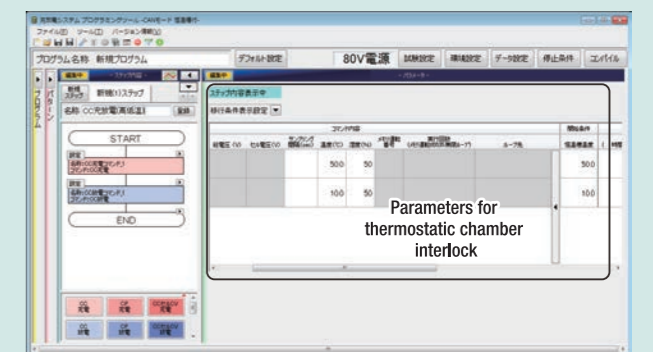
- You can set the condition of the thermostatic chamber (stop, or resume) that is active at the end of the program.
- Monitoring the temperature and humidity, the system can be stopped safely in case of abnormal condition.

Applications

- Temperature characteristic tests of batteries on the changing temperature environment and on high current condition

Item	Specifications
Communication I/F	RS485
Communication period	1000ms
system link	Temperature, humidity, starting temperature, ending condition

* Manufacturer of applicable thermostatic chamber:
Espec Corp.(Regarding other companies, please contact us.)



↑ Programming image of thermostatic chamber interlock



Specifications

BMU communication link

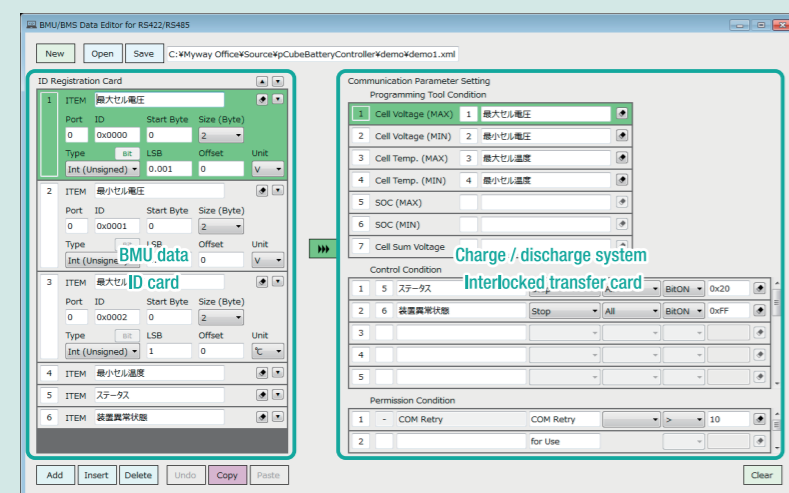
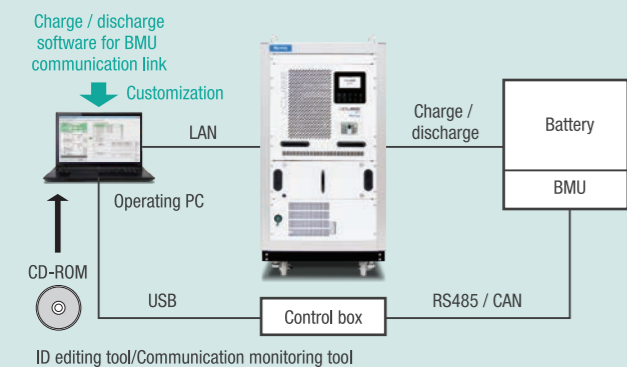
By customizing the charge / discharge software, you can read out various kinds of battery data and carry out charge / discharge tests through RS485 communication / CAN communication from the BMU of the test battery

Applications

- Development and evaluation of BMU and module/pack batteries which are becoming increasing capacity and greater number of cells

Item	Specifications
Communication I/F	RS485 / CAN
Communication interval	100–1000ms (* According to BMU communication specifications)
Control Term	Transit, shutdown, standby, resume, power limit etc.
System link	The maximum and minimum values of cell voltage, cell temperature, SOC, and total voltage combined with the transit and stop conditions.
BMU parameters	The parameters can be customized based on each manufacturer's specifications. (ID editing tool) (Parameter storage and readout)
BMU monitoring	Monitoring the data setting by ID editing tool (communication monitor tool).
Data record	Can be recorded synchronously with the charge / discharge system data.

* A communication I/F that differs for each BMU and also the communication sequence can be customized.



ID registration for each data item

ID registration can be made for each data item. Even if the ID differs from one BMU to another, communication with the BMU can be performed by simply change the ID at the BMU interlock software side, without any need to change the communication specifications on the BMU side.

* Customization needed according to the communication specifications.

BMU I/F communication specifications (example)

ID	Data item	Data range	Data type	Resolution	Unit
1000h	Maximum cell voltage	0–5000	Unsigned	0.001V	V



System control according to the status of the BMU

The voltage and temperature values measured on the BMU are utilized for program operation in the charge / discharge controller, thus enabling charge / discharge tests that closely simulate actual tests to be implemented.

[1] The control interlock items are transferred to the communication card in the control interlock list.

* The transfer method is the same as a programming tool interlock setting.



[2] Set the control conditions.

Setting the control condition (example)

- If one of the bits of the BMU fault alarm (2 bytes) becomes 1, the operation of the charge / discharge program will stop.
- If Bit0 of the BMU communication status (2 bytes) is 1, the operation of the charge / discharge program will pause.
- If Bit0 of the communication status (2 bytes) becomes 0, operation of the charge / discharge program will resume.
- The current values are saved as data in the charge / discharge system.

Item	Port	ID	Start Byte	Size (Byte)	Type	Bit	LSB	Offset	Unit
1	2	BMU異常警報	Stop	All	BIRON	0xFFFF			
2	4	BMU通信状態	Wait	All	BIRON	0x0001			
3	4	BMU通信状態	Restart	All	BitOFF	0x0001			
4	5	電流値							
5									

List of specifications

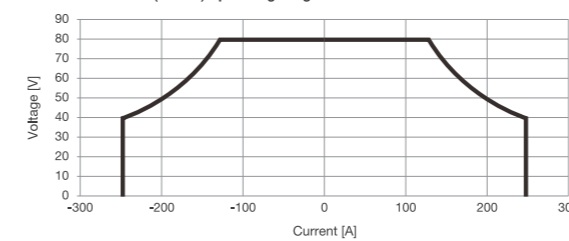
Regenerative type DC power supply			
Model	MWCDS-1008-J02	MWCDS-1250-J02	
Mounted pCUBE model	MWBFP3-1008-J02	MWBFP3-1250-J02	
Total voltage	Measurement range (resolution)		
	H range	-1.1V–80.1V (1mV)	-2V–500V (1mV)
	L range	-1.01V–5.01V (0.1mV)	-1.1V–50V (1mV)
	Measurement accuracy	±0.1% of F.S.	±0.1% of F.S.
Current	Measurement range (resolution)		
	H range	-250A–250A (1mA)	-35A–35A (1mA)
	L range	-25.1A–25.1A (1mA)	-4.01A–4.01A (1mA)
	Measurement accuracy	±0.2% of F.S.	±0.2% of F.S.
Power	Measurement range (resolution)		
	Voltage H, Current H	-10.1kW–10.1kW (1W)	-11.6kW–11.6kW (1W)
	Voltage H, Current L	-2.01kW–2.01kW (1W)	-2.02kW–2.02kW (1W)
	Voltage L, Current H	-1.26kW–1.26kW (1W)	-1.7675kW–1.7675kW (1W)
	Voltage L, Current L	-126W–126W (0.1W)	-202W–202W (0.1W)
	Measurement accuracy	±0.3% of F.S.	
Current capacity	Measurement accuracy	1mAh	
Power capacity	Measurement accuracy	1mWh	
Cell voltage	Measurement range (resolution)	±15V/10V of F.S. (1mV) (100 mV–100 range switchable) *1	
	Measurement accuracy	±0.1% of F.S.	
	Number of channels	15 channels (Can be expanded in 15 ch steps.)	
Cell temperature	Measurement range (resolution)	±100°C/100°C of F.S. (0.1°C) (500°C range switchover)	
	Measurement accuracy	±0.05% of F.S. ±1%	
	Number of channels	30 channels (Can be expanded in 15 ch steps.)	
External analog input	Measurement range (resolution)	-5V–5V (1mV)	
	Measurement accuracy	±1% of F.S.	
	Number of channels	2ch	
Others	Measurement period	10ms–600s	
	Protection function	System protection, Output voltage / Current protection, Emergency shutdown (external contact input)	
External dimensions	570mm (W)×1100mm (H)×1057mm (D)		
Mass	Approx. 200 kg		

*1 The maximum rated voltage between the channels of one unit (15 channels) is 200 VDC, and the maximum rated voltage between the unit and ground is 600 V AC and DC.

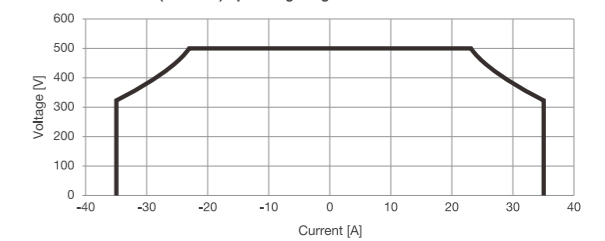
- The guaranteed temperature range at the above accuracy is +23°C±5°Cs, and the humidity 70% or less.
- For overseas specifications, please consult us separately.

Operating range (for a single battery charge / discharge system)

▶ MWCDS-1008-J02 (10 kW) operating range



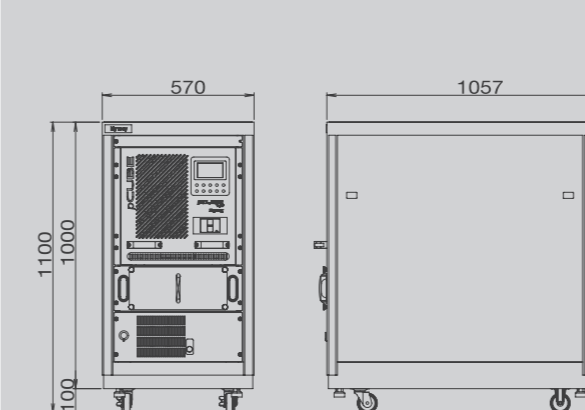
▶ MWCDS-1250-J02 (11.5 kW) operating range 0



External dimensions (battery charge / discharge system)

▶ 1-system dedicated rack

- The sizes of both the 1-system dedicated rack and the 2-system dedicated rack can be customized.
- There is a door at the rear panel.
- The size of the racks may be changed along with changes in the specifications.



▶ 2-system dedicated rack

