

FORTELION

Battery System



CAUTION

Please read the instruction manual carefully before use for safety.

•Specifications and appearance may be changed without prior notice for improvement.
•Due to printing condition, actual product color can be different from the product image in this catalog.

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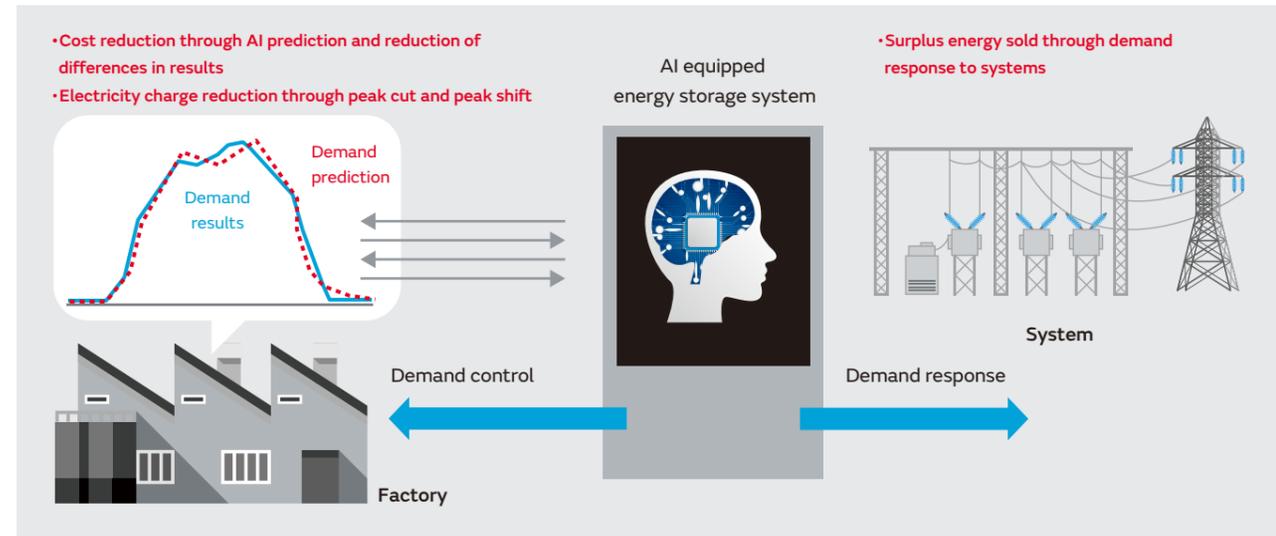


From Energy Saving to Efficient energy use

In addition to "Energy Saving," "Efficient Energy Use," a method to effectively use limited energy, is another approach that is currently being widely embraced. Murata's **FORTELION** battery system that enables cost and electricity charge reduction through proper use of electricity and automatic control is a system that contributes to "Efficient Energy Use" which enables long-term use even with high cycle use and instantaneous discharging and charging.

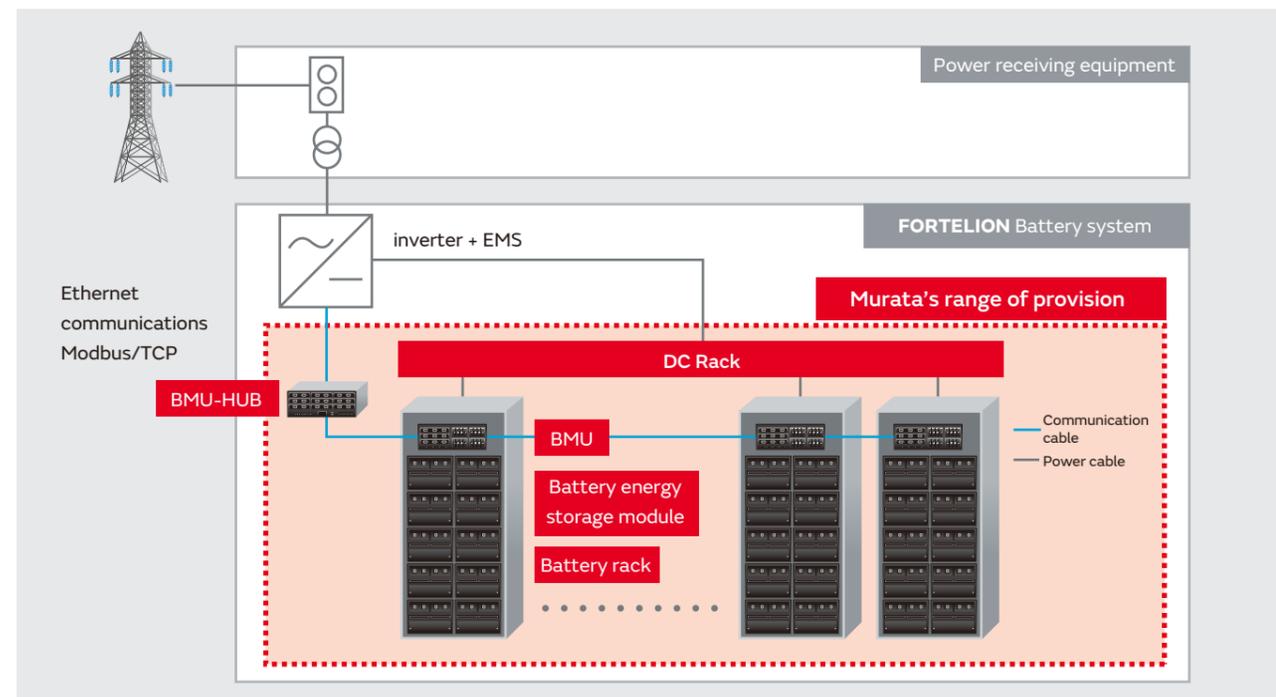
An energy storage system in high demand

It is assumed an energy storage system that grasps weather forecasts and customer electric power usage through technology such as AI, as well as one that performs discharging and charging at timely intervals, will become widespread. This approach would enable a reduction of electricity charges by peak cutting and peak shifting customer electricity demands, selling surplus energy of energy storage as VPP and demand response to the power market, and "Energy Saving" and "Efficient Energy Use" will subsequently become possible. **FORTELION** is optimal for these kinds of solutions due to its low level of deterioration in capacity even through repeated discharging and charging.



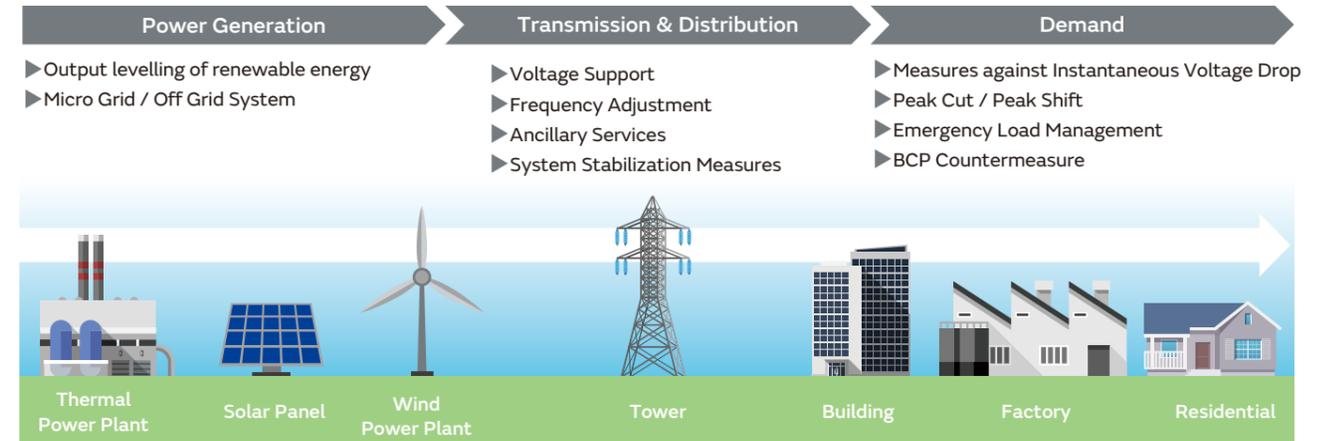
Murata's FORTELION Battery system

We make proposals from battery boards to containers based on customer needs.



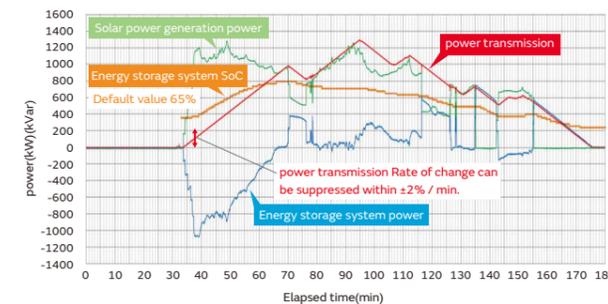
* AC panels are required for containers.

Covering Various Regions from Power Generation, Power Transmission, Power Distribution, to Demands



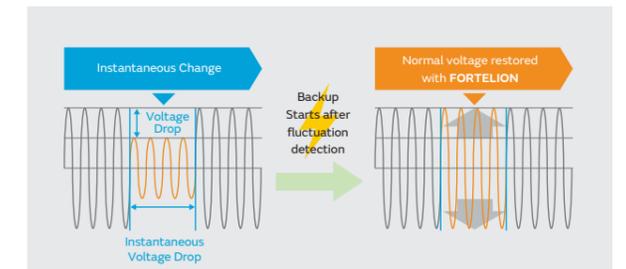
Solar power generation Short Period Variation adjustment

By instantaneously discharging and charging to level power output that changes depending on the weather, power transmission Rate of change can be suppressed within $\pm 2\%$ / min.



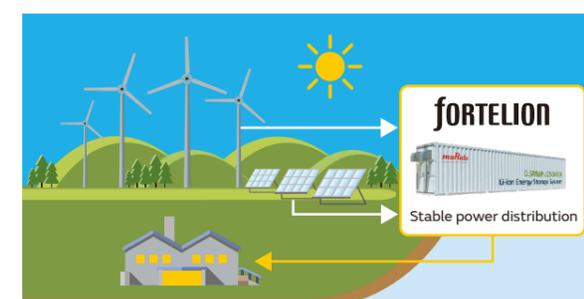
Measures against Instantaneous Voltage Drop

Maintains voltage with high rate discharge even at instantaneous voltage drop



Micro Grid / Renewable Energy

Supports stable power distribution to remote locations such as isolated islands. Enables efficient operation by stabilizing solar and wind power generation that change frequently and are difficult to predict.



UPS / Back Up

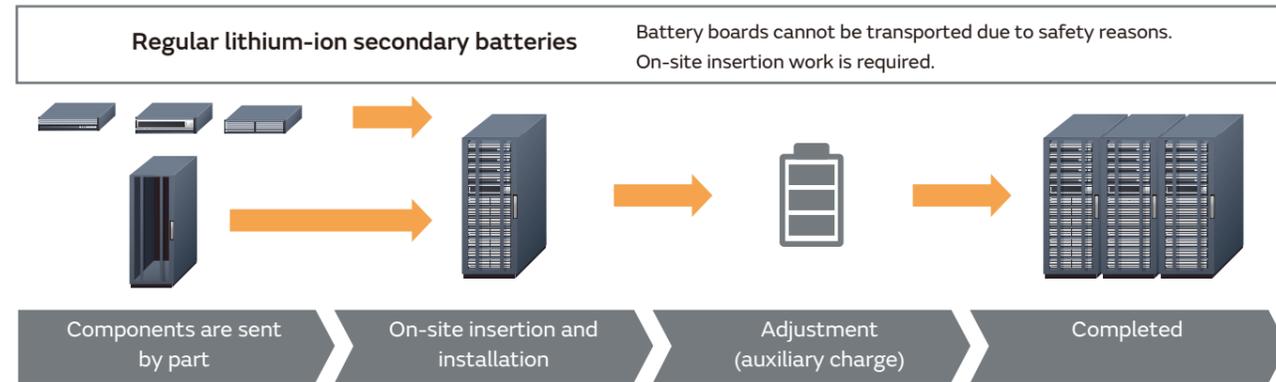
Enables continued and stable power distribution when power failures and instantaneous voltage drops occur due to disasters, and can be used to sustain production equipment and BCP measures. Since **FORTELION** is highly safe, it is suitable for installation in densely populated areas and indoors.



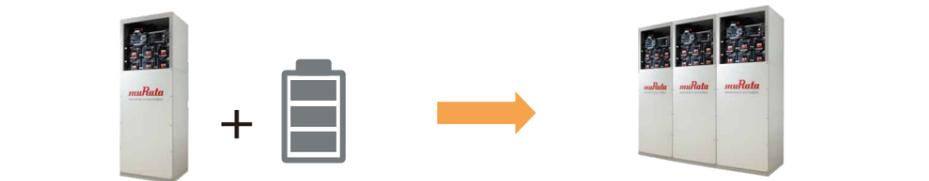
Secure Support from Installation to Maintenance

The **FORTELION** battery system largely reduces installation construction periods, and contributes to early discovery of defects and maintenance cost reduction.

Greatly Reduces the Installation Period and Work Hours



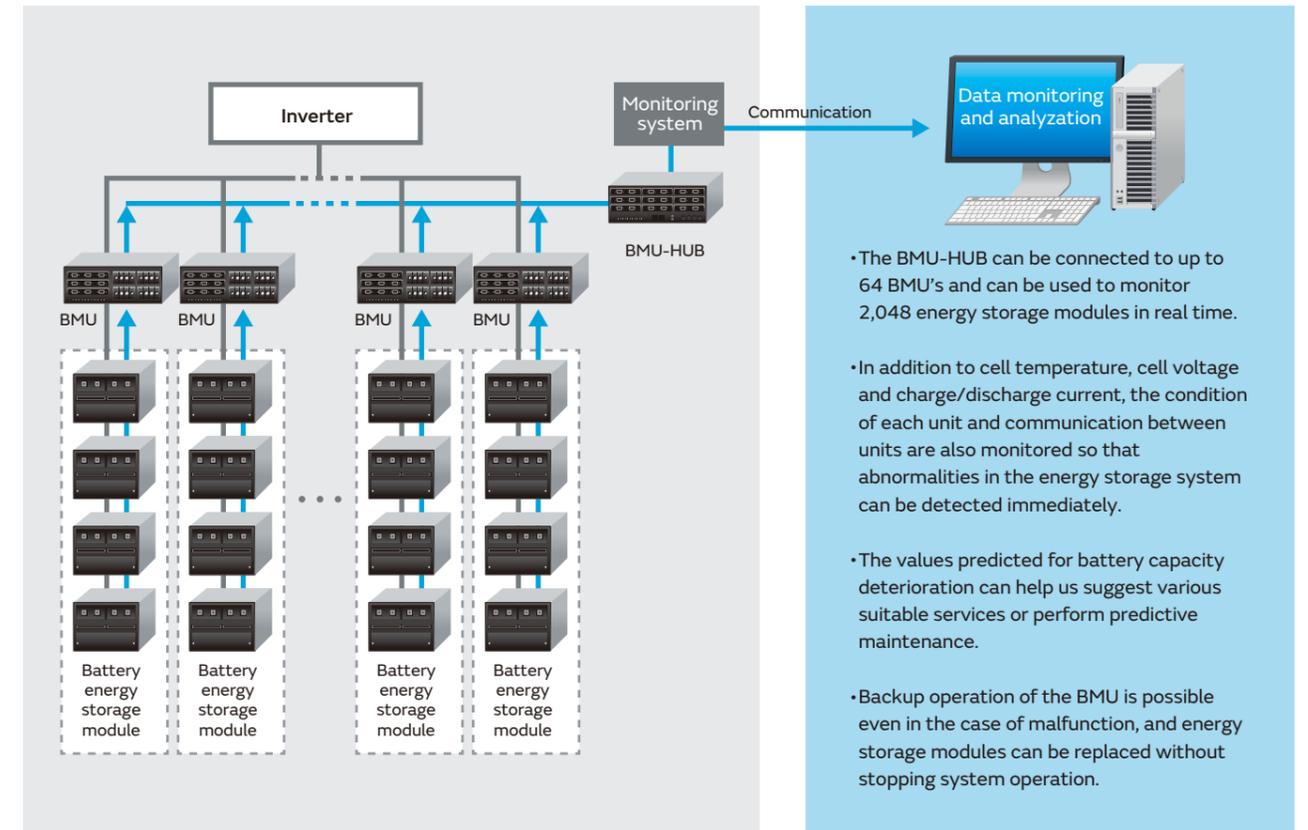
FORTELION Since the highly safe **FORTELION** is equipped, transportation with the energy storage module inserted to the battery board is possible.



Construction period reduced by approximately **60%**
Cost savings*

*Murata product comparison

Function for maintaining the safety and quality of the entire energy storage system



Introduction Examples



Off-grid (Australia)

Stable power supply to remote regions
Effective use of solar power and electric generator power

Capacity : 57.6 kWh



Semiconductor factory (Japan)

Stable power distribution during occurrences of instantaneous voltage drops
Continuous power distribution during power failures

Capacity : 0.72 kWh

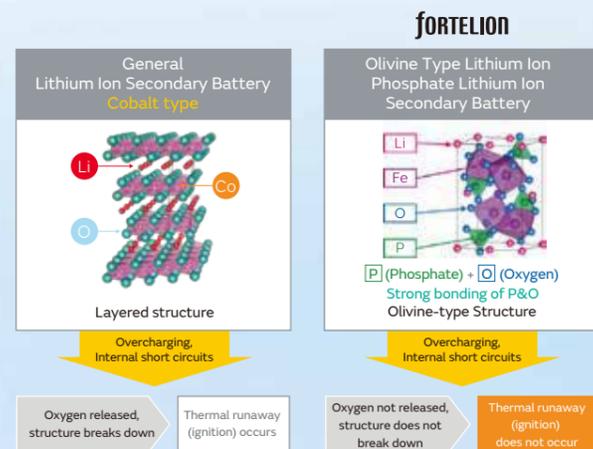
“FORTELION,” a Long-Life and Safe Battery System

“FORTELION” is a lithium ion secondary battery with a cathode composed of olivine-type lithium iron phosphate, and has an expected life of 15 years or more with a high level of safety.

“FORTELION” is a word created by combining the Italian word “Forte (strong)” and Li-ion. This name incorporates the meaning of “stronger safety, stronger life, and stronger environmental performance” with compared to typical lithium ion batteries.

High Safety

Thanks to the stable crystalline structure made possible by employing olivine-type lithium iron phosphate as the cathode material, “FORTELION” is less vulnerable to breakage, less likely to catch fire, even if subjected to a large impact or significant pressure, and maintains a reliable battery performance even under intense workloads.



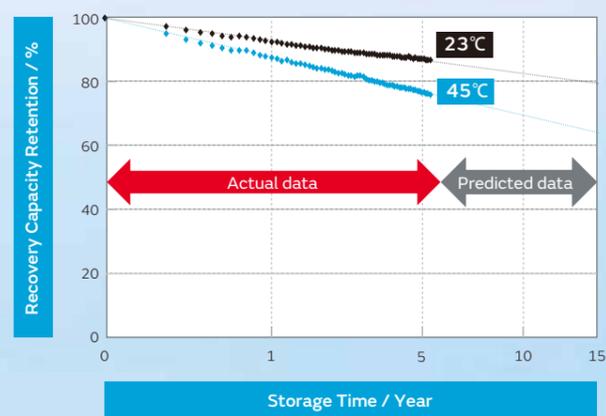
Long Life (Calendar)

* Expected life of 15 years or more

Capacity deterioration becomes more gradual over time.

(A film forms on the anode.)

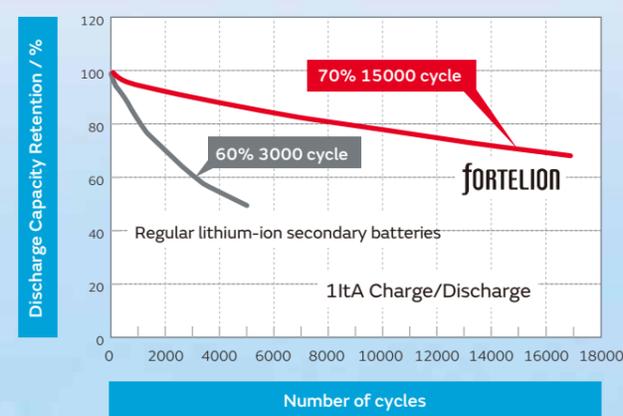
Self-discharge is also extremely low (a few percent per year) compared to lead batteries.



Long Life (Cycle)

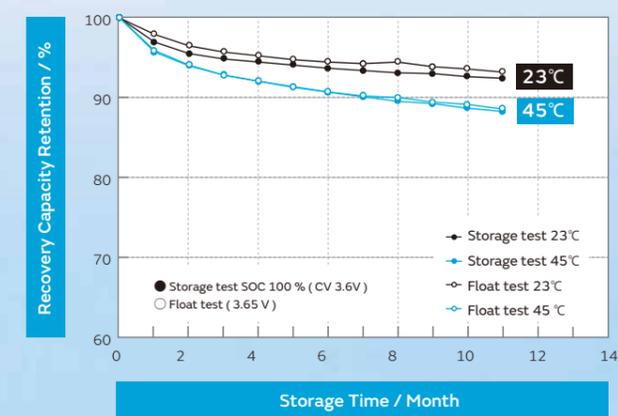
The crystalline structure is solid and stable, so capacity deterioration does not accelerate even with repeated charging/discharging.

*70% capacity maintained over 15,000 charge/discharge cycles, DOD100% (room temperature 23°C)



Long life (Float Charging)

Deterioration does not accelerate even in the float charging condition (the condition when stored with charging voltage applied).



High input / output

6C discharge and 3C charge is possible.

This makes these batteries ideal for the instantaneous voltage drop countermeasures and backup power that are important in the event of natural disasters, and applications where power is required such as stabilization of renewable energy.

Cobalt free

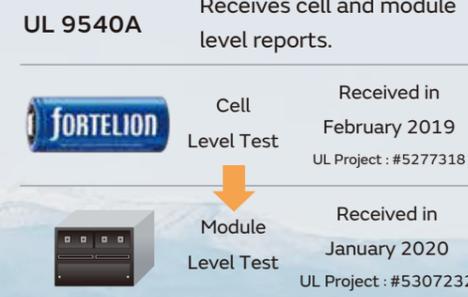
The use of cathodes mainly composed of iron poses fewer resource constraints and is environmentally friendly.

Certification and international standard

First Lithium Ion Secondary Battery in Japan to obtain fire protection certification

First in Japan to obtain the international standard 「UL9540A」 report

Energy Storage System acquires World's First U.S. Safety Standards Certification to 'UL Subject 1973' from UL



Contribution of SDGs

Murata contributes to realize a safe and highly disaster resistant sustainable society with the long-life and safe “FORTELION.”

7. AFFORDABLE AND CLEAN ENERGY

Ensure access to affordable, reliable, sustainable and modern energy

9. INDUSTRIES, INNOVATION AND INFRASTRUCTURE

Build resilient infrastructure, promote sustainable industrialization and foster innovation

11. SUSTAINABLE CITIES AND COMMUNITIES

Make cities inclusive, safe, resilient and sustainable

FORTELION Battery Module

High Output Battery Module



MPRMH1701	
Rated Capacity	1.75kWh
Nominal Voltage	51.2V
Maximum Discharge Current	200A
Maximum Charge Current	100A
Operating Ambient Temperature	-20~50°C
Weight	26kg
Dimensions	W435×H80×D570 (mm)
Safety Standard	UL1973

FORTELION™ has high safety and long life characteristics
New battery module achieving high output performance

Features

- FORTELION™ inside



- High safety : High thermal stability
No thermal runaway

- Long life : 15 years expected life time
- High accuracy life time prediction
- 19 inch rack mountable

Applications

- Equipment for voltage sag / drop
- UPS
- Smoothing of load fluctuation

Industries

- Factory (Semiconductor, chemical, food, etc)
- Hospitals
- Office / commercial building

FORTELION Battery Module

2.1kWh Battery Module



IJ1101M	
Nominal Capacity	2.1kWh (42.0Ah)
Rated Capacity	2.0kWh (39.5Ah)
Nominal Voltage	51.2V
Maximum Discharge Current	50A
Charge Voltage	56.0V
Maximum Charge Current	40A
Storage Temperature	-20°C~45°C (Recommended : Storage and use at room temperature)
Operating Ambient Temperature	Discharge : -20°C~50°C Charge : 0°C~45°C
Weight	27kg
Dimensions	W215×H160×D522 (mm)
Safety Standard	UL1973/FCC Part15/UL9540A report received

Control Equipment



BMU (Battery Management Unit)

IJ8101C	
Operating Voltage Range	300~1000V
Operating Current Range	0~100A
Storage Temperature	-20°C~65°C (Recommended : Storage and use at room temperature)
Operating Ambient Temperature	-20°C~50°C (Recommended : Storage and use at room temperature)
Communication Interface	RS232C/RS485C
Weight	14kg
Dimensions	W320×H120×D500 (mm)
Safety Standard	UL1973/FCC Part15 Class B * It is certificated along with IJ1101M. * UL 1973 is certified for maximum of 90 A.



BMU-HUB (BMU's Upper System)

IJ1101K	
Input Voltage	DC12V, DC24~60V
Storage Temperature	-20°C~65°C (Recommended : Storage and use at room temperature)
Operating Ambient Temperature	-20°C~60°C (Recommended : Storage and use at room temperature)
Weight	3.4kg
Dimensions	W320×H120×D300 (mm)
Purpose	Interface unit to connect IJ8101C for utility
Safety Standard	FCC Part15 Class B