Panasonic®

Installation Manual

Lithium-ion Storage Battery System Model No. LJ-SK56A

> Lithium-ion Battery Model No. LJ-SBK01

Network Adaptor Model No. LJ-NA02

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- Thank you for purchasing the Panasonic Lithium-ion storage battery system.
- Before installing the product, please read this manual carefully and follow all safety precautions at all times.
- After the installation, keep this manual and the User's Manual for future reference.
- Only qualified persons with the appropriate skills are allowed to perform the tasks described in this manual.
- After the installation, use this manual to check that the product operates correctly. Also, use the User's Manual to explain how to use and perform day to day operation of the product to the customer.
- If the product fails, even within the warranty period, due to non-conformance with the Installation Manual, the User's Manual or the caution labels attached to the product, it will not be repaired free of charge.
- For disposal, please contact your Household Hazardous waste depot.



- All instructions should be read and understood before attempting to install, wire, operate, and maintain.
- The installation requires a great degree of skill and should only be performed by qualified licensed professionals, including, without limitation, licensed contractors and licensed electricians.
- We shall not be in any way liable for any accident or malfunction resulting from failure to observe these precautions.
- If abnormal conditions are encountered, discontinue the operation immediately and contact the product distributor.
- Always use the included accessories and specified components for the product installation and wiring.
- Never install or process the product in a way not described in the Installation Manual.
- Incorrect installation due to failure to follow instructions below may cause harm or damage, the seriousness of which is classified as below:

	Denotes a hazardous situation which, if not avoided, will result in death or serious injury.
_	
	Denotes information that, if not observed correctly, can result in serious injuries to personnel.
	Denotes information that, if not observed correctly, can result in minor injuries to personnel and/or property damage.

The instructions to be followed are classified by the following symbols:



Denotes an action that must not be performed.



Denotes an instruction that must be followed.



	Do not use or leave the Battery near fires, stoves or heated places.
	Doing so may cause a short-circuit inside the Battery, resulting in excessive heat, smoke
	generation, explosion or fire.
	Do not use a Battery that has been dropped.
	This may result in excessive heat, smoke generation, explosion or fire.
	Do not put your hands, tools or foreign materials into the Battery.
	Doing so may result in injury, electric shock or failure.
	Do not store the unpacked Battery on top of each other.
	Doing so may result in an accident or failure due to failure.
	Do not drive a nail into the Battery, strike it with a hammer, or stand on it.
	Doing so may explode or deform the Battery and cause an internal short-circuit, resulting in
\frown	excessive heat, smoke generation, explosion or fire.
\bigcirc	Do not subject the Battery to impacts or throw it.
Prohibited	Doing so may cause the Battery to leak, generate excessive heat, smoke, explode or ignite.
	Excessive heat, smoke generation, explosion or fire may occur if the built-in protective functions of the
	Battery become damaged.
	Do not use a Battery that is conspicuously damaged or deformed.
	This may result in excessive heat, smoke generation, explosion or fire.
	Do not touch the Battery with your bare hands if electrolyte has been leaking.
	The electrolyte solution can cause serious damage to your eyes. If the solution accidentally gets in your
	eyes, rinse with water and seek medical attention immediately. Never rub your eyes.
	Do not put the Battery on top of foreign materials, such as tools, electrical wires, and screws.
	This may result in excessive heat, smoke generation, explosion or fire. For traverse installations, handle
	the unit with care and make sure that there are no objects underneath.
	Do not handle the Battery without insulated gloves and shoes.
	Electric shock may result from the discharge of electricity from the Battery.

	Do not disassemble the product other than by the methods described in this manual or modify the
	product. Deing so may recult in fire, electric shock, short circuit or failure
\bigotimes	 Do not install the product in locations where there is high humidity exposure to steam, vapour or cold
	air. or large amounts of greasy fumes or dust, fire or exhaust gas from vehicles.
	Doing so may result in fire, electric shock, short-circuit or failure.
	Do not connect a heating appliance.
	A Lithium-ion battery storage system may repetitively turn ON/OFF the power supply in short intervals
Prohibited	in the events of power outage and recovery. Since heating appliances cannot shut down safely in such
	short periods of time, connecting them to a Lithium-ion battery storage system may result in fire or carbon monoxide poisoning
	 Do not place tools or other objects on the product.
	Doing so may result in injury or failure.
	Do not insert your hands or foreign objects into the vent holes or fan.
	Doing so may result in injury, electric shock or failure.
	 All electrical wiring must comply with local electrical regulations.
	Fire, electric shock, or injury may otherwise result.
	Wear protective gloves and use insulated tools during the installation/wiring work. Heavy objects must be bendled in secondarias with least regulations.
	be nandled in accordance with local regulations.
	 Make sure that the vent holes are not blocked when installing the product
	Blocked vent holes will reduce heat dissipation and may result in fire.
	Observe the following when installing/wiring the product:
	Failure to do so may result in a fire, electric shock or failure.
	> Protection device for the Lithium-ion storage battery, protection device for Network Adaptor, the
	Stand-alone breaker and DC protector unit must be set to OFF until the wiring is completed.
	> Prior to starting work, be sure to check that there is no voltage at all of the terminals.
	> Do not allow water to enter the inside of the main body. > Never perform any work when the coeffeld and/or your hands/hady are water.
	> Never perioritiany work when the scallou and/or your hands/body are wet.
	> Do not charage the insulation of any of the electrical conductors. > Do not short-circuit the [+] and [-] cables of the Battery.
Mandatory	 Establish a proper ground connection in accordance with local regulations.
Manualory	Imperfect grounding may result in electric shock or failure.
	 Carry the product using the specified method of transportation.
	Failing to do so may result in injury.
	The installation should be carried out by a suitably qualified installer in accordance with this document
	(Installation Manual).
	Failing to do so may result in electric snock, injury or fire.
	Install the product in an environment that meets the specified requirements. Failing to do so may result in injury or failure.
	 Attach the battery only after the product installation
	Failing to do so may result in electric shock or injury.
	 Before attaching the battery, be sure to attach the lower panel and verify that the battery breaker is
	OFF.
	Failing to do so may result in electric shock.
	Attach the Battery securely using the included screws.
	Failing to do so may result in fire or accident.

	 Make sure to work in a natural posture when lifting the Battery during installation. 			
	Back injury may otherwise result.			
	Use adequately insulated tools.			
	Failing to do so may result in electric shock.			
Mandatory	 Electrical wires should be connected properly with the correct polarity/phase. 			
	Failing to do so may result in smoke generation, fire or failure.			
	Attach power cables and other cables securely so that no tension is applied to any of the terminals.			
	Failing to do so may result in fire.			

	Do not drill holes in the product or base using a hole saw or electric drill.
	Doing so may cause the shavings to stick to the substrate, resulting in ignition or failure.
	Do not place objects on or around the product.
	There is a risk of the objects catching fire from the heat generated during the operation.
	Do not leave the Battery in high-temperature locations such as those exposed to direct sunlight
Prohibited	or inside of a sun-heated car.
	Doing so may cause the Battery to leak, generate excessive heat or smoke as well as reduce
	the performance and lifetime of the Battery.
	Do not install the product in locations that may become a habitat for small animals.
	Small animal may enter the interior of the product, resulting in smoke generation, fire or failure.
	Make sure that the wiring connections are correct.
	Incorrect wiring will result in product failure.
	■ Install the product in a location that can sufficiently bear the product's weight. Reinforce the ground as
	necessary.
	The product may tip over if not fastened properly, resulting in failure or accident.
	Use the proper cable thickness and colour for wiring in accordance with local regulations.
Mandatory	Fire or failure may occur if instructions are not followed.
	Fasten cable gland with the specified tightening torque.
	Failing to do so may result in fire or failure.
	Be sure to observe the installation requirements.
	Failing to do so may result in fire or accident.

Installation

1. Typical System Configuration

1-1. Power and Communication Line Configuration

In this manual, "Lithium-ion Storage Battery System" is described as "storage battery system".

This is a storage battery system designed for residential use.

The product is connected using 1-phase 2-wire or 1-phase 2-wire from 3-phase 4-wire. The connection design should be carried out based on this manual and the regulations.



- The specified protection devices must be installed on the power supply side of the storage battery system and the Network Adaptor.
- In an emergency, turn off these protection devices in the distribution board and DC protector in the product.
- Do not connect to an IT system.
- Ensure that the PE wire is grounded securely.

- Use specified types and sizes of wires in accordance with local regulations for the wiring.
- Make no mistake with the wiring and the polarities.

NOTICE

- This system cannot be used for a circuit with a system power supply exceeding 100 A.
- The CT for reverse current should be connected to the phase line to which the product is connected (LINE side).
- Increase the separation if the communication/control lines and the power line that are using large currents are running in parallel.
- The cable wire types, sizes and colours must be properly selected and the wiring lengths must be within the specified range and in accordance with local regulations.
- This product is designed for installation of one system per house. Do not install more than 1 system property.

* PE: Protective Earthing

System Configuration



- This wiring system chart is only a typical example and may be configured with different specifications. The wiring system can be designed as necessary in accordance with wiring rules.
 - * Network Adaptor and/or DRED are not installed on some systems depending on contractual coverage.
 - * CT/COM/DRM/SYSTEM line is SELV circuit.

Protection Device

In compliance with the law and regulations, please select and install protection devices with reference to the following.

© Circuit-breaker

Select and install the circuit breaker for protection of AC over current.

For Storage battery system : AC230V 16A trip (TYPE C) : AC230V 10A trip (TYPE C) For Network Adaptor For STAND-ALONE Socket outlet : AC230V 16A trip (If necessary)*

* This product is equipped with STAND-ALONE breaker "Type-AC". If the circuit breaker other than "Type-AC" is required, please install the appropriate circuit breaker for STAND-ALONE Socket-outlet in accordance with the law and regulations.

RCD
 RCD

- In compliance with the law and regulations, select RCD "type" and "rated sensitive leakage current".
 - * In this product, between the DC side of battery and the AC side is insulated.

Wiring

Conductors		Cable/Wire Size	Cable/Wire Length	
1	Grid-interactive Line	PVC Circular Cable 2C+E 2.5 mm ²	max. 50 m	
2	Grid Line	PVC Circular Cable 2C+E 1.5 mm ²	max. 50 m	
3	Stand-alone Line	PVC Circular Cable 2C+E 2.5 mm ²	max. 50 m	
4	CT Line	PVC Flexible Cable 2C 0.75 mm ²	max. 50 m	
5	COM Line	PVC Flexible Cable 2C 0.75 mm ²	max. 50 m	
6	DRM Line	CAT5e (10BASE-T/100BASE-TX)	max. 50 m	
7	SYSTEM Line	PVC Flexible Cable 2C 0.75mm ²	max. 50 m	

* Please use copper wire cables.

◎ Installation of Multiple System

This is an example diagram for 3-phase 4-wire system Refer to "Protection device" and "wiring" in the previous page.



Installation Manual

■ Internal Configuration of Storage Battery System



* For Stand-alone circuit, the N phase and the ground in the storage battery system are connected. Therefore, do not connect the PE and the N phase on the load side of Stand-alone circuit.

•Wiring Design Check

- $\hfill\square$ The specified protection devices are installed on the power supply.
- $\hfill\square$ The products are grounded.
- □ The phase line to which the CT for reverse current is attached and the phase line to which the storage battery system is connected are the same.
- □ The cable wire types and sizes are correct and the wiring lengths are within the specified value range and in accordance with local regulations.
- \square Cable colours are selected in accordance with the regulations.

1-2. Internet Line Configuration

The Network Adaptor connects to the Internet using 10BASE-T or 100BASE-TX.

Develop a configuration by combining it with a network hub and other network devices as required.



Wiring

Conductors		Cable/Wire size	Cable/Wire Length
1	Internet line	CAT5e (10BASE-T/100BASE-TX)	max. 50 m

Wiring Design Check

□ Correct network devices have been selected.

 $\hfill\square$ Adequate LAN cables have been selected for the Network Adaptor.

2. Product Description

• Do not use products that show signs of deformation or impact damage.

NOTICE

• When opening the package, check that all accessory parts are included in the correct quantities and store them so that they do not get lost prior to installation.

2-1. Lithium-ion Storage Battery System [LJ-SK56A]

A slimline storage battery system which achieves financial benefits through GRID integration which takes advantage of PV power generation and time-of-use rates.

The batteries described in section 2-2 are installed in this product enclosure.

Exterior Dimensions and Part Names



COM/CT/DRED/SYSTEM cable gland Power cable gland











B Details

Main Parts

No.	Name	Purpose	Remarks
1	Control Panel	For display/settings and control	
2	DC Protector	Switch for powering on from the battery	
3	STAND-ALONE Breaker	Circuit breaker for STAND-ALONE power supply	

Accessories











Position	Designation	Quantity	Note	Check
А	Lithium-ion storage battery system	1		
В	CT (Current Transformer)	1		
С	One-touch CT connector	2		
D	Battery fixing bracket	4		
E	Bracket fixing screw (M3 x 8)	16		
F	Battery fixing nut (M5 Hexagon nut)	8		
G	User's Manual, Installation Manual Shutdown procedure label	1 each		

Unpacking Check

□ No signs of deformation or impact damage on the product.

□ All accessories are included in the package.

2-2. Lithium-ion Battery [LJ-SBK01]

A compact and exchangeable Lithium-ion battery designed for easy maintenance.

Charging and discharging capabilities can be achieved by mounting this battery into the system described in section 2-1.

Exterior Dimensions and Part Names



Accessories



Position	Designation	Quantity	Note	Check		
А	Lithium-ion battery	1				
* Two bottories pood to be mounted into the overtem						

* Two batteries need to be mounted into the system.

* Manuals are not included.

See the instruction manual for the Lithium-ion storage battery system (this manual).

Unpacking Check

□ No signs of deformation or impact damage on the product.

 \Box All accessories are included in the package.

2-3. Network Adaptor [LJ-NA02]

It is the Network Adaptor which integrated with the server, to control charging and discharging.

* Network Adaptor is not installed on some systems depending on contractual coverage.



Exterior Dimensions and Part Names

④Accessories



Position	Designation	Quantity	Note	Check
А	Network Adaptor	1		
В	Setting Manual	1		

* Installation and instruction manuals are not included.

See the instruction manual for the Lithium-ion storage battery system (this manual).

Unpacking Check

□ No signs of deformation or impact damage on the product.

В

□ All accessories are included in the package.

3. Confirming Product Number

The serial number will be required for connecting to the server, maintenance, etc.

NOTICE

- Check the serial number and write it in this manual, and keep this manual.
- Check that the battery lot number match for two units.

3-1. Serial Number Location

Lithium-ion Storage Battery System
 <On Product Unit>



<On Packaging>



 Lithium-ion Battery <On Product Unit>



<On Packaging>

Example



Network Adaptor <On Product Unit>



<On Packaging>





* Network Adaptor is not installed on some systems depending on contractual coverage.

3-2. Checking the Battery Lot Number

Check that the battery lot number matches for two units.

If one of lot number is "AA", check that the other battery have the same "AA" lot number.

* Please contact the distributor if the numbers do not match.



• Serial Number and Lot Number

Model Name	Model No.	Serial No.	Lot No.
Lithium-ion Storage Battery System	LJ-SK56A		
Lithium-ion Battery	LJ-SBK01		
Network Adaptor	LJ-NA02		

* The Network Adaptor may not be installed on some systems depending on contractual coverage. In such a case, write "None" in the Serial No. field.

Number Check

□ The serial numbers are written in this manual.

□ The battery lot numbers are written in this manual.

□ The battery lot numbers match for two units.

4-1. Location

The Lithium-ion storage battery system is a non-portable product suitable only for outdoor installation. Determine the installation location in accordance with the conditions outlined in this manual. The Battery is only designed for installation inside the system enclosure. Do not use it in other locations.

- Do not mount in a location that does not meet the criteria described below.
- Do not mount in places where there are high temperatures, or in the proximity of something that is burning.
- Do not mount in a location that cannot bear the weight of the product.
- Do not mount the product on a sloped surface.
- Do not install the battery anywhere else besides the inside of the product enclosure.

NOTICE

- The work must be performed by qualified personnel.
- Do not attempt to mount the product in special locations listed below.
- Install in a place whereas the Rating Label can be seen.

Standard Installation Location for Lithium-ion Storage Battery System

Installation location	Outdoor/Indoor*	
Storage temperature range [°C]	-20 to +40°C	
Operating temperature range [°C]	0 to +40°C (Discharging: -10 to 40°C)	
Operating humidity [% RH]	0 to 90% RH (No dew condensation)	
Maximum atmospheric pressure/altitude	Lower than 1000 m above sea level	
Sunlight	Protected from exposure to continuous direct sunlight.	

* When the product is installed in the building or house, it is necessary to ensure all local building and fire regulations are complied with.

■ Locations where Lithium-ion Storage Battery System cannot be Installed

- x Locations where it will receive or be subject to the impact of continuous direct sunlight.
- x Locations that exceed the operating temperature range.
- x Locations where the sunlight hits directly in the north or west side of the buildings without roof (eaves).
 - * See "
 Guidelines how to protect the product from direct sunlight" below explanation.
- x Rooms such as solariums and greenhouses.
- x Locations on moving objects such as trailer houses or cruisers.
- x Locations where strong reflected sunlight strikes during the day.
- x Enclosed locations with insufficient heat radiation. (Storage Battery Systems require free air to keep cool. Installation in confined/ enclosed spaces such as garden sheds or in close proximity to other appliances (i.e. air conditioner) that have the potential of impeding free air flow is not permitted.)
- x Locations where the product may potentially become buried in snow. (Install a roof or a fence if installing the product in snowbound regions.)
- x Locations where humidity, salinity, sulfur or nitrate concentration are constantly high.
- x Locations where the required installation space is not available.
- * See "
 Clearance space for the installation location" in the next page.
- x Locations exposed to or which potentially could be exposed to excessive steam, oil vapour, smoke, dust, corrosive substances, explosive/flammable gases, chemicals, fire or exhaust gas from vehicles.
- x Locations subject to extreme temperature fluctuations. (Where dew condensation occurs.)
- x Locations with strict noise requirements. (Operational noise of 40dB or lower.)
- x Locations subject to impacts, shocks or vibrations caused by such as vehicle passing, machine operating, dropping, kicking or acting of vandalism.
- x Locations in the proximity of equipment/devices that are susceptible to radio interference, or locations that are emitting powerful radio waves.
- x Locations unable to bear the weight of the product.
- x Locations where concrete foundations or equivalent floor materials cannot be laid.
- x Regions where there is severe salt pollution.
- x Locations where above sea level is below 0 m.
- x On the upper floors or the roof of the building.

Guidelines How to Protect the Product from Direct Sunlight

When installing the north, put awning, eaves or things to make shadow that not exposed to sunlight during the daytime.



When installing the east or west, put awning, eaves or things to make shadow that not exposed to sunlight during the daytime.



When installing the south, put awning or eaves above the product.



When installing the north-east or south-east, put awning, eaves or things to make shadow that not exposed to sunlight during the daytime.



When installing the north-west or south-west, put awning, eaves or things to make shadow that not exposed to sunlight during the daytime.



■ Clearance Space for the Installation Location

The mounting location must have the clearance space described below for installing, maintenance and heat radiation. When wiring to the main body left side, not only the values below, the mounting location have enough space for wiring.



Location Check

- \Box The mounting position is as described in this manual.
- □ The mounting location does not belong to special locations where Lithium-ion storage battery system cannot be mounted.
- $\hfill\square$ Sufficient mounting space has been allocated.
- □ The location can bear the product's weight, and the location is constructed with a foundation that possesses sufficient strength.
- □ The mounting surface is not inclined.

4-2. Mounting of Lithium-ion Storage Battery System

Since the Lithium-ion storage battery system is a heavyweight product, the mounting work must be performed with sufficient workers and working space.



- Do not modify or disassemble.
- Do not allow water to enter the inside of the main body. Please pay special attention while it is raining or snowing.
- Do not perform work when the scaffolding and/or your hands are wet.
- Do not use a product that has been damaged due to dropping, etc.
- Heavy objects must be handled in accordance with the regulations.
- The correct anchor bolts are being used for secure fixing.
- Mount the product in a level and straight manner.
- Tighten the fixing screws of each part with adequate torque.
- When you put the Main body on the base, be careful to avoid pinching fingers.

NOTICE

- The work must be performed by qualified personnel.
- Fix the screws using the appropriate tools.

1 Removing the Panel Base

1) Removing the front lid screw.

2) Remove the front lid.

- (1) Lift the bottom of the front lid.
- (2) Lift up and remove the front lid.



3) Remove the base cover.





4) Remove the base.



<Parts Details>

Main body x 1



Front lid screw Base cover screws ×6 @@@@@@@ (M5 x 15 Security torx T30)

Front lid x 1





²Securing the Base

1) Selecting and attaching anchor bolts to the foundation

Align with the fixing holes on the base and tighten all six M12 anchor bolts.

Flat washer



2) Mount the base on the foundation.

Mount the base by aligning with the anchor bolt positions of the foundation, adjust the levelness, and then tighten all six M12 anchor bolts.



3Securing the Main Body

1) Attaching the main body to the base

Place the main body onto the base with at least two people.

2) Secure the main body to the base.

Secure it using six body fixing screws. [Tightening torque 23 - 26 N•m]



Mount the Base Cover and Front Lid

This operation may be performed after the battery installation and wiring work are completed.

1) Mount the base cover.

Hook the bottom part of the base cover onto the base, and secure the top part using the two base cover screws. [Tightening torque 2 - 2.5 N•m]



2) Mount the front lid to the main body.

Hook the upper part of the front lid on the main body, and secure it using the four front lid screws. [Tightening torque 2 - 2.5 N•m]



Mounting Check

- \Box Do not modify or disassemble.
- $\hfill\square$ There is no damage on the product.
- $\hfill\square$ The mounting location can bear the product weight.
- $\hfill\square$ The specified number of correct anchor bolts are being used for secure fixing.
- $\hfill\square$ The product is mounted level in all directions.
- $\hfill\square$ The fixing screws of each part are tightened with adequate torque.

4-3. Mounting of Lithium-ion Battery

Since the Lithium-ion battery is a heavyweight device, furthermore since it is a rechargeable device, be extremely careful in handling it, and safely install it.

- Do not modify or disassemble.
- Do not allow water to enter the inside of the main body. Please pay special attention while it is raining or snowing.
- Do not perform work when the scaffolding and/or your hands are wet.
- Do not use a product that has been damaged due to dropping, etc.
- Do not touch or short-circuit the POWER electrodes.
- Do not stack batteries on top of each other that have been taken out of the packaging.
- Wear insulating gloves and insulated shoes while doing the wiring work.
- If the battery electrolytes are leaking, do not touch the liquid with your bare hands.
- Tighten the fixing screws for each part with adequate torque.
- Do not immerse the battery in liquids (water, sea water, oils, chemical waters ets.), or get it wet.

NOTICE

- The work must be performed by qualified personnel.
- Install the battery after the base and main body installation has been completed.
- Fix the screws using the appropriate tools.
- Do not remove the connector cover until the wiring is started.

Battery Installation

1) Mounting the battery fixing bracket

On each battery, attach two battery fixing brackets that are included with the system. For this purpose, use the bracket fixing screws (M3 x 8) included with the system. [Tightening torque 0.65 - 0.85 N•m]



2) Mounting the battery on the main body

Insert the battery into the main body from the front, align the battery fixing bracket holes with the stud bolts on the main body and slide the battery horizontally.

Then secure each battery using the four battery fixing nuts (M5) included with the product.

Following the same procedure, mount the other battery module on the upper level and the other module on the lower level.

[Tightening torque 2 - 2.5 N•m]

Notice:

The batteries are installed in the back of the Main body.



* Attach the cover and front lid if it will be some time before the test run after the wiring work has been completed. (Front Lid installation method See 4-2 ④ 2)

Mounting Check

□ Do not modify or disassemble.

- $\hfill\square$ There is no damage on the product.
- $\hfill\square$ The batteries are mounted in the correct orientation.
- □ The fixing screws of each part are tightened with adequate torque.

5. Electrical Connection of System and Battery

5-1. Electrical Connection of Battery

The Lithium-ion storage battery system is a rechargeable product and is therefore classified as an electrical instrument. Be extremely careful and wire it safely.

- Do not allow water to enter the inside of the main body. Please pay special attention while it is raining or snowing.
- Do not perform work when the scaffolding and/or your hands are wet.
- Do not touch or short-circuit the POWER electrodes.
- Always wear insulating gloves and insulated shoes while doing wiring. If the battery electrolytes are leaking, do not touch the liquid with your bare hands.

• Discharge static electricity before working with the wires.

NOTICE

- The work must be performed by qualified personnel.
- Check that the battery connector is plugged in securely.
- Make sure that the battery is wired correctly.
- Check that the DC protector is OFF before wiring the batteries.
- Do not remove the connector cover until the wiring is started.

1 Battery Wiring

1) DC protector OFF check

Make sure that the DC protector is OFF before connecting the battery connector.

DC Protector -



2) Battery wiring

Connect the harness for the battery COM-IN connector and battery COM-OUT connector which is blocked into the battery in the system, then remove the connector cover, and connect the battery power connector. Connect them to all two batteries.

(SB1 does not have "COM-OUT")

- * Match the battery number with the harness block number. (Connect an SB1 harness block to an SB1 battery.)
- * Check connection by pulling gently, to make sure that it is securely connected.



Connection Check

- □ The Battery is not wet.
- $\hfill\square$ No leakage of electrolytes from the Battery.
- □ The DC protector is OFF.
- □ No mistakes in the wiring.
- □ The COM connectors (IN, OUT) are connected securely.
- □ The battery power connectors (SB1, SB2) are connected securely.

5-2. Electrical Connection of System

The Lithium-ion storage battery system is classified as an electrical instrument. Please wire it safely following the applicable laws and regulations.

- Do not allow water to enter the inside of the main body. Please pay special attention while it is raining or snowing.
- Do not perform work when the scaffolding and/or your hands are wet.
- Always wear insulating gloves and insulated shoes while performing wiring work.
- Protection device for the Lithium-ion storage battery system, the stand-alone breaker and DC protector must be set to OFF until the wiring is completed.
- Check that there is no voltage at all of the terminals.
- Ensure that the PE line is securely connected to the ground.
- Do not damage the covered sections of the wiring.
- Prevent the introduction of foreign objects such as scrap wires.

- Use the soecified types and sizes of wires in accordance with local wiring regulations for the wiring.
- Do not mistake the wiring systems and the polarities.
- Process the wires as specified for secure connections.
- Discharge static electricity before working with wires.
- Be sure to tighten the cable gland securely. Do not over tighten it.

NOTICE

- The work must be performed by qualified personnel.
- The outer diameter of the cables which pass through the cable glands must be within the range of a suitable size.
- Plug up the hole for the COM cable gland when the Network Adaptor is not connected.
- Do not use CT other than the designated CT.
- The end of conduit pipe for outside wiring installation should be put to near the joint of cable gland, then to seal with using putty.
- Punched parts of the knockout will be repaired with deburring and rust paint.
- Rubber seal of the cable gland that does not pass through the wiring is not taken off.

■ Checking the Cable Retracting and Terminal Positions

After checking the cable retracting and terminal positions in advance, punch the knock-out of the necessary point in the base. If necessary, please connect the piping.



Processing the Knockout of the Base

Please remove the knockout only where necessary to retract cable.

1) Pressing a tool to knock out by tapping the tool with a hammer, punching a knockout.



2) Remove the metal pieces that occurred when punching a knockout. And remove the burr of the edge of the knockout, paint the rust.



3) Connect the pipe to the base.

Preparation

Be sure to turn OFF the protection device for the Lithium-ion storage battery system, the Stand-alone breaker and DC protector.

Be sure there is no voltage at all of the terminals.

Retracting the Cable

Check the outer diameter of the cables and feed it through the specified cable glands.

1) Applicable cable sizes for the cable glands

Cable Gland	Applicable Cable Diameter (mm)	Specified Cable
СТ	Φ5 - Φ10	PVC Flexible Cable 2C 0.75 mm ²
COM	Φ5 - Φ10	PVC Flexible Cable 2C 0.75 mm ²
SYS	Φ5 - Φ10	PVC Flexible Cable 2C 0.75 mm ²
DRM	Φ5 - Φ10	CAT5e (10BASE-T/100BASE-TX)
GRID-INTERACTIVE	Φ6 - Φ12	PVC Circular Cable 2C+E 2.5 mm ²
STAND-ALONE	Φ6 - Φ12	PVC Circular Cable 2C+E 2.5 mm ²

* Please use copper wire cables.

* See 1-1. Power and Communication Line Configuration for the cable details.

2) How to retract cables from the cable glands

This procedure is performed only where necessary.

(1) Push the rubber seal of cable gland surface with a screw driver from the bottom side of the enclosure gently.

Put screw driver toward the inner edge and break the rubber seal from the inside. (2) The screw driver tip will come out when the rubber seal is broken through.Then press the seal horizontally to the unopened parts to enlarge the open area. (3) When the rubber seal is almost open, tear it up with your hands slightly.

Now you have an open seal. Then remove the burr around the cap nut.



(4) Loosen the cap nut and insert the wire from the bottom of the enclosure.

Then retract the cable for wiring through the cap nut.

Cable

Cap nut

(5) Tighten the cap nut with proper tightening torque.

[Tightening torque]

- CT/COM/DRM/SYS Cable gland 2.0-3.0N m
- GRID-INTERACTIV/STAND-ALONE Cable gland 3.5-4.5N • m



■ Connecting the CT/COM/DRM/SYS Terminal

Only where necessary, connect wire cables in accordance with the following procedure.

DRM 6

1) Terminal layout and polarities

Make sure that the wires and polarities are correct.

* If the DRED serves the power, do not connect DRM V- and V+.



СТ :Current trancefer d.c.5V COM :Network Adaptor(RS485) d.c.5V SYS :Communication(RS485) d.c.5V :Demand response modes DRM d.c.24V ◎ The demand response modes supported by this product. DRM 0 🗙 DRM 1 DRM 2 🗙 DRM 3 DRM 4 🗙 DRM 5 🗙

DRM 8 🗙

2) Cable types and sizes

- © CT/COM/SYSTEM Cable PVC Flexible Cable 2C 0.75 mm²
- ◎ DRM Cable CAT5e (10BASE-T/100BASE-TX)

3) Stripping of wire

Please strip as conductor's stripped length related as drawing.



* If the cable is shielded, protect the stripped end of the sheath with insulating tape, etc.

4) Connecting

While pressing the release button on the terminal, insert the conductor of the wire all the way into the terminal.

DRM 7 🗙



■ Connecting the GRID-INTERACTIVE/STAND-ALONE Terminal

Check the terminal position, retract the cable, through the specified cable glands, connected to the terminal.

1) Terminal layout and polarities

Make sure that the wires and polarities are correct.



2) Cable types and sizes

PVC Circular Cable 2C+E 2.5 mm²

- Please use copper wire cables.
- See 1-1.Power and Communication Line Configuration for the cable details.

3) Stripping of wire

Please strip as conductor's stripped length related as drawing.



4) Connecting

- (1) Pull up an operating lever.
- (2) Insert a wire into a wire hole all the way.
- (3) Hold the wire and pull down (4) Pull the wire slightly to the operating lever.

WARNING

This symbol indicates a wiring terminal intended for connection of a PROTECTIVE EARTHING

Do not connect the GRID wire with

STAND-ALONE terminal

CONDUCTOR.

check if connecting has been done completely. (Don't pull strongly.)









Connecting the SYSTEM Terminal

When multiple inverter combination mode is used, signal lines among lines among the Lithium ion storage battery system should be connected.

Refer to the following diagram.


Operations after Connection

1) Secure the cable to the fixing hardware with an insulating lock.

If any excess lengths of the cables are getting in the way, open the cable gland seal nuts on the base side and adjust them. Then retighten the seal nuts with the appropriate torque.

2) Completely remove foreign objects such as scrap wires.



* Attach the cover and front lid if there is some length of time before the test run after the wiring work has been completed. (Front Lid installation method See 4-2 ④ 2)

Connection Check

- □ The interior of the main body is not wet.
- □ The power is turned OFF.
- Deburr to the end face of the knockout, it is repaired with rust-proof.
- □ Rubber seal and knockout of the cable gland that does not pass through the wirring has not been removed.
- $\hfill\square$ The PE wire is connected and grounded securely.
- □ The cable wires are not damaged.
- $\hfill\square$ The cable wire types and sizes are correct.
- $\hfill\square$ The wires have been processed as specified and are connected securely.
- □ There are no mistakes in the wiring.
- □ The cable gland seal nuts are tightened securely.
- □ There are no foreign objects such as scrap wires.

Connecting the CT for Reverse Current

1) CT configuration and polarities

The CT should be wired such that the polarity of the CT terminal and the CT output lines are the same. Use the included one-touch CT connector for connecting the CT output line and the cable.



2) Cable types and sizes

PVC Flexible Cable 2C 0.75 mm²

- * Please use copper wire cables.
- * See 1-1 Power and Communication Line Configuration for the cable details.

3) Stripping of wire

Please strip as conductor's stripped length related as drawing.



4) Connecting











- (1) Checking using a strip gauge
- (2) Push up the lever. Do not push up all of the levers at the same time.
- (3) Insert the wire as deeply as possible.
- (4) Push down the lever to establish the wire connection.
- (5) Gently pull on each of the wires to make sure that they do not come out. (Do not pull on them too hard.)

5) Attaching the CT for reverse current on the distribution board side

Connect the CT for reverse current to the phase line on the system side of the distribution board to which the storage battery system is connected.

Be sure to attach the CT in the correct orientation.



* The CT has a diameter of Φ16 and its maximum current is 100 A. The CT cannot be attached to a wire with a greater diameter or be located where it would subject to higher currents.

Connection Check

- \Box The power is turned OFF.
- □ The covered insulation of the wiring is not damaged.
- \Box The cable wire types and sizes are correct.
- □ The wires have been processed as specified and are connected securely.
- \Box There are no mistakes in the wiring.
- □ The CT is attached to the correct phase line in the correct orientation.
- □ There are no foreign objects such as scrap wires.

6. Mounting of Network Adaptor

6-1. Location

The Network Adaptor is a wall-mounted product for indoor use. Determine the installation location in accordance with the conditions outlined in this manual.



• Do not install it in places where there is a lot of humidity such as outdoors or in bathrooms.

NOTICE

- The work must be performed by qualified personnel.
- Do not install the product in the special locations listed below.

Standard Mounting Location of the Network Adaptor

Installation location	Indoor		
Operating temperature range [°C]	0 to 40 °C		
Operating humidity [% RH]	0 to 80% RH (No dew condensation)		
Maximum atmospheric pressure/altitude	Lower than 1000 m above sea level		

Special Locations where Network Adaptor cannot be Mounted

- x Locations exposed to direct sunlight.
- x Locations exposed to rain or drops of water.
- x Locations exposed to or potentially exposed to excessive steam, oil vapour, smoke, dust, corrosive substances, explosive/ flammable gases, chemicals or fire.
- x Locations subject to vibrations or shocks.
- x Locations in the proximity of equipment/devices that are susceptible to radio interference, or locations that are emitting powerful radio waves.
- x Locations where wall mounting is not possible.

Mounting Position

Mount the Network Adaptor so that it is not tilted, and position the Lid release button so that is at the bottom.



■ Clearance Space for the Installation Location

The mounting location must have the clearance space described below for installation and maintenance.

* If one side only has a minimal clearance space, make sure to allocate more space on the other side.



Preparation for the Installation Location

<Exposed installation> Drill holes into the wall and align them with the wiring holes on the main body.

<Semi-embedded installation> Drill holes into the wall for semi-embedded installation.

* Provide adequate reinforcement if the fixing strength of the wall is insufficient.



Semi-embedded depth 30 mm



Location Check

□ The mounting position is as described in this manual.

□ The mounting location is not in the location listed "special locations."

- □ The Network Adaptor is mounted in the correct orientation.
- □ Sufficient mounting space has been allocated.
- \Box The mounting surface is not inclined.

 \Box The mounting location has undergone the pre-mounting preparatory processing.

6-2. Mounting

The Network Adaptor may be installed indoors in high and narrow areas. Be extremely careful in installing it, and turn OFF the protection device for the Lithium-ion storage battery system, the Stand-alone breaker and DC protector. Be sure there is no voltage at all of the terminals.



- Do not modify or disassemble.
- Do not perform work with wet hands.
- Do not use a product that has been damaged by dropping, etc.
- The correct screws are being used for secure fixing.

NOTICE

• The work must be performed by qualified personnel.

Securing the Product

1) Removing the lid

Press the Lid release button at the bottom to open the lid.



3) Attaching the lid

Hook the top of the lid on the main body and close the lid.



* This operation may be performed after the wiring work has been completed.

Mounting Check

 \Box Do not modify or disassemble.

- □ There is no damage on the product.
- □ The mounting location can bear the product's weight.
- $\hfill\square$ The correct screws are being used for secure fixing.
- $\hfill\square$ The product's mounting orientation is correct. Also, it is not tilted.

2) Secure the product in four spots using the appropriate screws.



7. Electrical Connection of Network Adaptor

7-1. Electrical Connections

The Network Adaptor is classified as an electrical instrument. Please wire it safely following the applicable laws and regulations.

- Always wear insulating gloves and insulated shoes while doing wiring.
- Protection device for the Network Adaptor must be set to OFF.
- Check that there is no voltage at all of the terminals.
- Ensure that the PE line is securely connected and grounded.
- Do not damage the covered insulation of the wiring.
- Prevent the introduction of foreign objects such as scrap wires.

- Use the specified types and sizes of wires in accordance with local regulations.
- Do not mistake the wiring systems and the polarities.
- Process the wires as specified for secure connections.
- Please explain how to discharge static electricity.

NOTICE

- The work must be performed by qualified personnel.
- The PE wire should be approximately 20 mm longer than the LINE wire.
- The wiring should be concealed in the walls.
- Increase the separation if the communication line and the power line carrying large currents are running in parallel.

Preparation

Be sure to turn OFF the protection device in the distribution board and check that there is no voltage.

Checking the Cable Retracting and Terminal Positions

When retracting the cable, remove the terminal cover of the power supply unit because the POWER line terminal is located inside the terminal cover.

The communication terminal for connecting with the storage battery system, and the modular jack for connecting with the router are located on the communication unit.



Retracting the Cable

1) Retraction method

Retract the cable through the wiring hole as in the illustration on the right.

2) Cable termination

Strip the cable sheaths to appropriate lengths for connecting them to the terminal.

* If the cable is shielded, protect the stripped end of the sheath with insulating tape, etc.



GRID terminal

Connecting the GRID Terminal

1) Terminal layout and polarities

Make sure that the wires and polarities are correct.



This symbol indicates a wiring terminal intended for connection of a PROTECTIVE EARTHING CONDUCTOR.

2) Cable types and sizes

PVC PVC Circular Cable 2C+E 1.5 mm²

- * Please use copper wire cables.
- * See 1-1. Power and Communication Line Configuration for the cable details.

3) Stripping of wire and specifying the PE wire length <Stripping of wire>

Please strip as conductor's stripped length related as drawing.



<Notes on the PE wire length>

The PE wire should be approximately 20 mm longer than the LINE wire.



4) Connecting



Fully insert the wire while pressing down on the screwdriver.



Release the screwdriver and pull gently on the wire to check that it has been fully inserted. (Do not pull on the wire too hard)

Connecting the COM Terminal

1) Terminal layout and polarities

Make sure that the wires and polarities are correct.



2) Cable types and sizes

PVC Flexible Cable 2C 0.75 mm²

- * Please use copper wire cables.
- * See 1-1. Power and Communication Line Configuration for the cable details.

3) Stripping of wire

Please strip as conductor's stripped length related as drawing.



Fully insert the wire while pressing down on the screwdriver.

Release the screwdriver and pull gently on the wire to check that it has been fully inserted. (Do not pull on the wire too hard)

Network Connection

1) RJ-45 modular jack layout and connection

Insert the LAN cable into the modular jack as shown on the below and check that the cable is connected securely.



Post Connection Processes

1) Securing the wires

Secure the POWER line and NETWORK/COM line wires with insulating locks as shown in the illustration below. The POWER line should be held by the wire clamp in the power supply unit.



2) Cable types

CAT5e (10BASE-T/100BASE-TX)

3) Mounting the terminal cover

Hook the terminal cover at the bottom of the power supply unit and secure it with screws from the front. [Tightening torque 1.2 N•m]



4) Completely remove foreign objects such as scrap wires.

* Attach the lid if there is some length of time before the test run after the wiring has been completed. (How to install the front lid See 6-2 3) Attaching the lid)

Connection Check

- □ The power is turned OFF.
- □ The PE wire is connected and grounded securely.
- $\hfill\square$ The covered insulation of the wiring are not damaged.
- □ The cable wire types and sizes are correct.
- $\hfill\square$ The wires have been processed as specified and are connected securely.
- \Box No mistakes in the wiring.
- □ The connecting length of the PE wire to the GRID terminal is longer than that of the LINE wire.
- $\hfill\square$ The cable is secured with an insulating lock.
- □ The terminal cover is attached.
- \Box No foreign objects such as scrap wires.



1. Control Panel

Control Panel



1-1. Indicators

Number	Name	State	Description
		Blinking red	Error
(1)	ALARM	Blinking green	Date/Time or Charging/Discharging Schedule /Destination not set
		Off	No error
		Lit orange	Power failure
(2)	GRID	Blinking green	Waiting for power restoration
		Lit green	Grid in the normal state
	BATTERY	Lit green	Discharging
		Blinking green	Discharging (battery remaining is low)
(3)		Lit orange	Charging
		Blinking orange	On standby due to out of range temperature
		Off	Charging/Discharging stopped
	MODE	Lit green	Grid-connected
(4)		Blinking green	Grid-connected (output restriction)
		Lit orange	Stand-alone mode
		Blinking orange	Stand-alone (output restriction)
		Off	Stopped

1- . peration uttons

Number	Name	State	Description
	ON/OFF	During operation	Press for one second to start/stop the operation.
(5)	•	During setting	Cancel the setting and return to the previous state.
	CANCEL	During error	Press for three seconds to clear the error.
	CLOCK	During operation	Display the current date/time.
(6)	•	During operation	Press for three seconds to enter the date/time setting mode.
	▼	During setting	Change the setting item and/or setting value.
(7)	DATA •	During operation	The charging/discharging power, remaining battery level and operation mode are displayed in a cycle. The charging/discharging power is always displayed after five minutes of inactivity.
		During setting	Change the setting item and/or setting value.
		Other	Long-press simultaneously with the "MENU" to enter the work setting mode.
	MENU	During operation	Press for one second to enter the user setting mode.
(8)	•	During setting	Confirm the selected item or setting.
	ENTER	Other	Long-press simultaneously with the "DATA" to enter the work setting mode.

1-3.Character Display

Name	Description
8. 8. 8. 8. 8	Grid operations while operating
8.8.8.8.8.	Grid operations while stopped
8 8 8 8 8	Stand-alone operations while operating
8 . 8 . 8. 8.	Stand-alone operations while stopped
8 8 8 8	Remaining battery level
8. 5 . 8. 8. 8.	
8. 8. 8. 8. 8.	Operation mode
8. 8. 8. 8 . 8.	
8. 8. 8. 8 . 8.	DRED mode
8. 8. 8. 8 . 8 .	Remote control
88888	Date/Time
88888	 If the date/time is not set Year (e.g. 2016) Month/Day (e.g. 10 December)
88588	• Hour/Minute (e.g. 15:48)
88888	Error
B B B B B	User setting menu
88888	Work setting menu



* This only mentions basic operations. Check each chapter for details.



3. Setting Procedures

3-1. Setting Procedures

The following settings and test runs are required in order to start up this system normally;

NOTICE

- The actual operation cannot be performed until all the settings have been configured.
- Turn off the DC protector the protection device for the storage battery system, and the protection device for Network Adaptor.



(See chapter 4) [2] Setting Date/Time

normally.

[1] Checking Energization

- Set the date/time in order to activate the clock function. (See chapter 5)
- [3] Setting Parameters
- Set the operation parameters. (See chapter 6 and 7)

[4] Test Runs

- · Perform test runs such as the reverse current CT test and stand-alone operation test. (See chapter 8)
- Check battery lot number status.(See chapter 9)
- ٠ Check PCS communication status. (it connecting three PCS) (See chapter 9)

[5] Checking Network Adaptor Connections

· Turn ON and launch the Network Adaptor and check the communications between the Network Adaptor and the storage battery system. (See chapter 9)

4. Checking Energization

4-1. Checking Energization

After finishing the wiring, check that the battery system side wiring and the GRID connection were normally completed in accordance with installation instructions and local regulations.

NOTICE

- Check that the wiring work has been completed in accordance with Chapter "Installation". The device may fail if the power is turned on with it incorrectly wired.
- The work must be performed by qualified personnel.

4-2. Powering ON the DC/AC

Preparation

- Check that the wiring work has been completed in accordance with Chapter "Installation".
- Set the protection device for the Network Adaptor to OFF. (3)

Operation Procedure



• Turn ON the DC Protector.(①) Power is supplied from the battery to the system. All indicator LED lamps illuminate for five seconds and then return to normal state.



All LED lamps illuminate for five seconds and then return to normal state.

• Turn ON the protection device for the storage battery system. (②) Power is supplied from the AC side to the system.

4-3. Checking DC/AC Voltage Energization

Operation Procedure



- Press "CLOCK (▼)"+"DATA (▲)" for three seconds in the normal state to open the status selection mode.
- Press "DATA (▲)" or "CLOCK (▼)" to display the system status [S1].
- The second digit indicates the AC voltage status, and the third digit indicates the DC voltage status.
- [] appears in the normal state, and [] appears in the error state. Make sure that the displays for the 2nd and 3rd digits turn to [].

■ If the AC Voltage Status or DC Voltage Status are Showing an Error

- If you do not set the destination setting, AC voltage status (2nd digit) will be NG (Error). Please check again after setting the grid operator mode (Chapter 7).
- The DC protector or the AC protection device may be turned OFF. Check that the DC protector and the AC protection device are turned ON.
- Refer to Chapter "Installation", check that the battery is wired correctly.
- Refer to Chapter "Installation", check that the wiring on the AC side is wired correctly.

Reference: How to check the voltage with the Grid terminal

Terminal levers have holes for measurement in the upper part. Insert the test bar of a voltmeter into the hole to measure the voltage.



5. Setting Date/Time

5-1. Date/Time

The date/time needs to be set for this system to operate normally. The Programmed charge/discharge time mode cannot work correctly if the date/time is not set correctly.

NOTICE

- If the ALARM LED is blinking in green, the date/time has not yet been set. Set the date/time.
- The date/time setting is required when not connecting to the Network Adaptor. The scheduled operation mode cannot work correctly if the date/time is not set.
- When connecting with the Network Adaptor, the date/time notified by the Network Adaptor is given higher priority. However, the date/time needs to be set manually as an initial setting.
- The work must be performed by qualified personnel.

5-2. Date/Time Setting

Preparation

• See the list of commands in P.52 to switch to normal state conditions.



- Press "CLOCK (▼)" for three seconds in the normal state to switch to the date/time setting mode. The year digit is selected (i.e. blinks) initially.
 Press "CLOCK (▼)" or "DATA (▲)" to change the selected (i.e. blinking) value. Set the year data.
- Set the year data and press "MENU (ENTER)" to fix the year data and proceed to the month setting. The month data starts blinking.
 Press "CLOCK (▼)" or "DATA (▲)" to change the selected (i.e. blinking) value. Set the month data.
- Set the month data and press "MENU (ENTER)" to fix the month data and proceed to the day setting. The day data starts blinking.
 Press "CLOCK (▼)" or "DATA (▲)" to change the selected (i.e. blinking) value. Set the day data.
- Set the day data and press "MENU (ENTER)" to fix the day data and proceed to the hour setting. The hour data starts blinking.
 Press "CLOCK (▼)" or "DATA (▲)" to change the selected (i.e. blinking) value. Set the hour data.
- Set the hour data and press "MENU (ENTER)" to fix the hour data and proceed to the minute setting. The minute data starts blinking.

Press "CLOCK ($\mathbf{\nabla}$)" or "DATA ($\mathbf{\Delta}$)" to change the selected (i.e. blinking) value. Set the minute data.

Set the minute and press "MENU (ENTER)" to complete the date/time setting.

The set date/time data are displayed in a cycle in the order of (Year) => (Month/Day) => (Hour/Minute) and then return automatically to the normal display.

- Check that the ALARM Indicator is not blinking in green.
 - * If the ALARM Indicator is blinking in green, the date/time setting is not set. Set the date/time correctly.



5-3. How to Check the Set Date/Time

Follow the procedure below to check the current date/time setting.

Preparation

See the list of commands in P.52 to switch to normal state conditions.



- Press "CLOCK (▼)" in normal state to check the current date/time setting.
- The set date/time data are displayed in a cycle in the order of (Year) => (Month/Day) => (Hour/Minute) (The data are displayed for two seconds) and then normal state is automatically returned to.

6. Setting Parameters for Installer

6-1. Setting Parameters

To operate this system normally, it is necessary to set the operation parameters. Note that the system may fail to operate normally if these parameters are not properly set.

NOTICE

- The system cannot operate normally if the parameters have not been set correctly.
- The system must be operated by a qualified personnel. Password authentication is required for switching to the parameter setting mode.

6-2. Switching to the Parameter Item Selection Mode

Preparation

• Set the storage battery system to the stopped state in the normal state. The system can only be switched to the parameter setting mode while it is in a stopped state.



- Press "DATA (▲)" + "MENU (ENTER)" simultaneously for three seconds to switch to the password input mode.
- Enter the password when prompted. The system switches to the parameter selection mode if the entered password is correct.
- (See 6-3 Password Input for details on the password input mode)
- The initial display [no 1-1] of the parameter item selection mode appears if the mode switch is successful.
- To return to the normal state, press "ON/OFF (CANCEL)" for one second while in the password input mode or parameter item selection mode.
- If the password is unsuccessfully entered three times, or the operation buttons are not operated for a span of ten minutes, it reverts to the normal state.

6-3. Password Input

Password authentication is required for changing the parameter values in the parameter setting mode. The following illustration demonstrates how to enter the password.

MENU

ENTER

password.

password prompt again.

Operation Procedure



- configurable digit.
- The currently configurable digit blinks.



Press this button to change the value of the blinking digit.

	ON/ OFF
С	ANCEL

Press this button for one second to abort the password input mode. The system will return to normal state.

Press this button after all the digits have been set.

When this switch is pressed, the system will start

The system switches to the parameter setting mode if the password is correct. If the password is wrong, [Error] appears for one second followed by the

matching the entered value against the correct

- The currently configurable digit blinks. The configurable digit changes each time "CLOCK (▼)" is pressed.
 (3rd digit => 2nd digit => 1st digit => 3rd digit)
- The value of the selected digit changes each time "DATA (\blacktriangle)" is pressed. (0 => 1 => 2 => ... => 9 => 0)
- Once all the digits have been set, press "MENU (ENTER)". The system then matches the entered value against the correct password.

The system switches to the parameter selection mode if the password is correct. If the password is wrong, [Error] appears for one second followed by the password prompt again.

• To abort the password input, press "ON/OFF (CANCEL)" for one second.

6-4. Parameter Item Selection

Select the parameter to be edited from the following: Network Adaptor communications setting/Remaining battery level setting.

Preparation

See 6-2 to 6-3 and switch to the parameter item selection mode showing the initial display [no 1-1].



- Select the parameter to be edited: Network Adaptor Communications Setting, or Remaining Battery Level Setting.
- Press "CLOCK (♥)" or "DATA (▲)" to change the selected item.
 The displayed items and their corresponding settings are as described below.
 - [no 1-1] : Network Adaptor Communications Setting
 - [no 1-2] : Remaining Battery Level Setting
- Press "MENU (ENTER)" to switch to the setting mode.
- Press "ON/OFF (CANCEL)" for one second to restore to the normal state.

6-5. Network Adaptor Communications Setting

This system features a function for performing remote control and data communications via communications with the Network Adaptor.

The Network Adaptor communications setting is configured in this section.

NOTICE

- The work must be performed by qualified personnel.
- The Network Adaptor communications setting is not required for Stand-alone System, as the system is not connected to the Network Adaptor.

Preparation

See 6-2 to 6-4 and switch to the parameter item selection mode showing the initial display [no 1-1]. Then select [no 1-1] and press "MENU(ENTER)" to switch "Network Adaptor Connection [c1-00]".



[Display Mode]

- In the display mode, change the level setting to be edited (Network Adaptor connection setting/Communications ID setting). Press "CLOCK (♥)" or "DATA (▲)" in the display mode to cycle through items. (c1. Network Adaptor connection display / c2. Communications ID display)
- The item number and the current parameter are displayed.
- Select the desired item to change its parameter and press "MENU (ENTER)" to switch from the display mode to the parameter setting mode.

[Setting Mode]

■ c1: Network Adaptor Connection Setting

- In the display mode, set the focus to the Network Adaptor connection and press "MENU (ENTER)" to switch to the Network Adaptor connection setting mode. The setting value blinks.
- Press "CLOCK (▼)" or "DATA (▲)" to change the selected (i.e. blinking) value. Set the value by referring to Table below.
- After editing the setting, press "MENU (ENTER)" to apply the new parameter value and return to the Network Adaptor connection display mode.
- Press "ON/OFF (CANCEL)" to abort the setting. Note that the changed values are discarded if you abort the setting.

No	Setting Item	Setting	Description	Factory Default Setting
o1	Network Adaptor	0	Not Connected	0
CI	Connection Setting	1	Connected	0

■ c2: Communications ID Setting

- In the display mode, set the focus to the Communications ID and press "MENU (ENTER)" to switch to the Communications ID setting mode.
 - The setting value blinks.
- Press "CLOCK (▼)" or "DATA (▲)" in the Communications ID setting mode to change the selected (i.e. blinking) value.

Set the value by referring to Table below.

- After editing the setting, press "MENU (ENTER)" to apply the new parameter value and return to the Communications ID display mode.
- Press "ON/OFF (CANCEL)" to abort the setting. Note that the changed values are discarded if you abort the setting.
- Set to 1 when connecting the Network Adaptor.
- If it is set to anything other than 1, then the Network Adaptor cannot be connected to.

No	Setting Item	Setting	Description	Factory Default Setting
c2	Communications ID Setting	1 to 30	ID value for Network Adaptor Communications	1

[Settings Complete]

• Press "ON/OFF (CANCEL)" in the display mode to return to the parameter item selection mode.

6-6. Remaining Battery Level Setting

This setting can be used to set the remaining battery level to be reserved for the event of a prolonged power outage. No discharging is performed when the remaining battery is lower than the value specified in this setting, regardless of the operation mode (i.e. gird or stand-alone).

• During remote-control system mode, discharging is stopped at the level of remaining battery level adding 2 for blackout.

NOTICE

- Since normal operations will no longer be operable when the set value is lower than the set remaining battery if the remaining battery is set via the remaining battery level setting, be careful in setting this.
- The work must be performed by qualified personnel.

Preparation

See 6-2 to 6-4 and switch to the parameter item selection mode showing the initial display [no1-1]. Then select [no1-2] and press "MENU(ENTER)" to switch "Remaining Battery Level [Prb **]".



[Display Mode]

- The current remaining battery level setting is displayed in the display mode. It is displayed in the form of [Prb] (which indicates the remaining battery level setting) followed by the current parameter.
- Press "MENU (ENTER)" to switch from the display mode to the setting mode.

[Setting Mode]

- Press "MENU (ENTER)" in the display mode to switch to the remaining battery level setting mode. The setting value blinks.
- Press "CLOCK (▼)" or "DATA (▲)" in the remaining battery level setting mode to change the selected (i.e. blinking) value.

Set the value by referring to Table below.

- After editing the setting, press "MENU (ENTER)" to apply the new parameter value and return to the remaining battery level display mode.
- Press "ON/OFF (CANCEL)" to abort the setting. Note that the changed values are discarded if you abort the setting.

No	Setting Item	Setting	Description	Factory Default Setting
Prb	Remaining Battery Level Setting	0 to 40 [%]	Remaining Battery Level Setting	0 [%]

[Settings Complete]

• Press "ON/OFF (CANCEL)" in the display mode to return to the parameter item selection mode.

6-7. Terminating the Parameter Setting Mode

Operation Procedure



Once all the parameters have been set, close the parameter setting and return to the normal state.

• To return to the normal state, press "ON/OFF (CANCEL)" for one second while in the parameter item selection mode.

7. Setting Parameters for Grid Operator

7-1. Setting Parameters

To operate this system normally, it is necessary to set the operation parameters. Note that the system may fail to operate normally if these parameters are not properly set.

NOTICE

- The system cannot operate normally if the operation data have not been set correctly.
- Only the grid operator can set up and operate this parameter. The password is not in this installation manual.

7-2. Switching to the Parameter Item Selection Mode

Preparation

• Set the storage battery system to the stopped state in the normal state. The system can only be switched to the parameter setting mode while it is in a stopped state.

Operation Procedure



- Press "DATA (▲)" + "MENU (ENTER)" simultaneously for three seconds to switch to the password input mode.
- Enter the password when prompted. The system switches to the parameter item selection mode if the entered password is correct.

(See 6-3 Password Input for details on the password input mode)

- The initial display [no4.00] of the parameter item selection mode appears if the mode switch is successful.
- To return to the normal state, press "ON/OFF" for one second while in the password input mode or parameter item selection mode.

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7-3. Parameter Item Selection

Preparation

• See 7-2 and switch to the parameter item selection mode showing the initial display [no4.00].

- While the Parameter Item Mode is selected, press "DATA ▲" or "CLOCK ▼" and select parameter item. Then press "MENU (ENTER)" to switch to the Parameter Display and Setting mode.
- Press "ON/OFF (CANCEL)" for one second to restore to the Normal State.



7-4. Destination Setting

Select the destination for grid protection. Notice:

If this setting is not set "1" or "2", the product does not connect to the grid.

Setting Item	Destination	Comment	
ST 0	(no defined)	Default	
ST 1	Australia		
ST 2	New Zealand		

Table Destination List

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.00].

- While [no4.00] is displayed, press "MENU (ENTER)" to switch to the Display mode.
- While the Display mode is displayed, press "MENU (ENTER)" to switch to the Setting mode. Or press "ON/OFF (CANCEL)" to return to the Parameter Item Selection mode.
- While the Setting mode is displayed and the digit is blinking, press "DATA ▲" or "CLOCK ▼" and select the destination.
- After the selection, press "MENU (ENTER)" to store the data. Or press "ON/OFF (CANCEL)" to cancel and return to the Display mode.
- Press "ON/OFF (CANCEL)" to restore to the Parameter Item Selection.



7-5. Protection Level Setting

In this setting mode, listed below items can be selected.

Description	Parameter Item	Australia		New Zealand	
Parameter item	Display	Default Set Point	Range	Default Set Point	Range
Trip Level Over voltage stage 1	8.8.8.8	260.0V	230.0V~ 260.0V	260.0V	230.0V~ 260.0V
Trip Time Over voltage stage 1	8888	2.0s	1.0s ~ 2.0s	2.0s	1.0s~ 2.0s
Trip Level Over voltage stage 2	8.8.8.8.8.	265.0V	260.0V ~ 265.0V	265.0V	260.0V ~ 265.0V
Trip Time Over voltage stage 2	8.8.8.8	0.2s	Setting Disable	0.2s	Setting Disable
Trip Level Under voltage stage	8.8.8.8.8.	180.0V	180.0V ~ 230.0V	180.0V	180.0V ~ 230.0V
Trip Time Under voltage stage	8.8.8.8	2.0s	1.0s ~ 2.0s	2.0s	1.0s~ 2.0s
Trip Level Over frequency	8 8 8 8 8	52.00Hz	50.00Hz ~ 52.00Hz	52.00Hz	50.00Hz ~ 52.00Hz
Trip Time Over frequency	<u>8</u> 8 8 8 8	0.2s	Setting Disable	0.2s	Setting Disable
Trip Level Under frequency	8 8 8 8 8	47.00Hz	47.00Hz ~ 50.00Hz	45.00Hz	45.00Hz ~ 50.00Hz
Trip Time Under frequency	88888	2.0s	1.0s ~ 2.0s	2.0s	1.0s~ 2.0s
Vnom_max	8 8 8 8 8	255.0V	244.0V ~ 258.0V	248.0V	244.0V~ 258.0V
fstop	<u>8. 5. 8. 8. 8.</u>	52.00Hz	51.00Hz ~ 52.00Hz	52.00Hz	51.00Hz ~ 52.00Hz
fstop-CH	8. 5. 8. 8. 8.	49.00Hz	47.00Hz ~ 49.00Hz	49.00Hz	47.00Hz ~ 49.00Hz

Table Protection Level Setting List

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.01].

- While [no4.01] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Display mode is selected, press "DATA ▲" or "CLOCK ▼" and select parameter item. Then press "MENU (ENTER)" to switch to the Parameter Setting mode. Or press "ON/OFF (CANCEL)" to return to the Parameter Item selection.
- While the Parameter Setting mode is selected and digits are blinking, press "DATA ▲" or "CLOCK ▼" and adjust the parameter level. (If digits are not blinking, you can not change the value.)
- When the numerical parameter is 4 or 5 digits, at first set the numerical number in front of the decimal point, and press "MENU", set the numeric number behind the decimal point.
- During adjusting the parameter level, press "MENU (ENTER)" to fix the parameter level. Or press "ON/OFF (CANCEL)" to cancel. Then return the Parameter Display mode.
- After returning the Parameter Display mode, press "ON/OFF (CANCEL)" to return the Parameter Item Selection.




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7-6. DRM (Demand Response Modes) Setting Select DRM from DRM0 to DRM8.

Table DRM mode List

Parameter Itom	Parameter Item	Australia/New Zealand		
Farameter item	Display	Default Set Point	Range	
DRM0	8.8.8.8.	OFF	ON/OFF	
DRM1	8.8.8.8.8	OFF	ON/OFF	
DRM2	8888	OFF	ON/OFF	
DRM3	8 8 8 8 8	OFF	ON/OFF	
DRM4	88888	OFF	ON/OFF	
DRM5	88588	OFF	ON/OFF	
DRM6	88888	OFF	ON/OFF	
DRM7	8.8.8.8.8	OFF	ON/OFF	
DRM8	8 8 8 8 8	OFF	ON/OFF	

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.02].

- While [no4.02] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- Select DR mode from 0 to 8 by pressing "DATA(\blacktriangle)" or "CLOCK(\triangledown)".
- After the selection of DRM mode number, press "MENU (ENTER)" to switch to the Parameter Setting mode. Or press "ON/OFF(CANCEL)" to return Parameter Item Selection.
- While the Parameter Setting mode is selected and digits are blinking, press "DATA(▲)" or "CLOCK(▼)" to select from "ON" or "OFF".
- After the selection, press "MENU (ENTER)" to store the data and switch to the Parameter Display mode. Or press "ON/OFF(CANCEL)" to cancel the selection and return Parameter Display mode.
- Press "ON/OFF (CANCEL)" to return to Parameter Item Selection.



7-7. Lower Discharge Limit Setting

In this setting mode, lower discharge limit can be set during DR operation.

Parameter Itom	Parameter Item	Australia/New Zealand		
Falameter item	Display	Default Set Point	Range	
Lower Discharge Limit (DR)	88888	40%	$0\%\sim90\%$	

Table DRM Mode List

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.03].

- While [no4.03] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- After Parameter Display mode is selected, press "MENU (ENTER)" to switch the Parameter Setting mode. Or press "ON/OFF(CANCEL)" to return Parameter Item Selection.
- While the Parameter Display mode is displayed, press "MENU (ENTER)" to switch to the Parameter Setting mode.
- While the Parameter Setting mode is selected and digits are blinking, press "DATA (▲)" or "CLOCK (▼)" to adjust the value.
- After the adjustment, press "MENU (ENTER)" to store the data and switch to the Parameter Display mode. Or press "ON/OFF(CANCEL)" to cancel parameter changed and return to the Parameter Display mode.
- Press "ON/OFF (CANCEL)" to return to Parameter Item Selection.



7-8. Reactive Power Level Setting (DRM)

In this setting mode, reactive power level can be set during DR operation.

Parameter Itom	Parameter	Australia/New Zealand		
Falameter item	Selection Display	Default Set Point	Range	
Reactive Power Level Source Reactive Power (DRM3)	<u> </u>	0%	$0\% \sim 60\%$	
Reactive Power Level Sink Reactive Power (DRM7)	8 8 8 8 8	0%	$0\% \sim 60\%$	

Table Reactive Power Level

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.04].

- While [no4.04] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Parameter Display mode is selected, press "DATA (▲)" or "CLOCK (▼)" to select the Parameter Item.
- After Parameter Item is selected, press "MENU (ENTER)" to switch the Parameter Setting mode. Or press "ON/OFF(CANCEL)" to return Parameter Item Selection.
- While the Parameter Setting mode is selected and digits are blinking, press "DATA (▲)" or "CLOCK (▼)" to adjust the value.
- After the adjustment, press "MENU (ENTER)" to store the data and switch to the Parameter Display mode. Or press "ON/OFF(CANCEL)" to cancel parameter changed and return to the Parameter Display mode.
- Press "ON/OFF (CANCEL)" to return to Parameter Item Selection.



7-9. Multiple Inverter Combinations Setting

In this setting mode, parameter during Multiple inverter operation can be set.

Inverter ID that be set as '01' is the parent machine. Its parent machine looks for Battery systems according with set value at (G2).

Notics:

- Parent machine does not mather anywhere on the connection of system line (see Chapter 1-1 ◎ Installation of multiple system).
- When "00 : Disabled" is set, the number of connection (G2) is ignored.
- If Multiple Inverter combination setting is not set properly, erroe code "U110" will be displayed 24 hours after start working.
- Parent machine is set only one.
- Please do not set as the parent machine in two or three.
- Make sure the number of connection is correct.

Table	Multiple	Inverter	Combinations
	•		

Baramatar Itam	Parameter	Australia/New Zealand		
Falameter item	Selection Display	Default Set Point	Range	
Connection State and ID Number (G1)	<u>8</u> . 8. 8. 8. 8.	00:Disabled	00:Disabled 01:PCS1 02:PCS2 03:PCS3	
The Number of Connection (G2)	8 . 8. 8. 8. 8.	1	1~3	

Table Setting ample									
		Single			Double			riple	
System	No.1	No.2	No.3	No.1	No.2	No.3	No.1	No.2	No.3
G1	00	_	_	01	02	_	01	02	03
G2	1	_	-	2	2	_	3	3	3

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.05].

- While [no4.05] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Parameter Display mode is selected, press "DATA (\blacktriangle)" or "CLOCK (∇)" to select the Parameter Item.
- After the selection of parameter item, press "MENU (ENTER)" to switch to the parameter setting mode. Or press "ON/OFF(CANCEL)" to return Parameter Item Selection.
- While the parameter setting mode is selected and digits are blinking, press "DATA(▲)" or "CLOCK(▼)" to set the value.
- After the selection, press "MENU (ENTER)" to store the data and switch to the parameter display mode.
- Or press "ON/OFF(CANCEL)" to cancel parameter changed and return to the parameter display mode.
- Press "ON/OFF (CANCEL)" for one second to return to Protection Level setting[no4.05] .



7-10. The Power Rate Limit Setting

- The power rate limit is the ramp rate of real power output in response to changes in power and is defined as a percentage of rated power per minute.
- The percentage change of the output power limit set by the SET rate 1. The decreasing rate of the output power limit is set to SET rate-1, and the rate of increase of the output power limit is set to the SET rate + 1.
- The percentage change of the input power limit set by the SET rate 2. The decreasing rate of the input power limit is set to SET rate-2, and the increasing rate of the input power limit is set by the SET rate + 2.

Parameter Item	Parameter Item	Australia/New Zealand			
Parameter item	Display	Default Set Point	Range		
SET rate+1	8 . 8. 8. 8. 8.	16.67%	5.00% ~ 100.00%		
SET rate-1	<i>B. B. B. B. B.</i>	16.67%	$5.00\% \sim$ 100.00%		
SET rate+2	8 . 8. 8. 8. 8.	16.67%	5.00% ~ 100.00%		
SET rate-2	<u> </u>	16.67%	$5.00\% \sim$ 100.00%		

Table Power Rate

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.06].

- While [no4.06] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Display mode is selected, press "DATA(▲)" or "CLOCK(▼)" and select the parameter item. Then press "MENU (ENTER)" to switch to the Parameter Setting mode. Or press "ON/OFF (CANCEL)" to return to the Parameter Item selection.
- While the Parameter Setting mode is selected and digits are blinking, press "DATA(▲)" or "CLOCK (▼)" and adjust the parameter level. (If digits are not blinking, you can not change the value.)
- When the numerical parameter is 4 or 5 digits, at first set the numerical number in front of the decimal point, and press "MENU", set the numeric number behind the decimal point.
- After the adjustment of the parameter level, press "MENU (ENTER)" to fix the parameter level. Or press "ON/OFF (CANCEL)" to cancel. Then return the Parameter Display mode.
- After returning the Parameter Display mode, press "ON/OFF (CANCEL)" to return the Parameter Item Selection.



7-11. Volt Response Reference Values Setting

Volt response mode is to respond to voltage changes at the inverter terminals, and is to increase the number of systems which can be connected at a point on the grid without adversely affecting the voltage within an electrical installation.

The volt-watt and volt var response modes shall use the volt response reference values.

%Reference Voltage 4 shuld be set to be equal to or greater than Reference Voltage 3.

Parameter Itom	Parameter Selection	Aust	tralia	New Zealand	
Farameter item	Display	Default Set Point	Range	Default Set Point	Range
Reference Voltage 1	<i>8.8.8.8.</i> 8.	207.0V	Setting Disabled	207.0V	Setting Disabled
Reference Voltage 2	8 8 8 8 8 8	220.0V	216.0V~ 230.0V	220.0V	216.0V~ 230.0V
Reference Voltage 3	8.8.8.8.8.	250.0V	235.0V ~ 255.0V	244.0V	235.0V ~ 255.0V
Reference Voltage 4	88888	265.0V	244.0V~ 265.0V	255.0V	244.0V~ 265.0V

Table Volt Response Reference Values

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.07].

- While [no4.07] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Display mode is selected, press "DATA(▲)" or "CLOCK(▼)" and select the parameter item. Then press "MENU (ENTER)" to switch to the Parameter Setting mode. Or press "ON/OFF (CANCEL)" to return to the Parameter Item selection.
- While the Parameter Setting mode is selected and digits are blinking, press "DATA(▲)" or "CLOCK (▼)" and adjust the parameter level. (If digits are not blinking, you can not change the value.)
- When the numerical parameter is 4 or 5 digits, at first set the numerical number in front of the decimal point, and press "MENU", set the numeric number behind the decimal point.
- After the adjustment of the parameter level, press "MENU (ENTER)" to fix the parameter level. Or press "ON/OFF (CANCEL)" to cancel. Then return the Parameter Display mode.
- After returning the Parameter Display mode, press "ON/OFF (CANCEL)" to return the Parameter Item Selection.



7-12. Volt-watt Response Mode Setting

The Volt-watt response mode varies the output power of the inverter in response to the voltage at its terminal. The response curve required for the volt-watt response mode is defined by the volt response reference values in table listed in the section 7-11 and corresponding power levels.

Parameter Itom	Parameter	Australia/New Zealand		
Falameter item	Selection Display	Default Set Point	Range	
Volt-watt Response Mode (Discharge)	8 8 8 8 8	OFF	ON/OFF	
Volt-watt Response Mode (Charge)	8888	OFF	ON/OFF	

Table	Volt-watt	Response	Mode
10010	ron man	1.000001100	

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.08].

- While [no4.08] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Display mode is selected, press "DATA(▲)" or "CLOCK(▼)" and select the parameter item. Then press "MENU (ENTER)" to switch to the Parameter Setting mode. Or press "ON/OFF (CANCEL)" to return to the Parameter Item selection.
- While the Parameter Setting mode is selected and digits are blinking, press "DATA(▲)" or "CLOCK (▼)" and select "On" or "Off".
- After the selection, press "MENU (ENTER)" to fix the data. Or press "ON/OFF (CANCEL)" to cancel. Then return the Parameter Display mode.
- After returning the Parameter Display mode, press "ON/OFF (CANCEL)" to return the Parameter Item Selection.



7-13. Reactive Power Mode Setting

Select the reactive power mode from table listed below

Table Reactive Power Mode

Paramatar Itam	Parameter	Australia/New Zealand		
Falameter item	Selection Display	Default Set Point	Range	
Reactive Power Mode Setteing	8 8 8 8 8	0 *	0-4 *	

Mode	Explanation *		
0	All disenable		
1	Volt-var response mode only enabled		
2	Fixed reactive power mode only enabled		
3	Fixed power factor mode only enabled		
4	Characteristic power factor mode only enabled		

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.09].

- While [no4.09] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Display mode is selected, press "MENU (ENTER)" to switch to the Parameter Setting mode. Or press "ON/OFF (CANCEL)" to return to the Parameter Item selection.
- While the Parameter Setting mode is selected and the digit is blinking, press "DATA(▲)" or "CLOCK (▼)" and select the value from 0 to 4.
- After setting the value, press "MENU (ENTER)" to store the data and switch to the parameter display mode. Or press "ON/OFF (CANCEL)" to cancel. Then return the Parameter Display mode.
- After returning the Parameter Display mode, press "ON/OFF (CANCEL)" to return the Parameter Item Selection.



7-14. Volt-var Response Set-point Value Setting

%This mode is enabled only when it is set to the MODE1 as described in Chapter 7-13.

The volt-var response mode varies the reactive power output of the inverter in response to the voltage at its grid – integrative. The response curve required for the volt-var response is defined by the volt response reference values specified in Table listed in the Section 7-11 and corresponding var levels. The default values are listed in table listed below.

Paramotor Itom	Parameter Selection	Australia/New Zealand		
Farameter item	Display	Default Set Point	Range	
Set-point Value 1	8 . 8. 8. 8. 8.	30% Leading	0% \sim 60% Leading	
Set-point Value 2	8 8 8 8 8	0%	0%	
Set-point Value 3	8 8 8 8 8	0%	0%	
Set-point Value 4	8 8 8 8 8	30% Lagging	0% \sim 60% Lagging	

Table	Volt-var	Response	Set-point	Values	for F	Reference	Voltages

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.10].

- While [no4.10] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Display mode is selected, press "DATA(▲)" or "CLOCK(▼)" and select the parameter item. Then press "MENU (ENTER)" to switch to the Parameter Setting mode. Or press "ON/OFF (CANCEL)" to return to the Parameter Item selection.
- While the Parameter Setting mode is selected and digits are blinking, press "DATA(▲)" or "CLOCK (▼)" and adjust the parameter level. (If digits are not blinking, you can not change the value.)
- After the adjustment of the parameter level, press "MENU (ENTER)" to fix the parameter level. Or press "ON/OFF (CANCEL)" to cancel. Then return the Parameter Display mode.
- After returning the Parameter Display mode, press "ON/OFF (CANCEL)" to return the Parameter Item Selection.



7-15. Fixed Reactive Power Setting

%This mode is enabled only when it is set to the MODE2 as described in Chapter 7-13.

- While the power inputs the inverter, the reactive power is set "0[var]".
- While the inverter outputs the power, the reactive power is fix and the reactive power is set rated power times .

Baramatar Itam	Parameter	Australia/New Zealand		
Farameter item	Selection Display	Default Set Point	Range	
fix Reactive Power	<u>8. 8. 8. 8. 8.</u>	0%	0% \sim 60%	
fix Source or Sink	8.8.8.8.8.	LAGG	LAGG /LEAD	

Table olt-watt Response Mode	Table	olt-watt Response Mode
------------------------------	-------	------------------------

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.11].

- While [no4.11] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Display mode is selected, press "DATA(▲)" or "CLOCK(▼)" and select the parameter item. Then press "MENU (ENTER)" to switch to the Parameter Setting mode. Or press "ON/OFF (CANCEL)" to return to the Parameter Item selection.
- While the Parameter Setting mode is selected and digits are blinking, press "DATA(▲)" or "CLOCK (▼)" and adjust the parameter level.
- After the adjustment of the parameter level, press "MENU (ENTER)" to fix the parameter level. Or press "ON/OFF (CANCEL)" to cancel. Then return the Parameter Display mode.
- After returning the Parameter Display mode, press "ON/OFF (CANCEL)" to return the Parameter Item Selection.



7-16. Fixed Reactive Factor Setting

%This mode is enabled only when it is set to the MODE3 as described in Chapter 7-13.

- While the power inputs the inverter, the reactive factor is set "0[var]".
- While the inverter outputs the power, the reactive power is fix and the maximum ratio of reactive power (vars) to rated apparent power should be 60%.

Parameter Itom	Parameter	Australia/New Zealand		
Parameter item	Selection Display	Default Set Point	Range	
fix Reactive Factor	8 . 8. 8. 8. 8.	1.00	0.80 ~ 1.00	
fix Source or Sink	<u>8</u> 8 8 8 8	LAGG	LAGG /LEAD	

Table Fixed Reactive Factor Setting

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.12].

- While [no4.12] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Parameter Display mode is selected, press "DATA(▲)" or "CLOCK(▼)" and select the parameter item. Then press "MENU (ENTER)" to switch to the Parameter Setting mode. Or press "ON/OFF (CANCEL)" to return to the Parameter Item selection.
- While the Parameter Setting mode is selected and digits are blinking, press "DATA(▲)" or "CLOCK (▼)" and adjust the parameter level.
- After the adjustment of the parameter level, press "MENU (ENTER)" to fix the parameter level. Or press "ON/OFF (CANCEL)" to cancel. Then return the Parameter Display mode.
- After returning the Parameter Display mode, press "ON/OFF (CANCEL)" to return the Parameter Item Selection.



7-17. Characteristic Power Factor Curve Setting

This mode is enabled only when it is set to the MODE4 as described in Chapter 7-13.

With this mode can be changed along the power factor on the output. Setting the way is as follows.

①While the power inputs the inverter, the power factor is set' 1'.

- ②When the power output is from 0[W] to Characteristic Power(P1) X Rated Power[W], the power factor is set' $\cos \varphi$ of point1 (λ 1)'.
- (3) When the power output is from Characteristic Power(P1) X Rated Power[W] to Characteristic Power(P2) X Rated Power[W], the power factor is set' cos φ of point1 (λ 1)' at Characteristic Power(P1) X Rated Power[W] and the power factor is set' cos φ of point2 (λ 2)' at Characteristic Power(P2) X Rated Power[W]. As 'cos φ of point1 (λ 1)' at Characteristic Power(P1) X Rated Power[W] and 'cos φ of point2 (λ 2)' at Characteristic Power[W] and 'cos φ of point2 (λ 2)' at Characteristic Power[W] and 'cos φ of point2 (λ 2)' at Characteristic Power[W] and 'cos φ of point2 (λ 2)' at Characteristic Power[W].
- (4) When the power output is from Characteristic Power(P2) X rated Power[W] to Rated Power[W], the power factor is set ' $\cos \varphi$ of point2 (λ 2)'.

% Characteristic Power (P2) should be set to be equal to or greater than Characteristic Power (P1).



Table Characteristic Power Factor Setting Parameter List

Devementer litere	Parameter Selection	Australia/New Zealand	
Parameter item	Display	Default Set Point	Range
Characteristic Power (P1)	<u>8.88.8.8</u>	0.00	0.00 ~ 1.00
Cosφ of Point1 (λ1)	<u>8.88.8.8</u>	1.00	0.90 ~ 1.00
Source or Sink Setting(λ1)	<u>8. 8. 8. 8.</u>	LAGG	LAGG /LEAD
Characteristic Power (P2)	<u>8.88.8.8</u>	1.00	0.00 ~ 1.00
Cosφ of Point2 (λ2)	<u>8</u> . 8. 8. 8. 8.	1.00	0.90 ~ 1.00
Source or Sink Setting (λ2)	<u> </u>	LAGG	LAGG /LEAD

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.13].

- While [no4.13] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Parameter Display mode is selected, press "DATA(▲)" or "CLOCK(▼)" and select the parameter item. Then press "MENU (ENTER)" to switch to the Parameter Setting mode. Or press "ON/OFF (CANCEL)" to return to the Parameter Item selection.
- While the Parameter Setting mode is selected and digits are blinking, press "DATA(▲)" or "CLOCK (▼)" and adjust the parameter level.
- After the adjustment of the parameter level, press "MENU (ENTER)" to fix the parameter level. Or press "ON/OFF (CANCEL)" to cancel. Then return the Parameter Display mode.
- After returning the Parameter Display mode, press "ON/OFF (CANCEL)" to return the Parameter Item Selection.



7-18. Reverse Power Mode Setting

In this setting mode. thepropriety of reverse power flow from the storage battery system can be set. However, if there in an instruction from DRED, it gives priority to the instruction of DRED not set here.

Devementer litere	Parameter Selection	Australia/New Zealand	
Farameter item	Display	Default Set Point	Range
Reverse Power Mode Setting	<i>8. 8. 5. 8. 8.</i>	0	0∶enable 1∶disenable

Table DRM Mode List

Preparation

• See 7-2 and switch to the Parameter Item Selection mode showing the initial display [no4.14].

- While [no4.14] is displayed, press "MENU (ENTER)" to switch to the Parameter Display mode.
- While the Parameter Display mode is selected, press "MENU (ENTER)" to switch to the Parameter Setting mode. Or press "ON/OFF (CANCEL)" to return to the Parameter Item selection.
- While the Parameter Setting mode is selected and the digit is blinking, press "DATA(▲)" or "CLOCK (▼)" and set "0" (enable) or "1" (Disenable).
- After the selection, press "MENU (ENTER)" to store the data. Or press "ON/OFF (CANCEL)" to cancel. Then return the Parameter Display mode.
- After returning the Parameter Display mode, press "ON/OFF (CANCEL)" to return the Parameter Item Selection.



7-19. Terminating the Parameter Setting Mode

Operation Procedure



Once all the parameters have been set, close the parameter setting and return to the normal state.

• To return to the normal state, press "ON/OFF (CANCEL)" for one second while in the parameter item selection mode.

8. Test Run

8-1.Test Run

The following test runs are required before operating this system: the actual operation cannot be performed until test runs have been completed.

- Stand-alone Operation Test
- Reverse Current CT Test

NOTICE

- Test runs are required before the actual operation of the system. Actual operations cannot be performed until test runs have been completed.
- The work must be performed by qualified personnel.

8-2. Test Run Selection

Preparation

• Set the storage battery system to the stopped state in the normal state. The system can only be switched to the parameter setting mode while it is in a stopped state.

Operation Procedure



Press "CLOCK(▲)"+"MENU(ENTER)" simultaneously for three seconds in the normal state to switch to the test run selection prompt in the test run mode.
 Stand alone Operation test ITEST11 is displayed initially.

Stand-alone Operation test [TEST1] is displayed initially.

- Press "ON/OFF (CANCEL)" for one second in the test run selection prompt to return to the normal state.
- Press "CLOCK (▼)" or "DATA (▲)" in the test run selection prompt to switch between the Stand-alone Operation test [TEST1] and Reverse Current CT test [TEST2].

NOTICE:

If the destination setting is not set, TEST run operation is not possible (See 7-3).

If DRED setting is not to OFF, TEST run operation is not possible. (See 7-6)

8-3. Stand-alone Operation Test

Perform test runs of the stand-alone operations.

NOTICE

- Be sure to turn OFF the backup breaker during a test run. Otherwise, it may result in the failure of the connected load device.
- Be sure to turn the stand-alone breaker back ON after the test runs have been completed. Otherwise, no power will be supplied to the load during the actual stand-alone operations.

Preparation

- Be sure to turn the stand-alone breaker to OFF.
- See the list of commands in P.52 or 8-2 and select the Stand-alone Operation test [TEST1].

Operation Procedure



- Select the stand-alone test [TEST1] in the test run selection prompt.
- With the Stand-alone Operation test 1 selected, press "MENU (ENTER)" to start the test run.
- [CHE 1] is displayed during the test run. The test run takes several minutes to complete.
- When the test is complete, the test run finishes automatically and the test result is displayed.
- [□□□□] appears if the test run is normally completed, but if it does not normally complete, the abnormal termination appears as [---].
- Press "ON/OFF(CANCEL)" after the results display, and switch to the test run selection.

Abnormal Termination

- The DC protector may be turned OFF. Check that the DC protector is turned ON.
- The setting value for the Remaining Battery Level Setting may exceed the remaining battery level. Change the setting value.

Switch the Stand-alone Breaker Back ON.

• When the Stand-alone Operation test completes normally, be sure to turn the stand-alone breaker ON again.

NOTICE

- Be sure to turn the stand-alone breaker back ON after the test run has completed. Otherwise no power will be supplied to the load connected to the stand-alone circuit during a power cut.
 - * Reference 4-3: How to check the voltage with the Grid terminal.

8-4. Reverse Current CT Test

Test the installation of the reverse current control CT.

Preparation

See the list of commands in P.93 or 8-2 and select the Reverse Current CT test [TEST2].

Operation Procedure



- Select the Reverse Current CT test [TEST2] in the test run selection prompt.
- With the Reverse Current CT test selected, press "MENU (ENTER)" to start the test run.
- [CHE 2] is displayed during the test run. The test run takes several minutes to complete.
- When the test is completed, the test run finishes automatically and the test result is displayed.
- [□□□] appears if the test run is normally completed, but if it does not normally complete, the abnormal termination appears as [---].
- Press "ON/OFF(CANCEL)" after the results display, and switch to the test run selection.

Abnormal Termination

- The mounting position and direction of the CT may be incorrect. Check the mounting position and direction of the CT again.
- The DC protector and the protection device for storage battery system may not be ON. Check that the DC protector and the protection device for storage battery system are both ON.
- When the remaining battery level is over 90%, discharge it until it becomes 80%, then retry. Discharging can be performed via Stand-alone Operations.
- Check that the storage battery system's operating temperature range (0 40°C) is within range. It cannot be charged if the temperature drops below 0°C.

8-5. Checking Test Run Results

Check whether the test run was completed normally.

Preparation

• Set the storage battery system to the stopped state in the normal state. The system can only be switched to the parameter setting mode while it is in a stopped state.

Operation Procedure Status Selection



- Press "CLOCK (▼)"+"DATA (▲)" for three seconds in the normal state to open the status selection mode.
- Press "DATA (▲)" or "CLOCK (▼)" to display the test run status (S2).
- The first and second digit indicate the results of the Reverse Current CT test and Stand-alone test, respectively.
- The results would be [] for completion and [] if incomplete.
- The actual operations cannot be performed unless the Reverse Current CT test and Stand-alone test results were both completed normally.

8-6. Checking Battery Lot Number and Inverter Communication Status



C : completion

- : Incomplete

1st digit : Battery Lot Number Status 2nd digit : Inverter Communication Status

- While the Status selection mode is selected, press "DATA (\blacktriangle)" or "CLOCK (\triangledown)" to display the test run status (S3).
- The first and second digits indicate the results of the Battery Lot Number Status and Inverter Communication Status Communication Status, respectively.
- The results would be [] for completion and [] if incomplete.
- If 1st digit is not [[], check Battery serial number (See 3-2 Checking the battery lot number).
- Please contact the distributor if the numbers do not match.

9. Checking the Network Adaptor Connections

9-1. Checking the Network Adaptor Connections

In order to connect this system to the server via the Network Adaptor to perform remote controls, etc., the communications with the Network Adaptor must be operating normally. Otherwise, the remote control instructions, etc. from the server cannot be accepted.

NOTICE

- The DR control instructions, etc. from the server cannot be accepted if the communications with the Network Adaptor are not properly configured.
- The work must be performed by qualified personnel.

9-2. Starting Up the Network Adaptor

Preparation

• Switch the DC Protector (0) and protection device for the storage battery system to ON.(0)

Operation Procedure

Switch ON the protection device for Network Adaptor.(③)
 The Network Adaptor launches and starts communicating with the storage battery system.



9-3. Checking the Network Adaptor Communications

Operation Procedure



- Press "CLOCK (▼)"+"DATA (▲)" for three seconds in the normal state to open the status selection mode.
- Press "DATA (▲)" or "CLOCK (▼)" to display the system status (S1).
- The first digit indicates the communications status with the Network Adaptor.
- [] indicates that the communications with the Network Adaptor is operating normally; and []appears if it is not in operation. Make sure that the display for the 1st digit turns to [].

■ If the Communications with the Network Adaptor are not Functioning

- The Network Adaptor may not be running. Check whether the protection device for Network Adaptor is turned ON.
- The communications line may be connected incorrectly. Check chapter 6-1 in the "Installation" section again and verify that the communications line is connected correctly to both the Network Adaptor and the storage battery system.

10.Complete Settings

The settings are now complete.

Attach the front lid by referring to P.26.

When connecting the Network Adaptor, refer to the Setting Manual which is included with the Network Adaptor, then perform the settings. Finally, cut "Emergency Response Measures sheet" below and put it and "Stop procedure label" in a prominent position near the battery storage system.

Emergency Response Measures

[FIRST-AID MEASURES]

Spilled internal cell materials

Inhalation : Make the victim blow his/her nose, gargle. Seek medical attention if necessary.

Skin contact : Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately.

Eye contact: Do not rub one' s eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

A battery cell and spilled internal cell materials

Ingestion : Make the victim vomit. When this is not possible or feeling unwell after vomiting, seek immediate medical attention.

[FIRE-FIGHTING MEASURES]

Suitable extinguishing media : Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.

Specific hazards : Corrosive gas may be emitted during fire.

Specific methods of fire-fighting: When the battery burns with other combustibles simultaneously, take fire-extinguishing method which correspond to the combustibles. Extinguish a fire from the windward as much as possible.

Special protective equipment for firefighters :

Respiratory protection : Respiratory equipment of a gas cylinder style or protection-against-dust mask Hand protection : Protective gloves

Eye protection : Goggle or protective glasses designed to protect against liquid splashes Skin and body protection: Protective cloth

[ACCIDENTAL RELEASE MEASURES]

Spilled internal cell materials, such as electrolyte leaked from a battery cell, are carefully dealt with according to the followings.

Precautions for human body: Remove spilled materials with protective equipment (protective glasses and protective gloves). Do not inhale the gas as much as possible. Moreover, avoid touching with as much as possible.

Environmental precautions: Do not throw out into the environment.

Method of cleaning up: The spilled solids are put into a container. The leaked place is wiped off with dry cloth. Prevention of secondary hazards: Avoid re-scattering. Do not bring the collected materials close to fire.

Installation Manual

Panasonic®

User's Manual

Lithium-ion Storage Battery System Model No. LJ-SK56A

> Network Adaptor Model No. LJ-NA02



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- Thank you for purchasing a Panasonic product.
 Please read this User's Manual thoroughly before operating the system.
 For future reference, please keep this manual in a safe place.
- For disposal, please contact your Household Hazardous waste depot.

Safety Precautions

- To reduce the risk of personal injury, injury to others and property damage, always observe the safety precautions described below.
- This product is an important resource. Be sure to inspect it appropriately and observe the safety precautions set forth below.
- We shall not be in any way liable for any accidents or malfunctions resulting from failure to observe these precautions.
- The levels of danger and damage that may result when the product is installed incorrectly are classified and indicated as shown below.

This symbol denotes information that, if not observed correctly, can result in serious injuries to personnel.
This symbol denotes actions that may result in minor injury and/or property damage.

Instructions that must be observed are indicated by the following graphical symbols.



This symbol denotes an action that is prohibited.



This symbol denotes actions that are mandatory.

	 Do not modify or disassemble the product. Doing so may result in fire, electric shock, short-circuit or failure.
	 Do not remove the front lid of the product. Doing so may result in electric shock, injury or failure.
	 Do not climb on or hang from the product. Doing so may result in injury or failure.
	 Do not touch the product in hazardous conditions such as flooding or lightning. Doing so may result in electric shock, injury or burns.
	 Do not subject the product to impacts, shocks or vibrations caused by such as vehicle passing, machine operating, dropping, kicking or acts of vandalism. Doing so may result in fire or failure.
	 If gas is produced from the product, do not approach it until the gas is removed. Doing so may result in burns or injury.
Prohibited	 If you have a pacemaker or other implanted medical device, do not touch or go within the reach of the product. Some implants (e.g. a pacemaker) may be affected by the product.
	 Do not place hazardous solid substances near the product. Do not place or use flammable solvents such as gasoline and benzene near the product. Doing so may result in fire or failure.
	 Do not use flammable gases such as insecticides near the product. Doing so may cause the gases to ignite, resulting in burns or fire.
	 Do not insert your hands or foreign objects into the vent holes. Doing so may result in injury, electric shock or failure.
	 Do not use devices that generate heat or steam near the product. Doing so may result in fire or failure.
	 Do not pour water on the product or wash the product by hose. Doing so may result in failure.
	 Do not bump vehicles against the product. Doing so may result in fire or failure.

Safety Precautions

Mandatory	 In the event of the following, stop operating and switch OFF the protection devices for the product inside the distribution board. Continued use may result in failure, electric shock or fire. Contact the service/inquiry counter where you purchased/contracted this product. Emergency situations such as a major earthquake or fire. When the system is submerged in water When the system is emitting smoke, strange odours or generating abnormal sounds When the earth leakage breaker in the residential distribution board is activated frequently. When the defective appearance caused by impact such as a vehicle collision.
	If the battery electrolyte is leaking, do not touch the liquid with bare hands. If the electrolyte comes into contact with your hands, wash them immediately with clean water. The electrolyte solution can cause damage to the skin or cause blindness in the eyes. Seek medical attention immediately.

	 Unless required, refrain from touching the product while it is operating. Do not touch the product while it is operating since it may be hot. Doing so may result in burns. Use extra caution if you have small children and/or elderly family members.
\bigcirc	Do not place objects on top of the product. There is a risk of the objects catching fire from the heat generated during the operation.
Prohibited	 Do not put stickers on the product. Doing so may result in failure because of rising temperature of the product.
	 Do not expose to excessive steam, oil vapour, smoke, dust, corrosive substances, explosive/ flammable gases, chemicals, fire or exhaust gas from vehicles. There is a possibility that the products of degradation progress.
Mandatory	 Allow sufficient space (at least below lengths) around the product for heat dissipation. (Upper 200mm Right 50mm Left 200mm Front 800mm Back 50mm) Failing to do so may cause the inside temperature to rise excessively, resulting in fire, failure or shorter product life.

■ Stand-alone operation

Prohibited	 Do not plug the following electric equipment into the output connected to the stand-alone socket: Any medical devices or security equipment Equipments that might lose information during power failure such as desktop computer. Kerosene heaters or any heating equipment that starts automatically when the power supply is restored. The product will stop operating when the power consumption of the electrical equipment plugged into the outlet connected to the stand-alone socket exceeds the maximum output power of the product. Never connect any electrical equipment that may pose a threat to human life or properties in the event of a power failure. 				

Q Mandatory	Inspect the product as described in the User's Manual, and start the stand-alone operation after verifying that the product and the electrical equipment to be connected to the stand-alone socket are in a safe condition.				
	Immediately stop operating if smoke, strange odours or abnormal sounds are produced from the product or the electrical equipment connected to the stand-alone socket after starting the stand-alone operation.				

1. How the System Works

In this manual, "Lithium-ion Storage Battery System" is described as "storage battery system".

This product can be used as an on-line system (the utility power company controls charging/discharging) or an off-line system (the storage battery system operates by itself).



1-1 On-line System

In on-line system, the product controls the charging and discharging in accordance with the on-line commands which are determined by the programs in the utility power servers. The system operates identically to the off-line system during periods when there are not any control commands from the utility.

On-line Commands	ON OFF			
Storage Battery System		Control commands from the utility operate the system.	Off-line system operates by itself.	Control commands from the utility operate the system.

- * Operating on-line system requires a network adaptor (LJ-NA02) and network environments to access the server of the utility power company.
- * With the on-line system, the storage battery system operates giving priority to control commands from the utility.
- * Select an operation mode when operating the off-line system. For details, see the explanation of 1-2 off-line system.
- * As for the operations of the storage battery system via the programs of the server of the utility, contact the utility you are contracted with.

1-2 Off-line System

Off-line system has three operation modes determined by the way the storage battery is used, the maximum selfconsumption mode, programmed charge/discharge time mode, and Back-up mode. Select an operation mode to use the storage battery system. See 8-2 to see how to select.

- * If you are a user of the on-line system, the off-line system operates when the programs are not issuing control commands. The operation mode needs to be set.
- * In order to correct the remaining battery level, charging and discharging operation are stopped once a day (From 3:00 to 3:30), except in the back-up mode operation.

Maximum Self-consumption Mode

- · The product works in harmony with PV generation.
- By storing excess electricity in the product during the day, clean energy can be used around the clock even after the sun goes down. This allows not only for the maximum utilization of clean energy, but also reduces the user's electricity bills.
 - * Energy is not sold to the utility while the product is discharging.

Programmed Charge/Discharge Time Mode

- The customer can set the charge or discharge time on the product directly. The battery will be charged or discharged only during this designated time. At other times it will not be charged or discharged.
 - * Energy is not sold to the utility while the storage battery is discharging.
 - * Set the charging/discharging duration. See 8-4 to see how to set it.

Back-up Mode

• Always charge the storage battery until it is fully charged, after it has been completely charged it is in standby in preparation for a power failure.

1-3 Stand-alone Operation

When power fails, the product can supply electrical power to the Stand-alone socket.

- * Switch the operation mode manually to stand-alone operation when power fails. Switch the operation mode manually to grid operation when the power comes back on. For details, see Chapter 5.
- * Stand-alone operating time is dependent on the "battery remaining" and "connected load". See Chapter 8-3.

NOTICE:

- * This is not an UPS (Uninterruptible Power Supply).
- * The degree of deterioration and the remaining amount of battery influence power supply time.
- * Stand-alone socket can not be used during Grid Operation.
- * The amount of electricity that can be used in stand-alone socket is the maximum 2kVA.
- * If maximum power supply in stand-alone socket is more than 2kVA, power supply will stop.
- * The low power factor and high output distortion ratio equipment will not work.
- * Power supplied from this product is not completely same as the commercial power supply.
- * When the battery remaining level reaches zero, the "Stand-alone" operation will automatically stop. The operating state of dimming lights may differ in the case of operating in grid mode and in the case of operating in stand-alone mode.

The following equipments are supposed to be connected to the Stand-alone socket.

- * LED light bulb/Florescent desk lamp/Incandescent lamp
- * Modem
- * Router
- * Cellular telephony/Smart phone/Tablet computer
- * Portable TV/Radio
- * Electric kettle

%When you connect one of the Electric kettle to Stand-alone Socket-outlet, the power consumption of the Electric kettle is less than or equal to 2kW. When connecting a plurality of load, the sum of the load is to use the power consumption of the Electric kettle of less than or equal to 2kW.

And the power output is stopped from the Stand-alone Socket-outlet because of a reduction of the remaining battery level, there is a possibility that can not boil water completely in the Electric kettle.

1-4 Operational Temperatures

The Storage Battery System MUST be installed in a location NOT exposed to direct sunlight continuously in regions where the minimum/maximum monthly mean temperature is always less than +40°C and greater than 0°C. Regions/site locations that do not meet both requirements are not suitable for the Storage Battery System. On the odd occasions when the temperature exceeds +40°C or falls below -0°C, the battery storage system automatically gives high priority to preserving battery health by reducing battery output and extending the battery charging time.

When these temperatures are exceeded, the battery storage system automatically shuts down. The Storage Battery System operation is automatically restarted when its safe to do so.



	Customer Site
Max Temp	+40°C
Min Temp	0°C

1-5 Battery Capacity

A battery capacity to maintain its charge 'State of Health' (SOH*1) slowly decreases over time due to the charging & discharging process.

The following chart shows typical SOH decrease at 25°C, 1 cycle/day.



1-6 Battery Charge and Discharge Cycles

A 'one charge/discharge cycle' definition is when the batteries over a 24 hour period are discharged to their minimum remaining battery level then re-charged to their maximum remaining battery level. This is the recommended and factory default known as 'Maximum Self consumption Mode'.

We do not recommend charge/discharge mode that exceed the one per day cycle (i.e multiple daily full charge/ discharge) as the battery capacity will fall below 60% sooner than 10 years.

1-7 DRED Mode

DRED provides a method by which a controlling authority, most likely a power supply company, can limit the amount of power that the storage battery system can consume in comparison to its nominal full load power consumption.

The aim is to reduce overall power consumption to the supply network at critical peak load times.

* DR mode is given priority from other modes.

2. System Overview



LJ-SK56A: Lithium-ion Storage Battery System

This system is equipped with two battery modules. This product incorporates a network adaptor that is connected to the external server of the utility via the Internet.

This system automatically updates its charging/discharging schedule based on instructions from the utility. In the event of a power failure, you can use the stored electrical power via a Stand-alone Socket-outlet.

LJ-NA02: Network Adaptor

The network adaptor facilitates the communications between the demand response server and the lithium-ion storage battery system (LJ-SK56A) to update the charging/discharging schedule and/or send information on the state of the stored electrical power.
3. Control Panel

Control Panel

(2)

(3)

(4)



Base

cover

LJ-SK56A

Operation Buttons

MODE

GRID

BATTERY

Lit orange

Lit green

Lit green

Lit orange

Lit green

Lit orange

Blinking green

Blinking orange

Off

Off

Blinking green

Blinking green

Blinking orange

1

1

П

Power failure

Discharging

temperature

Grid-connected

Stand-alone mode

Charging

Stopped

Waiting for power restoration

Discharging (battery remaining is low)

On standby due to out of range

Charging/Discharging stopped

Grid-connected(output restriction)

Stand-alone (output restriction)

Grid in the normal state

Number	Name	State	Description
	ON/OFF	During operation	Press for one second to start/stop the operation.
(5)	٠	During setting	Cancel the setting and return to the previous state.
	CANCEL	During error	Press for three seconds to clear the error. (* [UXXX] error only)
	CLOCK	During operation	Display the current date/time.
(6)	•	During operation	Press for three seconds to enter the date/time setting mode.
	▼	During setting	Change the setting item and/or setting value.
	DATA	During operation	The charging/discharging power, remaining battery level and operation mode are displayed in a cycle.
(7)	•		The charging/discharging power is always displayed after five minutes of inactivity.
		During setting	Change the setting item and/or setting value.
(8)	MENU	In operation	Press for one second to enter the user setting mode.
	ENTER	During setting	Confirm the selected item or setting.

4-1 Stopping a Grid Operation

- When the product is stopped while the grid is in a normal state, the control panel display will change to ①.
- Pressing the "ON/OFF (CANCEL)" for one second in state ① will start the grid operation and display the charging/ discharging power as in ②.
- While the battery is charging/discharging in state ②, pressing the "ON/OFF (CANCEL)" for one second will stop the charging/discharging; and ① will be displayed.



4-2 Stopping a Stand-alone Operation

- When the product is stopped during power failure, the control panel display will change to ①.
- Pressing the "ON/OFF (CANCEL)" for one second in state ① will start the stand-alone operation and display the charging/discharging power as in ②.
- While the battery is charging/discharging in state ②, pressing the "ON/OFF (CANCEL)" for one second will stop the charging/discharging; and ① will be displayed.



* If you enable the child lock function, the switching operations described above will change from pressing "ON/OFF (CANCEL)" for one second to pressing "ON/OFF (CANCEL)" + "MENU (ENTER)" together for one second. See 8-6 Child Lock Setting for details.

5. Switching between Grid Operations and Stand-alone Operations

5-1 Switching from Grid Operation to Stand-alone Operation

• When power fails during a grid operation, the control panel display will change to ①. The GRID Indicator will light up orange and [E020] (Low grid voltage) will appear, indicating power failing. (Other error codes may be displayed depending upon the system status.)

A blinking power display indicates that the operation mode needs to be switched from grid to stand-alone.

- Pressing the "ON/OFF (CANCEL)" for one second will stop the operation; and the control panel display will change to ②.
- Pressing the "ON/OFF (CANCEL)" for one second in a stopped state ② will start the stand-alone operation; and the operation and the control panel display will change to ③.
- % If you select automatic start for the Stand-alone operation, the product will start the Stand-alone operation automatically without operating control panel when power failure.



5-2 Switching from Stand-alone Operation to Grid Operation

- When the grid becomes normal during stand-alone operation, the control panel display will change to ①. The GRID Indicator indicating the grid state will light or blink in green and [PF] will disappear.
- A blinking power display indicates that the operation mode needs to be switched from stand-alone to grid.
- Pressing the "ON/OFF (CANCEL)" for one second will stop the stand-alone operation; and the control panel display will change to ②.
- Pressing the "ON/OFF (CANCEL)" again for one second will start the grid operation; and the control panel display will change to ③.



6. Display Modes

6-1 Normal State

- This product has the following three mode views: ① Normal state, ② Remaining battery level, and ③ Operation mode.
- The ① Normal state displays the operating status of the system (stopped, grid operation, Stand-alone operation, etc.) as well as error codes in the event of system problems.
- The ⁽²⁾ Remaining battery level displays the current remaining capacity of the storage battery.
 - * Depending upon the battery's condition the battery might not be able to be discharged down to 0%.
 - * Order to carry out the re-calculation of the remaining amount of the battery, there is a case where the value of the remaining amount is not continuously changed.
- The ③ Operation mode view displays the currently selected operation mode (Maximum self-consumption mode / Programmed charge/discharge time mode / Stand-alone mode).
- Press "DATA (▲)" to switch between the display modes.
 - * ② Remaining battery level and ③ Operation mode views automatically return to the ① Normal state after five minutes of inactivity.
 - * The mode views can be switched while the system is operating or stopped.



The following information is displayed in the normal state:



Stopped (Stand-alone)



Stopped via User's command. If "ON/OFF (CANCEL)" is pressed for one second, the system will start the grid operation.



Stopped via User's command. "PF" will display. If "ON/OFF (CANCEL)" is pressed for one second, the system will start the stand-alone operation.

The system in grid operation display indicates charge or discharge power. If "ON/OFF (CANCEL)" is pressed for one second, the system will stop.





System shows the Inspection notice. Period until inspection added. (See 10-3)

The system in stand-alone operation, indicates output power and "PF". If "ON/OFF (CANCEL)" is pressed for one second, the system will stop.

The system has abnormally stopped and indicates error mode (F/H/U/P/E) and code.

7-1 Date/Time Display

- Press "CLOCK (▼)" in the normal state to check the current date/time.
- The current year => month/day => hour/minute will each be displayed for two seconds.
- The control panel display will automatically return to the normal state after displaying the current hour/minute.
- * This product uses the date/time data to control the charging/discharging and to fine-tune the storage battery. Abnormal operations may result if the date/time is incorrect. Be sure to check the date/time setting on a periodic basis.
- * If there is an error between the date/time setting and the actual date/time, refer to 7-2 Date/Time Setting to set the date/time correctly.

7-2 Date/Time Setting

- Press "CLOCK (▼)" for three seconds in the normal state to switch to the date/time setting mode.
- Each time you press "Menu (ENTER)", the active item will change in the order of year => month => day => hour => minute.

The active setting value blinks.

- Press "DATA (▲)" and "CLOCK (▼)" to change the value of the blinking digit.
- Set the minute and press "MENU (ENTER)" to complete the date/time setting.
- Once the date/time setting is complete, the set date/time data will be displayed in the order of year => month/day => hour/minute for two seconds each and then the normal display will be automatically returned to.
 - * This product uses the date/time data to control the charging/discharging and to fine-tune the storage battery. Abnormal operations may result if the date/time is incorrect. Be sure to set the date/time accurately.
 - * If not linked with the network adaptor, an error may occur in the date/time data depending on the precision of the internal clock of the storage battery system. Once a month, it is recommended that you confirm the time.
 - To maintain normal operations of the battery system, you are advised to check the date/time setting on a periodic basis.
 - * When linked with the network adaptor, the date/time setting is automatically updated by a server via the network adaptor.
 - * The product's time might deviate about 60 seconds per month. If this builds up, it will affect the electric bills. Adjust the time in conjunction with checking the time once per month.



* Press "DATA (\blacktriangle)" and "CLOCK (\triangledown)" to change the value.

8. User Setting

8-1 User Setting Mode

- You can set the following items in the user setting mode:
 - No. 1. Operation mode setting

Select the operation mode (Maximum self-consumption mode / Programmed charge/discharge time mode / Standalone mode) for the off-line system.

No. 2. Lower discharge limit setting

Set the lower battery discharge limit for the off-line system.

No. 3. Charging/discharging schedule setting

Set the charge start time/charge end time/discharge start time/discharge end time to be used in the Programmed charge/discharge time mode for the off-line system.

No. 4 Daylight-saving time setting

Set the daylight-saving time setting to ON/OFF. Manual switching is required for a off-line system

* When linked with the network adaptor, the date/time setting is automatically updated by a server via the network adaptor. The daylight-saving time setting will therefore be ignored.

No. 5 Child lock setting

Set the child lock setting to ON/OFF. When this option is set to ON, more complex key commands will be required to start/stop the system operations in order to prevent failure caused by tampering.

No. 6 Stand-alone operation start setting

Set the Stand-alone operation start setting to manual/automatic.

Operation

- Press "MENU (ENTER)" for one second in the normal state to switch to the user setting mode.
- Press "CLOCK (▼)" or "DATA (▲)" to cycle through the setting items.
- · Press "ON/OFF (CANCEL)" for one second to switch to the normal state.

Normal State



User's Manual

8-2 Operation Mode Setting

• In the operation mode setting, you can select the operation mode (Maximum self-consumption mode / Programmed charge/discharge time mode / Back-up mode) for the off-line system.

* If you are using a on-line system, the specified operation mode will only take effect when the on-line is disabled.

Operation

User Setting Mode

- Refer to 8-1 to select the operation mode setting in the user setting mode [no- 1].
- Press "MENU (ENTER)" to switch to the display mode in the operation mode setting. The current operation mode of the system is displayed.
- Press "MENU (ENTER)" in the display mode to switch to the setting mode. The character display will blink.
- Press "DATA (\blacktriangle)" and "CLOCK (\triangledown)" while the character display is blinking to cycle through the setting items.
- Press "MENU (ENTER)" to complete the setting and switch to the display mode.
- Press "ON/OFF (CANCEL)" to cancel the setting and switch to the display mode. Press "ON/OFF (CANSEL)" to cansel the setting and switch to the display mode.
- Press "ON/OFF (CANCEL)" in the display mode to return to the User setting mode [no-1].



Operation Mode Setting

8-3 Lower Discharge Limit Setting

- In the lower discharge limit setting, you can set the lower discharge limit value for the off-line system for daily use.
 - * If you wish to use the battery system for a longer period during power failure, you are advised to set a higher value for the lower discharge limit.
 - * If you are using a on-line system, the specified lower discharge limit will only take effect when the on-line is disabled. If the on-line is enabled, the system will operate with the lower discharge limit command from the programs.

Operation

- Refer to 8-1 to select the lower discharge limit setting in the user setting mode [no- 2].
- Press "MENU (ENTER)" to switch to the display mode in the lower discharge limit setting. The current lower discharge limit setting of the system is displayed in the display mode.
- Press "MENU (ENTER)" in the display mode to switch to the setting mode. The character display will blink.
- Press "DATA (▲)" and "CLOCK (▼)" while the character display is blinking to change the setting value (0-40%).
- Press "MENU (ENTER)" to complete the setting and switch to the display mode. Or press "ON/OFF (CANCEL)" to cancel the setting and switch to the display mode.
- Press "ON/OFF (CANCEL)" in the display mode to return to the User setting mode [no-2].



Setting a small value for the lower discharge limit may shorten the storage battery discharge time during power failure. Furthermore, the discharge times may become shorter when the battery temperature is lower. The discharge times change depending on the remaining battery level and the operation period of the system, when the device was installed.

Lower Discharge Limit Value [%]	Load Capability [KW]	Discharge Time
40	2.0*	Max. 1.5 hours
40	1.0	Max. 3 hours
20	2.0*	Max. 0.75 hours
20	1.0	Max. 1.5 hours

* When the remaining battery level is low, the storage battery system can not supply 2.0kW power.

8-4 Charging/Discharging Schedule Setting

- Set the (A) charge start time/(B) charge end time/(C) discharge start time/(D) discharge end time to be used in the programmed charge/discharge time mode for the off-line system.
 - * This setting is only effective when the programmed charge/discharge time mode is selected for the off-line system. If you are using the on-line system, the specified date/time setting will only take effect when the on-line is disabled.
 - * Note that you cannot obtain the desired results if the date/time setting is incorrect.

Operation

- Refer to 8-1 to select the charging/discharging schedule setting in the user setting mode [no- 3].
- Press "MENU (ENTER)" to switch to the display mode in the charging/discharging schedule setting.
 Press "DATA (▲)" and "CLOCK (▼)" to switch the display item. The currently set schedule will be displayed.
- Press "MENU (ENTER)" in the display mode to switch to the setting mode.
- The date/time must be set in the order of (A: hour) => (A: minute) => (B: hour) => (B: minute) => (C: hour) => (C: minute) => (D: hour) => (D: minute).

Use "DATA (\blacktriangle)" and "CLOCK (\triangledown)" to set/check the blinking value correctly and then press "MENU (ENTER)" to confirm the setting.

Press "MENU (ENTER)" to move to the next item.

- Press "ON/OFF (CANCEL)" to cancel the setting and switch to the display mode.
- Press "MENU (ENTER)" after setting D: Minute to switch to the display mode.
- Press "DATA (▲)" and "CLOCK (▼)" in display mode and check that the setting value is correct.
- Press "ON/OFF (CANCEL)" in the display mode to return to the User setting mode [no-3].



Time chart of battery remains

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8-5 Daylight-saving Time Setting

- If the daylight-saving time setting is set to ON, the internal time is one hour earlier. Switch the setting OFF after daylight-saving time has ended. If it is switched OFF, the time will be one hour behind than when it is ON.
 - * When linked with the network adaptor, the date/time data is obtained automatically from a server. The daylight-saving time setting will therefore be ignored.

Operation

- Refer to 8-1 to select the daylight-saving time setting in the user setting mode [no- 4].
- Pressing "MENU (ENTER)" will switch to the display mode. The current daylight-saving time setting will be displayed.
- Press "MENU (ENTER)" in the display mode to switch to the setting mode. The current setting will blink.
- Press "DATA (▲)" and "CLOCK (▼)" to enable/disable the daylight-saving time setting.
- Press "ON/OFF (CANCEL)" to cancel the setting and switch to the display mode.
- Press "MENU" to set the data and switch to the display mode. Or pressing "ON/OFF (CANCEL)" to cancel the setting and switch to the display mode.
- Press "ON/OFF (CANCEL)" in the display mode to return to the User setting mode [no-4].



8-6 Child Lock Setting

This setting allows you to make the key commands for starting/stopping the operation more complex, in order to
prevent failure caused by tampering. If the child lock setting is set to ON, the key commands required to start/stop
the operation will change as described below.

Operation

	Child Lock OFF	Child Lock ON
Start/Stop	"ON/OFF (CANCEL)"	"ON/OFF (CANCEL)" + "MENU (ENTER)"
Start/Stop	Press for one second	Press for one second

- Refer to 8-1 to select the child lock setting in the user setting mode [no- 5].
- Pressing "MENU (ENTER)" will switch to the display mode. The current child lock setting will be displayed.
- Press "MENU (ENTER)" in the display mode to switch to the setting mode. The current setting will blink.
- Press "DATA (▲)" and "CLOCK (▼)" in the setting mode to enable/disable the child lock setting.
- Press "MENU" to set the data and switch to the display mode. Or pressing "ON/OFF (CANCEL)" to cancel the setting and switch to the display mode.
- Press "ON/OFF (CANCEL)" in the display mode to return to the User setting mode [no-5].



Notice:

* When "Child lock" is on, it is necessary to take time to operate changing mode.

User's Manual

8-7 Stand-alone Operation Start Setting

<u>/!</u> WARNING		
Prohibited	 Do not plug the following electric equipment into the output connected to the Stand-alone Socket-outlet: Any medical devices or security equipment Equipments that might lose information during power failure such as desktop computer. Kerosene heaters or any heating equipment that starts automatically when the power supply is restored. The product will stop operating when the power consumption of the electrical equipment plugged into the outlet connected to the back-up socket exceeds the maximum output power of the product. Never connect any electrical equipment that may pose a threat to human life or properties in the event of a power failure. 	

- In this setting, Stand-alone operation can be selected from manual start or automatic start when grid power stopped. Default set is "manual start".
- The manual start (CH-01) is the mode to be manually switched to Stand-alone operation from the grid operation. Please see the Chapter 5
- The automatic start (CH-02) is the mode to be automatically switched to Stand-alone operation from the grid operation.

Operation

- Refer to 8-1 to Stand-alone operation start setting in the user setting mode [no- 6].
- Pressing "MENU (ENTER)" will switch to the display mode. The Stand-alone operation start setting will be displayed.
- Press "MENU (ENTER)" in the display mode to switch to the setting mode. The current setting will blink.
- Press "DATA (▲)" and "CLOCK (▼)" to select from manual start (CH-01) or automatic start (CH-02) when grid power stopped.
- Press "MENU" to set the data and switch to the display mode. Or pressing "ON/OFF (CANCEL)" to cancel the setting and switch to the display mode.
- Press "ON/OFF (CANCEL)" in the display mode to return to the User setting mode [no -6].



Notice:

- * If there is a switch for the Stand-alone Socket-output, please set "OFF" normally.
- * When the grid power recovers the system does not connect the grid automatically. The system will continue to output the power using the battery energy. See chapter 5 and switch to the grid operation.

9. Settings Overview

Date/Time

Normal Display



User's Manua

* This only mentions basic operations. Check each chapter for details.

User Setting



10. Inspection and Maintenance

10-1 Inspection

- Check the exterior of the product for damage, rust and dents. Contact the installer if a large dent and/or deformation is found.
- Consult the installer for information on regular maintenance/inspection of the product.

10-2 Maintenance

Use a soft cloth to gently wipe off any dirt or fingerprints on the surface of the front lid and base cover.

For stubborn dirt:

- (1) Remove dust/debris from the surface first.
- (2) Dampen a soft cloth with clean water or neutral detergent (diluted to a ratio of 1:100).
- (3) Wring the cloth tightly.
- (4) Finally, wipe off all moisture from the surface.

Notice:

- * Stop operating the product before cleaning it. The surface temperature may become hot while the product is in operation.
- * Do not clean the product by sprinkling water over it (never use a high-pressure water hose).
- * Do not use a hard cloth and/or rub the surface strongly. Doing so may cause scratches on the surface.
- * Keep the surface away from volatile substances such as insect repellents, solvents and thinners. Failing to do so may result in degradation of the paint surface quality and/or peeling of the paint coating.
- * The surface of the display panel has been treated with special processing and is prone to damages. Exercise caution not to hit or damage the surface with fingernails or other hard objects.
- * Do not allow rubber or PVC materials to come in contact with the cabinet for an extended period of time. This may result in degradation of the surface quality.

10-3 Installation Check List for the Storage Battery System

Standard Installation Location

Installation location	Outdoor/Indoor*	
Storage temperature range [°C]	-20 to +40°C	
Operating temperature range [°C]	0 to +40°C (Discharging: -10 to 40°C)	
Operating humidity [% RH]	0 to 90% RH (No dew condensation)	
Maximum atmospheric pressure/altitude	Lower than 1000m above sea level	
Sunlight	Protected from exposure to continuous direct sunlight.	

* When the product is installed in the building or house, it is necessary to ensure all local building and fire regulations are complied with.

■ Locations Where the Storage Battery System Cannot be Installed

- x Locations where it will receive or be subject to the impact of continuous direct sunlight.
- x Locations that exceed the operating temperature range.
- x Locations where the sunlight hits directly in the north or west side of the buildings without roof (eaves).
- * See "
 Guidelines how to protect the product from direct sunlight" in the installation manual.
- x Rooms such as solariums and greenhouses.
- x Locations on moving objects such as trailer houses or cruisers.
- x Locations where strong reflected sunlight strikes during the day.
- x Enclosed locations with insufficient heat radiation. (Storage Battery Systems require free air to keep cool. Installation in confined/ enclosed spaces such as garden sheds or in close proximity to other appliances (i.e. air conditioner) that have the potential of impeding free air flow is not permitted.)
- x Locations where the product may potentially become buried in snow. (Install a roof or a fence if installing the product in snowbound regions.)
- x Locations where humidity, salinity, sulfur or nitrate concentration are constantly high.
- x Locations where the required installation space is not available.
- * See "
 Clearance space for the Lithium-ion Storage Battery System" below explanation.
- x Locations exposed to or which potentially could be exposed to excessive steam, oil vapour, smoke, dust, corrosive substances, explosive/flammable gases, chemicals, fire or exhaust gas from vehicles.
- x Locations subject to extreme temperature fluctuations. (Where dew condensation occurs.)
- x Locations with strict noise requirements. (Operational noise of 40dB or lower.)
- x Locations subject to impacts, shocks or vibrations caused by such as vehicle passing, machine operating, dropping, kicking or acting of vandalism.
- x Locations in the proximity of equipment/devices that are susceptible to radio interference, or locations that are emitting powerful radio waves.
- x Locations unable to bear the weight of the product.
- x Locations where concrete foundations or equivalent floor materials cannot be laid.
- x Regions where there is severe salt pollution.
- x Locations where above sea level is below 0 m.
- x On the upper floors or the roof of the building.





Clearance space for Lithium-ion Storage Battery System

10-4 Check the Installation Conditions for the Network Adaptor

Please ensure that the installation location is suitable as per the below conditions.

Please refer any concerns to the company that installed the product.

Standard Installation Location

Installation location	Indoor
Operating temperature range [°C]	0 to 40°C
Operating humidity [% RH]	0 to 80% RH (No dew condensation)

Special Locations Where Network Adaptor Cannot be Mounted

- x Locations exposed to direct sunlight.
- x Locations exposed to rain or drops of water.
- x Locations exposed to or potentially exposed to excessive steam, oil vapour, smoke, dust, corrosive substances, explosive/flammable gases, chemicals or fire.
- x Locations subject to vibrations or shocks.
- x Locations in the proximity of equipment/devices that are susceptible to radio interference, or locations that are emitting powerful radio waves.
- x Locations where the required installation space (Upper 10mm Right 50mm Left 50mm Front 500mm Under 300mm) is not available.



Clearance space for Network Adaptor

10-5 "Maintenance Reminder" Function

As a high powered battery device that is charged and discharged on a daily basis, the product requires a safety / maintenance check to ensure the Battery Storage System is working as intended.

Also, when used for many years, a lithium ion battery will not be able to demonstrate original performance. This product includes a "Maintenance remainder" function.

After 10 years and 6 months usage or when storage capacity is reduced to a specified value (=<60% State of Heath), the server and Battery Storage System front panel will display a "Maintenance Reminder" massage.

When the "Maintenance reminder" has been informed, please contact the service / enquiry contact where you purchased this product.

In the inspection of the product, the deterioration state of the battery will be checked. If the battery is significantly degraded, the three batteries or whole system are necessary to replace .

If the battery is not deteriorated, the product can be used the next two years after the inspection. The next "Maintenance reminder" is after 2.5 years. After the six months, a replacement of the entire system is required.



11. Troubleshooting

Case	Description / where to check	
The system does not work.	 Check if the protection device is turned off. Check if timers have been set. Check the remaining battery level. During On-line mode or DRED mode, the system does not work according with user setting mode. 	
During the stand-alone operation, operation of the load becomes unstable.	Power supplied from this product is not completely same as the commercial power supply. For example, in the case of dimming equipment, it might flicker occurs by dimming level. At that time, please use it to adjust the dimming level.	
Charging stops	The batteries are full. (Battery indicator on the Control panel turns off from orange.)	
Charging stops	When battery temperature is low, the maximum amount of charged power is limited for battery protection.	
nevertheless battery is	When battery temperature is too high, charging is limited for battery protection.	
not full.	Power failure or the protection device for storage battery system may have been turned off. Check the protection device in the distribution board.	
Discharging stops	The batteries are empty. (Battery indicator on the Control panel turns off from green.)	
	When battery temperature is too high or low, discharging is limited for battery protection.	
Discharging stops nevertheless battery is	During on-line system mode, discharging stops before reaching 0% of remaining battery level for blackout.	
empty.	Depending on the batteries condition, the battery might not be able to be discharged down to 0%.	
There is a time period that is not charging and discharging.	In order to correct the remaining battery level, charging and discharging operation is stopped once a day (From 3:00 to 3:30).	
Stand alone socket does	Stand-alone socket can not be used during Grid operation.	
not supply the power.	Stand-alone breaker in this product may have turned off by electric leakage in the load. Please contact installer or shop you bought this product.	
	The switch near the Stand-alone Socket-outlet is off. Output power from the Stand-alone Socket-outlet does not is not.	

Please check the following before contacting the repair service:

The list of error codes is shown below.

Check the error code in the display panel and address the issue by referencing the information below.

Error code	Description/where to check		
E010	Abnormal in grid (High grid voltage)		
E020	Abnormal in grid (Low grid voltage)		
2020	\rightarrow Especially when power fails.		
E030	Abnormal in grid (AC over frequency)		
E040	Abnormal in grid (AC under frequency)	The system operation will resume automatically as	
E060	Abnormal in grid (Islanding)		
E070	Abnormal in grid (Instant over voltage)		
E080	Abnormal in grid (Decrease in instantaneous voltage)		
E100	Multiple inverter combinations error	The storage battery systems up to three can be operated in cooperation. One of them stops because of grid-side problem, other inverters stops. If grid problems is resolved, this error will be canceled automatically.	
P170	Under voltage	Please check the lead which is connected to an	
P300	Overload	electrical outlet for stand-alone. Its operation will	
U030	Overload ("P300" 10 times in a row)	resume automatically after an abnormal eliminated	
U060	Under voltage ("P170" 10 times in a row)		
U100	Communications anomaly between the control panel and PCS unit	Please contact the repair service.	
U110	Communications anomaly among the storage battery systems in the multiple inverter mode	Please contact the repair service.	
P620, P690	Battery module is over discharged.	After the battery is charged by a grid power, starts the normal operation.	
P660, P700	Battery module is high temperature.	If the temperature of the built-in battery falls within the operating temperature range, this product will resume operation automatically.	
P140, U050	Internal DC protector is off.		
P350	There is a problem with the storage battery system. Or internal DC protector is off. Or the lines are disconnected.	Please contact the repair service.	
P430, U020	Communications anomaly	Please contact the repair service.	
H010-H490	There is a problem with the battery module.		
H500-H990	There is a problem with the storage battery system.		
F010-F490	There is a problem with the battery module.	Please contact the repair service.	
F500-F990	There is a problem with the storage battery system.		
The PXXX other than those above	There is a problem with the storage battery system.	After an abnormality is eliminated, this product will resume operation automatically. When operations do not resume, please contact the repair service.	
The UXXX other than those above	There is a problem with the storage battery system.	Please restart the operation. Press the "ON/OFF (CANCEL)" for three seconds to clear the error.	
H290	Battery lifespan	Please contact the repair service.	

12. Specifications

■ Lithium-ion Storage Battery System

Model number		LJ-SK56A
Width x Height x Depth [mm	1]	966×1380×279
Weight		86kg
		* 136kg with the batteries included
Colour		lvory (3Y7.8/1.1)
Operating temperature		0°C to 40°C
Storage temperature		-20°C to 40°C
Humidity		0% to 90% RH
		(no dew condensation)
Maximum altitude		1000m
Noise emission		less than 40dB
Maximum inverter conversion	on efficiency	91.5%
Energy storage port	Voltage(nominal)	d.c.93.6V
	Voltage(range)	d.c.88V to 107V
	Rated current(max continuous)	d.c.26A
	Storage type	Lithium-ion battery
		*Adaptation battery:LJ-SBK01×2pcs
a.c. input ratings	Voltage(nominal)	a.c.230V 1W+N+PE
(grid-interactive)	Rated current	a.c.8.7A
	Frequency(nominal)	50Hz
	Rated active power	2000W
	Rated apparent power	2000VA
	Power factor	1.0
	Total current harmonic distortion	<5%
a.c.output ratings	Voltage(nominal)	a.c.230V 1W+N+PE
(grid-interactive)	Rated current	a.c.8.7A
	Current(inrush)	a.c.28A
	Frequency(nominal)	50Hz
	Rated active power	2000W
	Rated apparent power	2200VA
	Power factor range	0.8 to 1.0
	Maximum output fault current	a.c.10A
	Maximum output over current protection	a.c.19.6A
	Total current harmonic distortion	<5%
a c output ratings	Voltage(nominal)	a c 230V 1W+N+PF
(stand-alone)	Rated current	a c 8 7 A
		a c 284
	Frequency(nominal)	50Hz
	Rated active power	2000W
	Rated apparent power	2000\/A
	Power factor	10 (resistive load)
	Maximum output foult ourront	
	Maximum output lault current	a.c. 10 GA
	protection	a.c. 19.0A

Inverter topology		High-frequency insulation
Active anti-islanding method		Frequency shift
Protective class		I
Over voltage category		OVC III
Ingress protection (IP) rating		IP54 (Main body)
		IP44 (Control panel/Display)
Standard	Safety	IEC62109-1/-2
		IEC62040-1
		AS3100:2014
	Grid	AS/NZS 4777.2:2015
EMC		IEC61000-3/-6
Initial usable Battery capacit	Y	5.3kWh

Lithium-ion Battery

Model number	LJ-SBK01
Rated battery capacity	2817Wh/1pc.
Rated voltage	DC46.8V/1pc.
Weight	25kg/1pc.
Storage temperature	-20°C to 40°C (if stored more than 3 months, keep temperature below 30°C)

Network Adaptor

Model number		LJ-NA02
Width x Height x Depth [mm]	150×325×111
Weight		1.4kg
Colour		White (10Y9/0.5)
Operating temperature		0°C to 40°C
Humidity		0% to 80% RH
		(no dew condensation)
Maximum altitude		1000m
Rated voltage		AC230V 1W+N+PE
Rated current		0.03A
Rated frequency		50Hz
Network interface	Ethernet	100BASE-TX/10BASE-T
[LAN port]	Number of port	1
	Type of connector	RJ-45
	Communication protocol	HTTP over IPv4
Serial interface	Communication method	2-wire
[RS-485]	Transfer rate	9600bps
	Communication protocol	Modbus RTU

Panasonic Warranty

Lithium-ion Battery Storage System Warranty (LJ-SK56A, LJ-SBK01, LJ-NA02)

- 1. Subject to the conditions of this warranty, Panasonic or its Authorised Service Centre will perform the necessary repairs on the Lithiumion battery storage system comprising the Lithium-ion batteries, the Battery Storage Cabinet and a Network Adaptor (the "Product") without charge for parts or labour, if in the opinion of Panasonic, the product is found to be faulty within the specified warranty period.
- 2. The Product is supplied with the following warranty conditions from the date of the installation:
 - a) Product warranty : Ten (10) years (120 months) parts and labour in respect to the battery cabinet enclosure, its internal control devices and the Network Adaptor.
 - b) Performance warranty: Ten (10) years (120 months) or at least sixty percent (60%) 'State of Health' (SOH) of the initial battery's charge capacity, whichever comes first in respect to the Lithium-ion batteries when used in the factory default 'Maximum Self Consumption Mode' where every 24 hours, one full discharge cycle (100% to 1%) is followed by one full charge cycle (1% to 100%). When used in this mode, the battery will maintain at least 60% of its charge capacity during the 10 year warranty period if operated in accordance with the operating conditions specified. When other charge/discharge modes are employed which exceed one per day (i.e. multiple daily full charge/discharge), the battery charge capacity will fall below 60% sooner than 10 years.
- 3. The Product operation life, with scheduled maintenance, may be up to a maximum of 14 years after which time the product will permanently shut-down and cease to operate. The product warranty provided by Panasonic is limited to the warranty period specified above from the date of installation.
- 4. The Product must not be installed in a place or location where it will receive or be subject to the impact of continuous direct sunlight.
- 5. The Purchaser must provide evidence of the date of installation in order to claim the warranty. Where the Purchaser is unable to provide evidence to the satisfaction of Panasonic of the date of installation, Panasonic will calculate the Product warranty from the date of purchase or the date of manufacture.
- 6. This warranty only applies to the Panasonic product when:
 - Purchased in Australia and sold by Panasonic Australia, it's Authorised Distributors, or Dealers, and only where the products are used and serviced within Australia or its territories.
 - Warranty service is carried out by a Panasonic Authorised Service Centre, and only if valid proof of installation is presented when warranty service is requested.
 - Installed for normal domestic or small business use.
 - The product is installed and used in accordance with the manufacturer's recommendations.
 - Installed in regions where the min/max monthly average temperatures are always less than +40 degrees C and greater than 0 degrees C.
 On the occasions when the temperature exceeds +40 Celsius degrees or falls below 0 Celsius degrees the product automatically functions to give high priority to preserving battery health by reducing the battery output and extending the battery charging time.
 - The product is installed with compliance to the relevant Australian Wiring Standards, including, but not limited to AS/NZS 3000, AS/NZS 3008.1.1, and AS4777.1.
- 7. The warranty on this product does not cover the following items:
 - Damage, misuse, neglect, or abuse.
 - Malfunction or failure resulting from the use of incorrect voltages, or mains supply problems.
 - Incorrect installation, tampering or repair by unauthorised persons (including unauthorised alterations and or modifications).
 - Build-up of dirt or dust.
 - Mal-adjustment/incorrect settings of customer accessible controls.
 - · Failure due to thunderstorm/lightning activity or exposure to abnormally corrosive environmental conditions.
 - · Infestation by insects or vermin.
 - · Any foreign objects or matter having entered the product.
 - Product operational or vibration noises that are considered normal.
 - Damage to cabinet parts (unless notified at the time of purchase).
 - Installation corrections (e.g. fixing to the ground, correction to wiring, correction to network connections/set-up).

8. To claim warranty service, when required, you should contact Panasonic's Customer Care Centre on 132600, or your point of purchase.

9. The warranty hereby conferred does not extend to, and excludes, any costs associated with the installation, de-installation or re-installation of a product, including costs related to the mounting, de-mounting or remounting of any hardware, (and any other ancillary activities), delivery, handling, freighting, transportation or insurance of the product or any part thereof or replacement of and do not extend to, and exclude, any damage or loss occurring by reason of, during, associated with, or related to such installation, de-installation, re-installation or transit.

Panasonic Authorised Service Centres are located in major metropolitan areas and most regional centres of Australia, however, coverage will vary dependant on product within remote locations. For advice on exact Authorised Service Centre locations for your product, please telephone our Customer Care Centre on 132 600.

In addition to your rights under this warranty, Panasonic products come with consumer guarantees that cannot be excluded under the Australian Consumer Law. If there is a major failure with the product, you can reject the product and elect to have a refund or to have the product replaced or if you wish you may elect to keep the product and be compensated for the drop in value of the product. You are also entitled to have the product repaired or replaced if the product fails to be of acceptable quality and the failure does not amount to a major failure.

If there is a major failure in regard to the product which cannot be remedied then you must notify us within a reasonable period of time by contacting the Panasonic Customer Care Centre. If the failure in the product is not a major failure then Panasonic may choose to repair or replace the product and will do so in a reasonable period of time from receiving notice from you.

If you require assistance regarding warranty conditions or any other enquiries, please visit the **Panasonic Australia**

website www.panasonic.com.au or contact by phone on 132 600

Panasonic Australia Pty. Limited

ACN 001 592 187 ABN 83 001 592 187 1 Innovation Road, Macquarie Park NSW 2113 www.panasonic.com.au

PRO-031-F36 Issue: 1.0

User's Manual

Lithium-ion Battery Storage System Warranty (LJ-SK56A, LJ-SBK01, LJ-NA02)

- 1. Subject to the conditions of this warranty, Panasonic or its Authorised Service Centre will perform the necessary repairs on the Lithiumion battery storage system comprising the Lithium-ion batteries, the Battery Storage Cabinet and a Network Adaptor (the "Product") without charge for parts or labour, if in the opinion of Panasonic, the product is found to be faulty within the specified warranty period.
- 2. The Product is supplied with the following warranty conditions from the date of the installation:
 - a) Product warranty: Ten (10) years (120 months) parts and labour in respect to the battery cabinet enclosure, its internal control devices and the Network Adaptor.
 - b) Performance warranty: Ten (10) years (120 months) or at least sixty percent (60%) 'State of Health' (SOH) of the initial battery's charge capacity, whichever comes first in respect to the Lithium-ion batteries when used in the factory default 'Maximum Self Consumption Mode' where every 24 hours, one full discharge cycle (100% to 1%) is followed by one full charge cycle (1% to 100%). When used in this mode, the battery will maintain at least 60% of its charge capacity during the 10 year warranty period if operated in accordance with the operating conditions specified. When other charge/discharge modes are employed which exceed one per day (i.e. multiple daily full charge/discharge), the battery charge capacity will fall below 60% sooner than 10 years.
- The Product operation life, with scheduled maintenance, may be up to a maximum of 14 years after which time the product will permanently shut-down and cease to operate. The product warranty provided by Panasonic is limited to the warranty period specified above from the date of installation.
- 4. The Product must not be installed in a place or location where it will receive or be subject to the impact of continuous direct sunlight.
- 5. The Purchaser must provide evidence of the date of installation in order to claim the warranty. Where the Purchaser is unable to provide evidence to the satisfaction of Panasonic of the date of installation, Panasonic will calculate the Product warranty from the date of purchase or the date of manufacture.
- 6. This warranty only applies to the Panasonic product when:
 - Purchased in New Zealand and sold by Panasonic New Zealand, it's Authorised Distributors, or Dealers, and only where the products are used and serviced within New Zealand or its territories.
 - Warranty service is carried out by a Panasonic Authorised Service Centre, and only if valid proof of installation is presented when warranty service is requested.
 - · Installed for normal domestic and small business use, and under reasonable operation (as noted in the installation and user's manual).
 - The product is installed and used in accordance with the manufacturer's recommendations.
 - Installed in regions where the min/max monthly average temperatures are always less than +40 degrees C and greater than 0 degrees C. On the occasions when the temperature exceeds +40 Celsius degrees or falls below 0 Celsius degrees - the product automatically functions to give high priority to preserving battery health by reducing the battery output and extending the battery charging time.
 - The product is installed with compliance to the relevant AS/NZ Wiring Standards, including, but not limited to AS/NZS 3000, AS/NZS 3008.1.1, and AS4777.1.

7. The warranty on this product does not cover the following items:

- Damage, misuse, neglect, or abuse.
- Malfunction or failure resulting from the use of incorrect voltages, or mains supply problems.
- Incorrect installation, tampering or repair by unauthorised persons (including unauthorised alterations and or modifications).
- Build-up of dirt or dust.
- Mal-adjustment/incorrect settings of customer accessible controls.
- · Failure due to thunderstorm/lightning activity or exposure to abnormally corrosive environmental conditions.
- · Infestation by insects or vermin.
- Any foreign objects or matter having entered the product.
- · Product operational or vibration noises that are considered normal.
- Damage to cabinet parts (unless notified at the time of purchase).
- · Installation corrections (e.g. fixing to the ground, correction to wiring, correction to network connections/set-up).

8. To claim warranty service, when required, you should contact Panasonic's Customer Care Centre on 09 2720178, or your point of purchase.

9. The warranty hereby conferred does not extend to, and excludes, any costs associated with the installation, de-installation or re-installation of a product, including costs related to the mounting, de-mounting or remounting of any hardware, (and any other ancillary activities), delivery, handling, freighting, transportation or insurance of the product or any part thereof or replacement of and do not extend to, and exclude, any damage or loss occurring by reason of, during, associated with, or related to such installation, de-installation, re-installation or transit.

Panasonic Authorised Service Centres are located in major metropolitan areas and most regional centres of New Zealand, however, coverage will vary dependant on product within remote locations. For advice on exact Authorised Service Centre locations for your product, please telephone our Customer Care Centre on 09 2720178 or visit our website referred to below and use the Service Centre Locator.

Unless otherwise specified to the consumer the benefits conferred by this express warranty are additional to all other conditions, warranties, guarantees, rights and remedies expressed or implied by the Consumer Guarantees Act of New Zealand and all other obligations and liabilities on the part of the manufacturer or supplier. Nothing herein shall restrict or modify such rights, remedies, obligations and liabilities.

If there is a major failure in regard to the product which cannot be remedied then you must notify us within a reasonable period of time by contacting the Panasonic Customer Care Centre. If the failure in the product is not a major failure then Panasonic may choose to repair or replace the product and will do so in a reasonable period of time from receiving notice from you.

If you require assistance regarding warranty conditions or any other enquiries, please visit the **Panasonic New Zealand** website <u>www.panasonic.co.nz</u> or contact by phone on **09 2720178**

Panasonic New Zealand Customer Care Centre

Phone: 09 2720178 Fax: 09 2720129 Email: customerservice@nz.panasonic.com If you need to repair, please contact distributor or the installer you purchased.

* To who has confirmed the installation. Please write down serial number, lot number, installation completion date, installation company name, signature in the following in the column below.

Model No.		Serial No.	Lot No.
LJ-SK56A			
LJ-SBK01	1		
	2		
LJ-NA02			
Installation date			
Installation Comp	any		
Signature			

Panasonic Corporation Eco Solutions Company Web Site: http://panasonic.net/