

OWNER'S &  
INSTALLATION MANUAL

# Energy Storage System

Please read this manual carefully before installing  
your set, and retain it for future reference.

LGE ESS Home 6 (RA600K11A00 / RA600K07A00)

LGE ESS Home 4.6 (RA460K11A00 / RA460K07A00)



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<https://www.lg.com/global/business/ess/business-resources/download>

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# Important Safety Instructions

**IMPORTANT: THIS PRODUCT SHOULD NOT BE USED FOR ANY PURPOSE OTHER THAN THE PURPOSE DESCRIBED IN THIS INSTALLATION MANUAL.**



## **DANGER**

**Indicates a hazardous situation that will result in death or serious injury if the instructions are not followed.**

- Do not open the door. There are no user serviceable parts inside. Service may be performed only by a trained service provider.
- Risk of electric shock from energy stored in capacitor. Do not open the door until 10 minutes after disconnecting all sources when service is needed.
- Electric shock hazard. Do not touch uninsulated wires when the product cover is removed.
- Do not disconnect, disassemble, or attempt to repair to avoid injuries, electric shock, or burns.
- There is a high risk of electric shock or serious burns due to high voltage in the ESS.
- The AC and DC cables contain high voltage. Risk of death or serious injury due to electric shock.
- This product poses potential danger such as death or serious injury from fire, high voltage, or explosion if appropriate precautions are not read, fully understood, and followed.
- When the photovoltaic array is exposed to light, it supplies a DC voltage to the PCS.
- Do not place or install flammable or potentially explosive objects near the product or in an explosive atmosphere.
- Do not charge or discharge arbitrarily. It may lead to failure, electric shock, or burns.
- Do not damage the unit in any manner, such as by dropping, deforming, mishandling, cutting, or piercing with a sharp object. It may cause electrolyte leakage or fire.
- Breakdown of the unit may cause electrolyte leakage or flammable gas generation.
- If electrolytes leak, avoid contact with eyes, skin, and clothes. In the event of accidental contact, flush with water and seek medical help immediately.
- Do not place near open flame or incinerator. It may lead to fire or explosion.

- Keep the unit away from moisture or liquid. Do not touch or use the product if liquids have been spilled on it.
- This product has been certified IP56 and can be installed indoors as well as outdoors. However, if installed outdoors, do not allow the product to be exposed to direct sunlight or water sources, as they may cause:
  - Power-limitation phenomena in the battery (with a resulting decrease in energy production by the system).
  - Premature wear of the electrical/electromechanical and mechanical components.
  - Reduction in performance, performance warranty, and possible damage of the battery.
- Keep out of reach of children and animals.
- Electrical installation must be done in accordance with local standards, national electrical safety standards, and the manufacturer's instructions.
- The battery system is a bidirectional source of voltage. The battery circuit breaker and inverter must both be off before working in the wiring box.
- Disconnect each circuit individually before servicing. Both AC and DC voltage sources are terminated inside this equipment.
- Do not dispose of batteries in a fire. The batteries may explode.
- Do not open or assemble while product is in operation.

**WARNING**

**Indicates a potentially dangerous situation. Death or serious injury may result if appropriate precautions are not taken.**

- A potentially hazardous circumstance, such as excessive heat or electrolyte mist, may occur due to improper operating conditions, damage, misuse, and/or abuse.
- Do not place any kinds of objects on top of the product during operation.
- All work on the PV modules, power conditioning system, and battery system must be carried out by qualified personnel only.
- Electrical installation must be done in accordance with local and national electrical safety standards.
- Wear rubber gloves and protective clothing (protective glasses and boots) when working on high voltage/high current systems such as PCS and battery systems.
- There is a risk of electric shock. Do not remove Safety Cover. There are no user serviceable parts inside. Refer servicing to a qualified and accredited service technician.
- In the event of a failure, the system must not be restarted. Product maintenance and repairs must be performed by qualified personnel, or personnel from an authorized support center.
- LG ESS system is not intended for use as a primary or backup power source for life-support systems, other medical equipment, or any other use where product failure could lead to injury, loss of life, or catastrophic property damage. LG disclaims any and all liability arising out of any such use of the system. Further, LG reserves the right to refuse to service any system used for these purposes and disclaims any and all liability arising out of LG's service or refusal to service systems in such circumstances.



## CAUTION

**Indicates a situation where damage or injury could occur. If it is not avoided, minor injury and/or damage to property may result.**

- This product is intended for residential use only and should not be used for commercial or industrial purposes.
- Before testing electrical parts inside the system, it takes at least a 10-minute standby period to completely discharge the system.
- This inverter includes an integrated residual current device (RCD). If an external residual current device (RCD) is used, a device of type A or B should be used, with a tripping current of 30 mA or higher.
- The contents included in this box are the ESS system and its accessories, and the entire weight is very heavy. Serious injury may occur due to the heavy weight of the package with product and accessories inside. Therefore, special care must be taken in handling. Make sure to have at least two persons deliver or remove the package.
- Do not use any damaged, cracked, or frayed electrical cables and connectors. Protect the electrical cables from physical or mechanical damage, such as being twisted, kinked, pinched, closed in a door, or walked upon. Periodically examine the electrical cables of your product, and if its appearance indicates damage or deterioration, discontinue use of this product, and have the cables replaced with an exact replacement by qualified personnel.
- Ensure that the earth ground wire is connected to prevent possible electric shock. Do not try to ground the product by connecting it to telephone wires, lightning rods, or gas pipes.
- To prevent a fire or electric shock hazard, do not expose this product to heavy rain or moisture.
- Do not block any ventilation openings. Ensure reliable operation of the product and protect it from overheating. The openings must never be blocked by placing any object on this product.
- The temperature of the metal enclosure may be high during operation.
- In order to avoid radio interference, all accessories (like an energy meter) intended for connection to the product are suitable for use in residential, commercial, and light-industry areas. Usually this requirement is fulfilled if the equipment complies with the class B limits of EN55022.
- The product must be disposed of according to local regulations.
- The electrical installation of this unit must be performed only by an LGE service person or trained installer, qualified to install PCS.
- If the AC circuit breaker is turned off and the product has not been operated for a long time, the battery may be overdischarged.

- Connect the DC+ and DC- cables to the correct DC+ and DC- terminals on the product.
- Danger of damaging the PCS by overload. Only connect the proper wire to the DC terminal block. Refer to the [Connection Diagram](#) for details.
- Do not step on the product or the product package. The product may be damaged.
- Do not dispose of batteries in a fire. The batteries may explode.
- Do not open or damage the batteries. Released electrolytes are harmful to the skin and eyes. It may be toxic.
- A battery can pose a risk of electrical shock and high short-circuit current. The following precautions should be observed when working on batteries.
  - Remove watches, rings, or other metal objects.
  - Use tools with insulated handles.
  - Wear rubber gloves, boots, and glasses.
  - Do not lay tools or metal parts on top of the battery.
- Do not leave the ESS in the fault standby state for a long time because battery discharge may occur.
- Do not open or assemble while product is in operation.
- If a battery failure occurs immediately after starting the PCS it means battery failure. Check the battery SoC as well as voltage and fault information, and turn off the power of the ESS until service action is taken.
- If the battery SoC is low, the battery may charge from the grid for self-protection. (Emergency Charging) This function is to prevent shutdown of the ESS, deep discharge, and failure of the battery. An Emergency Charge is not an ESS fault.
- If the battery SoC is too low during the backup operation in a power outage, the PCS will only charge the battery from Solar PV. It means no power is supplied to the home load. Emergency Charging(backup) will charge the battery up to the backup SoC level that is set (30 % by default). Emergency Charging(backup) is not an ESS fault.
- Install the PCS where the noise from the PCS will not inconvenience neighbors. Failure to do so may result in conflict with neighbors.

**INFO****Indicates a risk of possible damage to the product.**

- Before making connections, please make sure the PV array open circuit voltage is within 600 V; otherwise, the product could be damaged.
- Never use any solvents, abrasives, or corrosive materials to clean this product.
- Do not place the product on or against any objects. It may cause serious defects or malfunctions.
- Before making a connection, make sure the PV switch on this product is switched off.
- This unit is designed to feed power to the public grid only. Do not connect this unit to an AC source or generator. Connecting the product to external devices could result in serious damage to that equipment.
- Servicing batteries should be performed or supervised by an LG service person or trained installer.
- The battery does not discharge when the load is under a certain level.
- This product can cause current with a DC component. Where a residual current-operated protective device (RCD) or residual current monitoring (RCM) device is used for protection in case of direct or indirect contact, only a RCD or RCM of type A (or type B) is allowed on the supply side of this product.
- This document is for your reference only. Read the installation manual on the website below.
- Please check the following website for the warranty policy.  
<http://www.lg.com/global/business/ess/business-resources/download>
- For stable operation and periodic system updates of the product, LG Electronics strongly recommends that the user register with EnerVu and stay connected.
- LG ESS is under continuous development and its firmware is updated at regular intervals. To ensure that the product works properly, LG ESS must be updated with the latest firmware.
- Malfunctions that can be traced back to the use of outdated firmware are not covered by the LG Electronics' product warranty. The automatic firmware update takes place when LG ESS is registered with EnerVu (strongly recommended) and connected to the Internet. Further information can be found in Chapter "EnerVu Settings" of the LG ESS installation manual.

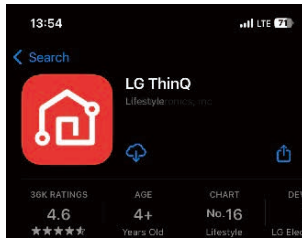
# ThinQ Registration Guide

## Advantages of ThinQ Registration

- Remote monitoring & control of ESS
- Extended warranty on ESS if the system is commissioned using the app
- Firmware update for better user experience
- Access to “Emergency Ready” feature which protects you from a potential outage based on live weather forecasts
- Remote trouble-shooting (when applicable)

## Things to check before registering the ThinQ app

- 1 Ensure there is a reliable internet source around you to connect "LGE ESS".
- 2 Download the ThinQ mobile app on your iOS/Android device to configure the system.



- 3 Create an account to log in to the ThinQ App. With this app, you can monitor the status of installed devices.

**Sign In**

13:53 LTE 62%

Italy, English ▾

## LG ThinQ

ID  
Please enter your email ID

Password  
Please enter a password

Login

[Find ID](#)   [Reset password](#)  
[Register](#)

OR

**Register**

13:53 LTE 62%

← Register

ID \*  
Please enter your email ID

Send verification code

Password \*  
Please enter a password

Personal Business Other

Combination of 3+ types: Capital letters/lowercase letters/numbers/special characters  
More than 8 characters

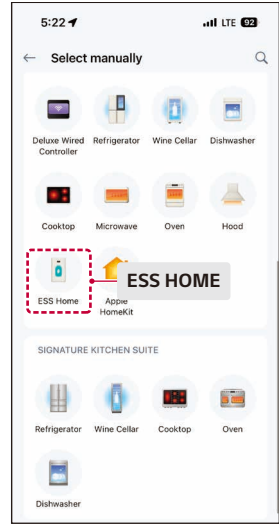
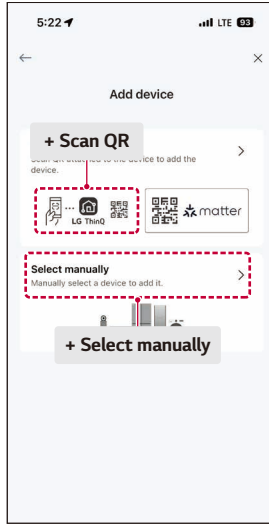
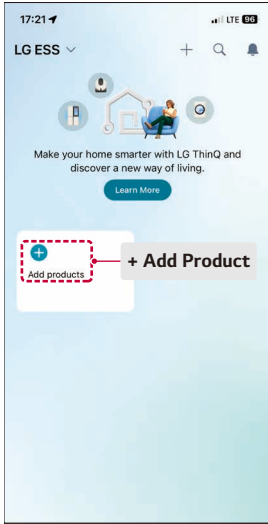
FIRST NAME \*  
Please enter your name

LAST NAME \*  
Please enter your last name



## Connecting your LG ESS to the LG ThinQ app

- 1 Register your product according to the ThinQ App Guide.

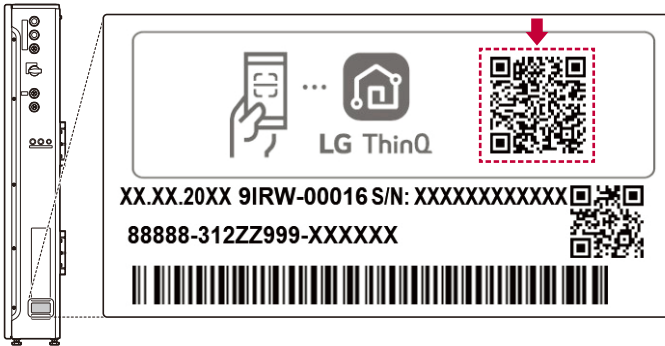


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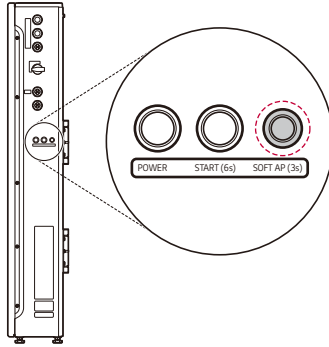
Getting Started

### INFO

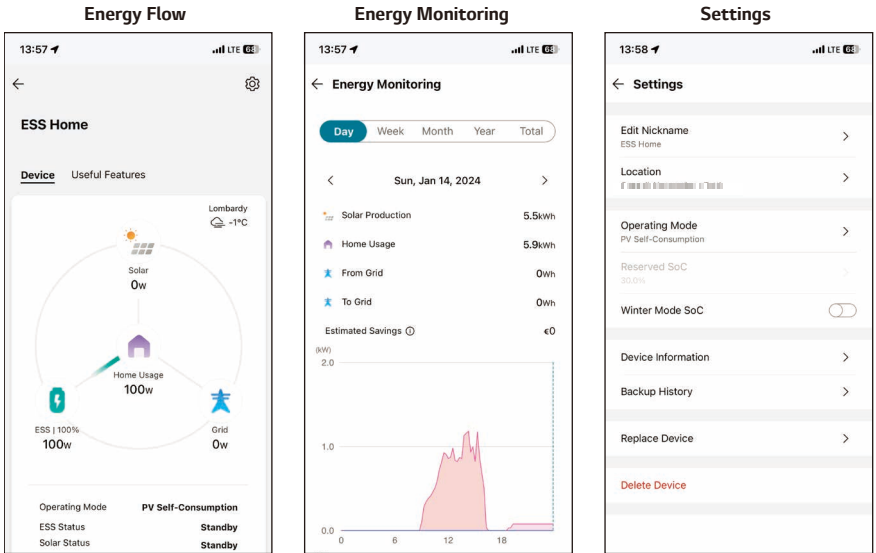
- The QR code for the ThinQ app is on the right side of the product



- To enable the Soft AP, please press and hold for more than 3 seconds.



- Keep your mobile phone close to the ESS Home (H/W) so that they connect.
- Once connected, open the ESS Home screen on the ThinQ app for energy flow, energy monitoring, and settings.



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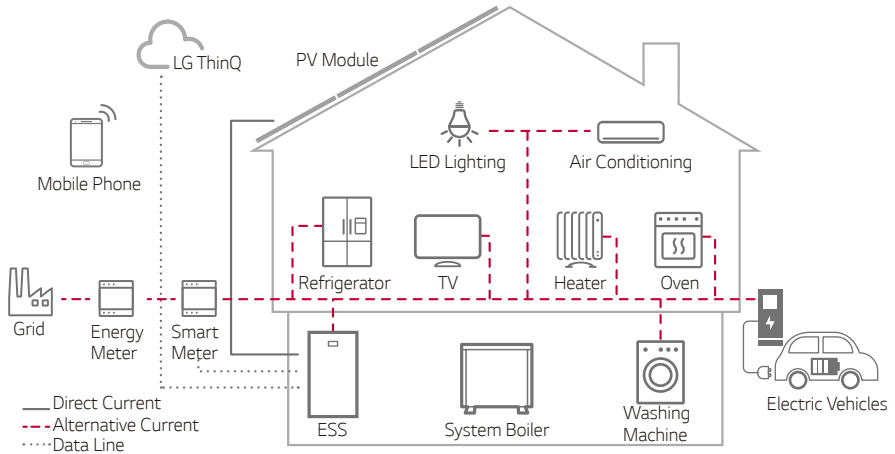
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# Product Features

This product is intended to store direct current (DC) electricity generated from photovoltaics (PV) to the connected Lithium-Ion Battery, and convert direct current (DC) electricity from the connected battery and PV to alternating current (AC) electricity and feed this into the power grid.

Additionally, the battery supplies power to the household load in an emergency.



The electricity generated from a PV array can be stored in the connected battery or sold to energy supply companies.

- **DC-Coupled ESS**

LG ESS is a product designed to integrate a grid-connected inverter and battery in one enclosure. This product is a DC-Coupled type and is directly connected to the household power grid.

- **Single-Phase Connection**

This product is for use exclusively for single-phase use in the home.

- **Smart Management**

The built-in Smart PMS analyses PV generation, load consumption, electricity rate, and weather information. It also monitors the main system & battery conditions to maintain a stable condition. Internet connection and LG ThinQ® connection required.

- **Backup Mode**

In an emergency, the battery supplies power to the household load.

- **App & Web-Monitoring Service**

The user can monitor their ESS with a tablet or smart phone. The installer can monitor their ESS with PC, tablet or smart phone.

## Symbols used on Labels

Label	Symbol	Description																																																																																												
<table border="1"> <tr> <td colspan="3"> <b>Energy Storage System</b> Grid Support Interactive Inverter / Residential Use         </td> </tr> <tr> <td>Model : Home 6</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td></td> <td>RA600K07A00</td> <td>RA600K11A00</td> </tr> <tr> <td colspan="3">Li-Ion Battery System</td> </tr> <tr> <td></td> <td>RA000K07A00</td> <td>RA000K11A00</td> </tr> <tr> <td rowspan="2">Battery Capacity</td> <td>Total</td> <td>7.91 kWh / 11.87 kWh</td> </tr> <tr> <td>Usable</td> <td>7.12 kWh / 10.68 kWh</td> </tr> <tr> <td colspan="2">Battery Nominal Voltage</td> <td>203.28 Vdc / 304.92 Vdc</td> </tr> <tr> <td colspan="2">Rated Capacity</td> <td>36.9 Ah / 36.9 Ah</td> </tr> <tr> <td colspan="3">Chemistry</td> </tr> <tr> <td colspan="2">Battery Designation(IEC)</td> <td>NR2271(FOP56) / NR2271(FOP84) / M/G-50/90 / NR2271(FOP84) / M/G-50/90</td> </tr> <tr> <td colspan="3">USE ONLY RA600K00A10 Charger</td> </tr> <tr> <td colspan="3">INVERTER SYSTEM</td> </tr> <tr> <td rowspan="4">PV INPUT (OVC II)</td> <td>Vmax PV</td> <td>600Vdc</td> </tr> <tr> <td>MPPT range</td> <td>150~510Vdc</td> </tr> <tr> <td>Imax PV</td> <td>13Adc (per MPPT)</td> </tr> <tr> <td>Isc PV</td> <td>18Adc (per MPPT)</td> </tr> <tr> <td rowspan="4">AC OUTPUT (2/N/PE-) (OVC II)</td> <td>Vac Nom.</td> <td>230Vac</td> </tr> <tr> <td>Isc Max</td> <td>36Acc</td> </tr> <tr> <td>Freq. Nom.</td> <td>50Hz</td> </tr> <tr> <td>Apparent Power</td> <td>7,500VA (Max Continuous)</td> </tr> <tr> <td colspan="2">Power</td> <td>6,000W (Max Continuous)</td> </tr> <tr> <td colspan="2">Power Factor</td> <td>-0.8 ~ +0.8</td> </tr> <tr> <td colspan="2">Operation Temperature Range</td> <td>-10 to 45 °C (Charging) -20 to 50 °C (Discharging)</td> </tr> <tr> <td colspan="2">Ingress Protection</td> <td>IP56</td> </tr> <tr> <td colspan="2">Dimension (W x D x H)</td> <td>698 x 205 x 1,260 mm</td> </tr> <tr> <td colspan="2">Weight (Max)</td> <td>110kg / 135kg</td> </tr> <tr> <td colspan="2">Protective Class</td> <td>Class I</td> </tr> <tr> <td colspan="3"> <p><b>⚠ DANGER</b></p> <ul style="list-style-type: none"> <li>■ DANGER TO LIFE DUE TO HIGH VOLTAGES OF THE PV ARRAY</li> <li>■ DANGER TO LIFE DUE TO HIGH VOLTAGES ON THE BATTERY PACK</li> <li>■ DANGER TO LIFE DUE TO ELECTRIC SHOCK.</li> <li>■ DO NOT CONTACT WITH ELECTRICALLY ACTIVE PARTS.</li> </ul> <p><b>⚠ WARNING</b></p> <ul style="list-style-type: none"> <li>■ REFER TO USER AND INSTALLATION MANUALS BEFORE INSTALLING, OPERATION OR SERVICING, DISPOSAL THE UNIT.</li> </ul> </td> </tr> <tr> <td colspan="3">  8 906099 949011         </td> </tr> <tr> <td colspan="3">    10min         </td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td colspan="3"> </td> </tr> </table>	<b>Energy Storage System</b> Grid Support Interactive Inverter / Residential Use			Model : Home 6	<input type="checkbox"/>	<input type="checkbox"/>		RA600K07A00	RA600K11A00	Li-Ion Battery System				RA000K07A00	RA000K11A00	Battery Capacity	Total	7.91 kWh / 11.87 kWh	Usable	7.12 kWh / 10.68 kWh	Battery Nominal Voltage		203.28 Vdc / 304.92 Vdc	Rated Capacity		36.9 Ah / 36.9 Ah	Chemistry			Battery Designation(IEC)		NR2271(FOP56) / NR2271(FOP84) / M/G-50/90 / NR2271(FOP84) / M/G-50/90	USE ONLY RA600K00A10 Charger			INVERTER SYSTEM			PV INPUT (OVC II)	Vmax PV	600Vdc	MPPT range	150~510Vdc	Imax PV	13Adc (per MPPT)	Isc PV	18Adc (per MPPT)	AC OUTPUT (2/N/PE-) (OVC II)	Vac Nom.	230Vac	Isc Max	36Acc	Freq. Nom.	50Hz	Apparent Power	7,500VA (Max Continuous)	Power		6,000W (Max Continuous)	Power Factor		-0.8 ~ +0.8	Operation Temperature Range		-10 to 45 °C (Charging) -20 to 50 °C (Discharging)	Ingress Protection		IP56	Dimension (W x D x H)		698 x 205 x 1,260 mm	Weight (Max)		110kg / 135kg	Protective Class		Class I	<p><b>⚠ DANGER</b></p> <ul style="list-style-type: none"> <li>■ DANGER TO LIFE DUE TO HIGH VOLTAGES OF THE PV ARRAY</li> <li>■ DANGER TO LIFE DUE TO HIGH VOLTAGES ON THE BATTERY PACK</li> <li>■ DANGER TO LIFE DUE TO ELECTRIC SHOCK.</li> <li>■ DO NOT CONTACT WITH ELECTRICALLY ACTIVE PARTS.</li> </ul> <p><b>⚠ WARNING</b></p> <ul style="list-style-type: none"> <li>■ REFER TO USER AND INSTALLATION MANUALS BEFORE INSTALLING, OPERATION OR SERVICING, DISPOSAL THE UNIT.</li> </ul>			 8 906099 949011			  10min									<p>PV INPUT = = = (OVC II)</p>	Photovoltaic Power Input
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		Caution: risk of danger																																																																																												
		Risk of electric shock																																																																																												
		Refer to the installation manual																																																																																												
		Caution: hot surface																																																																																												
	10min	Caution: risk of electric shock, energy storage timed discharge																																																																																												
		The relevant equipment complies with the requirements in the EC guidelines.																																																																																												
		TÜV SÜD Certification mark.																																																																																												

## Symbols used on Labels

Symbol	Description
	Caution: risk of electric shock
	No open flame, open ignition source, or smoking
	Wear protective glasses when working on the battery unit.
	Install this product out of reach of children.
	Observe precautions when handling corrosive substances.
	Observe precautions when handling explosive materials.
	Serious injury may occur due to the heavy weight of the product.
	Observe precautions for handling electrostatic-discharge-sensitive devices.
	Disconnect the machine or equipment before carrying out maintenance or repair.
	Observe precautions to avoid causing a fire by igniting flammable material.
	Ensure adequate ventilation of the charging area and observe precautions to avoid coming in contact with acid.
	In case of contact with acidic material, immediately flush the area with plenty of water. Get medical attention immediately. Wash contaminated clothing with sufficient water before reuse.
	Fire extinguishers must be used to put out flames.
	Ensure the conductive terminals are matched to their corresponding counterparts.



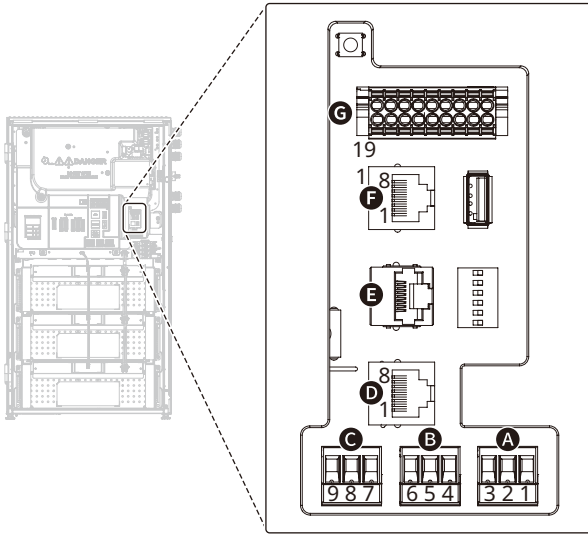
## Abbreviations in this Manual

Abbreviation	Designation	Explanation
ESS	Energy Storage System	Inverter system that stores energy into a battery and uses it.
AIO (All-In-One unit)	HOME 6 HOME 4.6	Battery integrated PCS
PCS	Power Conditioning System	A device intended to convert DC electricity generated from the PV system to AC electricity and feed it to household appliances.
PMS	Power Management System	A device to control the whole system, including the power management algorithm, and to communicate with the cloud server.
PV	Photovoltaic	A solar panel system that converts solar energy into direct current electricity.
SoC	State of charge	The current state of a battery.
BMS	Battery Management System	The electronic system that manages a rechargeable battery.
BCU	Battery Control Unit	An electronic system that controls a rechargeable battery system to ensure battery safety.
BIC	Battery Interface Circuit	An electronic system that measures and monitors a rechargeable battery's status.
ATS	Automatic Transfer Switch	A device to separate the home micro grid from the utility grid.
Backup Light	Outage Response	An output terminal to supply power in case of a power outage without the need for a separate ATS Box.
DC	Direct Current	-
AC	Alternating Current	-
DHCP	Dynamic Host Configuration Protocol	A standardized network protocol used on Internet Protocol (IP) networks for automatically distributing network configuration parameters, such as IP addresses for interfaces and services.
LAN	Local Area Network	A network that interconnects computers within a limited area.
IP	Internet Protocol	A set of rules for sending data across a network.
AWHP	Air to Water Heat Pump	Low-carbon heating solution

## Additional Components for Installation

Applied to	Additional Components
Wall mounting	<ul style="list-style-type: none"> <li>Stainless steel screws with a diameter of 6 mm - 8mm</li> <li>Anchors</li> </ul>
PV connections	<ul style="list-style-type: none"> <li>Lead wires with a cross-sectional area 4 mm<sup>2</sup> - 6 mm<sup>2</sup></li> </ul>
Grid connections	<ul style="list-style-type: none"> <li>Lead wires with a cross-sectional area 4 mm<sup>2</sup> or thicker (including a yellow-green stripe cable)</li> <li>M4 O-ring</li> </ul>
Grounding	<ul style="list-style-type: none"> <li>Lead wires with a cross-sectional area 4 mm<sup>2</sup> - 6 mm<sup>2</sup></li> </ul>
Energy meter and internet connections	<ul style="list-style-type: none"> <li>LAN cable</li> <li>RJ-45 plug</li> <li>Energy meter cable</li> </ul>
ATS	<ul style="list-style-type: none"> <li>ATS connectors</li> <li>ATS connector cables</li> </ul>

## Wiring Reference



No.	Function	No & Terminal	Recommended Wire Color	Wire Gauge
A	Meter	1 RS485_A	Orange-White (CAT5 UTP or better) or signal cable	24 – 16 AWG
		2 RS485_B	Orange (CAT5 UTP or better) or signal cable	24 – 16 AWG
		3 GND	Green (CAT5 UTP or better) or signal cable	24 – 16 AWG
B	AWHP	4 RS485_A	Orange-White (CAT5 UTP or better) or signal cable	24 – 16 AWG
		5 RS485_B	Orange (CAT5 UTP or better) or signal cable	24 – 16 AWG
		6 GND	Green (CAT5 UTP or better) or signal cable	24 – 16 AWG
C	RS485	7 RS485_A	Orange-White (CAT5 UTP or better) or signal cable	24 – 16 AWG
		8 RS485_B	Orange (CAT5 UTP or better) or signal cable	24 – 16 AWG
		9 GND	Green (CAT5 UTP or better) or signal cable	24 – 16 AWG
D	Ripple Control	2 RC4	Orange (CAT5 UTP or better)	24 – 22 AWG
		3 RC3	Green-White (CAT5 UTP or better)	24 – 22 AWG
		4 RC2	Blue (CAT5 UTP or better)	24 – 22 AWG
		5 RC1	Blue-White (CAT5 UTP or better)	24 – 22 AWG
		6 RC FASTSTOP	Green (CAT5 UTP or better)	24 – 22 AWG
		7 RC_12V	Brown-White (CAT5 UTP or better)	24 – 22 AWG
		8 RC_GND	Brown (CAT5 UTP or better)	24 – 22 AWG
E	Ethernet	-	T-568B Standard (CAT5 UTP or better)	24 – 22 AWG

No.	Function	No & Terminal	Recommended Wire Color	Wire Gauge
F	ATS	3 ATS_K3	Green-White (CAT5 UTP or better)	24 – 22 AWG
		4 ATS_K14	Blue (CAT5 UTP or better)	24 – 22 AWG
		6 ATS_EN	Green (CAT5 UTP or better)	24 – 22 AWG
		7 ATS_12V	Brown-White (CAT5 UTP or better)	24 – 22 AWG
		8 ATS_GND	Brown (CAT5 UTP or better)	24 – 22 AWG
G	Parallel Connection	1 CAN H IN	Orange-White (CAT5 UTP or better)	24 – 22 AWG
		2 CAN L IN	Orange (CAT5 UTP or better)	24 – 22 AWG
		3 GND	Green (CAT5 UTP or better)	24 – 22 AWG
		4 PCS_INPUT	- CAT5 UTP or better * Refer to <a href="#">Connection Diagram</a>	24 – 22 AWG
		5 CAN H OUT	Orange-White (CAT5 UTP or better)	24 – 22 AWG
		6 CAN L OUT	Orange (CAT5 UTP or better)	24 – 22 AWG
		7 GND	Green (CAT5 UTP or better)	24 – 22 AWG
8 PCS OUTPUT	- CAT5 UTP or better * Refer to <a href="#">Connection Diagram</a>	24 – 22 AWG		

- If a communication cable may use cable types other than CAT 5E UTP (or better), follow the twisted pair correctly.  
Twisted-pair : CAN, RS485

## Required Tools



Insulated gloves  
(Class 0 :1,000 AC  
/1500 DC-Red  
recommended)



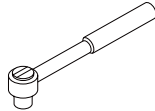
Safety glasses



Protective footwear



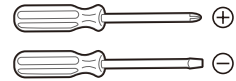
Drill and drill bit



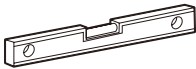
Torque wrench with  
hex socket  
M5, M8



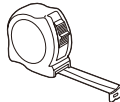
200 mm magnet bit  
holder  
M6 (For battery module  
assembly)



Screw driver  
Phillips (5 mm)  
Flat head  
(6, 5, 4, 2 mm)



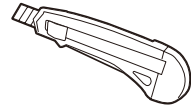
Inclinometer



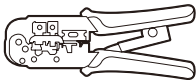
Tape measure



Writing utensil



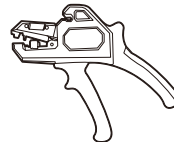
Cutter



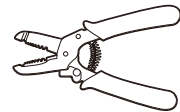
RJ 45 crimping tool



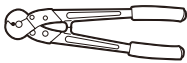
Wire stripper (A)



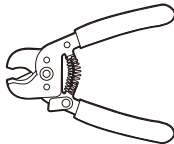
Wire stripper (B)



Wire stripper (C)



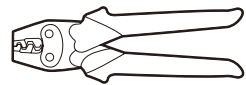
Wire cutter (A)



Wire cutter (B)



Spanner 17 mm



Ring terminal crimping  
tool (optional)

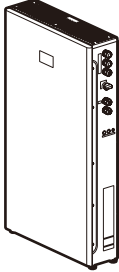


### WARNING

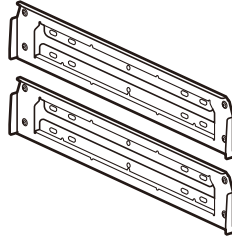
- This product is heavy. Wear appropriate personal protective equipment (such as gloves and protective footwear) when handling these units.

# Unpacking

## Contents of this Product

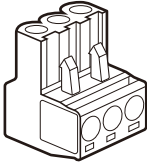


Product (1EA)

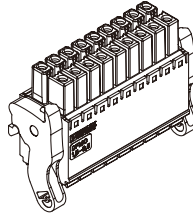


Wall bracket (2EA)

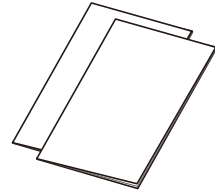
## Accessory Components of this Product



Energy meter / AWP plug (2EA)



Communication connector (1EA)



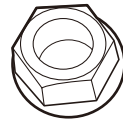
Quick Installation Guide & Mount Hole Guide



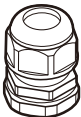
Power cable harness (1EA)



Communication cable harness (1EA)



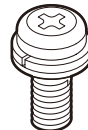
M6 nut (10EA)



Cable gland single hole (2EA)



Cable gland 4holes (3EA)



M4 screw (3EA)

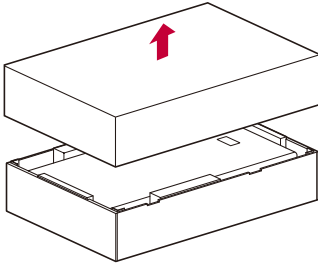
## Unpacking



### WARNING

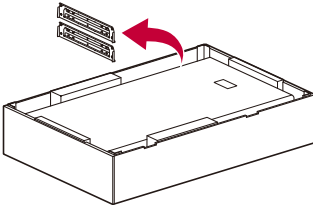
- When working on this product, at least two people are needed for safe installation and moving.
- This product is heavy. Wear appropriate personal protective equipment (such as gloves and protective footwear) when handling the unit. Only a sufficient number of trained movers should lift the product.

1



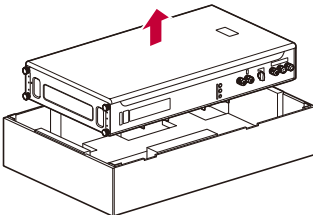
Remove the package banding and open the box.

2

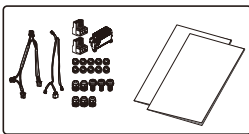


Take out all the wall brackets and the wall bracket box.

3

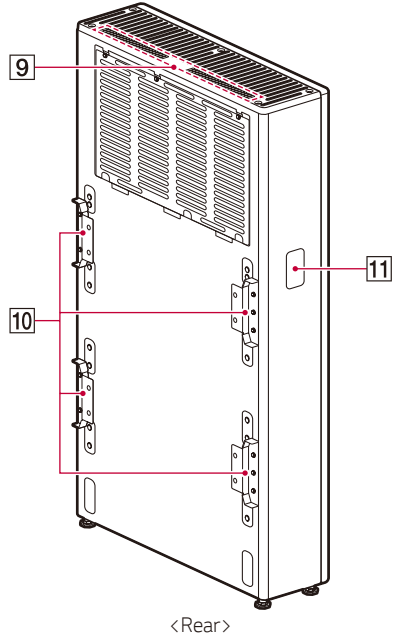
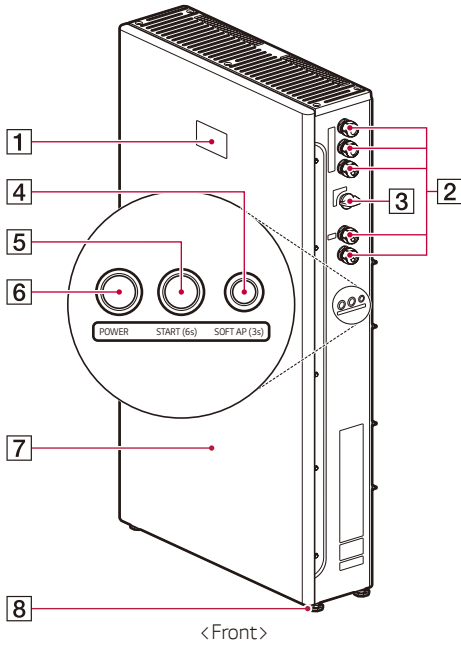


Pull the product out from the packaging.  
Accessory components are located inside of the product.



# Name of Each Part

## Front and Rear

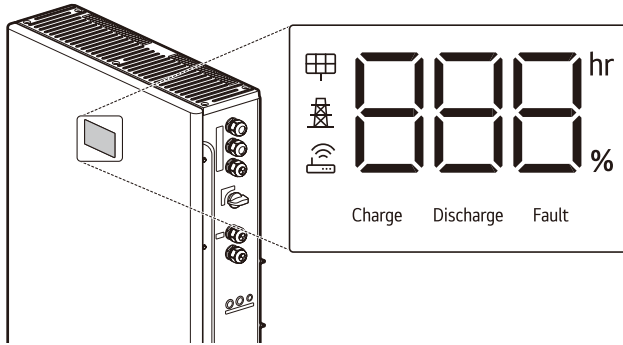






- 1** LED Indicators
- 2** Cable Gland Hole
- 3** DC Switch
- 4** SOFT AP (3s) Button  
(Momentary type, press and hold for 3 seconds)
- 5** START (6s) Button  
(Momentary type, press and hold for 6 seconds)
- 6** POWER Button  
(Push type, ON/OFF toggle button)

- 7** Front Cover
- 8** Height Leveling Adjustable Leg
- 9** Ventilation Openings
- 10** Bracket Connected Parts
- 11** WLAN Antenna Cover



## LED Indicators



LED		Status and Indications			
	(PV)	<b>Green</b>	<b>Red</b>	<b>Red Blink + Error Code</b>	
		Generating	Not Generating	PMS Fault	
	(Grid)	<b>Green</b>	<b>Red</b>	<b>Red Blink + Error Code</b>	
		Normal	Abnormal	PCS Fault	
	(Gateway)	<b>Green</b>	<b>Red</b>	<b>Red Blink + Error Code</b>	<b>Green Blink</b>
		Connected	Not Connected	Battery Fault	Soft AP on
	<b>SoC level + %</b>	<b>Remaining Time + hr<sup>1)</sup></b>	<b>Error Code</b>	<b>Udt</b>	
	On-Grid	Backup Operation	Fault	Updating	
<b>Charge</b>	<b>On</b>	<b>Off</b>			
	BAT. Charging	Not Operating			
<b>Discharge</b>	<b>On</b>	<b>Off</b>			
	BAT. Discharging	Not Operating			
<b>Fault</b>	<b>On</b>	<b>Off</b>			
	Fault	Normal			

<sup>1)</sup>“Lo” appears on the indicator if the remaining time is backup operation is below 1 hour

# Plan the Installation

## 1. Select Installation Location

- Select an appropriate installation location for the safe use of the product.
- For guidance on the selection of a proper environment, see “Installation location.”
- This product must be installed on the floor and placed against a wall for support due to its heavy weight.
- Choose a leveled floor and wall capable of supporting the full weight of the product.
- Prepare appropriate screws, anchors, and additional supports for the wall type.

## 2. Plan the Cable Connection

- Determine the cable route for the connection, including other devices.

## 3. Distance Between Components

Follow the table below for the maximum allowable length between system components. The wire gauge must meet local codes and, in some circumstances, the wire gauge requirements may change based on length.

Types of Connections	Maximum Cable Length
Wired Ethernet Connection	Less than 20 m
RS485 Communication Cable	Less than 20 m



### CAUTION

- If you do not follow maximum cable size and length requirements, it may result in intermittent or unreliable operation of the product. In addition, performance issues may arise even after successful commissioning in systems that still need to meet these minimum requirements.

## Installation Location

Before installing the product, select an appropriate installation location for the safe use of the product.

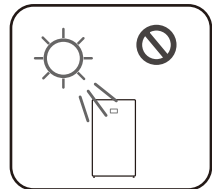
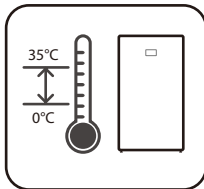
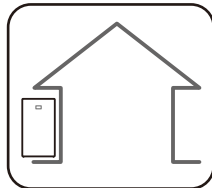
The product has been certified IP56 and can be installed outdoors as well as indoors. However, if installed outdoors, do not allow the product to be exposed to water sources or continuously exposed to sunlight or other conditions that result in a consistent operating temperature below  $-10\text{ }^{\circ}\text{C}$  or exceeding  $45\text{ }^{\circ}\text{C}$ .

- Power-limitation phenomena in the battery (with a resulting decrease in energy production by the system).
- Premature wear of the electrical/electromechanical and mechanical components.
- Reduction in performance, performance warranty, and possible damage of the battery.

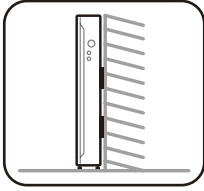


### WARNING

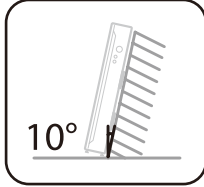
- Install the unit in consideration of the possibility of strong winds or earthquakes.
- If the installation is in an area that consistently receives heavy snowfall or is subjected to flooding, make the foundation as high as possible, and indoors installation is recommended in cold-climate regions.
- If the product is continuously exposed to sunlight or other conditions that result in a consistent operating temperature below  $-10\text{ }^{\circ}\text{C}$  or exceeding  $45\text{ }^{\circ}\text{C}$ , it may degrade its performance and life cycle.



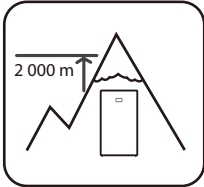
- This product is designed to be installed for indoor/outdoor use.
- Install this product in a place where PV cables, energy meter cables, grid cables, and battery cables are easily accessible.
- The recommended operating temperature range is from  $0\text{ }^{\circ}\text{C}$  to  $35\text{ }^{\circ}\text{C}$ .
- Indoors installation is recommended in cold-climate regions below  $0\text{ }^{\circ}\text{C}$ .
- Avoid installing this product in a location exposed to direct sunlight.



- This product is designed to be installed on the floor and placed against a wall for support. Do not install this product laying on its side.
- This product must be installed on a leveled floor and the surface must be able to support the weight of the product. (approx.135 kg )



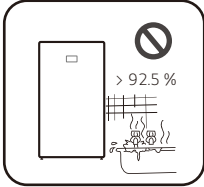
- Do not install the product on the ceiling.
- Do not install the product on its side or against a wall with a lean of more than 10 degrees.
- Ensure the product is not tilting forward after installation.



- This product must be installed and used at an altitude of less than 2,000 m.



- Do not install this product in an area prone to flooding.



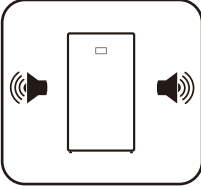
- Do not install this product in a highly humid area such as a bathroom.
- Do not install the product in an area prone to strong vibrations.



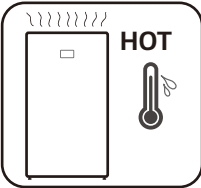
- Do not install this product in a place with ammonia, corrosive vapors, acids, or salts.
- Install this product out of reach of children and pets.



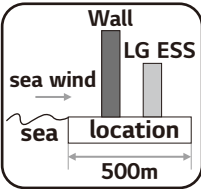
- Do not install this product in places or environments subject to the heavy build-up of dust.
- Do not block the air ventilation openings needed for cooling.
- When cleaning the air duct, shut off all of the systems.



- This product generates some noise at times and should not be installed close to living or sleeping areas.
- Please consult with your installer when installing in places subject to noise sensitivity.

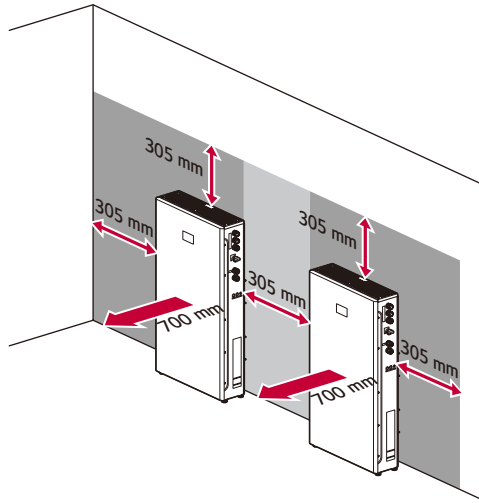


- The top area of the installed product can become hot due to the heat coming through the air outlet. Do not place any object near the air outlet.



- Do not install within 500 m of the coastline. Sea salt in the air may cause the product to corrode.
- If the product is not exposed to wind currents, it can be installed within 500 m of the coastline.

## Minimum Clearance



This product must be installed with minimum clearance on the left, right, top, bottom and front of the product as shown in the figure.

Make sure to keep at least a 305 mm distance between each product and between the product and other devices.

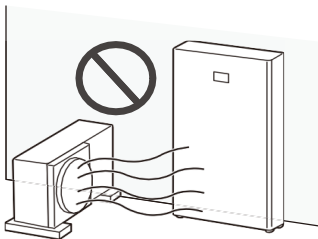
Keep at least a 700 mm distance between the front door and any obstacles in order to allow space for installation and servicing.

If the door is closed, all other products should be at least 305 mm from the front door for safe operation.

Ensure that the distance between the wall and the product is at least 25 mm.

Be sure not to place any object on top of the product to prevent risk of fire or serious injury due to high temperature.

If the ESS is installed outdoors with eaves, there must be at least a 915 mm clearance from the eaves.



When installing the product next to an outdoor air conditioning unit, install the product in a position that avoids any hot air expelled from the air conditioning unit.

# Floor Standing Wall Support

The product must be installed on the floor and placed against a wall for support due to its heavy weight. The proper conditions described in "Installation Location" must be considered. Be sure to follow the instructions exactly.

## Mounting



### WARNING

- It is important to ensure that the drilling locations do not cross any electrical wiring or plumbing inside the wall.
- Align both bracket positions correctly. If the bracket positions are not correct, the product may not be mounted properly.



### CAUTION

- Make sure the screws, anchors, and additional supports are appropriate for the wall type.
- Make sure the pilot hole size matches the anchor type.
- The product weight is 135 kg. The wall must contain blocked studs that can bear the weight and are of masonry or other suitable structures.



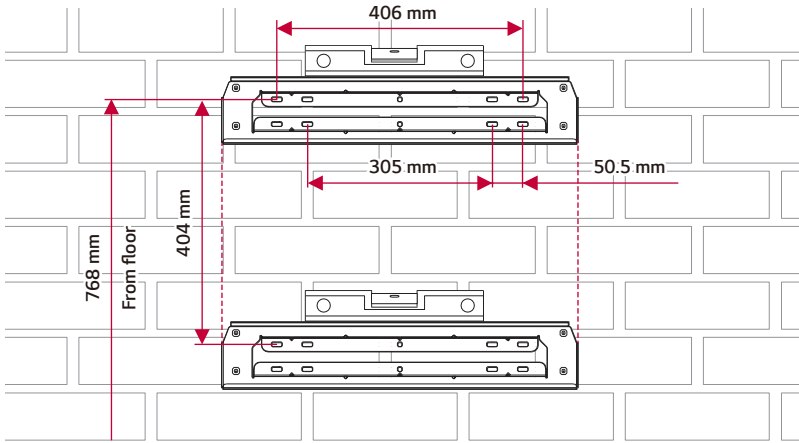
### INFO

- When attaching the wall bracket to a wall, adjust the horizontal level using an inclinometer or a leveler.
- When indicating the position to drill, you can refer to the Mount Hole Guide, which is a true-to-scale print of the actual wall bracket if required.
- The Mount Hole Guide is in the accessory package.
- Before fixing the bracket screws, check the horizontal level once again using an inclinometer or a leveler.
- Depending on the surface, different screws and anchors may be required for installing the wall bracket. These screws and anchors are not included with the product. The system installer is responsible for selecting the proper screws and anchors.
- It is recommended to use stainless steel screws which are M8 and 76 mm in length.

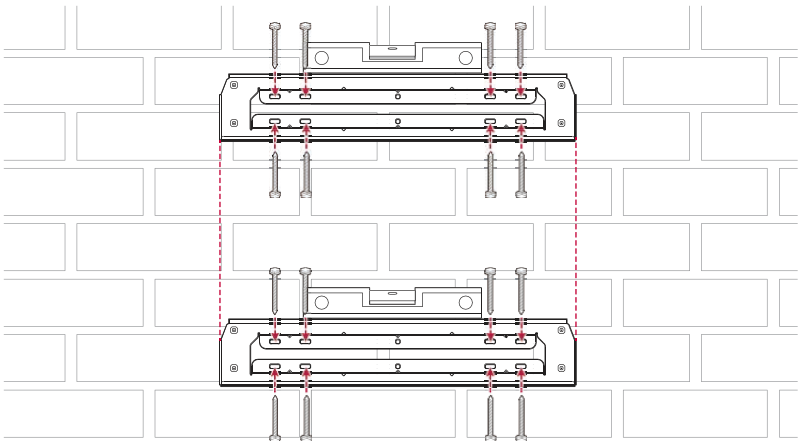
## INFO

- The following images are for reference. For safe installation, the installers must assess whether additional fixing is required.

- 1 Place the wall bracket on a wall which meets every installation condition and clearance requirement. Indicate the positions to drill using a pencil or other writing utensil, drilling holes in the indicated positions. It may help to use the true-to-scale print of the actual wall bracket, which provides the hole positions, and is included in the package.



- 2 Affix the wall bracket to the wall with screws or anchors. Align the upper and lower brackets so that they are straight vertically.





## ! WARNING

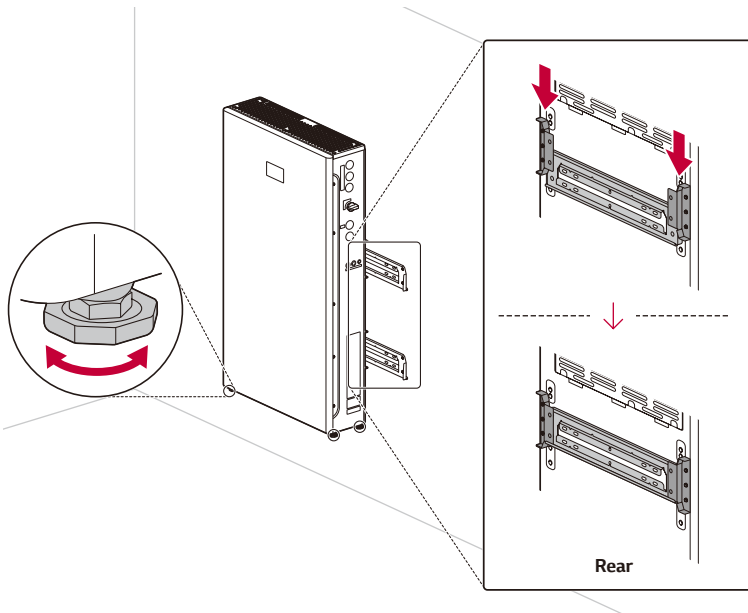
- The unit must be installed on the floor due to its the heavy weight. Wall support is only for supporting purposes.
- If installation is difficult due to a stem wall, reinforce the wall or floor to ensure proper installation.
- Be sure the floor is hard enough to support the weight of product.
- Rotate the legs at the bottom of the product to adjust the level.

## ! CAUTION

- The unit is very heavy. Serious injury may occur due to the heavy weight when mounting it on the wall. Therefore, special care must be taken in handling.
- When hanging the unit on the wall bracket, slowly lower the unit and make sure the unit is properly mounted on the wall bracket.
- If 4 points on the wall brackets (both sides of the 2 wall brackets) are not properly fixed to the wall, the product may fall over.

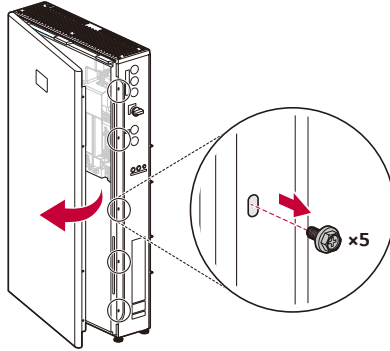
### 3 Hang the product on the wall bracket.

Then rotate the legs to bring the product level with the floor.

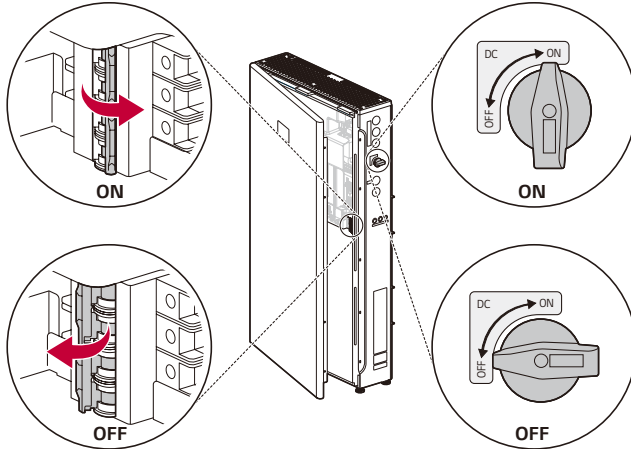


# Installing Components

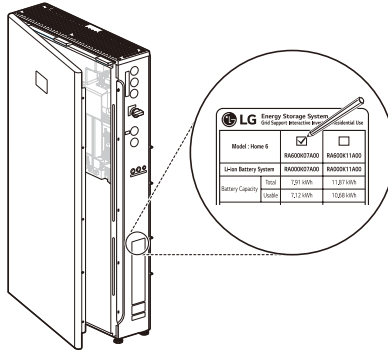
- 1 Remove the screws on the right side and open the front cover of the product (Hex socket: M8).



- 2 Before starting the wiring, make sure the circuit breaker and the DC Switch is OFF.



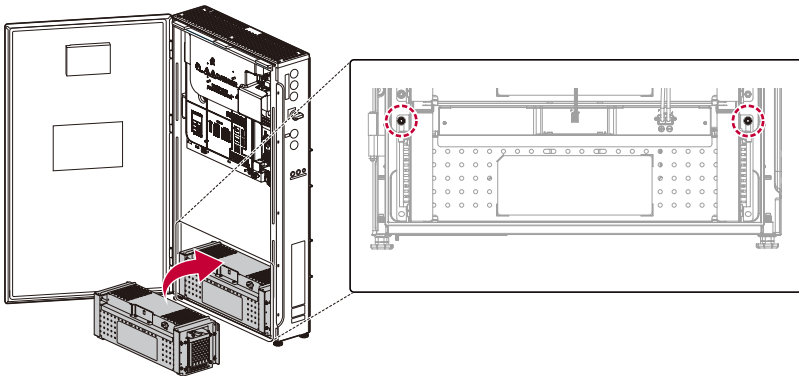
- 3 Find the product label on the right side of the product and mark the checkbox of the applicable items using an oil-based autograph pen (black).



## CAUTION

- Use a magnetic wrench for nut removal.
- Be careful to avoid injury when disassembling and assembling the battery packs. The battery packs are very heavy.

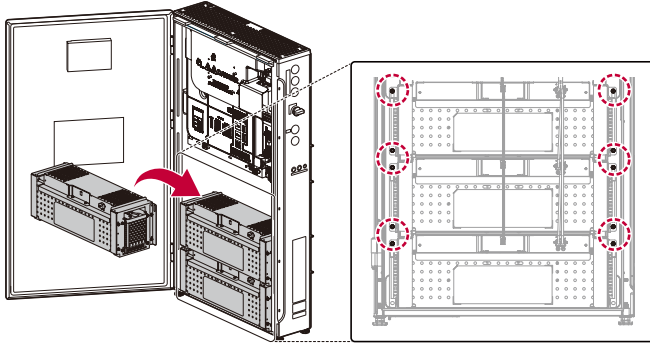
- 4 Place a battery module inside the enclosure and fix the battery module using the supplied nuts (2 positions, 4.5 N.m).



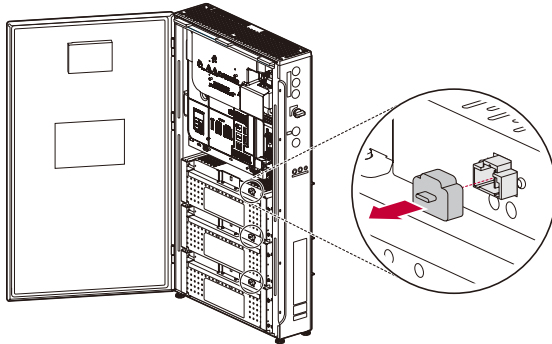
- 5 Stack the remaining battery modules inside the enclosure and fix them with the supplied M6 nuts, referring to previous step.  
Each battery module need 4 M6 nuts.

Nut assembling positions are indicated in the figure.

The total number of battery modules may differ depending on your model.



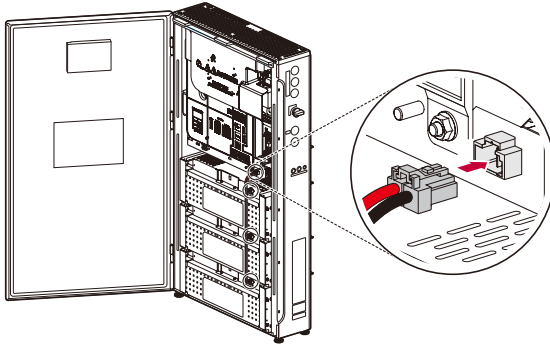
- 6 Remove the protective covers on the power connector of the battery modules. Do not touch the terminals after removing the protective label and cover.



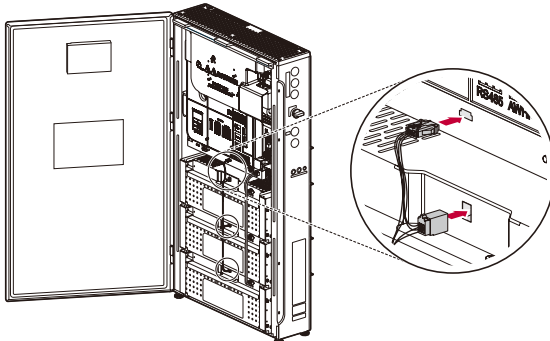
## WARNING

- When attaching the battery power cable and the battery communication cable, connect the cables until you hear a “click” and make sure that the connectors do not detach easily when you pull on them lightly.
- When attaching the battery power cable, make sure the long black cable is on the right side and not crossing over.

- 7** Connect the power cable harness as shown in the figure.



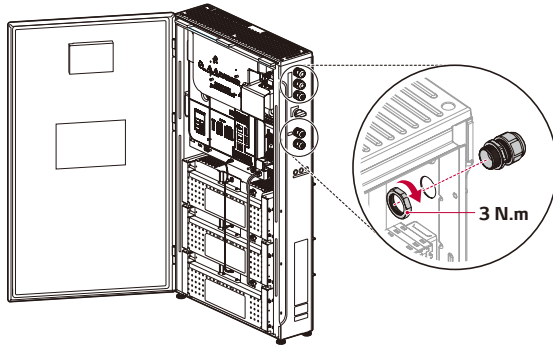
- 8** Connect the communication cable harness as shown in the figure.



## ⚠ WARNING

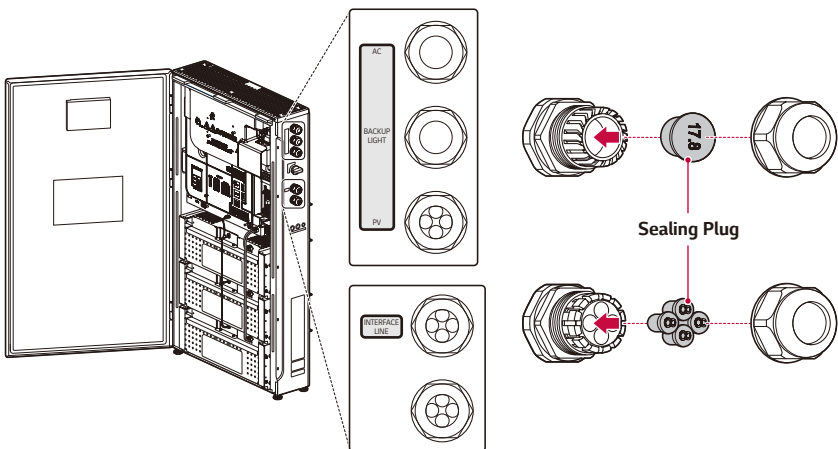
- Before making a connection on this product, make sure that the battery circuit breaker is OFF. If the circuit breaker is ON, death or serious injury may occur due to electric shock.
- High voltage is energized through the internal battery module and wiring. Special care must be taken when working on all wire connections.
- High voltage may be energized inside the safety cover. Do not open the safety cover of the product.

- 9 Assemble the supplied cable glands to the right side of the product.



## ⚠ CAUTION

- There are two types of cable glands among the five cable glands provided. Make sure each part is in the correct position.
- To ensure waterproofing, make sure that unused holes are sealed with sealing plugs.

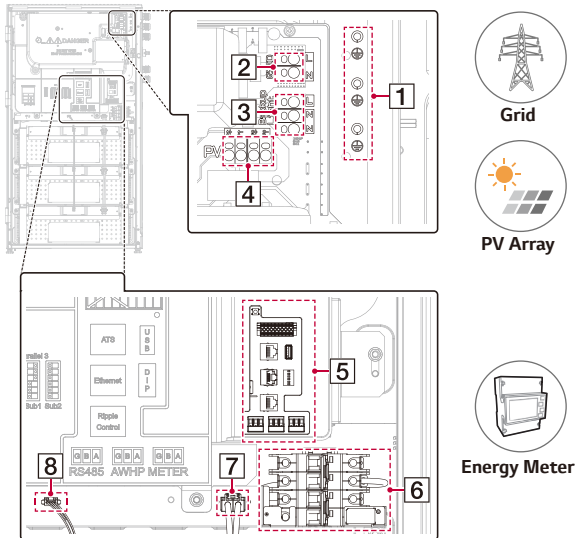


# Connections

## Connection Overview

### WARNING

- When the photovoltaic array is exposed to light, it supplies a DC voltage to the product.
- Before starting the electrical cable connections or open the door, turn off the AC circuit breaker, PV switch, and DC circuit breaker of the battery. (In case of reinstallation, turn them off and wait at least 10-minutes for the complete discharge within this product.)
- Electrical shock hazard. Do not touch the uninsulated wires. Do not remove safety cover.
- The battery packs and harness contain high voltage. There is a risk of death or serious injury due to electric shock. Before working on any wiring, make sure the battery circuit breaker is set to OFF.

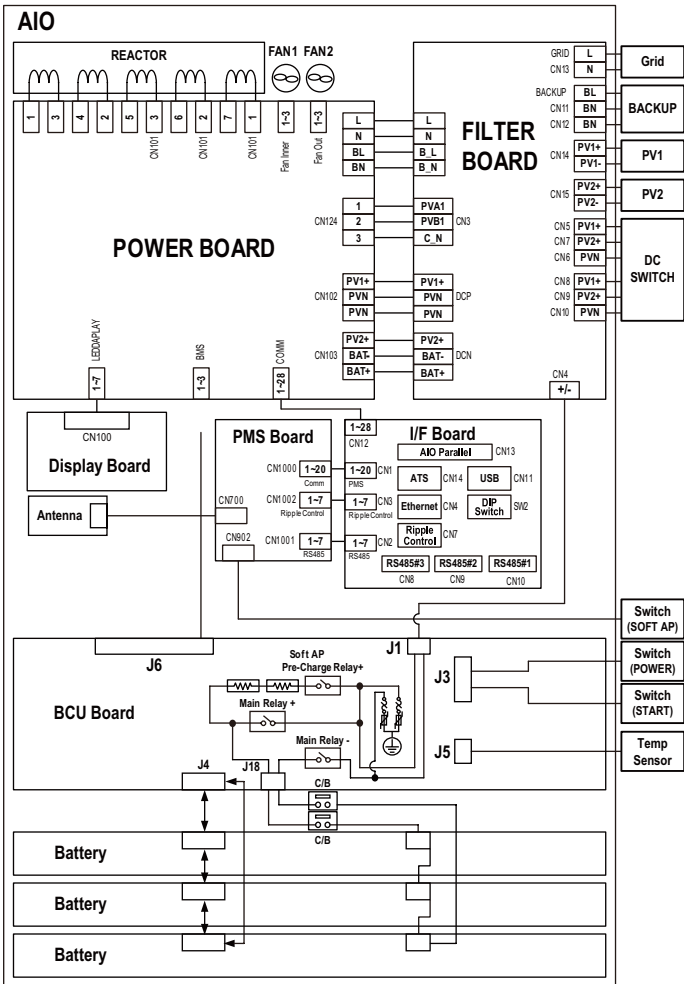


- 1** Ground Terminal (Protective Earth Terminal)
- 2** AC Power Terminals (L, Neutral)
- 3** Backup Light AC Power Terminals
- 4** PV Terminal (PV1 +/-, PV2 +/-)
- 5** Communication Interface Board
- 6** Battery Switch
- 7** Battery Power Terminal (Output)
- 8** Battery Communication Terminal (Output)

**CAUTION**

- The electrical installation of this product must only be performed by electricians or technicians qualified to install this product.
- When removing the cover, make sure not to damage the connection components.
- After connecting the normal and backup load to the corresponding ATS terminals, check if electricity is supplied properly and whether the grid status is live or out.
- Refer to the ATS BOX manual at the following site for detailed information on installing ATS BOX. <https://enwitec.eu/>

**Connection Diagram**





## Grid Connections

To use or sell the generated energy through a grid connection, you should connect this product to a grid. This product converts DC electricity generated from the PV array to AC electricity. The generated energy can be sold to electric utilities or used for household appliances.



### WARNING

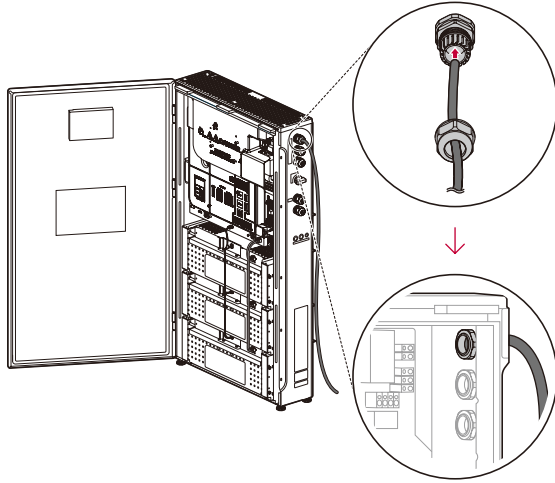
- Make sure the AC circuit breaker, PV switch, and DC circuit breaker of the battery are disconnected before starting electrical cable connections.
- The ground terminal must be connected to only one ground wire with ring terminal. Do not connect other cables to the ground terminal. There are three ground terminals. Connect one by one for this purpose.
- This Product faithfully adheres to the local grid code. Refer to the Grid range page. It will be from a fault out of grid range. In such a case, contact the Grid supplier.



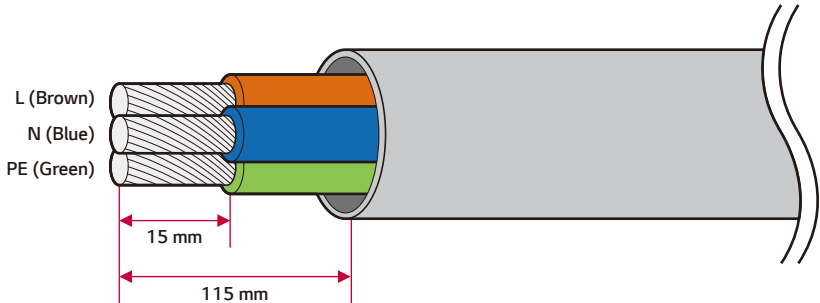
### INFO

- AC circuit breaker must be the current ratings of
  - 6 kW / 4.6 kW : 40 A
- This product can cause current with a DC component. Where a residual current-operated protective device (RCD) or residual current monitoring (RCM) device is used for protection in case of direct or indirect contact, only a RCD or RCM of type A (or type B) is allowed on the supply side of this product.
- Connect the equipment grounding before connecting the AC wires to the grid.

- 1 Insert the AC (Grid) cable through the upper cable gland to the right side of the unit.  
Pass the AC cable through the cable gland, rubber seal and housing as shown in the figure.



- 2 Strip off the 3-conductor power wires from at the AC (Grid) as shown in the figure.  
Power wires with a cross-sectional area  $4 \text{ mm}^2 - 6 \text{ mm}^2$   
Not using the PE equipotential point at the AC output port: two-core (L and N).  
Using the PE equipotential point at the AC output port: three-core (L, N, and PE) outdoor copper cable.



## ⚠ CAUTION

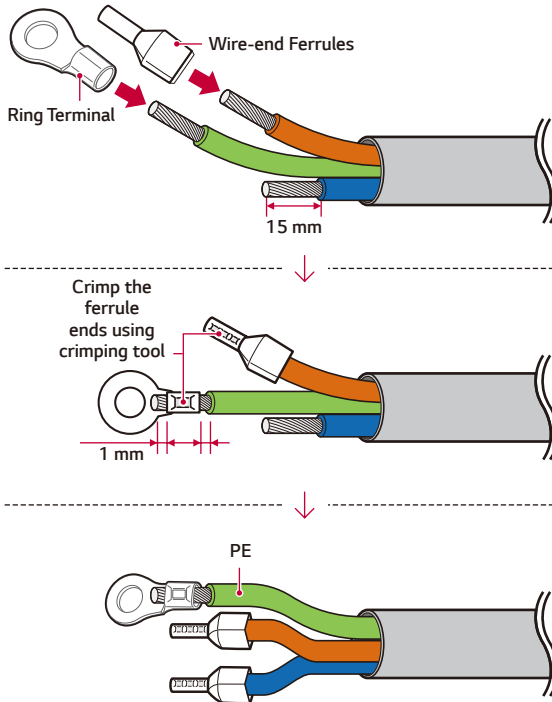
- Make sure that the AC power grounding wire is longer than the main power wires so that it is not pulled before the main power wire when it is pulled from the outside.

### 3 Assemble the wire-end ferrules and the ring terminal on each wire.

Insert the ring terminal into grounding wire and crimp the ring terminal using crimping tool.

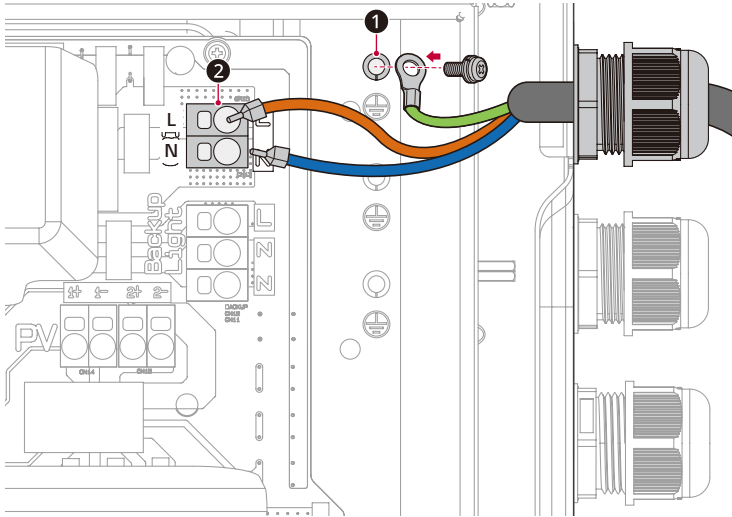
Crimp the ring terminal using the crimping tool.

insert a wire-end ferrule into the remaining wires and crimp the ferrule ends using the crimping tool.

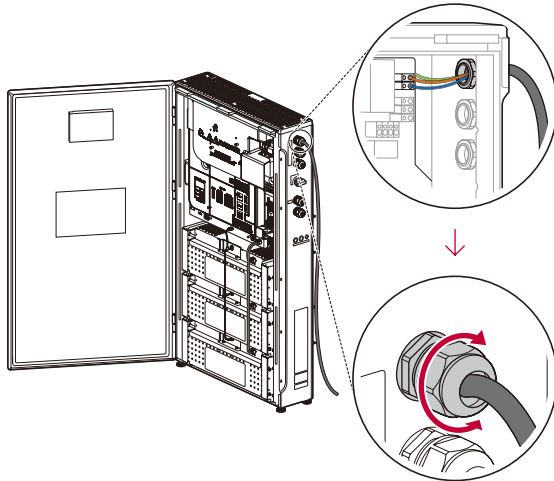


- 4 Connect the grounding wire (PE) with the M4 screw included in the accessory package.  
( $1.5 \pm 0.2$  N.m Torque)

Insert the remaining wire-ends into the corresponding ferrule-hole in the grid terminal



- 5 Rotate the cable gland to tighten the gland hole.



### CAUTION

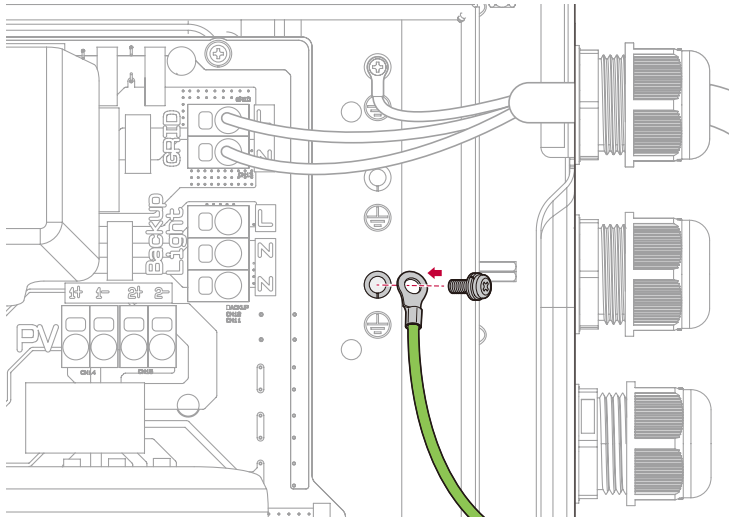
- Make sure the cables are not moving after tightening the cable gland. Otherwise, the IP56 grade cannot be maintained.

## Additional grounding

### INFO

- Because the ground connection for the backup operation can be different depending on the environment, check with an expert.

Make sure to connect the additional grounding wire (PE) to the additional grounding connector.  
To connect the additional grounding wire through the hole in the cable-gland for INTERFACE LINE.

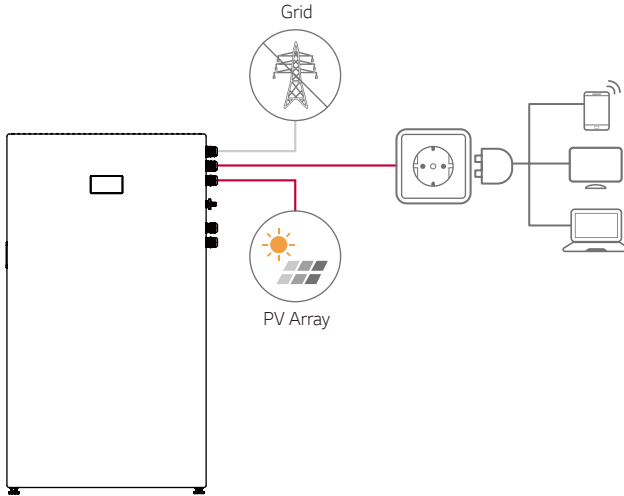


## Backup Light

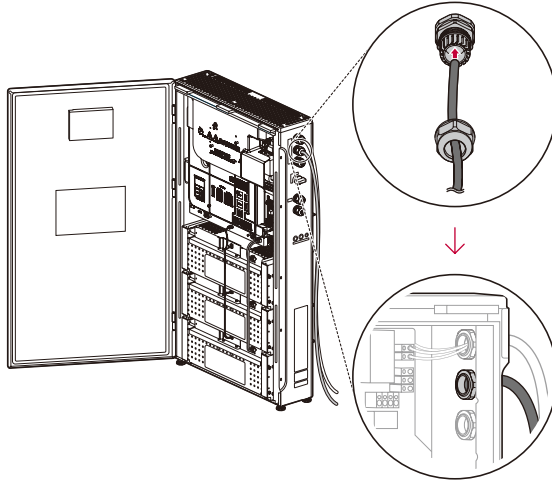
It is a socket that is only supplied in case of grid outage based on the currently available battery.

The switch happens automatically via the inverter and doesn't require any additional grid separation components (ATS Box).

Backup Light is for emergency load. It can support up to 3kW in a single phase.

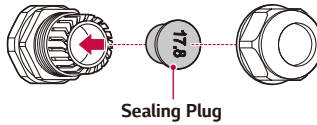


- 1 Insert the AC (Backup Light) cable through the second cable gland from the top. Pass the cable through the cable gland, rubber seal and housing as shown in the figure.

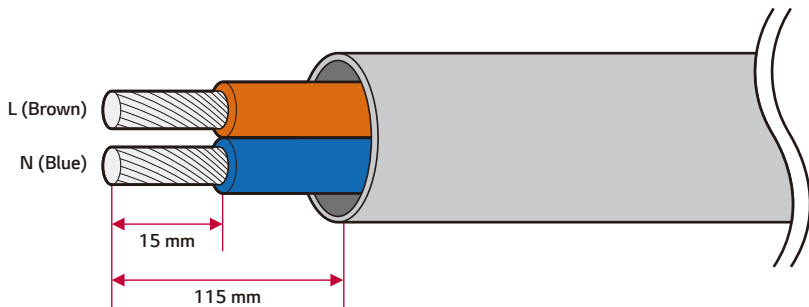


### ⚠ CAUTION

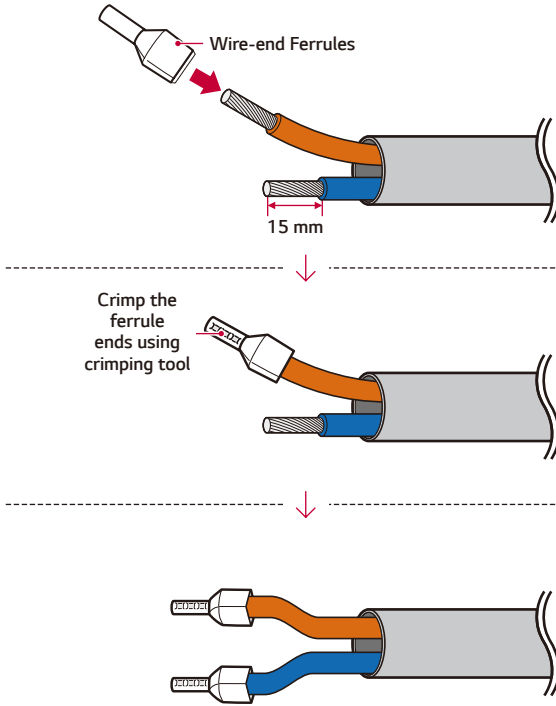
- To ensure waterproofing, make sure that unused holes are sealed with sealing plugs.



- 2 Strip off the 2-conductor power wires at the AC (Backup Light) as shown in the figure. Power wires with the cross-sectional area  $4 \text{ mm}^2$  -  $6 \text{ mm}^2$

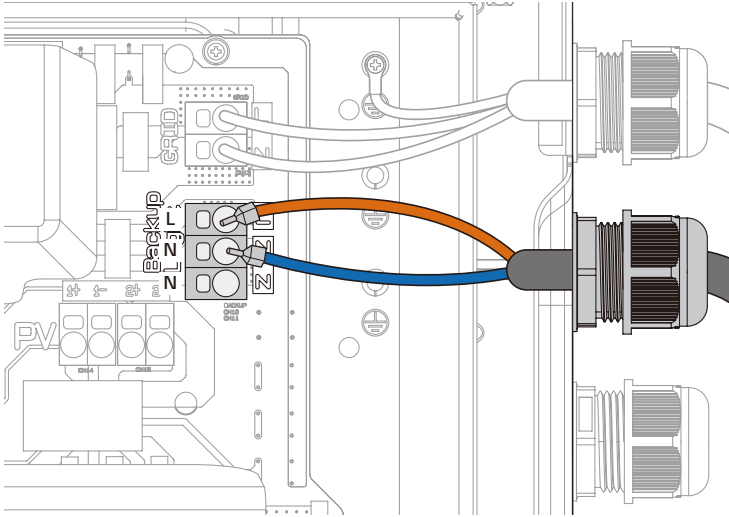


- 3 Assemble the wire end ferrules on each wire. And crimp the ferrule ends using the crimping tool.

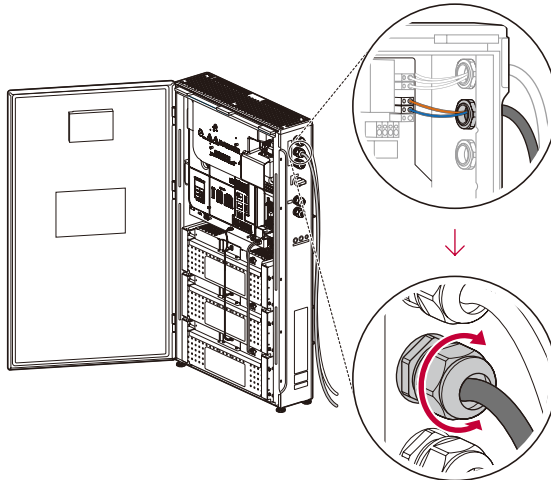




- 4 Insert the wire-ends into the corresponding ferrule-hole in the Backup Light terminal



- 5 Rotate the cable gland to tighten the gland hole.



**CAUTION**

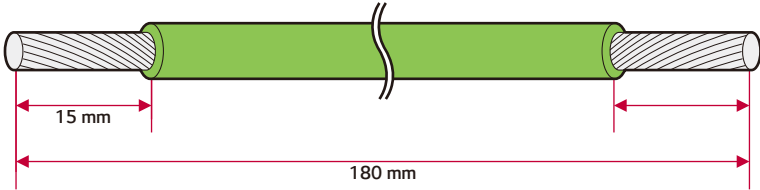
- Make sure the cables are not moving after tightening the cable gland. Otherwise, the IP56 grade cannot be maintained.

## INFO

- A grounding cable has to be executed to the Backup Light.

- 6** Strip off both sides of the wire as shown in the figure.

Ground the wire for the Backup Light with a cross-sectional area of  $4 \text{ mm}^2 - 6 \text{ mm}^2$

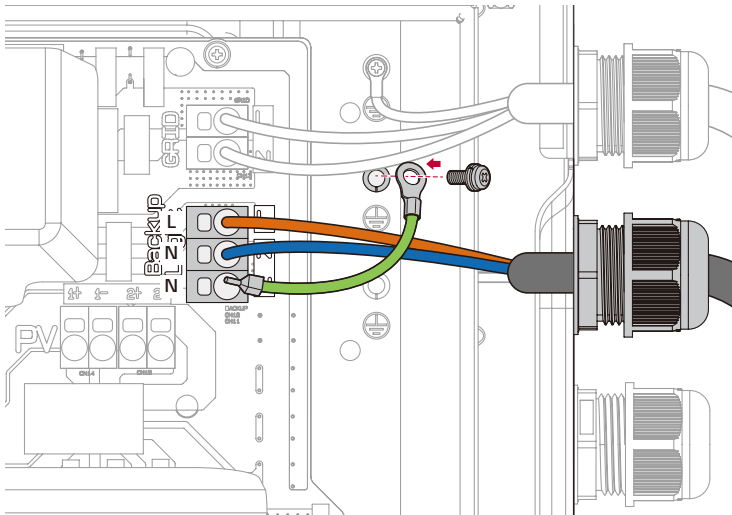


Crimp the ring terminal and wire-end ferrules on each wire-end and crimp the ends using the crimping tool as shown in the figure.



- 7** Connect the grounding wire (PE) with the M4 screw included in the accessory package. ( $1.5 \pm 0.2 \text{ N.m Torque}$ )

Insert the remaining wire-ends into the grounding ferrule-hole in the Backup Light terminal



## PV Array Connections

You can connect up to two PV arrays on this product.



### WARNING

- Make sure the AC circuit breaker, PV switch, and DC circuit breaker of the battery are disconnected before starting electrical cable connections.



### CAUTION

- Before connecting a PV array, make sure that the open circuit voltage of the PV array is less than 600 V. Otherwise this product could be damaged.
- Do not connect a ground to a PV+ or PV- connector. It may cause electric shock or the product may become permanently damaged.
- Make sure not to change +/- during PV connections. It may cause electric shock or the product may become permanently be damaged.
- The PV open circuit voltage can be changed depending on external circumstances such as solar radiation or temperature. In the case, have this inspected by electricians or technicians qualified to install this product before the installation.

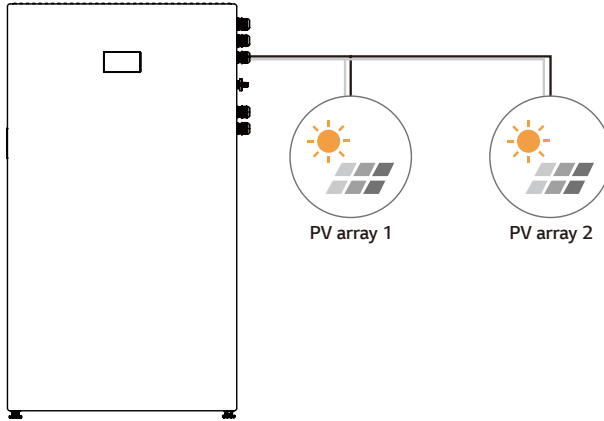


### INFO

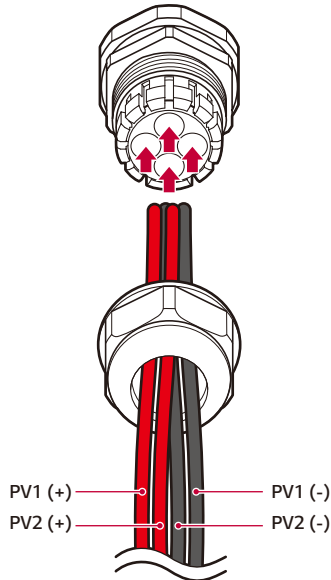
- PV modules shall have an IEC61730 Application Class A rating or equivalent.
- For DC cables of PV connections, it is recommended to use a lead wire with a cross-sectional area of  $4 \text{ mm}^2$  -  $6 \text{ mm}^2$ .
- When you connect only one PV array to the PCS, the PV array must be connected to the PV1 (+ and -) connectors.
- When you use all PV1, PV2 connectors, use the PV1 connectors for the bigger PV array.
- Cables, ring terminals, and wire-end ferrules are not supplied with this product package. The installer is responsible for selecting the proper components for the installation.

## PV1 / PV2 Connection

Connect the DC cables of a PV array to PV1 & 2 connectors on this product.

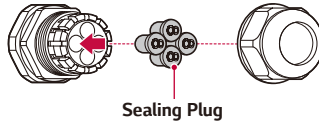


- To connect the PV cable, separate the cable gland as shown in the figure and pass the PV cable through. Note the labelling on the each cables when connecting. The third cable gland from the top is for PV connection.



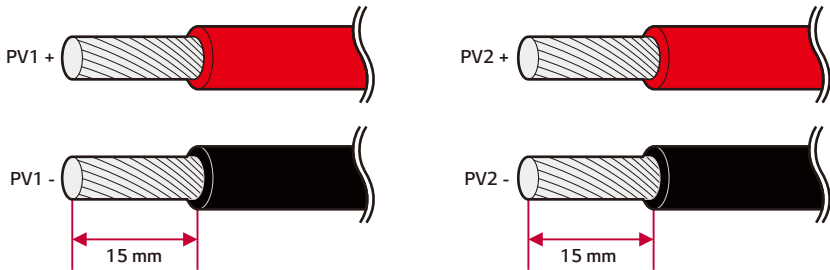
## ⚠ CAUTION

- To ensure waterproofing, make sure that unused holes are sealed with sealing plugs.

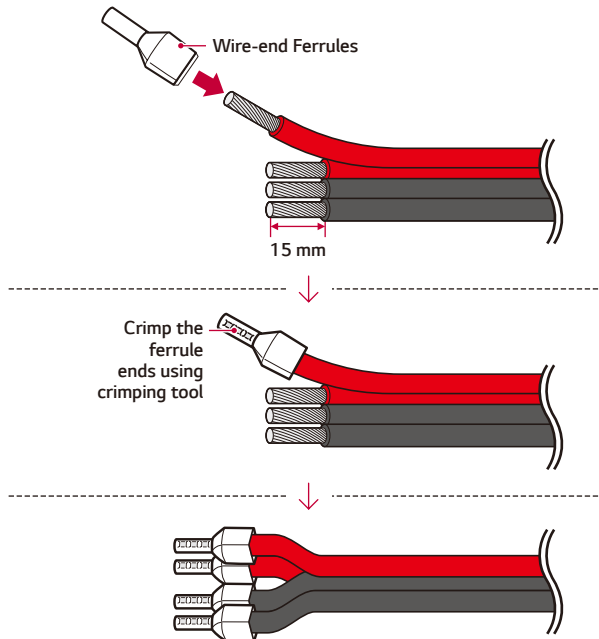


- 2** Strip off the 2-conductor power wires at the PV module as shown in the figure.

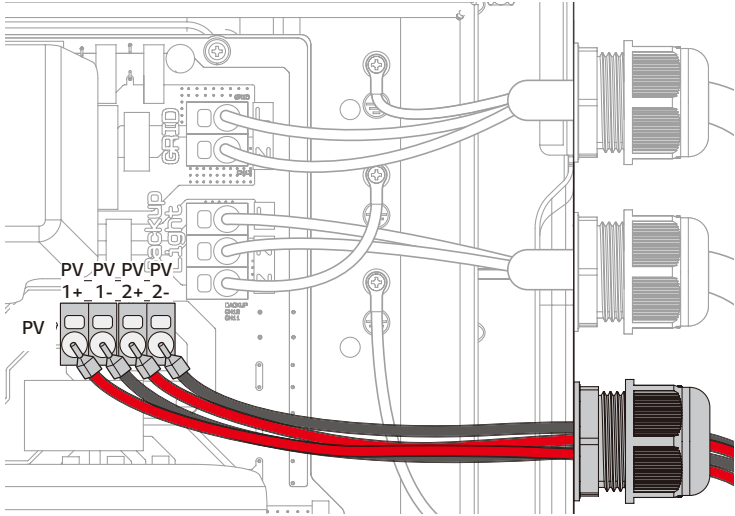
Power wires with a cross-sectional area of  $4 \text{ mm}^2 - 6 \text{ mm}^2$



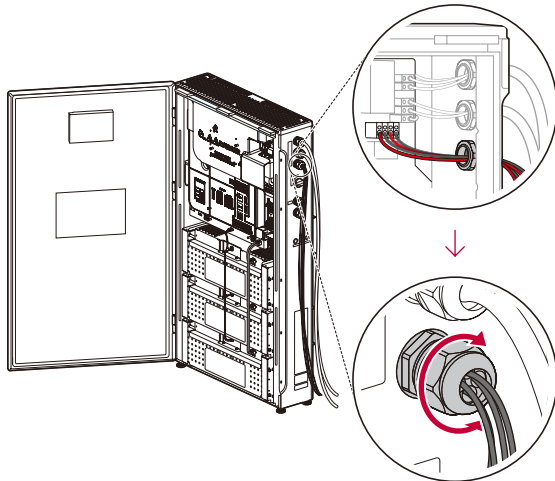
- 3** Assemble the wire end ferrules on each wire. And crimp the ferrule ends using the crimping tool.



- 4 Connect to +/- of the PV1 and PV2 terminals.  
 Assemble the supplied cable glands to the right side of the PV power wire.



- 5 Rotate the cable gland to tighten the gland hole.

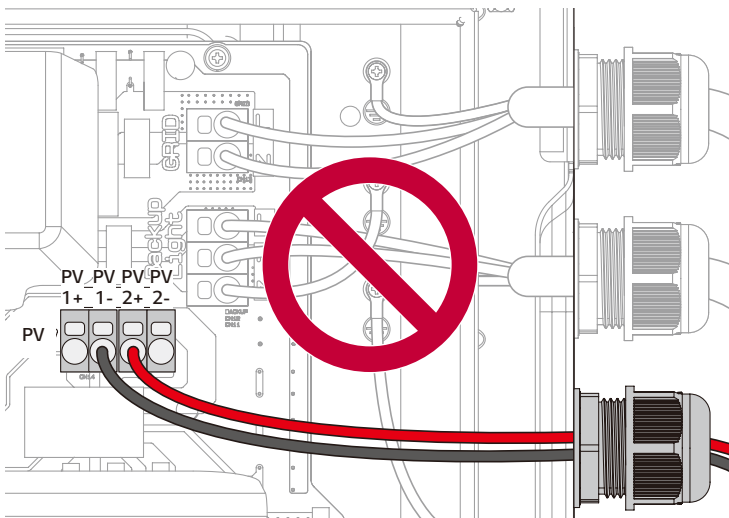
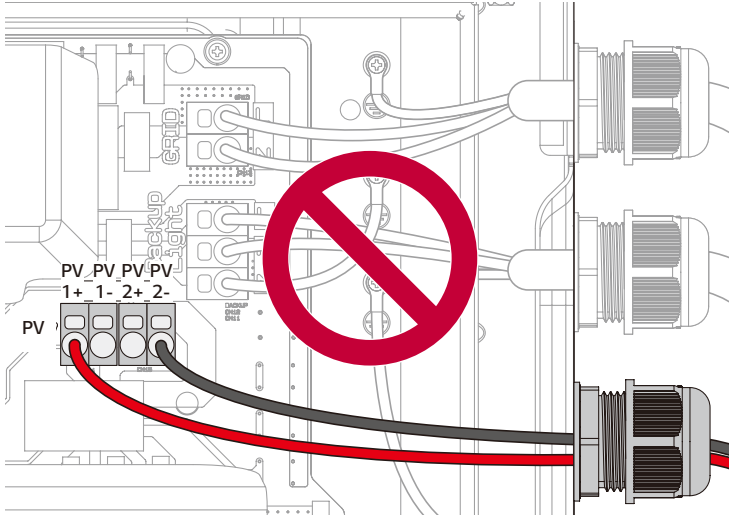


**CAUTION**

- Make sure the cables are not moving after tightening the cable gland. Otherwise, the IP56 grade cannot be maintained.

## WARNING

- Do not mismatch the connection of the electric poles + to - and - to + when installing. Otherwise, this may cause electric shock or the product may become permanently damaged.
- PV+ and PV- cables from one PV array must be connected to the same PV connector number. (PV1+ and PV1-, PV2+ and PV2-) A mismatched connection may cause electric shock or the product may become permanently damaged.
- Note the labelling on the each cables when connecting.



## Energy meter, heat pump, and internet connection

The energy meter connection is required to get information about the energy flow. The energy meter for this product is not included with this product package. Before connecting the energy meter to this product, install the energy meter. Refer to the installation manual of the energy meter for more information about energy meter installation.

A heat pump connection is required to control heat pump. The heat pump for this product is not included with this product package. Before connecting the heat pump to this product, install the heat pump. Refer to the installation manual of the heat pump for more information about heat pump installation.

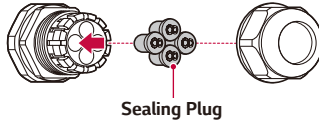
An internet connection is required to use a variety of functions such as network update, ThinQ monitoring system, and more. You may need to contact your internet service provider (ISP) to connect this product to the internet.

### **!** WARNING

- Make sure the AC circuit breaker, PV switch, and DC circuit breaker of the battery are disconnected before starting electrical cable connections.

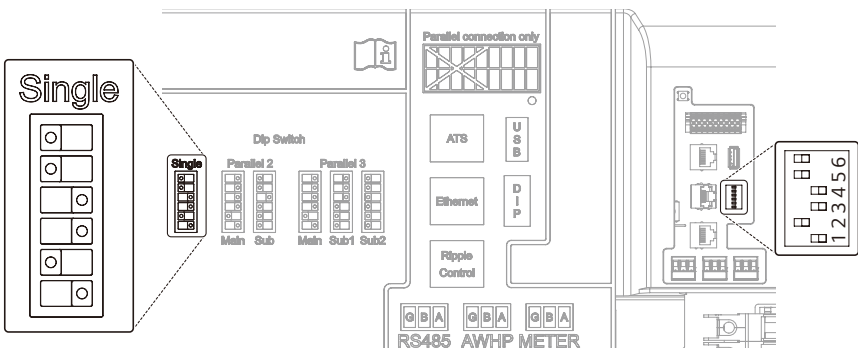
### **!** CAUTION

- To ensure waterproofing, make sure that unused holes are sealed with sealing plugs.



### **!** CAUTION

- Make sure the position of the DIP Switch matches the pictures below.  
If the DIP Switch is incorrectly positioned, the product may not function properly.



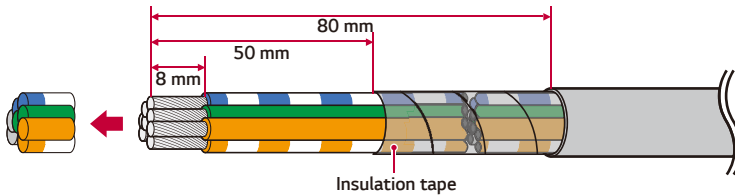


## Energy Meter Connection

### INFO

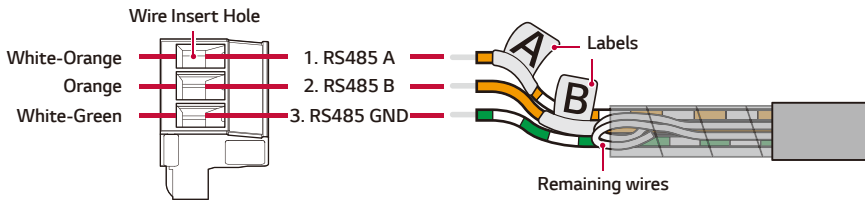
- Compatible energy meter brand and model names are listed in [‘Energy Meter Compatibility’](#)
- The numbers described in the figure are the port numbers for the Eastron energy meter connection.

- 1 Strip the 3-conductor communication cable and tie up the communication wires and drain wire using insulation tape as shown in the figure.

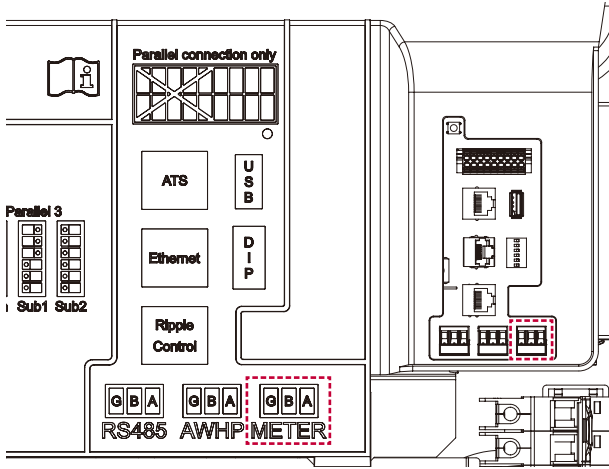


- 2 When taping the communication wire, wrap the remaining wire and cover it with insulation tape. Connect the 3-conductor communication wires to the communication terminal block as shown. (if GND is not present, the G pin will not connect)

Check the labels BUS-A and BUS-B on both ends of the connection to connect to the Energy Meter. The BUS-A connection on the ESS side should be connected to the BUS-A connection on the Energy Meter side, and the BUS-B connection on the ESS side should be connected to the BUS-B connection on the Energy Meter side.

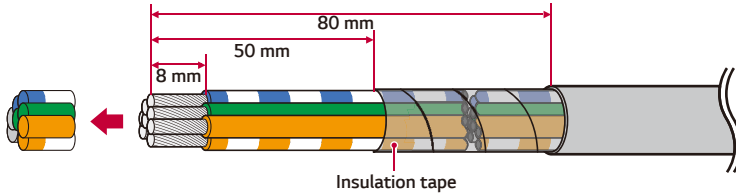


- 3 Connect the plug to the energy meter connector.



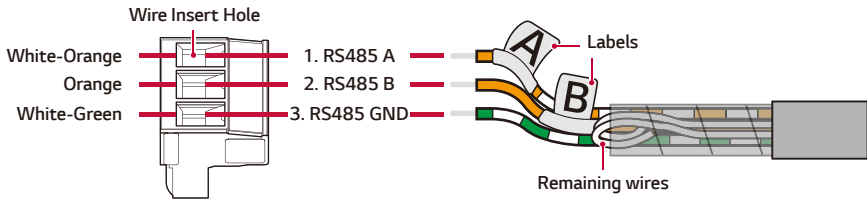
## Heat Pump Connection

- Strip the 3-conductor communication cable and tie up the communication wires and drain wire using insulation tape as shown in the figure.

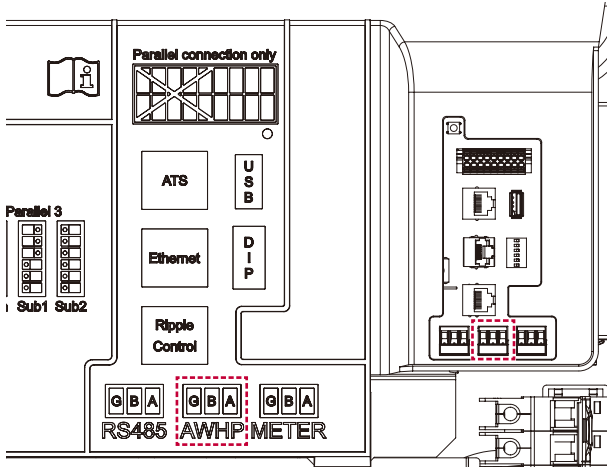


- When taping the communication wire, wrap the remaining wire and cover it with insulation tape. Connect the 3-conductor communication wires to the communication terminal block as shown. (if GND is not present, the G pin will not connect)

Check the labels BUS-A and BUS-B on both ends of the connection to connect to the heat pump. The BUS-A connection on the ESS side should be connected to the BUS-A connection on the heat pump side, and the BUS-B connection on the ESS side should be connected to the BUS-B connection on the heat pump side.

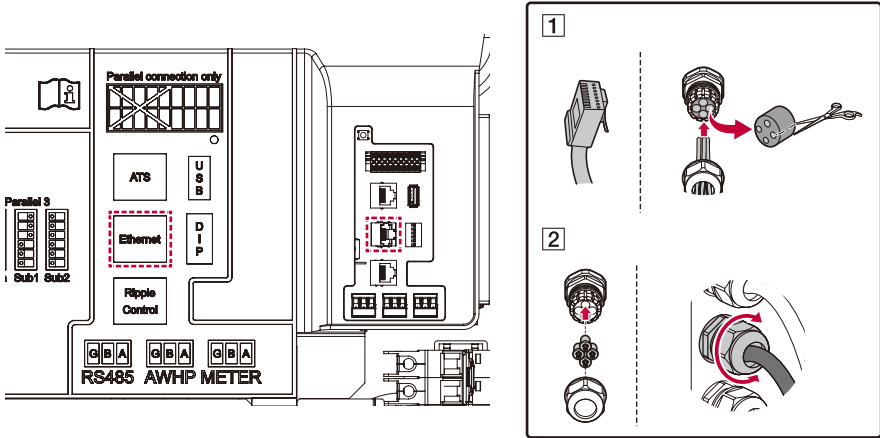


- 3 Connect the plug to the Heat Pump connector.



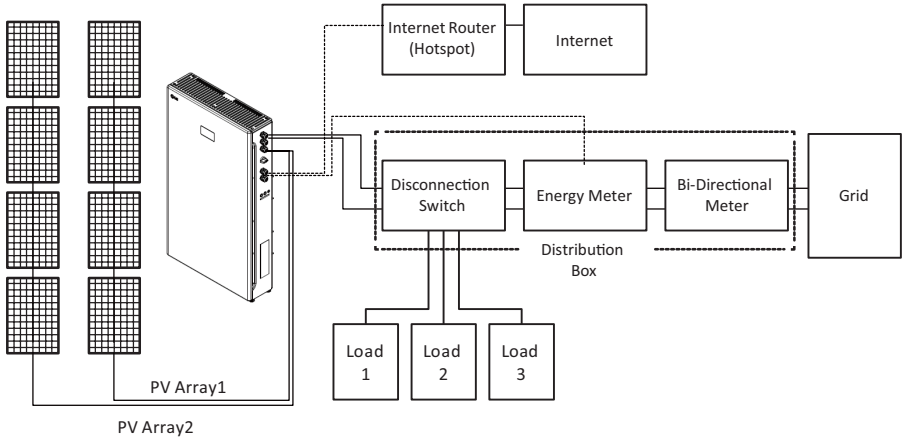
## Internet Connection

Insert an ethernet cable with an RJ-45 plug to the ethernet port at the front of the product as shown in the figure.



2  
Installation

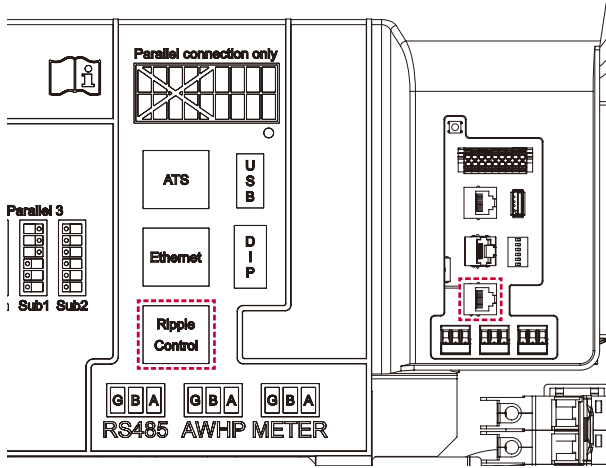
## Energy Meter and LAN Connection Diagram



## SPI(Italy only) / Ripple Control Connection (if capable)

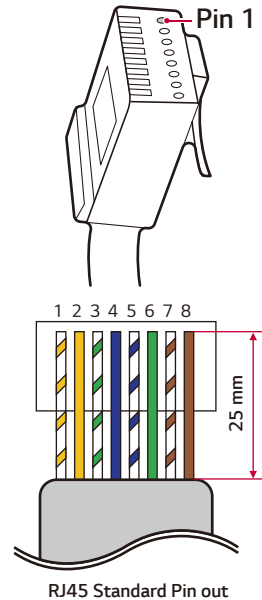
Using CAT5 (or better) cable, make an RJ45 connector, referring to the figure below, and connect to the SPI(Italy only) / Ripple Control Receiver.

Make sure the AC circuit breaker, PV switch, and DC circuit breaker of the battery are disconnected before starting electrical cable connections.



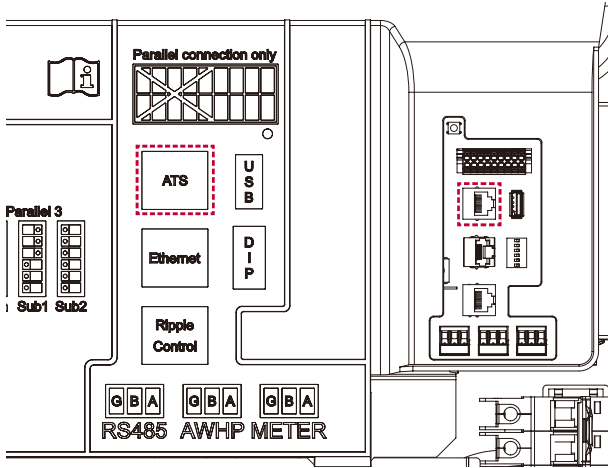
Pin	Recommended Wire Color	Ripple Control	SPI
1	White-Orange	-	-
2	Orange	K4 (0 %)	Ext. signal
3	White-Green	K3 (30 %)	Local Command
4	Blue	K2 (60 %)	-
5	White-Blue	K1 (100 %)	-
6	Green	-	Trip signal
7	White-Brown	Int.12 V	-
8	Brown	-	GND

\* Cable type : CAT5 UTP or better



## ATS Connection (if capable)

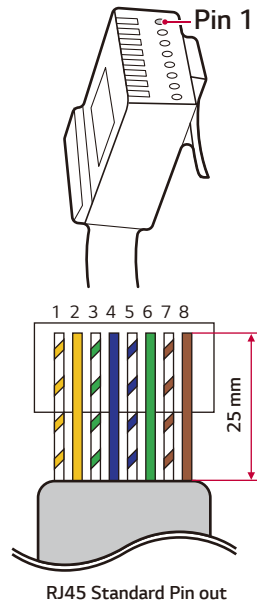
Using CAT5 (or better) cable, make an RJ45 connector, referring to the figure below, and connect to the ATS. Make sure the AC circuit breaker, PV switch, and DC circuit breaker of the battery are disconnected before starting electrical cable connections.



### RJ45 Pin out (T-568B Standard)

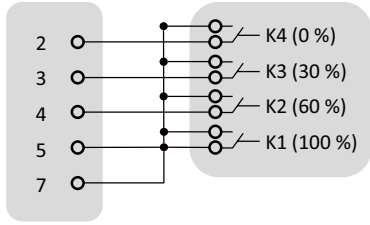
Pin	Recommended Wire Color	ATS
1	White-Orange	Not Connected
2	Orange	Not Connected
3	White-Green	ATS_K3
4	Blue	ATS_K14
5	White-Blue	Not Connected
6	Green	ATS_EN
7	White-Brown	12V
8	Brown	GND

\* Cable type : CAT5 UTP or better

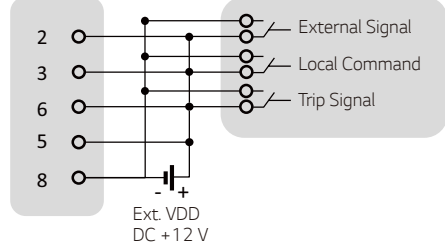


RJ45 Standard Pin out

### Ripple Control



### SPI



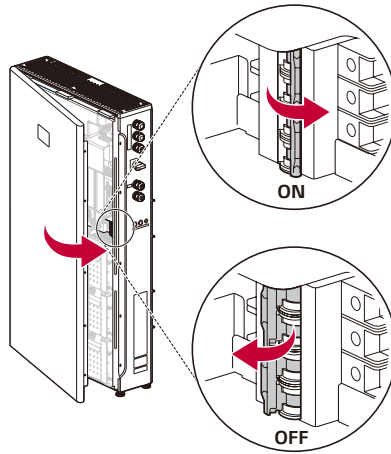


## Installation Completion

### CAUTION

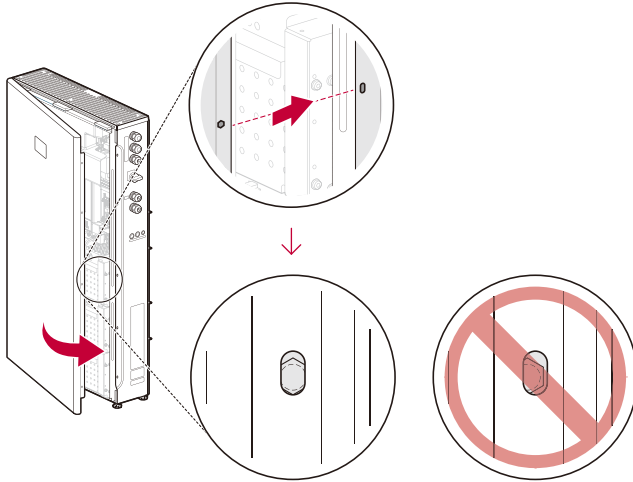
- High voltage is energized through the internal battery modules and wiring. Special care must be taken.

- 1 Switch the battery circuit breaker on this product to the ON position and close the door. When closing the door, make sure the front cover is securely fitted to the gasket for a secured waterproof seal.

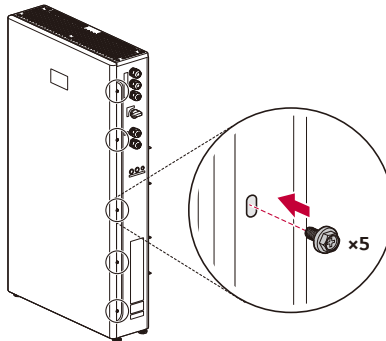


## ⚠ CAUTION

- Make sure the door is correctly closed and all bolts are fastened. Otherwise, IP56 grade cannot be maintained.
- Make sure to push the door in to align the screw holes when fastening the screws.

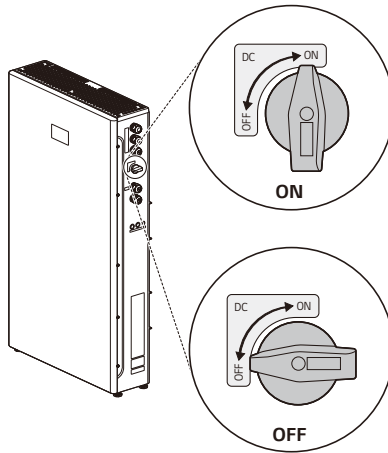


- 2** Fasten the screws on the right side of the product.  
(2.45 N.m torque, Hex socket : M8)



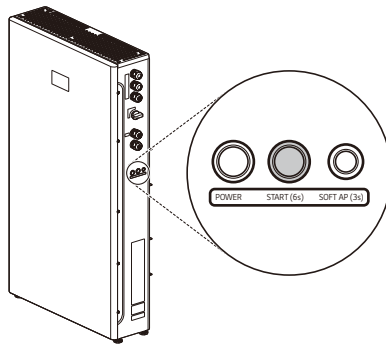
- 3** Switch the grid's main circuit breaker to the ON position and wait until the Grid icon signals that complete power is on. It will take about 30 seconds.

- 4 Switch the PV circuit breaker to the ON position.



- 5 Press the POWER button and press and hold the START (6s) button for at least 6 seconds until you hear a "click."

If the SoC level is shown on the LED display of the product, the booting process has been completed normally.



### CAUTION

- All covers must be correctly reassembled. Otherwise, the IP56 grade cannot be maintained.

### INFO

- The SoC level displayed on the LED display after turning on the product may differ from the actual SoC level. It may take up to 30 minutes to synchronize with the actual SoC level.

## Backup Load Connection

### Max. load available during backup operation

\* This function is applicable only with a qualified ATS box.

Installed PCS (ATS)		4.6 kW	6 kW
Maximum usable home load capacity in backup operation <sup>1)</sup>	11 H	4.6 kW	5.6 kW
	7 H	3.68 kW	
Installed PCS (Backup Light)		4.6 kW	6 kW
Maximum usable home load capacity in backup operation <sup>1)</sup>	11 H	3 kW	
	7 H	3 kW	

1) The capacity may decrease as the battery ages.

- Please connect the backup load to the backup power terminal of the ATS below the max. power defined in the table above.
- After connecting the normal and backup load to the corresponding terminals of the ATS, check if electricity is supplied properly and whether the grid status is live or out.
  - Backup load : Home load to supply electricity even if a power outage occurs.
  - Normal load : All electrical home load except backup load

### Additional checklist for connecting single-phase and high-power loads, even within the max. usable home load capacity

Type of Load	
Acceptable	Small plug-in appliances such as TVs, Computers, Radios, Routers
	Lighting (compact fluorescent or LED recommended)
	Refrigerators and freezers, microwaves, cookers
Unacceptable	Large capacity AWHP (Air-to-water heat pump)
	Air conditioners
	Spas / Saunas
	Electric cooktops / Electric ovens
	Hair dryers
	Other household appliances with high in-rush current at start-up (e.g. water pumps, sprinklers, etc.)

- Do not connect “loads exceeding the maximum capacity” or “unacceptable loads” in the backup system. Otherwise, the PCS may stop operating.
- In these stop conditions, PCS issues an alarm with a warning message of “Overload” or “Unacceptable load” through the APP.
- The information above is subject to change at any time and without notice.

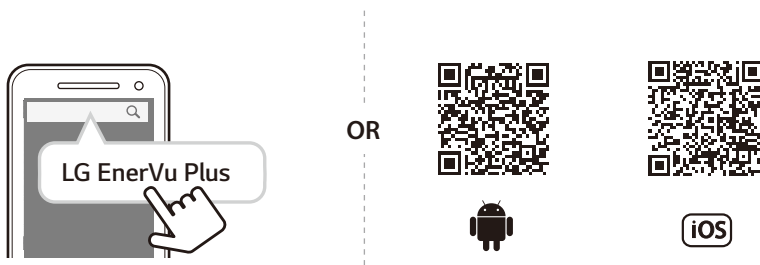
## Installer Settings

When this product is turned on for the first time, settings in the [Setup] menu must be set by authorized service personnel.

Before starting [Setup], make sure that the physical connection and installation are done as described in this manual exactly and securely.

### Installing the 'LG EnerVu Plus' App

Download the 'LG EnerVu Plus' on the Apple App Store or Google Play Store.

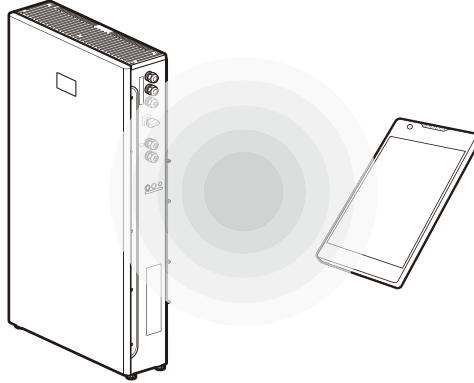


#### INFO

- Depending on the device, the 'LG EnerVu Plus' app may not work.
- The LG EnerVu Plus app is available for the following software:
  - Android O/S : Lollipop (5.0) or later
  - iOS O/S : iPhone 6 (9.0) or later
- For the stable operation and periodic system update of the product, LG Electronics strongly recommends that the user register with EnerVu Plus and stay connected.
- LG ESS is under continuous development and its firmware is updated at regular intervals. To ensure that the product works properly, LG ESS must be updated with the latest firmware.
- Malfunctions that can be traced back to the use of outdated firmware are not covered by LG Electronics' product warranty. The automatic firmware update takes place when LG ESS is registered to EnerVu Plus (strongly recommended) and connected to the internet. Further information can be found in the chapter called "EnerVu Plus Settings" of the LG ESS installation manual.

## Connecting to a Mobile Device

To connect the system to a mobile device, the LG EnerVu Plus mobile application must be installed on your mobile device. Search and download the 'LG EnerVu Plus' application from the Apple App store or Google Play store.



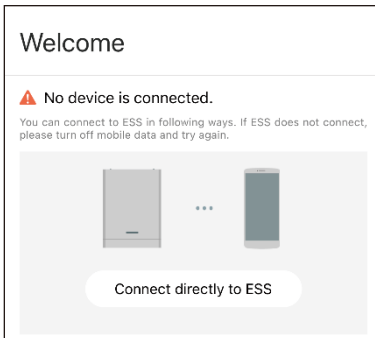
### Connect directly to ESS

1



Run the 'LG EnerVu Plus' app on your mobile device.

2



If it is the first time connecting to the system, the connection method selection screen appears.

Tap the [Connect directly to ESS] option.

3

**Connect directly to ESS**



Push the WLAN button on bottom of ESS, and go to the menu Setting > WLAN and select ESS to Connect.  
ESS WLAN password is 'WLAN password' on right side of ESS device.

**CANCEL** **OK**

Press and hold the wireless connection button on the system for 3 seconds until a melody sounds.

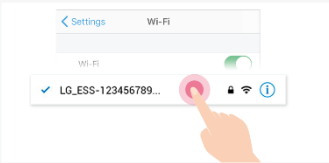
On your mobile device, tap [OK] to go to the next step.

### INFO

- If a connection has not been established after 10 minutes, the Network LED light will turn green or red and the WLAN signal will be disabled.

4

**Connect directly to ESS**



Push the WLAN button on bottom of ESS, and go to the menu Setting > WLAN and select ESS to Connect.  
ESS WLAN password is 'WLAN password' on right side of ESS device.

**CANCEL** **OK**

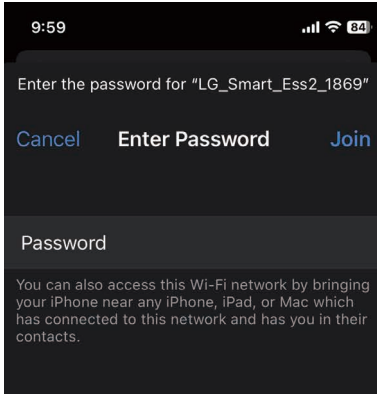
Read the guidance and tap [OK] to display the WLAN selection screen.

Select the SSID which starts with 'LG\_Smart\_Ess2'.  
The password input screen will appear.

### INFO

- Example :  
LG\_Smart\_Ess2\_f678

5

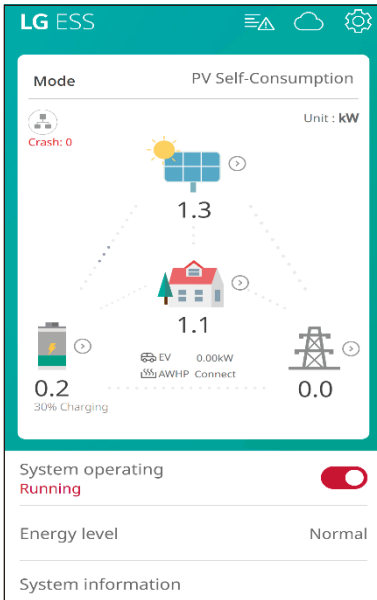


Input WLAN password in the password field to connect to the system.

The WLAN password is 8 characters. The WLAN password is 8 characters long, repeating the last 4 characters of the SSID twice.

### INFO

- If the connection failed, try again after turning off the mobile data option on your mobile device.

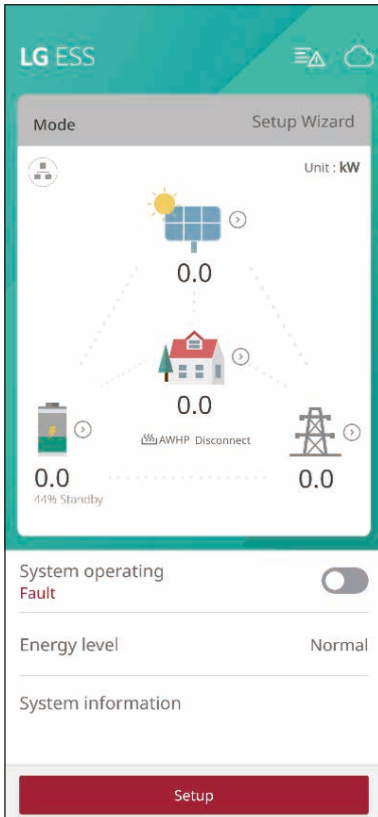


**Android** : If the connection is successful, run the [LG EnerVu Plus] app to display the main screen as shown in the figure.

**iOS** : If the connection is successful, run the [LG EnerVu Plus] app to display the main screen as shown in the figure.



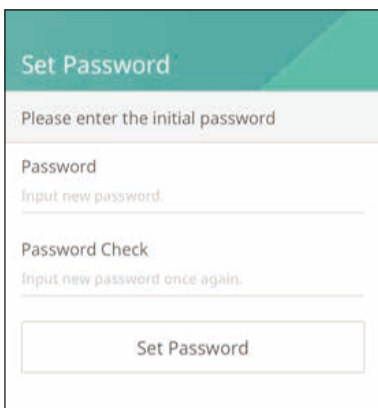
## Entering the [Setup] Screen



### [Setup]

To enter [Setup] on your mobile device, follow the instructions described below.

- 1 Tap [Setup] on the main screen to display the password input screen.



### [Setup] First time

When entering the [Setup] screen for the first time, you must set an installer password.

## Country

**Country**

Country  
**Italy**

Grid Code  
**Italy**

Time Zone  
**UTC +01:00 Rome**

Previous 1/10 Next

[Country]

- 1 Select country, grid code, and time zone.

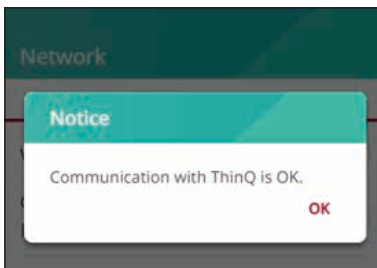
## Network

The screenshot shows the 'Network' settings page. At the top, there's a teal header with the word 'Network'. Below it, a red bar indicates 'Connection Status'. The main content area is white and contains several sections: 'Web server data upload' with a 'Test' button; 'Connection Type manual' with 'Wired' and 'Wireless' radio buttons; 'IP Address' (192.168.0.10); 'Subnet Mask' (255.255.255.0); 'Gateway' (192.168.0.1); and 'DNS' (165.186.85.11). At the bottom, there are three red buttons: 'Previous', '2/10', and 'Next'.

### [Network]

You can view the current connection type and IP information.

The default network connection type is set to [Wired]. To set up a wireless connection, select the connection type as [Wireless].



To check if communication with the cloud is working properly, click the [Test] button and check the OK message.

## Wired Network

The screenshot shows the 'Network' settings page with the 'Wired Setting' option selected. A green status bar at the top indicates 'Internet Connected'. Under the 'IP Setting' section, the 'Manual' toggle is turned on, and a 'SET' button is visible. Below this, there are four input fields for IP configuration: IP Address (192.168.0.10), Subnet Mask (255.255.255.0), Gateway (192.168.0.1), and DNS (165.186.85.11). At the bottom, there are 'Previous' and 'Next' buttons, with a page indicator '2/10' in the center.

When the [Connection Type] option in the [Connection Status] is set to [Wired]. Wired connection options are displayed.

If the connection is successful, [Internet Connected] is displayed on the screen.

If the [IP Settings] option in [Wired Settings] is set to [Auto], this product will be automatically assigned an IP address from the local area network (LAN) via the wired connection. You may need to set the network connection manually depending on the network conditions. In this case, tap [Auto] to change to [Manual].

If you set the [IP Settings] option to [Manual], fill in the [IP address], [Subnet Mask], [Gateway], and [DNS] options manually.

The screenshot shows the 'Network' settings page with the 'Wired Setting' option selected. A green status bar at the top indicates 'Internet Connected'. Under the 'IP Setting' section, the 'Auto' toggle is turned on. The 'IP Setting' label is visible above the toggle.

## Wireless Network

**Network**

**Wireless Setting**

Internet Connected

**Wireless Connect**

SSID  
iptime\_etc

Encryption  
wpa2\_psk

Password  
Input password.

Connect

**IP Setting** Manual  SET

Enter the required fields \* for IP setting

IP Address \*  
192.168.0.70

Previous 2/11 Next

When the [Connection Type] option in the [Connection Status] is set to [Wireless]. Wireless connection options are displayed.

Tap the [SSID] field to display the SSID list. Select the SSID which your ESS is connected to and then tap [CONFIRM].

Select the encryption type from the [Encryption] option. And then input the password of the SSID in the [Password] field.

After entering all the fields, tap [Connect] to finish the wireless network connection.

If the connection is successful, [Internet Connected] is displayed on the screen.

If the [IP Settings] option in the [Wireless Settings] tab is set to [Auto], this product will be automatically assigned an IP address from a local area network (LAN) via wireless connection. You may need to set the network connection manually depending on the network conditions. In this case, tap [Auto] to change to [Manual].

If you set the [IP Settings] option to [Manual], fill in the [IP address], [Subnet Mask], [Gateway], and [DNS] options manually.

## Firmware Update

Firmware Update

Update Method  
Local

---

System information SCAN

### [Firmware Update]

This product must be upgraded to the latest firmware prior to setup.

Upgrade methods are provided as local or server options.

Firmware Update

Update Method  
Local

---

System information SCAN

	PMS : 1	PCS : 1	BMS : 1
	Device	Local	
PMS SW Version	1.0.3422	1.0.3422	
PCS SW Version	<span style="color: red;">LG P11</span> <span style="color: red;">01.00.01.00</span> <span style="color: red;">R37 21.16</span>	LG P11 01.00.01.00 R62 38.24	
BMS SW Version	<span style="color: red;">0107</span>	0113	

Update

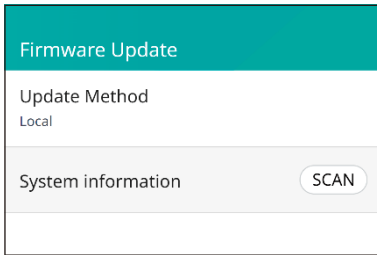
Previous

3 / 12

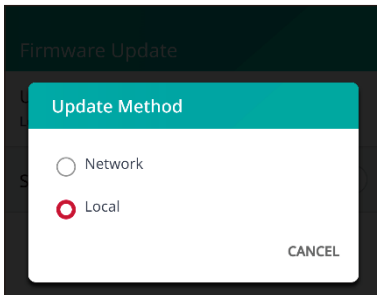
Next

### [Update Method > Local]

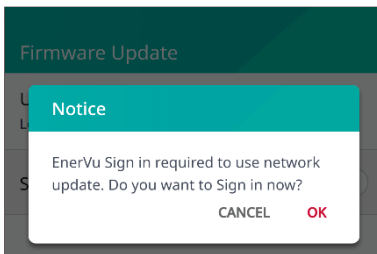
- 1 Press [SCAN] to retrieve the information.
- 2 The device version and local version of the system firmware are displayed.
- 3 Press [Update] to start the firmware update.

**[Update Method > Network]**

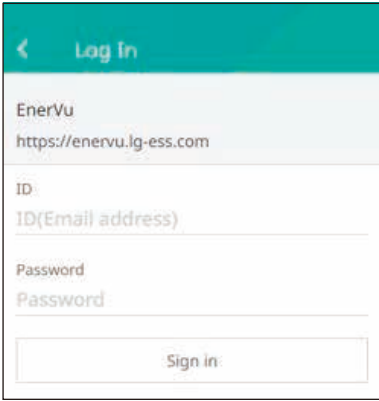
**1** Press [Update Method].



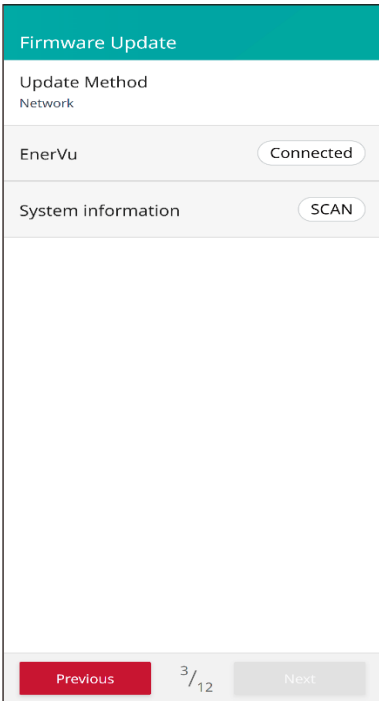
**2** Set the Update Method to [Network].



**3** EnerVu Sign-in is necessary to use network update.



4 Enter your EnerVu account, Press [Sign-in].



5 Then [Update Method] is changed to [Network] automatically.



**Firmware Update**

Update Method  
Network

---

EnerVu Connected

---

System information SCAN

---

	PMS : 1	PCS : 1	BMS : 1
		Device	Local
PMS SW Version		1.0.3422	1.0.3422
PCS SW Version		<span style="color: red;">LG P11</span> <span style="color: red;">01.00.01.00</span> <span style="color: red;">R37 21.16</span>	LG P11 01.00.01.00 R62 38.24
BMS SW Version		<span style="color: red;">0107</span>	0113

Update

---

Previous
3 / 12
Next

**[Update Method > Network]**

- 1** Press [SCAN] to retrieve the information.
- 2** The device version and server version of the system firmware are displayed.
- 3** Press [Update] to start the firmware update.

# Meter

Meter

Meter Start Auto

Model  
**Unknown**

Baudrate  
**0 bps**

Parity Bit  
**None**

Stop Bit  
**0 bit**

Previous 4/10 Next

## [Meter]

Press the [Start Auto] button to collect the connected energy meter information and set all the option values automatically.

## PV

PV
PV
Brand Input the name of PV Brand.
PV1
PV System Capacity 0.0 kWp
Azimuth angle 0 °
Tilt angle 0 °
PV2
PV System Capacity 0.0 kWp
Azimuth angle 0 °
Tilt angle 0 °
<a href="#">Previous</a> 5 / 10 <a href="#">Next</a>

[PV]

- 1 Input PV brand name.
- 2 Input PV capacity, azimuth, and tilt for PV 1.
- 3 Input PV capacity, azimuth, and tilt for PV 2.

## PCS

PCS

Feed in limitation  
100 %

Installation Date  
31.12.2022

▶ GRID

Previous 6/10 Next

### [PCS]

[Feed in limitation] and [Installation Date] options can be changed manually.

Set the options as described below.

- 1 Select the current value. The input menu appears on the screen.
- 2 Input the desired value.
- 3 Select [Save] to complete the settings.
- 4 Tap [Grid] to show more settings options for the PCS.

If the country selection is Portugal, it is possible to set the AC Power Limitation in the PCS Setting screen.

PCS

Feed in limitation  
100 %

AC Power Limitation  
Not Confirmed

Installation Date  
01.01.2023

▶ GRID

Previous 6/10 Next

< AC Power Limitation

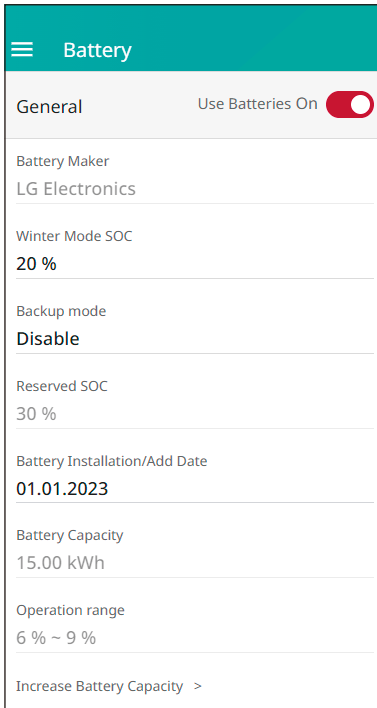
AC Power Limitation  
4000 W

If you don't install additional Energy Meter device,  
you have to limit AC Output Power Limitation under  
4kW.

**⚠ Caution!**  
Cannot modify the setting after confirmation.

Confirm

# Battery



## [Battery]

You can change the [Use Batteries] settings.

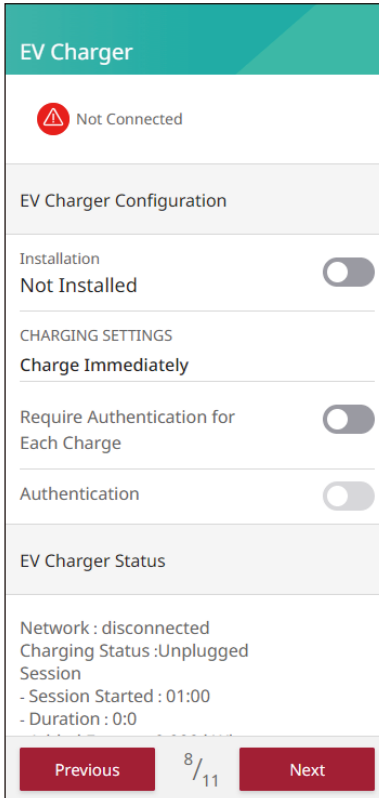
Tap the switch to set battery use [On] or [Off].

If the setting is set to [Off], generated energy will not charge the connected battery.

[Winter Mode SoC], [Backup mode], [Battery Installation Date], and [Reserved SoC] can be set manually.

- 1 Winter Mode SoC
  - During the set winter mode period, the battery will not discharge when below the set SoC.
- 2 Backup mode
  - Backup mode can be selected from among Disable, ATS Backup, or Backup Light.
  - **ATS Backup** : A mode that supplies power to the entire load of the ATS connector in the event of a power outage.
    - Power outage detection by ATS.
    - Supply 5 kW to household load within 3 seconds after ATS detection.
    - The battery must be charged when there is sufficient sunlight.
  - **Backup Light** : For users who have not installed ATS, it can be accessed through a separate output terminal on the PCS itself. 230 V single phase / generates 3 kW output (depending on battery capacity).
    - When solar power generation is possible, output is provided as a joint power generation source of PV + battery.
    - When solar power generation is not possible (night time, cloudy weather), output is provided only by batteries.
    - Backup Light & ATS Backup both available.
    - Power supply only when power outage is detected.
- 3 Reserved SoC
  - Reserved SoC can be set when either ATS backup or Backup Light is selected. Battery SoC can be set as high as the set SoC.
- 4 Operation range
  - This is the emergency charging range and is based on the Real Soc. When it reaches 6%, forced charging begins and charges until it reaches 9%.

## EV Charger



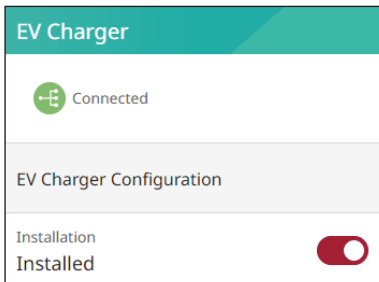
### [EV Charger]

[Precondition]

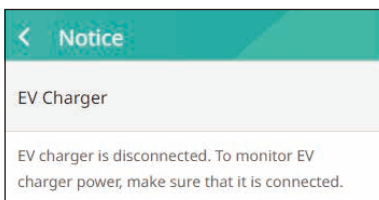
This product and EVC can be connected through LAN.

To install the EV Charger with LGE ESS, the LG ESS and EV Charger must be connected to the same network.

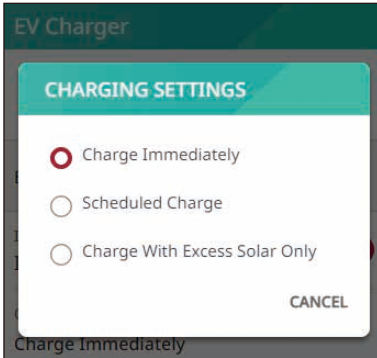
- 1 Installation
  - Press the [Installation] toggle button to connect the EV Charger.
  - It automatically locates and connects to an EVC on the same network, and when the connection is complete, the state icon changes to [Connected] and the toggle button changes too.



- 2 Uninstall
  - Press the [Installation] toggle button to uninstall the EV charger.



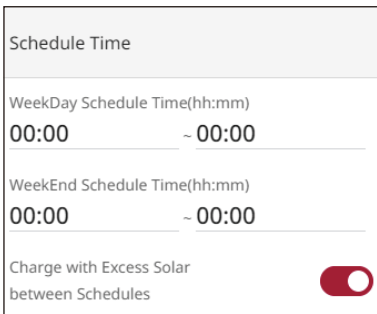
- 3 If no EVC device is connected, a notice will appear as a pop-up.



### [Configuration > Charging Settings]

#### 1 Charge Immediately

- Charging immediately begins using all available energy sources.

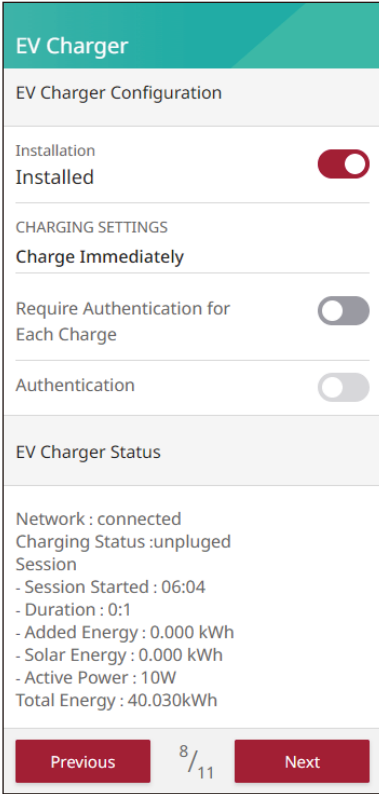


#### 2 Scheduled Charge

- You can set the desired time on weekdays or weekends, and charging begins using all available sources during the set time.
- If [Charge with Excess Solar between Schedules] is enabled, charging is performed if Excess Solar is present outside of the set time.

#### 3 Charge With Excess Solar Only

- Charging is performed if Excess Solar is present outside of the set time.

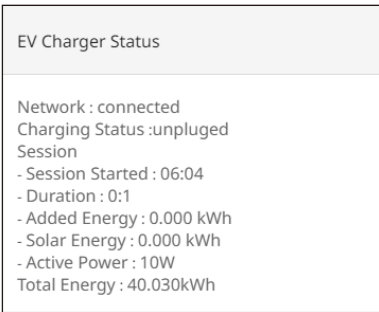


**[Configuration > Require Authentication for Each Charge]**

If the toggle button is enabled, an authentication process is required.

Authentication is possible with the [Authentication] toggle button or RFID registered on the EV Charger.

\*When the toggle button is disabled, charging occurs immediately without authentication.




**[Status]**

You can see the Network connection status and Charger Status.



## Air-to-Water Heat Pump

Air to Water Heat Pump


Disconnected

Interface

Installation  
Not Installed

Protocol
LG MODBUS

ON Command

Battery SOC(%)
90

Surplus Power(kW)
3.00

Wait Time(min)
1

Previous
9 / 11
Next


### [Air-to-Water Heat Pump]

[Precondition]

This product and AWHP can be connected through RS485. To install the AWHP, this product and AWHP must be connected with twisted wire.

- 1 Installation
  - Press the [Installation] toggle button to connect to an AWHP.
  - It automatically locates and connects to an AWHP, and when the connection is complete, the state icon changes to Connected and the toggle button changes too.

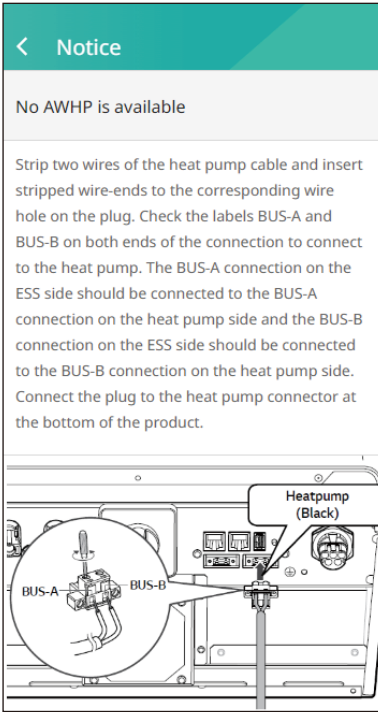
Air to Water Heat Pump


Connected
Normal 0

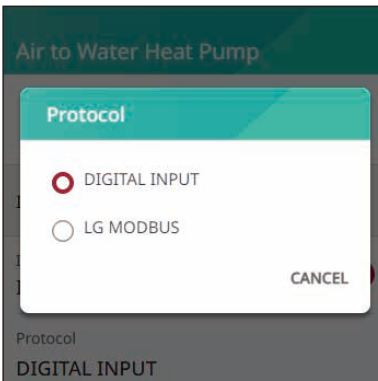
Interface

Installation  
Installed

- 2 Uninstall
  - Press the [Installation] toggle button to uninstall the AWHP.



3 If no AWHP device is connected then a notice will pop up.



[Air-to-Water Heat Pump > Protocol]

1 This product supports two types of AWHP: LG Modbus and DIGITAL INPUT (SG Ready), and they are automatically detected and connected by tapping the Install button.

**[Air-to-Water Heat Pump]**

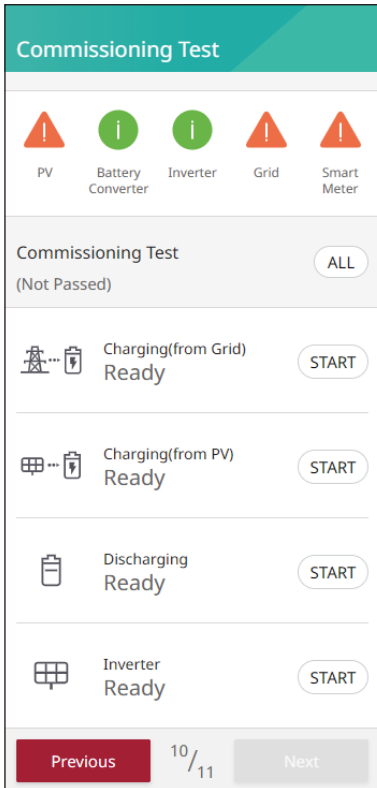
- 1 LG Modbus : There are ON Commend, ON Recommended, Energy Saving, Super Energy Saving, and Normal modes; additionally, Battery SoC, Surplus Power, and Wait Time can be set.

ON Commend	Energy Saving
Battery SOC(%) 90	Battery SOC(%) 40
Surplus Power(kW) 3.00	Surplus Power(kW) 0.75
Wait Time(min) 1	Wait Time(min) 5
ON Recommend	Super Energy Saving
Battery SOC(%) 70	Battery SOC(%) 20
Surplus Power(kW) 1.50	Surplus Power(kW) 0.25
Wait Time(min) 5	Wait Time(min) 10

<b>SG4 (ON Commend)</b>		
Battery SOC(%)	90	
Surplus Power(kW)	3.00	
Wait Time(min)	1	
<b>SG3 (ON Recommend)</b>		
Battery SOC(%)	70	
Surplus Power(kW)	1.50	
Wait Time(min)	5	
<a href="#">Previous</a>	9 / 11	<a href="#">Next</a>

**2** DIGITAL INPUT (SG Ready) : There are SG4 (ON Commend), SC3 (ON Recommended), and Normal; additionally, Battery SoC, Surplus Power, and Wait Time can be set.

## Commissioning Test



### [Commissioning Test]

You should perform 4 operating tests. To start the test, tap [ALL] to start all the operating test automatically.

You can also run tests separately by tapping [START] on each test.

It is recommended to run all the tests at once using the [ALL] button rather than running the tests separately.



#### Charging (from Grid) :

The operating test for battery charging from the grid.



#### Charging (from PV) :

The operating test for battery charging from PV.



#### Discharging:

The operating test for battery discharging to the grid.



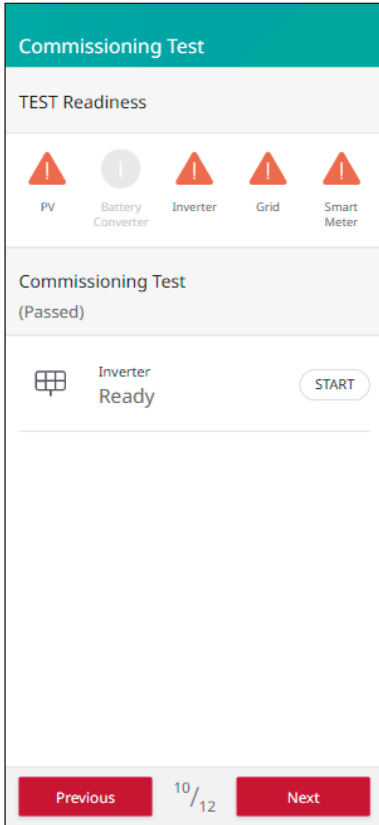
#### Inverter :

The operating test for converting PV's DC power to AC power.

The result is displayed when each test is completed. When there is no problem with the test, [Success] is displayed. When [Fail] is displayed, tap each test result to display detailed information. Check and resolve any error, referring to the error codes in the information, and perform the test again. For information on the error codes, refer to 'Error Codes and Messages'

### INFO

- The operating test is a step to verify the PCS status for solar power generation and battery charging / discharging.
- Users are recommended to proceed when the battery SoC is more than 20 % and the solar radiation amount is sufficient.



### [Commissioning Test]

You should perform the Inverter test. You can also run tests by tapping [START] for test.



#### **Inverter :**

The operating test for converting the PV's DC power to AC power.

The result is displayed when the test is completed. When there is no problem with the test, [Success] is displayed.

When [Fail] is displayed, tap the test result to display detailed information. Check and resolve any error, referring to the error codes in the information, and perform the test again. For information on the error codes, refer to 'Error Codes and Messages'.

## CEI 0-21 (Italy Only)

CEI 0-21
SPI
SPI <b>None</b>
Operation Mode
Operation Mode <b>Final</b>
<div style="display: flex; justify-content: space-between; align-items: center;"> <span>Previous</span> <span>11 / 12</span> <span>Next</span> </div>

### [SPI Self-Test]

Inverters of  $\leq 10$  kW supplied to the electrical grid according to Italian CEI 0-21 must perform a self-test.

During the self-test, the inverter checks the response time for overvoltage, undervoltage, overfrequency, and underfrequency.

The self-test changes the upper and lower trip limit values for each protection function for frequency monitoring and voltage monitoring.

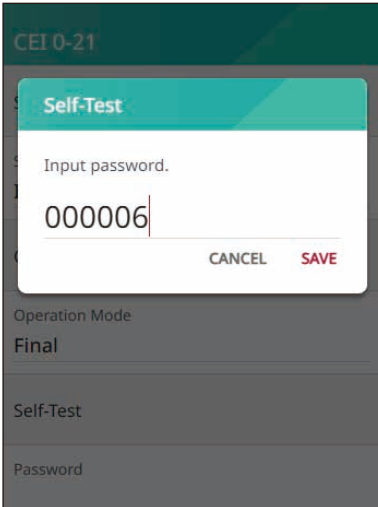
If the measurement exceeds the allowed trip limit, the setup wizard cannot be completed and the inverter will not be usable.

After the self-test is complete, if successful, you can enable ESS operation.

- Requirements :  
Install the inverter, connect the electrical components, and have sufficient solar radiation.

CEI 0-21
SPI
<input checked="" type="radio"/> None <input type="radio"/> Internal <input type="radio"/> External
CANCEL

### 1 SPI Mode Internal mode settings



2 Enter Self-Test Password (000006)

SPI Test	ALL
TWO-L O.V (59.S2) Ready	START
ONE-L O.V (59.S1) Ready	START
TWO-L L.V (27.S2) Ready	START
ONE-L L.V (27.S1) Ready	START
TWO-L O.F (81>.S2) Ready	START
ONE-L O.F (81>.S1) Ready	START
TWO-L L.F (81<.S2) Ready	START
ONE-L L.F (81<.S1) Ready	START

3 Select test items (ALL)

Perform 8 items sequentially by pressing the ALL button, or Items can be tested individually by pressing the START button.

- Items : overvoltage 2, overvoltage 1, undervoltage 2, undervoltage 1, overfrequency 2, overfrequency 1, underfrequency 2, underfrequency 1



SPI Test	STOP
TWO-L O.V (59.S2) Ready	
ONE-L O.V (59.S1) Ready	
TWO-L L.V (27.S2) Ready	
ONE-L L.V (27.S1) Ready	
TWO-L O.F (81>.S2) Ready	
ONE-L O.F (81>.S1) Ready	
TWO-L L.F (81<.S2) Ready	
ONE-L L.F (81<.S1) Ready	

**4** Progress and Stop

- Indicates that the selected test item is being tested.
- The item test can be interrupted with the Stop button.

SPI Test	ALL	STOP
TWO-L O.V (59.S2) Ready		

**5** Individual Progress and Stop

- Indicates that the selected test item is being tested.
- The item test can be interrupted with the Stop button.

[Result SPI Self-Test] Example

<p>TWO-L O.V (59.S2) Success <span style="float:right">START</span></p> <table border="1"> <tr><td>SET</td><td>264.5V 200ms</td></tr> <tr><td>MEASURE</td><td>5.2V</td></tr> <tr><td>TEST</td><td>5.23V 205ms</td></tr> </table>	SET	264.5V 200ms	MEASURE	5.2V	TEST	5.23V 205ms	<p>TWO-L O.F (81&gt;.S2) Success <span style="float:right">START</span></p> <table border="1"> <tr><td>SET</td><td>51.5Hz 1000ms</td></tr> <tr><td>MEASURE</td><td>49.99Hz</td></tr> <tr><td>TEST</td><td>49.99Hz 1003ms</td></tr> </table>	SET	51.5Hz 1000ms	MEASURE	49.99Hz	TEST	49.99Hz 1003ms
SET	264.5V 200ms												
MEASURE	5.2V												
TEST	5.23V 205ms												
SET	51.5Hz 1000ms												
MEASURE	49.99Hz												
TEST	49.99Hz 1003ms												
<p>ONE-L O.V (59.S1) Success <span style="float:right">START</span></p> <table border="1"> <tr><td>SET</td><td>253V 2000ms</td></tr> <tr><td>MEASURE</td><td>5.2V</td></tr> <tr><td>TEST</td><td>5.24V 2002ms</td></tr> </table>	SET	253V 2000ms	MEASURE	5.2V	TEST	5.24V 2002ms	<p>ONE-L O.F (81&gt;.S1) Success <span style="float:right">START</span></p> <table border="1"> <tr><td>SET</td><td>50.2Hz 100ms</td></tr> <tr><td>MEASURE</td><td>49.99Hz</td></tr> <tr><td>TEST</td><td>49.99Hz 102ms</td></tr> </table>	SET	50.2Hz 100ms	MEASURE	49.99Hz	TEST	49.99Hz 102ms
SET	253V 2000ms												
MEASURE	5.2V												
TEST	5.24V 2002ms												
SET	50.2Hz 100ms												
MEASURE	49.99Hz												
TEST	49.99Hz 102ms												
<p>TWO-L L.V (27.S2) Success <span style="float:right">START</span></p> <table border="1"> <tr><td>SET</td><td>34.5V 200ms</td></tr> <tr><td>MEASURE</td><td>5.2V</td></tr> <tr><td>TEST</td><td>5.23V 197ms</td></tr> </table>	SET	34.5V 200ms	MEASURE	5.2V	TEST	5.23V 197ms	<p>TWO-L L.F (81&lt;.S2) Success <span style="float:right">START</span></p> <table border="1"> <tr><td>SET</td><td>47.5Hz 4000ms</td></tr> <tr><td>MEASURE</td><td>49.99Hz</td></tr> <tr><td>TEST</td><td>49.99Hz 3997ms</td></tr> </table>	SET	47.5Hz 4000ms	MEASURE	49.99Hz	TEST	49.99Hz 3997ms
SET	34.5V 200ms												
MEASURE	5.2V												
TEST	5.23V 197ms												
SET	47.5Hz 4000ms												
MEASURE	49.99Hz												
TEST	49.99Hz 3997ms												
<p>ONE-L L.V (27.S1) Success <span style="float:right">START</span></p> <table border="1"> <tr><td>SET</td><td>195.5V 1500ms</td></tr> <tr><td>MEASURE</td><td>5.2V</td></tr> <tr><td>TEST</td><td>5.24V 1497ms</td></tr> </table>	SET	195.5V 1500ms	MEASURE	5.2V	TEST	5.24V 1497ms	<p>ONE-L L.F (81&lt;.S1) Success <span style="float:right">START</span></p> <table border="1"> <tr><td>SET</td><td>49.8Hz 100ms</td></tr> <tr><td>MEASURE</td><td>49.99Hz</td></tr> <tr><td>TEST</td><td>49.99Hz 95ms</td></tr> </table>	SET	49.8Hz 100ms	MEASURE	49.99Hz	TEST	49.99Hz 95ms
SET	195.5V 1500ms												
MEASURE	5.2V												
TEST	5.24V 1497ms												
SET	49.8Hz 100ms												
MEASURE	49.99Hz												
TEST	49.99Hz 95ms												

Voltage

- Items: overvoltage 2, overvoltage 1, undervoltage 2, undervoltage 1

Frequency

- Items: overfrequency 2, overfrequency 1, underfrequency 2, underfrequency 1

CEI 0-21

SPI Report

SPI  
Internal

Operation Mode

Operation Mode  
Final

Self-Test

Password  
\*\*\*\*\*

SPI Test ALL

TWO-L O.V (59.S2)  
**Success** START

SET      0V 0ms

Previous 11 / 12 Next

**[Report]**

When all items are tested and the result is successful, a Report button appears in the upper right corner.

A login procedure is required to report the test results to the EnerVu server.

< Log In

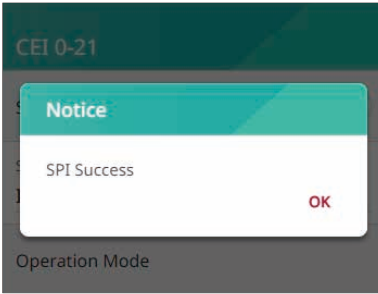
**Notice**

Log In Success OK

Password  
\*\*\*\*\*

Sign In

- 1 If you press the Report button, you can sign in with your installer account.



- 2 When you press the Report button after successfully logging in, the self-test results are reported to the server.

## Summary

Summary	
<b>Country</b> - Country : Italy - Grid Code : Italy - Time Zone : UTC +01:00 Rome	Edit >
<b>Network</b> - Type : Wired - Connection Type : Manual - Status : Not Connected	Edit >
<b>Firmware</b> - PMS SW Version : 1.0.1941 - PCS SW Version : LG P11 01.00.01.00 R8 4.4 - BMS SW Version : 0101	Edit >
<b>Meter</b> - Model : Unknown	Edit >
<b>PV1</b> - PV1 Capacity : 1.1 kWp - PV2 Capacity : 0.0 kWp	Edit >
<b>PCS</b> - Feed in limitation : 100 %	Edit >
<b>Battery</b>	Edit >
<input type="button" value="Confirm"/>	

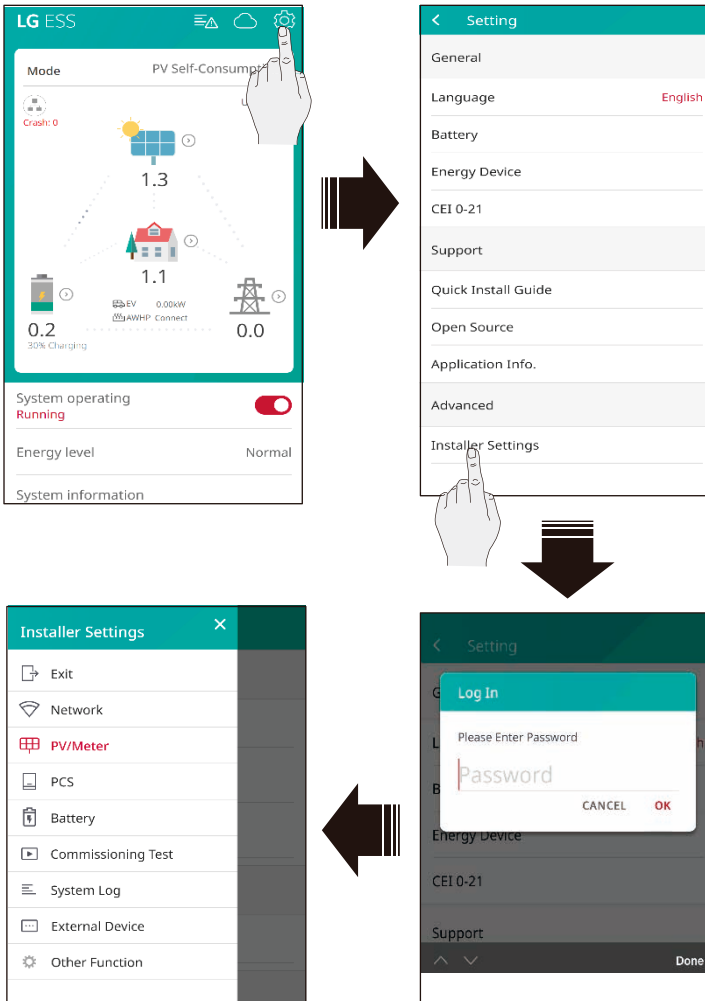
### [Summary]

This is the last section of the settings. Before operating the system, check all of the settings on the [Summary] display.

## Entering the [Installer Settings] screen

To enter the [Installer Settings] menu on your mobile device, follow the instructions described below.

- 1 Tap [⚙️] on the main screen. The [Settings] screen appears.
- 2 Tap the [Installer Settings] option to display the password input screen.
- 3 Enter the installer password and tap [OK] to enter the [Installer Settings] screen.  
The initial password is the case-insensitive registration number printed on the outside of the PCS. It is recommended to change the password after entering the initial password. See '[Other function] settings' for more information on [Password Change] options.



## Installer Settings

### [PV/Meter] Settings

You can check the PV and meter information.

PV/Meter	
Country	
Country	Italy
Grid Code	Italy
Time Zone	UTC +01:00 Rome
PV	
Brand	LG
PV1	
PV System Capacity	4.5 kWp
Azimuth angle	0°
Tilt angle	0°
PV2	

Tap [PV/Meter] in [Installer Settings]. PV and energy meter information is displayed.

#### [PV], [PV1], [PV2]

- 1 Input PV brand name.
- 2 Input PV Capacity, azimuth, and tilt for PV 1.
- 3 Input PV capacity, azimuth, and tilt for PV 2.

#### [Meter]

Press the [Start Auto] button to collect the connected energy meter information and set all the option values automatically.

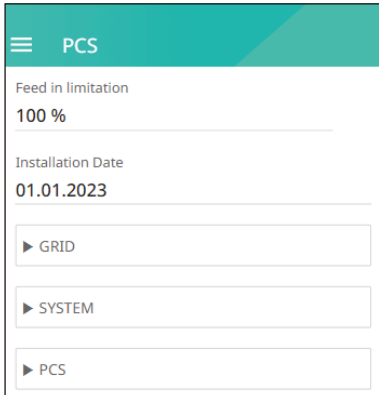


#### INFO

- The [PV System Capacity] options for [PV1] and [PV2] are mandatory for the operating test.

## [PCS] Settings

You can set or check the PCS settings and status.



Select [PCS] on [Installer Settings]. PCS information is displayed.

### [PCS]

All the settings options and values for PCS information are displayed.

[Feed in limitation], and [Installation Date] options can be changed manually.

Set the options as described below.

- 1 Select the current value. The input menu appears on the screen.
- 2 Input the desired value.
- 3 Select [Save] to complete the settings.

Tap [Grid], [System], or [PCS] to show more settings options for the PCS.

### INFO

- The values on the [PCS] screen should not be edited by the user. This may cause a system malfunction if the values are changed.
- Viewable information names are listed below -  
Stable Volt Mode, fixed cosPhi Type, fixed cosPhi Setpoint, cosPhi(P) Type, cosPhi(P) Start, cosPhi(P) End, cosPhi(P) PowerStart, cosPhi(P) PowerEnd, fixedQ Reactive Setpoint, Q(U) Xa, Q(U) Xb, Q(U) Xc, Q(U) Xd, Q(U) Ya, Q(U) Yb, Q(U) Yc, Q(U) Yd, EV Meter Enable, PV Settings.
- When changing the option values in the [PCS] menu, refer to '[Others](#)' for more information.



## [Network] Settings

Network

Connection Status Wired Setting

Web server data upload Test

Connection Type Wired  
manual Wireless

IP Address  
192.168.0.10

Subnet Mask  
255.255.255.0

Gateway

Select [Network] in [Installer Settings]. The current status of the network connection is displayed.

Tap [Test] to check the server connection.

## Wired Network Settings

Network

Connection Status Wired Setting

Internet Connected

IP Setting Manual SET

Enter the required fields \* for IP setting

IP Address \*  
192.168.0.10

Subnet Mask \*  
255.255.255.0

Gateway \*  
192.168.0.1

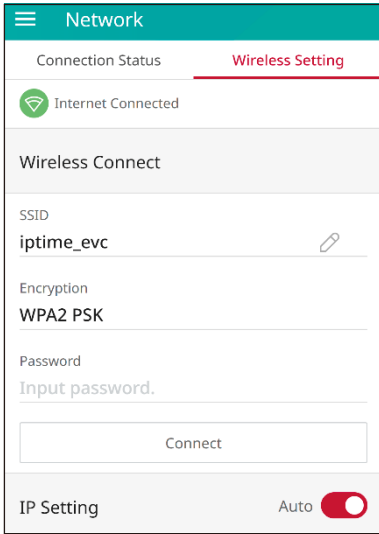
DNS \*  
165.186.85.11

When the [Connection Type] option in the [Connection Status] is set to [Wired], Wired connection options are displayed.

If the [IP Settings] option in the [Wired settings] tab is set to [Auto], the system will automatically be assigned an IP address from a local area network (LAN) via the wired connection. You may need to set the network connection manually depending on the network conditions. In this case, tap [Auto] to change to [Manual].

If you set the [IP Settings] option to [Manual], fill in [IP address], [Subnet Mask], [Gateway], and [DNS] options manually.

## Wireless Network Settings



When the [Connection Type] option in the [Connection Status] is set to [Wireless], Wireless connection options are displayed.

Tap the [SSID] field to display the SSID list. Select the SSID which your ESS is connected to and then tap [CONNECT].

Select the encryption type on the [Encryption] option. Then input the password of the SSID in the [Password] field.

After filling in all the fields, tap [Connect] to finish the wireless network connection.

If the connection is successful, [Internet Connected] will be displayed on the screen.

If the [IP Settings] option in the [Wireless Settings] tab is set to [Auto], this product will be automatically assigned an IP address from a local area network (LAN) via the wireless connection. You may need to set the network connection manually depending on the network conditions. In this case, tap [Auto] to change to [Manual].

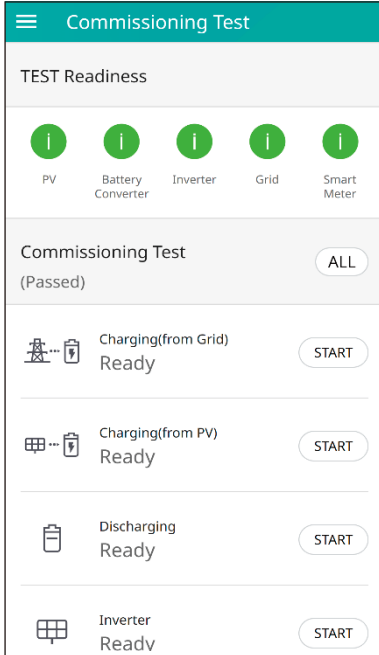
If you set the [IP Settings] option to [Manual], fill in [IP address], [Subnet Mask], [Gateway], and [DNS] options manually.

 INFO

- Notes on Internet Connection:
  - Many network connection problems during setup can often be fixed by resetting the router or modem. After connecting the product to the home network, quickly power off and/or disconnect the power cable of the home network router or cable modem. Then power on and/or connect the power cable again.
  - Depending on the internet service provider (ISP), the number of devices that can receive internet service may be limited by the applicable terms of service. For details, contact your ISP.
  - Our company is not responsible for any product malfunction and/or internet connection failure caused by communication errors/malfunctions associated with your broadband internet connection, or other connected equipment.
  - Some internet connection operations may not be possible due to certain restrictions set by the internet service provider (ISP) that supplies your broadband Internet connection.
  - A 10 Base-T or 100 Base-TX LAN port is required for a wired connection to this product. If your internet service does not allow for such a connection, you will not be able to connect this product.
  - A DSL modem is required to use DSL service and a cable modem is required to use cable modem service. Depending on the access method and subscriber agreement with your ISP, you may not be able to use the internet connection feature contained in this product or you may be limited to the number of devices you can connect at the same time. (If your ISP limits your subscription to one device, this product may not be allowed to connect when a PC has been already connected.)
  - The use of a router may not be allowed or its usage may be limited depending on the policies and restrictions of your ISP. For details, contact your ISP directly.
  - Turn off all unused network equipment in your local home network. Some devices may generate network traffic.
  - For the purpose of better wireless transmission, install the PCS as close as possible to the access point.
  - In some instances, placing the access point at least 0.45 m above the floor may improve the reception.
  - When using a wireless network connection, remove all obstacles between the PCS and the access point for better transmission.
  - The reception quality over wireless depends on many factors, such as type of access point, distance between the PCS and the access point, and the location of the PCS.

## [Commissioning Test] Settings

This is the last section of mandatory settings. Before operating this product, an [Operating Test] must be done to check whether all the systems are ready to run. If the [Operating Test] is not run, this product will not work.



Tab [Operating Test] on [Installer Settings]. The operating test menu is displayed.

You should perform 4 operating tests. To start the test, tap [ALL] to start all the operating tests automatically.

You can also run tests separately by tapping [START] on each test.

It is recommended to run all the tests at once using the [ALL] button rather than separately.



### Charging (from Grid) :

The operating test for battery charging from the grid.



### Charging (from PV) :

The operating test for battery charging from PV.



### Discharging:

The operating test for battery discharging to the grid.



### Inverter:

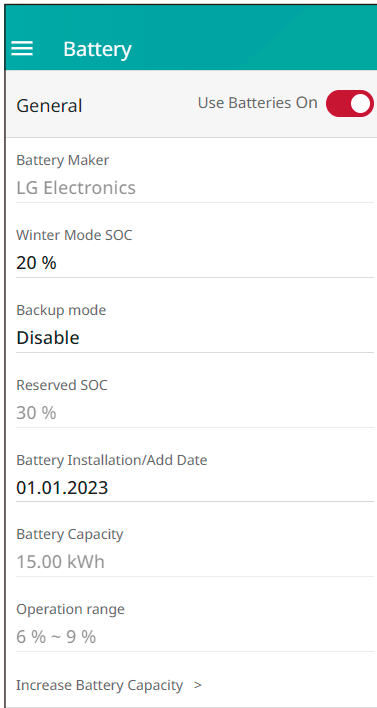
The operating test for converting PV's DC power to AC power.

The result is displayed when each test is completed. When there is no problem with the test, [Success] is displayed. When [Fail] is displayed, tap each test result to display detailed information. Check and resolve any errors, referring to the error codes in the information, and perform the test again. For information on errors code, refer to 'Error Codes and Messages'

### INFO

- The operating test is a step to verify the PCS status for solar power generation and battery charging / discharging.
- Users are recommended to proceed when the battery SoC is more than 20 % and the solar radiation amount is sufficient.

## [Battery] Settings



### [Battery]

You can change the [Use Batteries] settings.

Tap the switch to set battery use [On] or [Off].

If the setting is set to [Off], generated energy will not charge the connected battery.

[Winter Mode SoC], [Backup mode], [Battery Installation Date], and [Reserved SoC] can be set manually.

- 1 Winter Mode SoC
  - During the set winter mode period, the battery will not be discharged below the set SoC.
- 2 Backup mode
  - Backup mode can be selected from among Disable, ATS Backup, or Backup Light.
  - **ATS Backup** : A mode that supplies power to the entire load of the ATS connector in the event of a power outage.
    - Power outage detection by ATS.
    - Supply 5 kW to household load within 3 seconds after ATS detection.
    - The battery must be charged when there is sufficient sunlight.
  - **Backup Light** : For users who have not installed ATS, it can be accessed through a separate output terminal on the PCS itself. 230 V single phase / generates 3 kW output (depending on battery capacity).
    - When solar power generation is possible, output is provided as a joint power generation source of PV + battery.
    - When solar power generation is not possible (night time, cloudy weather), output is provided only by batteries.
    - Backup Light & ATS Backup both available.
    - Power supply only when power outage is detected.
- 3 Reserved SoC
  - Reserved SoC can be set when either ATS backup or Backup Light is selected. Battery SoC can be set as high as the set SoC.
- 4 Operation range
  - This is the emergency charging range and is based on the Real Soc. When it reaches 6%, forced charging begins and charges until it reaches 9%.



## CAUTION

- If the [Use Batteries] setting is set to off or the system is turned off for a long period of time, the battery can be completely discharged and cannot be used anymore. Be sure not to leave the battery dormant for a long period of time.

## Increase Battery Capacity

← Increase Battery Capacity

**Additional Battery Pack 1**

Battery Pack Serial Number

---

Additional Battery Voltage For Battery 1

**0**

Confirm Battery Voltage 1

---

Matching the voltage could take a while depending on the total battery capacity

- Battery 1 (A)
- Unit Status : Normal
- Target Voltage : 104.00v
- Current Voltage : 89.60v
- Target Voltage Low : 95.20v
- Target Voltage High : 112.00v
- Unit Battery Current : 12.0A
- Unit Target Power : 1234w

Match

This menu is used when a 2Pack user adds the battery expansion function to 3Pack.

Enter the Pack Serial Number and voltage information of the battery you want to add.

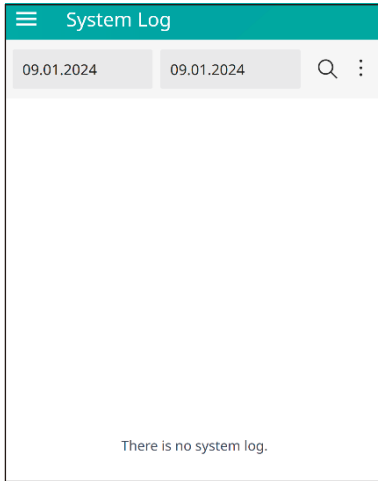
Afterwards, when you press the Match button, the voltage of the battery you want to add will match the voltage of the battery you are using through charging or discharging.

When the battery voltage is matched, the matching process automatically stops, and the ESS can then be used on an expanded (3pack) basis.

## [System Log]

You can see the list of mode changes, system errors, and the system warning log.

Refer to 'Error Codes and Messages' for more information about error codes, messages, and solutions.



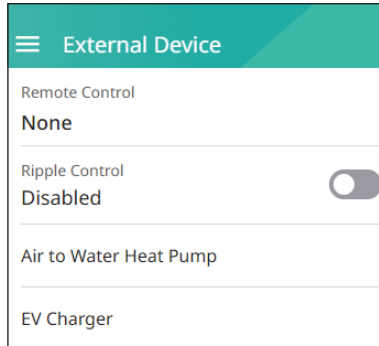
Tap [System Log] on [Installer Settings]. This displays a list of all notices that have occurred over certain period.

Set start date and end date and then select [Search] to display the list of notices during the selected period.



## [External Device] Settings

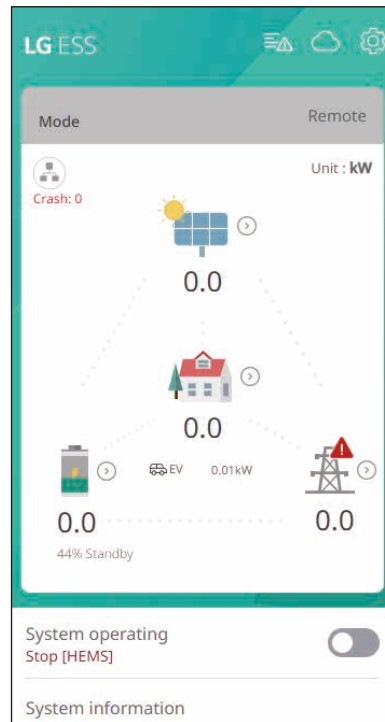
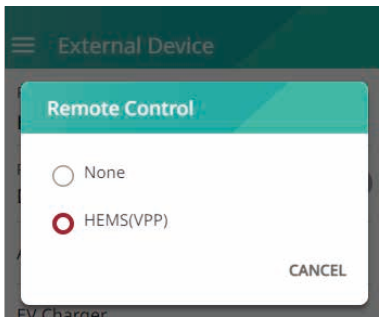
Select [External Device] on [Installer Settings] to [Remote Control], [Ripple Control], [Air-to-Water Heat Pump], and [EV charger] options.



## [Remote Control]

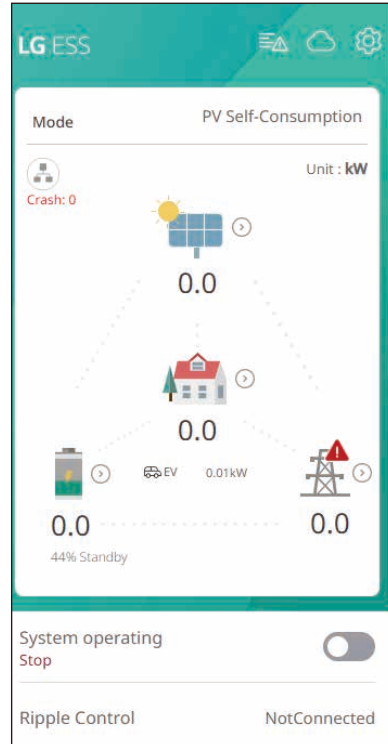
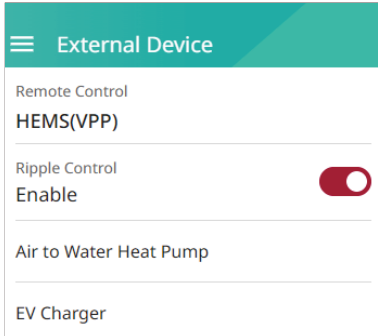
You can Select HEMS (VPP) mode. Then ESS is controlled by a VPP provider.

When you select remote mode, you can see that it operates in remote mode on the home screen.



## [Ripple Control]

You can enable Ripple Control. Then ESS Rated Output power is controlled by a Ripple Control Receiver. When you enable Ripple Control, you can see that it operates in Ripple Control on the home screen.



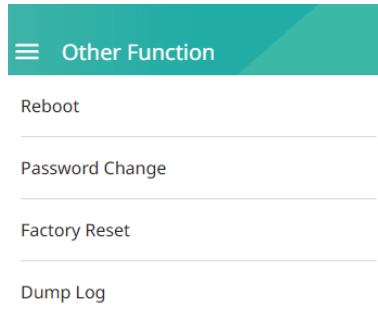
## [Air-to-Water Heat Pump]

## [EV Charger]

For [Air-to-Water Heat Pump](#) and [EV Charger](#), please refer to the Setup Wizard Page.

## [Other function] Settings

Select [Other Function] on [Installer Settings] for [Reboot], [Password Change], [Factory Reset], and [Dump Log] options.



### [Reboot]

Select [Reboot] to reboot the system.

### [Password Change]

Select [Password Change] on [Installer Settings]. The [Change Password] menu is displayed.

Enter the new password in the [New Password] and [Password Check] field. And then select [Change Password] to complete the password change.

### [Factory Reset]

Select [Factory Reset] to set all the system settings to their default. All the settings and system logs will be deleted after resetting.

### [Dump Log]

You can save the system log file to a USB memory stick with this option. Be sure to check whether any files that may affect the system are stored on the memory stick before inserting them.

### INFO

- If you lose your password, please contact a service team.

## About the Main Screen

The main screen displays and indicates the current ESS status in the ESS status menu area. And you can check several settings and information in the ESS setting menu and ESS Information menu areas.

**EnerVu web page link**

**ESS Setting Menu**

- Language
- Battery
- Energy Device
- CEI 0-21
- Quick Install Guide
- Open Source
- Application Information
- Installer Settings

**ESS Info**

- Individual PV
- Individual Battery

**ESS Status Menu**

- Load
- Battery
- Energy Device
- PV
- Grid
- Energy Overview
- Notice List
- System Operating

**ESS Information Menu**

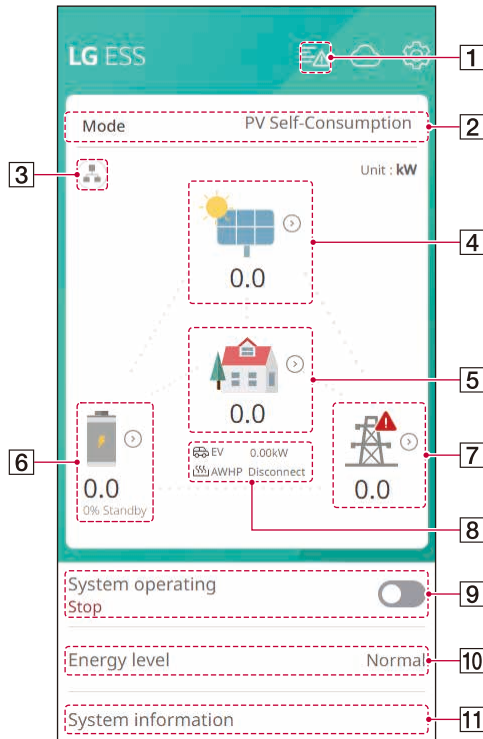
- Energy Level
- System Information

The screenshot shows the LG ESS main screen with the following details:

- Header:** LG ESS logo and a gear icon for settings.
- Mode:** Individual PV (indicated by a house icon).
- PV Self-Consumption:** 0.0 kW (Unit: kW).
- Energy Flow:**
  - PV: 0.0 kW
  - House: 0.0 kW
  - Battery: 0.0 kW (44% Standby)
  - Grid: 0.0 kW
- System Status:** System operating (Running) with a red toggle switch.
- Energy level:** Normal.
- System information:** Accessible via a menu icon.

## ESS Status Menu

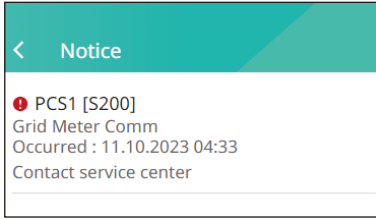
The main screen displays and indicates the current ESS status briefly. When you select an area indicated above, it displays detailed information.



### INFO

- The displayed values are not exact values. The values may differ from actual values.
- Please turn on the AP again, if there is a problem during connection with the AP.

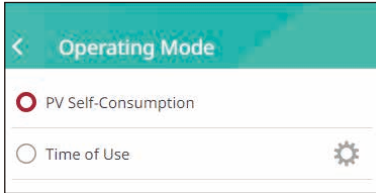
1



Displays details about the system status.

When an error has occurred, the error code, time, and date are displayed on the list.


2



Displays the operation mode of the system.

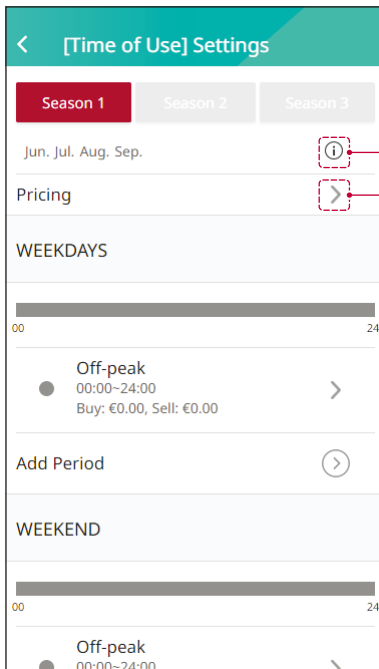
The Operation modes are displayed on the list.

If you select Time of Use, you can input more details.

Please press [  ] button.

## [Time of Use] Settings

### 1. Season and pricing



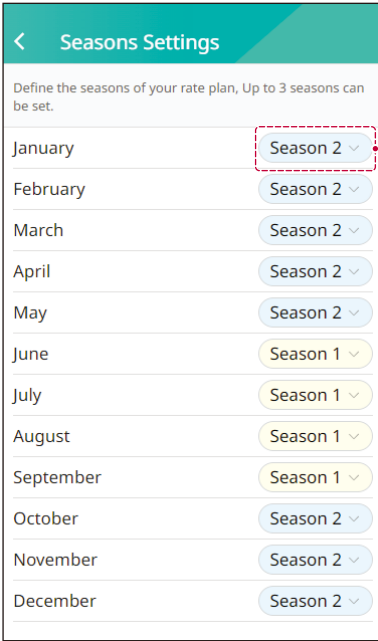
You can change seasons and prices.

Under the Season button, you will see the selected month.

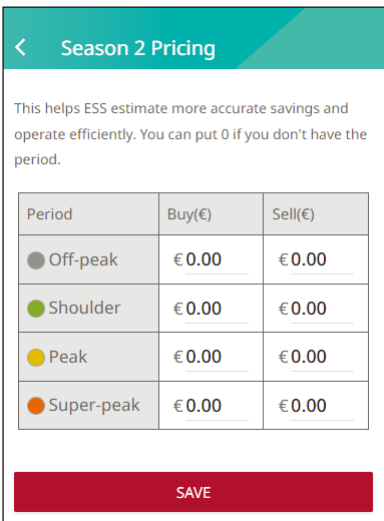
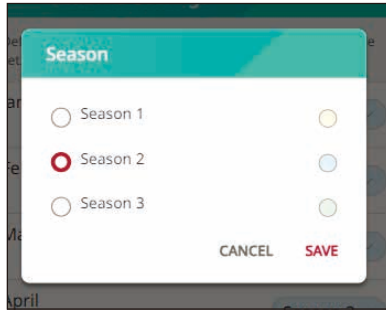
Tap this to change the month of the season.

Tap this to change the pricing.

Please see the next page for detailed information.



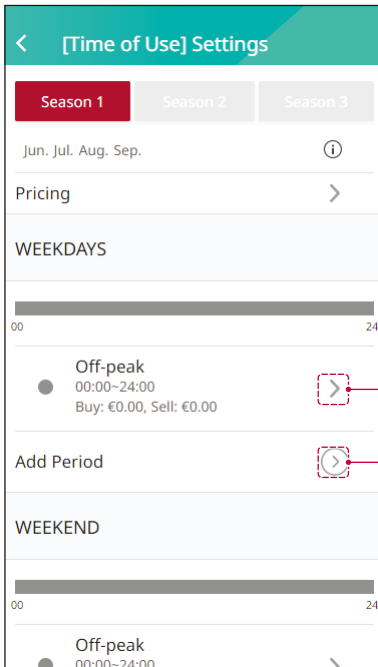
Displays the season corresponding to the month. Change and save the season.



Enter the price for each period, and press the SAVE button.



## 2. Edit and Add Period

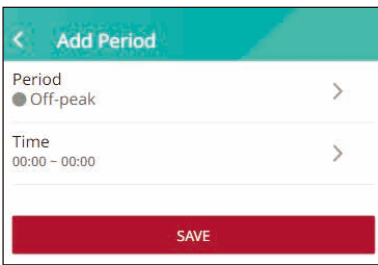
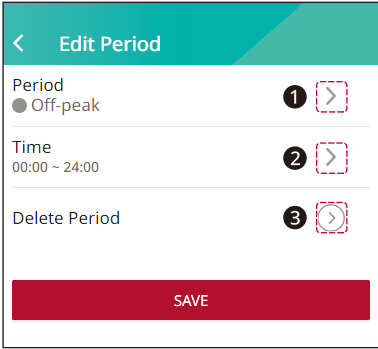


You can edit and add periods.

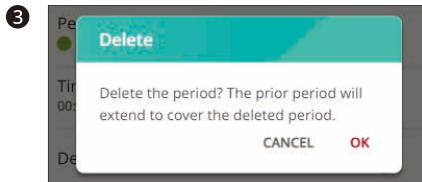
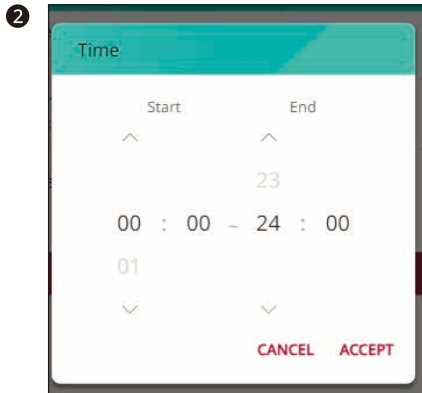
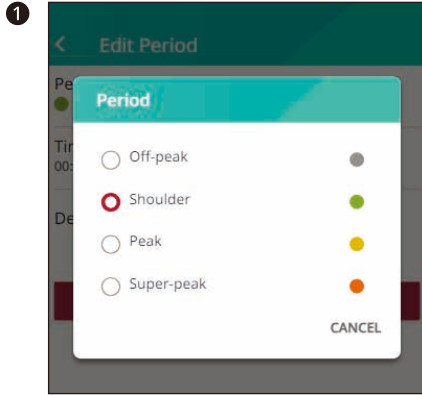
Tap this to edit the periods.

Tap this to add the periods.

Please see the next page for detailed information.

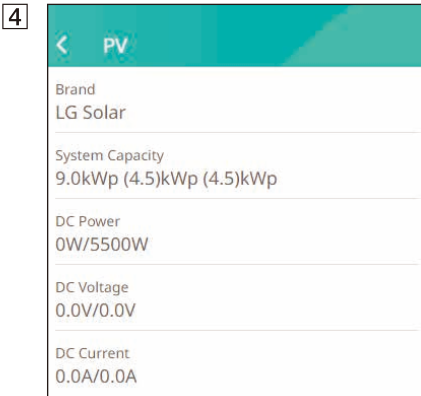
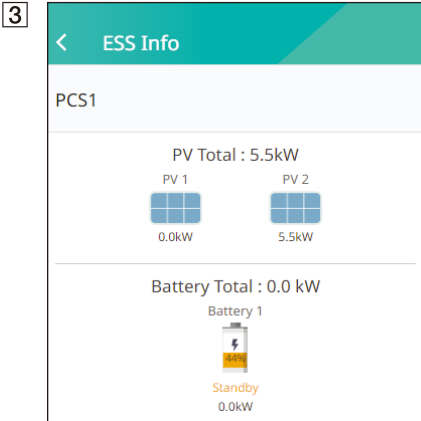


Change the period and time to save it.



## [ESS Info]

Displays the current PV power generation and battery status.



Displays the generating status of the connected PV briefly. The status values are the sum of PV1 and PV2.

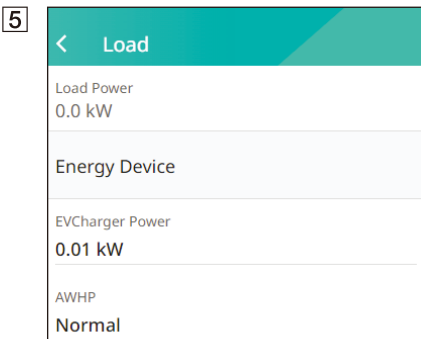
**Brand** : PV Manufacturer (Default : LGE)

**System Capacity** : PV capability

**DC Power** : Current PV power

**DC Voltage** : Current PV voltage

**DC Current** : Current PV electric current



Displays detailed status of energy consumed in the household.

**Load Power** : Current power consumed in the household.

**Energy Device**

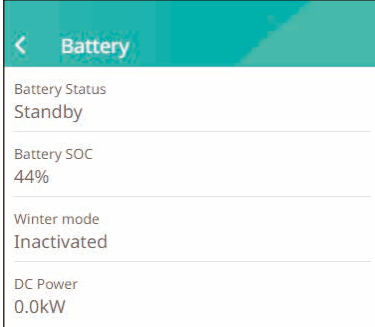
**EVCharger Power** : Current Power consumed for EV.

**AWHP** : AWHP connectivity and ESS energy level indication.

 **INFO**

- Energy Level is displayed only when the EV Charger and AWHP are installed and the monitoring option is enabled.

6



Displays the charging and discharging status of the battery briefly.

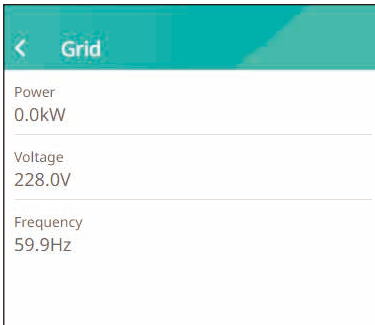
**Battery Status** : Charging / Discharging / Standby

**Battery SoC** : Current SoC (state of charge) level

**Winter Mode** : Shows winter mode status.

**DC Power** : Current output power from the battery

7



Displays the current status of the power grid.

**Power** : Current grid power

**Voltage** : Current grid voltage

**Frequency** : Current grid frequency

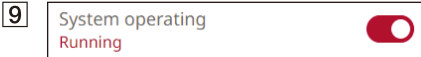
- 8 After the EV Charger and heat pump setup is completed, you can check the EV charging power and heat pump status on the Home screen.

A description of each state is as follows.

**EV** : EV charging power.

**AWHP Connected** : AWHP is connected.

**AWHP Disconnected** : AWHP is disconnected.



### [System Operating]

Tap the switch to start or stop system operation.



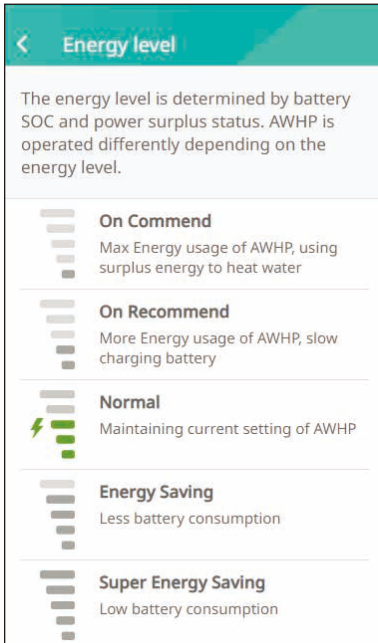
### [Energy level]

Display ESS Energy Level.

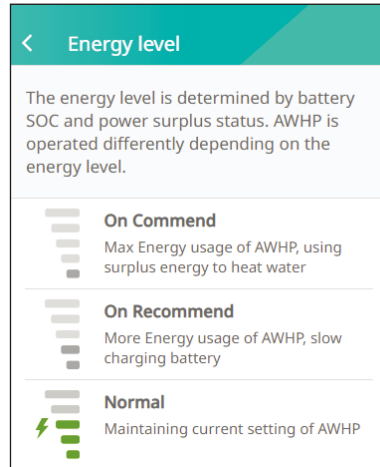
\*Energy Level is displayed only when AWHP is installed and the monitoring option is enabled.

\*\*Depending on the protocol, the levels are as follows.

### [Protocol]LG MODBUS



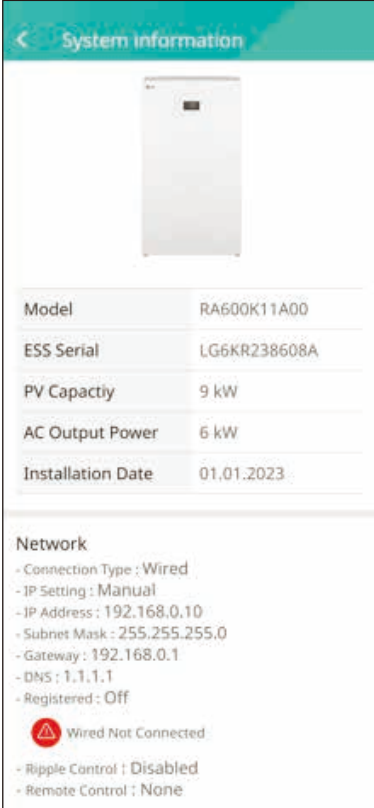
### [Protocol]DIGITAL INPUT




## System Information

Displays system information of this ESS. You can check the information of the PCS, battery, and network status. Scroll up or down to display next or previous information.

11




**System Information**



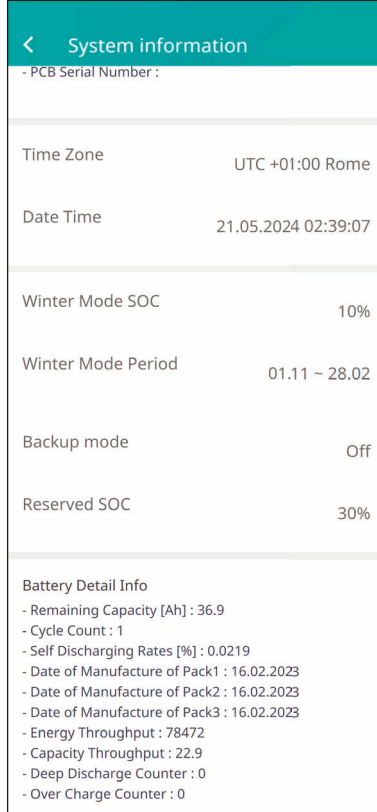
Model	RA600K11A00
ESS Serial	LG6KR238608A
PV Capacity	9 kW
AC Output Power	6 kW
Installation Date	01.01.2023

**Network**

- Connection Type : Wired
- IP Setting : Manual
- IP Address : 192.168.0.10
- Subnet Mask : 255.255.255.0
- Gateway : 192.168.0.1
- DNS : 1.1.1.1
- Registered : Off

 Wired Not Connected

- Ripple Control : Disabled
- Remote Control : None



**System information**

- PCB Serial Number :

---

Time Zone : UTC +01:00 Rome

Date Time : 21.05.2024 02:39:07

---

Winter Mode SOC : 10%

Winter Mode Period : 01.11 ~ 28.02

Backup mode : Off


Reserved SOC : 30%

---

**Battery Detail Info**

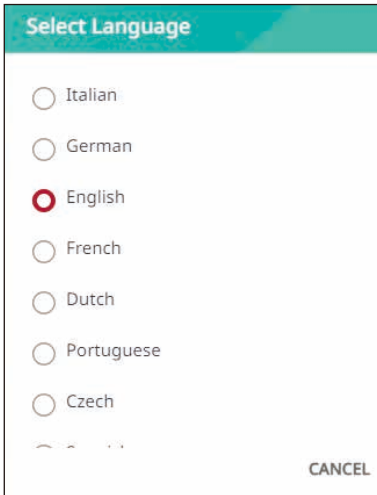
- Remaining Capacity [Ah] : 36.9
- Cycle Count : 1
- Self Discharging Rates [%] : 0.0219
- Date of Manufacture of Pack1 : 16.02.2023
- Date of Manufacture of Pack2 : 16.02.2023
- Date of Manufacture of Pack3 : 16.02.2023
- Energy Throughput : 78472
- Capacity Throughput : 22.9
- Deep Discharge Counter : 0
- Over Charge Counter : 0

## ESS Settings Menu

You can adjust the general settings of the system. Select [main screen] >  to display the [Settings] screen.

### Language

Select  > [Language] to display the language selection screen.

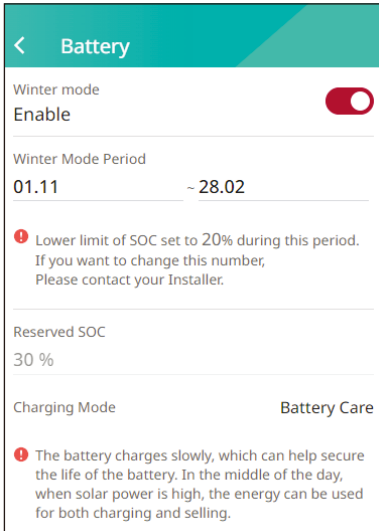


#### [Select Language]

Select the desired language.

## Battery

Select  > [Battery] to display the battery settings screen.



### [Winter mode]

Tap this switch to select [Enable] or [Disable].

The minimum SoC level for winter mode can only be changed by the installer.

### [Winter Mode Period]

Tap the current value to display the settings menu. You can change the period.

- 1 Select the current value. The period settings menu is displayed.
- 2 Adjust [Month] and [Day] using **▲** or **▼**.
- 3 Select [APPLY] to complete the setting.

### [Reserved SoC]

The minimum SoC level of Reserved SoC can only be changed by the installer.

### [Charging Mode]

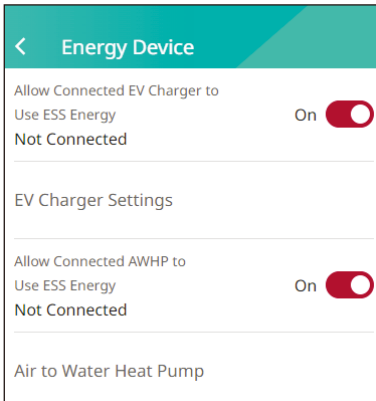
Tap this switch to select [Battery Care], [Fast Charging], or [Weather Forecast].

You can change the mode on your own.



## Energy Device

Select  > [Energy Device] to display the Energy Device screen.



### [EV]

Tap this switch to select [On] or [Off].

If the 'EV Charger' is not installed, a notice will pop up. Set the option to [On] to enable EV monitoring.

### [EV Charger Settings]

You can set the EV Charge Configuration and monitor the EV Charger Status.

Please refer to the Installation Guide for detailed information.

### [AWHP]

Tap this switch to select [On] or [Off].

The status description of the energy device is as follows.

**Not Connected:** AWHP setting is enabled and is not connected.


**Connected:** AWHP setting is enabled and is connected.

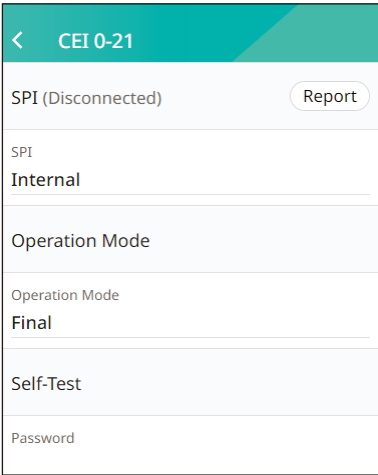
### [Air-to-Water Heat Pump]

You can set the AWHP Configuration.

Please refer to the Installation Guide for detailed information.

## CEI 0-21

Select  > [CEI 0-21] to display the CEI 0-21.




### [SPI Self-Test]

- 1 SPI Mode set Internal mode
- 2 Enter Self-Test Password (000006)
- 3 Press the All button

Please refer to the setup CEI 0-21 Guide for detailed information.

## Quick Install Guide

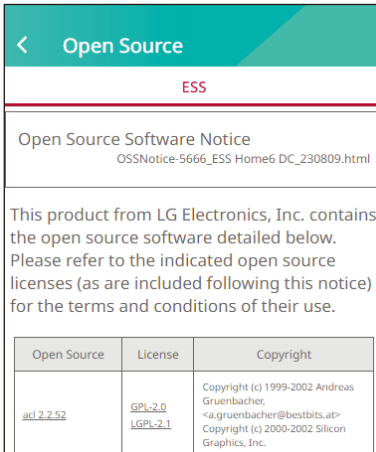
Select  > [Quick Install Guide] to display the install guidance screen.

You can check the brief installation instructions on the [Quick Install Guide] screen.

## Open Source

You can check the open source information of the application and the system.

Select  > [Open Source] to display the open source notice screen.



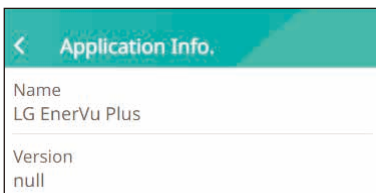
Open Source	License	Copyright
<a href="#">ad_2_2_52</a>	<a href="#">GPL-2.0</a> <a href="#">LGPL-2.1</a>	Copyright (c) 1999-2002 Andreas Gruenbacher, <a href="mailto:a.gruenbacher@bestbits.at">a.gruenbacher@bestbits.at Copyright (c) 2000-2002 Silicon Graphics, Inc.

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## Application Information

Select  > [Application Information] to display the application information screen.



You can check the information of this application, including the application name, application package name, and application version.

# Error Codes and Messages

## PCS Error Codes

- Do not leave the ESS in the fault standby state for a long time because battery discharge may occur.
- If battery fault occurs immediately after starting the PCS, it means battery failure. Check the battery SoC as well as voltage and fault information, and turn off the power of the ESS until service action is taken.
- If the battery SoC is low, the battery may charge from the grid for self-protection. (Emergency Charging)  
This function is to prevent the shutdown of the ESS, deep discharge, and failure of the battery. An Emergency Charge is not an ESS fault.

Code	Message	Description	Solution
P105	Battery A Disconnect	BMS communication of BAT A is connected but the power line of BAT A is not connected	Contact service center
P110	Battery A Miswiring	BAT A reverse polarity wiring	Contact service center
P131	AC Relay Fault	The grid relay is not operational	Contact service center
P132	Fan1 Heavy Fault	Despite being enabled, the fan does not operate	Contact service center
P133	Fan2 Heavy Fault	Despite being enabled, the fan does not operate	Contact service center
P140	SMCU Comm.	A communication error with the connected Slave MCU for over 10 minutes	Contact service center
P141	PMS Comm.	A communication error with the connected PMS for over 10 minutes	Contact service center
P142	BMS Comm.	A communication error with the connected battery for over 10 minutes	Contact service center
P150	Backup Soft-Start Fail	During the soft-start backup operation, PCS faults occur more than 10 times	Contact service center
P152	Bat Low SoC	The SoC of the battery is lower than 10 %	Contact service center
P160	PCS Initial Startup Fail	The PCS failed the initial startup	Contact service center
P203	Grid Overvoltage	The voltage level of the grid is higher than the limit	Automatically restart after grid voltage is normal
P213	Grid Undervoltage	The voltage level of the grid is lower than the lower limit	Automatically restart after grid voltage is normal
P220	Grid Overfrequency	The frequency level of the grid is higher than the limit	Automatically restart after grid frequency is normal

Code	Message	Description	Solution
P221	Grid Underfrequency	The frequency level of the grid is lower than the lower limit	Automatically restart after grid frequency is normal
P222	Grid Frequency Change	The amount of frequency change is higher than the limit	Automatically restart after grid frequency is normal
P225	Residual Current	The residual current is higher than the limit	Automatically restart after residual current is normal
P234	Grid DC Offset Current	DC offset current is added to the grid	Automatically restart after detecting fault
P240	Anti-Islanding Detection	There was a power failure	Automatically restart after detecting fault
P253	Grid Over Voltage 10 min	The average voltage of the grid for 10 minutes is higher than the limit	Automatically restart after grid voltage is normal
P300	Battery Overvoltage (Batt1)	The voltage level of BAT A is higher than the limit	Automatically restart after BAT A voltage is normal
P310	Battery Undervoltage (Batt1)	The voltage level of BAT A is lower than the lower limit	Automatically restart after BAT A voltage is normal
P320	Battery Over Current (Batt1)	The current level of BAT A is higher than the limit	Automatically restart after BAT A current is normal
P330	Battery Over Current Instant (Batt1)	The current level of BAT A suddenly spikes above the limit	Automatically restart after BAT A current is normal
P350	Battery Low SoC Trip (Batt1)	The SoC level of BAT A is lower than the lower limit	Automatically restart after BAT A SoC is normal
P351	Battery State Fault (Batt1)	A State Error occurs in BAT A	Automatically restart after BAT A state is normal
P353	Battery Sleep (Batt1)	BAT A power goes into power saving mode	Automatically restart after BAT A black start operation is normal
P354	Battery Power Down (Batt1)	BAT A power is turned off	Automatically restart after BAT A black start operation is normal
P370	DC-Link Overvoltage	The voltage level of the DC Link is higher than the limit	Automatically restart after DC-Link voltage is normal
P372	DC-Link Undervoltage	The voltage level of the DC Link is lower than the lower limit	Automatically restart after DC-Link voltage is normal
P400	PV Overvoltage (PV1)	The voltage level of the PV1 is higher than the limit	Automatically restart after PV1 voltage is normal
P401	PV Overvoltage (PV2)	The voltage level of the PV2 is higher than the limit	Automatically restart after PV2 voltage is normal
P420	PV Overcurrent (PV1)	The current level of the PV1 is higher than the limit	Automatically restart after PV1 current is normal

Code	Message	Description	Solution
P421	PV Overcurrent (PV2)	The current level of the PV2 is higher than the limit	Automatically restart after PV2 current is normal
P430	PV Overcurrent Instant (PV1)	The current level of the PV1 suddenly spikes above the limit	Automatically restart after PV1 current is normal
P431	PV Overcurrent Instant (PV2)	The current level of the PV2 suddenly spikes above the limit	Automatically restart after PV2 current is normal
P450	PV Insulation Resistance Error	PV insulation resistance is lower than the lower limit.	Automatically restart after PV insulation resistance is normal
P505	Grid Overcurrent	The current level of the grid is higher than the limit	Automatically restart after grid current is normal
P514	Grid Overcurrent Instant	Current level of the grid suddenly spikes above the limit	Automatically restart after grid current is normal
P553	Backup Overvoltage	During backup operation, the voltage level of the inverter is higher than the limit	Automatically restart after detecting fault
P560	Backup Overload (Total)	During backup, the load is higher than the discharge power limit of the inverter	Automatically restart after detecting fault
P573	Backup Unacceptable Load	During backup, an unacceptable load is connected	Automatically restart after detecting fault
P580	Backup Inverter Voltage Fail	During backup, the voltage of the inverter is lower than the lower limit	Automatically restart after detecting fault
P585	Grid Live	During backup operation, grid power is activated	Automatically restart after detecting fault
P593	Backup Undervoltage	During backup, the voltage of the inverter is lower than the lower limit	Automatically restart after detecting fault
P600	AC L1 A Relay	Grid relay is not operational (L1 -Grid side)	Automatically restart after detecting fault
P601	AC L1 B Relay	Grid relay is not operational (L1 -Inverter side)	Automatically restart after detecting fault
P606	AC N A Relay	Grid relay is not operational (N-Grid side)	Automatically restart after detecting fault
P607	AC Relay Open During Operation	During PCS operation, the Grid Relay is open	Automatically restart after detecting fault
P608	AC N B Relay	Grid relay is not operational (N-Inverter side)	Automatically restart after detecting fault
P621	Fan A Fault	Fan A is not operational	Contact service center
P622	Fan B Fault	Fan B is not operational	Contact service center
P631	Inverter Top Over Temperature	The inverter (Top) temperature is higher than the limit	Automatically restart after INV top temp is normal

Code	Message	Description	Solution
P632	Inverter Bottom Over Temperature	The inverter (Bottom) temperature is higher than the limit	Automatically restart after INV bottom temp is normal
P651	Battery Top Over Temperature	The BAT converter (Top) temperature is higher than the limit	Automatically restart after BAT Converter top temp is normal
P671	PV A Over Temperature	The PV A converter temperature is higher than the limit	Automatically restart after PV A Converter temp is normal
P672	PV B Over Temperature	The PV B converter temperature is higher than the limit	Automatically restart after PV B Converter temp is normal
P690	Inside Over Temperature	The PCS inner temperature is higher than the limit	Automatically restart after inner temp is normal
P691	Outside Over Temperature	The PCS ambient temperature is higher than the limit.	Automatically restart after ambient temp is normal
P700	SMCU Comm Fault	A communication error with the connected Slave MCU for over 10 seconds	Automatically restart after Communication is normal
P701	PMS Comm Fault	A communication error with the connected PMS for over 10 seconds	Automatically restart after Communication is normal
P702	Battery A Comm Fault	A communication error with the connected battery for over 10 seconds	Automatically restart after Communication is normal
P720	SMCU Fault	The Slave MCU unit in the product is faulty	Automatically restart after detecting fault
P721	MCU Control Power Fault	The MCU supply power exceeds the allowable range	Automatically restart after MCU Control Power is normal
P722	Gate Desat Fault	The PCS Gate-Drive detects a fault	Automatically restart after detecting fault
P723	Gate Undervoltage Fault	The gate voltage for the PCS Gate-Drive is lower than the lower limit	Automatically restart after detecting fault
P740	ATS Relay Fault	An ATS operation status error occurs	Automatically restart after ATS is normal
P741	Initial Charge Fault	The DC-link initial charging of the inverter does not operate normally	Automatically restart after detecting fault
P742	AC Circuit Breaker is Open	AC Circuit Breaker is Open	Automatically restart after AC Circuit Breaker is normal
P750	Grid Voltage Difference Fault	A grid voltage sensing error occurs	Automatically restart after grid voltage sensing is normal

Code	Message	Description	Solution
P751	Grid Frequency Difference Fault	A grid frequency sensing error occurs	Automatically restart after grid frequency sensing is normal
P752	Safety Function Operation Fault	Error in performing safety functions	Automatically restart after safety function operation is normal
P753	Micom State Fault	Micom status abnormality detected	Automatically restart after MICOM state is normal
P760	SRD Parameter Fault	A Grid SRD Parameter setting error occurs	Automatically restart after detecting fault
P765	Relay Power Off Fault	A relay operation error occurs and the relay power is turned off	Automatically restart after Relay Status is normal
P771	Inverter Top NTC Fault	The inverter (Top) NTC is not working	Automatically restart after INV top temp is normal
P772	Inverter Bottom NTC Fault	The inverter (Bottom) NTC is not working	Automatically restart after INV bottom temp is normal
P791	Battery Top NTC Fault	The BAT converter (Top) NTC is not working	Automatically restart after BAT Converter top temp is normal
P803	PV Module NTC Fault	The PV Module NTC is not working	Automatically restart after PV Converter temp is normal
P820	Inside NTC Fault	The PCS inner NTC is not working	Automatically restart after inner temp is normal
P821	Outside NTC Fault	The PCS ambient NTC is not working	Automatically restart after ambient temp is normal
P900	SRD Parameter Warning	A Grid SRD Parameter setting error occurs	Automatically restart after detecting fault
P910	Eeprom Parameter Warning	An Eeprom Parameter setting error occurs	Automatically restart after detecting fault



## Battery Error Code

Code	Message	Description	Solution
B678	Discharge Over Temperature Warning	The discharge temperature level is higher than the limit	Automatically released after warning condition is cleared
B679	Discharge Under Temperature Warning	The discharge temperature level is lower than the lower limit	Automatically released after warning condition is cleared
B680	Charge Over Temperature Warning	The charge temperature level is higher than the limit	Automatically released after warning condition is cleared
B681	Charge Under Temperature Warning	The charge temperature level is lower than the lower limit	Automatically released after warning condition is cleared
B682	Terminal Over Temperature Warning	The Power Terminal temperature level is higher than the limit	Automatically released after warning condition is cleared
B686	Discharge Over Current Warning	The discharge current level is higher than the limit	Automatically released after warning condition is cleared
B687	Charge Over Current Warning	The charge current level is higher than the limit	Automatically released after warning condition is cleared
B689	Atmosphere Discharge Over Temperature Warning	The Discharge Atmosphere temperature level is higher than the limit	Automatically released after warning condition is cleared
B690	Atmosphere Discharge Under Temperature Warning	The Discharge Atmosphere temperature level is lower than the lower limit	Automatically released after warning condition is cleared
B691	Atmosphere Charge Over Temperature Warning	The Charge Atmosphere temperature level is higher than the limit	Automatically released after warning condition is cleared
B692	Atmosphere Charge Under Temperature Warning	The Charge Atmosphere temperature level is lower than the lower limit	Automatically released after warning condition is cleared
B694	Over Discharge Power Limit Warning	The Discharge Power level is higher than the limit	Automatically released after warning condition is cleared

Code	Message	Description	Solution
B695	Over Charge Power Limit Warning	The Charge Power level is higher than the limit	Automatically released after warning condition is cleared
B701	Safety CRC Check Error	A warning about the safety memory range CRC data	Automatically released after warning condition is cleared
B702	Cell Over Voltage Fault 1	The Cell Voltage level of the battery cell is higher than the limit	Automatically restart after fault condition is cleared
B703	Cell Under Voltage Fault 1	The Cell Voltage level of the battery cell is lower than the lower limit	Automatically restart after fault condition is cleared
B707	Unit Voltage ADC Mux Fault 1	A unit voltage AD conversion multiplex fault	Automatically restart after fault condition is cleared
B710	Discharge Over Temperature Fault 1	The discharge temperature level is higher than the limit	Automatically restart after fault condition is cleared
B711	Discharge Under Temperature Fault 1	The discharge temperature level is lower than the lower limit	Automatically restart after fault condition is cleared
B712	Charge Over Temperature Fault 1	The charge temperature level is higher than the limit	Automatically restart after fault condition is cleared
B713	Charge Under Temperature Fault 1	The charge temperature level is lower than the lower limit	Automatically restart after fault condition is cleared
B714	Terminal Over Temperature Fault 1	The Power Terminal temperature level is higher than the limit	Automatically restart after fault condition is cleared
B718	Discharge Over Current Fault 1	The discharge current level is higher than the limit	Automatically restart after fault condition is cleared
B719	Charge Over Current Fault 1	The charge current level is higher than the limit	Automatically restart after fault condition is cleared
B721	Atmosphere Discharge Over Temperature Fault 1	The Discharge Atmosphere temperature level is higher than the limit	Automatically restart after fault condition is cleared
B722	Atmosphere Discharge Under Temperature Fault 1	The Discharge Atmosphere temperature level is lower than the lower limit	Automatically restart after fault condition is cleared

Code	Message	Description	Solution
B723	Atmosphere Charge Over Temperature Fault 1	The Charge Atmosphere temperature level is higher than the limit	Automatically restart after fault condition is cleared
B724	Atmosphere Charge Under Temperature Fault 1	The Charge Atmosphere temperature level is lower than the lower limit	Automatically restart after fault condition is cleared
B725	Current ADC Mux Fault 1	A current AD conversion multiplex fault.	Automatically restart after fault condition is cleared
B734	Cell Over Voltage Fault 2	The Cell Voltage level of the battery cell is higher than the limit	Contact service center
B735	Cell Under Voltage Fault 2	The Cell Voltage level of the battery cell is lower than the lower limit	Contact service center
B737	Unit Over voltage Fault 2	The Unit Voltage level of the battery cell is higher than the limit	Contact service center
B738	Unit Under voltage Fault 2	The Unit Voltage level of the battery cell is lower than the lower limit	Contact service center
B740	Cell Voltage Imbalance Fault 2	The cell voltage difference between the battery cells is higher than the limit	Contact service center
B741	Pack Voltage Imbalance Fault 2	The pack voltage difference between the battery packs is higher than the limit	Contact service center
B742	Discharge Over Temperature Fault 2	The discharge temperature level is higher than the limit	Contact service center
B743	Discharge Under Temperature Fault 2	The discharge temperature level is lower than the limit	Contact service center
B744	Charge Over Temperature Fault 2	The charge temperature level is higher than the limit	Contact service center
B745	Charge Under Temperature Fault 2	The charge temperature level is lower than the lower limit	Contact service center
B746	Terminal Over Temperature Fault 2	The Power Terminal temperature level is higher than the limit	Contact service center
B750	Discharge Over Current Fault 2	The discharge current level is higher than the limit	Contact service center
B751	Charge Over Current Fault 2	The charge current level is higher than the limit	Contact service center
B753	Atmosphere Discharge Over Temperature Fault 2	The Discharge Atmosphere temperature level is higher than the limit	Contact service center
B754	Atmosphere Discharge Under Temperature Fault 2	The Discharge Atmosphere temperature level is lower than the limit	Contact service center

Code	Message	Description	Solution
B755	Atmosphere Charge Over Temperature Fault 2	The Charge Atmosphere temperature level is higher than the limit	Contact service center
B756	Atmosphere Charge Under Temperature Fault 2	The Charge Atmosphere temperature level is lower than the limit	Contact service center
B762	Relay Operation Fault 2	A battery power supply relay operation fault	Contact service center
B766	BIC ADC Reference Voltage Error	BIC ADC Reference Voltage Error	Contact service center
B767	Cell Voltage Sensor Open Wire	Cell Voltage Sensor Open Wire	Contact service center
B768	Temperature Sensor Error	Temperature Sensor Error	Contact service center
B769	Current Sensor Line Error	Current Sensor Line Error	Contact service center
B771	Main Power Connection Error	An error in the main power connection	Contact service center
B772	Unit High Voltage Error (H/W)	Unit High Voltage Error (H/W)	Contact service center
B773	Circuit Breaker Switch Open	Circuit Breaker Switch Open	Contact service center
B774	Magic Number Error	SW Module Routine Check Error	Contact service center
B775	Pack Number Error	Pack Number Error	Contact service center
B776	MCU ADC Stuck Error	MCU ADC Stuck Error	Contact service center
B777	Temperature ADC Stuck Error	Temperature ADC Stuck Error	Contact service center
B778	Cell ADC Stuck Error	Cell ADC Stuck Error	Contact service center
B779	BCU ADC Reference Voltage Error	BCU ADC Reference Voltage Error	Contact service center
B782	BCU OSC HR Object Error	BCU OSC HR Object Error	Automatically restart after detecting fault
B783	Internal Communication Error (BCU ↔ BIC)	Internal Communication Error (BCU ↔ BIC)	Automatically restart after detecting fault
B784	External Communication Error (PCS ↔ BCU)	External Communication Error (PCS ↔ BCU)	Automatically restart after detecting fault
B785	Watchdog Counter Error	Watchdog Counter Error	Automatically restart after detecting fault
B787	CPU Register Error	CPU Register Error	Automatically restart after detecting fault

Code	Message	Description	Solution
B788	FPU Register Error	FPU Register Error	Automatically restart after detecting fault
B789	VCU Register Error	VCU Register Error	Automatically restart after detecting fault
B790	PIE RAM Error	PIE RAM Error	Automatically restart after detecting fault
B791	PIE Handler Error	PIE Handler Error	Automatically restart after detecting fault
B792	BCU ROM ECC Check Error	BCU ROM ECC Check Error	Automatically restart after detecting fault
B793	BCU RAM ECC Check Error	BCU RAM ECC Check Error	Automatically restart after detecting fault
B794	BCU MCU Clock Check Error	BCU MCU Clock Check Error	Automatically restart after detecting fault
B795	MarchC 1 Region Copy Error	MarchC 1 Region Copy Error	Automatically restart after detecting fault
B796	MarchC 2 Region Copy Error	MarchC 2 Region Copy Error	Automatically restart after detecting fault
B797	BCU Oscillator Source Error	BCU Oscillator Source Error	Automatically restart after detecting fault

- The firmware version, error codes, and fault conditions listed above can be accessed on the display. They can also be accessed from the server.

## PMS Battery Error Code

Code	Message	Description	Solution
S100	PCS Ver Mismatch	PCS Version Mismatch	Contact service center
S101	BMS Ver Mismatch	BMS Version Mismatch	Contact service center
S106	SW Update Done	FOTA Update success	This is an SW update notification
S107	SW Update Fail	FOTA Update Failure	This is an SW update notification
S200	Grid Meter Comm	Grid Meter Communication Error	Contact service center

If you have technical problems or questions, contact the installation company or LG Electronics.

### Installation Company

Address :	Tel :
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### ESS Service Contact Point

LG Electronics Italy, Via Aldo Rossi 4 - 20149 Milan, Italy	Tel : +39 02 81485454 E-Mail: <a href="https://www.lg.com/it/supporto/email">https://www.lg.com/it/supporto/email</a>
LG Electronics Spain, C. Chile, 1, 28290 Las Rozas de Madrid, Spain	Tel : +34 963 05 05 00 E-Mail: <a href="mailto:b2b.es@lgepartner.com">b2b.es@lgepartner.com</a>
LG Electronics Portugal, Taguspark - Ed. Inovação I Corpo I, Av. Jacques Delors 3, 2740-122 Porto Salvo, Portugal	Tel : +351 300 600 033 E-Mail: <a href="mailto:pt.cic@lge.com">pt.cic@lge.com</a>

### Customer Service

LG Electronics ESS   Solar Service E-Service Haberhorn GmbH Augustenhöhe 7 06493 Harzgerode	Tel: Germany: 0049 (0)39484 / 976 380 Austria: 0043 (0)720 / 11 66 01 Switzerland: 0041 (0)44 / 505 11 42 Belgium, Netherlands, Luxembourg : 0031 20 / 456 1660 E-Mail: <a href="mailto:lge@e-service48.de">lge@e-service48.de</a>
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### LG Electronics Contact

LG Electronics Deutschland GmbH Alfred-Herrhausen-Allee 3-5 65760 Eschborn	Tel: + 0049 18 06 807 020 E-Mail: <a href="mailto:b2b.service@lge.de">b2b.service@lge.de</a>
LG Electronics Benelux Krijgsman 1, 1186 DM, Amstelveen, The Netherlands	Tel: +0031 (0)20 456 3100 E-Mail: <a href="mailto:b2b.service@lge.de">b2b.service@lge.de</a>

# Maintenance

## Cleaning the Product

Wipe off the outside of the product with a soft towel soaked in lukewarm water, and then dry it with a clean hand towel so that dirt will not accumulate when using a neutral detergent.

When cleaning the outside of the product, do not apply a rough brush, toothpaste, or flammable materials. Do not use cleaning agents containing flammable substances.

- This may cause discoloration of the product or damage to the product.
- Flammable substances: Alcohol (Ethanol, Methanol, Isopropyl alcohol, Isobutyl alcohol, etc.), Thinner, Benzene, Flammable liquid, Abrasive etc.)

Wiping with strong pressure may damage the surface. Do not leave rubber or plastic products in contact with the product for a long period of time.

When cleaning the air duct, shut off all the systems including the PCS, PV module, battery, and AC circuit breaker. Next, clean the filter with soft brush.

## Regular Inspection

It is recommended to check the operating status and connection status once a year. It should be done by a technician or authorized personnel. Contact an authorized dealer or wherever you purchased your product.

## Disposal of your old appliance



1. This crossed-out wheeled bin symbol indicates that waste electrical and electronic products (WEEE) should be disposed of separately from the municipal waste stream.
2. Old electrical products can contain hazardous substances so correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.  
Your old appliance may contain reusable parts that could be used to repair other products, and other valuable materials that can be recycled to conserve limited resources.
3. You can take your appliance either to the shop where you purchased the product, or contact your local government waste office for details of your nearest authorised WEEE collection point. For the most up to date information for your country please see [www.lg.com/global/recycling](http://www.lg.com/global/recycling).

### Removal of waste batteries and accumulators (Product with embedded battery ONLY)

In case the product contains a battery incorporated within the product which cannot be readily removed by end-users, LG recommends that only qualified professionals remove the battery, either for replacement or for recycling at the end of this product's working life.

To prevent damage to the product, and for their own safety, users should not attempt to remove the battery and should contact LG Service Helpline, or other independent service providers for advice.

Removal of the battery will involve dismantling of the product case, disconnection of the electrical cables/ contacts, and careful extraction of the battery cell using specialized tools.

### Disposal of waste batteries / accumulators



1. This symbol may be combined with chemical symbols for mercury (Hg), cadmium (Cd) or lead (Pb) if the battery contains more than 0.0005 % of mercury, 0.002 % of cadmium or 0.004 % of lead.
2. All batteries/accumulators should be disposed separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.
3. The correct disposal of your old batteries/accumulators will help to prevent potential negative consequences for the environment, animal and human health.
4. For more detailed information about disposal of your old batteries/ accumulators, please contact your city office, waste disposal service or the shop where you purchased the product. (<http://www.lg.com/global/sustainability/environment/take-back-recycling/global-network-europe>)



# Specifications

PV Input	4.6 kW	6 kW
Input Voltage Range	150 ~ 600 V <sub>DC</sub>	
Max. DC Power (max. channel)	6.9 kW(3.68 kW)	9 kW(4.5 kW)
Usable MPP Voltage Range	150 ~ 510 V	
Number of MPPT	2	
Number of String per MPPT	1	
Max. Short Current per MPPT	18 A	
Rated Current per MPPT	13 A	
Max. Inverter Backfeed Current to the Array	0 A	

AC Output	4.6 kW	6 kW
Rated Grid Voltage	230 V	
AC Voltage Range	207 ~ 253 V	
Frequency	50Hz	
Rated Output Power	4.6 kW	6 kW
Rated Output Current	20 A	26 A
Apparent Power	5750 VA	7500 VA
THD / Power Factor	< 5 % / ± 0.8	
Max. Output Fault Current	78.09 Aac / 60 ms	

Battery	RA000K07A00 (7H)	RA000K11A00 (11H)
Battery Type	Lithium Ion	
Total Capacity	7.91 kWh	11.87 kWh
Usable Capacity <sup>1)</sup>	7.12 kWh	10.68 kWh
Max. Charge Power <sup>2)</sup>	2.5 kW	4 kW
Max. Discharge Power <sup>2)</sup>	3.8 kW	5.6 kW
Inrush Current (1 ms)	100 A	

1) Approximately 10 % of the battery usable capacity is used by the system for battery protection. The capacity may decrease as the battery ages.

2) Charging and discharging may take longer depending on the ambient temperature and SoC. The specified value relates to the consumption of the entire system. The available capacity to supply the loads depends on the operating behavior of the overall system, the protection against depth charging, the installation location, and the age of the LG ESS battery.

Backup Power (ATS)		4.6 kW	6 kW
Maximum Usable Home Load Capacity in Backup Operation <sup>1)</sup>	11 H	4.6 kW	5.6 kW
	7 H	3.68 kW	

Backup Power (Backup Light)		4.6 kW	6 kW
Maximum Usable Home Load Capacity in Backup Operation <sup>1)</sup>	11 H	3 kW	
	7 H	3 kW	

1) Charging and discharging may take longer depending on the ambient temperature and SoC. The specified value relates to the consumption of the entire system. The available capacity to supply the loads depends on the operating behavior of the overall system, the protection against depth charging, the installation location, and the age of the LG ESS battery.

\* The capacity may decrease as the battery ages.

Battery		11 H	7 H
DC Input	Voltage (nominal or range)	344.32 ~ 271.32 V <sub>DC</sub>	229.54 ~ 180.88 V <sub>DC</sub>
	Nominal battery voltage	304.92 V <sub>DC</sub>	203.28 V <sub>DC</sub>
	Current (maximum continuous)	16 A	16 A
DC Output	Voltage (nominal or range)	344.32 ~ 271.32 V <sub>DC</sub>	229.54 ~ 180.88 V <sub>DC</sub>
	Nominal battery voltage	304.92 V <sub>DC</sub>	203.28 V <sub>DC</sub>
	Current (maximum continuous) @Nominal Voltage	18.69 A	18.69 A

Efficiency (PCS)		
Max. Efficiency (PV to Grid)	4.6 kW	6 kW
	97.7 %	

General Data		
Dimensions (W x D x H, mm)	698 x 205 x 1,260	
Weight (kg)	Battery 3Pack 135 / 2Pack 110	
Operating Temperature (With Battery)	Charging	-10 °C ~ 45 °C (Non-derating 0 °C ~ 35 °C)
	Discharging	-20 °C ~ 50 °C (Non-derating 0 °C ~ 40 °C)
Operating Temperature (Without Battery)	Charging	-20 °C ~ 50 °C (Non-derating -20 °C ~ 40 °C)
	Discharging	-20 °C ~ 50 °C (Non-derating -20 °C ~ 40 °C)
Storage Temperature	With Battery	-20 °C ~ 50 °C
	Without Battery	-20 °C ~ 60 °C

### Energy Meter Compatibility

Single Phase	ABB	B21-112-100, B21-212-100, B21-312-100
	Easton	SDM230-MODBUS
	Herholdt Controls	ECS M1PRO 80 Modbus MID
Three Phase	ABB	B23 112-100, B23 212-100, B23 312-100
	Easton	SDM630-Modbus V3
	CHINT	DTSU666(QPV)
	HerHoldz ECS	M3Pro

\* Single Phase PCS can also be used in homes where AC Three phase phase is introduced.  
Three phase energy meters can be used, and the PCS has to be connected to L1.

Features & Functions		
Noise Emission (Typical)		< 47 dB
Cooling		Forced Convection
Topology		Transformerless
Max. Permissible Value of Relative Humidity (non-condensing)		92.5 %
Limited Warranty <sup>1)</sup>		See URL for full Limited Warranty
Compliance	Inverter Safety	IEC/EN 62109-1/-2
	Battery Safety	IEC/EN 62619, IEC60730-1 Annex H, IEC 63056
	Grid	CEI 0-21, NTS V2.1, UNE 217001, UNE 217002, EN 50549-1, EN 50549-10
	EMC	EN 55011, EN IEC 61000
	RF	RED(2014/53/EU)
Degree of Protection	IP56	IEC 60529
Class B Group 1 Product		Protection Class (Class I)
Pollution degree		3

1) To see the SoH and warranty about the energy throughput of specific batteries, please visit the following site:  
<https://www.lg.com/global/business/e1ss/business-resources/download>

## Open Source Software Notice Information

To obtain the source code that is contained in this product, under GPL, LGPL, MPL, and other open source licenses that have the obligation to disclose source code, and to access all referred license terms, copyright notices and other relevant documents, please visit <https://opensource.lge.com>. LG Electronics will also provide open source code to you on CD-ROM for a charge covering the cost of performing such distribution (such as the cost of media, shipping, and handling) upon email request to [opensource@lge.com](mailto:opensource@lge.com). This offer is valid to anyone in receipt of this information for a period of three years after our last shipment of this product.

- The noise emission value is measured in a soundproof room and can vary depending on the environment.
- If you are installing in a place sensitive to noise, please consult the installer.
- Design and specifications are subject to change without notice.



Contact office for compliance of this product: LG Electronics European Shared Service Center  
 B. V Krijgsman 1, 1186 DM Amstelveen, The Netherlands  
[www.lg.com/global/business/ess](http://www.lg.com/global/business/ess)

#### SIMPLIFIED EU DECLARATION OF CONFORMITY

Hereby, LG Electronics declares that the radio equipment type  
 PCS Unit is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:

<http://www.lg.com/global/support/cedoc/cedoc#>

This device is a 2.4 GHz wideband transmission system, intended for use in all EU member states and EFTA countries.

For consideration of the user, this device should be installed and operated with a minimum distance of 20 cm between the device and the body.

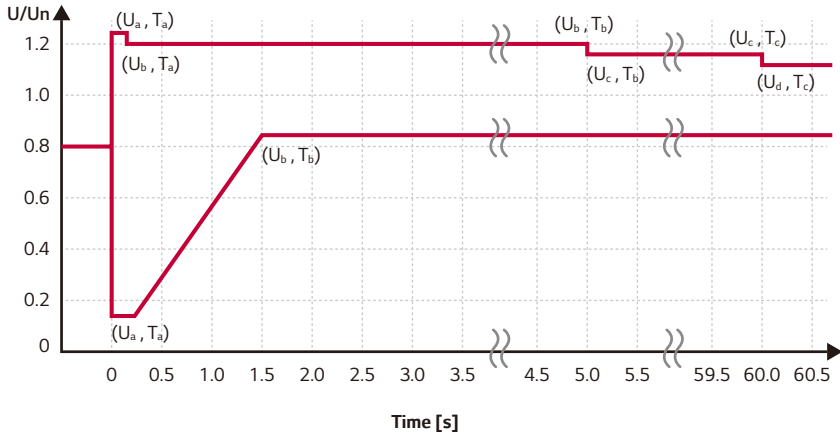
<b>Frequency Range</b>	2400 - 2483.5 MHz
<b>Output Power (Max.)</b>	17.93 dBm
<b>Software Version</b>	LG P11101 02.00.01.00

## Grid Range

Grid Connection Operating Range		Italy		Spain	Portugal
Voltage [V]	Min	195.5		195.5	195.5
	Max	253		253	253
	Nominal	230		230	230
Frequency [Hz]	Min	47.5	49.8	48	47.5
	Max	51.5	50.2	51.0	51.5
	Nominal	50	50.0	50	50
Standard		CEI-0-21	SPI	RD1699	IEC 50549-1 + ND

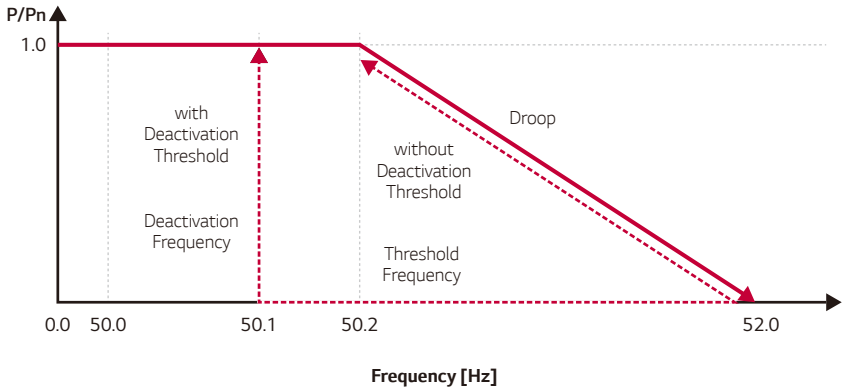
## Others

### Under voltage ride through & Over voltage ride through



Function	Name	Description	Default	Range	Unit
Over-Volt. Ride-Through	Function Enable	Enable / Disable	Disable	Enable / Disable	-
	Ta	Time for point 'a'	0.1	0 – 100	sec
	Tb	Time for point 'b'	5	0 – 100	sec
	Tc	Time for point 'c'	60	0 – 100	sec
	Td	Time for point 'd'	0	0 – 100	sec
	Ua	Volt. for point 'a'	1.25	0 – 1.3	U/Un
	Ub	Volt. for point 'b'	1.2	0 – 1.3	U/Un
	Uc	Volt. for point 'c'	1.15	0 – 1.3	U/Un
	Ud	Volt. for point 'd'	1.1	0 – 1.3	U/Un
	UcurrLimit	Volt. for current reduction	1.15	0 – 1.3	U/Un
Under-Volt. Ride-Through	Function Enable	Enable / Disable	Disable	Enable / Disable	-
	Ta	Time for point 'a'	0.15 – 0.25	0 – 100	sec
	Tb	Time for point 'b'	1.5 – 3.0	0 – 100	sec
	Ua	Volt. for point 'a'	0.05 – 0.2	0 – 1.3	U/Un
	Ub	Volt. for point 'b'	0.75 – 0.85	0 – 1.3	U/Un
	UcurrLimit	Volt. for current reduction	0 – 100	0 – 1.3	U/Un

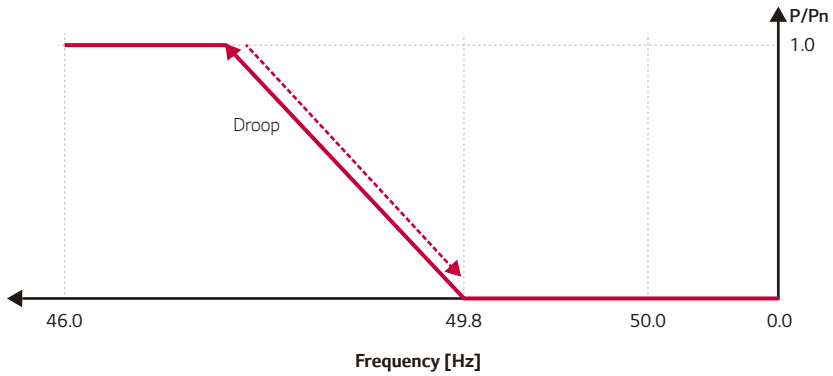
## Over Frequency : Freq-Watt



Function	Name	Description	Default	Range	Unit
Power Response To Over-Freq.	Function Enable	Enable / Disable	Disable	Enable / Disable	-
	Threshold Freq.	Start Frequency	50 – 52	50.2	Hz
	Deactivation	With / Without Deactivation	With / Without	Without	Hz
	Droop	Power slope	2 – 12	5	%
	Deactivation Threshold	End Frequency	50 – 52	50.1	Hz
	Deactivation Time	Wait time	0 - 600	30	sec

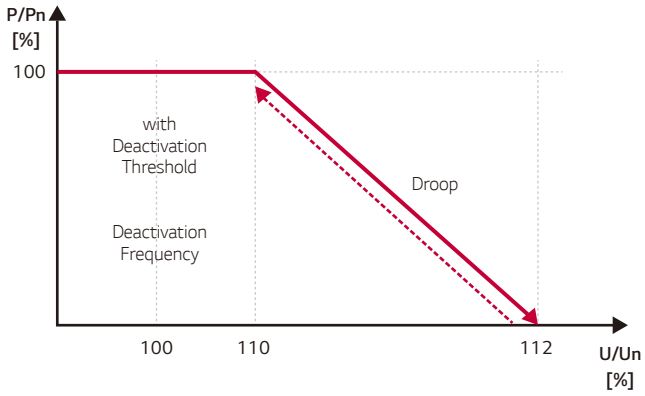


## Under Frequency : Freq-Watt



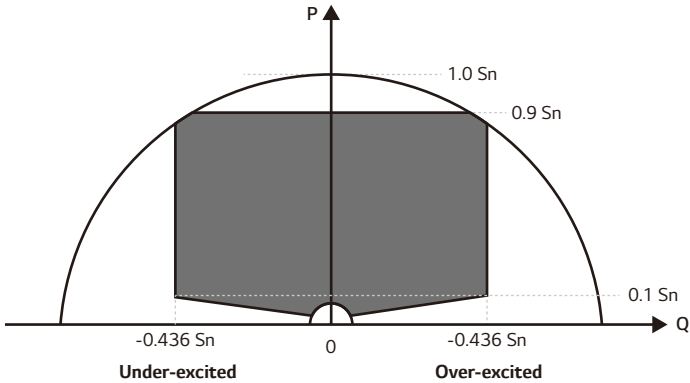
Function	Name	Description	Default	Range	Unit
Power Response To Under-Freq.	Function Enable	Enable / Disable	Disable	Enable / Disable	-
	Threshold Freq.	Start Frequency	46 - 50	49.8	Hz
	Deactivation	With / Without Deactivation	With / Without	Without	Hz
	Droop	Power slope	1 - 100	5	%
	Deactivation Threshold	End Frequency	46 - 50	49.8	Hz
	Deactivation Time	Wait time	0 - 600	0.1	sec

## P(U) : Volt-Watt

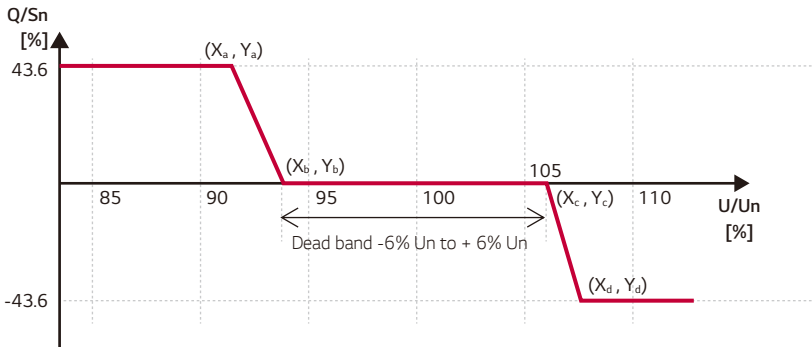


Function	Name	Description	Default	Range	Unit
Power Response To Over-Volt.	Function Enable	Enable / Disable	Disable	Enable / Disable	-
	Droop	Power Slope	100	0 - 100	%
	Volt. at Start Point	Start Voltage	110	100 - 120	%
	Volt. at End Point	End Voltage	112	100 - 120	%
	PT1 Curve Time Const.	Time Constant	3	1 - 60	sec

## P-Q Diagram

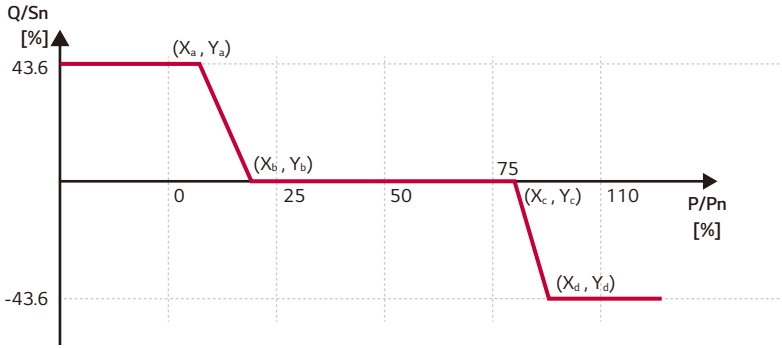


## Q(U) : Volt-Var



Function	Name	Description	Default	Range	Unit
Q(U) Volt-Var	Xa	Volt. at Point 'a'	93	80 – 120	%Un
	Xb	Volt. at Point 'b'	97	80 – 120	%Un
	Xc	Volt. at Point 'c'	103	80 – 120	%Un
	Xd	Volt. at Point 'd'	107	80 – 120	%Un
	Ya	Q at Point 'a'	43.6	-60 – 60	%Sn
	Yb	Q at Point 'a'	0	-60 – 60	%Sn
	Yc	Q at Point 'a'	0	-60 – 60	%Sn
	Yd	Q at Point 'a'	-43.6	-60 – 60	%Sn
	Time Constant	Time Constant	3	1 – 30	sec
	Lock-in Power	Activation Thres.	20	0 – 20	%Pn
	Lock-out Power	Deactivation Thres.	5	0 – 20	%Pn

## Q(P) : Watt-Var



Function	Name	Description	Default	Range	Unit
Q(P) Watt-Var	Xa	P at Point 'a'	15	0 - 100	%Pn
	Xb	P at Point 'b'	20	0 - 100	%Pn
	Xc	P at Point 'c'	70	0 - 100	%Pn
	Xd	P at Point 'd'	80	0 - 100	%Pn
	Ya	Q at Point 'a'	43.6	-60 - 60	%Sn
	Yb	Q at Point 'a'	0	-60 - 60	%Sn
	Yc	Q at Point 'a'	0	-60 - 60	%Sn
	Yd	Q at Point 'a'	-43.6	-60 - 60	%Sn

## ROCOF

Function	Name	Description	Default	Range	Unit
ROCOF	Function Enable	Enable / Disable	Default	Enable / Disable	-
	ROCOF Threshold	ROCOF Threshold	2.5	0 - 5	Hz/s

## Remote Control

Function	Name	Description	Default	Range	Unit
Remote Control	Function Enable	Enable / Disable	Default	Enable / Disable	-
	Power Gradient	RPower Gradient	50	33-36	%Pn/s

## Connection / Connection after tripping

Function	Name	Description	Default	Range	Unit
Reconnection In Normal Condition	Maximum Voltage	Upper Voltage	110	100 – 130	%Un
	Minimum Voltage	Lower Voltage	85	50 – 100	%Un
	Maximum Frequency	Upper Frequency	50.1	50.0 – 52.0	Hz
	Minimum Frequency	Lower Frequency	49.5	47.0 – 50.0	Hz
	Observation Time	Wait Time	60	1 – 600	sec
	Gradient Enable	Gradient Enable	Disable	Enable / Disable	-
	Power Gradient	Power Gradient	20	6 – 3000	%Pn/min
Reconnection After Tripping	Maximum Voltage	Upper Voltage	110	100 – 130	%Un
	Minimum Voltage	Lower Voltage	85	50 – 100	%Un
	Maximum Frequency	Upper Frequency	50.2	50.0 – 52.0	Hz
	Minimum Frequency	Lower Frequency	49.5	47.0 – 50.0	Hz
	Observation Time	Wait Time	60	1 – 600	sec
	Gradient Enable	Gradient Enable	Enable	Enable / Disable	-
	Power Gradient	Power Gradient	10	6 – 3000	%Pn/min

