

INSTALLATION MANUAL

Residential Battery unit

LG Electronics strongly advises to take due care in following LGE's product installation manual. A warranty claim is invalid if damage is caused by human error, inconsistent with the installation manual.

MODEL

LG ESS HB 7.0
(BLGRESU7H)

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

Copyright © 2019 LG Electronics Inc. All Rights Reserved.

The information included in this manual is accurate at the time of publication. However, this manual is subject to change without prior notice. In addition, the illustrations in this manual are meant only to help explain system configuration concepts and installation instructions. Please note the image shown is for illustration purposes only.

 **CAUTION**

After installation, the installer must explain the User Guide to the end-user.



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

LG Electronics hereby declares that this product is in compliance with the essential requirements and other relevant provisions of EMC Directive 2014/30/EU, LVD Directive 2014/35/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#>

Contents

1	Safety	5
1.1	Symbols	5
1.2	Safety Instructions	6
1.2.1	Allgemeine Sicherheitsvorkehrungen	6
1.2.2	Richtlinien zum Umgang mit Akkus	7
1.2.3	Response to emergency situations	8
1.3	Warning label	9
1.4	Qualified personnel	10
2	Product Introduction	11
2.1	Technical Data	11
2.1.1	Dimensions and weight	11
2.1.2	Performance	12
2.2	Feature	13
2.3	Packaging specification	13
3	Installation	14
3.1	Mechanical requirements	14
3.1.1	Unboxing the package	14
3.1.2	Items in the package	16
3.1.3	Installation locations	16
3.1.4	Clearance	17
3.1.5	Tools & safety gears required	17
3.1.6	Mounting bracket	19
3.1.7	Appearance and Dimension	20
3.1.8	System clearance	20
3.1.9	Installing the battery pack	21
3.2	Cable connection	24
3.2.1	Spring terminal blocks	26

1

2

3

4

5

6

7



1

2

3

4

5

6

7

4	Commissioning	27
4.1	LED indicators	27
4.2	Powering up the battery pack.....	28
4.3	Shutting off the battery pack.....	28
5	Troubleshooting	29
5.1	Troubleshooting	29
5.1.1	Post-Installation Check List.....	30
5.1.2	Troubleshooting Guideline	30
6	Uninstallation & Return	33
6.1	Return/replacement instructions.....	33
6.1.1	Uninstallation from the wall.....	33
6.1.2	Contact information.....	35
7	Maintenance	35



1 Safety

1.1 Symbols



Safety



Caution, risk of electric shock



Do not place nor install near flammable or explosive materials.



Install the product out of reach of children.



Read the instruction manual before starting installation and operation.



Heavy weight may cause serious injury to the back.



Do not dispose of the product with household wastes.



Recyclable



Disconnect the equipment before carrying out maintenance or repair.



Observe precautions for handling electrostatic discharge sensitive devices.



Protective Class 1



Caution, risk of electric shock, energy storage timed discharge.

1.2 Safety Instructions

For safety reasons, installers are responsible for familiarizing themselves with the contents of this document and all warnings before performing installation.

1.2.1 General Safety Precautions

Over-voltages or wrong wiring can damage the battery pack and cause deflagration, which can be extremely dangerous.

All types of breakdown of the product may lead to a leakage of electrolyte or flammable gas.

Avoid installing the battery pack where flammable materials are stored. Do not install in places where explosive gas or chemicals are present.

During installation of the battery, the utility grid, solar input must be disconnected from the Battery Pack wiring. Wiring must be carried out by a qualified personnel.

Battery Pack is not user serviceable. High voltage is present in the device.

The electronics inside the Battery Pack are vulnerable to electrostatic discharge. Be sure to be grounded before handling the battery pack.

Read the label with Warning Symbols and Precautions, which is visibly under the Battery Cover (see Section 1.3).

1.2.2 Battery Handling Guide

- Do not expose battery to open flame.
- Do not place the product nearby highly flammable materials. It may lead to fire or explosion in case of accident.
- Do not expose or place near water sources like downspouts or sprinklers.
- Do not store this product in a place exposed to direct sunlight.
- A ventilated area is strongly recommended for handling the product.
- Store at cool and dry place. (Do not store in greenhouses and storage areas for hay, straw, chaff, animal feed, fertilizers, vegetables or fruit products.)
- Store the product on a flat surface.
- Store the product out of reach of children and animals.
- Store the product where it should be minimal dust and dirt in the area.
- Do not disconnect, disassemble or repair by unqualified personnel. Services must be made by qualified personnel only.
- Do not damage the unit in such ways as dropping, deforming, impacting, cutting or penetrating with a sharp object. It may cause a leakage of electrolyte or fire.
- Do not touch if liquid is spilled on the product. There is a risk of electric shock. Handle the battery wearing the insulated gloves.
- Do not step on the product or the product package. The product may be damaged.
- Do not place any foreign objects on the top of the battery pack and on the cooling fin.
- Do not put the battery pack upside down on the ground.
- Do not connect the power cables at terminal block opposite direction.
- Do not charge or discharge damaged battery.
- If the battery pack is installed in the garage then ensure the product is above the height of the vehicle bumper and/or door.
- This battery pack has been certified IP55 and can be installed indoors as well as outdoors. However, if installed outdoors, do not allow the battery pack to be exposed to direct sunlight and water source as it may cause:
 - Power limitation phenomena in the battery
(with a resulting decreased energy production by the system)
 - Premature wear of the electrical/electromechanical components and mechanical components.
 - Reduction in performance, service life and possible damage of the battery
- Do not connect any AC conductors or Photo-voltaic conductors directly to the battery pack and should be only connected to the inverter.

1.2.3 Response to emergency situations

This battery pack comprises multiple batteries that are designed to prevent hazards resulting from failures. However, LG electronics cannot guarantee their absolute safety.

- If a user happens to be exposed to internal materials of the battery cell due to damage on the outer casing, the following actions are recommended.
Inhalation : Leave the contaminated area immediately and seek medical attention.
Eye contact : Rinse eyes with running water for 15 minutes and seek medical attention.
Contact with skin : Wash the contacted area with soap thoroughly and seek medical attention.
Ingestion : Induce vomiting and seek medical attention.

If a fire breaks out in the place where the battery pack is installed, perform the following countermeasures:

- **Fire extinguishing media**

Respirator is not required during normal operations.

Use FM-200 or CO2 extinguisher for battery fire.

Use an ABC fire extinguisher, if the fire is not from battery and not spread to it yet.

- **Fire fighting instruction**

1. If fire occurs when charging batteries, if it is safe to do so, disconnect the battery pack circuit breaker to shut off the power to charge.
2. If the battery pack is not on fire yet, extinguish the fire before the battery pack catches fire.
3. If the battery pack is on fire, do not try to extinguish but evacuate people immediately.

WARNING

There may be a possible explosion when batteries are heated above 150 °C. When the battery pack is burning, it leaks poisonous gases. Do not approach.

- **Effective ways to deal with accidents**

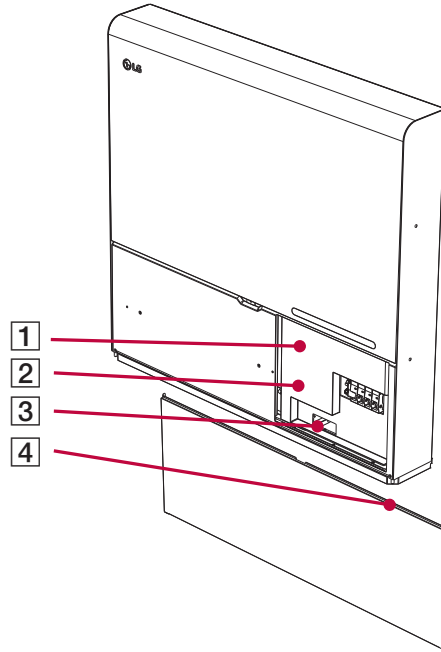
On land : Place damaged battery into a segregated place and call local fire department or service engineer.

In water : Stay out of the water and don't touch anything if any part of the battery, inverter, or wiring is submerged.

Do not use submerged battery again and contact the service engineer.

1.3 Warning label

Warning labels and other relevant labels are attached to the inside of the battery pack.



Safety

1 Warning Label

<p>DANGER / HIGH VOLTAGE INSIDE</p>		
<p>Do not disassemble or repair to avoid injuries, electric shock or burns. Service by authorized personnel only. Do not charge or discharge arbitrarily. It may lead to fault, electric shock or burns. Do not damage the unit in such ways as drop, deform, impact, cut or open with a sharp object. It may cause electrolyte leakage. Measure DC voltages before working in wiring box. WARNING: Battery system is a bidirectional source of voltage. Battery circuit breaker, and inverter must both be off, before working in the wiring box.</p>	<p>Do not attempt to break open the unit. The units are only serviceable by certified personnel. Do not place near open flame or incinerate. Keep out of reach of children or animals. Do not install this product in the place exposed to the direct sunlight. Sometimes even if the DC Disconnect is OFF, there may be voltage on the lines to the Inverter. So please ensure the DC Disconnect on the Inverter is also OFF during service/maintenance. Single person lift could cause injury. Use assistance when moving or lifting. Electric shock hazard if a ground/fault is indicated. Normally grounded conductors may be Ungrounded and energized.</p>	<p>Es kann vorkommen, dass selbst im ausgeschalteten Zustand des Speichers eine Spannung zwischen Batterie und Wechselrichter messbar ist. Also stellen Sie immer sicher, dass der DC-Trenner des Wechselrichters ist auch ausgeschaltet während Wartungen oder Service-Arbeiten durchgeführt werden. Einzelne Personen können sich beim Arbeiten des Speichers verletzen. Holen Sie sich Hilfe, wenn sich den Speicher versetzen oder arheben müssen. Es herrscht Stromschlaggefahr, wenn es zu einem Erdchluss kommen sollte. Es kann vorkommen, dass geerdete Leiter doch nicht geerdet wurden und unter Strom stehen.</p>
<p>Verboten zu zerlegen oder zu reparieren, um Verletzungen wie Stromschlag oder Brände zu vermeiden. Nur geschulte Fachkräfte dazu berechtigt. Verbotenes zu laden oder entladen. Es könnte zu Fehler, Stromschlag oder auch Brandgefahr führen. Schäden am Gerät wie Herunterfallen, Deformationen, äußere Einflüsse, aufschneiden mit einem spitzen Gegenstand müssen verhindert werden. Es könnte dazu führen, dass Elektrolyt ausläuft. Messen Sie zuerst die DC-Spannung bevor Sie am Gerät arbeiten wollen. WARNUNG: Das Batteriesystem ist eine bidirektionale Spannungsquelle. Batterie, Freischalter und Wechselrichter müssen ausgeschaltet sein bevor Sie an beiden Geräten arbeiten wollen.</p>	<p>Versuchen Sie nicht die Batterie aufzubrechen. Die Geräte sind nur durch zertifiziertes Personal bedienbar. Platzieren Sie die Batterie nicht in der Nähe von offenem Feuer oder Zündquellen. Halten Sie Kinder und Tiere fern. Installieren Sie die Batterie nicht in Umgebungen wo sie direktem Sonnenlicht ausgesetzt ist.</p>	<p>Ne pas installer le produit dans un endroit directement exposé au soleil. Parfois, même si le courant continu est coupé, il peut y avoir du courant dans les lignes de l'onduleur. Assurez vous donc que l'onduleur est également hors tension durant les interventions de maintenance. Porter l'appareil seul personnel entraine un risque de blessure. Merci de demander une assistance pour porter ou déplacer l'appareil. Si un défaut de la terre est indiqué alors il y a risque de choc électrique. Dans ce cas il se peut que la mise à la terre ne fonctionne pas.</p>
<p>Ne pas démonter ou réparer pour afin d'éviter des blessures, chocs électriques ou brûlures. Seul un personnel de dépannage qualifié est autorisé à intervenir sur l'appareil. Ne pas charger et décharger arbitrairement. Cela risquerait d'engendrer des défauts, chocs électrique ou brûlures. Cela pourrait engendrer une fuite de liquide électrolytique. Mesurer les tensions en continu avant câblage.</p>	<p>ATTENTION : le system de la batterie est une source de tension bidirectionnelle. Le disjoncteur du circuit de batterie et l'onduleur doivent être hors tension avant câblage. Ne pas placer près d'une flamme ou incinérer le produit. Tenir hors de portée des enfants ou d'animaux.</p>	

2 Product Label

<p>LG Electronics Inc. EU Representative Wijk aan Zee 1, 1185 EM, Netherlands</p>		
<p>Series Name Internal Type of battery</p>	<p>Capacity Voltage Range 150-400V 48V</p>	<p>Max. Surge DC Power Max. continuous power Substrate to connect cables position</p>
<p>Product name Product No. Type of model</p>	<p>Rated capacity Nominal voltage Discharge voltage</p>	<p>Max. Continuous DC Power Max. continuous AC power Discharge current</p>
<p>Model Material Finish</p>	<p>Max. charge Max. charge temp. Max. charge current</p>	<p>Operating temp. Page of Page of Instruction</p>
<p>Max. weight Dimensions Weight</p>	<p>Max. charge temp. Max. charge current Storage condition to connect to DC</p>	<p>Max. Surge DC Power Max. continuous power Substrate to connect cables position</p>
<p>Series Name Product No. Type of model</p>	<p>Max. charge temp. Max. charge current Storage condition to connect to DC</p>	<p>Max. Surge DC Power Max. continuous power Substrate to connect cables position</p>
<p>Dimensions Weight</p>	<p>Max. charge temp. Max. charge current Storage condition to connect to DC</p>	<p>Max. Surge DC Power Max. continuous power Substrate to connect cables position</p>

3 Traceability Label



4 DS Warning Label

Warning

Please follow the ON/Off procedure.
ON : Disconnect switch ON ⇒ Circuit breaker ON
OFF : Circuit breaker OFF ⇒ Disconnect switch OFF

1.4 Qualified personnel

This guide and the tasks and procedures described herein are intended for use by skilled workers only. A skilled worker is defined as a trained and qualified electrician or installer who has all of the following skills and experience:

- Knowledge of the functional principles and operation of on-grid and off-grid (backup) systems.
- Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.
- Knowledge of the installation of electrical devices
- Knowledge of and adherence to this guide and all safety precautions and best practices.

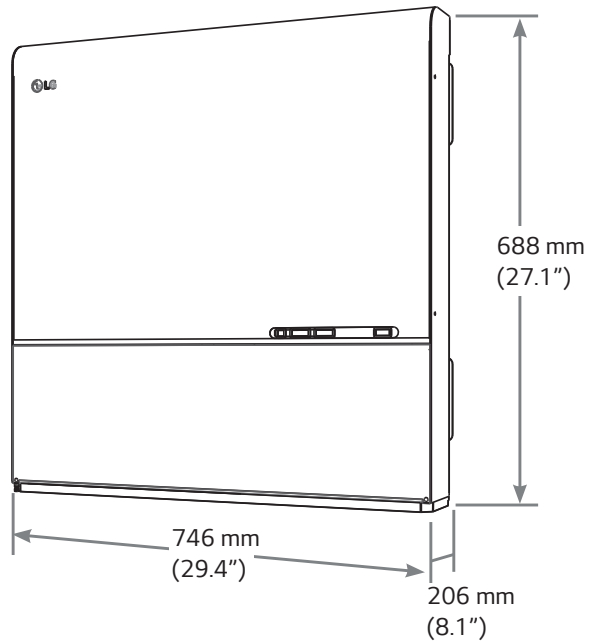
2 Product Introduction

2.1 Technical Data

2.1.1 Dimensions and weight

Battery Unit 7H	
P/N	TLB008603
Width	746 mm (29.4")
Height	688 mm (27.1")
Depth	206 mm (8.1")
Weight ¹⁾	79 kg (174 lbs)

1) A battery pack's weight varies slightly.



2.1.2 Performance

Battery Unit 7H

Electrical Characteristics

Total Energy Capacity	7 kWh@25°C (77°F), 100% SOE	
Usable Energy Capacity ¹⁾	6.6 kWh	
Battery Capacity	63 Ah	
Voltage Range	Charge	400 to 450 VDC
	Discharge	350 to 430 VDC
Absolute Max. Voltage	520VDC	
Max. Charge/Discharge Current	8.5 A@420V / 14.3A@350V	
Max. Charge/Discharge Power ²⁾	3.5 kW	
Peak Power ³⁾ (only discharging)	5 kW for 5 sec.	
Peak Current (only discharging)	13.5 A@370V for 5 sec.	
Communication Interface	RS485	
DC Disconnect	Circuit Breaker	
Connection Method	Spring Type Connector	
User interface	LEDs for Normal and Fault operation	

Operating Conditions

Installation Location	Indoor / Outdoor (Wall-Mounted)	
Operating Temperature	-10 to 45 °C (14 to 113 °F)	
Operating Temperature (Recommended)	15 to 30 °C (59 to 86 °F)	
Storage Temperature	-30 to 55°C (-22 to 131°F)	
Humidity	5% to 95%	
Altitude	Max. 2,000m (6,562 ft)	
Cooling Strategy	Natural Convection	
Noise Emission	< 40 dBA	

Certification

Total Energy Capacity	Cell	UL1642
	Battery Pack	TUV(IEC 62619) / CE(IEC 60950-1) / RCM
Emissions	IEC 61000-6-1 / IEC 61000-6-3	
Hazardous Materials Classification	Class 9	
Transportation	UN38.3	
Ingress Rating	IP55	

- ※ Test Conditions - Temperature 25°C, at the beginning of life.
- ※ Energy is measured under specific condition from LGE (0.3CCCV/0.3CC).
- ※ Short circuit Current: 496.5A
- 1) Value for Battery Cell Only (Depth of Discharge 95%).
Actual usable energy at the AC output may vary by condition, such as the battery converter, inverter efficiency and temperature.
- 2) LG Electronics recommends 2.1kW for maximum battery lifetime.
- 3) Peak Current excludes repeated short duration (less than 5 sec. of current pattern).

2.2 Feature

- Compact Energy storage unit for domestic photovoltaic system compatibility
- Residential 400V DC battery pack system : Daily cycle residential battery system.
- Additional Devices : Protection Devices* Included
 - * Protection Devices
 - Inverter interface (between Battery Pack and Inverter) : Over Voltage, Over Current, External Short Circuit, Reverse Polarity, Inrush Current, Ground Fault, Over Temp.
 - Battery inside (between Li-Ion battery and DC/DC converter) : Internal Short Circuit, Over Voltage, Over Current, Over Temp, Under Voltage
- Flexible installation : Indoor or Outdoor

2.3 Packaging specification

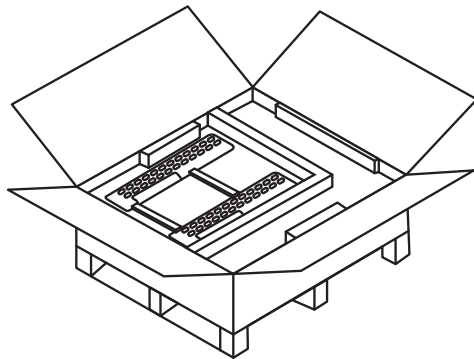
Category	Contents			
Size (L×W×H) (mm)	960 (37.8")	850 (33.5")	450 (17.7")	Outer Size
Qty/Box (ea)	1			1 piece × 2 layers
Packaging Materials	Box	Corrugated Cardboard		Disposable
	Inner	EPS		Disposable
	Pallet	Wood		Disposable
Weight (kg)	Product	84 (185 lbs)		1 piece/Box (Battery + Package Items)
	Packaging	24 (53 lbs)		Pallet + Box + Inner
	Gross	108 (238 lbs)		Product + Packaging

3 Installation

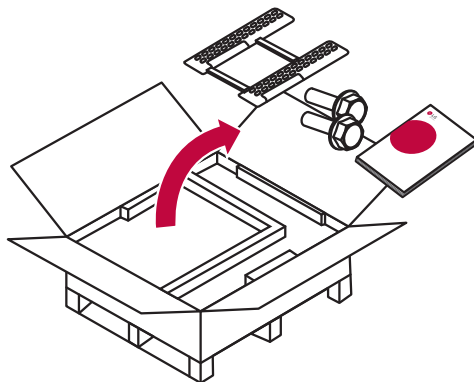
3.1 Mechanical requirements

3.1.1 Unboxing the package

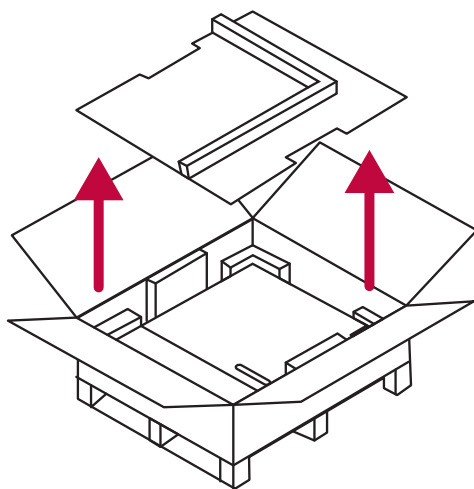
3
Installation



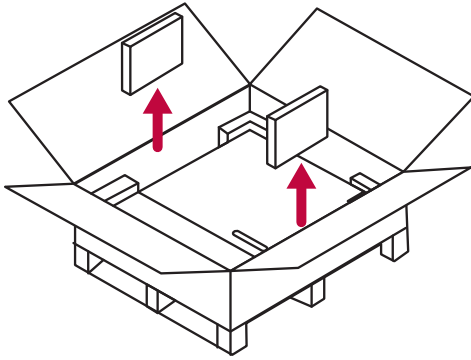
1 Cut the packing tape and open the carton.



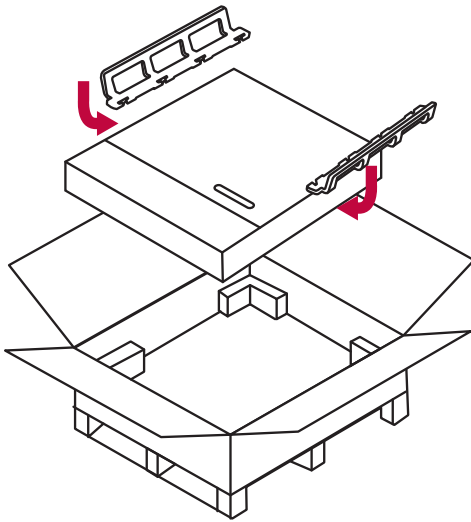
2 Pull out other items.
Take them out and check if any item is missing.
See Package items on section 3.1.2



3 Remove the wall bracket guide pad & cushioning pad.



- 4 Remove the side pad.



- 5 Pull out the battery pack using handles and stand it up. (Lift handles are sold separately for this product.)

CAUTION

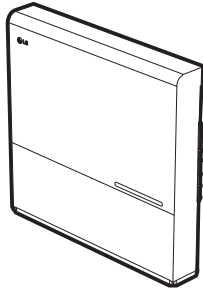
According to regional regulations, several people may be required for moving equipment.

3

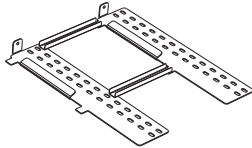
Installation

3.1.2 Items in the package

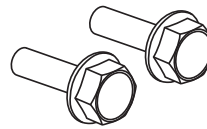
These items are included in the package.



Battery pack



Wall bracket



M6 wall mount
bolts (2EA)



Manual

3

Installation

3.1.3 Installation locations

Required :

- There must be no highly flammable or explosive materials nearby.
- The ambient temperature should be within the range of -10 ~ 45 °C (14 ~ 113 °F).
- Battery pack must be installed on walls that are upright and can support battery weight.
- Product can be installed indoors (ex. Basement or garage); or, outdoors but must be installed under an eave and out of direct sunlight.
- Battery pack must be Installed indoors in areas within 1 km from the coast.

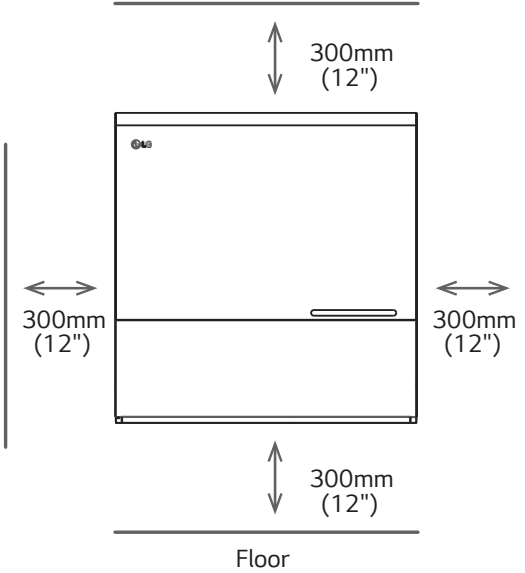
Recommended :

- The building should be designed to withstand earthquakes.
- The waterproof and properly ventilated area is recommended. (IP55)
- Install the product on a flat wall.
- Install this product out of reach of children and animals.

CAUTION

If the ambient temperature is outside the operating range, the battery pack stops operating to protect itself. The optimal temperature range for the battery pack to operate is from 15 to 30 °C (59 to 86 °F). Frequent exposure to harsh temperatures may deteriorate the performance and life of the battery pack.

3.1.4 Clearance

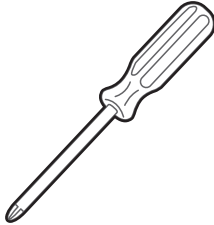


Minimum clearances for the left, right, top and bottom of the product is shown in the figure for the proper ventilation and installer convenience.

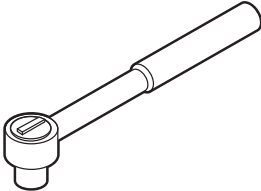
3.1.5 Tools & safety gears required

• Tools

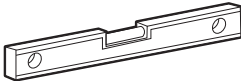
The following tools are required to install the battery pack :



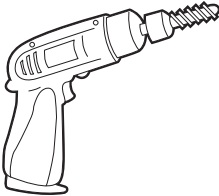
Precision screwdriver



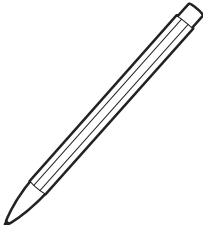
M6 Torque wrench



Inclinometer



Drill
(Min. Diameter 10 mm, 0.4")



Pencil or Marker

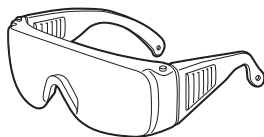


- **Safety gears for personal protection**

It is recommended to wear the following safety gears when handling the battery pack.



Insulated gloves



Safety goggles



Safety shoes

3

Installation

***i* NOTE**

This battery is heavy and challenging to lift. Lift handles are recommended.

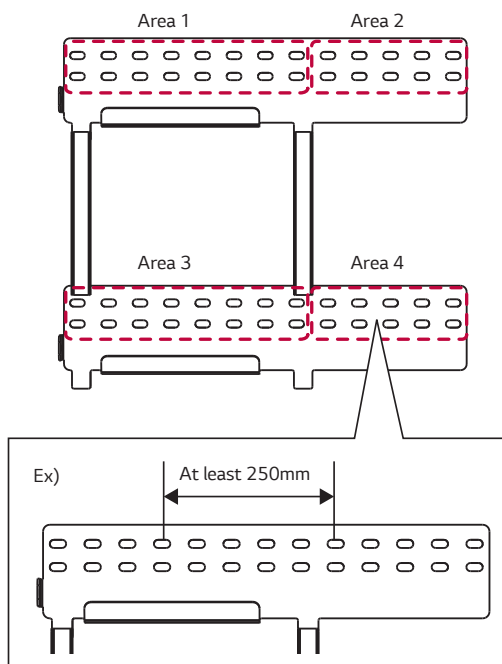


3.1.6 Mounting bracket

When installing the battery pack on a wall, make sure that the wall is capable of supporting the weight of the battery pack.

To mount the battery pack on a wall, take the following steps :

- 1 Mark the location on the wall for the holes.
- 2 Drill holes for fasteners in the wall.
- 3 Drive the fasteners through the mounting bracket into the holes.



- Recommended diameter : 10mm(0.4") Min.
- Recommended length : 70mm(2.8") Min.
- Recommended material : Stainless steel (8.8T)
- Recommended fastener count : 4 (Area1) / 2 (Area2) / 4 (Area 3) / 2 (Area4) - Vertically
- Recommended minimum fastener clearance : At least 250mm (10")
ex. Between Area 1's last fastener and Area 2's first fastener.

3

Installation

! CAUTION

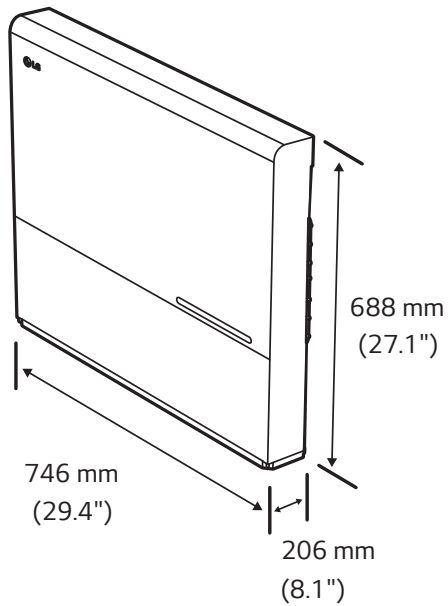
- Make sure that the battery pack is at all times exposed to the ambient air. The battery pack is cooled by natural convection. If the battery pack is entirely or partially covered or shielded, it may cause the battery pack to stop operating.

3.1.7 Appearance and Dimension

- **Appearance**

Proper handling and care is recommended as disassembly, change of color, scratches, leakage of liquid, and stains may influence the economic value of the battery pack.

- **Pack appearance and dimension**

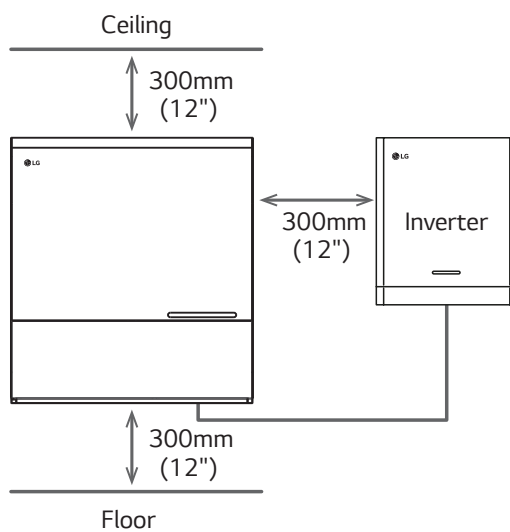


- **Color and Material**

- Front/Top Cover : Silver, Stainless
- Side Cover : Gray, Steel
- Rear Cover : Gray, Steel & Aluminium
- LED Cover : Black, Plastic

3.1.8 System clearance

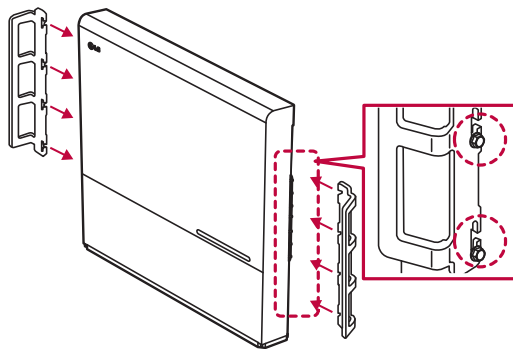
Battery requires adequate clearance for installation, cabling and air flow. Minimum clearance in the system configuration is as follows.



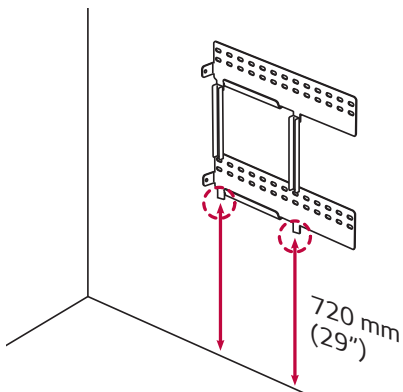
3.1.9 Installing the battery pack

! CAUTION

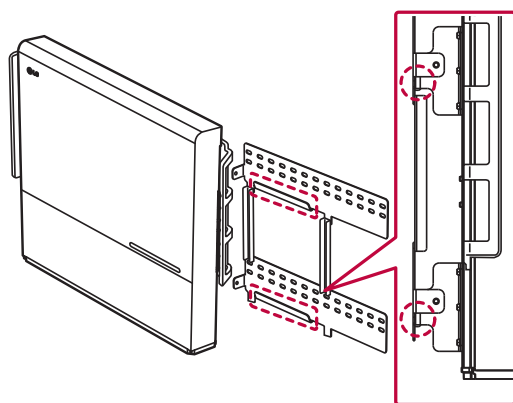
Make sure that the inverter AC and DC disconnects are turned off before connecting the power cable to the battery pack.



- 1 Fix the lift handles to the hex-socket screws on the rear (marked position) of both left and right sides.

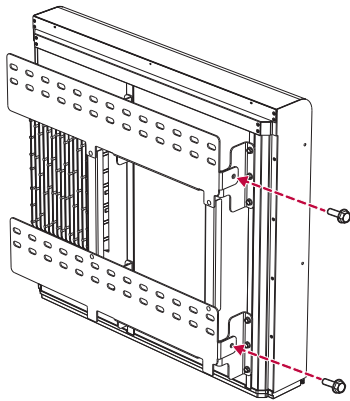


- 2 Mount the wall bracket to a wall. Tighten the screws, ensuring that they are horizontally driven into the wall. (Must be installed with recommended clearances (720mm [29"]) on the edge of the wall bracket as shown in the figure)

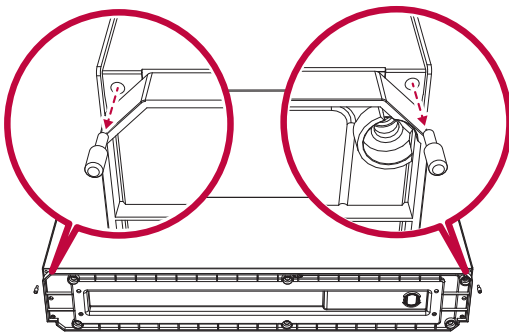


- 3 Mount the battery pack to a wall bracket's "U" shape clip using the support by lift handles. Remove the lift handles.

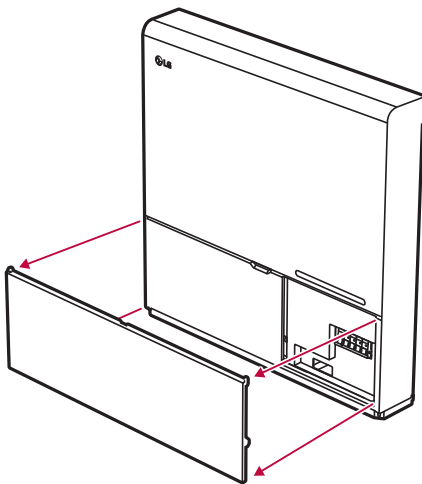
3
Installation



- 4 Tighten the two hex-socket screws enclosed and remove the lift handles. The nuts for these screws are welded to the battery pack chassis. Tighten to a torque of 5 N•m using the M6 torque wrench.



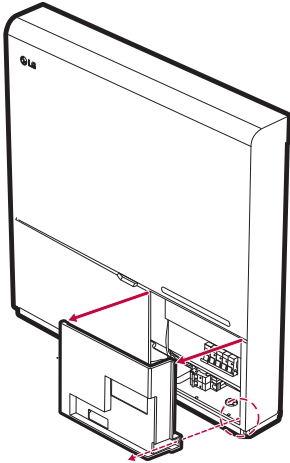
- 5 Loosen the two screws (marked position) at the bottom of wiring box cover.



- 6 Pull the wiring box cover to remove it.

! CAUTION

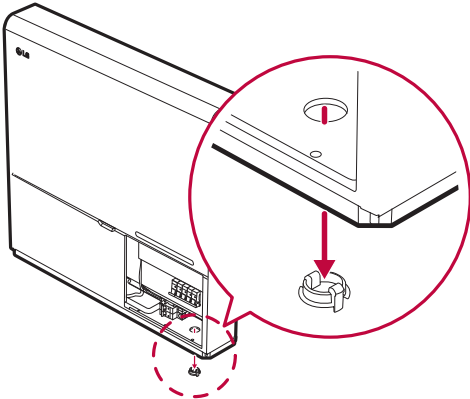
The wiring box cover is heavy. [approx. 1 kg (2.2 lbs)] If dropped it may cause injury.



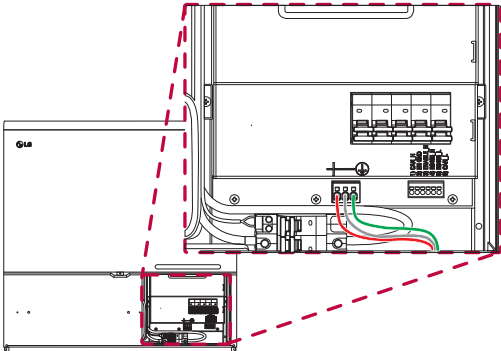
- 7 Loosen the screw (marked position), and remove the transparent protection cover.

CAUTION

If you lose or break a protection cover, that violates NEC Regulation.



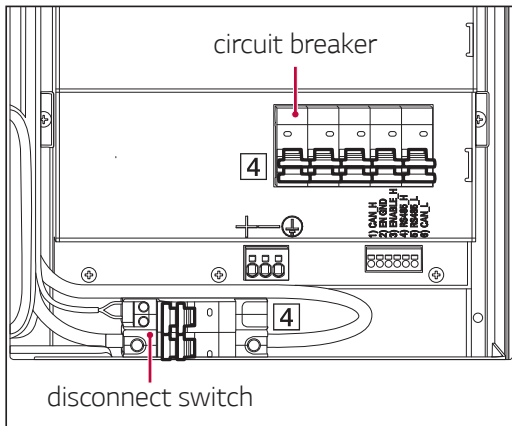
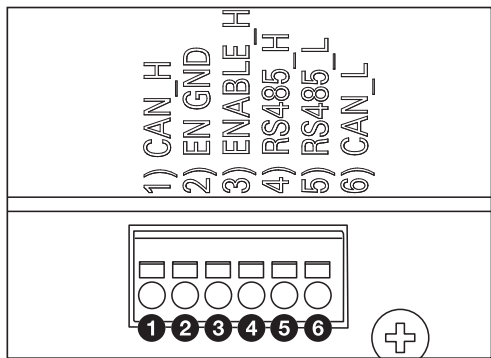
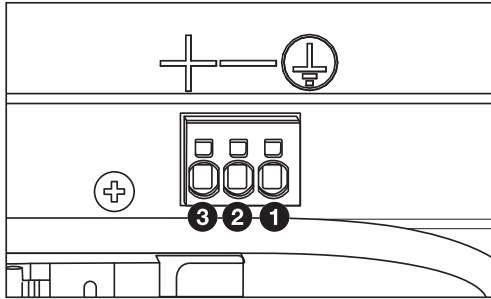
- 8 Remove the cap on hole in the bottom side, and assemble the 3/4" conduit plug. In the case outdoor, it must be sealed to comply "IP55" [ex] gasket, sealing foam, silicon, etc], where the battery pack installation is outdoor.



- 9 Connection Power / Communication cables, according to the labels marked.

3.2 Cable connection

3

 Installation


- 1 See 3.2.1. for Power Cable specifications
 - a) Connect the ground wire to terminal **1**.
 - b) Connect the negative line of the power cable to terminal **2**.
 - c) Connect the positive line of the power cable to terminal **3**.

- 2 See 3.2.1. for Communication Cable specifications
 At first, connect the ground wire to terminal **2**.
 Then, make connections to the other terminals one after another.

Install protection cover before turning on.

- 3 Connecting the battery pack to the inverter. Refer to the Installation Instructions for the inverter to connect the power cable and communication cable to the inverter.

※ Must turn off the disconnect switch to reduce self-discharge of battery during shipping and storage.

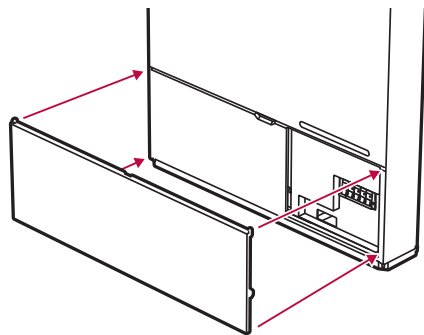
- 4 The switch-on process is described in Chap. 4.2 on page 28

CAUTION

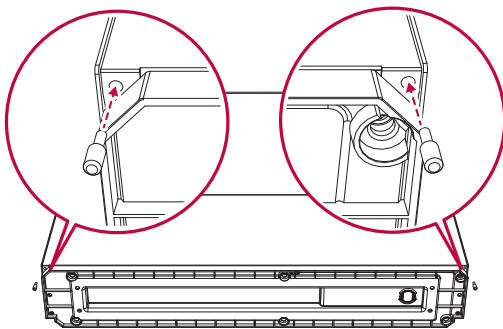
MUST follow the turn on procedure.

CAUTION

Please turn on or off the switch by pushing the middle of the bar. It is forbidden to push either end side of the bar. Any improper use could damage the product.

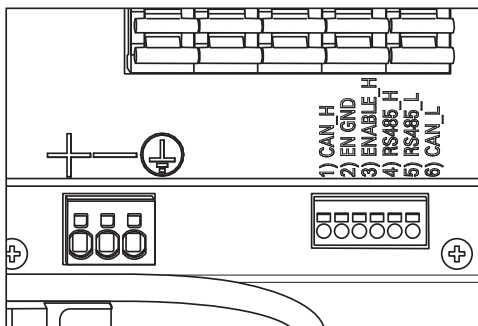


5 Close the wiring box cover.



6 Fasten the two screws (marked position) at the bottom of wiring box cover.

※ **Connect/disconnect the wire to connector sequence**



1 Make sure the circuit breaker off and the disconnect switch off.

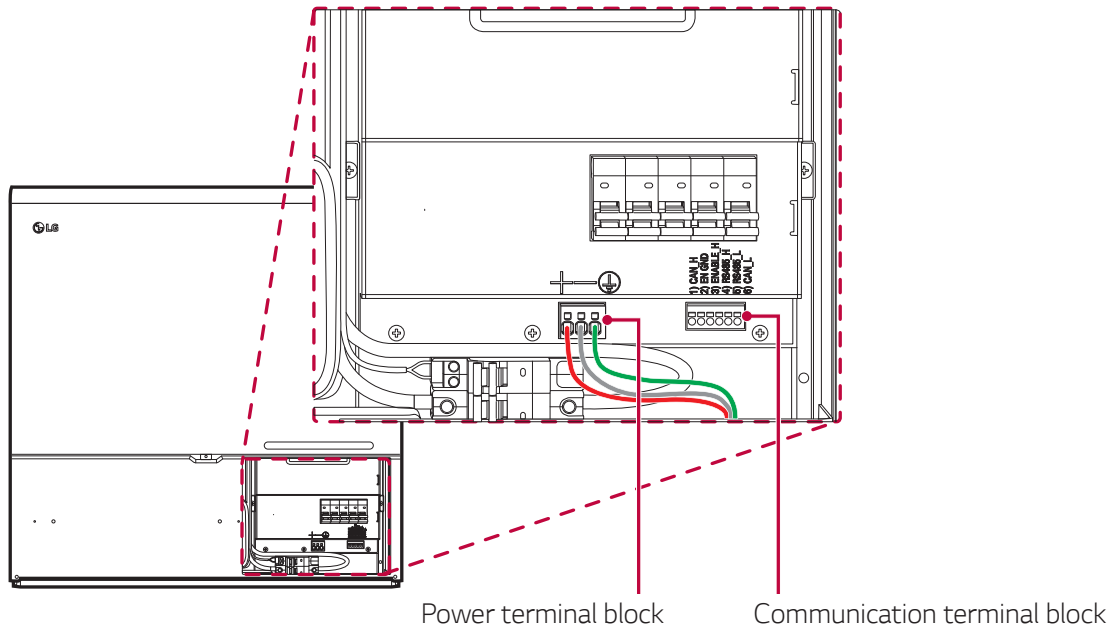
If removing power cables, check for voltage at power cable terminal

2 To remove one of the wires from its terminal, insert a small screwdriver into the rectangular hole above the terminal.

3 Apply slight pressure to the screwdriver and at the same time pull out the wire.

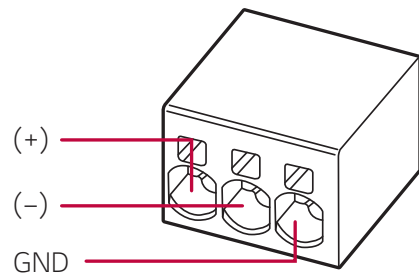
3.2.1 Spring terminal blocks

3
Installation



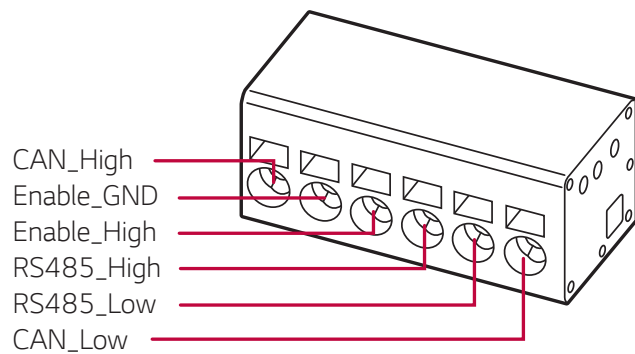
1 Power terminal block

- Max cable length: 10 m (35 ft)
- Cable Type : 4~10 mm² (8~12 AWG)
- DC 600 V insulated
- Pinning
- Phoenix Contact
- PCB Terminal Block SPT 5/3-V-7,5-ZB
- P/N : 1719325



2 Communication terminal block (SELV)

















- Max cable length: 10 m (35 ft)
- Cable Type : 0.2~1.5 mm² (18~24 AWG)
- Pinning
- Phoenix Contact
- PCB Terminal Block SPT 2,5/6-V-5,0
- P/N : 1991134



4 Commissioning

4.1 LED indicators

The LED indicators on the front of the battery pack show its operational state as follows:

LED Status				Action
 Power	 Charge	 Discharge	 Fault	Power on, Idle
 Power	 Charge	 Discharge	 Fault	Charging
 Power	 Charge	 Discharge	 Fault	Discharging
 Power	 Charge	 Discharge	 Fault	Fault

There are four LED indicators on the front of the battery packs to show its operating status.

- ON: This indicator stays on while the battery pack is ON.
- Charging: This stays on while the battery pack is charging.
- Discharging: This stays on while the battery pack is discharging.
- FAULT: This comes on when the battery pack is in a warning state. See Troubleshooting on page 29

4.2 Powering up the battery pack

Put the battery pack in operation by taking the following steps :

- 1 Remove the wiring box cover.
- 2 Turn on the disconnect switch after installation battery pack. Make sure that the Circuit Breaker switch is in the OFF position (including Trip position)
- 3 Move the circuit breaker switch to the ON position within 60 seconds after turn on the Disconnect switch.
- 4 Seconds after the Circuit Breaker switch is ON, 4 LEDs will be lit.
- 5 Make sure that ON indicator is on and see if the battery pack is successfully initialized. The power on indicator on the front should turn on in green.
- 6 Close wiring box cover.
- 7 Turn on the inverter.

CAUTION

If it stays off, indicates FAULT or fails to operate, do not use the battery pack and contact LG Electronics (page 35) or your distributor.

4.3 Shutting off the battery pack

To shut down the battery pack, follow these steps :

- 1 Turn off the inverter.
- 2 Remove the wiring box cover.
- 3 Turn off the battery pack by moving the Circuit Breaker switch to the OFF position.
- 4 Turn off the disconnect switch.
- 5 Close wiring box cover.

WARNING

Do not turn off the disconnect switch at normal operation (Charge/Discharge/Idle).

If not commissioning after installation or there is any fault on the battery pack, turn off the Circuit Breaker, then turn off the disconnect switch.

5 Troubleshooting

5.1 Troubleshooting

Check the indicators on the front to determine the state of the battery pack. A warning state is triggered when a condition, such as with voltage or temperature, is beyond design limitations. The battery pack's BMS periodically reports its operating state to the inverter.

When the battery pack falls outside prescribed limits, it enters a warning state. When a warning is reported, the inverter immediately stops operation.

Use the monitoring software on the inverter to identify what caused the warning. The possible warning messages are as follows:

- Battery Over Voltage
- Battery Under Voltage
- Battery Over Temperature
- Battery Under Temperature
- Battery Discharge Over Current
- Battery Charge Over Current
- BMS Internal Communication
- Battery Cell Voltage Imbalance

The abnormal state is cleared when the battery pack recovers normal operation. If battery pack is not working correctly and the issue persists, contact a qualified personnel, Installer or LGE regional contact point.

NOTE

For a serious warning, if no proper corrective actions are taken by the inverter, the battery pack's circuit breaker and disconnect switch automatically trip to protect itself.

CAUTION

If the battery pack or the inverter indicates FAULT or fails to operate, contact LGE regional contact point (page 35) or your distributor immediately.

5.1.1 Post-Installation check List

	YES	NO
1. Visual check if the wiring matches with the installation manual. (3.2 Cable connection)	<input type="radio"/>	<input type="radio"/>
2. The disconnect switch is ON.	<input type="radio"/>	<input type="radio"/>
3. The Circuit Breaker is ON.	<input type="radio"/>	<input type="radio"/>
4. The battery "ON" LED is ON.	<input type="radio"/>	<input type="radio"/>
5. The inverter power is ON. ¹⁾	<input type="radio"/>	<input type="radio"/>
6. The inverter has the latest firmware. ²⁾	<input type="radio"/>	<input type="radio"/>
7. The inverter recognizes the battery.	<input type="radio"/>	<input type="radio"/>
8. The battery can operate after installation is correctly done.	<input type="radio"/>	<input type="radio"/>
8-1. The AC grid is connected.		
8-2. The Meter is installed.		
8-3. The government approval is complete.		
9. IF ANY OF #8 IS CHECKED AS "NO" OR THE INVERTER NEEDS TO BE TURNED OFF, TURN OFF THE CIRCUIT BREAKER. ³⁾	<input type="radio"/>	<input type="radio"/>

5

Troubleshooting

5.1.2 Troubleshooting guideline

If the battery LED is OFF

1. Turn off the Circuit Breaker.
2. Turn off the disconnect switch.
3. Turn off the inverter. Verify there is no power at the battery connection.
4. Unplug all the wires and reconnect. Re-check the wiring on the battery is done correctly. Refer to the installation manual (3.2 Cable connection).
5. Turn on the Circuit Breaker.
6. Turn on the inverter.
7. If the LED is still off, turn off the Circuit Breaker.
8. Contact LGE regional contact point.

1) Contact the inverter manufacturer.

2) Refer to the inverter installation manual or troubleshooting guideline.

3) Refer to the User guide or Installation manual (3.2 Cable connection) for the location of the battery Disconnect switch and the Circuit Breaker.

If the battery LED is ON, but the battery is not charging or discharging

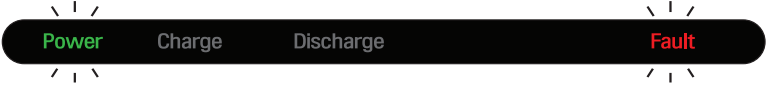
1. Update both the inverter and battery firmware version. Refer to the inverter's troubleshooting guide for instruction.
2. Check the inverter's setting for battery.
Refer to the inverter's troubleshooting guide for the battery set-up instruction.
3. If the battery is recognized, inverter set up is correct.
4. If the issue persists,
 - 4-1. Turn off the Circuit Breaker.
 - 4-2. Turn off the disconnect switch.
 - 4-3. Turn off the inverter. Verify there is no power at the battery connection.
 - 4-4. Unplug all the wires and reconnect. Re-check the wiring on the battery is done correctly. Refer to the installation manual (3.2 Cable connection).
 - 4-5. Turn on the disconnect switch first, then Turn on the Circuit breaker.
5. If the battery set up is correctly done, but the battery still does not operate, turn off the Circuit Breaker first, then turn off the Disconnect Switch.
6. Contact LGE regional contact point.

LED Status	Action
	Power on, Idle
	Charging
	Discharging



If the battery FAULT LED is ON

1. Check if the inverter recognizes the battery. Refer to the inverter's troubleshooting guide on the battery set-up instruction.
2. If the inverter is connected to the internet, collect the log file from the inverter company.
 - 2-1. Send the fault ID to LGE regional contact point.
 - 2-2. Turn off the Circuit Breaker first, then turn off the disconnect switch.
 - 2-3. Wait further instruction from LGE
3. If the inverter is not connected to the internet, check the inverter LCD to read battery's fault ID. Refer to the inverter's troubleshooting guide for instruction.
 - 3-1. Send the fault ID to LGE regional contact point.
 - 3-2. Turn off the Circuit Breaker first, then turn off the Disconnect Switch.
 - 3-3. Wait further instruction from LGE.

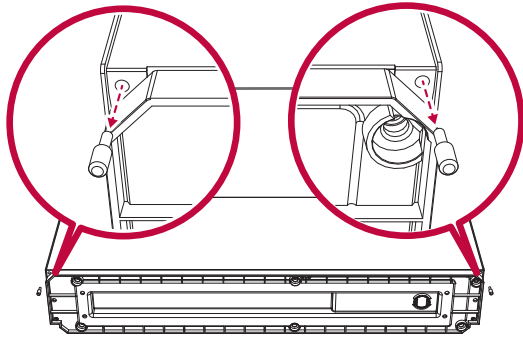
LED Status	Action
	Fault



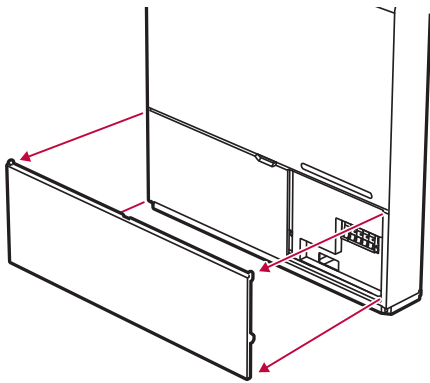
6 Uninstallation & Return

6.1 Return/replacement instructions

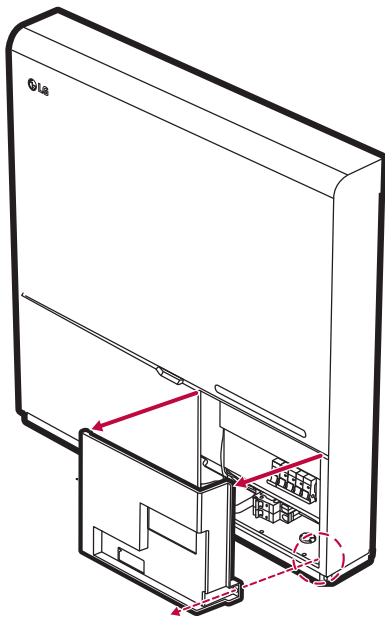
6.1.1 Uninstallation from the wall



- 1 Switch OFF the Inverter before starting the uninstallation of the battery pack.
- 2 Loosen the two screws (marked position) at the bottom of wiring box cover.



- 3 Pull the wiring box cover to remove it.

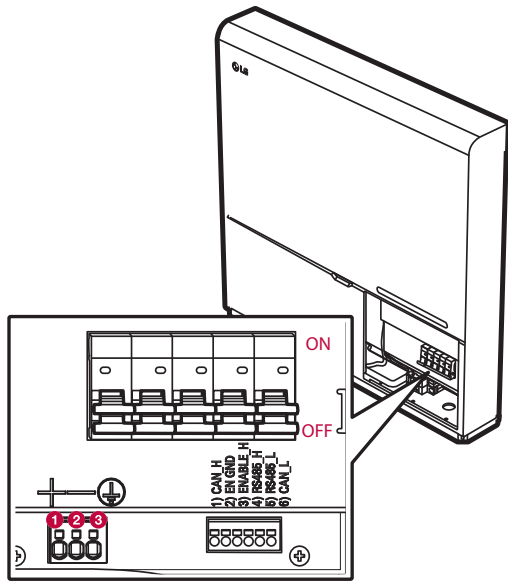


- 4 Switch off the circuit breaker and make sure that is in the OFF position. After that turn off the disconnect switch.

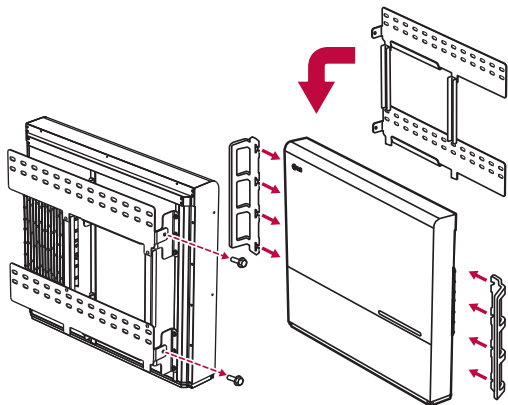
! CAUTION

MUST follow the turn off procedure. And do not turn off the disconnect switch while the battery is in operation.

- 5 Loosen the screw (marked position), and remove the transparent protection cover.



- 6 Check for voltage at power cable terminal.
- 7 Disconnect the communication cable from the communication port.
- 8 Disconnect the power cable from the terminal block. Disconnect the positive terminal (+) 1 first, and next the negative terminal (-) 2 and finally ground terminal 3
- 9 Assemble transparent protection cover. Close the wiring box cover, and fasten the screws.



- 10 Loosen the two hex-socket screws using a socket wrench to detach the battery pack from the wall using lift handles.

CAUTION

According to regional regulations, several people may be required for moving equipment.

- 11 Repack in Box (See 3.1.1)

6.1.2 Contact information

Damaged batteries are dangerous and must be handled with extreme caution. They are not fit for use and may pose a danger to people or property. If the battery pack seems to be damaged, contact LGE regional contact point or your distributor. Use the contacts below for technical assistance. These phone numbers are available only during business hours on weekdays.

Service Contact

Europe	Service	Address	LG Electronics ESS Solar Service E-Service Haberkorn GmbH Augustenhöhe 7 06493 Harzgerode
		Telephone	(Germany) 0049 (0)39484 / 976 380 (Austria) 0043 (0)720 / 11 66 01 (Switzerland) 0041 (0)44 / 505 11 42 (Benelux) 0031 (0)20 / 225 1660
		Email	lge@e-service48.de
	Germany Corporation	Address	LG Electronics Deutschland GmbH Alfred-Herrhausen-Allee 3-5 65760 Eschborn
		Telephone	0049 (0)18 / 06 807 020
		Email	b2b.service@lge.de
Benelux Corporation	Address	LG Electronics Benelux BV. Krijgsman 1, 1186 DM, Amstelveen, The Netherlands	
	Telephone	0031 (0)20 456 3100	
Australia	Australia Corporation	Address	LG Electronics 2 Wonderland drive, Eastern Creek, NSW 2766, Australia
		Telephone	0061 1800 042 568
		Email	solar.sales@lge.com.au

7 Maintenance

Check sealing components [ex) gasket, sealing foam, silicon, etc] (p.23 no9) every half year for IP 55.

