

RESU FLEX

Full Installation Manual for RESU FLEX

LG Energy Solution strongly advises users to exercise due care in following LG Energy Solution's product installation manual. Warranty claims are invalid if damage is caused by human error in a manner inconsistent with the installation manual's instructions.

Version 1.0

About this manual

This manual describes how to install LG Energy Solution’s RESU FLEX battery pack. Read this manual before you attempt to install the product, and follow the instructions throughout the installation process. If you are uncertain about any of the requirements, recommendations, or safety procedures described in this manual, contact LG Energy Solution immediately for advice and clarification. The information included in this manual is accurate at the time of publication. However, the product specifications are subject to change without prior notice. In addition, the illustrations in this manual are meant to help explain system configuration concepts and installation instructions. The illustrated items may differ from the actual items at the installation location.

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1. Safety

1.1 Symbols

-  Caution, risk of electric shock
-  Do not place or install near flammable or explosive materials
-  Install the product out of reach of children
-  Read the instruction manual, in its entirety, before starting installation and operation
-  Heavy weight may cause serious back injuries
-  Do not dispose of the product with household waste
-  Recyclable
-  Disconnect the equipment before carrying out maintenance or repair
-  Observe precautions for handling electrostatic-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 and service.

1.2.1 General Safety Precautions

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

Any type of product breakdown may lead to a leakage of electrolytes 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 and solar input must be

disconnected from the Battery Pack wiring. Wiring must be carried out by qualified personnel.

Battery pack should only be serviced by qualified personnel.

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 are visible under the Battery Cover (see Section 1.3 Warning Label).

1.2.2 Battery Handling Guide

- Do not expose the battery to an open flame.
- Do not place the product near to highly flammable materials.
- Do not expose or place near water sources such as downspouts or sprinklers.
- Do not store or install the product in direct sunlight.
- Do not install the product in an airtight enclosure or in an area without ventilation.
- Do not install the product in living area of dwelling units or in sleeping units other than within utility closets and storage or utility spaces.
- Store in a cool and dry place. (Do not store in greenhouses or storage areas for hay, straw, chaff, animal feed, fertilizer, vegetables, or fruit products.)
- Store the product on a flat, level surface.
- Store the product out of reach of children and animals.
- Store the product in clean environment, free of dust, dirt and debris.
- Do not disconnect, disassemble or repair the product unqualified personnel. Only qualified personal are to handle, install and service the Product.
- Do not damage the Product by dropping, deforming, impacting, cutting or penetrating with a sharp object. Doing so may cause a fire or leakage of electrolytes.

- Do not touch the product if liquid spills on it. There is a risk of electric shock. Handle the battery wearing insulated gloves.
- Do not step on the product or the product's packaging since the product may be damaged.
- Do not place any foreign objects on 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 the block in the opposite direction.
- Do not charge or discharge a damaged battery.
- If the Product is installed in a garage or carport, ensure there is adequate clearance from vehicles.
- The 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 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
- Only use the product with a LGES-authorized inverter.
For a list of compatible inverters, go to :
<https://www.lgessbattery.com/us> (in case of North America)
<https://www.lgessbattery.com/au> (in case of Australia)
<https://www.lgessbattery.com/eu> (in case of all EU-countries in general)
<https://www.lgessbattery.com/de> (in case of Germany)
<https://www.lgessbattery.com/it> (in case of Italy)
<https://www.lgessbattery.com/es> (in case of Spain)
- Do not connect any AC conductors or photovoltaic conductors directly to the battery pack. These are only to be connected to the inverter.

1.2.3 Response to Emergency Situations

The Product includes internal fault mechanisms designed to prevent failures and subsequent risk hazards. However, LG ES cannot guarantee safety performance of the Product is ever exposed to abuse, damage or negligence.

- If a user happens to be exposed to the internal materials of the battery cell due to damage on the outer casing, the following actions are recommended.

In case of inhalation: Leave the contaminated area immediately and seek medical attention.

In case of contact with eyes: Rinse eyes with running water for 15 minutes and seek medical attention.

In case of contact with skin: Wash the contacted area with soap thoroughly and seek medical attention.

In case of ingestion: Induce vomiting and seek medical attention.

If a fire breaks out at the location where the battery pack is installed, perform the following countermeasures.

- Utilize fire-extinguishing media

A respirator is not required during normal operation.

Use an FM-200 or CO₂ extinguisher for battery fires.

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

- Follow proper fire-fighting instructions

1) If a fire occurs when charging batteries, provided it is safe to do so, disconnect the battery pack circuit breaker to shut off the power charge.

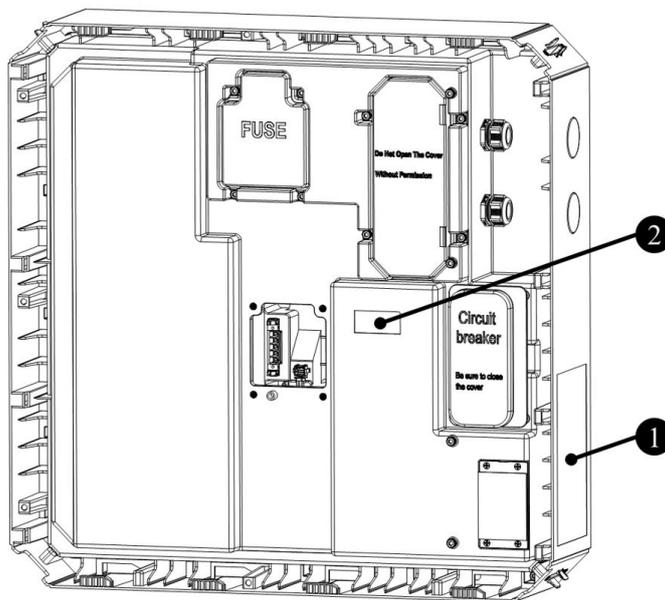
2) If the battery pack is not on fire yet, extinguish the fire before the battery pack catches fire preferably with water.

3) If the battery pack is on fire, do not try to extinguish it, and evacuate people from the premises immediately.

1.3 Warning Label

Product/warning label and Battery Control Unit's traceable label are behind the front cover. The Design cover opens. Battery Modules' traceable labels are attached to the side of the Battery Modules.

1.3.1 BPU



1. Product/Warning label

LG Energy Solution

Battery System Specification

- Battery Type : Rechargeable Li-Ion
- Model Name : RESU FLEX
- Rated Capacity : 37Ah
- Operating Temp. : -10~50°C
- IP Rating : IP55
- Short Circuit Current : 1.26kA
- Time Duration : 250ms
- Protective Class : Class I

Model No.	Nominal Voltage	Nominal Energy	Output Power	Battery designation
RESU FLEX 8.6	235Vdc	8.6kWh	4.3kW	ICP6/102/150/SP643/E/10+50/100
RESU FLEX 12.9	352Vdc	12.9kWh	6.5kW	ICP6/102/150/SP963/E/10+50/100
RESU FLEX 17.2	470Vdc	17.2kWh	8.5kW	ICP6/102/150/SP1283/E/10+50/100

K-P-2

⚠ WARNING

- Do not disconnect, disassemble or repair to avoid injuries, electric shock or burns. Service by authorized engineers.
- 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 spear with a sharp object. It may cause electrolyte leakage or fire.
- Breakdown of the unit may cause electrolyte leakage or flammable gas generation. In such case, please contact our support department at the following number.

Emergency Contact info : US +1 - 888 - 375 - 8044
 EU +49 - 0 - 6196 - 5719 - 660
 AU +61 - 1300 - 173 - 064
 JP +81 - 3 - 6369 - 8583

- When electrolyte leaks out, avoid contact with eyes, skin or clothes. In event of accident, flush with water and get medical help immediately.
- Do not place near open flame or incinerate. It may lead to fire or explosion.
- Keep the unit away from moisture or liquid. Do not touch or use if liquid spills on it.
- Single person lift could cause injury. Use assistance when moving or lifting.
- Keep out of reach of children or animals.

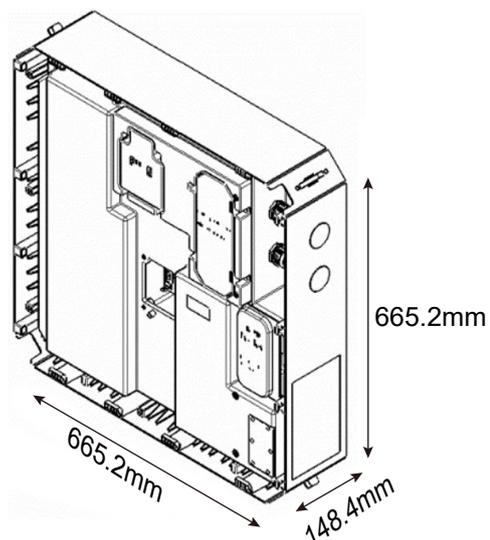
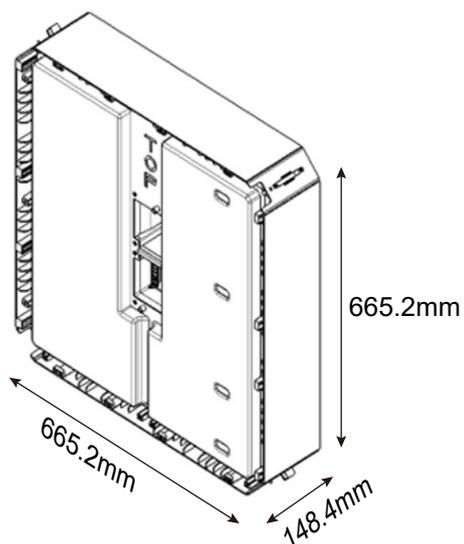
2. Traceable label

NAME : RESU FLEX BPU
MDM : EEA00462AAKKK
S/N : YYMDDL-SSS

2. Product Introduction

2.1 Technical Data

2.1.1 Dimensions and Weight



P/N	EH117037P9S1 (BMA)
Width	665.2 mm
Height	665.2 mm
Depth	148.4 mm
Weight	48.9 kg

P/N	EEA00462AA (BPU)
Width	665.2 mm
Height	665.2 mm
Depth	148.4 mm
Weight	16.5 kg

* Without Design Cover and Brackets

** Weight of BPU(with Design Cover) : 16.6 kg

2.1.2 Performance

Model Name	RESU FLEX 8.6	RESU FLEX 12.9	RESU FLEX 17.2
Electrical Characteristics			
Configuration	BPU 1ea, BMA 2ea	BPU 1ea, BMA 3ea	BPU 1ea, BMA 4ea
Usable Energy ¹⁾	8.6 kWh	12.9 kWh	17.2 kWh
Battery Capacity	37Ah	37Ah	37Ah
Voltage Range	192 to 265.6V	288 to 398.4V	384 to 531.2V
Max. Current	22A	22A	22A
Max. Power	4.3kWh	6.5kWh	8.5kWh
Peak Power ²⁾ (only discharging)	5kW for 3sec	7kW for 3sec	11kW for 3sec
Short circuit Current			
Communication Interface	RS485, RJ45		
DC Disconnect	Circuit Breaker		
Connection Method	Spring Type Connector		
User Interface	LEDs for Normal and Fault Operation		

Operating conditions

Installation Location	Indoor/Outdoor
Ingress Rating	IP55
Operating Temperature (Recommended)	14°F to 122°F (-10°C to 50°C)
Operating Temperature	68°F to 86°F (20°C to 30°C)
Storage Temperature	-22°F to 140°F (-30°C to 60°C), acceptable for 7 -4°F to 113°F (-20°C to 45°C), acceptable for the first 6 months -4°F to 86°F (-20°C to 30°C), acceptable for months 7-12
Humidity	Humidity 5% to 95%
Altitude	Altitude Max. 6,562 ft (2,000 m)
Cooling Strategy	Natural Convection

Certification & Reliability

Safety	Cell	UL1642, IEC62619
	Battery Pack	CE,RCM,UL1973,IEC62619, IEC62477-1
EMC	FCC,IEC61000-6-1/-2/-3	
Hazardous Materials Classification	Class 9	
Transportation	UN38.3	
Ingress Rating	IP55	

※ Test Conditions: Temperature 25°C/77°F, at the beginning of life.

※ Energy is measured under specific conditions from LG Energy Solution (0.3CCCV/0.3CC).

1) Value for battery pack only. Maximal usable energy at the AC output may vary by condition, such as inverter efficiency, configuration and temperature.

2) Peak current excludes repeated short duration (less than 10 sec. of current pattern).

2.1.3 Arc Flash Protection Calculations

In order to protect personnel from the possibility of getting injured by an arc flash Hazard, Arc flash calculation of the battery system is estimated with the Incident Energy calculations refer to Annex D of NFPA 70E.

Model name	RESU FLEX 8.6	RESU FLEX 12.9	RESU FLEX 17.2
Battery System Voltage	235V	352V	470V
Battery System Internal Resistance	0.240 ff	0.349 ff	0.473 ff
Bolted Fault Current	1.260kA	1.013kA	0.766kA
Arcing Current	0.630kA	0.506kA	0.383kA
Clearing Time	250us	250us	250us
Arc Flash Incident Energy	0.000168	0.000261	0.000344
Working Distance	450mm(18inches)		

Battery system installers must wear PPE (Personal Protective Equipment) according to NFPA 70E Article 130.

 **WARNING**

When installing the battery system, the worker shall wear arc-rated clothing on every occasions and places to protect him/her from any possible exposure to an electric arc flash.

- The arc-rated clothing worn by the worker must assure the worker's movement and visibility while covering all ignitable clothing.
- The worker shall always wear the non-conductive safety helmet on every occasions and places to protect him/her from any danger of head injury from electric shock or burns due to the contact with energized electrical conductors or circuit parts resulting from electrical explosion.
- The worker shall wear non-conductive protective equipment for the face, neck, and chin on every occasion and location to protect him/her from danger of injury from exposure to electric arcs or flashes resulting from an electrical explosion.
- The worker shall wear non-conductive protective equipment for the eyes on every occasion and location to protect him/her from any danger of injury from electric arcs or flashes resulting from an electrical explosion.
- The worker shall wear hearing protection within the arc flash boundary.
- The worker shall wear heavy-duty leather gloves or arc-rated gloves, satisfying the following regulation level, for arc flash protection. In the case of wearing the rubber gloves for the shock protection, he/she shall wear additional leather protectors above the gloves.
- The worker shall wear heavy-duty leather footwear or dielectric footwear or both to provide some arc flash protection.
- The worker shall inspect arc-rated apparel before every use. Work clothing or arc flash suits that are contaminated or damaged to the extent, impairing the protective qualities, shall not be used. Protective items that become contaminated with grease, oil, flammable liquids or combustible materials shall not be used.
- The garment manufacturer's instructions for care and maintenance of arc-rated apparel shall be followed.
- Arc-rated apparel shall be stored in a manner that prevents physical damage; damage from moisture, dust, or other deteriorating agents; or contamination from flammable or combustible materials.

2.2 Features

- Compact energy storage unit for domestic photovoltaic system compatibility
- Residential battery pack system: Daily cycle and emergency back-up capability.
- Protection devices included for protection against internal short-circuit, overvoltage, over current, over temperature and under voltage.
- Flexible installation: Indoors or Outdoors

2.3 Maintenance

RESU FLEX does not require maintenance during normal operation if properly installed per the installation manual. In the event of fault, contact the regional service center.

2.4 Packaging Specifications

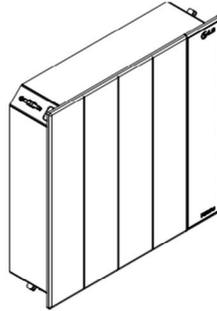
Category		Contents	
P/N		BMA	BPU
Size (LxWxH)		1,050*870*230	860*860*195
Qty/Box (ea)		1	1
Packaging Materials	Box	Corrugated cardboard	Corrugated cardboard
	Inner	Corrugated cardboard	Corrugated cardboard, Honeycomb
	Pallet	Wood	Corrugated cardboard, Wood
Weight	Product	48.9kg	16.6kg
	Pakaging	10kg(Box), 5.3kg(Accessory parts)	3.9kg(Box)
	Gross	64.2kg	20.5kg

3. Installation

3.1 Package Contents

3.1.1 BPU Package

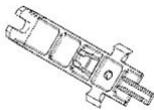
The Following item is included in the BPU Package.



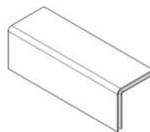
BPU

3.1.2 BPU Bundle Package

The Following items are included in the BPU Bundle Package.



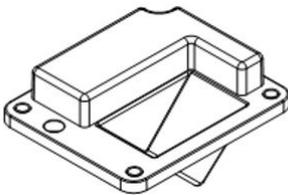
Fixing Bracket



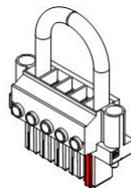
Single Corner Cover



Quick Installation Manual



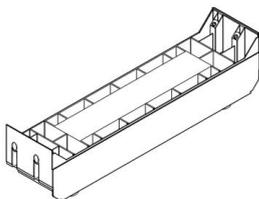
Connector Cover



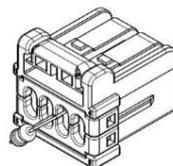
End Connector



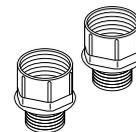
M6 Wrench Bolt(Black)



Basic Standing Bracket



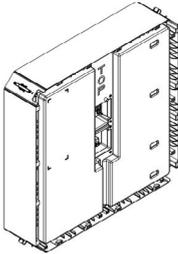
Terminal Resistor



3/4"-1" Adapter

3.1.3 BMA Package

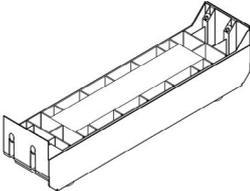
The Following items are included in the BMA Package.



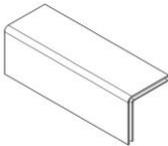
Battery Pack (BMA)



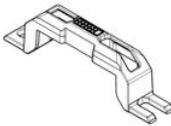
BMA Inter Cable Assy



Basic Standing Bracket



Single Corner Cover



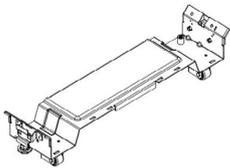
Corner Bracket



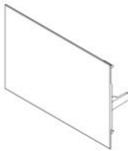
M6 Wrench Bolt(Black)

3.1.4 Option Item Package (Optional Standing type)

The Following items are included in the Option Item Package



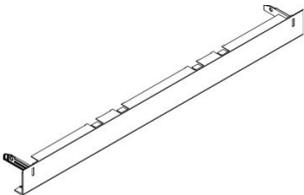
Pack Standing Bracket



Double Corner Cover



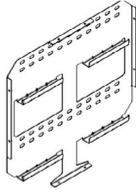
M6 Wrench Bolt(Black)



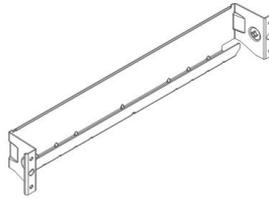
Optional Standing Bracket Cover

3.1.5 Option Item Package (Wall Mounting type)

The Following items are included in the Option Item Package (Wall Mounting Type)



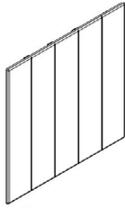
Wall Mounting Bracket



Pack Mounting Bracket



Double Corner Cover



Design Cover BMA



Corner Bracket



M6 Wrench Bolt (Black)



Wall Mount layout
information Manual

3.2 Installation Location

Make sure that the installation location meets the following conditions:

- The building is designed to withstand earthquakes.
- The location is far away from the sea, to avoid salt water and humidity.
- The floor is flat and level.
- There are no flammable or explosive materials nearby.
- The optimal ambient temperature is between 15 and 30°C.
- The temperature and humidity stays at a constant level.
- There is minimal dust and dirt in the area.
- There are no corrosive gases present, including ammonia and acid vapor.

NOTE

The RESU Battery pack is rated at IP55 and thus can be installed outdoors as well as indoors. However, if installed outdoors, do not allow the battery pack to be exposed to direct sunlight and moisture.

NOTE

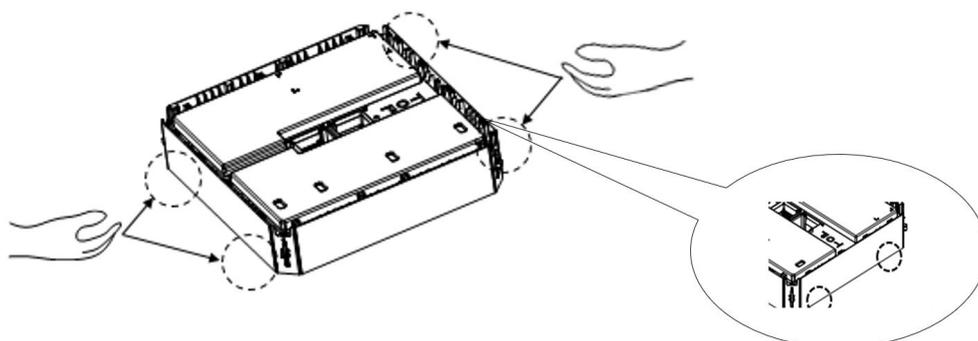
If the ambient temperature is outside the operating temperature range (-10°C ~ 50°C), the battery pack will stop operation to protect itself. The optimal ambient temperature range for the battery pack is between 20°C and 30°C .

Frequent exposure to harsh temperatures may deteriorate the performance and life of the battery pack.

3.3 Lifting Guide

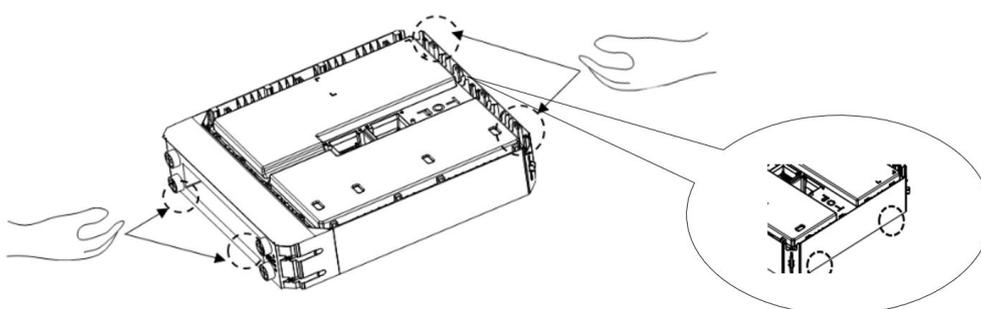
3.3.1 Only BMA

When taking the BMA out of the box



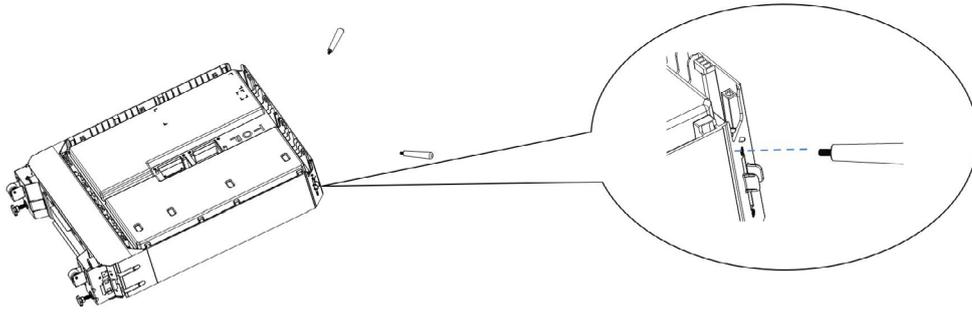
3.3.2 BMA With Basic Standing Bracket

When moving after assembling the Basic Standing bracket

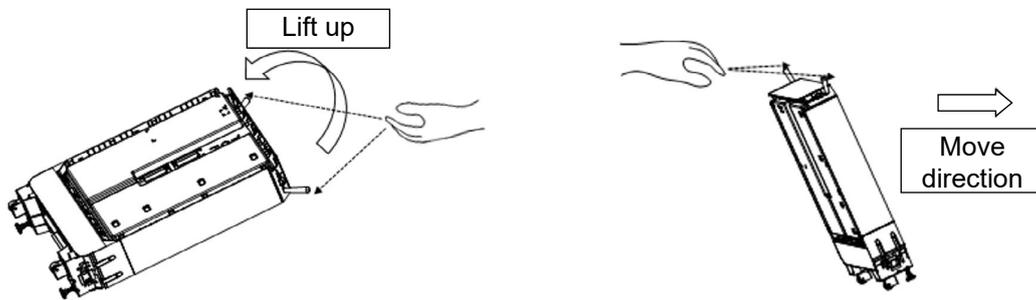


3.3.3 BMA With Optional Standing Bracket

Where to place the handle assemble.

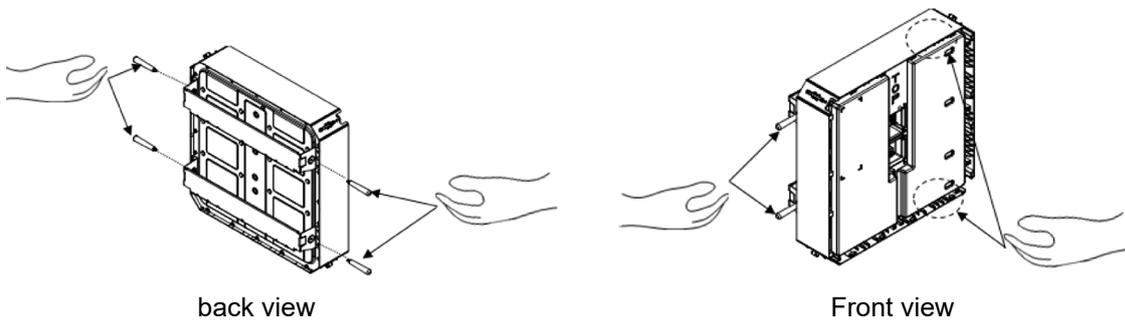


How to move BMA



3.3.4 BMA With Pack Mounting Bracket

When moving after Assembling Pack Mounting Bracket, The available location of the handle is different, depending on the installation order or type (Reference 3.8.1)



CAUTION

When moving the BMA and BPU, be careful of breakage and fall over.

When moving the BMA and BPU, be careful of shaking the Battery pack.

3.4 Tools

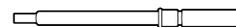
These tools are required to install the battery pack.



Torque screwdriver



Phillips-screwdriver bit



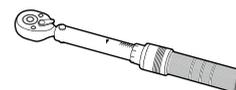
Hex-key bit



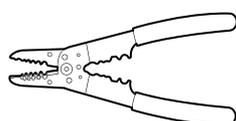
Phillips-head screwdriver



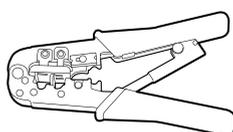
Flat-head screwdriver



Torque wrench



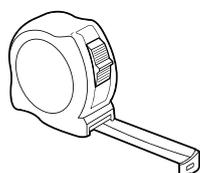
Wire stripper



Cable crimper



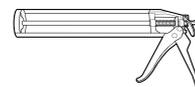
Voltmeter



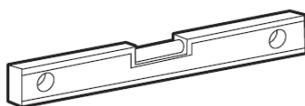
Tape measure



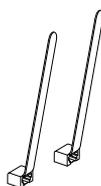
Drill



Sealant gun



Inclinometer



Cable tie

Use properly insulated tools to prevent accidental electric shock or short circuits.

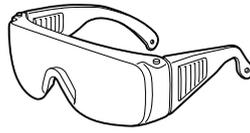
Use adjustable tools and measuring instruments that are certified for precision and accuracy.

3.5 Safety Gear

Wear the following safety gear when dealing with the battery pack. Installers must meet the relevant requirements on the national standards, such as IEC 60364 or the domestic legislation.



Insulated gloves



Safety goggles



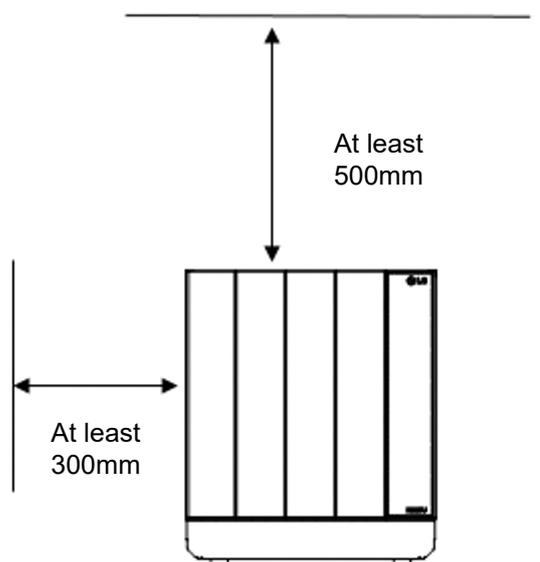
Safety shoes

3.6 Standing Installation (Basic Standing / Optional Standing)

3.6.1 Items for Stand type (Basic Standing / Optional Standing)

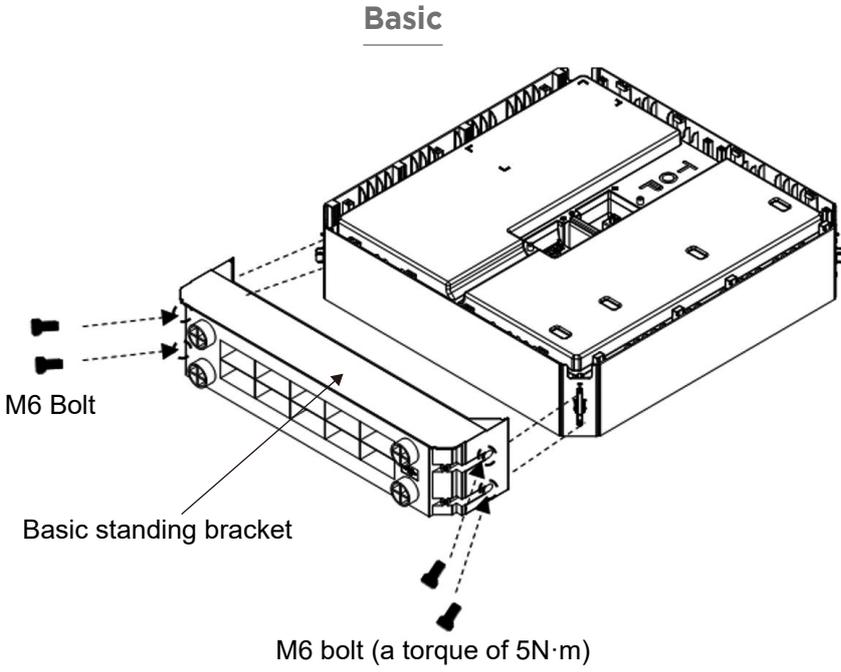
- M6 Wrench Bolt
- Basic Standing Bracket
- Handle
- Corner Bracket, Single Corner cover, Wall Standing Bracket
- BMA Inter Cable Assembly, BMA TML End CNT Assy, Terminal Cover End Assy

3.6.2 Clearance

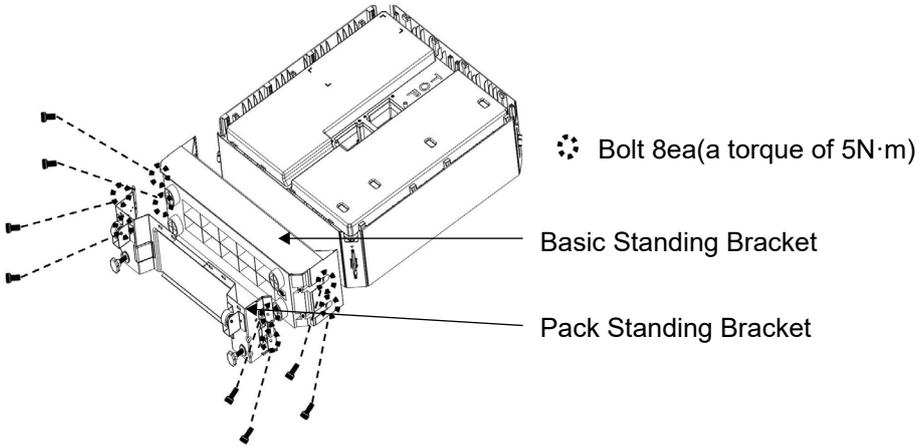


3.6.3 Install Battery Pack for Stand type

1. Assemble the Basic standing bracket



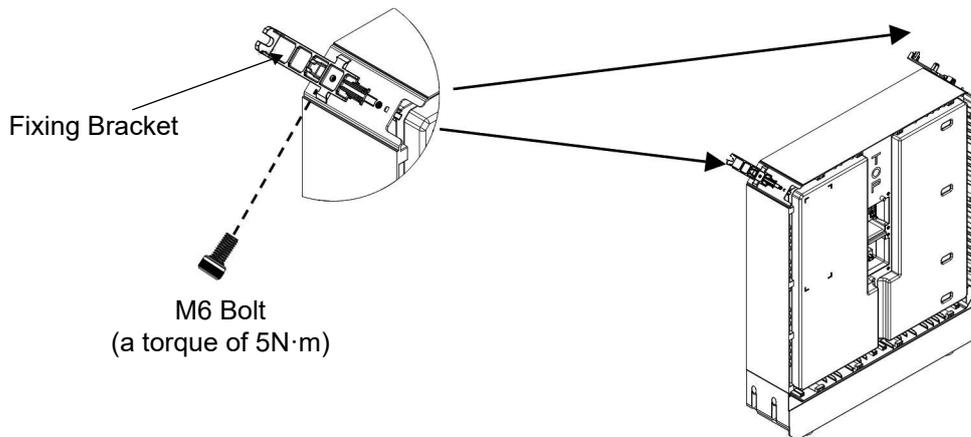
When adding Optional Standing Bracket



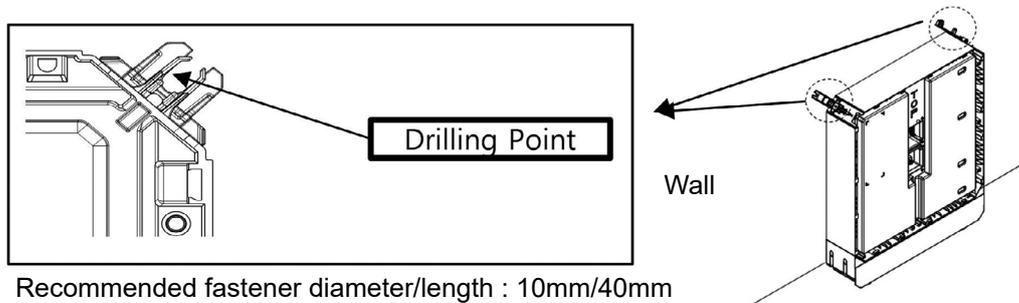
*Optional Standing Bracket is for additional purchase and is not included in basic package.

2. Fix the first BMA to the wall

1) Assemble Fixing Brackets on the first BMA

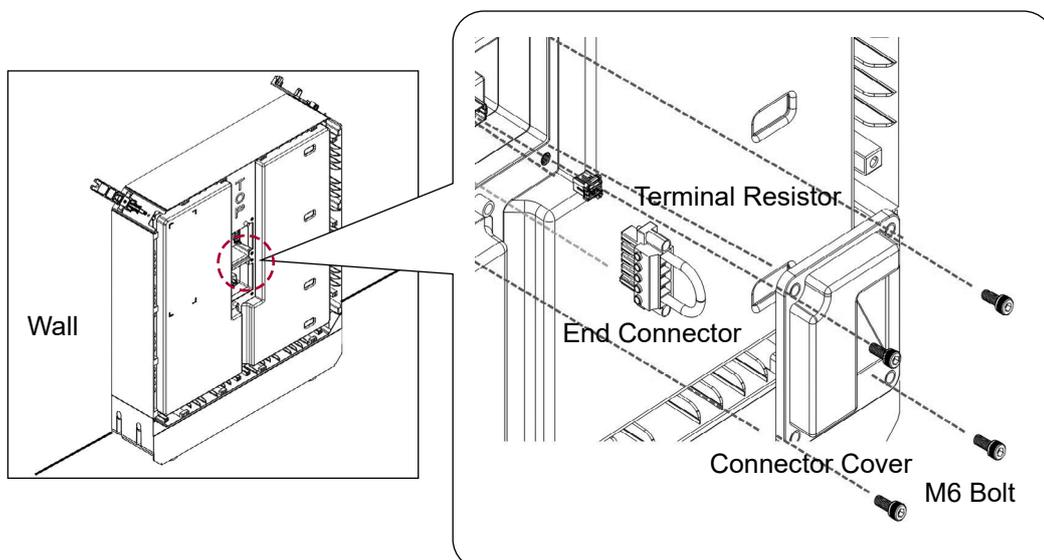


2) Move the first BMA to the wall and mark the drill point for the Fixing Brackets. Drill holes at the marked points and fix the BMA to the wall.

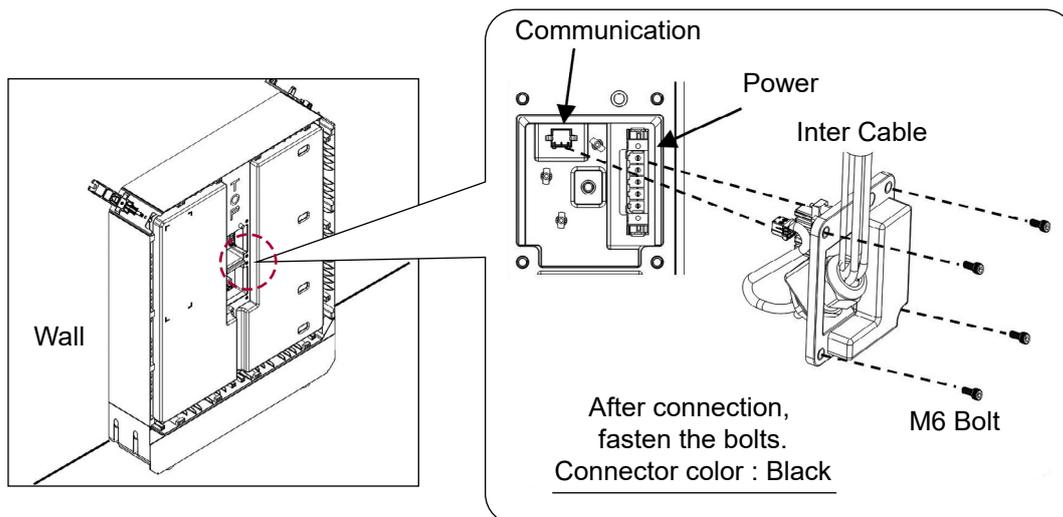


3. Connect the Terminal Resistor, End Connector and Connector Cover to the Bottom Terminal Block inside the BMA.

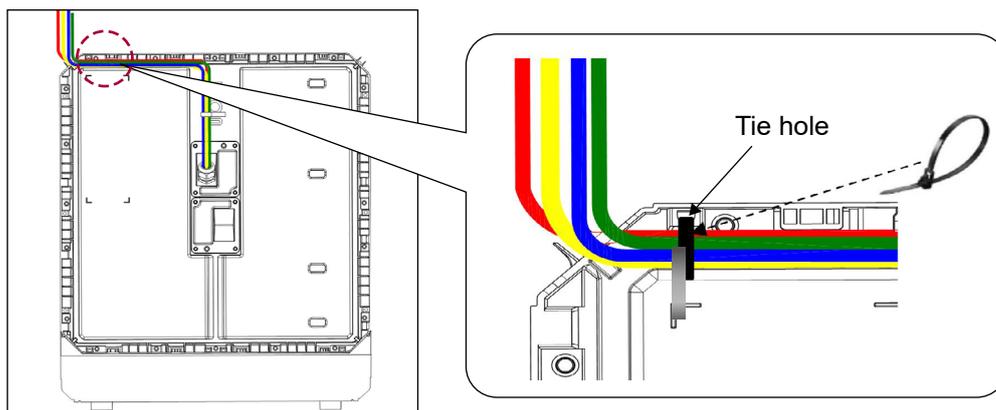
* Terminal Resistor, End Connector and Connector Cover are included in the BPU Bundle Package.



4. Connect the Inter Cable to the Top Terminal Block inside the BMA.



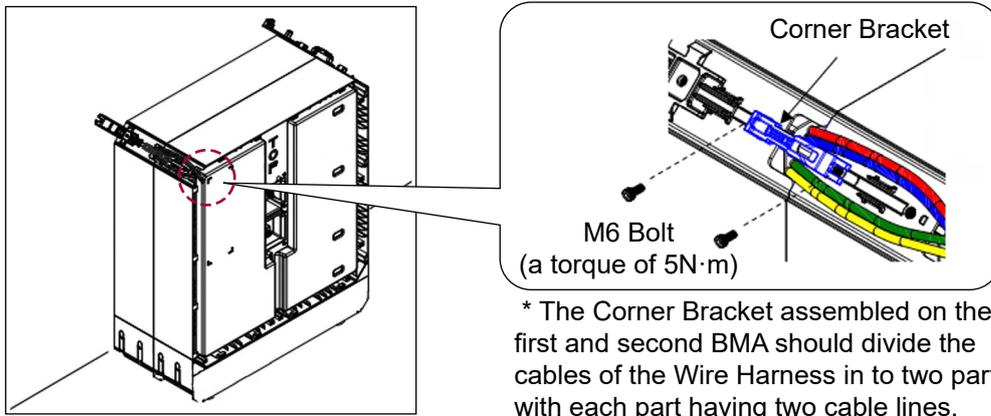
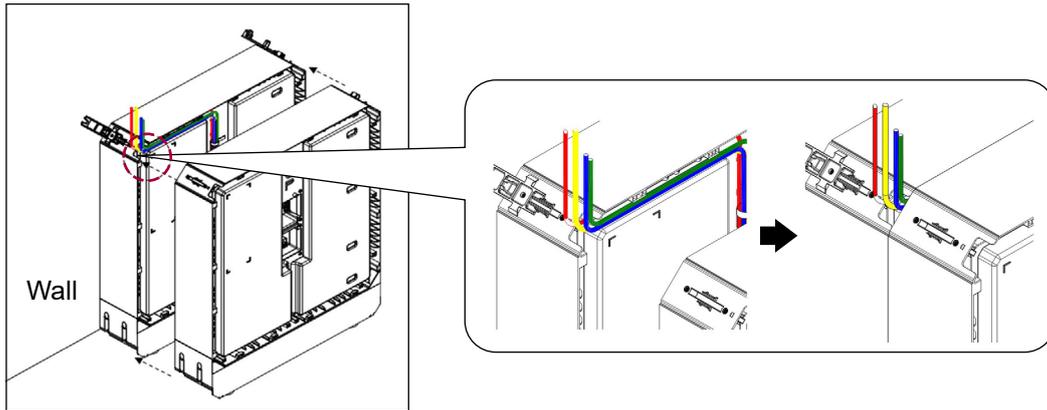
5. Tidy up the cable by inserting in the attachable path inside the BMA and fasten the cable using the Tie hole.



⚠ CAUTION

Be careful not to damage the cable.

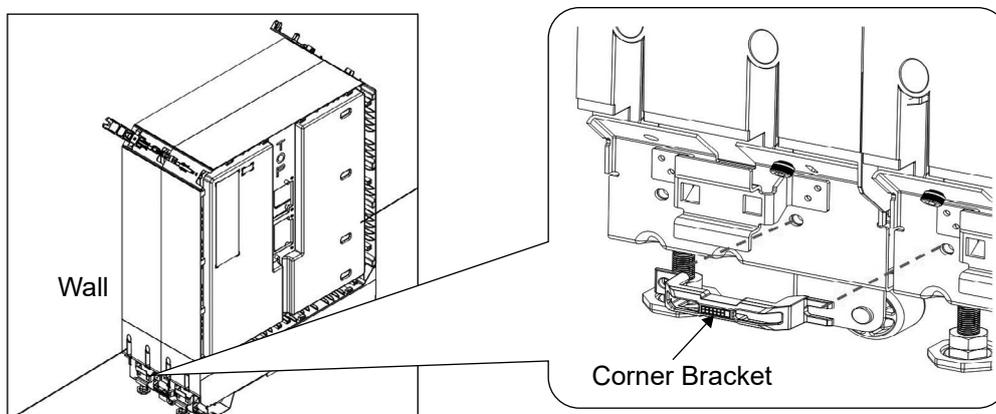
6. Install the second BMA in front of the first BMA.



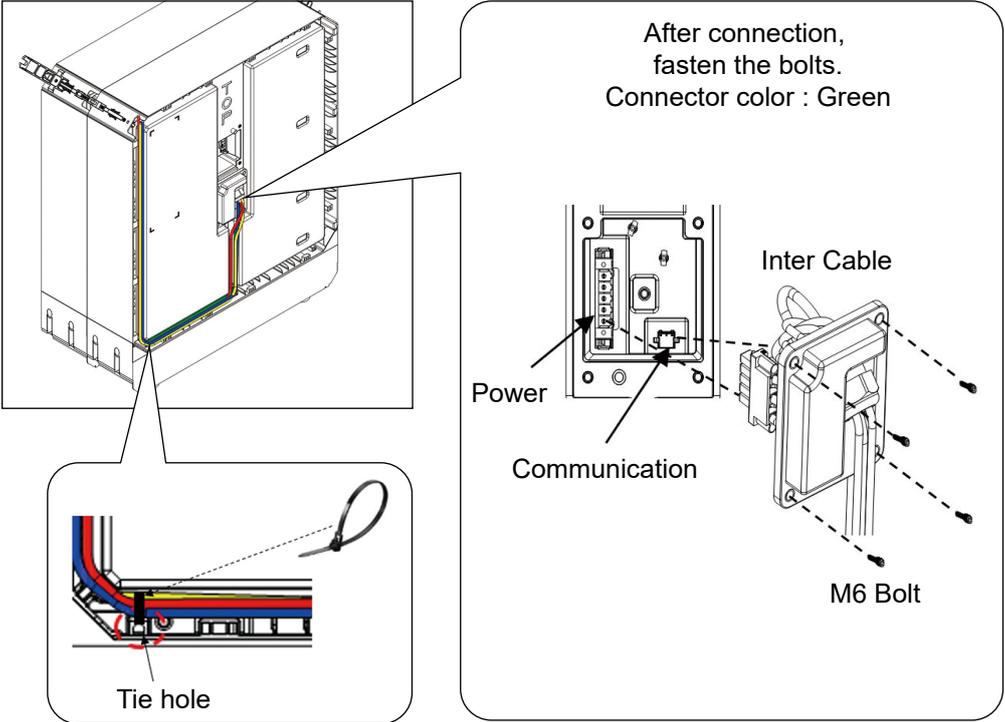
 **CAUTION**

When the second BMA is installed in front of the first BMA, make sure that the Inter Cable does not interfere between the BMAs.

When adding Optional Standing Bracket



7. Apply the Wire Harness along the attachable path as the below image and connect it to the Bottom Terminal Block of the second BMA.

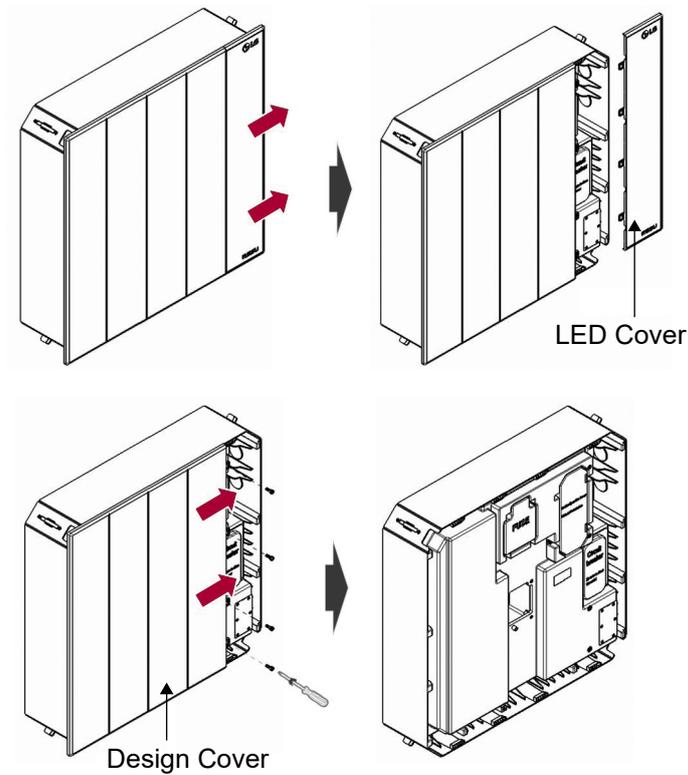


8. If the third and/or fourth BMAs are to be installed, repeat the steps from No.4 to No.7.

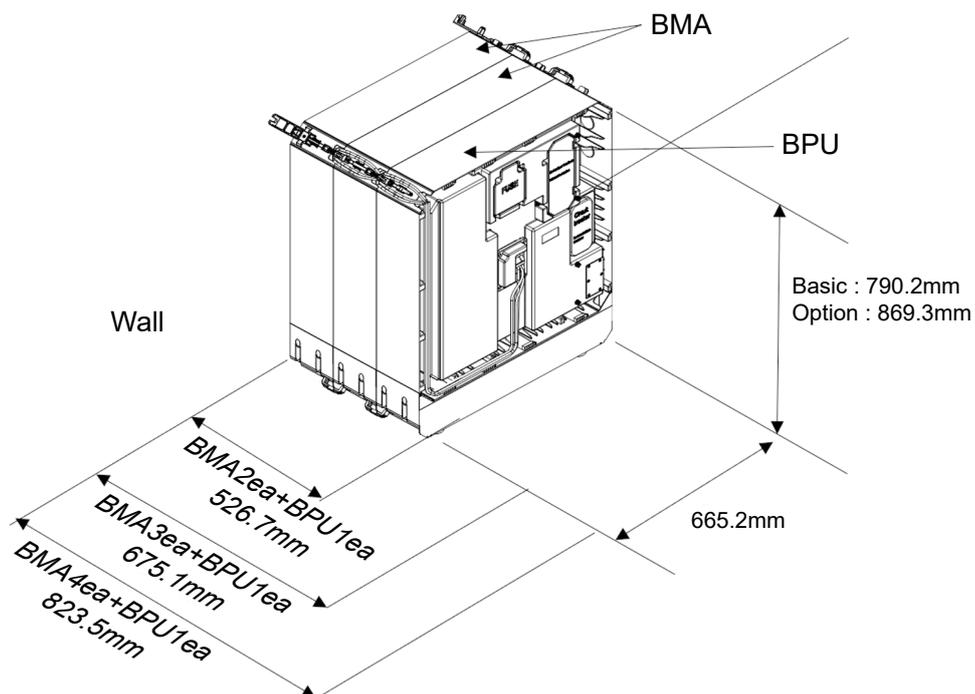
9. Apply the BPU in front of the last BMA, and connect the last BMA with the BPU with Wire Harness by repeating the steps from No.4 to No.7.

Remove LED Cover and Design Cover of the BPU

- 1) Slide and remove the LED Cover of the BPU.
- 2) Unscrew the 4 bolts on the right side of the BPU as illustrated below.
- 3) Slide and remove the Design Cover of the BPU.



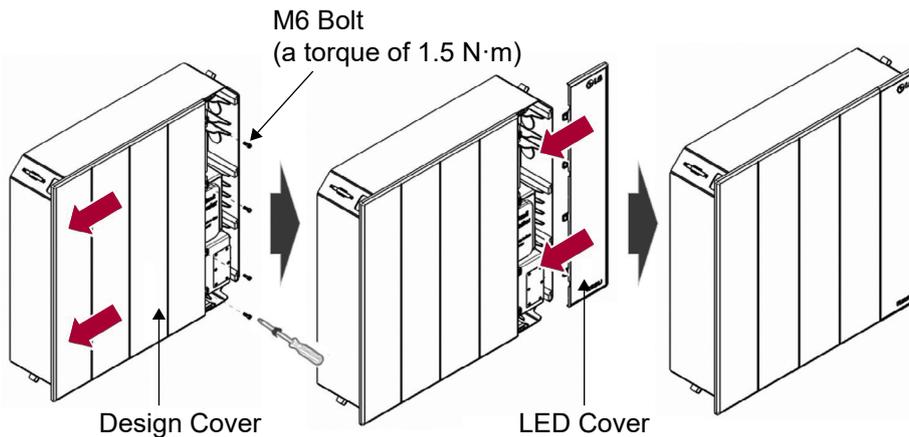
10. Refer to the dimension information by different number of BMAs, as illustrated below.



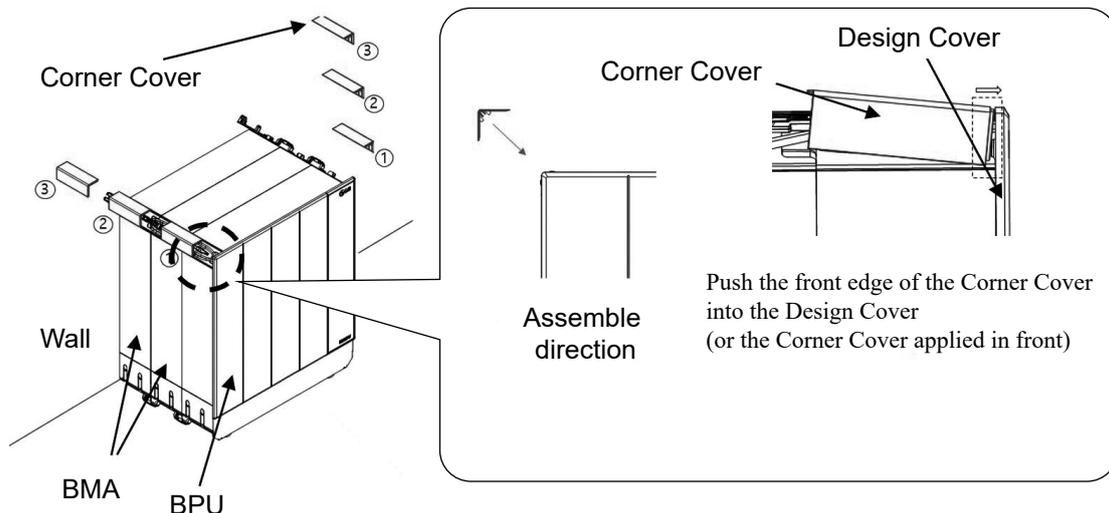
3.6.4 Finalizing Installation

The following steps shall be executed after the connection to the inverter and commissioning is completed.

1. Reassemble the BPU's Design Cover and LED Cover.
 - 1) Reassemble the Design Cover of the BPU by sliding it backwards
 - 2) Fasten the 4 bolts that were removed.
 - 3) Reassemble the LED Cover of the BPU by sliding it backwards.



2. After the installation of the BPU, assemble corner covers on each corner to protect the cables.
 - 1) Push the front edge of the Corner Cover into the Design Cover (or the Corner Cover applied in front)

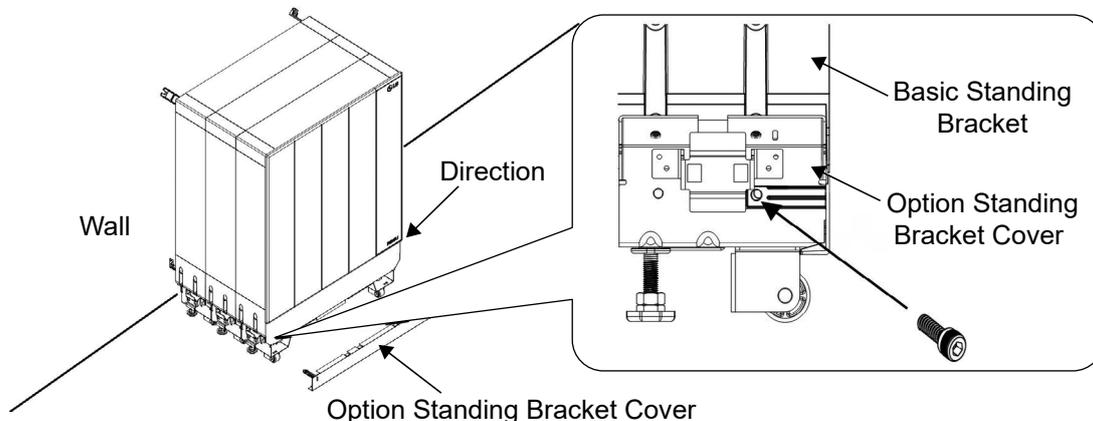


Wall-mounting Layout

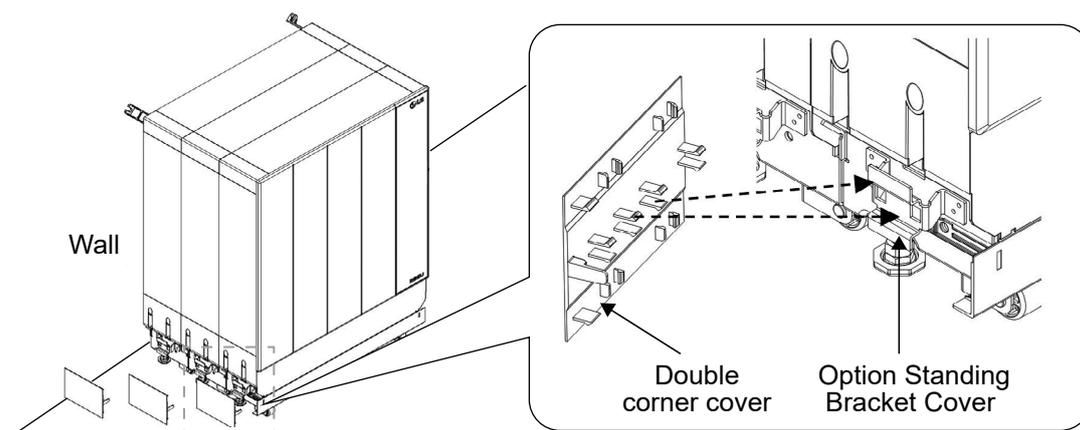
<div style="display: flex; justify-content: space-around;"> <div style="background-color: #0070C0; color: white; padding: 5px; font-weight: bold;">BPU</div> <div style="background-color: #FFD700; color: black; padding: 5px; font-weight: bold;">BMA</div> </div> <p>BPU1+BMA2 (8.6kWh)</p> <p>1 BMA installation order</p> <p>H: Height W: Width</p>	3-1	3-2	3-3	3-4	3-5	
	H : 1342.4mm W : 1342.4mm	H : 1342.4mm W : 1342.4mm	H : 2013.6mm W : 671.2mm	H : 1342.4mm W : 1342.4mm	H : 671.2mm W : 2013.6mm	
<div style="display: flex; justify-content: space-around;"> <div style="background-color: #0070C0; color: white; padding: 5px; font-weight: bold;">BPU</div> <div style="background-color: #FFD700; color: black; padding: 5px; font-weight: bold;">BMA</div> </div> <p>BPU1+BMA3 (12.9kWh)</p> <p>1 BMA installation order</p> <p>H: Height W: Width</p>	4-1	4-2	4-3	4-4	4-5	
	H : 2013.6mm W : 1342.4mm	H : 671.2mm W : 2684.8mm				
	4-6	4-7	4-8	4-9	4-10	
	H : 1342.4mm W : 2013.6mm	H : 1342.4mm W : 2013.6mm	H : 1342.4mm W : 1342.4mm	H : 2013.6mm W : 1342.4mm	H : 1342.4mm W : 2013.6mm	
<div style="display: flex; justify-content: space-around;"> <div style="background-color: #0070C0; color: white; padding: 5px; font-weight: bold;">BPU</div> <div style="background-color: #FFD700; color: black; padding: 5px; font-weight: bold;">BMA</div> </div> <p>BPU1+BMA4 (17.2kWh)</p> <p>1 BMA installation order</p> <p>H: Height W: Width</p>	5-1	5-2	5-3	5-4	5-5	
	H : 2013.6mm W : 1342.4mm	H : 2013.6mm W : 1342.4mm	H : 2013.6mm W : 2013.6mm	H : 2013.6mm W : 2013.6mm	H : 2013.6mm W : 2013.6mm	
	5-6	5-7	5-8	5-9	5-10	
	H : 2013.6mm W : 2013.6mm	H : 2013.6mm W : 2013.6mm	H : 2013.6mm W : 2013.6mm	H : 2013.6mm W : 1342.4mm	H : 1342.4mm W : 2013.6mm	
	5-11	5-12	5-13	5-14	5-15	
	H : 2013.6mm W : 2013.6mm	H : 1342.4mm W : 2684.8mm	H : 2013.6mm W : 1342.4mm	H : 1342.4mm W : 2684.8mm	H : 1342.4mm W : 2684.8mm	
	5-16	5-17	5-18	5-19	5-20	
H : 1342.4mm W : 2684.8mm	H : 2013.6mm W : 2013.6mm	H : 1342.4mm W : 2684.8mm	H : 1342.4mm W : 3356mm	H : 1342.4mm W : 2013.6mm		

When adding Optional Standing Bracket

1) Apply the Wire Harness along the attachable path as the below image and connect it to the Bottom Terminal Block of the second BMA.



2) Assemble Double Corner covers into Optional Standing Bracket



3.7 Wall-mounting Installation

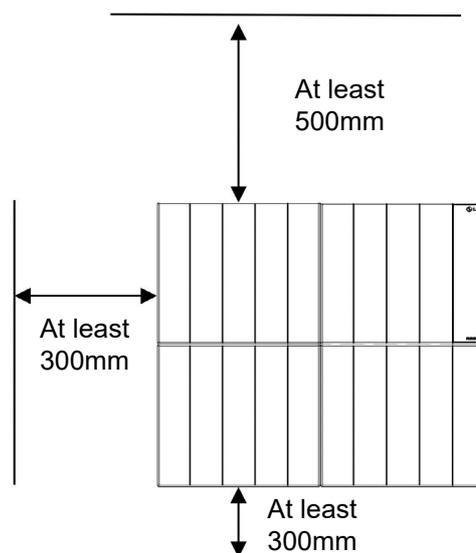
For Wall-mounting installation, the BMA and BPU can be placed in various layouts. Please select a layout for installation in advance and check for the mounting and cabling order in the following ‘Wall-mounting Layout’ section

3.7.1 Items for Wall Mount Type

These items are used for Wall Mount type

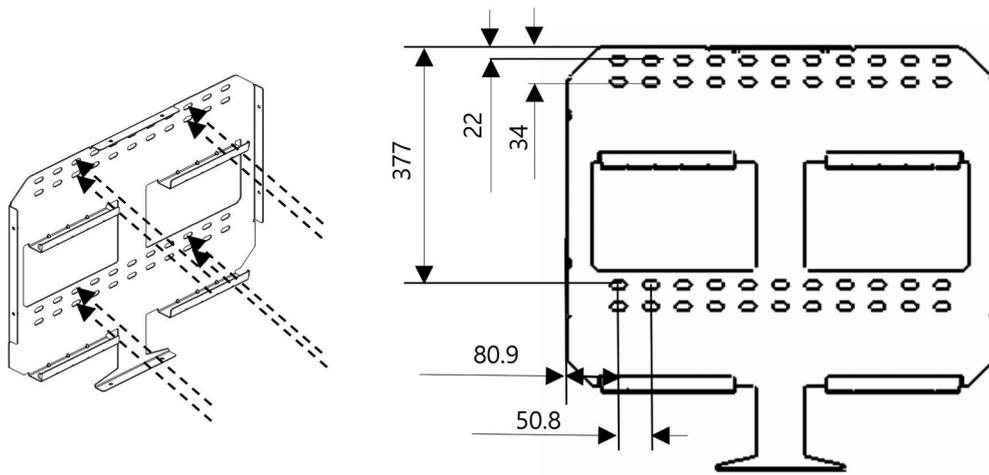
- M6 Wrench Bolt
- Anchor Bolt
- Wall Mounting Bracket, Pack Mounting Bracket
- Design Cover
- Corner Bracket, Single Corner Cover, Double corner cover
- Handle
- BMA Inter Cable Assy, BMA_TML End_CNT Assy, Terminal Cover End Assy

3.7.2 Clearance



3.7.3 Mounting Brackets Installation

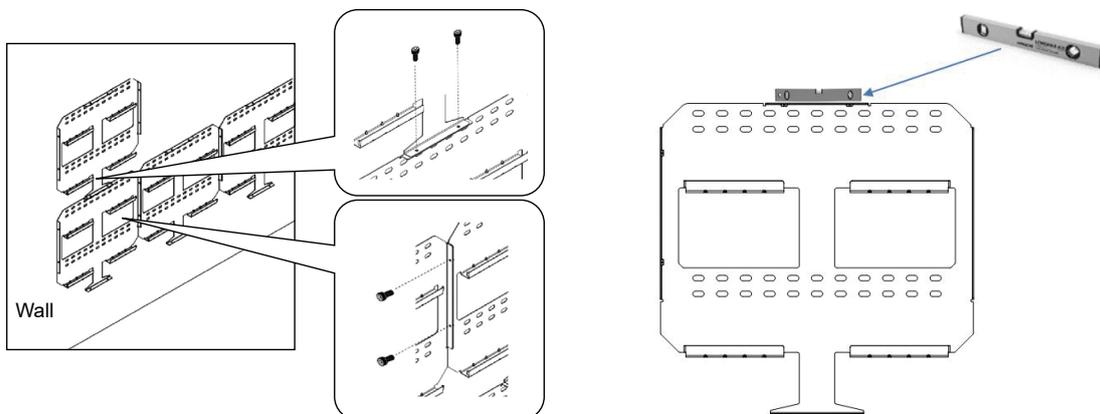
1. Select a layout referring to the enclosed layout document.
2. Decide the position of Mounting Bracket.
3. Drill holes in the wall for the anchor bolts (Minimal size of M8 0.3in is required). The drilling depth should be at least 50mm.
4. Drive the anchor bolts into the wall holes through the screw holes at the Wall Mounting Bracket



Depending on the condition of the wall, bolt at least 8 points

Information of hole position (mm)

5. Connect the Brackets with each other using bolts, from left to right and from top to bottom direction. After connecting the Mounting Brackets, check the balance and fully fasten the bolts to the wall.

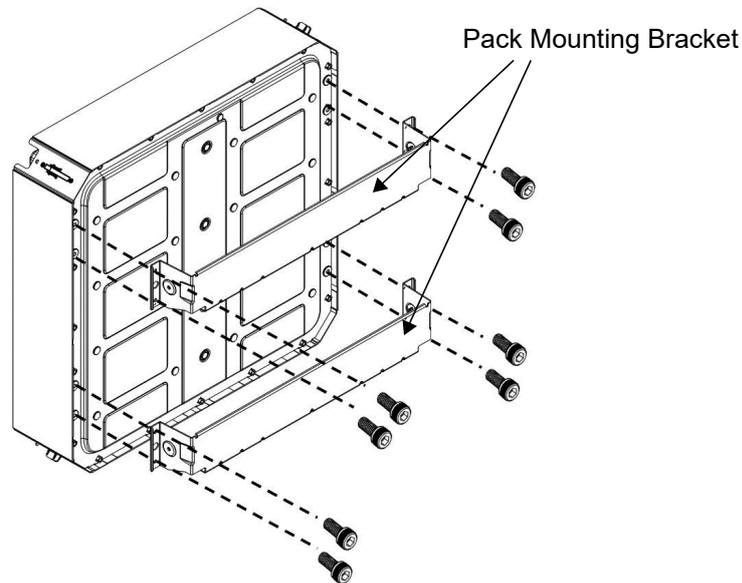


Fasten the Mounting Brackets with M6 bolts.

After check the balance and fully fasten the bolts to the wall

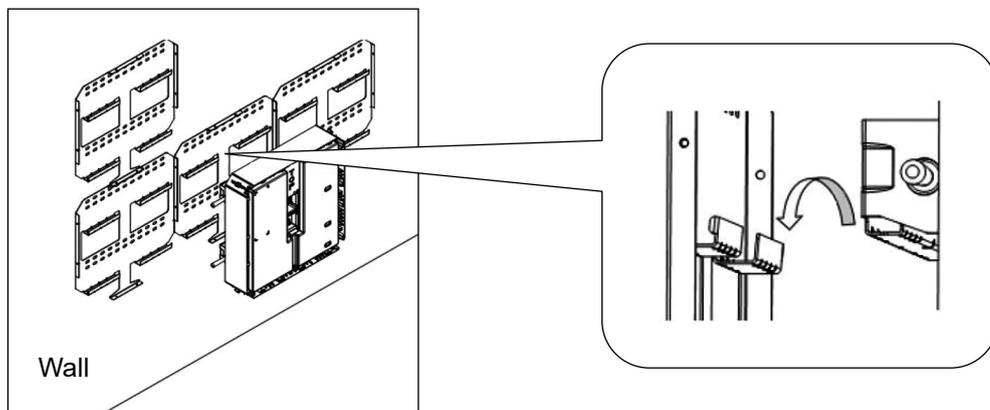
3.7.4 Installation and Cable Connection of BMA and BPU for Wall type

1. Assemble the Pack Mounting Bracket to the BMA



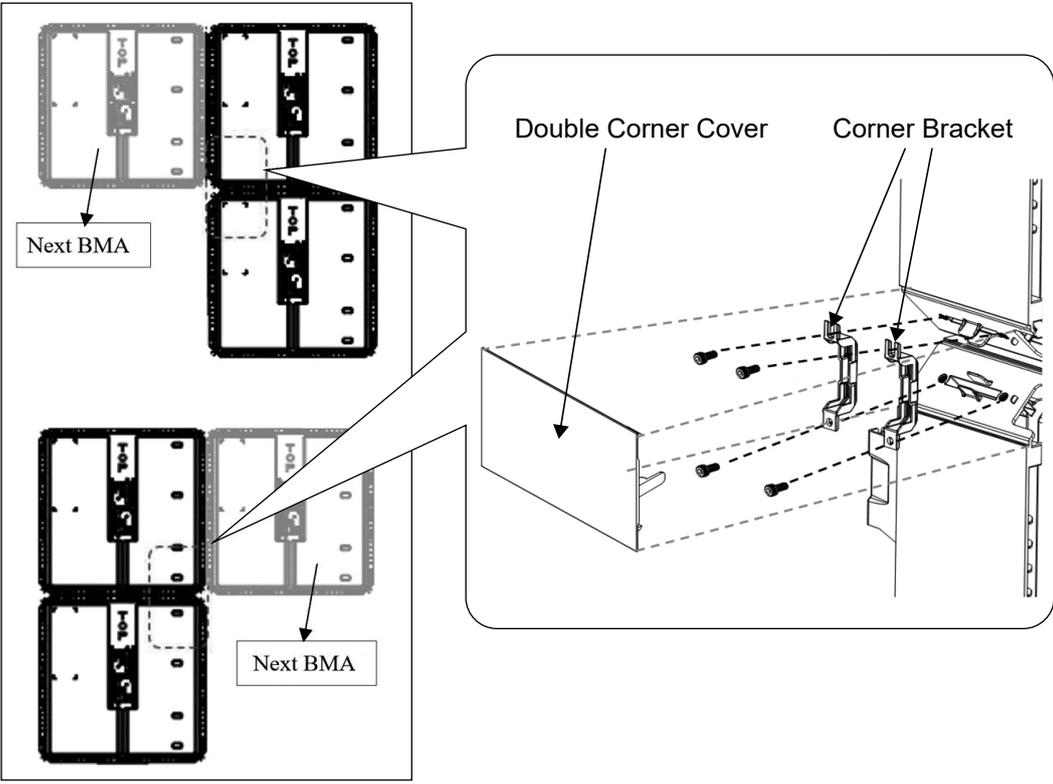
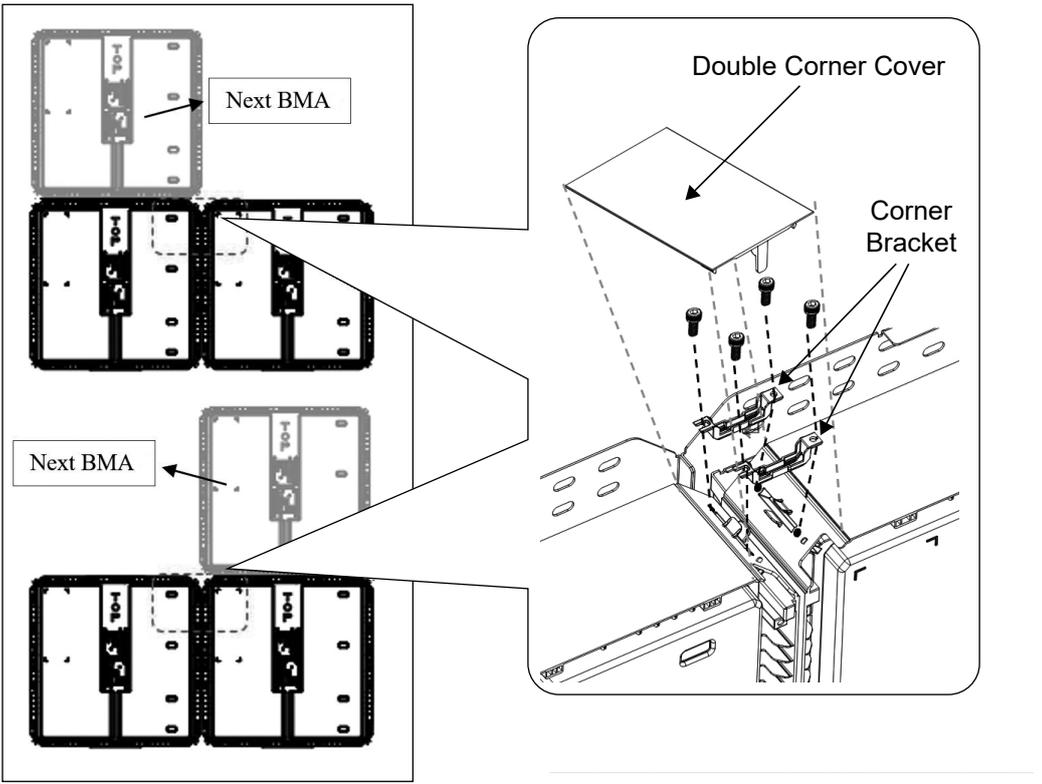
2. Assemble the BMA to the Wall Mounting Bracket using the handle.

- * Depending on the BMA attachment location, the location of the handles will be different.
- * The Design Cover of the BPU should be removed before installing the BPU to the Mounting Bracket.



The positions of the handles are different depending on the location of the second BMA.

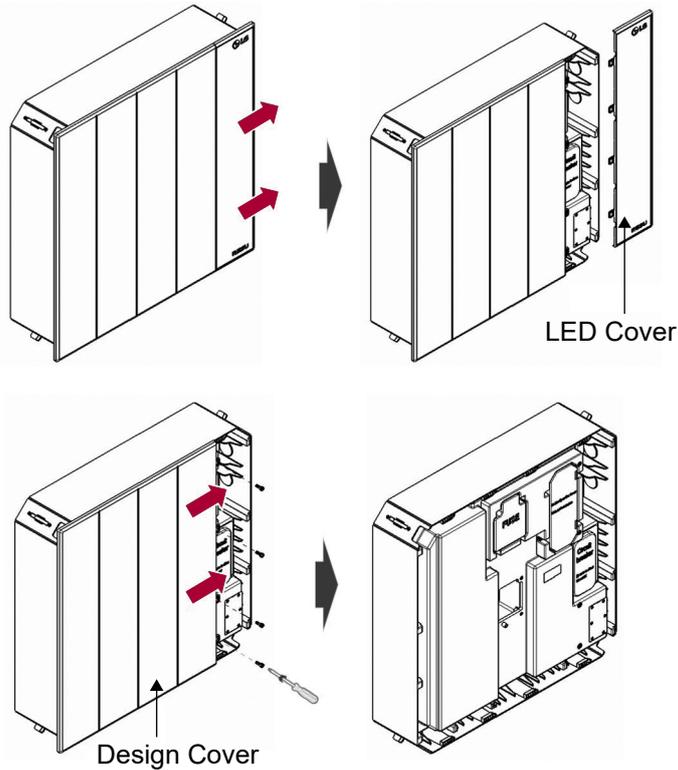
3. In the marked part, assemble the corner bracket and double corner cover first and then install the next BMA



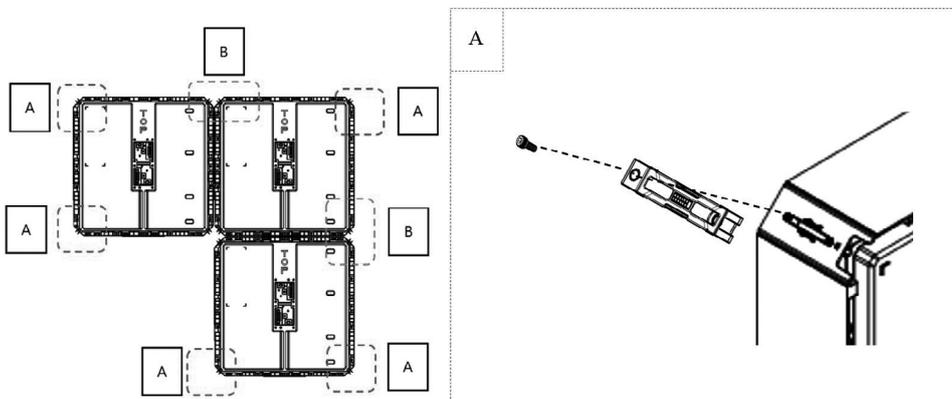
4. Remove LED Cover and Design Cover of the BPU

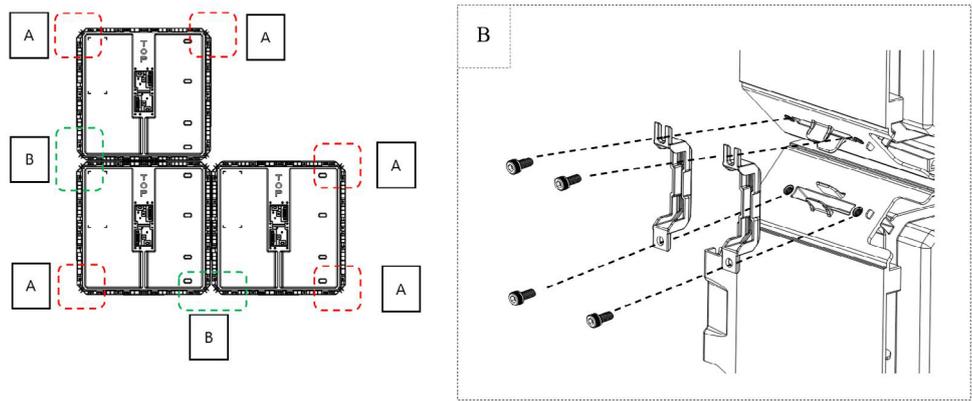
Remove LED Cover and Design Cover of the BPU

- 1) Slide and remove the LED Cover of the BPU.
- 2) Unscrew the 4 bolts on the right side of the BPU as illustrated below.
- 3) Slide and remove the Design Cover of the BPU.



5. Once all the BMAs and BPU are installed, assemble the Corner Brackets on all corners of the BMAs and BPU.
(A : Corner Bracket 1ea, B : Corner Bracket 2ea)

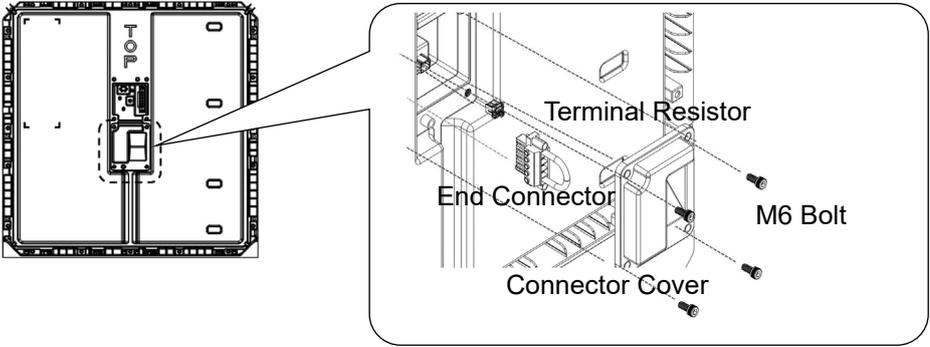




6. Once all the BMAs and BPU are installed, start the cable wiring between the BMAs and BPU. Make sure that the cabling order is the same as the installation order of the BMA as the Wall-mounting Layout and the BPU is always the last one in the order.

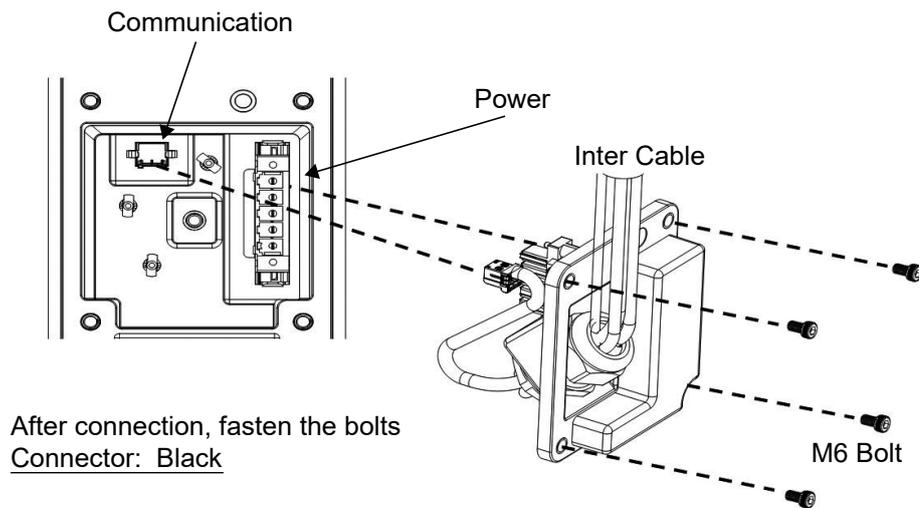
7. Connect the Terminal Resistor, End Connector and Connector Cover to the Bottom Terminal Block of the first BMA in order of the 'Wall-mounting layout'

* Terminal Resistor, End Connector and Connector Cover are included in the BPU Bundle Package.

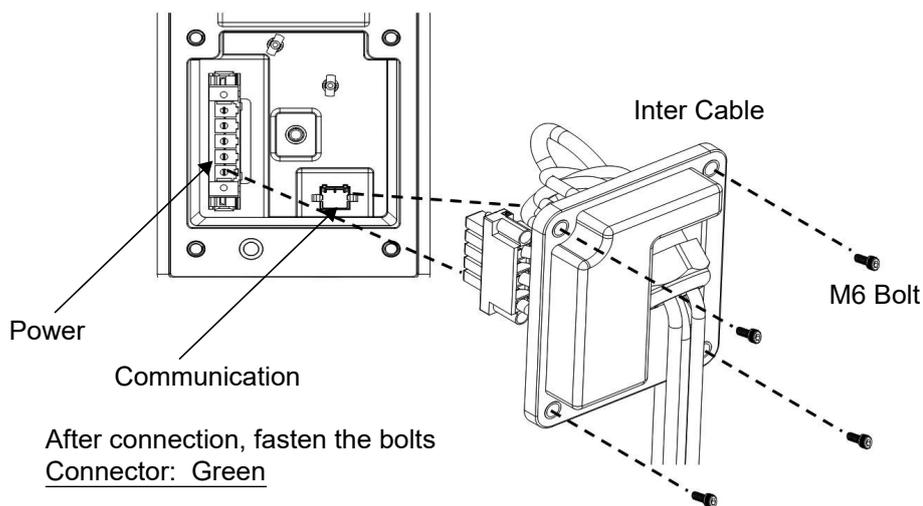


8. Connect the Inter Cables between the BMAs and BPU in order.

1) Top Terminal Block



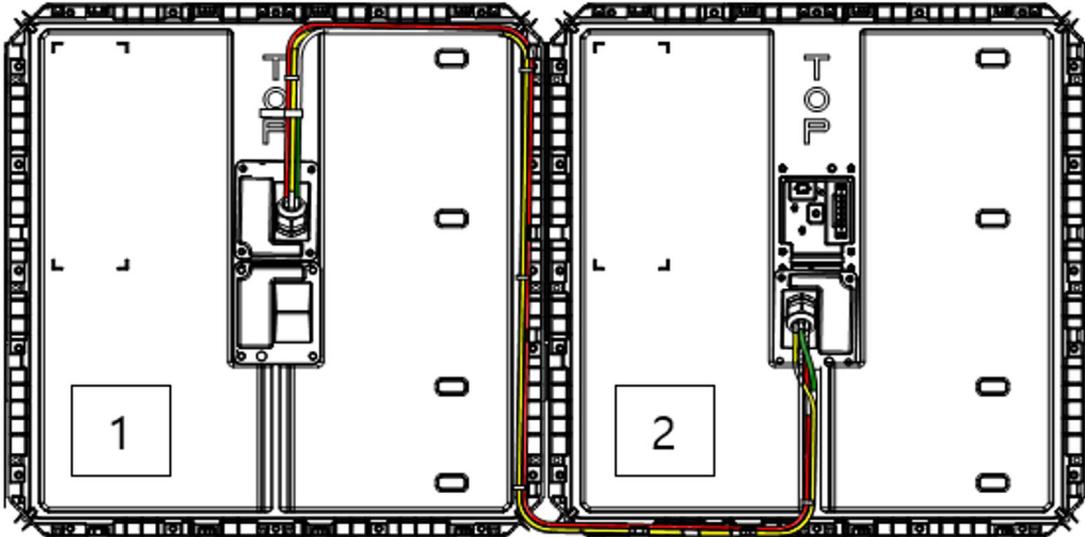
2) Bottom Terminal Block



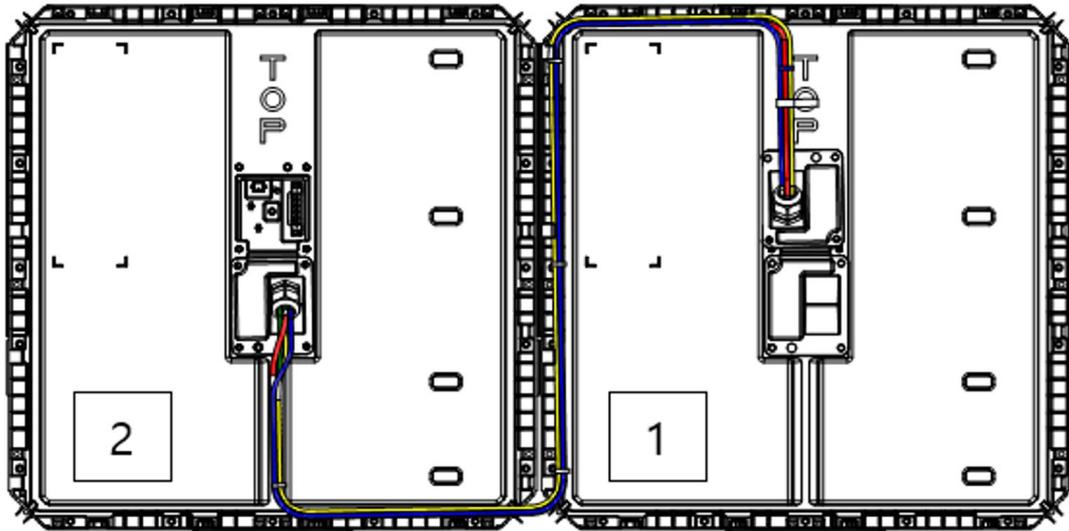
9. Tidy up the Inter Cable by inserting it into the attachable path inside the BMA and fasten the cable using the Tie hole.

10. Only use the cable path from the three following illustration.

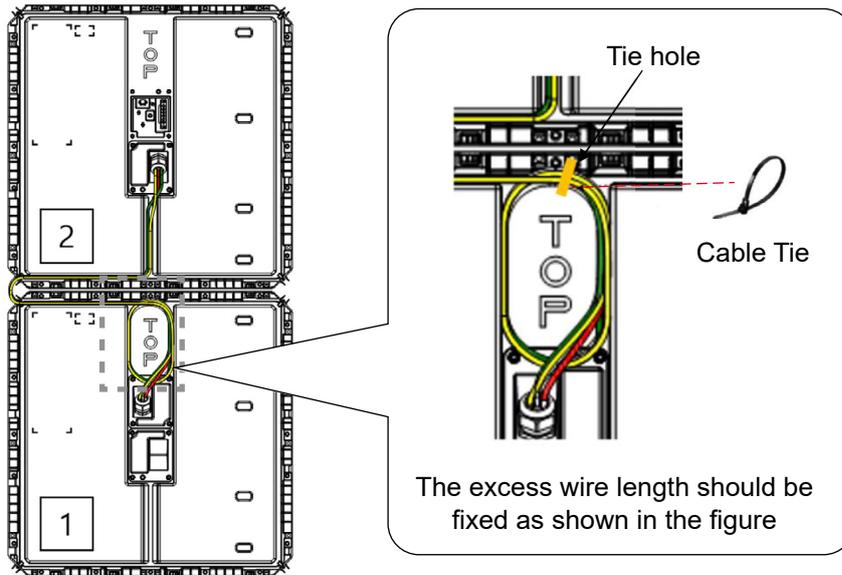
1) Left to right connection



2) Right to left connection



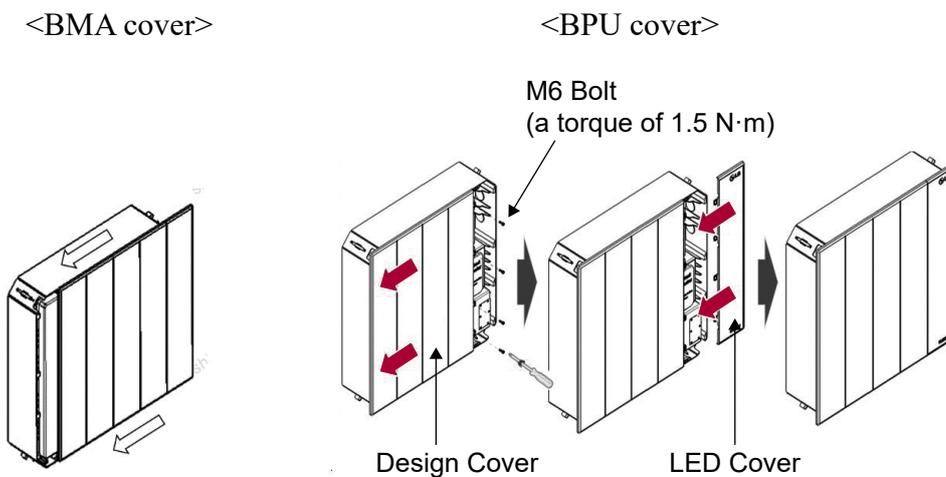
3) Bottom to top connection



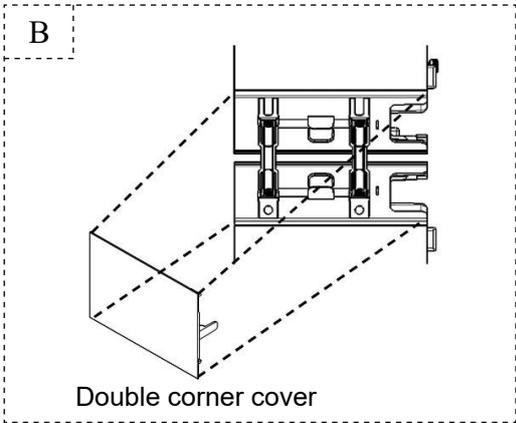
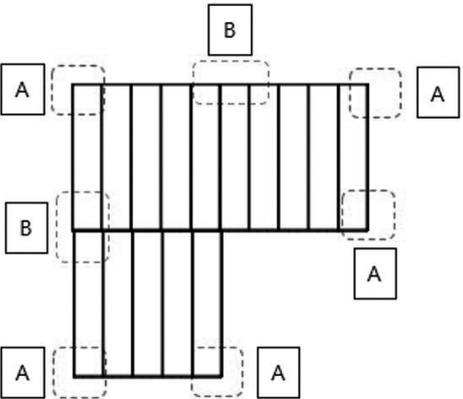
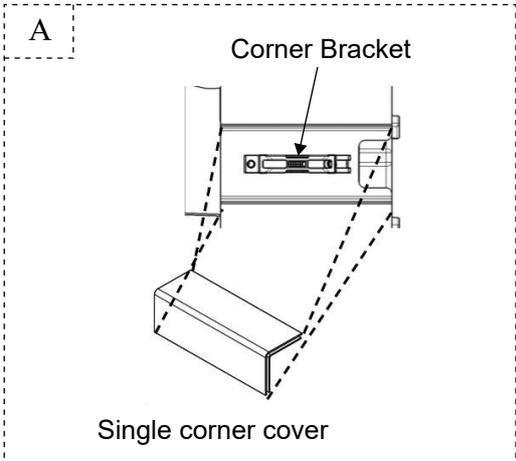
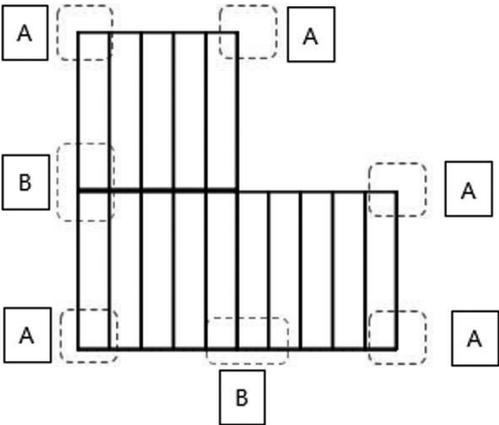
3.7.5 Finalizing Installation

The following steps shall be executed after the connection to the inverter and commissioning is completed.

1. Attached Design Cover to all BMAs by sliding it from right to left.
2. Replace the Design Cover of the BPU by sliding it from right to left.
3. Fasten the 4 bolts that were removed.
4. Replace the LED Cover of the BPU by sliding it backwards.



5. Assemble all Single Corner Cover and Double Corner Cover.
(A : Single Corner cover, B: Double corner cover)

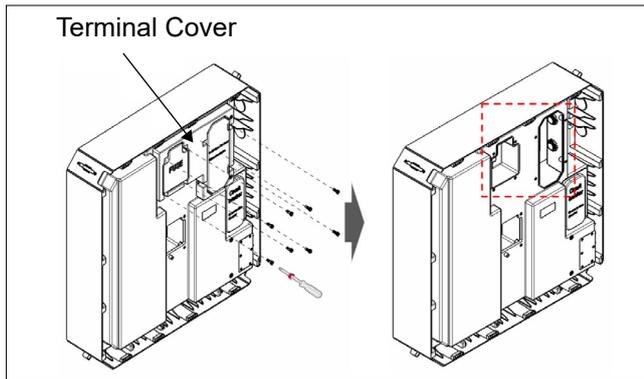


4. Connection to the Inverter

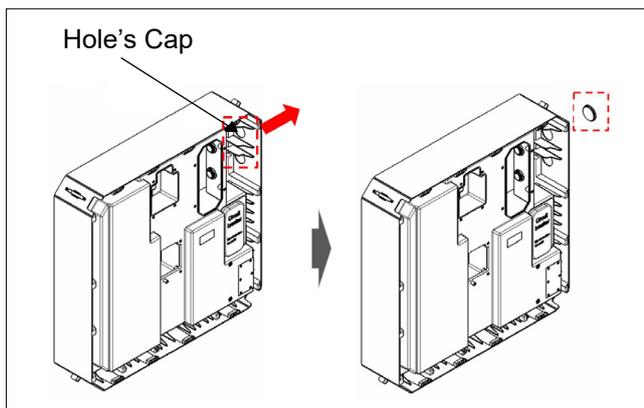
WARNING

Make sure that the inverter is turned off before connecting the BPU to the inverter.

4.1 Prepare for connection

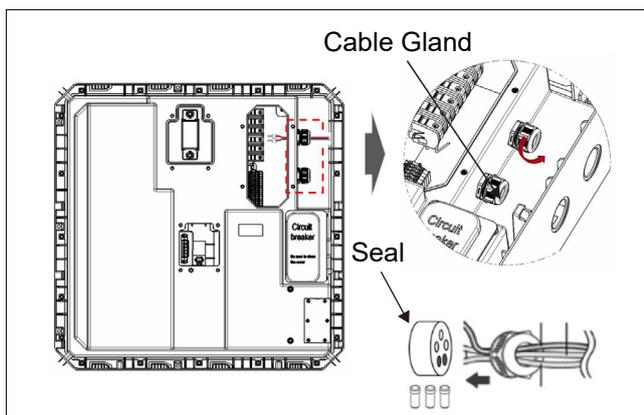


1. Disassemble the Terminal Cover of the BPU by removing the bolts on 8 points.



2. Remove a cap from the hole on the top right side of the BPU

* One of the Cap is for the BPU parallel connection



- 3-1. Loosen the Cable Gland

* One of the Cable Glands is for the BPU parallel connection

* Assemble the adapter according to regional regulations.

- 3-2. Pull out the seal from the Cable Gland

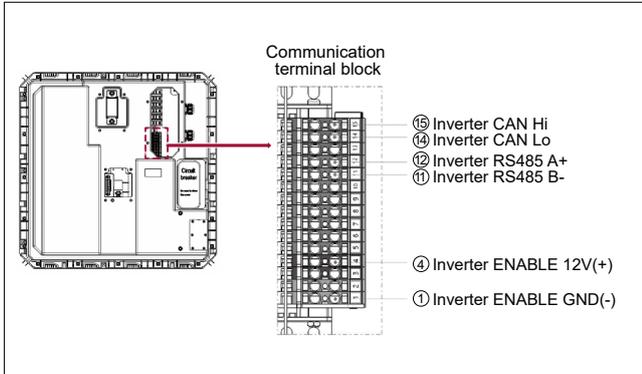
- 3-3. Pull out the rubber inserts from the seal

- 3-4. Insert the cables through the Cable Gland

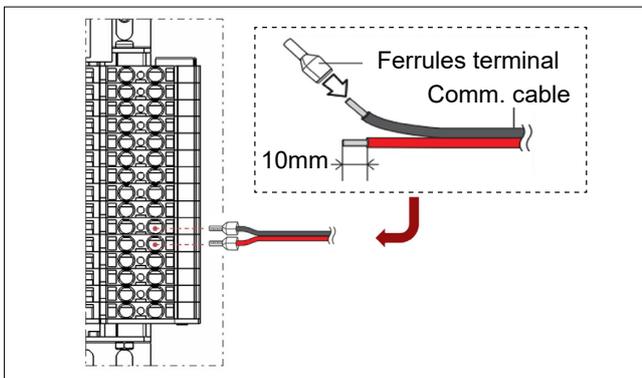
4. Make sure the circuit breaker's switch is off

4.2 Communication Line Connection

It is required for the battery pack to communicate with the inverter for proper operation. Connect a communication cable between the BPU and the inverter.



1. Find the Communication terminal block inside the terminal hole.



- 2-1. Prepare the Communication line

Recommended communication cable

a) Max. cable length : < 30m(98ft)

b) Conductor cross section : 0.3 ~ 0.5mm²

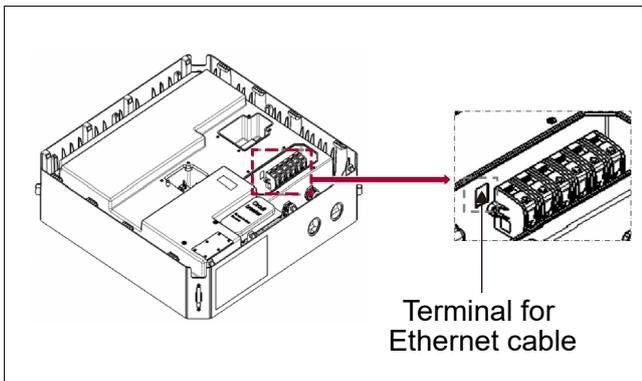
* Use a multi conductor cable(Core 4 or 5) with an outer diameter of 5.5 ~ 6.5mm.

c) Use ferrule terminal for the communication cable

d) Use twisted-pair communication cable

- 2-2. Connect the Communication line according to the communication type (CAN or RS485)

* Refer to the following pin-map



3. Insert the Ethernet cable through the gland hole and connect the cable it to the Terminal for Ethernet cable.

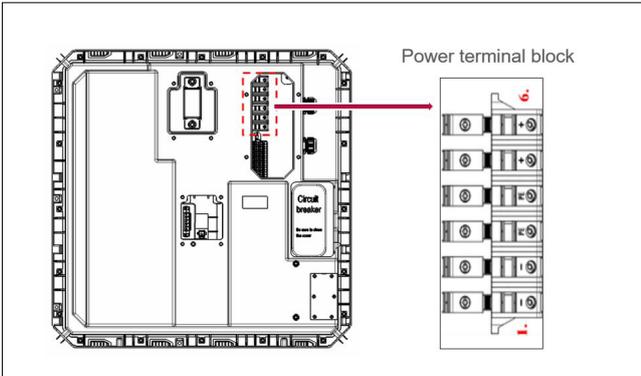
Pin-map of the communication terminal block

No.	Color	Pin map
1	GRAY	ENABLE GND(-)
2		LTE/WAKE GND(-)
3	BLACK	INPUT 12V (BPU EOL)
4		ENABLE 12V (IN)
5	RED	WAKE OUT
6		WAKEK IN
7		INTERNAL CAN GND
8		INTERNAL CAN Lo
9		INTERNAL CAN Hi
10	BLUE	LTE 12V(+)
11		INVERTER RS485 B-
12		INVERTER RS485 A+
13	GREEN	INVERTER COMMS GND
14		INVERTER CAN Lo
15		INVERTER CAN Hi

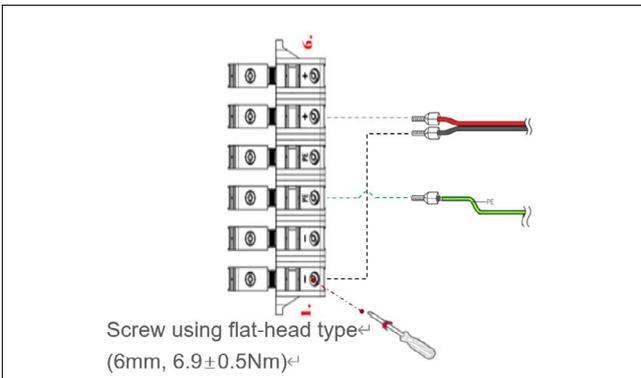
4.3 Power (Charging/Discharging) Line Connection

NOTE

Pay attention to polarity. Reverse polarity connection causes severe damage to the BMA.



1. Find the Power terminal block inside the terminal hole

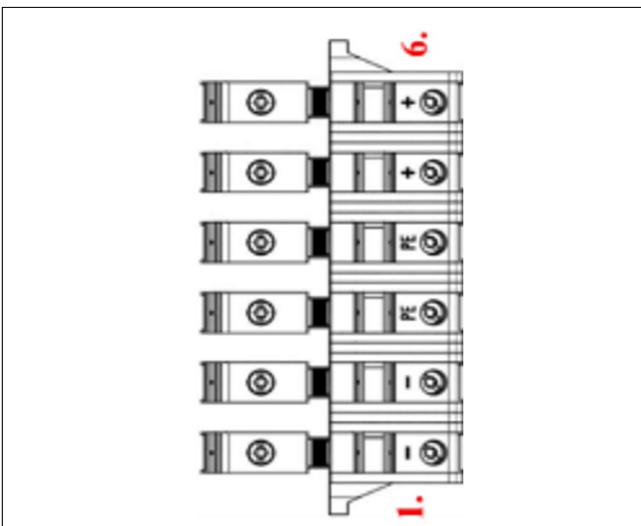


2-1. Prepare the power cable

Recommended power cable

- a) Max. cable length : < 30m(98ft)
- b) Conductor cross section : 6mm²
- c) Use ferrule terminal for the power cable

2-2. Connect the power cable according to the pin-map

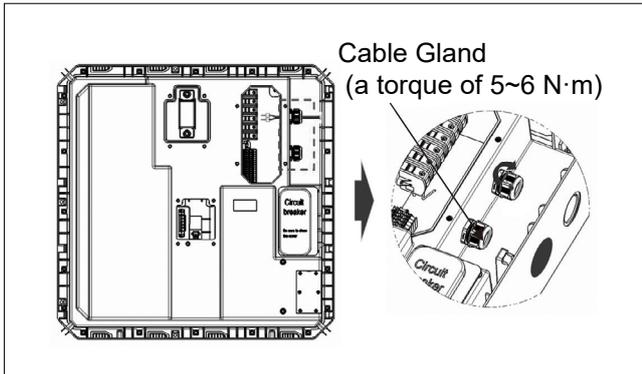


No.	Pin map
6	(+)*
5	(+)
4	PE
3	PE
2	(-)*
1	(-)

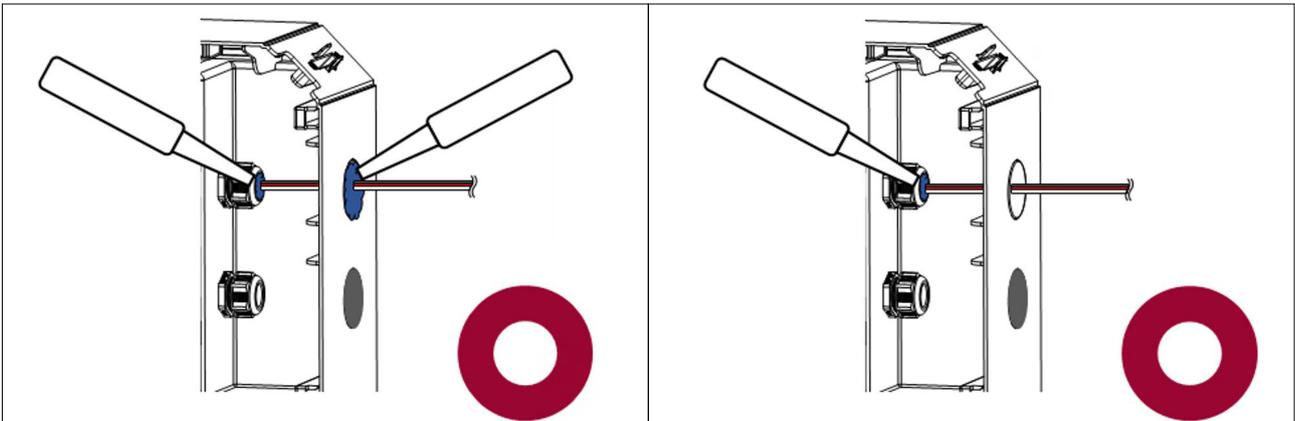
* Reserved port for parallel-connected

4.4 End of Connection

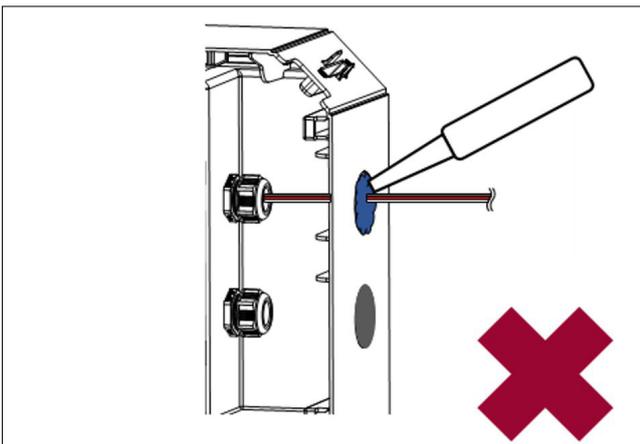
1-1. Insert the seal into the Cable Gland and fasten the Cable Gland



1-2. Or seal the Cable gland with sealant after fasten the Cable Gland.



※ IP55 is not met when only outer hole is sealed. Make sure that inter hole of the Cable Gland is sealed properly.



5 Commissioning

5.1 Pre-preparation

5.1.1 Account

If you don't have your account, please visit LG ESS Battery website and make an account.

Below are dedicated URL following on the regions :

<https://www.lgessbattery.com/us> (in case of North America)

<https://www.lgessbattery.com/au> (in case of Australia)

<https://www.lgessbattery.com/eu> (in case of all EU-countries in general)

<https://www.lgessbattery.com/de> (in case of Germany)

<https://www.lgessbattery.com/it> (in case of Italy)

<https://www.lgessbattery.com/es> (in case of Spain)

5.1.2 App

For the battery setting, you need 'RESU Monitor' app on your smart device (Smart phone or tablet).

For downloading the app scan the QR code below.

For AOS



For iOS



Or 'REUS Monitor' is available to download in Play store(AOS) or App store(iOS)

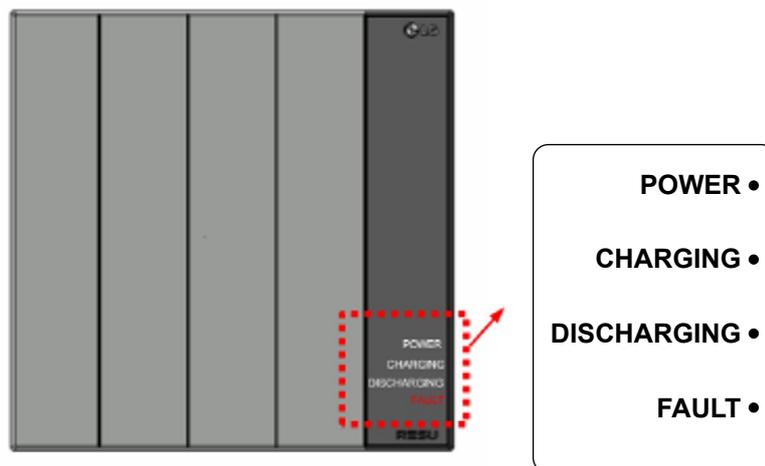
5.2 Battery Setting .

1. Install the Battery Setting by following the instructions on the App.
2. After battery setting is completed, check the LED state (refer to 5.3.1)

5.3 LED Indicator

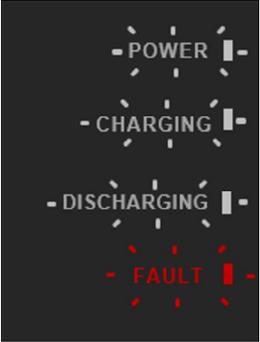
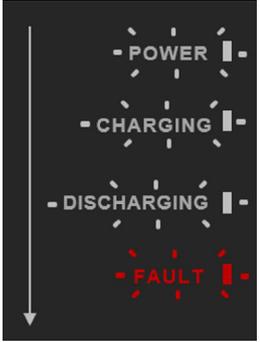
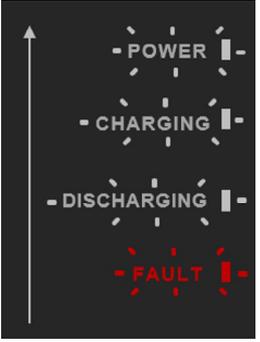
There are four LED indicators on the front of the battery packs to show its operating status.

- Power: This indicator stays on while the battery pack is supplied with power for operation.
- Charging: This stays on while the battery pack is charging.
- Discharging: This stays on while the battery pack is discharging.
- Warning: This comes on when the battery pack is in a warning state.



5.3.1 LED State for Battery Setting

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

During initial battery setup			
Initial setting not performed	Initial setup error 1*	Initial setup error 2**	Initial setup error 3***
			
When all LEDs are blinking	When the LEDs are blinking from Power to Fault sequentially	When the LEDs are blinking from Fault to Power sequentially	When POWER, CHARGING and FAULT LEDs are blinking

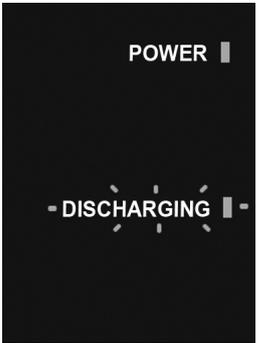
* Initial setup error 1: The number of BMA connected to BPU is higher than number of BMA set within the RESU Monitor App.

** Initial setup error 2: The number of BMA connected to BPU is less than the number of BMA set within the RESU Monitor App.

*** Initial setup error 3: The SW versions of the BMAs are different.

5.3.2 LED state for operation

After the Battery is setup via RMD, the Battery will be operated as below.

Battery Operation			
STANDBY	CHARGE	DISCHARGE	POWER SAVING
			

Battery fault status.

Battery Fault	
FAULT1	FAULT2
	

5.3.3 Powering On the Battery Pack

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

1. Open the front cover.
2. Ensure the circuit breaker switch is in the OFF position.
3. Turn on the circuit breaker.
4. Seconds after the circuit breaker switch is ON, four (4) LED indicators will light up and
 - 4.1 If all LEDs are blinking every second. Battery setting is required.
 - 4.2 Ensure the 'POWER' LED indicator is ON to confirm that the battery pack has successfully initialized. Go to step 5.
 - 4.3 If the LEDs are in a state other than 4.1 and 4.2, initialization was not successful. Go to Troubleshooting.
5. Close the front cover.
6. Turn on the inverter.

5.3.4 Shutting Off the Battery Pack

Shut off the battery pack through the following steps:

1. Turn off the inverter.
2. Open the front cover.
3. Turn off the battery pack by moving the circuit breaker switch to the OFF position.

4. Make sure that every LED indicator on the battery pack is OFF. (After 10 seconds, the LED lights will turn off and the battery will shut down completely.)
5. Close the front cover.

6. Troubleshooting

6.1 Troubleshooting Overview

Check the LED indicators on the front to determine the state of the battery pack. The battery enters into a fault state when certain conditions like voltage or temperature are beyond designed limitations. The battery pack's BMS periodically reports its operating state to the inverter.

When the battery pack falls outside of prescribed limits, it enters into fault state. When a fault is reported, the inverter immediately terminates operation.

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

- Battery Overvoltage
- Battery Undervoltage
- Battery Over Temperature
- Battery Under Temperature
- Battery Discharge Overcurrent
- Battery Charge Overcurrent
- Battery Overcharge Power Limit
- Battery Overdischarge Power Limit
- BMS Internal Error
- External Communication Error
- Internal Communication Error
- Battery Cell Deviation Voltage
- Battery Pack Undervoltage
- Battery Urgent Undervoltage

The fault state will be cleared when the battery pack resumes into normal operation. If battery pack is not working properly and the issue persists, contact a qualified staff, Installer or LG Energy Solution regional contact service point.

NOTE

For serious warnings, if no proper corrective action is taken by the inverter, the battery pack's circuit breaker will automatically trip to protect itself.

CAUTION

If the battery pack or the inverter indicates FAULT or fails to operate, contact LG Energy Solution regional contact point or your distributor immediately.

6.1.1 Post-Installation Checklist

	Yes	No
1. Visually check if the wiring matches the installation manual. (Refer to the chapter.4)	<input type="radio"/>	<input type="radio"/>
2. The circuit breaker is ON.	<input type="radio"/>	<input type="radio"/>
3. The battery LED power indicator is ON.	<input type="radio"/>	<input type="radio"/>
4. The inverter power is ON.	<input type="radio"/>	<input type="radio"/>
5. The inverter has the latest firmware installed.	<input type="radio"/>	<input type="radio"/>
6. The inverter recognizes the battery.	<input type="radio"/>	<input type="radio"/>
7. The battery is operational after installation.	<input type="radio"/>	<input type="radio"/>
7-1. The AC grid is connected.		
7-2. The meter is installed.		
7-3. Government approval is complete.		
8. IF ANY ITEM IN #7 IS CHECKED AS "NO" OR IF THE INVERTER NEEDS TO BE TURNED OFF, TURN OFF THE CIRCUIT BREAKER. 3)	<input type="radio"/>	<input type="radio"/>

6.12 Troubleshooting Guidelines

If the battery LED power indicator is OFF

1. Turn off the circuit breaker.
2. Turn off the inverter. Verify there is no power at the battery connection.
3. Unplug all the wires and reconnect. Check if the wiring on the battery has been done properly. Refer to Section 4. Connection to the Inverter.
4. Turn on the circuit breaker.
5. Turn on the inverter.
6. If the LED power indicator is still OFF, turn off the circuit breaker.
7. Disconnect the power cable connector.
8. Contact LG Energy Solution regional contact point.
 - 1) Contact the inverter manufacturer.
 - 2) Refer to the inverter installation manual or troubleshooting guidelines.
 - 3) Refer to the Installation manual (4.Battery-inverter connection) for the location of the battery, and the Circuit Breaker.

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

1. Update both the inverter and battery firmware versions. Refer to the inverter's troubleshooting guide for instructions.
2. Check the inverter's battery settings. Refer to the inverter's troubleshooting guide for battery setup instructions.
3. If the battery is recognized, inverter setup has been completed successfully.
4. If the issue persists:
 - 4-1. Turn off the circuit breaker.
 - 4-2. Turn off the inverter. Verify there is no power at the battery connection.
 - 4-3. Unplug all wires and reconnect. Check if wiring on the battery has been done properly. Refer to Section.3. and 4.
 - 4-4. Turn on the circuit breaker.

5. If the battery setup is correct, but the battery is still non-operational, turn off the circuit breaker
6. Contact LG Energy Solution regional service contact point.

If the LED fault indicator is ON

1. Check if the inverter recognizes the battery. Refer to the inverter's troubleshooting guide for battery setup instructions.
2. If the inverter is connected to the internet, collect the log files from the inverter company.
 - 2-1. Send the fault ID to LG Energy Solution regional contact point.
 - 2-2. Turn off the circuit breaker.
 - 2-3. Wait further instruction from LG Energy Solution.
3. If the inverter is not connected to the internet, check the inverter LCD to read the battery's fault ID. Refer to the inverter's troubleshooting guide for instructions.
 - 3-1. Send the fault ID to LG Energy Solution regional contact point.
 - 3-2. Turn off the circuit breaker.
 - 3-3. Wait further instruction from LG Energy Solution.

6.1.3 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 LG Energy Solution 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 Contacts

HQ (KOR) / Other Regions	Address	29, Gwahaksaneop-3-ro, Oksan- myeon, Heungdeok-gu, Cheongju-si , Chungcheongbuk-do, South Korea
	E-mail	essservice@lgensol.com
US	Address	19481 San Jose Ave City of Industry, CA 91748, U.S.A
	Telephone	+1 888 375 8044
	E-mail	help@etssi.com
Europe	Address	E-Service Haberkorn GmbH, Stolberger Str. 25, 06493 Harzgerode, Germany
	Telephone	+49 (0) 6196 5719 660
	E-mail	lgensol@supro.de
Italy	Address	Soirec srls, Via Keplero,6, 20016 Pero, Italy
	Telephone	+39 02 8239 7609
	E-mail	assistenza@lgresu.eu
Australia	Address	Unit 12, 35 Duolop Road, Mulgrave VIC 3170, Australia
	Telephone	+611300 178 064
	E-mail	essserviceau@lgensol.com
