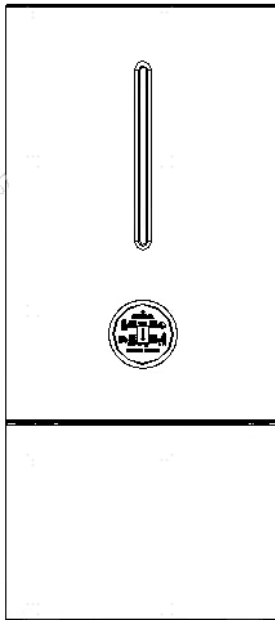




User Manual

Single Phase Hybrid Inverter



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1. About This Manual

1.1 Products Covered by This Manual

The manual mainly describes the product information, guidelines for installation, operation and maintenance. Please read this manual carefully before installations and operations and keep this manual for future reference.

The manual is valid for **GCA Series** Low Voltage Solar Hybrid Inverters:





GHyper 3000, GHyper 3680, GHyper 5000

1.2 Target Group

This manual is intended for qualified personnel who are responsible for the installation and commissioning of the inverter and interact with the inverter. Any electrical installation and maintenance on this inverter must be performed by professional electrical personnel who has obtained the license from local authorities.

1.3 Symbols

Safety instructions will be highlighted with the following symbols. These important instructions must be followed during installation, operation and maintenance of the inverter.

Symbol	Description
	Indicates a hazard with a high level of risk that, if not avoided, will result in death or serious injury.
	Indicates a hazard with a medium level of risk that, if not avoided, could result in death or serious injury.
	Indicates a hazard with a low level of risk that, if not avoided, could result in minor or moderate injury.
	Indicates a situation that, if not avoided, could result in equipment or property damage

The information in this manual is subject to change without notice. Please check www.Growcoltech.com for more information.

2. Safety & Warning

Safety Instructions

The safety instructions in this manual cannot cover all the precautions that should be followed. Perform operations considering actual onsite conditions. **GRWOCOL** shall not be held liable for any damage caused by violation of the safety instructions in this manual.

2.1 Personnel Safety

- The inverter must be installed, electrically connected, operated and maintained by specially trained technician;
- The technician must be familiar with the safety regulations of electrical system, working process of PV power generation system, and standards of local power grid;
- The technician must read through this User Manual carefully before any operations.

2.2 Inverter Protection



Danger to life from electric shock.

- Do not open the enclosure at any time. Unauthorized opening will void warranty and in most cases terminate the operating license.



- Do not disconnect the PV connectors or battery connectors when the inverter is running.
- Wait at least 10 minutes for the internal capacitors to discharge after the battery is powered off.
- Ensure that there is no voltage or current before installing or disconnecting any connectors.

- All safety instructions, warning labels, and nameplate on the inverter should not be removed or covered.

CAUTION

Risk of burns from hot surfaces.

- The surface of inverters might exceed 60°C, touching the surface may result in burns.
- Do not touch hot surfaces before it cools down.
- Only authorized service personnel are allowed to install the inverter or perform servicing and maintenance
- All powers, both AC and DC, should be disconnected from inverter before attempting any maintenance or cleaning or working on any circuits connected to inverter

NOTICE

- As soon as receiving the inverter please check if it is damaged during its transportation. If yes, please contact your dealer immediately.
- Only qualified personnel can change the country settings.
- Adequate ventilation must be provided for inverter installation location Mount the inverter in vertical direction, and ensure that no object is put on the heat sink affecting the cooling.

2.3 Battery Protection

DANGER

- Batteries deliver electric power, resulting in burns or a fire hazard when they are short circuited, or wrongly installed.
- Lethal voltages are present at the battery terminals and cables connecting to the inverter.
- Severe injuries or death may occur if the cables and terminals in the inverter are touched.

NOTICE

- Improper settings or maintenance can permanently damage the battery.
- Incorrect inverter parameters will lead to the premature aging of battery.

2.4 Electrical Connection

DANGER

- PV strings will produce electrical power when exposed to sunlight and can cause a lethal voltage and an electric shock.
- Always keep in mind that the inverter is dual power supplied. Electrical operators must wear proper personal protective equipment: helmet, insulated footwear, gloves, etc.
- Before touching the DC cables, operator must use a measuring device to ensure that the cable is voltage-free.
- The operator must follow all warnings on the PV strings and in its manual.
- All electrical connections must be in accordance with local and national standards.

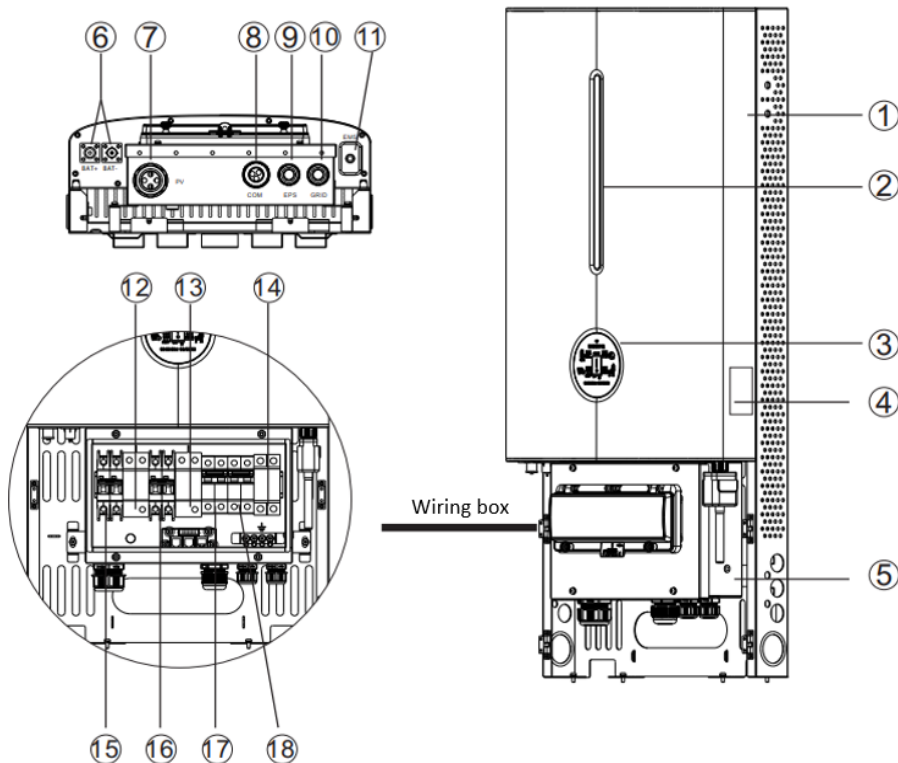
Only with the permission of the local utility grid company, the inverter can be connected to the utility grid.

3 Product Introduction

The hybrid system combining with a hybrid inverter and Low-voltage batteries. The energy produced by PV system shall be used to optimize self-consumption, excess power charge battery and the rest power could be exported to the grid. Battery shall discharge to support loads when PV power is insufficient. If battery power is not sufficient, the system will take power from grid to support loads.

The hybrid inverter must only be connected with lithium battery approved by GRWOCOL to prevent personal injury and property damage and to ensure long-term operation of the product.









3.1 View of the Inverter



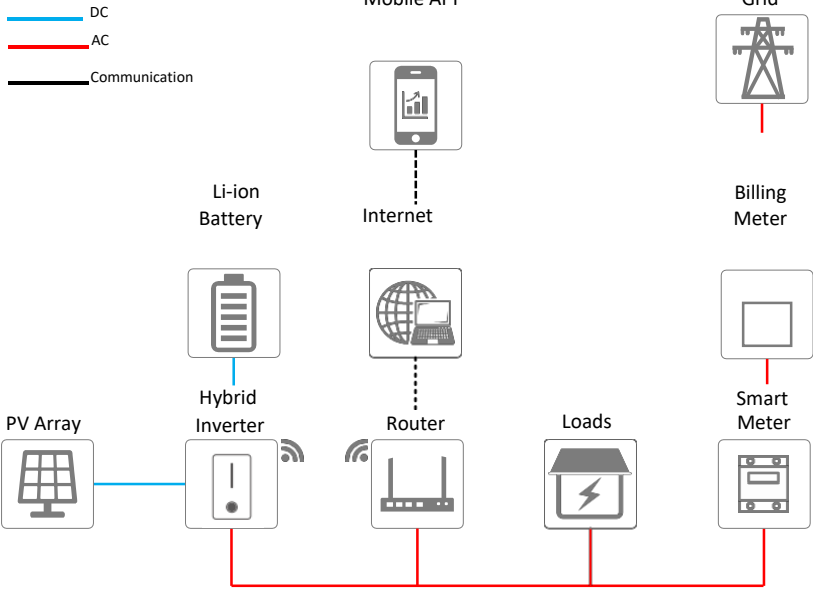
View of the Hybrid Inverter

Position	Description
1	Inverter
2	LED indicator: Indicates the operating status of the inverter and SOC of the battery connected.
3	LCD Panel: Displays the current operating data
4	Nameplate Label: Clearly identify the product, including the SN, technical data, certifications, etc.
5	Middle Control box: Integrated breakers & SPD modules
6	Battery connection area: Red for positive, black for negative
7	PV connection area
8	COM port: Communication port for BMS Cable & Smart Meter Cable & Parallel Cable
9	EPS output: System will supply emergency power from PV or Battery to supply some important loads that cannot be powered off
10	GRID connection area: AC input and AC output port(Depend on different working modes),can supply power by the grid or feed into the grid (comply with local regulations)
11	EMS port: Wi-Fi Stick communication port
12	PV1 SPD module
13	PV2 SPD module
14	AC SPD module
15	PV1 Breaker
16	PV2 Breaker
17	EPS Breaker
18	Grid Breaker

Icons on the Nameplate

Icon	Description
	CE Mark: The inverter complies with the requirements of the applicable CE guidelines
	Caution: Risk of Danger
	Caution: Risk of Electric Shock!
	Caution: Hot Surface.
	Refer to the corresponding instructions
	Danger to life due to high voltage. Cut off all power and wait at least 5 minutes before any work is carried out on the inverter.
	RCM mark of conformity
	WEEE Mark. Do not dispose of the inverter together with household waste

3.2 System Diagram



3.3 Working Mode Introduction

3.3.1 On Grid Self-Use Working Mode (Default)

The on grid self-use operating mode is recommended for when the system is installed in an area with a stable grid. The purpose is to increase self-consumption of clean PV energy. When Inverter is set to work in this mode:

- **During daytime and there is sufficient PV Power**
 - The PV energy is used to supply local loads as first priority and then charge the battery, excess energy will be fed into grid*1*2.
 - When battery is fully charged, PV energy is supplied to the local loads and fed into grid*1*2.
- **During nighttime or there is not sufficient PV Power**
 - The battery is discharged to provide energy to loads. If there is not enough power from the battery, the unmet power will be supplied by the grid.
 - When the battery SOC is below the DischargeEndSOC@Grid value or the battery is empty, the inverter will stop working and local loads will be supplied from the grid.
 - Thanks to the on-grid operation, the switch from battery power, PV power and grid power is automatic and seamless.
- **When grid fails**
 - When grid fails, the inverter will automatically disconnect from grid and output power to the EPS port.
 - When battery is discharged to the DischargeEndSOC@EPS value, the inverter will stop working and wait for the grid to recover or until there is sufficient power from PV panels to charge the battery.
 - If grid failure can be a common occurrence in your area, you can adjust the DischargeEndSOC@Grid higher to ensure there is battery power available.
- **You can also:**
 - Set a schedule for the inverter to charge the battery using cheap off-peak grid power.
 - Specify the daily working periods of self-use for inverter.

*1: The inverter can be set not to feed power into the grid. But a small amount of energy will still inevitably be fed into grid due to unpredictable PV energy change and load fluctuations.

*2: Firmware update may be required to support this function.

NOTICE

For on-grid self-use Working Mode, one can set the discharge end SOC@Grid as low as the battery allows (10% or 20% for example). Please refer to your local battery technician for minimum discharging end SOC.

3.3.2 Off Grid / Back-up Working Mode^{*3}

For systems installed in area with a weak grid or even without grid, the inverter should be working in off grid / back-up Working Mode:

- **When grid or diesel generator is available**
 - When the battery is below the DischargeEndSOC@Grid value, it will be charged firstly from PV and secondly from grid at the max allowable current.
 - When the battery is above the DischargeEndSOC@Grid value, it will be charged by excess PV energy and will discharge if the PV power is not enough to support the loads.
- **When grid or diesel generator is not available**
 - When there is enough energy stored in the battery, the EPS port will export power to support local loads firstly from PV. If there's excess PV energy, it will be used to charge the battery. Otherwise battery will be discharged to feed the load.
 - When the battery SOC is below the DischargeEnd SOC@EPS value, the inverter will disconnect power to the EPS port. All energy from PV will be used to charge the battery until the SOC reaches the EPS restart value.
- **When working in this mode:**
 - The max power^{*3} from the EPS port is limited by inverter type, battery type and battery SOC.
 - A larger battery is always recommended for off grid / back up configuration.

You should never discharge the battery too deeply to avoid it “Running Flat”.

- When there is an overload or short circuit fault, the inverter will stop working and an alarm will sound. It will try to restart several times before shutting down completely. Turn off or unplug load to remove the short circuit fault or overload as soon as possible.

*2: Firmware update may be required to support this mode.

*3: Please be noted that refrigerators, air conditioners, water pumps and etc., demand a large start up currents and may trip EPS overload protection. Be sure not to connect too many of this kind of load to avoid frequent system shutdown and restart.

3.3.4 Declaration for backup loads

Hyper series inverter is able to supply a continuous 5000VA output (max 5500VA for 10s) on EPS side. Inverter will shut down under full loading with high ambient temperature if grid is absent.

Accepted loads as below:

- Inductive Load: Max 1.5KVA for single inductive load, max 2.5KVA for total inductive load power.
- Capacitive load: Total capacitive load (like computer, switch power etc.) power $\leq 3.0\text{KVA}$

(Any load with high inrush current at start-up is not supported on EPS circuit)




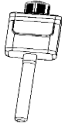


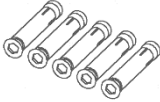









NOTICE

For off-grid / back-up Working Mode, one should set a higher DischargeEndSOC@Grid value (above 50% for example). So that there will be some energy in battery when a grid failure occurs.

4 Unpacking and Storage

4.1 Packing List

Make sure the inverter is intact during transportation. Before installation, please inspect the unit. If there is any visible damage or missing, please contact your local distributor immediately.

 A	 B	 C	 D
 E	 F	 G	 H
 I	 J	 K	 L
 M	 N	 O	 P

Scope of delivery

Item	QTY	Description
A	1	Inverter
B	1	Inverter-Bracket
C	1	Battery-Bracket
D	1	Wi-Fi Stick
E	1	Smart Meter
F	3	Terminal Resistor (1kOhm) for Smart Meter
G	5	Expansion bolts for Fixing Inverter-Bracket
H	1	User Manual
I	1	BMS Cable, 0.2m
J	1	Smart Meter Cable, 5m
K	2	Power Cable (Red for positive, black for negative), 0.4m
L	8	Connection terminals for PV and AC cables
M	2	PE terminal for internal enclosure grounding
N	1	PE terminal for external enclosure grounding
O	2	Crystal heads for Parallel connection cable
P	4	Fixed Screws for Fixing Battery-Bracket,M5

4.2 Storage

The following storage instructions apply if the inverter is not installed immediately.

- Do not unpack the inverter (Store the inverter in the original packing box).
- The storage temperature must be always between -30°C and $+70^{\circ}\text{C}$, and the storage relative humidity must be always between 0 and 95 %, non-condensing.
- In case of stacking storage, the number of stacking layers should never exceed the limit marked on the outer side of the packing case.
- Do not position the inverter at a front tilt excessive back tilt or side tilt or upside down.
- Conduct periodic inspection during storage Replace the packing materials immediately if any rodent bites are found.
- Ensure that qualified personnel inspect and test the inverter before use if it has been stored for a long time.

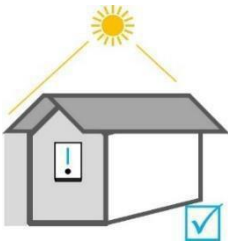
5 Mounting Installation

5.1 Requirements for Mounting

NOTICE

- Make sure there is no electrical connection before installation.
- In order to avoid electric shock or other injury, make sure that holes will not be drilled over any electricity or plumbing installations.
- Always follow the instructions when moving and positioning the inverter.
- Improper operation may cause injuries or serious wounds.
- In the case of poor ventilation, the system performance may compromise.

5.1.1 Location Requirements



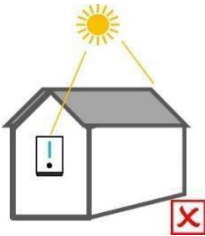
No direct sunlight



No rain exposure



No snow lay up



Direct sunlight



Rain exposure



Snow lay up

Select an optimal mounting location for safe operation, long service life and expected performance. Please AVOID direct sunlight, rain exposure, snow laying up during installation and operation. And DO NOT install the inverter in a place where personnel are likely to come into contact with its enclosure and heat sinks because these parts are extremely hot during operation.

5.1.2 Environment Requirements

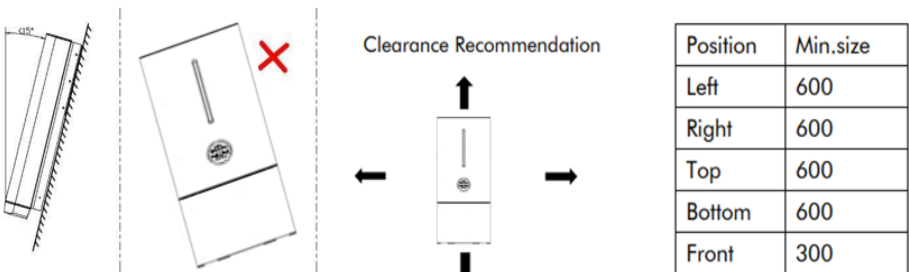
The inverter must be installed in a ventilated environment to ensure good heat dissipation. Make sure the installation site meets the following conditions:

- Not in areas where accessible to children
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television antenna or antenna cable.
- Not higher than altitude of about 2000m above sea level. Above 2000m the inverter output will be de-rated.
- Not in environment of precipitation or humidity ($> 95\%$).
- The ambient temperature in the range of -20°C to $+60^{\circ}\text{C}$, -4°F to $+140^{\circ}\text{F}$.
- The slope of the wall should be within $\pm 5^{\circ}$.
- Do not install the inverter on a wall made of flammable materials or gypsum boards or similar materials with weak sound insulation.

5.1.3 Angle and Space Requirements

NOTICE

- Never install the inverter horizontally, or with a forward tilt or with a backward tilt or even with upside down.
- The horizontal installation can result in damage to the inverter.
- Install the inverter upright or at a maximum back tilt of 15 degrees to facilitate heat dissipation.



5.2 Mounting Instructions

Step1: Choose a Location

Choose a wall capable of supporting the full weight of Hybrid system with one of the following characteristics:

- Wood studs at regular intervals
- Plywood sheathing of sufficient thickness
- Solid concrete or masonry
- Metal studs of sufficient gauge

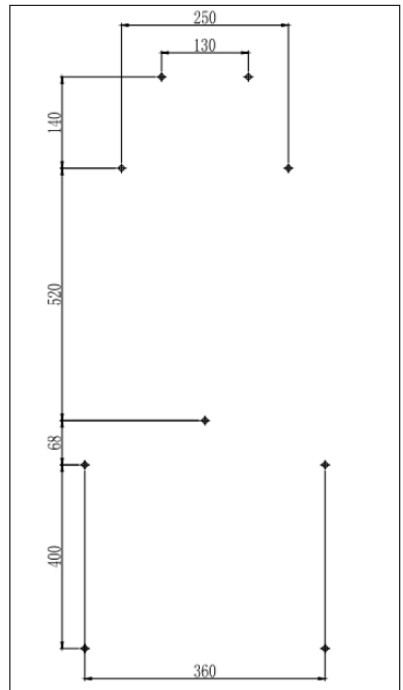
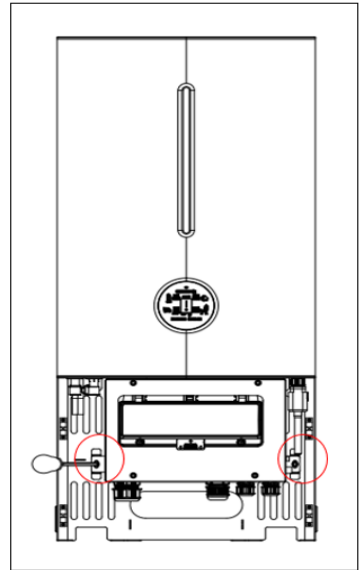
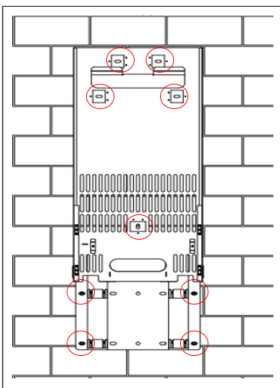
Step 2: Take out the Brackets

Open the inverter packing box and take out the wall-mounting brackets.

Before taking out the inverter-bracket, you need to unscrew the screws between the inverter and the inverter bracket.

Step 3: Anchor the Mounting-Bracket

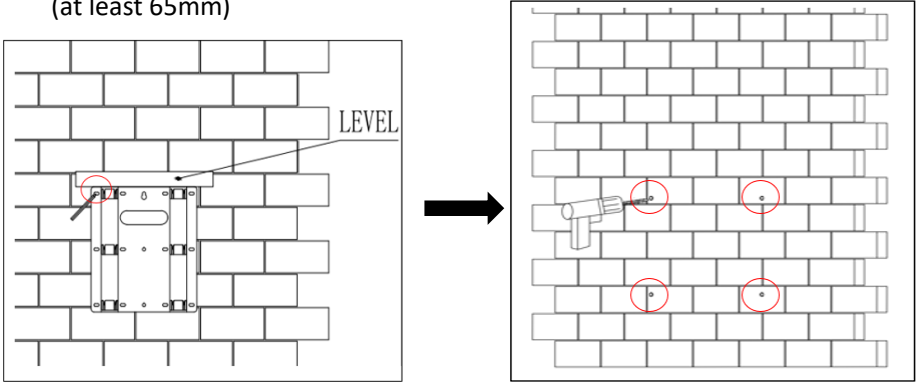
Plan and measure distance between system components and determine whether cables will be routed into the system from the top, bottom, or side of the enclosure before installation.



Step 4: Drill holes on the wall

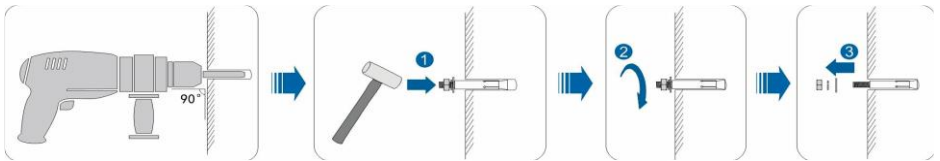
Using a drill and level, measure and determine the positions for the inverter and the battery to the selected wall.

- Be sure to choose a flat wall.
- The height of the holes from the ground must be $\geq 400\text{mm}$
- Drill holes with driller(Drill bit: $\phi 12$), make sure the holes are deep enough (at least 65mm)

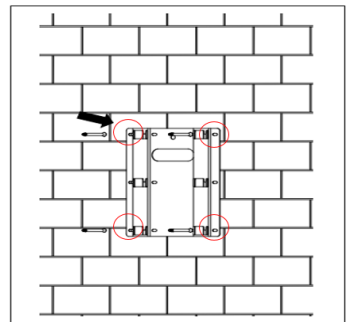


Step 5: Secure the Battery-bracket on the wall

- a) Insert the expansion bolts (M12*4) into the holes and secure with a hammer.
- b) Fasten the nut with a wrench to expand the bolt.
- c) Remove the nut, spring washer, and flat washer, and store them properly.



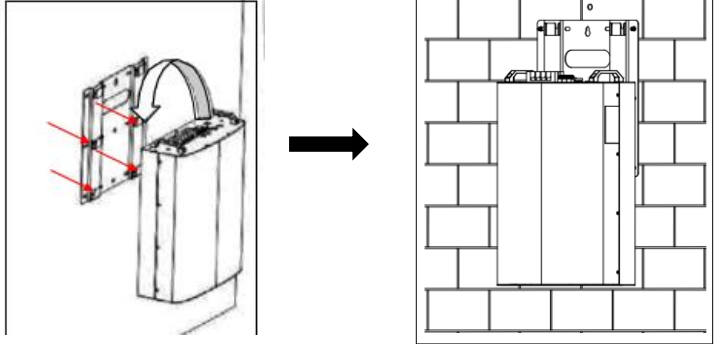
- d) Fix the Battery-bracket with expansion bolts.
 - e) Tighten the bracket using the Expansion bolts.
- Be sure to mount the bracket vertically.



Step 6: Mount the Battery on the Bracket

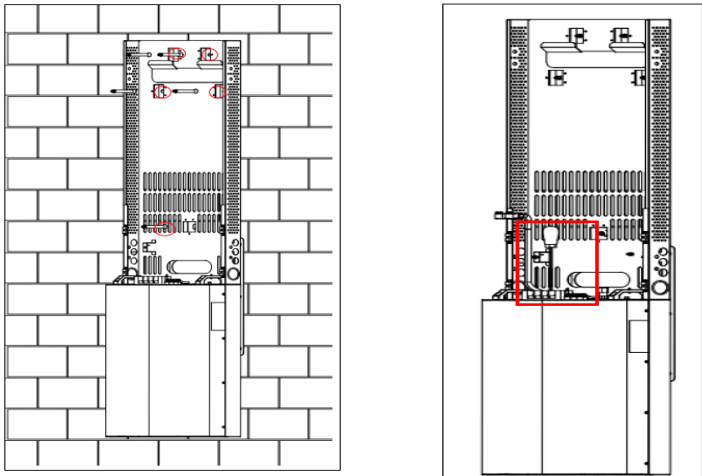
Lift and hang the battery to the battery-bracket and ensure that the 4 mounting ears perfectly engage with the battery -bracket.

After this process, it's recommended to connect the battery cable firstly to avoid interference caused by insufficient space.



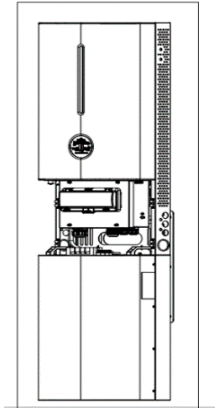
Step 7: Secure the Inverter-bracket on the wall

- a) Fix the inverter-bracket to the two mounting ears on the upper part of the battery-bracket.
- b) Fasten the inverter-bracket to the wall with 5 expansion bolts and don't forget to lock the inverter-bracket to the battery using M5 screws.



Step 8: Mount the Inverter on the Bracket

Lift and hang the Inverter to the inverter-bracket and ensure that the mounting ears perfectly engage with the inverter-bracket.

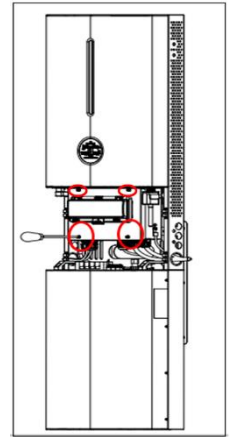


Step 9: Wiring Connection

Remove the cover by unscrewing the screws on the middle control box and connect the wires between Grid, PV, Battery and inverter.

Then close the cover of the middle control box after completing the wiring and tighten the screws.

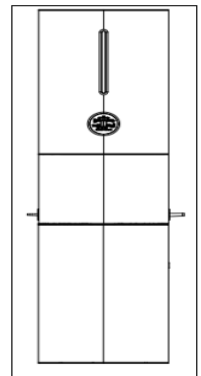
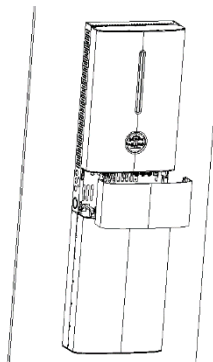
Note: Please refer to the next chapter (6 Electrical connection) for wiring specifications and connection.



Step 10: Close the Wiring Compartments

Buckle the cover of Wiring Compartments area after the electrical connections are finished.

Remember to grounding the Inverter and battery.



6 Electrical Connection

This chapter mainly describes the cable connections of the system.

- Prior to any electrical connections, keep in mind that the inverter has dual power supplies.
- It is mandatory for the qualified personnel to wear personal protective equipments (PPE) during the electrical work.

DANGER

Danger to life due to a high voltage inside the inverter!

- The PV string will generate lethal high voltage when exposed to sunlight.
- Before starting electrical connections, disconnect the DC and AC circuit breakers and prevent them from inadvertent reconnection.
- Ensure that all cables are voltage free before performing cable connection.

WARNING

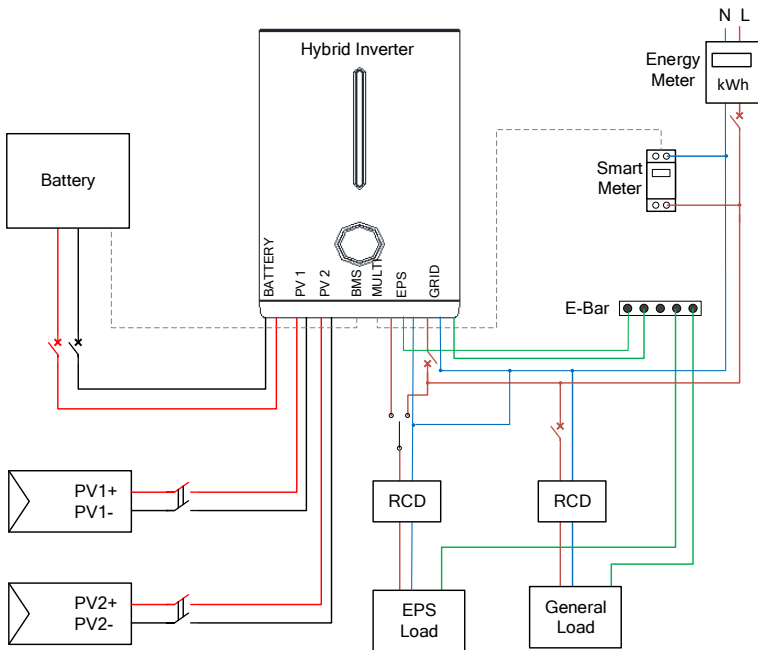
- Any improper operations during cable connection can cause device damage or personal injury.
- Only qualified personnel can perform cable connection.
- All cables must be firmly attached, undamaged, properly insulated and adequately dimensioned.

NOTICE

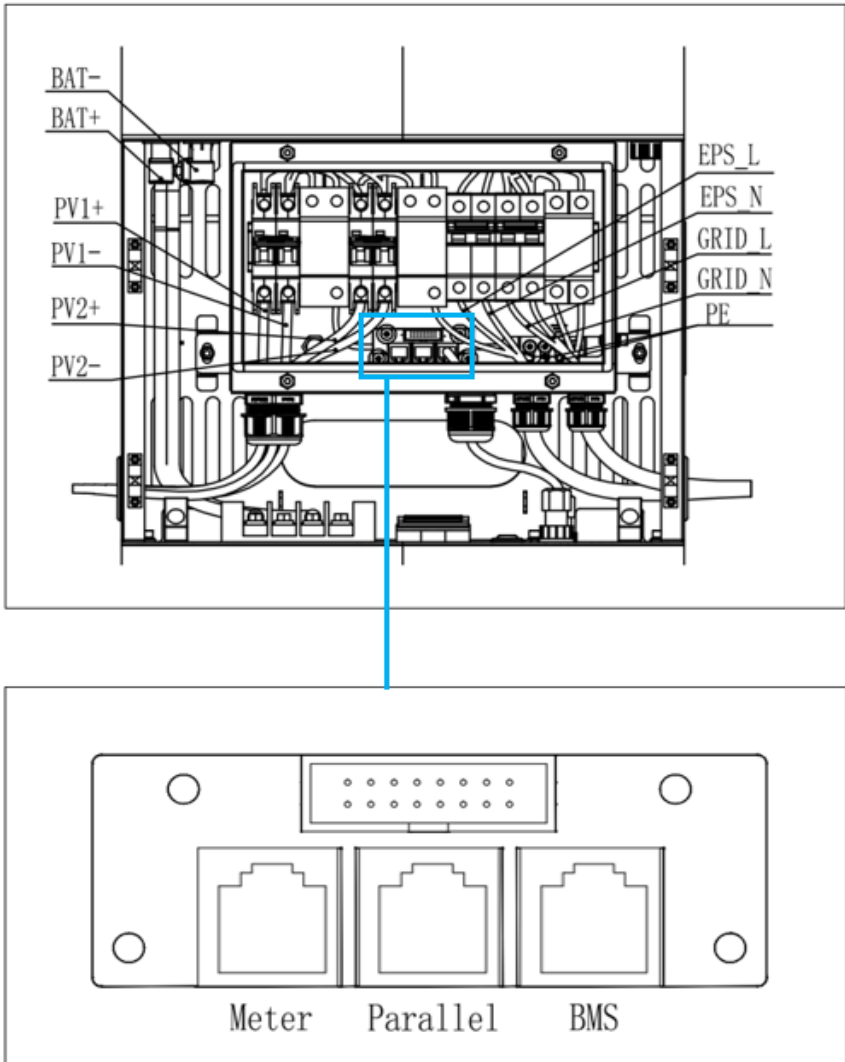
- Comply with the safety instructions related to the PV strings and the regulations related to the utility grid.
- All electrical connections must be in accordance with local and national standards.
- Only with the permission of the utility grid, the inverter can be connected to the utility grid.

6.1 Wiring Diagram

Wiring Diagram



6.2 Overview of Connection Area



Wire connection area of Middle control box


6.3 PV Connection

Please use the PV terminals from the accessory box for connection. Before connecting, please make sure:

- The voltage, current and power ratings of the panels to be connected are within the allowable range of the inverter. Ensure polarity is correct. Please refer to the Technical Data in chapter 9 for voltage and current limits.
- Since the inverter is transformerless, please do not ground either output of the PV panels. Ground the panel frames.
- The 3.68kW/5kW inverter is designed with 2 MPPT trackers, if the inputs of the PV panels are paralleled, please consult with your local distributor for technical support.
- If the inverter is equipped with a PV switch, please make sure it is in the “off” position. Otherwise please use an external PV switch to cut off the PV connection during wiring and when necessary.
- It's very important for system safety and efficient operation to use appropriate cable for PV module connection. To reduce risk of injury, please use the proper recommended cable size as below.

Typical Amperage	Cable Size	Torque
18A	12 AWG	1.4~1.6 Nm

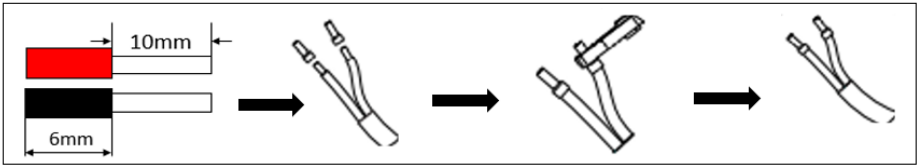
Procedure:

 WARNING
<ul style="list-style-type: none">• Use IEC61730 class-A Rating PV modules.• When exposed to light, PV panels will generate DC voltage.• Turn off the PV switch before connecting any wiring.

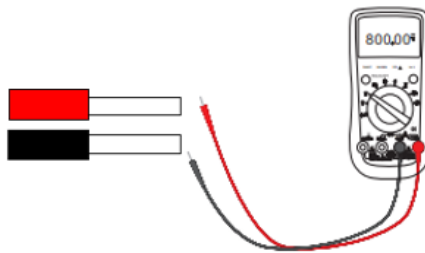
Step1: Assembling the PV Connector:

- Unscrew the cap on the PV port and remove the waterproof cover from the PV port at the bottom of the middle control box, insert 4 PV cables (two pairs of positive and negative) through the waterproof connector.
- Remove an appropriate length of the insulation layer from the positive and negative power cables using a wire stripper.
- Insert the exposed areas of the positive and negative power cables into the

connection terminals of the positive and negative connectors respectively and crimp them using a crimping too.

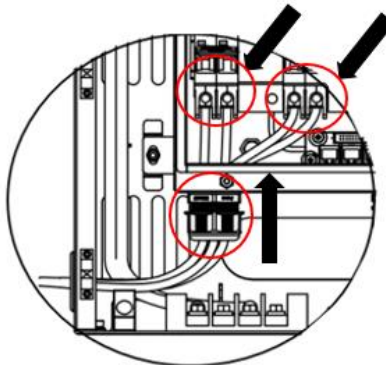


- Measure the voltage of every route Strings using a Multi-meter. Ensure that the polarities of the DC input power cables are correct.



Step 2: Installing the PV Connector

Check correct polarity of connection cable from PV modules and PV input connectors. Then, connect positive pole (+) of connection cable to positive pole (+) of PV circuit breaker. Connect negative pole (-) of connection cable to negative pole (-) of PV circuit breaker.



6.4 Grid Connection

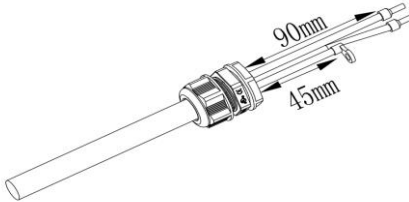
Take out the AC connector terminals from the packaging. And ensure the information below before connecting the inverter to the grid:

- The grid voltage and frequency must be in the permissible range.
- Disconnect the AC circuit breaker and secure it against reconnection.
- All wiring must be performed by a qualified personnel.

Procedure:

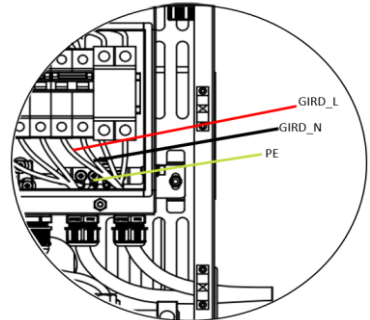
Step1: Assembling the AC Connector

- Lead the AC cable through the cable gland and the housing.
- Unscrew the cap on the AC port at the bottom of the middle control box, insert the AC cable through the waterproof connector.
- Remove an appropriate length of the insulation layer from the wire.
- Fully insert the conductors to the corresponding terminal and tighten the screws.
- Pull cables outward to check whether they are firmly installed.



Step 2: Installing the AC Connector

- Connect "PE" conductor to the grounding electrode.
- Connect "L" and "N" conductors to the AC circuit breaker.



WARNING

High leakage current!

- Earth connection essential before connecting supply

6.5 EPS Connection

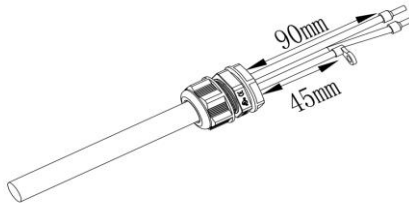
If you want to use the energy storage system to power the house (as a standalone system or during Grid failure), the EPS connector should be used and the EPS function should be enabled during setup. Otherwise you could leave the EPS port disconnected. Where possible, please install an external switch to bypass the inverter to power backup loads in the event of inverter failure.

- Before connecting, please check the following:
- The grid voltage and frequency must be in the permissible range.

Procedure:

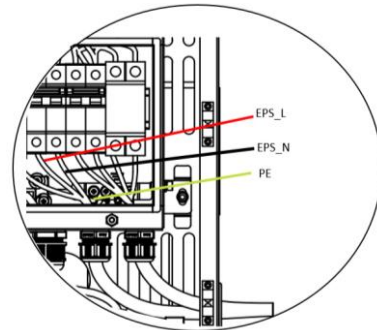
Step 1:

- Unscrew the cap on the EPS port at the bottom of the middle control box, insert the EPS cable through the waterproof connector.
- Assemble the EPS connector (reference to AC connector).
- Make sure Live/Neutral/PE wires are correct;
- Be sure follow the markings on the connector



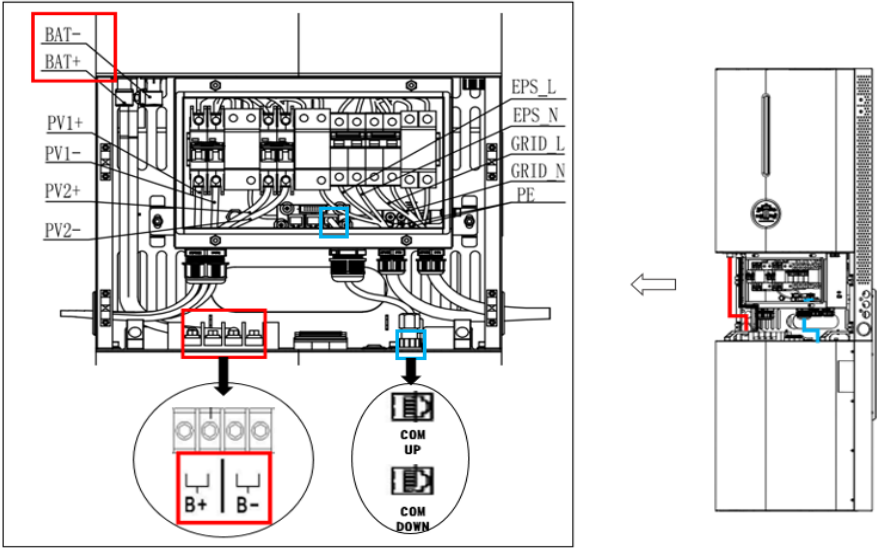
Step 2:

- Connect "PE" conductor to the grounding electrode.
- Connect "L" and "N" conductors to the AC circuit breaker.



6.6 Battery Connection

Battery connection diagram

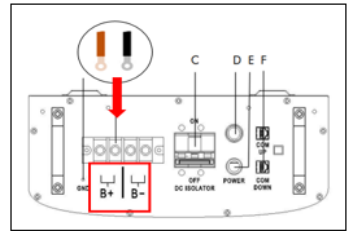


6.6.1 Battery Connection

Procedure:

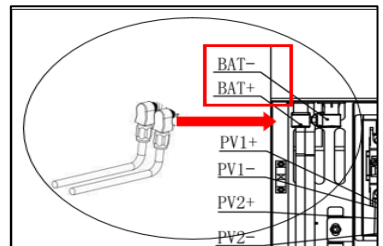
Step1: Connect the Battery cable into the battery

- Install the connectors to battery power ports; make sure the polarities are correct



Step 2: Plug the Battery cable into the inverter

- Plug the other ends of power cables into inverter. Please contact with your inverter vendor for detailed information.
- If the connector from wire to battery is not assembled, you need to contact with your battery vendor for detailed information.



⚠ CAUTION

- A DC breaker with OCP function is compulsory for installation between inverter and battery. The battery may have this switch integrated. If not, an external DC switch of proper ratings should be used.
 - Only use properly insulated tools to prevent accidental electric shock or short circuits. If insulated tools are not available, use electrical tape to cover the entire exposed metal surfaces of the available tools except their tips.
-

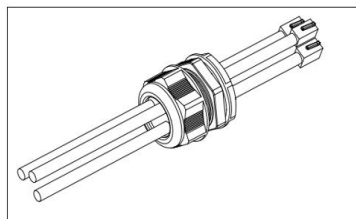
6.6.2 BMS Communication Connection

The COM port is a three-in-one communication port of BMS cable, meter cable and parallel cables. It is recommended to receive the function of the inverter before wiring, and install the three cables at the same time to save installation steps.

Procedure:

Step 1:

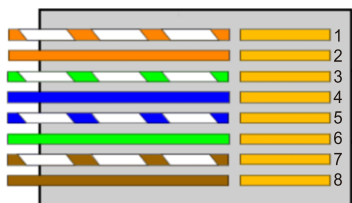
- Unscrew the cap on the COM port at the bottom of the middle control box, insert the BMS cable through the waterproof connector.
- Communication interface between inverter and battery is CAN with a RJ45 connectors.
- Insert the RJ45 connector into the port marked with “BMS” on the middle control box.



Step 2:

Insert other side of the BMS cable into COM port on the battery.

BMS Connector Pin Definition:



1. BMS_CAN_H
2. BMS_CAN_L
3. BMS_485_A
4. GND
5. BMS_485_B
6. GND
7. NULL
8. NULL

6.7 Smart Meter Connection

Procedure:

Step 1:

- Normally the smart meter should be placed in or near the grid distribution box right after the billing meter.
-

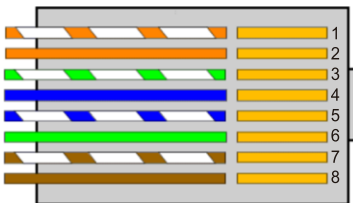
Step 2:

- Please use the smart meter cable in the accessory box for communication.
 - Communication interface between inverter and battery is CAN with a RJ45 connectors.
 - Insert the RJ45 connector with water- proof cap into the port marked “Meter” on middle control box.
-

Step 3:

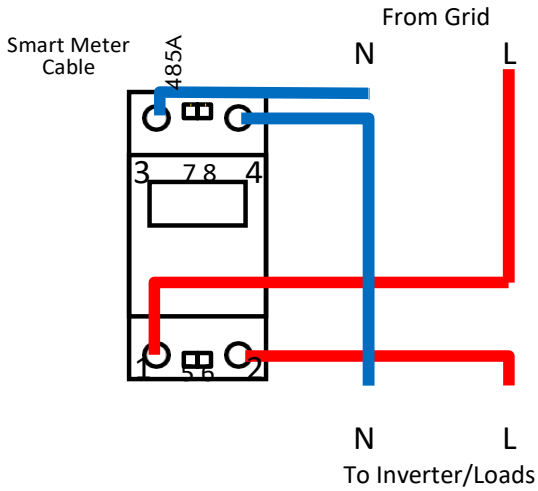
The wires on the other end should be stripped and connected to the smart meter accordingly. If the cable length is not enough, please use the RJ45 extender in accessory box to extend the cable and install the included 1kohm resistor.

“MULTI” Connector Pin Definition



1. METER_485B
2. METER_485A
3. GND
4. Reserved
5. Reserved
6. GND
7. Reserved
8. Reserved

➤ **Smart meter type: CHINT DDSU666-D**



6.8 Parallel Connection

This inverter supports 2 units in parallel, please refer to the “parallel user manual” for specific operations.

6.9 Wi-Fi Stick Connection

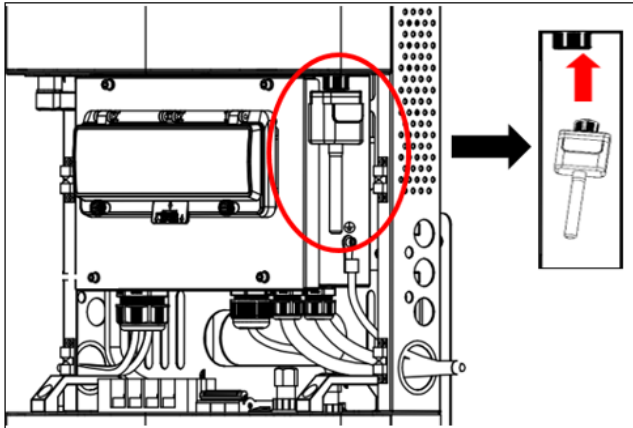
Procedure:

Step 1:

Peel off the tape that covers the EMS port

Step 2:

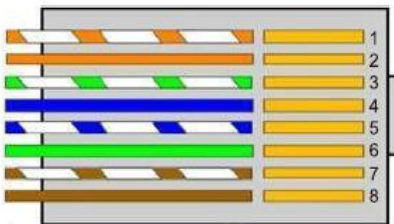
Insert the Wi-Fi stick into the Wi-Fi port and screw it tightly.



6.10 DRM Connection

DRM is provided to support several demand response modes by certain control signals.

“DRM” Connector Pin Definition



1. DRM1/5
2. DRM2/6
3. DRM3/7
4. DRM4/8
5. 3.3V
6. DRM0
7. 3.3V
8. GND

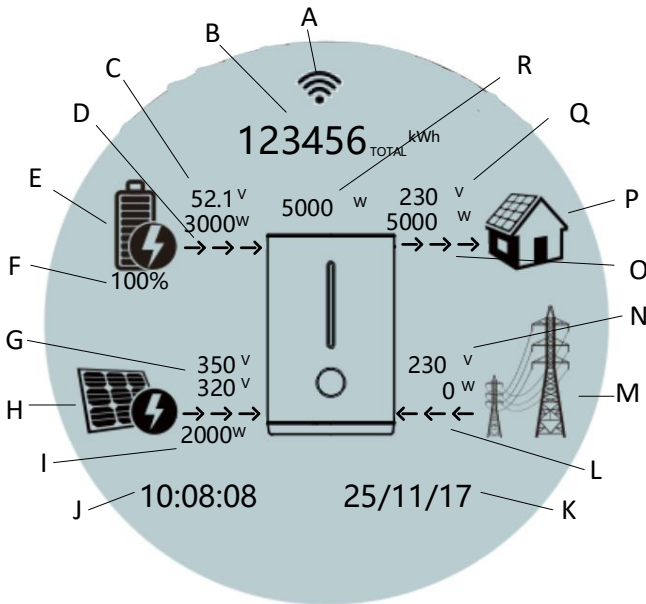
7 Operating of the Inverter

7.1 LEDs and Graphical Display

The LEDs indicate the operating state of the inverter and also battery SOC.

LED	Status	Explanation
Green LED	Glowing	The inverter has been powered up.
Red LED	Glowing	An Error has occurred.
Blue LEDs	Full Length	SOC > 75%
	3 Bars	75% > SOC > 50%
	2 Bars	50% > SOC > 25%
	1 Bar	25% > SOC > 10%
	No Light	SOC < 10% or BMS not Connected

The graphical display shows the detailed information of the inverter



Position	Designation
A	EMS port communication status.
B	Total energy the inverter has produced.
C	Battery parameters, voltage and current are displayed alternatively.
D	Direction of the battery energy.
E	BMS Status. If this label is not shown, BMS Connections should be checked.
F	SOC of the Battery.
G	PV panels parameters, voltage and current are displayed alternatively.
H	PV panels status. If there's no PV voltage, this label will not be shown.
I	Total PV power generation
J	Default as current time, when an error occurred, fault code will be displayed alternatively.
K	Default as current date, when an error occurred, fault code will be displayed alternatively.
L	Direction of the grid power.
M	Grid status. If there's no grid, this label will not be shown.
N	Grid parameters, voltage and current are displayed alternatively.
O	Direction of the load power. If PV Inverter is installed, it could feed power back into the grid.
P	Indicating local load.
Q	Load parameters, voltage and current are displayed alternatively.
R	Current power of the inverter.

7.2 Commission

Before commissioning the inverter, make sure:

- The country mark on the box is in accordance with the installation site;
- The inverter is correctly and firmly mounted;
- The Circuit breaker and RCD are correctly connected and are all in “off” position;
- All cables are connected according to chapter 6;
- Unused inputs must be sealed using the corresponding connectors or sealing plugs.

Procedure:

Step 1: Power on the Grid

- Wait for a while, the green led should be glowing and the graphical display should start displaying. Item “L”, “M”, “N”, should appear on the screen. If not, please power off and check for the connections of grid power line and smart meter.

Step 2: Power on the Battery

- The battery icon and its parameters should be shown on the screen. If the SOC of the battery is greater than 10%, the blue LEDs should also be turned on to indicate the SOC.

Step 3: Power on the PV

- If there’s sunlight, the PV icon and its parameters should be shown on the screen.
- Wait for a moment and the inverter will start a self-test procedure. When it is done successfully, the inverter will start using PV power to charge the battery or feed in power to the house and grid.

Step 4: Switch on the loads

- The load parameters should show.

Step 5: Configure the Wi-Fi stick

- Configure the Wi-Fi stick for remote monitoring. Please follow the instructions manual in the Wi-Fi stick’s box. Otherwise, please contact LIVOLTEK and we will provide detailed instructions.
-

Step 6: Self-test in accordance with CEI 0-21 (Italy Only)

- The self-test is only required for inverters to be commissioned in Italy. During the self-test, the inverter will consecutively check the reaction times for: overvoltage, undervoltage, maximum frequency and minimum frequency.
 - Please use the LIVOLTEK APP to initiate the self-test procedure and get the test results. Refer to LIVOLTEK APP Operation Instructions for details.
-

7.3 Decommission

Step 1: Turn off the load;

Step 2: Turn off the PV;

Step 3: Turn off battery;

Step 4: Turn off the main grid switch;

Step 5: Wait for at least 5 minutes after the LED and graphical display black out for the internal circuits to discharge energy;

Step 6: Disconnect all the power cable;

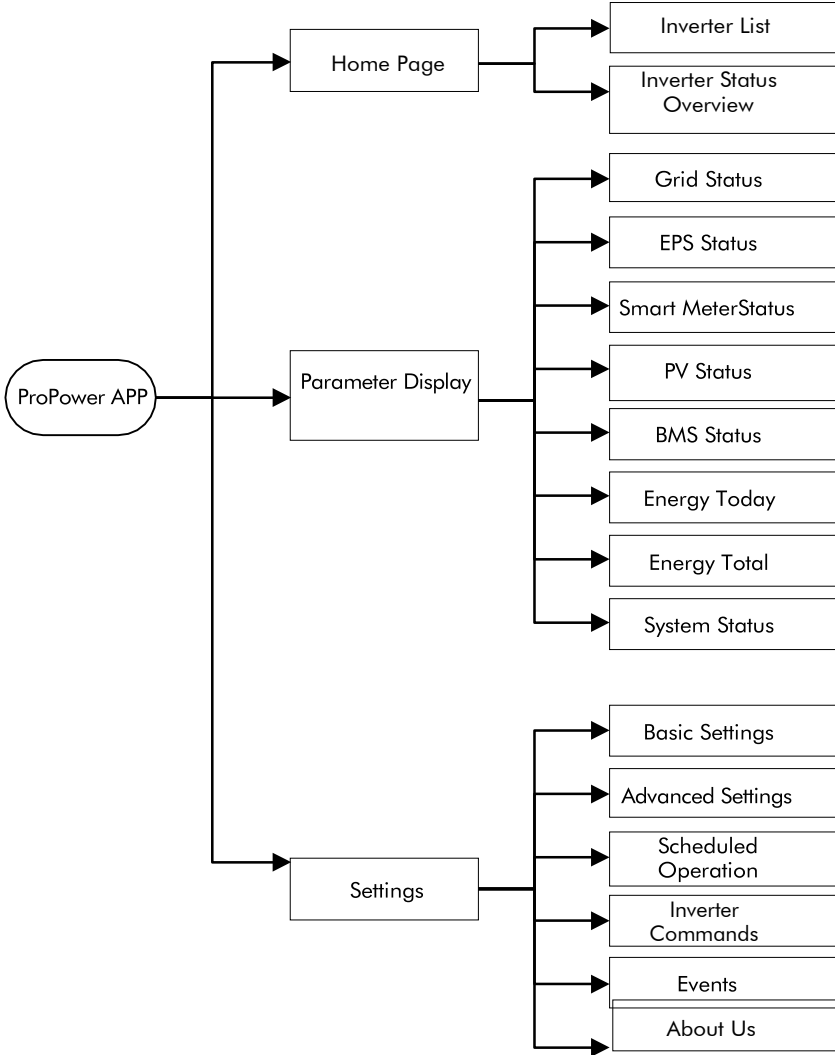
Step 7: Disconnect all the communication cable, Remove the Wi-Fi stick;

Step 8: Remove the inverter from the wall, also remove the bracket if necessary; **Step**

Step 9: Pack the inverter with the original carton, and store it.

7.4 Settings on the APP

7.4.1 User Interface Introduction



7.4.2 Install the APP and Connect to the Inverter

Preparation

- Power the inverter and/ or Wi-Fi router on;
- Make sure the Wi-Fi stick is connected to the inverter and the network is configured.

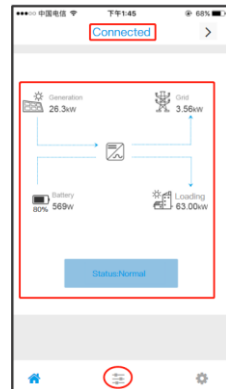
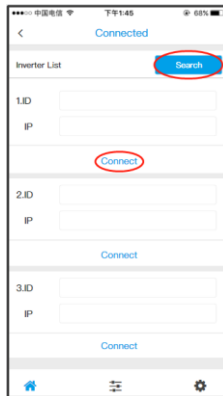
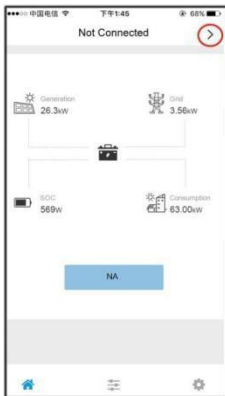
Procedure:

Step 1: Install Propower APP

- Search for the keyword "**Propower**" from Google Play Store or Apple AppStore, download and install the latest version of the monitoring software for free

Step 2: Connect to the inverter

- Confirm the network information connected to the inverter before starting. There are two ways to connect APP to the Inverter. One is to connect to the same wireless network of the router, and the other way is to connect to the Wi-Fi stick's network (Wi-Fi name is AP_*****).
- Open the APP,click the arrow on the upper right corner of home page;
- Search the inverter ID, and connect to target inverter;
- If it is successfully connected, the home page will show the general status of the inverter. One can also check the detailed status in the Parameter interface.



7.4.3 Check the Country

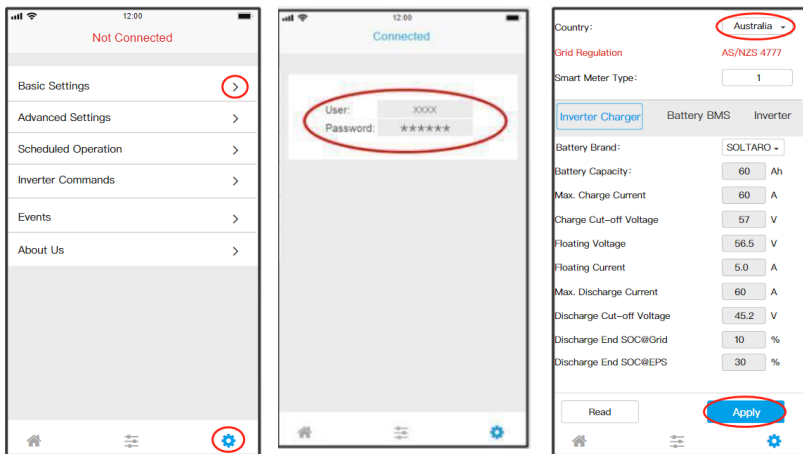
Procedure:

Step1: Enter the Setting interface

- Turn to Settings interface, click the “BasicSettings”;
- Write in the password, to enter the setting interface. This can be accessed by contacting LIVOLTEK.

Step 2: Set the country

- Check the “Country”, make sure it is your current location;
- If it is not your current location, please choose the right country, and click “Apply” to save the setting.



7.4.4 Time Synchronization

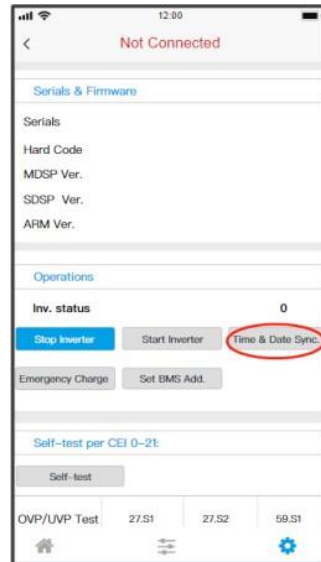
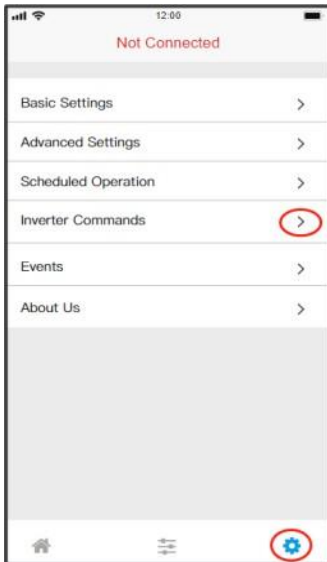
Procedure:

Step 1: Enter the Setting interface

- Go to Settings interface, click “Inverter Commands”.

Step 2: Time Synchronization

- Click the “Time & Date Sync.”



7.4.5 Scheduled Operation (Optional)

Procedure:

Step 1: Enter the Setting interface

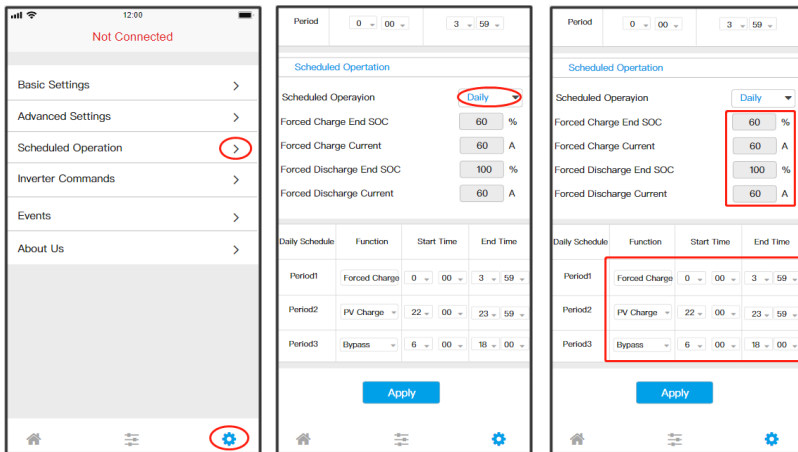
- Go to Settings interface, click the “ScheduleOperation”.

Step 2: Set the Operation Periods and Parameter

- Enable the Scheduled Operation;
- Set the operation period and parameters, according to your requirement;
- One can also set the discharge period for the EPS mode, if necessary.
- Click “Apply” to save the setting.

NOTICE

If the scheduled periods conflict, the priority of period1 is higher than period2, which is higher than period 3, and so on.



7.4.6 Other Settings (Optional)

One may change the following settings, according to the situations and/or local regulations.

Settings other than the following, may also be available, but should be under the suggestions or assistance of distributors/manufacturer.

Procedure:

Step 1: Enter the Setting interface

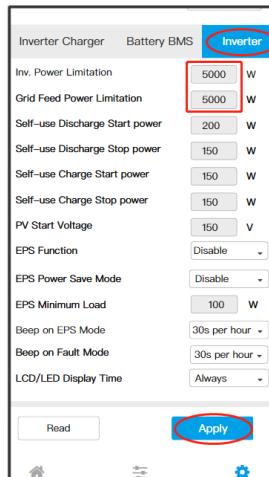
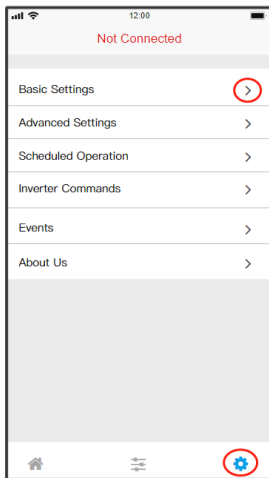
- Go to Settings interface, click the “BasicSettings”.

Step 2: Max. Charge/Discharge Current

- Click the “Battery BMS”;
- Set the max. charge/discharge current according to requirement, which should not exceed the limitation of battery;
- Click “Apply”, to save the settings.

Step 3: Inverter Power Limitation

- Click “Inverter”;
 - Set the power limitation, according to your situation and/or local regulations;
 - Click “Apply”, to save the settings.
-



8 Troubleshooting

This chapter is a guide for troubleshooting problems that may arise in the installation and operation of hyper series inverters.

In the event that more than one error is generated at the same time, the hexadecimal error corresponding to each alarm are added together. That is to say, if error code 0006H is displayed, errors 0002H and 0004H are being produced simultaneously.

Error Code	Description	Solution
F1:00000001	PV1 OVP	Check the configuration of connected PV Panels.
F1:00000002	PV1 OCPs	
F1:00000004	PV2 OVP	
F1:00000008	PV2 OCPs	
F1:00000010	System generation insufficient	
F1:00000020	PV2 OCPH	
F1:00000040	Rev	TBD
F1:00000080	Rev	TBD
F1:00000100	Grid Voltage Abnormal	Check if grid fails.
F1:00000200	Grid Frequency Abnormal	
F1:00000400	DC Bus OVP	These errors will reset itself. If it keeps coming and finally the Inverter is latched up, please contact with your local distributor.
F1:00000800	AC OCPs	
F1:00001000	DC Component of AC Current Abnormal	
F1:00002000	Leakage Current Protection	
F1:00004000	AC OCPH	
F1:00008000	Rev	TBD
F1:00010000	EPS Voltage Abnormal	Check the EPS load. Unplug some to see if too much loads are connected.
F1:00020000	EPS OCP	
F1:00040000	EPS Over Power	
F1:00080000	EPS SCP	

Error Code	Description	Solution
F1:00100000	Over Heat P1	Wait for the Inverter cools down. Check if the installation place is too hot.
F1:00200000	Over Heat P2	
F1:00400000	Over Heat P3	
F1:00800000	Bat. OTP	These errors will reset itself. If it keeps coming and finally the Inverter is latched up, please contact with your local distributor.
F1:01000000	Bat. Voltage Protection	
F1:02000000	Bat. OCP1	
F1:04000000	Bat. OCP2	
F1:08000000	Bat. OCP3	
F1:10000000	Bat. OCP4	
F1:20000000	Internal OVP1	
F1:40000000	Internal OVP2	

F1:80000000	Internal OVP3	
F2:00000001	Grid Grounding Fault	Check the grounding wire.
F2:00000002	L/N Reversely Connected	Check the L/N wire.
F2:00000004	Insulation Fault	Check the insulation of PV panels.
F2:00000008	RCMU Fault	Check the PV Panels.
F2:00000010	Grid Relay Fault	These errors will reset itself. If it keeps coming and finally the Inverter is latched up, please contact with your local distributor.
F2:00000020	EPS Relay Fault	
F2:00000040	Bypass Relay Fault	
F2:00000080	EEPROM1 Error	
F2:00000100	Single Faults	
F2:00000200	Internal Comm. F1	
F2:00000400	Internal Comm. F2	
F2:00000800	Internal Comm. F3	
F2:00001000	PV1 Reversed	Check the PV terminals, confirm the positive and negative polarity and re-wire.
F2:00002000	PV2 Reversed	

Error Code Description Solution		
F3:00000001	BMS External Fault	Check the battery for parameter settings. Contact with your local battery's distributor.
F3:00000002	BMS Internal Fault	
F3:00000004	BMS OVP	
F3:00000008	BMS UVP	
F3:00000010	BMS Charge OCP	Check the battery for parameter settings. Contact with your local battery's distributor.
F3:00000020	BMS Discharge OCP	
F3:00000040	BMS OTP	
F3:00000080	BMS UTP	
F3:00000100	Cell Imbalance	
F3:00000200	BMS Reversed	Confirm the positive and negative polarity and re-wire.
F3:00000400	Meter Comm. Fault	Please check the communication cable for smart meter. If using cable other than what is included, a 1000-ohm resistor should be connected to the meter.
F3:00000800	Internal Comm. F5	These errors will reset itself. If it keeps coming and finally the Inverter is latched up, please contact with your local distributor.
F3:00001000	System crash alarm	
F3:00002000	EPS off alarm	
F3:00004000	External Comm. BMS	Communication between Inverter and BMS is not working. Check BMS cabling is connected correctly and battery powered on. Check BMS setting for inverter
F3:00008000	Firmware fault	First, disconnect the power and restart. If the problem cannot be solved after restarting, please contact with the distributor.

9 Technical Data

9.1 Hyper 3000/3680/5000

PV Inputs	GHyper 3000	GHyper 36800	GHyper 5000
Max. PV-generator power	3000VA	4000VA	5400VA
Max. PV voltage	550V d.c.		
Rated PV Voltage	360V d.c.		
MPPT Voltage Range	125~500V d.c.		
PV Start Voltage	100V d.c.		
Max. PV current	10A/10A d.c.		
Max. Short Circuit Current	14A/14A d.c.		
Strings per MPP Tracker	1		
Number of MPP Trackers	2		
Galvanic Isolation for PV Modules	Transformerless		
Reverse Current to PV Panels	No		
AC Ratings			
Rated AC Power	3000VA	3680VA	5000VA
Rated AC Voltage	230V a.c.		
AC Voltage Range	180V~264V a.c.		
Rated AC Frequency	50Hz/60Hz		
Max. AC Current to Grid (Feed Back Current)	13A a.c.	16A a.c.	21.7A a.c.
Max. AC Current from Grid (Bypass + Grid Charge)	26A a.c.	30A a.c.	30A a.c.
Max. Output Overcurrent Protection	32A a.c.	40A a.c.	40A a.c.
Power Factor Range	-0.8~+0.8		
Total Harmonic Distortions (i)	<3%		
Inrush Current (Peak/Duration)	120A/32us		
Max. Output Fault Current (Peak/Duration)	200A/10ms		
EPS Ratings			
EPS Rated Power	3000VA	4000VA	5000VA
Overload Capacity	1.1 x Pnom, 10 sec; 1.5 x Pnom, 100 ms		
EPS Rated Voltage	230V a.c.		
EPS Rated Frequency	50Hz/60Hz		
EPS Rated Current	13A	17.4A	21.7A
Changeover Time	2s in EPS Mode, 10ms in UPS Mode		
Total Harmonic Distortion (V)	< 3%		
Parallel Operation	No		

Battery Ratings			
Battery Type	Lithium		
Rated Battery Voltage	48V d.c.		
Battery Voltage Range	40~60V d.c.		
Max. Charge Current	60A d.c.	60A d.c.	100A d.c.
Max. Discharge Current	60A d.c.	60A d.c.	100A d.c.
PS Max. (per CEI 0-21)	2800W	2800W	4700W
PC Max. (per CEI 0-21)	3600W	3600W	5000W
Galvanic Isolation for Battery	YES		
Communication Interfaces	CAN/RS485		
Efficiencies			
MPPT Efficiency	99.9%	99.9%	99.9%
Euro Efficiency	97.0%	97.0%	97.0%
Max. Efficiency	97.5%	97.5%	97.5%
Max. PV to Bat. Efficiency	95%	95%	95%
Max. PV to AC Efficiency	94%	94%	94%
Protections			
OVP/UVF	YES	YES	YES
OCP/OLP	YES	YES	YES
PV Insulation Protection	YES	YES	YES
Grounding Fault Monitoring	YES	YES	YES
Grid Protection	YES	YES	YES
DC Injection Protection	YES	YES	YES
Back Feed Current Monitoring	YES	YES	YES
Residual Current Detection	YES	YES	YES
Anti-islanding Protection	YES	YES	YES
General			
Dimensions (LxHxD)	415*675*145mm		
Weight	33kg	33kg	35kg
Mounting Type	Wall Mount		
Operating Temperature	-20~+60 Degree C		
Storage Temperature	-20~+60 Degree C		
Humidity	4%~100%, Condensing		
Ingress Protection	IP65		
Protective Class	I		
Over Voltage Category	III (mains), II(PV)		
Pollution Degree	III		
Cooling Method	Natural		
Noise Level	<40dB		

9.2 Certificates and Grid Regulations

EMC:

EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4, EN61000-4-16,
EN61000-4-18, EN61000-4-29

Safety:

IEC/EN62109-1 & -2,
IEC62040-1

Grid Regulations:

EN50549
IEC61727
NRS097-2-1

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