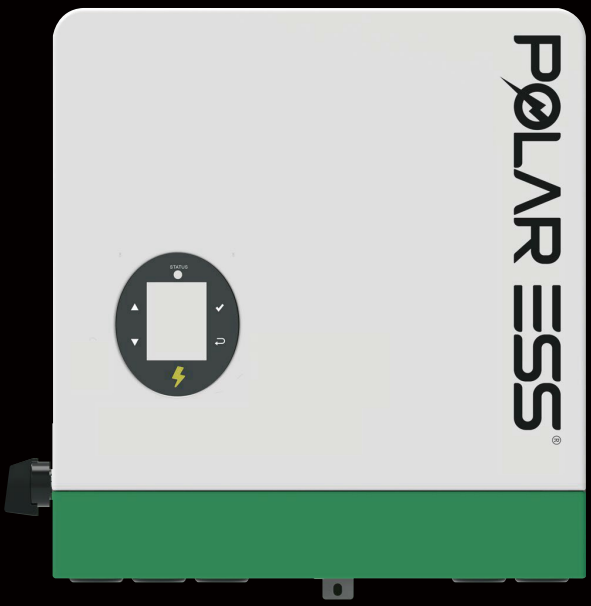
POLAR ESS

ALPS SERIES

USER MANUAL



CONTENTS

1 PRODUCT DESCRIPTION

1.1 Overview

The ALPS series models, developed and manufactured by PolarESS, are primarily designed for the of energy storage. That can be the energy stored by solar PV, or energy from the grid.

They can also be used to feed energy to the grid for profit, or as a back-up power source to provide electricity to the user when grid power is lost.

This manual provides product information and installation instructions for ALPS users.

For other detailed information, please contact our customer service technicians. Note that in the event of content updates, without notice to the user, the latest release version prevails. Please contact our customer service team to obtain.

In the following manual we will refer to the product as ALPS inverter.
The Polar ESS ALPS inverter includes:

- ALPS HY3.6-GL
- ALPS HY4.6-GL
- ALPS HY5.0-GL
- ALPS HY6.0-GL
- ALPS HY8.0-GL

1.2 Security Declarations

CAUTION

The ALPS is designed according to international safety regulations. It has been rigorously tested to ensure its safety and reliability. Please refer to the contents of this manual and the relevant safety information before any operation of the inverter, and strictly observe them during installation and use.

During installation, make sure that the installer has the relevant qualifications and that the installation and use comply with local regulations or standards. Any installation or use of the product that does not comply with the product's safety instructions or regulatory requirements may result in the following problems:

- Result in injury or death to the installer, the user, or a third-party organization.
- Damage or other irreversible effects on the ALPS inverter and other property etc. attributable to the user or third-party organization.

1.3 Safety Instructions

During the pre-installation/installation/post-installation and subsequent use and maintenance of the inverter, there are safety issues including but not limited to the following. Installers and users are requested to read the following carefully:

DANGER
High Voltages and Large Currents

- CAUTION PV HIGH VOLTAGE HAZARD: To avoid electric shock, disconnect the DC switch on the inverter before and during installation.
- CAUTION GRID HIGH VOLTAGE HAZARD: Prevent electric shock by disconnecting the AC switch at the grid connection before and during installation.
- CAUTION BATTERY HIGH CURRENT HAZARD: Switch off the battery module before and during installation to prevent electric shock.
- Do not disassemble the inverter during operation to avoid electric shock or damage from system operating voltage/current.
- Do not operate the inverter when running except for the LCD and panel buttons; the rest of the inverter should only be touched when switched off or in other safe situations.
- Do not plug or unplug any connection cables (including PV, battery, power grid, communication cables, etc.) during operation.
- Ensure that the inverter is reliably earthed, and the operator should be well protected by reasonably reliable insulation (e.g., personal protective equipment (PPE)).
- Carefully check the existing wiring at the installation site before installation, operation, or maintenance to ensure it is in good condition.
- During installation, meticulously inspect the connections between the machine and PV, battery, and grid to avoid damage or injury due to poor contact.

WARNING
Avoid Misoperation and Inappropriate Usage

- Installation work for the inverter (including system design, installation, operation, setup, configuration, and maintenance) must be conducted by qualified personnel as required.
- All connections must adhere to the relevant local and national standards and regulations.
- The inverter and its system may only be connected to the public grid if permitted by the public grid.
- Ensure that all warning labels and nameplates on the inverter remain clearly visible and are not removed, obscured, or covered.
- Installation must be carried out by selecting the correct and suitable location in accordance with the requirements of this manual, considering the safety of the user's subsequent operations.
- Prevent children from touching or misusing the inverter and its associated systems.
- Be aware that most areas of the inverter and its associated systems may become hot during operation; therefore, only the LCD and buttons should be touched during inverter operation.

NOTE

- Please read this manual thoroughly before performing any work on the inverter. After the installation is complete, store this manual in a safe place for future reference.
- Qualified installers should be trained in the installation and commissioning of electrical systems and the handling of hazards, and should also have the knowledge to read and understand these manuals and other relevant documents. As an installer and operator, it is crucial to familiarize yourself with local regulations and directives.

1.4 Symbols

1.4.1 Document Identification

This document includes various types of safety instructions and information, outlined as follows:

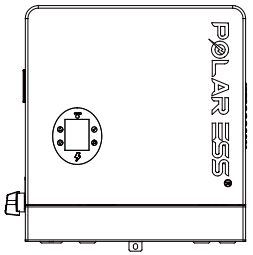
Manual	MANUAL - Read the Manual
Danger	DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.
Warning	WARNING indicates a hazardous situation that, if not avoided, may result in death or serious injury.
Caution	CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
Note	NOTE - Failure to observe this warning may lead to damage to property.

1.4.2 Product Identification

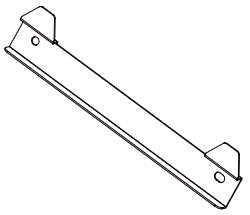
Symbol	Description
	Warning regarding dangerous voltage: The product operates with high voltage. All tasks related to the product must strictly adhere to the instructions in its documentation and should be performed only by qualified professionals.
	Disposal Instructions: The Hybrid inverter must not be disposed of with household waste.
	Caution - Hot Surface: Be cautious of hot surfaces. The product may become hot during operation; avoid touching it while in use.
	Operating Instructions: Prior to any work, thoroughly read the product's documentation. Adhere to all safety precautions and instructions outlined in the documentation.
	Grounding Protection: Identify the designated point of connection for grounding protection.
	Electrical Terminology: Direct Current (DC)
	Electrical Terminology: Alternating Current (AC)
	Electrical Shock Warning: Danger due to electrical shock. It indicates the recommended waiting time (5 minutes) after turning off and disconnecting the inverter to ensure safety during any installation operation.

INSTALLATION 2

2.1 Packaging List



A



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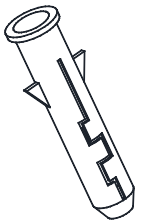

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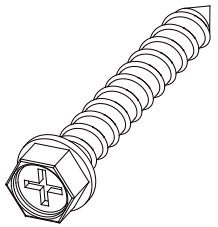

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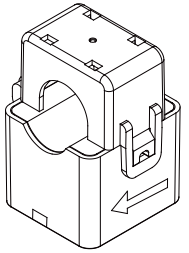


E

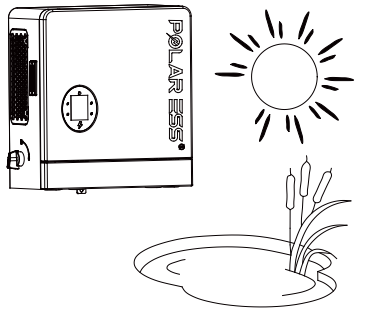
F

Item	Item name	Quality
A	ALPS HY GL	1
B	Mounting Bracket	1
C	Mounting Frame Fixings	3
D	Mounting Frame Fixings Screw	3
E	CT	1
F	User Manual	1

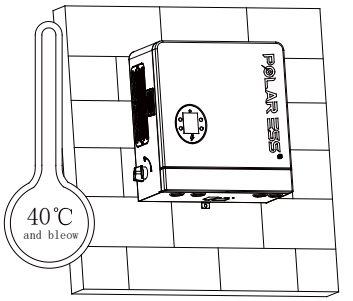
2.2 Installation Instructions

2.2.1 Installation Guidelines

(1) Do not install in direct sunlight or near water sources; the inverter must be installed in a dry environment.



(2) The inverter must be installed in an ambient area — the temperature should be below 40° to ensure optimal operation.



(3) Mount the inverter on a wall capable of supporting its weight and dimensions.

(4) Do not install on flammable construction materials.

(5) The humidity of the installation position should be 0-95% and no condensation.

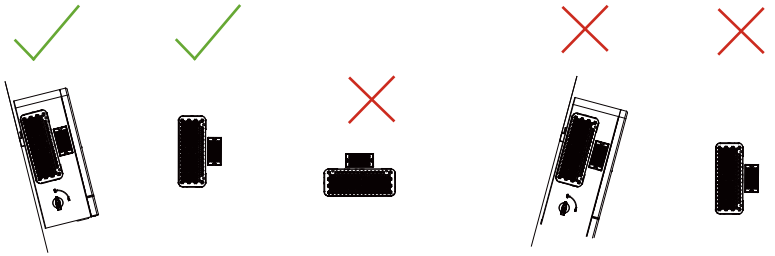
(6) The installation position should be safe

(7) Do not put anything on the inverter; prevent covering the inverter

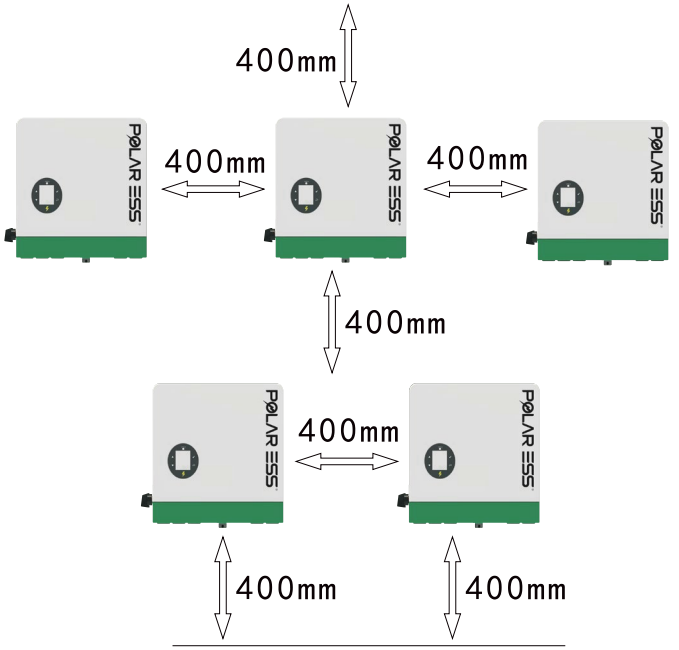
(8) Do not install near TV antenna or another antenna power cable

(9) The unit must be installed in an easily accessible location. The status display must be visible and not obstructed

(10) The inverter must be installed vertically with connections always positioned at the bottom; never install horizontally and avoid tilting the unit

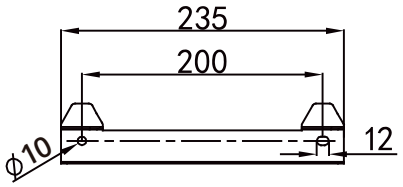


(11) Observe the minimum clearances to walls, other inverters or objects as shown in the diagram below in order to guarantee sufficient heat dissipation

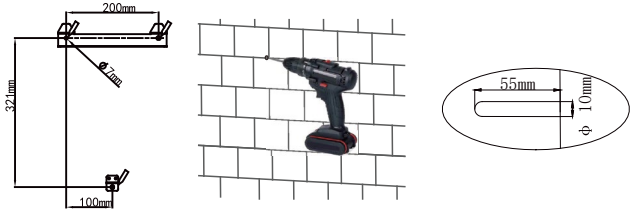


2.2.2 Step-by-Step Installation Guide:

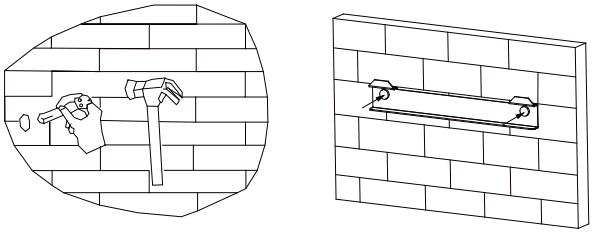
1.Ensure the minimum required wall thickness for inverter mounting is 120mm. Position the wall mounting bracket horizontally on the wall and mark the bracket hole locations.



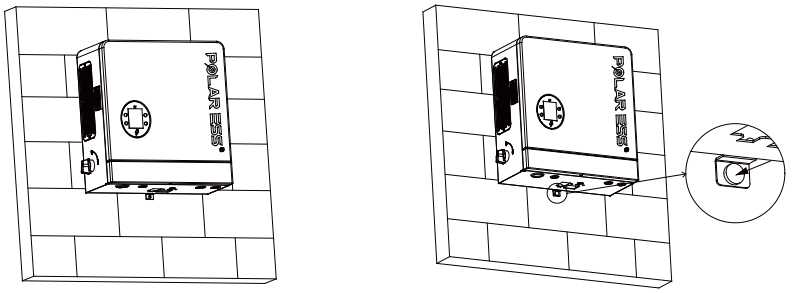
2.Drill 3 holes at the marked positions, reaching a depth of at least 55mm. Secure the mounting rack to the wall using 3 M6x40 expansion bolts.



3.Attach the bracket using 2 fixings.

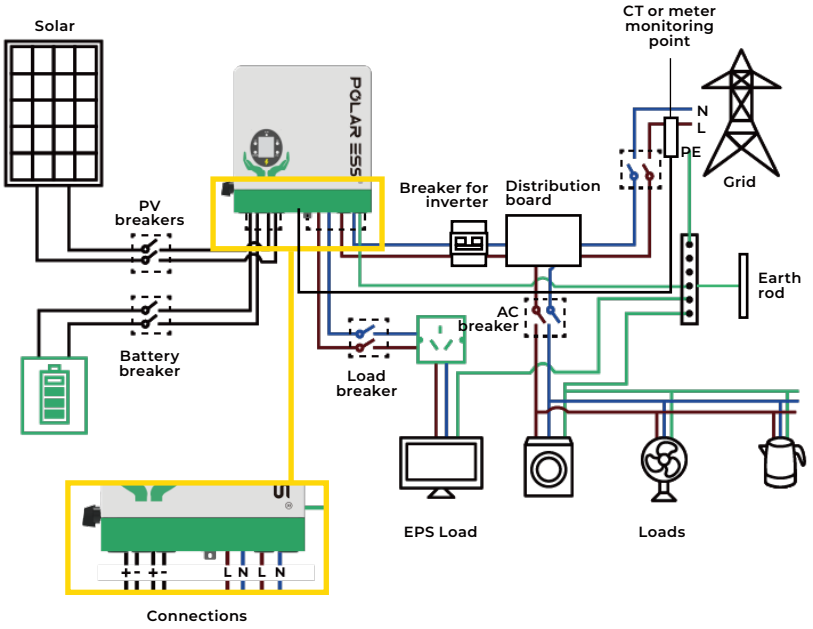


4.Mount the inverter and secure it with 1 screw in the bottom bracket.



2.2 Installation Instructions

2.3.1 System Wiring Diagram

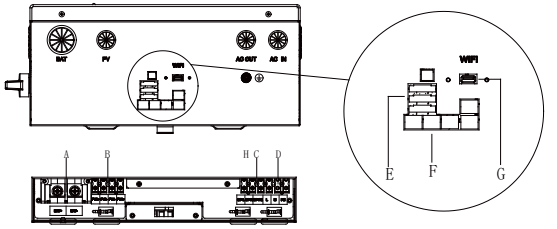


For on-grid connection and to isolate from the grid when necessary, an external AC breaker is required. The AC breaker specifications depend on the inverter model:

Inverter Model	AC Breaker Specification
ALPS HY3.6-GL	400Vac/32Amax(e.g.NXB-32)20A
ALPS HY4.6-GL	40oVac/32Amax(e.g.NXB-32)25A
ALPS HY5.0-GL	400Vac/32Amax(e.g.NXB-32)
ALPS HY6.0-GL	400Vac/32Amax(e.g.NXB-32)
ALPS HY8.0-GL	400Vac/63Amax(e.g.NXB-63)

Note: If the EPS port load is between 6kW and 9kW, the switch should be 230Vac/63A.

Inverter Overview

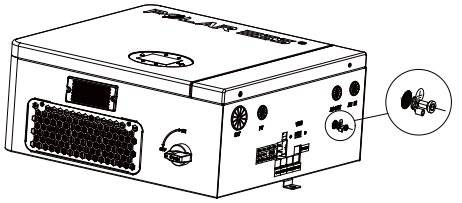


Number		Item Name
A		Battery Terminal
B		PV Terminal
C		Backup Output Terminal
D		AC Output Terminal
E	Comm port	DI 1 DI 2
		CT Meter
		DO 1 DO 2
F		DRM CAN/485 Parallel Communication Terminals
G		WiFi Terminals
H		Ground Terminals

2.3.2 PE Connection

Ensure the ground cable is connected to the ground plate on the grid side.

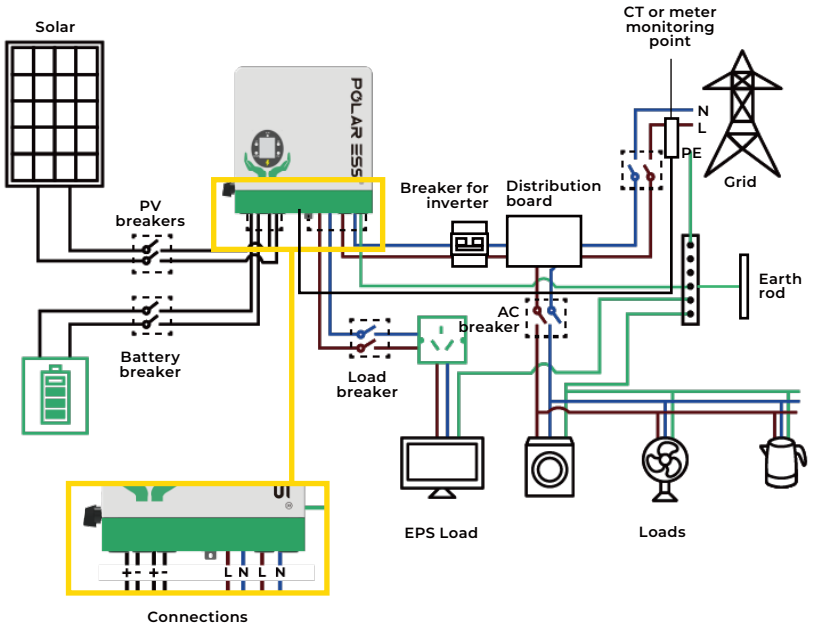
Suggested Cable Requirement for PE Wires:
Use the correct current-rated cable:



2.3.3 AC Grid and EPS Connection

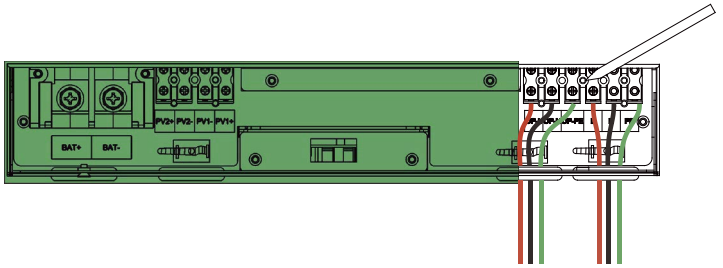
2.3.3.1 On/Off-Grid Load Connection

Distribute the load on the AC Grid side and EPS side based on the inverter's rated power. Follow these wiring guidelines:



2.3.3.2 AC Connection

Suggested Cable Requirement for AC Wires:



Step1. Peel off 1/4 to 5/16 inch (6-8mm) insulation from one end of the AC/EPS wire.

Step2. Release the screw, pull down and open the lower cover of the inverter to expose the inner wiring bay, and remove the dust plug of the AC input/output port.

Step3. Use an art knife to cut a hole and pass the AC/EPS wire through the AC input/output holes, inserting it into the connecting port of the AC terminal block.

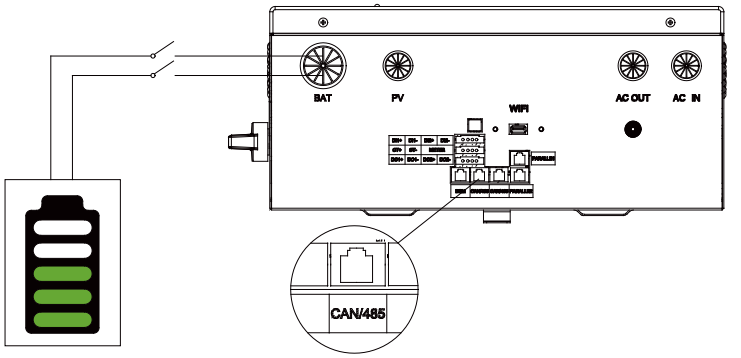
Step4. Tighten the screws on the AC connection terminal block to ensure stable and secure wiring.

2.3.3.3 CT/Meter Connection

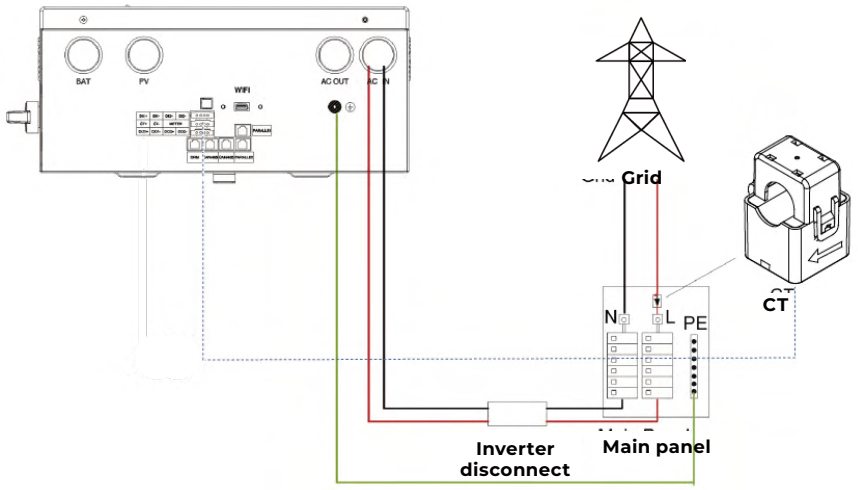
For accurate power measurement between the system and the grid, install a CT at the total output port of the system. Typically, place it in front of the meter or main switch. The inverter comes with a standard CT.

CT Outlet Pin Definition:

The RJ45 connector is used for CT connection. We have included the RJ45 connector in advance, allowing users to connect and use it directly.



Port	1	2	3	4
CT/Meter	CT+	CT-	METER485+	METER485+



Meter Outlet Pin Definition:

If customers desire to use meters, they must purchase them separately and connect the provided communication cable directly to the METER network port. If customers prefer to prepare the wire separately, please refer to the following definition.

Recommended:

We recommend using a shielded cable for meters compatible with comms meter.

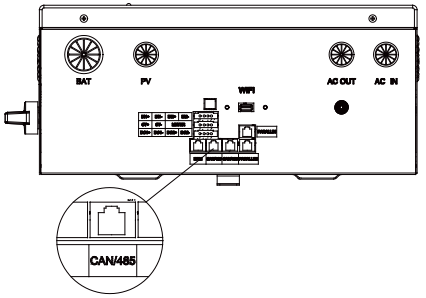
Installation Guidelines:

For the correct installation position and mode of CT/electric meter, please refer to the above wiring examples.

Ensure that the arrow on the CT points toward the inverter for proper alignment.

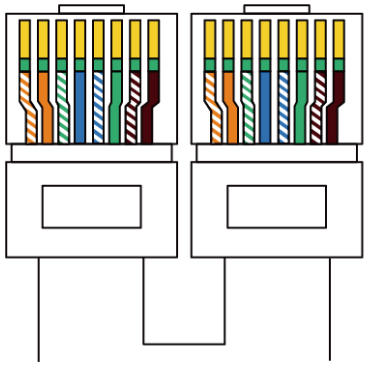
2.3.4 Battery Comms Connection

When connecting a lithium battery to the inverter, the system runs only when the battery communication cable is linked to the inverter. The battery communication port is an RJ45 socket with the following pin definitions. The provided battery accessories already include a finished wire. For additional wiring, consult the following pin definition. Current models support CAN and 485 communication.



Pin	Pin1 Orange -White	Pin2 Orange	Pin3 Green-White	Pin4 Blue	Pin5 Blue-White	Pin6 Green	Pin7 Brown-White	Pin8 Brown
CAN/ RS485	/	/	GND	CANH	CANL	/	RS485+	RS485

We use the connection of TS568B.



2.3.5 PV Connection

WARNING:

Before installation, carefully verify the minimum ambient temperature at the installation site. The rated Voc on the solar panel nameplate is determined at 25 °C.

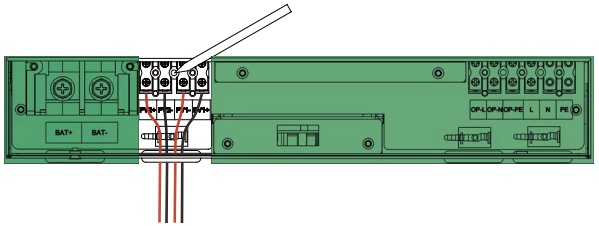
The Voc of solar panels increases as the ambient temperature decreases. To prevent issues, ensure that the maximum solar panel string voltage corrected at the lowest temperature does not exceed the maximum input voltage of the inverter.

NOTE

1.The inverter has two independent MPPTs; for each MPPT, users can connect one string.

2.When a customer has only one string with a large current, its output line can be connected to two MPPT interfaces, and it can still operate normally.

3.When two PV channels are connected, the inverter limits the total solar input power to 9KW. The maximum input power of a single MPPT is restricted to 4.5KW. When only one PV is connected, the inverter limits the maximum MPPT input power to 6KW.



Installation Steps:

Step1. Peel off 1/4 to 5/16 inch (6-8mm) insulation from one end of the battery positive and negative output wires. Crimp the OT terminals (Model OT25-8, wire hole 22-25mm2, screw hole ϕ8.4mm) to the wires, marking the OT terminal aperture.

Step2. Open the lower cover of the inverter to expose the internal wiring bay and remove the dust plug on the battery input port.

Step3. Pass the battery wire through the battery input hole and fix the OT ring on the corresponding terminal block.

Step4. Tighten the screws on the battery connection terminal block to ensure stable and secure wiring.

2.3.6 DRMS Function

When the inverter is utilized in Australia, it is required to connect the Demand Response Management System (DRMS) device and DRMS terminal of the inverter for proper operation. The RJ45 terminal is defined as follows:

Pin	Pin1 Orange-White	Pin2 Orange	Pin3 Green-White	Pin4 Blue	Pin5 Blue-White	Pin6 Green	Pin7 Brown-White	Pin8 Brown
DRMS	DRM1/5	DRM2/6	DRM3/7	DRM4/8	Ref/Gen	GND	/	/

Demand Response Modes for the Inverter:

MODE	RJ45 pins to be connected	Demand
DRM0	Connect Pin5 and Pin6	Stop
DRM1	Connect Pin1 and Pin5	Disallow charge
DRM2	Connect Pin2 and Pin5	Charge power should be less than 50% of the rated power
DRM3	Connect Pin3 and Pin5	Charge power should be less than 75% of the rated power
DRM4	Connect Pin4 and Pin5	Charge power should be less than 100% of the rated power
DRM5	Connect Pin1 and Pin5	Disallow discharge
DRM6	Connect Pin2 and Pin5	Discharge power should be less than 50% of the rated power
DRM7	Connect Pin3 and Pin5	Discharge power should be less than 75% of the rated power
DRM8	Connect Pin4 and Pin5	Discharge power should be less than 100% of the rated power

DRM1-4 are exclusively effective for charging and do not impose restrictions on charge power; DRM5-8 are solely effective for discharging and do not impose restrictions on charge power.

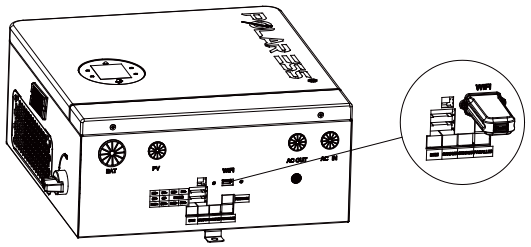
2.3.7 Data Collector Connection

2.3.7.1WiFi/4G Dongle Connection

Users can use the WiFi/4G dongle to monitor the inverter and remotely view monitoring data through the mobile app or portal.

For mobile phone usage, please download the app, follow the instructions to register an account, and ensure proper setup.

The 4G dongle connection process is similar to the WiFi Dongle, but make sure to check the SIM card for proper functionality.



2.4 Operating the Generator

2.4.1 Required Devices

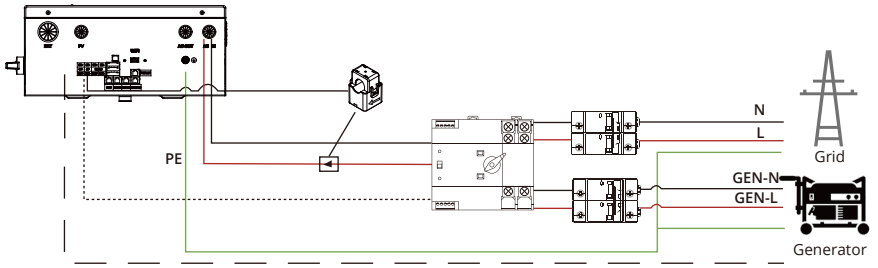
1.Generator (Support remote start/stop)
2.ATS (With digital feedback)

2.4.2 Generator System Connection

1.Connect the generator and grid to the AC IN port of the ATS.

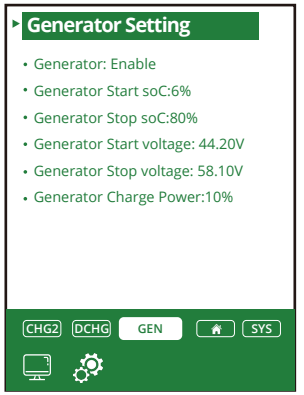
2.Connect the DO1+ and DO1- terminals of the ALPS to the remote control port of the generator.

3.Connect the digital signal of ATS to the DI1+ and DI1- terminals of ALPS.



- Enable the generator function.
- When the inverter cannot detect the AC grid, and simultaneously, the battery SOC is below the cutoff value (adjustable from 5% to 20%), ALPS will initiate remote start for the generator. Conversely, when the battery SOC or voltage exceeds the set value (adjustable range from 20% to 100%), ALPS will remotely shut down the generator.
- The battery will be charged during generator operation, and the generator is bypassed to the AC output to support all loads.
- Ensure that the combined load and charging power do not exceed the rated power of the generator when it is operational.

2.4.3 Generator Startup and Stop Settings



Depending on the Battery Charge Control setting, the system will use either battery SOC or battery voltage to determine whether the generator needs to start or stop.

Generator Start Conditions (Need to meet both of the following):

1.Enable the generator.
2.Grid loss.
3.When the battery voltage or SOC is lower than the Generator Charge Start Volt/SOC settings.

Generator Stop Conditions (Meet one of the following):

1.Grid-tied.
2.When the battery voltage or SOC is higher than the Charge End Volt/SOC settings value.
3.Generator is disabled.

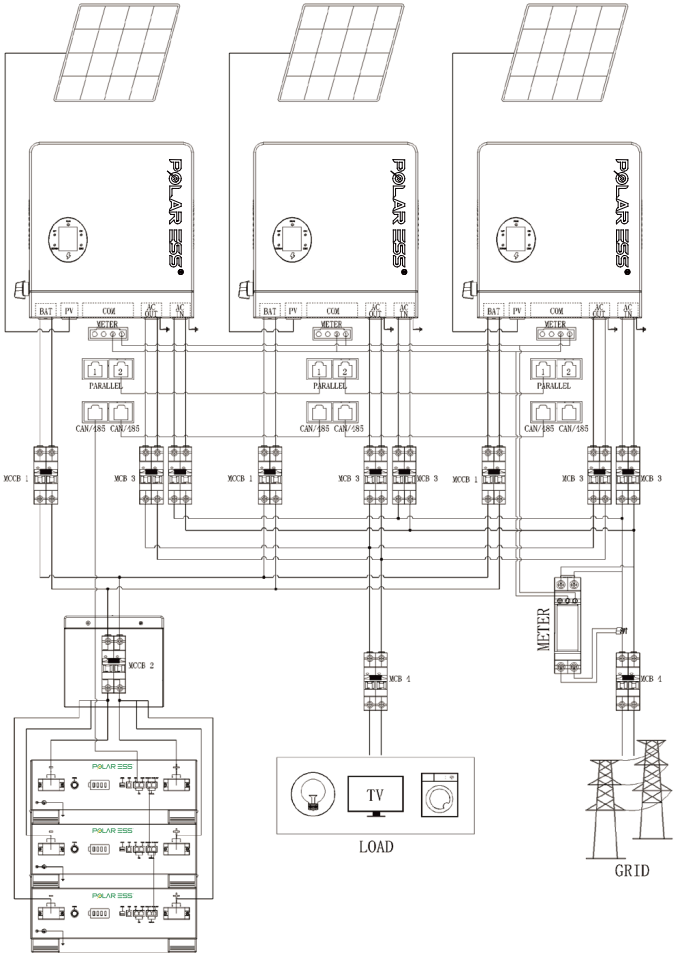
Note: SOC setting is effective only under LFP battery mode, and voltage setting is effective under Lead-acid battery mode.

2.5 Parallel Operation

WARNING!

All inverters must be connected to the same batteries, ensuring that each group of cables from the inverters to the batteries is of the same length.
The ALPS series inverter supports up to 3 units to compose a single-phase parallel system for parallel system setup.

2.5.1 Cable Connection: The system connection is as follows:



Device Selection: (As shown above)
MCCB 1: Please select a DC breaker with a rated current of 150A or above.
MCCB 2: Please select a DC breaker with a rated current of 400A or above.

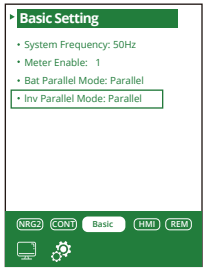
Note: We can use a batteries parallel box here; please contact the distributor.

MCB 3: Please select an AC breaker with a rated current of 63A or above.
MCB 4: Please select an AC breaker with a rated current of 63A or above.

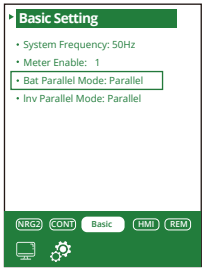
Note: Binding clamp is optional, image as following:

2.5.2 Parallel Function Setting

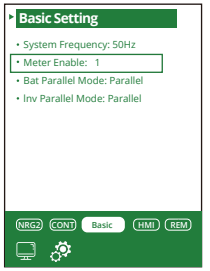
1.Enable the Inverter Parallel Function



2.Enable the Battery Parallel Function



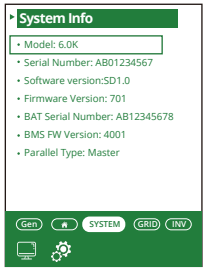
3.Enable the Meter



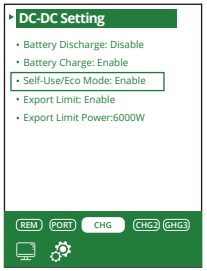
Note: All ALPS inverters need to have these parameters set.

2.5.3 Match All the Settings

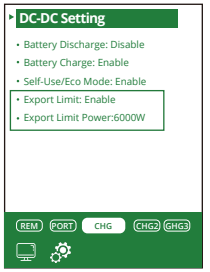
1.Model



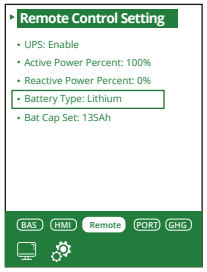
2.Self-Use/ECO Mode



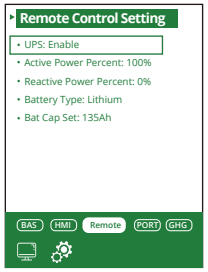
3.Export Limit



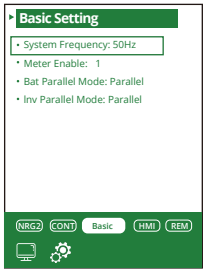
4.Battery Type



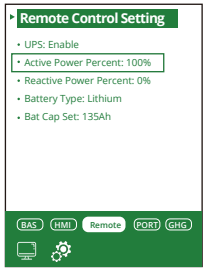
5.UPS



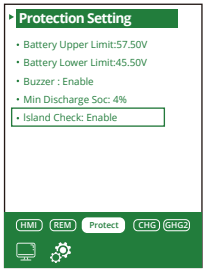
6.System Frequency



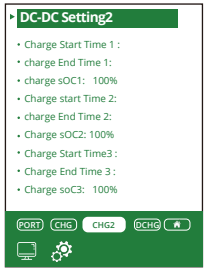
7.Active Power Percent



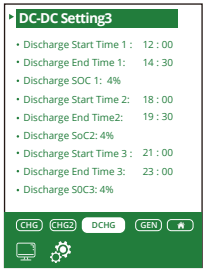
8.Island Check



9.Charge Start Time & Charge SOC



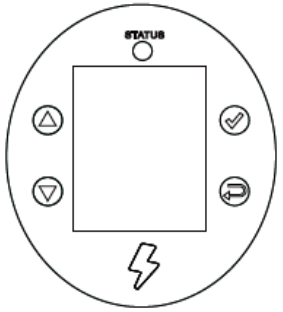
10.Enable the Battery Parallel Function



Note: Please ensure that all settings are identical before activation. Otherwise, the inverter may display an error. If the inverters cannot run in parallel after configuring the settings above, please contact the distributor or PolarESS.

LCD DISPLAY DESCRIPTION 3

The inverter is equipped with an LED screen, an LED indicator, and 4 function buttons, enabling customers to view pertinent information and configure certain functions. The buttons and indicators are detailed below:



DESCRIPTIONS	CLARIFICATION	
Buttons	For operating the display and setting up the system	
Status indicator	Green light always on	Run normally
	Red light always on	Fault state
	Green light flashing	Standby or bypass state
	Red light flashing	Alarm state
	Red and green lights flash alternatively	Software updating

These indicators display grid status, PV battery information, load power, energy flow, current operating mode, and basic system details.

3.1 Basic Information View

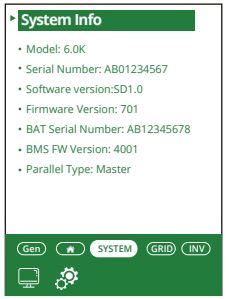
Main Interface

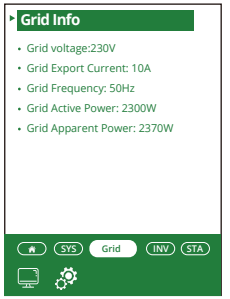
If the screen is in sleep mode, it can be activated by pressing any button. The screen will then display the main interface, presenting information on the grid, PV, battery, load power, energy flow, current operating mode, and the basic status of the inverter

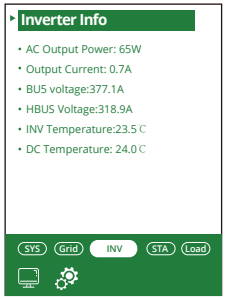
- **Countdown Timer:** 0S
- **System Mode:** Tied Grid
- **Inv/Bat Status:** Normal / Charge
- **Normal**

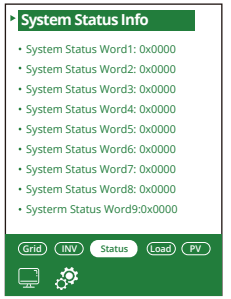
System Information

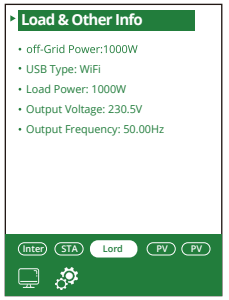
Upon waking up the screen, press the OK button to access the system menu. Here, you will find the system information interface. Press the down button to scroll through the page, allowing you to view essential system parameters, the current operating state, power generation history, and other pertinent details.

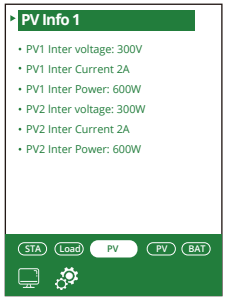


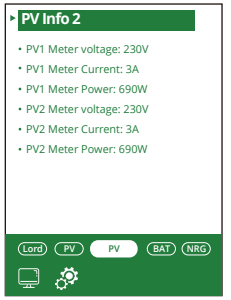


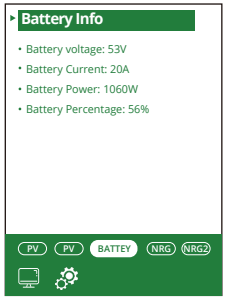


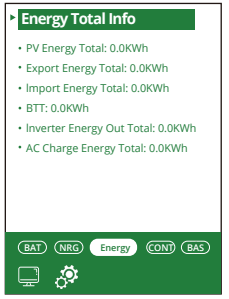


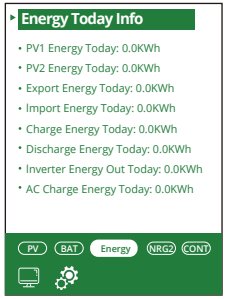






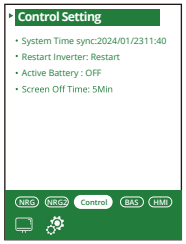






3.2 Parameterisation

With the screen active, press OK to access the system menu, and press down to navigate through screens, skipping the system information screen until you reach the parameter setting screen.

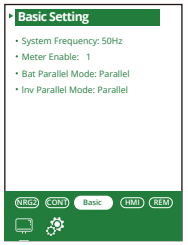


Control Setting

System Tine Sync: Calibrates system time; requires internet access.

Restart Inverter: Restarts the system; please note that power supply may be momentarily interrupted during the restart process.

Active Battery: When enabled, activates the battery via power and requires a normal grid and PV connection for use.

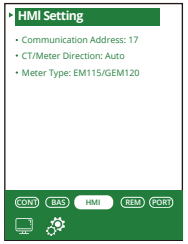


Basic Setting

Certification: Adheres to safety regulations for switching ECOs.

System Frequency: Modifies the system grid frequency.

Meter Enable: When turned on, allows user connection to a compatible smart meter.

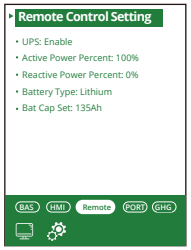


HMI Setting

Communication Address: Modifies the external communication address of the accumulator.

CT/Meter Direction: Modifies the input direction of CT/Meter, used if the direction of CT/Meter is reversed.

Meter Type: Switches the matching meter type.



Remote Control Setting

UPS: Switches on/off UPS function.

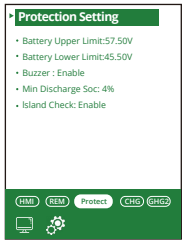
Active Power Percent: Sets the maximum active power percentage of the output.

Reactive Power Percent: Sets the maximum output reactive power percentage.

Battery Type: Switches access to battery types, including lead-acid and lithium batteries.

BAT Cap Set: Sets battery ampere hours; effective for lead-acid batteries.

System Information



Protection Setting

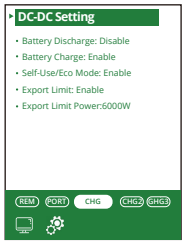
Battery Upper Limit: Sets the maximum battery voltage protection value; effective for lead-acid batteries.

Battery Lower Limit: Sets the minimum battery voltage protection value; effective for lead-acid batteries.

Buzzer: Switches on/off the buzzer.

Min Discharge SOC: Sets the minimum discharge SOC value of the battery.

Island Check: Enables/disables the island checking function.



DC-DC Setting

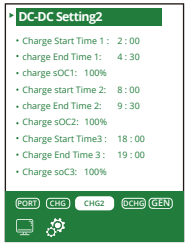
Battery Discharge: Enables/disables battery discharge.

Battery Charge: Enables/disables battery charge.

Self-Use: Enables/disables self-generation and self-use mode; enabled by default.

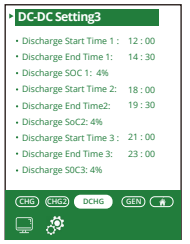
Export Limit: Enables/disables the Export limit function.

Export Limit Power: Sets the maximum Export limit power value.



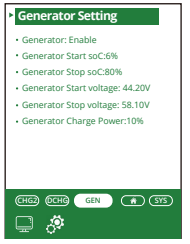
DC-DC Setting2

Sets the time for the inverter to enter the charging priority mode and the charging cut-off SOC value; a total of three time periods can be set.



DC-DC Setting3

Sets the time for the inverter to enter the discharge priority mode and the discharge cut-off SOC value; a total of three time periods can be set.



Generator Setting

On this page, you can configure all generator-related settings based on your actual status.

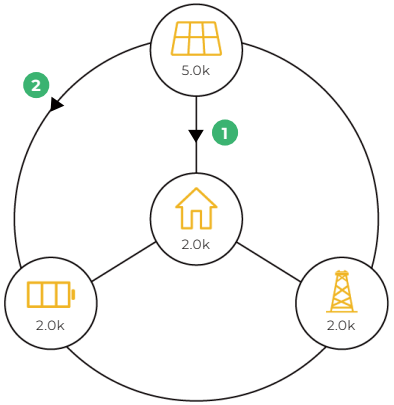
Refer to the WiFi documentation for settings.

MODE SETTING 4

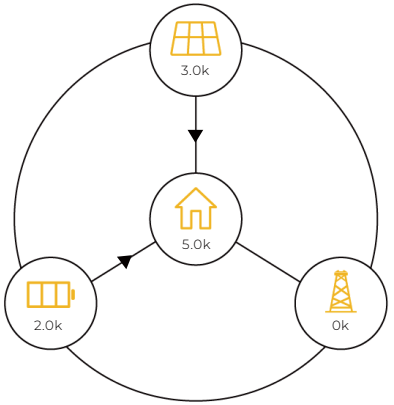
ALPS can be configured to operate in various modes to cater to the diverse requirements of customers in different application scenarios:

4.1 Self-Generation and Self-Use Mode (Default)

In this mode, the load response priority is set as follows: photovoltaic > battery > power grid, and the photovoltaic energy flow priority is load > battery > power grid. Automatic Self-Use is the default factory setting for this mode, applicable when the inverter is not operating in any other mode. Users also have the option to manually disable this mode. Once disabled, the battery will no longer respond to the load.



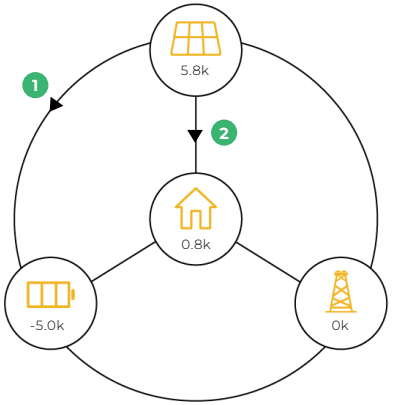
- **Countdown Timer:** 0S
- **System Mode:** Tied Grid
- **Inv/Bat Status:** Normal / Charge
- **Normal**



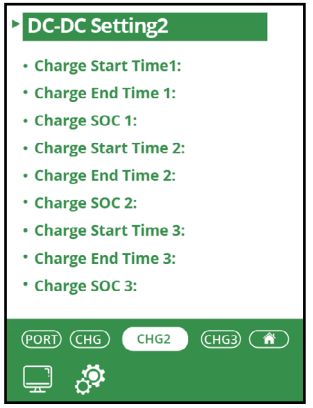
- **Countdown Timer:** 0S
- **System Mode:** Tied Grid
- **Inv/Bat Status:** Normal / Discharge
- **Normal**

4.2 Charge Priority Mode

Upon waking up the screen, press the OK button to access the system menu. Here, you will find the system information interface. Press the down button to scroll through the page, allowing you to view essential system parameters, the current operating state, power generation history, and other pertinent details.



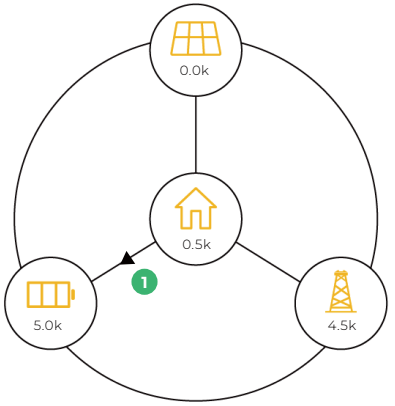
- **Countdown Timer:** 0S
- **System Mode:** Tied Grid
- **Inv/Bat Status:** Normal / Charge
- **Normal**

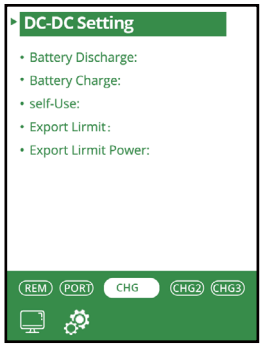


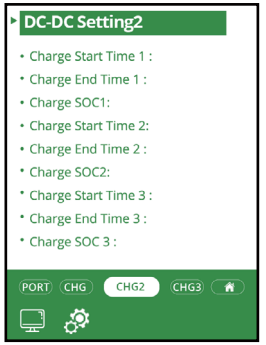
Settings

Set the required working period and the SOC you want to stop charging, and you can enter the charging priority mode. Automatically cut in and out at the set time period.

4.3 Discharge Priority Mode







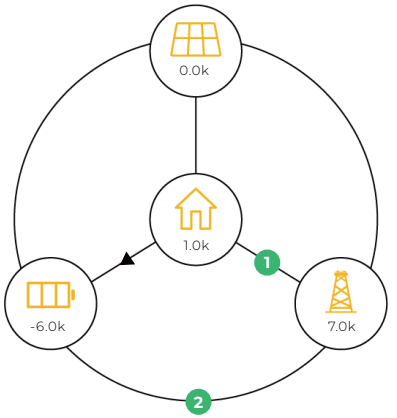
- **Countdown Timer:** 0S
- **System Mode:** Tied Grid
- **Inv/Bat Status:** Normal / Discharge
- **Normal**

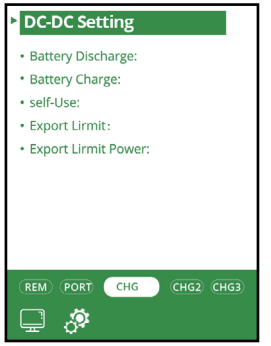
To activate the Discharge Priority mode, enable Battery Discharge, specify the desired operating period, and set the State of Charge (SOC) at which you wish to halt the discharging process.

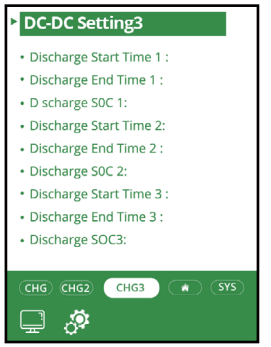
4.4 AC Charge Function

When activated, the inverter permits the utilization of grid energy to charge the battery, facilitating the storage of power for arbitrage or emergency use, particularly in anticipation of a trough tariff or a power outage.

To enable the AC Charge function, set "Battery Charge." Subsequently, configure the Charge Start time, Charge End time, and the desired State of Charge (SOC) at which charging should cease before initiation.



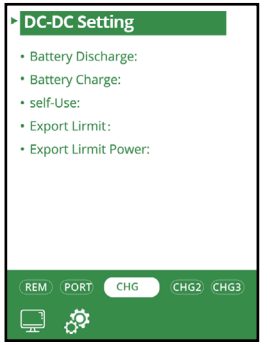




- **Countdown Timer:** 0S
- **System Mode:** Tied Grid
- **Inv/Bat Status:** Normal / Discharge
- **Normal**

4.5 Export Limit Function

When this feature is activated, the maximum power fed into the grid by the inverter will not exceed the user-set value. This is particularly useful in regions with a predefined upper limit for grid-connected power consumption.



TROUBLESHOOTING & MAINTENANCE 5

5.1 Troubleshooting Based On LCD Displays

If any fault or error occurs during usage, the LED lights will indicate their display state. Users can troubleshoot by referring to the table below based on the information displayed on the LCD. If the issue persists and cannot be resolved promptly, please save relevant information and contact our after-sales personnel for assistance.

FAULT CODE	DESCRIPTION	TROUBLESHOOTING
DCI High	High DC component of output current	Restart the inverter; contact PolarESS for technical support.
PV Isolation Low	Low insulation resistance of photovoltaic panels	Check that the connection between the PV panel and the inverter is good; Check that the earth wire of the inverter is well connected.
NTC Open	NTC open circuit fault	Switch off the inverter and contact after-sales personnel.
Bus Voltage High	High bus voltage	Check the PV panel input voltage; ensure it is within the rated input voltage range of the inverter; Restart the inverter.
PV Voltage High	High PV voltage	Check the PV panel input voltage; ensure it is within the rated input voltage range of the inverter.
Boost Over Temperature	Boost over-temperature	Check the ambient temperature; ensure it is within the specifications for the use of the inverter.
Buck Boost Over Temperature	Buck-boost over-temperature	Check the ambient temperature; ensure it is within the specifications for the use of the inverter.
INV Over Temperature	Inverter overheating	Temperature heck the ambient temperature; ensure it is within the specifications for the use of the inverter.
EPS Output Short Fault	Off-grid output short circuit	Check the EPS port loads for damage or shorts; Check the EPS port for damage or the presence of foreign objects.
Initialization Model Fault	Initialization mode exception	Verify that the inverter mode number is set correctly.

FAULT CODE	DESCRIPTION	TROUBLESHOOTING
Relay Fault	Relay Failure	Restart the inverter.
Bus Voltage Unbalance	Positive and Negative Bus Voltage Imbalance	Turn off the inverter for one hour before turning it back on.
Firmware Mismatch	M3 and DSP Version Mismatch	Verify the correctness of the inverter software version information through the LCD; Attempt remote upgrading if necessary.
PV1 Short Circuit Fault	PV1 Short Circuit Fault	Inspect the PV1 input wire to ensure the correct orientation of the positive and negative terminals; examine the PV panel output wires for shorts; reconnect the PV1 input wire if needed.
PV2 Short Circuit Fault	PV2 Short Circuit Fault	Inspect the PV2 input wire to ensure the correct orientation of the positive and negative terminals; check the PV panel output wires for shorts; reconnect the PV2 input wire if needed.
No Earth Detection Fault	Zero Ground Fault Detection	Restart the inverter.
External Device Fault	Failure of External Equipment	Check that external devices are working properly; ensure proper connection of the external device to the inverter communication cable.
Internal Communication Fault 1	Internal Communication Failure 1	Restart the inverter.
Internal Communication Fault 2	Internal Communication Failure 2	Restart the inverter.
GFCI (Ground Fault Circuit Interrupter) High	High Leakage Current	Check that the inverter power cable is properly connected; verify the correct grounding of the inverter; restart the inverter.
Internal Communication Fault 3	Internal Communication Failure 3	Restart the inverter.
Internal Over Temperature	Temperature Too High	Check that the ambient temperature is within the specifications for the inverter's use.
Fan Fault	Fan Failure	Check for clogged fans; restart the inverter; replace the fan if necessary.
Hardware Mismatch	Hardware Version Mismatch	Restart the inverter.
Meter Communication Loss	Loss of Meter Communication	Check that the meter is functioning correctly; ensure proper connection of the meter communication cable.

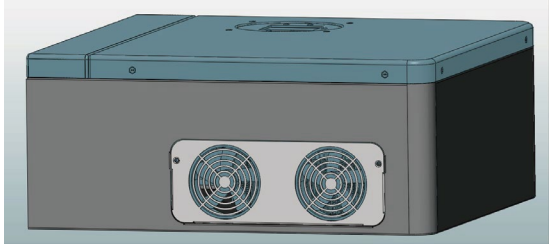
5.2 Data Collector Connection

5.2.1 ALPS HY3.6~6.0-GL

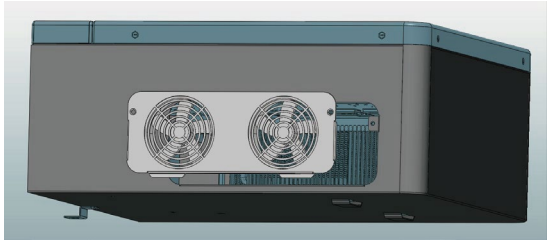
Ensure to inspect and clean the fans at regular intervals, with the recommended period being every 6 months. However, this may need to be done sooner depending on the environmental conditions. If you encounter issues with the fans, follow the steps below:

Turn off the system and wait for more than 5 minutes before disassembling the machine.

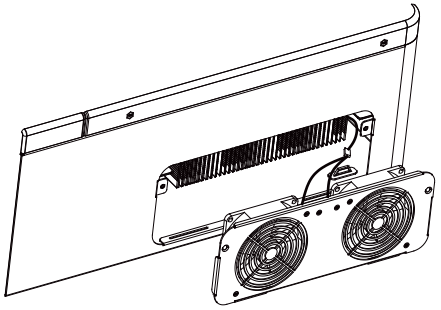
a.Remove the fixing screws.



b.Remove the fan (note the internal power cable connected).



c.Clean the fan of any dust and inspect the cable for damage.



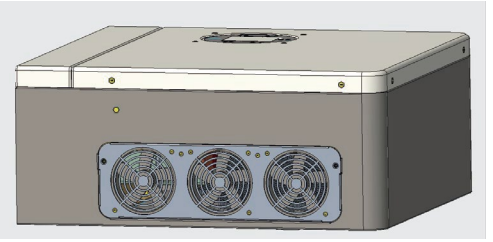
d. If the fan is damaged, replace it with a new one and reinstall following the above instructions.

5.2.2 ALPS HY8.0-GL

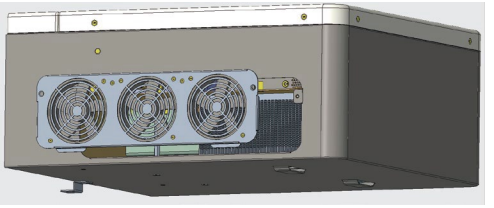
Ensure to inspect and clean the fans at regular intervals, with the recommended period being every 6 months. However, this may need to be done sooner depending on the environmental conditions. If you encounter issues with the fans, follow the steps below:

Turn off the system and wait for more than 5 minutes before disassembling the machine.

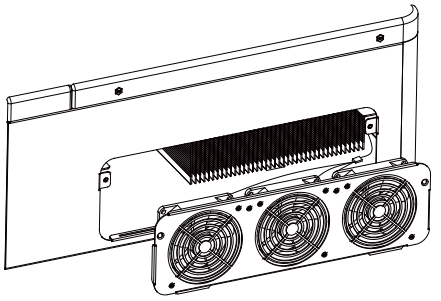
a.Remove the fixing screws.



b.Remove the fan (note the internal power cable connected).



c.Clean the fan of any dust and inspect the cable for damage.



d. If the fan is damaged, replace it with a new one and reinstall following the above instructions.

DATASHEET 6

MODEL	ALPS HY3.6-GL	ALPS HY4.6-GL	ALPS HY5.0-GL	ALPS HY6.0-GL	ALPS HY8.0-GL
Input Data (PV)					
Max. DC Input Power (W)	5400W	7000W	7500W	9000W	12000W
Start-up Voltage	90V				
Max. PV Voltage	550V				
MPPT Range	90V-530V				
Nominal Voltage	360V				
Max. Short Current	23A/23A				
Max. Input Current	17A/17A	17A/17A	17A/17A	17A/17A	20A/20A
MPPT Tracker/No. of Strings per MPPT Tracker	2/1				
Battery					
Battery Type	Lead-acid or Li-ion				
Battery Voltage Range	46.7-57.6V				
Nominal Voltage	51.2V				
Charge/Discharge Current	83A/83A	112A/112A	114A/114A	130A/130A	175A/175A
Max. Battery Charge/Discharge Power (W)	4000W/4000W	5000W/5000W	114A/114A	130A/130A	175A/175A
Communication Interface	RS485/CAN				
Output Data (AC)					
Nominal AC Output Power	3600W	4600W	5000W	6000W	8000W
Max. Apparent Power Output to Utility Grid (VA)	7200VA	9200VA	10000VA	12000VA	16000VA
Max. Output Current	16Aa.c.	20Aa.c.	21.7Aa.c.	26Aa.c.	34Aa.c.
Nominal Voltage/Range	230/180-270V				
Frequency Range	50Hz/60Hz				
Power Factor (@Full Load)	>0.99				
Power Factor Range	0.8 Lagging - 0.8 Leading				0.85 Lagging - 0.85 Leading
THDI (@Nominal Power)	<3%				
AC Output Topology	Single Phase				

Backup Terminal Parameter (EPS)					
Nominal EPS Output Power	3600W	4600W	5000W	6000W	8000W
EPS Peak Power (10s)	7200VA	9200VA	10000VA	12000VA	16000VA
Nominal Voltage	230Va.c.				
Max. Output Current	16Aa.c.	20Aa.c.	21.7Aa.c.	26Aa.c.	34Aa.c.
Nominal Frequency	50Hz				
Automatic Switch Time	≤10ms				
THDV (Linear Load)	<3%				
General Data					
Battery Charge/Discharge	94%/94%				
PV Max. Efficiency	97.00%				
Euro Efficiency	96.5%				
MPPT Efficiency	99.90%				
Protection Class	IP20				
Noise Emission (Typical)	<45dB				
Operation Temperature	-25℃~+60℃				
Full Load Operation Temperature	-25℃~+45℃				
Cooling	Forced Air Cooling				
Altitude	4000m (Derating above 2000m)				
Dimensions (W×H×D)	455mm×425mm×190mm				
Weight	22kg				
Installation Mode	Wall hanging				
Self-Consumption	10W				
Features					
Display	LCD/LED				
Interface	Communication with meter: pluggable connector Communication with portal: Wi-Fi (USB)				
Certificates	CE, UKCA, G98, G99, EN50549, C10/11, NRS097				