USER MANUAL

3.68/4/5/6 kW Single-Phase HV Hybrid Inverter

RHS-3.68/4/5/6K-H

EN

Version

Document Name	RESS User Manual_INV_RHS-3.68/4/5/6K-H_V1.2		
Product Model	RHS-3.68K-H, RHS-4K-H, RHS-5K-H, RHS-6K-H		
Version Number	**Version Description**	**Release Date**	**Posting Personnel**
1.0	First release	20251219	Yarra
1.1	Replace the “Type Plate” with the latest version.	20260113	Yarra
1.2	Added instructions for battery expansion capability and accessories. Added instructions for AC Couple retrofit solutions for existing systems.	20260305	Yarra

Content

Preface

Thank you for choosing the RCT Power Storage DC inverter!

You have purchased an innovative, high-quality product with unique features and consistently high efficiency.

RCT Solar Inverters are transformerless, highly flexible and robust. With this device, you will always achieve the highest possible yield from your PV system.

 **WARNING**	Solar modules, inverters, cables and other components of the photovoltaic system are electrical devices. During installation, wiring, grid connection, operation, maintenance and service they can cause various hazards. Please read the documents supplied with the product carefully and follow the instructions and device information to avoid material damage and personal injury.

	Keep this manual in a safe place for future reference.

Declaration of conformity

RCT Power confirms that the inverter described in this document is in compliance with the essential requirements and provisions of the following European Union directives:

- RED Radio Equipment Directive [RED]2014/53/EU
- Electromagnetic Compatibility Directive [EMC]2014/30/EU
- Low Voltage Directive [LVD]2014/35/EU
- Restriction of Hazardous Substances in Electrical and Equipment Directive [RoHS2]-2011/65/EU

The detailed declaration of conformity can be found under:

www.rct-power.com.

1. About this Manual

1.1 Validity, Purpose, Scope of this document and Legal Regulations

This document is applying to the Power Storage DC 3.68/4.0/5.0/6.0 SP.

Power Storage DC 3.68/4.0/5.0/6.0 SP is referred to as "Inverter", " Power Storage DC ", "Device" or "Product" unless otherwise stated.

This installation manual provides general instructions for installing, wiring, commissioning and operating the inverter and the battery.

The content of this manual is regularly updated and revised as a part of the continuous product development.

The current document version can be found at: www.rct-power.com.

We explicitly reserve the right to make technical changes which improve the device or increase its safety standard. These changes do not require a separate notification. RCT Power is not liable for damages resulting from the use of this document.

This manual does not supersede existing laws, regulations, rules, standards or conventions.

The warranty conditions are enclosed with the device. No further warranty claims can be derived from this document.

1.2 Explanation of Symbols and References

It is important to follow the references in the manual during the installation, operation and maintenance of the Power Inverter. The table below shows the warning signs and symbols used in the manual.

Symbols and References	Description
 DANGER	This symbol indicates a direct imminent danger. If the safety regulations are not observed, this may result in death, personal injury or serious damage to property.
 WARNING	This symbol indicates a direct imminent danger of medium risk. If the safety regulations are not observed, this may result in death, personal injury or serious damage to property.
 CAUTION	This symbol indicates a direct imminent danger of low risk. If the safety regulations are not observed, it might result in minor or moderate material damage.
 NOTICE	This symbol indicates a potentially hazardous situation which, if not avoided, could result in material damage to equipment or property.
	This symbol indicates important information and hints. They will help you to better understand the functionality of the inverter.
	This symbol indicates that the user manual must be read and understood before the device is put into operation.
	HIGH VOLTAGE WARNING! Indicates hazardous high voltages are present, which, if not avoided, will result in death or serious injury. Thus, only authorized and trained personnel should install and/or maintain this product.
	After disconnecting the electrical connections, wait a minimum of 5 minutes before opening the unit.

Symbols and References	Description
	Hot surface!
	Equipment grounding conductor (PE).
	This product must not be disposed of as normal household waste.
	CE mark The inverter complies with the requirements of the applicable CE guidelines

2. Safety Instructions

2.1 Personnel and Qualifications

 WARNING	The inverter and the battery must only be installed, wired, connected, commissioned and serviced by qualified personnel to prevent material damage or personal injury.

Qualified personnel authorised to perform the tasks described in this manual must have the following skills and technical expertise:

They are trained to install electrical equipment.

They understand the technical functionality of an inverter

They are familiar with lithium iron phosphate (LiFeP04) accumulators.

They have read and understood the documents shipped with the unit.

They know and use the appropriate tools and equipment to perform the tasks described in the manual.

They are familiar with all current laws and applicable regulations, standards and directives for electrical equipment.

They are familiar with the safety requirements and guidelines for electrical equipment.

They are familiar with occupational health and safety regulations.

They know and use appropriate personal protective equipment.

Before starting installation or commissioning, read through the entire manual and note all DANGER! WARNING! CAUTION! and NOTICE! statements.

2.2 Safety Procedures

The inverter was developed and tested in strict accordance with international safety regulations.

All safety instructions relating to electrical and electronic equipment must be complied with during installation, operation and maintenance.

 DANGER	Danger to life or serious injury due to electric shock! High voltages are present in cables and inner parts of the inverter if it is connected to the grid (AC / AC voltage source) or the solar generator (DC / DC voltage source) is exposed to sunlight. • Qualified personnel must perform any work that involves wiring, connecting or opening the inverter case. • Important: Both voltage sources (DC / solar generator and AC / grid) must be switched off before any electrical work is carried out on the inverter. • Turn the DC Switch into the 0 position to disconnect the DC voltage. • Activate the circuit breaker or remove the fuse to disconnect the mains voltage (AC). Do not reconnect until the work has been completed. • To disconnect the battery voltage, both voltage sources (DC / solar generator and AC / mains) must be switched off and the battery switch on the master must be set to "0". • Allow a minimum of 5 minutes for the capacitors to fully discharge and then check the voltage with a suitable measurement device. • Ensure that other persons stay away from cables and internal components.

WARNING

Risk of injury due to electric shock!

Installation, service and maintenance work must only be carried out by a qualified electrician.

- Do not drop the device. Do not expose it to knocks or pressure.
- Only switch on again after all electrical work has been completed.

CAUTION

Risk of burns on hot parts of the inverter housing.

During standard operation of the inverter, some parts of the inverter's housing can become hot.

- Use care when touching the housing while the inverter is operating.
- Do not cover the inverter (especially not the top).

NOTICE

- All electrical installations must be carried out in accordance with local and national standards and guidelines.
- Contact your local energy supplier or grid operator before connecting the inverter to the grid.
- Ensure that electrically conductive surfaces of the entire PV system are grounded to prevent personal injury.
- A malfunction can impair inverter safety. Do not operate or start the inverter if it shows visible damage or if the displayed error message is unclear.
- The inverter does not contain any parts to be serviced by the owner. Please contact qualified personnel locally for servicing work on the inverter.
- Only use devices and accessories approved by the manufacturer. Do not make any changes to the device. Do not remove the type plate.

3. Unpacking and Storage

3.1 Unpacking and Inspection

Our products are inspected for proper condition before shipment. Despite careful packaging, transport damage can occur. The transport company usually has to take responsibility for this damage.

- Check the packing case for any visible damage.
- Check the scope of delivery for completeness according to the packing list.
- Check the inner contents for damage after unpacking.

Please inform the transport company immediately if you notice any damage to the packaging or the inverter. Your specialist dealer will be happy to assist you if necessary.

Do not install, wire or operate the inverter if any damage has been detected.

Do not dispose of the original packing case. It is recommended to store the device in the original packing case when the product is decommissioned.

3.2 Scope of Supply

Check the contents of the shipment for completeness in accordance with Fig. 3-1.

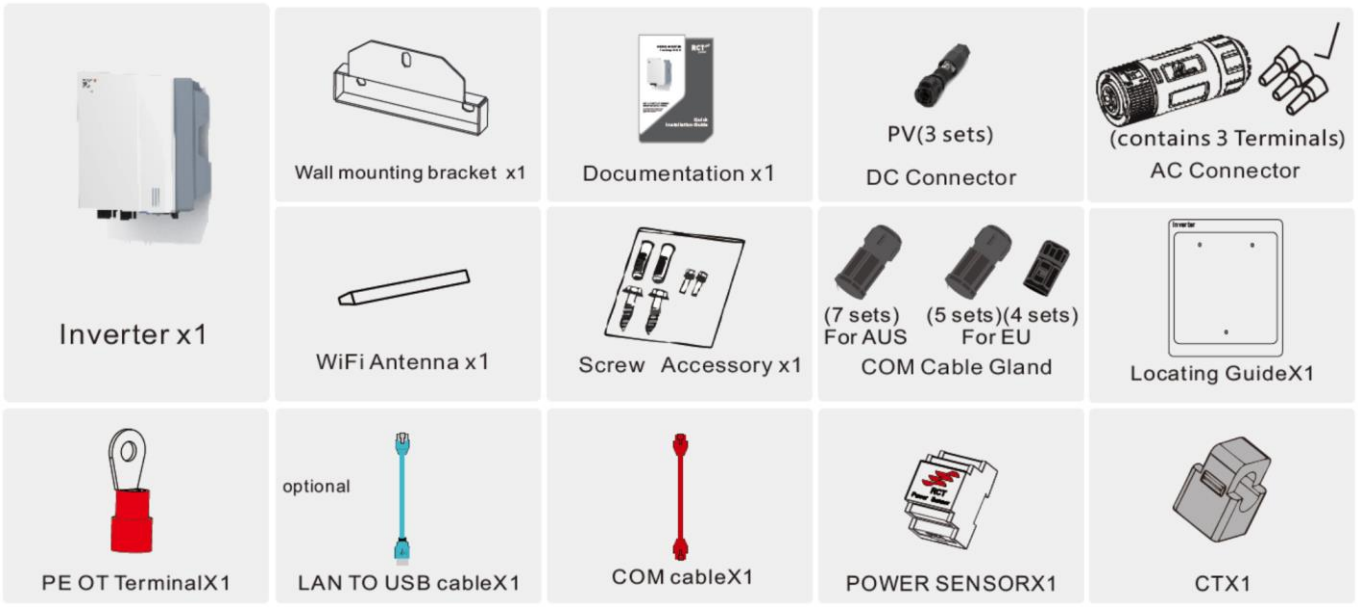


Fig. 3-1 Scope of supply

Pos_No	Description
1	1x Inverter
2	1x Inverter wall mounting bracket
3	1x Documentation
4	3x DC connector *
5	1x AC connector
6	1x WIFI antenna
7	1x Screw accessory
8	COM Cable Gland
9	Loading Guide
10	1x PE OT Terminal
11	1x LAN to USB cable
12	1x COM Cable
13	1x Power Sensor

Pos_No	Description
14	1x CT

*Note： 3 sets DC Connector.

3.3 Inverter Storage

If the equipment is not to be installed or used immediately, please ensure that the storage environment meets the following requirements:

- Do not unpack the outer package or throw the desiccant away, and check it regularly (every three months is recommended). If the package is damaged due to moth bites, please replace the package in time. If the inverter is unpacked and not immediately put into use, place the inverter in its original package, retain the desiccant, and seal it with tape.
- Make sure the temperature and humidity of the storage environment are appropriate and no condensation. The ambient air must not contain corrosive or flammable gases.
- Store the equipment in a clean place and prevent dust and water vapor erosion. Do not suffer from rain or ground water erosion.
- The height and direction of the stacking inverters should follow the instructions on the packing box.
- The inverters must be stacked with caution to prevent them from falling.
- If the inverter has been long term stored, it should be checked by professionals before being put into use.

4. Product Presentation

4.1 Intended Use

The inverter is stationary 1-phase inverter with integrated battery charging unit.

The energy received from the connected solar generator and the battery is converted into grid-compliant AC current and fed into the grid. PV energy can also be charged directly into the battery on the DC side.

Please note:

The inverter is not designed for other use cases or connections to other devices.

Any deployment of the device that is different from the intended use is considered a misuse.

RCT Power is not liable for damages resulting from misuse of the device.

Any misuse terminates the warranty, guarantee and general legal liability of the manufacturer.

4.2 System solution

4.2.1 New system installation solution

The energy received from the connected solar generator and the battery is converted into grid-compliant AC current and feed into the grid. PV energy can also be charged directly into the battery on the DC side.

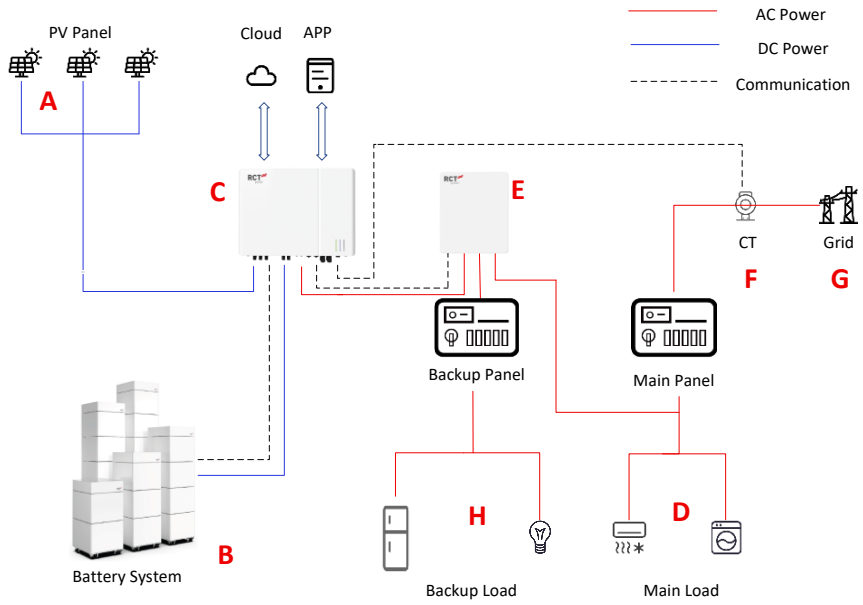


Fig. 4-1 Intended use of the inverter with the Power Battery in the PV system.

Item	Description	Comment
A	PV Panel	Monocrystalline silicon; polycrystalline silicon
B	Battery	RCT Power Battery 3.8 ~ 11.5kWh, 5 ~ 15kWh
C	Inverter	RHS-3.68/4/5/6K-H
D	Dwelling	Domestic electricity consumers
E	Power Switch Box	In the event of a power failure, the system switches to back-up operation mode.
F	Power Sensor	Current sensors to collect AC power measurements
G	Public grid	230V, L/N/PE
H	Back-up	Connect to domestic back-up load

4.2.2 Existing system retrofit solution

If your home already has solar panels installed and you want to add battery storage to store excess energy without replacing your existing inverter, AC Coupling is the ideal solution.

AC Coupling is the classic way to add energy storage to a home with an existing PV system. It involves installing a separate battery inverter alongside your current PV inverter. The two inverters operate in parallel, sharing the same distribution board—working together like two independent systems in harmony.

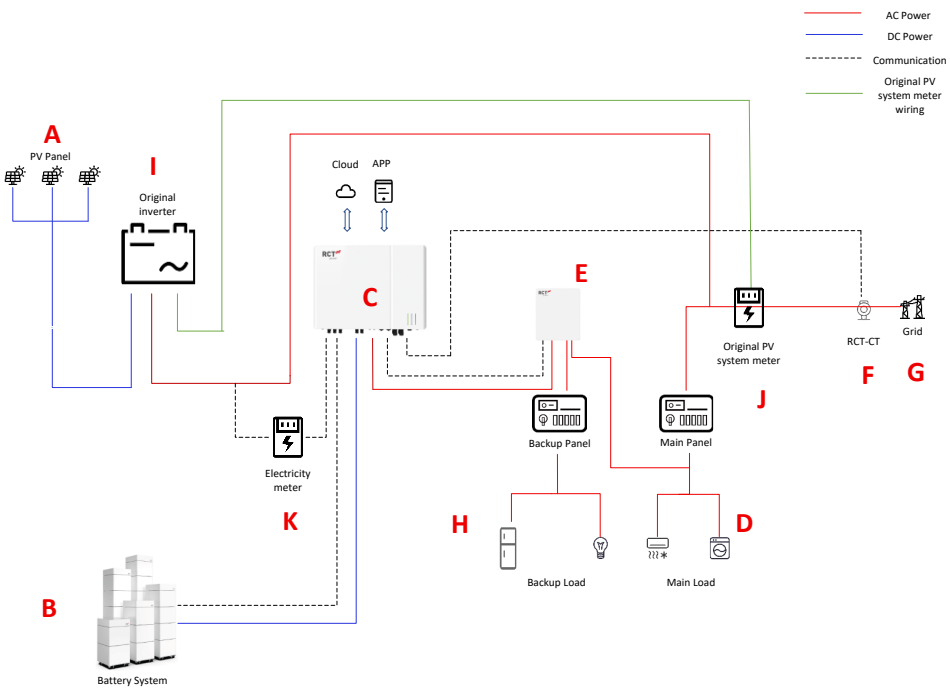


Fig. 4-2 AC Coupling Retrofit Solution Wiring Diagram

Item	Description	Comment
A	PV Panel	Monocrystalline silicon; polycrystalline silicon
B	Battery	RCT Power Battery 3.8 ~ 11.5kWh, 5 ~ 15kWh
C	Inverter	RHS-3.68/4/5/6K-H
D	Dwelling	Domestic electricity consumers
E	Power Switch Box	In the event of a power failure, the system switches to back-up operation mode.
F	Power Sensor	Current sensors to collect AC power measurements
G	Public grid	230V, L/N/PE
H	Back-up	Connect to domestic back-up load
I	Inverter	Inverter in the existing PV system
J	Meter (or CT)	Meter or CT used by the existing PV system to monitor the grid connection point; must be installed at the main utility entrance
K	Meter	Additional external meter for the RCT inverter, installed at the output of the existing PV inverter

The specific prerequisites and solutions for the AC Coupling retrofit are as follows:

1) Prerequisites

The existing PV system must support Zero Export functionality or have configurable output power (grid feed-in power).

Existing PV inverter setting: Manually configure the existing PV inverter to enable Zero Export, or limit its maximum output power to below 1.5 kW.

The existing PV system must be equipped with a CT (Current Transformer) or meter interface, and the CT/meter should be installed at the main utility entrance.

2) RCT Inverter Application Scenarios

Scenario 1: RCT inverter without PV panels connected

Operating mode: Set to Self-Consumption Mode.

Operation logic: Priority is given to supplying the load; excess power charges the battery. Since no PV input is connected, the system will not actively feed power into the grid.

Scenario 2: RCT inverter with PV panels connected

Operating mode: Set to Self-Consumption Mode with Anti-Reverse Power Function enabled.

Anti-reverse setting: Default anti-reverse power is set to 0W (i.e., no feed-in to the grid is allowed).

NOTICE	**Installation Notes:** • PV System Detection Point: The CT/meter of the existing PV system must still be installed at the main utility entrance. • RCT Inverter Detection Point Configuration: The external CT of the RCT inverter must be installed at the same detection location as the existing PV system's CT to ensure that both devices accurately measure the current at the main utility entrance. • RCT Inverter Additional Meter Configuration: An additional external meter must be installed for the RCT inverter at the output of the existing PV inverter.

4.3 Working Mode

There are four working modes of the inverter, Back-up, Self-Consumption, TOU, Storm watch.

4.3.1 Backup-reserve

In this mode, battery is as a backup power supply and always keep sufficient energy. The inverter monitors the grid, and when the grid is down it automatically switches to backup mode, disconnecting from the grid and supplying power to backed-up loads.

1) Load priority: charging the Battery -> Load consumption -> feeding to the GRID

When the PV energy is sufficient, first charges the battery, then supply power to the load, finally feed to the Grid.

2) Power priority: PV -> GRID, NONE from battery

When the load power consumption is too large, first from the PV energy, then from the Grid. Under normal conditions, the battery does not supply energy to the load, only when the grid is down the battery as a backup power supply to the backup load.

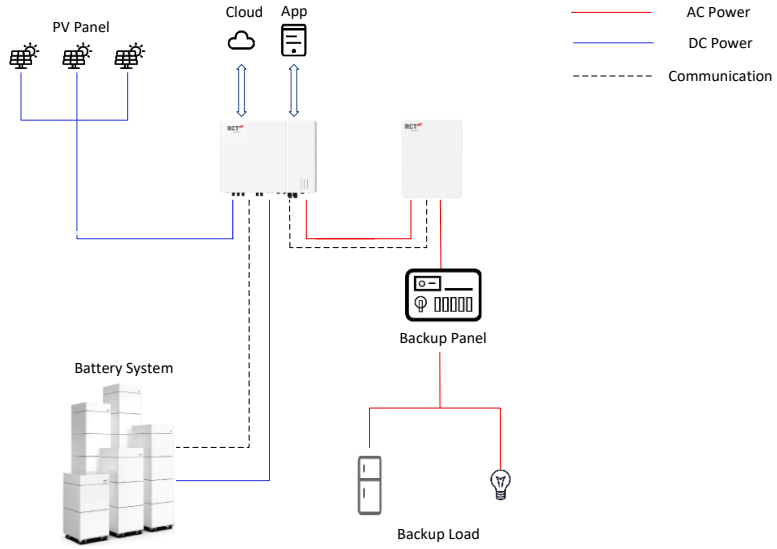


Fig. 4-3 Back up mode

4.3.2 Self-power

In this mode, the PV energy is preferentially used by local load (main load and backup load) to improve the self-consumption rate and self-sufficiency rate. The battery is automatically charged and discharged to meet consumption needs and reduce the amount of electricity purchased from the grid.

When there is sufficient sunlight and the photovoltaic power generation exceeds the household electricity demand, the system will automatically divert all surplus energy to charging. In this mode, if you are using the RHS-6K-H model, you may observe that the battery charging power can reach the maximum value allowed by the device (for specific values, please refer to "Technical Date").

1) Load priority: Load consumption -> charging the battery ->feeding to the GRID

When the PV energy is sufficient, first supply power to the load, then charges the battery, finally feed to the Grid.

2) Power priority: PV -> battery -> GRID

The PV energy is as the main energy to supply the load, if the PV energy cannot satisfy the needs of local load, then the battery will discharge to the load, and finally use the power from GRID. In the same time, the inverter monitors the grid, and when the grid is down it automatically switches to backup mode, disconnecting from the grid and supplying power to backed-up loads.

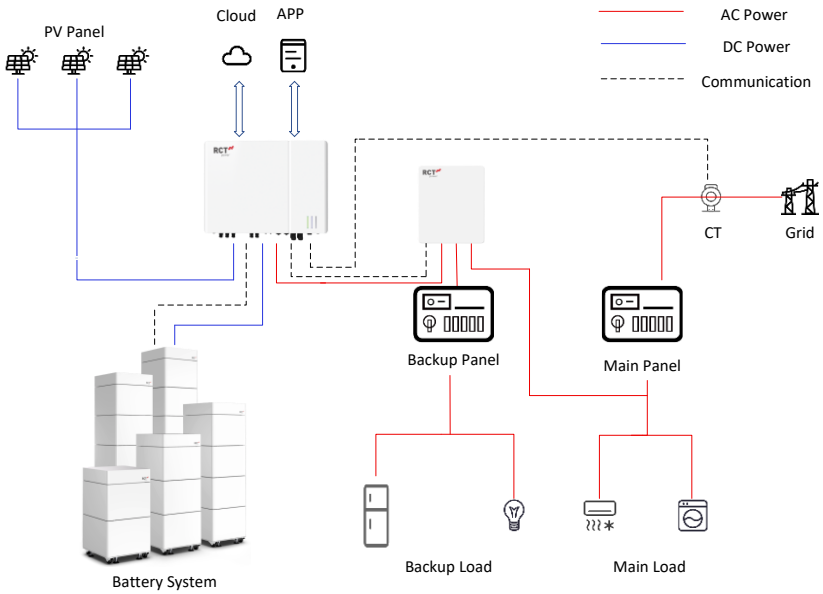


Fig. 4-4 Self-Consumption

4.3.3 TOU

In this mode, users can manage the energy according to their own needs, and set the daily regular charging and discharging configurable profile on the app. The system operates according to a configurable charge/discharge profile - a Time-of-use (TOU) arbitrage profile, in which the battery is charged from the PV system or grid when tariffs are low, and discharged when tariffs are high.

This mode supports configuration via the APP, enabling the RHS-3.68/4/5/6K-H series devices to utilize both grid and PV hybrid charging. With sufficient power supply, the system may achieve maximum power charging (for specific values, please refer to "Technical Date").

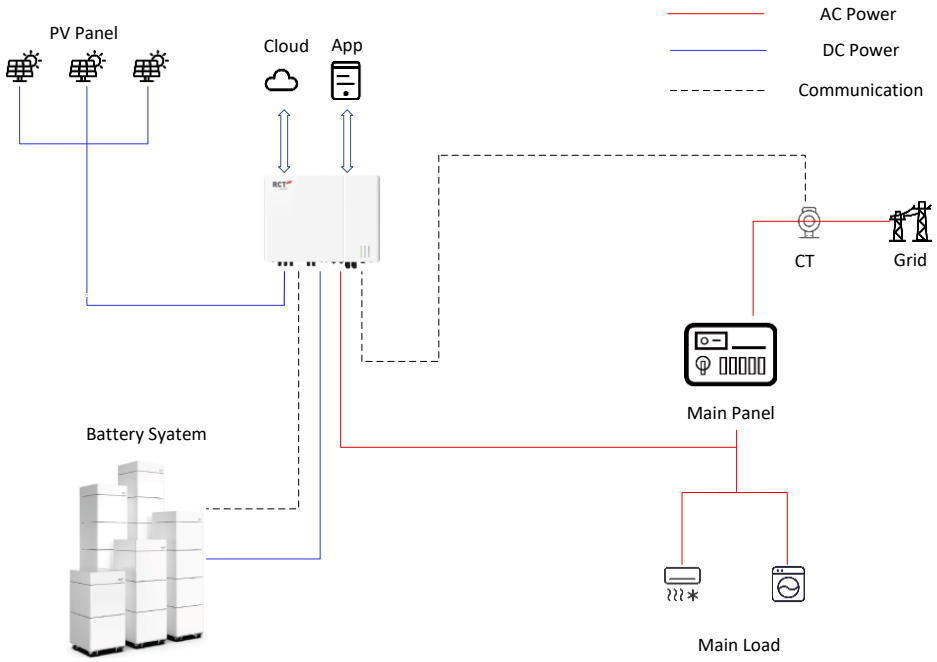


Fig. 4-5 Time-of-use (TOU)

4.3.4 Weather watch

In this mode, the system will allow battery charging from Grid in case it can be charged fully as soon as possible to against the grid outage. Battery is as a backup power supply and always keep sufficient energy.

4.4 Product Specification

4.4.1 Component Description

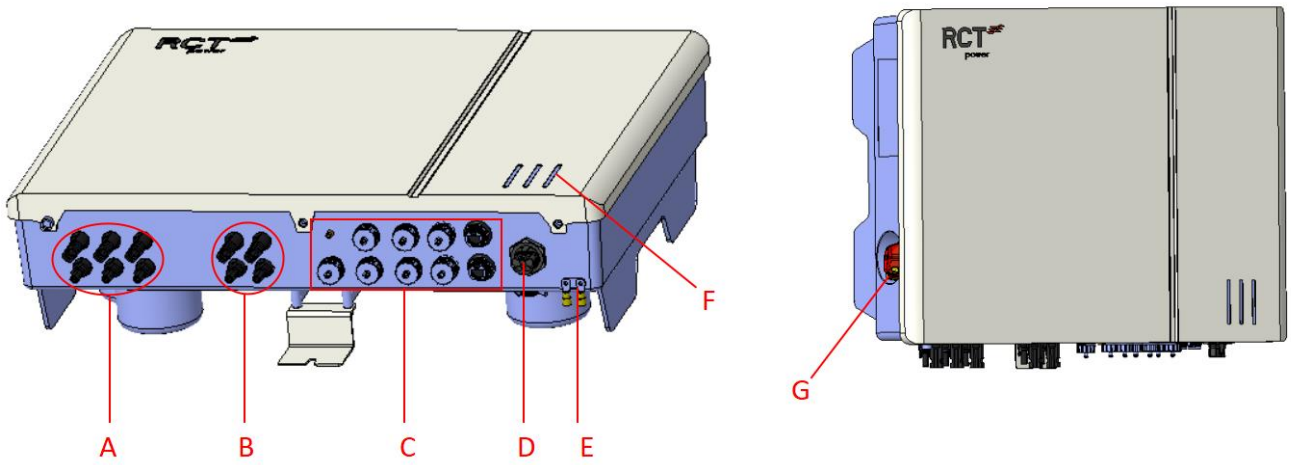


Fig. 4-6 Product Specification

Pos_No	Component	Description
A	PV Terminal	Three separate Solar generator inputs (PV1 & PV2 & PV3)
B	BAT Terminal	2 x BMS input (BAT1 &BAT2)
C	Communication Port	EU version: ANT /ETH/ Power switch / Power sensor / BMS1 / BMS2 / RCR /RS485/ IO/S0 / MFR
		AUS version: ANT /ETH/ Power switch / Power sensor / BMS1 / BMS2 / DRM /RS485
D	AC Terminal	230V (L, N, PE)
E	PE Terminal	PE connection bar
F	LED Indicators	3 x LED Indicators
G	DC Switch	1 x DC Switch

4.4.2 Type Plate and Warning Signs

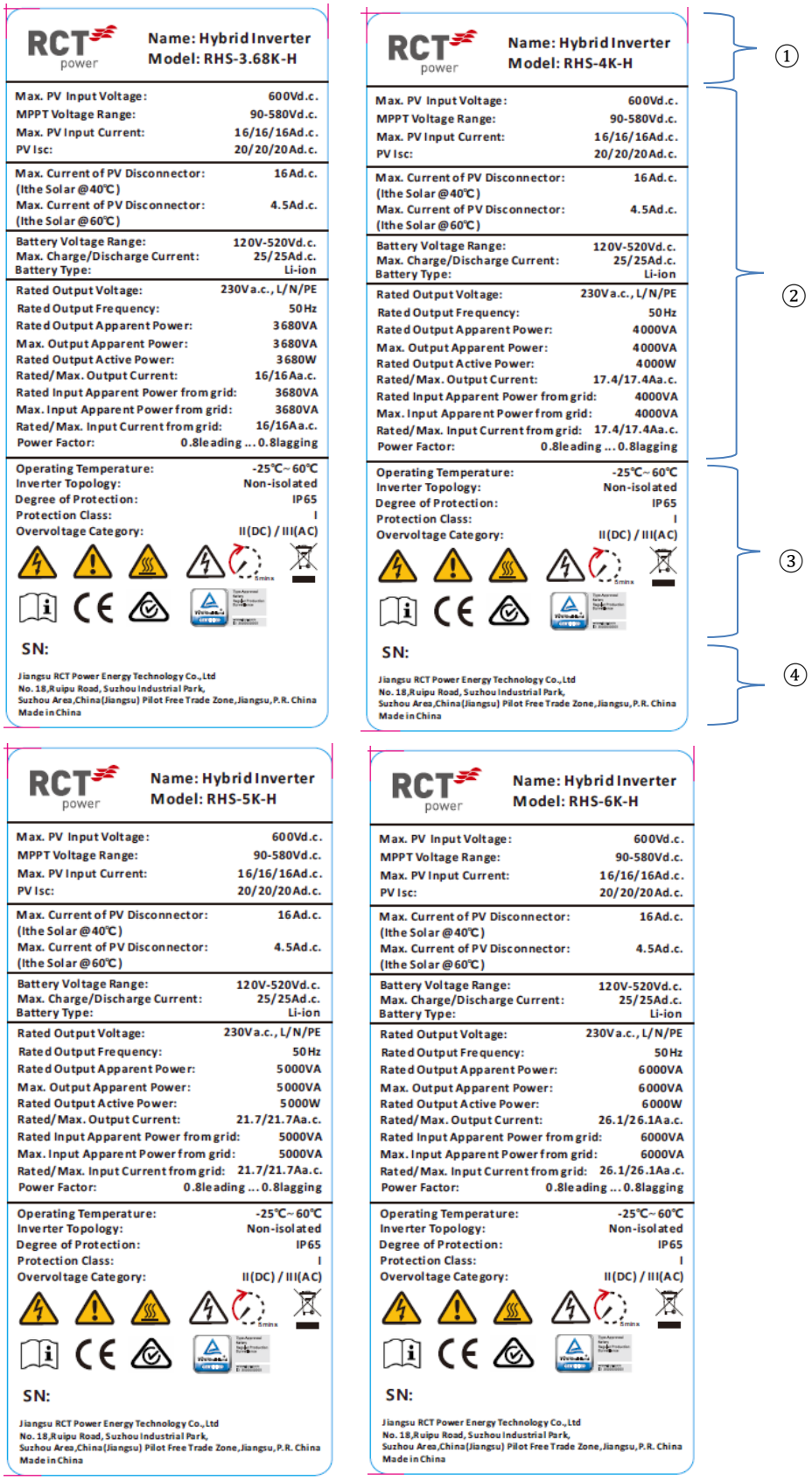


Fig. 4-6 Type plate

Pos_No	Description
1	Trademark and model
2	Technical data
3	Compliance symbols

4	Serial number, company name and country of origin

	Warning! High leakage currents. It is essential to establish an earthing connection before connecting to the power supply circuit (AC mains)!
	Hot surface! The housing can heat up during operation.
	After disconnecting the electrical connections, wait a minimum of 5 minutes before opening the unit.
	CE mark The inverter complies with the requirements of the applicable CE guidelines
	TUV Rheinland certified.
	This product must not be disposed of as normal household waste.
	This symbol indicates that the user manual must be read and understood before the device is put into operation.

5. Mechanical Installation

5.1 Pre-installation inspection

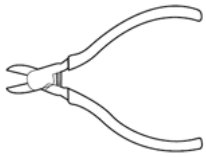
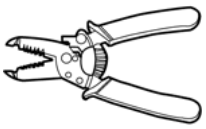
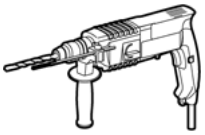
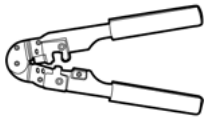
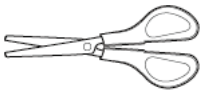
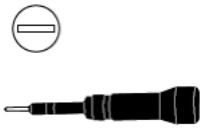
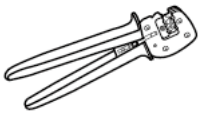
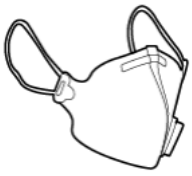
Check the outer package

Before unpacking the outer package of the inverter, check the outer package for visible damage, such as holes, cracks or other signs of possible internal damage, and check the inverter type. If there is any abnormal packaging or inverter type does not match, do not open, and contact your dealer as soon as possible.

Check delivery

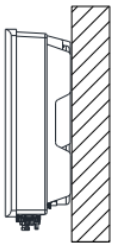
After unpacking the inverter, check that the deliverables are complete and there is no obvious external damage. If anything is missing or damaged, contact your dealer.

5.2 Installation tool preparation

Category	Tool			
Installation	 Diagonal pliers	 Wire stripper	 Hammer drill	 Vacuum cleaner
	 RJ45 crimping tool	 Rubber hammer	 Multimeter	 Marker
	 Level	 Heat shrink tube	 Cable tie	 Scissors
	 Straight insulated torque screwdriver	 Phillips insulated torque screwdriver	 Terminal crimping	
Personal protective articles	 Insulating gloves	 Goggles	 Goggles	 Safety shoes
	 Safety helmet	 Reflective vest	 Protective gloves	

5.3 Select mounting location

DANGER	Danger to life or serious injury from fire or explosions! • Do not mount the inverter on a flammable surface. • No combustible materials must be stored within 3m (9.84ft) of the inverter. • The inverter must not be installed in areas and rooms subject to explosion hazards.



The mounting surface must be made of flame-retardant material.

Flammable and explosive materials are not allowed in the installation environment.

The location of the Inverter must be free of obstructions and protected from dust, snow, rain and direct thermal radiation (e.g. solar radiation, central heating radiators, etc.).

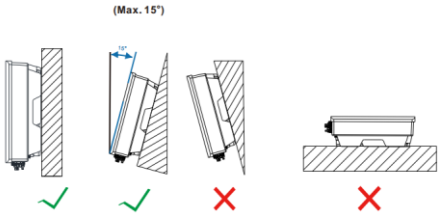
The following requirements must be met:

Relative humidity 5 ... 95 % (non-condensing).

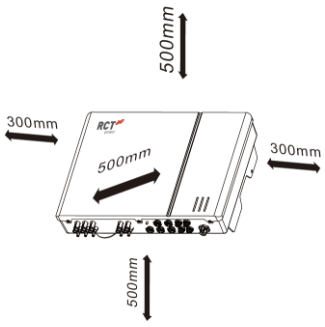
Ambient temperature -25℃ ~ 60℃ (-13 ... 140 ° F).

The mounting surface must be solid and able to permanently support the weight of the inverter unit.

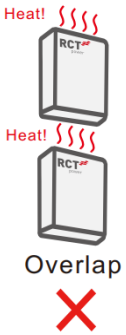
The selected- location must be accessible easily and safely at all times. Ensure no additional aids (e.g. ladder, scaffolding) are required for access.



Mount the inverter in an upright or slightly backward inclined position.



Required minimum distances to allow sufficient free convection of air for cooling the unit.



To prevent mutual heating, inverters must not be mounted on top of each other.

It is very important to ensure that the inverter is ventilated and dissipated well. Please install the inverter in a ventilated environment

NOTICE	• Ensure sufficient air convection for the inverter. Overheating of the inverter due to poor cooling will result in reduced performance. • The inverter can produce noise levels of up to 30db during operation. Ensure the inverter is mounted in a way that people cannot be disturbed by the operating noise.

5.4 Handling Inverter

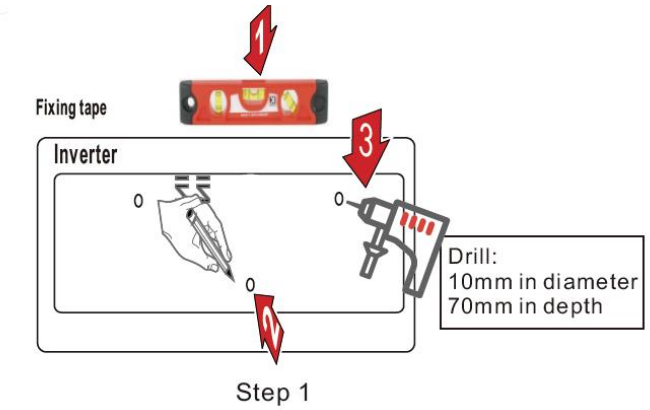
- During transportation, turnover, installation and other operations, you must meet the laws, regulations and relevant standards of the country or region where you are located.
- Before installation, move the inverter to the installation site. To avoid personal injury or equipment damage, pay attention to the following:

1. Assign personnel according to the weight of the device. Otherwise, personnel may be injured if the device exceeds the weight that can be carried by the human body.
2. Wear safety gloves to avoid injury.
3. Ensure that the device is balanced to avoid falling.
4. If the inverter is placed directly on the hard ground, it will cause damage to the metal shell, so the sponge pad or foam should be laid under it.

5.5 Wall Mounting

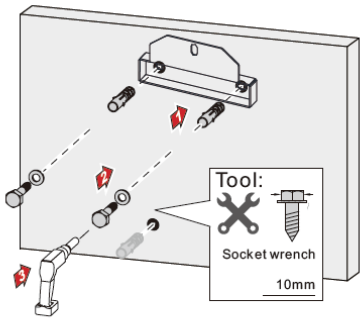
Procedure:

Step 1. Place the locating guide plate to a proper on the wall. Mark the hole position, then drill holes in the wall.



Step 1

Step 2. Use expansion bolts in accessory bag to fix the wall-mounted bracket onto the wall tightly.



Step 2

Step 3. Carry the Inverter by holding the handle on two sides and place it on the wall-mounted bracket. Use screw sets to lock bottom side.

Step 3

6. Electrical Installation

6.1 Overview of the connections

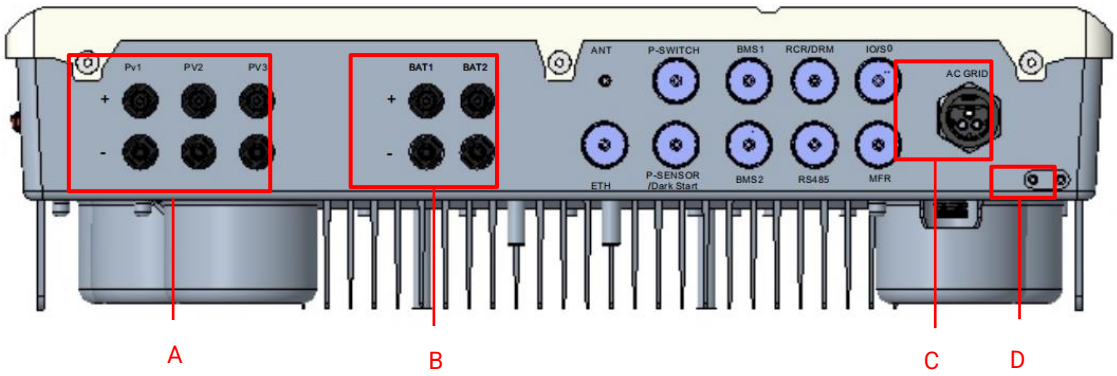


Fig. 6-1 Overview of the connections

No	Component	Comment	Comment	Customer
A	PV1 ~ PV3	Terminals for PV input.	See 6.5	All
B	BAT1 - BAT2	Connectors for the battery power cables	See 6.6	
C	AC Grid	Terminals to connect to the grid. 230V (L, N, PE)	See 6.4	
D	GROUND	Additional grounding terminal.	See 6.3	

6.2 Cable preparation

No.	Cable	Type	Cable Diameter	Cross-section
1	PV cable	Outdoor multi-core copper wire cable complying with 600 V and 26 A standard	6 - 9 mm	6 mm^2
2	Battery power cable	Complying with 600 V and 35A standard	5.5 - 8 mm	6 mm^2
3	AC cable	Outdoor 3-core copper wire cable	12 - 25.8 mm	6 mm^2
4	Ethernet cable	CAT 5E outdoor shielded network cable	4.8 - 6 mm	0.08 - 0.2 mm^2
5	Additional Grounding cable	Outdoor single-core copper wire cable	The same as that of the PE wire in the AC cable.	
6	Communication cable	Shielded twisted pair	4.8 - 6 mm	0.5 - 1.0 mm^2
		CAT 5E outdoor shielded network cable	4.8 - 6 mm	0.08 - 0.2 mm^2

6.3 Grounding

DANGER	Electric shock! • Make sure that the grounding cable is connected reliably. Otherwise, it may cause electric shock. • Before proceeding with electrical connections, please ensure that the power supply is disconnected and the relevant cables are prepared.

NOTICE	• Since the inverter is not equipped with a transformer, neither the negative electrode nor the positive electrode of the PV string can be grounded. Otherwise, the inverter will not operate normally. • Connect the grounding terminal to the external protective grounding point before AC cable connection, PV string connection, and communication cable connection. • The external protective grounding point provides a reliable ground connection. Do not use an improper grounding conductor for grounding, Otherwise, it may cause product damage or personal injury. • Depending on Local Rules, please also ground the PV panel subconstruction to the same common grounding point (PE Bar) in addition to local lightning protection rules. • If the PV end of the inverter is not connected with earth, the inverter will turn on a red light Inspect and report ERR_ISO Fault.

6.3.1 Grounding Requirements

- When there is only one inverter, connect the grounding cable to a nearby grounding point.
- When there are multiple inverters, ensure that the grounding points of all inverter chassis enclosures are equipotential connected.
- All non-current carrying metal parts and device enclosures in the PV power system should be grounded, for example, brackets of PV modules and inverter enclosure.

6.3.2 Wiring Procedure:

Step 1. Insert the cable into the corresponding metal pin and firmly crimp it.

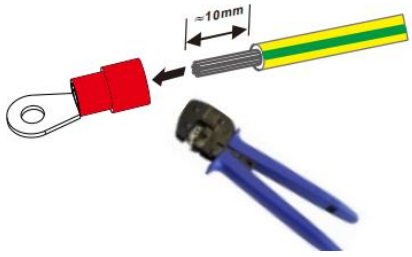


Fig. 6-2 terminals crimping

	• After being crimped, the OT terminal must wrap the wires completely, and the wires must contact the OT terminal closely.

Step 2. Remove the screw on the grounding terminal and fasten the cable with a screwdriver.

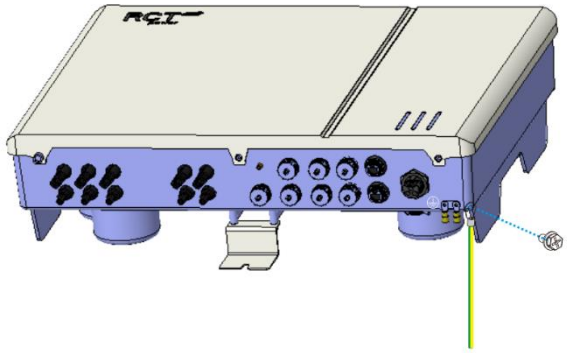


Fig. 6-3 PE cable connection

6.4 AC Connection

6.4.1 AC side Requirements

Before connecting the inverter to the grid, ensure the grid voltage and frequency comply with requirements, for which, refer to "Technical Date". Otherwise, contact the electric power company for help.

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

DANGER	Danger to life or serious injury from electric shock! • Only qualified personnel must carry out the work described in this section. • Important: All voltage sources (DC /solar generator, DC /battery and AC /grid) must be disconnected before carrying out any electrical work on the inverter. • To disconnect the solar generator voltage, turn the DC switch (on the inverter) to the position 'OFF'. • To disconnect the battery voltage, turn the DC switch (on the Power Battery Master) to the position '0'. • To disconnect the mains voltage (AC) activate the circuit breaker or remove the fuse. Do not reconnect until the work has been completed. • Only switch inverter back on after all electrical work has been completed. • Ensure that other persons stay away from cables and internal components. • Avoid traction forces on cables and plugs. Avoid sharp edges. Do not exceed the maximum bending radius of the cables.

WARNING	Danger to life or serious injury from electric shock or fire! • Do not mix up the wires L, N and PE! • Install an overcurrent protection device (circuit breaker, fuse) of max. 40A.

Residual Current Monitoring Device

With an integrated universal current-sensitive residual current monitoring unit included, the inverter will disconnect immediately from the mains power once a fault current with a value exceeding the limit is detected.

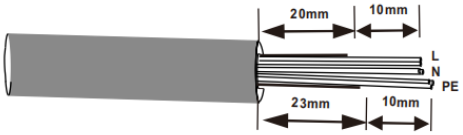
If an external residual current device (RCD) (type A is recommended) is mandatory, the switch must be triggered at a residual current of 300 mA (recommended). RCD of other specifications can also be used according to local standard.

No.	Inverter Model	RCD Type（Grid）	RCD Type（Load）
1	RHS-3.68/4/5/6K-H	300mA	30mA

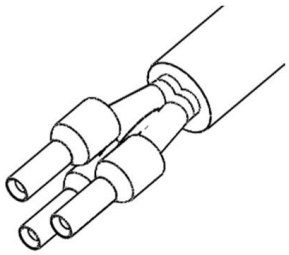
6.4.2 Install AC cable

Step 1. Disconnect the AC side circuit breaker and prevent it from accidentally reconnecting to it.

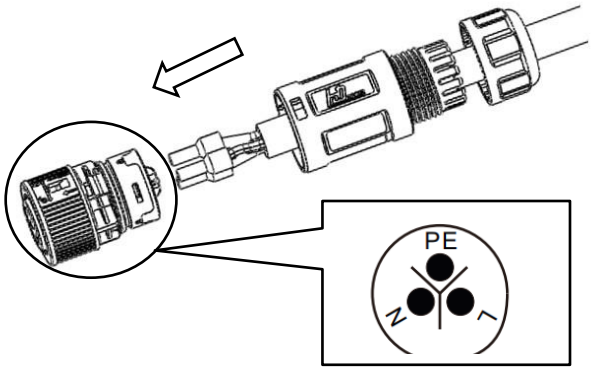
Step 2. Strip the cable jacket and the wire insulation as shown in the following figure.



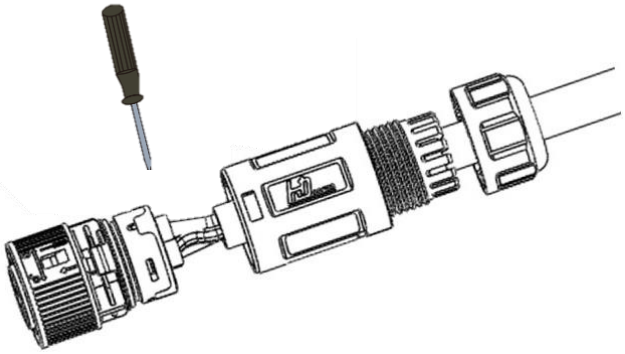
Step 3. Crimp terminals.



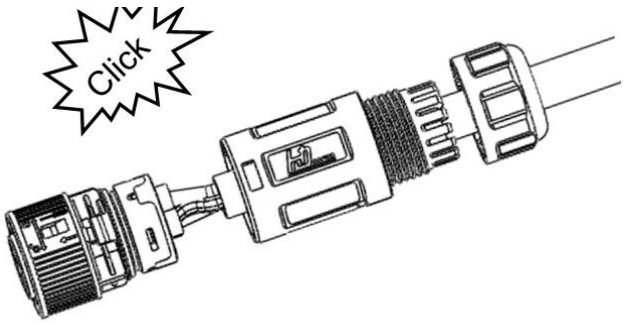
Step 4. Insert the wire into the corresponding terminal.



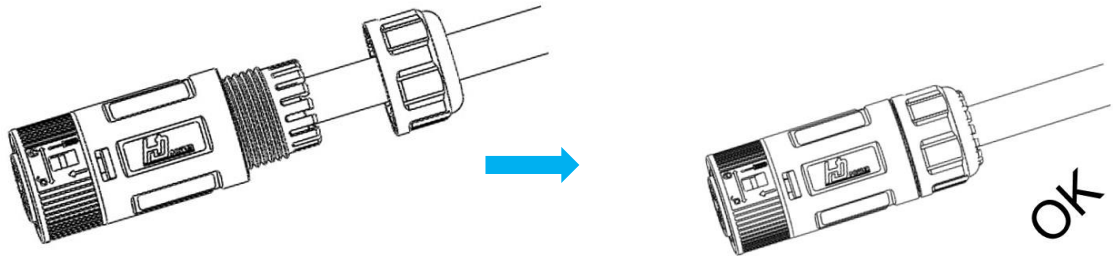
Step 5. Insert the wire into the corresponding terminal. Crimp the wire with an inner hexagon screwdriver and screw the torque 1.2+/-0.1N·m.



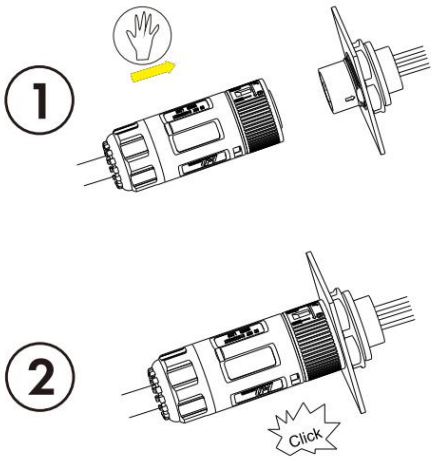
Step 5. Insert the main body into the corresponding buckle and hear “Click”.

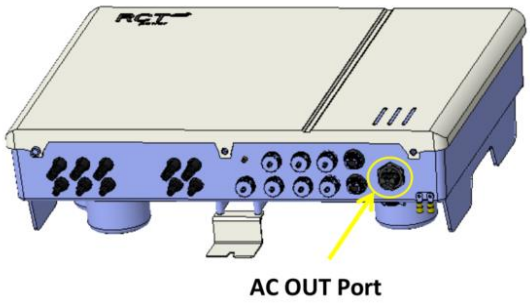


Step 6. Screw the lock wire nut into the body. Torque: 2.5+/-0.5Nm.



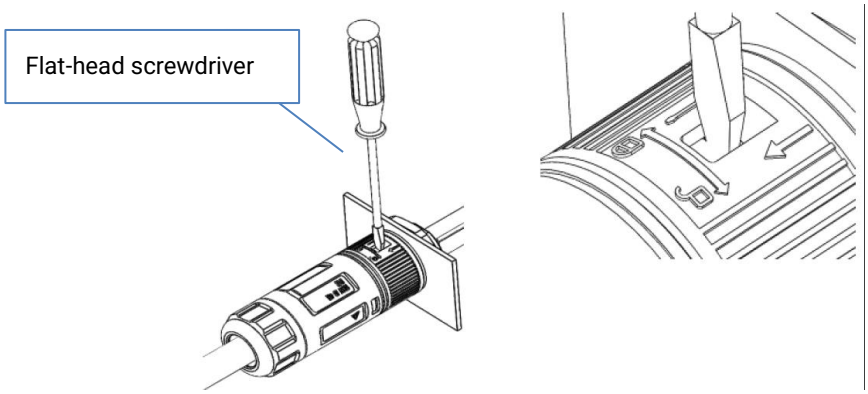
Step 7. Insert the AC connector plug into the corresponding AC out port on the inverter.



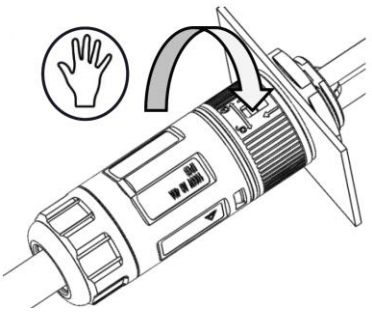


6.4.3 Unlock instructions

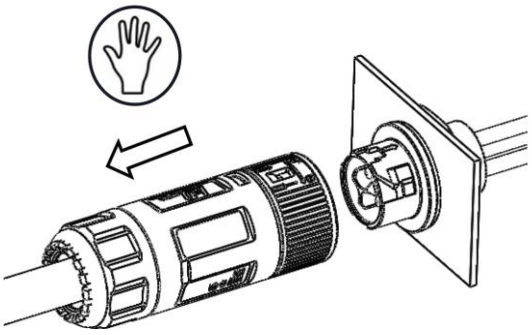
Step 1. Use the flat-head screwdriver installation icon to flip the unlock lock (skip this step if you use a tool to unlock the lock).



Step 2. Rotate the latch as shown.



Step 3. Remove the female end of the cable to unlock the account.



6.5 DC connection

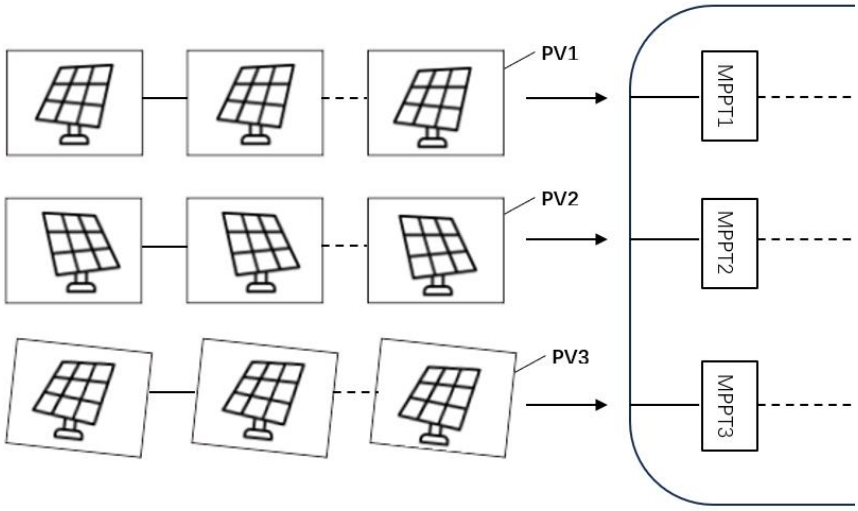
DANGER	Danger to life or serious injury from electric shock! • A high voltage of up to 600 V is applied to the DC cables while the PV system is exposed to sunlight. Ensure that nobody touches the positive and negative cables at the same time. Touching the DC conductors can lead to lethal electric shocks. • The inverter is transformerless. Therefore, the PV array must not be earthed! • Avoid traction forces on cables and plugs. Avoid sharp edges. Do not exceed the maximum bending radius of the cables. • Do not disconnect the DC connectors under load.

NOTICE	• Check the cables for correct polarity. Ensure the polarity of the PV terminals are all correct. • Ensure the DC Switch is set to position "OFF" before connecting the connectors. • The system voltage must not exceed the maximum input voltage of the inverter (see Type plate). PV modules are suitable for a maximum system voltage according to IEC 61730 Class A. Overvoltage will destroy the inverter. All warranty claims become void. If necessary, check the string layout to avoid an electrical surge.

	• Any type of contamination (dust, moisture, etc.) negatively influences the functionality of the connector system over the intended period of use. It is therefore essential to avoid contamination during the connector assembly and installation. • The voltage in the DC cables correlates with the intensity of the solar radiation onto the PV array. It is lower in the morning and evening hours or when the PV panels are shaded.

6.5.1 Requirements for the PV modules of a string:

- PV modules of the connected strings must be of: the same type, identical alignment and identical tilt.
- The thresholds for the input voltage and the input current of the inverter must be adhered to (see Section 13 "Technical data DC input ").
- On the coldest day based on statistical records, the open-circuit voltage of the PV array must never exceed the maximum input voltage of the inverter.
- The connection cables of the PV modules must be equipped with the terminal included in the scope of delivery.
- The PV strings to three DC input areas may differ from each other, including PV module type, number of PV modules in each string, angle of tilt, and installation orientation.



Prior to connecting the inverter to PV inputs, the following electrical specifications must be met simultaneously:

No.	Inverter Model	Open-circuit Voltage Limit	Max. Current for Input Connector
1	RHS-3.68/4/5/6K-H	600V	16A

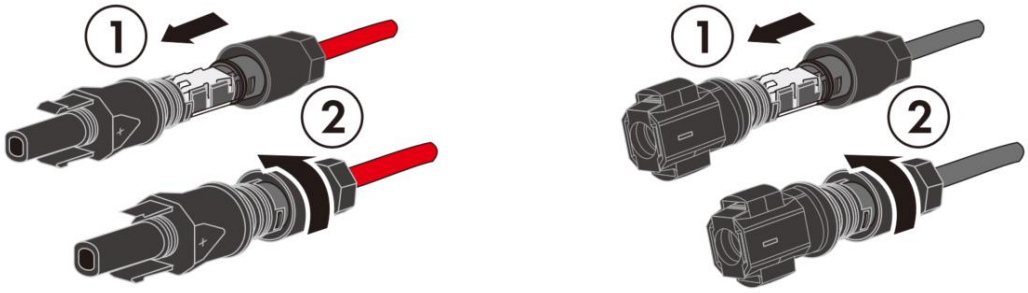
6.5.2 Installing the PV Connectors:

DANGER	High voltage may be present in the inverter! • Ensure all cables are voltage-free before performing electrical operations. • Do not connect the DC switch and AC circuit breaker before finishing electrical connection.

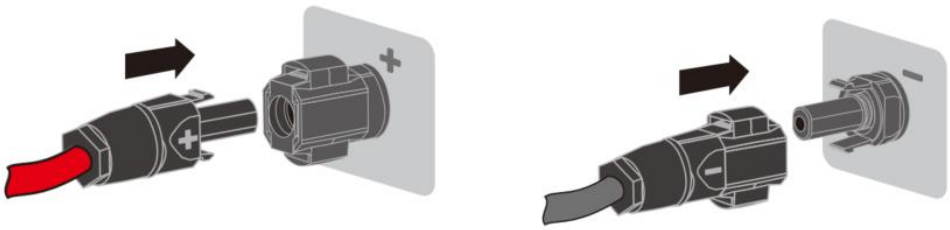
Step 1. Strip the insulation from each DC cable about 12 mm.

Step 2. Contact the PV stick.

Step 3. Push the tail nut up to the thread and tighten it. Torque: 2.0 N.m.



Step 4. Insert the PV connector plug into the corresponding PV input port on the inverter.



Step 5. Check for polarity correctness.

NOTICE	If the PV polarity is reversed, the inverter will be in a fault or alarm state and will not operate normally.

6.6 Battery connection

DANGER	Danger to life or serious injury from electric shock! • Only the battery systems specified and certified by RCT Power must be connected! Check the cables for correct polarity. • Cables must only be connected or disconnected in a voltage-free state.

NOTICE	• Check the cables for correct polarity. Ensure the polarity of the battery DC terminals are all correct. • Ensure the DC Switch is set to position "OFF" before connecting the connectors. The battery ON/OFF switch needs to be set to "0" and AC on the inverter is disconnected by the main switch or by the fuse. • The battery DC voltage must not exceed the maximum input voltage of the inverter. Overvoltage will destroy the inverter. All warranty claims become void. If necessary, check the string layout to avoid an electrical surge.

	For more information about Power Battery Master and Power Battery Stack, please refers to “User Manual” of Power Battery.

A CAN connection between the inverter and Power Battery Master is required for correct functionality.

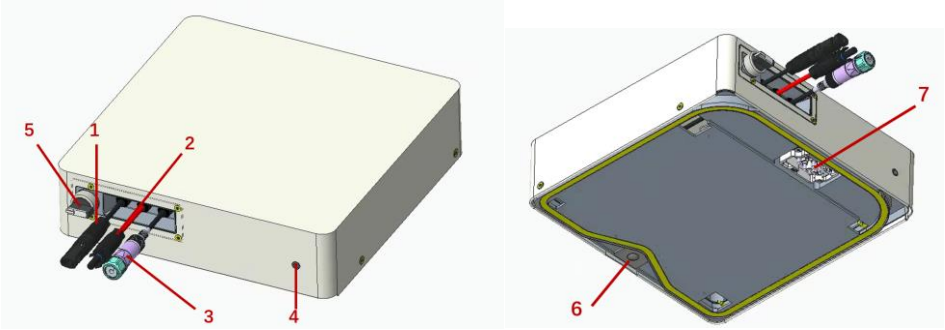
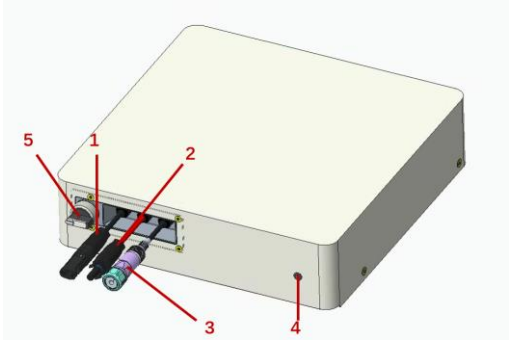


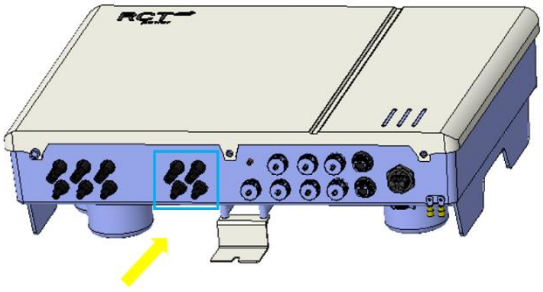
Fig. 6-4 Power Battery Master

Pos_No	Component
1	DC cable (-) to the Power Storage Inverter
2	DC cable (+) to the Power Storage Inverter
3	RJ45 connector for network cable to Power Storage Inverter
4	PE connection for protective conductor
5	DC switch
6	LED status display
7	Floating connector to stack

6.6.1 Battery power line connect

Insert cable ①&② into corresponding bat port on the Inverter.





Connect the DC cable “+“ of the Power Battery Master to the “BAT +“ Port on the Inverter side.

Connect the DC cable “-“ of the Power Battery Master to the “ BAT -“ Port on the Inverter side.

1	DC cable (-) to the power storage
2	DC cable (+) to the power storage

Fig. 6-5 Battery wiring to Inverter

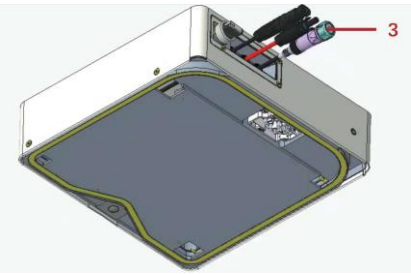
	• **For more information about Power Battery Master and Power Battery Stack, please refers to “User Manual” of Power Battery.**

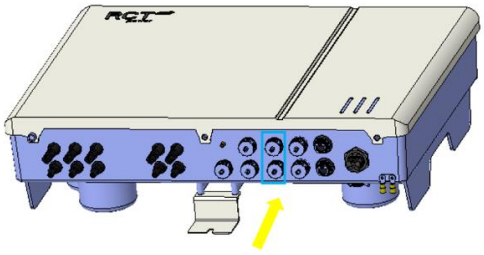
6.6.2 Communication connection

Thread the Cat 5 network cable through com cable gland.

Then plug the cable into the RJ45 connector for BMS1, BMS2 (CAN).

Cat 5 cable for CAN connection from Power Battery Master to Power Storage Inverter





BMS1/BMS2 Port

Fig. 6-6 BMS connection

	• **For more information about Power Battery Master and Power Battery Stack, please refers to "User Manual" of Power Battery.**

6.6.3 Increase battery capacity by adding additional battery modules

The configurable total battery capacity ranges from 5kWh to 60kWh.

The capacity per battery cluster ranges from 5kWh to 15kWh.

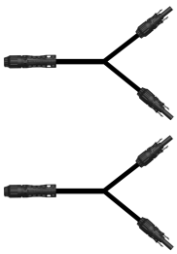
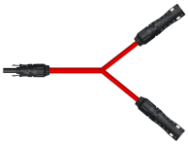
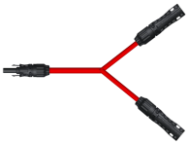
The inverter can be expanded to connect up to 4 battery clusters.

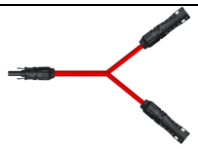
Please refer to the above 6.6.1 for the wiring steps.

And visit the website link below to get the instructions for specific configurations.

https://www.rct-power.com

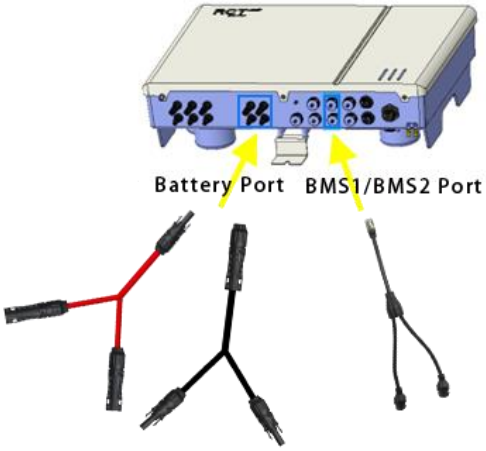
The inverter is equipped with 2 battery interfaces, allowing direct connection of 1–2 battery clusters. To connect 3–4 battery clusters, additional adapters must be purchased separately. The specific models are as follows:

Model / Part Number	Description	Connection cables required for 3 battery clusters	Connection cables required for 4 battery clusters
APC035SD03N-AU1 P/N: 3EE021817	Negative adapter		
APC035SD03P-AU1 P/N: 3EE021818	Positive adapter		

			
ASC000SD03C-AU1 P/N: 3EE021835	Communication adapter		

Connect the head of the power adapter to the "BAT +" or "BAT -" port on the inverter side, and connect the tail of the power adapter to the "+" or "-" port on the Power Battery Master side using a DC cable.

Connect the head of the communication adapter to the BMS port on the inverter side, and connect the tail of the communication adapter to the communication port on the Power Battery Master side using a communication cable.



6.7 Disconnecting voltage sources

Ensure that the DC break switch of the inverter is set to "OFF". The battery ON/OFF switch needs to be switched to "OFF". AC on the inverter is disconnected by the main switch.

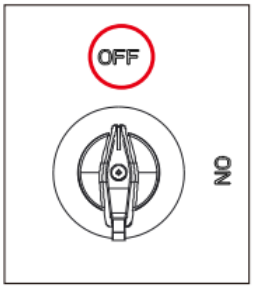
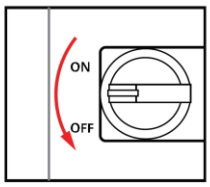


Fig. 6-7 Inverter DC switch



Power Battery Master

Fig. 6-8 Battery BMS switch

DANGER	Danger to life or serious injury from electric shock! High voltage is present in the inverter components when the inverter is connected to the mains (AC voltage source) and/or to a PV array exposed to sunlight or is connected to a battery (DC voltage source). This voltage can cause fatal electric shocks. • Any work involving wiring, connecting or opening the inverter housing must be carried out by qualified personnel. • Ensure that other persons stay away from cables and internal components.

WARNING	Danger to life or serious injury from electric arc! High voltage is present in the inverter components when the inverter is connected to a solar generator exposed to sunlight or a battery (DC voltage source). This voltage can result in electric arcs if the DC connectors are pulled under load. Electric arcs can cause severe electric shocks or burns.

Procedure:

Step	Description
1	Turn the DC load break switch to position "OFF"
2	Switch off the battery via the ON/OFF switch on the Battery master. Position "OFF".
3	Disconnect the inverter from the mains by using the external circuit breaker or the main switch.
4	Wait a minimum of 5 minutes to allow the capacitors to discharge fully.
5	Disconnect the DC side (PV and battery), Remove the battery and DC connectors. Squeeze the connector lock together and unplug the connector.
6	Disconnecting the AC side. Remove the inverter cover. Identify the AC terminal block. Press the terminals down with an insulated screwdriver to open the connections. Pull out the cable ends L1, L2. Loosen the cable gland and pull out the AC cable cautiously. Disconnect the inverter from the mains by using the external circuit breaker or the main switch.

7. Communication Ports

7.1 Overview of Communication Port

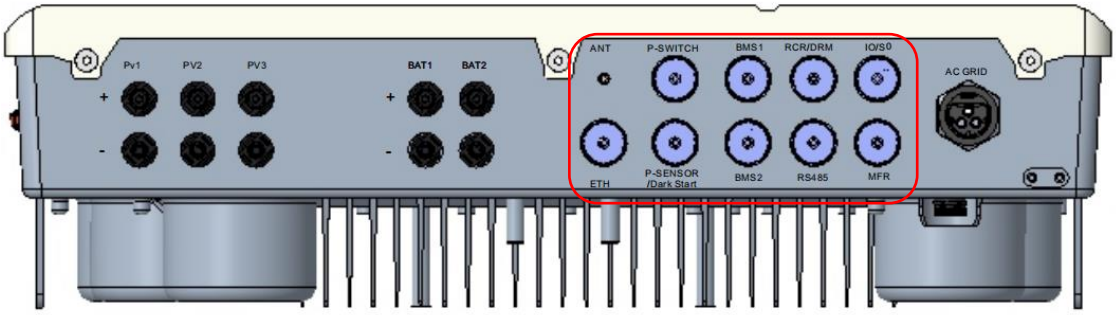


Fig. 7-1 Communication Port

Connection of the communication interfaces:

No.	Component	Description
1	ANT	Antenna, Wi-Fi monitoring.
2	ETH	Ethernet, LAN monitoring.
3	Power Switch	Communication with Back-up box
4	Power Sensor	Power Sensor: Communication with energy control detector.
5	BMS1	Communication with Power battery – 1.

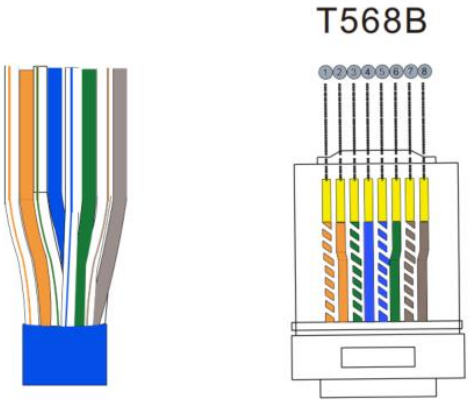
6	BMS2	Communication with Power battery – 2.
7	RCR/DRM	RCR (EU version Only): In Germany and some European areas, a ripple control receiver is used to convert a power grid dispatching signal to a dry contact signal. The dry contact is required for receiving the power grid dispatching signal. DRM (AU version Only): According to Australia AS 4777.2-2015, solar inverters need to support the function of demand response mode (DRM).
8	RS485	The serial interface enables the connection of external data loggers or meters.
9	IO/S0	IO/S0 (EU version Only): Digital Inputs and Outputs, Standard use case for input signals is the connection of an electricity meter with S0 output. Standard use case for an output signal is the connection of a display of feed-in data. One port can be used for emergency shutdown switches (mandatory in some countries).
10	MFR	Multifunction relay (EU version Only): The multifunction relay can be configured in two ways: As an alarm relay. As a load relay.

7.2 COM cable Connection

7.2.1 Making network cables procedure

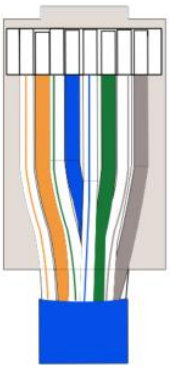
Step 1. Use network cable pliers to peel off the cover of the network cable. The recommended length of the cover is 1.5 to 2cm.

Step 2. Separate the eight core wires of the peeled network cable in different colors and sort them from left to right according to the international standard connection T568B.



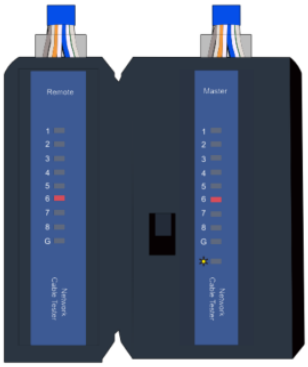
Step 3. Sort and straighten the network cable, place the network cable into the cutting port, and cut the length of the network cable, reserving about 1.4cm.

Step 4. Insert the cut core wire slowly along the eight cable slots in the RJ45 connector until it is at the top of the cable slots.



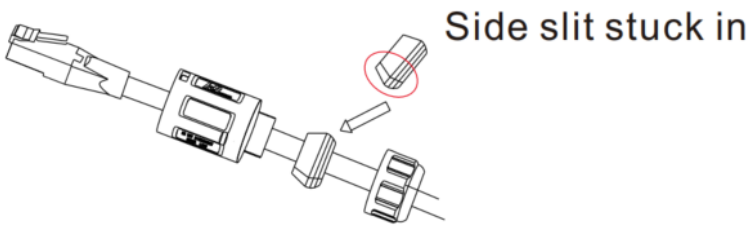
Step 5. After the core wires are connected and the cable sequence is correct, insert the RJ45 connector into the corresponding pliers and crimp the connector. Then make the other end of the network cable by following the same steps. Note that the cable sequence of this end is T568B.

Step 6. Finally, the made network cable is inserted into the tester, and the lights from 1 to 8 are successively indicating normal, and the network cable is successfully made.

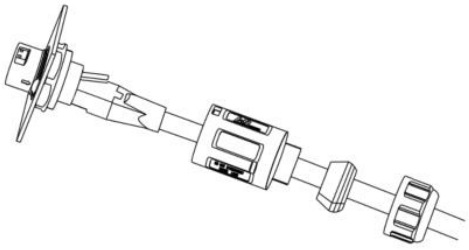


7.2.2 Installation Procedure

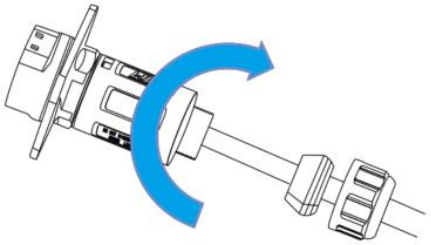
Step 1. Route the network cable through the lock nut, sealing plug, and body, and insert the sealing plug into the side slit.



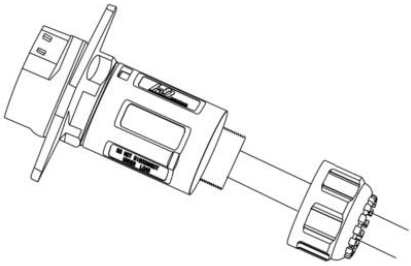
Step 2. Insert the cable plug into the Rj45 connector.



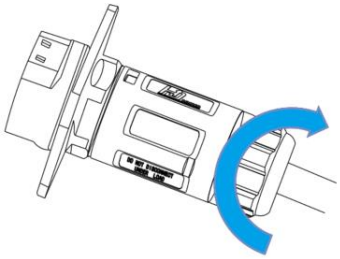
Step 3. Use an open wrench to lock the main body on the Rj45 plate and connector. Torque:2.0+/-0.5Nm.



Step 4. Insert the sealing plug into the main body.



Step 5. Use an open wrench to lock the wire nut into the body. Torque:2.0+/-0.5Nm.



7.3 ANT Port Connection

Procedure for WiFi

1. Remove the protective cap.
2. Tighten the Antenna.

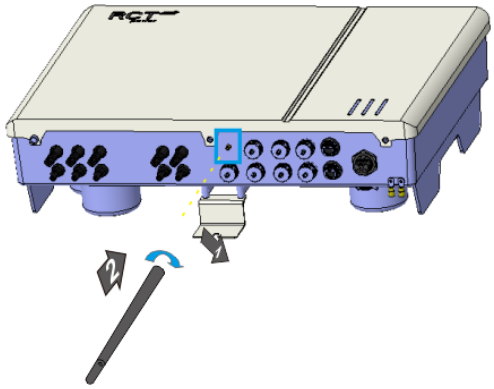


Fig. 7-2 ANT Port connection

7.4 ETH Port Connection

After the initial commissioning, the Power Storage DC offers the option to communicate via an Ethernet interface in addition to communication over a Wi-Fi network.

Communication over Ethernet requires a network cable of Cat5e or higher standard. The Power Storage DC is connected to the network device (usually a network router) with this cable.

To configure the Ethernet connection, open the RCT RESS APP and select the menu item "Network Settings".

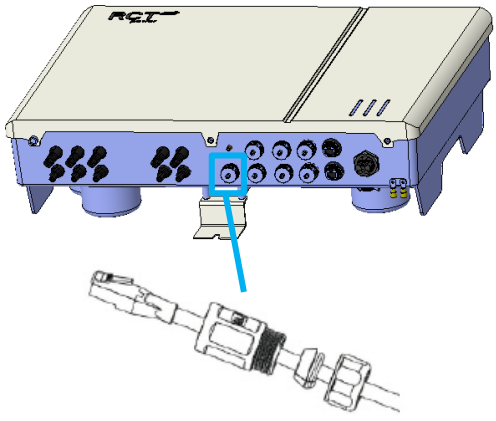


Fig. 7-3 ETH Port connection

7.5 RJ45 connections for Power Battery, Power Sensor and Power Switch

The inverter communicates with the battery via a Controller Area Network (CAN bus).

The connection of RJ45 interfaces:

Step	Description
1	Disconnect voltage sources.
2	Use the corresponding cable ducts for the supply cable.
3	Select the correct interface. Insert the plug into the RJ45 socket.

7.5.1 Battery communication

Up to 4 battery clusters can be connected via adapters for communication. For details, see Section 6.6.3.

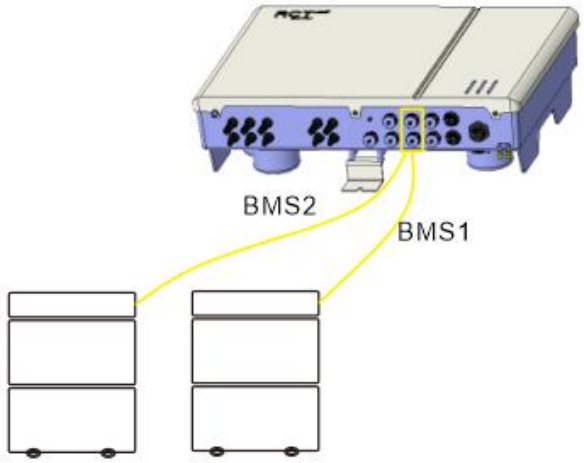


Fig. 7-4 Standard communication Power Battery

7.5.2 Power Switch communication

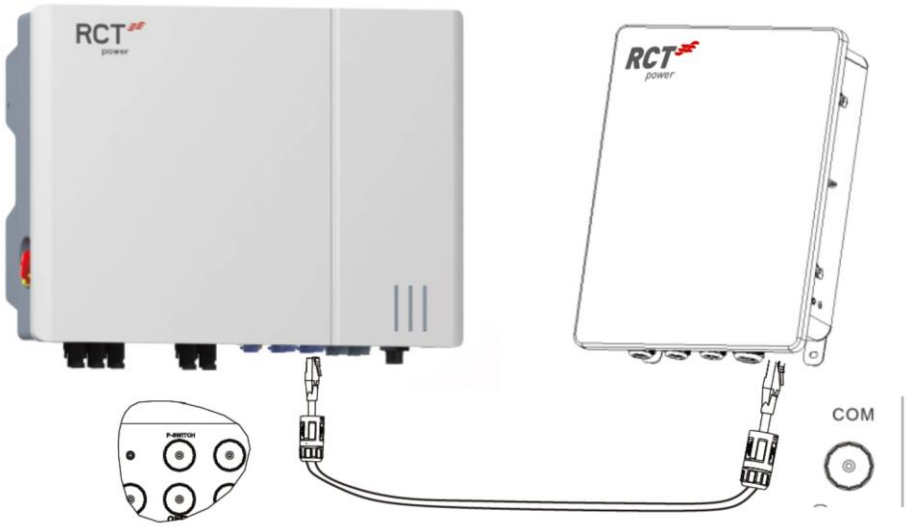


Fig. 7-5 Additional communication Power Switch

7.5.3 Power Sensor

1) Power Sensor communication

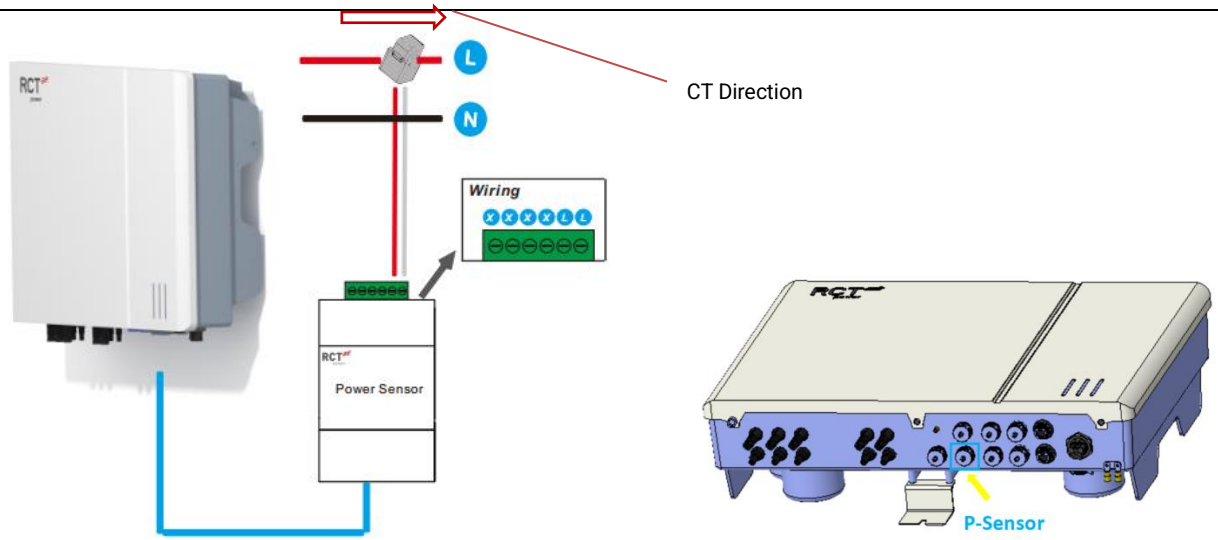


Fig. 7-6 Additional communication Power Sensor

7.6 RCR/DRM Port Connection

7.6.1 DRM Port Connection (Australia only)

DRED means demand response enable device. The AS/NZS 4777.2:2020 required inverter need to support demand response mode (DRM). This function is for inverter that comply with AS/NZS 4777.2:2020 standard.

DRED is used for Australia and New Zealand installation to support several demand response modes.

Demond response mode	Requirement
DRM0	Disconnected Import power = 0 & Generate power = 0
DRM1	Import power = 0
DRM2	Import power < 50%
DRM3	Import power < 75%
DRM4	Import power = Not limited
DRM5	Generate power = 0
DRM6	Generate power < 50%
DRM7	Generate power < 75%
DRM8	Generate power = Not limited

A RJ45 interfaces is used for DRED connection.

Pin	Definition
1	DRM1/5
2	DRM2/6
3	DRM3/7
4	DRM4/8
5	REFGEN
6	COM/DRM0
7	V+
8	V-

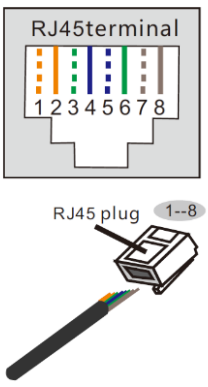


Fig. 7-8 Connection - Demand response enable device

7.6.2 RCR Port Connection

In Germany and some other European regions, grid companies use Ripple Control Receiver to convert grid dispatching signals into dry contact mode for transferring. And the power station receives grid dispatching signals through dry contact communication mode.

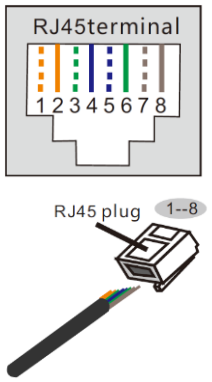
Four digital inputs are available for potential-free relay contacts connecting one or more inverters to a ripple control receiver.

NOTICE

- A maximum of 3 inverters can be connected to each other via RCR Port.
- The total cable length must not exceed 20 m.

The connector pin assignment and function definition:

Pin	Definition
1	+5V_RES
2	+5V_RES
3	RSE1
4	RSE2
5	RSE3
6	RSE4
7	/
8	/



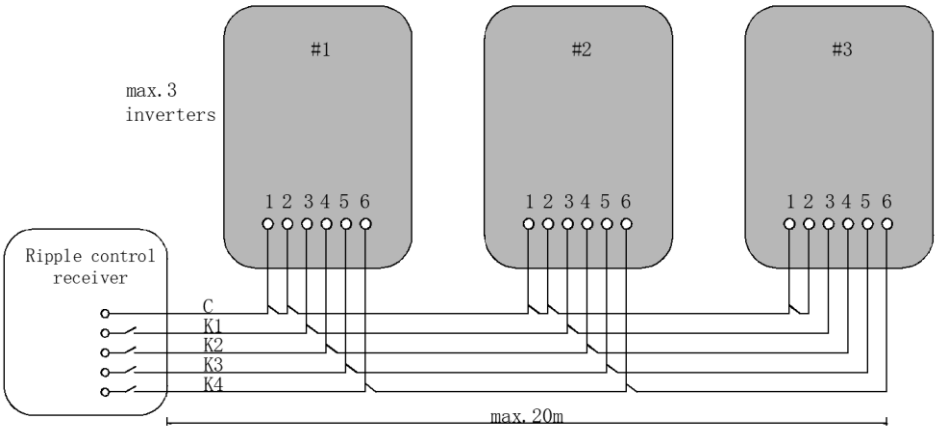


Fig. 7-9 Connection - Ripple control receiver

NOTICE

•The inverter has not been tested to AS/NZS 4777.2:2020 for multiple inverter combinations and/or multiple phase inverter combinations such combinations should be used or external devices should be used in accordance with the requirements of AS/NZS 4777.1.

7.7 RS485 Connection

Application:

The serial interface enables the connection of external data loggers or counters.

Wiring:

The number of inverters that can be connected to a joint data logger is limited. Refer to the data logger manual for details and specifications.

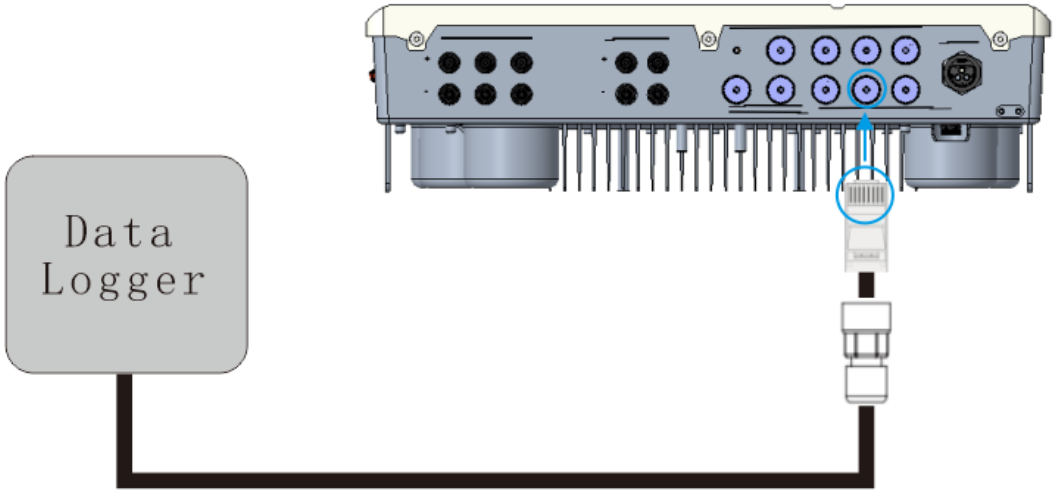
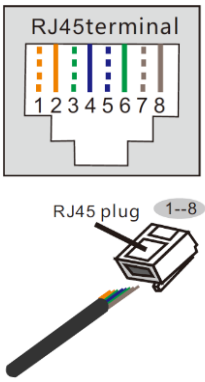


Fig. 7-10 Connection data logger

A RJ45 interfaces is used for RS485 connection.

Pin	Definition
1	GND_RS485
2	485-TX
3	485-RX
4	GND_RS485
5	/
6	/
7	/
8	/



7.8 IO/S0 Port Connection

Digital Inputs and Outputs IO/S0 Interface Application:

Standard use case for input signals is the connection of an electricity meter with S0 output.

Standard use case for an output signal is the connection of a display of feed-in data.

One port can be used for emergency shutdown switches (mandatory in some countries).

Wiring:

WARNING	Each port of the IO/SO interface can be configured to receive input or output signals.

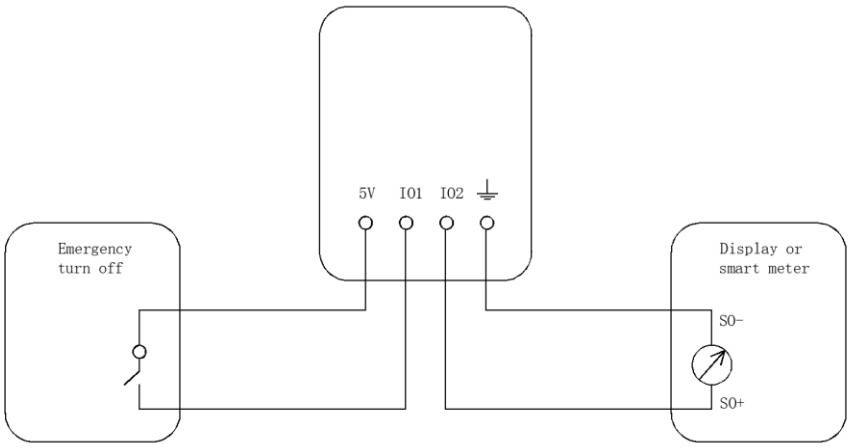
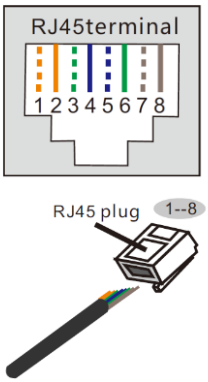


Figure 7-11 IO/SO interface connected with an emergency shutdown switch and a solar display unit or meter

A RJ45 interfaces is used for IO/S0 connection.

Pin	Definition
1	5V_IO
2	IO1
3	IO2
4	GND_IO
5	/
6	/
7	/
8	/



7.9 MFR Port Connection

The multifunction relay can be configured in two ways:

- As an alarm relay. In the event of an inverter fault, the alarm signal is connected.
- As a load relay. It will be connected above a defined threshold power generated by the inverter and can be used, for example, to control a contactor with an external power supply connecting a household consumer.

WARNING	A number of signals can be operated in parallel as long as the maximum current of 1 A and 24 V is not exceeded.

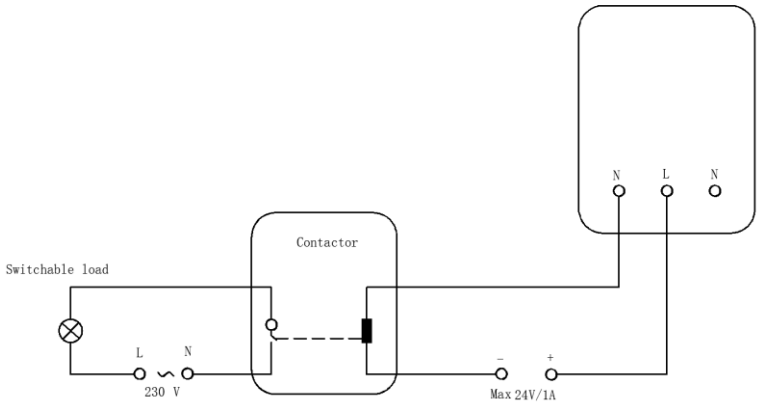
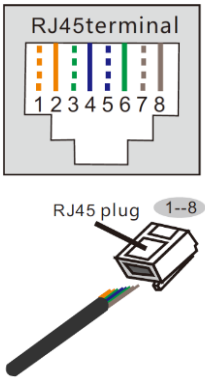


Fig. 7-12 Connection - Contactor and switchable load

A RJ45 interfaces is used for MFR connection.

Pin	Definition	
1	NA	
2	NO	
3	C	
4	NC	
5	/	
6	/	
7	/	
8	/	

8. Commissioning

The inverter is equipped with an internal Wi-Fi module. To set up and commission the inverter, you must connect to it via Wi-Fi using the RCT RESS App.

 WARNING	To avoid material damage and personal injury, the Power Inverter must only be installed, wired, connected, commissioned and serviced by qualified personnel.

	The following tasks must have been completed before the inverter can be commissioned and operated: ● The Inverter is mounted. ● The Inverter is connected to the public grid (AC). ● The PV modules are connected to the inverter. ● The electrical connections to the battery are established. ● Additional protective conductor connection established if required. ● Power Switch and/or Power Sensor are connected if available. ● The inverter cover is assembled.

8.1 Mechanical checks

Procedure:

1. Make sure the inverter has been correctly mounted with wall bracket.
2. Make sure the cover has been correctly mounted.
3. Make sure the communication cable and AC connector have been correctly wired and tightened.

8.2 Electrical checks

Procedure:

1. Check the PE connection with a multimeter, make sure that the inverter's exposed metal surface has a ground connection.
2. Check the PV voltage of the strings does not exceed the permitted limits and make sure the PV voltage has the correct polarity.
3. Check the PV array's insulation to ground with a multimeter, make sure that the insulation resistance to ground is greater than 1 MOhm.
4. Check the grid voltage at the point of connection of the inverter complies with the permitted value.
5. Check the battery voltage at the point of connection of the inverter complies with the permitted value, make sure the battery voltage has the correct polarity.
6. Check the battery BMS communication cable connection is normal.

8.3 Switch on the Inverter

Procedure:

Step	Description
1	Switch on the mains connection using the external circuit breaker.
2	Switch on the solar generator voltage by closing the DC load break switch (switch position "1"). If the input voltage is sufficient, the LED light of the device will switch on (LED status see section "12 LED Indicators").

Fig. 8-1 LED light

9. RCT RESS App

9.1 Installing App

RCT RESS APP is an external monitoring/ configuration application for the inverter, used on smart phones or tablet for both Android and iOS system.

With the powerful RCT RESS App you can manage and control all functions of your storage system. Installation, maintenance and control are made easy.

The App is a flexible tool and includes comprehensive data visualisation and various configuration options.

For Android system, please open the Google Play Store, search for "RCT RESS" and install or scan the QR code on the bottom of this user manual.

For IOS system, please open the Apple Store, search for "RCT RESS" and install or scan the QR code on the bottom of this user manual.

Main functions are as below:

1. Wi-Fi configuration.
2. Edit system configuration to make the system work as customer needs.
3. Monitor and check the performance of the Power Storage system.
4. The App also ensures easy data collection and facilitates troubleshooting.
5. Set safety parameters, such as PU curve, QU curve, voltage and frequency protection parameters, and other adjustable parameters.

For more operations in detail, refer to the RCT RESS User Manual.

iOS App Store

Google Play Store

9.2 Login

Preconditions:

- The AC/DC side of the inverter is powered on.
- The RCT RESS App has been installed.
- You have registered an account or obtained your account and password to log in to the RCT RESS APP from your distributor/installer.

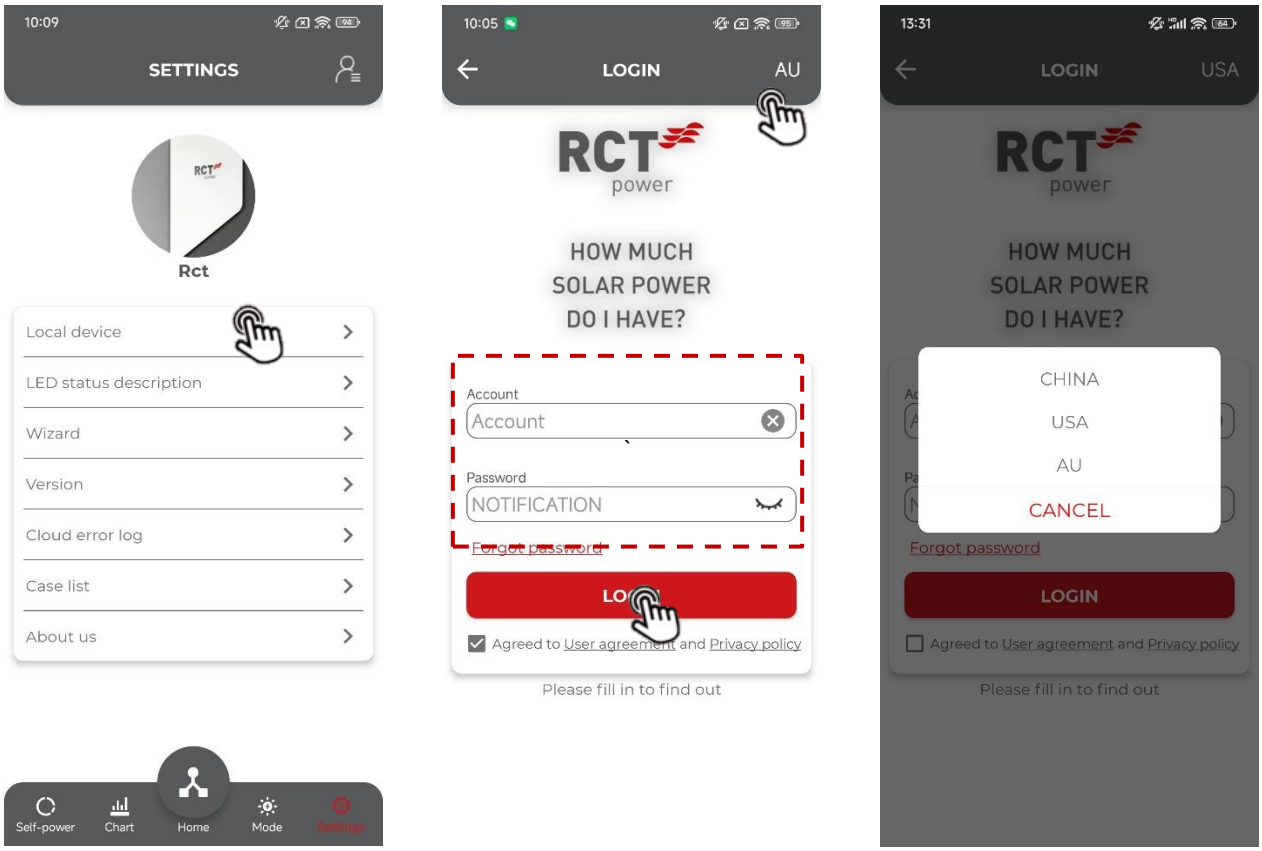
Open the app and enter the following login interface:

Procedure:

Step 1: Click the "Click to login" button to enter the Login screen.

Step 2: Select the country/region,

Step 3: Enter the account and password and click "Agree to Service Agreement and Privacy Guide". Then, tap "SIGN IN" to enter the RCT REST APP.



NOTICE	The "Country/Region" must be set to the country where the inverter is installed at. Otherwise, the inverter may report errors.

For more detailed operational guidance, please refer to the separate "App User Manual". You are welcome to visit our official website at *https://www.rct-power.com* to view or download it.

10. System Connection Diagram

10.1 Only inverter system connections

This diagram is an example for Australia and New Zealand grid system.

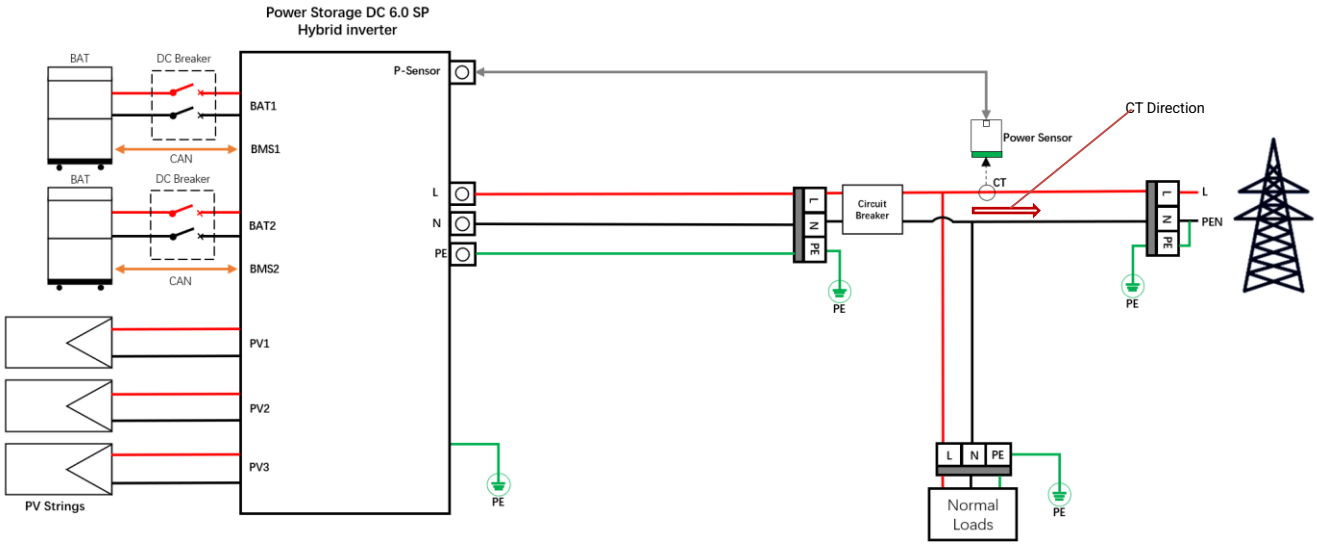


Fig. 10-1 System Connection Diagram for Australia and New Zealand (Only inverter)

This diagram is an example for grid system without special requirement on electrical wiring connection.

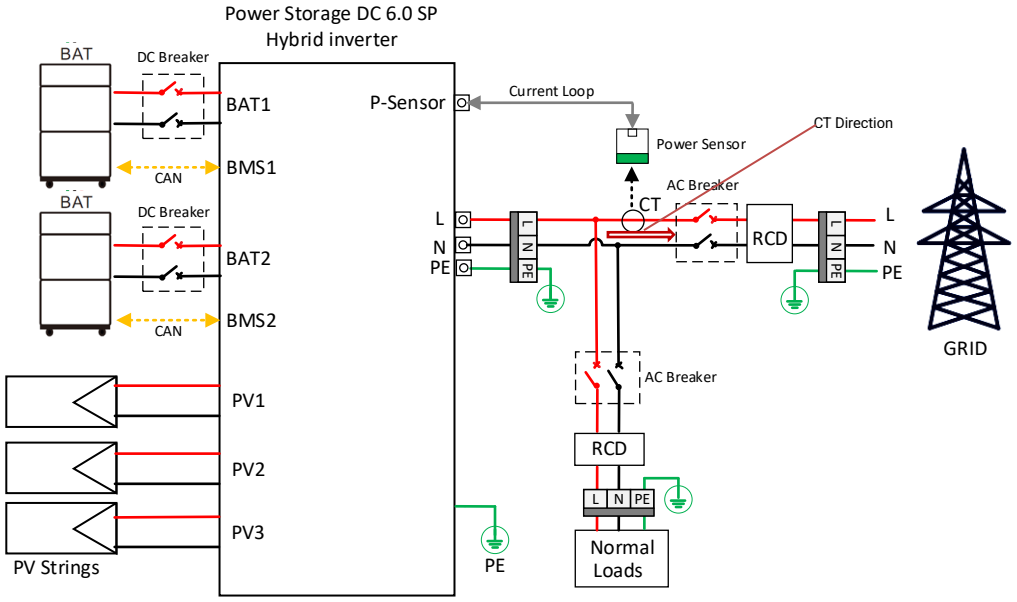


Fig. 10-2 System Connection Diagram for other regions (Only inverter)

10.2 Inverter and Power switch box system connections

For Australia safety country, the neutral cable of On-Grid side and Back-Up side must be connected together, otherwise Back-Up function will not work.

This diagram is an example for Australia and New Zealand grid system.

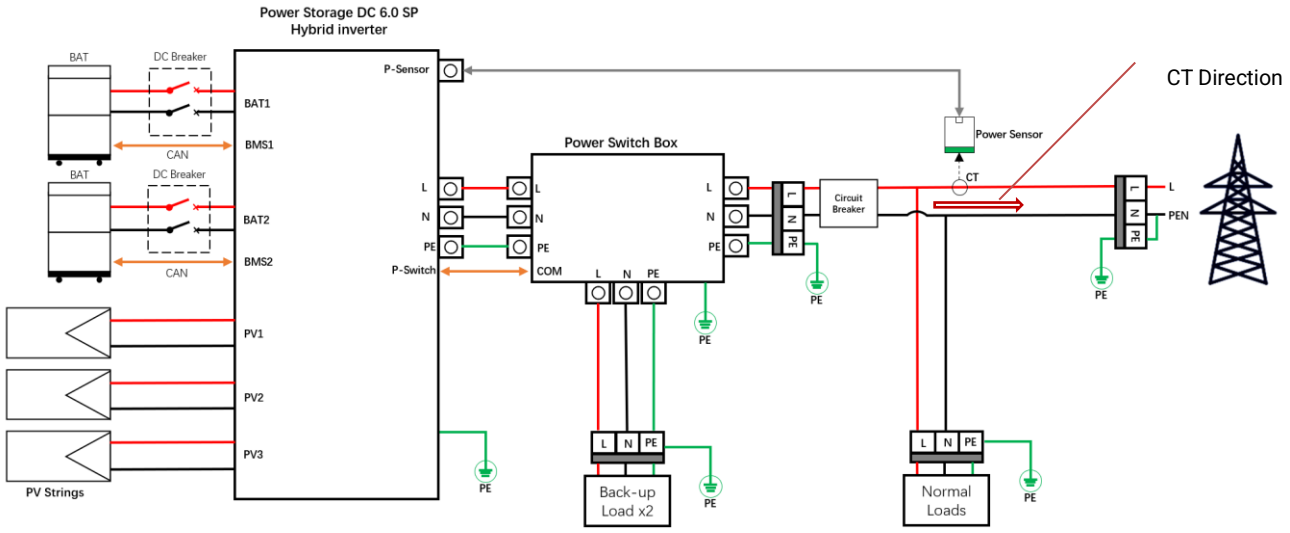


Fig. 10-3 System Connection Diagram for Australia and New Zealand (With Power switch box)

This diagram is an example for grid system without special requirement on electrical wiring connection.

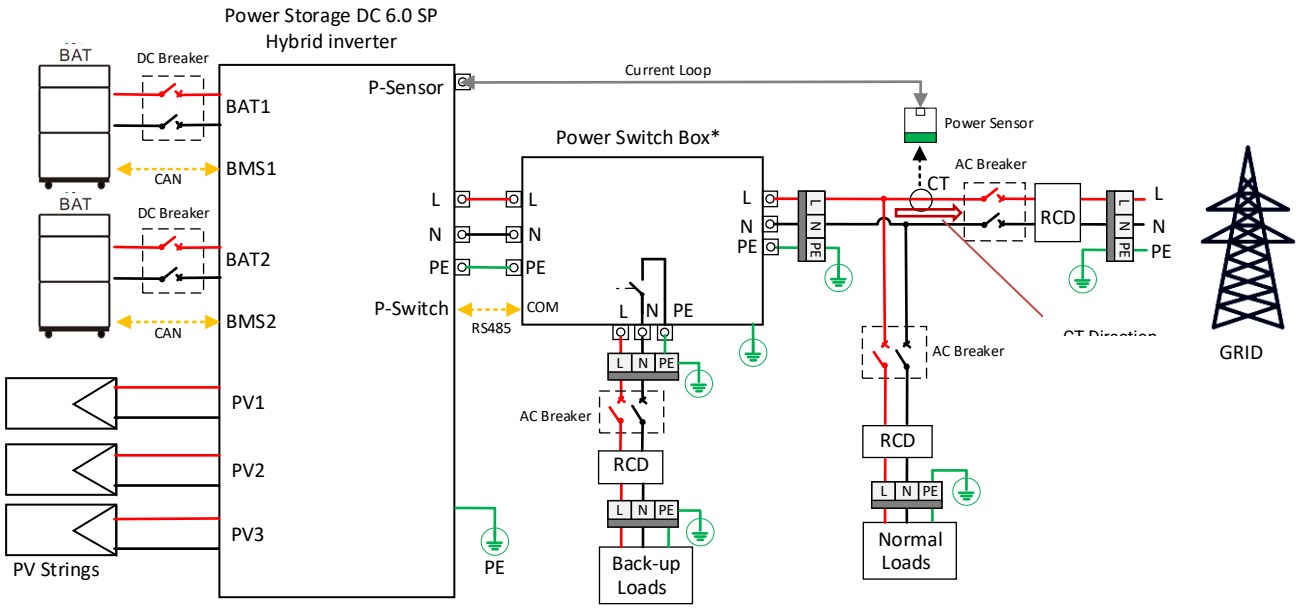


Fig. 10-4 System Connection Diagram for other regions (With Power switch box)

11. System Decommissioning

11.1 Disconnecting Inverter

 NOTICE	Danger of burns! Even if the inverter is shut down, it may still be hot and cause burns. Wear protective gloves before operating the inverter after it cools down.

For maintenance or other service work, the inverter must be switched off.

Proceed as follows to disconnect the inverter from the AC and DC power sources. Lethal voltages or damage to the inverter will follow if otherwise.

Step 1: Disconnect the external circuit breaker and prevent it from inadvertent reconnection.

Step 2: Rotate the DC switch to the "OFF" position for disconnecting all of the PV string inputs.

Step 3: Wait about 5 minutes until the capacitors inside the inverter completely discharge.

Step 4: Ensure that the DC cable is current-free with a current clamp.

11.2 Dismantling the Inverter

 NOTICE	Risk of burn injuries and electric shock! Do not touch any inner live parts until for at least 5 minutes after disconnecting the inverter from the utility grid and the PV input.

	Before dismantling the inverter, disconnect both AC and DC connections.

Step 1: Refer to "6 Electrical Installation" for the inverter disconnection of all cables in reverse steps.

Step 2: Dismantle the inverter referring to "5 Mechanical Installation" in reverse steps.

Step 3: If necessary, remove the wall-mounting bracket from the wall.

Step 4: If the inverter will be reinstalled in the future, please refer to "3 Unpacking and Storage" for a proper conservation.

11.3 Disposal of Inverter

Users take the responsibility for the disposal of the inverter.

 WARNING	Please scrap the inverter in accordance with relevant local regulations and standards to avoid property losses or casualties.

 NOTICE	Some parts of the inverter may cause environmental pollution. Please dispose of them in accordance with the disposal regulations for electronic waste applicable at the installation site.

12. LED Indicators

LED lights indication:

LED light

Category	LED States			Description
Running Indicator	LED1	LED3		-
	▬	OFF		On-grid mode operation
	▬▬▬	OFF		Off-grid mode operation
	▪ ▪ ▪ ▪	OFF		Standby
	OFF	OFF		No voltage on PV or battery.
	OFF	▬▬▬		System alarm
	OFF	▬▬▬		System fault
Communication Indicator	LED2			-
	▬▬▬			Server Connection
	▪ ▪ ▪ ▪			Local Connection
	OFF			No communication
Firmware upgrade	LED1	LED2	LED3	-
	▬▬▬	▬▬▬	▬▬▬	Firmware upgrade

13. Error Messages and Troubleshooting

Error message	Description	Cause and possible corrective action
ERR_TRAP	General error, causing switch-off of inverter. Occurs always with additional single fault.	Please refer to instructions on additional single fault.
ERR_HW_STOP_UZK ERR_U_ZK_UNDERVOLTAGE ERR_U_ZK	Overvoltage occurred in DC-link. Inverter stops feeding.	DC-link-voltage is out of permissible range. Switch of inverter (DC and AC) and BMS for about 15 min. and check PV-voltage. If error still occurs, contact technical hotline.
ERR_U_SG_A ERR_U_SG_B ERR_U_SG_C	Your power storage is approved for a max. open-circuit solar generator voltage of 520 V. All components are sufficiently dimensioned with a safety factor. If the threshold is exceeded, the Power Storage stops feeding.	Max. allowed DC-voltage was exceeded: Check dimensioning of PV-generator. Reduce the number of modules in series and carry out commissioning again.
ERR_HW_STOP_PV_OCP	PV over current.	If the error occurs multiple times, restart the Power Storage. If the error still occurs, please contact service.
ERR_AFCI_OCCURRED_CHANNEL1 ERR_AFCI_OCCURRED_CHANNEL2 ERR_AFCI_OCCURRED_CHANNEL3	AFCI alarm happened.	Check the internal PV wiring of inverter. Check whether the PV panel connect are in poor contact. Turn OFF the DC switch and turn on after 5 minutes. If the error still occurs, please contact service.
ERR_U_ACC	The battery voltage is outside of the expected range.	If the error occurs multiple times, restart the BMS and the Power Storage. If the error still occurs, please contact service.
ERR_CURRENT_UNSTABLE	Overcurrent in throttle.	Error could be caused by grid interruption or problems with cabling of PV-generator. Please restart inverter. If problem occurs permanent or very often, please contact service.
ERR_HW_STOP_INV_OCP ERR_SW_STOP_INV_OCP	AC over current	If the error occurs multiple times, restart the Power Storage. If the error still occurs, please contact service.
ERR_COMM_U_GRID_DIFF	The voltage difference between L phase voltage and N phase voltage exceeds the allowable value	Ask grid provider about grid stability.
ERR_FRT_OVERVOLTAGE	High voltage has lasted for more than the value specified by High Voltage Ride Through (HVRT).	If the error occurs multiple times, restart the Power Storage. If the error still occurs, please contact service.
ERR_FRT_UNDERVOLTAGE	Low voltage has lasted for more than the value specified by Low Voltage Ride Through (LVRT).	If the error occurs multiple times, restart the Power Storage. If the error still occurs, please contact service.
ERR_BAT_OVERCURRENT	Your power storage continually monitors	If the error occurs multiple times, check

Error message	Description	Cause and possible corrective action
	charge/discharge current. When the maximum permissible limit exceeded, Power Storage stops charge/discharge.	configuration of battery in APP. If error still occurs after reboot, contact technical hotline.
ERR_BAT_OVERVOLTAGE	Your power storage continually monitors battery voltage level. When the maximum permissible battery voltage limit is exceeded, Power Storage stops charging.	If error occurs for a long period of time, contact technical hotline.
ERR_UL_UNDER_L1_LV1 ERR_UL_OVER_L1_LV1	Your power storage continually monitors voltage level of grid. If this is outside of the permitted level 1, inverter stops feeding.	Check grid voltage level and / or ask grid provider about grid stability.
ERR_UL_UNDER_L1_LV2 ERR_UL_OVER_L1_LV2	Your power storage continually monitors voltage level of grid. If this is outside of the permitted level 2, inverter stops feeding.	Check grid voltage level and / or ask grid provider about grid stability.
ERR_FL_OVER_LV1 ERR_FL_UNDER_LV1	Your power storage continually monitors the grid frequency. If this is outside of the permitted level 1, inverter stops feeding.	Ask grid provider about grid stability.
ERR_FL_OVER_LV2 ERR_FL_UNDER_LV2	Your power storage continually monitors the grid frequency. If this is outside of the permitted level 2, inverter stops feeding.	Ask grid provider about grid stability.
ERR_SW_ON_UMIN_L1 ERR_SW_ON_UMAX_L1	Your power storage continually monitors voltage level of grid before starting to feed in. If this is outside of the permitted value, inverter doesn't start feeding.	Check grid voltage level and / or ask grid provider about grid stability.
SW_ON_FMIN SW_ON_FMAX	Your power storage continually monitors the grid frequency. If this is outside of the permitted level, inverter doesn't start feeding.	Ask grid provider about grid stability.
ERR_ISLAND_FAULT	3 attempts of island building are failed.	Check the battery SOC, if it is very low, inverter can't work in island mode. Wait for the PV to charge the battery. Else, Turn OFF the DC switch and turn them on after 5 minutes. If error still occurs, contact technical hotline
ERR_ISO (Earth Fault Alarm) ERR_AFI_ISO	Before connection to grid, your power storage checks the PV-system for a possible earth fault or insulation fault. If an insulation error is detected, Power Storage don't start feeding.	Check the PV-system for possible insulation faults (e.g. pinched-off DC lines etc.). The measured insulation resistance must be at least 400k Ohms.
ERR_GFCI_TEST ERR_AFI_GFCI_TEST	GFCI Device Check Failure.	Turn OFF the DC switch and turn them on after 5 minutes. If error still occurs, contact technical hotline.
ERR_30mA ERR_60mA ERR_150mA ERR_300mA ERR_AFI_30mA	This monitoring device has detected a fault current. Inverter stops feeding.	It will happen only in the rainy or higher air humidity weather and is recovered soon. If the alarm occurs frequently or persists, check whether the impedance between the PV string and the Ground is too low. Turn OFF the DC switch and turn them on

Error message	Description	Cause and possible corrective action
ERR_AFI_60mA ERR_AFI_150mA ERR_AFI_300mA		after 5 minutes. If error still occurs, contact technical hotline.
ERR_IDC_SLOW	Your power storage continually monitors the quality of current fed in. If an increased DC-component in AC-current is detected, inverter stops feeding.	Restart the Power Storage. If the error still occurs, please contact service.
ERR_CAN_TIMEOUT	CAN communication timeout with battery module.	Check the RJ45 connector fitting. Check the RJ45 connector wire ring. Restart the BMS, If the error still occurs, please contact service.
ERR_HW_STOP_BAT_OCP	Battery module over current.	If the error occurs multiple times, restart the BMS and the Power Storage. If the error still occurs, please contact service.
ERR_DC_IGBT_FAILURE	Battery buck/boost IGBT failure.	Restart the BMS and the Power Storage. If the error still occurs, please contact service.
ERR_RELAYS TEST	Before connection to grid, your power storage checks the operation of mains relays. An error was detected during this check.	Restart the Power Storage If the error still occurs, please contact service.
ERR_EXT_OFF	Your power storage has the possibility to be switched off by a configurable “emergency stop”. This signal is active and inverter stops feeding.	Check “emergency stop” switch to be unlocked. Check configuration of “emergency stop” function in APP.
ERR_RS485_POWER_SW	Error by RS485 communication with the Power Switch Box.	Check the RS485 connector fitting. Check the RS485 connector wire ring. If the error still occurs, please contact service.
ERR_TEMP_SINK1	Your power storage is designed to feed full power up to an ambient temperature of +70°C. If heatsink temperatures exceed a specific threshold inverter reduces power.	Check ambient temperature of installation. Clean the heatsink of inverter. Observe the installation distances specified in manual. Remove possible objects laying on the convection paths of heatsink. If error still occurs, contact technical hotline.
ERR_TEMP_HIGH	Your power storage is designed to feed full power up to an ambient temperature of +70°C. If heatsink temperature exceeds 90°C inverter stops feeding. After the heatsink temperature drops, inverter restarts feeding.	Check ambient temperature of installation. Clean the heatsink of inverter. Observe the installation distances specified in manual. Remove possible objects laying on the convection paths of heatsink. If error still occurs, contact technical hotline.
ERR_TEMP_BAT	Your power storage is designed to feed full power up to an ambient temperature from -15°C to +55°C. The charge/discharge current will be reduced. If heatsink temperature exceeds the	Check ambient temperature of installation. Clean the heatsink of inverter. Observe the installation distances specified in manual. Remove possible objects laying on the

Error message	Description	Cause and possible corrective action
	battery will be disconnected.	convection paths of heatsink. If error still occurs, contact technical hotline.
ERR_TEMP_BAT_HIGH	If heatsink temperature exceeds +65°C the battery will be disconnected. After the heatsink temperature drops, battery restarts feeding.	Check ambient temperature of installation. Clean the heatsink of inverter. Observe the installation distances specified in manual. Remove possible objects laying on the convection paths of heatsink. If error still occurs, contact technical hotline.
ERR_PE_DETECT	A grounding error occurs, including the grounding connection of the power switch box	Check whether the ground connection of the inverter, battery, and power switch box is correct
ERR_SOFT_HARD_LIMIT	Australian safety regulations specific fault, soft and hard limit function failed. The power on the AC bus exceeds the power setting value to trigger the limit protection.	Check if there are other power sources on the AC bus, if there are, there may be power overruns, causing the inverter to be unable to limit the power within the range. If not, there may be a problem with the inverter itself and it needs to be checked by a professional.

14. Maintenance

This section describes the inverter's routine maintenance work and the suggested time intervals.

Maintenance Tasks	Method	Maintenance Interval
System cleaning	Check that the heat sink is free of dust.	Half-yearly or annually depending on environmental conditions
System operating status	Check if the inverter is damaged or deformed. Check if the operating noise of the inverter is normal. When the inverter is running, check whether the parameters of the inverter are correctly set.	Half-yearly
Electrical connections	Check that all cables are tight. Check that all cables are intact. Ensure that waterproof caps cover all unused connections. Turn the DC load break switch off and on.	Annually
Grounding connection safety	Check that the grounding cables have good contact with their connection points.	Annually

Important: Before Maintenance and Cleaning tasks are carried out, please ensure that the DC load break switch, the battery unit's on/off switch and the circuit breaker between the inverter and the mains are all switched off.

15. Exclusion of Liability

Although the information contained in this manual has been carefully checked for accuracy and completeness, no liability can be assumed for errors or omissions.
RCT Power reserves the right to change the hardware and software features described in this manual at any time without prior notice.
Warranty or liability claims of any kind are excluded due to one or more of the following reasons:

- Incorrect use or installation of the product.
- Installation or operation of the product in an unsuitable environment.
- The relevant safety regulations during installation and commissioning at the operation site are ignored.
- The product relevant safety notices and instructions contained in the product documentation are ignored.
- By installing or operating the product under insufficient safety and security conditions.
- By modifying the product or by unauthorised software installation.
- A defect in the product caused by the operation of the product or adjacent equipment outside the permitted limits.
- Damage caused by force majeure.

RCT Power does not accept any liability for damage caused by incorrect or lost data, due to incorrect operation or malfunction of the inverter, the software, additional devices or personal computers

16. Technical Data

Model Number	RHS-3.68K-H	RHS-4K-H	RHS-5K-H	RHS-6K-H
PV INPUT				
Max. Recommended PV Power	7360W	8000W	10000W	12000W
Max. Input Voltage	600V			
Start-up Voltage	120V			
Min. Operating Voltage	90V			
Rated Input Voltage	360V			
MPPT Operating Voltage Range	90-580V			
Max. Input Current per MPPT	16A			
Max. Short-circuit Current per MPPT	20A			
Number of MPPT Trackers	3			
Number of Strings per MPPT	1			
BATTERY INPUT				
Compatible Battery	RCT Power Battery			
Battery Type	$LiFePO_4$			
Number of Battery Input	2			
Battery Voltage Range	120-520V			
Max. Charge / Discharge Current	25A / 25A			
Max. Charge / Discharge Power	10500W/3680W	11000W/4000W	11000W/5000W	11000W / 6000W
AC INPUT/OUTPUT (On-grid)				
Rated Input Apparent Power	3680VA	4000VA	5000VA	6000VA
Max. Input Apparent Power	3680VA	4000VA	5000VA	6000VA
Rated Output Power	3680W	4000W	5000W	6000W
Rated Output Apparent Power	3680VA	4000VA	5000VA	6000VA
Max. Output Power	3680W	4000W	5000W	6000W
Max. Output Apparent Power	3680VA	4000VA	5000VA	6000VA
Rated AC Voltage	230V, L/N/PE			
AC Voltage Range	184-265V			
Rated Grid Frequency	50 Hz			
Grid Frequency Range	45-55 Hz			
Max. Output Current (@230V)	16 A	17.4A	21.7A	26.1A
Max. Input Current from Grid	16 A	17.4A	21.7A	26.1A
Power Factor at Rated Power	>0.99			
Adjustable Power factor	0.8 leading - 0.8 lagging			
Total Harmonic Distortion	<3% at rated power			

AC OUTPUT (Back up*[1])				
Max. Output Apparent Power	3680VA*[2]	4000VA*[2]	5000VA*[2]	6000VA*[2]
Rated Output Voltage	230V, L/N/PE			
Rated Output Frequency	50Hz			
PROTECTION				
PV String Current Monitoring	Integrated			
PV Insulation Monitoring	Integrated			
Residual Current Monitoring	Integrated			
DC Reverse Polarity Protection	Integrated			
Anti-Islanding Protection	Integrated			
AC Short-circuit Protection	Integrated			
AC Overcurrent Protection	Integrated			
AC Overvoltage Protection	Integrated			
DC Switch	Integrated			
DC Surge Protection	Type II			
AC Surge Protection	Type III			
EFFICIENCY				
MPPT Efficiency	99.9%			
Max. Efficiency	97.1%			
European Efficiency	96.6%			
Max. Efficiency (BAT to AC)	97.1%			
Max. Efficiency (PV to BAT)	98.0%			
GENERAL				
Operating Temperature Range	-25°C~+60°C (Derating above +45°C)			
Relative Operating Humidity	0%-100% ,non-condensing			
Max. Operating Altitude	4000m			
Cooling Method	Natural Convection			
Topology	Non-isolated			
Noise emission	<30dB			
Degree of Protection	IP65			
Environmental category	4K4H			
Display	LED Indicator; WLAN+APP			
Communication	RS485 / CAN / Wi-Fi / LAN			
DC Connection	Phoenix XLIX (PV) / Weidmüller WM4 or MC4 Evo2 (Battery)			
AC Connection	Quick connection plug			
Dimensions (W×H×D)	605×445×165mm			
Weight	22kg			

Type of installation	Wall-mounting bracket			
Pollution Degree	3			
Overvoltage Category	II (DC) / III (AC)			
Protection Class	I			
PV, Battery and AC port	DVCC			
Communication port	DVCA			
Active Anti-islanding Method	Active frequency drift (AFD)			
Country of manufacture	China			
SAFETY / STANDARDS*3				
Safety	IEC62109-1&2			
Grid support regulation	AS/NZS4777.2	AS/NZS4777.2	AS/NZS4777.2	EN 50549-1, RD1699/661, G99, CEI 0-21, AS/NZS4777.2
EMC	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4, EN 61000-4-16, EN 61000-4-18, EN 61000-4-29			

* 1: Backup power output via RCT back-up power switch box;

* 2: Need to use 4~6 pcs power battery stacks;

* 3: Not all certifications & standards listed, check the official website for details.

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