



User's Manual

CPSHB300ETR

Cyber Power Systems, Inc.
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Contents

1 Information on this Manual.....	1
1.1 Validity.....	1
1.2 Target Group	1
1.3 Symbols Used.....	1
2 Safety	2
2.1 Intended Use.....	2
2.2 Safety Precautions	2
2.3 Assembly Warnings.....	3
2.4 Electrical Connection Warnings	4
2.5 Operation Warnings	4
2.6 Symbols on the Inverter	5
3 Product Description	6
3.1 CPS Hybrid PV Inverter Overview	6
3.2 Size and Weight.....	6
3.3 Transportation	7
3.4 Storage of Inverter	7
3.5 The Advantage of CPS Hybrid PV Inverters	7
4 Unpacking.....	8
5 Installation	9
5.1 Safety Instruction	9
5.2 Selecting the Installation Location.....	9
5.3 Electrical Connections	10
5.3.1 Safety.....	10
5.3.2 Wiring PV Input.....	10
5.3.3 Wiring External Battery Input.....	11
5.3.4 Wiring AC Output.....	13
6 Commissioning	13

6.1 Commission the Inverter	13
6.2 Operation Modes	14
6.3 Charge Current Setting	15
6.4 LEDs Indicators	16
7 Start-up and Shut-down the Inverter	19
7.1 Start-up the Inverter for On Grid Operation	19
7.2 USB Charger Only	19
7.3 Start-up the Inverter for Off Grid Operation	19
7.4 Shut-down the Inverter	20
8 Maintenance	21
8.1 Replace the Internal Batteries	21
8.2 Replace the Fuse	22
9 Decommissioning	23
9.1 Dismantling the Inverter	23
9.2 Packing the Inverter	23
9.3 Disposing of the Inverter	23
10 Specification	24
10.1 Specification of CPSHB300ETR	24
10.2 Torque Values	25
11 Contacts	26

Table of Figures

Fig. 2-1	Energy storage system	2
Fig. 3-1	Layout of CPSHB300ETR	6
Fig. 3-2	Dimensions of CPSHB300ETR	7
Fig. 4-1	Components included in the scope of deliver	8
Fig. 5-1	Permitted and prohibited installation positions	10
Fig. 5-2	Clearance space for installation	10
Fig. 5-3	Grid output and standalone output connections	11
Fig. 5-4	Connect PV connectors to inverter	12
Fig. 5-5	The location of extended battery connector	13
Fig. 7-1	Power flow of On-Grid operation	19
Fig. 7-2	Power flow of Off-Grid operation	20
Fig. 8-1	Procedure of replacing batteries	21
Fig. 8-2	Grid O/P fuse replacement	22

Table of Figures

Table	6-1 Charge current setting	15
Table	6-2 LEDs indicators for On Grid operation	16
Table	6-3 LEDs indicators for Off Grid operation.....	17
Table	10-1 Specification	24
Table	10-2 Torque values	25

1 Information on this Manual

1.1 Validity

This installation guide contains installation, commissioning, basic troubleshooting and tech-support contact information regarding CyberPower's *CPS Hybrid PV inverter CPSHB300ETR*

Using this guide, users will be able to install and operate the inverter rather easily. This manual does not cover any details regarding equipment connected to the inverter.

1.2 Target Group

This manual is most suitable for users who have basic knowledge around electricity and electrical devices.

Note: *CyberPower Systems, Inc.* will not inform users for any changes taken place within this guide.

1.3 Symbols Used

The following types of safety instructions and general information appear within this document:

Symbol	Description
	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	WARNING indicates a hazardous situation which, if not avoided, can result in death or serious injury.
	CAUTION indicates a hazardous situation which, if not avoided, can result in minor or moderate injury.
	NOTICE indicates a situation which, if not avoided, could result in property damage.
	Information that you must read and know to ensure optimal operation of the system.

2 Safety

2.1 Intended Use

The CPS Hybrid PV inverter can be used to convert photovoltaic energy to battery and/or to balance the attached load power. Please note, that charging the batteries takes presidency over all other functions! It can supply power to appliances when public grid is not available. The unit contains 2 x 12V/9Ah Sealed Lead Acid batteries in 24VDC configuration that can be expanded through the use of an external battery array. It also has a built-in USB charger that provides 2ports with 2A totally maximum, able to charge connected 5VDC USB devices, such as Smart Phones, Tablets, Cameras, etc.

Hybrid Energy Storage System Overview:

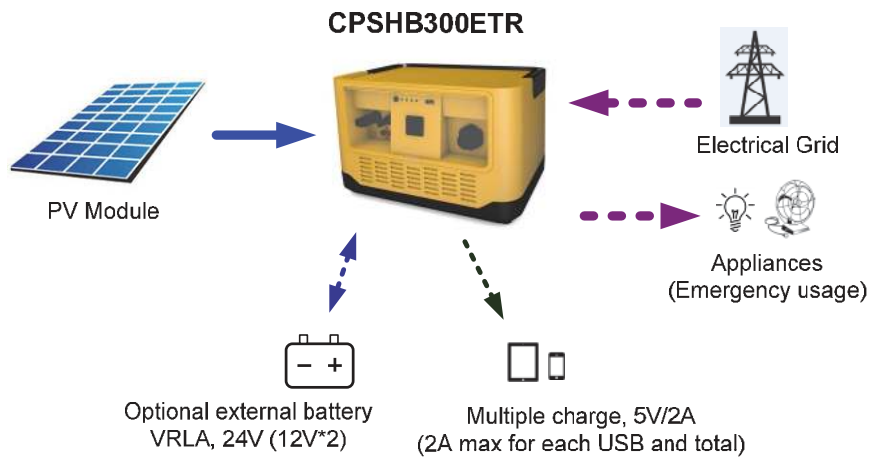


Fig. 2-1 Energy storage system

Like the above drawing indicates, a complete energy storage system consists of PV module, CPS hybrid PV inverter, public grid and other components.

2.2 Safety Precautions

The CPS hybrid series is designed and tested according to international safety requirements; however, certain safety precautions must be observed when installing and operating this inverter. Read and follow all instructions, cautions and warnings in this installation manual.

2.3 Assembly Warnings

 WARNING	➤ Prior to installation, inspect the unit to ensure absence of any transport or handling damage, which could affect insulation integrity or safety clearances; failure to do so could result in safety hazards. ➤ Unauthorized removal of necessary protections, improper use, incorrect installation and operation may lead to serious safety, shock hazards or equipment damage. ➤ In order to minimize the potential of a shock hazard due to hazardous voltages, cover the entire solar array with dark material prior to connecting the array to any equipment.
 CAUTION	Grounding the PV modules: Comply with the local requirements for grounding the PV modules and the PV generator. CyberPower recommends connecting the generator frame and other electrically conductive surfaces in a manner which ensures continuous conduction and ground these in order to have optimal protection of the system and personnel.

2.4 Electrical Connection Warnings

 WARNING	➤ Make all electrical connections (e.g. conductor termination, fuses, PE connection, etc.) in accordance with prevailing regulations. When working with the inverter powered on, adhere to all prevailing safety regulations to minimize risk of accidents. ➤ The unit may only be operated with PV generators (modules and cabling) with protective insulation. Do not connect any source of energy other than PV modules to the CPS hybrid inverter. ➤ Systems with inverters typically require additional control (e.g., switches, disconnects) or protective devices (e.g., fusing circuit breakers) depending upon the prevailing safety rules. ➤ Please read this manual carefully, the manufacturer or supplier is not responsible for damage caused by incorrect operation, installation, wiring, transport, etc.
 CAUTION	When energy flows into the house grid through the inverter, household devices or lighting consume that energy. Leftover energy may be fed into the public grid. If you choose this function and indeed there is left-over power fed into the public grid, depending on your connection, the energy consumption meter might be spinning backwards!

2.5 Operation Warnings

 WARNING	➤ Ensure all covers and doors are closed and secure during operation. ➤ Although designed to meet all safety requirements, some parts and surfaces of Inverter are still hot during operation. To reduce the risk of injury, do not touch the surfaces while Inverter is operating. ➤ Incorrect sizing of the PV plant may result in voltages being present which could destroy the inverter.
 CAUTION	➤ Anytime the inverter has been disconnected from the power network, use extreme caution as some components can retain charge sufficient to create a shock hazard; to minimize occurrence of such conditions, comply with all corresponding safety symbols and markings present on the unit and in this manual. ➤ In special cases, there may still be interference for the specified application area despite maintaining standardized emission limit values (e.g. when sensitive equipment is located at the setup location or when the setup location is near radio or television receivers). In this case, the operator is obliged to take proper action to rectify the situation.

2.6 Symbols on the Inverter

Symbol	Explanation
	Observe the documentation Observe all documentation supplied with product
	Danger to life due to high voltage There high voltage inside the product, don't open the enclosure or touch the live parts.
	Notice Install and operate the product must follow the manual and instruction, incorrect installation or operation may damage the product.
	Danger to life due to high voltage Prior to performing any work on the product, always disconnect it from all sources and wait for 2 minutes.
	Risk of burns The product's surfaces are hot during operation. Don't touch during operation.
	Don't dispose of the product together with the household waste. In accordance with the applicable disposal regulations for electronic waste.

3 Product Description

3.1 CPS Hybrid PV Inverter Overview

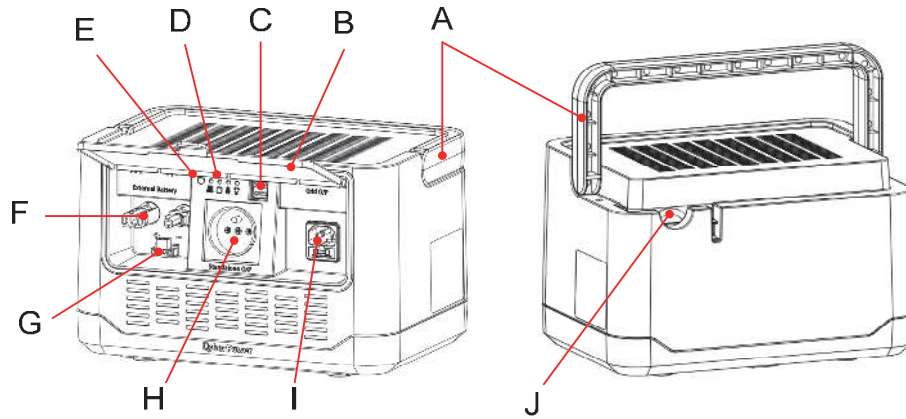


Fig. 3-1 Layout of CPSHB300ETR

Position	Description
A	Handle
B	Transparent Cover
C	USB Charger
D	LED Indicators (4 LEDs)
E	Operation Button
F	PV Input Connectors
G	External Battery Connector
H	AC-out Power Outlet
I	AC-in Power Outlet / GRID
J	Tool for Removing PV Connectors

3.2 Size and Weight

The dimensions of CPSHB300ETR as Fig. 3-2, the weight is 9kg includes batteries.

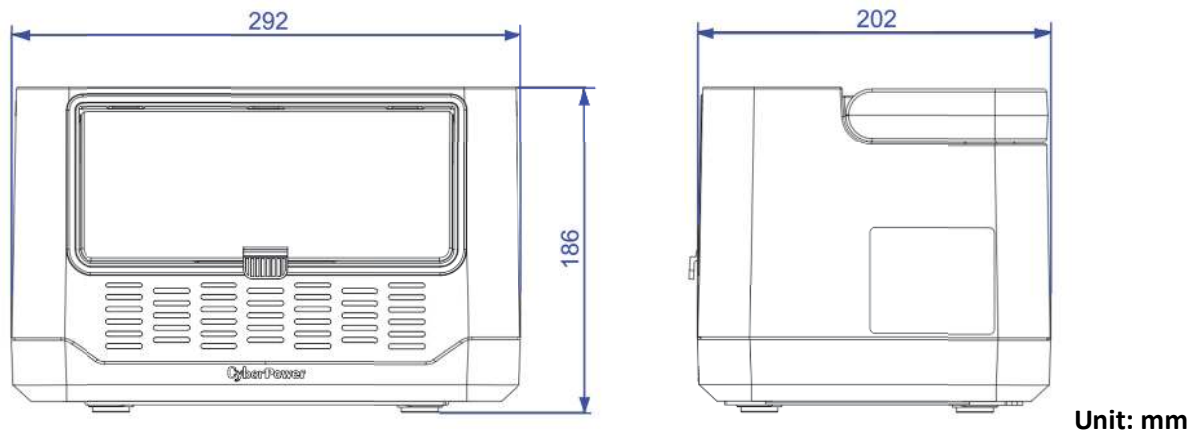


Fig. 3-2 Dimensions of CPSHB300ETR

3.3 Transportation

The inverter is thoroughly tested and inspected strictly before delivery. Our inverters leave our factory in proper electrical and mechanical condition. Special packaging ensures safe and careful transportation. However, transport damage may still occur. The shipping company is responsible in such cases. Thoroughly inspect the inverter upon delivery. Immediately notify the responsible shipping company if you discover any damage to the packaging which indicates that the inverter may have been damaged or if you discover any visible damage to the inverter. We will be glad to assist you, if required. When transporting the inverter, the original or equivalent packaging should be used.

3.4 Storage of Inverter

If you want to storage the inverter in your warehouse, you should choose an appropriate location to store the inverter.

- The unit must be stored in original package and desiccant must be left in the package.
- For the life and capacity of battery, the storage temperature should be always between -10 °C and +40 °C. And the storage relative humidity should be always between 0 and 95%.
- After long term storage, local installer or service department of CyberPower should perform a comprehensive test before installation

3.5 The Advantage of CPS Hybrid PV Inverters

Features of CPSHB300ETR are follows:

- User friendly handle, making carrying very convenient
- Very easy to install
- 2 USB charger ports with 2A maximum charging current in total *1
- Extendable battery capacity

*1 High power operation can cause high temperature and influence the charging current of USB, please keep light or no power from AC-Out outlet during USB charging operation.

4 Unpacking

Before opening packing, please note that whether there are any visible external damages.
After opening packing, please check the contents for completeness and for any visible external device damages. If there are any damages, or parts missing, please contact your dealer. Complete delivery should contain the following:

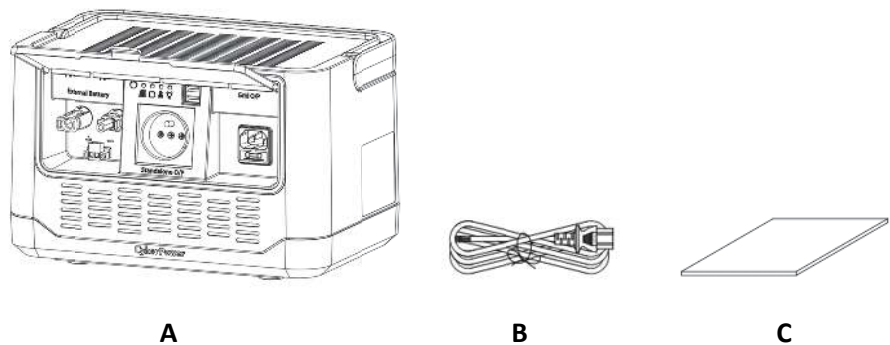


Fig. 4-1 Components included in the scope of deliver

Item	Quantity	Description
A	1	Hybrid PV Inverter
B	1	Power cord for AC connection
C	1	User manual & Warranty Card



Information

Even though packaging is made to be durable, please treat it gently and avoid tossing it around.

5 Installation

5.1 Safety Instruction

	Danger to life due to fire or explosion ➤ Despite careful construction, electrical devices can cause fires. ➤ Do not install the inverter on easily flammable materials and where flammable materials are stored.
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- Carefully remove the unit from its packaging and inspect for external damage. If you find any imperfections, please contact your local dealer.
- The PV input interface can only be connected with PV panel(s), and the external battery connector can only accept SLA battery types in 24VDC configuration.
- Disconnect whole connections before servicing.
- Do not connect this unit to an AC source or generator.
- When a photovoltaic panel is exposed to light, it generates a DC voltage. When connected to this equipment, a photovoltaic panel will charge the DC link capacitors.
- Energy stored in this equipment's DC link capacitors presents a risk of electric shock. Even after the unit is disconnected from the grid, external battery and photovoltaic panels, high voltages may still exist inside the inverter. Do not remove the casing until at least 2 minutes after disconnecting all power sources.
- Although designed to meet all safety requirements, some parts and surfaces of inverter are still hot during operation. To reduce the risk of injury, do not touch the surfaces of inverter during operation.

5.2 Selecting the Installation Location

The points below help you select a suitable installation location, thus avoiding any potential damages to both device and operators:

- 1) Obviously the location selected must be suitable for the inverters' dimensions, with room to spare.
- 2) Do not install the inverter on structures constructed of flammable or thermo labile materials.
- 3) Never install the inverter in environment of little or no air flow, nor dust environment.
- 4) The inverter must be installed indoors.
- 5) Do not expose the inverter to direct sunlight, in order to avoid the power and efficiency de-rating caused by excessive heating.
- 6) The humidity of the installation location should be 0~95% without condensation.
- 7) The ambient temperature of the inverter should be -10°C~+50°C.
- 8) The installation location must be freely and safely to get at all times.
- 9) Vertically installation only. Never install in horizontal positions, and avoid forward and sideways tilting; (*observe drawings below*)

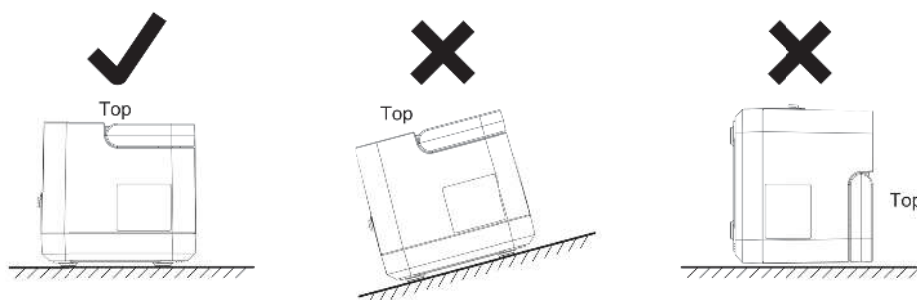


Fig. 5-1 Permitted and prohibited installation positions

- 10) Notice the minimum clearances of the inverter. (Refer to 3.3 Dimensions and Fig.5.2 Required Clearances).

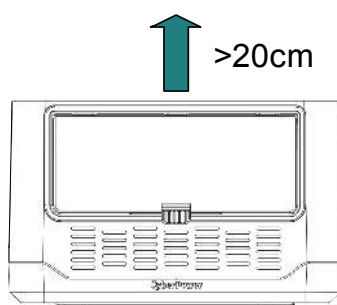


Fig. 5-2 Clearance space for installation

- 11) Do not install the inverter near TV antennas, or any other antennas and antenna cables.
12) Don not install in place where the children can easily reach.

5.3 Electrical Connections

5.3.1 Safety

	Danger to life due to lethal voltages! High voltages which may cause electric shocks are present in the conductive parts of the inverter. Prior to performing any work on the inverter, disconnect the inverter on the AC and DC sides
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5.3.2 Wiring PV Input

	To reduce the risk of electric shock, avoid touching the live components and treat the terminals carefully. NEVER connect or disconnect the DC connectors under load.
	Risk of damage to the inverter. If the voltage of the PV modules exceeds the maximum input voltage of the inverter, it can be destroyed by the overvoltage. This will void all

	warranty claims. Do not connect strings to the inverter that have an open-circuit voltage greater than the maximum input voltage of the inverter.
 Information	Please use the same brand male and female PV connectors. Under any conditions the total circuit current should never exceed the Max. Current.

Check the connection cables of the PV modules for correct polarity and make sure that the maximum open circuit voltage shall never exceed 50V.

- 1 The diagram drawing of DC side is shown as below, notice that the connectors are in pair (male and female connectors).
- 2 Check the DC connectors for correct polarity and connect them onto the inverter.

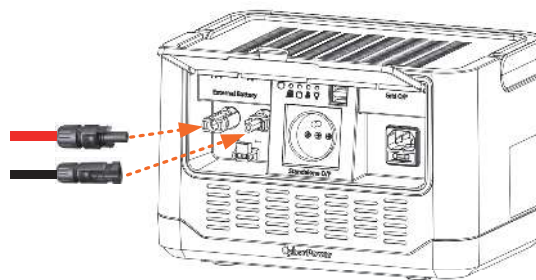


Fig. 5-3 Connect PV connectors to inverter

5.3.3 Wiring External Battery Input

 WARNING	To reduce the risk of electric shock, avoid touching the live components and treat the terminals carefully. NEVER connect or disconnect the connectors under load.
 NOTICE	Risk of damage to the inverter. If the voltage of the battery exceeds the maximum input voltage of the inverter, it can be destroyed by the overvoltage. This will void all warranty claims. If the polarity of battery is reversed connect, it can damage the inverter fuse and inverter can't operate anymore. Before connecting, make sure the polarity is correct. Battery type must be valve-regulated lead-acid battery
 NOTICE	Improper operation during the wiring process can cause fatal injury to operator or unrecoverable damage to the inverter.

- 1 Loosen the screw of battery connector by screwdriver and pull out the connector.
- 2 Tighten connector screws after you insert battery-wires to lock them into place. An **AWG14** wire type is recommended. Place the battery connector back to the inverter and tighten it into place.

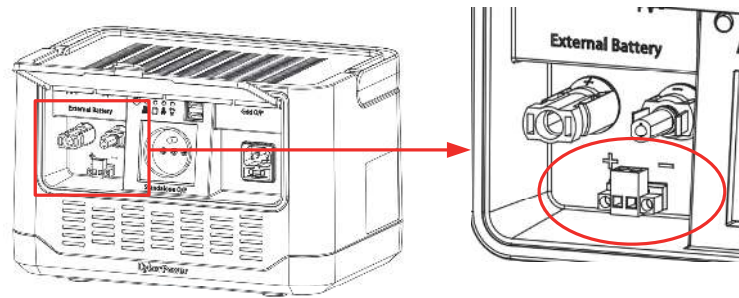


Fig. 5-4 Location of extended battery connector

5.3.4 Wiring AC Output

Conditions for the AC Connection

Measure the grid's voltage and frequency. It should be: (Voltage: 220~240VAC single-phase; Frequency: 50Hz/60Hz).

1. Open the transparent cover and plug in the AC power cord, the other end of power cord plug to electrical socket
2. Plug-in the load power cord if needed.

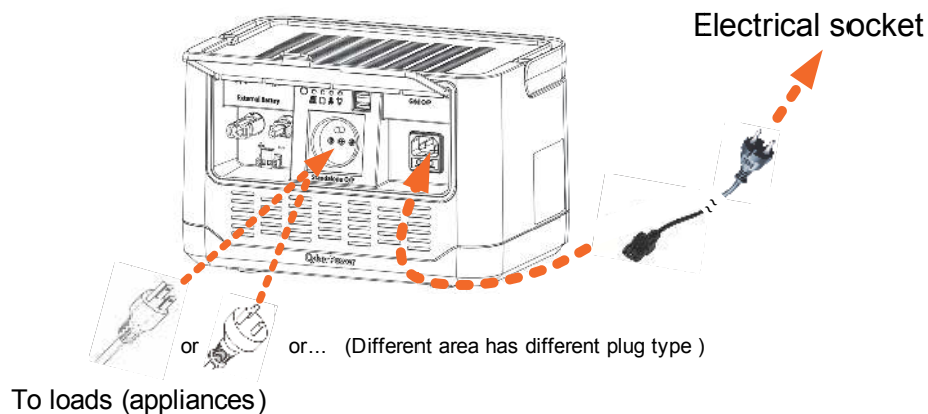


Fig. 5-5 Grid output and standalone output connections

6 Commissioning

6.1 Commission the Inverter

- 1) Remove the cover from the PV panel.
- 2) Check the PV and AC voltage.
- 3) If there's DC switch, turn it to ON position.

If the inverter is connected with PV panel and the input voltage is higher than 27Vdc, while the AC grid is not connected yet, LEDs will display as below. PV power would be transferred to charge the batteries.

	 PV >27V and <50V
	 (Off)

- 4) Connects inverter Grid O/P to electrical socket, it will bypass the Grid power to standalone output automatically.
- 5) Under normal operating conditions, the Grid LED turns green.

	 PV >27V and <50V
	

- 6) Plug in load to inverter standalone output, inverter will feed-in the residual power to Grid to balance the power consumption of load (If the residual power is more than load, inverter would reduce the input power to make the net power to Grid as zero).

6.2 Operation Modes

Self-consumption (On-Grid) Mode

In this mode, the inverter converts PV power to charging battery and/or to balance the load power consumption; Whenever the DC voltage is lower than 25Vdc, the inverter will work in waiting state and attempt to connect the grid by 5mins for <25Vdc and 30s for <16Vdc. In waiting state the inverter continuously monitors the internal system. Grid bypasses power to load directly.

Note: The inverter starts up automatically when DC power from the PV panel is sufficient.

Off Grid Mode

In this mode, whenever the PV or Battery has sufficient power, the inverter converts PV and/or battery power to loads when Grid power is no available.

Fault Mode

The internal intelligent controller can continuously monitor and adjust the system state. If inverter finds any fault conditions, inverter would shutdown immediately

Bypass Mode

When no PV power during On Grid operation, inverter off internal switch but keep bypass relay on to continuously supply loads power from Grid directly.

Charger Mode

If user doesn't want On-Grid, bypass or Off-Grid operation, wants all PV power to charge battery. Either one of below ways can make inverter stay in charger mode.

- Disconnect Grid O/P and Standalone, power on PV power.
- Press and hold button for 3s during operation (inverter would back to On-Grid operation after PV power off and on) if Grid is available.

Sleeping Mode

User can off inverter by press and hold the button for 3s during inverter operation. In this mode, inverter off all LEDs to save energy but keep monitoring the internal system for quickly going back to normal operation. When PV power comes back, inverter will enter charger mode automatically. When PV power is gone, inverter will enter shutdown mode.

Shutdown Mode

Inverter automatically stop running during no PV power and low battery. In shutdown mode the inverters take no power from panel and battery. If Grid is available, the inner charger would continuously charge battery but without any LED indicator. If user wants to check the capacity of battery in this mode, can press the button and see the battery LED color.

De-rating mode

When temperature high or PV voltage >38Vdc, the inverter will de-rate its output power.

6.3 Charge Current Setting

 NOTICE	Risk of damage to the inverter Adjust the charge current according the total Ah value of battery and don't more than 0.3C (ex. Set 2Amax for 9Ah, 6Amax for 20Ah). Larger charge current to lower capacity battery can reduce the life of battery.
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User can set the charge current as 1/2/3/5/7/9A (default is 1A).

Note: The charger power comes from PV. Larger charge current would reduce the feeding power to Grid and/or loads.

Procedure for changing charge current,

Press and hold the button. → 3s later, inverter shutdown and all LEDs are red → Another 3s later, all LEDs are green → Another 3s later, BAT LED is blinking with green and the other LEDs are orange, release the button immediately. → PV LED on green and red alternately, means inverter stay in setting mode.

Note: It is not able to enter setting mode if user don't release the button within 4s when all LEDs are orange, must release the button and redo the procedures.

Now, user can change the charge current by pressing button (refer to Table 6-1 for the setting).

Table 6-1 Charge current setting

 PV Panel	 Battery	 AC/On-Grid	 Off-Grid	Charge Current
 Green and Red alternately			 Orange	1A
		 Orange		2A
		 Orange	 Orange	3A
				5A

	Orange			
	 Orange		 Orange	7A
	 Orange	 Orange	 Orange	9A

Procedure for confirming charge current setting and exiting setting mode,

When the charge current setting is changed to what user wants. → Press and hold the button → 3s later, inverter confirms the setting and exit setting mode, jump to Sleep mode and all LEDs off. → When all LEDs are Green, release the button immediately. → Inverter goes back to normal operation.

6.4 LEDs Indicators

Inverter has 4 LEDs. They are: PV, Battery, On Grid, and Off Grid.

The LEDs would display Green, Red, or Orange to indicate Status or Operation modes.

Table 6-2 LEDs indicators for On-Grid (Self-consumption or Bypass) operation

Flash frequency (on/off): ☀: 2s/1s; ☀☀: 0.5s/0.5s; ☀☀☀: 0.2s/0.2s

Status	 PV Panel	 Battery	 AC/On-Grid	 Off-Grid	Explanation
Countdown	 Green	Depend on the status of charge, refer to next row	 Green Flash	 Off	Countdown and prepare to On-Grid operation
Normally operating	 Green	 Green	 Green	 Off	Operating normally with battery capacity $\geq 75\%$
		 Green with slowly flashing			Operating normally with battery capacity between 50% and 75% and under charging
		 Orange with slowly flashing			Operating normally with battery capacity between 25% and 50% and under charging $< 24.5\text{Vdc}$ and $\geq 23\text{Vdc}$ and charging

		 Red with Slowly flashing			Operating normally with battery <25% and under charging
		 Red			Operating normally with failed or no battery
Bypass Operation	 Off	Depends on the status of charge	 Green	 Off	The load power is fully supplied from Grid
Fault	 Orange	Depends on the status of charge	 Off	 Off	PV panel is over voltage
	 Off		 Off	 Off	PV panel is under voltage
	 Red		 Off	 Off	Array impedance is too low
	Any		 Orange	 Off	Grid is abnormal
	Any		 Red	 Off	Internal fault occurs (ex. CT test fail, relay test fail, etc.)

Table 6-3 LEDs indicators for Off Grid operation

Flash frequency (on/off): : 2s/1s; : 0.5s/0.5s; : 0.2s/0.2s

Status	 PV Panel	 Battery	 AC/On-Grid	 Off-Grid	Explanation
Countdown	 Green  Off	Depend on the status of battery	 Orange  Off	 Green Flash	Countdown and self-test for Off Grid operation
Output power from PV and battery	 Green	*A, *B	 Off	 Green	Operating normally, supply power from PV and battery to loads

Output power from battery, without PV	 Off	 Green with fast flashing	 Orange	 Green	Operating normally with battery $\geq 75\%$ and under discharging
		 Orange with fast flashing	 Off		Operating normally with battery 25~75% and under discharging
		 Red with fast flashing	 Orange  Off	 Green	Operating normally with battery <25% and under discharging
Abnormal condition or fault	 Orange	(*A)	 Orange  Off	 Off	PV panel voltage > 50V
	 Green  Off	(*A, *B)	 Orange  Off	 Orange	Inverter is operating with over load, output power > 240W or 300VA
		(*A)		 Red	Inverter is Off: A Fault, or Over-Load, or Low-Battery condition has Occurred
		 Red		 Off	Battery Fault, No battery or voltage is > 31Vdc
		 Red		 Red	Low battery, a. <20V if Pout > 100W b. <21V if Pout 30-100W c. <22V if Pout <30W

(*A) -> Color: depend on the remaining capacity.

(*B) -> Flashing frequency: charging is slow, discharging is fast.

(*C) -> If Off-Grid operation transfers from On-Grid mode and Grid is abnormal.

7 Start-up and Shut-down the Inverter

7.1 Start-up the Inverter for On Grid Operation

1. Connect AC power cord from inverter's AC-In to the wall's electrical socket.
2. Connect Output to attached Load (ex. Appliances).
3. When exposing PV panel under sunlight, the inverter will start working automatically if input voltage is higher than 27Vdc.

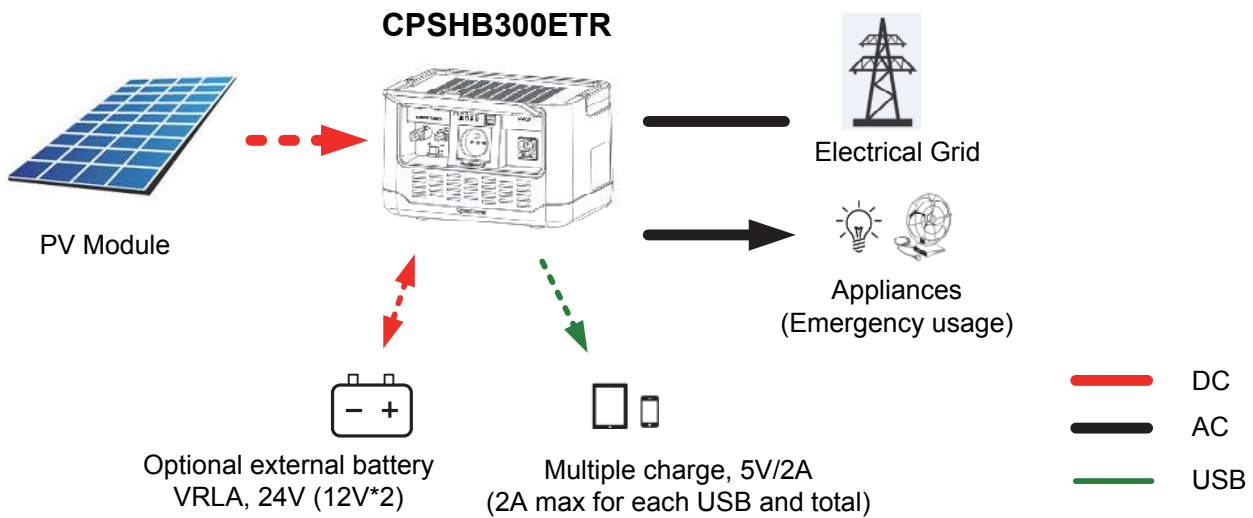


Fig. 7-1 Power flow of On-Grid operation

7.2 USB Charger Only

With PV power,

When PV voltage has sufficient power, USB charger will automatically operate.

Without PV power,

1. Make sure the inverter is staying in shutdown mode.
2. Disconnect Off-Grid plug.
3. Press and hold the button until all LEDs are green, it takes around 1-2s (release the button immediately when the LEDs are green).
4. USB charger starts to operate.

7.3 Start-up the Inverter for Off Grid Operation

With PV power,

1. Disconnect inverter Grid plug.
2. Turn on the DC switch or connect PV connectors, press and hold the button of inverter until Off-Grid LED is green (release the button immediately when that LED is green).
3. Inverter will start Off-Grid operation if the input voltage is higher than 27V or battery voltage is

higher than 22V.

Without PV power,

1. Disconnect inverter Grid O/P plug.
2. Press and hold the button until all LEDs are green in order to wake up inverter, (takes about 1-2s), and then release the button immediately.
3. Wait until the Battery LED is ON, and the others are OFF.
4. Press and hold the button again until Off-Grid LED is flashing, (takes around 3s), and then release the button immediately.
5. The inverter supplies power to Standalone O/P outlet if the battery voltage is higher than 22V.

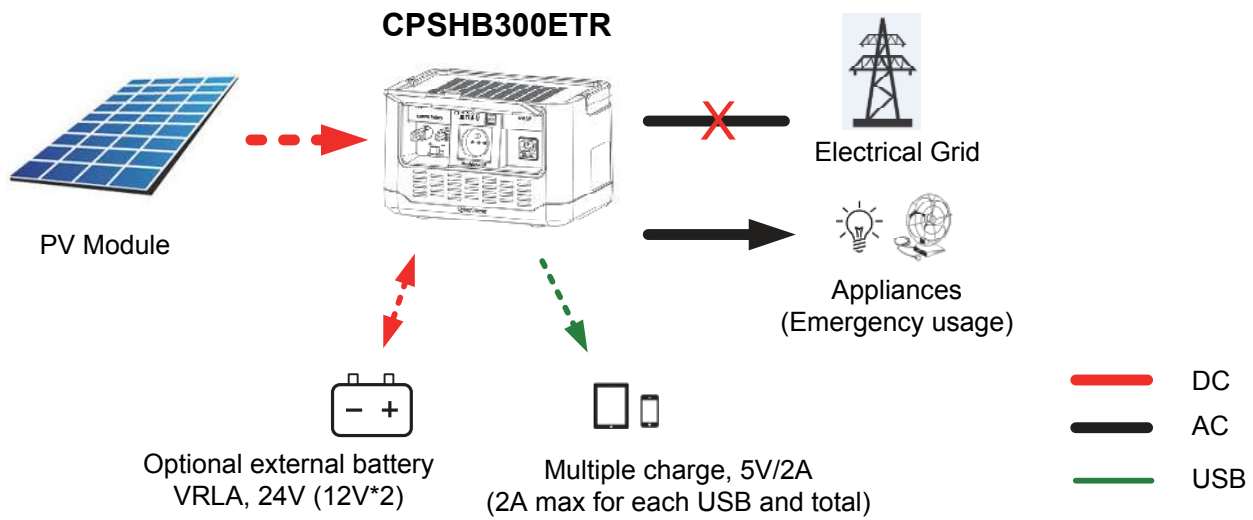


Fig. 7-2 Power flow of Off-Grid operation

7.4 Shut-down the Inverter

1. If inverter is operating, press and hold the button until all LEDs are red, it takes around 3 seconds.
2. Disconnect the AC/Grid power cord.
3. Disconnect all PV connectors.
4. When all LEDs are OFF, the inverter will totally shutdown.

8 Maintenance

Once the internal battery's discharge time is much lower than expected (< 10/30 minutes at 240W/120W load respectively), it is recommended to replace the battery.

If the inverter always shows a Grid abnormal LED, please check the fuse inside the socket of AC-In/Grid module. If damaged please and replace it with a same rating one..

8.1 Replace the Internal Batteries

 DANGER	Danger to life due to high voltage Prior to performing any work on the product, always disconnect it from all sources and wait for 2 minutes at least.
 CAUTION	Hot surface The inverter may be hot during operation. Before touching the inverter, shutdown and wait for 20minutes.
 NOTICE	Risk of damage to the inverter Note the polarity of connection, reverse connection can cause fuse open and inverter can't operate.

1. Turn the unit off and disconnect all connections: AC, PV, attached load, and external battery connections; wait for at least 2minutes for any internal charge to dissipate.
2. Invert the unit and remove the 4-screws from the battery's cover; (Fig. 8-1a).
3. Slide the cover towards front and lift it up; (Fig. 8-1b).
4. Turn the batteries to bring up their connectors; (Fig. 8-1c & d).

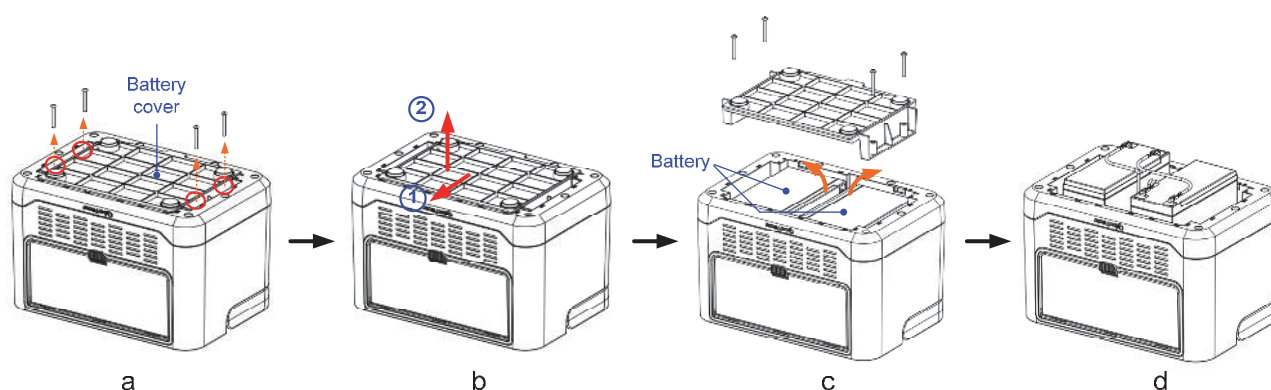


Fig. 8-1 Procedure of replacing batteries

5. Disconnect the 2 batteries from inverter and replace them with new ones.
6. Connect the new batteries to inverter, notice the polarity!
7. Assemble the inverter in reverse order.

8.2 Replace the Fuse

 DANGER	Danger to life due to high voltage Prior to performing any work on the product, always disconnect it from all sources and wait for 2 minutes at least.
 CAUTION	Hot surface The inverter may be hot during operation. Before touching the inverter, shutdown and wait for 20 minutes.

1. Turn the unit off and disconnect all connections: AC, PV, attached load, and external battery connections; wait for at least 2 minutes for any internal charge to dissipate.
2. Pull out the fuse holder underneath the AC/Grid socket.
3. Replace the broken fuse with new one. Note the rating must be 6.3A/250V
4. Place the fuse assembly back into the AC/Grid socket.

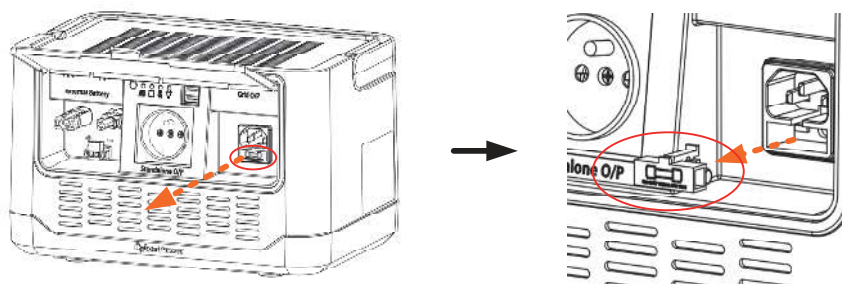


Fig. 8-2 Grid O/P fuse replacement

9 Decommissioning

9.1 Dismantling the Inverter



CAUTION

Danger of burn injuries due to hot enclosure parts

Wait 20 minutes before disassembling until the housing has cooled down.

1. Disconnect the inverter as described in section 7.
2. Remove all connection cables from the inverter.

9.2 Packing the Inverter

If possible, always pack the inverter in its original carton and secure it with tension belts. If it is no longer available, you can also use an equivalent carton. The box must be capable of being closed completely and made to support both the weight and the size of the inverter.

9.3 Disposing of the Inverter



Do not dispose of faulty inverters or accessories together with household waste. Please accordance with the disposal regulations for electronic waste which apply at the installation site at that time. Ensure that the old unit and, where applicable, any accessories are disposed of in a proper manner.

10 Specification

10.1 Specification of CPSHB300ETR

Table 10-1 Specification

	CPSHB300ETR
PV Input	
Max. input power	310W
Absolute max. input voltage	50Vdc
Full power voltage range	34-38Vdc
Operating voltage range	28-48Vdc
Rated input voltage	36Vdc
Max. input current	9Adc
MPP Tracker	1
Measurements deviation	Voltage: <2% Current: <2% Power: <3%
Battery Input (internal)	
Battery type	VRLA rechargeable battery
Operating voltage range	20-28.8Vdc
Nominal voltage	24Vdc (12Vdc*2)
Nominal Capacity	9Ah
Shutdown voltage	20V for >100W 21V for 30-100W 22V for <30W
Measurements deviation	Voltage: <2% Current: <2% Power: <3%
USB Charger	
Nominal charge power	10W
Nominal voltage	5Vdc
Number of USB port	2
Max. charge current	2A/2A (per port/total)
Grid (AC)	
Nominal voltage	230Vac, single phase
Frequency range	50/60Hz $\pm$ 0.3Hz
Voltage range	-10%/+10%
Max. current bypass to load	3A

Off-Grid Output (AC)	
Nominal power	240W/300VA
Nominal voltage	230Vac, single phase
Nominal frequency	50/60Hz (default is 50Hz)
Overload capacity	105-125%, 1 minute 125-150%, 30 seconds >150%, immediately
Regulation	
Safety	IEC 62109-1/-2 IEC62040-1
EMC	IEC 61000-6-1 IEC 61000-6-3
General	
Indicator	PV/Battery/On-Grid/Off-Grid LEDs
Button	One button for ON, off, and select functions
Operation temperature range	-10-50°C (de-rating above 40°C)
Storage temperature	-20-40°C
Relative humidity	0-95%
Operating elevation	0-2000m (0-6666ft)
Cooling	Natural convection
Mechanical	
Dimension (W*H*D, mm)	292*186*202
Weight	9kg
Package dimension (W*H*D, mm)	380*305*290

10.2 Torque Values

Table 10-2 Torque values

Battery cover screws	10kgf.cm (0.98N.m)
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11 Contacts

If you have technical problems concerning our products, contact your installer or CyberPower. During inquiring, please provide below information:

1. Model Name
2. Serial Number
3. Detailed Error Description

Cyber Power Systems, Inc.

www.cyberpower.com

Note

Note

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