

2400W Balcony Energy Storage Off/grid Hybrid Inverter User Manual



1. Preface

Welcome to choose our balcony energy storage hybrid inverter, The small hybrid inverter has all the functions of home energy storage inverter, off grid, and grid connected hybrid inverters, including: mains charging, solar energy Charging, off grid inverter with load, UPS, grid connection, parallel operation, independent usage, AC coupling and other functions.

The product scheme is derived from the household off grid hybrid energy storage inverter and has comprehensive functions, application is for such as balcony, garden energy storage, it's DIY product, plug and play design, big saving on installation and maintenance costs.

Balcony energy storage system, including small hybrid inverter and batteries, through this system, the energy conversion can be achieved, to provide energy for home applicants, meanwhile store excess energy into battery. additional users can control the energy usage through a mobile app based on your actual electricity needs.

Statement

- a. The manual provides a detailed description for small off grid hybrid inverter, before installation and operation, please read the manual carefully. If product is damaged by improper operation or exceeding the usage conditions which is specified in the manual, our company will not take responsibility.
- b. Our company has the right to modify the content of the manual without notice

2. Product features

- **Super fast charging**

Charge/inverter integrated bidirectional conversion, charging/inverter power, can be set.

- **Efficient MPPT**

MPPT tracking efficiency reaches 99.9%, with a maximum power of 800w * 2.

- **Grid connection**

Equipped with grid connection function, the grid connection power can be set, suitable for balcony energy storage application scenarios, meanwhile supply the load together with mains (support independent usage).

- **Phase connection**

Three inverters can form a three-phase system, and more than two inverters can be parallel use to increase the power.

- **Excellent load adaptability**

Output is 220/230/240V, 50/60Hz sine wave, strong overload capacity, suitable for various IT equipment, electric tools, household appliances, etc.

- **Ultra wide input voltage frequency range**

Extremely wide input voltage range is 90-280Vac (230V system) and frequency input range is 40-70Hz, high tolerance for harsh power environment (when used in grid connection).

- **Use DSP digital control technology**

Adopting advanced DSP digital control technology, multiple protection functions, stable and reliable

- **Set working mode, grid connection time, and power by mobile app**

Equipped with WiFi/Bluetooth for remote connection to cloud platform

- **Charging mode output protection**

In the mains charging mode, the output is controllable and can be completely switch off output

- **Battery under voltage wake-up (mains wake-up and MPPT wake-up)**

Due to long time discharge at outdoor application, meanwhile no charging in time, battery is empty, so need wake up for charging to ensure normal operation.

- **High efficiency of charging and discharging**

Adopting advanced technology design, low loss, low heat generation, saving battery power, and prolonging discharge time

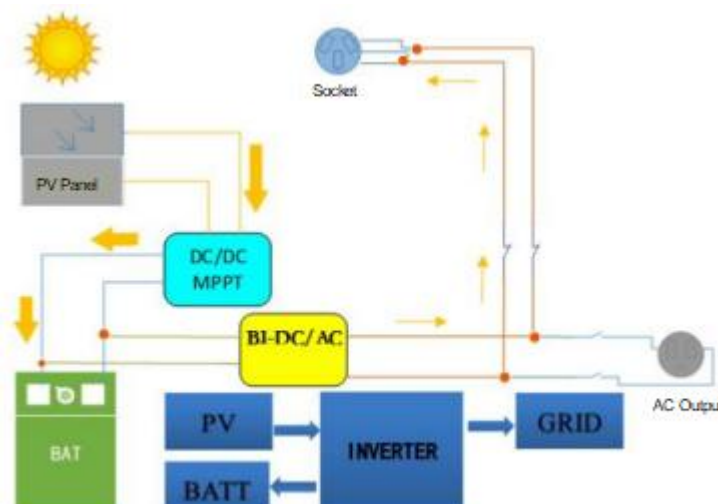
- **Reliable product design**

IP65 high protection design, avoiding environmental erosion, waterproof, rodent and insect resistant

3. Working mode

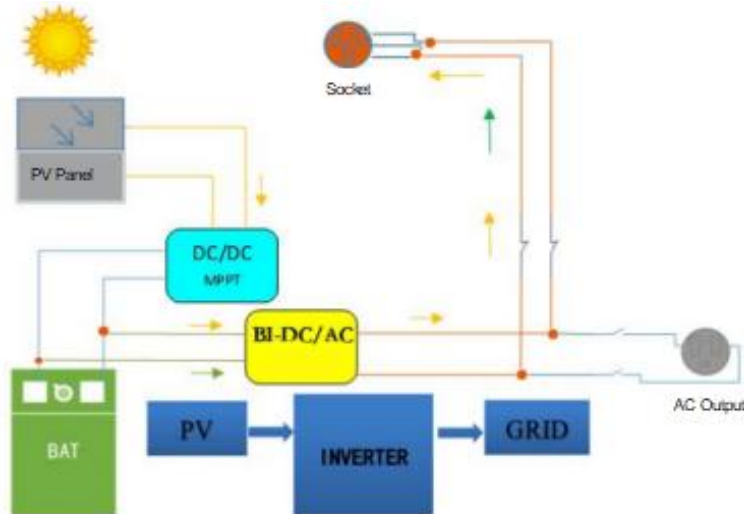
- **PV panels charge the battery**

When there is sunlight during the day and the battery level is low, the photovoltaic panel charges the battery through MPPT



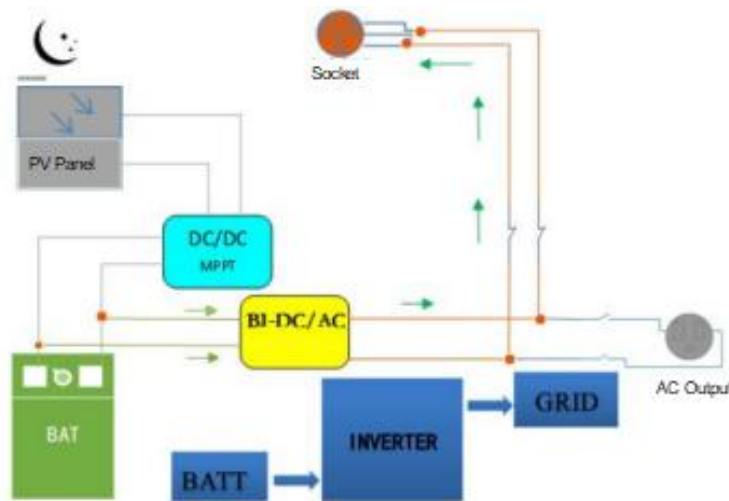
- **PV grid connected power generation**

When there is sunlight during the day and the battery is fully charged, the photovoltaic panel generated energy through MPPT and DCAC inverter going to grid, entering the power generation mode



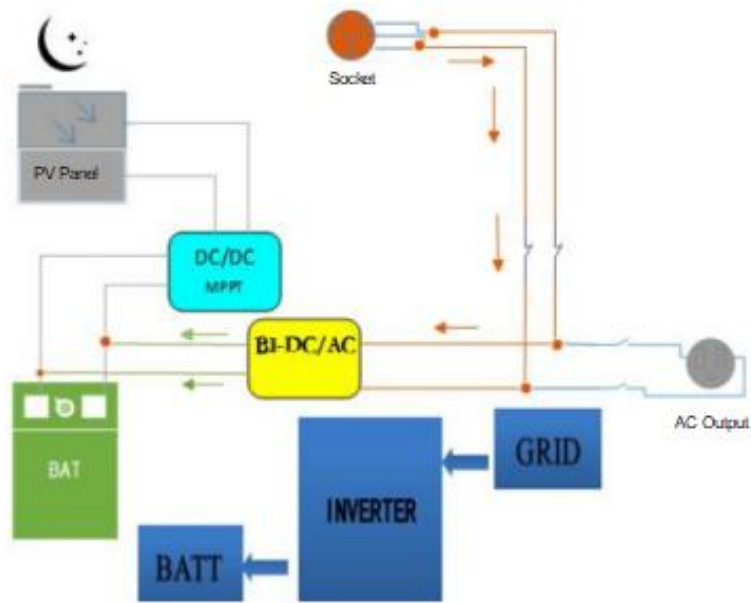
- **Grid connected battery power generation**

At night, there is no sunlight, the battery stored electricity is connected to the power grid through DCAC inverter, entering power generation mode, the power can be set through APP



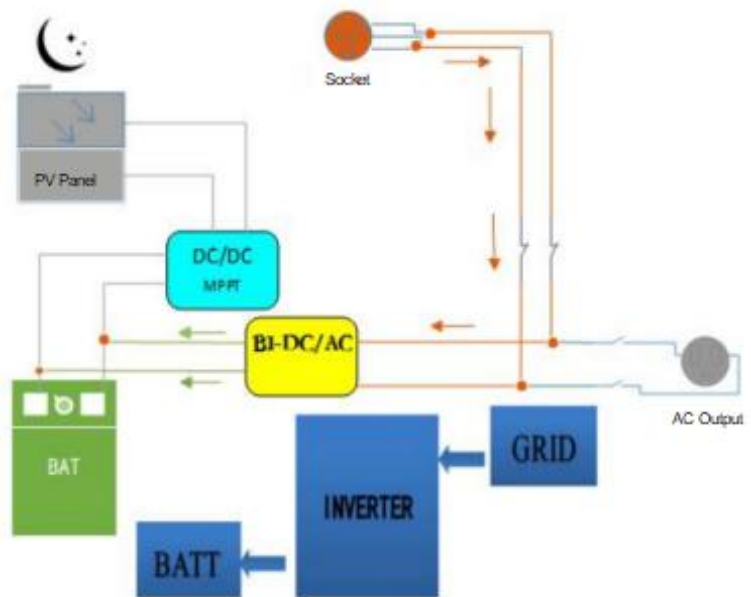
- **Mains charging**

When the battery level is low at night or in cloudy or in raining weather, meanwhile the electricity price is at a low point, the mains electricity charges the battery through Bi-DC/AC bidirectional inverter, and then generate energy, connect to grid when the electricity price is high for cost saving, (including daytime interaction with rooftop photovoltaic grid connected inverters or micro inverter AC coupling)



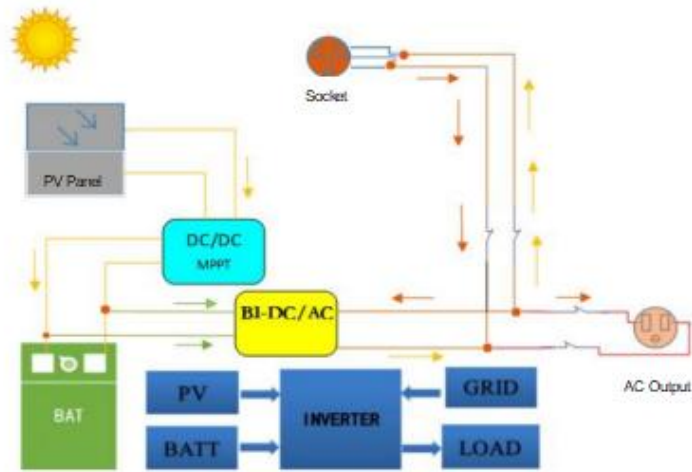
- **Photovoltaic and mains charging together**

When it is urgently needed as a backup power source but the battery level is low, the photovoltaic panel and mains power are used together to charge the battery.



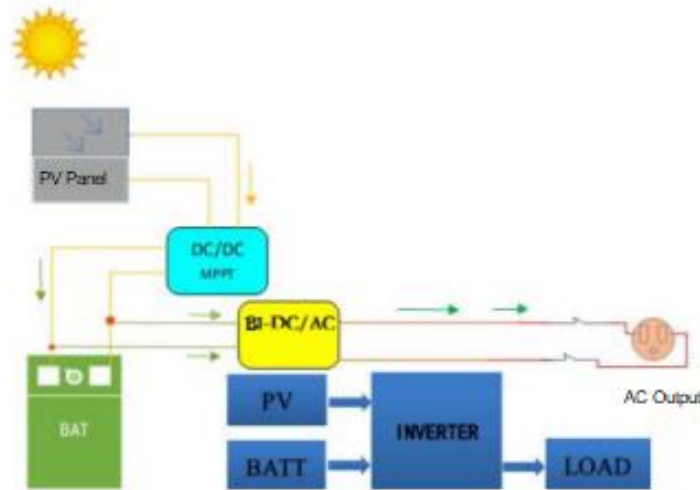
- **Used as UPS**

To ensure the power supply of critical loads, the system is used as a UPS, when used as a UPS, grid connection or charging can also be set according to the needs.



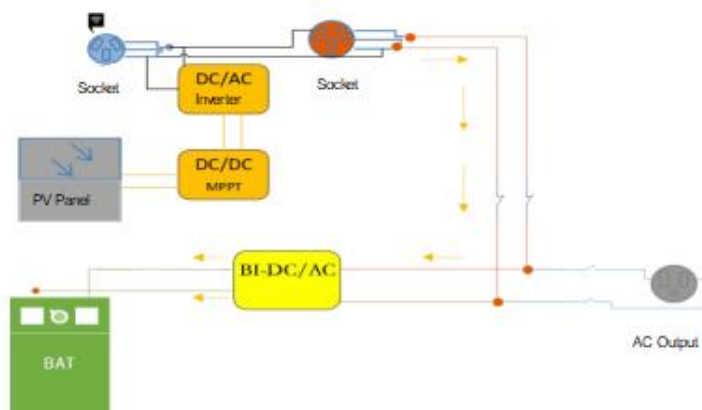
- **Used as a portable energy storage outdoor power source**

When used at outdoors, photovoltaic panels can be used to charge the battery, and at the same time, the battery provides AC power through DCAC inverter for electrical equipment.



- **AC coupled household energy storage usage (off grid and connect grid use)**

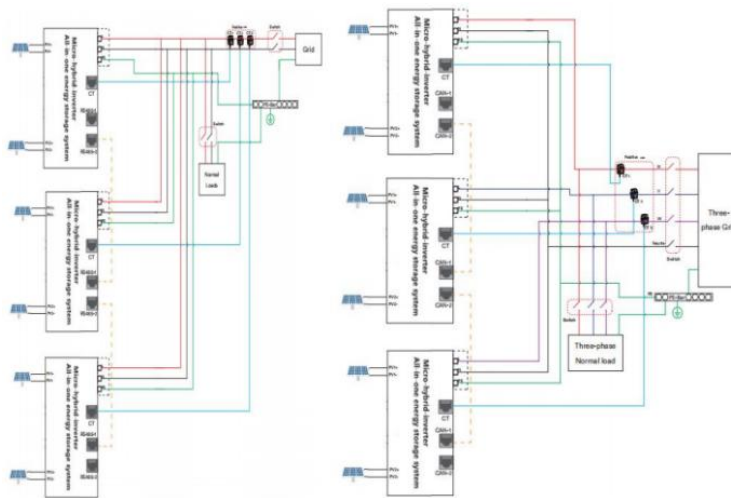
Coupled with rooftop photovoltaic or balcony micro inverter to achieve household energy storage use



- **Split phase mode**

When there are the following requirements, parallel or phase separation connection can be used

- There are a lot of photovoltaic panels available (which can be placed in multiple locations), and they can be grouped and connected for both grid connected and off grid applications.
- Power consumption is high when off grid, inverter can be paralleled to expanded output power according to power needs.
- This product can also be used in phases, when there are three or more units, it can form a three-phase system to meet the high-power loads need
- Multiple placement positions, convenient for phase separation connection.



4. Parameter

Model	Light-elf4824V16 * 2-100
Rated power	2400VA/2400W
Peak power	4800W
Machine architecture	bidirectional AC/DC inverter/buck-boost MPPT
Input/output phase number	single-phase input/single-phase output
Working mode	<p>Automatic charging: Connect to the mains to automatically charge the battery, and connect to the photovoltaic system to automatically charge the battery</p> <p>Automatic inverter discharge: manually start the battery discharge for inverter AC output, automatically connect to the grid</p> <p>Off grid uninterruptible power supply mode (UPS): AC directly supply from mains power, automatically switching of inverter power supply after mains power interruption (typical value</p>

		10ms)
Output	Number of output lines	single-phase two lines (L, N)+protective ground
	Rated voltage	220/230/240VAC
	Output voltage accuracy	± 1%
	Output frequency	50/60Hz ±0.1% (adjustable, automatically detecting mains frequency)
	Output waveform	pure sine wave
	Output distortion(THDV%)	<2% (linear load) <7% (nonlinear load)
	Overload capacity	5 minutes @ 102%~120% rated load 10s@120 %~150% rated load 5S @>150% rated load
Efficiency	Mains charging (AC ->battery)	93%
	Battery discharge (battery ->AC)	92%
	MPPT	99.9%
	PV charging efficiency	96%
Energy saving mode		<20W (with output but no load)
Shutdown leakage current		<100uA
Mains input	Number of input lines	single-phase two lines (L, N)+protective ground
	Input voltage range	L, N voltage: 184Vac~253Vac
	Input frequency range	48Hz-51Hz
	Input power factor	≥ 0.95
Battery and charging	Rated voltage	48V
	Battery type	Lithium iron phosphate 16 series, ternary 14 series
	Charging control methods	pre charging, constant current, constant voltage, uniform charging, float charging, shutdown
	Charging termination voltage	56.8V/continuously adjustable
	Discharge termination voltage	44V/continuously adjustable
	Charging current	The maximum is 40A, which can be digitally set, with a default of 20A
	Pre charge current	1.5A
	Charging control command	charging termination voltage, charging current, charging enable, charging full, battery failure, battery temperature, charging mode switch
Protection functions		overload protection, over temperature protection, input over voltage protection, input under voltage protection, over charge protection, and over discharge protection
Solar charging	PV maximum input power	800W * 2
	PV maximum open circuit voltage	100VDC
	PV working voltage range	10~100VDC
	PV input current	PV connected to MPPT working mode, 16Amax
	MPPT quantity	2
	PV charging current	0-16A * 2

Grid connection	Function available	Grid connection power can be set to 0-1600W (the default power for grid connection is less than 800W, and it has anti backflow function, can realize power is generated for self usage only)
Man-machine interface	APP	Mobile APP manage and control of grid connection time and power
	Communication interface	Switch on/off instruction, RS485, CAN communication
	LCD display screen (optional)	displays input and output voltage, frequency, load percentage, PV voltage and current, working mode, and machine status
Environmental parameters	Working temperature range	-20°C~+55°C
	Working humidity range	0-98% (without condensation)
	heat dissipation and cooling	External fan
	Noise	<45dB
	Protection level	IP65
Structure	Size	380mm * 260mm * 90mm
	Weight (kg)	7.5kg
Insulation		isolation voltage withstand battery and AC terminal insulation voltage withstand: 4242VDC leakage current<1mA
Safety regulations and EMC standards		IEC/EN 62109-1, IEC/EN 62109-2, IEC/EN 61000-6-1/-2/-3/-4, IEC/EN 61000-3-2/-3, VDE4105, UL 1741, UL 62109, PCC Class B

5. Safety instructions for usage

a. Unpacking

Check if the module has been damaged during transportation, keep the packaging materials until the module units have been registered and inspected.

b. General rules

- The air flow for the module unit should not be obstructed.
- The distance between any conductive part of the module and the metal components must comply with relevant safety standards.

c. Safety protection

- Once the safety protection of the module is damaged, it must stop working and refer to relevant maintenance for handling.
- When change the module from a cold environment to a warm environment, condensation may cause dangerous problems, so grounding requirements must be strict execution, qualified personnel are required to connect the module to the power grid.
- After switch off power supply, requires a 5-minutes for sufficient discharge time for the capacitor before

maintenance can be carried out on the module.

d. Precautions

- The module should be used under the environmental conditions specified in the manual.
- During using, the module should be kept in good ventilation and heat dissipation, If smoke or unpleasant odor is found during startup or use, turn off the power immediately.
- The input power supply and power equipment must be connected in series with a fuse.

e. Packaging

The packaging box contains the product name, model, manufacturer identification, inspection certificate from the manufacturer's quality department, manufacturing date, etc; Inside the packaging box, There is a product testing report and an attachment list.

f. Transportation

Package is suitable for transportation by car, boat, and airplane, but it should be covered with canopy, sun protection, and civilized handling for loading and unloading during transportation.

g. Storage

When the product is not in use, it should be placed in the packaging box. The warehouse environment temperature is $-40\sim+70$ °C, and the relative humidity is 5%~90%. In the warehouse, it is not allowed to have harmful gases, flammable, explosive products, and corrosive chemical products, meanwhile without strong mechanical vibration, impact, and strong magnetic field effect.

The packaging box should be placed at least 20cm above the ground and at least 50cm away from walls, heat sources, and window, The storage period is one year under the condition, it should be re inspected if exceed one year.

h. Warranty

During the warranty period of this product (based on the business contract, default to one year), company will take responsibility free repair if any natural damage under normal use. But the warrant will be excluded if any following situations is happened

- Damage is caused by unauthorized repair without the permission of our company.
- Any modification.
- Incorrect operation or use.
- Abnormal environmental conditions exceeding specifications, resulting in damage.
- Intentional destruction caused by human
- Damage is caused by uncontrollable natural disasters.

i. Safety instructions for operation

Regardless of the circumstances, such as operation, cleaning, or maintenance, please be sure to follow the safety regulations specified below. Any violation may result in exceeding the safety concerns of the original design and manufacturing, our company will not be responsible. not allowed operate in environments with volatile gases or flammable substances.

After using the fan for a period of time, if there is a lot of dust on the mesh, it is necessary to do dust removal treatment, otherwise there may cause module overheating and load reduction, rust in shorten the service life of the product.

6. APP set up

6.1. Installation on your Smartphone

Scan below QR code to download the APP on your Smartphone and complete the installation by creating and confirming your own user account.



6.2. Illustration

