HIGH FREQUENCY INVERTER CHARGER USER MANUAL

GUIDE OFFACILITY,START-UPANDTROUBLESHOOTING

The Must Inverter Charger of the rangePV18It is characterized by:

- Pure sine wave inverter.
- With built-in PWM or MPPT charge regulator.
- With 30 or 60A battery charger depending on the version.
- Multifunction LCD display.
- Compatibility with all types of batteries.
- Support for remote WiFi monitoring.

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3000VA 24V

5000VA 48V

ABOUT THE MANUAL

Aim

This manual describes the assembly, installation, and troubleshooting instructions for this device. Read this manual carefully before beginning the installation. Keep it in an easily accessible place for future reference. If you have any questions or concerns, please contact Technical Support for advice.

SAFETY INSTRUCTIONS

ATTENTION: This chapter contains important safety and operating instructions. Read and retain this manual.

1. Before using the equipment, read the inverter instructions and cautionary notices.
2. CAUTION - Use batteries appropriate for the power of your inverter. Regardless of the battery technology, the battery size must be correct.
3. Do not disassemble the equipment yourself. Contact qualified service personnel for repairs. Incorrect assembly may pose a risk of electric shock or fire, and any resulting failure will not be covered by the warranty.
4. For any maintenance or cleaning and to reduce the risk of electrocution, disconnect all cables as a precaution in the correct order.
5. **NEVER** charge frozen batteries.
6. For optimal operation of the inverter/charger, please take into account the characteristics of the recommended cables with the correct sections and terminals.
7. Be very careful when working with metal tools near batteries. Dropping tools on batteries can be dangerous and could cause an electrical problem.
8. Strictly follow the installation procedure when disconnecting the AC and DC terminals. It is imperative that the inverter be turned off when handling the AC terminals.
9. The use of a disconnect switch is recommended for battery connections. When connecting the wiring, this will prevent sparking and facilitate quick disconnection from the battery bank. Remember to disconnect the solar panels before disconnecting the batteries.
10. This inverter must always be grounded.
11. Be careful not to confuse the inverter inputs and outputs, as this may damage the equipment.
12. Attention!
    This inverter should only be installed and operated by qualified personnel.

INTRODUCTION

This unit is a multifunction inverter/charger that combines the functions of an inverter, solar charger, and AC battery charger to provide uninterruptible power. Its simple display provides the user with a convenient way to configure inverter functions, such as battery charging current, charger priority, and load power or input voltage, depending on the application.

Characteristics

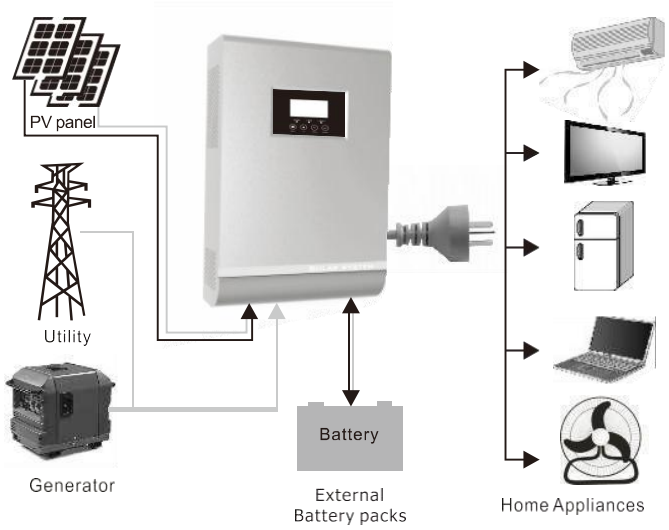
-Pure sine wave inverter.
-Input intensity adjustable via the display.
-Battery charging current adjustable via the display.
-Priority for both battery charging and adjustable load supply.
-Inverter compatible with 230V electrical grid or single-phase generator.
-Automatic restart in case of low battery or excessive consumption failures.
-Protection against overload / overheating / short circuit.
-Small battery charger designed to cover extra consumption demands and extend battery life.

Basic operating system

The diagram below shows how this inverter works. The diagram includes the grid or generator, photovoltaic modules, and batteries.

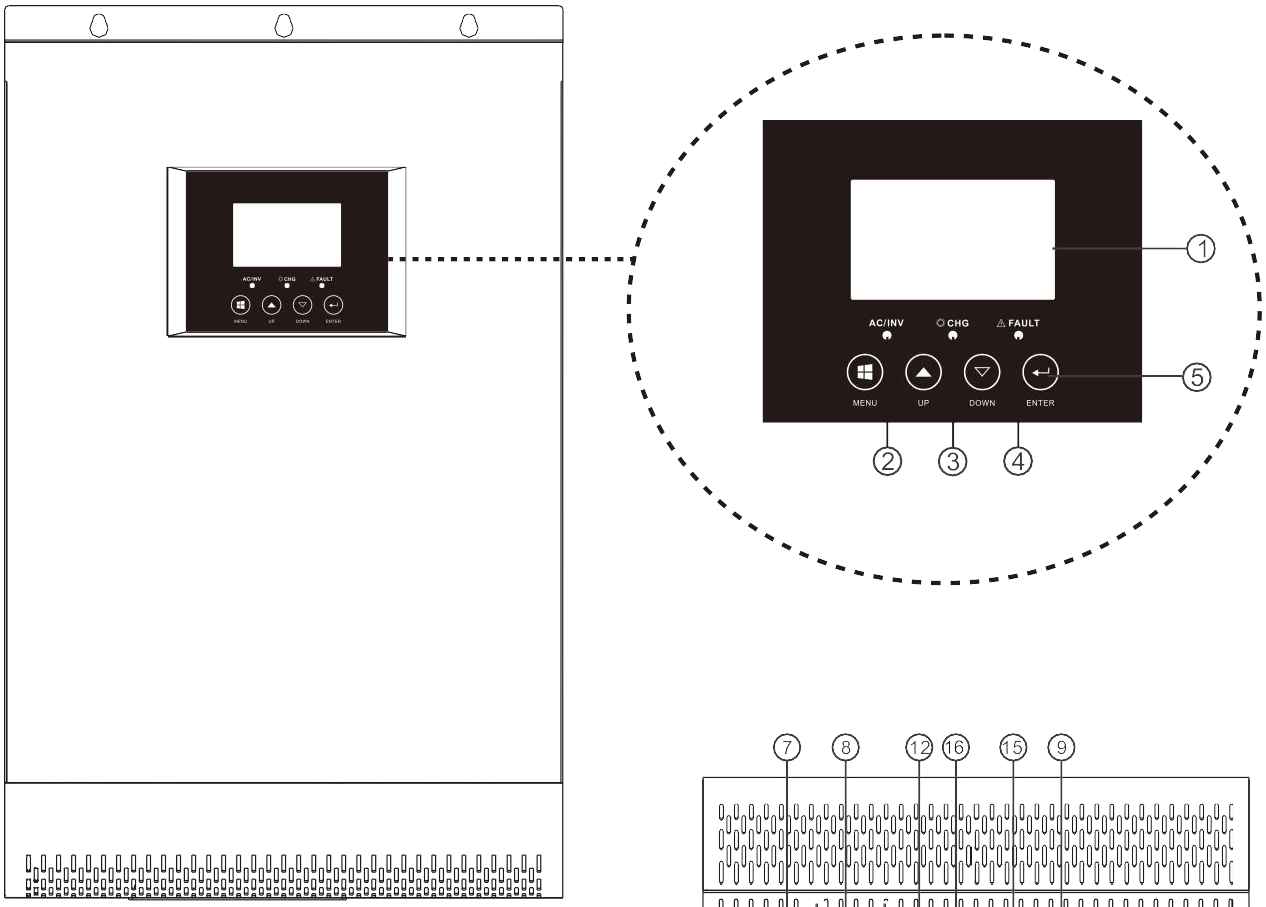
Consult your dealer for other systems to meet your needs (three-phase or higher power)

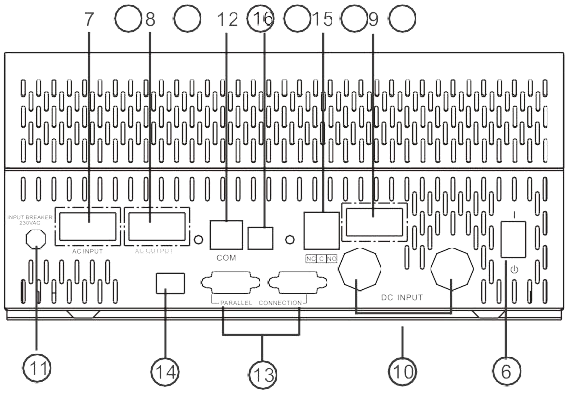
This inverter can power any household appliance, including applications with motors such as fans, refrigerators, or air conditioners.



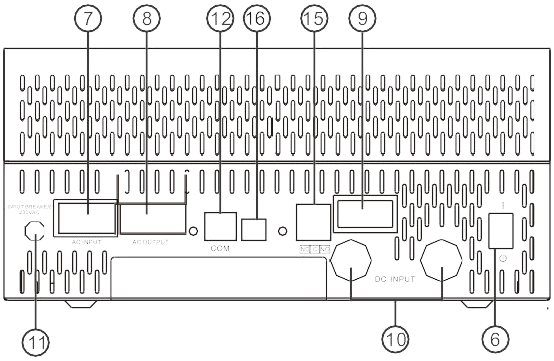
Note: Air conditioning applications need at least 2 or 3 minutes to start.
Please take this specification into account if you are connecting your air conditioning system to an inverter, as well as ensuring the correct sizing of the accumulator capacity.

Product Review

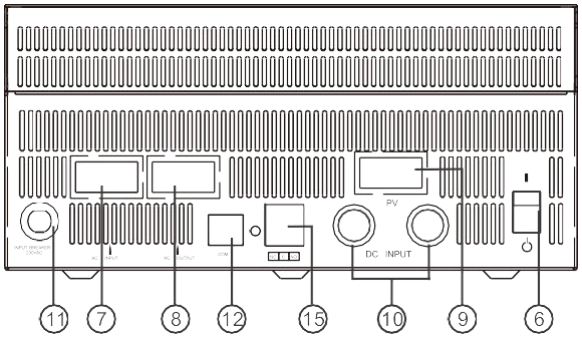




5KVA Models - PARALLEL



5KVA Models



3KVA Models

1. LCD display
2. Status indicator
3. Charging indicator
4. Error indicator
5. Function buttons
6. On/Off switch
7. AC input
8. AC Outlet
9. PV Input
10. Battery input
11. AC input circuit breaker
12. Communications port
13. Parallel communication cable
14. Connection for parallel installation
15. Automatic start contactor
16. USB port

FACILITY

Unpacking and inspection

Before installation, please inspect the equipment. Make sure nothing is damaged. The following items should be included in the shipment:

- Must Solar Inverter x 1 User
- Manual x 1 Communication
- Cable x 1 Software CD x 1
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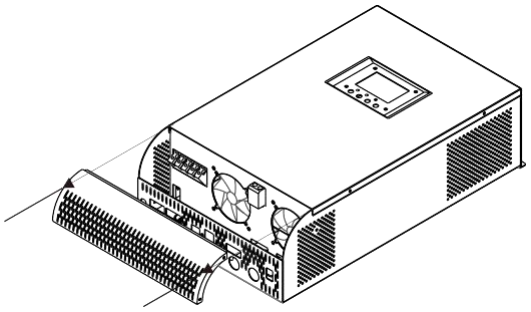


Preparation

To make all the connections it is necessary to remove the lower cover of the inverter by removing the 4 screws that hold it.**Removing the top cover voids the product warranty!**

Mounting the inverter

Consider the following points before selecting the inverter installation location:

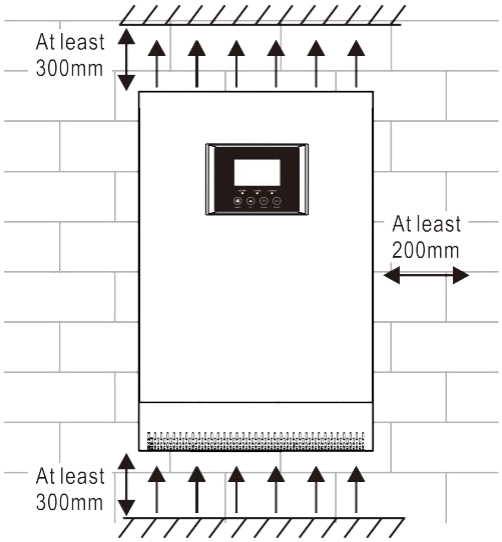
-Do not mount the inverter in places with flammable materials.

-Please note that the surface is solid.

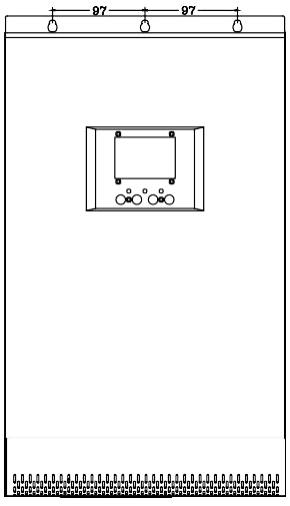
-Install the inverter at eye level so you can see the display notifications at all times.

-For proper heat dissipation, consider the clearances on the sides, top, and bottom of the inverter from other objects or devices. (Figure, right)

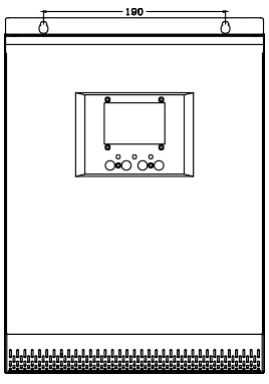
-The ambient temperature should be between 0ºC and 55ºC (without condensation) to ensure optimal operation.



-The recommended position is vertical.



4~5KVA



2~3KVA

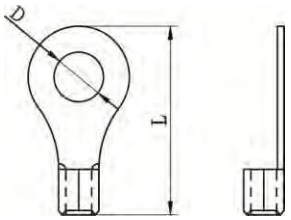
-Make sure you have enough space to be able to remove the screws if necessary.

-The inverter is not resistant to water or abrasives. Make sure it is protected from leaks and vapors that may be produced by connected batteries. We recommend keeping the inverter slightly separate from the battery location.

Place the equipment by screwing the three screws indicated in the diagram.

Battery connection

CAUTION: For safe operation before connecting the batteries, install a power disconnect switch between the batteries and the inverter.



WARNING!All connections must be made by qualified personnel.

WARNING!It is very important for system safety and efficient operation to use the appropriate cables for the connection of batteries. To reduce any risk, use the recommended cable and terminals shown in the table below or contact your dealer.

MUST SOLAR

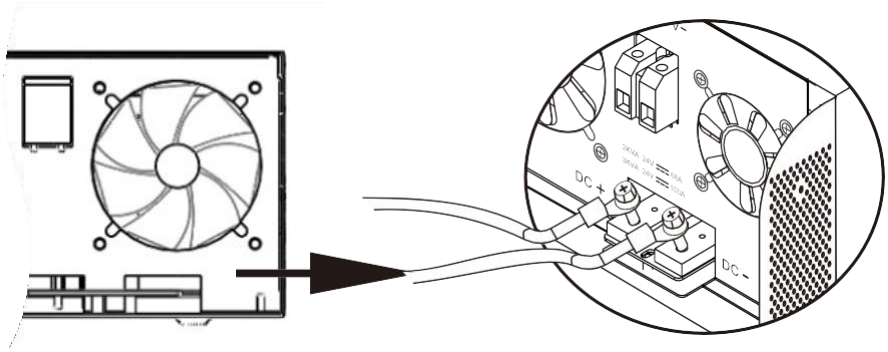
Model	Amperage typical CC	Amperage maximum CC	Ability min. battery	Cable to battery	Tightening torque
1KW	85A	150A	150Ah	35mm2	2~3 Nm
3KW	125A	225A	230Ah	50mm2	2~3 Nm
5KW-24V	200A	375A	500Ah	50mm2	2~3 Nm
5KW-48V	100A	185A	400Ah	50mm2	2~3 Nm

WARNING!
When wiring panels, you must respect the maximum input voltage supported by the inverter regulator; overvoltage in the solar field can seriously damage the charge regulator.

WARNING!
For investors with**PWM regulator**, make sure you never exceed the maximum voltage and usethe same voltage in solar field as in batteries .

For investors with**MPPT regulator**, never exceed the maximum voltage on each panel string. The open-circuit sum of the panels in each string should not exceed 145 volts under low-temperature conditions.

Insert the battery cable into the terminal and make sure it is securely fastened. Also, make sure to ensure the correct polarity between the batteries and the inverter/charger. We recommend first connecting the cable inside the inverter and then to the battery terminal, or using a power disconnect switch.



WARNING: Electrocution

Installation must be done with extreme care due to the high intensity of battery current.

ATTENTION!!Do not apply any anti-oxidant to the battery terminals once they are connected, instead use petroleum jelly before connecting. **ATTENTION!!**Before making the last DC connection or opening the DC switch, make sure the polarity is correct.

AC input and output connection

ATTENTION!!Before connecting the AC input, please install a circuit breaker between the grid input and the inverter. This system will allow emergency disconnection in case of any problem.

ATTENTION!!There is a silkscreen about the terminals with the brands "INPUT" and "OUTPUT." Keep these instructions in mind to avoid mistakes when connecting the input and output.

WARNING!All connections should be made by qualified personnel.

WARNING!It is very important for system safety and efficient operation to use the appropriate cables for connection to the power grid. To reduce any risk, use the recommended cables and terminals listed in the following table:

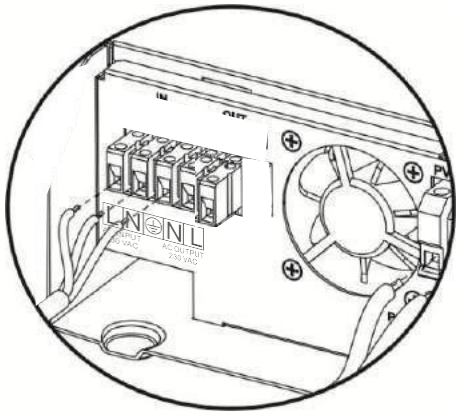
Model	Section mm2	Tightening torque
1KW	1.5 mm2	0.5~0.6 Nm
3KW	2.5 mm2	0.8~1.0 Nm
5KW	4 mm2	1.4~1.6 Nm

Please follow the steps below to install the AC inlet and outlet:

WARNING: Make sure the network is disconnected.

1. Before connecting the AC input and output, be sure to turn off the inverter with the bottom switch.
2. Remove the insulating shield from the connectors. Remember to leave a gap to facilitate connection.
3. Connect the AC connection cables to the terminal blocks, taking into account the different polarities. Remember to connect the ground wire first.

L→LINE (brown or black)
⏚→ EARTH (yellow and green)
N→NEUTRAL (blue)

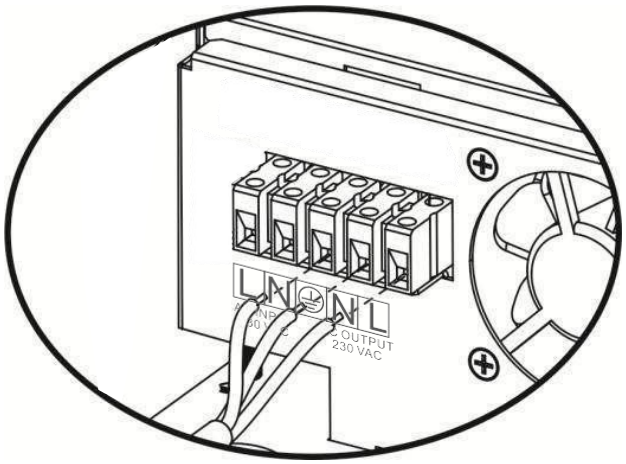


4.Connect the output connectors according to the polarities indicated on the terminal block.

Make sure to connect the ground wire first () **L→LINE (brown or black)**

→ **Earth (yellow-green)**

N→Neutral (blue)



5. Make sure the cables are connected securely.

Connecting photovoltaic (PV) modules

ATTENTION: Before connecting the photovoltaic modules, make sure the battery is connected to the inverter.Connecting the panels before the batteries can damage the regulator. .

WARNING!All connections should be made by qualified personnel. You can use a fuse and disconnect switch to quickly and easily disconnect the modules.

Selection either n of them either doppelgangers photovoltaic:

WARNING!When selecting the appropriate modules, keep the following considerations in mind:

1. The open-circuit voltage of the photovoltaic modules cannot exceed (Voc) the maximum voltage of the inverter. The sum of the Imp currents of the panels cannot exceed the maximum current of the regulator.

PWM

INVESTOR MODEL	1KW	3KW	5KW
Solar charger			
Charger current (PWM)	50 A		60 A
DC voltage	12Vdc	24Vdc	48Vdc
Voltage range	15~18Vdc	30~32Vdc	60~72vdc
Max open circuit voltage	**30Vdc**	**60Vdc**	**90Vdc**

1. If you use 12V panels (36 cells):

   12V Inverter - All connected in parallel.
   24V inverter - All connected in series-parallel pairs (an even number is required). 48V inverter - All connected in groups of 4 units in series (a multiple of 4 is required).

2. If you use 24V panels (72 cells):

   12V inverter - Not possible with PWM controller.
   24V inverter - All connected in parallel.
   48V Inverter - All connected in series-parallel pairs (an even number is required).

3. 60-cell panels should not be used with PWM regulators (the efficiency is very low).

MPPT

INVESTOR MODEL	3KVA 24V	5KVA 48V
Solar charger		
Minimum voltage	30 Vdc	60 Vdc
Voltage range	30~80vdc	60~115vdc
Max open circuit voltage	**100Vdc**	**145Vdc**

The efficiency of photovoltaic modules will increase as the voltage approaches the optimal Vmp. (Note: * Vmp: maximum voltage point of the panel)
With MPPT regulator you can use<u>any type of panels</u> As long as the voltage range of the panels is always within the limits set by each inverter model. If we need to create parallel connections to add more total power, all branches must operate at the same voltage.

P<u>MAXIMUM POWER ON PLATES ACCORDING TO PWM INVERTER</u>

1 KW€50A / 8.5A (x 150W panel) = 5 panels x 150W = 750W approx. | PARALLEL CONNECTION

1 KW€50A / 11A (x 200W panel) = 4 x 200W panels = approx. 800W | PARALLEL CONNECTION

3 KW€50A / 8.5A (x 320W panel) = 5 panels x 320W = 1600W approx. | PARALLEL CONNECTION

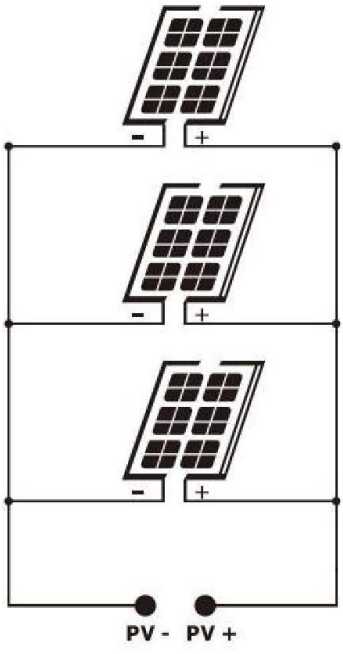
5 KW€60A / 8.5A (x pair of 320W) = 12 panels x 320W = 3800W approx. | SERIES-PARALLEL

<u>MAXIMUM POWER IN PLATES ACCORDING TO MPPT INVERTER</u>

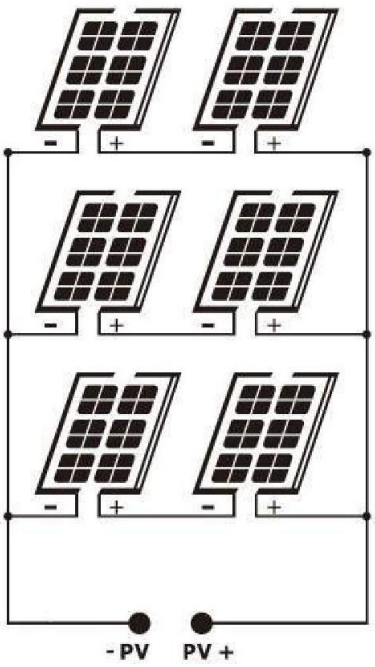
3 KW€50A x 28V = 1400W Distribution in pairs for 72c panels and for 60c panels.

5 KW€80A x 28V = 2240W Distribution in pairs for 72c panels and in trios for 60c panels.

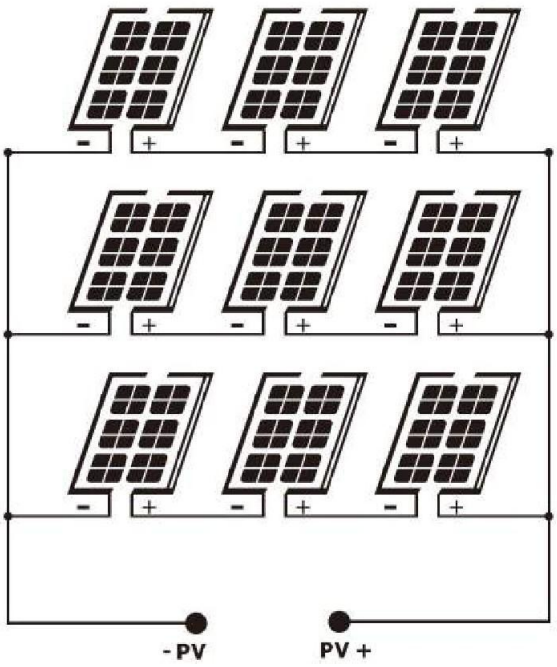
5 KW€80A x 54V = 4320W Distribution in pairs for 72c panels and in trios for 60c panels.



parallel panels

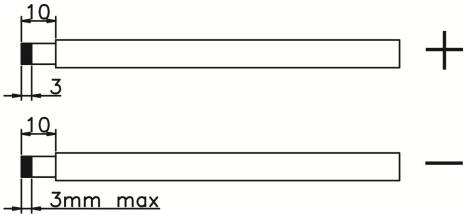


series-parallel panels in series of 2 units



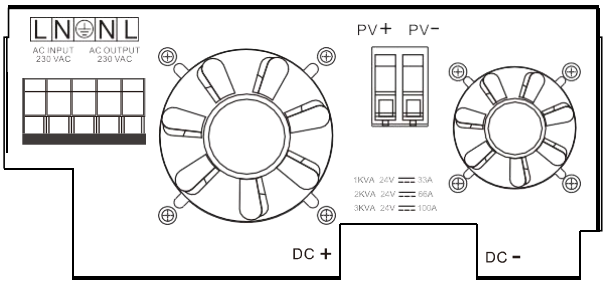
series-parallel panels in series of 3 units

Follow these steps to install the photovoltaic modules:

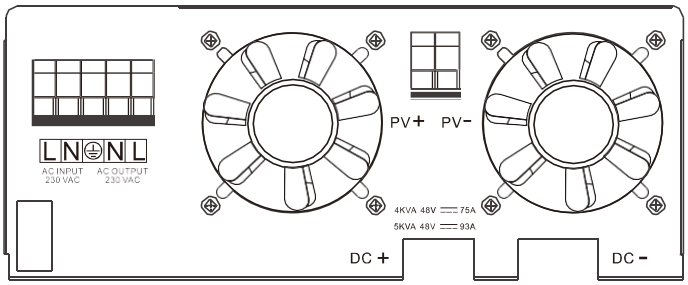


1. Remove the insulation protector from the positive and negative poles

2. Check the polarity of the input and output cables and photovoltaic modules and make connections taking these polarities into account.



（1–3KVA）



（4–5KVA）

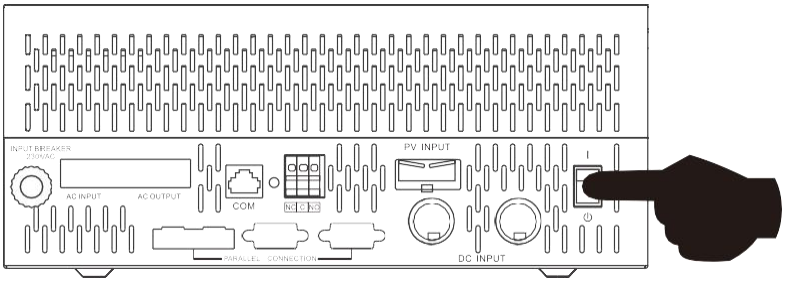
3. Make sure the cables are connected firmly.

Dry contact signs

On the bottom of the device are dry contact terminals. This can be used to send external alerts when the battery voltage drops to the minimum we have specified. The following table shows how it works.

State investor	**Situation**			**Port contacts dry** 	
				NC & C	**NO & C**
Off	The equipment is off and there is no output			Closed	Open
On	The loads are being supplied through the grid			Closed	Open
	The loads are being fed for energy solar and by the batteries	Program 01 configured network priority (Utility)	Bat voltage < Low DC voltage warning	Open	Closed
			Battery voltage > Voltage set to program 13 or when it reaches the float voltage	Closed	Open
		Program 01 configured as a priority Solar SBU or SUN	Battery voltage < Set Pr. 12	Open	Closed
			Battery voltage > Value set in Pr. 13 or when it reaches float voltage	Closed	Open

On/Off

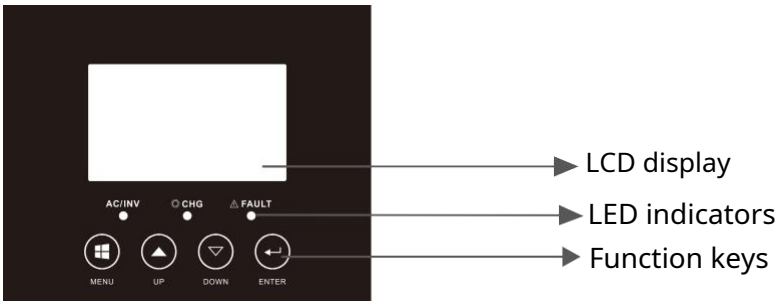


Once the device is properly installed, turn the power switch to the ON position (located on the bottom right of the device).
This button**It only acts on the 230V power output**from the inverter. Both the charge controller and the external 230V grid can charge the batteries even if the inverter is turned off with this switch.

If we are going to be away for a long period of time and there will be no power supplies connected, we can turn off the inverter using the lower switch. Once it is off,**will be responsible for keeping the batteries charged**if you have the panels connected.

Operation and display

The display consists of three indicator LEDs and four buttons to access the different inverter configuration menus.



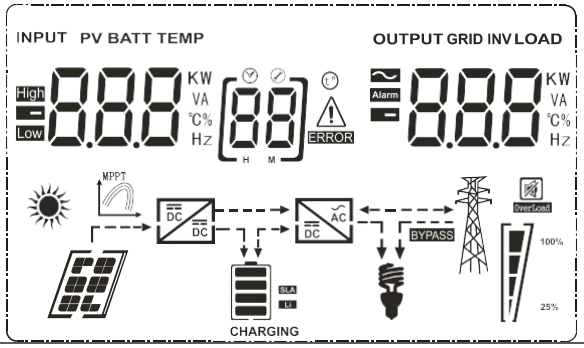
LED Indicators

LED Indicators			Messages
AC / INV	Green	Fixed	Output available in bypass mode.
		Blink	Output powered by batteries in inverter mode
CHG	Yellow	Blink	Battery charging or discharging
⚠ FAULT	Red	Fixed	Error mode
		Blink	Warning mode

Function buttons

Button	Description
MENU	Enter or exit settings or go to the previous selection.
UP	Increase value.
DOWN	Decrease value.
ENTER	Confirm the selection in settings mode or advance to the next selection.

Display Icons



Icon	Job description
Input source	
	AC input indicator.
	PV input indicator (photovoltaic modules)
KW VA ℃% Hz	Indicator of input voltage, input frequency, plate voltage, battery voltage and charger current.
Program settings and error information	
	Indicates the configuration program number
ERROR	Indicates the alarm or error code. Alarm: flashes with the alarm code Mistake: turns on with error number
Exit information	
KW VA ℃% Hz	Indicates output voltage, output frequency, load percentage, load in VA and W.
Battery information	
SLA Li CHARGING	Indicates the approximate charge level 0-24%, 25-49%, 50-74% and 75-100%.

In grid mode, the battery charge status will be present.

State	Battery voltage	Display
Current mode constant / Tension mode constant	< 2 V / cell	4 bars flashing
	2 – 2083 V / cell	One of them is fixed and the other three are blinking.
	2.083 – 2.167 V / cell	Two fixed bars and two flashing bars
	> 2167 V / cell	The three bottom bars are fixed and one is flashing
Float mode. Batteries fully charged.		The four bars will be fixed

In battery mode, an estimate of the battery charge will appear:

Load percentage	Battery voltage	Display
Load > 50%	< 1.717 V / cell	
	1.717 V/cell – 1.8 V/cell	
	1.8 – 1.883 V / cell	
	> 1.883 V/cell	
50% > load > 20%	< 1.817 V / cell	
	1.817 V/cell – 1.9 V/cell	
	1.9 – 1.983 V/cell	
	> 1.983	
Load < 20%	< 1.867 V / cell	
	1.867 V/cell – 1.95 V/cell	
	1.95 – 2.033 V / cell	
	> 2,033	

Power consumption information				
OVER LOAD	Indicates overload			
100% 25%	Indicates the consumption level 0-24%, 25-50%, 50-74% and 75-100%.			
	0%~25%	25%~50%	50%~75%	75%~100%
Operating mode information				
	Indicates that the device is connected to an external 230V source.			
	Indicates that the inverter is connected to the solar panels.			
BYPASS	Indicates that the load is supplied through the mains.			
DC DC	Indicates that the solar charger is working.			
AC DC	Indicates that the DC/AC inverter circuit is working.			
Mute				
	Indicates that the device alarm is disabled.			

DISPLAY

Display menu settings

After pressing ENTER for 2 seconds, the device enters settings mode. Pressing the ENTER button will advance, and pressing the MENU button will advance. In each setting, pressing the "UP" or "DOWN" buttons will change the information depending on the program you are currently in. To exit the menu, scroll to the last option by pressing the ENTER button intermittently.

Progr	Description	Option	
00	Exit the menu configuration		Exit the settings menu
01	Food priority loads		Solar power provides power as the first priority. If the battery voltage is higher than the voltage set in step 21 for more than 5 minutes, the inverter will switch to battery mode. Solar power and the battery will power the loads. If the battery voltage drops below the voltage set in step 20, the inverter will enable bypass. The grid will cover power consumption, and solar power will charge the battery at the same time.
			Solar energy provides power as the first priority. If, within a 5-minute interval, there is solar production and the battery voltage is higher than the voltage set in point 21, the inverter will switch to battery mode. Solar energy and the battery will power the loads. If the battery voltage drops below the voltage set in point 20, the inverter will enable bypass. The grid will cover the current consumption, and solar energy will charge the battery at the same time.
		(default) The external grid provides power for the 	consumption as the first priority. Solar and battery power will power consumption only when the power grid is unavailable.
02	Alternating input range		When we select this mode, the AC input range can vary between 90 and 280Vac.
			When we select this mode, the AC input range can vary between 170 and 280Vac.
			The AC input range may vary between 184 and 254Vac according to standard VDE4105
			This mode should be selected when connecting a generator to the AC input.

03	Output voltage		Sets the output voltage range. (between 220 and 240Vac)
04	Output frequency	50Hz (default) 	60HZ 
05	Solar energy priority		Solar energy charges the battery as a first priority
		(predetermined) 	Solar energy feeds consumption as a first priority
06	Overload Bypass: When enabled, the inverter switches to external power if there is an overload in battery mode.	Bypass disabled 	Bypass enabled (predetermined) 
07	Auto restart when there is overload	Reboot disabled (predetermined) 	Reboot enabled 
08	Auto restart when overheating	Reboot disabled (predetermined) 	Reboot enabled 
10	Battery charger priority:	If this inverter/charger is connected to external power, standby or error mode, the charger can be programmed in the following modes:	
		First solar 	Solar power will charge the battery as a first priority. The external grid will charge the battery when solar power is unavailable.
		Solar and grid (predetermined) 	Solar and grid power will charge the battery at the same time.
		Solar only 	Solar energy will be the only one that charges the battery even if the grid is available.
		If the inverter charger is operating in battery or energy-saving mode, only solar power can charge the battery. Solar power can charge the battery if it is available and sufficient.	

<table>
<tr><td rowspan="2">11</td><td rowspan="2">Maximum load current:
To set the maximum combined load of solar energy + battery charger.</td><td>40A (default)
  </td><td>Depending on the model, we can increase the combined solar + charger charge up to 70A.</td></tr>
<tr><td>60A (default)
  </td><td>Depending on the model, the range up to which we can increase will be 80A for the combined solar + charger charge.</td></tr>
<tr><td>13</td><td>Maximum charger current</td><td>20A (depending on models)
  </td><td>30A (maximum depending on model)
  </td></tr>
<tr><td rowspan="4">14</td><td rowspan="4">Battery Type</td><td>AGM (default)
  </td><td>Open lead acid
  </td></tr>
<tr><td>GEL
  </td><td>Lead acid
  </td></tr>
<tr><td>Lithium-Ion
  </td><td>Personalized
  </td></tr>
<tr><td colspan="2">If we use the custom option, the detailed charging voltages can be configured in options 17, 18 and 19.</td></tr>
<tr><td rowspan="2">17</td><td rowspan="2">Bulk charge voltage (CV voltage)</td><td colspan="2">Default values: For 24V: 28.2V. For 48V: 56.4V
  </td></tr>
<tr><td colspan="2">Configurable parameter if we select USE in 14. 24V Model: Range between 24.0V and 29.2V.
48V model: Range between 48.0V and 58.4V.</td></tr>
<tr><td rowspan="2">18</td><td rowspan="2">Float charge voltage</td><td colspan="2">Default values: For 24V: 27.0V. For 48V: 54.0V
  </td></tr>
<tr><td colspan="2">Configurable parameter if we select USE in 14. 24V Model: Range between 24.0V and 29.2V.
48V model: Range between 48.0V and 58.4V.</td></tr>
<tr><td rowspan="2">19</td><td rowspan="2">Low Disconnect voltage</td><td colspan="2">Default values: For 24V: 20.4V. For 48V: 40.8V
  </td></tr>
<tr><td colspan="2">Configurable parameter if we select USE in 14. 24V Model: Range between 20.0V and 24.0V.
48V Model: Range between 40.0V and 48.0V.</td></tr>
</table>

20	Battery discharge limit when AC In is on available	Default values: For 24V: 23V. For 48V: 46V  Configurable parameter if we select USE in 14. 24V Model: Range between 22V and 29V. 48V Model: Range between 44V and 58V.
21	Battery charge limit when AC In is available	Default values: For 24V: 27V. For 48V: 54V  Configurable parameter if we select USE in 14. 24V Model: Range between 22V and 29V. 48V Model: Range between 44V and 58V.
22	Screen change automatic	(predetermined)  The inverter will automatically change the information displayed on the screen.  The inverter will keep the latest information we consulted on screen.
23	Backlight control	On  Off (default) 
24	Alarm control	On (default) Alarm off  
25	Warning when the primary power source is interrupted	Notice activated  Warning disabled (default) 
27	Error log	Logging On (default) Logging Off  

After pressing and holding the “MENU” key for 6 seconds, the device will enter reset mode. Press the “UP” and “DOWN” buttons to select an option. Press the “ENTER” button to exit.

	(predetermined) 	Disable reset
		Enable reset

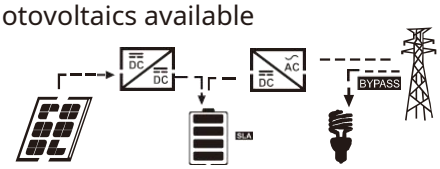
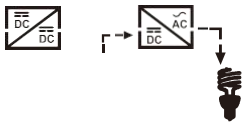
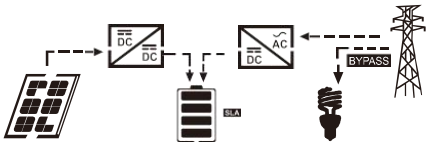
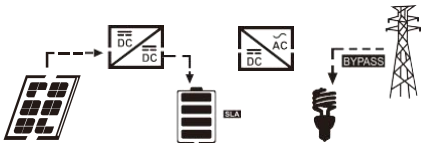
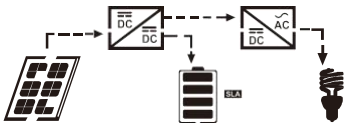
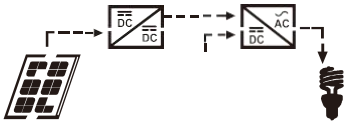
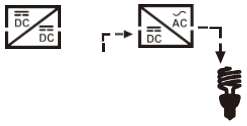
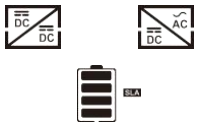
Error Reference Table

Error No.	Error description	Icon
01	Blocked fan	
02	Excess temperature in the transformer	
03	Battery voltage too high	
04	Battery voltage too low	
05	Short circuit at the output	
06	Excessive voltage at the inverter output	
07	Overload	
08	Excessive voltage on the inverter bus	
09	Bus boot error	
11	Main relay failure	
21	Inverter output voltage sensor error	
22	Charger voltage sensor error	
23	Error in the inverter output current sensor	
24	Charger current sensor error	
25	Error in the consumption current sensor	
26	Charger current intensity error	
27	Inverter radiator overheated	
31	Voltage error in the solar charge controller	
32	Error in the solar charge controller current sensor	
33	Solar charge controller current out of range	

41	Low voltage at the charger input	
42	High voltage at the charger input	
43	Low frequency at the charger input	
44	High frequency at the charger input	
51	Overcurrent protection error	
52	Inverter bus voltage too low	
53	Bus boot error	
55	Excess voltage on the AC output	
56	Battery connection error	
57	Inverter current sensor error	
58	Inverter output voltage too low	

61	Fan blocked with inverter on	
62	Fan 2 blocked with the inverter on	
63	Battery with excess voltage	
64	Low battery	
67	Overload in consumption	
70	Output power reduction	
72	Solar battery charging interrupted due to low battery	
73	Solar battery charging interrupted by high PV voltage	
74	Solar battery charging interrupted due to overcurrent	
75	Solar charger with excess temperature	
76	Communication error in solar charger	
77	Parameter error	

Description of operating states

State	Description	LCD screen
With external power grid	Solar battery charging. External network feeds consumption and also charge battery.	Photovoltaics available 
		No panel production 
State of charge	Solar and grid energy charge batteries simultaneously	
On bypass	Internal error due to short circuit or other reasons such as excessive temperature or error in the inverter output.	
In isolation	The investor provides energy from solar panels and from batteries.	Consumptions powered by solar. 
		Consumptions powered by solar and batteries 
		Battery powered consumption 
At a stop	The inverter stops if the power is disconnected. same or by a error of availability of the grid	

On-screen information

The LCD screen displays information that can be accessed by pressing the "UP" or "DOWN" buttons. The available information is displayed in the following order: battery voltage, battery current, inverter voltage, inverter current, grid voltage, grid current, wattage, VA, input frequency, output frequency, panel voltage, panel load power, photovoltaic charge voltage, and panel charge intensity.

Information	LCD screen
Battery voltage / DC discharge current	
Inverter output voltage / inverter output current	
Mains input voltage / mains current	
Consumption in kW / VA	
Grid input frequency / inverter output frequency	
Panel voltage and incoming photovoltaic power	
Solar charger output and MPPT charging current	

SPECS

Power unit

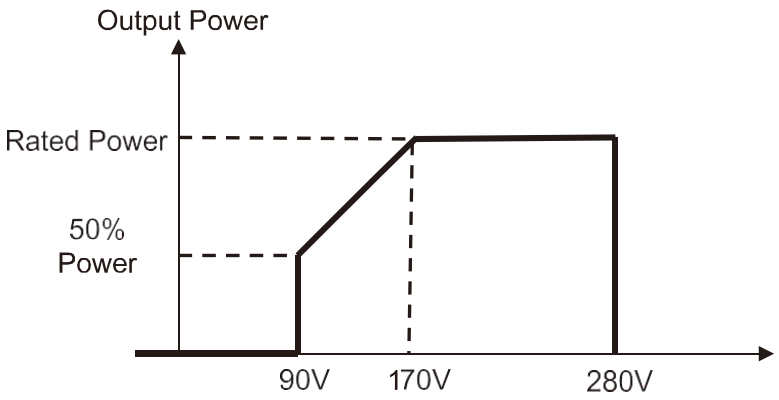
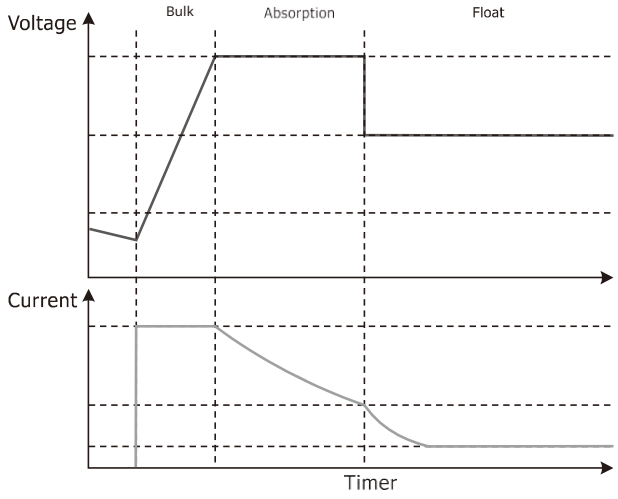
MODEL	3000VA	5000VA
Input wave	Sinusoidal (grid or generator)	
Nominal input voltage	230Vac	
Low voltage loss (modes)	90Vac±7V(APL,GEN); 170Vac±7V(UPS) 186Vac±7V(VDE)	
Low voltage return (modes)	100Vac±7V(APL,GEN);180Vac±7V(UPS) 196Vac±7V(VDE)	
High voltage loss limit (modes)	280Vac±7V(APL, UPS, GEN) 253Vac±7V(VDE)	
High return voltage (modes)	270Vac±7V(APL,UPS,GEN) 250Vac±7V(VDE)	
Maximum input voltage	300Vac	
Nominal input frequency	50Hz / 60Hz (Auto detection)	
Low frequency loss	40HZ±1HZ(APL,UPS,GEN) 47.5HZ±0.05HZ(VDE)	
Low frequency recovery	42HZ±1HZ(APL,UPS,GEN) 47.5HZ±0.05HZ(VDE)	
High frequency loss	65HZ±1HZ(APL,UPS,GEN) 51.5HZ±0.05HZ(VDE)	
High frequency recovery	63HZ±1HZ(APL,UPS,GEN) 50.05HZ±0.05HZ(VDE)	
Output short circuit protection	Line mode: Circuit breaker Battery mode: Electronic circuitry	
Efficiency (Line Mode)	> 95% (Constant charge, fully charged battery)	
Transfer time	10ms typical (UPS, VDE) 20ms typical (APL)	
Power restriction: When the voltage at the AC input drops below 170V depending on the model the output power will decrease.	230Vac model: 	

Table 2 Inverter specifications

INVESTOR MODEL	**3000**	**5000**
Nominal output power	3KVA/3KW	5KVA/5KW
Wave type	Pure sine wave	
Output voltage regulation	230Vac±5%	
Output frequency	60Hz or 50Hz	
Peak Efficiency	90%	
Overload protection	5s@≥150% load; 10s@110%~150% load	
Peak starting power	2* nominal for 5 seconds	
Nominal battery voltage	24Vdc	48Vdc
Cold start voltage	23.0Vdc	46.0Vdc
Low voltage alarm		
@ consumption < 20%	22.0Vdc	44.0Vdc
@ 20% ≤ consumption <50%	21.4Vdc	42.8Vdc
@ consumption ≥ 50%	20.2Vdc	40.4Vdc
Low voltage alarm recovery		
@ consumption < 20%	23.0Vdc	46.0Vdc
@ 20% ≤ consumption <50%	22.4Vdc	44.8Vdc
@ consumption ≥ 50%	21.2Vdc	42.4Vdc
Low voltage cut-off		
@ consumption < 20%	21.0Vdc	42.0Vdc
@ 20% ≤ consumption <50%	20.4Vdc	40.8Vdc
@ consumption ≥ 50%	19.2Vdc	38.4Vdc
High voltage alarm recovery	29Vdc	58Vdc
Maximum disconnection voltage	30Vdc	60Vdc
No-load consumption without load	<20W	<50W

Table 3 Charger specifications

Battery charger					
Investor Model		**3000 PWM**	**3000 MPPT**	**5000 PWM**	**5000 MPPT**
Charging current @Nominal input voltage		30A		60A	
Absorption Voltage	**AGM / Gel / LEAD Battery**	25Vdc		50Vdc	
	Open battery	25Vdc		50Vdc	
Refloating Voltage	**AGM / Gel / LEAD Battery**	27.4Vdc		54.8Vdc	
	Open battery	27.4Vdc		54.8Vdc	
Floatation Voltage	**AGM / Gel / LEAD Battery**	28.8Vdc		57.6Vdc	
	Open battery	28.8Vdc		57.6Vdc	
Battery charging algorithms		3-stage (Open batteries, AGM/Gel), 4-stage (LI)			
Solar charger					
Investor Model		**3000 PWM**	**3000 MPPT**	**5000 PWM**	**5000 MPPT**
Charging current		50A	50A	60A	80A
System voltage		24Vdc	24Vdc	48Vdc	48Vdc
Operating voltage range		30-32Vdc	30-80Vdc	60-72Vdc	64-130Vdc
Maximum open-circuit voltage PV		70Vdc	100Vdc	105Vdc	145Vdc
Standby consumption		2W			
Battery voltage accuracy		+ /-0.3%			
Precision voltage panels		+/-2V			
Battery charging algorithms		3-stage (Open batteries, AGM/Gel), 4-stage (LI)			
Lead-acid battery charging curve (open / AGM / GEL)					

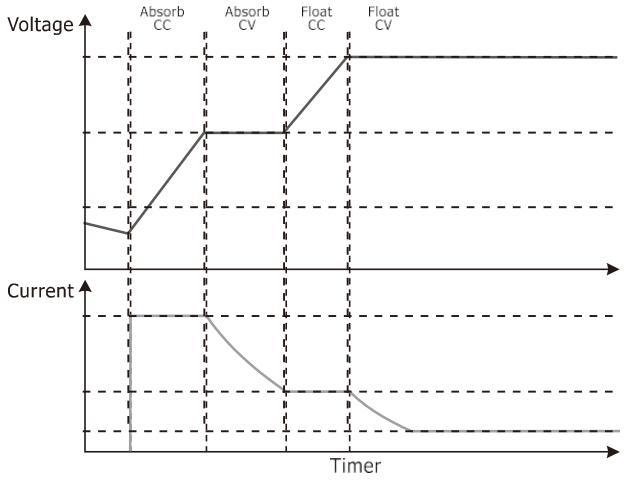
Lithium battery charging curve		
Joint solar charging + charger		
INVESTOR MODEL	**3000**	**5000**
Maximum load current	80A	140A (MPPT)/120A (PWM)
Default charging current	60A	60A

Table 4 General specifications

INVESTOR MODEL	**3000**	**5000**
Security certification	EC	
Operating Temperature Range	0°C to 55°C	
Storage Temperature Range	- 15°C~ 60°C	
Dimensions (mm)	272x 355 x 125	297.5 x 468 x 125
Net weight, kg	6.9 to 11 kg	10.2 to 12.5 kg

PROBLEM SOLVING

Problem	LCD/LED/Beep	Explanation/Cause	To do
The device is turns off during the process of start	LCD, LEDs and beep active for 3 seconds and act they often turn off	The battery voltage is very low (<1.91V/cell)	1.Recharge battery. 2.Replace battery.
No answer after starting	They do not indicate anything	1.Extremely low battery voltage (<1.4V/cell) 2.Incorrect battery polarity.	1.Check the battery connection. 2.Recharge battery. 3.Replace battery.
There is an entrance of network but it continues working in battery mode.	The input voltage is 0 and the green light blinks.	Input protection has been triggered.	Check if the AC protection has tripped and the connection is correct.
	Green light flashing	Poor quality of the electrical wave connected to the AC input.	1.Check that the AC cables have the section and suitable length. 2.Check that the generator works in a suitable voltage range.
When it is connected, the relay does not stop start and stop	The display and LCD screen flash.	The battery is disconnected.	Check that the battery cables are securely fastened.
The beep is constant and the red light remains lit.	Error 07	Overload error. The inverter operates at 110% for a long time.	Reduce consumption connected turning off devices.
	Error 05	Short circuit at the output	Check wiring connections and disconnect suspicious power supplies.
	Error 02	The internal temperature exceeds 90ºC	Check that the airflow is not blocked and the ambient temperature is correct.
	Error 03	Battery overcharged	Take the product for repair
		The battery voltage is too high	Check that the batteries comply with the specs.
	Error 01	Fan failure	Take the product for repair
	Error 06 or 58	Abnormal output. Inverter offering voltage below 202Vac or above 253Vac	1. Reduce consumption connected. 2.Take the product for repair
	Error 08, 09, 53 or 57	Internal component failure	Take the product for repair
	Error 51	Input overcurrent	Restart the inverter. If the fault persists, have the product repaired.
	Error 52	Low bus voltage	
	Error 55	Unbalanced voltage output	
	Error 56	Battery not connected correctly	If the battery is properly connected, take the product in for repair.

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